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**SCIENCE AND SECURITY:
Strengthening US-China Research Networks Through University Leadership**

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ABSTRACT

This paper describes the current criticisms of academic research collaboration between the US and China and proposes a university-led initiative to address those concerns. The article begins with the assertion that bilateral research collaboration has historically benefitted both countries, citing cooperation in virology as an example. The paper continues with a discussion of the criticisms leveled by several US government agencies against the Chinese government, especially with regard to the Thousand Talents Program (TTP). A close examination of publicly available appointment letters under the TTP suggests that Chinese universities are given wide discretion when it comes to defining the specific terms of scholarly collaboration. Along with additional supporting arguments, the paper concludes that the most significant violations of commonly accepted research norms are owing to the behavior of individual Chinese institutions and are not directed by the TTP or the Chinese national government. The paper then suggests several steps for addressing these issues at the university level, beginning with a convening of campus leaders from both countries.

Keywords: Science, National Security, United States, China, Technology, Intellectual Property

How to balance the benefits of transnational academic research with the potential risks to national security and economic competitiveness? The following discusses the potential risks related to transnational research cooperation and how to manage what is an increasingly important mode of generating new knowledge.

Many have already demonstrated the value of transnational research collaboration, including the benefits to the academic research communities in the United States and China. Freeman (2010) lays out a framework of five factors that are associated with the growth of transnational research: (1) the overall growth of higher education worldwide, including the growth of academic research budgets and research positions, (2) growth in the number of international students, especially in the science, technology, math, and engineering (STEM) fields, (3) the transnational movement of scientists, scholars, and engineers to permanent positions in other countries, (4) the transnational movement of short-term visitors through conferences, guest lectures, and similar arrangements, and (5) increases in co-authorship and co-patenting. Thanks to technology advances within the academic publishing industry, we can now document this last development at an unprecedented level of detail.

Transnational academic research (TAR) facilitates the global diffusion of knowledge. Most typically, this means the movement of knowledge from developed countries to developing countries, raising important questions about the relationship between national competitiveness and indigenous knowledge creation. The enduring power of geographic clusters for innovation shows that location still matters.

One assumption that underlies Freeman's list is that the written and unwritten norms that govern the production of knowledge are consistent across disciplines, institutions, and national boundaries. These include the rules for managing and sharing data, norms for sharing personal and institutional credit for group projects, obligations to funding agencies, and guidelines for maintaining the

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integrity of peer review. In a recent publication, the National Science Foundation in the United States collectively described these norms as research integrity (JASON, 2019). Transnational academic research assumes that all research scholars are playing by the same rules.

But what if that is not the case? Can transnational research networks threaten national security and economic competitiveness? In the United States, many agencies in the federal government—including the intelligence community, the federal agencies that fund academic research, and both legislative chambers—argue that universities are increasingly vulnerable to these risks. While these agencies cite several countries as perpetrators, they mention China much more frequently than the others. All of these voices have emphasized that the relative openness of the academic research community in the United States is a major asset, contributing to knowledge creation, innovation, and economic progress. They argue for a rebalancing that preserves this core strength.

Among Chinese university leaders and government officials, the reaction to these concerns has been a combination of consternation and resignation. The consternation is in response to the vehemence of the criticisms, and the resignation is a reaction to the extent to which the shift is owing to issues beyond their control. One senior diplomat described US-China relations as moving in regular cycles of warmth and friction, without regard to specific policies or disagreements. Many university leaders in both countries believe they can still separate higher education cooperation from the more sensitive areas of the relationship and use that separation as a way to maintain a basic level of engagement. But the door is closing rapidly. American universities are increasingly important—if reluctant—participants in the debate over how to engage with a rapidly rising China, which includes such issues as intellectual property transfer, undue influence, and the limits to legitimate public diplomacy.

This paper argues that the university communities in both countries can take the lead in defining the bilateral relationship. I make several recommendations for achieving the balance between the global diffusion of knowledge and perceived threats to national security and competitiveness in a way that responds to the concerns expressed by the federal government in the United States. These recommendations focus on changing the behavior of universities in both countries through the development and standardization of norms for transnational academic research. I argue that much of this work can be done by the university communities themselves in both countries, although in regular consultation with their governments.

