

The Pandemic's Impact on Supply Chains from China and their Evolution: The View from South Korea

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Today's global economy is highly interconnected and interdependent. Supply chains across the world are finely tuned to deliver parts just when they are needed, so that companies and industries do not need to waste money on maintaining big warehouses. The economic system runs with remarkable efficiency, and companies are able to keep inventory to a minimum. However, firms have started rethinking their supply chains in response to changing labor costs, advances in automation, rising protectionism, and external shocks, such as natural disasters. In particular, the COVID-19 pandemic has revealed the structural fragility of current global supply chains and has forced many global enterprises to fundamentally reconsider their approach to global manufacturing and sourcing. The crisis has also highlighted geopolitical tensions, trade restrictions, and nationalist politics aimed at promoting a country's domestic industries, which are likely to continue reshaping the global business landscape. As a consequence, most global enterprises are going to be under greater political and competitive pressure to increase their domestic production, grow employment in their home countries, and rethink their use of lean manufacturing strategies that involve minimizing the amount of inventory held in their global supply chains.

Previously, supply chains were designed to keep costs low and inventories lean. However, supply chains are now being reworked to reduce the risks of future disruption even if doing so means incurring additional costs. Because China is decidedly the world's largest goods exporter and is also currently mired in a trade conflict with the United States, supply chains going through China may be among the most vulnerable to future disruptions. Hyundai, South Korea's largest automaker, temporarily stopped production lines at its factories in South Korea because of shortages of Chinese parts. The Hyundai shutdown—encompassing the first factory lines to be idled outside China—could foreshadow considerably more serious disruptions in the complex networks that supply automakers with essential components and materials (Automakers are especially susceptible to interruptions in the flow of goods because the industry is global, and cars are complex products with a myriad of precision parts).

Recognizing the risk that dependency on China poses to national industries, some governments have offered manufacturers incentives to exit China and ease the pain of diversification. For example, Japan put \$2.2 billion of its COVID-19 economic stimulus package into supporting its manufacturers moving toward shifting production outside of China. There was also mounting public pressure in some countries, such as the United States, to move essential production of pharmaceuticals and medical equipment out of China and closer to home.

It is, however, not that simple to reduce global supply chain reliance on China: the nation still retains not only considerable comparative advantages in many areas (e.g. electronics, machinery, and equipment manufacturing), but also enormous purchasing power as the world's second largest market. Even those companies that have diversified production are finding it hard to break free of China's pervasive influence. Anticipating a

rise in tariffs due to the U.S.-China trade conflict, videogame producer Nintendo shifted the manufacturing of its blockbuster gaming console called Switch to Vietnam in 2019. There was, however, a shortage of Switch consoles in stores in early 2020 due to a lack of essential components flowing to the company's Vietnamese factories, as COVID-19 paused production of component parts by Chinese suppliers. In addition, most businesses have developed complex interdependencies, resulting in a deep tiering of supply chains. Many manufacturers depend on first-tier suppliers which, in turn, rely on a second-tier, and so on. Therefore, relocating factories or replacing all Chinese suppliers would be infeasible in the short-term.

This chapter reviews the impact of supply chain disruption caused by COVID-19 on the South Korean economy and examines the future of regional supply chains centered on China. The rest of the paper is structured as follows. How supply chain disruption caused by COVID-19 will affect the South Korean economy, including trade, is discussed in Section 2. According to the latest national GDP report by the Bank of Korea (BOK), South Korea is going to see a mere 1 percent GDP contraction for 2020, the second-best performance among major economies behind only China. Reasons for why the South Korean economy was not seriously affected by the pandemic are also discussed in Section 2. Section 3 highlights the difficulty of reducing global supply chain reliance on China. China is likely to remain a key player, and the world must look at the reality that global supply chains are highly interconnected with China and that disconnecting from China's supply chain is not an easy economic task for many multinational companies. The final section offers a few concluding remarks on deepening regionalism specifically in Asia, including policy implications for South Korea.

The Pandemic's Impact on the Korean Economy

The COVID-19 pandemic proved to be an unprecedented shock to the world's economies, and South Korea's economy was no exception. However, it has successfully limited the damage to its economy from the crisis, through swift and effective measures to contain the virus and protect households and business. Until the second quarter of 2020, the Korean economy was quickly contracting as consumption and exports decreased. Industrial production dropped by 1.2 percent in the first quarter of 2020 compared with the fourth quarter of 2019, and severely fell by 3.5 percent in the second quarter. The service sector was also hurt critically in the first quarter, experiencing a drop of 3.0 percent, particularly among the food and accommodation service sectors (Table 1). Exports also began to decline rapidly in the first quarter of 2020. In April 2020, exports fell by 24.3 percent, the largest single month drop since the global financial crisis in 2008. For the second quarter, exports of goods and services declined 16.1 percent from the first quarter. As a result, real GDP decreased by 1.3 percent in the first quarter of 2020 compared to the previous quarter, and it continued to decline by 3.2 percent in the second quarter (Table 2).

