

18-13 China's Forced Technology Transfer Problem— And What to Do About It

Lee G. Branstetter

June 2018

Lee G. Branstetter is a professor of economics and public policy at Carnegie Mellon University and a nonresident senior fellow at the Peterson Institute for International Economics.

© Peterson Institute for International Economics.
All rights reserved.

The Trump administration's trade confrontation with China is occurring on several fronts, none more crucial than the dispute over China's alleged misappropriation of foreign technology. In a report issued March 22, 2018, the United States Trade Representative (USTR 2018) cited numerous instances of forced technology transfer and failure to protect US intellectual property from infringement or theft. Following this report, the administration announced plans to impose tariffs on up to \$60 billion worth of Chinese exports to the United States and tighten the rules governing Chinese investment in the United States. China countered with tariff threats of its own, and President Trump then threatened more tariff actions against up to \$150 billion worth of Chinese exports. At the time of this writing, the Trump administration has renewed threats to impose tariffs on tens of billions of dollars' worth of Chinese goods, though negotiations continue.

A broad range of experts and market observers agree that China has repeatedly forced foreign multinational corporations (MNCs) to transfer technology to indigenous firms as a condition for market access and that China has persistently failed to protect the intellectual property of foreign firms

doing business in China.¹ At the same time, stock markets, American industry, and farm sectors dependent on exports to China have been worried in recent weeks by the prospect of a US-China trade war. The Trump administration has repeatedly threatened a strategy of broad-based "retaliation" that will arguably cause US firms and workers more economic pain than the Chinese behavior the administration's trade negotiators are seeking to change.² The indiscriminate nature of its proposed tariffs—and the rhetoric that accompanies them—cedes the moral high ground to China and undermines the international and corporate support Trump needs to solve the real problem.

Fortunately, there is a better way. Instead of indiscriminate tariffs, carefully targeted sanctions should be imposed on the Chinese entities directly involved in technology misappropriation. Two issues need to be addressed to make such a strategy possible. First, the detailed data on forced technology transfers that are necessary for targeted sanctions have been hard to find because US multinationals have been reluctant—justifiably—to voluntarily disclose their complaints. Second, there are few important technical domains in which US firms retain a monopoly on technological leadership, and China has become quite adept at pitting different Western governments and firms against one another. Any policy intervention that only involves US firms could lock them out of Chinese markets and still allow forced technology transfers to happen through firms based in other advanced industrial nations. Therefore, any successful strategy will need to be multilateral, relying on joint action by the United States and its traditional European and Asian allies and trading partners. Fortunately, the governments of

1. See Shang-Jin Wei, "How to Avoid a U.S.-China Trade War," *Project Syndicate*, March 23, 2018; David Dollar and Ryan Hass, "Trump Could Be on the Brink of Starting a Trade War with China," *Order from Chaos* blog, Brookings Institution, August 9, 2017; Campbell and Ratner 2018; "America versus China: The Battle for Digital Supremacy," *Economist*, March 17, 2018; and "Technopolitics: The Challenger," *Economist*, March 17, 2018.

2. Lovely and Liang (2018) show that the retaliatory tariffs proposed by the Trump administration will hit multinational supply chains serving US firms and companies far harder than Chinese entities potentially benefitting from technology misappropriation.

these nations are increasingly resolved to respond to China's technology misappropriation (Atkinson, Cory, and Ezell, 2017).

This Policy Brief proposes a new structure, based on a current bill with bipartisan support in Congress, that can equip policymakers with the data they need, outlines existing policy tools they can use, and points to ways to engage Western allies in taking this more targeted approach.

FORCED TECHNOLOGY TRANSFER: WAYS AND MEANS

In many respects, the USTR report released in March breaks little new ground. Earlier studies undertaken by the US International Trade Commission (USITC 2011) and the bipartisan Commission on the Theft of American Intellectual Property (2013, 2017) had already noted the ways in which

China has adopted policies deliberately designed to force foreign multinationals to transfer strategically sensitive technologies to indigenous Chinese firms.

Chinese firms misappropriate foreign technology and had even made efforts to quantify the losses these practices impose on US owners of intellectual property (IP). These earlier studies indicated that annual losses could be measured in tens of billions—perhaps even hundreds of billions—of dollars. The wide-ranging estimates mostly reflect the value of American intellectual property believed to be stolen or infringed by Chinese entities, and an impressive body of evidence points to China's significant weaknesses in enforcing intellectual property rights (IPR).³

However, inadequate IPR enforcement is only part of the problem. China has also adopted a set of policies deliber-

3. For evidence on the weaknesses of China's IPR enforcement system, see McGregor (2010); Kennedy (2017); Branstetter, Conti, and Zhang (2018); and Rassenfosse and Raiteri (2016), among many other sources. Nicholas R. Lardy notes that Chinese payments for the use of foreign intellectual property have risen significantly since the early 2000s, and China now ranks fourth globally in terms of the dollar value of these aggregate payments. This is true, but it reflects, in part, China's emergence as the world's largest manufacturer and exporter of goods and the fact that China exports these goods to advanced industrial nations with strong patent systems and trade laws that allow for the impounding of patent-infringing goods at the border. These aggregate statistics do not disprove the existence of forced technology transfer or widespread IPR infringement within China itself. (Nicholas R. Lardy, "China: Forced Technology Transfer and Theft?" *China Economic Watch* blog, Peterson Institute for International Economics, April 20, 2018.)