SOME HISTORY

Academic engagement between the United States and China is unique because of its longevity, scale, and productivity. This is for a variety of historical reasons, including the large number of Chinese who have come to the United States since the mid-19th century, the career success of those who entered many academic fields, and the commitment by the Chinese to build China's research capacity through their participation in transnational research networks.

For the first three decades following normalization of relations between the United States and China, public policy in both countries focused on promoting these exchanges. In the United States, there have been several arguments for academic engagement. One enduring theme has been public diplomacy. Another has been the economic windfall of having international students—and especially talented students in STEM fields—remain in the United States after graduation in order to contribute to the innovative capacity of US companies. Some of these graduates are employed by US companies in China as these businesses have increased their investments in research and development. In November 2020, the American Council on Education convened a group of experts to develop a research agenda for tracking the career pathways of international students enrolled in US universities. They identified large gaps in our knowledge, especially with regard to professional degrees at the masters level, and they collectively contributed to a research paper that concludes with a list of pressing research questions (Esaki-Smith, 2021). Additional data and analysis on these career pathways could potentially inform important debates on immigration and innovation policy.

Both governments have publicly supported transnational research collaboration as a means for creating and sharing knowledge. After the SARS epidemic of 2002-03, the US Centers for Disease Control and Prevention (CDC) and the Chinese National Influenza Center (CNIC) signed a cooperative agreement for the purpose of (1) training Chinese researchers in virology and epidemiology, (2) strengthening monitoring and reporting systems, (3) increasing China's capacity to analyze and disseminate survey data, and (4) and boosting China's capacity to respond to disease outbreaks with pandemic potential (Shu et al., 2019). China agreed to share survey data with the World Health Organization, which was then used for the development of global vaccine strain recommendations. The agreement expired in 2014 and was not renewed.

One can only imagine what China's response to COVID-19 would have been without this decade of close collaboration with the scientific community in the United States. While the focus of the collaboration was on developing research capacity in China, the benefits have had worldwide consequences. For one, the global pool of knowledge about the pandemic was significantly enlarged because of China's enhanced capacity for surveillance and detection. In addition, China's enhanced capabilities in influenza laboratory diagnostics led to the sharing of this expertise with other countries in Asia.

In the early stages of the current pandemic, the Chinese research community was regularly sharing survey findings on the outbreak with the rest of the world, and they quickly provided the full genome of the early version of the virus (Schnirring, 2020). Since that time, their record is much more mixed, with reports of Chinese government controls on research output and limited access to information on the origins of the outbreak (Associated Press, 2020).

Nevertheless, starting with the first days of cooperation following the normalization of diplomatic relations, the United States has viewed China as a potential competitor. A book that analyzes research collaboration during this early period acknowledges that the flow of knowledge was not reciprocal, with China disproportionately benefitting from access to scholars, degree programs, and laboratories in the United States (Lampton, 1986). Written in the mid-1980s, the author was already anticipating a rising China that would challenge the United States politically, militarily, and economically. With the benefit of more than 30 years of hindsight, a reassessment of the principles and norms for academic cooperation appears long overdue.

There is a striking parallel between the current debate over China's rise and the debate over Japan's economic rise more than 30 years ago. When Japan assumed global dominance in several industries in the 1980s, including automobiles and consumer electronics, there was widespread debate over the causes. One line of argument was that the United States needed a more coherent industrial policy in order to compete with Japan, with the Ministry of International Trade and Industry (MITI) often cited as the ultimate cause of Japan's industrial dominance (Méthé, 1991, p. 1-2). Another line of argument criticized the US approach to the development of commercial products, suggesting that US companies were structurally incapable of developing products as rapidly as their Japanese competitors (Méthé, 1991, p. 170-171).

