



The US-South Korea Global Comprehensive Strategic Alliance: Cooperation on Semiconductor Supply Chains and Technology

By Dr. Soyoung Kwon


Introduction

The alliance between the United States and the Republic of Korea (ROK), a steadfast and enduring security arrangement, is a testament to the long-term commitment of the two countries to foster stability in East Asia and deter potential threats. Forged initially as a security pact through the 1953 Mutual Defense Treaty, this bilateral alliance was primarily aimed at protecting South Korea from North Korean and Chinese aggression during the Cold War. It featured an asymmetric security relationship that focused on containing communism through a strong US military presence and joint defense strategies.

In the shifting geopolitical landscape of the post-Cold War era and with growing Korea's capabilities, the alliance took on new missions, including managing North Korea's provocations, monitoring China's increasing regional influence, and expanding cooperation on non-traditional security issues like climate change, human rights, and energy. Over the decades, the alliance—centered on traditional defense and security issues—evolved into a broader, more comprehensive, and strategic bilateral relationship that accommodates non-military forms of cooperation to meet new security challenges in an ever-changing international environment.¹

Today's security landscape is becoming ever more complex with the intensifying rivalry between the United States and China, increasing competition in critical and emerging technologies, and the revolution in military affairs driven by artificial intelligence (AI), unmanned aerial vehicles (UAVs), robots, and cyberspace. To meet the multifaceted security environment, US and South Korean leaders envision an alliance that integrates military, technological, and economic interests. In May 2022, US President Joe Biden and South Korean President Yoon Suk-yeol agreed to further advance the alliance into a “global

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comprehensive strategic alliance” and “strategic economic and technology partnership” rooted in shared values and rules-based international order to highlight bilateral cooperation in military, economic, and diplomatic areas in the Indo-Pacific region and beyond.² As part of this evolution, the alliance is now closely connected with broader minilateral and multilateral frameworks of cooperation among like-minded allies and partners on semiconductor supply chain resilience, technological advancement, and a new global economic order.

There are concerns over the excessively securitized discourse surrounding the semiconductor supply chain and industrial sectors, with the increasing use of “technology or semiconductor alliance” to define cooperation in the new economic and technological domain, which conflates the concept of an alliance with that of a partnership.³ Alliances and partnerships differ significantly in terms of the level of institutionalization, the nature of commitment, and the range of cooperation for agreed-upon purposes.⁴ Despite reservations, this trend has profound implications for evolving alliance dynamics, motivations for alliance-like behaviors in the technological domain, and application of tenets of security alliances to semiconductor cooperation.

This paper navigates the complex dynamics of the US-ROK alliance, especially in the context of economic security and technological cooperation amid intensifying US-China competition. It offers a comprehensive analysis of US-South Korea cooperation in the semiconductor supply chain within the framework of a global comprehensive strategic alliance, highlighting its achievements, identifying opportunities for further development, addressing potential challenges, and suggesting ways to enhance future collaboration within the alliance framework.

The Security Logic to Supply Chain Resilience and Technology Cooperation

With technological advancement, semiconductors and the resilience of their supply chains have become crucial in various critical and emerging technology sectors, such as electronics, telecommunications, AI, and robotics. Semiconductors also run military equipment, power AI targeting and information analysis, and model nuclear weapons design. The control over semiconductor technology thus underpins a technological and military edge over peer competitors. The strategic importance of semiconductor supply chains, which are vital for advancing high-tech industries, securing military advantages, and ensuring economic growth, has resulted in the securitization of the semiconductor ecosystem.⁵ The semiconductor supply chain issue has now become a critical component of national security.

US-China Competition in Supply Chains

Semiconductors were previously a symbol of globalization.⁶ Under the global value chain structure, the semiconductor ecosystem was based on interdependent supply chains and a highly efficient division of labor. Despite ideological and systemic differences, countries participating in the global supply chain for semiconductors were closely interconnected as mutual consumers and suppliers and cooperated by leveraging their unique strengths under the free-trade-based liberal order. The United States, South Korea, Japan, and Taiwan led the semiconductor business in research, development, and chip design. The Netherlands led the world in advanced semiconductor manufacturing equipment, South Korea and Taiwan dominated in advanced manufacturing, and Japan excelled in supplying other essential materials and equipment. Assembly, testing, and packaging were primarily outsourced to countries with lower labor costs, such as China, Malaysia, and Vietnam. This division of labor enabled cost optimization, technological innovation, increased efficiency, and the concentration of critical stages of production and key suppliers in specific regions.

Recent trends in de-globalization and US-China strategic competition are rapidly dismantling the existing semiconductor supply chain. Recognizing the vulnerabilities of interdependencies, countries involved in the global semiconductor industry are devising goals and strategies to secure the semiconductor supply chain based on their strengths and weaknesses. Countries are diversifying their supply chains to de-risk and secure stability for key products. They employ protectionist and nationalistic policies to build domestic production facilities, stockpile large quantities of goods, and acquire STEM talent. The rise of techno-nationalism is causing greater instability in global supply chains and higher supply costs, which will ultimately result in a decline in global economic growth. Yet, a security-driven logic has entered this domain of competition in the name of economic security, diverging from the traditional liberal economic logic centered on efficiency and growth.