ately designed to *force* foreign multinationals to transfer strategically sensitive technologies to indigenous Chinese firms. These policies are a key component of China's longstanding ambition to replace Western firms currently at the forefront of key technologies with Chinese national champions. In many cases, technology transfers are effectively required by China's foreign direct investment (FDI) regime, which closes off important sectors of the economy to foreign firms unless they enter into joint ventures with Chinese entities they do not control.⁴

Examples of forced technology transfer abound in industries ranging from autos to information technology (IT). In the auto industry, foreign ownership restrictions (and high tariffs) force foreign firms to serve the booming Chinese auto market—now the world's largest—through joint ventures in which they are prevented from holding a controlling interest. China's well-publicized drive to become a leader in electric vehicles has resulted in complaints by European auto firms that they are being pressured to turn over sensitive technology, including proprietary software code, to joint venture partners who may later compete with them in China and elsewhere.⁵ China's Internet censorship regime—known as the Great Firewall—effectively prevents US digital services companies from operating freely in the Chinese market, and the telecommunications services industry is generally closed to wholly foreign-owned enterprises.⁶ As the world of computing migrates to cloud-based services, the global IT industry is increasingly forced to access Chinese customers through a gauntlet of joint venture partners that may someday pose a competitive threat.⁷ Even in officially open sectors, foreign firms must obtain approval from relevant regulators in a process that lacks transparency and is subject to political influence—foreign firms can often be quietly pressured to transfer technology to local firms in order to obtain these necessary approvals.⁸

4. See Lardy (2014) and Gary Clyde Hufbauer and Zhiyao (Lucy) Lu, "Section 301: U.S. Investigates Allegations of Forced Technology Transfers to China," *East Asia Forum*, October 3, 2017.

5. Charles Clover, "Foreign Carmakers on Edge Despite China Tech Transfer Assurances," *Financial Times*, March 30, 2017.

6. These investment restrictions in telecommunications were negotiated as part of China's accession to the WTO; they can be downloaded from the WTO website at https://www.wto.org/english/thewto_e/acc_e/completeacc_e.htm.

7. David Dollar and Ryan Hass, "Trump Could Be on the Brink of Starting a Trade War with China," *Order from Chaos* blog, Brookings Institution, August 9, 2017.

8. Gary Clyde Hufbauer and Zhiyao (Lucy) Lu, "Section 301: U.S. Investigates Allegations of Forced Technology Transfers to China," *East Asia Forum*, October 3, 2017.

State-owned enterprises (SOEs), prominent players in key sectors of the Chinese economy, often function as another mechanism through which foreign firms are forced to transfer technology in order to gain market access. A well-known example occurred in the early 2000s, when China was building out its energy grid to meet booming demand, and General Electric (GE) sought to enter this important market. GE soon encountered the reality that power generation in China is dominated by SOEs, a position perpetuated by the regulatory structure of the industry. The top executives of these firms are effectively appointed by the Chinese Communist Party, as are all top executives of major Chinese SOEs, and their appointment is driven, in part, by the extent to which their management of their firms contributes to the Party's objectives. If the Party wants to create an indigenous Chinese manufacturing industry capable of producing high-tech products for energy plants, like advanced turbines, that can compete with GE and Siemens, then the head of a Chinese power company—sensitive to this objective—can insist that any supplier of turbines transfer valuable technology to indigenous Chinese suppliers, even if this condition raises prices for his own firm, reduces product availability and reliability, and limits the options for his customers. As the Chinese market is too big to ignore, GE and its multinational competitors all realize that the short-term costs of refusing to play by Chinese rules are quite high—since, if one firm refuses to play, another is likely to acquiesce.⁹

According to China's critics, this dynamic is playing out in industry after industry, enabling SOEs to function as gatekeepers, determining which products and services will be incorporated into China's energy, communications, transportation, and healthcare systems.¹⁰ China's enormous size gives these SOEs real power, which is being exercised in service to Chinese government plans to replace the world's leading companies with Chinese companies. In recent years, diverse industries manufacturing products ranging from wind turbines to medical devices have voiced their concerns

about forced technology transfer (European Chamber of Commerce in China 2017).

THE GLOBAL WELFARE IMPLICATIONS OF FORCED TECHNOLOGY TRANSFER

It has long been recognized that efficient international business practices *require* technology transfer across national and firm boundaries (Vernon 1966). If US multinationals were *voluntarily* transferring technology to Chinese entities over which they have no control, then any proposal to regulate or limit that transfer would deserve skepticism. As the previous section makes clear, however, some technology transfers

To the extent that China's forced technology transfer practices deter multinationals from investing or operating there, they can harm both China and the broader global economy.

taking place in China today are only “voluntary” in the sense that business with the fictional gangster of the *Godfather* movie series, Vito Corleone, was voluntary. China is effectively making offers multinationals cannot refuse.

