U.S.-ROK TECH COOPERATION

EXPORT CONTROLS, DATA POLICY, AND ARTIFICIAL INTELLIGENCE

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Edited by Gwanhoo Lee and Doug Strub

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Introduction: Fostering U.S.-ROK Cooperation on Emerging Technologies and Data

Gwanhoo Lee

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The world is witnessing unprecedented sea changes brought about by the development of artificial intelligence (AI) and other critical and emerging technologies, such as advanced semiconductor chips. The exponential growth of global data fuels the power of these technologies. AI has profound impacts on society, the economy, global affairs, and even human existence.[1] The competitive dynamics in AI development between the United States and the People's Republic of China (PRC) have accelerated, as the PRC is seeking to compete for AI leadership with the United States by leveraging its access to large data sets, ambitious entrepreneurs, and supportive government policies.[2] Semiconductors are an essential component of advanced technology such as AI and electric vehicles (EVs) and have significant implications for global geopolitics and economics as well as national security. Control over semiconductor supply chains is a key factor in the balance of international power.[3]

U.S. Export Controls on Critical and Emerging Technologies

In recent years, amid growing U.S.-PRC tension over critical and emerging technologies, the United States has overhauled its export control regime. Recognizing that existing multilateral agreements were insufficient for the PRC challenge, Washington adopted a series of unilateral policies to protect emerging and foundational technologies for national security. The CHIPS and Science Act, signed into law by President Joe Biden on August 9, 2022, aims to enhance the United States' competitiveness in science and technology. The CHIPS Act prioritizes investment in semiconductor manufacturing, research, and development to decrease reliance on foreign chip production.[4] It allocates funds for semiconductor research and production, which will bolster supply chain resilience. Additionally, the legislation includes initiatives to improve scientific research, STEM education, and workforce development in various tech areas, which will boost U.S. innovative capacities. A week after the CHIPS and Science Act was signed, President Biden signed the Inflation Reduction Act on August 16, 2022.[5] This legislation focuses on climate change, healthcare costs, and tax reform. While not directly addressing export controls for EVs and batteries, the Inflation Reduction Act significantly affects the EV sector, mainly through tax incentives. It also includes provisions for investment in the U.S. production of EV batteries, potentially influencing the global battery supply chain and indirectly altering export dynamics.

On October 7, 2022, the U.S. Department of Commerce's Bureau of Industry and Security (BIS) issued new export controls to limit China's military advancements by restricting access to advanced AI chips produced with U.S. technology.[6] These measures are part of ongoing efforts to safeguard U.S. national security and foreign policy interests. The updates specifically aim to hinder China's procurement and production of high-end chips for military use. On October 17, 2023, a year after its initial rule was set, BIS updated its regulations to address loopholes in the

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[1] Henry A. Kissinger, Eric Schmidt, and Daniel Huttenlocher, *The Age of AI and Our Human Future* (London: Hachette UK, 2021).

[2] Kai-Fu Lee, *AI Superpowers: China, Silicon Valley, and the New World Order* (New York: Houghton Mifflin, 2018).

[3] Chris Miller, *Chip War: The Fight for the World's Most Critical Technology* (New York: Simon and Schuster, 2022).

[4] The text of the CHIPS and Science Act is available at https://www.congress.gov/bill/117th-congress/house-bill/4346.

[5] White House, *Building a Clean Energy Economy: A Guidebook to the Inflation Reduction Act's Investments in Clean Energy and Climate Action*, version 2 (Washington, D.C., January 2023), https://www.whitehouse.gov/wp-content/uploads/2022/12/Inflation-Reduction-Act-Guidebook.pdf.

[6] "Commerce Implements New Export Controls on Advanced Computing and Semiconductor Manufacturing Items to the People's Republic of China (PRC)," U.S. Department of Commerce, Bureau of Industry and Security, Press Release, October 7, 2022, https://www.bis.doc.gov/index.php/documents/about-bis/newsroom/press-releases/3158-2022-10-07-bis-press-release-advanced-computing-and-semiconductor-manufacturing-controls-final.

original rules. The revision included changes to the Validated End-User Program, specifically authorizing Samsung (China) Semiconductor Co., Ltd. and SK Hynix Semiconductor (China), Ltd. to receive various items governed by the Export Administration Regulations. However, this authorization excludes certain extreme ultraviolet equipment and components related to NAND memory development or production.[7]

These recent U.S. export controls, however, have posed difficulties for South Korean firms exporting common commercial technologies to civilian users, indicating potential misalignment in the targeting of export control policies. In particular, semiconductor giants in the Republic of Korea (ROK), like Samsung Electronics and SK Hynix, which are crucial to the country's technological and economic growth, find their substantial business interests in the PRC entangled with U.S. export control policies.[8] These companies have major investments in production facilities in China, and China has become the biggest export market for them. With advanced semiconductors being a central focus of U.S. export control policies, these companies face challenges to their revenue and profitability, potentially hindering their R&D and innovation investments. South Korean policymakers are aware of the disproportionate effects of these unilateral U.S. export control policies, which create obstacles to deeper U.S.-ROK collaboration on critical emerging technologies.

U.S. Policies Aiming to Secure Leadership in Safe, Responsible AI

The United States wants to be a global leader in AI development. Vice President Kamala Harris said: "Let us be clear: When it comes to AI, America is a global leader. It is American companies that lead the world in AI innovation. It is America that can catalyze global action and build global consensus in a way that no other country can."[9] At the same time, China also wants to be a global leader in the sector. In October 2017 the State Council of the PRC designated AI a national priority, setting a goal for the country to emerge as the leading AI innovation hub worldwide by 2030.

As the competition between the United States and China in the AI race intensified, the United States issued a series of policies to ensure safe, secure, and trustworthy AI development. On October 5, 2022, the White House unveiled the AI Bill of Rights.[10] This document outlines key principles aimed at protecting people's privacy and civil rights by ensuring that AI development is more transparent and responsible. Precautions include monitoring for inaccurate and biased data, among others. A year after releasing the AI Bill of Rights, on October 30, 2023, President Biden issued a landmark executive order to promote the safe, secure, and trustworthy development

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[7] "Commerce Strengthens Restrictions on Advanced Computing Semiconductors, Semiconductor Manufacturing Equipment, and Supercomputing Items to Countries of Concern," BIS, U.S. Department of Commerce, Press Release, October 17, 2023, https://www.bis.doc.gov/index.php/documents/about-bis/newsroom/press-releases/3355-2023-10-17-bis-press-release-acs-and-sme-rules-final-js/file.

[8] Kim Hoe-seung et al., "Korea's Dilemma: U.S.-Led Chip Alliance or Chinese Market?" *Hankyoreh*, July 21, 2022, https://english.hani.co.kr/arti/english_edition/e_business/1051886.html.

[9] "Remarks by President Biden and Vice President Harris on the Administration's Commitment to Advancing the Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence," White House, October 30, 2023, https://www.whitehouse.gov/briefing-room/speeches-remarks/2023/10/30/remarks-by-president-biden-and-vice-president-harris-on-the-administrations-commitment-to-advancing-the-safe-secure-and-trustworthy-development-and-use-of-artificial-intelligence.

[10] White House, *Blueprint for an AI Bill of Rights: Making Automated Systems Work for the American People* (Washington, D.C., October 2022), https://www.whitehouse.gov/ostp/ai-bill-of-rights.

and use of AI.[11] It sets new standards for AI safety, mandates disclosure of safety test results by developers of significant AI systems, and introduces measures to mitigate AI-related risks, such as the misuse of AI to create hazardous biological materials. The executive order prioritizes privacy protection, advocating for privacy-preserving AI technologies and federal data privacy laws. It tackles issues of equity and civil rights, seeking to prevent AI-driven discrimination across sectors. It also promotes responsible AI use in healthcare and education, addresses the impact on labor markets, and encourages innovation and competitiveness, with an emphasis on the federal government's responsible use of AI and international coordination for a common AI framework.

The profound impact of AI on the global economy and politics led the United Kingdom to host an AI Safety Summit in November 2023 at Bletchley Park. The summit convened leaders in the AI space, including international governments, companies, civil society groups, and experts, to understand the risks of AI and to discuss risk mitigation through global coordination and action. The summit's Bletchley Declaration emphasizes the critical need for collaboration across governments, businesses, academia, and civil society to tackle the challenges imposed by frontier AI. It highlights the significance of sharing information and cooperative practices in AI safety, including the agreement on AI model safety testing and independent evaluation. The declaration advocates for robust policies like setting international safety standards, verifying the safety of AI models before deployment, and involving governments in the testing process throughout the AI lifecycle. It also calls for equitable AI access and benefits in various sectors, stressing the urgency of safe AI development and the importance of building public trust in AI.[12]

Data Governance Challenges

Data has become essential in driving AI development, digital transformation, and the growth of the digital economy. It has a significant impact on cross-border digital services and technologies. However, issues regarding data privacy, ownership, and security are contentious, particularly in cross-border contexts. Consequently, policies governing data privacy and international data flows are crucial for domestic growth and international technological and economic collaboration. The ROK has established itself as a leader in data governance, thanks to the Personal Information Protection Act and the Network Act, combined with institutional support from the government.

Over the past decade, the United States has issued a series of policies to promote data transparency, privacy, and security. President Barack Obama's executive order "Making Open and Machine Readable the New Default for Government Information," issued on May 9, 2013, mandates that government data must be made available in open, machine-readable formats by default.[13] This initiative aims to enhance transparency, promote innovation, and improve efficiency by making government data accessible to the public, entrepreneurs, and other stakeholders. The executive order requires federal agencies to publish their information in these formats and create an inventory of available data, supporting the development of new applications and services

[11] White House, "Executive Order on the Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence," October 30, 2023, https://www.whitehouse.gov/briefing-room/presidential-actions/2023/10/30/executive-order-on-the-safe-secure-and-trustworthy-development-and-use-of-artificial-intelligence.

[12] "The Bletchley Declaration by Countries Attending the AI Safety Summit, 1–2 November 2023," November 1, 2023, https://www.gov.uk/government/publications/ai-safety-summit-2023-the-bletchley-declaration/the-bletchley-declaration-by-countries-attending-the-ai-safety-summit-1-2-november-2023.

[13] White House, "Executive Order—Making Open and Machine Readable the New Default for Government Information," May 9, 2013, https://obamawhitehouse.archives.gov/the-press-office/2013/05/09/executive-order-making-open-and-machine-readable-new-default-government-.

using government data. On June 9, 2021, President Biden issued the executive order "Protecting Americans' Sensitive Data from Foreign Adversaries."[14] It addresses the risks associated with foreign adversaries accessing large data sets of sensitive personal information through evaluating and managing the risks posed by software applications developed or supplied by foreign entities. The executive order directs the implementation of measures to counter these data privacy risks while maintaining an evidence-based, criteria-driven approach.

Although the ROK's data governance regime is considered one of the most mature and advanced in the world,[15] legislation proposed in South Korea concerning network fees and in-app payments has sparked concerns in the U.S. business and tech sectors about over-regulation and potential market distortions. On the other hand, the United States still lacks a unified national approach to data privacy and protection, making it challenging for companies to navigate the patchwork of regulations and ensure adequate data protection for users.[16]

U.S.-ROK Cooperation on Critical and Emerging Technologies and Data

The tremendous opportunities and daunting challenges presented by AI development, the profound impact of advanced semiconductors on national security and global geopolitics, and the difference in approaches to cross-border data flows require the United States to cooperate closely with its technologically advanced allies, such as South Korea. Amid U.S.-PRC trade tensions and pandemic-induced supply chain issues, the importance of international collaboration has grown. The CHIPS and Science Act signifies widespread agreement in the United States regarding the significance of maintaining leadership in critical and emerging technologies, for both the United States and its allies. This aligns with President Yoon Suk Yeol's commitment, following the 2021 announcement of the K-Semiconductor Belt strategy, to make South Korea a top semiconductor powerhouse by 2030. In February 2022, the Biden administration's new Indo-Pacific Strategy highlighted the need to "work with partners to advance common approaches to critical and emerging technologies."[17] This was further underlined in the Biden-Yoon joint statement in May 2022, stressing cooperation in advanced technologies like "leading-edge semiconductors, eco-friendly EV batteries, AI, quantum technology, biotechnology, biomanufacturing, and autonomous robotics."[18] Enhanced technological cooperation between the United States and the ROK, especially in AI and semiconductors, could significantly bolster the leadership positions of both nations in these critical sectors.

The Global Cross-Border Privacy Rules Declaration, announced by the U.S. Department of Commerce, emphasizes the development of a global privacy framework.[19] Its main points include

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[14] White House, "Executive Order on Protecting Americans' Sensitive Data from Foreign Adversaries," June 9, 2021, https://www.whitehouse.gov/briefing-room/presidential-actions/2021/06/09/executive-order-on-protecting-americans-sensitive-data-from-foreign-adversaries.

[15] Clara Gillispie, "How Can South Korea Teach, Lead, and Better Engage with the Asia-Pacific in Shaping Data Governance for the 5G Era?" *Asia Policy* 16, no. 4 (2021): 143–66.

[16] Paul Pittman, Kyle Levenberg, and Shira Shamir, "Data Protection Laws and Regulations USA 2022," Global Legal Group, August 7, 2022, https://iclg.com/practice-areas/data-protection-laws-and-regulations/usa.

[17] White Houe, *Indo-Pacific Strategy of the United States* (Washington, D.C., February 2022), https://www.whitehouse.gov/wp-content/uploads/2022/02/U.S.-Indo-Pacific-Strategy.pdf.

[18] "United States–Republic of Korea Leaders' Joint Statement," White House, May 21, 2022. https://www.whitehouse.gov/briefing-room/statements-releases/2022/05/21/united-states-republic-of-korea-leaders-joint-statement.

[19] "Global Cross-Border Privacy Rules Declaration," U.S. Department of Commerce, https://www.commerce.gov/global-cross-border-privacy-rules-declaration.

fostering international cooperation to facilitate cross-border data flows while ensuring data privacy and protection. The declaration seeks to create interoperable privacy standards, improve trust and confidence in the digital economy, and support the participation of a diverse range of economies. The goal is to bridge different privacy regimes, ensuring effective protection and enforcement of privacy rules globally. With the Yoon administration's ambition to develop the world's best digital platform government connecting all data from the public and private sectors, it is increasingly vital for the United States and the ROK to resolve differences in data policy, find mutually acceptable bilateral solutions, and shape regional and global digital norms to align with their shared interests.

Organization of the Report

Against the backdrop of the increasing global competition over AI and semiconductors and the compelling need for streamlining cross-border data flows, this report aims to analyze the current state of U.S.-ROK cooperation on technology and data, identify challenges and barriers to greater collaboration, and propose practical options for policymakers and businesses in both countries to advance their common interests. This report also seeks to bring together the technology and policy communities in both nations by suggesting ways to strengthen technology partnerships across government, industry, and academia. To this end, experts from the United States and the ROK collaborated to author chapters on export controls, AI, and data policy. Each chapter includes sections in which the U.S. and ROK authors, respectively, present their analysis and perspectives on the given topic, followed by a jointly authored concluding section with a set of policy options.

In the chapter on export controls, Mireya Solís discusses the escalating U.S.-China tech rivalry, emphasizing U.S. efforts to safeguard emerging technologies like AI, semiconductors, and quantum computing through stringent export controls. She highlights the crucial role of South Korea, a key U.S. ally with strengths in semiconductors and EVs, in bolstering these efforts. However, she also acknowledges the challenges in aligning U.S. and ROK policies and the impact of U.S. restrictions on Chinese access to advanced technologies, particularly in the semiconductor industry. She underscores the complexity of U.S. export controls amid geopolitical shifts. Next, Jungmin Pak and his colleagues examine the impact of U.S. semiconductor export controls on the global industry, with a focus on South Korea. The U.S. restrictions aiming to limit China's access to advanced technology significantly affect South Korean firms due to their extensive operations in China. These measures have created operational uncertainties and challenges for South Korea's semiconductor industry, which is heavily reliant on both the U.S. and Chinese markets. The authors underscore the need for collaborative U.S.-ROK approaches to export controls, advocating for a cooperative framework that balances national interests and maintains industry stability.

In the chapter on AI, Ahram Moon emphasizes the role of AI as a catalyst for economic growth globally. As countries are competing to create policies for safe and responsible AI use, she acknowledges that innovation requires collaboration among various stakeholders for resources like computing power, data, and cloud services. She highlights the limitations of single-country efforts in establishing AI ethics and safety, advocating for global cooperation. She examines South Korea's AI ecosystem, reviewing its policy landscape and exploring challenges and opportunities for U.S.-ROK collaboration on responsible AI development. In the second part of the chapter, Cole McFaul highlights the escalating role of AI in global security and economic

sectors, emphasizing U.S. and South Korean efforts to govern AI development responsibly. He recognizes the broad impact of AI across industries and its potential for misuse. The United States is engaging allies, notably South Korea, to counter rivals like China in AI advancement. Despite challenges in policy harmonization and research partnerships, a strong U.S.-ROK alliance in AI is vital to influence global standards and safeguard mutual interests.

In the concluding chapter on data policy, Nigel Cory discusses the underutilized potential in U.S.-ROK cooperation in digital and high-tech sectors, despite the two countries' leadership in technology and close alliance. Differing approaches to data governance provide a key challenge by impeding cross-border data flows. He advocates for diversified and inclusive bilateral engagement, incorporating commercial and regulatory bodies alongside diplomatic channels. He also argues for aligned strategies and policies on data protection and cloud services between the United States and the ROK. Enhanced collaboration is viewed as crucial to balancing national security with innovation and trade in the digital economy. Nohyoung Park then analyzes South Korea's Personal Information Protection Act and its 2023 amendments, which expanded the legal bases for international personal data transfer to align more with global data governance norms. Initially restrictive, the law has undergone revisions aimed at facilitating data flows while ensuring protection, introducing mechanisms like the reciprocity principle, and encouraging other countries to liberalize their data policies. He highlights South Korea's role in international data transfer frameworks and trade treaties, emphasizing the need for further alignment with global standards.

In its entirety, this report discusses important opportunities and significant challenges as the United States and the ROK cooperate to assume global leadership in AI, semiconductors, and data governance and offers insights and policy options to foster collaboration going forward.

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Export Control Policies in U.S.-ROK Relations

Mireya Solís and Jungmin Pak, Hyunsoo Joo, and Haeyoon Chung

EXECUTIVE SUMMARY

This chapter analyzes the differing approaches to export controls in the U.S. and the Republic of Korea (ROK) and identifies potential pathways to strengthen collaboration, minimize challenges, and increase the effectiveness of these policies.

MAIN ARGUMENT

In the first section, Mireya Solís examines the drivers, tools, and objectives of the U.S. approach to export controls and argues that greater allied cooperation, including between the U.S. and the ROK, is essential for U.S.-led export controls to be effective. Nevertheless, the challenges of export control coordination are steep. Gaps in threat perception over the risks posed by China's technological deepening, different competitive niches within the vast semiconductor supply chain, asymmetrical vulnerabilities to potential Chinese retaliation, and dissimilar legal regimes governing the export of sensitive technologies and products can be daunting barriers limiting the degree of coordination, even among allied countries.

