



March 28, 2018

## China's Technonationalism Toolbox: A Primer

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The Chinese government has pursued comprehensive, long-term industrial strategies to build internationally competitive domestic firms and replace foreign technology and products with those designed and made by Chinese companies first at home, and then abroad.<sup>1</sup> This state-led approach is enshrined in the “Made in China 2025” strategy—the government’s industrial blueprint designed to transform China into a technological powerhouse.\* The Chinese government’s toolbox includes localization targets, massive state funding for industry development, government procurement and research and development (R&D), China-specific standards, foreign investment restrictions, recruitment of foreign talent, state-directed acquisition of foreign technology and intellectual property, and, in some cases, industrial espionage (see Table 1).<sup>2</sup>

In a broad range of industries—from aerospace to semiconductors—Chinese government policies require U.S. and other foreign firms to transfer technology, move manufacturing and assembly facilities to China, and collaborate with their future competitors (often as minority joint-venture partners) as the price of market entry, impacting U.S. firms’ profitability, operations, and future competitiveness.<sup>3</sup> More recently, China has been leveraging the openness of the United States and other market-based economies to gain access to advanced research and data, recruit a globally talented workforce, acquire and invest in leading-edge firms through Chinese state financing, and freely sell their products and services abroad.<sup>4</sup> The scale and volume of government resources directed toward these sectors severely limits the ability of foreign firms to compete fairly in China’s market, and creates distorted global and domestic market conditions.<sup>5</sup>

**Table 1: China’s Industrial Policy Toolbox**

Policy Tool	Description
<b>Localization Targets</b>	Within its industrial plans, the Chinese government sets targets for domestic and international market share that should be held by local technology and production, such as increasing Chinese companies’ share of the domestic industrial robot market to 70 percent by 2025.
<b>State Funding for Industry Development</b>	The central government provides national investment funds, subsidies, tax breaks, preferential loans, export subsidies and guarantees, and other forms of financial support to develop national champions in strategic sectors. For example, in the solar sector, China’s Ministry of Finance subsidized 50 to 60 percent of production costs of select solar companies, and 50 to 70 percent of installation costs for solar generation and distribution systems. Local governments, which account for the largest share of financial aid, provide additional support to local champions. At least 21 cities and five provinces have pledged a combined \$6 billion in subsidies for robotics. These subsidies account for an estimated 10 percent of total operation revenue for Chinese robotics firms Siasun and Estun. Local governments are also subsidizing between 15 and 30 percent of the purchase price of robotics to encourage greater usage. Designated national

\* The Made in China 2025 targets ten key sectors: (1) energy saving and new energy vehicles, (2) next-generation IT, (3) biotechnology, (4) new materials, (5) aerospace, (6) ocean engineering and high-tech ships, (7) railway, (8) robotics, (9) power equipment, and (10) agricultural machinery. For more information, see Katherine Koleski, “The 13th Five-Year Plan,” *U.S.-China Economic and Security Review Commission*, February 14, 2017. [https://www.uscc.gov/sites/default/files/Research/The%2013th%20Five-Year%20Plan\\_Final\\_2.14.17\\_Updated%20%28002%29.pdf](https://www.uscc.gov/sites/default/files/Research/The%2013th%20Five-Year%20Plan_Final_2.14.17_Updated%20%28002%29.pdf).

