U.S.-China Economic and Security Review Commission

Economics and Trade Bulletin

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Highlights of This Month's Edition

- **Bilateral trade:** U.S.-China goods trade deficit reached $33.2 billion in May 2018, and $152.2 billion year-to-date.

- **Bilateral policy issues:** U.S. tariffs against $34 billion worth of Chinese imports go into effect as China implements retaliatory action and takes steps to dull the impact of U.S. tariffs on China's economy; U.S. Department of Commerce reverses ZTE exclusion order, but Members of Congress are working on legislation to reinstate sanctions.

- **Policy trends in China's economy:** Chinese investment in the United States fell 90 percent year-on-year to $1.8 billion in the first five months of 2018 due, in part, to Beijing's intensified scrutiny of outbound flows; China issues new foreign investment negative list, lifting ownership restrictions in 22 industries, including airplane design and manufacturing, agriculture, automotive, banking, railway construction, and shipping.

- **Sector Focus – China Pursues Foreign Semiconductor Technology:** Since 2015, U.S. semiconductor firm Micron has been subject to a persistent, wide-ranging technology acquisition campaign from multiple Chinese actors, involving an attempted purchase, alleged IP theft, a direct challenge of Micron's IP in China, and an on-going antitrust case.

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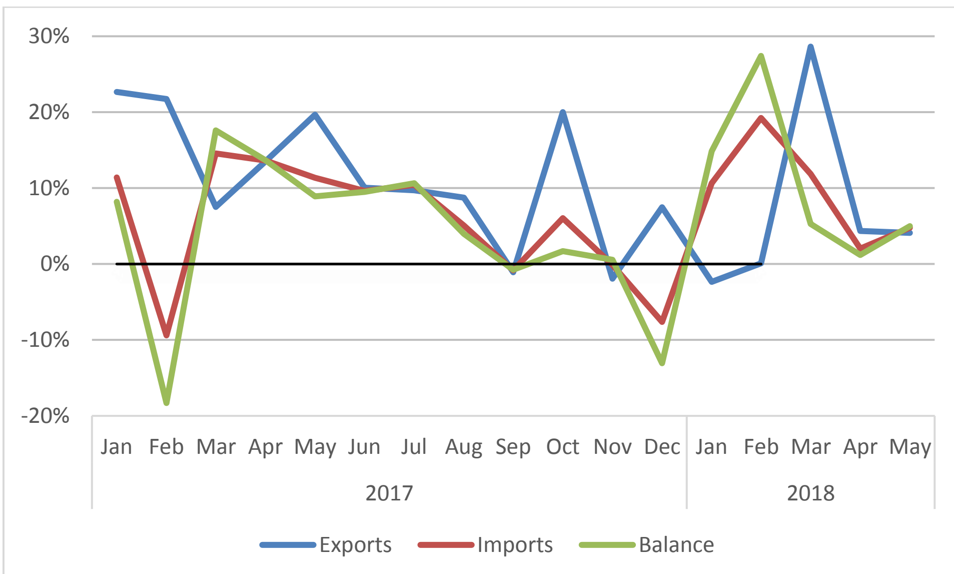
Bilateral Trade

U.S. Deficit with China Reaches $33.2 Billion in May 2018

The U.S. trade deficit in goods with China totaled $33.2 billion in May 2018, its highest monthly level since January and a 4 percent increase year-on-year (see Figure 1). U.S. exports to China grew 7.6 percent year-on-year to $10.6 billion, while U.S. imports from China increased 4.8 percent year-on-year to $43.8 billion.[1] In the first five months of 2018, U.S. exports to China were $52.9 billion, a 7.8 percent increase year-on-year, and imports from China reached $205.1 billion, up 9.4 percent year-on-year.[2] The year-to-date, U.S. deficit with China totaled $152.2 billion, an increase of 9.9 percent from 2017.[3]

Figure 1: U.S. Exports, Imports, and the Trade Deficit with China, January 2017–May 2018



Source: U.S. Census Bureau, *Trade in Goods with China*, August 4, 2017. *https://www.census.gov/foreign-trade/balance/c5700.html*.

