

U.S.-China Economic and Security Review Commission

Economics and Trade Bulletin



March 6, 2019

Highlights of This Month's Edition

- **Bilateral trade:** In 2018, the U.S. goods trade deficit with China grew 11.6 percent year-on-year to \$419 billion due to a 7.4 percent drop in exports to China, while U.S. imports from China grew 6.7 percent to reach a record \$539.5 billion.
- **Bilateral policy issues:** U.S.-China trade negotiations continue as the March 1 deadline for tariff increases is delayed until further notice; Huawei's troubles compound as the U.S. Department of Justice charges the company with violating U.S.-Iran sanctions and stealing trade secrets; countries around the world weigh Huawei's 5G participation, some push back on U.S. warning of security concerns.
- **Policy trends in China's economy:** The long-awaited Greater Bay Area Plan, an ambitious blueprint to integrate nine cities in Guangdong Province with Hong Kong and Macau, sets the goal of rivalling Silicon Valley against high barriers to coordination.
- **Sector focus – Digital Services:** With over 800 million internet users, the Chinese digital services market is growing quickly, creating lucrative opportunities for digital services providers in industries such as cloud computing, digital content, and e-commerce. However, U.S. and other foreign digital services companies face significant regulatory obstacles and strong domestic competition.

Contents

Bilateral Trade	2
In 2018, U.S. Goods Exports Drop, and Deficit up to a Record \$419 Billion	2
Top Three U.S. Export Categories to China Account for Half of Total	3
Advanced Technology Products Deficit Holds Steady	4
Bilateral Policy Issues	5
U.S.-China Trade Negotiations Continue as March 1 Tariff Deadline Is Postponed	5
U.S. Department of Justice Indicts Huawei for Violating Iran Sanctions IP Theft	5
Huawei Faces International Scrutiny	6
Policy Trends in China's Economy	7
Greater Bay Area Plan Aims to Rival Silicon Valley by 2035	7
Sector Focus: Digital Services	9
Cloud Computing	9
Digital Content	11
E-Commerce	11

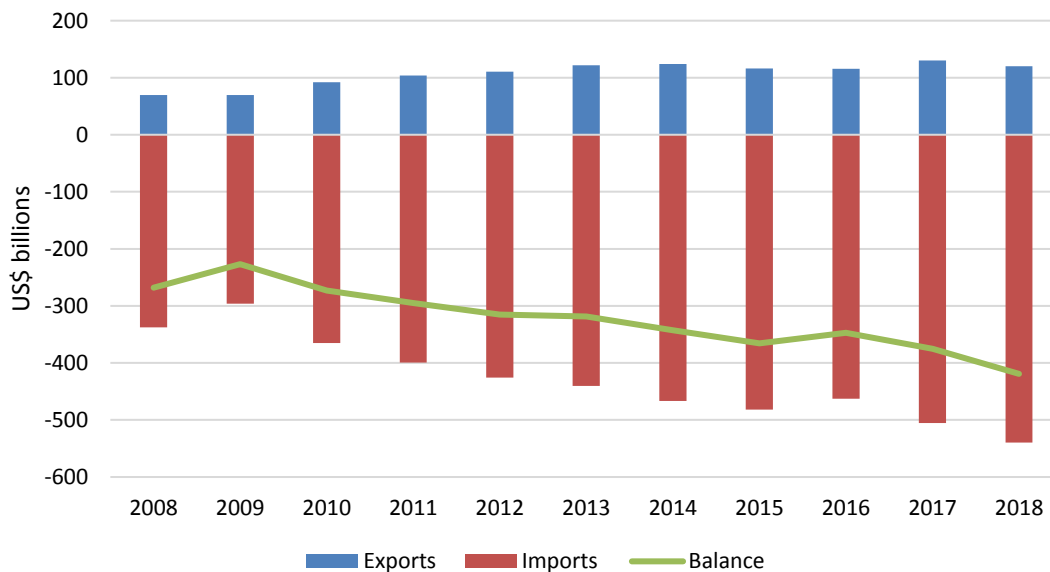
This issue of the Economics and Trade Bulletin was prepared by Nargiza Salidjanova, Lauren Dudley, Charles Horne, Michelle Ker, Sean O'Connor, and Suzanna Stephens. For inquiries, please contact us at contact@uscc.gov.

Bilateral Trade

In 2018, U.S. Goods Exports Drop, and Deficit up to a Record \$419 Billion

In 2018, the U.S. deficit with China reached \$419 billion, up 11.6 percent over 2017, as U.S. exports to China fell by 7.4 percent to \$120.3 billion and U.S. imports from China grew by 6.7 percent to a record \$539.5 billion (see Figure 1).

Figure 1: Annual Goods Trade with China, 2008—2018

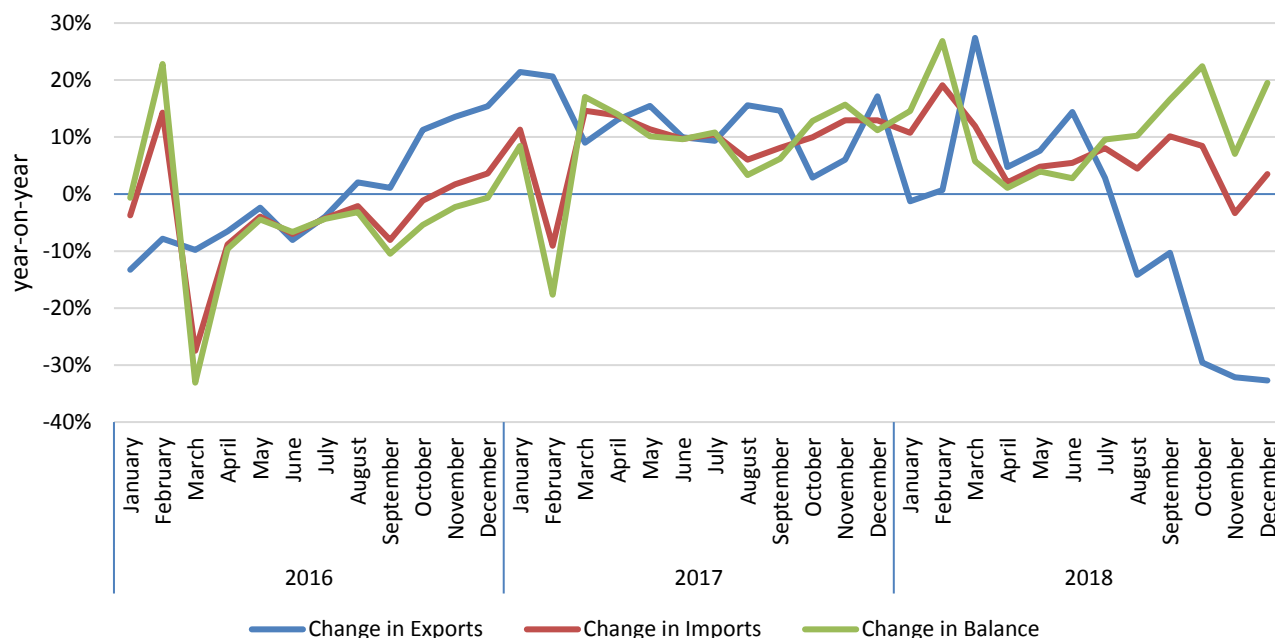


Source: U.S. Census Bureau, Trade in Goods with China, March 6, 2019. <https://www.census.gov/foreign-trade/balance/c5700.html>.

In 2018, the periods from January to March and April to July stand out for a higher volume of trade between both countries. Between January and March, U.S. gross monthly exports to China rose from \$9.8 billion to \$12.4 billion, with monthly exports in February representing a 27 percent increase year-on-year. Similarly, gross monthly U.S. imports from China picked up between April and May of 2018 (from \$38.2 billion in April to \$43.8 billion in May (see Figure 2). U.S. exports to China increased year-on-year during the same period. These trends may be due to higher import volumes ahead of the imposition of tariffs on July 6, 2018.¹

In the second half of 2018, however, monthly U.S. exports fell precipitously, clearly visible in year-on-year change in monthly U.S. exports to China (see Figure 2). While U.S. exports to China in July 2018 were nearly unchanged from July 2017, this was followed by a sustained decline, particularly in the last three months of 2018. Exports dropped by about 30 percent year-on-year in October, 32 percent in November, and 33 percent in December.