Table 1. Growth Rates of Industrial Production (% change over previous quarter)					
	2020				
	Q1	Q2	Q3	Q4	Year
All Industry	-1.2	-3.5	2.6	2.0	-0.8
Mining, Manufacturing and Electricity & Gas	0.1	-7.1	5.7	3.7	0.4
Service Industry	-3.0	-1.5	1.9	1.2	-2.0

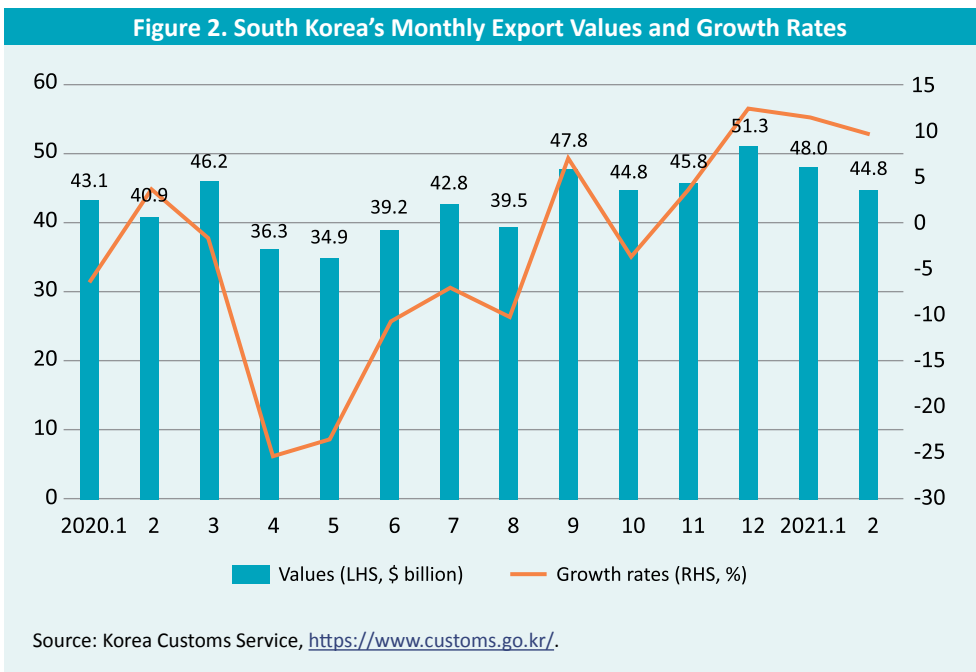
Source: Data from Statistics Korea, <https://kostat.go.kr/portal/eng/index.action>.

Table 2. Growth Rates of Real GDP, Trade, and GNI (% change over previous quarter)								
	2019				2020			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
GDP	-0.3	1.0	0.4	1.3	-1.3	-3.2	2.1	1.2
Total Exports	-3.1	1.9	4.5	0.6	-1.4	-16.1	16.0	5.4
<i>Goods</i>	-3.7	1.1	5.2	1.0	-1.0	-15.9	18.4	5.1
<i>Services</i>	1.0	7.5	-0.2	-2.5	-3.2	-17.4	-0.2	8.0
GNI	0.1	-0.2	0.4	0.6	-0.8	-2.2	2.4	1.4

Source: Data from Bank of Korea (2021), Gross National Income.

However, South Korea's economy returned to growth in the third quarter of 2020, recovering from its sharpest contraction in over a decade, as the government pushed through stimulus measures and major trading partners eased coronavirus restrictions. Industrial production grew 2.6 percent and real GDP advanced 2.1 percent in the third quarter from the previous quarter owing to a 16.0 percent turnaround in exports, which account for about half of GDP (Tables 1 and 2). Despite global demand being battered in the first half of 2020 and a weak economic outlook for many big economies amid a second wave of coronavirus infections, South Korea's exports have been revived. Leading tech manufacturers, including Samsung, LG, and SK, all benefited from robust demand, stemming from greater demand for connectivity during the pandemic, China's strong economic recovery, and a surge in demand from Huawei ahead of the latest U.S. sanctions against the Shenzhen-based telecom company. Recently, the BOK reported that the South Korean economy contracted by 1 percent in 2020. While this would be the country's worst performance since 1998, it would still make South Korea one of the best-performing economies in 2020 (Figure 1).

In February 2021, South Korea's exports increased by 9.5 percent compared with the same month in 2020. The main reason for the strong export performance in February is that the export unit price of Korea's flagship items such as automobiles, semiconductors, displays, and home appliances increased due to the recent global recovery, after consecutive months of growth in November (4.1 percent), December (12.6 percent), and January (11.4 percent) (Figure 2).