Whether or not firms “voluntarily” trade with parties that possess monopoly power on the supplier side or monopsony power on the demand side does not obviate the reality of economic harm. The forced technology transfer problem can be viewed as the outcome of a *de facto* cartel, organized by the Chinese party-state, in which Chinese purchasers collude to expropriate key technologies from a foreign supplier or group of suppliers. If a Chinese firm “licenses” an extremely valuable technology at a price that is a small fraction of its commercial value, and is able to do so by exercising monopsony power, its actions are conceptually quite close to intellectual property theft.

To the extent that China's forced technology transfer practices (or the expectation of intellectual property theft) deter multinationals from investing or operating there, they can harm both China and the broader global economy. A series of formal models (Lai 1998, Branstetter and Saggi 2011, Gustafsson and Segerstrom 2011) shows how fear of losing control of key technologies could prevent multinational corporations (MNCs) from shifting production to lower cost countries. This outcome prevents low-cost countries from fully realizing their comparative advantage in manufacturing established products; it also prevents advanced countries from fully realizing their comparative advantage in devel-

9. Kathryn Kranhold, “China’s Price for Market Entry: Give Us Your Technology, Too,” *Wall Street Journal*, February 26, 2004.

10. See Massie (2011); Robert D. Atkinson, testimony before the House Committee on Foreign Affairs, Subcommittee on Asia and the Pacific, hearing on “China’s Technological Rise, Challenges to U.S. Innovation and Security,” April 26, 2017; Kathryn Kranhold, “China’s Price for Market Entry: Give Us Your Technology, Too,” *Wall Street Journal*, February 26, 2004; Branstetter and Lardy (2008); “America versus China: The Battle for Digital Supremacy,” *Economist*, March 17, 2018; and “Technopolitics: The Challenger,” *Economist*, March 17, 2018.

oping new goods. As a consequence, production costs are higher, efficiency is lower, and the rate of innovation in the global economy is slower than it would be in an equilibrium in which multinationals are able to retain control over their technology.¹¹

When forced technology transfers enable Chinese firms to displace the Western enterprises that created the technology in the first place, the global economy can be harmed in a different way. The forced technology transfers described here amount to a subsidy of a less innovative domestic firm and a *de facto* tax on the foreign enterprise. If Chinese government intervention succeeds in tilting the playing field in favor of less innovative (but heavily subsidized) Chinese firms, and thereby limits the resources flowing to the world's most innovative firms, then, in the long run, the rate of innovation can slow, and consumers around the world could suffer.¹²

Finally, China's misappropriation of foreign technology violates World Trade Organization (WTO) principles and China's obligations under its accession agreement to the WTO. The Trade-Related Investment Measures (TRIMs) Agreement, which is part of the WTO charter, forbids a signatory state from requiring technology transfers in return for market access. China also agreed in its WTO accession protocol that the procurement of its state-owned enterprises should be undertaken according to commercial concerns, not state industrial policy goals. As a signatory of the Trade-Related Aspects of Intellectual Property Rights (TRIPS) Agreement, China committed to protecting the intellectual property—patents, trademarks, copyrights, and trade secrets—of foreign firms operating in its territory, providing them the same degree of protection it provides to its own firms, *and* providing all inventors with a degree of protection that meets the WTO's high minimum standard.

Unfortunately, past efforts to resolve these issues through bilateral negotiations have failed to address the underlying problems, and the realities of the WTO dispute resolution process make it extremely difficult to sanction China's behavior through WTO litigation. China's requirements for technology transfer are not stipulated in law and are imposed instead through extralegal means; hence, few foreign firms are willing to make their complaints public. China's patent statutes are in *de jure* compliance with WTO standards,

although the *de facto* level of protection falls far short of what the law appears to promise. It has proven difficult for the United States to seek WTO remedies against TRIPs violations that are shortcomings of enforcement rather than statutory deficiencies. Nevertheless, rules that are routinely violated without sanction quickly cease to be rules. For all of these reasons, inaction is not an appropriate response to China's current behavior.

WHAT CAN THE UNITED STATES DO TO CHANGE CHINA'S BEHAVIOR?

Efforts to change China's behavior should be limited, well targeted, and multilateral. Any sanctions designed to limit forced technology transfer should be applied solely to firms and individuals who are responsible for pressuring foreign multinationals and who benefit from the transfer. This would raise the costs and limit the benefits of the behavior the West is seeking to constrain in a targeted fashion, without inviting the sort of broad-based trade retaliation that could generate far more harm than good.

Unfortunately, multinationals are often extremely reluctant to publicly disclose the details that could enable such targeted sanctions, out of fear of retribution from China. This silence has served China's interests for decades and severely constrained the ability of Western governments to undertake the kinds of targeted sanctions this Brief endorses. To overcome that problem, the Trump administration must create a monitoring mechanism that enables—and requires—multinationals to disclose when they are being subject to forced technology transfers. Fortunately, a bill currently advancing through Congress with bipartisan support may provide the foundation for building this kind of monitoring mechanism.