Economic Security Goals and Threats

Economic security has two components: the recognition of potential threats targeting a nation's economic stability and the ability to safeguard the national economy against deliberate attempts of disruption and coercion.⁷ Given its complex nature, however, many countries face challenges in defining the scope of economic security, identifying potential threats, and balancing the tensions between maintaining open economic exchange and addressing national security concerns.⁸ While prioritizing the resilience of supply chains

against external shocks as a key security objective, the United States, China, Japan, and South Korea have distinct concerns, goals, and strategies of protection, promotion, and partnership regarding economic security.⁹

The United States views China's rise in high-tech manufacturing as a key threat.¹⁰ In response, the United States prioritizes technological innovation, focusing on industries and competition strategies while ensuring supply chain resilience, particularly in sectors like chips, batteries, biotech, and rare earth metals. The United States is on a mission to restructure the global chip supply chain by investing in its domestic semiconductor industry and bringing back chip manufacturing to the United States to complete the semiconductor production ecosystem and prevent supply chain disruptions in the future.¹¹ A sweeping set of export controls aims at preventing China from acquiring higher-end chips, chip designs, and chip-making equipment, thus acquiring certain advanced capabilities in semiconductor technology.¹²

China, on the other hand, perceives hostile foreign forces as a threat and focuses on achieving "innovation-led growth" through technological self-strengthening. China aims to localize semiconductors by building an independent, self-sustaining semiconductor ecosystem to counter US control. Its priorities include strengthening industrial policies, increasing research and development (R&D) investment, and promoting domestic consumption. At the same time, China's economic statecraft employs tactics such as import and export controls, public boycotts, and other coercive economic measures, particularly concerning key minerals.¹³

Japan faces threats from geopolitical instability and its reliance on overseas resources. It prioritizes de-risking by expanding domestic production, reducing dependency on foreign technologies, and enhancing global competitiveness in critical emerging technologies (CETs). Japan aims to revitalize its semiconductor industry based on equipment material competitiveness by securing advanced semiconductor technology and ensuring production capacity. Japan's policies focus on promoting strategic autonomy, preventing technology leakage, and achieving economic growth through innovation.¹⁴

South Korea aims to expand its semiconductor ecosystem and find trust-based resilient supply chains that can complement its lack of competitiveness in system semiconductors and equipment materials while highlighting its global competitiveness in the memory semiconductor field.¹⁵ South Korea, heavily reliant on China and influenced by major power rivalry, focuses on diversifying its dependencies as a means of de-risking. South Korea's strategies

involve strengthening its semiconductor supply chains, partnering with like-minded countries, and developing a comprehensive China policy to balance security and economic interests.¹⁶

In short, the United States and China are primarily concerned with each other's actions, while Japan and South Korea are more attentive to vulnerabilities caused by major power rivalries and overseas dependencies. These differences drive distinct strategies, reflecting a broader divergence in how each country prioritizes and responds to economic security threats. Responses include both offensive measures to enhance the country's power and influence and defensive measures to safeguard the country's economic interests against external threats and vulnerability.

Offensive and Defensive Strategies for Economic Security

In the context of economic security and supply chain resiliency, offensive strategies focus on growth and expansion, while defensive strategies prioritize protection and stability. The respective US and Chinese defensive and offensive strategies regarding semiconductors have had complex and varied effects on South Korea's chips-related economic security. The US defensive strategy strives for increased self-reliance by promoting high-tech and strategic industries. Its goals are to revive the US semiconductor industry with subsidies and tax incentives to chip companies, construct semiconductor production facilities in the United States, and process a US-centered semiconductor supply chain reorganization.¹⁷

The US offensive strategy aims to contain China's rise by blocking technology transfers to China. The United States implemented export controls on semiconductor manufacturing equipment, fab expansion restrictions as part of the CHIPS and Science Act, and inbound and outbound investment screenings for national security reasons, rallying like-minded partners to align their policies.¹⁸ The US strategy is to check China's access to advanced semiconductor technologies and manufacturing capabilities, not only to restrict the pace of technological progress development but also to degrade the peak technological capability of China's semiconductor industry.

China's defensive strategy focuses on boosting self-reliance and technological resilience by promoting domestic consumption, developing self-sustaining supply chains, and advancing homegrown technologies. Beijing is taking concrete steps toward increased legalization and institutionalization of economic security measures.¹⁹ On the offensive side, China employs economic coercion as a strategic tool, using import and export controls and the weaponization of interdependence to penalize foreign entities and individuals who adhere to sanctions against China.

Table 1. US and Chinese Economic Strategies in Semiconductor Supply Chains²⁰

	Strategy	Purpose	Policy	Effect on South Korea
United States	Defensive	Increase self-reliance	Promote High-Tech and Strategic Industries <ul style="list-style-type: none"> • CHIPS and Science Act, IRA< EO14081 • FAB 4, MSP, IPEF 	Positive
	Offensive	Contain China's rise	Protect US Technology Transfers to China ("Small Yard, High Fence") <ul style="list-style-type: none"> • Export controls • Inbound/outbound investment screening 	Negative
China	Defensive	Increase self-reliance	Dual Circulation and Tech Self-strengthening <ul style="list-style-type: none"> • Domestic consumption and self-sustaining supply chains • Indigenize fundamental technologies 	Negative
	Offensive	Weaponize interdependence	Economic Coercion <ul style="list-style-type: none"> • Penalize foreign entities complying with sanctions against China • Import / export controls 	Threats