On July 2, China's General Administration of Customs released an unexpected statement describing exports to the United States in the first six months of 2018.[4] According to the statement, exports to the United States grew only 5.4 percent year-on-year during that period, a significant decline from the same period in 2017.[5] Some analysts questioned the data's reliability, noting, in particular, that taking into account the renminbi's (RMB) exchange rate against the U.S. dollar, China's exports to the United States should have sustained double-digit growth rates.[6] Analysts also noted that the timing of the release (on the eve of U.S. tariffs on Chinese products going into effect) was suspicious, and likely aimed at deescalating the tensions over the size of the U.S. deficit with China.[7]

Bilateral Policy Issues

U.S. Tariffs Imposed and Released in June

On July 6, 2018, the U.S. government began collecting 25 percent duties on $34 billion worth of imports from China, triggering an equivalent response from China. The tariffs are the first tangible outcome of the Trump Administration's Section 301 investigation into China's policies and practices on intellectual property (IP) and technology transfer.[*] On June 15, the Office of the U.S. Trade Representative (USTR) published two lists of imports from China (List 1 products, which already passed through a public comment period, and List 2 products, containing newly proposed tariff lines) on which Section 301-related 25 percent tariffs will be imposed. Together with exports from several other countries, Chinese exports are also subject to a separate set of tariffs stemming from Section 232 investigation into the impact on U.S. national security from imports steel and aluminum, which went into effect on June 1.[†] These actions are summarized in Table 1 below.

Table 1: Summary of June 2018 U.S. Trade Actions

Action	Product	Measure	Tariff Rate	Est. Value	Date in Effect	Countries of Origin
Section 232	Steel	Tariff	25%	over $23 billion	6/1/2018	All countries of origin, except Australia, Argentina, Brazil, and South Korea
		Quota		$5.5 billion	6/1/2018	Argentina, Brazil, and South Korea
Section 232	Aluminum	Tariff	10%	$17 billion	6/1/2018	All countries of origin, except Australia and Argentina
		Quota		$0.5 billion	6/1/2018	Argentina
Section 301	USTR List 1	Tariff	25%	$32–$34 billion	7/6/2018	China
	USTR List 2	Tariff	25%	$14–$16 billion	TBD	China

Note: Section 232 import value estimates derive from Congressional Research Service country of origin estimates using 2017 data.
Source: Various.[8]

- *Section 232 tariffs:* On June 1, U.S. Customs and Border Protection announced the addition of Section 232 tariffs on steel and aluminum products.[9] Tariffs on steel apply to all countries of origin except Australia, Argentina, Brazil, and South Korea; Argentina, Brazil, and South Korea are covered by an absolute quota.[10] Similarly, tariffs on aluminum apply to all countries of origin except Australia and Argentina; Argentina is covered by an absolute quota.[11] The Congressional Research Service (CRS) estimated the total import value of steel products at issue at about $29 billion and aluminum products at issue at about $17 billion in 2017.[12]

- *Section 301 List 1 tariffs imposed July 6:* List 1 represents a revised product list culled from the original list of proposed tariff lines published on April 6 by the USTR.[13] Compiled by several government agencies, the list identified imports that benefit from Chinese industrial policies as described by the USTR's Section 301 investigation into China's technology policies and practices.[14] Of the original 1,333 tariff lines, 818 remain following public comment, during which approximately 3,200 written submissions were received and 121 witnesses testified.[15] These products' import value is estimated between $32 and $34 billion.[‡] [16]

[*] For more information on the USTR Section 301 investigation, see U.S.-China Economic and Security Review Commission, *Economics and Trade Bulletin*, April 2018, 2–4. *https://www.uscc.gov/sites/default/files/trade_bulletins/2018%20May%20Trade%20Bulletin.pdf*.

[†] For more information regarding the U.S. Department of Commerce's Section 232 investigations into steel and aluminum, see U.S.-China Economic and Security Review Commission, *Economics and Trade Bulletin*, March 2018, 2–5. *https://www.uscc.gov/sites/default/files/trade_bulletins/2018%20May%20Trade%20Bulletin.pdf*.

[‡] The $2 billion difference likely reflects the year in which import value was estimated. The USTR calculated the value of proposed tariff lines based on 2018 trade values and found List 1 tariff lines to cover $34 billion in U.S. imports from China. At PIIE, Chad Bown, Euijin Jung, and Zhiyao Lu found that List 1 tariff lines cover an estimated $32 billion in U.S. imports based on 2017 trade data from the USITC.

According to U.S. International Trade Commission (USITC) import data pulled by researchers at the Peterson Institute of International Economics (PIIE), about half of List 1 products' 2017 U.S. import value came from the top 36 products, including LEDs, airplane and printer parts, radio navigation aids, pumps, flat panel displays, and refrigeration equipment.[17] Customs and Border Protection began to enforce the 25 percent tariff on List 1 product categories on July 6.[18]

- *Section 301 List 2 tariffs in public comment period:* List 2 represents a new product list covering 284 tariff lines (valued at an estimated $14–$16 billion) compiled by the Interagency Section 301 Committee.[19] According to USITC import data pulled by PIIE researchers, about half of List 2 products' 2017 U.S. import value came from the top 11 products, including integrated circuits and semiconductor inputs.[20] List 2 will be subject to a public comment period—including a hearing on July 24—before coming into force.[21]