CFIUS as an Instrument to Limit Forced Technology Transfers to China

In 2017, Senator John Cornyn (R-TX) and Congressman Robert Pittenger (R-NC) introduced legislation designed to give the Committee on Foreign Investment in the United States (CFIUS) the power to limit or block outbound foreign direct investment and technology transactions.¹³ This proposal, originally known as the Foreign Investment Risk Review Modernization Act (FIRRMA) of 2017, or H.R. 4311, was inspired, in part, by the concerns outlined earlier.

11. See Branstetter, Fisman, Foley, and Saggi (2011).

12. One of the most influential trade and growth papers of the early 1990s, coauthored by leading economic theorists Gene Grossman and Elhanan Helpman (1990), showed how this scenario could come to pass. Chinese innovative capability is growing (Wei, Xie, and Zhang 2017) but arguably still lags behind that of the industrial West (Kennedy 2017; Branstetter, Li, and Veloso 2015).

13. CFIUS is a cabinet level interagency committee charged with reviewing foreign merger and acquisition bids to acquire US companies, with the goal of determining whether any such acquisitions threaten national security. For an extensive review of CFIUS, its history, and administrative processes, see Jackson (2018). See also Moran (2009) and Moran and Oldenski (2013) for a critical review of CFIUS actions, especially with respect to China.

The original Cornyn-Pittenger proposal significantly broadened the range of transactions CFIUS could scrutinize and, through the president, block. CFIUS would be directed and authorized to examine nearly every inbound and outbound investment and technology transaction with “countries of special concern,” which are not named or defined in the draft legislation, that might allow important technologies to diffuse to these adversarial nations and undermine national security.

The proposal also left the executive branch with broad discretion to define both countries of concern and critical technologies. That discretion could lead to significant economic harm if wielded by an injudicious chief executive. For instance, a president who sought to punish companies that shifted production abroad could, in principle, invoke the new powers of CFIUS under the original proposal to prevent such shifts indefinitely.

At the time of this writing, the original proposal is being substantially amended in ways that could address some of these concerns, but it is not yet clear what will emerge from the legislative process.¹⁴ Instead of attempting to forecast the outcome of ongoing congressional debates, this Brief proposes a number of changes to the original architecture that could make it an effective instrument in combatting forced technology transfer.

Improving the Cornyn-Pittenger Proposal

First, CFIUS should **not** be given authority to review or block the outbound FDI of US multinationals, even when they involve countries of concern. The decision by a multinational to shift production or operations abroad through greenfield investment or acquisition may raise the risks of an accidental transfer or industrial espionage, but firms are in a better position than the government to judge these risks and balance them against potential returns.¹⁵

Instead, any potential expansion of CFIUS review of outbound transactions should focus solely on technology licensing or transfer of critical technologies to unaffiliated indigenous parties that can reasonably be viewed as operating under the influence of the governments of countries of special

concern.¹⁶ By exempting outbound FDI and technology transfers within MNCs from additional CFIUS scrutiny, the revised proposal would encourage China to allow US multinationals to retain formal ownership and control of their technology, while effectively penalizing China for forcing transfer to unaffiliated entities. Limiting the expanded jurisdiction of CFIUS in this manner would keep CFIUS close to its current structure and scale, retaining the current interagency balance within CFIUS that ensures security *and* economic concerns

CFIUS should *not* be given authority to review or block the outbound FDI of US multinationals, even when they involve countries of concern.

both receive appropriate weight. The proposed limitation has the added benefit of conforming closely to a review process China recently imposed on its own firms when transferring technology abroad; the US government would thus not be doing anything China is not already doing.¹⁷

On the other hand, by subjecting potentially forced technology transfer to the scrutiny of a government investigative process with subpoena power, multinationals that might otherwise be pressured into silence can now tell their Chinese interlocutors that they have no choice but to disclose their true circumstances, since silence or partial disclosures could be met with a subpoena. This could substantially alter the dynamic that has prevented the US government from obtaining the detailed data it needs for effective countermeasures.¹⁸ The expectation that exerting extralegal pressure on a

16. Broad-based, global licensing agreements into which Chinese parties enter on the same basis as other users of the technology around the world would be exempt from this additional scrutiny. On the other hand, technology transfer agreements in which US firms are transferring technology to indigenous Chinese entities under terms that are very different from what is observed in other markets would be of special interest to this proposed review process.

17. Lester Ross and Jennifer Zhao, “China Tightens Scrutiny Over the Transfer of Intellectual Property Rights to Foreign Parties,” WilmerHale blog post, April 5, 2018.

18. Multinationals rarely welcome the government’s use of subpoena power, but it would be impossible for the antitrust agencies or the Securities and Exchange Commission (SEC) to enforce US law without the information they can obtain through judicious exercise of this authority. The principal reason forced technology transfer persists is that the US government has never been able to obtain the detailed data necessary to combat it. If the US government remains unwilling to exercise subpoena power in this domain, then it will be forced to choose between acquiescence and a punishingly expensive trade war.

14. In its review of the proposal, the Senate Banking Committee eliminated the review of outward FDI and joint venture deals from the draft legislation.