There could be several reasons why South Korea's economy continued its rebound from a pandemic slump, with exports and manufacturing activity rising in the third quarter of 2020 despite the virus resurgence. The main reason is the country's efficacious handling of the outbreak. The government never implemented a full lockdown in response to COVID-19 but instead decided to fight the virus aggressively through an epidemiological approach with wide diagnostic testing and isolation of contacts, while encouraging cooperation to adhere to social distancing based on trust in the authorities. Korea has won international praise for its swift deployment of mass testing, high-tech contact tracing, and tough quarantine rules to combat the virus. The Korean government already had valuable experience during the spread of the Middle East Respiratory Syndrome (MERS) in 2015 and was able to draw on this in their handling of COVID-19.¹ South Korea was able to contain the epidemic more efficiently than other nations and thus a strict national lockdown was largely unnecessary, which in turn meant less economic dislocation from shuttered factories, closed restaurants, and the like.

Even though South Korea was not hit as hard as most countries, it quickly launched a fairly aggressive fiscal response, pouring around \$12.2 billion, or about 0.7 percent of the GDP, into the pockets of businesses and citizens in early spring. This was not as big a percentage as that deployed by countries such as Germany, which launched a stimulus package worth around 4 percent of GDP. However, because Korea provided support quickly, it helped keep consumption levels up. South Korea is also continuing to provide support in the form of loans and guarantees totaling about \$238 billion.² Moreover, its fiscal response carried more "bang-for-the buck" than in other places. First, more businesses were open to spending the aforementioned cash payouts, which translated to consumers spending more and saving less of their bailout checks. Indeed, a significant portion of the money distributed in the first three tranches of stimulus payments was spent by consumers. Second, some provinces used supplemental creative solutions to ensure that government payouts would be recycled into the economy and help boost consumption.³

However, as in many countries, deficit hawks are worried about the sustainability of big fiscal stimulus packages that can ameliorate short-term pain, but only at the cost of long-term debt accumulation. A series of policies to overcome the pandemic has led to rapidly mounting debts in the private and government sectors, necessitating preemptive measures to secure financial soundness from a mid-term perspective. Given the long-term demographic changes and decline in potential growth, efforts are needed to control the pace at which government debt is growing and to secure financial sustainability.⁴

The Future of Regional Supply Chains Centered on China

The pandemic has affected many businesses around the world. From national lockdowns to closed borders, COVID-19 has disrupted economies, placed major strains on global supply chains, and demonstrated how vulnerable the modern supply chain can be to disruptions. There is a growing need and pressure for companies to build "resilient" supply chains. Hence, it is becoming increasingly apparent, considering news of shortages worldwide,

that the issue of unsteady global supply chains needs to be resolved in order to not only weather the current pandemic, but also to prepare for potential disruptions of a similar scale in the future.

Many companies were forced to look for alternatives when China, known as “the world’s factory,” shut down its plants and factories during COVID-19. The supply chains of many companies are reliant on China’s ecosystem. Businesses have learned this the hard way by heavily relying on China’s economy through this pandemic. In response, the CEOs of many companies requested that their supply chain teams find other sources that are wholly independent of China. In line with this message, there is much evidence that global companies are cooling on China. According to *Financial Times*, in the latest annual survey conducted by the American Chamber of Commerce in China, only 28 percent of member companies said their investment in China would increase in 2020, which is down from 48 percent in 2019, around 60 percent in 2018, and 81 percent in 2016.⁵ A Gartner, Inc. survey of 260 global supply chain leaders in February and March 2020 revealed that 33 percent had moved sourcing and manufacturing activities out of China or plan to do so by 2023.⁶

There was also increasing pressure from investors and government bodies who discouraged overreliance on any one source and called for decoupling from China. Trump’s push to “decouple” the U.S. economy from China is typical of such political pressure. Based on an article from Oxford Business Group,⁷ COVID-19 has intensified the trend of U.S. companies trying to realign supply chains closer to home in countries such as Mexico, while also diversifying them to mitigate potential risks by shifting production to ASEAN (Association of Southeast Asian Nations), such as Vietnam, Indonesia, Thailand, and Malaysia. There is a report that large Asian companies such as Honda and Samsung have already started to mitigate risks by expanding their sources beyond solely China.

However, alternative views suggest that these diversification efforts may take a long time or may be infeasible for certain companies. In particular, there is an argument that China remains popular as a manufacturing location due to its huge and expanding domestic market, competent labor, entrenched supplier ecosystem, as well as the government’s continued assistance towards manufacturers and its establishment of dependable infrastructure. The global technology and consumer electronics sectors are especially reliant on China’s infrastructure and specialized labor pool, neither of which will be easy to replicate.

