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Cooperation Among Innovative Societies Promotes Competitiveness

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Fair and transparent trade and investment can boost economic growth but, by themselves, are insufficient to ensure long-term national security and economic well being. Why? Trade negotiations, like the U.S.-Japan talks on agriculture and automobiles begun in April 2019, address current and past practice, focusing on often long-standing unresolved tensions. They do not directly address the foundation of strong national and economic security: innovation. The components of global innovation leadership—human capital, science, technology, and business climate—are the key to the future. Competition in trade and investment will increasingly be replaced by competition in innovation.

> Innovation lies at the core of any solution to the challenges facing our world today. Whether it's the creation of new technologies that can help us stretch the limits of what is possible, or the development of new business models that make our world more efficient and interconnected, it is our business imperative as leaders to continuously reinvent, rethink, and reimagine.[1]
>
> --- *The Global Innovation Index 2018: Energizing the World with Innovation*

The global economy has seen the rapid emergence of new economic and technological powerhouses in the 21st century, some of which approach the world differently than the United States and Japan. China, for example, ranked 35th globally in innovation in 2013, rose to 17th in 2018.[2] Its share of global research and development (R&D), a major indicator of

[1] Cornell University, INSEAD, and WIPO (2018): *The Global Innovation Index 2018: Energizing the World with Innovation.* Ithaca, Fontainebleau, and Geneva, pg. IX.
[2] Op Cit., *The Global Innovation Index: 2018*.

the science and technology component of innovation, rose from 14.7 percent in 2013 to 21.6 percent in 2018.[3] For comparison, in 2018, the United States globally ranked 6th and Japan 13th in innovation. The United States accounted for 25.2 percent and Japan 8.5 percent of global R&D in 2018.

Globalization offers opportunities, but also has created risks that could be mitigated by like-minded partners cooperating to enhance their innovation leadership. No country is big enough in terms of knowledge and/or capabilities in today's world to go it alone.

Today, the United States and Japan together account for 30 percent of the global economy, and just under 35 percent of global R&D expenditures. As the world's first and third largest economies and funders of research, the United States and Japan must fully tap and utilize the knowledge that comes from coordinating and cooperating more strategically bilaterally and multilaterally on the components of innovation. As front runners, we are in a good position to lead and involve others who share our values such as the United Kingdom, Germany, Canada, Australia, and South Korea.

> We will nurture a healthy innovation economy that collaborates with allies and partners, improves STEM education, draws on an advanced technical workforce, and invests in early-stage research and development (R&D).[4]
>
> --- *The National Security Strategy of the United States*

This cooperation becomes more and more imperative as our relative shares of global R&D fall even as total expenditures increase. By 2050, the U.S. share of global R&D is forecast to drop from around 25 percent in 2018 to around 14.4 percent.[5] It stood at 37 percent in 2000.

Science and Technology Cooperation

One clear area of innovation in which we should cooperate more fully is in science and technology. U.S.-Japan cooperation can help both countries maintain global national security and economic leadership positions. It is time to focus on innovation by rethinking our bilateral science and technology relationship.

> The security environment is also affected by rapid technological advancements and the changing character of war. The drive to develop new technologies is relentless, expanding to more actors with lower barriers of entry, and moving at accelerating speed. New technologies include advanced computing, "big data" analytics, artificial intelligence, autonomy, robotics, directed energy, hypersonics, and biotechnology—the very technologies that

[3] *2019 Global R&D Funding Forecast*, R&D Magazine, Winter 2019, pg. 3.

[4] Executive Office of the President of the United States, *The National Security Strategy of the United States*, December 2017, pg. 20.

[5] Dehmer SP, Pardey PG, Beddow JM, Chai Y (2019) Reshuffling the global R&D deck, 1980-2050. PLoS ONE 14(3): e0213801. https://doi.org/10.1371/journal.pone.0213801.

> ensure we will be able to fight and win the wars of the future…. Maintaining the Department's technological advantage will require changes to industry culture, investment sources, and protection across the National Security Innovation Base.[6]
>
> --- *The U.S. National Defense Strategy 2018*

We have much to build upon. The United States and Japan already enjoy long-term collaboration in basic science. For example, the Human Frontier Science Program is celebrating its 30th anniversary and nuclear research cooperation goes back to the 1950s.

However, our bilateral science and technology relationship has not been as strategic or sufficiently resourced as will be demanded going forward. There are many reasons why it is not, ranging from a U.S. not-invented-here mentality, different approaches to innovation and sensitivity around military technology competition to structural barriers to access to Japanese government-funded technology, differing government funding cycles and lack of dedicated funds for international collaboration. Areas of engagement that should be expanded include: energy (renewables, advanced nuclear, energy storage, efficiency), basic science, cybersecurity, climate, sustainable society (e.g., aging, health, effective infrastructure, transportation), and common platform technologies and standards.