The first argument has been revived in the current debate over China policy. China's return to heavy state intervention in the economy reversed a lengthy period of de facto privatization. The shift has been carefully analyzed by Nicholas Lardy in two books (Lardy, 2014; Lardy, 2019). He has demonstrated that China's state sector has consistently under-performed the private sector, arguing that the current slowdown in economic growth is the result of a shift in policy rather than cyclical or demographic changes. Even though Lardy's research has shown that subsidies do not contribute to the innovative capacity of state-owned enterprises in China, they continue to be on the agenda for trade negotiations.

The second argument is also resurfacing: that Chinese companies have an unfair advantage when it comes to the commercialization of fundamental research, including university research. Many in the United States have noted that China has a plan for economic and technological development that prioritizes specific industries and technologies (US Chamber of Commerce, 2017). Although China has always had an articulated development strategy of some kind, recent documents are much more explicit about overtaking the United States and other developed countries.

In China, the arguments in favor of a coordinated national strategy have usually been balanced by those who point out the limitations of this approach; they argue that China's remarkable economic growth over the past 40 years has been led by the private sector, which has rarely received State support and often suffers from policy discrimination (Lardy, 2014). My own observation is that the voices in favor of a more decentralized, market-driven approach are now largely silent in China, at least publicly.

PROTECTING RESEARCH INTEGRITY AND INTELLECTUAL PROPERTY (EVIDENCE AND TYPES OF ABUSES)

Starting with Congressional testimony from FBI director Christopher Wray in February 2018, the academic community in the United States was accused of being naïve and vulnerable to threats from China in three areas: illicit technology transfer, undue influence, and inappropriate forms of public diplomacy (Redden, 2018).

At the center of the criticism is the Thousand Talents Program (TTP), a program run by the Chinese Communist Party (CCP) that provides funding for overseas scholars to do research in China. Although the Thousand Talents Program has received most of the attention, China has many other talent programs at the provincial, regional, and municipal levels. The Thousand Talents Program typically targets members of the Chinese diaspora: the program is run by the United Front Office, a party agency charged with engaging the overseas Chinese community, and the TTP website is primarily in Chinese.

A search of Chinese language sources on the Thousand Talents Program reveals that a variety of Chinese entities are eligible, including universities, companies, research institutes, and technology parks. A search of open research positions on the official TTP website shows that the vast majority of positions were with universities; searches for "enterprise" and "government" were much less productive (Thousand Talents Program, n.d.). Moreover, 20 Chinese university logos appear prominently on the site. (Note that much of the material on the official TTP website has since been removed, most likely in response to US government scrutiny.)

Several US government agencies have accused these talent programs of being the means to extract intellectual property from the United States as part of China's national technology strategy. Among research funding agencies, the National Institutes of Health has been the most aggressive, focusing on cases where foreign support for research has been omitted from grant applications. The NIH effort began with a letter in August 2018 from Francis Collins (2018), the NIH director, to more than 10,000 recipients of NIH grants. The letter focused on three problems:

- Identical or similar applications submitted to the National Institutes of Health and a "foreign entity," without the mandatory disclosure to the National Institutes of Health;
- Intellectual property developed with the support of the National Institutes of Health and then claimed by a foreign government;
- Individual recipients failing to disclose financial support from foreign institutions. The National Institutes of Health later told Congress that it had identified at least 190 NIH grantees from 50 institutions who could be in violation of NIH regulations because of their foreign ties (Cohen, 2019).

The National Institutes of Health has been very open with the scientific community in the United States, sharing case studies and examples and giving an extended interview in *Science* magazine (Mervis, 2019). In addition to this internal investigation, the National Institutes of Health commissioned an Advisory Committee to the Director, co-chaired by Roy Wilson, president of Wayne State University. Their report and recommendations were presented at the American Council on Education annual meeting in March 2018 (NIH, 2018). A university administrator who is familiar with the work of the task force and who had personal access to classified data stated that the violations were credible and serious.

The National Science Foundation responded by commissioning its own report in 2019 (Jason, 2019). The report affirmed the historic definition of fundamental research, arguing that university research should be classified as fundamental research by default, with the burden on government agencies to identify the research activities that require classified status. The NSF report went on to say that universities should review their current policies on external research linkages, especially their policies on conflict of interest and conflict of commitment. The report acknowledged the accuracy and seriousness of the current accusations toward China, but it also classified these transgressions as violations of "research integrity" that can be managed by the universities themselves. The report said little about illicit technology transfers.