Figure 2: Monthly Goods Trade with China, Year-on-Year Change, January 2016 – December 2018



Source: U.S. Census Bureau, Trade in Goods with China, March 6, 2019. <https://www.census.gov/foreign-trade/balance/c5700.html>.

Top Three U.S. Export Categories to China Account for Half of Total

The top three U.S. products exported to China accounted for slightly over half (51.5 percent) of all U.S. goods exports to China in 2018. In 2018, the top U.S. export product category to China, transportation equipment, accounted for nearly a quarter (\$27.8 billion, or 23 percent) of total U.S. exports to China. Together, computer and electronic products and chemicals made up another 28 percent (14.9 percent and 13.5 percent respectively). All other product categories accounted for less than 10 percent of total U.S. goods exports to China.

This concentration of U.S. exports in three categories was accompanied by a substantial drop in agricultural exports to China in 2018. Agricultural products, which had comprised the third largest U.S. export category to China in 2017, fell from \$15.9 billion in 2017 (12 percent of all U.S. goods exported to China in 2017) to \$5.9 billion by the end of 2018 (4.9 percent of all U.S. goods exported to China in 2018), a drop of 63 percent year-on-year. The decline looks set to continue: U.S. Department of Agriculture Chief Economist Robert Johansson reported that in fiscal year 2019, U.S. agricultural exports are forecast to fall \$1.9 billion from 2018, with only a 6 percent share of U.S. agricultural exports heading to China.² According to the U.S. Department of Agriculture, China had been the largest or second largest export market for U.S. agricultural products since 2010.*

* According to the U.S. Department of Agriculture, China was the fourth largest market for U.S. agricultural exports in the fiscal year of 2008 at \$11.2 billion, the fourth largest in 2009 at \$11.1 billion, the second largest in 2010 at \$15.0 billion, the largest in 2011 at \$19.9 billion, the largest in 2012 at \$23.4 billion, the largest in 2013 at \$23.4 billion, the largest in 2014 at \$25.7 billion, the largest in 2015 at \$22.6 billion, the second largest in 2016 at \$19.2 billion, and the largest in 2017 at \$21.8 billion. Bryce Cooke and Hui Jiang, “Outlook for U.S. Agricultural Trade,” U.S. Department of Agriculture, November 29, 2018, 9. <https://downloads.usda.library.cornell.edu/usda-esmis/files/6m311p28w/6969z408j/8g84mq92s/AES106.pdf>; “Outlook for U.S. Agricultural Trade,” U.S. Department of Agriculture, November 30, 2016, 9. <https://downloads.usda.library.cornell.edu/usda-esmis/files/6m311p28w/f4752h44n/ks65hc84c/AES-11-30-2016.pdf>; “Outlook for U.S. Agricultural Trade,” U.S. Department of Agriculture, December 2, 2013, 7. <https://downloads.usda.library.cornell.edu/usda-esmis/files/6m311p28w/n870zr46x/6t053g726/AES-12-02-2013.pdf>; “Outlook for U.S. Agricultural Trade,” U.S. Department of Agriculture, November 30, 2010, 9. <https://downloads.usda.library.cornell.edu/usda-esmis/files/6m311p28w/2z10wq78t/0c483k04d/AES-11-30-2010.pdf>.

Table 1: U.S. Trade with China: Top Five Exports and Imports, 2018
(US\$ millions)

U.S. Top-Five Exports to China				U.S. Top-Five Imports from China			
	Exports (in US\$ millions)	Share of total (%)	Change over Q4'17 (%)		Imports (in US\$ millions)	Share of total (%)	Change over Q4'17 (%)
<i>Quarter 4 (Oct-Dec'18)</i>				<i>Quarter 4 (Oct-Dec'18)</i>			
Transportation Equipment	\$7,363	27.3%	-10.2%	Computer & Electronic Products	\$50,421	34.8%	-11.8%
Computer & Electronic Products	\$4,866	18.0%	6.3%	Electrical Equipment, Appliances & Components	\$13,644	9.4%	16.3%
Chemicals	\$3,750	13.9%	-11.9%	Miscellaneous Manufactured Commodities	\$13,165	9.1%	6.2%
Machinery, Except Electrical	\$2,509	9.3%	-1.1%	Machinery, Except Electrical	\$9,509	6.6%	9.0%
Miscellaneous Manufactured Commodities	\$898	3.3%	8.2%	Apparel and Accessories	\$7,654	5.3%	6.8%
Other	\$7,592	28.1%		Other	\$50,378	34.8%	
Total	\$26,978	100.0%		Total	\$144,772	100.0%	
<i>2018 Year-to-Date</i>				<i>2018 Year-to-Date</i>			
Transportation Equipment	\$27,834	23.1%		Computer and Electronic Products	\$186,452	34.6%	
Computer & Electronic Products	\$17,940	14.9%		Electrical Equipment, Appliances, and Component	\$49,912	9.3%	
Chemicals	\$16,218	13.5%		Miscellaneous Manufactured Commodities	\$43,962	8.1%	
Machinery, Except Electrical	\$11,093	9.2%		Machinery, Except Electrical	\$38,739	7.2%	
Oil and Gas	\$7,101	5.9%		Apparel and Accessories	\$29,845	5.5%	
Other	\$40,156	33.4%		Other	\$190,593	35.3%	
Total	\$120,341	100.0%		Total	\$539,503	100.0%	

Source: U.S. Census Bureau, USA Trade Online, March 6, 2019. <https://usatrade.census.gov/>.

Advanced Technology Products Deficit Holds Steady

The U.S. trade deficit in advanced technology products (ATP) stood at \$134.6 billion at the end of 2018, a reduction of 0.6 percent over 2017. Both U.S. and Chinese ATP exports are heavily skewed towards specific industries. In 2018, the largest U.S. ATP exporting industry to China, aerospace, stood at about \$18.3 billion and comprised 47 percent of total U.S. ATP exports to China. U.S. imports of information and communications products comprised over 90 percent of all U.S. ATP imports from China, or \$157.1 billion of \$173.8 billion. Imports from this industry remain the largest contributor to the U.S. deficit in ATP products with China.

Table 2: ATP Trade through December 2018
(US\$ millions)

Quarter 4	Quarterly					Cumulative year-to-date			
	Exports	Imports	Balance Q4'2018	Balance Q4'2017	Balance YOY	Exports	Imports	Balance 2018	Balance 2017
TOTAL	\$10,934	\$46,847	-\$35,912	-\$43,479	-17.4%	\$39,141	\$173,774	-\$134,633	-\$135,473
(01) Biotechnology	\$361	\$61	\$300	\$206	45.9%	\$1,074	\$266	\$808	\$769
(02) Life Science	\$937	\$635	\$302	\$394	-23.4%	\$3,865	\$2,639	\$1,226	\$1,116
(03) Opto-Electronics	\$172	\$2,128	-\$1,957	-\$1,768	10.7%	\$748	\$5,391	-\$4,643	-\$4,705
(04) Information & Communications	\$997	\$42,261	-\$41,264	-\$47,912	-13.9%	\$3,988	\$157,118	-\$153,130	-\$151,089
(05) Electronics	\$2,131	\$971	\$1,160	\$514	125.5%	\$6,932	\$5,129	\$1,803	\$1,617
(06) Flexible Manufacturing	\$672	\$350	\$321	\$452	-28.9%	\$3,890	\$1,448	\$2,442	\$1,607
(07) Advanced Materials	\$63	\$91	-\$28	-\$37	-24.9%	\$272	\$426	-\$154	-\$133
(08) Aerospace	\$5,572	\$291	\$5,281	\$4,718	11.9%	\$18,271	\$1,150	\$17,121	\$15,276
(09) Weapons	\$1	\$43	-\$42	-\$43	-2.2%	\$4	\$140	-\$136	-\$134
(10) Nuclear Technology	\$30	\$16	\$14	-\$2	-670.0%	\$97	\$67	\$30	\$203