15. At the time of this writing, Washington-based sources suggest that President Trump may soon issue an executive order asserting broad authority to limit outbound FDI at his discretion. Congressional passage of a substantial revision of the Cornyn-Pittenger proposal, along the lines described in this Policy Brief, could serve the useful function of preempting such an executive order.

US firm to transfer technology might be disclosed to the US government could, in turn, have a disciplining effect on the use of this practice.

Second, the current bill gives the US president dangerously broad discretion in identifying critical technologies capable of harming national security. Instead, a revised CFIUS statute should stipulate a process that engages the expertise of the National Academies of Sciences, Engineering, and Medicine and other federal science agencies in creating a narrow definition of critical technologies that could prudently restrain the scope of CFIUS reviews.¹⁹ The national security agencies involved in the CFIUS process are likely to use their influence (and technological expertise) to push for a relatively broad definition of critical technologies, encompassing dual

Any new CFIUS statute needs to spell out an interagency evaluation process and criteria by which nations are designated as countries of special concern.

use technologies with civilian and military applications. These political realities cut both ways. From the standpoint of a free trader seeking to limit the scope of government interference in mutually beneficial transactions, the definition of critical technologies likely to emerge from the interagency process may be too broad. From the standpoint of a critic of China's current policy, worried that a review process predicated on threats to national security might miss Chinese efforts to misappropriate strategically important civilian technologies, the breadth of the definition on which the Pentagon and the intelligence agencies will likely insist may be about right.

Third, any new CFIUS statute needs to spell out an interagency evaluation process and criteria by which nations are designated as countries of special concern. At the moment, the president appears to have wide discretion in deciding which nations fit into this category. The contradictory message sent by a chief executive proposing to block steel imports from defense treaty allies on the grounds that such imports threaten national security drives home the need for strong limits on future executive discretion.

19. Gary Clyde Hufbauer, "Revamping CFIUS—and Going Too Far," *Trade and Investment Watch* blog, Peterson Institute for International Economics, December 1, 2017; and Gary Clyde Hufbauer, "CFIUS Reform: Examining the Essential Elements," testimony before the Senate Committee on Banking, Housing, and Urban Affairs, January 18, 2018, available at <https://piie.com/commentary/testimonies/cfius-reform-examining-essential-elements> (accessed on June 7, 2018).

Instead, any new CFIUS statute should mandate an extensive review involving intelligence agencies, the Department of Defense, and economic agencies, which documents that a country's IP regime, investment regime, SOE purchases, and other institutional factors are insufficiently protective of US firms' IP and trade secrets. The interagency review should be conducted exclusively by individuals possessing a permanent (not provisional) high-level security clearance, and the reviewing agencies should have subpoena power. The review must document a significant number of forced technology transfers (or instances of IP theft) where the economic value of appropriated technology is meaningfully large. This review process should also be conducted in concert with key defense treaty allies and free trade agreement partners, and some degree of international concurrence should be required by statute before a country can be designated as one of special concern.²⁰ Lastly, when designated countries have measurably improved their practices, they should be deleted from the list of countries of concern, and the statute should allow countries to petition for reclassification after some period of time has elapsed since their designation.

While CFIUS would, in principle, limit its legal authority to block technology transfer to cases that posed some threat to national security, the investigation into whether a country is of special concern would admit as evidence forced technology transfers that do not threaten national security. Such transfers would still constitute evidence of systematic under-protection of foreign technology and pervasive efforts to shift technology to indigenous parties.

In addition to placing bounds on the dangerously wide executive discretion that exists in the original Cornyn-Pittenger bill, this comprehensive review process and clear criteria would create a strong incentive for China to change its system. If China relied on *market-driven* technology transfers to private firms, upheld by strong IP laws, then it could avoid or end designation as a country of special concern, and that would enhance its access to technology. China could still be subject to limitations imposed by export control laws, but better behavior would allow it to escape this extra CFIUS review. However, any reversion to a pattern of forced technology transfer or biased application of IP law could reopen CFIUS scrutiny.

Fourth, in its review of a prospective transfer of a critical technology to an indigenous entity in a country of concern, the statute should require that CFIUS consider whether the

20. It seems reasonable that a well-constructed review process would designate only one or two countries as countries of concern. Other than China, and possibly Russia, it seems unlikely that any other nation is undertaking these actions of forced technology transfer on a scale that poses any meaningful threat to US national security or to the global regime of trade and investment in technology.

foreign entity can obtain the technology through third countries.²¹ If it can, then a CFIUS-ordered restriction cannot be imposed unless and until the third parties are also willing to limit transfer. This will limit the degree to which the new authority would place US multinationals under a competitive disadvantage relative to multinationals in Europe, Japan, South Korea, or Israel that operate outside of US jurisdiction.

