THE U.S.-JAPAN ALLIANCE IN AN AGE OF RESURGENT TECHNO-NATIONALISM

ASIA STRATEGY INITIATIVE

POLICY MEMORANDUM #4

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About the Asia Strategy Initiative

The U.S.-Japan alliance remains the cornerstone of regional security and prosperity, but it is vital that Washington and Tokyo pursue an ambitious agenda to deepen, broaden, and sustain the alliance. The Asia Strategy Initiative brings together leading experts to develop detailed policy proposals to form the foundation for the next set of efforts to enhance the U.S.-Japan alliance. The Asia Strategy Initiative seeks to stimulate debate in both capitals about how to move the alliance forward by identifying, developing, and disseminating novel policy proposals. To that end, the Asia Strategy Initiative issues policy memos with specific and actionable recommendations, which are authored jointly by experts from both countries. Although the findings and recommendations are discussed by all members of the group, the specific proposals remain those of the individual authors. The Asia Strategy Initiative was established under Japan-U.S. Program of the Sasakawa Peace Foundation in 2017 and it meets regularly in Washington and Tokyo.

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Introduction

Techno-nationalism is resurgent in the world today, and it comes at a time of more intense strategic friction between the United States and China, compared to the U.S.-Japan trade battles and technology competition from three decades ago. That was a relatively short-lived era of rivalry between allies, but this is likely to be a longer-term and intense competition with China that sees the United States and Japan on the same side for the most part, due to their wide range of shared interests.

This memo assesses the scope of evolving technology development challenges to the United States and Japan, summarizes some of the steps that both countries are taking to address these challenges—through a combination of access restriction and collaborative innovation—and recommends additional measures they can consider for protecting national and economic security without risking technological isolation. The memo focuses heavily on the unique role that the U.S-Japan alliance can play with regard to these challenges, given the two countries' science and technology strengths, their shared regional and global interests, and their track record of basic science collaboration that spans more than fifty years.

Assessment

1. The Emergence of Technological Competition

- **Great power competition has coincided with the Fourth Industrial Revolution:** Many highly advanced technologies including artificial intelligence, big data, robotics, faster telecommunications networking (5G), the Internet of Things (IoT), synthetic biology, and others have achieved near simultaneous breakthroughs. The United States and China are now trying to exploit these technologies to build the next generation of military, industrial, and information power. These two major states are engaged in a straightforward bilateral competition over national power that also involves Japan (government, companies, and universities) with direct implications for allied economic and security interests.

- **Race to apply advanced technologies for industrial and military purposes is accelerating:** Major states are focused on promoting economic growth and enhancing their competitiveness through the use of advanced technologies. China's *Made in China 2025* is a case in point. Furthermore, defense authorities and military organizations are also seeking to exploit cutting-edge commercial technologies for military purposes in order to strive for military overmatch. The U.S. Department of Defense is pursuing defense innovation in which artificial intelligence, quantum technology and hypersonics are among the primary technologies selected for military application. The reemergence of "great power competition" referenced in the National Security Strategy of U.S. President Donald Trump's administration as it applies to China is predominately about technological rivalry, or as Vice President Mike Pence described it: a battle for the "commanding heights of the 21st century

economy." There are also views in Japan that at the heart of the U.S.-China rivalry is a competition over advanced technology.[1]

2. The Meaning of Competition for Technological Dominance

- **An early lead could be nearly impossible to overcome:** Historically, technological advances have increased public knowledge and spread economic benefits over time, but it is possible that the profitability and mastery of next generation technologies under development today could be much narrower.[2] In the past, while it is true that initial inventors and the most successful application designers reaped outsized rewards, the playing field for these products usually leveled over time and other countries' firms were able to compete successfully (e.g., automobiles, nuclear energy, computers, semiconductors, and smartphones). In the emerging digital era, however, it is possible that early data monopolies combined with AI and quantum computing leadership could quickly dominate certain markets and make international competition prohibitive.

