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The US–China Competition, Restructuring the Global Supply Chain, and Economic Security

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Abstract

Mounting geoeconomic competition between the United States (US) and China alongside the global shocks due to the COVID-19 pandemic and the Russia–Ukraine war have drawn significant attention to the instability and vulnerability issues in the global supply chain (GSC), which is critical for international trade, production, and economic security. Can the US, South Korea, and Japan successfully coordinate their efforts to establish a secure and resilient GSC in key industries? Can these efforts promote economic security? By defining the efforts to reshape the GSC as part of the US–China power competition, this study evaluates the impact of its restructuring around the US on various aspects of the economic and national security of South Korea and Japan. Overall, the findings highlight that restructuring the GSC poses complex challenges for South Korea and its foreign policy in the contemporary globalization era.

Keywords: global supply chains; economic security; technology; power; competition

Introduction

The global economy has experienced global supply chain (GSC) disruptions, and many countries, particularly the United States (US), have pursued efforts to bolster its resilience at the local, regional, and global levels. Given that a sudden GSC disruption can pose a serious threat to national economic stability, issues surrounding economic security have been actively discussed in both academic and policy communities. As key technologies such as leading-edge chips, high-capacity batteries, and artificial intelligence have become important for national security and economic growth, technology leaders in the US, Japan, and South Korea have deepened their cooperation to build a resilient GSC in key industries. For example, at the 2023 Camp David Summit, the leaders of South Korea, the US, and Japan agreed to “launch a supply chain early warning system pilot program aimed at identifying critical minerals and other priority materials and products and develop approaches to rapidly share data on potential disruptions to supply chains” (US Department of Defense 2023).

However, as the strategic competition between the US and China heads toward a technological and financial decoupling, the efforts to restructure the GSC have become

a politically salient issue in international politics. Such efforts can intensify the ongoing US–China power competition and destabilize regional and global politics, posing serious challenges for South Korea. One challenge is that by excluding China from the reshaped GSC in key industries, South Korea is at risk of weakened economic ties with China and is likely to face China’s economic and other security-oriented retaliation. Fundamentally, South Korea may need to revisit and renounce its hedging strategy as a core element of its national security. Another challenge is that economic and diplomatic friction exists in terms of the cooperation between South Korea and the other two partners after the Camp David Summit. Thus, restructuring the GSC in key industries may not necessarily promote South Korea’s economic security but may weaken it through reduced trade and investment flows, decreasing economic diversification, and weakened state sovereignty vis-à-vis multinational corporations (MNCs). Can the US, South Korea, and Japan successfully coordinate their efforts to establish a secure and resilient GSC in key industries? Can these efforts promote economic security? This study addresses these questions by exploring the nature of the US–China power competition and evaluating the impact of restructuring the GSC around the US on various aspects of the economic and national security of South Korea and Japan.

This study makes three contributions to the literature. First, by highlighting China’s limited contribution to the disruptions of the GSC during COVID-19 (Akinci et al. 2023) and the strong association between the reshaping of the GSC, technology, and industrial capacity promotion, this study reveals the nature of the US–China competition and the US’s efforts to reshape the GSC. Second, this study evaluates whether South Korea and Japan can maintain their solidarity with the US in restructuring the GSC. Reshaping the GSC around the US may require South Korea and Japan to revisit or renounce their hedging strategies or strategic ambiguities as the core elements of their national security strategies. A challenge for these two strong US allies is whether to join the US’s efforts to de-risk¹ or decouple itself from China. However, since South Korea, the US, and Japan compete in key industries, there are potential fissures in their solidarity. Third, this study identifies multiple aspects of economic security and reveals how reshaping the GSC will affect them. While reshaping the GSC around the US may promote the economic security of South Korea and Japan by reducing their economic dependency on China and the risk of GSC disruptions, it may potentially weaken their economic security in other areas, such as economic efficiency, diversification of economic partnerships, and protection of state sovereignty vis-à-vis MNCs. Overall, this study proposes that a complete decoupling from China is unrealistic, and that doing so can pose challenges for South Korea.

Restructuring the GSC and the US–China power competition

Given the belief that China has contributed to the instability of the GSC in key industries in recent years, efforts to build a resilient GSC by excluding China have received significant US attention. According to a Federal Reserve Bank of New York report, China has made limited contributions to the changes in the GSC pressure index, a GSC disruption indicator (Akinci et al. 2023). Moreover, the index revealed that the GSC disruption level significantly decreased in 2022. Therefore, the current efforts to restructure the GSC around the US are associated with the US–China power competition.

Many scholars have argued that we are entering a “new Cold War” era in which the US and China are competing over geoeconomic interests (Roberts, Henrique, and Ferguson 2019). The core goal of this competition is to maintain technological dominance. During the Cold War, the US’s main competitive strategy against the Soviet Union was containment. This strategy was possible because the US, the Soviet Union, and their allies were geographically, economically, and politically separable. However, in the new Cold War era, in which China, the US, and their allies are economically integrated to a great extent, this strategy is no longer feasible. Instead, the new strategy involves building strong regional partnerships and infrastructure worldwide (Doshi 2021). For example, through the 2013 Belt and Road Initiative (BRI), China attempted to establish itself as a global leader in both infrastructure finance and transnational infrastructure construction and build strong economic partnerships with countries along the BRI route. The US responded by establishing the 2018 International Development Finance Corporation and signing bilateral agreements with Indonesia, Singapore, Taiwan, and South Korea to offer infrastructure financing and market construction (Schindler, DiCarlo, and Paudel 2022). The US also signed multilateral agreements, such as the 2019 Blue Dot Network (initiated by the US, Japan, and Australia), which was coopted into the 2021 Build Back Better World (B3W) (initiated by the G7), and launched the 2022 Indo-Pacific Economic Framework for Prosperity (IPEF) with the Mineral Security Partnership (MSP). Therefore, a key feature of the new strategy is the integration of territory into the GSC anchored by domestic firms (Schindler, DiCarlo, and Paudel 2022). The BRI intends to connect places with resources and key markets with global value chains (GVC) anchored in Chinese firms (Flint and Zhu 2019; Mayer and Zhang 2020). Meanwhile, in terms of key technological and industrial sectors, the US’s goal appears to be to snatch critical technological and industrial power away from China (Friedberg 2020).