With 14 government agencies funding university research, there is considerable risk that each agency will come up with its own policies to address the problem. A private conversation with a senior administrator at a leading research university in the United States suggests that faculty are already confused and frustrated with the additional reporting burden. In 2019, as part of the National Defense Authorization Act, the US Congress passed and the president signed into law the Securing American Science and Technology Act (SASTA), which will create a working group to coordinate policies across all of the relevant federal agencies (National Defense Authorization Act, 2019). The American Council on Education and other major higher education associations supported this legislation.

Two TTP cases, at MD Anderson Cancer Center in Houston (Nedelman, 2019) and Emory University in Atlanta (Dilanian, 2020), have received widespread publicity, largely because they led to the firing of researchers and one conviction for tax evasion (Department of Justice, 2020b). More recently, a report by the Senate Permanent Subcommittee on Investigations (2019) included appendices (2019a; 2019b) with some of the first publicly available details on faculty appointments under the Thousand Talents Program and similar programs. The details include redacted copies of five appointment letters under the Thousand Talents Program and 12 examples of inappropriate behavior by individual scholars. The names of the researchers and the names of their employers in the United States have been redacted, but not the names of the host Chinese universities. These include Wuhan University, Sun Yat-sen University (or Zhongshan University), Tsinghua University, Shanghai Tech University, Zhejiang University, Qingdao University, and a template contract from the State Administration of Foreign Experts' Affairs (SAFEA). They are referenced by their shortened names in this section.

Based on what we know about the scale of the NIH investigations, these examples are only a small subset of the total cases under review.

Based on this evidence, the violations fall into three broad categories:

1. **Conflicts of commitment.** TTP obligations could interfere with the researcher's primary appointment in the United States (Wuhan). Other contracts allow for working remotely, although they require visits to China (Zhongshan). One contract states that the scholar will work for nine months annually at the Chinese institution and eventually resign from their US institution altogether (Zhejiang). The Zhejiang contract also states that compensation will be based on the actual hours worked; the same contract in several places implies that all work must be performed on site, but it does not state this directly. Another

contract simply states that the appointment is full time and prohibits work with a “foreign unit” without the consent of the Chinese institution.

The time commitment in some cases is substantial enough to raise the question of how the scholar will fulfill their obligations to their home institution. The level of compensation suggests that the expected time commitment is being taken seriously by the host university in China. As far as US government funding agencies are concerned, faculty commitments in China could prevent them from devoting sufficient time to their funded projects.

The National Institutes of Health and other government agencies require proposal budgets that state the amount of time that the principal investigator and other researchers will spend on the project. If they accept the grant but do not work the hours stipulated in the proposal budget, they could be subject to disciplinary action. In one prominent case, the federal government prosecuted a researcher at the University of Kansas in 2019 for program fraud (U.S. charges Kansas researcher, 2019).

In July 2020, the charges were revised to wire fraud and making false statements (Kemsley, 2020). The federal government cites a TTP contract as evidence that the defendant could not possibly have worked at the level of effort required under the terms of an NIH grant, while the defendant’s lawyers maintain the allegations amount to a typical employment issue that should be resolved in-house. A more recent and notorious example is that of a Harvard professor who allegedly accepted a large salary and other subsidies under the Thousand Talents Program and then lied about it to university administrators, who then passed his statements on to federal investigators (Barry, 2020). He has been fired by Harvard and indicted for making false statements to the US government.

This very public effort by the National Institutes of Health has caused research administrators on US campuses to look more closely at their policies on outside faculty work. They are reviewing faculty appointments and contracts, tenure and promotion policies, and policies on faculty roles and responsibilities. Based on my own experience, universities often take a de facto approach to outside work: if the faculty member is fulfilling all of their responsibilities for teaching, research, and service, including compliance with the guidelines set by external funding agencies, then the institution is unlikely to investigate further. (My own appointment at the University of Michigan regularly exceeded 125% of effort and included time on a federal grant.) Universities are now assuming responsibility for developing more comprehensive guidelines that cover all types of outside engagement, whether international or domestic.