The Chinese government is already mobilizing resources to convince producers of China’s unique merits as a manufacturing location. For example, Zhengzhou, within Henan Province, has appointed officials to support Apple’s partner Foxconn in mitigating the disruptions caused by COVID-19, while the Ministry of Finance is increasing credit support to the manufacturing sector. Further, the Chinese government is likely to channel stimulus efforts to develop the country’s high-tech manufacturing infrastructure, moving away from its low-value manufacturing base and accelerating its vision for a technology-driven service economy.⁸ Manufacturers are cognizant of China’s potential as a major consumer market for iPhones today and for advanced technologies such as robotics, autonomous vehicles, and smart devices in the near future. A poll by the Beijing-based U.S. Chamber of Commerce conducted in March 2020 shows that U.S. businesses are still bullish on Chinese consumers, despite the impact of the pandemic.⁹

Deep Relations in Trade Between China and Major Countries

China and major economies such as the European Union, United States, Australia, and Japan, developed important, rapidly growing trade and investment relations during the last two decades. The importance of trade with China is particularly remarkable for Australia, Japan, and South Korea as well as ASEAN countries. Figure 3 and Table 3 below show the dominance of China as an export or import market of major countries. China is Australia’s biggest trading partner for both exports and imports of goods. More than 40 percent of all goods exported in 2019 were toward China, while 25.9 percent of all goods imported were from China. China’s share (including Hong Kong) in Australia’s total exports rapidly rose to 40.6 percent in 2019 from 8.7 percent in 2000, while in imports it increased to 25.9 percent from 8.9 percent during the same period.

Both South Korea and Japan are increasingly reliant on China for their big export market. In 2019, China’s share of Japan’s total exports was about 24 percent and China’s share of South Korea’s exports was 31 percent. Japan’s imports from China account for about 24 percent of its total, similar to South Korea. China also accounts for more than 20 percent of the ASEAN 6 core countries’ total exports and imports. By comparison, China accounts for 12.7 percent of the EU’s total exports of goods and 21.0 percent of its total imports (Figure 3), and U.S. exports to China account for 8.4 percent of overall exports in 2019, indicating relatively low reliance on China. However, U.S. imports from China account for 18.6 percent of overall imports in 2019, slightly lower than other countries analyzed here (Table 3).

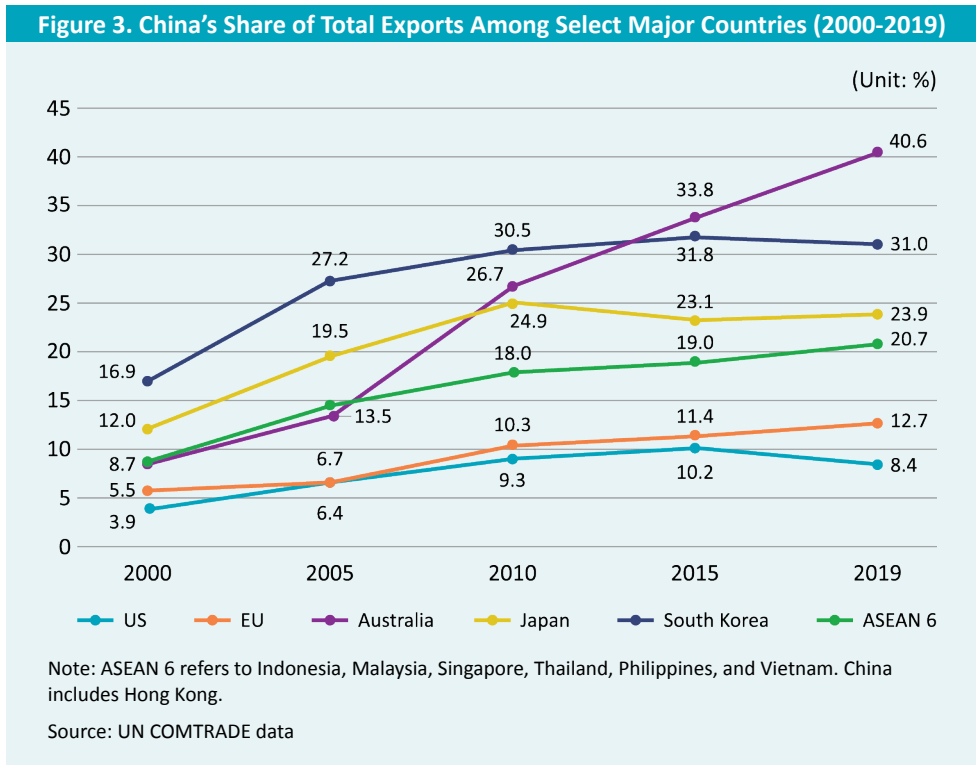


Table 3. China's Share of Total Imports Among Major Countries (2000-2019, %)

	2000	2005	2010	2015	2019
United States	9.2	15.5	19.7	22.1	18.6
European Union	8.7	14.1	19.4	21.1	21.0
Australia	8.9	14.7	19.4	23.6	25.9
Japan	15.0	21.3	22.3	26.0	23.8
India	4.5	8.7	14.0	17.3	17.9
South Korea	8.8	15.6	17.3	21.0	21.7
ASEAN 6	7.4	12.5	14.7	20.6	22.9

Note: ASEAN 6 means Indonesia, Malaysia, Singapore, Thailand, Philippines, and Vietnam. China includes Hong Kong.

Source: UN COMTRADE data

A close look at the trade level between China and other major countries reveals how deep cross-country integration is, with respect to China. In general, the number of manufactured goods traded is about 4,000~4,500 on the basis of HS six-digits.¹⁰ As shown in Table 4, the total number of manufactured goods imported in the EU is 4,427 and for the U.S. it is 4,373 (The second column of Table 4).