Competition over technological power

In the twenty-first century, the key components of national power have shifted from military strength and natural components (e.g., natural resources and population) to scientific and technological components (e.g., technology and industrial capacity). To examine how the technological power gaps between the US and China have changed, this study examines three areas: high-tech exports, research and development (R&D) expenditure, and state charges for the use of intellectual property. High-tech exports include products with high R&D intensity, such as computers, aerospace, electrical machinery, scientific instruments, and pharmaceuticals. R&D expenditures include the capital and current expenditures of business enterprises, government, higher education, and private non-profits. Charges for the use of intellectual property include the authorized use of proprietary rights (e.g., patents, trademarks, and copyrights), produced originals, prototypes, and related rights,² which are strongly associated with a state’s possession of technological power and its potential for the future. Figure 1 shows the trend in the technological power gaps between the US and China in these areas (measured in US\$ billion) between 2007–2020. The data were obtained from the World Bank (2023).

As Figure 1 shows, China’s technological power has exceeded that of the US in terms of the sum of the three areas since 2011. Although China’s technological power accounted for only about 56 percent of the US’s in 2007, the gap shrinks over time;

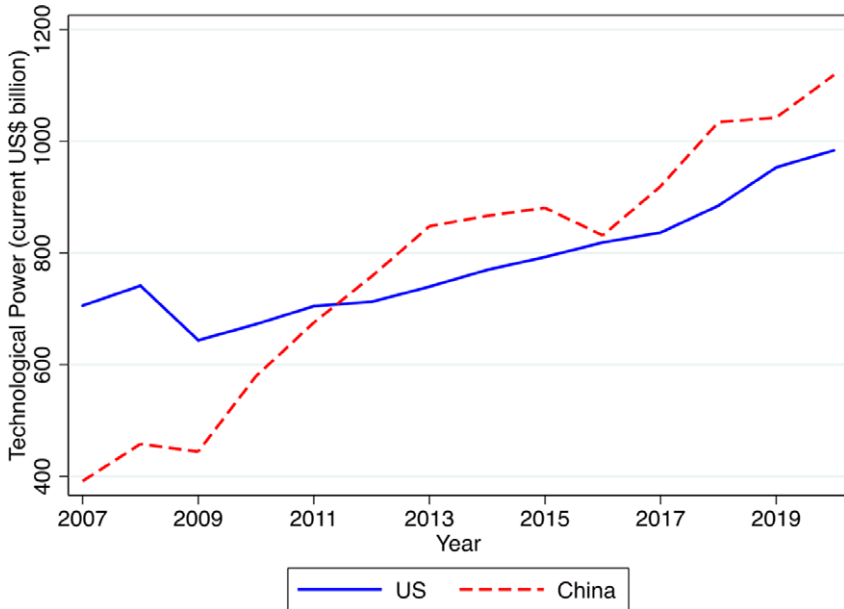


Figure 1. Trends of technological power (2007–2020).
Source: World Bank (2023).

in 2020, China had approximately 14 percent more technological power than the US. However, this sole indicator cannot be used to assess the two states' overall technological power gaps. The US maintains strong technological power over China in many areas, such as the diffusion capacity of science and technology (Ding 2023). Nevertheless, the power gap significantly decreased in recent years. Therefore, suppressing China's rise as a technological and industrial power is crucial for the US to maintain its dominance as a national power. As militarized options are politically infeasible and practically ineffective, non-militarized conflicts in trade and investment are often utilized as new stages in the power competition (Liao 2022). Similarly, by restructuring the GSC in key industries around the US and excluding China, the US can strengthen its dominance in key technological and industrial sectors, which may significantly affect its national power.

Overall, the main logic behind the call for the US to reshape the GSC is to reduce its dependence on Chinese imports in key industries and its vulnerability to China's influence. Based on the 2021 Executive Order 14017, the US National Economic Council identified the US's GSC vulnerabilities in four key products: semiconductor manufacture and advanced packaging, high-capacity batteries, critical minerals and materials, and pharmaceuticals and advanced (active) pharmaceutical ingredients (APIs).³ To reduce these vulnerabilities, the US has attempted to build a new GSC in these key industries by isolating China.⁴

Industrial policy: Effectiveness and limitations

Restructuring the GSC in key industries requires massive levels of public and private investment in R&D alongside regulations in market forces. Industrial policies or

strategies that support such needs are critical, even though they largely conflict with the established liberal market principles in the globalization era. For example, the semiconductor industry is arguably the most important industry in the current efforts to rebuild the GSC (Malkin and He 2023), and its importance in the world economy has increased. Global semiconductor sales in 2021 totaled US\$556 billion; they increased from US\$139 billion in 2001 to US\$440 billion in 2020 (Palma et al. 2022). Although semiconductor sales account for only approximately 0.25%~0.5% of the world's gross domestic product (GDP), their impact on the world economy is critical, as they are essential in the production of key products, such as computers, artificial intelligence, data centers, autonomous systems, satellites, and robotics. Accordingly, they constitute strategic assets for key industrial value chains and can be regarded as a dual-use product. The semiconductor industry's economic impact on the US economy is non-negligible; the total contribution of the US's semiconductor industry to its GDP was US\$276.9 billion in 2021, accounting for approximately 1.19 percent of its GDP. Semiconductors are the US's fourth highest export item (Semiconductor Industry Association 2022).