Proponents of the tariffs argue that stronger trade enforcement actions against China like "tariffs, investment restrictions, and a WTO [World Trade Organization] case" might help stop IP theft and unfair practices.[22] American Federation of Labor and Congress of Industrial Organizations (AFL-CIO) Trade and Globalization Policy Specialist Celeste Drake commented that "we think these tariffs are a good start, if used strategically."[23] Georgetown Law Professor Owen E. Herrnstadt concurred: "The Trump Administration's report on 301 and its initial announcement concerning proposed tariffs on certain Chinese aerospace products is a start."[24] Detractors expressed concern that tariffs harm U.S. firms more than Chinese firms. Analysis by Brookings Institution senior fellow David Dollar and George Mason University senior fellow Zhi Wang found that more than half of China's computer and electronic exports come from multinational firms operating in China, now paying duties on importing their own products.[25] PIIE researchers Chad Bown, Euijin Jung, and Zhiyao Lu found that Section 301 tariffs will primarily impact capital goods (43 percent share of import value) and intermediate goods (52 percent share of import value), increasing supply chain costs for U.S. producers.[26]

China Imposes Wide-ranging Tariffs on U.S. Products, Takes Steps to Lessen Impact of U.S. Tariffs

On July 6, China imposed tariffs of 25 percent on $34 billion of U.S. exports in response to U.S. Section 301 duties against Chinese products.[27] In addition to China's tariffs on agriculture and auto exports, Beijing announced a second round of tariffs on U.S. coal, petroleum, chemical, and medical exports that will be implemented at a future date (see Table 2).[28]

Office of the U.S. Trade Representative, *USTR Issues Tariffs on Chinese Products in Response to Unfair Trade Practices*, June 15, 2018. *https://ustr.gov/about-us/policy-offices/press-office/press-releases/2018/june/ustr-issues-tariffs-chinese-products*; Chad Bown, Euijin Jung, and Zhiyao Lu, "Trump, China, and Tariffs: From Soybeans to Semiconductors," *Peterson Institute for International Economics*, June 18, 2018. *https://piie.com/blogs/trade-investment-policy-watch/trump-china-and-tariffs-soybeans-semiconductors*.

Table 2: China's Retaliatory Tariffs of Imports from the United States

Product	**Est. Value (2017)**	**Date in Effect**
Agricultural Products	$17.3 billion	7/6/2018
Soybeans	*$12.4 billion*	
Cotton	*$976 million*	
Sorghum	*$836 million*	
Pork	*$663 million*	
Other Agricultural Products	*$2.4 billion*	
Seafood Products	$1.2 billion	7/6/2018
Automobiles and Auto Parts	$11.3 billion	7/6/2018
Coal	$397 million	TBD
Petroleum and Petroleum Products	$7.8 billion	TBD
Chemical Products	$5.5 billion	TBD
Medical Equipment	$1.6 billion	TBD
Total	**$45 billion**	

Source: Evelyn Cheng, "China Announces Retaliatory Tariffs on $34 Billion Worth of U.S. Goods, Including Agriculture Products," *CNBC*, June 15, 2018. *https://www.cnbc.com/2018/06/15/china-announces-retaliatory-tariffs-on-34-billion-worth-of-us-goods-including-agriculture-products.html*; UN Comtrade, "International Trade Statistics Database." *https://comtrade.un.org/data/*; U.S. Department of Agriculture Foreign Agricultural Service, *Global Agricultural Trade System Online*. *https://apps.fas.usda.gov/gats/ExpressQuery1.aspx*.

China's duties on U.S. agricultural products will have a large impact on U.S. farmers who rely on China's market. In 2017, China was the United States' second-largest export market, accounting for $20.8 billion (roughly 14 percent of U.S. agriculture exports worldwide).[29] Roughly 89 percent of all U.S. food and agriculture exports to China will be affected, including sorghum and soybeans, which are heavily dependent on China's market.[30] In 2017, China accounted for 81 percent and 57 percent of all U.S. sorghum and soybean exports, respectively (see Table 3).[31] China's position as the world's largest importer of sorghum and soybeans will make it difficult for U.S. farmers to transition to other markets without a significant price cut. In 2017, China claimed 73 percent of the world's imports of sorghum and 71 percent of global soybean imports according to Chinese and UN statistics.[32] As soybeans represent over half of the United States' agriculture exports to China and nearly 10 percent of global U.S. agriculture exports, China's tariffs will have a significant negative impact on U.S. agricultural exports.[*]

Table 3: U.S. Food and Agriculture Products Subject to Chinese Tariffs by Exposure to China's Market

Product	**Est. Value (2017)**	**China's Share of U.S. Global Exports**
Sorghum	$835 million	81%
Soybeans	$12.4 billion	57%
Hay	$340 million	27%
Seafood Products	$1.2 billion	23%

Source: U.S. Department of Agriculture Foreign Agricultural Service, *Global Agricultural Trade System Online*, April 12, 2018. *https://apps.fas.usda.gov/gats/ExpressQuery1.aspx*.