In the second section, Jungmin Pak, Hyunsoo Joo, and Haeyoon Chung assess the impact of the U.S. export controls on Korean companies. While the ROK government understands the reasoning behind the U.S.'s unilateral imposition of these controls, the authors argue that their erratic and unpredictable application, coupled with the absence of consistent long-term policies, creates unnecessary challenges for allied countries. While some steps have been taken to mitigate these negative impacts, a more stable and predictable policy environment is needed.

POLICY IMPLICATIONS

- The strict U.S. export controls implemented in recent years are ambitious in their objectives and execution, but to be effective they need the support of like-minded, technologically advanced countries.
- Export controls affect economies in unique ways, and more coordination and planning are needed to minimize negative consequences for partners and allies.
- Restrictions on the export of technology do not operate in a vacuum. Therefore, the design of export control policies should take into account the combined impact of other economic security measures such as FDI screenings, industrial policies, and subsidy programs.
- At a time when deepening geopolitical divides hamper the operation of multilateral export control regimes, the importance of developing effective plurilateral regimes has increased.

This chapter analyzes the differing approaches to export controls in the United States and the Republic of Korea (ROK) and identifies potential pathways to strengthen collaboration, minimize challenges, and increase the effectiveness of these policies. In the first section, Mireya Solís examines the drivers, tools, and objectives of the U.S. approach to export controls and argues that greater allied cooperation, including between the United States and the ROK, is essential for U.S.-led export controls to be effective. Nevertheless, the challenges of export control coordination are steep. Gaps in threat perception over the risks posed by China's technological deepening, different competitive niches within the vast semiconductor supply chain, asymmetrical vulnerabilities to potential Chinese retaliation, and dissimilar legal regimes governing the export of sensitive technologies and products can be daunting barriers limiting the degree of coordination, even among allied countries.

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The chapter concludes by considering policy options for improving U.S.-ROK coordination on export controls and maximizing their effectiveness.

U.S. Export Controls in the Era of Strategic Competition: Implications for South Korea[1]

Mireya Solís

As the U.S.-China relationship grows more competitive, the development and protection of sensitive technologies have become pressing tasks for U.S. policymakers. In the midst of rapid technological advancements in areas such as artificial intelligence (AI), microelectronics, and quantum computing, the United States has become more concerned with shoring up critical infrastructure and preventing leakages of advanced technologies that China could use to build up its military capabilities. Tighter rules and novel uses of export controls have been a feature of Republican and Democratic administrations alike, with China foremost in mind.

Central to the success of U.S. export controls is the ability to enlist the support of like-minded countries. Plurilateral export controls are more effective in restricting the supply of sensitive technologies, facilitating more efficient monitoring of compliance, and boosting the legitimacy of the technology restrictions. They also obviate the need for extraterritorial measures that rankle allies and help assuage U.S. firms that they will not be designed out of new products as foreign manufacturers hedge against the risk of tighter controls on U.S. technology and equipment. Nevertheless, differences in export control regimes, the competitive niches of each partner's advanced manufacturing ecosystems, and gaps between their respective China policies create hurdles to effective coordination.

[1] This section is authored by **Mireya Solís**, who is director of the Center for East Asia Policy Studies at the Brookings Institution. She can be reached at <msolis@brookings.edu>.

Cooperation with South Korea, a close U.S. ally in Asia and a leading technological power globally, will increase the effectiveness of U.S. export control policies. South Korean firms have a competitive edge in memory semiconductors, specialized chip manufacturing equipment, and electric batteries and electric vehicles (EVs). With the announcement of investments in the United States upward of $100 billion, Korean companies are expanding manufacturing capacity in sectors where the United States aims to boost supply chain resilience (chips) and advance the green transition (EVs).[2] The administrations of Presidents Joe Biden and Yoon Suk Yeol have declared their intention to develop a "global comprehensive strategic alliance," with cooperation in emerging technologies and economic security as key pillars of the partnership.[3] Yet, coordination on advanced technology export restrictions has proved challenging.

When the United States revamped its export control policies in October 2022 to prevent China's access to advanced chips and the equipment to produce them indigenously, South Korea's semiconductor giants Samsung Electronics and SK Hynix were left in limbo. They were granted just a one-year waiver to continue to supply equipment to sustain operations in their large chip fabrication plants (fabs) in China. After intense bilateral consultations, the United States one year later recognized these two South Korean firms as validated end users, exempting them from the requirement to apply for case-by-case licenses.[4] While this was welcome news for the South Korean government and industry, the uncertainty over the long-term future of advanced chip manufacturing in China has not fully abated. Technological upgrading is still restricted by U.S. controls, and South Korean firms with fabs in China may yet be affected by U.S.-China technology competition. Moreover, recent advancements in the U.S.-ROK relationship only amounted to a damage-control exercise, not a broader realignment of export control policies. Hence, the potential for more effective coordination that can cement the transformation of the U.S.-ROK alliance into a comprehensive partnership in technology is still unrealized.

The Era of U.S.-China Strategic Rivalry

Over the course of the 21st century, U.S.-China relations have experienced a profound shift away from engagement and toward strategic rivalry. The competitive drivers are strong across both the security and economic domains, with the technology race becoming a focal point. The bilateral relationship and global geopolitical landscape changed with the remarkable economic rise and military modernization that China has achieved in the past few decades. China's role in the manufacturing value chain has also morphed from a low-cost assembly hub to one of greater advanced manufacturing capabilities and growing ambitions for cutting-edge technological development. In addition to these structural shifts, the evolution of China's domestic political and economic systems and Beijing's more assertive foreign policy are key factors behind the competitive turn. The centralization of power under President Xi Jinping intensified domestic authoritarian control with the rise of a surveillance state. Meanwhile, the spirit of "reform and opening up"

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[2] "Republic of Korea States Visit to the United States," White House, Fact Sheet, April 26, 2023, https://www.whitehouse.gov/briefing-room/statements-releases/2023/04/26/fact-sheet-republic-of-korea-state-visit-to-the-united-states.

[3] "United States–Republic of Korea Leaders' Joint Statement," White House, Press Release, May 21, 2022, https://www.whitehouse.gov/briefing-room/statements-releases/2022/05/21/united-states-republic-of-korea-leaders-joint-statement.

[4] "Commerce Issues Rule to Strengthen National Security Partnership to Secure Semiconductor Supply Chains with Republic of Korea," U.S. Department of Commerce, Bureau of Industry and Security, Press Release, October 13, 2023, https://www.bis.doc.gov/index.php/documents/about-bis/newsroom/press-releases/3351-2023-10-13-bis-press-release-rok-veus/file.

that previously guided Chinese economic policy waned, and the "hide and bide" approach that counseled moderation gave way to a more assertive foreign policy.[5]

Decades of weaving a vast and intricate global economic tapestry through trade and investment flows, coupled with the integration of China into the international trading system, including through a central role in the increasingly complex networks of global supply chains, have given rise to new challenges that have soured attitudes toward these arrangements. Hence, geoeconomics is a fundamental axis of the new era of strategic competition. Both China and the United States are maneuvering to sustain the economic benefits of interdependence while hedging against the risks of overdependence and using their command of chokepoints in strategic supply chains as potential levers of influence. China's ambitions to achieve self-sufficiency in cutting-edge manufacturing were advertised in its Made in China 2025 policy document. These ambitions manifested in mass subsidization of the semiconductor industry and other advanced technologies, the proliferation of national security controls governing economic transactions at home and abroad, and the flexing of China's economic influence as a tool of both engagement (e.g., infrastructure finance and trade negotiations) and coercion (e.g., informal boycotts of goods amid political disputes and restrictions on critical mineral exports).

For the United States, the China challenge has only grown in complexity. Long-standing complaints about the lack of a level playing field for U.S. firms in the Chinese market, theft of intellectual property, and the loss of domestic factory jobs due to Chinese imports have been superseded by the strategic implications of China's growing technological prowess—aided by the heavy hand of the state—and the leakage of critical technologies that can be siphoned off toward military purposes. As such, the export controls on technology discussed in this chapter are central to the U.S.-China contest. But they are also part of a broader retooling of policy instruments following the logic of strategic competition:

- The Committee on Foreign Investment in the United States has received an expanded mandate to review noncontrolling investments in critical technologies and infrastructure.
- President Biden issued an executive order on screening outbound investment in sensitive technologies for countries of concern.
- The Inflation Reduction Act includes tax credits for EVs, contingent on a phaseout of Chinese rare earth minerals from EV batteries.
- Industrial policy subsidies are available for semiconductor manufacturing in the United States with strings attached, since recipients cannot expand chip production capacity by more than 10% over the next ten years in countries of concern like China.

All the while, the 2018 trade war tariffs largely remain in place.

U.S. Export Controls from Trump to Biden

Both the Trump and Biden administrations have attached great importance to preventing technology leaks that could harm national security amid a sharp deterioration in the geopolitical environment. But there are important differences in strategy and implementation. The winds of change were evident with the 2018 Export Control Reform Act, which mandated that emerging and foundational technologies essential to national security be subject to export controls. This revision

[5] Joe Leahy et al., "'Dare to Fight': Xi Jinping Unveils China's New World Order," *Financial Times*, March 31, 2023, https://www.ft.com/content/0f0b558b-3ca8-4156-82c8-e1825539ee20.

broke new ground by incorporating technologies that are ubiquitous in economic activities.[6] It was largely informed by competition with China, since the Bureau of Industry and Security's subsequent list of covered technologies mirrored the sectors targeted in Made in China 2025.

The Trump administration used the Entity List to punish sanctions infringement and address vulnerabilities in critical infrastructure posed by Chinese technology firms. ZTE's violation of its settlement with the U.S. government following proscribed sales of telecommunications equipment to Iran resulted in swift export restrictions in spring 2018 that threatened its financial solvency. President Donald Trump, however, intervened to ease the controls at the behest of President Xi Jinping.[7] Concerned over the national security risks of Huawei's 5G networks, the Trump administration banned the company from U.S. infrastructure and placed it on the Entity List in May 2019. U.S. companies were henceforth required to obtain a license (with the presumption of denial) to sell chips to Huawei and 68 of its affiliates. A year later, the rule was amended to close a loophole extending the export restrictions to foreign firms that rely on U.S. technology or equipment. The novel use of the Foreign Direct Product Rule vastly extended the reach of U.S. technology restrictions. For instance, Taiwan-based TSMC curtailed its sales to Huawei and other Chinese companies on the Entity List. These long-arm controls were a heavy blow to the giant Chinese telecommunications firm.[8]

When the Biden administration took over in 2021, some important lessons had been learned. First, China's dependence on high-performance chips was recognized as a key weakness in its ambitions to lead in advanced manufacturing and develop cutting-edge weaponry. Second, the inconsistent implementation of the export controls (as a result of President Trump's political interventions) blunted U.S. policy objectives. And third, export controls that applied only to U.S. companies would enable China to find workarounds to the disadvantage of these firms. Important decisions loomed regarding the feasibility and tradeoffs of extraterritorial applications and plurilateral arrangements. But the Biden administration went beyond tinkering with existing export control policies to offer a new set of objectives and far more comprehensive strictures on chip exports.

In a landmark speech in September 2022, National Security Advisor Jake Sullivan spoke of the new challenges of protecting force-multiplier technologies—microelectronics, edge computing, AI, biotechnology, and clean energy—in a transformed security environment.[9] The old approach of maintaining relative advantage over China, Sullivan admonished, would no longer satisfy U.S. national security objectives. Instead, stalling Chinese development in sensitive sectors was deemed necessary. This reassessment by the Biden administration was informed in large part by China's military-civil fusion practices, which make it hard to forestall the diversion of advanced commercial technologies to sophisticated weapons programs. Mounting geopolitical challenges have also influenced the Biden administration. Noting the successful experience of technology sanctions on Russia, Sullivan remarked that "technology export controls can be more than just a

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[6] Elena Lazarou and Nicholas Lokker, "United States: Export Control Reform Act (ECRA)," European Parliamentary Research Service, EPRS Report, November 2019, https://www.europarl.europa.eu/cmsdata/210523/EPRS_BRI(2019)644187_EN.pdf.

[7] Gregory C. Allen, "China's New Strategy for Waging the Microchip Tech War," Center for Strategic and International Studies (CSIS), May 3, 2023, https://www.csis.org/analysis/chinas-new-strategy-waging-microchip-tech-war.

[8] Paul Triolo and Kevin Allison, "The Geopolitics of Semiconductors," Eurasia Group, September 10, 2020, https://www.eurasiagroup.net/files/upload/Geopolitics-Semiconductors.pdf.

[9] Jake Sullivan, "Remarks by National Security Advisor Jake Sullivan at the Special Competitive Studies Project Global Emerging Technologies Summit," White House, September 16, 2022, https://www.whitehouse.gov/briefing-room/speeches-remarks/2022/09/16/remarks-by-national-security-advisor-jake-sullivan-at-the-special-competitive-studies-project-global-emerging-technologies-summit.

preventative tool. If implemented in a way that is robust, durable, and comprehensive, they can be a new strategic asset in the U.S. and allied toolkit to impose costs on adversaries, and even over time degrade their battlefield capabilities."[10]

The October 7, 2022, export control rules were an important step in the implementation of these new strategic goals. Their basic thrust is to curtail China's access to the high-performance chips needed to train AI models and develop supercomputers. The rules are complex, but, in broad strokes, they include barring the sale of certain advanced computing chips; restricting the supply of semiconductor production equipment used to manufacture logic semiconductors below 16nm or 14nm, DRAM chips at or below 18nm, and NAND flash memory chips with 128 or more layers (for U.S. firms as well as foreign companies that use U.S. technology or equipment); and forbidding U.S. persons from assisting with advanced logic manufacturing in China.[11] These controls seek to frustrate China's technological advancement by curtailing its access to chips, machinery, and talent.

This was a bold and unilateral move by the United States, and one that carried huge repercussions for its allies and partners. The long-arm controls on chip and equipment sales hinder the ability of companies headquartered in partner countries to serve the Chinese market via exports or local production. Equally important has been the U.S. effort to plurilateralize these restrictions to increase their effectiveness. Allied export control diplomacy acquired new urgency.

Export Control Coordination: What Role for South Korea?

The challenges of export control coordination are steep. Gaps in threat perception over the risks posed by China's technological deepening, different competitive niches within the vast semiconductor supply chain, asymmetrical vulnerabilities to potential Chinese retaliation, and dissimilar legal regimes governing the export of sensitive technologies and products can be daunting barriers limiting the degree of coordination, even among allied countries. Another complicating factor is that export control policies are a moving target. By necessity, adjustments will be needed to factor in technological innovations—including China's indigenous technological progress—and to close loopholes in extant regulations.

These headwinds notwithstanding, the United States was able to reach an agreement with the Netherlands and Japan a few months after the October 7, 2022, controls were put in place. This understanding addressed two major U.S. concerns: that Dutch and Japanese firms would not export to China the highly advanced lithography equipment they alone dominate, and that they would not retool operations to provide other advanced semiconductor equipment that U.S. firms were forbidden to supply to China after October 2022.[12] This agreement was quietly worked out behind the scenes, with each government adjusting its regulations in the spring and summer of 2023. The Dutch government announced export controls that went beyond extreme ultraviolet lithography to include some deep ultraviolet lithography equipment.[13] In the case of Japan, 23 new categories of semiconductor production equipment were added to the list of

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[10] Sullivan, "Remarks by National Security Advisor Jake Sullivan."

[11] Martijn Rasser and Kevin Wolf, "The Right Time for Chip Export Controls," Lawfare, December 13, 2022, https://www.lawfaremedia.org/article/right-time-chip-export-controls.

[12] Gregory C. Allen and Emily Benson, "Clues to the U.S.-Dutch-Japanese Semiconductor Export Controls Deal Are Hiding in Plain Sight," CSIS, March 1, 2023, https://www.csis.org/analysis/clues-us-dutch-japanese-semiconductor-export-controls-deal-are-hiding-plain-sight.

[13] Rem Korteweg, "Dutch Perspective: How the Netherlands Followed Washington's October 7 Export Restrictions," in "The Post–October 7 World: International Perspectives on Semiconductors and Geopolitics," ed. Gregory C. Allen, CSIS, September 28, 2023, 30, https://www.csis.org/analysis/post-october-7-world.

controlled items. The new Japanese export control policies are China-agnostic, as they do not target any specific country. In practice, however, Japan will apply them with a presumption of denial toward Chinese entities.[14] China responded to these measures by restricting exports of the critical minerals germanium and gallium, thus demonstrating its leverage over other critical nodes of the supply chain.

No similar deal to align export control policies has been reached with Seoul. South Korea is a global leader in the production of memory chips and possesses a small but highly sophisticated semiconductor equipment sector, with a global market share of 73% in DRAM and 51% in NAND flash. The stakes of great-power competition in semiconductor manufacturing could not be higher for the South Korean economy, as chips capture the largest share of the country's exports, at almost 19% in 2022.[15] But South Korea has a distinct form of exposure in the chip war compared with the Netherlands or Japan—namely, the large China-based fab operations of leading chip producers Samsung Electronics and SK Hynix. Around 40% of these two companies' memory chips are produced in China.[16] When the United States rolled out the October 2022 rules, it provided a temporary reprieve, allowing South Korean firms to continue importing needed equipment to support their China-based fabs at existing performance levels.

South Korean firms have been contending with an unpredictable environment and difficult options given the sunk costs of their large fab operations in China. Relying on a temporary waiver in U.S. export controls for the supply of chip equipment created uncertainty about the long-term future of these plants. The inability to upgrade their existing manufacturing operations will also render them less valuable over time.[17] China's plans to boost its domestic champions in the memory chip segment and the increasing use of national security controls in market operations among key semiconductor-producing countries have created a host of additional competitive pressures and risks.

Heading into the one-year anniversary of the October 2022 rules, the U.S. Department of Commerce on October 17, 2023, announced upgrades geared toward closing loopholes by changing the criteria used to evaluate chip performance based on total processing performance and performance density rather than speed of interconnection. This was spurred by Nvidia's move to evade the original export control rule by redesigning its chips to continue selling to Chinese customers. For that reason, U.S. authorities imposed a notification requirement for the export of certain chips below the restricted performance threshold, which may nevertheless be subjected to licensing.[18] The updated export control rules also greatly expanded the geographic reach of the restrictions. In an effort to prevent transshipment through third countries to Chinese affiliates, the list of countries subject to licensing requirements grew by 43.[19]

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[14] Kazuto Suzuki, "Japanese Perspective: Japan Embraces Its Strategic Indispensability in Alliance with the United States," in Allen, "The Post–October 7 World," 22.

[15] U.S. International Trade Administration, "South Korea Semiconductors," https://www.trade.gov/market-intelligence/south-korea-semiconductors.

[16] Martin Chorzempa, "How U.S. Chip Controls on China Benefit and Cost Korean Firms," Peterson Institute for International Economics, Policy Brief, July 2023, https://www.piie.com/publications/policy-briefs/how-us-chip-controls-china-benefit-and-cost-korean-firms.

[17] Wonho Yeon, "South Korean Perspective: South Korea Needs Increased (but Quiet) Export Control Coordination with the United States," in Allen, "The Post–October 7 World."