The semiconductor manufacturing GSC consists of three stages: design, in which the blueprint of a chip's architecture is sketched out based on the needs and functions of the chip; chip manufacture (wafer fabrication); and back-end technologies, such as assembly, testing, and packaging. In the second and third stages, the raw materials and chemicals for the fabrication of semiconductor manufacturing equipment (SME) are necessary. Revenues from the semiconductor market is generated during each stage. The US and South Korea are key players in the first stage, Taiwan and South Korea are key players in the second stage, and China and Taiwan are key players in the third stage. Meanwhile, the US, Japan, and the Netherlands are key SME providers (Thadani and Allen 2023). In 2021, the US held approximately 46% of the overall global semiconductor market share followed by South Korea (19%), Japan (9%), the European Union (EU) (9%), Taiwan (8%), and China (7%). In terms of the global semiconductor consumption in 2021, the US and China accounted for 32% and 24% of the share, respectively (Kwon 2022). The issue is that approximately 89% of the semiconductor foundry market (wafer fabrication) revenue in 2021 was shared by Taiwan (64%), South Korea (18%), and China (7%), while the US had less than 10% (Chiao 2022). While the US's semiconductor industry has maintained market share leadership in the overall chip manufacturing processes, particularly in chip design and manufacturing equipment, the front- and back-end manufacturing processes are concentrated in the aforementioned Asian countries. This makes the US vulnerable to shocks from this region, particularly around the Taiwan Strait, which may disrupt the semiconductor GSC.

The US implemented related industrial policies and strategies to establish a security and resilient semiconductor GSC. The 2022 CHIPS and Science Act (CSA) enacted allowed the US government to invest US\$280 billion in the domestic research and manufacture of semiconductors and incentivize leading semiconductor manufacturers, such as Taiwan's TSMC and South Korea's Samsung, to build new facilities in the US. Restrictions limiting China's access to chipmaking software and equipment were also implemented and strengthened. For example, in 2020, the Trump administration and the Dutch government imposed restrictions on the export of key SME to Chinese companies. In 2022, the Biden administration implemented export controls that targeted China, including a measure to limit the supply of semiconductor chips below 28 nm made by the US or foreign companies that use US equipment and technology.

The ban significantly reduced the possibility for China to develop and expand chips measuring 16 nm or below in the future. However, China increased its subsidies to chip industries, firms, and countries as a countermeasure.

Another notable example of industrial policy was the 2022 Inflation Reduction Act (IRA), which provided US\$379 billion worth of tax credits, loans, and grants to incentivize the domestic manufacture of clean energy-related products, such as solar panels and batteries, and draw foreign investment into the US economy. This policy aimed to secure the GSC for products by boosting the domestic manufacture efforts to reduce the US's economic reliance on China.

Within a year of the IRA's implementation, approximately US\$270 billion was invested in clean-energy projects in the US (Toussaint 2023), which was double that of the previous year's figure.

Overall, the efforts to reshape the GSC can be understood in terms of the US–China competition over technological power. It can also be understood in terms of the 'weaponized interdependence' literature; by taking the central positions in the key global economic networks, the US and China may weaponize their structural advantages as leverages to coerce others or deny their network access (i.e., the chokepoint effect) (Drezner, Farrell, and Newman 2021; Farrell and Newman 2019). Vying over control of the key economic networks may be the main feature of the US–China power competition. Will this power competition destabilize the global political economy? The issue is that the US and China have remained divergent in their satisfaction with the status quo (the US-led liberal international order) over time and have frequently disagreed over various international agendas (Bailey, Strezhnev, and Voeten 2017; Hwang, Willemain, and Lee 2020). Movements to restructure the GSC in key industries around the US will further increase their differences. Decoupling and recoupling in the newly constructed GSC at the regional and global level may further drive global divisions, destabilizing the global political economy.

The more fundamental issue is that the US's complete decoupling from China is unrealistic. These two large economies are heavily integrated with complex multilayer networks. Therefore, the US and China, along with their respective allies, cannot disconnect from one another in a meaningful way. For example, China controls almost all the critical parts needed for battery manufacture, including cathodes and anodes for batteries and the lithium processing, and it builds almost all the wafers that are used in solar panels. Trade diversion from China can incur increased costs for domestic consumers and companies, worsening the US's budget deficit. During her visit to China in 2023, the Secretary of the Treasury Janet Yellen stated that a complete decoupling would be unrealistic and risky for both economies; this was reconfirmed by President Biden, Secretary of State Antony Blinken, and National Security Adviser Jake Sullivan. Moreover, newfound US industrial policies and strategies can be viewed as protectionism acts, inviting criticisms and policy responses from others (Chazan, Fleming, and Inagaki 2023). Many of the US industrial policy incentives encourage US and foreign firms to move their production lines to the US. Due to concerns over the competitive threat and migration of domestic companies to the US, the EU and Asia have responded by increasing their industrial subsidies or economic incentives to keep their domestic firms in their territories and help them compete. South Korea is one such country. For example, in 2023, South Korea passed the K-Chips Act in response to the US. This act was designed to boost the domestic semiconductor industry by providing major tax cuts for companies investing in the manufacture of semiconductors and other national strategic goods (Jo 2023). The EU, Japan, and India have implemented similar policies.

The US's efforts to restructure the GSC in key industries, and its associated industrial policies, have had significant effects on the GSC and the world economy. However, as Japan's semiconductor industry's turbulent history has shown, industrial policy and financial support are likely to induce tension, blockage, and competition from other countries, limiting the effectiveness of industrial policies. Moreover, industrial policies have limitations in terms of regulating private firms and their business activities, which are driven by self-interests and economic principles. For various reasons, including financial difficulty, market conditions, and industrial structure, private firms may be unable to meet government-led industrial policies (Tomoshige 2022).