South Korea actively partakes in the US defensive strategy while being passive toward the US offensive strategy. The South Korean government has been expanding semiconductor cooperation with the United States while cautiously navigating export control policies that could negatively impact South Korean chip factories in China. While the Netherlands, Japan, and Taiwan quickly aligned their export control policies toward China, South Korea has been more hesitant, weighing the risks and benefits of aligning with the United States outside of traditional multilateral frameworks and abandoning the Chinese market.²¹

China's defensive strategy of greater self-sufficiency adversely affects the supply of raw materials and the export of Korean semiconductors, causing South Korean chip-making firms to lose profit. China's offensive strategy of

economic sanctions directly threatens South Korea. China's growing use of economic leverage to achieve political objectives increases the risks associated with dependence on or interactions with China. Whether the United States can provide security assurances or a safety net against China's offensive strategy remains a point of contention in Korea. Therefore, the key to economic security for South Korea is to avoid vulnerabilities while increasing supply chain resiliency and reducing dependence on China.

Collective Economic Security: Chip 4, IPEF, and MSP

From the outset, the Biden administration has aimed to “repair” traditional alliances to restore US global leadership and “reinvent” partnerships to address shared priorities and emerging challenges, including by enhancing collaboration in response to the evolving semiconductor supply chain landscape.²² Emerging technologies are now seen as a strategic asset for securing future global leadership. The United States has sought to complete a trusted value chain that excludes China and expands bilateral and multilateral consultative bodies with allies and like-minded countries.

The Chip 4 alliance is one such consultative body. The Chip 4 grouping was initially proposed by President Biden in early 2022 to invite Asian countries with relative strengths in the semiconductor sector to counter China's emerging chip industry. The grouping envisioned semiconductor cooperation that combines US design and source technology, Japanese semiconductor materials and equipment, and Korean and Taiwanese memory and non-memory semiconductor manufacturing capabilities. However, the proposed Chip 4 alliance, officially named the “US-East Asia Semiconductor Supply Chain Resilience Working Group,” has not been formalized nor systemized in its operation. It features a close cooperative entity focused on stabilizing the semiconductor manufacturing supply chain rather than an exclusive alliance that explicitly identifies adversaries. Still, this alliance has critical potential. Membership among the United States, Japan, South Korea, and Taiwan constitutes almost the entire global semiconductor industry, accounting for 82 percent of the global market share and 74 percent of the global semiconductor value chain.²³ The influence of the four countries will likely spread rapidly to other key industries that depend on semiconductors.

Additionally, the Indo-Pacific Economic Framework for Prosperity (IPEF) is a US-led economic framework aiming to strengthen economic ties with like-minded countries in the Indo-Pacific region to advance supply chain resiliency. Under US leadership, IPEF was officially launched in May 2022 with the objectives of “advancing resilience, sustainability, inclusiveness, economic growth, fairness, and competitiveness” in the four pillars of trade, supply chains, clean economy,

and fair economy.²⁴ Since its inception, IPEF has held six negotiating rounds and five ministerial meetings to make a proposal for ensuring resilient, reliable, and efficient supply chains. In February 2024, the IPEF Supply Chain Agreement was enacted, establishing a framework for deeper collaboration to prevent, mitigate, and prepare for supply chain disruptions.²⁵

The Minerals Security Partnership (MSP), launched in June 2022, is another multilateral platform led by the United States that includes the European Union and 14 countries around the world with the commitment to enhance the resilience of the critical minerals supply chain. Focusing on the minerals and metals supply chains most relevant for clean energy technologies, the MSP aims to accelerate the development of diverse and sustainable supply chains for critical energy minerals by working with host governments and industries to facilitate targeted financial and diplomatic support for strategic projects along the value chain.

The Chip 4 alliance and other US-led minilateral groupings, which are linked to a restructuring process of the semiconductor supply chain, have presented Seoul with strategic concerns. Membership could provide South Korea access to advanced technology, shared R&D resources, and supply chain resilience. The trade-off is increased dependence or competition within the alliance, potentially reducing market share and pricing power for South Korean semiconductor manufacturers and further limiting South Korea's independence and flexibility to protect its proprietary technologies or critical semiconductor technologies. The South Korean government and private sector were wary of such implications and the potential restrictions that might be imposed by Chinese economic sanctions or export and import controls.

Addressing these economic security concerns regarding the securitization of the global supply chain necessitates enhanced intra-alliance consultative mechanisms between the United States and South Korea that can reinforce commitments and partnerships in emerging sectors. Such a fortified consultative architecture will empower both nations to proactively tackle shared challenges and the vulnerabilities associated with economic disruptions, ensuring that they remain resilient against potential economic threats. For this purpose, the US-ROK global comprehensive strategic alliance gains prominent importance in navigating the complexities of today's dynamic security environment.

Charting Leader-Level Commitments and Working-Level Progress in Semiconductors and Technology Cooperation

The May 2022 Biden-Yoon summit upgraded the US-ROK alliance into a global comprehensive strategic alliance, highlighting a strong commitment at both the leader and working levels to strengthen bilateral cooperation in military,

economic, and diplomatic areas. As part of that process, the two leaders agreed to promote resilient global supply chains, enhance public-private partnerships to protect CETs, support R&D exchanges, and develop collaboration within IPEF. Whereas the 2022 summit agreement outlined broad and somewhat vague commitments on supply chain resilience and cooperation in CETs, the April 2023 US-South Korea summit clarified and formalized such commitments with specific plans like the establishment of dialogues and working-level frameworks to implement the alliance's goals in a more tangible way.