Bilateral Policy Issues

U.S.-China Trade Negotiations Continue as March 1 Tariff Deadline Is Postponed

U.S. and Chinese negotiators are reportedly finalizing a trade agreement following months of negotiations between the two governments.³ However, there are differing views within the Trump Administration on how close a deal is. On February 28, President Donald J. Trump stated, “We are well on our way to doing something special” with China but that the United States could still “walk from a deal.”⁴ The previous day, U.S. Trade Representative Robert Lighthizer testified before the House Ways and Means Committee that negotiations were making “real progress,” but that there was still more work to be done.⁵ Ambassador Lighthizer told the Committee:

If we can complete this effort—and again I say “if”—and can reach a satisfactory solution to the all-important outstanding issue of enforceability as well as some other concerns, we might be able to have an agreement that helps us turn a corner in our economic relationship with China.⁶

In one sign that negotiations have been making progress, the Trump Administration postponed until further notice the increase of tariffs from 10 percent to 25 percent on \$200 billion worth of Chinese imports. The tariffs were originally set to increase automatically on March 1.⁷ The United States is also reportedly seeking to organize a summit between President Trump and Chinese President and General Secretary of the Chinese Communist Party Xi Jinping in March to sign the final agreement.⁸

Although little is known about what a final agreement could contain, experts and officials familiar with the negotiations suggest the agreement could include as many as six different agreements focused on key structural challenges: forced technology transfer and cyber theft, intellectual property (IP) rights, services, currency, agriculture, and nontariff barriers to trade.⁹ Potential Chinese commitments under the deal are reported to include (1) increasing Chinese purchases of U.S. goods to shrink the U.S. trade deficit (Beijing is reported to have offered to increase purchases of U.S. goods by \$1.2 trillion over the next six years); (2) cutting Chinese subsidies on state-owned companies; and (3) disclosing when China’s central bank intervenes in currency markets.¹⁰

In a development that could give the United States additional leverage in negotiations, on February 28 a World Trade Organization (WTO) panel ruled China had gone beyond WTO limits in subsidizing wheat and rice producers between 2012 and 2015.¹¹ Although the WTO panel sided with the United States in the case, Beijing can still appeal the decision.

U.S. Department of Justice Indicts Huawei for Violating Iran Sanctions IP Theft

On January 28, 2019, the U.S. Department of Justice announced sweeping charges against Chinese telecommunications giant Huawei, accusing the company and its affiliates of stealing trade secrets and violating Iran sanctions. The nearly two dozen charges were filed in two separate indictments.¹²

In the first indictment, Washington State authorities charged Huawei with conspiracy and attempt to commit trade secret theft, wire fraud, and obstruction of justice.¹³ The investigation stemmed from a civil suit brought by T-Mobile in 2014 alleging that in 2012 and 2013 Huawei stole designs and parts of T-Mobile’s smartphone testing robot nicknamed “Tappy,” back when the Huawei supplied phones for T-Mobile.¹⁴ The indictment alleges Huawei directed its employees to take protected information about Tappy without permission and steal the robot’s arm in order for Huawei engineers in China to replicate it.¹⁵ During the investigation, the Federal Bureau of Investigation (FBI) obtained emails revealing the attempted theft was part of a company-wide effort in which Huawei offered bonuses to employees based on the value of confidential information they stole from foreign companies.¹⁶

The second indictment filed in New York City charged Huawei, Huawei’s chief financial officer Meng Wanzhou, and two of Huawei’s affiliates—Huawei USA and Skycom—with financial fraud, money laundering, conspiracy to defraud the United States, obstruction of justice, and violating U.S. sanctions on Iran.¹⁷ According to the indictment, Huawei had a long-running scheme to deceive the U.S. government and various global financial institutions about Huawei’s business activities in Iran. The indictment alleges that beginning in 2007, Huawei

employees misled Huawei's banking partners about the company's relationship with Skycom, a Hong Kong firm that was selling U.S. goods to Iran in violation of U.S. sanctions, by falsely claiming that it was not a Huawei subsidiary.¹⁸ In particular, Ms. Meng allegedly lied about Huawei's relationship with Skycom during a 2013 presentation to an executive of one of Huawei's major banking partners.¹⁹ U.S. laws prohibit banks from processing U.S.-dollar transactions involving Iran through the United States.²⁰ In December 2018, Ms. Meng was arrested in Canada and is awaiting extradition to the United States.²¹

At a news conference announcing the charges, FBI Director Christopher Wray said, "Companies like Huawei pose a dual threat to both our economic and national security."²² Huawei has been largely blocked from the U.S. telecommunications equipment market due to concerns the company could build "back doors" into its products to enable the Chinese government to spy on U.S. citizens.²³ The National Defense Authorization Act for Fiscal Year 2019, passed in August 2018, includes provisions prohibiting U.S. government agencies from using certain telecommunications and surveillance services or equipment from several Chinese companies, including Huawei and ZTE.²⁴ In April 2018, the U.S. Federal Communications Commission proposed a rule that would prohibit U.S. telecommunications carriers from using federal funds to purchase equipment or services from "suppliers that pose a national security threat to the integrity of communication networks or the communications supply chain."²⁵

On February 25, 2019, a bipartisan group of 11 senators wrote U.S. Department of Energy Secretary Rick Perry and U.S. Department of Homeland Security Kirstjen Nielsen to express their concern over the national security threat Huawei-made solar inverters * pose to U.S. electrical systems and infrastructure and to urge the Administration to consider a ban on the use of Huawei inverters in the United States.²⁶ In response, Secretary Nielsen released a statement saying: "Supply chain risk management is one of the Department's top priorities. We are particularly concerned about risks posed by companies beholden to the intelligence and military services of nations with values and interests contrary to those of the U.S. and our allies."²⁷

Huawei Faces International Scrutiny

Even without access to the U.S. market, Huawei remains the largest maker of telecom equipment and second-largest smartphone company worldwide after Samsung.[†]²⁸ However, the company is under increasing scrutiny around the world as countries, including Australia, Japan, and the United Kingdom, are rethinking their relationships with the company over the national security concerns posed by its close ties to the Chinese government.²⁹ At the same time, many U.S. allies disagree are pushing back against an outright ban.³⁰

Huawei is positioning itself as global leader in 5G, the next generation of wireless communications.[‡] Meanwhile, the U.S. government is trying to persuade its allies and partners not to allow Huawei to build their 5G networks. In February 2019, U.S. Secretary of State Mike Pompeo warned the United States would not be able to partner with or share information with countries that use Huawei technology in their information technology system, stating, "We're not going to put American information at risk."³¹ U.S. allies and partners are considering whether to impose a ban on the use of Huawei's 5G equipment or work to mitigate the risks.³²

* Solar inverters are considered the brain of solar electric power systems. Their basic function is to convert the direct current generated by the solar panel into alternating currents required by the grid, and solar inverters enable the rapid expansion of residential and utility scale energy generation. Huawei is the world's largest manufacturer of solar inverters. *Letter from Members of Congress to Secretary Rick Perry and Secretary Kirstjen Nielsen*, February 25, 2019.

<https://www.cornyn.senate.gov/sites/default/files/PerryNielsen%20Letter%20re.%20Grid%20Security.pdf>; Kathie Zipp, "What Is a Solar Inverter and How Does It Work?" *Solar Power World*, April 18, 2013. <https://www.solarpowerworldonline.com/2013/04/how-do-solar-inverters-work/>.

† At the end of 2018, Huawei's share of the global telecommunications equipment market reached 28 percent and its share of the global smartphone market was about 15 percent. Adam Satariano, "Huawei's Plight Hangs over Wireless Industry Showcase," *New York Times*, February 22, 2019; Ryan Browne, "Samsung and Apple Are Losing Ground to Huawei Because Their Phones Are Too Expensive, Research Shows," *CNBC*, February 21, 2019. <https://www.cnbc.com/2019/02/21/huawei-takes-market-share-from-apple-iphone-samsung-galaxy-gartner.html>.