Fifth, US firms subject to CFIUS-ordered restrictions on outbound technology transfer should have the right to appeal the decision and, if dissatisfied, to challenge the government ruling in a legal proceeding.²² Grounds for appeal might include the following arguments: The technology in question is not truly military nor dual use in nature, the technology can be obtained through other sources not blocked by CFIUS, or the country of concern no longer meets the criteria for such designation. Commercial loss or inconvenience, *per se*, would not be a basis for appeal. This right of appeal would only apply to CFIUS-ordered restrictions on outbound technology transfer, not to restrictions on inward investment, which would continue to operate under current rules. Giving firms the right of appeal will impose useful discipline on the internal interagency deliberative process, and it will help limit the overuse of CFIUS in cases where a national security threat is limited or indirect. If a CFIUS ruling were overturned on appeal or by a court, but there were strong reasons to expect a meaningful threat to national security, then the government could invoke other legal grounds for preventing the transfer. Technology transfers that truly threaten national security could also be denied on the legal basis provided by export control laws, and the statute should allow evidence gathered in the CFIUS review process (including classified evidence gathered through intelligence) to be used in prosecution under export control laws.

Other Policy Tools

The Use of Complementary Targeted Sanctions Under IEEPA (1977). Any time CFIUS blocks a transaction, whether inbound or outbound, it prevents financial flows that could benefit US-based firms and individuals. Ideally,

one would prefer policy countermeasures designed to punish Chinese behavior to have substantially more negative impact on the Chinese parties than on US firms and individuals. The International Emergency Economic Powers Act of 1977, or IEEPA, provides sweeping legal authority for the US president to order sanctions of firms, individuals, and countries. The IEEPA was the legal basis for the US sanctions recently imposed on the China-based telecommunications company ZTE, which quickly brought this major multinational to its knees.

If the CFIUS-led interagency review proposed above designates China as a country of concern, then that designation could also serve as the basis for an executive order, as called for under the IEEPA, that would allow the broad powers of that statute to be utilized to deal with the economic threat posed by forced technology transfer. Once codified in the federal register, this executive order could authorize targeted sanctions on Chinese entities that benefit from forced technology transfer, the top executives of those Chinese entities, and the government officials involved in brokering the transfer. The comprehensive analysis proposed as a prerequisite for designating China as a country of concern would produce sufficiently detailed evidence of forced transfers to identify these beneficiary firms and other parties involved. The judicious use of subpoena power and the full involvement of US intelligence agencies in the review process would further ensure that outcome.

Targeted sanctions could involve travel bans in the Western world for key Chinese individuals and their families, foreign asset freezes, and financial and trade penalties on the firms and products benefitting from forced technology transfer. America's allies possess similar statutes (which provided the basis for their cooperation during the sanctions regime against Iran) and could participate in enforcing multilateral sanctions against entities that forced the transfer of US technology, and the United States could reciprocate and enforce sanctions on Chinese entities that benefit from the forced transfer of European, Japanese, South Korean, and Israeli technology.

As the ongoing CFIUS review process described above identifies new cases of forced technology transfer or intellectual property theft, targeted sanctions of this type, using IEEPA authority, could also be employed (or threatened) as a complement to or a substitute for the restrictions imposed by CFIUS. Like the sanctions that could be imposed under CFIUS, these would not come without economic costs to the United States and its Western allies. However, the focus of these sanctions on specific Chinese entities currently pressuring Western firms to transfer technology or specific Chinese entities already benefitting from such transfers

21. Gary Clyde Hufbauer, "Revamping CFIUS—and Going Too Far," *Trade and Investment Watch* blog, Peterson Institute for International Economics, December 1, 2017.

22. This would constitute a significant change in CFIUS structure, and the details of its full implementation might require a separate Policy Brief. One potential approach would be to designate the Federal Circuit Court of Appeals as the single appellate body, provide an expedited procedure for review, and place the burden on the complainant firm to show that the government decision was wrong.

would ensure that maximum pressure would be brought on the offending parties, with limited collateral damage to unrelated sectors. The targeted nature of the sanctions on China would invite similarly limited countersanctions (if any), from the Chinese, further minimizing the fallout from this dispute. One hopes that the existence of a well-targeted, credible sanction could significantly deter forced technology transfer, such that the sanctions rarely occur in the first place. As this Brief has argued, technology transfer motivated by mutual benefit rather than coercion would be in the best interests of China and its trading partners.

Export Controls. The limited CFIUS reform supported here will not necessarily be sufficient to prevent all transfers of sensitive technology to adversarial nations. To limit that risk, the United States and its allies should also rely on existing export control laws, which already apply to technology transfers and outbound FDI as well as actual exports of sensitive goods.²³ When the risks of leakage of technology to a potential adversary are present but unclear, existing statutes and executive orders grant the Bureau of Industry and Security (BIS) of the Department of Commerce broad authority to investigate activities involving dual use technology. BIS agents can subpoena documents, compel testimony, and suspend or postpone transactions that may carry with them a national security risk. If concerns intensify, then the federal government could expand the resources and staff made available to BIS to enforce existing laws.

Section 337 Cases. The governments of the United States, Japan, South Korea, Israel, and Europe are right to pressure China to substantially upgrade its flawed legal regime for enforcing intellectual property rights—and such reform would be in the long-run best interest of China itself. However, it will almost certainly take years of determined effort by Chinese policymakers to bring China's patent system into line with international best practices. Any American policy that imposes high tariffs in the absence of instant patent reform in China will simply drive the world's two largest economies into a trade war.