China's tariffs on U.S. auto exports may have less impact on U.S. firms. While China is the United States' third-largest market for automobile and automobile parts exports (accounting in 2017 for $12.8 billion, or 9.5 percent of

[*] For more on U.S. sorghum and soybean exports to China, see U.S.-China Economic and Security Review Commission, *Economics and Trade Bulletin*, March 9, 2018. *https://www.uscc.gov/sites/default/files/Research/March%202018.pdf*.

total U.S. auto and auto part exports), the largest U.S. auto firms rely on joint ventures (JVs) and overseas subsidiaries rather than exports to sell their cars in China.[33] General Motors (GM) has ten JVs and two wholly owned enterprises in China, while Ford has seven Chinese JVs and wholly owned enterprises.[34] Additionally, most U.S. auto exports to China are from foreign firms manufacturing vehicles in the United States for export to China. For example, German automakers BMW and Daimler AG are predicted to export nearly $7 billion worth of cars from the United States to China in 2018.[*] [35]

Given the wide gap in exports each country can target, Beijing may feel compelled to take additional retaliatory actions to mount an equivalent response to U.S. tariffs. In 2017, the United States imported over $505 billion of goods from China; President Donald Trump suggested levying tariffs on as much as $450 billion of Chinese imports.[36] By contrast, U.S. goods exports to China totaled $129.8 billion in 2017.[37] In June, a spokesperson for China's Ministry of Commerce said that if the United States expands its own list of tariffs, China would respond with "comprehensive quantitative and qualitative measures."[38] Many U.S. observers believe "qualitative measures" refer to informal economic pressure the Chinese government can bring to bear on U.S. businesses. In the past, China's government has retaliated against foreign governments by interfering with the operations of their businesses. For example, in 2016 after the United States and South Korea announced their decision to deploy a U.S. Terminal High Altitude Area Defense anti-missile battery, China responded by launching investigations into South Korean businesses in China, closing South Korean stores for alleged safety violations, and halting Chinese tourism to South Korea.[†]

Considering the volume of China's exports to the United States, trade restrictions would have a negative effect on China's economy. In 2017, exports to the United States amounted to roughly 4 percent of China's total gross domestic product (GDP) that year.[39] Prior to imposing tariffs, Beijing took several steps to alleviate the impact of U.S. tariffs on China's exporters and Chinese tariffs on China's ability to import from the United States. In an attempt to reduce China's dependence on U.S. soybeans (the United States is China's second-largest supplier of soybeans), on July 1 China removed tariffs on soybeans, soymeal, and other animal feed ingredients from Bangladesh, India, Laos, South Korea, and Sri Lanka.[40] In May, Chinese authorities declared a soybean "emergency," ordering local officials to increase domestic soybean planting and issuing large subsidies for Chinese soybean farmers.[41] In June, China's central bank cut reserve requirements for Chinese banks by 50 basis points in an attempt to provide additional lending to Chinese small and medium enterprises.[42] The reduction in reserve requirements would provide $108 billion in new lending and may be an effort to stimulate China's economy to offset economic damage from trade friction with the United States.[43]

U.S. Department of Commerce Reverses ZTE Exclusion Order

In June 2018, the U.S. Department of Commerce (DOC) reversed its decision to suspend the U.S. export privileges of ZTE Corporation, a Chinese information and communications technology (ICT) firm. Two months earlier, DOC banned U.S. companies from selling components, software, and technology to ZTE for seven years following the company's repeated violations of U.S. export controls.[44] Shortly after the initial ban was announced, President Trump tweeted that he and Chinese President and General Secretary of the Chinese Communist Party Xi Jinping were "working together" to provide ZTE with "a way to get back into business" in the United States.[45] On July 2, ZTE received a temporary license from DOC allowing it to conduct business related to maintaining existing networks and equipment through August 1.[46]

[*] For an assessment of China's market for conventional autos, see U.S.-China Economic and Security Review Commission, *Economics and Trade Bulletin*, June 6, 2018. *https://www.uscc.gov/sites/default/files/trade_bulletins/June%202018%20Trade%20Bulletin.pdf*.

[†] For more on China's response to South Korea's missile shield deployment, see Ethan Meick and Nargiza Salidjanova, "China's Response to U.S.-South Korean Missile Defense System Deployment and its Implications," *U.S.-China Economic Security Review Commission*, July 26, 2017.
https://www.uscc.gov/sites/default/files/Research/Report_China%27s%20Response%20to%20THAAD%20Deployment%20and%20its%20Implications.pdf.