Analyzing trade with China not just by category, but also by volume is also revealing of the scope of cross-country integration. To do this, China's share of total imports by product and number of products in which imports from China ranks first among total imports of that product should be examined. For example, the U.S. imported automatic data processing machines and units (HS 847130) from almost 100 countries, including China. The total import value was \$40.9 billion in 2019 and the value from China was \$37.9 billion, so China ranked first in the U.S. import market for that product (HS 847130).

Table 4 and Table 5 show how major countries are dependent on China for a large number of the aforementioned products, showing the level of reliance on China in terms of the number of products. For the European Union, the number of manufactured goods whose imports from China ranked first in 2019 is 1,788, implying that about 40 percent of European Union's total imports relied on China in terms of number of products (Table 4). Although relatively small compared with other countries, the same indicator stands at 1,349 for the United States, implying that the reliance on China for imports in terms of number of products is about 31 percent. For most Southeast Asian countries, as well as Japan, Korea, and India, the number of manufactured goods for which imports from China ranked first is roughly 2,000, which means that the level of reliance on China is greater than 40 percent.

Table 4. The Level of Reliance on China: Major Economies (2019)

	The Number of Manufactured Goods Imported in 2019 (Based on H.S. 6 digit) (A)	The Number of Manufactured Goods Imported Whose Imports From China Ranks First Among Total Imports in 2019 (B)	(B/A) (%)
European Union	4,427	1,788	40.4
United States	4,373	1,349	30.8
Australia	4,154	1,765	42.5
India	4,293	2,015	46.9
Japan	4,225	1,932	45.7
Taiwan	4,233	1,677	39.6
Korea	4,351	1,985	45.6
ASEAN 6	4,202	1,906	45.4

Note: ASEAN 6 refers to Indonesia, Malaysia, Singapore, Philippines, Thailand, and Vietnam. Figures of ASEAN 6 imply the average value of six countries above.

Source: Author's calculation based on UN COMTRADE data

Table 5 shows a much clearer picture of how severely major countries are dependent on the imports from China. We calculate the number of products of which import values from China are greater than 50 percent, 60 percent, and 80 percent of total imports of the product concerned, and then check the ratio of those products to the total number of manufactured goods imported. As shown in Table 5, China's share of total imports is greater or equal than 50 percent for 990 out of 4,427 products for the EU, 22.4 percent (parentheses in the second column of Table 5).

For Australia, Japan, South Korea, India, Taiwan, and ASEAN 6, the frequency when X is 60 percent is in general higher than 20 percent (19.7 percent for Australia), which implies that those countries heavily rely on Chinese imports. The level of U.S. reliance on China is the lowest among countries analyzed here.

Table 5. The Number of Goods of which Imports from China is Greater or Equal than 50%, 60%, 80% of Total Imports of the Product Concerned and its Ratio (2019)

	EU	U.S.	Australia	India	Japan	Taiwan	Korea	ASEAN 6
X ≥ 50%	990 (22.4)	695 (15.9)	1,104 (26.6)	1,214 (28.3)	1,277 (30.2)	1,154 (27.3)	1,320 (30.6)	1,225 (29.1)
X ≥ 60%	707 (16.0)	492 (11.3)	817 (19.7)	931 (21.7)	956 (22.6)	853 (20.2)	1,032 (23.7)	938 (22.3)
X ≥ 80%	261 (5.9)	198 (4.5)	349 (8.4)	441 (10.3)	423 (10.0)	410 (9.7)	501 (11.5)	460 (10.9)

Note: X implies China's share (value term) of total imports of the product concerned. Parentheses means the ratio of the products to the total of trading manufactured goods. ASEAN 6 means Indonesia, Malaysia, Singapore, Philippines, Thailand, and Vietnam.

Data: Author's calculation based on UN COMTRADE data

Complexity of Modern Supply Chains

Complexity of current supply chains can be an important factor contributing to the difficulty of relocating global companies' supply sourcing out of China. Modern supply chains have been built up over generations, through complex processes and interactions among enormous sub-suppliers. Thus, untangling supply chains is a complex task. Many ICT companies can have hundreds of junior tier suppliers for a single product and they often do not know who their tier-2, tier-3, or tier-4 suppliers are. Companies find that some of their tier-1 suppliers do not want to share who their suppliers are for reasons that can seem unfounded. Indeed, some tier-1 suppliers withhold this information by claiming that there are proprietary or regulatory reasons for doing so, which strikes most companies as not credible.

On the other hand, it is difficult for original equipment manufacturers (OEMs) to tell a company where every single component of a product is sourced from and at what location because these more junior tier suppliers are frequently changed. For many high volume "commercial off the shelf" (COTS) products, the ability to source components from multiple suppliers is essential for managing cost and agility. To that end, many companies also try to reduce risk by avoiding custom designs that require specialized components and, therefore, vendors. In most cases, however, companies desire enhanced communication and information-sharing with their vendors and suppliers as they can often provide assistance for supply chain issues but need the necessary insight in order to help.