In the meantime, one legal tool that American firms can put to immediate use is Section 337 of the 1930 Tariff Act, which allows firms to call upon the US International Trade Commission to conduct an expedited investigation of the import of IP-infringing products into the US market. These investigations tend to be much faster—and often far less costly—than civil litigation in IP courts. At

the same time, many of the legal tools available in patent infringement cases, such as discovery, are available, and can be applied even if the exporting firm is located outside the United States.²⁴ Under existing law, an administrative law judge has the authority to order US customs to impound IP-infringing imports at the border. While this judgment can be overturned by civil courts, such appeals can take months to years. Section 337 cases therefore offer a useful tool for US firms facing competition with IP-infringing goods in their home market.

Most of America's top trading partners have similar provisions in their laws, so US multinational firms with significant business operations overseas can often protect their sales in overseas markets by using similar tools. A sizable increase in the International Trade Commission's budget targeted to Section 337 cases could expand the agency's administrative capacity to undertake these investigations and accelerate their speed.

Unilateral Efforts to Strengthen US Technological Leadership in Key Domains. The US government could and should undertake a number of steps to reinforce its leadership in high technology sectors. American universities remain global leaders in the basic science underlying key domains like artificial intelligence (AI). Unfortunately, the Trump administration has pushed for deep cuts in government science budgets rather than increases—an unnecessary and self-imposed setback for a president bent on maintaining American greatness.

The other critical ingredient for sustained technological leadership is access to talent. There is a worldwide shortage of individuals trained in AI and related disciplines. Foreign-born students at US universities constitute a large fraction of students pursuing advanced degrees in the sciences and engineering. If President Trump is serious about maintaining US technological leadership, then he should abandon anti-immigrant positions and instead embrace high-skilled immigration. Arora, Branstetter, and Drev (2013) show that US openness to immigration played a critical role in enabling Silicon Valley to respond to a software-biased shift in technological opportunity in IT—an opportunity Japan's far more restrictive immigration regime effectively closed off to its IT firms. The current administration would do well to heed this lesson.

23. California Congressman Ed Royce has introduced a bill that would strengthen export controls and give them a firmer legal basis. Representative Royce's proposal, H.R. 5040, has a number of attractive features, but a full appraisal of that bill is beyond the scope of this Policy Brief.

24. The absence of a discovery procedure in Chinese civil litigation makes the prosecution of patent infringement much more challenging in that legal context.

CONCLUSIONS

At the core of the Trump administration's dispute with China lies a real problem—China's persistent misappropriation of foreign technology. This longstanding pattern of activity violates China's WTO commitments, distorts international trade and investment, and undermines China's own long-run ability to contribute to the advancement of the global technological frontier. The problem is serious enough that it merits action. Unfortunately, the policies put forward by the Trump administration are unlikely to change China's behavior. By unilaterally threatening high tariffs on a wide range of products, the administration is already undermining the support of multinational corporations and US trading partners that the more comprehensive approach outlined here would require. These parties are now concluding—rationally—that the threatened tariffs

would be a cure worse than the disease they are meant to remedy.

This Policy Brief outlines a better approach—one that is multilateral in its operation, limited in scope, and targeted at exactly the behavior the United States and its allies seek to change. This approach will produce the kind of detailed data whose absence has prevented effective countermeasures in the past. While the use of the new policy tools—and the more aggressive use of existing ones—proposed here will not be without economic costs, such costs will be limited by design. These tools stand a reasonable chance of changing the strategic calculus of Chinese entities, thereby limiting the misappropriation of foreign technology going forward. The administration's current path will almost certainly result in failure—but there is still time for President Trump and his advisors to choose a more effective approach.