‡ For more on China's pursuit of 5G development and implications for U.S. economic competitiveness and national security, see U.S.-China Economic and Security Review Commission, Chapter 4, Section 1, "Next Generation Connectivity," in *2018 Annual Report to Congress*, November 2018, 441–468.

- *Australia*: In August 2018, the Australian government effectively banned Huawei from providing 5G technology, noting in a statement that Australian carriers may be restricted from buying equipment from “vendors who are likely to be subject to extrajudicial directions from a foreign government that conflict with Australian law.”³³
- *Germany*: The German government has not yet reached a decision on whether to let Huawei participate in building the country’s 5G network.³⁴ However, in February 2019, a spokesperson for Germany’s Federal Interior Ministry said, “A direct exclusion of a particular 5G manufacturer is currently not legally possible and not planned. For [Germany’s Federal Interior Ministry], the focus is on adapting the necessary security requirements so that the security of these networks will be guaranteed even if there are potentially untrustworthy manufacturers on the market.”³⁵
- *Japan*: In December 2018, Japan effectively banned government purchases of equipment from Huawei and other Chinese companies with the release of new public procurement guidelines for telecoms equipment.³⁶ Following the release of the new guidelines, Japan’s four mobile phone carriers announced they would not use Chinese equipment in their 5G networks.³⁷

Policy Trends in China’s Economy

Greater Bay Area Plan Aims to Rival Silicon Valley by 2035

A year and a half after President Xi mentioned the Guangdong-Hong Kong-Macao Greater Bay Area (GBA) in a work report, the Chinese People’s Political Consultative Conference (CPPCC) released the GBA Plan on February 18, 2019.³⁸ The document lays out lofty goals, pledging to integrate Hong Kong and Macau Special Administrative Regions (SARs) with nine cities in Guangdong, including Shenzhen and Guangzhou, and in so doing create an innovation hub rivaling Silicon Valley, convert the Pearl River Delta’s manufacturing hinterland into highly automated factories, and serve as the logistics hub connecting the Mainland to countries in the Belt and Road Initiative (BRI).³⁹ In the eyes of many in Hong Kong and the Mainland, the plan also sends a sharp political message to Hong Kong: the future is in economic integration with the Mainland.⁴⁰

Coordination between the SARs, China’s central government, and the provincial and city-level governments will likely delay rollout. Still, early progress in streamlining customs between Hong Kong and the Mainland may present arbitrage opportunities, particularly for Chinese firms looking to sidestep sanctions. In the longer term, even partial success in the GBA Plan could strengthen Shenzhen’s competitive challenge to Silicon Valley.

Plan Contents and Early Implementation

The economic logic of the plan is straightforward: Hong Kong’s strong financial institutions and robust legal system can support international expansion of Shenzhen’s vibrant technology sector and also guide international investment flowing into Guangdong; Hong Kong’s world-class universities can provide human capital to realize China’s various industrial goals, foremost upgrading the Pearl River Delta’s manufacturing base. Meanwhile, Hong Kong’s logistics capacity can serve high trade volumes from the Delta’s retooled factories and between the Mainland and BRI countries.⁴¹ In turn, greater opportunities and mobility in the GBA can lift Hong Kong out of economic stagnation and give its citizens an affordable alternative to the city’s soaring real estate prices.*⁴²

For now, the GBA Plan provides a high-level outline and leaves more detailed and prescriptive aspects of creating a unified regional economy to be defined by 2022, with full implementation to be realized by 2035.⁴³ However, both China and the two SARs have already launched several high-profile infrastructure connectivity initiatives under the umbrella of the plan: last year, a costly bridge connecting Hong Kong, Macau, and Zhuhai, and a high-

* Although Hong Kong has not gone into recession, its economic growth, which is highly dependent on the Mainland, has faltered in recent years as retail, tourism, and transport have declined with fewer mainland visitors. A study by the Bauhinia Foundation, a local think tank, found that Hong Kong natives reported stagnating quality of life even when economic growth was stronger between 2000 and 2015, largely due to rapidly rising property costs. Ben Bland, “Hong Kong: One Country, Two Economies,” *Financial Times*, July 19, 2016. <https://www.ft.com/content/eb0e795a-3d17-11e6-9f2c-36b487ebd80a>; Bauhinia Foundation, “Bauhinia Well-Being Index (BWI),” October 18, 2016. <http://www.bauhinia.org/index.php/english/research/79>.

speed rail system connecting Hong Kong and Shenzhen to Guangdong were opened;⁴⁴ a major highway reducing travel time between the two sides of the Pearl River Delta is slated for completion in 2024;⁴⁵ and Shenzhen and Hong Kong are jointly working on a technology park that would allow Shenzhen companies international access to talent and capital through Hong Kong.⁴⁶

Less visible than infrastructure projects, Hong Kong, the Guangdong government, and the central government have all enacted policies encouraging the integration of professional services markets and lowering barriers to the flow of people and goods.⁴⁷ Aside from trade liberalization and shared customs clearance, various measures allow professional designations to be mutually recognized between jurisdictions and increase the ease of allocating revenue between firms in Hong Kong and the Mainland.⁴⁸

Long-Term Outlook: Multi-Level Coordination Challenges

These initial steps toward administrative integration are low-hanging fruit, however. Both Chinese and foreign analysts are skeptical that overcoming more substantive differences between the three legal systems, business environments, and public service systems of Hong Kong, Macao, and the Mainland will be as easy as the plan suggests.⁴⁹ Chinese officials acknowledged these difficulties at a press conference on February 28, 2019, but indicated they were still discussing how to address them.⁵⁰

Even within the Mainland, sharp divergence between the policy objectives of city governments versus the provincial and central government suggests coordination between different mainland governments may be as much of a stumbling block as institutional integration between the Mainland and the two SARs. Where initial national and provincial policy has primarily focused on practical steps to improve commerce, mainland cities in the GBA are mostly pursuing top-down industrial and innovation planning in competition with each other.⁵¹ Ding Li, a researcher at Guangdong Academy of Social Sciences who advised drafting of the GBA Plan, expressed pessimism the plan would succeed without mainland cities finding a common interest to unite their efforts, noting China's fiscal system discourages cooperation between city officials.⁵²

Implications for the United States

While coordination challenges will likely delay the comprehensive integration envisioned in the GBA Plan, initial steps to ease the flow of goods and capital could present arbitrage opportunities for both mainland and Hong Kong firms. Mainland firms looking to skirt trade enforcement measures on mainland companies imposed by China's trading partners could relocate final assembly to Hong Kong.⁵³ Lower barriers to the flow of capital may also increase global financial risk and exposure to financial instability in China, particularly as mainland firms may seek to exploit Hong Kong's comparatively hands-off securities regulation and slow response to regulatory arbitrage.*

In the longer term, full or even partial success of the GBA Plan could pose challenges to the competitiveness of the United States. If the Greater Bay Area succeeds in lifting the transparency and market orientation of mainland firms, improving the legal environment, and removing barriers for foreign investment, Shenzhen and other cities in Guangdong could become much more attractive destinations for startups looking to take advantage of Shenzhen's technology prowess and the region's manufacturing capabilities.⁵⁴

* In the past few years, mainland firms have sought "backdoor listings" by acquiring shell companies listed in Hong Kong and injecting assets into them, allowing them to become public while skirting both the more rigorous review required to list in Hong Kong and the Mainland's more active securities enforcement. Chinese firms used a similar technique on U.S. exchanges in the 2000s that was closed off by the New York Stock Exchange and Nasdaq in 2011; the Hong Kong Securities and Futures Commission has been slow to close this loophole. Peter Guy, "Integrity of Hong Kong's Main Board and GEM Threatened by Wholesale Regulatory Arbitrage," *South China Morning Post*, July 20, 2018. <https://www.scmp.com/business/article/1920094/integrity-hong-kongs-main-board-and-gem-threatened-wholesale-regulatory>; U.S.-China Economic and Security Review Commission, *Hearing on Risks, Rewards, and Results: U.S. Companies in China and Chinese Companies in the United States*, written testimony of Paul Gillis, February 28, 2019.