[18] "Commerce Strengthens Restrictions on Advanced Computing Semiconductors, Semiconductor Manufacturing Equipment, and Supercomputing Items to Countries of Concern," U.S. Department of Commerce, Bureau of Industry and Security, Press Release, October 17, 2023, https://www.bis.doc.gov/index.php/documents/about-bis/newsroom/press-releases/3355-2023-10-17-bis-press-release-acs-and-sme-rules-final-js/file.

[19] Emily Benson, "Updated October 7 Semiconductor Export Controls," CSIS, October 18, 2023, https://www.csis.org/analysis/updated-october-7-semiconductor-export-controls; and William Alan Reinsch, Matthew Schleich, and Thibault Denamiel, "Insight into the U.S. Semiconductor Export Controls Update," CSIS, October 20, 2023, https://www.csis.org/analysis/insight-us-semiconductor-export-controls-update.

A significant step in U.S.-ROK coordination on export controls was the U.S. Commerce Department's recognition in mid-October 2023 of Samsung Electronics and SK Hynix manufacturing operations in China as validated end users. With this designation, it will be possible to ship approved semiconductor equipment with a general license in lieu of repeated individual licenses.[20] This move was very much welcomed in South Korea. It does not, however, fully eliminate uncertainty about the future of ROK chip manufacturing in China. There are still constraints on the types of semiconductor equipment that can be shipped, which will hinder the technological upgrading of these plants and minimize the expansion of productive capacity in China. Strings also still apply regarding the extent that South Korean firms can accept subsidies for their U.S. investments, which could reduce the incentive to pursue this strategy. At this juncture, the U.S.-ROK dialogue has centered on damage control (i.e., easing the immediate fallout of the October 7 export rules). However, a broader movement to realign export control regimes, similar to the deals with the Netherlands and Japan, has not materialized.

The Biden and Yoon administrations have made strides in deepening the alliance by taking on the new challenge of economic security. Much is at stake in their ability to lead in emerging technologies, nurture the critical semiconductor industry, and prevent the leakage of sensitive knowledge and intellectual property. Despite recent efforts, robust export control coordination in the era of strategic competition is still a work in progress in the U.S.-ROK relationship.

[20] "Commerce Issues Rule to Strengthen National Security Partnership to Secure Semiconductor Supply Chains with Republic of Korea."

The Impact of Export Controls on South Korean Companies and Pathways to Plurilateral Cooperation[21]

Jungmin Pak, Hyunsoo Joo, and Haeyoon Chung

In recent years, the global semiconductor industry has witnessed a substantial transformation driven primarily by the implementation of U.S. semiconductor export control policies under the U.S. Export Administration Regulations (EAR), which seek to limit China's access to cutting-edge technology. These export controls have typically applied to items that are located in the United States, are of U.S. origin, contain substantial U.S.-origin controlled content, or are the foreign-produced direct product of certain U.S. software or technology, known as the Foreign Direct Product (FDP) Rule. Historically, South Korean businesses have not experienced a disproportionately high level of exposure to the U.S. EAR compared with other countries. This can be attributed to their limited reliance on controlled items. However, the situation has taken a distinct turn as more items have become subject to the FDP Rule in recent years, greatly augmenting their role. When focusing on the semiconductor manufacturing sector, the EAR, in particular by virtue of the FDP Rule, has become especially relevant with regard to recent U.S. export controls on semiconductor products destined for China.

A Brief Overview of U.S. Semiconductor Export Controls on China

On October 7, 2022, the U.S. Department of Commerce introduced new regulations prohibiting U.S. companies from exporting technology, software, and equipment essential for advanced computing and semiconductor production in China. These controls mandate that U.S. companies obtain licenses if they intend to sell such equipment or technology to Chinese companies. The rules also require exporters, re-exporters, and transferors to obtain a license to ship an extensive range of electronics and computer-related items to China—or, in some cases, any item subject to the EAR—when they are destined for supercomputing end uses or for use in semiconductor fabrication facilities that manufacture chips that meet certain performance parameters.[22] Other sections of the new rule are aimed at preventing the sale of specific U.S. semiconductor manufacturing equipment to China without a license, the development or production of semiconductor manufacturing equipment within China, the manufacture of certain chips designed in China at fabs outside China, and the provision of support by U.S. persons with respect to items not subject to the EAR in the development or production of specific types of integrated circuits in China.

Although allied nations had not made prior commitments to enforce similar restrictions, this announcement marked a significant expansion of export controls. Implicitly, it had the effect of pressuring U.S. allies to align diplomatically and politically with these new restrictions. Securing support from allies was considered crucial for the success of this policy.[23] In January 2023, both Japan and the Netherlands agreed in principle to join the United States in imposing semiconductor

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[22] "'Supercomputer,' 'Advanced-Node Integrated Circuits,' and Semiconductor Manufacturing Equipment End Use Controls," Code of Federal Regulations, 15 CFR § 744.23, https://www.ecfr.gov/current/title-15/subtitle-B/chapter-VII/subchapter-C/part-744/section-744.23.

[23] Stephen Nellis, Karen Freifeld, and Alexandra Alper, "U.S. Aims to Hobble China's Chip Industry with Sweeping New Export Rules," Reuters, October 10, 2022, https://www.reuters.com/technology/us-aims-hobble-chinas-chip-industry-with-sweeping-new-export-rules-2022-10-07.

export controls.[24] By July 2023, Japan had escalated its measures by including cutting-edge manufacturing equipment required for producing high-end chips. However, companies like South Korea's Samsung Electronics and SK Hynix and Taiwan's TSMC, which already had operations in China, received a one-year waiver, initially set to expire in October 2023. Although the waiver was extended, uncertainties still loomed in the industry regarding the duration of the extension.[25] Just as the one-year waiver was nearing its expiration, the United States designated semiconductor plants of Samsung Electronics and SK Hynix in China as validated end users, a status that significantly reduces the licensing burden on South Korean firms with operations in China.[26]

Impacts on and Challenges for the ROK Semiconductor Industry

The ROK semiconductor industry faces a unique and disproportionate impact from U.S. export controls, primarily due to its substantial investments in manufacturing facilities located within China. The two largest South Korean semiconductor manufacturers, Samsung Electronics and SK Hynix, have established manufacturing facilities in China, and China is a major buyer of NAND flash and DRAM components that are produced by them. Samsung Electronics produces approximately 40% of its NAND flash chips at its Xi'an plant, while SK Hynix manufactures around 40% of its DRAM chips in Wuxi and 20% of its NAND flash chips in Dalian.[27] In total, Samsung Electronics and SK Hynix have invested over $28 billion and $29 billion, respectively, in establishing semiconductor manufacturing facilities in China. These substantial investments underscore their significant presence in the Chinese semiconductor landscape, creating a notable impact compared with competitors in other countries, such as Japan. This is due to the ROK semiconductor industry's heavy reliance on both China and the United States as key export destinations.

For context, according to the Bank of Korea's latest economic outlook report, South Korea's semiconductor exports over the past decade have exhibited 1.9 times as much volatility as Taiwan's and 2.7 times as much as Japan's in terms of value.[28] Until Samsung Electronics and SK Hynix were designated as validated end users, uncertainty persisted regarding when, for how long, and how frequently these waivers would be renewed for a market on which the South Korean semiconductor industry relied heavily. In 2022, South Korea shipped 55% of all its semiconductor exports to China, followed by 12% to Vietnam, 9% to Taiwan, and 7% to the United States.[29] By contrast, South Korea's biggest chip export rival, Taiwan, ships a more balanced mix of chip products to more countries, which protects it from volatile market conditions. This dependence has left South Korean products disproportionately vulnerable to U.S. semiconductor export controls targeting China.

In addition to these overarching challenges, South Korean semiconductor manufacturers have encountered complex issues stemming from U.S. export controls, with effects that extend beyond

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[24] Matthew Townsend et al., "The Netherlands Joins the U.S. in Restricting Semiconductor Exports to China," Allen and Overy, March 13, 2023, https://www.allenovery.com/en-gb/global/news-and-insights/publications/the-netherlands-joins-the-us-in-restricting-semiconductor-exports-to-china.

[25] Jasmine Choi, "Samsung, SK Breathe Sigh of Relief as U.S. Postpones China Semiconductor Export Controls," *Business Korea*, August 24, 2023, https://www.businesskorea.co.kr/news/articleView.html?idxno=200254.

[26] Jasmine Choi, "U.S. Approves VEU Status for Samsung, SK Hynix, Reflecting Solid U.S.–South Korea Alliance," *Business Korea*, October 18, 2023, https://www.businesskorea.co.kr/news/articleView.html?idxno=203677.

[27] Karen Freifeld, Chris Sanders, and Alexandra Alper, "U.S. Allows Samsung, SK Hynix to Keep Getting U.S. Tools in China," Reuters, October 13, 2023, https://www.reuters.com/technology/us-allow-samsung-sk-hynix-ship-certain-products-china-2023-10-13.

[28] Jin-Gyu Kang, "S. Korean Chips' Heavy Reliance on China, U.S. Poses Risk to National Economy," *Korea Economic Daily*, May 29, 2023, https://www.kedglobal.com/korean-chipmakers/newsView/ked202305290002.

[29] Ibid.

the scope of the controls themselves. Washington has been stringent in curbing investments in China, which has in turn triggered countermeasures from Beijing. One example of these countermeasures has been China's partial ban on the sale of products from Micron, the largest memory semiconductor company in the United States. In response, the United States has requested that South Korean companies refrain from filling the vacancy in the Chinese market. This dynamic has placed them in a difficult position. Compliance with the request has proved to be a complex endeavor because there are numerous purchase orders from distributors, often with the ultimate end users being Chinese companies. Moreover, the situation has raised concerns about potential antitrust and cartel-related consequences. It could be perceived as a case of multiple companies within the semiconductor industry cooperating to limit or control the supply of a product to China, which in turn diminishes competition within the industry. Moreover, there is a growing concern that the United States might use its discretionary authority in granting exemptions as leverage to compel South Korean companies to align with this request, intensifying the complexity and uncertainty of their operational landscape.

These challenges shed light on the broader issues encountered by South Korean semiconductor manufacturers, which face the often erratic and unpredictable application of export controls. This situation is compounded by the absence of consistent long-term policies, which can hinder long-term strategic planning. Semiconductor companies must make substantial investments in research, development, and manufacturing equipment, often requiring extended lead times. Thus, instability in policy can deter companies from committing to certain ventures or investments, potentially affecting their competitive positioning and technological advancement. There is a perception among industry stakeholders that certain policies might be influenced by political considerations. Such influence introduces an additional layer of unpredictability into the semiconductor industry, altering market dynamics and forcing South Korean manufacturers to adjust their strategies rapidly.

However, this landscape is continually evolving. Most recently, substantial pushback on restrictions affecting South Korean semiconductor manufacturers with operations in China and exports to China has led to increased U.S.-ROK bilateral discussions, including through forums such as the United States–Korea Supply Chain and Commercial Dialogue and the Export Control Working Group. As a result of these discussions, on October 17, 2023, Samsung Electronics and SK Hynix were designated as validated end users and secured a waiver that allows them to indefinitely supply U.S. chip equipment to their facilities in China without the need for separate licenses.[30] This designation substantially eases their regulatory burden, affording South Korean companies much-needed relief, mitigating concerns within the industry, and establishing a more stable and predictable operational framework.

Broader Implications for the Global Semiconductor Industry

The U.S. export controls constrain and isolate China's semiconductor industry for reasons of economic and national security. The United States is actively encouraging other semiconductor powerhouses besides South Korea, such as Japan, Taiwan, and the Netherlands, to participate in these measures, signaling its intention to create a united allied front.

[30] Choi, "U.S. Approves VEU Status for Samsung, SK Hynix, Reflecting Solid U.S.–South Korea Alliance."

However, the implementation of these export control policies, while potentially effective in the short term, carries with it significant long-term consequences. For example, Nvidia's CFO Colette Kress has highlighted that restrictions prohibiting the sale of data center GPUs to China could lead to a permanent loss of opportunities for the U.S. semiconductor industry to compete and thrive in one of the world's largest markets. This concern underscores the importance of carefully considering the ramifications of export control policies for the future of the semiconductor industry.[31] The unilateral imposition of such restrictions is also expected to result in deteriorating financial performance for the semiconductor companies of U.S. allies because China, being a substantial importing market, will inevitably face challenges that could adversely affect the global semiconductor landscape in the medium to long term. China has sought to become self-reliant in the production of semiconductors, while the United States has sought to block China's advancements and return parts of the semiconductor supply chain to the United States.

The CHIPS and Science Act has introduced an additional layer of complexity. In March 2023 the U.S. Department of Commerce proposed rules to prevent China and other countries of concern from tapping the $52 billion of funds earmarked for semiconductor manufacturing and research under the legislation.[32] Under the subsidy program, semiconductor manufacturers receiving funding are compelled to restrict their production capacity for advanced semiconductors in China, limiting the increase to 5% over the next ten years. For older-generation general-purpose chips, this increase is capped at 10%. Exceeding these limits requires repayment of the full subsidy, effectively prohibiting additional investment and limiting firms to maintaining current production levels.

Samsung Electronics and SK Hynix fall under the category of companies manufacturing advanced semiconductors. If they were to receive U.S. government subsidies, these limitations would significantly constrain their operations. The former ROK minister of trade, industry, and energy, Lee Chang-yang, voiced concerns. He mentioned that the ROK government and the semiconductor industry "are concerned about the conditions attached to the Act." He explained that "given the high investment costs, investing in the United States is becoming less appealing," and "such conditions have increased uncertainty for Korean chipmakers and are feared to infringe upon Korean companies' business rights."[33]

Samsung Electronics and SK Hynix have also submitted statements in response to the CHIPS Act. Notably, the statements included the necessity for clear terms and definitions concerning clauses related to "material expansion" and "technology clawback" to ensure that investments in the U.S. semiconductor manufacturing sector are not inadvertently or unfairly restricted.[34] The statement also pointed out that essential research efforts that drive advancements in semiconductor manufacturing often rely on international collaboration. The Korea Semiconductor Industry Association (KSIA) has expressed concerns about the impact on joint research and collaboration conducted with countries of concern before receiving subsidies under the CHIPS Act. Additionally, KSIA highlighted potential disruptions to routine business operations that could result from restrictions on patent usage agreements and requested that such agreements be

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31 Arjun Kharpal, "Nvidia Warns More Semiconductor Curbs Will End U.S. Chipmakers' Ability to Compete in China," CNBC, August 24, 2023, https://www.cnbc.com/2023/08/24/nvidia-says-ai-chip-export-curbs-to-china-will-hit-us-chipmakers.html.

32 Soo-Hyang Choi, "South Korea Asks U.S. to Review China Rule for Chip Subsidies," Reuters, May 23, 2023, https://www.reuters.com/technology/south-korea-asks-us-review-china-rule-chip-subsidies-2023-05-24.

33 So-Hyeon Kim, "Concerned about CHIPS Act, Korea Says U.S. Investment Less Attractive," *Korea Economic Daily*, March 6, 2023, https://www.kedglobal.com/business-politics/newsView/ked202303060030.

34 Jo He-rim, "S. Korea Asks U.S. to Give More Leeway on Chip Expansion in China," *Korea Herald*, May 24, 2023, https://www.koreaherald.com/view.php?ud=20230524000500.

excluded from the "technology transfer" clause under "joint research." Furthermore, it proposed a narrower definition of "foreign entities of concern" to specifically include companies listed on export control lists.[35]

These challenges are not confined to industry giants like Samsung Electronics and SK Hynix. South Korea hosts a robust fabless sector that faces similar issues. The extensive reach of the FDP Rule now compels fabless companies to provide end-user statements or certificates to U.S. exporters, subjecting them to more extensive restrictions. Consequently, these limitations extend beyond what is explicitly prohibited by the EAR, affecting companies' operations in China.

Conclusion

Governments can have a significant impact on businesses through policies, regulations, and other means, which often impose burdensome restrictions and bureaucratic hurdles that hinder corporate activities. Recent developments in the global semiconductor industry, shaped by U.S. export controls and their repercussions, serve as an example of how governmental decisions can reshape the landscape for key players in an industry. Looking ahead, it is crucial that the United States consider the broader implications of its actions when seeking cooperation from partners and allies in the semiconductor industry to minimize the damage to their interests. Navigating this landscape will require more careful consideration and adaptation to the dynamics of the global semiconductor industry.

South Korea's export control regime comprises (1) controls on strategic items, aligning with those in multilateral export control regimes, without any unilaterally controlled items, and (2) catch-all controls to align with its key allies such as the United States. The catch-all controls require license for export of a certain nonstrategic item to a certain country or to an individual or entity of concern, or in instances where any red flags arise. South Korea has historically utilized and updated its catch-all controls to coordinate its export controls with key allies. For example, it updated the list of nonstrategic items subject to license requirements if destined to Russia to coordinate export controls against Russia with the United States after the Russian invasion of Ukraine. South Korea has also aligned its export control measures with those of the United States by regularly updating the list of concerned entities to reflect the U.S. Entity List, thereby subjecting them to South Korea's catch-all control measures.

South Korea's controls on semiconductor and related technologies and equipment focus on (1) strategic items under multilateral export control regimes or (2) broader semiconductor-related items if destined to Russia under catch-all controls. Consequently, many semiconductor-related items destined to China currently fall outside South Korea's export controls. Like other allied nations, such as Japan and the Netherlands, South Korea is considering adopting controls on the export of certain semiconductors to China, depending on various factors such as its companies' presence in the Chinese market or reliance on the U.S. technologies, as well as diplomatic relations with China, which are far more complicated than those with Russia. Once adopted, to the extent these controls overlap with the scope of U.S. export controls, this approach could simplify compliance for South Korean companies. By adhering to ROK regulations, these companies would simultaneously meet U.S. requirements, effectively reducing their compliance burden and risk in the semiconductor sector. However, this also implies limited business opportunities for South

[35] Kim Yoo-jin, "South Korea Demands Relaxation of the U.S. Semiconductor Subsidy Requirements," *Kyunghyang Shinmun*, May 24, 2023, https://m.khan.co.kr/world/america/article/202305240646001#c2b.

Korean companies with China, in terms of market or manufacturing place, which could cause them to request government subsidies or other forms of support to compensate them for such loss.

An additional consideration is the prospect of the United States and South Korea working together on export controls. In this collaborative approach, South Korea would independently enforce export controls on items of critical U.S. concern for export to China. Such a strategy would not only shield South Korea from the far-reaching implications of the FDP Rule but also align with U.S. objectives. While the range of items subject to control in this approach may be narrower than under the comprehensive FDP Rule, South Korea would gain the ability to exercise effective regulation over specific items.

This approach carries several benefits, including clearer criteria when compared with the cumbersome compliance requirements. Further, a precedent was set when South Korea successfully navigated the United States' blanket application of the FDP Rule to secure an exemption during the onset of the Russian invasion of Ukraine.[36] Such coordinated and effective enforcement would not have been feasible without South Korea's independent export control regulations, nor would relying solely on the United States' extended FDP rule have yielded the same positive outcomes.