National security: Revisiting hedging strategies and other challenges

The US's efforts to restructure the GSC in key industries has intensified the power competition with China and may destabilize regional and global politics, which poses challenges for other countries. South Korea, a key partner in the technological alliance with the US, faces serious political and economic challenges, including the need to revisit its hedging strategy as a core element of its foreign policy. South Korea and Japan have utilized hedging as a survival strategy during the US–China power competition⁵ and have actively engaged in multiple dimensions and adopted strategic ambiguity policies over contentious issues. For example, South Korea has attempted to increase its strategic importance for each side, thereby hedging the risk that its national security may become adversely affected by the power competition, and it has optimized its national interests (Hwang and Ryou-Ellison 2021; Lake 1996; Wallace 2013). The success of the dual binding engagement strategy depends on how effectively South Korea maintains its strategic position of ambiguity or neutrality. If it fails to hold on to such conditions, then the strategy may work as a trap to drag it into the middle of the power competition (Hwang and Ryou-Ellison 2021). Its hedging strategy has thus been shaken by the rapidly growing strategic competition between the two powers and the ensuing amalgamation process between its economic and military security.

The security background of moving closer to the US

The cooperation between South Korea, Japan, and the US over building a US-centered GSC is primarily driven by security concerns. Historically, East Asia's regional security has been maintained by the San Francisco System, through which the US has developed exclusive relationships with Japan and South Korea (Calder 2004). However, China's rise as a regional power and the US–China strategic rivalry have posed serious threats to the system. Japan has continued its national security vigilance against China, especially since the 1971 territorial sovereignty dispute over the Senkaku/Diaoyu Islands (Sato and Chadha 2022), in which Japan perceived that China had expressed military ambition over these islands. Japan's current capacity to counterattack China can be understood in a similar manner. China is believed to have taken the security vacuum in Southeast Asia created by the 1992 withdrawal of US troops from the Philippines as an opportunity to realize its military expansion (Storey 1999). Since the 2010s, Japan and China have been in a competitive state in terms of national security, which has often involved the dispatches of warships and aircraft

into territorial seas and contiguous zones of the disputed islands (Grieger 2021). In 2022, Japan announced revisions to three major security documents: the National Security Strategy, National Defense Strategy, and Defense Buildup Program. The most important part of the revisions was that Japan's defense strategy was formulated based on the assumption that its territory was under military attack (Watanabe 2023). Japan decided to conduct offensive and defensive operations in defense of the Japanese Archipelago to support the larger US strategic scheme in Northeast Asia, including the defense of Taiwan. Specifically, Japan officially recognized China as a security rival and announced an increase in its defense budget from 1 percent to 2 percent of its GDP by 2027, focusing on investing in integrated deterrence (Prime Minister's Office of Japan 2022). Japan's defense budget has only increased once in the last 30 years, while China's has increased 39 times over the same period. Moreover, China's defense budget is five times greater than that of Japan (Sohn 2023). Therefore, even if Japan rapidly increases its military spending, it is unlikely that it will achieve a balance with China in terms of its military spending in the short term, which will lead Japan to strengthen its US alliance (Sohn 2023).

South Korea has enjoyed economic benefits from trade, investment, and offshoring with China since its diplomatic normalization with China in 1992. However, South Korea realized the national security risk of over-relying on China when bilateral relations deteriorated in 2016. In response to the US's installation of an advanced missile defense system (Terminal High Altitude Area Defense [THAAD]) in South Korean territory in 2016, China imposed economic sanctions on South Korea. This led the newly elected South Korean President Moon Jae-in to announce the Three No's policy in 2017: no additional deployment of US THAAD battery systems, no participation in Washington's missile defense system, and no participation in a trilateral US–South Korea–Japan military alliance (Kim 2022). This series of events made South Koreans realize that China could use South Korea's economic dependence as a weapon to generate pressure. Thereafter, South Koreans' opinions of China deteriorated, as revealed through multiple surveys (Silver, Devlin, and Huang 2020; Turcsanyi and Song 2022). President Yoon Seok Yeol announced that the new government would make the South Korean–US alliance their first priority, implying that they were ready to enhance the alliance into a global strategic partnership.

Overall, South Korea and Japan moved closer to the US to enhance their security partnerships. Building a technological alliance with the US, through which they could detach China from the restructured GSC in key industries and reduce their reliance on China, was part of their efforts to strengthen the security alliance. However, this did not necessarily mean that South Korea abandoned its hedging strategy as a core element of its foreign policy. South Korea is still attempting to engage the two powers in multiple dimensions and hedge the risk that its military and economic security may be adversely affected by the power competition. This strategic position can be observed in South Korea's 2023 Indo-Pacific Strategy, which defines China as a "key partner for achieving prosperity and peace in the Indo-Pacific" (Government of the Republic of Korea 2022, 14). The South Korean government has indicated that this strategy is an inclusive initiative that "neither targets nor excludes any specific nation" (Government of the Republic of Korea 2022, 11), thus leaving room to cooperate with China (Kim 2023). The issue is that the current efforts to build a resilient GSC based around the US can render South Korea's hedging strategy as ineffective or impractical.

Technological alliance and its challenges

A resilient GSC can be built internally and externally. Internally, sustained investments in labor and domestic firms can be made to enhance domestic productivity in key industries such as semiconductors and large-capacity batteries. Reshoring or nearshoring, which redirects manufacturing operations back to the home country, can also be used to build a resilient GSC. Externally, states can strengthen their trade and investment partnerships with political or military allies to enhance their control over the GSC of key products (i.e., friend-shoring). South Korea and Japan are key contributors to vulnerable areas in the GSC for the US.

However, building a technological alliance with the US by reshaping the GSC in key industries poses serious challenges for South Korea and Japan. First, it may require South Korea and Japan to revisit and renounce their hedging strategies as core elements of their national security. By excluding China from the reshaped GSC in key industries, they risk weakening their economic ties with China and are likely to subsequently face China's economic retaliation. For example, the 2022 US-imposed export control restrictions on advanced computing and semiconductor manufacturing items prevented South Korea's two major memory chip producers from upgrading their critical lithography equipment and producing next-generation chips in their Chinese plants. As China accounts for approximately 40 percent of South Korea's semiconductor exports, such restrictions and associated retaliation from China can deteriorate their economic ties. In 2023, Japan and the Netherlands agreed to extend the US's ban on the export of chip-making technology to China, which will be detrimental to China's semiconductor industry (Koc and Leonard 2023). However, governments and private sectors are wary of the implications and potential retaliatory restrictions imposed on them by China. Accordingly, it is difficult for South Korea and Japan to utilize dual engagement as an effective hedging strategy to deal with political situations that arise as a result of the US–China power competition.