Deepening and Broadening Cooperation

Coinciding with the 70th anniversary of the alliance, the leaders' joint statement of 2023 reaffirmed their previous commitment to enhancing the alliance to reflect a broader, more integrated approach to regional and global security rooted in shared values and strategic interests. Yet, of particular salience was their commitment to upgrade the alliance into a strategic economic and technology partnership by establishing the Next Generation Critical and Emerging Technologies (CET) Dialogue to lead advanced technology cooperation.²⁶ The joint statement once again underscored the importance of aligning with like-minded countries to enhance resilience and detect potential disruptions in the global supply chains. It also highlighted the need for greater collaboration to counter the challenges of economic coercion.

Following the April 2023 summit, South Korea has shown a more substantial commitment to take an active role in US-led international cooperation on supply chain resilience. In July 2023, South Korea hosted the fourth IPEF negotiating round, which reaffirmed the grouping's commitment to detect and address potential supply chain disruptions and strengthen resiliency within the IPEF institutional framework. When the IPEF supply chain bodies—Supply Chain Council, Crisis Response Network (CRN), and Labor Rights Advisory Board—officially launched and entered the implementation phase in July 2024, Korea was elected as the inaugural chair of the crisis response network under the IPEF supply chain agreement to lead the cooperative mechanism for the global supply chain.²⁷

Building upon the US-ROK Energy Security Dialogue held in March 2023 and the US-ROK Senior Economic Dialogue in February 2024, the two countries expanded their bilateral cooperation within the 13-member MSP, focusing on joint research policies for emerging strategic technologies and securing access to critical minerals. South Korea assumed chairmanship of the MSP in July 2024, leading collaboration among members to strengthen the critical minerals supply chain.²⁸ The importance of US-Korea-Japan trilateral cooperation in

aligning economic and technological priorities was also emphasized by the Camp David Summit in 2023, the Defense Trilateral Talks in April 2023, and the Trilateral Leaders' Summit in August 2024.

Enhanced Public-Private Collaboration

In line with the commitments and plans outlined at the leader level, various bilateral working groups, task forces, and collaborative research projects have been created at the working level to facilitate substantive cooperation in the semiconductor supply chain and technology. Enhanced public-private collaboration was reflected in the official December 2023 launch of the Next Generation CET Dialogue, led by the two countries' national security advisors, focusing on semiconductor supply chains, biotechnology, batteries, and AI.²⁹ Cooperation on semiconductor supply chains and technology between both governments, industry, and academia was upgraded to provide the US and Korean research teams preferential access to advanced technology nodes for expanded joint R&D opportunities. The two governments committed to enhancing cooperation between their respective public and private research organizations, including establishing the US National Semiconductor Technology Center and the Korean Advanced Semiconductor Technology Center. A symbolic STEM exchange program was launched, inviting 2,023 students from each country to foster expertise in CETs.³⁰

Furthermore, the Supply Chain and Commercial Dialogue (SCCD), led by the US Department of Commerce and the ROK Ministry of Trade, Industry and Energy, laid the groundwork for deeper economic and commercial collaboration. There has been substantive progress with the working groups to discuss deepening semiconductor investment cooperation and collaboration between the public and private semiconductor R&D organizations through sharing best practices and aligning R&D priorities.³¹

The commitments in the semiconductor sector have led to three key achievements in enhancing the technology partnership between the United States and South Korea. First, joint initiatives, such as the US-South Korea Semiconductor Forum and the planned AI Semiconductor Innovation Centers at major US universities, foster collaborative R&D efforts. Second, the STEM talent exchange program enhances collaboration in advanced technology sectors, including semiconductors, by building expertise and driving innovation. Third, the regular ministerial-level Supply Chain and Commercial Dialogue (SSCD) and the US-Korea Semiconductor Forum promote closer collaboration between industrial, academic, and government stakeholders to discuss the promotion of resilient supply chains for key products, workforce development, and R&D.

Table 2. US-ROK Global Comprehensive Strategic Alliance in CET and Supply Chain

	Leader-Level Commitments	Working-Level Progress
Critical and Emerging Technologies (CET)	<p>2022 Summit: (General Commitments)</p> <ul style="list-style-type: none"> • Pledged to “enhance public and private cooperation to protect and promote critical and emerging technologies, including leading-edge semiconductors, eco-friendly EV batteries, Artificial Intelligence, quantum technology, biotechnology, biomanufacturing, and autonomous robotics.” <p>2023 Summit: (Institutionalization)</p> <ul style="list-style-type: none"> • Commitment to establish the Next Generation CET Dialogue led by the two countries’ national security advisors. • Agreed to implement the STEM Educational Initiative, inviting 2,023 Korean and 2,023 US students. 	<p>Public Sector Cooperation</p> <ul style="list-style-type: none"> • Next Generation CET Dialogue: The countries officially launched the dialogue in December 2023, agreeing to cooperate on semiconductor supply chains, biotechnology, batteries and clean energy, quantum science, digital connectivity, and AI. • Supply Chain and Commercial Dialogue (SCCD): US Secretary of Commerce Gina Raimondo and ROK Minister of Trade, Industry and Energy Chang-Yang Lee signed a Memorandum of Understanding to launch the US-Korea Supply Chain and Commercial Dialogue on May 21, 2022.
Supply Chain Resilience	<p>2022 Summit: (General Commitments)</p> <ul style="list-style-type: none"> • The two countries agreed to “continue working together to tackle immediate and long-term challenges in the supply chain ecosystem.” • South Korea agreed to join the Indo-Pacific Economic Framework for Prosperity (IPEF). <p>2023 Summit: (Institutionalization)</p> <ul style="list-style-type: none"> • Reaffirmed their commitment to “to detect and address potential supply chain disruptions and strengthen resiliency.” • South Korea hosted the fourth IPEF negotiating round in Busan from July 9 to 15, 2023. • South Korea was elected as the Crisis Response Network Chair under the IPEF supply chain agreement in 2024. 	<ul style="list-style-type: none"> • Minerals Security Partnership (MSP): South Korea has been a member country since its establishment in 2022. South Korea assumed one-year chairmanship in July 2024. <p>Private Sector Cooperation</p> <ul style="list-style-type: none"> • South Korean semiconductor and EV battery corporations, including Samsung, SK, LG Energy Solution, and Hyundai Motor, are constructing manufacturing facilities in the United States. • Establishment of the US National Semiconductor Technology Center and the Korean Advanced Semiconductor Technology Center.