Under the terms of the revised deal, ZTE agreed to pay a $1.4 billion settlement and retain a team of compliance coordinators for ten years.[47] As part of the agreement in July, ZTE also replaced its board of directors, including its chairman, and other top executives.[48] However, ZTE's state-backed controlling shareholder, which remains the company's primary decision maker, selected longtime ZTE employees to fill the incoming board member positions. In addition, at least two of ZTE's outgoing directors may continue to influence the firm through stakes they own in a ZTE shareholder.[49] As a result, some observers fear the changes may only shuffle personnel around while effectively leaving ZTE's leadership unchanged. Mark Stokes, former China director in the Office of the Secretary of Defense, said, "If you want real change in leadership, you'd probably have to target the actual institutions behind those people."[50]

Lawmakers on Capitol Hill are working on legislation to reinstate sanctions on ZTE. On June 18, the U.S. Senate approved the annual National Defense Authorization Act (NDAA), including an amendment that would keep in place the penalties on the Chinese firm.[51] The following week, the House of Representatives passed a bill that would ban the Pentagon from doing business with ZTE as well as Huawei Technologies, another Chinese ICT firm.[52] The two chambers must reconcile the differing language of the bills before the legislation can be passed to the White House.

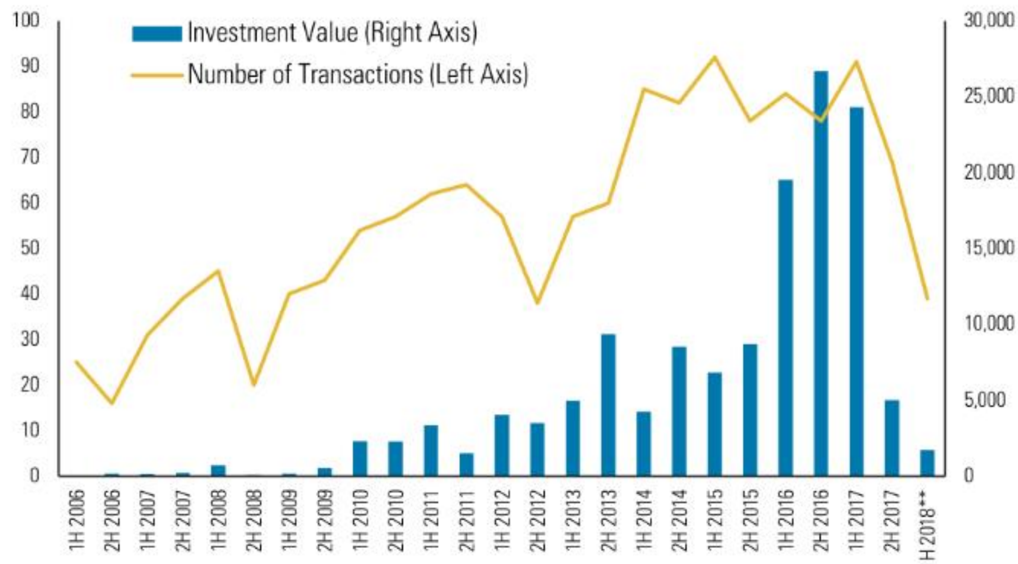
Policy Trends in China's Economy

Chinese Investment in the United States Continues to Decline in 2018

Data from Rhodium Group, a U.S. economic research firm, show Chinese foreign direct investment (FDI) in the United States totaled just $1.8 billion in the first five months of 2018—a 90 percent decline from a year ago and the lowest level in seven years (see Figure 2).[53] The number of transactions also fell, tumbling from a biannual average of 84 transactions since 2014 to 39 transactions in the first five months of 2018.[54]

Figure 2: Completed Chinese FDI Transactions in the United States, 2006–May 2018

(US$ millions)



Source: Thilo Hanemann and Daniel Rosen, "Arrested Development: Chinese FDI in the US in 1H 2018," *Rhodium Group*, June 19, 2018. *https://rhg.com/research/arrested-development-chinese-fdi-in-the-us-in-1h-2018/.*

According to Rhodium, after reaching a record high of $46 billion in 2016, Chinese FDI in the United States fell to $29 billion in 2017 in part due to Beijing's intensified scrutiny of outbound flows and tougher U.S. regulatory reviews of inbound Chinese acquisitions through the Committee on Foreign Investment in the United States (CFIUS), the primary government body responsible for reviewing foreign acquisitions of U.S. companies for national security risks.[*] [55] These two factors continue to weigh on Chinese investment in 2018.