- **Technological competition forms part of a larger strategic competition that is ultimately about achieving upward national trajectory in the coming decades.** The issue of how to prevent or limit the transfer of critical technologies to China is an important but tactical issue. Efforts to enhance foreign investment regulation and export controls are also necessary, but they are defensive in nature. Successfully applying various technologies to enhance military effectiveness and economic competitiveness as well as to expand secure information communication and data access will ultimately prove crucial in the competition. Designing and forging the appropriate ecosystems from a holistic point of view will be key to generating innovation. There is a trade-off between restricting inbound human and investment flows from China on the one hand and boosting technological innovation on the other. A central question then is, what is the optimal level of "openness" that allows the United States and Japan to guard against technology transfers with negative security implications while at the same time enhancing the innovation ecosystem?

3. The Shape and Form of Technological Competition

- **Technological competition, broadly speaking, is unfolding in at least three areas – military, industry, and information communication.**
  - **Military:** Defense authorities are seeking to exploit cutting-edge technologies for

[1] There have been numerous Japanese articles with the heading of "*Beichu Hi-tech Haken Arasoi* (U.S.-China Competition over Hi-tech Hegemony)" or "*Beichu Hi-tech Reisen* (U.S.-China Hi-tech Cold War)" in the public domain. An example of a book for general readership is NHK Special Program Crew, *Beichu Hi-tech Haken Arasoi no Yukue (The Future of U.S.-China Competition over Hi-tech Hegemony)*, NHK Publishing, 2019.
[2] This paragraph builds upon a point made by co-author Schoff (with Prof. Asei Ito) in "Competing with China on Technology and Innovation," Carnegie Endowment for International Peace and Japan Forum on International Relations, October 2019.

military purposes in order to strive for overmatch. The U.S. Defense Department's Defense Innovation Initiative, Defense Innovation Board, and Defense Innovation Unit Experimental are all examples of this push to maintain military technology superiority, bolstered by large increases in defense R&D for AI and 5G networking, to over $2.3 billion per year in 2021 (proposed). Meanwhile, China has a national effort to create synergy between military and commercial technological innovation through its military-civil fusion strategy strongly advocated by the Chinese president himself.

- **Industry:** Major states are aiming to boost economic growth and competitiveness with advanced technologies. China has been buying, learning and stealing foreign advanced technologies, and using them to grow its economy through large-scale national initiatives such as *Made in China 2025*. China is now a world-leading patent filer for nine of the top ten advance technology areas, and recent investments coming on line are expanding China's NAND and DRAM semiconductor production from "virtually zero" in 2018 to 5 percent of the global total in 2020. In addition, the U.S. government is strengthening its foreign investment regulation and export control arrangements to guard against unlawful Chinese technology transfer. At the same time, the White House's "Industries for the Future" has identified AI, advanced manufacturing, quantum information science, and 5G as four key technologies that promise to fuel American prosperity and improve U.S. security. The Trump administration's 2021 budget proposal would double the amount of non-defense federal R&D spending on AI and quantum science, for example. R&D spending by all OECD countries has risen by $200 billion annually in just the last ten years.
- **Information Communication:** China's information communication technology (ICT) has been spreading both inside and outside of China through its major ICT companies such as Huawei. Under its so-called Digital Silk Road initiative, China is attempting to dominate standards and patents related to 5G, and also selling a wide variety of ICT-related software and hardware – including submarine fiber optic cable systems, 5G radio access networks, electronic commerce platforms, and cloud computing systems, among others – in various parts of the world. The U.S. government is determined to eject certain Chinese ICT equipment and services from federal IT systems, and accelerate the construction of its own 5G network while persuading foreign governments to reject high-risk Chinese ICT vendors, but it faces an uphill battle with Huawei 5G already rolling out in nearly 80 countries. Data governance has also become a salient issue as China imposes data localization requirements and other data-related rules based on its notion of digital sovereignty.

Alliance-related Tasks

- **The allies have a solid foundation of shared interests and a history of cooperation in public and private endeavors, but their most important current challenge is to sustain technology leadership in as open and collaborative an environment as possible without allowing unfair exploitation.** This will be a difficult balance to strike, yet failure will either limit innovation too much over the long term or effectively subsidize other nations' growth. Japan and the United States are two of the top three global investors (public and private) in

science and technology research, and they are in a similar position in terms of researchers (per capita), distribution of hyperscale data centers, patent applications, and many other related categories measuring technological prowess. China is usually that other country in the top three and could possibly top them all in coming years. Also noteworthy, Japan spends more on R&D in the United States than any other foreign country and is the leading foreign manufacturer in the United States. Japan and the United States are also China's top two trading partners. In so many ways, the United States and Japan together have sufficient technological strength and market influence to compete effectively with China and shape the high-tech future—especially if coordinated with others—whereas each on their own will struggle to remain a leader and maintain a viable innovation ecosystem.