We also should cooperate in building what Japan's Council for Science, Technology, and Innovation proposed in 2016: Society 5.0, the creation of super smart societies. We need to take advantage of our greatest strength—the creativity and innovation of our people:

> "A culture of "boldly challenging the future" will be cultivated to create future industries and transform society. A "super smart society" (Society 5.0) designed to make people prosperous will be posed to shape our future, and efforts will be enhanced to build a framework to continually create new value, services, and businesses. STI [Science, Technology and Innovation] will also be strategically utilized in international collaboration to help address both domestic and international issues. To respond flexibly to any change, the foundations of STI will be strengthened to achieve knowledge implementation with a sense of speed into society. An open, global innovation system will be built to better develop and secure brilliant professionals."[7]
>
> -- *Japan's 5th Basic Science and Technology Plan*

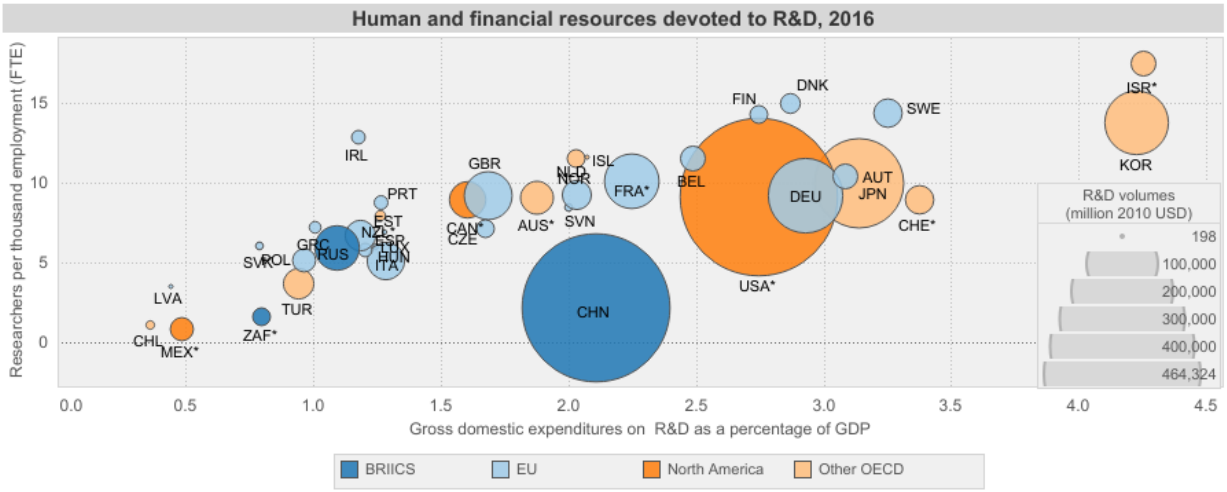
Economic and Security Cooperation

Seeking solutions to common challenges through the U.S.-Japan Economic Dialogue, the U.S.-Japan Science and Technology Agreement, the interaction of our private sectors and academia, and other avenues can make a major contribution to innovation and thus the

[6] Summary of the 2018 National Defense Strategy of the United States: Sharpening the American Military's Competitive Edge, pg. 3.

[7] Government of Japan, *Japan's 5th Basic Science and Technology Plan,* 2016.

economic and national security positions of both Japan and the United States. We must strategically expand and sustain economic and technical cooperation in regional and multilateral fora such as APEC and the OECD. We also need to make greater use of, and coordinate, our science and technology diplomacy.



Source: OECD, Main Science and Technology Indicators Database, http://oe.cd/msti , July 2018.
* Latest available data prior to 2016

Enhance the Partnership

What can be done to help deepen our partnership to jointly address our common innovation challenges?

First, we should expeditiously resolve outstanding trade and investment tension that undermine cooperation. Japan must facilitate deeper access to its market and continue to make room for outsiders that share our core values from within and outside of Japan. The United States must continue to welcome foreign investment and maintain a welcoming environment to attract human capital.

Second, both countries must invest more consistently and strategically in science, technology and engineering, including seeking out and creating long-term bilateral and global partnerships where it makes sense. Innovation needs to be a key element of both our long-term economic and national security strategies.

Third, both countries must build a positive and hopeful future for their populations by helping them adjust to, and prosper from, the global economy by building a flexible, productive and rewarded workforce. Globalization is a fact and our policies need to reflect both the opportunities it brings and the adjustments it necessitates.

And, fourth, both countries need to increase their diplomatic and commercial engagement especially in Asia to support and spread our common values and approaches through science, technology, investment, trade, and human development.

It will not be easy to expand cooperation. As a veteran of U.S.-Japan trade, technology and economic negotiations in the 1980s and 1990s, I understand the frustrations and the successes that permeate our relationship. Significant differences and tensions exist between our nations but so also does a like-minded approach to many economic, security and global issues. We have many deep shared values. Our relationship has matured and evolved but we have yet to take full advantage of it. It is time that we do so to help ensure our global innovation leadership.