The complexity of a company's supply chain does not necessarily constitute a weakness, if it provides redundancies and flexibility. However, complex and vast networks can make it difficult to identify vulnerabilities and interdependencies within supply chains. Indeed, a large multinational organization can have hundreds of tier-1 suppliers from which it purchases components directly. In turn, each of those tier-1 suppliers relies on hundreds of tier-2 suppliers. In the end, the whole supplier network for a large company can include tens of thousands of companies around the world when the deepest tiers are included in the network. Importantly, communications equipment companies are one of the sub-industries that have the largest number of tier-1 suppliers, with 2.2 times the industry median.

Therefore, current supply chains are so interconnected that the economic case for making large-scale changes in their physical locations is very limited. In addition, value chains often span thousands of interconnected companies, and their configurations reflect specialization, access to consumer markets around the world, long-standing relationships, and economies of scale. Relocations can be significantly restricted by the characteristics of value chains, that is, whether the value chain is capital- or knowledge-intensive or tied to geology and natural resources. All of these factors make relocation less feasible. It is, thus, clear that more resilience results in additional structural costs to the network.

China's Attractiveness as Future Huge Consumer Market and Matured Production Ecosystems for High-tech Goods

According to a recent Morgan Stanley report, Chinese consumer spending is predicted to more than double by 2030, with an emphasis on services rather than goods. By 2030, China's private consumption is set to reach \$12.7 trillion, about the same amount that American consumers currently spend. The report states that this expected growth comes from greater government emphasis on policies to support the domestic Chinese economy, increases in household income, further growth of urban areas, changes in technology, and demographic shifts. A report published by McKinsey & Company in November of 2020, similar to the Morgan Stanley report, makes a very positive prediction on the future growth of China. The report states,

While some companies might benefit from diversifying risks in their supply chains, this does not mean that companies and investors will rush to leave China overnight. China has contributed about 25 percent of global GDP growth over the past two decades, and the latest International Monetary Fund (IMF) forecast suggests that even as 90 percent of the world experiences negative GDP growth in 2020, China's economy may still expand by 1.2 percent. As such, China is likely to remain an important growth engine for the world, and the extensive supply chains that have evolved to serve domestic demand will continue to be needed. Moreover, few countries possess the mature and highly scaled production ecosystems that exist in China.¹¹

Over the last two decades, China has successfully increased the role that consumption plays in its economy, which is now the driving force behind economic growth. Indeed, China's share of global consumption growth rose from 9 percent in the 2000-2005 period to 23 percent in 2013-2018. China's consumption power is also pronounced in the luxury segment, where Chinese consumers accounted for 32 percent of global consumption in 2018 and are expected to account for 40 percent by 2025.¹²

China's technology sector has also seen remarkable growth in the past few decades. Its digital economy is now worth around 30 percent of its GDP. Previously, the Chinese government would protect companies such as Alibaba, Baidu, Tencent in their infancy. Chinese strategy is now one of innovation, being promoted through "Made in China 2025," a state-led industrial policy which strives to secure China's global dominance in high-tech manufacturing. It is also investing massively in R&D and education and has experienced venture capital investment in its startups. As a result, China has increased its competitiveness across multiple sectors.

China now excels in key technologies and sectors such as AI (Artificial Intelligence) and 5G.¹³ This has increased China's potential to expand its leverage on the international system. Moreover, China was recently set to release a new ambitious 15-year industrial development plan called "China Standards 2035" with the aim of influencing how the next generation of technologies will work. The plan is widely seen as the follow-up plan to "Made in China 2025."

Finally, the recent message from 158 senior business executives working at American, Chinese, European, Japanese, and South Korean global high-tech firms says much about the future of supply chains. As the U.S. and China compete for technological supremacy in advanced semiconductor design and manufacturing, software, and other core technologies, global high-tech companies do not plan to pick sides. Rather, they pragmatically aim to compete in both Chinese and U.S. ecosystems regardless of the extra cost and complexity involved.¹⁴

As manufacturers examine their supply chains in a post-COVID-19 era, the imperative for greater supply chain resilience versus the attractiveness of China as a tech-forward consumer market is the defining tension that they will need to navigate. The outcome is unlikely to be a clean break from China for most. Lower-value sectors or labor-intensive sectors, such as apparel, are most likely to expedite diversification. Indeed, many garment manufacturers have already diversified from China to Southeast Asia and Ethiopia on the basis of rising labor costs. It will be the higher-value technology and consumer electronics sectors that will find it hardest to turn away from China's distinctive allure.

Conclusion

The typical approach to supply chain management emphasizes the need to strike a balance between efficiency and resiliency. While these concepts are often at odds with one another, ideal supply chains are those that find the equilibrium between the two. Moreover, companies need to seamlessly integrate supply chains with many different components and a large, human workforce supporting and serving as its backbone. Increased competition and often-compressed profit margins have driven supply chain managers to emphasize cost reduction, "just-in-time" deliverables (JIT), and days of supply inventory management.