Sector Focus: Digital Services

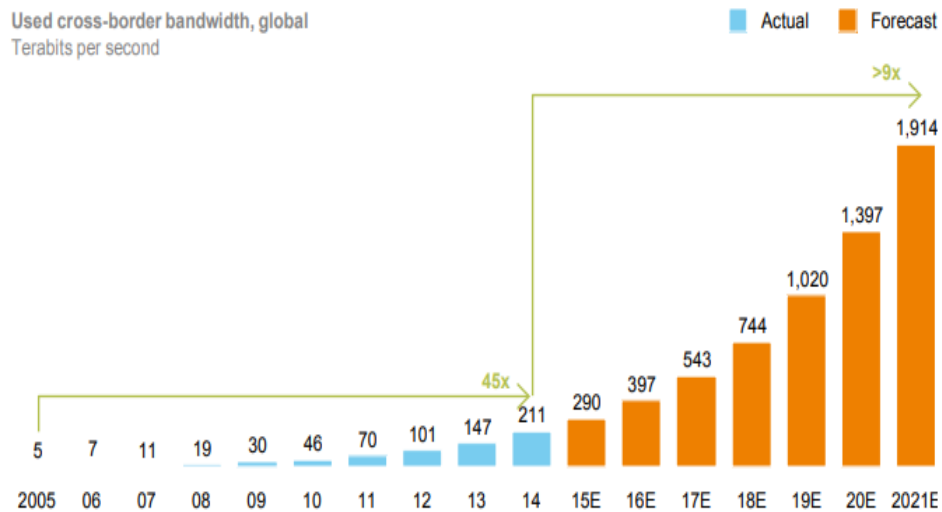
On January 25, 2019, China joined the WTO e-commerce initiative created to establish rules facilitating digital trade.⁵⁵ A multilateral negotiation on global digital trade rules seems to run contrary to China’s adherence to “cyber sovereignty,” where each country exercises control over the internet within its own borders.⁵⁶ Prior to joining the initiative, China voiced concern over the language advocating a “high standard” agreement, suggesting China is not fully committed and may use its call for “full respect [...] to the reasonable requests of developing members” to allow self-designated “developing countries” exemptions to the high standards.⁵⁷

One major aspect expected to be covered at the WTO discussions is how to define “digital trade.” While there is no globally accepted definition of digital trade, the U.S. International Trade Commission (ITC) defines it as:

*The delivery of products and services over the Internet by firms in any industry sector, and of associated products such as smartphones and Internet-connected sensors. While it includes provision of e-commerce platforms and related services, it excludes the value of sales of physical goods ordered online, as well as physical goods that have a digital counterpart (such as books, movies, music, and software sold on CDs or DVDs).*⁵⁸

The McKinsey Global Institute estimates that since 2014, digital trade has contributed a larger share of global gross domestic product (GDP) growth than trade in goods.⁵⁹ As China’s middle class grows and global cross-border bandwidth expands, there will be greater infrastructure, service speed, and demand in China for digital services (see Figure 3). U.S. companies operating in China will be presented with lucrative opportunities and tough challenges, particularly in the cloud computing services, digital content, and e-commerce industries.

Figure 3: Global Used Cross-Border Bandwidth
(terabits per second)



Note: Estimates are provided for 2015–2021.

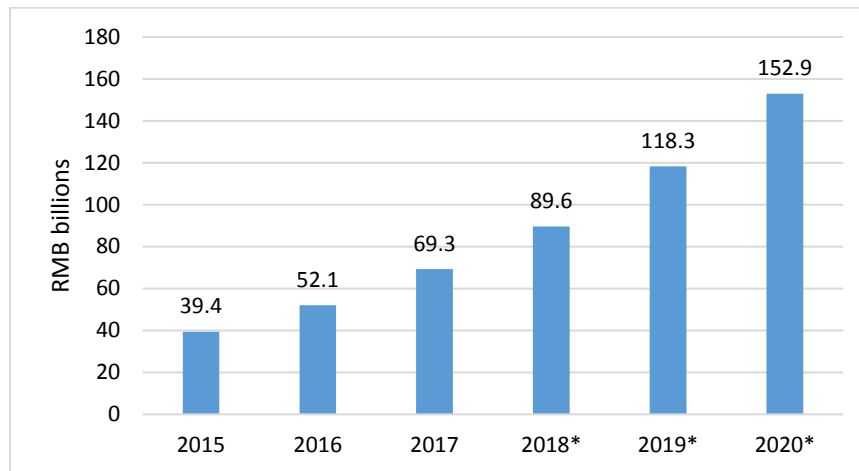
Source: James Manyika et al., “Digital Globalization: The New Era of Globalization,” *McKinsey Global Institute*, February 2016.

Cloud Computing

U.S. companies hope to benefit from future opportunities in the growing Chinese cloud computing market (see Figure 4), but face significant regulatory obstacles. The Chinese cloud computing market was second in terms of size behind that of the United States in 2018, accruing renminbi (RMB) 89.6 billion (approximately \$13.4 billion) in annual revenues compared to \$53.4 billion in the United States.⁶⁰ But the Chinese government is dedicated to pushing the market to approximately \$64 billion by 2020, creating major business opportunities for cloud computing providers.⁶¹

Chinese businesses are beginning to ramp up investment in cloud computing, but they use cloud computing services at a lower rate than companies in the United States and other developed markets.⁶² While Chinese companies generally prefer the private cloud (i.e., data is stored on a company’s intranet), rather than the public cloud (i.e., data is stored by the provider), China’s public cloud market is set to grow over 20 percent by 2020 as more Chinese companies adopt public cloud services.⁶³

Figure 4: Annual Revenue of the Cloud Computing Services Market in China



Note: Estimates are provided for 2018–2020.

Source: iResearch via Statista.

U.S. cloud computing providers can help increase China’s cloud-usage rate by providing highly secure public cloud services; however, foreign firms face protectionist, market-distorting policies. Moreover, close relationships between the Chinese government and domestic competitors disadvantage foreign companies.

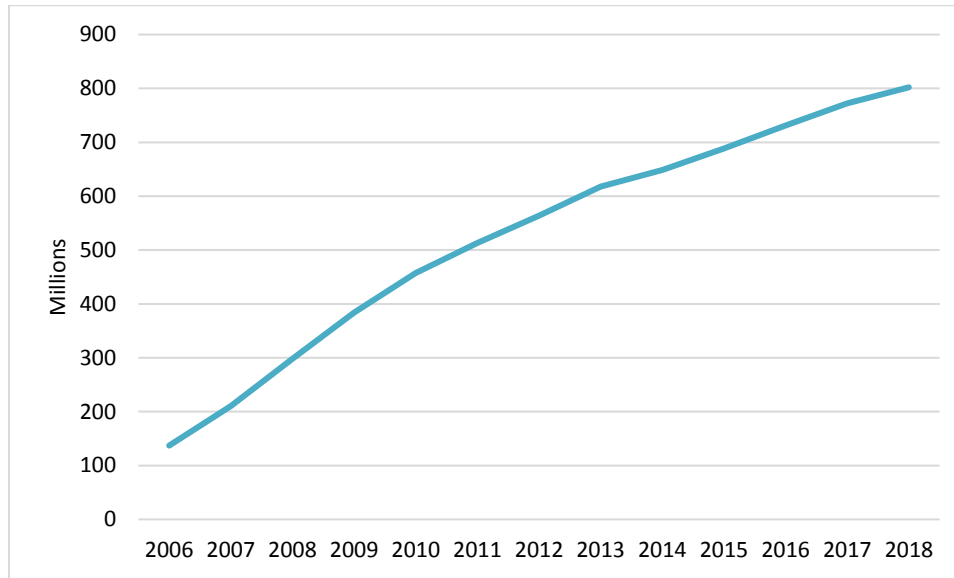
In China, cloud computing is classified as a “value-added telecom service” (VATS), which subjects cloud computing providers to extra regulatory, licensing, and ownership restrictions.⁶⁴ While applicable to both foreign and domestic companies, the licensing approval process has disproportionately benefitted domestic cloud providers, which received 29,000 licenses between 2013 and 2017 compared to only 31 licenses for foreign companies.⁶⁵ Furthermore, foreign companies are required to form joint ventures with domestic partners holding at least 50 percent shareholding power, which raises the risk of technology transfer or IP theft.⁶⁶ These market restrictions have prevented U.S. and other foreign cloud providers from gaining a meaningful share of the Chinese market. In 2017, the top players in China’s cloud computing market were Alibaba Cloud, China Telecom, Tencent Cloud, Amazon Web Services (AWS)/Sinnet, and Huawei. Despite having strong control of 33 percent of the global market, AWS, through its joint venture with Sinnet, held only 10 percent of the Chinese market in 2017 due to discriminatory formulation and application of Chinese regulations.⁶⁷