2. ***Nondisclosure of TTP involvement.*** This could be a violation of US university policy in some cases, although conflict of interest policies vary by US institution. One appointment letter acknowledges that the appointee is still subject to the rules and regulations of their US institution, including rules on conflict of interest (Zhongshan).

The requirement that the Chinese government must agree to the termination of the contract is problematic given that circumstances for the scholar could change over time, including the rules and regulations established by their employer in the United States. As I interpret the contracts, however, this clause only prohibits the disclosure of the terms of the TTP agreement; it does not prohibit the participant from disclosing the existence of the agreement or their participation in the TTP program. Nevertheless, the National Institutes of Health has examples of where TTP scholars did not disclose their work in China on grant application forms. Unlike generic disclosure policies, applicants for federal funding must proactively disclose all outside work and especially document any funding that they are already receiving, or may receive, for the research project for which they are applying. Some of the cases go beyond omission, with researchers stating in writing that they are not receiving funding from other sources.

4. ***Ownership of intellectual property.*** One letter stipulates that the intellectual property created by the TTP scholar will be owned by that scholar’s employer in the United States; an exception would occur when the work in China is jointly produced with local Chinese collaborators, in which case the intellectual property would be jointly owned (Zhongshan). Another contract stipulates that any research conducted at the Chinese institution must not conflict with NIH-funded projects (ShanghaiTech). The same appointment letter states that intellectual property created by the TTP scholar while at the Chinese institution will be jointly owned by the scholar and the Chinese institution, with no mention of the scholar’s institution in the United States. But a different section of the same letter also discusses the ownership of intellectual property, beginning the paragraph with “to the extent that it is consistent with the policies of Party B’s [the TTP scholar] primary employer....”

A template letter provided by the Chinese national government (SAFEA) suggests that the issue of intellectual property is left open to individual universities. For example, on the question of intellectual property ownership, the template letter only states that the appointment contract should describe the terms by which intellectual property will be developed and shared. It does not require ownership by the Chinese institution.

Based on this review, the direct evidence—including the redacted TTP appointment letters, public court documents in criminal cases, private conversations with university investigators, anonymized case studies, and policy documents produced by the Chinese government—suggests that participating Chinese universities have been given broad discretion to draft and sign appointment letters according to their own institutional priorities. This conclusion suggests that the most effective way to address the concerns raised over the Thousand Talents Program is through direct engagement with universities in China.

CHINESE HIGHER EDUCATION AND THE CHINESE STATE

China's goals for higher education have been remarkably consistent over time: to strengthen and expand the higher education sector in ways that advance the goals of the Chinese state. Toward that end, there has been a general trend toward greater institutional autonomy in many areas, although with three critical exceptions: academic freedom, the appointment of senior campus leaders, and required content in the curriculum. For the most part, the Chinese state has given substantial autonomy to universities when it comes to global engagement and transnational research collaboration.

The state has three powerful levers for controlling universities (Han and Xu, 2019). These are (1) laws, including those that give the state the power to appoint senior leaders, (2) policies, including detailed rules and guidelines on curriculum, and (3) financing. On the latter, the Chinese state has increasingly tied funding to policy goals rather than provide unrestricted support for operations. Chinese universities are expected to fund a growing share of their operations through the development of other funding sources, including tuition revenue. Over the same period, the Chinese government has developed more sophisticated ways to measure performance and ensure accountability.

At Duke-Kunshan 2019, there was a strong consensus that Chinese universities have benefitted from transnational research collaboration, and especially those institutions that have achieved world-class status. In the early years of the reform period, institutions and their faculty accurately saw China as lagging far behind the West in many academic disciplines; they tended to be generous with time and resources, without regard for reciprocity. Nevertheless, a study of early (1978-84) engagement concluded that US institutions also benefited by gaining access to data, research samples, and talent (Lampton 1986).