In light of these considerations, it is crucial for the United States and South Korea to consider implementing a genuinely cooperative framework for export controls concerning China. This collaboration should extend beyond the ROK merely aligning with the United States and following its directives, as has often been the case in the past. The extraterritorial application of U.S. export control regulations, such as the FDP Rule, could be limited or exempt for countries that actively engage in this cooperative approach with the United States to ensure true collaboration. This strategy offers a pragmatic and forward-looking path in the complex and ever-evolving realm of international semiconductor trade, fostering regulatory predictability and industry stability.

[36] Oh Seok-min, "(4th LD) S. Korea Wins Exemption from U.S.' Foreign Direct Product Rule Regarding Exports to Russia," Yonhap, March 4, 2022, https://en.yna.co.kr/view/AEN20220304001254320.

Policy Options to Increase U.S.-ROK Export Control Cooperation

Mireya Solís and Jungmin Pak

Given the preceding analyses of U.S. and South Korean export control policies in an era of strategic competition with China and rapid technological development, the United States and ROK should consider the following policy options to maximize the effectiveness of each country's export control policies and ensure adequate coordination among them.

Ensure a "small yard/high fence approach." The Biden administration's goal of maintaining targeted and narrow restrictions on the export of sensitive technologies that can be diverted to advanced weaponry development is important in order to balance national security interests with the preservation of dynamic innovation ecosystems. In practice, however, implementing this restrained approach is challenging for several reasons. The identified force-multiplier technologies—AI, microelectronics, supercomputing, biotechnology, and clean energy—are present in scores of economic sectors. Restricting their dissemination will have wide-ranging effects. Moreover, as the 2023 upgrade to the October 7, 2022, rule demonstrated, the emphasis on closing loopholes to ensure the effectiveness of the restrictions makes the yard bigger and the fence higher. For these reasons, the United States and South Korea, in the development of their individual and coordinated export controls, might make use of periodic reviews to delist technologies and products that have reached maturity or for which restricted access no longer serves a national security goal.

Ameliorate gaps in threat perception. As the United States has referenced China's military-civil fusion to justify export control restrictions on technologies widely available for commercial use, it will be important to improve channels of communication and information sharing between the United States, South Korea, and other partners to close gaps in threat perception on the risks of technology dissemination in sensitive areas. The U.S.-ROK Next Generation Critical and Emerging Technologies Dialogue, which held its inaugural meeting in December 2023, holds promise in facilitating information exchange. Because emerging technologies are advancing rapidly and China's military buildup is nontransparent, a better understanding of how Chinese technology acquisition and development practices pose national security risks will provide a more solid ground on which to build a joint approach to export controls.

Build resilience to shared and asymmetrical vulnerabilities to Chinese retaliation. One of the risks of tightening the outflow of advanced technology is Chinese retaliation. While China is still incapable of indigenously manufacturing advanced chips, it controls other chokepoints in the supply chain—most notably key critical minerals—and possesses levers of economic coercion. Chinese countermeasures to date include tightened export controls on germanium, gallium, and graphite and the banning of U.S. firm Micron from its government procurement programs. Unreliable supply or higher prices for critical mineral inputs negatively affect both South Korea and the United States. In sanctioning Micron, Beijing sought to create a potential rift between the allies on the issue of backfilling. Geographic proximity, greater dependence on Chinese demand, and the sunk costs of large fab operations in China result in greater risk exposure for South Korea than for the United States. Therefore, the two allies should develop supply chain resilience and anti-coercion instruments that take into account both shared and asymmetrical vulnerabilities. To this end, it will be important to develop supply chain early-warning systems, mutual assistance

programs to respond to economic coercion, support for the development of alternative sources for critical minerals, and diversification efforts to reduce overdependence on China.

Ensure good coordination across economic security policy instruments. Export controls do not operate in a vacuum. They are part of broader economic security toolkits that are also undergoing steep change. Taking advantage of the bilateral economic security dialogue established by the United States and South Korea, it will be important to evaluate the impact of export control policies as they interact with other ongoing initiatives, such as investment screening, technology standard setting, cybersecurity measures, industrial policies, and anti-coercion instruments. The annual U.S.-ROK Senior Economic Dialogue provides a good platform for such evaluation and coordination.

Maximize the effectiveness of export control policy by building a plurilateral framework. Due to deepening geopolitical divides, current multilateral export control regimes will not be nimble enough to meet the challenges of the moment. Unilateral export controls are ineffective and costly, and bilateral coordination is insufficient, given the important role of third parties in the vast and complex semiconductor supply chain. South Korea and the United States might work with like-minded countries, such as Japan, the Netherlands, Taiwan, and Germany, to build a robust plurilateral regime on export controls by using bilateral and trilateral (with Japan) mechanisms as stepping stones. A plurilateral export control regime will be more effective and efficient.

Ensure Export Control Classification Number (ECCN) consistency across agencies such as the U.S. Department of Commerce's Bureau of Industry and Security (BIS) and the Korea Strategic Trade Institute (KOSTI). Discrepancies among jurisdictions in the assignation of ECCNs create confusion and reduce the effectiveness of export control enforcement. Joint efforts might be made to ensure consistency of classification for controlled items. To facilitate this process, BIS and KOSTI could form a consultative working group comprising relevant officers for the purpose of comparing classification numbers and developing processes for resolving any inconsistencies that arise. This could be achieved by reclassifying inconsistent controlled item ECCNs to align across countries. In cases where that is not possible, both organizations could disclose these differences to the public through their websites so that companies can more easily ensure that they are in compliance when trading those items.

Increase information sharing on export control violations and enforcement actions. Common practices exist to avoid or circumvent export controls across jurisdictions—for example, through Harmonized System Code laundering. U.S. and ROK agencies should establish better processes for sharing information on export control violations, including details on how the circumvention attempts were carried out as well as the corresponding enforcement measures taken in response. This information sharing could similarly be led by a BIS-KOSTI consultative working group and would help ensure the effective implementation and enforcement of export controls. Sharing this information with the public—to the extent possible without undermining enforcement—would provide further deterrence by highlighting the consequences of failure to comply with regulations.

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Pathways for U.S.-ROK Collaboration on Artificial Intelligence

Ahram Moon and Cole McFaul

EXECUTIVE SUMMARY

This chapter examines the U.S. and South Korean approaches to the development and governance of artificial intelligence (AI) and proposes pathways to greater cooperation on advancing shared values in AI.

MAIN ARGUMENT

With AI poised to affect both domestic and global economic and security environments, governments around the world have been working to develop policy approaches to balance the opportunities and risks arising from the technology's increasingly broad utilization. The U.S. and the Republic of Korea (ROK) have both adopted foundational AI policy frameworks, and both countries are well-positioned as advanced technology powers to play leading roles in shaping global AI governance.

In the first section of this chapter, Ahram Moon provides insight into South Korea's AI industry, highlighting the government's endeavors to foster innovation and ensure trustworthy AI. She then argues for U.S.-ROK cooperation to effectively tackle AI risks and address challenges stemming from potential overconcentration.

In the second section, Cole McFaul highlights recent policy developments in the U.S. approach to AI governance and examines the state of U.S.-ROK research collaboration. Noting that the U.S. has thus far been cautious to avoid imposing excessive regulations on the AI sector, he emphasizes the need for global cooperation among like-minded countries to find common policy approaches. Given the shared interests and values of the U.S. and South Korea, he concludes that there is a significant opportunity for the two countries to play a leading role in establishing global AI norms and frameworks.

POLICY IMPLICATIONS

- Given the significant risks as well as opportunities arising from AI, it is imperative that in addition to fostering AI development, related policies ensure trustworthy and ethical practices.
- As technology leaders with shared values, it is critical that the U.S. and South Korea work together to develop effective policies that can shape global discourse on AI governance.
- Heightened engagement across all levels of government and civil society will facilitate greater policy alignment among stakeholders in both countries. In addition to government-to-government dialogue mechanisms, efforts should be made to increase business-to-business ties, joint research, and academic exchanges, which will foster closer cross-country cooperation in AI and ultimately facilitate the development of solutions to shared challenges.

This chapter examines the U.S. and South Korean approaches to the development and governance of artificial intelligence (AI) and proposes pathways to greater cooperation on advancing shared values in AI. With AI poised to affect both domestic and global economic and security environments, governments around the world have been working to develop policy approaches to balance the opportunities and risks arising from the technology's increasingly broad utilization. The United States and the Republic of Korea (ROK) have both adopted foundational AI policy frameworks, and both countries are well-positioned as advanced technology powers to play leading roles in shaping global AI governance.

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ROK Policies for Innovation and Competitiveness in the Global AI Arena[1]

Ahram Moon

As AI continues its rapid advance, including through developments in generative AI, it is evolving into a more general-purpose technology. Alongside these developments, countries around the world are leveraging AI as an engine for economic growth and competing to establish policy frameworks that ensure its safe and responsible utilization. AI-driven innovations, which require advanced computing power, large data sets, and cloud services, can be accelerated through collaborative efforts among stakeholders. The rapidly expanding impact of AI transcends national borders, geographic boundaries, and time zones. Single-country efforts to establish ethical practices and safety in AI have limitations, warranting the need for global cooperation.

This section analyzes the status of the ROK's industrial ecosystem and policies, highlighting the necessity of increasing policy collaboration with the United States in the process of securing technological competitiveness and establishing effective governance. To achieve this, the section analyzes the current state of the Korean industry within the AI value chain, encompassing computing power, data, models, and applications, and identifies potential weak links that hinder the ROK's competitiveness in the global AI market. Additionally, it examines the prominence of AI in South Korea's policies for the information and communications technology (ICT) industry and outlines recent efforts toward creating a legal framework aligned with global governance.

[1] This section is authored by **Ahram Moon**, who is a research fellow at the Korea Information Society Development Institute, where her work focuses on generating insights to formulate policies, fostering an environment for evidence-based policymaking (including AI ethics), assessing the impact of AI on the labor market, and participating in the Intelligent Information Society Panel Survey. She can be reached at <ahrammoon@gmail.com>.

Through this analysis, challenges and opportunities for collaboration between South Korea and the United States in the AI sector are explored.

By leveraging high-quality data and computing power, AI has the potential to generate economies of scale and scope based on a single advanced model, enabling the development and release of numerous powerful applications.[2] ChatGPT clearly demonstrates this potential. In 2019, OpenAI, benefiting from Microsoft Azure's supercomputer infrastructure, began working to improve its GPT (generative pre-trained transformer) large language model. In 2022, it unveiled ChatGPT, based on GPT3.5, demonstrating the economies of scale in AI technology.[3] Subsequently, OpenAI's GPT was integrated into numerous applications, including Bing Chat in Microsoft's Edge web browser and Copilot in Microsoft 365, demonstrating AI's ability to achieve economies of scope as well.[4]

As AI emerges as a general-purpose technology across all industries, its extensive socioeconomic implications become increasingly evident. In this context, the drive to achieve economies of scale by a single entity or nation is inherently limited in its capacity to maximize benefits and mitigate risks. The dominance in AI of one actor, however influential, may not adequately address the diverse and complex challenges presented across various sectors. Therefore, the creation of mechanisms for reliable technological development, standards, norms, and governance requires transnational cooperation. Such collaboration is essential to steer the course of technological progress and ensure that the development and application of AI is equitable, ethical, and beneficial on a global scale. This approach underlines the necessity of collective efforts in shaping the future of AI, transcending national boundaries and interests.

Now, thanks to advancements in machine learning such as deep learning and foundational models, AI has entered a phase where it serves as an enabler for other emerging digital technologies like blockchain and the metaverse. As with other new technologies, however, AI also comes with its share of challenges. It functions as a predictive machine based on data and algorithms, bringing issues like data bias, privacy infringement, misinformation and disinformation, and labor displacement due to automation. In a hyperconnected society enabled by advanced networks, the impact of AI transcends borders. Therefore, addressing its challenges will require international cooperation rather than the efforts of a single nation.

The prevalence of these challenges could outweigh the benefits of AI, creating barriers to societal acceptance and reducing the technology's actualization. In practice, governments worldwide have participated in supranational forums such as the G-20, the Organisation for Economic Co-operation and Development (OECD), and UNESCO, among others, to ensure the safety of successful AI development and deployment. As a result, a shared ethical framework, including principles of respecting human dignity, autonomy, nondiscrimination, and privacy, has been embraced as a foundation for trustworthy AI.

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[2] Ajay Agrawal, Joshua Gans, and Avi Goldfarb, eds., *The Economics of Artificial Intelligence: An Agenda* (Chicago: University of Chicago Press, 2019).

[3] Economies of scale refer to the phenomenon where larger operational sizes of firms result in production benefits. Economies of scale in AI arise as larger volumes of data enhance accuracy and learning capabilities. Increased computing power enables the operation of advanced AI models. Additionally, larger research teams with substantial investments can innovate more effectively. This suggests that AI benefits larger organizations, offering them competitive advantages and greater opportunities for profit maximization. See Agrawal, Gans, and Goldfarb, *The Economics of Artificial Intelligence*.

[4] While economies of scale focus on cost advantages achieved through increased production volume, economies of scope involve cost advantages from producing a variety of products or services within the same organization. Successful AI firms, such as Google's parent company Alphabet, leverage a variety of applications like search engines, online video services, and autonomous vehicles, benefiting from shared resources like data and AI talent. See Agrawal, Gans, and Goldfarb, *The Economics of Artificial Intelligence*.

Looking ahead in the realm of AI policy, the establishment of international collaborative frameworks will become increasingly imperative. For such frameworks to materialize, however, it is essential for nations to align and share their guiding principles and values and respect disparities in policy priorities, legal systems, economic levels, societal norms, and geopolitical contexts of partner nations. By examining South Korea's AI policy and the state of its AI industry, this section seeks to explore the challenges and opportunities for robust collaboration between South Korea and the United States based on shared principles and values.

The Ecosystem of South Korea's AI Industry

South Korea's major corporations have actively participated in the AI value chain, which encompasses data acquisition and processing, model development, and deployment. They have integrated AI primarily into well-established industries such as finance, healthcare, mobility, and entertainment, aiming to enhance their global competitiveness and generate added value. Recently, AI deployment has transitioned to the cloud, with the value chain extending into the domains of network infrastructure and semiconductor technologies, which are integral parts of the cloud's ecosystem. In this extended value chain, South Korean companies in the semiconductor and telecommunications sectors—notably Samsung Electronics and SK Hynix—have leveraged their unique technological expertise and financial resources to play significant roles in these backend industries.

While South Korea holds a relatively low market share of 1%–2% in the global AI market, the domestic AI industry ecosystem has been consistently developing.[5] South Korea's well-established conglomerates are proactively collaborating with promising startups by providing them with data and model infrastructure and jointly creating new services. Global tech giants like Apple, Google, and Microsoft operate in South Korea and have employed acquisition-hire strategies or major investments in startups such as Siri, DeepMind, and OpenAI, subsequently launching services like Siri, AlphaGo, and Bing Chat. Naver, a South Korean online platform company, is equipped with an in-house research facility known as Naver AI Lab. It acquired computer vision startup V.DO and integrated the company's technology into the content service Naver Webtoon. Furthermore, it strengthened its capabilities in natural language processing by acquiring CompanyAI and enhancing its language model engine CLOVA.

While the ICT sector has played a significant role in driving South Korea's economic growth, the competitiveness of the country's AI industry remains relatively weak when compared with leading nations like the United States, where private sector innovation has been instrumental, and China, where the industry benefits from strong government support. Unlike major companies in these two giants, which participate across nearly all segments of the AI value chain, South Korean AI firms are limited to specific areas, making it challenging to fully incorporate external innovations domestically. In particular, global companies such as Google, Microsoft, and Amazon Web Services have already taken the lead in securing cloud platforms, which serve as the foundation for the AI ecosystem. Unfortunately, South Korea lacks companies with a global competitive edge in the cloud service sector, which is crucial for AI development. South Korean AI companies like Naver, KT, and Kakao do offer cloud services, but domestic companies still

[5] South Korea's AI market share is calculated by the author using estimated figures from Statista. According to Statista, the global market size of AI in 2022 was $134.9 billion, and South Korea's size was $2.37 billion. See Statista, "Artificial Intelligence—South Korea," https://www.statista.com/outlook/tmo/artificial-intelligence/south-korea.

rely heavily on global cloud platform services. A 2022 study by the Korea Fair Trade Commission found that Amazon Web Services held approximately 70% of the domestic cloud market from 2019 to 2021, demonstrating the substantial presence of global players. The market exhibited a high degree of concentration. Microsoft (12% in 2021) and Naver (7% in 2021) showed slight increases, but overall market dynamics have remained largely stable.[6]

While South Korea has been building a self-sustaining AI industrial ecosystem, including through government efforts to promote its growth, the country has not seen the emergence of startups with global competitiveness. The share of AI unicorn births increased from around 10% in 2020 to 13% in 2022.[7] However, Korean companies are notably absent from this list. Additionally, in 2021, Korean startups secured only $1.1 billion of investment, which equates to merely 2% of the United States' $52.9 billion. The challenges faced by AI startups in South Korea are often attributed to difficulties in acquiring data and establishing viable business models rather than to shortcomings in technical capabilities. While these startups may possess technological prowess, they struggle to create sustainable market demand and face challenges arising from shortages of the skilled technical workforce needed to effectively adopt their advanced technologies. As a result, the ecosystem's vitality is hindered.[8]

Current AI Policies in South Korea

The ROK government has prioritized AI as an opportunity to enhance the country's national competitiveness in science and technology and overcome the challenges posed by low economic growth and the "new normal" since around 2015.[9] Despite maintaining a stable but relatively low economic growth rate in the range of 2%, South Korea sought to reinvigorate its economy through the resurgence of its ICT industry, which had been a historical driver of economic growth. In anticipation of the transition to the Fourth Industrial Revolution, characterized by the intelligence of ICT technologies, South Korea recognized the pivotal role of AI as a general-purpose technology for integrating various industries and increasing productivity throughout the socioeconomic spectrum. To catch up with leading nations like the United States and China, known for their advanced AI technology and major companies' high market shares in the AI field, South Korea unveiled initiatives such as the National Strategy for Artificial Intelligence.[10]

These initiatives introduced policies seeking to boost AI competitiveness, facilitate widespread AI integration, and realize a society that revolves around human-centric AI. These efforts included funding for fundamental research as well as the full-scale release of high-quality public data held by government agencies. Moreover, there have been initiatives to establish AI hubs that provide data, software, and high-performance computing for private AI development, benefiting academia, startups, and other entities in the private sector.

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6 "Announcement of Findings from Cloud Industry Survey," Korea Fair Trade Commission, Press Release, December 28, 2022.

7 Between 2020 and 2022, the total unicorn companies founded each year were 137, 537, and 259, respectively. In the same period, the number of AI unicorn companies founded was 13, 73, and 34 for each year. In the first three quarters of 2023, there were 47 new unicorns overall, with 13 of these being in the AI sector. See "State of Venture Q3'23 Report," CB Insights, October 12, 2023, https://www.cbinsights.com/research/report/venture-trends-q3-2023; and "State of AI Q3'23 Report," CB Insights, November 15, 2023, https://www.cbinsights.com/research/report/ai-trends-q3-2023.

8 "AI Ecosystem: The Voice of Startups," Startup Alliance Report, 2022.

9 "New normal" is a term reflecting the new economic reality for the design of ICT policies. It refers to the global economic order that emerged after the 2008 global financial crisis, encompassing phenomena such as low growth, low inflation, low interest rates, and high unemployment.