Another challenge is that South Korea, Japan, and the US compete in key industries. For example, Samsung and SK Hynix from South Korea; Intel, Qualcomm, and Micron Technologies from the US; and Sony from Japan all compete in the semiconductor industry. In 2021, Samsung accounted for 10.9% of the global semiconductor market share revenue followed by Intel (9.7%), SK Hynix (6%), Qualcomm (5.8%), and Micron Technologies (4.6%) (Gartner 2023). Regarding the global memory chip market, Samsung and SK Hynix are the two largest producers (accounting for 70% of the global dynamic random-access memory chip market and 50% of the flash memory chip market) followed by Micron Technologies. Technology industries are naturally highly competitive because competitive firms reap significant profits, while those that fall behind lose market shares. Given this competitive nature, the extent to which such firms can cooperate poses a challenge regarding their technological alliance. Similarly, these states do not necessarily have strong trust in each other's economic policies. For example, in 2019, Japan imposed export controls on semiconductor components to South Korea over historical and diplomatic disputes. These export restrictions significantly damaged South Korea's semiconductor industry, driving it to find alternative supplies from other sources (mainly China) and domestically produce materials. This revealed another crack in the joint efforts regarding export controls to China. While the US-imposed controls mandated South Korea's Samsung and SK Hynix to incur significant business losses, Intel, a large US market competitor, incurred relatively marginal losses by diversifying its manufacturing facilities into the US,

Germany, Malaysia, Israel, and India prior to the implementation of the export controls. Therefore, when these states realize that the drive to build a resilient GSC is mainly fueled by the promotion of each other's self-centric interests, such as supporting domestic firms vis-à-vis foreign competitors rather than de-risking the GSC disruptions, their GSC cooperation is likely to decline.

Meanwhile, when China banned the sale of Micron products in 2023 in retaliation to the US, South Korea's Samsung and SK Hynix benefited from higher chip prices in China. These firms may have been incentivized to fill Micron's gap in China, although monitoring this replacement is technically difficult (Chiang 2023). Similarly, new economic opportunities could be created for South Korean or Japanese firms as the US tightened its regulations on imports from Chinese chipmakers. To some extent, these firms could replace Chinese chips in the US market, particularly in the defense industry (Park 2023). However, such possibilities may induce concerns and complaints from competitive firms in the US, creating fissures in technology alliances.

Further, although the reshaping of the GSC can potentially reduce the vulnerability of South Korea and Japan to Chinese risks or shocks, it may also deepen their economic and military dependence on the US, which may subsequently threaten their sovereign autonomy and national security. National security can be enhanced if a state becomes autonomous. If South Korea and Japan are heavily dependent on the US both economically and militarily, their national security will become vulnerable to external shocks and pressure from the US. For example, the series of negotiations between South Korea, Japan, and the US over defense cost-sharing in 2020 saw exorbitant demands and the associated threats of abandonment from the US and created fissures among the relationships. Therefore, it is uncertain whether South Korea and Japan can maintain solidarity with the US in restructuring the GSC if they perceive that the US is turning away from them by putting its national interests first, or if such movements require serious revisions of their hedging strategies. Moreover, it remains unclear as to whether restructuring the GSC around the US can strongly promote the economic security of South Korea and Japan. Since economic security is composed of diverse components, it is necessary to evaluate the impact of restructuring the GSC around the US on various aspects of economic security.

Economic security: Risks and opportunities regarding restructuring the GSC in key industries

Although there is no concrete consensus on the definition of economic security,⁶ global economic security can be defined as security resulting from the risks from non-state actors and their cross-border networks (e.g., illicit cross-border exchange, illegal migration, or challenges to state sovereignty by MNCs), the new global environment (e.g., financial crises or COVID-19), and other states and their economic instruments (e.g., economic sanctions and leverage) (Kahler 2004). Specific areas relevant to contemporary economic security include the balance of trade, free and fair trade, foreign investment, state sovereignty vis-à-vis MNCs, economic dependence, and vulnerabilities in the supply of critical raw or intermediate materials. Here, reshaping the GSC is primarily associated with the supply of critical materials and the economic dependence on China. The current US-led efforts to reshape the GSC are strongly associated with reduced production in China and the near-shoring or reshoring of manufacturing back to the home countries. However, such movements can pose both

opportunities and risks to the participating states' economic security. This study focuses next on three areas of economic security: flows of trade and investment, economic diversification, and state sovereignty vis-à-vis MNCs.

Tradeoffs between economic security and efficiency: Reglobalization and deglobalization

To reduce internal vulnerabilities in the supply of critical materials, states can promote domestic productivity in key industries via their sustained investment in labor and domestic firms. Externally, they can diversify their trade partners to reduce their vulnerabilities to external supply shocks and build strong trade and investment partnerships with key contributors to support vulnerable areas in the GSC. For example, in 2022, Japan's National Diet passed an economic security bill to guard sensitive technologies and reinforce critical supply chains (Reuters 2022). This ensured that Japan had "strategic technology and supplies, prevented technologies from flowing out of the country, and created a self-sustaining economy" (Nagata 2021). Meanwhile, South Korea's Foreign Ministry launched an in-house economic security center in 2022 to monitor and analyze the supply of key industrial items, technology trends, and global supply chains. Finally, the European Commission announced its consideration of the EU Chips Act, which included US\$43 billion worth of investment in the semiconductor industry to target the production of 20 percent of the world's semiconductors by 2030.