It is difficult to reconcile this history of higher education development with recent arguments that the goal of the Chinese state is to expropriate intellectual property through any means necessary, including through academic research networks. For one, largely playing by established global norms has strengthened China's universities in ways that support its goals for national development. Second, the vast and growing library of policy documents on higher education does not provide direction on this issue, leaving it up to individual institutions to define and manage the terms of their international research collaborations. And third, scholars in the West have every incentive to detect and stop any illicit use of their own research; technology advances have made it easier to monitor Chinese academic publications.

This does not mean there are no violations; I am suggesting that the violations are the actions of single institutions, academic departments, and individuals. Here our community should take some responsibility for a lack of initiative: there has never been a comprehensive survey of transnational research collaboration that asks specifically about violations of research integrity.

China's increasingly aggressive stance on the role of the state in technology development raises some important questions about a possible shift in its policy goals for higher education. During the reform era, Chinese universities made important contributions to economic development through global engagement: they increased their research productivity, rose in world rankings, and served as the headwaters for downstream commercial development. If that model were ever to become subservient to the policy goal of maximizing technology transfer by any means necessary, then Chinese higher education would be at risk from being cut off from the developed world, much as it was before 1978.

So far, this does not appear to be the case. For example, I can find little evidence to support the claim that academic research is subservient to the goals of "Made in China 2025," China's national strategy to achieve prominence in a variety of emerging technologies. In both the English and Chinese versions of the plan, there are only four references to universities, two of which are on training (Guowuyuan, 2015). A third statement is that university research will be subordinate to private research and development. Nevertheless, Made in China 2025 is unprecedented in its ambition, commitment of resources, detailed performance targets, and state control over the development of key technologies. The most important impact this document has on the bilateral relationship may be its alienation of the US business community, which has historically had a moderating influence on US policy.

RECOMMENDATIONS FOR ACTION

The thesis of this paper is that closer cooperation between universities in the United States and China will effectively address the concerns over illicit intellectual property transfer and undue influence. The focus of this cooperation should be on the creation and

enforcement of global research norms that emphasize the universality of transparency, integrity, and reciprocity, beginning with three broad areas:

Improving access to Chinese research output. China's research output has grown exponentially in recent years, largely as the result of increases in research funding, the growth in the size and number of Chinese universities, and the increase in the number of faculty. Our prevailing model is that all academic research funnels into a single, global pool of knowledge through publications, conference presentations, and private communication among scholars. Our community should take positive action to ensure that China is an active and responsible member of the global research community.

Address conflicts of interest and conflicts of commitment. At US institutions, the rules for conflict of interest often follow the honor system, where individual faculty are only required to certify in writing that any outside work does not conflict with their responsibilities to their home institution. While this approach is consistent with deep institutional values on the independence and autonomy of individual faculty, this paper argues that our community should engage in a major review of these rules; the scope should include a wide variety of external engagements, both domestic and international, and there would be disciplinary consequences for violations. It will be critical for faculty to be directly involved in this process.

Clarify ownership of intellectual property. There are several subordinate questions here, including: (1) how data and other pre-publication information can be shared, (2) how researchers and their institutions will be recognized in publications and other means of dissemination, and (3) how researchers and their institutions will share intellectual property rights if the research is commercialized. This includes the assumption that research activity before publication—including the development of ideas, the writing of funding proposals, the collection and analysis of data, and early paper drafts—will remain under the control of the researcher or principal investigator.

In this context, intellectual property would also include any information that is protected by the confidentiality of peer review. Confidentiality is one of the fundamental norms for academic research, and the National Institutes of Health has stated that funding proposals under peer review have been shared with colleagues in China. There is widespread consensus that this is essential because of the competitive nature of academic research, including decisions on tenure, promotion, funding, and publications.

Institutional policies on intellectual property must be consistently applied if they are to have any meaning, and this can only be done through the application of standardized language in institutional agreements. The intellectual property problem cannot be managed at the person-to-person level of transnational engagement. For university administrators who are simultaneously charged with promoting international research collaboration, enforcing the law, and applying university regulations, the best option is to require that all external research collaborations be operated under the umbrella of institutional agreements.