Through industrial policy planning, the Chinese government actively promotes the growth and development of Chinese cloud computing providers, creating market distortions that negatively impact U.S. companies. In the Three-Year Action Plan for Cloud Computing Development (2017–2019), the Chinese government calls for increased loan offerings to domestic cloud computing providers. In doing so, the Chinese government hopes the Chinese industry, led by two or three “national champions,” will be at the top of the global market by the end of 2019.⁶⁸ Beijing’s promotion of these “national champions” has created tight technical links between the Chinese government and domestic cloud companies. Lack of similar access to the Chinese government may hurt U.S. companies in areas such as regulation, bureaucratic approvals, cybersecurity, and data protection, according to industry insiders.⁶⁹

Digital Content

While U.S. companies dominate 51 percent of the Asian digital content market—an industry that includes online entertainment, search, and news—U.S. companies are facing heightened barriers in China.⁷⁰ Valued at \$228.1 billion in 2018, China’s media and entertainment market was the second largest in the world (around 20 percent of the global market) trailing only the United States (\$678.4 billion).⁷¹ With over 800 million internet users (see Figure 5), China is becoming one of the world’s largest markets for digital content.⁷² The amount of time and money the average Chinese consumer spends on digital content—such as e-books, music, and video streaming—will grow by 2020, providing opportunities for companies that capture or maintain hold of the Chinese market.⁷³ While U.S. profits in the Chinese market for digital content have mostly experienced growth, U.S. companies are losing market share; for example, U.S. movies’ box office share has fallen from 45.5 percent in 2014 to around 25 percent in 2018.

Figure 5: Number of Internet Users in China, 2006–2018



Source: National Bureau of Statistics of China.

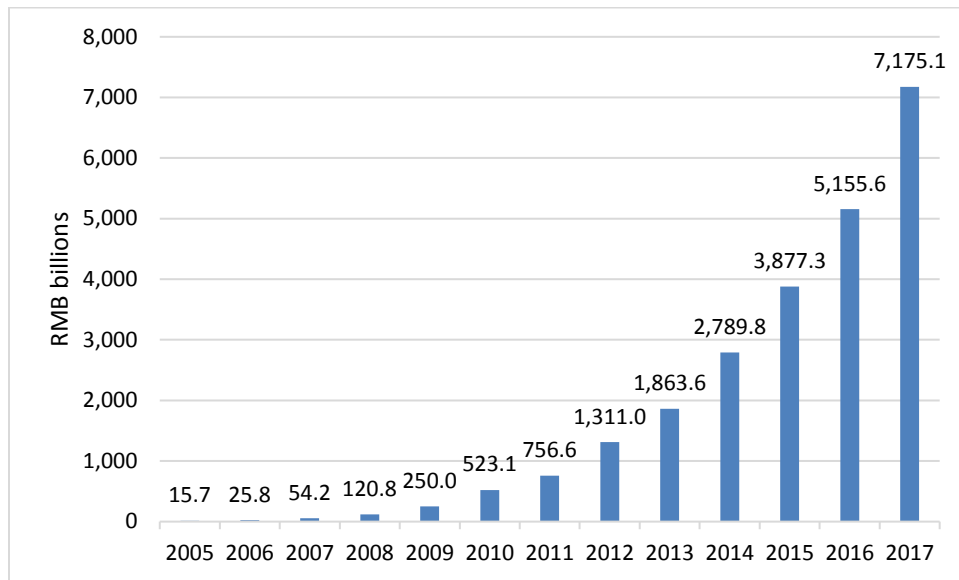
In addition to loss of market share, U.S. companies are also hurt by censorship and IP theft in China. Despite years of promises by the Chinese government to crack down on piracy, U.S. companies still complain of pirated content appearing online and diverting legitimate business, notably during the approval process, when the State Administration for Press, Publication, Radio, Film, and Television reviews and censors films released on DVDs and Blu-ray discs.⁷⁴ While the Chinese government maintains that censorship is equally applied to domestic and foreign companies, the American Chamber of Commerce in China asserts that censorship and foreign media quotas, such as those for film, are used to unfairly restrict market access for foreign media producers.⁷⁵ Censorship has restricted some of the top U.S. search, news, and social networking companies, such as Google, Facebook, Bloomberg, and the *New York Times*, from accessing the Chinese market without consumer use of a virtual private network.⁷⁶

E-Commerce

E-commerce includes the provision of e-commerce, digital payments, records, logistics, and other related services.⁷⁷ The Chinese e-commerce market is growing quickly, reaching over RMB 7 trillion (approximately \$1 trillion) in 2017, more than 46 percent of the global market (see Figure 6).⁷⁸ While by the ITC’s definition of digital trade, e-commerce does not include the revenue from the sale of physical goods, it is a large and expanding market with important implications for related industries. Chinese companies hold strong market shares relative to foreign companies in China’s e-commerce market; for example, Alibaba commands a 58.2 percent market share compared to only 0.7 percent for Amazon (the top foreign e-commerce retailer in China).⁷⁹ The wide disparity in market share

held by domestic and foreign e-commerce retailers is attributed to the difficulties faced by foreign firms trying to penetrate the market, and to Chinese consumer preferences and habits.

Figure 6: E-Commerce Sales in China, 2005–2017



Source: China Internet Network Information Center via CEIC Database.

For example, although China committed to let foreign payment providers enter its market during its WTO accession in 2000, the first such provider, American Express, was not granted entry until November 2018.⁸⁰ By the time this market opening happened, domestic companies consolidated unassailable market positions, leaving little hope that foreign financial service providers will have meaningful success in the Chinese market.⁸¹

The Chinese e-commerce ecosystem has been transformed into one dominated by mobile payments, tailored to Chinese consumer preferences. With 98 percent of China's internet user base accessing the internet through their mobile phones, China's mobile payment market has experienced substantial growth, reaching \$15.4 trillion in 2017 from just \$200 billion in 2013.⁸² The rise of the mobile payment market is linked to the integration of digital payments into mobile apps and other digital services, particularly those provided by Tencent and Alibaba.⁸³ The widespread popularity of app-based integration in China may make it difficult for foreign companies to compete given Chinese customer loyalty to these companies and the convenience these companies' apps provide.⁸⁴

While Chinese companies have been very successful in the domestic e-commerce market, they have not had nearly as much success in the U.S. e-commerce market, which is dominated by Amazon, eBay, and other U.S. retailers like Apple and Walmart.⁸⁵

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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.