JIT allows manufacturing companies to cut costs by reducing the amount of goods and materials a firm needs to hold in stock. Production should be for specific customer orders and the production cycle commences only after a customer has placed an order with the producer, thereby eliminating the need to hold a large inventory.

The COVID-19 pandemic proved that we need more resilient supply chains. In particular, the global spread of the coronavirus has sparked a definite call to diversify supply chains away from China. However, the country's singularity as both a manufacturing location and a huge future consumer market makes it hard to find alternatives in the short run. Thus, it is highly likely that relocating factories or replacing all Chinese suppliers will be infeasible in the short-term.

However, in the long-term it is plausible that many companies would consider shifting manufacturing out of China or diversifying suppliers because of China's steadily rising labor and other costs, as well as because of the greater uncertainty in a single source of production or the concentration of production centers.¹⁵ But what are the alternatives to China for businesses hoping to diversify their operations into other parts of the world? Low-cost economies in Southeast Asia could provide benefits given their proximity to China and existing ties to the global supply chain infrastructure. For example, Vietnam could be a

preferred choice, thanks to its strategic location along regional shipping routes, low labor costs, and young and growing workforce. In this sense, countries would move towards a “China Plus One” strategy, which focuses on diversification by having a factory in China and another in a developing country in the Southeast Asia region, such as Thailand or Vietnam. The China Plus One strategy could also generate growth opportunities for Southeast Asian developing countries.

Through this perspective, regional economic integrations in Asia would be rapidly growing in the post-COVID-19 pandemic era, strengthening Asian regionalism. Major global corporations could rapidly shift their supply chains out of China to other Asian countries with greater beneficial effects for ASEAN developing economies. This will lead to deeper economic integration between China and ASEAN. Further, the effectuation of RCEP will also contribute to the strengthening of new regional supply chains that center on China, and also include Japan and South Korea.

Then, what does such an evolution of Asian supply chains in the post COVID-19 imply for South Korea’s trade policies? It is unlikely that within a couple of years, South Korea will diversify and broaden its current supply source, in which China plays an important role as a world factory. China has been South Korea’s biggest trading partner for exports since 2003. China’s share (including Hong Kong) of South Korea’s total exports was almost 32 percent in 2020. The RCEP 14 countries (excluding China) are also important to South Korea because South Korea’s exports to that area amounts to 27 percent of its total exports. At the same time, South Korea needs to fully recognize the potential of China as a future enormous consumer market.

In the long term, South Korea, however, needs to reduce its dependence on China as a production hub. There is still a lot of uncertainty surrounding the U.S.-China trade war, despite the Phase One trade deal that was signed in January 2020. The U.S. tariffs on Chinese products have remained in place and the tech competition between the U.S. and China continues, even after the new Biden administration has taken office. Thus, South Korea needs to consider a China Plus One strategy of spreading production between China and a Southeast Asian country in the long term.

Additionally, South Korea needs to recognize that trade based on labor-cost arbitrage is continuously declining. According to a McKinsey report in 2019,¹⁶ today only 18 percent of goods trade is based on labor-cost arbitrage. Moreover, in all value chains, capitalized spending on R&D and intangible assets such as ideas, software, and intellectual property (IP) is growing as a share of revenue. The growing emphasis on knowledge and intangibles favors countries with highly skilled labor forces, strong innovation and R&D capabilities, and robust intellectual protections (e.g. in general, developed countries such as the U.S. and EU). Thus, South Korea should keep deep relations with the U.S. and the EU.

In the future, the distinction between goods and services will continue to blur as manufacturers increasingly introduce new types of leasing, subscription, and other “as a service” business models. Also, automation and AI will transform labor-intensive manufacturing into capital-intensive manufacturing. Considering its reliance on China in goods trade and the importance of knowledge and digital technologies in future trade, South Korea has to play an essential role in creating globalization 2.0 or a resilient globalization through bridging three regional supply chains: the Asian supply chains, the Euro supply

chains (centered on Germany), and the North American supply chains (centered on the U.S.). The China Plus One strategy is just a regional concept and is not enough to act as a link between South Korea and the rest of the world's economies.