With these areas in mind, I propose the following steps:

- A national organization in the United States, in partnership with a counterpart organization in China, would create a joint commission of US and Chinese universities that would develop a recommended framework, including sample language, for inclusion in transnational research agreements.
- Universities in both countries would agree to adopt the framework. A fully executed bilateral research agreement at the institutional level would be a condition for any research collaboration at the individual level. This would not be limited to participants in talent programs, and it would apply to visiting scholars who come to the US.
- A national higher education organization in each country would list the Chinese and US universities that have adopted the framework and who are in full compliance, which would be defined as certification that all of their written agreements contain the recommended language.

This plan raises several operational questions:

- How can institutions ensure the support and cooperation of faculty? Are the boundaries negotiable? What about domestic consulting?
- What is the minimum level of engagement to qualify as research cooperation? What if a faculty member only gives a lecture or meets privately with faculty?
- What is the enforcement mechanism? How do we recognize those in compliance—and those who are not?
- How will institutions bear the administrative costs of monitoring and evaluation?

While writing this article, I asked several China experts about the role of the Chinese government in implementing these recommendations. One senior Chinese diplomat told me that the Chinese government does not have to be involved at all, whereas others identified a range of agencies that would have to at least acquiesce to any plan that would insert standardized language into university agreements. These include three cabinet-level ministries: education, foreign affairs, and science and technology. Others have suggested that the Chinese Academy of Sciences take a leading role. Another possible agency would be the United Front Department, the party organization that funds the Thousand Talents Program. Another recommendation has been to engage universities first and then to ask them for guidance on the role of government. The wide range of thoughtful recommendations suggests that there is no obvious political home for this issue.

PROTECTING NATIONAL SECURITY AND PROMOTING NATIONAL COMPETITIVENESS

All US government funding agencies, including the National Institutes of Health and National Science Foundation, make a clear distinction between fundamental research—which should be freely available to all scholars in all countries—and research that should be protected for national security reasons. Until recently, this distinction has been widely accepted within the scientific and policy communities. The board of directors at the National Science Foundation (2018) recently affirmed this policy, citing an executive order from the 1980s, and it was reaffirmed in a recent report on science and security (JASON, 2019).

The Bureau of Industry and Security (BIS) in the US Department of Commerce regulates foreign access to technologies that have civilian and military applications, known as dual use technologies. The BIS has the authority to single out foreign organizations that pose a significant national security risk, including universities, by placing them on an “entities” list. Any organization in the United States must apply for a license to export to one of these entities. The rules may apply to transnational research collaborations when they involve the sharing of intellectual property with foreign universities, even when the foreign researcher accesses the information while in the United States.

A recent proposal to revise these controls would dramatically expand their scope to include “emerging” or “foundational” technologies. The arguments for the change are similar to those that were voiced in the 1980s regarding Japan: when a national competitor targets specific industries and technologies for development, then the United States should respond in kind. Many groups (Council on Government Relations et al., 2019) have expressed concerns over these proposed changes, including the higher education community (with the American Council on Education supporting comments submitted by the Association of American Universities and the Council on Government Relations) and the US-China Business Council (2019). The report from the higher education community argues for a continuing focus on the controls on military and dual-use applications with the further stipulation that the domestic research environment in the United States should not be harmed.

The US-China Business Council (2019) has summarized the public comments on the proposed revisions to export control regulations. They fall into two areas. The first is the challenge of identifying fundamental research with commercial potential, since fundamental research by definition does not have a commercial application. Such a policy would in effect be picking commercial winners before they come to market. The second challenge concerns the increasingly global nature of research networks, where it is often difficult to determine the national ownership of emerging technologies.