Predictable Environment for Business Activities and Bold Investment

On the private sector front, the US and South Korean leadership have committed to close consultations to ensure that legal measures foster a favorable and predictable environment for corporate investment in the United States.³² The need for close consultation has been spurred by mounting apprehension among Korean businesses over the Inflation Reduction Act (IRA), the CHIPS and Science Act, and the guardrails provision.³³ The guardrails provision intends to restrict the recipients of subsidies and tax benefits under the CHIPS Act from investing in countries of concern, including China, which had been a significant burden for Korean companies that previously established production bases in China. The Korean government and businesses requested extended exemptions from semiconductor equipment export controls, and the US government incorporated some of the requests. Under the finalized guardrails provision of the CHIPS Act, South Korean chipmakers, including Samsung and SK Hynix, can process “routine upgrades” of their production facilities in China.

Supported by substantial funding and subsidies from the US government, significant investments are being made by Korean companies in the United States—the United States provides tax credits up to 25 percent of the amount invested in the United States. Currently, Samsung is building a new semiconductor manufacturing facility in central Texas with USD 6.4 billion in US government funding, while SKC Corporations’ subsidiary company *Absoilics* is constructing a semiconductor facility in Georgia for the development of advanced packaging substrates technology with USD 75 million in US funding.³⁴ SK Hynix is also receiving USD 450 million in direct subsidies and USD 500 million in loans to manufacture high bandwidth memory (HBM) high-end packaging and to establish R&D facilities in Indiana. Hyundai is constructing an electric car plant in Georgia to manufacture batteries for electric pickup trucks.³⁵ These investments are part of a broader effort by the United States to build resilient supply chain ecosystems for critical technologies and strengthen R&D collaboration in the field of leading-edge semiconductors, advanced packaging, and advanced materials. They also reaffirm the importance of public-private partnerships and business-to-business cooperation between the United States and South Korea in navigating global competition.

Although it may be too early to fully evaluate the visible outcome of these efforts, the global comprehensive strategic alliance has reaffirmed leader-level commitments and established working-level communication channels and platforms that support the convergence of economic and security concerns

through strategic partnerships. It has also set a collaborative mechanism for a resilient supply chain structure that operates under the norms of collective security that is institutionalized through regional strategic frameworks.

Changing Dynamics of the US-ROK Alliance: Implications and Challenges

The global comprehensive strategic alliance and strategic and economic partnership frameworks have significantly altered the nature and scope of the US-ROK alliance. Traditionally, the US-ROK alliance was grounded in formal agreements on military cooperation and mutual defense against external threats. As the scope of the alliance expands to include partnerships in high-tech areas beyond military cooperation, it facilitates a transition from an asymmetric security relationship focused on threats to a strategic partnership based on mutual interests. This transformation blurs the line between security and economic cooperation, as well as the military and strategic partnership frameworks, introducing complexities in how the alliance functions.

By expanding cooperation into new areas and stretching the concept of the alliance itself, the global comprehensive strategic alliance framework may strain traditional alliance mechanisms that are not suited for addressing the evolving goals of an economic and technological partnership. Moreover, incorporating economic security into the alliance presents challenges insofar as conventional alliance theory is not designed to fully address the complexities of economic and technological interdependence. Such conceptual stretching raises pertinent questions. Do states behave like allies when engaging in technological cooperation? Are existing alliance mechanisms fit for the purposes of technological cooperation among allied states?

In attempting to answer these questions, various distinctive challenges stand out, highlighting South Korea's apprehensions regarding its partnership with the United States, particularly in the reconfiguration of semiconductor supply chains.

Entrapment-Abandonment Dilemma

One challenge relates to the broadening of the alliance into a strategic economic and technology partnership, which can lead to mixed signals among allies, particularly when their respective threat perceptions and economic security objectives differ. The United States and South Korea share common threat perceptions regarding China's illiberal practices in technological development, illegal theft, and economic aggression. However, US and South Korean threat perceptions diverge in terms of their nature and perceived urgency, which

highlights the challenge of adopting a unified approach. Washington is more concerned about the military implications of Beijing's semiconductor technology, while Seoul is more focused on the economic implications of Beijing's technological ascendancy. US initiatives to restrict China's access to cutting-edge semiconductor technologies are framed through a national security perspective, seeking to reduce dependency on China and enhance supply chain resilience.³⁶

South Korea prioritizes economic interests, competitiveness, and its own manufacturing strengths in micro-process technology and memory conductors. South Korea's challenge lies less in China's rapid semiconductor advancements and more in the escalating US-China tensions. China remains the biggest market for South Korean semiconductor companies, with over 50 percent of semiconductor exports going to China.³⁷ While South Korea's security depends on the United States, South Korea's industry is heavily reliant on the Chinese market. This dual dependence puts South Korea in a diplomatic dilemma, caught between the competing interests of its key security ally and its largest trading partner.