	champions also received advantageous capital terms from state-owned banks and investment funds (e.g., wind turbine manufacturer Goldwind received a \$5.5 billion loan from the state-owned China Development Bank).
<b>Government R&amp;D Funding</b>	The Chinese government provides significant R&D funding to strategic sectors. From 2005 to 2015, total government R&D spending grew more than 350 percent to reach \$44.5 billion. China’s R&D expenditures are rapidly catching up to the United States, with China’s total R&D spending (public and private) increasing from 26.5 percent of total U.S. R&D expenditures in 2005 to 75.1 percent in 2015.
<b>Government Procurement</b>	The Chinese government leverages its large central and local government procurement markets to benefit domestic firms in strategic sectors. For example, in 2012, the central government mandated its agencies to purchase only Chinese automobile brands, leading several municipal and provincial governments to follow suit.
<b>Technology Standards</b>	The Chinese government has repeatedly created China-specific standards to raise the costs of market entry for foreign firms. For example, the People’s Bank of China announced a new technical encryption standard for bank cards—incompatible with existing international standards and only used by the state-owned China UnionPay—effectively cutting foreign electronic payment firms such as Visa and MasterCard out of the market and forcing them to spend additional money to redesign their cards to meet the standard.
<b>Regulations</b>	The Chinese government advantages domestic firms by setting high regulatory thresholds for market entry and creating vague regulations that allow for discretionary enforcement and interpretation to favor domestic firms. In the automobile sector, for instance, the government requires foreign firms to form joint ventures with state-owned firms as the price of market entry.
<b>Foreign Investment Restrictions and Import Guidance</b>	Through its <i>Catalogue on Guiding Foreign Investment</i> and <i>Catalogue on Encouraged Imported Technology and Products</i> , the Chinese government directs foreign investment and technology imports toward strategic sectors by designating industries as either “encouraged,” “permitted,” or “restricted” to foreign investment. Foreign investment in targeted sectors is first welcomed to build domestic capacity, but after domestic firms become competitive, the government gradually restricts this investment to provide a protected market for domestic firms. For example, the automobile industry shifted from “encouraged” in 1994–2010 to “permitted” in 2011–2014 to “restricted” in 2015.
<b>Foreign Talent</b>	The Chinese government is recruiting overseas Chinese and foreign academics, experts and entrepreneurs in strategic sectors to come teach and work in China, most notably through its Thousand Talents Program and Project 111. The Thousand Talents Program was launched in December 2008 and has brought more than 4,000 foreigners to China’s scientific laboratories, companies, and research centers. The Chinese government also uses research and startup funding to incentivize foreign experts and entrepreneurs to split time between their positions overseas and in China. Project 111 was launched in 2006 to recruit 1,000 foreign experts in strategic sectors from the world’s top 100 universities and research institutes.
<b>Acquisition of Foreign Technology</b>	The Chinese government encourages Chinese companies in strategic sectors to expand their global market access and gain ownership of key foreign technology, intellectual property, and assets. Under the 13th Five-Year Plan (2016–2020), hundreds of government-controlled venture capital funds with combined endowments worth at least \$325 billion support Chinese companies in these strategic industries and enable them to pursue foreign acquisitions. For example, the National Integrated Circuit Industry Investment Fund (with at least \$17.9 billion in endowment) has been instrumental in providing financing for the rapid increase in domestic capacity and acquisitions abroad. In 2015–2016, Chinese firms attempted or completed at least 21 acquisitions of U.S. semiconductor companies.
<b>Industrial Espionage</b>	The Chinese government continues to conduct pervasive industrial espionage against U.S. companies, universities, and the government, and to direct efforts to circumvent U.S. export controls to gain access to cutting-edge technologies and intellectual property in strategic sectors.

Source: Adapted from U.S.-China Economic and Security Review Commission, “Chapter 4, Section 1: China’s Pursuit of Dominance in Computing, Robotics, and Biotechnology,” *2017 Annual Report to Congress*, November 2017, 511–515; U.S.-China Economic and Security Review Commission, “Chapter 1, Section 3: China’s 13th Five-Year Plan,” *2016 Annual Report to Congress*, November 2016, 151, 156–160.

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## Selected Recommendations

The Commission has made the following recommendations to address China’s trade-distorting policies related to technology development and intellectual property.

*2017 Annual Report to Congress:*

- Congress consider legislation updating the Committee on Foreign Investment in the United States (CFIUS) statute to address current and evolving security risks. Among the issues Congress should consider are:
  - Prohibiting the acquisition of U.S. assets by Chinese state-owned or state-controlled entities, including sovereign wealth funds.
  - Requiring a mandatory review of any transaction involving the acquisition of a controlling interest in U.S. assets by Chinese entities not falling under the above class of acquiring entities.
  - Requiring reviews of investments in U.S.-based greenfield assets by Chinese-controlled entities to assess any potential harm to U.S. national and economic security.
  - Expanding the definition of “control” to include joint ventures, venture capital funds, licensing agreements, and other arrangements or agreements that enable Chinese entities to access and/or determine the disposition of any asset.
  - Prohibiting any acquisition or investment that would confer “control” with regard to critical technologies or infrastructure. The U.S. Departments of Homeland Security, Commerce, and Defense shall prepare and regularly update a list of critical technologies or infrastructure that would not be eligible for acquisition or investment by any Chinese entities to ensure U.S. economic and national security interests are protected.
  - Including a net economic benefit test to assess the impact of acquisitions by Chinese entities in the United States to ensure they advance U.S. national economic interests.
  - Requiring that any proposed acquisition of a media property by a Chinese entity be assessed in terms of the acquiring entity’s history of adhering to Chinese Communist Party propaganda objectives and its potential to influence public opinion in the United States.
  - Authorizing an independent review panel, appointed by Congress, to review the actions and activities of CFIUS on a continuing basis.
  - Allowing any CFIUS member agency to bring a transaction up for review and investigation.
- Congress direct the National Science and Technology Council, in coordination with the National Economic Council and relevant agencies, to identify gaps in U.S. technological development vis-à-vis China, including funding, science, technology, engineering, and mathematics workforce development, interagency coordination, and utilization of existing innovation and manufacturing institutes, and, following this assessment, develop and update biennially a comprehensive strategic plan to enhance U.S. competitiveness in advanced science and technology.
- Congress direct the Federal Bureau of Investigation in concert with the U.S. Department of Commerce’s International Trade Administration to expand outreach to and develop educational materials and tools for U.S. academics, businesses, venture capitalists, and startups in dual-use sectors on potential risks associated with Chinese investors and partners, the Chinese government’s role in acquiring technology through programs such as the Thousand Talents Program and Project 111, and steps to prevent industrial and cyber espionage.