REFERENCES

- Atkinson, Robert, Nigel Cory, and Stephen Ezell. 2017. *Stopping China's Mercantilism: A Doctrine of Constructive, Alliance-Backed Confrontation*. Information Technology and Innovation Foundation Report (March). Washington: Information Technology and Innovation Foundation.
- Branstetter, Lee, Raffaele Conti, and Huiyan Zhang. 2018. *Welcome to the Jungle: An Expedition into China's Patent Thicket*. CMU Working Paper. Pittsburgh, PA: Carnegie Mellon University.
- Branstetter, Lee, Ray Fisman, Fritz Foley, and Kamal Saggi. 2011. Does Intellectual Property Rights Reform Spur Industrial Development? *Journal of International Economics* 83, no. 1: 27–36.
- Branstetter, Lee, and Nicholas R. Lardy. 2008. China's Embrace of Globalization. In *China's Great Economic Transformation*, ed. Loren Brandt and Thomas G. Rawski. Cambridge: Cambridge University Press.
- Branstetter, Lee, Guangwei Li, and Francisco Veloso. 2015. The Rise of International Co-Invention. In *The Changing Frontier: Rethinking Science and Innovation Policy*, ed. A. Jaffe and B. Jones. National Bureau of Economic Research and University of Chicago Press.
- Branstetter, Lee, and Kamal Saggi. 2011. Intellectual Property Rights, Foreign Direct Investment, and Industrial Development. *Economic Journal* 121, no. 555: 1161–1191.
- Campbell, Kurt, and Ely Ratner. 2018. The China Reckoning: How Beijing Defied American Expectations. *Foreign Affairs* 97, no. 2: 60–70.
- Commission on the Theft of American Intellectual Property. 2013. *The IP Commission Report*. May. Washington: National Bureau of Asian Research.
- Commission on the Theft of American Intellectual Property. 2017. *Update to the Commission Report: Reassessments of the Challenge and United States Policy*. February. Washington: National Bureau of Asian Research.
- European Chamber of Commerce in China. 2017. *China Manufacturing 2025: Putting Industrial Policy Ahead of Market Forces*. Beijing.
- Grossman, Gene, and Elhanan Helpman. 1990. Comparative Advantage and Long-Run Growth. *American Economic Review* 80: 796–815.
- Gustafsson, Peter, and Paul Segerstrom. 2011. North-South Trade with Multinational Firms and Increasing Product Variety. *International Economic Review* 52, no. 4: 1123–1155.
- Jackson, James. 2018. *The Committee on Foreign Investment in the United States (CFIUS)*. Congressional Research Service Report RL33388. March. Washington: Congressional Research Service.
- Kennedy, Scott. 2017. *The Fat Tech Dragon: Benchmarking China's Innovation Drive*. CSIS China Innovation Policy Series. Washington: Center for Strategic and International Studies.
- Lai, Edwin. 1998. International Intellectual Property Rights Protection and the Rate of Product Innovation. *Journal of Development Economics* 55, no. 1 (February): 133–53.
- Lardy, Nicholas R. 2014. *Markets over Mao: The Rise of Private Business in China*. Washington: Peterson Institute for International Economics.
- Lovely, Mary E., and Yang Liang. 2018. *Trump Tariffs Primarily Hit Multinational Supply Chains, Harm US Technology Competitiveness*. PIIE Policy Brief 18-12. Washington: Peterson Institute for International Economics.
- Massie, Joe. 2011. *Digestion and Re-Innovation: A Lesson Learned from China's High-Speed Rail Technology Transfer Agreements*. American University Intellectual Property Brief (August 7). Washington: American University.
- McGregor, James. 2010. *China's Drive for 'Indigenous Innovation': A Web of Industrial Policies*. Report of APCO Worldwide undertaken for the US Chamber of Commerce. Washington: APCO Worldwide.
- Moran, Theodore. H. 2009. *Three Threats: An Analytical Framework for the CFIUS Process*. Policy Analyses in International Economics 89. Washington: Peterson Institute for International Economics.
- Moran, Theodore H., and Lindsay Oldenkski. 2013. *Foreign Direct Investment in the United States: Benefits, Suspicions, and Risks with Special Attention to FDI from China*. Policy Analyses in International Economics 100. Washington: Peterson Institute for International Economics.

- Rassenfosse, Gaetan, and Emilio Raiteri. 2016. Technology Protectionism and the Patent System: Strategic Technologies in China. Paper.
- Shapiro, Carl. 2001. Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard Setting. In *Innovation Policy and the Economy, Volume 1*, ed. Adam Jaffe, Joshua Lerner, and Scott Stern. Cambridge, MA: MIT Press.
- USTR (United States Trade Representative). 2018. *Findings of the Investigation into China's Acts, Policies, and Practices Related to Technology Transfer, Intellectual Property, and Innovation, under Section 301 of the Trade Act of 1974*. Executive Office of the President of the United States. Washington.
- Wei, Shang-Jin, Zhuan Xie, and Xiaobo Zhang. 2017. From 'Made in China' to 'Innovated in China': Necessity, Prospect, and Challenges. *Journal of Economic Perspectives* 31 no. 1: 49-70.
- USITC (United States International Trade Commission). 2011. *China: Effects of Intellectual Property Infringement and Indigenous Innovation Policies on the U.S. Economy*. Investigation No. 332-519, USITC Publication No. 4226, May 2011. Washington.
- Vernon, Raymond. 1966. International Investment and International Trade in the Product Cycle. *Quarterly Journal of Economics* 80: 190-207.

© Peterson Institute for International Economics. All rights reserved.

This publication has been subjected to a prepublication peer review intended to ensure analytical quality.

The views expressed are those of the author. This publication is part of the overall program of the Peterson Institute for International Economics, as endorsed by its Board of Directors, but it does not necessarily reflect the views of individual members of the Board or of the Institute's staff or management.

The Peterson Institute for International Economics is a private nonpartisan, nonprofit institution for rigorous, intellectually open, and indepth study and discussion of international economic policy. Its purpose is to identify and analyze important issues to make globalization beneficial and sustainable for the people of the United States and the world, and then to develop and communicate practical new approaches for dealing with them. Its work is funded by a highly diverse group of philanthropic foundations, private corporations, and interested individuals, as well as income on its capital fund. About 35 percent of the Institute's resources in its latest fiscal year were provided by contributors from outside the United States.

A list of all financial supporters is posted at <https://piie.com/sites/default/files/supporters.pdf>.