The entrapment-abandonment dilemma complicates South Korea's strategic calculation. A state engaged in an alliance must constantly consider the prospect of being abandoned by its ally for non-cooperation while also being concerned about potential entrapment in its ally's disputes with other states.³⁸ As the United States pushes for closer technological cooperation and supply chain realignment, South Korea must balance its security commitments to the United States with its economic ties to China. Strong demands from the United States—a key ally—could pressure South Korea to compromise its policy autonomy and take the risk of being entangled in unwanted economic and technological conflicts that may not align with its national interests.³⁹ While participating in multilateral semiconductor cooperation talks, South Korea has kept a low profile, wary of becoming overly dependent on US-led initiatives and getting caught in the US-China tech rivalry.

One solution to this issue is strengthening shared understanding between Washington and Seoul regarding Beijing's economic coercion and introducing an economic version of extended deterrence. In 2017, South Korea faced China's coercive retaliatory measures following the deployment of the THAAD system, highlighting the critical need for defensive measures and the diversification of supply sources.⁴⁰ The US government's 2022 National Security Strategy also emphasizes China's coercive statecraft as a key reason to strengthen collaboration with allies and like-minded countries.⁴¹ Therefore, sharing concerns regarding threats and reinforcing deterrence against common threats, particularly China's economic coercion, should be the primary focus of the technological alliance between the United States and South Korea.

Collective Resilience and Deterrence

Another challenge revolves around the alliance moving beyond the traditional US-led hub-and-spokes model to adopt more inclusive and flexible intra-spoke security frameworks that form a new regional security and economic architecture.⁴² This architecture includes regional allies and partners joining multilateral economic and security platforms like the MSP and IPEF. While these initiatives aim to enhance supply chain resilience among US allies and reduce their over-dependence on critical materials in China, there is a limit to applying collective security to the economic and technology realm.

An alliance is traditionally built upon a legally codified, mutual defense commitment to come to a fellow alliance member's defense in the event of an external attack. Such treaty-based alliance commitments often result in a well-institutionalized division of labor, wherein each alliance members' respective authorities, roles, and responsibilities are clearly delineated. However, an economic and technological partnership is not based on a binding, formal agreement or well-institutionalized architecture. In the absence of a clear or well-institutionalized framework, establishing collective deterrence or formulating a collective strategy or response in the realm of economic security presents various challenges.

While allies and partners would be better off by cooperating, the collective action problem is exacerbated by their divergent perceptions and strategic objectives, prioritization of the immediate cost-benefit analysis of their national interests, and skepticism regarding the US political will to respond on their behalf in the event of Chinese economic coercion. In some cases, a coordinated retaliatory response would not benefit one's commercial interests. These various challenges are evident in the effort to reconfigure the semiconductor supply chain, including the failure to effectively establish a cohesive Chip 4 alliance.

The collective deterrence of and responses to economic coercion remain under-institutionalized. At the policy level, there is an ongoing discussion about how to institutionalize a collective response against China's economic retaliation. As Victor Cha suggests, collective resilience could "use the threat of punishment with trade retaliation to impose significant and unacceptable costs on China if it attempts to coerce others economically."⁴³ Yet, these policy initiatives have not yet fully materialized or been tested for tangible outcomes. The collective resilience platform suggested by the Group of Seven (G7) is not yet a firm base for collective defense, and thus, it will not resolve the collective action issue.⁴⁴

Value-Based Alliance vs. Profit-Based Cooperation

The upgraded US-ROK alliance, within which shared values have gained prominence, presents another challenge. In an increasingly uncertain and unpredictable security landscape, alliances are advancing to minilateral groupings of like-minded countries that share values and a collective identity that emphasizes democratic governance and a rules-based international order that is free, open, prosperous, and secure. Economic and technology cooperation is increasingly linked with these shared values, which implicitly—and sometimes explicitly—calls for countering authoritarian states. A values-based alliance, however, does not always align with the economic incentives of the private sector. While governments focus on strengthening values-based cooperation for economic security, private firms primarily seek absolute profit, making it difficult to fully apply the logic of national security to private sector behavior.⁴⁵ In technological cooperation, corporate interests do not always coincide with state interests. Companies can and do resist costly measures like relocating production or changing suppliers, as these actions may conflict with their economic interests and shareholder expectations.

South Korean chipmakers have vigorously expressed concerns over the uncertainty surrounding US subsidies and competitive pressures in global markets.⁴⁶ These companies expect governments to provide clear incentives with subsidies or regulatory measures to align private sector actions with broader national security goals and de-risking strategies.⁴⁷ The cost of fully joining US-led efforts to reconfigure global semiconductor supply chains is that South Korean chip firms active in China will lose their largest market and will need to make up for the losses. The benefit, however, is that joining the US-led effort will help technological progress and enable Korea's involvement in the global semiconductor supply chain in the long run. Yet, as noted, the public and private sectors utilize different logics in their respective cost-benefit analysis. Whereas the government favors long-term benefits over short-term costs, the private sector favors maximizing benefits and minimizing costs.