As efforts to promote domestic productivity increase, we are likely to observe increased R&D investment in innovation infrastructure, which can reduce GSC vulnerabilities. Investment in workers is also likely to increase because resilient production requires skilled labor workers who can produce key products and quickly solve problems. In the era of globalization, labor is often considered as a cost rather than as an asset, and wages and political power have decreased in many places (Blanton and Blanton 2016; Rudra 2005). However, due to the drive to enhance the resilience of the GSC, governments may try to reshape their globalization efforts to ensure that workers and small businesses can survive in key industries. Similarly, having respect for workers' rights and democratic economic partnerships are important for building trade and investment partnerships. These represent positive economic consequences of building a resilient GSC. However, these movements can drive a state to make a tradeoff between its economic security and efficiency. In short, as the priority of economic policy shifts from efficiency to security, traditional concepts (e.g., comparative advantages and cost-saving diversification) that underlie international trade and investment can be replaced by more economic security-driven concepts (e.g., relative gains, sustainability, power competition, and the weaponization of key products and industries). This can make the overall economy inefficient, leading to reduced international trade and investment and the slowing of economic growth.

Private firms are autonomous actors motivated by profit. However, mobilizing them to join the efforts to restructure the GSC may incur significant costs alongside technical and practical issues.⁷ Further, since the US's economic partners in key industries also have strong economic ties with China, reshaping the GSC and reducing production China will be costly and time-consuming. For example, China is the most significant trading partner in the semiconductor sectors of Japan, South Korea, and Taiwan. In 2021, China's combined trade volume was US\$234

billion (US\$129 billion with Japan, US\$81 billion with South Korea, and US\$24 billion with Taiwan), where the US's combined trade volume was only US\$14 billion for the same year (Kwon 2022). Therefore, excluding China from a reconstructed semiconductor GSC is not an easy decision for Asian countries that are heavily dependent on China for their semiconductor exports. Further, China provides 80 percent and 60 percent of the world's cobalt and lithium, respectively, which are core ingredients in high-capacity batteries essential for the electric auto industry.

For South Korea, whose economy is heavily intertwined with China's, the economic costs of reducing its bilateral economic ties and diversifying supply chains away from China are tremendous. An important indicator of a country's economic integration is its trade-to-GDP ratio, which demonstrates the relative importance of international trade for the economy. In 2022, South Korea's trade-to-GDP ratio was about 97 percent. Since its trade with China accounted for 23 percent of its total trade, its trade with China alone accounted for 18.5 percent of its GDP. Conversely, the US's trade-to-GDP ratio was about 25.5 percent in 2021, while its trade with China accounted for only 7.7 percent of its total trade. This indicates that the US's trade with China accounted for only 1.96 percent of its economy. For South Korea, which is an export-led economy, detaching itself from the China's economy will be much more difficult compared to the US. Moreover, South Korea's economy depends heavily on small sets of exported and imported items. The total trade volume share of its top items (e.g., automobiles, semiconductors, and cellphones) has continuously increased from 50 percent in the 1980s to 80 percent in recent years (Hwang 2017). For example, semiconductors, the biggest export item, have accounted for 6.4 percent of South Korea's GDP of late. Meanwhile, 60 percent of its chip exports go to China and Hong Kong, accounting for approximately 3.8 percent of its GDP. Samsung manufactures approximately 40 percent of the flash memory chips at its Chinese plant, while SK Hynix makes approximately 40–50 percent of its dynamic random-access memory chips in Wuxi and 20 percent of its flash chips in Dalian. To produce these items, these firms have invested approximately US\$52 billion into China in recent years. Therefore, the damage that South Korea will incur by participating in Chinese export controls will be incomparable to that of the US or Japan, whose economies are less trade dependent on trade with China.⁸

In terms of the commodity types, approximately 80 percent of South Korea's exported goods to China were intermediate goods in 2017, while less than 50 percent of the items exported to the US were such goods (Yonhap News 2018). Moreover, the import of industrial raw materials from China accounted for 33.4 percent of the total imports in 2020 (Lee 2022). This trade structure implies the following. First, the South Korean and Chinese economies are deeply integrated through the GSC, which generates mutual benefits. Since the export of intermediate goods usually enjoys high tariff benefits, trade with China can bring greater economic benefits to the South Korean economy than trade with other countries. This may also imply that South Korea's heavy GSC reliance on China exposes it to a high risk of GSC disruptions compared to other countries. Moreover, China is South Korea's main source of key materials for battery manufacture and chipmaking, meaning that trade with China cannot be easily replaced by trade with the US or other countries. In sum, excluding China from the reconstructed GSC is unrealistic and can cause significant damages to the South Korean economy.

Meanwhile, it is unclear whether building a resilient GSC will lead to reglobalization or deglobalization. Although we are not moving toward a totally deglobalized world, reshaping the GSC can, to some extent, reduce the flow of goods and services,

because 80 percent of the world's trade is associated with GVC. In their analysis of China and 41 trading partners from 1995 to 2013, Bown, Erbahar, and Zanardi (2021) report that bilateral industry-specific domestic value-added growth in foreign production significantly reduces duties: specifically, rapid GVC growth in the 2000s promoted trade flows by 15 percent via a 35 percent removal of trade restrictions. This implies that China's integration and involvement in the GVC has contributed to the reduction of trade barriers, benefiting its global trade partners and consumers. Therefore, excluding China from a reshaped GSC may eliminate these positive effects to some extent.⁹

Diversification of economic partnerships

Another important aspect of economic security concerns the diversification of partnerships. By diversifying their economic partners in key industries, states can reduce their vulnerabilities to economic shocks caused by GSC disruptions. If key industries engage with more partners than before via a reconstructed GSC, then this can contribute to the promotion of states' economic security. However, it is unclear whether the current efforts to reshape the GSC can contribute to economic partnership diversification. Replacing China with an alternative economic partner will be difficult. For example, China produces key lithium and cobalt required for battery production and rare-earth elements needed for wind power generators, firearms, missiles, and radar (Seligman 2022). Therefore, in the restructuring of the GSC, these industries will find it challenging to exclude China, as doing so will require building new partnerships with alternative states, making heavy investments in related domestic industries, and potentially incurring environmental damages due to domestic mining and the production of critical minerals.¹⁰ Moreover, the level of economic partnership diversification of South Korea or Japan has continuously declined since the early 2010s because of their growing dependence on trade with the US and China (Hwang 2021). To evaluate the economic partnership diversification level, this study measured the inequality among exports (and imports) of the largest trade partners of South Korea and Japan via the Gini index (Figures 2 and 3). A Gini index of zero reflects perfect equality, where the trade volumes of all trade partners are the same, whereas a Gini index of 100 reflects the maximal inequality among trade volumes across trade partners.