10 Ministry of Science and ICT (ROK), *National Strategy for Artificial Intelligence* (Seoul, December 2023), https://www.msit.go.kr/bbs/view.do?sCode=eng&nttSeqNo=9&bbsSeqNo=46&mId=10&mPid=9.

In light of the recent proliferation of large language model–based generative AI, the importance of high-performance semiconductors specialized for AI computations has been recognized. Consequently, the government, in collaboration with industry, academia, and research institutions, initiated the K-Cloud Project to develop high-speed, low-power domestic AI semiconductors. These semiconductors are intended for use in data centers, which will strengthen South Korea's competitiveness in the cloud sector.[11]

South Korea has focused on establishing flexible governance and frameworks to mitigate potential risks and enhance innovation and opportunities in the field of AI. Specifically, the authorities have worked to ease the uncertainties in existing legislation that have hindered industry activation. This was done to reduce the burdens on business activities while simultaneously focusing on creating a self-regulatory environment for trustworthy AI. For instance, in 2020, South Korea's three data acts were revised to protect personal data and privacy while promoting their use.[12] Also, the amended Personal Information Protection Act adopted in September 2023 includes updated provisions on overseas data transfers and introduces a legal basis for ordering the suspension of cross-border data transfers in cases of violation of the law.[13]

Similar to the development of the OECD's AI Principles and the European Union's Ethics Guidelines for Trustworthy AI, the ROK Ministry of Science and ICT established the National Guidelines for AI Ethics at the end of 2020 and the National Strategy for Trustworthy AI in 2021. Various measures, such as ethics checklists, have been developed for the voluntary adoption and dissemination of ethical standards by the private sector. Moreover, a policy forum consisting of stakeholders from various sectors, including government, academia, and industry, has been established to discuss ethical AI from technical, governance, and educational perspectives. The establishment of the AI Legislation and Regulation Review Team in 2020 is another significant step. It conducts research on issues related to AI laws, regulations, and institutions; selects tasks for legislative revisions; and provides support for their implementation.

Concerns over issues like deepfakes and biased outcomes that could threaten democratic values, as well as the possibility of AI progressing to artificial general intelligence, have been at the forefront of global discussions on AI regulation. Domestically, South Korea's National Assembly proposed the Act on Promotion of AI Industry and Framework for Establishing Trustworthy AI (the AI Basic Act) on February 14, 2023. This legislation seeks to bolster the industry by designing a national AI strategy and establishing a foundation of trust in AI. The AI Basic Act emphasizes fostering innovation, including through its general principle of "permission first, regulation later," which implies that regulations must allow anyone to develop new AI technology without having to obtain government preapproval.[14] The AI Basic Act also designates high-risk application areas that could threaten public safety, such as autonomous driving, and provides a legal framework for AI ethics as well as measures to ensure trust and reliability. Unlike the EU's AI Act, which adopts a risk-based approach, the primary objective of South Korea's AI Basic Act is to foster

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[11] "Team Korea for Leading AI Semiconductor, K-Cloud Project in Full Swing," Ministry of Science and ICT (ROK), Press Release, June 26, 2023, https://www.msit.go.kr/eng/bbs/view.do?sCode=eng&mId=4&mPid=2&pageIndex=&bbsSeqNo=42&nttSeqNo=827&searchOpt.

[12] The three data acts are the Personal Information Protection Act, the Credit Information and Protection Act, and the Act on Promotion of Information and Communication Network Utilization and Information Protection.

[13] "Amended Personal Information Protection Act (PIPA) and Its Enforcement Decree Become Effective," Personal Information Protection Commission (ROK), Press Release, September, 15, 2023, https://pipc.go.kr/eng/user/ltn/new/noticeDetail.do?bbsId=BBSMSTR_000000000001&nttId=2331.

[14] Recent discussions, including feedback from the National Human Rights Commission and various civic groups, have raised concerns about potential risks, including violations of fundamental rights, if AI is developed and utilized indiscriminately. Considering these recent trends in the debate, the "permission-first, regulation-later" clause may be subject to revision.

innovation and expedite the development of AI, embracing its transformative capabilities.[15] The bill is currently open to feedback and consultation with academia and civic organizations.

Challenges and Opportunities for U.S.-ROK Collaboration

For the development of AI that promotes the welfare and prosperity of humanity, South Korea and the United States cannot exclude a cooperative framework with the EU. Pursuing principles such as human dignity, autonomy, and personal data protection in a manner that does not compromise democratic values is essential. However, the domestic regulation of AI, as seen in the EU's AI Act, could potentially create barriers to AI development in other countries. Therefore, it is imperative that the United States and South Korea work together through international cooperation to minimize disparities in regulatory environments between countries and identify areas where adjustments can be made.

To advance cutting-edge AI, the demand for data and computing power continues to increase. Efficient and close collaboration among key stakeholders within the AI value chain, including major technology companies, platforms, AI developers, hardware providers, cloud service providers, and startups, becomes increasingly crucial. Establishing an efficient and cooperative supply chain can result in cost savings and significant service enhancements, benefiting society as a whole. One example is the collaboration between Microsoft and OpenAI, where Microsoft is swiftly integrating generative AI into its applications and launching new services. Another example is Naver's HyperCLOVA X, which is utilized by around five hundred companies and academies and has resulted in the release of new business-to-business or business-to-consumer services.[16]

However, given that AI enhances value through industrial applications, it is worth noting that AI technologies initially activated through open-source platforms are progressively transitioning toward closed environments, akin to the evolution of traditional platform markets. Advanced AI technologies like foundational models are converging with other digital technologies, creating added value and visible profits. As a result, AI technologies that were initially based on open-source principles are gradually becoming more closed. Beginning with GPT-4, OpenAI has not disclosed the number of parameters or the training methods used to develop its multimodal large language model. As a result of ChatGPT's success, Google has also announced a policy of withholding AI research results that could benefit other companies until its own products are released.[17] Moreover, platforms that possess the massive user data necessary for model development are increasingly seeking cost settlements for data utilization or sharing data exclusively with partners, which is also contributing to a more closed ecosystem. In early 2023, Elon Musk threatened to sue Microsoft over the alleged violation of Twitter's data usage policies. Around the same time, Reddit announced that it would begin charging companies for access to its data for the purpose of training AI systems.[18]

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[15] "Artificial Intelligence Act: Council and Parliament Strike a Deal on the First Rules for AI in the World," Council of the European Union, Press Release, December 9, 2023, https://www.consilium.europa.eu/en/press/press-releases/2023/12/09/artificial-intelligence-act-council-and-parliament-strike-a-deal-on-the-first-worldwide-rules-for-ai.

[16] Ji-Eun Jeong, "Naver Eyes Global Market with New LLM HyperCLOVA X," *Korea Economic Daily*, August 24, 2023, https://www.kedglobal.com/artificial-intelligence/newsView/ked202308240018.

[17] Nitasha Tiku and Gerrit De Vynck, "Google Shared AI Knowledge with the World—Until ChatGPT Caught Up," *Washington Post*, May 5, 2023, https://www.washingtonpost.com/technology/2023/05/04/google-ai-stop-sharing-research.

[18] Kate Conger, Ryan Mac, and Cade Metz, "Twitter Accuses Microsoft of Improperly Using Its Data," *New York Times*, May 18, 2023, https://www.nytimes.com/2023/05/18/technology/twitter-microsoft-misusing-data.html; and Mike Isaac, "Reddit Wants to Get Paid for Helping to Teach Big AI Systems," *New York Times*, April 18, 2023, https://www.nytimes.com/2023/04/18/technology/reddit-ai-openai-google.html.

South Korea, which seeks to grow an ecosystem for innovative companies but faces relative disadvantages in the data and cloud industries, must formulate strategies to pioneer new markets and participate in the global value chain. The current trends of monopolization and blockage pose a challenge for it in finding global collaboration partners.

The United States, a leader in AI, can be this invaluable partner. However, when it comes to bilateral cooperation between nations, achieving an equal level of mutual benefit can be challenging due to differences in technological capabilities, financial resources, and policy priorities. In the broader context of national AI capabilities, there is indeed a noticeable gap between the United States and South Korea. Hence, there exists an inherent power imbalance, though each nation offers unique strengths to address their respective weaknesses. The Biden administration's October 2023 AI executive order, which takes steps toward establishing standards in personal data protection and content safety, presents significant challenges for South Korea's globally oriented technology sector, especially in aligning with Seoul's evolving AI regulatory frameworks.[19] Despite these challenges, both countries should strive to strengthen their partnership and contribute to advancing democratic values and technological development worldwide.

Taking into account such asymmetrical power dynamics, it may be challenging to achieve mutually beneficial outcomes in all areas. However, establishing a technical collaboration framework for addressing shared challenges, as agreed on by both countries, is feasible. Particularly in the AI market, which is becoming more closed and concentrated in a few big tech companies, it is essential to create an open and decentralized technological development environment through open-source software, data sharing, and other means. This will help build a collaborative ecosystem in which both countries can engage and share agendas related to areas like the environment or education.

Both the United States and South Korea could take a more flexible approach to AI regulation, opting for a "soft touch" approach before stringent regulation. As the EU establishes itself as a global leader in risk management for the vital neural components of AI, such as data and algorithms, through the GDPR and AI Act, the United States and South Korea should continue to discuss optimal ways to regulate and manage the risk of AI. For instance, there are proposals for generative AI regulations within the EU AI Act that restrict the use of copyrighted materials in the training data of large language models like OpenAI's GPT and Naver's HyperCLOVA X.

[19] The Biden administration's executive order, which includes a safety framework for AI tools, content authentication, enhancement of data privacy, and principles for labor sector application, may have implications for the business and technology industries in South Korea, particularly those targeting the global market. Additionally, it could influence the ROK government's policymaking in establishing standard systems for trustworthy AI, as well as in the preparation of the AI Basic Law.

U.S. AI Policies and Opportunities for Collaboration with the ROK[20]

Cole McFaul

AI will play an increasingly consequential role in global security, technological, and economic issues around the world and have serious implications for a wide range of industries. As the technology becomes more widely adopted, it has the potential to promote progress in biotechnology, computer science, and information and communication technologies, among other sectors. At the same time, some AI tools might advance the capabilities of malicious actors to spread disinformation, launch crippling cyberattacks, or more readily access information needed to develop weapons of mass destruction.[21]

In Washington, policymakers increasingly recognize the pivotal role that AI will have in shaping geopolitical and geoeconomic realities on the world stage. Whether in defense, cybersecurity, or biotechnology, the U.S. government will need to adapt to a rapidly shifting technological landscape. Amid rising competition between China and the United States to develop the world's most advanced AI systems, the Biden administration has leaned on its network of allies and partners to facilitate advancements in AI while engaging in a multifaceted approach to hampering the efforts of competitors—mainly China—to acquire sophisticated AI technologies. Most notably, the administration announced export controls on semiconductors and semiconductor manufacturing equipment, both of which are key chokepoints in the development of AI.[22] Although these controls, issued on October 7, 2022, were announced unilaterally, their success hinges on the buy-in of a few important powers that occupy critical positions in the global semiconductor supply chain: the Netherlands, Japan, Taiwan, and South Korea.

As AI is used to transform key industries, affect military systems and operations, and distort information environments around the world, the United States will need to rely on its allies and partners to shape how the nascent technology is adopted globally.[23] AI is no theoretical technology of the future. Already, its use has produced consequences that have adversely affected real people. These AI harms can be the result of both intentional and unintentional uses of AI.[24] Confoundingly, unlike with nuclear weapons or military jet engines, many applications of AI will require minimal resources to develop and deploy. Open-source models allow anyone with a computer to access and use the technology.

In addition, competitors like China and Russia have pledged to invest resources in the development of AI systems and applications that, if widely adopted, would almost certainly be

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[21] Tate Ryan-Mosley, "How Generative AI Is Boosting the Spread of Disinformation and Propaganda," *MIT Technology Review*, October 4, 2023, https://www.technologyreview.com/2023/10/04/1080801/generative-ai-boosting-disinformation-and-propaganda-freedom-house; and Steph Batalis, "Can Chatbots Help You Build a Bioweapon?" *Foreign Policy*, November 5, 2023, https://foreignpolicy.com/2023/11/05/ai-artificial-intelligence-chatbot-bioweapon-virus-bacteria-genetic-engineering.

[22] Ben Murphy, "Chokepoints: China's Self-Identified Strategic Technology Import Dependencies," CSET, May 2022, https://cset.georgetown.edu/publication/chokepoints.

[23] Owen J. Daniels, "The AI 'Revolution in Military Affairs': What Would It Really Look Like?" Lawfare, December 21, 2022, https://www.lawfaremedia.org/article/ai-revolution-military-affairs-what-would-it-really-look; and Ryan-Mosley, "How Generative AI Is Boosting the Spread of Disinformation and Propaganda."

[24] Heather Frase and Owen Daniels, "Understanding AI Harms: An Overview," CSET, August 11, 2023, https://cset.georgetown.edu/article/understanding-ai-harms-an-overview.

objectionable to policymakers in Washington.[25] Beijing is positioning itself as an important future player in setting rules for AI and is increasingly engaged in international discussions about regulatory issues.[26] In October 2023, China published its Global AI Governance Initiative, an alternative framework that enshrines "ensuring social security" and opposes "intervening in other countries' internal affairs, social systems and social order."[27] Beijing's vision for the future of AI governance clearly clashes with Washington's. Consequently, to counter rival approaches to AI, U.S. policymakers must ensure that the systems most widely adopted around the world are aligned with the core values and principles held by the United States.

Accordingly, the United States must not isolate itself from global trends in the adoption and regulation of AI. Washington should instead work closely with allies and partners to ensure the development and subsequent adoption of AI systems that adhere to shared values. Without the buy-in of its partners, the United States runs the risk of ceding global leadership in AI governance to competitors. Cooperation on governance issues among like-minded countries now will lead to the development of mutually acceptable AI systems in the future. This will enhance the technological and economic competitiveness of participating countries and thereby hamper efforts by competitors to promulgate alternative approaches that may contravene the United States' priorities as they relate to the protection of civil liberties and democratic values, as well as ensuring continued openness in digital commerce and the flow of cross-border data.[28]

Washington's ambitions to effectively promote and protect U.S. interests in AI will almost certainly depend on effectively managing collaboration and competition with a select number of key countries. As the locus of geopolitical and technological competition continues to shift eastward, policymakers in Washington must carefully consider their approach to critical and emerging technologies like AI. Cooperation with South Korea, a like-minded, technologically advanced democracy, represents an enormous opportunity to leverage an increasingly robust partnership in order to advance both countries' interests. As a fast-rising player in AI research and development, South Korea will play a significant role in the development and commercialization of AI and its applications. Given the already deep U.S.-ROK ties in AI investment, talent, and research, South Korea is an enormously consequential U.S. partner. Policymakers in both countries can leverage shared AI governance objectives in multilateral and minilateral forums to advance national priorities. At the same time, South Korean AI researchers publish infrequently with researchers from the United States, which may hamper collaboration. Furthermore, both governments are still in the early stages of their approach to AI governance. While recent momentum is encouraging, the U.S.-ROK relationship as it relates to the governance and promotion of AI remains unproven.

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[25] Ngor Luong and Margarita Konaev, "In & Out of China: Financial Support for AI Development," CSET, August 10, 2023, https://cset.georgetown.edu/article/in-out-of-china-financial-support-for-ai-development; and "Putin to Boost AI Work in Russia to Fight a Western Monopoly He Says Is 'Unacceptable and Dangerous,'" Associated Press, November 24, 2023, https://apnews.com/article/putin-russia-artificial-intelligence-3098b4f5205785f1b8281b34f13bff92.

[26] Kayla Blomquist and Keegan McBride, "It's Not Just Technology: What It Means to Be a Global Leader in AI," Just Security, January 4, 2024, https://www.justsecurity.org/90757/its-not-just-technology-what-it-means-to-be-a-global-leader-in-ai.

[27] Ministry of Foreign Affairs of the People's Republic of China, "Global AI Governance Initiative," October 20, 2023, https://www.mfa.gov.cn/eng/wjdt_665385/2649_665393/202310/t20231020_11164834.html.

[28] For more on the protection of civil liberties and democratic values, see White House, *Blueprint for an AI Bill of Rights: Making Automated Systems Work for the American People* (Washington, D.C., October 2022), https://www.whitehouse.gov/ostp/ai-bill-of-rights. For more on digital openness, see Aidan Arasasingham and Matthew P. Goodman, "Operationalizing Data Free Flow with Trust (DFFT)," Center for Strategic and International Studies, April 13, 2023, https://www.csis.org/analysis/operationalizing-data-free-flow-trust-dfft; and David Dreier and Joshua P. Metzler, "Growing the Global Internet Economy by Ensuring the Free Flow of Data across Borders," Brookings Institution, May 23, 2013, https://www.brookings.edu/articles/growing-the-global-internet-economy-by-ensuring-the-free-flow-of-data-across-borders.

As such, it would serve both countries' interests to make more concerted efforts to increase cooperation and collaboration on AI research, development, and governance.

The remainder of this section assesses the United States' approach to AI development and governance before highlighting potential opportunities for and barriers to cooperation with South Korea. It argues that while nascent U.S. approaches to AI governance may prove fruitful in the promotion of standards that advance trustworthy AI systems, Washington is mostly reluctant to implement compulsory regulations that could stifle the innovation and adoption of AI technologies. Moreover, even as the United States remains the world's preeminent player in the research, development, and commercialization of AI technology, it must look to its allies and partners in order to advance U.S. interests as they relate to the trajectory of AI development.

AI Development and Governance in the United States

The United States remains a key hub of innovation and commercialization of critical and emerging technologies, including AI. Although Chinese authors have produced more AI-related papers, scientific publications on AI authored by American researchers are cited more than papers from any other country in the world. American researchers collaborate with researchers from other countries at relatively high rates. Almost 40% of all AI papers published in the United States are the result of international collaborations.[29] Between 2010 and 2021, more than 35,000 AI patents were granted in the United States.[30] U.S.-based powerhouses like OpenAI, Alphabet, and Meta will certainly remain central players in AI in the near future. The United States is also the most important source of global AI investment.[31]

With the United States well-positioned for continued leadership in AI development, policymakers in Washington are exploring regulatory approaches to the technology. Announcing his executive order on the "Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence" on October 30, 2023, President Joe Biden remarked that "to realize the promise of AI and avoid the risk, we need to govern this technology."[32] The executive order reshapes the U.S. government's strategy toward AI by adopting a whole-of-government approach to leverage the technology's potential while maintaining provisions that allow for careful examination of harms that could arise from its use.

While the U.S. government is clearly prioritizing AI as a critical technology of the 21st century, it has remained cautious in its approach to regulation, especially when compared with the comprehensive, risk-based approach by the EU in its AI Act.[33] While some U.S. lawmakers have put forth proposals on AI, Congress has remained mostly unwilling to draft and pass comprehensive legislation to mitigate risks, instead adopting a wait-and-see approach to AI governance. Legislators, such as the bipartisan "AI gang," have hosted several roundtable

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[29] Emerging Technology Observatory, "Country Activity Tracker (CAT): Artificial Intelligence," https://cat.eto.tech/?countries=&countryGroups.