Domestic Political Considerations

While deepening and broadening the alliance is feasible and desirable in today's complex security environment, there are additional challenges regarding domestic political considerations. South Korea's polarized domestic political environment presents obstacles to its commitment and cooperation

with the United States and Japan on advanced technologies. For one, Japan's imposition of export curbs in 2019 against South Korea on semiconductor fabrication materials left lasting mistrust and skepticism toward Japan as a collaborative partner. Moreover, US policies, such as the CHIPS Act, have been criticized as protectionist measures that favor US interests under the guise of semiconductor cooperation and supply chain resilience. Concerns about whether the United States was exploiting South Korea's vulnerable position were intensified by US National Security Advisor Jake Sullivan's comment that "the economic losses suffered by allied and partner countries for joining the US industrial policy driven by national security concerns should be considered as part of the shared defense burden."⁴⁸

These concerns are compounded by the uncertainty surrounding the future direction of the incoming administration of President-elect Donald Trump. While the overall direction of the US economic security strategy focused on techno-nationalism and US-led supply chain reconfiguration is expected to persist regardless of the electoral outcome, Trump's specific approach likely will differ. Under Trump, there may be a shift toward more protectionist policies and fair-share rhetoric, which may strain alliances and disrupt existing frameworks of economic cooperation in the Indo-Pacific. A return to former President Donald Trump's China policy and America-First industrial strategy could possibly lead to a more radical agenda characterized by strategic decoupling, stringent high-tech controls and a resurgence of maximum pressure tactics.⁴⁹ Trump's campaign stance on reducing tax benefits for non-US companies and imposing stricter regulations on foreign investment is creating growing unease among semiconductor businesses in the United States.⁵⁰ Radical policy shifts in the next US administration could force the South Korean government to reassess its commitments and strategies within the alliance regarding advanced technology and supply chain cooperation.

Alliance Endurance

Alliances endure when they are founded upon common interests and objectives, dependability and credibility in commitments, equity in the benefits and costs, and strong domestic support.⁵¹ An economic and technology partnership within the global comprehensive strategic alliance should, ultimately, be based upon the same tenets. States should have confidence that allies will honor their commitments, especially regarding mutual defense and the broader goals of the alliances. Strong leadership within the alliance is also needed to organize and coordinate the alliance's activities and maintain cohesion and commitment.

Additionally, domestic support for an alliance significantly impacts its endurance—leaders with strong public backing are better positioned to sustain commitments, while domestic opposition can pressure them to reconsider.

While the US-ROK alliance meets most of these conditions, there are some aforementioned concerns regarding diverging threat perceptions, credibility, collective deterrence, and domestic political dynamics within both countries. As the alliance evolves into a more nuanced relationship—one where reciprocity is needed in order to become more balanced partners on the global stage—the United States and South Korea should focus on mutual interests and common objectives in economic security rather than on countering external threats.⁵² Thus, the alliance's sustainability and effectiveness will hinge on converging economic interests and strategic goals to enable deeper integration of supply chains and technological collaboration.⁵³

Conclusion: Path for Further Progress

US-South Korea cooperation within a global comprehensive strategic alliance framework offers new opportunities. The broadened alliance framework provides Korea with a platform to deter emerging security threats and increase its capabilities and resilience in semiconductor supply chains and critical infrastructure. It also enables Korean chipmakers to participate in the emerging international semiconductor landscape, providing access to a secure and stable supply chain as well as new market opportunities. Furthermore, the alliance could provide South Korea with access to cutting-edge semiconductor manufacturing technologies and processes, enhancing its competitiveness in the global semiconductor industry in the long run. With the upgraded alliance, the United States can complete its semiconductor supply chain reconfiguration centered on allies and like-minded states, thus establishing a new order in the technological ecosystem that deters China's advancements and solidifies US leadership in the global CET market.

From an economic security perspective, the alliance provides a vital platform for strengthening integration, coordination, and joint initiatives between Washington and Seoul. The focus is on achieving a careful balance of mutual interests, clear communication, and adaptable strategies for semiconductor supply chain and technology cooperation. The policy recommendations outlined here are designed to be purposeful yet flexible, ensuring that both allies can effectively build on the progress already made within the given framework.

- **Enhance bilateral strategic dialogues, such as the US-ROK Next Generation CET Dialogue, to regularly address semiconductor supply chain challenges and opportunities.**

Such platforms should promote in-depth consultations on economic security perspectives, ensuring alignment on policies and minimizing friction. A key focus should be understanding how US industrial policies impact South Korea and how South Korean policies and chipmakers' behaviors should interact with US imperatives. Policy coordination must be continuous, with a commitment to building confidence and trust between the two nations.

- **Encourage public-private partnerships to bolster the semiconductor industry's resilience, leveraging the strengths of both governments' support and industrial innovation.**

Governments must engage with the private sector, which remains the primary driver of innovation in the technology industry, to encourage the diversification of supply chains. Government support is critical in providing incentives for the private sector while balancing security and competitiveness. A transparent and collaborative framework is essential to ensure effective public-private cooperation, with policies that maximize compliance and industry engagement.