However, according to Joy Dantong Ma, a researcher at MacroPolo, an initiative of the Paulson Institute at the University of Chicago, the sharp decline in U.S.-bound Chinese investment was not principally caused by a deteriorating political climate in the United States for Chinese investors; rather, the FDI spike in 2016 was an outlier, and 2017 and 2018 data show a "reversion to the mean ... after a highly abnormal year."[56] The 2016 boom in Chinese FDI was driven by just four Chinese firms[†] seeking to diversify their holdings.[57] As Beijing moves to reduce the leverage of its heavily indebted private conglomerates, many Chinese companies are now being pushed to sell their overseas assets to pay off loans.[58] As a result, Chinese companies are divesting their assets in the United States at an unparalleled pace: in the first five months of 2018, Chinese investors sold $9.6 billion worth of U.S. assets, with another $4 billion of sales pending, making net FDI inflows to the United States negative by some $7.8 billion.[59]

Rhodium data show the sectoral composition of Chinese investment has also shifted dramatically in the first five months of 2018. Notably, the health and biotech sector became the top destination for Chinese FDI in the United States for the first time, led by Chinese medical company Shandong Weigao's $850 million acquisition of Argon Medical Devices.[‡] Real estate and hospitality remained the second-largest recipient of Chinese FDI despite Chinese capital controls, driven by smaller deals in commercial real estate.[60] Entertainment came in third, driven by investments from Chinese internet and gaming companies listed overseas, like Tencent and NetEase.[61]

Forthcoming U.S. policy changes on Chinese investment are likely to further dampen Chinese investment in the United States. On June 27, the White House released a statement from President Trump announcing his support for bipartisan legislation currently under consideration in Congress to broaden CFIUS's authority.[62] "This legislation, the Foreign Investment Risk Review Modernization Act (FIRRMA), will enhance our ability to protect the United States from new and evolving threats posed by foreign investment while also sustaining the strong, open investment environment to which our country is committed," said President Trump in a statement.[63] Both chambers of Congress recently passed different versions of FIRRMA, which means the House and the Senate will need to reconcile their bills before President Trump can sign the legislation into law.[64] Both versions would broaden the scope of investments subject to CFIUS review to include nonpassive investments in "critical technology" or "critical infrastructure" companies.[65] "Should Congress fail to pass strong FIRMMA legislation that better protects the crown jewels of American technology and intellectual property from transfers and acquisitions that threaten our national security—and future economic prosperity—I will direct my Administration to deploy new tools, developed under existing authorities, that will do so globally," President Trump said.[66]

Meanwhile, the Chinese government is scrapping limits on foreign ownership in select industries to stimulate inflows of investment. On June 28, China's National Development and Reform Commission and Ministry of Commerce jointly issued a new "negative list"[§] lifting restrictions in 22 industries, including airplane design and manufacturing, agriculture, automotive, banking, railway construction, and shipping.[67] The new list, slated to go

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[*] For more on Chinese FDI flows to the United States in 2017, see U.S.-China Economic and Security Review Commission, *Economics and Trade Bulletin*, February 7, 2018, 12–15. *https://www.uscc.gov/sites/default/files/trade_bulletins/February%202018%20Trade%20Bulletin.pdf*.

[†] More than 60 percent of Chinese investment in the United States in 2016 came from four Chinese companies: HNA, Anbang, Wanda Group, and Oceanwide Holdings. Joy Dantong Ma, "Reversion to the Mean: Why Chinese Investment in the US Did Not, in Fact, 'Collapse,'" *MacroPolo*, June 4, 2018. *https://macropolo.org/reversion-to-the-mean/*.

[‡] Chinese investment in the health and biotech sector was nearly 60 percent of its total investment in the United States, compared to 9 percent in 2017. Thilo Hanemann, "Arrested Development: Chinese FDI in the US in 1H 2018," *Rhodium Group*, June 19, 2018. *https://rhg.com/research/arrested-development-chinese-fdi-in-the-us-in-1h-2018/*.

[§] China's negative list identifies sectors foreign investors are either prohibited from investing in or restricted to JVs with Chinese companies where the foreign company has a minority stake; sectors not included on the list are open to foreign investment.

into effect July 28, brings the number of restricted sectors to 48, down from 63 in 2017 and 120 in 2011.[68] Many of the changes—such as loosened restrictions on foreign investment in the financial services and automotive sectors—were previously announced.[69] Further, foreign analysts note that openings in a number of sectors (e.g., power grids and rail construction) are unlikely to be meaningful for foreign companies as they are dominated by Chinese state-owned enterprises.[70]

Sector Focus: China Pursues Foreign Semiconductor Technology

China is the world's largest consumer of semiconductors, but relies on imports to meet roughly 85 percent of its consumption.[71] The Chinese government is employing a broad range of strategies to break China's dependence on imports from foreign producers. China strengthened its domestic firms through strong state financing, China-specific standards, localization targets, and government procurement requirements.* In addition, the government is leveraging acquisitions of foreign technology and IP, recruitment of foreign talent,† technology transfer and JV requirements, antimonopoly and antitrust reviews, and industrial espionage.[72]