[30] Cole McFaul et al., "Assessing South Korea's AI Ecosystem," CSET, August 2023, https://cset.georgetown.edu/wp-content/uploads/CSET-Assessing-South-Koreas-AI-Ecosystem.pdf.

[31] Husanjot Chahal et al., "Quad AI: Assessing AI-related Collaboration between the United States, Australia, India, and Japan," CSET, May 2022, https://cset.georgetown.edu/wp-content/uploads/Quad-AI.pdf.

[32] "Remarks by President Biden and Vice President Harris on the Administration's Commitment to Advancing the Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence," White Houe, October 30, 2023, https://www.whitehouse.gov/briefing-room/speeches-remarks/2023/10/30/remarks-by-president-biden-and-vice-president-harris-on-the-administrations-commitment-to-advancing-the-safe-secure-and-trustworthy-development-and-use-of-artificial-intelligence.

[33] Melissa Heikkilä, "Five Things You Need to Know about the EU's New AI Act," *MIT Technology Review*, December 11, 2023, https://www.technologyreview.com/2023/12/11/1084942/five-things-you-need-to-know-about-the-eus-new-ai-act; and Mia Hoffmann, "The EU AI Act: A Primer," CSET, September 26, 2023, https://cset.georgetown.edu/article/the-eu-ai-act-a-primer.

discussions with industry leaders, researchers, and advocates to better grasp what Congress can do to support safe AI development.[34] Much of the new executive order directs agencies to study and better understand the potential opportunities and pitfalls of AI. Barring an abrupt change in tack, the United States will not follow the approach of the EU's AI Act, which adopts more stringent requirements for AI systems.[35]

Instead, the United States has thus far adopted a voluntary, buy-in approach to AI governance. For example, as currently written, provisions in the executive order have little impact on the current landscape of AI models. Section 4.2 ("Ensuring Safe and Reliable AI") requires companies developing foundation models that present potential national security risks to disclose information about their activities and abilities to the federal government and encourages them to take measures to promote AI safety and trustworthiness. However, the provisions on foundation models in the executive order currently only apply to models that were trained using computing power greater than 10^{26} integer or floating-point operations, much higher than any AI models that are currently deployed.[36] While the most advanced AI models are rapidly requiring more computing power, as evidenced by an OpenAI study that found that the amount of computational resources used to train AI models doubled every 3.4 months between 2012 and 2018, companies are increasingly focused on making the process of training AI models more efficient.[37] Moreover, even if greater computational capabilities are cheaper to access, the cost of training a model that uses more computing power than the 1026 integer or floating-point operations benchmark set by the executive order would still be prohibitively expensive for all but the most powerful companies. Accordingly, as currently constructed, the provisions in the executive order will likely only affect a few top players, with the majority of the AI landscape not covered by its framework.

Other work by the U.S. government on AI governance is also voluntary. The National Institute of Standards and Technology developed and released the AI Risk Management Framework in January 2023, which established a process through which any organization developing an AI system can promote AI trustworthiness.[38] Shaped by conversations with stakeholders in both the public and private sectors, the framework has received praise for its applicability to a wide range of organizations and its practical set of recommendations for promoting safe and trustworthy AI.[39] The Biden administration has also worked closely with industry leaders. In July 2023 the White House announced that seven leading AI companies had agreed to increase their measures to ensure safe, secure, and trustworthy systems.[40] Thus, even though the regulations developed in the United States are less stringent than those developed by other AI governance leaders

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34 "Majority Leader Schumer Floor Remarks on President Biden's AI Executive Order and the Senate's Upcoming Bipartisan AI Insight Forums," U.S. Senate Majority Leader, October 30, 2023, https://www.democrats.senate.gov/newsroom/press-releases/majority-leader-schumer-floor-remarks-on-president-bidens-ai-executive-order-and-the-senates-upcoming-bipartisan-ai-insight-forums.

35 Hoffmann, "The EU AI Act."

36 White House, "Executive Order on the Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence," October 30, 2023, https://www.whitehouse.gov/briefing-room/presidential-actions/2023/10/30/executive-order-on-the-safe-secure-and-trustworthy-development-and-use-of-artificial-intelligence. The "AI gang" comprises Senators Chuck Schumer (D-NY), Todd Young (R-IN), Martin Henrich (D-NM), and Mike Rounds (R-SD).

37 Dario Amodei et al., "AI and Compute," OpenAI, May 16, 2018, https://openai.com/research/ai-and-compute.

38 "NIST Risk Management Framework Aims to Improve Trustworthiness of Artificial Intelligence," U.S. National Institute of Standards and Technology, Press Release, January 26, 2023, https://www.nist.gov/news-events/news/2023/01/nist-risk-management-framework-aims-improve-trustworthiness-artificial.

39 "Perspectives about the NIST Artificial Intelligence Risk Management Framework," U.S. National Institute of Standards and Technology, https://www.nist.gov/itl/ai-risk-management-framework/perspectives-about-nist-artificial-intelligence-risk-management.

40 "Biden-Harris Administration Secures Voluntary Commitments from Leading Artificial Intelligence Companies to Manage the Risks Posed by AI," White House, Fact Sheet, July 21, 2023, https://www.whitehouse.gov/briefing-room/statements-releases/2023/07/21/fact-sheet-biden-harris-administration-secures-voluntary-commitments-from-leading-artificial-intelligence-companies-to-manage-the-risks-posed-by-ai.

such as the EU, they demonstrate the increased emphasis that U.S. policymakers are placing on establishing AI policies, norms, and frameworks that facilitate responsible AI development while also promoting continued innovation.

Opportunities for and Barriers to U.S.-ROK Collaboration on AI

Increasingly, policymakers in both Washington and Seoul recognize the transformative potential of AI. In other high-tech industries, like ICT, electric vehicles, and semiconductors, the close partnership between the United States and South Korea has provided tremendous benefits to both countries. AI is no different. Strong ties between the innovation ecosystems of both countries should enable effective partnerships to emerge in AI. Every year, close to 40,000 South Korean students study at universities across the United States, and nearly 30% of them are enrolled in engineering, math, or computer science.[41] Moreover, the United States is by far the largest source of foreign investment in South Korean AI companies. Between 2010 and 2021, investors from the United States invested an estimated $3.8 billion. U.S. AI companies also benefit from financial ties between the two countries, with investors from South Korea investing nearly $4 billion over the same period.[42]

Beyond existing ties, the United States must leverage its technological and economic partnership with South Korea in order to most effectively advance U.S. AI capabilities. Since the 2016 "AlphaGo shock," when policymakers in Seoul recognized AI technology as a priority, South Korea has become an increasingly important player in the development and commercialization of AI technology.[43] Between 2010 and 2021, it granted 13,720 AI patents, trailing only China and the United States and nearly doubling the number of patents granted in Japan, the next largest source of AI patents in the world after South Korea.[44] Furthermore, South Korea's AI workforce is highly capable. In 2021, South Korea awarded 289.9 bachelor's degrees in engineering per 100,000 working-age persons, more than twice the level of China (143.6), the United States (117.8), and India (87.1).[45]

The ROK is also quickly becoming a key player in the advancement of impactful AI research. In recent years, South Korean researchers have been recognized for their contributions to some of the most prestigious AI conferences in the world.[46] Still, the United States and South Korea could do more to advance research collaboration to cultivate both countries' AI innovation ecosystems. Although the United States is by far its most important partner, South Korea's AI research ecosystem is comparatively isolated from the rest of the international community.[47] Just 31% of AI-related papers authored by Korean authors were published with a coauthor from a different

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41 Open Doors, "Fields of Study by Place of Origin," https://opendoorsdata.org/data/international-students/fields-of-study-by-place-of-origin.

42 McFaul et al., "Assessing South Korea's AI Ecosystem."

43 Fei-Yue Wang et al., "Where Does AlphaGo Go: From Church-Turing Thesis to AlphaGo Thesis and Beyond," *IEEE/CAA Journal of Automatica Sinica* 3, no. 2 (2016): 113–20; and Mark Zastrow, "South Korea Trumpets $860-Million AI Fund after AlphaGo 'Shock,'" *Nature*, March 18, 2016, www.nature.com/articles/nature.2016.19595.

44 McFaul et al., "Assessing South Korea's AI Ecosystem."

45 McFaul et al., "Assessing South Korea's AI Ecosystem"; and Benson Neethipudi et al., "How South Korea Implemented Its Computer Science Education Program," Brookings Institution, Center for Universal Education, October 2021, https://www.brookings.edu/wp-content/uploads/2021/10/How-S-Korea-implemented-its-CS-program_FINAL.pdf.

46 Park Jin-hyung, "Han keompyuteo bijeon AI yeongu segye 3 wi, silmu injae yangseongdo sogdonaeya" [Korea Ranked 3rd in the World for Computer Vision AI Research, Needs to Speed Up the Training of AI Talents], ETNews, July 29, 2021, https://www.etnews.com/20210728000170.

47 Karen White, "Publications Output: U.S. Trends and International Comparisons: International Collaboration," National Science Board, December 2019, https://ncses.nsf.gov/pubs/nsb20206/international-collaboration.

country.[48] While this rate of international collaboration is generally consistent with authors from other Northeast Asian countries like Japan and Taiwan and can be partially attributable to language barriers between research communities, lower levels of collaboration can inhibit domestic AI development by isolating the South Korean research environment from the rest of the global scientific community.

Beyond leveraging existing synergies to promote both countries' AI competitiveness, the United States stands to benefit from increased collaboration on AI governance. Here, progress remains extremely nascent.[49] Successive meetings between U.S. and ROK policymakers have resulted in statements on the importance of advancing coordination on AI.[50] Indeed, the Biden administration has announced several initiatives to better coordinate progress on AI with like-minded countries. The opportunities for collaboration are clear. Both the United States and South Korea have prioritized developing technology with liberal democratic values in mind, and the October 2023 executive order on AI calls for the U.S. government to work with allies and partners to develop a framework for effective international AI governance.[51] In October 2022 the U.S. Office of Science and Technology Policy announced the *Blueprint for an AI Bill of Rights*, which encourages the protection of civil liberties and democratic values when developing autonomous systems.[52] Many of the provisions also appear in the "Digital Bill of Rights" announced by the Yoon Suk Yeol administration in September 2023, which the ROK government hopes will be adopted internationally.[53]

Already, the United States and South Korea are two of the most important players in international discussions on AI governance. Their presence in multilateral and minilateral forums in the Asia-Pacific region and beyond makes cooperation especially important for advancing both countries' national priorities in AI. The Indo-Pacific Economic Framework, the Summit for Democracy, and the Global Partnership on AI all serve as forums in which the United States and South Korea can advance their national priorities.[54]

Yet both countries are still developing their approaches to AI governance, and barriers remain to full-fledged cooperation and coordination. Over the next year, as directed by the October 2023 executive order, the U.S. government will re-evaluate its regulatory approach to AI. In South Korea, the AI Basic Act, which promises legislative action on AI governance issues, has yet to be passed and implemented. If policymakers in both countries do not prioritize working together to promote cooperation on AI development and governance, the United States could turn to forums

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48 McFaul et al., "Assessing South Korea's AI Ecosystem."

49 Sanghyun Han, "ROK-U.S. AI Cooperation Needs Real Reciprocity," *National Interest*, September 8, 2023, https://nationalinterest.org/blog/korea-watch/rok-us-ai-cooperation-needs-real-reciprocity-206775.

50 "U.S.-ROK Leaders' Joint Statement," White House, Press Release, May 21, 2021, https://www.whitehouse.gov/briefing-room/statements-releases/2021/05/21/u-s-rok-leaders-joint-statement; "United States–Republic of Korea Leaders' Joint Statement," White House, Press Release, May 21, 2022, https://www.whitehouse.gov/briefing-room/statements-releases/2022/05/21/united-states-republic-of-korea-leaders-joint-statement; and "The Spirit of Camp David: Joint Statement of Japan, the Republic of Korea, and the United States," White House, Press Release, August 18, 2023, https://www.whitehouse.gov/briefing-room/statements-releases/2023/08/18/the-spirit-of-camp-david-joint-statement-of-japan-the-republic-of-korea-and-the-united-states.

51 White House, "Executive Order on the Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence."

52 White House, *Blueprint for an AI Bill of Rights*.

53 "South Korea Presents a New Digital Order to the World!" Ministry of Science and ICT (ROK), Press Release, September 26, 2023, https://www.korea.net/Government/Briefing-Room/Press-Releases/view?articleId=7042&insttCode=A110439&type=O.

54 U.S. Bureau of Democracy, Human Rights, and Labor, "Declaration of the Summit for Democracy," March 29, 2023, https://www.state.gov/declaration-of-the-summit-for-democracy-2023; and "The Global Partnership on AI (GPAI)," OECD, https://oecd.ai/en/gpai.

like the Quad, the G-7, or NATO to manage AI risks.[55] South Korea is not a member of these organizations. Moreover, although recent progress has been made to strengthen the U.S.-ROK technological relationship, domestic political realities threaten to limit headway in advancing ties between the two countries on AI going forward. More must be done to better institutionalize the recent diplomatic momentum and leverage advancements in AI to effectively promote both countries' technological, economic, and security interests.

[55] NATO, "NATO's Data and Artificial Intelligence Review Board: Summary of the Establishment of the Board," October 13, 2022, https://www.nato.int/cps/en/natohq/official_texts_208374.htm; "Fact Sheet: Quad Leaders' Summit," White House, Press Release, September 24, 2021, https://www.whitehouse.gov/briefing-room/statements-releases/2021/09/24/fact-sheet-quad-leaders-summit; and "G-7 Leaders' Statement on the Hiroshima AI Process," White House, Press Release, October 30, 2023, https://www.whitehouse.gov/briefing-room/statements-releases/2023/10/30/g7-leaders-statement-on-the-hiroshima-ai-process.

Policy Options to Advance U.S.-ROK Cooperation on AI

Ahram Moon and Cole McFaul

In the dynamic and rapidly evolving landscape of AI, ensuring effective collaboration between the United States and the ROK is increasingly important. As the world grapples with the complex ethical, economic, and social implications of AI, managing risks is a top international priority. The approaches to AI governance taken by the United States and South Korea—both tech leaders—will play a critical role in shaping global AI policies.

The Biden administration, through its executive order on AI, has laid out a broad framework for the U.S. government's approach to AI, emphasizing a whole-of-government approach and encouraging effective regulation while promoting the development and adoption of AI technologies. Meanwhile, the ROK's AI strategies and efforts to adopt trustworthy AI utilize similar approaches to those prescribed in the executive order, but with more emphasis on governance.

While other global AI governance proposals, such as the EU AI Act's risk-based classification of AI systems, have focused extensively on how to effectively design and implement legislation that proactively minimizes AI harms, the United States and ROK have thus far prioritized fostering an innovation-friendly environment that promotes advancement in AI technologies while allowing for future regulatory flexibility. This alignment in AI governance creates an opportunity for the two nations to lead the way in setting global standards and principles for AI development, deployment, and use.

Robust economic and security ties and long-standing scientific research collaboration serve as the core foundation of the U.S.-ROK partnership. Such collaboration has not only fostered a dynamic exchange of ideas and expertise but also created a mutually beneficial economic and technological relationship. Scientists from South Korea and the United States participate in important academic exchanges and joint research projects that lead to new discoveries in critical and emerging technologies, including AI, while the influx of South Korean students in AI and related fields to the United States ensures a strong foundation for the two nations to continue to deepen their joint efforts in advancing AI development.

Economically, the partnership has catalyzed growth in the AI sector for both countries. Over the last several years, cross-border investment flows into AI companies across myriad sectors have increased markedly, underlining a strong belief in the potential of collaboration beyond the statements of top-level government officials. Cross-country collaborations in cutting-edge AI research fields are further pushing the boundaries of the technology. Nascent AI collaboration now will advance both countries' economic and technological interests in the future.

Momentum in the U.S.-ROK alliance as it relates to AI is more than just a strategic partnership; it will be a cornerstone of the relationship in the era of digital transformation. The two countries' similar approaches to the opportunities and risks of AI, as well as the shared desire to align the technology with democratic values, provide an opportunity to shape the future of AI not only in their respective countries but on a global scale. Positioning AI as a key area of collaborative innovation and responsibility will allow both countries to advance their respective interests.

Despite this strong foundation for U.S.-ROK cooperation on AI, however, potential barriers exist. Thus far, most bilateral and multilateral mechanisms for U.S.-ROK technology cooperation remain untested and unproven. Additionally, shifting political dynamics in both countries could

pose challenges to various efforts to advance cross-country cooperation in AI development and governance.

The U.S.-ROK partnership in AI is a dynamic and multifaceted relationship that holds immense potential for shaping the future of the technology globally, and the stakes for advancing coordination are high. To effectively compete with alternative visions of AI development and governance, neither country can afford to pursue its aims unilaterally. Recognizing the importance of strengthening U.S.-ROK collaboration on AI, the two countries should consider the following policy options.

Increase engagement in bilateral and multilateral forums to coordinate on shaping core standards and principles for the development and use of AI in the Asia-Pacific region. Through working together and with other like-minded partners, the United States and South Korea could advance AI governance priorities that balance innovation with ethical considerations. Cooperation in multilateral forums like the AI Safety Summit and the Indo-Pacific Economic Framework can be further leveraged to promote AI policies that align with democratic values and protect civil liberties.

Institutionalize regular summits and high-level meetings that foster greater policy coordination on AI development and governance issues. These regularized coordination mechanisms would help ensure effective cross-country policy collaboration, especially in critical areas like national security, economic policy, and ethical governance. Ultimately, these channels of communication would contribute to a more sustainable and dynamic bilateral partnership.

Promote AI-related academic exchanges, joint scientific research, and cross-country business ties. Relying not on top-level government directives but on organic, grassroots cross-country partnerships would bring the two countries closer together and facilitate successful AI collaboration. Such ties also promote the competitiveness of each country's respective innovation ecosystem. Where possible, academic exchanges, joint scientific research, and business ties could be fostered and encouraged by policymakers, as they will help to further institutionalize collaboration between the United States and South Korea.

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U.S.-ROK Data Policy: Challenges and Opportunities

Nigel Cory and Nohyoung Park

EXECUTIVE SUMMARY

This chapter examines U.S. and South Korean approaches to data policy, including the barriers that arise from policy differences and the efforts made to find common ground and maximize cooperation.

MAIN ARGUMENT

In the first section, Nigel Cory points to several areas where the data policies of the Republic of Korea (ROK) are more stringent than those in the United States and discusses how these policies can hinder cross-border digital commerce. He notes that South Korea has made progress through updates to its data regulations and suggests that the country's growing participation in multilateral and plurilateral digital trade and economy agreements points toward further changes that align the ROK's data policy with like-minded trading partners. Key to the ROK's potential alignment is recognizing that less restrictive data regulations can better promote innovation and digital trade while still ensuring robust safeguards for the protection of personal data and national security.

In the second section, Nohyoung Park analyzes the impact of the 2023 amendments to South Korea's Personal Information Protection Act (PIPA). Noting that South Korea was an early adopter of data protection policies and has established one of the most robust data protection regimes in the world, he argues that the country has since updated and liberalized these policies to better facilitate digital commerce and cross-border data flows while still maintaining its desire for high levels of personal information protection for South Korean citizens. The PIPA amendments seek to achieve this balance in a number of ways. Moreover, through the introduction of a reciprocity principle, these policies seek to encourage other countries to strengthen their data protection policies in ways that enable greater exchanges of data containing personal information across borders.