The Chinese case is complicated by two factors. The first is that many government ministries own and manage their own universities, including military agencies. While most of the globally ranked research universities fall under the Ministry of Education, many still receive funding for military research. A “defense funding tracker” developed by an Australian think tank categorizes twenty-three out of forty-five universities under the Ministry of Education as either “high risk” or “very high risk,” including Beijing University (high), Shanghai Jiaotong University (high), Zhongshan University (high), and Tsinghua University (very high) (Joske, 2018). The second factor is the increasingly dominant role of the Chinese Communist Party in many aspects the economy and society. Like the argument that Huawei would have to surrender customer data if ordered to do so, Chinese universities may be seen by regulatory bodies in the United States as extensions of the Chinese state, without sufficient autonomy to protect sensitive technologies.

As of September 2020, the ties between Chinese universities and the military were emerging as a major bilateral issue. By presidential proclamation (Trump, 2020) in late May 2020, the White House announced that it was restricting entry into the US for Chinese nationals with ties to China’s “military-civil fusion strategy,” the term used for Chinese policies designed to coordinate research among universities, the private sector, and the military. The visa restrictions are limited to graduate students and visiting scholars. In September 2020, enforcement of the proclamation began with the revoking of 1,000 visas (Pamuk et al., 2020). According to the State Department, the proclamation only authorizes the denial of entry into the country and does not affect Chinese nationals who are already in the US. In addition, over the summer of 2020, the FBI arrested several Chinese nationals for visa fraud, accusing them of intentionally omitting information about their personal ties to the military (Department of Justice, 2020a).

The American higher education community can take the initiative on the military-civil fusion issue in two ways:

- After conversations with the intelligence community and the State Department, ACE has concluded that the details of the screening criteria that were authorized in the presidential proclamation of May 2020 will remain secret. Nevertheless, through the sharing of anonymized data, universities should be able to make an educated guess at defining these criteria. This additional transparency may encourage students and scholars to come to the US who would otherwise be tempted to study or work in countries with less restrictive policies.
- The higher education community can lead the discussion on what constitutes inappropriate ties between Chinese universities and the Chinese military. Without this action, there is strong evidence that other voices will fill the vacuum. The recommendations of the Australian think tank, mentioned above, have already been widely circulated in policy circles in Washington. More recently, the Hoover Institution (Tiffert, 2020) published its own report on the same issue, focusing on transnational research connections between US universities and the seven Chinese universities with close historical ties to the Chinese military. If we take on this project as a community, we should not assume that our recommendations will be ignored by the Biden administration: the issues are complex and our government does not have the capacity to investigate the history of every visa applicant, suggesting that simplifying assumptions are being applied.

Finally, on the question of economic competitiveness, the higher education community can do a better job of helping legislators and policymakers understand the relationships among university research, government funding, and commercial applications, and in particular the historical fact that the connections are serendipitous and convoluted. The United States has many advantages when it comes to the commercialization of fundamental research, but these strengths have never established a straight line between fundamental research and commercialization. Those advantages include the size and structure of its venture capital funding, the breadth and size of the talent pool available to technology companies, the size of the domestic market, the dominance of US-based operating systems for computers and mobile devices, and of course the quality and quantity of university research.

Helping the Washington policy community understand how and where university research is being commercialized would be a major step toward shifting the competitiveness debate toward evidence-based arguments. Such a study could include case studies on new commercial products in both countries and the extent to which they draw on university research in China, the United States, and other countries.

CONCLUSION

I close with a couple of points. The first is that Chinese universities must be full partners in any effort to develop global norms for transnational research collaboration. A unilateral approach would likely make matters worse. Like the ZTE and Huawei cases in the private sector, a unilateral approach would strengthen arguments for reducing China's reliance on global engagement as a development strategy. The unilateral approach would be even more confrontational if it were expanded to include Japan, Germany, the United Kingdom, and the European Union.

The risk of non-action is that China will become steadily disengaged from the rest of the world at a time when its universities are climbing in the global rankings and becoming major contributors to the global pool of scientific knowledge. Just as we are discussing decoupling with China, it has more to offer than ever before.

Finally, we are probably underestimating the costs of non-action. As the senior international officer of a flagship public research university stated to me recently, it is becoming costlier to work in China in every sense of the word: financially, legally, reputationally, and politically. To say this about the most important bilateral relationship in the world should be a call to action in both countries.

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