The challenges faced by Micron, a U.S. semiconductors U.S. company, present an interesting case study. Over the last three years, Micron has been subject to a persistent, wide-ranging technology acquisition campaign from multiple Chinese actors. In its 2018 quarterly statement, Micron noted the increased pressure:

> *In particular, we face the threat of increasing competition as a result of significant investment in the semiconductor industry by the Chinese government and various state-owned or affiliated entities that is intended to advance China's stated national policy objectives. The activities by the Chinese government may restrict us from participating in the China market or may prevent us from competing effectively with Chinese companies.*[73]

This pressure has comprised an attempted acquisition in 2015, recruitment of Micron employees, alleged IP theft by two state-owned firms from 2015 to 2016, direct challenge of Micron's IP in China, and an on-going antitrust case.

Attempted Acquisition of Micron

In July 2015, state-owned Tsinghua Holdings submitted an unsolicited $23 billion takeover bid for Micron, then the fifth-largest semiconductor manufacturer by revenue; in February 2016, Micron rejected the bid due to concerns that CFIUS would not clear it.[74] Several Chinese companies subsequently sought to establish partnerships, but Micron turned these offers down because it was concerned about protecting its IP.[75] This bid is one of more than 32 proposed mergers and acquisition deals by China-headquartered firms targeting U.S. semiconductor assets since 2014.[76]

During the acquisition negotiations in 2015, Tsinghua Unigroup‡ recruited Micron employees and allegedly conducted industrial espionage to gain access to Micron's IP. For example, in October 2015 Tsinghua Unigroup recruited the then head of a JV between Micron and Taiwan's Nanya Technology Corporation Charles Cheichan Kau to serve as executive vice president.[77]

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* For more information on China's state-led efforts to develop its semiconductor industry, see 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, 155–161. *https://www.uscc.gov/sites/default/files/Annual_Report/Chapters/Chapter%201%2C%20Section%203%20-%2013th%20Five-Year%20Plan.pdf*.

† Chinese firms are recruiting global semiconductor talent by reportedly offering chip specialists pay packages that are three to five times higher than those of Taiwan-based firms. Cheng Ting-Faang and Hiromi Sato, "Chinese Chipmakers Poach Talent from Global Rivals," *Nikkei Asian Review*, April 25, 2018. *https://asia.nikkei.com/Business/Business-Trends/Chinese-chipmakers-poach-talent-from-global-rivals*.

‡ Tsinghua Unigroup is a JV between Tsinghua Holdings and the Beijing municipal government's investment fund.

Alleged Theft of Micron IP

At least seven former Micron employees have been investigated for allegedly stealing Micron's IP and selling it to Chinese state-owned firms. In September 2017, Taiwan prosecutors charged five other employees of a Micron subsidiary in Taiwan for theft of trade secrets; the *United Evening News* reported that these employees shared trade secrets with Tsinghua Unigroup.[78] In the case, the five employees allegedly began stealing Micron's proprietary information in 2016 for a monthly reward of around $6,500—three times their monthly salary—and a promise of future employment.[79]

In September and October 2015, Taiwan's United Microelectronics Corporation (UMC)—a DRAM* manufacturer for leading semiconductor designers—recruited two former Micron employees in Taiwan.[80] Micron alleges that UMC promised these two engineers raises and bonuses in exchange for proprietary information and files on Micron's advanced DRAM chips.[81] In January 2016, UMC agreed to partner with Fujian Jinhua Integrated Circuit Company (founded in 2015 and owned by the Fujian provincial government).[82] Under the agreement, Fujian Jinhua would pay UMC $300 million for equipment and $400 million for DRAM process technology.[83] According to Micron, "As a semiconductor foundry with no advanced DRAM process, UMC had no realistic capability to fulfill its commitments under their agreement. Jinhua knew that UMC did not possess the technological resources to develop the promised technology by itself, and understood that the technology would be based substantially on Micron's DRAM designs and processes."[84]

Taiwan prosecutors allege UMC provided Micron's technology to Fujian Jinhua, which is set to begin DRAM manufacturing in late 2018.[85] In August 2017, Taiwan prosecutors indicted UMC and two former Micron employees for conspiring to steal and misappropriate Micron trade secrets and to deliver those trade secrets to Fujian Jinhua.[86]

In December 2017, Micron sued firm Fujian Jinhua and UMC in the U.S. District Court for the Northern District of California for DRAM trade secret theft and IP infringement.[87] Micron alleges that "UMC is prepared to make hundreds of millions of dollars for its purposed 'development work,' and Jinhua plans to avoid hundreds of millions of dollars in costs and the many months of R&D [research and development] effort that honest competition would require."[88]