POLICY IMPLICATIONS

- Differing approaches to data security and protection, cross-border data flows, and related data policies in South Korea have in some cases acted as barriers to stronger U.S.-ROK digital relations. Greater alignment on data policy issues is essential, as both countries share similar values and are well-positioned to be leaders in emerging digital technologies.
- Bilateral engagement mechanisms have not addressed long-standing barriers to greater digital cooperation and have not kept pace with technological changes. Updating and expanding Track 1.5 and Track 2 engagements, as well as other dialogue mechanisms, to include the appropriate stakeholders and address the latest technological developments could help mitigate challenges arising from policy differences.
- Bilateral cooperation needs to move from being reactive to proactive in identifying and talking about new data and technology policy issues. Early engagement helps ensure that each country's respective responses are not only aligned but reinforcing, and do not create new barriers to data and high-tech trade.

This chapter examines U.S. and South Korean approaches to data policy, including the barriers that arise from policy differences and the efforts made to find common ground and maximize cooperation. In the first section, Nigel Cory points to several areas where the data policies of the Republic of Korea (ROK) are more stringent than those in the United States and discusses how these policies can hinder cross-border digital commerce. He notes that South Korea has made progress through updates to its data regulations and suggests that the country's growing participation in multilateral and plurilateral digital trade and economy agreements points toward further changes that align the ROK's data policy with like-minded trading partners. Key to the ROK's potential alignment is recognizing that less restrictive data regulations can better promote innovation and digital trade while still ensuring robust safeguards for the protection of personal data and national security.

In the second section, Nohyoung Park analyzes the impact of the 2023 amendments to South Korea's Personal Information Protection Act (PIPA). Noting that South Korea was an early adopter of data protection policies and has established one of the most robust data protection regimes in the world, he argues that the country has since updated and liberalized these policies to better facilitate digital commerce and cross-border data flows while still maintaining its desire for high levels of personal information protections for South Korean citizens. The PIPA amendments seek to achieve this balance in a number of ways. Moreover, through the introduction of a reciprocity principle, these policies seek to encourage other countries to strengthen their data protection policies in ways that enable greater exchanges of data containing personal information across borders.

The chapter concludes by considering policy options for improving U.S.-ROK cooperation on data policy.

Barriers and Bridges to U.S.-ROK Cooperation on Data Governance and Digital Trade[1]

Nigel Cory

South Korea and the United States are world leaders in advanced technologies as well as close trade and national security partners. However, despite shared interests in digital development, emerging technology policy, and countermeasures to China's acquisition of advanced technology (as well as North Korea's), cooperation on data, digital, and high-tech issues falls far short of its potential given the two countries' close alliance and similar strategic objectives. Bilateral engagement and discussion mechanisms need a reset and rebalancing. Updating and diversifying the bilateral agenda to reflect the stakeholders and issues involved in new and emerging technology issues would help do this. These engagements should not only consist of diplomatic and national security officials but also include relevant commercial, trade, and regulatory agencies and viewpoints. With potential U.S.-ROK cooperation on semiconductors, batteries, electric vehicles, artificial intelligence (AI), and other advanced technologies, there is both a real need and a clear opportunity to level the digital playing field and ramp up U.S.-ROK cooperation on digital policies.

The U.S.-ROK digital and data relationship faces numerous challenges as a result of the two governments' differing approaches to data governance. Several South Korean digital and data laws

[1] This section is authored by **Nigel Cory**, who is an associate director covering trade policy at the Information Technology and Innovation Foundation and a nonresident fellow at the National Bureau of Asian Research. He can be reached at <cory@itif.org>.

and regulations disadvantage U.S. tech firms in South Korea, creating barriers to the seamless flow of data and digital services to the United States. While the 2007 Korea-U.S. Free Trade Agreement was a first-of-its-kind agreement for including a (hortatory, not enforceable) commitment to protect data flows, subsequent restrictions have not lived up to these commitments. There is a clear lack of reciprocity, as U.S. laws and regulations place no similar restrictions on data and digital services being exported to South Korea or otherwise target South Korean digital firms in the United States. Ultimately, U.S.-ROK Cyber Policy Consultations and other avenues of bilateral engagement and cooperation will be limited in what they can achieve if there are restrictions on data flows and cloud services.

Room for Progress: Data Governance and Data Flows

For the United States, the free flow of data is the norm, and restrictions on its movement are the rare exception. A key question relating to this approach is whether and how U.S. policymakers decide to restrict data flows to China given concerns about Chinese government access to sensitive U.S. data and the U.S. Trade Representative's decision to withdraw from talks on data flows at the World Trade Organization (WTO).[2] U.S. data governance is based on the concept of accountability. Firms are held responsible for how they manage data, regardless of where they transfer it. For example, U.S. data privacy legal protections travel with U.S. personal data in the event that a South Korean firm operating in the United States collects it and then transfers, stores, and processes it in a data center in the ROK. If there is a data privacy breach in South Korea involving U.S. personal data, the South Korean firm will still be legally liable under U.S. law.

The United States' and South Korea's membership in the newly launched Global Cross Border Privacy Rules (Global CBPR) initiative reflects their respective commitments to the accountability principle and the goal of achieving interoperability between different data privacy systems.[3] There is no single global data privacy law, so interoperability is both the most realistic and useful goal for ensuring trusted data flows and digital trade. The Global CBPR is a relatively new certification mechanism that provides firms and regulatory agencies with an additional layer of demonstrated accountability by auditing individual firms and certifying them as living up to the system's principles regarding the personal protection of data when transferred overseas. It builds on the long-running Asia-Pacific Economic Cooperation (APEC) CBPR, which was limited due to opposition from China and Russia (even though they were not members).

However, South Korea has sometimes associated the location where certain types of data are stored (namely, within its borders) with data privacy and protection and national security, leading it to enact data-related laws and regulations that force firms to store certain data within South Korea. This concept, known as data localization, restricts U.S. firms from transferring data overseas. Such actions do not align with the Global CBPR approach. It is essential that policymakers understand that the confidentiality of data does not generally depend on which country the information is stored in but rather on the measures used to store it securely. As long as firms have a legal entity in South Korea, they cannot escape local laws around how they manage data, regardless of where they transfer it.

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[2] "U.S. to End Support for WTO E-Commerce Proposals, Wants 'Policy Space' for Digital Trade Rethink," Inside U.S. Trade, October 24, 2023, https://insidetrade.com/daily-news/us-end-support-wto-e-commerce-proposals-wants-policy-space-digital-trade-rethink.

[3] See the Global CBPR website at https://www.globalcbpr.org.

Data localization is a major barrier to U.S.-ROK digital trade, innovation, and cooperation. U.S. firms would otherwise leverage centralized information technology facilities in the United States and around the world to operate in South Korea. The ROK's data localization requirements disadvantage U.S. firms, which are forced to either build or pay for expensive and duplicative local data center facilities. South Korean firms are more likely to already use local data centers, so they are less likely to be affected. Data localization is the digital equivalent to local content requirements that serve as barriers to traditional trade in manufactured goods. These rules force firms to either set up local factories or use local content as a condition for market entry. Samsung would be rightly upset if every country forced it to set up a local smartphone factory in order to sell its phones in that country.

For example, South Korea's Act on the Establishment and Management of Spatial Data uses a discriminatory licensing regime that effectively precludes U.S. firms from transferring South Korean mapping data outside the country to supposedly protect national security.[4] Despite numerous efforts by these firms, South Korea has never approved a license to export cartographic or other location-based data. This is a clear barrier to market entry for U.S. tech firms like Google and Apple that offer navigational and other mapping-based services. In 2016, Google requested the ROK government's approval to use South Korean mapping data, but permission was denied because the government thought it might exacerbate security issues with North Korea.[5] But national security is a spurious defense for this law, as South Korean mapping data is readily and commercially available abroad. These measures are in breach of WTO trade law, as its national security exception is not intended to provide grounds to enact these types of broad restrictions.[6] Meanwhile, the law provides clear protections for South Korean firms and services like Naver, Citymapper, and others. Again, South Korean firms and services face no equivalent barriers in the United States.

On a positive note, recent amendments to South Korea's Personal Information Protection Act will potentially make the free flow of personal data to the United States much easier. Previously, the country's data privacy law created a de facto data localization requirement, as it required an individual's consent to allow data to be transferred. This requirement was problematic. It created the false impression that data transfers are inherently risky, and collecting consent from every single user is onerous for firms. Such restrictions make it hard or even impossible to aggregate South Korean personal data with data from the United States and elsewhere, which can detract from efforts to develop new and more effective AI. Fortunately, the recent changes to PIPA open up mechanisms that allow for broader cooperation in digital trade and data-driven innovation with the United States, especially given the key role of personal data.

Excessive Cloud Service Restrictions in South Korea

South Korea's rules for public sector cloud service procurement (known as the Cloud Security Assurance Program, or CSAP) clearly do not provide equal treatment to U.S. cloud providers

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[4] "Act on the Establishment and Management of Spatial Data," Ministry of Land, Infrastructure and Transport (ROK), Act no. 12738, June 3, 2014, https://elaw.klri.re.kr/eng_service/lawView.do?hseq=32771&lang=ENG.

[5] Eun-Young Jeong, "Lost Seoul: South Korea Blocks Google from Expanding Local Maps," *Wall Street Journal*, November 18, 2016, https://www.wsj.com/articles/south-korea-blocks-google-from-expanding-local-maps-1479441204.

[6] Tania Voon, "Testing the Limits of WTO Security Exceptions," East Asia Forum, June 14, 2023, https://www.eastasiaforum.org/2023/06/14/testing-the-limits-of-security-exceptions; and William Alan Reinsch and Jack Caporal, "The WTO's First Ruling on National Security: What Does It Mean for the United States?" Center for Strategic and International Studies, April 5, 2019, https://www.csis.org/analysis/wtos-first-ruling-national-security-what-does-it-mean-united-states.

for protectionist ends.[7] The United States' equivalent system—known as FedRAMP—is open to firms from around the world.[8] South Korea also requires CSAP-like controls in other sectors. For example, the Ministry of Health and Welfare recently included CSAP-like controls—such as the physical location of cloud facilities, data residency, and Common Criteria certification obligations—as a requirement for electronic medical record system providers that seek to use public cloud services.[9]

South Korea's rules not only require cloud providers to locate data centers within its borders but also require facilities to be dedicated to government services and to use local (instead of global) certifications and encryption algorithms. South Korea's CSAP breaks from the norm of developed countries to permit a "multi-tenant" architecture, allowing both commercial and public sector customers to share the same computing resources, subject to robust access controls. The only exception is for national security applications. CSAP also breaches South Korea's commitments under the WTO's Agreement on Government Procurement, the government procurement chapter of the Korea-U.S. Free Trade Agreement, and the WTO's Technical Barrier Treaty Agreement.

As data centers typically manage both public and private data services, these requirements are both discriminatory and restrictive. This means that U.S. cloud firms must also build duplicative, dedicated local data centers in South Korea just to provide services to government agencies. Furthermore, requiring cloud firms to use local cybersecurity certifications and encryption algorithms not only presents a technical barrier to trade but also undermines best-in-class cybersecurity measures, as it means firms would have to change how they operate just for South Korea.

The ROK's restrictions preclude the type of bilateral and global cooperation needed to better defend against global cybersecurity threats. It is hard for Seoul to work with Washington on the critical issue of cloud cybersecurity if the former does not "trust" U.S. cloud providers, which are central players in this area. Google, Amazon Web Services, Microsoft, and others are world leaders in cloud and cybersecurity services. This is in part due to their ability to provide broad, cutting-edge services around the world, as well as to analyze and transfer data to learn from global operations to better detect and respond to cyberthreats. For example, in 2022, Google Cloud and other cloud firms defended themselves and their customers from the largest distributed denial-of-service attack on record—at 46 million requests per second—in part because they were able to identify the attack early on, as there were anomalous spikes in activity from IP addresses in four countries simultaneously: Brazil, India, Indonesia, and Russia.[10] If Google and other global cloud providers lose the ability to collect and share security telemetry from around the world, it will be far more challenging to respond to cyberthreats and attacks in South Korea and elsewhere.

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[7] Park Jae-hyuk, "ICT Ministry Hit for Allowing Amazon, Microsoft to Enter Public Cloud Market," *Korea Times*, December 30, 2022, https://www.koreatimes.co.kr/www/tech/2023/10/129_342689.html.

[8] Nigel Cory, "Europe's Cloud Security Regime Should Focus on Technology, Not Nationality," Information Technology and Innovation Foundation, March 27, 2023, https://itif.org/publications/2023/03/27/europes-cloud-security-regime-should-focus-on-technology-not-nationality.

[9] While the Ministry of Health and Welfare claims that CSAP is not mandatory, it plans to provide medical insurance reimbursement premiums only to medical institutions with certified electronic medical record systems, thus creating an unlevel playing field for companies that are unable to satisfy the CSAP-like controls.

[10] Emil Kiner and Satya Konduru, "How Google Cloud Blocked the Largest Layer 7 DDoS Attack at 46 Million RPS," Google Cloud, August 18, 2022, https://cloud.google.com/blog/products/identity-security/how-google-cloud-blocked-largest-layer-7-ddos-attack-at-46-million-rps.

Evolving Approaches to Data Governance and Digital Cooperation

South Korea's and the United States' respective approaches to data governance are evolving in several ways, some along similar lines, but others on different tracks. However, there is an overlap that both sides can expand on.

South Korea's interest in new plurilateral digital trade and economy agreements is more progressive and constructive than that of the United States, which has stepped away from its traditional role in advocating for new digital trade rules. The ROK has applied to join the eleven-country Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP); concluded negotiations to join the Digital Economy Partnership Agreement (DEPA), involving Chile, New Zealand, and Singapore;[11] and launched negotiations for a digital trade agreement with the European Union.[12] The CPTPP contains strong, legally enforceable commitments protecting data flows and digital trade. DEPA is premised on the free flow of data and digital trade to support its mechanisms for cooperation, which are critical for the development of AI and other emerging technologies. These changes demonstrate that South Korea is developing a global digital economic agenda that reflects its advanced digital economy.

In contrast, the United States not only withdrew from the CPTPP's predecessor (the Trans-Pacific Partnership) but, following its November 2023 withdrawal from WTO negotiations on data issues, is pursuing less ambitious, nonenforceable outcomes on digital trade within its Indo-Pacific Economic Framework initiative. These actions demonstrate that U.S. Trade Representative Katherine Tai is not prioritizing digital trade or data governance, which contributes to the United States' disproportionate use of a China and national security lens when looking at data governance. This is evident in the United States' bilateral engagement with South Korea and other like-minded countries. For example, both the U.S.-ROK Strategic Cybersecurity Cooperation Framework and the Information and Communications Technology Policy Forum largely focus on China-related digital and national security issues rather than on trade, commercial, and innovation issues.[13] While data and digital services raise legitimate national security concerns, an overly powerful and distorted national security agenda will inevitably lead to poor outcomes, especially given that many U.S. trading partners want a balanced agenda that also supports digital trade and data-driven innovation.

Conclusion

The challenge for South Korea and the United States will be to identify and build a pragmatic and ambitious data governance, digital economy, and trade agenda that balances national security concerns with trade, innovation, data privacy, and cybersecurity concerns. U.S.-ROK digital and tech cooperation will never reach its true potential if both sides do not proactively collaborate to ensure a fair market for their respective firms. Both governments need to do more to ensure that

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[11] Wu Jinhua, "Korea Is First Nation to Sign Global Digital Trade Deal DEPA," Korea.net, June 12, 2023, https://www.korea.net/NewsFocus/policies/view?articleId=233916; and "South Korea Officially Decides to Join the CPTPP to Strengthen Supply Chain," *Business Standard*, April 19, 2022, https://www.business-standard.com/article/international/south-korea-officially-decides-to-join-cptpp-to-strengthen-supply-chain-122041900182_1.html.

[12] "Korea and EU Issue Joint Statement on the Launch of Negotiations for Digital Trade Agreement," Ministry of Trade, Industry and Energy (ROK), Press Release, November 3, 2023, http://27.101.220.197/eng/article/EATCL0512e0b48/1508/view?pageIndex=11&bbsCdN=2.

[13] "U.S.-ROK Information and Communications Technology Policy Forum 2023," U.S. Department of State, Press Release, September 25, 2023, https://www.state.gov/u-s-rok-information-and-communications-technology-policy-forum-2023; and Joseph R. Biden and Yoon Suk Yeol, "Strategic Cybersecurity Cooperation Framework between the Republic of Korea and the United States of America," April 20, 2023, https://www.president.go.kr/download/644956452f9e3.

policies on data and emerging technologies are aligned as each country enacts its own domestic laws and regulations.

To this end, South Korea and the United States should ensure that future meetings and agendas reflect the diverse set of issues and stakeholders involved beyond the traditional diplomatic and trade officials. This might include officials and issues related to AI promotion and regulation; technical standards related to data privacy, cybersecurity, and other new and emerging technologies; nondiscriminatory technical requirements for "trusted cloud" procurement by respective governments; and rules and regulations to prevent foreign adversaries from accessing critical and sensitive technologies and data.

There has been progress in several of these areas, with successive ROK governments taking steps to improve related policies. However, a lot still needs to be done. The challenge for the Biden administration is to build a balanced agenda that addresses trade, innovation, cybersecurity, and national security concerns. The two countries need to ensure that bilateral forums do not become stale, with each side just going through the motions, but instead become venues for genuine discussion, cooperation, and action. South Korea's and the United States' involvement in the Global CBPR, along with their shared interest in developing advanced technologies like semiconductors and electric vehicles, provides a foundation for a more balanced bilateral workstream akin to the U.S.-EU Trade and Technology Council.

The International Transfer of Personal Information under South Korea's Personal Information Protection Act[14]

Nohyoung Park

In today's world, the movement of personal information across borders plays an important role in global business, international trade, and the expansion of cooperation between countries. Digital trade, where companies engage in international transactions in and through cyberspace, depends on the laws of countries that regulate the international transfer of data including personal information. At the same time, when personal information is transferred abroad, data subjects should receive an adequate level of protection, which should be essentially equivalent to the level applied to them in their own countries. The strong protection of personal information is often blamed for obstructing cross-border data flows, but it also often promotes the importation of such information, as it ensures that information is well-protected in the importing country.

While the ROK has implemented strict measures to protect users' personal data, it has also taken numerous steps over the past several years to liberalize its data and digital trade policies. These measures have included a number of free trade agreements (FTAs), digital trade agreements, and other bilateral and plurilateral agreements that have strengthened data protections and facilitated the increased flow of data across borders. The country has also passed major amendments to its data protection laws. These efforts have demonstrated a clear plan of first prioritizing the protection of domestic users' personal information and then using this foundation of robust protections as the basis for expanded and liberalized cross-border data transfers—but only to destinations that also provide strong protections to ensure that personal information is still well-protected after leaving South Korea's borders.