- **The United States and Japan will have to consider three broad lines of effort: 1) restricted access, 2) collaborative innovation and 3) third party engagement.**

- **Restricted Access:** Policy makers see investment restrictions, export controls, and some outright bans on Chinese ICT as the primary instruments through which Washington and Tokyo can limit Chinese access to American and Japanese critical/sensitive technologies and data. Regulations of this type should be based on consideration of national security rather than on industrial protection, and thus, will require rigorous risk assessments that determine the appropriate level and scope of regulations.

  - **The allies need to make smart choices regarding export controls, investment restrictions, and supply chain risk management:** China has a huge but less open economy than most G20 nations, and Chinese market advantages of size, preferential access to data, and direct government support could easily limit the medium- to long-term growth potential of U.S. and Japanese firms in new technology areas.[3] This challenge would be exacerbated if Chinese technological standards in these emerging fields become widely adopted around the world (not only in the context of ancillary product compatibility—such as apps designed to work only with Chinese platforms—but also in terms of complementary support systems and practices in such areas as data privacy, data localization, and cloud sourcing). In this scenario, the allies could face a choice between designing to international standards or ensuring that allied critical infrastructure is secure from cyber threats (potentially unable to do both).

  - **Emphasize investment oversight and limits instead of excessive export controls, harmonizing rules with allies to maximize a collective innovation ecosystem and available markets**. Some studies suggest that Chinese investment (direct and venture capital) has generally been a more significant vehicle for technology transfer (along with industrial espionage) than through reverse engineering of U.S. exports, so investment controls are likely to be a more important area for limiting Chinese access via greater scrutiny. Harmonizing these rules and encouraging the sharing of information will likely require some U.S. compromise from its current maximalist positions in these areas, but it will maximize a relatively safe innovation marketplace.

[3] Ibid.

- **Collaborative Innovation:** The United States and Japan will need to push forward with the innovative application of advanced technologies for military, industrial and information communication purposes. To that end, both the United States and Japan should find ways to connect their innovation ecosystems to maximize the benefits of science and technology collaboration. This could include more liberal sharing of government-held data for use by allied private R&D initiatives, more information sharing on critical technology supply chains, and increased collaboration among counter-intelligence operations related to Chinese industrial espionage.

  - **The allies can derive greater benefit from current U.S.-Japan science and technology collaboration in support of long-term shared strategic priorities.** The United States and Japan are science and technology leaders with a tradition and solid foundation for R&D collaboration in various fields, but innovation dynamics are changing and government resources are limited. The allies have established forums to share information and facilitate teamwork, but they have difficulty tapping into today's fast pace of innovation, identifying common priorities, and steering catalytic funding for sustained cooperation on a select list of critical basic science activities or emerging technologies. Bottom-up bilateral R&D cooperation can continue, but it should be supplemented with some top-down strategic investments in AI, Quantum Computing, High-Energy Density (HED) science, and bio security.

- **Third Party engagement:** Japan and the United States will need to devise a strategy for dealing with China's Digital Silk Road. China has leveraged its relatively cheap and affordable ICT equipment and services in emerging and developing markets around the world. The United States and Japan should not seek to pursue a symmetric response approach. Instead Japan and the United States can focus on making investments in and financing of digital infrastructure in strategic locations throughout Asia, and simultaneously develop and offer alternative digital infrastructure packages that include trustworthy hardware/software. Coordination with the EU on digital trade and democratic governance regarding the handling of data will strengthen allied engagements with other countries in Asia.

Main Initiatives and Recommendations

- **Initiative 1: Restricted Access – Allied coordination and updating of export control regimes and foreign investment regulations for critical technologies in concert with the EU and other like-minded tech leaders:**

  - Intensify alliance coordination for export control reforms that aim more toward end-use regulation and include legislative exchanges to maximize allied coherence for the legal basis of export controls. Form a plurilateral export control coordination dialogue among the United States, Japan, Taiwan and South Korea in order to exchange information and assess the impact of existing and prospective regulations in select high-tech areas including certain semiconductors and software.

  - Engage in similar activity for foreign investment regulation, and strengthen bilateral

information exchange in counter-intelligence areas related to evaluations of foreign investors.

