Maintaining America's Lead in Creating and Applying New Technology

John Deutch
Emeritus Institute Professor
MIT

Condoleezza Rice
Denning Professor of Global Business,
Stanford University
Stephenson Senior Fellow, Hoover Institution

At its 2017 meeting, the Aspen Strategy Group discussed the decisive impact that a growing and assertive China will have on the liberal order over the next half century. One of the issues that emerged was the rise of Chinese technical competence—and Beijing's willingness to augment these efforts with outright theft of intellectual property. That strategy is well understood and the US government has lobbied China consistently and publicly for change for more than two decades. Some argued, however, that an even more nefarious and potentially successful Chinese strategy is less obvious: imbed Chinese graduate students and scholars in American research institutions where they become a kind of "fifth column" for the transfer of ideas and intellectual property to their homeland. The picture is one of China reaping the benefits of both indigenous innovation and pilfered American breakthroughs. For American policymakers, the question is how the United States can best protect its substantial lead in technology and yet remain true to the principle of academic openness.

Most Americans understand that innovation is important for US economic growth and international competitiveness. Successful innovation, sustained over time, is the result of an educational system that stresses creativity and entrepreneurship, enjoys federal support for fundamental scientific and engineering research, and has access to a financial community that it is willing to provide risk capital for new ventures and to make investments in first-of-a-kind commercial plant and equipment. Finally, innovation rests on an intellectual property system and regulations that are fair, flexible, and responsive to changes in the application of new technology.

Effective combination of these elements implies an underlying ecosystem that encourages cooperation between government, the private sector, and many research communities. While not perfect, the United States possesses such an ecosystem, which is the envy of the entire world. Over the past two decades, the five digital US super powers—Amazon, Apple, Facebook, Google, and Microsoft—have leveraged the internet as a powerful global tool and now dominate it globally. Thousands of new, promising start-up companies, ranging from biomedicine to 3-D printing, have been launched by private equity and new government programs such as Department of Energy's ARPA-E. Foreign students and recent postgraduates come to train in US universities and to a remarkable degree these individuals seek to remain in the United States to strengthen the performance of many industries. US universities throughout the country continue to be a cornucopia of new ideas: CRISPR gene editing, quantum computing, and machine learning are just a few examples.

Not surprisingly other countries are seeking access to our secret sauce by a variety of means, fair and foul. China is the poster child for this activity. China is increasing its support for domestic R&D, emphasizing areas such as artificial intelligence where the United States has always been the leader. This is an area that is already changing commercial activity, and it has significant implications for the military sphere. Although a crude measure, China's patent production is growing substantially. China now boasts its own technology giants like Alibaba and Tencent, and Chinese firms are increasingly investing in high-technology start-up companies in Silicon Valley and elsewhere. Chinese students remain a significant presence at US universities, a trend begun during Deng Xaioping's historic 1979 visit to Washington. As China and other emerging countries mature technologically and economically, the United States should expect greater competition.

These activities are all within the bounds of legitimate competition. But China goes further. Chinese entities are involved in malicious efforts to gain access to US technology, increasingly through cyber hacking. The United States has responded, passing the Defend Trade Secrets Act of 2016. China is also known to have pressured US firms that have been encouraged to move some of their operations to China to agree to favorable IP sharing arrangements. Present and former administrations have taken steps to protect the country from these illegal efforts, as we know from our past government service.

The government should continue to press the Chinese to prevent theft of US technology, suppress the misappropriation of US intellectual property, and insist on rigorously symmetric rules for foreign investment in the emerging high-technology firms of both countries.

But judicious reports often lead to less-measured proposals that would lead the United States down a path, long discredited, of attempting to maintain US competitiveness and its lead in innovation by trying to keep others out or, for that matter, our ideas in. The only effective response to this external competition is to increase the pace of innovation by expanding support for R&D and recruiting the most talented workforce able to translate rapidly new ideas into practice.