- **Strengthen the platform for consensus building and institutional development among allies and partners.**

Enhancing trust-based bilateral and multilateral cooperation requires better intra-alliance politics focused on consensus building and institutional development based on shared interests and objectives.⁵⁴ Member states must engage in negotiation and compromise to build a shared vision for deeper cooperation and balance different power dynamics and divergent national interests involving burden- and cost-sharing. Intra-alliance politics should involve managing threat perceptions and reconciling these differences to agree on a unified strategic approach.

- **Align and adapt toolkits for technology protection, including export controls and investment screening mechanisms, and build a collective defense mechanism to ensure a secure semiconductor supply chain.**

Shared recognition and response to economic coercive measures should be institutionalized, with collective response principles and specific action plans. The agenda should include how to define unjust economic coercion and how to actively counter it in a collective manner among countries in similar situations. The United States should consider international collective deterrence measures to assure allies and partners partaking in the US-led supply chain and bolster its supply chain resilience.

The global comprehensive strategic alliance will serve as a vital platform that can further align and coordinate the shared interests of the United States and South Korea, advancing greater cooperation in supply chain management and technology. As both nations navigate the complexities of global economic shifts, this upgraded alliance will not only enhance their strategic capabilities but also foster innovation and resilience against potential economic disruptions. This proactive approach will pave the way for a more dynamic and mutually beneficial partnership, setting the stage for deeper engagement that goes beyond traditional security measures and ultimately contributes to shaping a new security architecture in East Asia.

Endnotes

- ¹ The United States and South Korea affirmed their commitment to build a constructive alliance based on “common values, trust, and peace.” See The White House, “Joint Vision for the Alliance of the United States of America and the Republic of Korea,” June 16, 2009, <https://obamawhitehouse.archives.gov/the-press-office/joint-vision-alliance-united-states-america-and-republic-korea>; Scott A. Snyder, *The US-South Korea Alliance: Meeting New Security Challenges* (Lynne Rienner Publishers, 2012); Seengho Shin, “A Smart Alliance in the Age of Complexity: In the 21st Century,” East Asia Institute, June 1, 2009, https://www.eai.or.kr/new/ko/pub/view.asp?intSeq=12591&board=kor_issuebriefing%27%27kor_workingpaper%27%27kor_special%27%27kor_multimedia&keyword_option=board_content&keyword=%EC%8A%A4%EB%A7%88%ED%8A%B8%20%EB%8F%99%EB%A7%B9&more=.
- ² In May 2022, Presidents Biden and Yoon agreed to further advance the alliance into a comprehensive global strategic alliance that envisions a heightened role in advancing freedom, peace, and prosperity in the Indo-Pacific region and beyond. See The White House, “The United States-Republic of Korea Leaders’ Joint Statement,” May 21, 2022, <https://www.whitehouse.gov/briefing-room/statements-releases/2022/05/21/united-states-republic-of-korea-leaders-joint-statement/>.
- ³ June Park, “Is Economic Security National Security? Defining South Korea’s Economic Security for Future Industries,” *Korea Policy* 1, no. 3 (2023): 52–69; Junghyun Yoon, “Supply Chain Security in the Age of Techno-Geopolitics: ‘FAB 4’ Case in the Semiconductor Industry,” *The Korean Journal of International Studies* 21, no. 1 (April 2023): 27–60.
- ⁴ An alliance is a formal agreement between nations, usually in the realm of national security and mutual defense, that commits each nation to support the other in the event of external aggression or attack. In contrast, partnerships are less formal, help build relationships between nations without the need for a treaty with specific terms and conditions, and can be short term. See Claudette Roulo, “Alliances vs. Partnerships,” US Department of Defense, March 22, 2019, <https://www.defense.gov/News/Feature-Stories/story/Article/1684641/alliances-vs-partnerships/>.
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- ⁶ Since the WTO Information Technology Agreement entered in force in 1997, semiconductor-related products, materials, and equipment have been subject to the lowest tariff rates in global trade. See Il-seok Oh, “반도체 공급망 경쟁에 따른 디지털 진영화와 우리의 대응 [Digital Fragmentation Following Competition on Semiconductor Supply Chain and Our Response],” *The Institute of National Security Strategy Strategy Report*, no. 162 (2022): 1–26, <https://inss.re.kr/upload/bbs/BBSA05/202205/F20220502165519492.pdf>.
- ⁷ Emily Benson, Catharine Mouradian, and Andrea L. Palazzi, “Toward a U.S. Economic Security Strategy,” Center for Strategic and International Studies, July 9, 2024, <https://www.csis.org/analysis/toward-us-economic-security-strategy>.
- ⁸ For instance, Korea’s Framework Act on Supporting Supply Chain Stabilization for Economic Security defines economic security as a “state in which national security is maintained and economic activities are unhindered by ensuring the smooth inflow of essential items of the nation’s economic activities and preventing inappropriate outflow, regardless of domestic and international variables.” See Ministry of Foreign Affairs, “The Yoon Suk Yeol Administration’s National Security Strategy,” June 2023, https://www.mofa.go.kr/eng/brd/m_25772/view.do?seq=16&page=1.
- ⁹ Jungmi Cha et al., “세계경제안보 현황과 한국경제안보에 대한 제언 [The Status of Global Economic Security and Recommendations on South Korea’s Economic Security],” *The National Assembly Futures Institute Policy Report* 23, no. 14 (December 2023).
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