- Increase US-Japan private sector communication regarding export controls and investment restrictions to deepen mutual understanding and seek opportunities for coordinated lobbying for more harmonized rules.

- **Initiative 2: Collaborative Innovation – Update the alliance cooperation infrastructure and practices of alliance science and technology collaboration by revising the 1988 bilateral agreement on Cooperation in Research and Development in Science and Technology (STA):**

  - Empower the U.S.-Japan Joint High-Level Committee to identify a few shared alliance S&T priorities and enable it to direct catalyst funding for collaborative R&D in these areas. These could be drawn from (or augment) Japan's existing "Moonshot" science R&D program and the U.S. "10 Big Ideas" program.

  - Dedicate some investment to boost a small number of important institutional relationships (personnel exchanges, reciprocal access to certain high-value research assets, pooling funding for such assets and related test beds, etc.) among our national laboratories and specific universities and research organizations to increase the effectiveness of bilateral R&D collaboration over the long-term. This could include some STEM education promotion and supporting science related study abroad in each other's countries.

  - Establish a bilateral public-private interdisciplinary body working in support of top U.S. and Japanese policy makers that can help leverage allied science and technology collaboration in new ways and with clear priorities amid fiscal constraints. It could be similar to the Joint High-Level Advisory Committee established (but later abandoned) by the 1988 STA, or it could propose joint funding initiatives to both NSC secretariats for inclusion in annual budget proposals. Reinvigorating select think tanks in both countries and strengthening ties among them (e.g., the Japan Science and Technology Agency's Center for Research and Development Strategy with the US Science and Technology Policy Institute supporting the Office of Science and Technology Policy in the White House).

  - Acknowledge that virtually all science and technology research can have defense applications, and this fact should not restrict bilateral R&D collaboration even as it prioritizes peaceful purposes. In Japan, promote greater cross-fertilization between non-defense and defense-related science R&D communities so that potentially dual use technology areas benefit fully from Japan's scientific expertise.

  - Japan should consider making more robust its own security clearance system (centralized background checks) in order to facilitate and vitalize Japan-U.S. joint research and development initiatives regarding dual-use technologies and "trusted researcher" programs. Expand visa access in both countries for researcher exchange related to allied R&D priorities.

- **Initiative 3: Third Party Engagement – Jointly develop and implement (with partners) a Digital Connectivity Strategy (DCS) for the Indo-Pacific that builds on digital trade and data governance principles found in the Trans Pacific Partnership and US-Japan digital trade agreement.**
  - The aim of the DCS should be to provide digital infrastructure and also share best practice for technology security and cyber security.
  - European states should also be considered as potential partners in advancing the digital connectivity in the Indo-Pacific region (leveraging ASEAN, the ASEAN Regional Forum, APEC, OECD and other multilateral forums).
  - Promote cyber security capacity building joint efforts (bilaterally—for such initiatives as the recent US/DoD Cybersecurity Maturity Model Certification, which aims to raise cyber security standards throughout the entire defense industrial supply chain —and in 3rd countries, such as with the Japan-US Joint Training for ICS Cybersecurity for critical infrastructure (e.g., major utilities) with ASEAN nations since 2018).
  - Explore possible collaborative countermeasures such as providing "secure enclaves" in the cloud where SMEs can support R&D work for our governments in a safe cyber environment. Strong cyber security can also be promoted by creating a Trusted Capital Marketplace to enhance venture capital money flows to "high-scoring" companies in the area of cyber security (i.e., those employing best practices).
  - American and Japanese private cybersecurity companies operating or planning to operate in the Indo-Pacific should establish a shared liaison office in host countries in order to fully engage digital communication authorities managing 5G and ICT infrastructure build-out. U.S. and Japanese embassies should support such efforts together with other like-minded states such as Australia.
  - The U.S. and Japanese governments together with other like-minded governments should explore how the submarine fiber optic cable market is changing and what impact this can have on critical digital network nodes in the Indo-Pacific region. A shift towards data center-to-data center connection (rather than population center to population center)—among other changes including strong demand growth amid heightened geopolitical competition—will increase the relevance of government policy on the build-out of future sub cable networks. Cable landing stations are an important component from both a physical security and a technology integrity perspective. Greater transparency and multilateral governance of these networks can improve their resiliency and security.