The figures show two noticeable points. First, South Korea and Japan maintain relatively high economic partnership inequality levels. In 2020, the export index values are 69 for South Korea and 71.5 for Japan, while the world average is 54; the import index values are 65.5 for South Korea and 66.8 for Japan, while the world average is 53.7. This is because their trade heavily depends on China and the US. Approximately 40 percent of South Korea's exports and 35 percent of its imports can be explained through its trade with the two powers. Similarly, Japan's trade with China and the US accounts for approximately 41 percent of its exports and 37 percent of its imports.

Second, South Korea's export and import inequality levels have increased (Figure 2). While South Korea's trade with the two powers accounts for 25% of its imports (16.5% from China, 8.5% from the US) and 34% of its exports (24.2% to China, 10.1% to the US) in 2011, this increased to 35% of its imports (22.5% from China, 12% from the US) and 40% of its exports (25.3% to China, 15% to the US) in 2020. Although South Korea has been highly trade-dependent on China in the past decade, its dependence on the US, particularly in exports, notably increases.

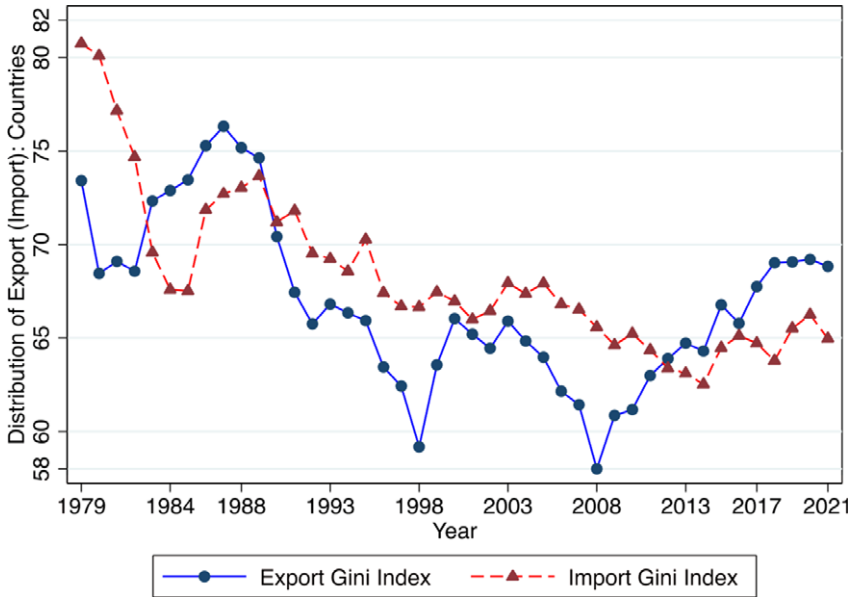


Figure 2. Diversification of export and import partners of South Korea (1979–2021)
 Source: World Integrated Trade Solution (2023)

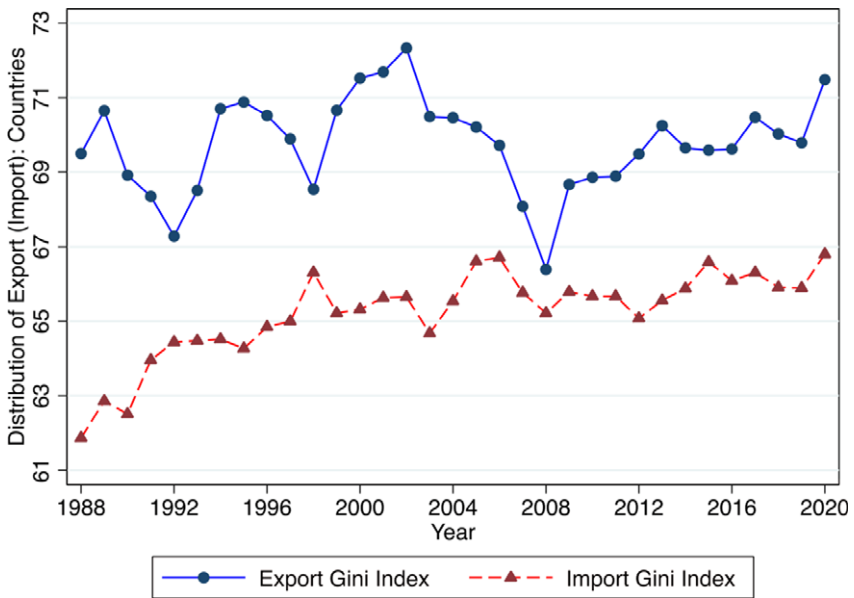


Figure 3. Diversification of export and import partners of Japan (1988–2020)
 Source: World Integrated Trade Solution (2023)

Japan's export and import inequality levels have also continuously increased over the past few decades (Figure 3). While Japan's trade with the two powers accounts for 29% of its imports (18.8% from China, 10.4% from the US) and 34% of its exports (16% to China, 17.8% to the US) in 2008, this increases to 37% of its imports (25.8% from China, 11.3% from the US) and 41% of its exports (22.1% to China, 18.5% to the US) in 2020. The deepening trade dependence on China and the US greatly contributes to this trend. However, restructuring the GSC in key industries around the US may not help South Korea or Japan to promote their economic partnership diversification but instead may deepen their dependence on the US and weaken their economic security, as participating in a reconstructed GSC may imply the need for more production in the US.