Endnotes

- ¹ Katia Dmitrieva, “U.S. Trade Gap Surged to \$621 Billion in 2018, 10-Year High,” *Bloomberg*, March 6, 2019. <https://www.bloomberg.com/news/articles/2019-03-06/u-s-trade-gap-surged-to-621-billion-in-2018-highest-in-decade?smd=premium>.
- ² Doug Palmer, “USDA: China Trade War Drags Down U.S. Agricultural Export Forecast,” *Politico Pro*, February 21, 2019.
- ³ Jenny Leonard, Andrew Mayeda, and Saleha Mohsin, “U.S. Prepares Final China Trade Deal as Hawks Urge Caution,” *Bloomberg*, February 28, 2019. <https://www.bloomberg.com/news/articles/2019-02-28/u-s-said-to-ready-final-china-trade-deal-as-hawks-urge-caution>.
- ⁴ Alan Rappeport and Ana Swanson, “Trump Officials Offer Mixed Signals on Trade Deal with China,” *New York Times*, February 28, 2019. <https://www.nytimes.com/2019/02/28/us/politics/us-china-trade-deal.html>.
- ⁵ Office of the U.S. Trade Representative, *Opening Statement of USTR Robert Lighthizer to the House Ways and Means Committee*, February 27, 2019. <https://ustr.gov/about-us/policy-offices/press-office/press-releases/2019/february/opening-statement-ustr-robert>.
- ⁶ Office of the U.S. Trade Representative, *Opening Statement of USTR Robert Lighthizer to the House Ways and Means Committee*, February 27, 2019. <https://ustr.gov/about-us/policy-offices/press-office/press-releases/2019/february/opening-statement-ustr-robert>.
- ⁷ Donna Borak, “US Ditches China Tariff Hike ‘Until Further Notice,’” *CNN Business*, February 28, 2019. <https://www.cnn.com/2019/02/28/business/us-china-trade-war-tariffs/index.html>.
- ⁸ Jenny Leonard, Andrew Mayeda, and Saleha Mohsin, “U.S. Prepares Final China Trade Deal as Hawks Urge Caution,” *Bloomberg*, February 28, 2019. <https://www.bloomberg.com/news/articles/2019-02-28/u-s-said-to-ready-final-china-trade-deal-as-hawks-urge-caution>.
- ⁹ Jeff Mason, “Exclusive: U.S., China Sketch Outlines of Deal to End Trade War – Sources,” *Reuters*, February 20, 2019. <https://www.reuters.com/article/us-usa-trade-china-deal-exclusive/exclusive-u-s-china-sketch-outlines-of-deal-to-end-trade-war-sources-idUSKCN1QA07U>.
- ¹⁰ Jenny Leonard, Andrew Mayeda, and Saleha Mohsin, “U.S. Prepares Final China Trade Deal as Hawks Urge Caution,” *Bloomberg*, February 28, 2019. <https://www.bloomberg.com/news/articles/2019-02-28/u-s-said-to-ready-final-china-trade-deal-as-hawks-urge-caution>.
- ¹¹ *Associated Press*, “WTO Panel Rules in Favor of US in Chinese Farm Subsidy Case,” February 28, 2019. <https://www.apnews.com/bbef6337deb545da90dba80454097988>.
- ¹² U.S. Department of Justice, *Press Release: Chinese Telecommunications Device Manufacturer and its U.S. Affiliate Indicted for Theft of Trade Secrets, Wire Fraud, and Obstruction of Justice*, January 28, 2019. <https://www.justice.gov/opa/pr/chinese-telecommunications-device-manufacturer-and-its-us-affiliate-indicted-theft-trade>; U.S. Department of Justice, *Press Release: Chinese Telecommunications Conglomerate Huawei and Huawei CFO Wanzhou Meng Charged with Financial Fraud*, January 28, 2019. <https://www.justice.gov/opa/pr/chinese-telecommunications-conglomerate-huawei-and-huawei-cfo-wanzhou-meng-charged-financial>.
- ¹³ U.S. Department of Justice, *Press Release: Chinese Telecommunications Device Manufacturer and its U.S. Affiliate Indicted for Theft of Trade Secrets, Wire Fraud, and Obstruction of Justice*, January 28, 2019. <https://www.justice.gov/opa/pr/chinese-telecommunications-device-manufacturer-and-its-us-affiliate-indicted-theft-trade>.
- ¹⁴ U.S. Department of Justice, *Press Release: Chinese Telecommunications Device Manufacturer and its U.S. Affiliate Indicted for Theft of Trade Secrets, Wire Fraud, and Obstruction of Justice*, January 28, 2019. <https://www.justice.gov/opa/pr/chinese-telecommunications-device-manufacturer-and-its-us-affiliate-indicted-theft-trade>.
- ¹⁵ U.S. Department of Justice, *Press Release: Chinese Telecommunications Device Manufacturer and its U.S. Affiliate Indicted for Theft of Trade Secrets, Wire Fraud, and Obstruction of Justice*, January 28, 2019. <https://www.justice.gov/opa/pr/chinese-telecommunications-device-manufacturer-and-its-us-affiliate-indicted-theft-trade>.
- ¹⁶ U.S. Department of Justice, *Press Release: Chinese Telecommunications Device Manufacturer and its U.S. Affiliate Indicted for Theft of Trade Secrets, Wire Fraud, and Obstruction of Justice*, January 28, 2019. <https://www.justice.gov/opa/pr/chinese-telecommunications-device-manufacturer-and-its-us-affiliate-indicted-theft-trade>.
- ¹⁷ U.S. Department of Justice, *Press Release: Chinese Telecommunications Conglomerate Huawei and Huawei CFO Wanzhou Meng Charged with Financial Fraud*, January 28, 2019. <https://www.justice.gov/opa/pr/chinese-telecommunications-conglomerate-huawei-and-huawei-cfo-wanzhou-meng-charged-financial>.
- ¹⁸ U.S. Department of Justice, *Press Release: Chinese Telecommunications Conglomerate Huawei and Huawei CFO Wanzhou Meng Charged with Financial Fraud*, January 28, 2019. <https://www.justice.gov/opa/pr/chinese-telecommunications-conglomerate-huawei-and-huawei-cfo-wanzhou-meng-charged-financial>.
- ¹⁹ U.S. Department of Justice, *Press Release: Chinese Telecommunications Conglomerate Huawei and Huawei CFO Wanzhou Meng Charged with Financial Fraud*, January 28, 2019. <https://www.justice.gov/opa/pr/chinese-telecommunications-conglomerate-huawei-and-huawei-cfo-wanzhou-meng-charged-financial>.
- ²⁰ U.S. Department of Justice, *Press Release: Chinese Telecommunications Conglomerate Huawei and Huawei CFO Wanzhou Meng Charged with Financial Fraud*, January 28, 2019. <https://www.justice.gov/opa/pr/chinese-telecommunications-conglomerate-huawei-and-huawei-cfo-wanzhou-meng-charged-financial>.
- ²¹ Klint Finley, “Huawei’s Many Troubles: Bans, Alleged Spies, and Backdoors,” *Wired*, January 17, 2019. <https://www.wired.com/story/huaweis-many-troubles-bans-alleged-spies-backdoors/>.
- ²² U.S. Department of Justice, *Press Release: Chinese Telecommunications Conglomerate Huawei and Huawei CFO Wanzhou Meng Charged with Financial Fraud*, January 28, 2019. <https://www.justice.gov/opa/pr/chinese-telecommunications-conglomerate-huawei-and-huawei-cfo-wanzhou-meng-charged-financial>.
- ²³ Klint Finley, “Huawei’s Many Troubles: Bans, Alleged Spies, and Backdoors,” *Wired*, January 17, 2019. <https://www.wired.com/story/huaweis-many-troubles-bans-alleged-spies-backdoors/>.
- ²⁴ Wiley Rein LLP, “Important Cyber Provisions Now Law under the 2019 NDAA,” August 13, 2018. <https://www.wileyrein.com/newsroom-articles-Important-Cyber-Provisions-Now-Law-Under-the-2019-NDAA.html>.