This section examines the amendments to South Korea's Personal Information Protection Act that were passed by the National Assembly in early 2023 and went into effect on September 15, 2023. It argues not only that the amendments take significant steps in liberalizing cross-border data flows, but also that some measures included in the new version—such as the reciprocity principle—will provide incentives for other countries to further liberalize their data policies.

PIPA was originally enacted in 2011 and had only one legal basis for the international transfer of personal information: data subjects' consent. The 2023 revisions, however, provide four additional legal bases for international transfers. PIPA was already regarded as one of the strongest data protection laws in Asia, facilitating the importation of personal information. But it will now also play an enabling role in the exportation of personal information abroad.

This section discusses the following issues under PIPA, which should more closely align U.S. and South Korean perspectives on cross-border data transfer: (1) five legal bases for international transfer, (2) onward transfer, (3) safeguards required for international transfer, (4) the conclusion of a contract for international transfer, (5) orders of the Personal Information Protection Commission (PIPC) to suspend international transfer, (6) the reciprocity principle, (7) the international regime for international transfer involving South Korea, and (8) the assessment of the rules for international transfer in South Korea.

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[14] This section is authored by **Nohyoung Park**, who is a professor of law at Korea University School of Law (KULS). He can be reached at <wtopark@korea.ac.kr>. Dr. Park would like to thank Sukhyun Jung, a research assistant at KULS, for her assistance with this section.

Five Legal Bases for International Transfer of Personal Information

The previous version of PIPA only allowed the international transfer of personal information through data subjects' consent. The 2023 amendments to PIPA expand on this by adding new bases for international transfer. The amendments also establish a specialized committee on international transfer under the PIPC to professionally review and deliberate on the policy of the international transfer of personal information.

Barring special circumstances, personal information processors, defined similarly to data controllers under the General Data Protection Regulation (GDPR) of the European Union, are still not automatically allowed to transfer personal information abroad—including provision (including inquiry), entrusted processing, or storage of such information.[15] However, the international transfer of personal information is allowed in the following five cases.

Separate consent of a data subject. The transfer of personal information abroad is permitted if the data subject has given a separate consent.[16] The consent of a data subject also allows for the provision of personal information to third parties in the country.[17] When a personal information processor obtains consent from a data subject, it should inform the data subject about what information is being transferred, its destination, and the purpose of the transfer.[18]

Special provisions of a law or a treaty. Personal information is permitted to be transferred abroad if there is a special provision on its transfer abroad in a South Korean law, or a treaty or other international agreement to which the country is a party.[19] For example, the 2008 "Agreement between the Government of the Republic of Korea and the Government of the United States of America on Enhancing Cooperation to Prevent and Combat Crime" provides for automated searches of some personal information between the two countries for the purpose of preventing and investigating criminal offenses and terrorism.

The conclusion and performance of a contract with a data subject. Personal information is generally permitted to be transferred abroad if its entrusted processing or storage is necessary for the conclusion and performance of a contract with a data subject.[20] However, the personal information processor must disclose the matters that are required for a separate consent from the data subject.

Certification of the PIPC. Personal information is permitted to be transferred abroad if the person to whom the information is transferred has received a certification prescribed by the PIPC and has taken appropriate security measures to protect the information and ensure the rights of data subjects.[21] This person must also take any measures necessary to implement the certification in the country to which the personal information is transferred.

The adequacy decision of the PIPC. Personal information is permitted to be transferred abroad if the PIPC decides that a country or an international organization to which the information is transferred has a data protection system, scope of data subjects' rights, and redress procedures that

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15 "Personal Information Protection Act," Personal Information Protection Commission, Act No. 16930, art. 28-8, par. 1, March 14, 2023, https://elaw.klri.re.kr/kor_service/lawView.do?lang=ENG&hseq=62389.

16 Ibid., art. 28-8, par. 1(1).

17 Ibid., art. 17, par. 1(1).

18 Ibid., art. 28-8, par. 2.

19 Ibid., art. 28-8, par. 1(2).

20 Ibid., art. 28-8, par. 1(3).

21 Ibid., art. 28-8, par. 1(4).

are substantially equivalent to the level of data protection under PIPA.[22] "Substantially equivalent" may be consistent with the actual meaning of "an adequate level of protection" as required in the adequacy decision under the EU's GDPR and is essentially equivalent.[23]

In deciding which countries and international organizations meet adequacy standards, the PIPC will examine whether the level of data protection of the country designated is maintained at a level substantially equivalent to the level required under PIPA during the period of designation.[24] If the level of data protection of the country designated, the scope of data subjects' rights guaranteed, or the damage redress procedure has changed, the PIPC may revoke or modify the designation after hearing the opinion of the country designated.[25]

On December 17, 2021, the European Commission adopted an adequacy decision on the transfer of personal information from the EU to South Korea.[26] The decision applies to its transfer in both the private and public sectors, but excludes the financial sector.[27] The EU adequacy decision is regarded as granting South Korea a status comparable to that of an EU member state with respect to data protection.[28] Importantly, it secures the EU digital marketplace for South Korean businesses. Based on the EU adequacy decision, the PIPC adopted the "Supplementary Regulation for the Interpretation and Application of the Personal Information Protection Act" for the processing of personal information transferred to South Korea, the content of which is generally consistent with the adequacy decision of the European Commission.[29]

Onward Transfer of Personal Information

If the recipient of personal information transfers that information to a third country, provisions on its transfer still apply.[30] In certain cases, the PIPC may issue an order to suspend the onward transfer.

The provisions on the onward transfer of personal information reflect a realistic possibility that this information may be transferred out of the country and then circulated abroad, including to another third country. This is because once the transferred personal information is again transferred to another country, there may be questions as to whether it can be protected at the same level in that country as provided in PIPA. Unlike the GDPR, PIPA does not include international organizations for the onward transfer of personal information, which may need to be improved. On the other hand, a financial company may entrust processing of the information to a third party

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22 "Personal Information Protection Act," art. 28-8, par. 1(5).

23 "Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the Protection of Natural Persons with Regard to the Processing of Personal Data and on the Free Movement of Such Data, and Repealing Directive 95/46/EC (General Data Protection Regulation)," European Union, art. 45, par. 1, April 27, 2016, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02016R0679-20160504. The word "adequate" means that a third country cannot be required to guarantee a level of protection that is "identical" to the level guaranteed under the act.

24 "Enforcement Decree of the Personal Information Protection Act," PIPC, art. 29-9, par. 4, September 12, 2023, https://elaw.klri.re.kr/kor_service/lawView.do?lang=ENG&hseq=63755.

25 Ibid., art. 29-9, par. 5.

26 "Commission Implementing Decision (EU) 2022/254 of 17 December 2021 Pursuant to Regulation (EU) 2016/679 of the European Parliament and of the Council on the Adequate Protection of Personal Data by the Republic of Korea under the Personal Information Protection Act," European Commission, December 17, 2021, https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32022D0254.

27 Data protection in the financial sector is governed by the Financial Services Commission under the Credit Information Use and Protection Act.

28 "Korea-EU Joint Press Statement on Adopting the Adequacy Decision," PIPC, Press Release, December 17, 2021, https://pipc.go.kr/eng/user/ltn/new/noticeDetail.do?nttId=1782.

29 In Annex II, those officials, including the president of the National Intelligence Service, certify their competencies in relation to government access (i.e., the legal framework for the collection and use of personal information by South Korean public authorities for criminal law enforcement and national security purposes).

30 "Personal Information Protection Act," art. 28-11.

if it is required for the performance of its authorized business, and the person entrusted with the processing of information may reassign the entrusted business to a third party.[31]

Safeguards Required for International Transfer

PIPA includes several new safeguards for the transfer of personal information abroad, including measures to ensure the security of data protection as well as measures to handle grievances and resolve disputes over infringements. If a personal information processor intends to transfer personal information abroad, it should consult with the recipient of the transfer in advance regarding these protective measures and reflect them in the content of the contract.[32]

Conclusion of a Contract for International Transfer

Personal information processors should not conclude contracts for the international transfer of personal information that contain provisions violating PIPA.[33] Contracts for the transfer of personal information outside the country may be concluded upon certification from the PIPC or upon designation of a country or an international organization by the PIPC to have a level of protection substantially equivalent to the level of protection under the act. If such a contract is concluded, it may not contain any provision that would violate PIPA.

Orders of the PIPC to Suspend International Transfer

PIPA states that the PIPC may order a personal information processor to suspend the transfer of personal information where its cross-border transfer violates certain provisions or where the recipient of personal information, or the state or international organization to which it is transferred, fails to properly protect it, and thus the data subject suffers damage or is highly likely to suffer damage.[34]

Reciprocity Principle

The PIPA amendments also introduce the principle of reciprocity to enable the reasonable and flexible management of the international transfer of personal information in accordance with the level of data protection in different countries.[35] Therefore, the international transfer of personal information from South Korea could be restricted when such information is sent to countries with their own laws that restrict the transfer of personal information to South Korea. However, restrictions based on reciprocity might not be imposed if they are necessary for the implementation of a treaty.[36] Through the application of the reciprocity principle, South Korea may contribute to more open cross-border data flows, given that countries wanting to import personal information from South Korea cannot restrict the transfer of such information to it.

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31 "Regulation on the Entrusting of Processing Information of Financial Companies," art. 4, par. 1 and 4.

32 "Enforcement Decree of the Personal Information Protection Act," art. 29-10, par. 2.

33 "Personal Information Protection Act," art. 28-8, par. 5.

34 Ibid., art. 28-9, par. 1.

35 The reciprocity principle was originally inserted in the September 2018 amendment of the Information and Communications Network Act, applying to providers of information and communications services. It was incorporated into PIPA as article 39-13 without change in the February 2020 amendment, and finally replaced by article 28-10 in the March 2023 amendment so that the reciprocity principle is generally applicable to personal information processors.

36 "Personal Information Protection Act," art. 28-10, proviso.

International Regimes for International Transfer Involving South Korea

The APEC Cross-Border Privacy Rules system. The CBPR system, approved in 2011 by the leaders of APEC, is a multilateral certification scheme that assesses and certifies the data protection systems of companies. It is based on the APEC Information Privacy Principles to support the free and secure transfer of personal information among member economies. At the time of writing, the United States, Canada, South Korea, Australia, Singapore, Taiwan, and the Philippines are members of the APEC CBPR system.

Meanwhile, on April 21, 2022, the Global CBPR Forum was launched under the leadership of the United States. It currently comprises a subset of the APEC CBPR economies, including South Korea. This forum is intended to extend the CBPR system beyond the APEC economies, probably with the intention of excluding China. Companies certified under the APEC CBPR system or the Global CBPR Forum can freely transfer personal information between participating economies.

Trade agreements. Recently, not only have major FTAs included separate chapters on digital trade, but stand-alone treaties entirely addressing digital trade have also been concluded. For example, the Regional Comprehensive Economic Partnership (RCEP), the Comprehensive and Progressive Agreement for Trans-Pacific Partnership, and the U.S.-Mexico-Canada Agreement have separate chapters on digital trade. South Korea is a party to the RCEP, which includes provisions on the cross-border transfer of information by electronic means to facilitate e-commerce. It stipulates that members do not prohibit the cross-border transfer of information by electronic means without good reason. This provision allows broad exceptions, when necessary, for a member to achieve a legitimate public policy objective or protect its essential security interests. Therefore, the international transfer of personal information between parties to the RCEP is likely to be restricted in practice.

South Korea has further demonstrated its commitment to open data flows through other agreements, such as the Korea-Singapore Digital Partnership Agreement and the Digital Economy Partnership Agreement with Singapore, New Zealand, and Chile. It has also participated in digital trade negotiations for the U.S.-led Indo-Pacific Economic Framework and in the WTO's plurilateral e-commerce negotiations. South Korea is negotiating a digital trade agreement with the EU as well.

Assessment of the Rules for International Transfer in South Korea

South Korea is a leading trading country that greatly depends on international trade for its economic development. As the Fourth Industrial Revolution continues, South Korea has made every effort to develop its data-driven economy. The strong level of data protection stipulated in PIPA, largely in favor of data subjects, was criticized for obstructing the development of this economy. This criticism may be true in that personal information processors, like companies, had some difficulty in using data subjects' personal information. However, the structure of digital trade is different from that of traditional trade in goods and services. Countries tend to promote the export of goods and services while restricting imports to protect their domestic industries. By contrast, countries need to import more data to develop their digital economy.[37] In the end, strong data protection may facilitate the import of personal information by ensuring the protection of such information in the importing country. Thus, South Korea is now ready to import more data,

[37] Populous countries like China and India do not need to import data and do not want to export it. Thus, they are in favor of data localization for various purposes.

including personal information, to facilitate its digital economy, as demonstrated by the adequacy decision of the European Commission in 2021.

Conclusion

It is an encouraging sign that South Korea recently allowed more bases for the international transfer of personal information by amending PIPA. Nevertheless, PIPA needs to be ambitious in adopting more legal bases like the GDPR.[38] A reason why PIPA does not make more allowances may include the uncertainty over whether South Korean data subjects' personal information could be protected outside South Korea. The PIPC might also lack the capacity for checking and ensuring the protection of personal information transferred outside the country. In the end, PIPA should include more bases for international transfer of personal information as South Korea gains more experience navigating these exchanges.

The reciprocity principle may prove effective for the facilitation of cross-border data flows. According to the principle, the international transfer of personal information from South Korea may be restricted for those countries that restrict their international transfer to South Korea. Through the application of the principle, other countries wanting to import personal information from South Korea may be forced to allow the free transfer of such information to it.

Digital trade chapters in FTAs or stand-alone digital trade agreements should play a significant role in facilitating the free flow of data across borders. While non-trade elements like privacy, data protection, and national security are stipulated as exceptions allowed in the agreements like the WTO's General Agreement on Trade in Services, they are basic principles for digital trade. Digital trade should be equipped with a secure platform and an adequate level of data protection. At present, however, rules on cybersecurity and data protection are basic and rudimentary compared with the other rules in digital trade agreements or chapters. Thus, South Korea could lead in improving these rules to further liberalize the international transfer of personal information in digital trade agreements in cooperation with like-minded countries like the United States.

[38] The GDPR comprehensively regulates the transfer of personal information to third countries or international organizations in chapter 5, which consists of articles 44 (General Principles for Transfer), 45 (Transfer Based on an Adequacy Decision), 46 (Transfer with Adequate Safeguards), 47 (Binding Corporate Rules), 48 (Transfer or Disclosure Not Authorized by EU Law), 49 (Derogations for Certain Situations), and 50 (International Cooperation for the Protection of Personal Data). Chapter 5 of the GDPR also applies to the extraterritorial application of the GDPR pursuant to article 3, paragraph 2, meaning that data controllers and processors established outside the EU are subject to the GDPR when transferring personal information to third countries or international organizations.

Policy Options to Strengthen U.S.-ROK Data Policies

Nigel Cory and Nohyoung Park

The United States and South Korea are at the forefront of digital and technological innovation. As countries with a shared vision of a free, open, and rules-based digital environment, it is essential that they work together to advance these values in today's increasingly complex global digital environment.

While the lack of federal data privacy laws leaves the United States lagging behind other technologically advanced societies in terms of data governance, South Korea has one of the most mature data protection regimes in the world. But as highlighted in this chapter by Nigel Cory, South Korea's data policies—including its Cloud Security Assurance Program for public cloud procurement—have raised concerns in the United States about being overly stringent. Meanwhile, as demonstrated by Nohyoung Park, South Korea's data policies have been continually evolving and improving, with the latest PIPA amendments taking several meaningful steps toward liberalizing cross-border data flows and mitigating some U.S. concerns. This change, along with ROK and U.S. involvement in the new Global CBPR initiative, provides a foundation for greater cooperation. However, potential cooperation on data policy is complicated by the U.S. Trade Representative's sudden withdrawal from WTO negotiations on data and digital trade. To continue improving U.S.-ROK data relations, the authors of this chapter have jointly developed the following policy options.

Cooperate on adequacy tools and "qualifying states" assessments. The United States and South Korea each have data adequacy tools that they could apply to each other. These tools, which deem another country comparable in relation to certain data and digital policies, build a linkage in the evolving legal architecture that can be used to advance U.S.-ROK cooperation regarding cross-border data flows.

South Korea's amended PIPA allows it to assess other jurisdictions as adequate as part of providing an expanded toolbox of legal tools for firms to use to transfer personal data. Likewise, the United States is designating "qualifying states" (under Executive Order 14086 on "Enhancing Safeguards for United States Signals Intelligence Activities") in terms of providing appropriate privacy safeguards related to national security activities like surveillance. Both the UK and the EU have deemed South Korea adequate as part of their respective data privacy assessments. Meanwhile, the United States has deemed both the EU and the UK as qualifying states under Executive Order 14086. Likewise, the EU-U.S. Data Privacy Framework allows EU personal data to be transferred to the United States. The United States and South Korea could initiate respective, reciprocal adequacy assessments to further expand this growing web of data governance agreements.

Work together on the foundational issue of privacy-respecting government access to data. South Korea and the United States are both signatories of the Organisation for Economic Co-operation and Development's hugely important Declaration on Government Access to Personal Data Held by Private Sector Entities. This declaration provides another opportunity for new and useful cooperation. It is critical that both the United States and South Korea work together to make this agreement on safeguards around government access to data a success, as addressing this issue is foundational to building trusted data flows in the global digital economy. The two countries might explore how to operationalize the OECD declaration by mapping how their respective laws and regulations live up to its principles. The United States possesses extensive and valuable experience

on this issue (given its sophisticated surveillance and data governance system and decade of work to address EU concerns) that it could lend to South Korea to help the country develop a clear map of how it lives up to this agreement. This issue was also covered in the EU adequacy decision for South Korea, where those officials in charge of national security and law enforcement certified their competences in relation to government access to personal information.

Pursue a reasoned and balanced approach to digital trade. Privacy, data protection, cybersecurity, and national security must be recognized as critical elements of digital trade; however, they should not be excessively used as reasons to create barriers to the free exchange of goods and services. U.S. and ROK policymakers could strive to formulate digital trade policies that preserve necessary levels of protection without undermining growth in the digital economy or preventing digital commerce between the two countries. The United States and South Korea are well-positioned to capitalize on the rapid expansion of digital trade, and leaders from both countries could ensure that this opportunity is not squandered by policies that hinder digital growth and development.

Facilitate increased engagement on digital policy issues. As evidenced in this chapter, despite the United States' and South Korea's largely shared values in cyberspace, significant differences in their respective data policies exist. Both countries could increase their efforts to promote dialogue and the sharing of ideas on how to better develop and implement effective digital policies among key stakeholders in government, the private sector, and civil society. This could include the expansion of Track 1.5 and Track 2 engagements seeking to find common ground on difficult issues. Additionally, a government-to-government working group might be established to focus solely on data governance and digital trade issues, with the objective of achieving the aforementioned balance between open, effective digital trade and concerns over privacy and security issues. This working group could include a wide range of participants with expertise in trade, data protection, cybersecurity, and related areas to assist both countries in developing a holistic approach to data policies and digital trade. Since its establishment in May 2022, the United States–Korea Supply Chain and Commercial Dialogue has demonstrated significant value and helped bridge policy divides pertaining to supply chains and export controls. This approach could be pursued to better align digital policies that can mutually benefit both countries' digital economies.

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