State sovereignty vis-à-vis MNCs

Building strong partnerships with key contributors in vulnerable areas in the GSC means that significant changes are required among state-state relationships. This also means that state-firm relationships may change in favor of a firm's interests. States are likely to be under pressure to more favorably treat private firms from a reconstructed GSC. According to a recent study on the link between GVC integration and investor-state dispute settlement (ISDS) (Moehlecke, Thrall, and Wellhausen 2023), host states tend to abandon or change their domestic regulations or laws to accommodate investors due to GVC disruption concerns directed by MNCs; host states abandoned 24 percent of the regulations disputed in the ISDS from 1987–2017, even if they had won their cases. These findings suggest that GVC integration empowers an MNC's power over a host state and thus weakens state sovereignty. Similarly, government-led economic policies to build a resilient GSC can be exploited by MNCs for their own interests. In the long term, this trend may decrease GSC resilience by offering MNCs enhanced autonomy to enter and exit an industry/market, thereby weakening economic security. Globally, there were more than 1,000 ISDS cases from 1987–2022, of which the host states won approximately 36.4 percent of the 852 concluded cases (UNCTAD [United Nations Conference on Trade and Development] 2023). In South Korea and Japan, the total number of ISDS cases was relatively small (17 in South Korea and seven in Japan). However, all cases occurred recently after 2012 in South Korea and 2015 in Japan. The number of ISDS cases in South Korea and Japan may increase if the GSC is restructured, which may weaken their economic security.

Conclusion

The GSC integration can create opportunities for states to significantly improve their productivity, employment, and economic development. However, efforts to reshape the GSC around the US by excluding China can intensify the ongoing US-China power competition and destabilize the regional and global political economy. For South Korea (a key US ally), participating in such efforts poses significant challenges for its national security and may require it to revisit and renounce dual engagement as a core element of its national security strategy. Moreover, building a resilient GSC around the US can adversely affect South Korea's economic security by decreasing its economic efficiency, reducing its economic partnership diversification, and weakening its state sovereignty vis-à-vis MNCs.

The supply shortage of key raw and intermediate materials, labor, and equipment is due to COVID-19, its impact on the GSC, and the Russia–Ukraine war. The problem continues owing to the spike in demand for certain goods and the ripple effect of bottlenecks. However, restructuring the GSC may not solve the labor and equipment shortage. Instead, GSC resilience can be improved as the adoption of digital technologies increases and many countries establish strong infrastructure to deal with health challenges. Although the total volume of world trade declined in 2020, it exceeded the pre-COVID-19 level in 2021 and 2022. As efforts to reshape the GSC continue, careful consideration of the advantages and disadvantages are necessary. If efforts to restructure the GSC around the US are pushed too hard, this can generate significant negative effects on South Korea's economic security.

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Notes

- 1 While decoupling refers to the complete and radical separation of ties between economies, de-risking is a more nuanced and moderate approach that focuses on mitigating the risks resulting from the heavy reliance on a single supplier or economy. Since the de-risking concept was introduced in 2023, it has been adopted by US officials when describing economic measures against China. However, the line between the two terms is blurred.
- 2 State technological power can also be measured in different ways. Examples include patents, the number of scientific personnel, and the amount of published scientific and technical journal articles (Liao 2022). However, to narrow this study's focus on the GSC of high-tech products, this study examines the values in the three areas as crude indicators. The Australian Strategy Policy Institute, a defense and strategic policy think tank founded by the Australian government, published a similar report in 2023. Out of the 64 critical and emerging technologies, China is recognized as a leader in 53 areas, while the US is recognized in only 11 areas (Gaida et al. 2023).
- 3 APIs account for approximately 13%–15% of the total pharmaceutical market. The market value was approximately US\$117.6 billion in 2020 and is expected to increase to US\$251.4 billion by 2025.
- 4 South Korea can contribute significantly to three of the four vulnerable areas in the GSC as identified by the US: semiconductors, large-capacity batteries, and APIs. During the sixth Senior Economic Dialogue (SED) between South Korea and the US in 2021, the agenda for building resilient semiconductor supply chains between South Korea and the US was raised.
- 5 Schindler, DiCarlo, and Paudel (2022) argue that during the US–China power competition, small states such as Nepal and Laos have also utilized hedging strategies to minimize the risk of engaging in the competition and maximize the opportunities presented by it. As an important part of these strategies, these states have transformed into infrastructure states that seek to enhance transnational connectivity by mobilizing foreign capital for infrastructure projects.
- 6 For example, Cable (1995) uses economic security to refer to aspects of trade and investment that directly affect a country's ability to defend itself in terms of its national security; utilize economic policy instruments for aggression purposes (e.g., economic sanctions); support domestic producers against foreign competitors; or control fears over global economic, social and ecological instabilities. By examining national security in the economic, political, societal, environmental, and military sectors, Buzan, Waever, and de Wilde (1998) promote economic security as an important and complementary element of national security.
- 7 Gereffi and Lim (2021) report that firms, as private actors, adopt strategies to reconfigure the GVC, avoid the negative consequences of trade restrictions/wars, and maximize firms' interests.
- 8 In 2021, the trade-to-GDP ratio was 80.5% in South Korea, 25.5% in the US, and 37.4% in Japan.
- 9 It is also possible that the exclusion of China from the reshaped GSC in key industries may generate positive effects on the long-term reduction of trade barriers. Due to the growing competition in these industries, China may be incentivized to remove or reduce trade barriers for products in such industries.

10 In 2020, China accounted for 16% of the lithium and 3% of the cobalt supply. In 2020, the biggest producers were Australia (46.3% of lithium, 4% of cobalt), Chile (23.9% of lithium), Indonesia, and the Democratic Republic of the Congo (70% of the world's cobalt production in 2021). Incorporating these states into these industries' global supply networks is critical.

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