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*2015 Annual Report to Congress:*

- Congress pass legislation to require the Securities and Exchange Commission (SEC) to make clear to publicly traded companies and their investors the circumstances under which the theft of intellectual property through a computer network intrusion may be a material fact that might affect a company's revenues and should therefore be required to be disclosed to the SEC.

## Further Reading

- U.S.-China Economic and Security Review Commission, "Chapter 4, Section 1: China's Pursuit of Dominance in Computing, Robotics, and Biotechnology," *2017 Annual Report to Congress*, November 2017.
- U.S.-China Economic and Security Review Commission, "Chapter 1, Section 3: China's 13th Five-Year Plan," *2016 Annual Report to Congress*, November 2016.
- U.S.-China Economic and Security Review Commission, "Chapter 1, Section 3: China's State-Led Market Reform and Competitiveness Agenda," *2015 Annual Report to Congress*, November 2015.
- U.S.-China Economic and Security Review Commission, "Chapter 1, Section 4: Commercial Cyber Espionage and Barriers to Digital Trade in China," *2015 Annual Report to Congress*, November 2015.

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This report is the product of professional research performed by the staff of the U.S.-China Economic and Security Review Commission, and was prepared at the request of the Commission to support its deliberations. Posting of the report to the Commission's website is intended to promote greater public understanding of the issues addressed by the Commission in its ongoing assessment of U.S.-China economic relations and their implications for U.S. security, as mandated by Public Law 106-398 and Public Law 113-291. However, it does not necessarily imply an endorsement by the Commission, any individual Commissioner, or the Commission's other professional staff, of the views or conclusions expressed in this staff research report.

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<sup>1</sup> People's Republic of China, *13th Five-Year Plan on National Economic and Social Development*, March 17, 2016. Translation; State Council of the People's Republic of China, *Made in China 2025*, May 8, 2015. Translation; Tai Ming Cheung et al., "Planning for Innovation: Understanding China's Plans for Technological, Energy, Industrial, and Defense Development," *University of California Institute on Global Conflict and Cooperation* (prepared for the U.S.-China Economic and Security Review Commission), July 28, 2016.

<sup>2</sup> Tai Ming Cheung et al., "Planning for Innovation: Understanding China's Plans for Technological, Energy, Industrial, and Defense Development," *University of California Institute on Global Conflict and Cooperation* (prepared for the U.S.-China Economic and Security Review Commission), July 28, 2016.

<sup>3</sup> U.S.-China Economic and Security Review Commission, Chapter 1, Section 3, "China's 13th Five-Year Plan," in *2016 Annual Report to Congress*, November 2016, 151–161.

<sup>4</sup> U.S.-China Economic and Security Review Commission, "Chapter 4, Section 1: China's Pursuit of Dominance in Computing, Robotics, and Biotechnology," *2017 Annual Report to Congress*, November 2017.

<sup>5</sup> PricewaterhouseCoopers, "A Decade of Unprecedented Growth: China's Impact on the Semiconductor Industry 2014 Update," January 2015, 74; Jost Wubbeke et al., "Made in China 2025: The Making of a High-Tech Superpower and Consequences for Industrial Countries," *Mercator Institute for China Studies*, December 2016, 23, 44; *Xinhua*, "China Establishes Fund to Invest in Advanced Manufacturing," *China Daily*, June 8, 2016; Engen Tham and David Stanway, "China Launches \$30 Bln State-Controlled Venture Capital Fund," *Reuters*, August 18, 2016; *Xinhua*, "China Launches \$14.6B Internet Investment Fund," *State Council of the People's Republic of China*, January 23, 2017; Ministry of Industry and Information Technology of the People's Republic of China, *Ministry of Industry and Information Technology and the China Development Bank Jointly Agree to Sign an Agreement to Advance the "Made in China 2025" Initiative*, November 9, 2016. Translation; Elias Glenn, "China State Firms Set up 150 Billion Yuan Fund to Invest in New Technologies: *Xinhua*," *Reuters*, May 16, 2017; U.S.-China Economic and Security Review Commission, *Hearing on China Ahead of the 13th Five-Year Plan: Competitiveness and Market Reform*, written testimony of Oliver K. Melton, April 22, 2015, 10.