Endnotes

- ¹ In responding to COVID-19, South Korea moved quickly to temporarily allow pharmaceutical firms and manufacturers to produce or import unapproved diagnostic products and eased the regulatory process so that private and public medical institutions could use them. The number of new tests started to mount in mid-February 2020. At its peak, about 12,000 to 18,000 tests were conducted every day. Massive testing helped avoid a full lockdown. Instead, the government strongly recommended both strict self-quarantine for travelers and social distancing as containment measures. The enhanced social distancing campaign to stay home and work from home lasted until mid-April 2020.
- ² This figure includes four supplementary budgets of 2020, which amounts to about \$57 billion.
- ³ Some provinces already have local digital currencies and used this for the relief payments. For example, Gyunggi-do Province, which surrounds Seoul, additionally provided its own coronavirus relief of 200,000 won per person. But the money has a restriction that it should be used in the province within three months of delivery, supporting local business in the region.
- ⁴ The finance ministry recently announced introduction of new fiscal rules to prevent deficit spending by managing government debt to stay under 60 percent of GDP or consolidated fiscal deficit to not exceed 3 percent of GDP from 2025. However, the government's consolidated fiscal deficit ratio already hit 3.7 percent of 2019 GDP by August of 2020. Although the national debt of South Korea amounted to 46 percent of GDP in Q3 in 2020, the South Korean government needs to still put more efforts into controlling the pace of fiscal debt and securing financial sustainability because of its super-aging trend and lowest total fertility rate. South Korea is projected to be one of eight super-aged societies in the world by 2024. A super-aged, also known as post-aged, society refers to a nation whose elderly population accounts for 20 percent or more of the entire population. Its total fertility rate was 0.84 in 2020, the lowest rate across countries in the world.
- ⁵ Kathrin Hille, "The great uncoupling: one supply chain for China, one for everywhere else," *Financial Times*, October 6 2020, <https://www.ft.com/content/40ebd786-a576-4dc2-ad38-b97f796b72a0>.
- ⁶ Sarah Hippold, "Gartner Survey Reveals 33% of Supply Chain Leaders Moved Business Out of China or Plan to by 2023," Gartner, press release, June 24, 2020, <https://www.gartner.com/en/newsroom/press-releases/2020-06-24-gartner-survey-reveals-33-percent-of-supply-chain-leaders-moved-business-out-of-china-or-plan-to-by-2023>.

- ⁷ “The Impact of COVID-19 on Global Supply Chains,” Oxford Business Group, April 24, 2020, <https://oxfordbusinessgroup.com/news/impact-covid-19-global-supply-chains>.
- ⁸ Recently, China’s Ministry of Commerce announced that Beijing would promote initiatives that attract foreign direct investment in high-tech sectors as a means to strengthen its supply chains, suggesting a range of moves including tax concessions and the expansion of free trade zones. Chinese officials often stress Beijing’s goal of becoming technologically self-reliant as well as Xi Jinping’s dual circulation strategy, which ties a planned increase in domestic demand and consumption to support of China’s export-oriented economy.
- ⁹ “Supply Chains Strategies Under the Impact of COVID-19 of Large American Companies Operating in China,” AmCham China, April 2020, <https://www.pwccn.com/en/consulting/supply-chain-strategies-under-impact-covid-19-large-american-companies-operating-china-1.pdf>.
- ¹⁰ The Harmonized System is an international nomenclature for the classification of products. It allows countries to classify traded goods on a common basis or by customs purposes. At the international level, the Harmonized System (HS) for classifying goods is a six-digit code system. The HS comprises approximately 5,300 product descriptions that appear as headings and subheadings, arranged in 99 chapters. (HS01~99). Up to the HS 6 digit level, all countries classify products in the same way. Here, agricultural products and fisheries (H.S. 01~24) were excluded in order to focus on the trade of manufactured goods.
- ¹¹ “China consumer report 2021 - Understanding Chinese Consumers: Growth Engine of the World,” McKinsey & Company, November 2020, <https://www.mckinsey.com/~/media/mckinsey/featured%20insights/china/china%20still%20the%20worlds%20growth%20engine%20after%20covid%2019/mckinsey%20china%20consumer%20report%202021.pdf>.
- ¹² “China Luxury 2019 Report: How young Chinese consumers are reshaping global luxury,” McKinsey & Company, April 2019, <https://www.mckinsey.com/~/media/mckinsey/featured%20insights/china/how%20young%20chinese%20consumers%20are%20reshaping%20global%20luxury/mckinsey-china-luxury-report-2019-how-young-chinese-consumers-are-reshaping-global-luxury.ashx>.
- ¹³ When we consider granted and active patent families, in terms of the number of 5G patents, Chinese firm Huawei takes first place in a ranking compiled by IPlytics. See Katharina Buchholz, “Who is Leading the 5G Patent Race?” Statista, February 25, 2021, <https://www.statista.com/chart/20095/companies-with-most-5g-patent-families-and-patent-families-applications/>.

¹⁴ See Christopher A. Thomas and Xander Wu, "How global tech executives view U.S.-China tech competition," Brookings, February 25, 2021, <https://www.brookings.edu/techstream/how-global-tech-executives-view-u-s-china-tech-competition/>.

¹⁵ Though it will not be easy to shift an entire center of operations from China, tech giants Apple, Microsoft, and Google have already stated their desire to begin the transition. There are other notable companies that are engaged in a long-term trend of shifting to Vietnam-based production. Samsung, Intel, Nike, and Adidas are among them. In particular, U.S. dependence on China for key medicines and supplies and other essential goods for national security could be significantly reduced due to the strong political will of the new Biden administration.

¹⁶ "Globalization in Transition: The Future of Trade and Value Chains," McKinsey & Company, January 2019, <https://www.mckinsey.com/~media/McKinsey/Featured%20Insights/Innovation/Globalization%20in%20transition%20The%20future%20of%20trade%20and%20value%20chains/MGI-Globalization%20in%20transition-The-future-of-trade-and-value-chains-Full-report.pdf>.