Micron's IP Challenged in China

While Micron has sued Fujian Jinhua and UMC in the United States for IP theft, in March and April 2018, Fujian Jinhua and UMC separately sued Micron's subsidiaries in Xi'an and Shanghai for patent infringement in China.[89] China is Micron's largest customer; in 2017, China accounted for 51 percent of Micron's net sales based on customer ship-to location, followed by the United States with nearly 14 percent.[90] The case is decided by the Fujian provincial court, where the provincial government is the owner of one of the plaintiffs.[91] In all of these cases, Fujian Jinhua and UMC are seeking an injunction prohibiting the sale of certain Micron chips in China.[92]

On July 5, 2018, Micron confirmed that the Fujian court ruled in favor of UMC and Fujian Jinhua and granted a preliminary injunction on the sale of a select Micron chips in China.[93] The ruling will affect around 1 percent of Micron's annualized revenues.[94] Joel Poppen, senior vice president at Micron Technology, noted "The Fuzhou

* DRAM (global dynamic random-access memory) chips are widely used in smartphones, tablets, and computers. DRAM chips store data or program code to allow a processor, such as in a computer or phone, to quickly access the data. China is the world's largest consumer of DRAM chips, accounting for 20 percent of global demand. South Korean and U.S. firms supply most of this demand: as of the fourth quarter of 2017, South Korean firm Samsung accounted for 46 percent of global DRAM revenues, followed by South Korean firm SK Hynix at 28.7 percent and Micron at 21 percent. DRaMeXchange, "China's Ministry of Commerce Held Meeting with Micron, Which May Restrain the Price Increase of DRAM, Says TrendForce," May 25, 2018. *https://www.dramexchange.com/WeeklyResearch/Post/2/4994.html*; Yoko Kubota, "China Launches Probe of Foreign Chip Makers," *Wall Street Journal*, June 4, 2018. *https://www.wsj.com/articles/china-launches-probe-of-foreign-chip-makers-1528098432*.

Court issued this preliminary ruling before allowing Micron an opportunity to present its defense."[95] Micron is appealing the decision.[96]

This case mirrors a 2017 patent infringement case of U.S. semiconductor equipment manufacturer Veeco.[97] In April 2017, Veeco sued German-based SGL Carbon and SGL Carge SE in the U.S. District Court for the Eastern District of New York for patent infringement and selling those products to its Chinese competitor, Advanced Micro-Fabrication Equipment, Inc. (AMEC).[98] In November 2017, the court granted Veeco a preliminary injunction.[99] In July 2017, AMEC filed a patent infringement case against Veeco's Shanghai subsidiary in Fujian court, seeking an injunction and monetary damages.[100] In December 2017, the Fujian court granted AMEC the injunction; the ruling affects all of Veeco's sales of the EPIK 700 wafer carrier technology system model in China, cutting the firm off from an important, growing market.[101] Veeco, AMEC, and SGL Carbon SE settled in February 2018, with all legal actions dismissed or withdrawn.[102]

Antitrust Investigation in Process

Tight supply and soaring demand for DRAM chips are contributing to price increases, squeezing the profit margins of Chinese smartphone and computer manufacturers that have to purchase these chips from foreign companies.[103] In December 2017, China's National Development and Reform Commission (NDRC)—China's industrial policymaking body—began investigating price fixing allegations against foreign DRAM chip producers.[104] In May 2018, officials from China's State Administration for Market Regulation—China's antimonopoly and antitrust body—visited China sales offices of Micron, Samsung Electronics, and SK Hynix.[105]

China is not the only government concerned with the sudden jump in prices.[106] On April 27, 2018, a class-action lawsuit was filed against Micron and other DRAM suppliers in the U.S. District Court for the Northern District of California for price fixing DRAM products from June 1, 2016 to February 1, 2018; two similar cases were filed in Montreal and Toronto, Canada.[107] However, unlike the U.S. and Canadian governments, Chinese officials are leveraging antitrust investigations to negotiate for lower prices. According to South Korean government officials, when Chinese government officials met with Samsung and SK Hynix in May, they requested both companies cut the prices of DRAM chips for their Chinese customers.[108] It is unclear whether Chinese officials made the same request to Micron.

China previously pursued antitrust cases against other U.S. technology firms, including Qualcomm, InterDigital, Microsoft, Dolby, and HDMI.[109] For example, in February 2015, the NDRC fined Qualcomm—then the world's largest producer of smartphone chips—$975 million for allegedly using its dominant market share to overcharge Chinese telecommunications firms for its patent royalties.[110] In addition to paying the fine, Qualcomm agreed to offer 3G and 4G licenses at a lower price in China than Qualcomm's normal wholesale figure.[111]

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