US university research and education is especially threatened by some suggestions to slow the leakage of US technology to adversaries and competitors. Examples include pre-publication clearance of research results supported by the DoD, creating a category of sensitive but unclassified research, and restrictions on foreign graduate students joining "sensitive" research projects and on the presentation of research at international meetings. Each of these measures conflicts with the open structure of admission, research, and publication that keeps the US innovative ecosystem fresh, exciting, and agile.

There certainly will be circumstances when a university will refuse to undertake a research or education program because of uncertainty about its social or security consequences or because of conditions placed by the research sponsor on how the work is to be carried out. The institution makes its decision based on its research policy and after vigorous internal debate. But individual faculty and university administrations have limited experience determining the security risks that a proposed project might present. There is plenty of room here for misunderstanding and conflict. Universities will rightly hold to the overriding principle that no arrangement is acceptable if it restricts any member of the university community from participating in an activity where he or she meets specified academic qualifications. There can be no "nationality" test or restriction. If the federal government insists on imposing such restrictions on sponsored research, it runs the risk of weakening its link with the universities that have been so central to US innovation. We say this although we are aware that some may take advantage of the openness of our system for nefarious purposes. Yes, there will be losses, but these are minor compared to the losses that will be incurred by restricting inquiry on university campuses.

It is better for the United States to hold to the strategy that has given us the substantial technological lead that we enjoy. In that regard, the greatest danger is that the federal government may reduce its support for R&D and universities and other performers may lessen their efforts. That is a greater risk to innovation than any country—no matter how determined—could ever be. America should try not only to protect what we have created—we must strive to master the next intellectual frontier.

In other words, stay well ahead of others by doing what we do best. As former provosts of two great universities that have been a part of America's remarkable story, we are confident that the United States will maintain its technological lead for decades to come.

John Deutch is an Institute Professor at the Massachusetts Institute of Technology. Mr. Deutch has been a member of the MIT faculty since 1970, and has served as Chairman of the Department of Chemistry, Dean of Science, and Provost. Mr. Deutch has published over 160 technical publications in physical chemistry, as well as numerous publications on technology, energy, international security, and public policy issues. He served as Director of Central Intelligence from May 1995-December 1996. From 1994-1995, he served as Deputy Secretary of Defense and served as Undersecretary of Defense for Acquisition and Technology from 1993-1994. He has also served as Director of Energy Research (1977-1979), Acting Assistant Secretary for Energy Technology (1979), and Undersecretary (1979-80) in the United States Department of Energy. He is a member of the Aspen Strategy Group.

Condoleezza Rice is currently the Denning Professor in Global Business and the Economy at the Stanford Graduate School of Business; the Thomas and Barbara Stephenson Senior Fellow on Public Policy at the Hoover Institution; and a professor of Political Science at Stanford University. She's also a founding partner of RiceHadleyGates. From January 2005 to 2009, Secretary Rice served as 66th Secretary of State of the United States. Secretary Rice also served as President George W. Bush's National Security Advisor from January 2001 to 2005. She served as Stanford University's Provost from 1993-1999. From 1989 through March 1991, Secretary Rice served on President George H.W. Bush's NSC staff. She served as Director; Senior Director of Soviet and East European Affairs; and, Special Assistant to the President for National Security Affairs. She's authored and coauthored numerous books, including three bestsellers, *Democracy: Stories from the Long Road to Freedom; No Higher Honor: A Memoir of My Years in Washington*; and *Extraordinary, Ordinary People: A Memoir of Family.* She currently serves on the boards of Dropbox, C3 and Makena Capital. In addition, she's vice chair of the board of governors of the Boys and Girls Clubs of America; a member of the board of the Foundation for Excellence in Education; and a trustee of the Aspen Institute. Born in Birmingham, AL, Secretary Rice earned her bachelor's degree in political science from the University of Denver; her master's from the University of Notre Dame; and her Ph.D. from the Graduate School of International Studies at the University of Denver. She is co-chair of the Aspen Strategy Group.