- ²⁵ Raymond Zhong, Paul Mozur, and Jack Nicas, “Huawei and ZTE Hit Hard as U.S. Moves against Chinese Tech Firms,” *New York Times*, April 17, 2018. <https://www.nytimes.com/2018/04/17/technology/huawei-trade-war.html>; Federal Communications Commission, *Protecting against National Security Threats to the Communications Supply Chain through FCC Programs*, May 2, 2018. <https://www.federalregister.gov/documents/2018/05/02/2018-09090/protecting-against-national-security-threats-to-the-communications-supply-chain-through-fcc-programs>.
- ²⁶ *Letter from Members of Congress to Secretary Rick Perry and Secretary Kirstjen Nielsen*, February 25, 2019. <https://www.cornyn.senate.gov/sites/default/files/PerryNielsen%20Letter%20re.%20Grid%20Security.pdf>.
- ²⁷ Michael B. Farrell, “Senators Sound Alarm over Huawei Grid Threat,” *Politico*, February 25, 2019. <https://www.politico.com/newsletters/morning-cybersecurity/2019/02/25/senators-sound-alarm-over-huawei-grid-threat-522179>.
- ²⁸ Kate Lyons, “Huawei Q&A: What You Need to Know about the Chinese Phone Maker,” *Guardian*, December 6, 2018. <https://www.theguardian.com/technology/2018/dec/06/huawei-qa-what-you-need-to-know-about-the-chinese-phone-maker>.
- ²⁹ Klint Finley, “Huawei’s Many Troubles: Bans, Alleged Spies, and Backdoors,” *Wired*, January 17, 2019. <https://www.wired.com/story/huaweis-many-troubles-bans-alleged-spies-backdoors/>.
- ³⁰ “America and Its Allies Disagree on Huawei,” *Economist*, February 21, 2019. <https://www.economist.com/business/2019/02/21/america-and-its-allies-disagree-on-huawei>.
- ³¹ Susan Heavey and Makini Brice, “U.S. Won’t Partner with Countries that Use Huawei Systems: Pompeo,” *Reuters*, February 21, 2019. <https://www.reuters.com/article/us-huawei-tech-usa-pompeo-idUSKCN1QA1O6>
- ³² *Al Jazeera*, “Why Are Countries Banning Huawei?” December 7, 2018. <https://www.aljazeera.com/news/2018/12/countries-banning-huawei-181206130850129.html>.
- ³³ Klint Finley, “Australia’s Ban on Huawei Is Just More Bad News for China,” *Wired*, August 24, 2018. <https://www.wired.com/story/australias-ban-on-huawei-is-just-more-bad-news-for-china/>.
- ³⁴ *Reuters*, “Germany Still in Talks on Huawei 5G Network Role, Minister Says,” *CNBC*, February 19, 2019. <https://www.cnb.com/2019/02/19/reuters-america-update-1-germany-still-in-talks-on-huawei-5g-network-role-minister-says.html>.
- ³⁵ Chloe Taylor, “Germany Says It’s Not Ready to Block Huawei from its 5G Network,” *CNBC*, February 19, 2019. <https://www.cnb.com/2019/02/19/germany-says-its-not-ready-to-bar-huawei-in-potential-us-snub.html>.
- ³⁶ *Nikkei Asian Review*, “Japan Bans Huawei and its Chinese Peers from Government Contracts,” December 10, 2018. <https://asia.nikkei.com/Economy/Trade-war/Japan-bans-Huawei-and-its-Chinese-peers-from-government-contracts>.
- ³⁷ Minoru Satake, “Japan’s 4 Carriers to Shun Chinese 5G Tech,” *Nikkei Asian Review*, December 10, 2018. <https://asia.nikkei.com/Business/Companies/Japan-s-4-carriers-to-shun-Chinese-5G-tech>.
- ³⁸ *Xinhua*, “Timeline: Xi Jinping and Guangdong-Hong Kong-Macao Greater Bay Area,” February 21, 2019. http://www.xinhuanet.com/english/2019-02/21/c_137840269.htm.
- ³⁹ Hong Kong Constitutional and Mainland Affairs Bureau, *Outline Development Plan for the Guangdong-Hong Kong-Macao Greater Bay Area (Courtesy Translation)*, February 18, 2018. https://www.bayarea.gov.hk/filemanager/en/share/pdf/Outline_Development_Plan.pdf.
- ⁴⁰ Gerry Shih, “China Wants to Pull Hong Kong into a ‘Greater Bay Area’ that Could Compete with Silicon Valley,” *Washington Post*, February 19, 2019. https://www.washingtonpost.com/world/china-wants-to-pull-hong-kong-into-a-greater-bay-area-that-could-compete-with-silicon-valley/2019/02/19/71f2518c-3412-11e9-946a-115a5932c45b_story.html?utm_term=.f7d9e0f783f9; Zhu Wenbing, “Hong Kong and Macao’s Development Receives New Kinetic Energy, the Greater Bay Area Anchors Future Coordinates,” *Shanghai Securities Times*, February 20, 2019. Translation. <https://finance.sina.cn/stock/ggyj/2019-02-20/detail-ihrfzka7367543.d.html?vt=4&pos=17>.
- ⁴¹ Hong Kong Constitutional and Mainland Affairs Bureau, *Outline Development Plan for the Guangdong-Hong Kong-Macao Greater Bay Area (Courtesy Translation)*, February 18, 2018. https://www.bayarea.gov.hk/filemanager/en/share/pdf/Outline_Development_Plan.pdf; Gerry Shih, “China Wants to Pull Hong Kong into a ‘Greater Bay Area’ that Could Compete with Silicon Valley,” *Washington Post*, February 19, 2019. https://www.washingtonpost.com/world/china-wants-to-pull-hong-kong-into-a-greater-bay-area-that-could-compete-with-silicon-valley/2019/02/19/71f2518c-3412-11e9-946a-115a5932c45b_story.html?utm_term=.f7d9e0f783f9; Zhu Wenbing, “Hong Kong and Macao’s Development Receives New Kinetic Energy, the Greater Bay Area Anchors Future Coordinates,” *Shanghai Securities Times*, February 20, 2019. Translation. <https://finance.sina.cn/stock/ggyj/2019-02-20/detail-ihrfzka7367543.d.html?vt=4&pos=17>.
- ⁴² Gerry Shih, “China Wants to Pull Hong Kong into a ‘Greater Bay Area’ that Could Compete with Silicon Valley,” *Washington Post*, February 19, 2019. https://www.washingtonpost.com/world/china-wants-to-pull-hong-kong-into-a-greater-bay-area-that-could-compete-with-silicon-valley/2019/02/19/71f2518c-3412-11e9-946a-115a5932c45b_story.html?utm_term=.f7d9e0f783f9.
- ⁴³ Hong Kong Constitutional and Mainland Affairs Bureau, *Outline Development Plan for the Guangdong-Hong Kong-Macao Greater Bay Area (Courtesy Translation)*, February 18, 2018. https://www.bayarea.gov.hk/filemanager/en/share/pdf/Outline_Development_Plan.pdf; Gerry Shih, “China Wants to Pull Hong Kong into a ‘Greater Bay Area’ that Could Compete with Silicon Valley,” *Washington Post*, February 19, 2019. https://www.washingtonpost.com/world/china-wants-to-pull-hong-kong-into-a-greater-bay-area-that-could-compete-with-silicon-valley/2019/02/19/71f2518c-3412-11e9-946a-115a5932c45b_story.html?utm_term=.f7d9e0f783f9.
- ⁴⁴ Mark Preen, “What Is the Greater Bay Area Plan?” *China Briefing*, Dezan Shira and Associates, February 21, 2019. <https://www.china-briefing.com/news/the-greater-bay-area-plan-china/>.
- ⁴⁵ Mark Preen, “What Is the Greater Bay Area Plan?” *China Briefing*, Dezan Shira and Associates, February 21, 2019. <https://www.china-briefing.com/news/the-greater-bay-area-plan-china/>.
- ⁴⁶ Phila Siu et al., “Hong Kong and Shenzhen Settle Border Dispute as They Join Hands to Develop Technology Park,” *South China Morning Post*, January 4, 2017. <https://www.scmp.com/news/hong-kong/economy/article/2058878/hong-kong-and-shenzhen-set-partner-innovation-and-technology>.

- ⁴⁷ Hong Kong Constitutional and Mainland Affairs Bureau, *Mainland Policies and Measures*, December 28, 2018. <https://www.bayarea.gov.hk/en/resource/mainland-policies-measures.html>.
- ⁴⁸ Hong Kong Constitutional and Mainland Affairs Bureau, *Clearance Facilitation*, December 28, 2018. <https://www.bayarea.gov.hk/en/opportunities/clearance.html>; Hong Kong Constitutional and Mainland Affairs Bureau, *CEPA and Professional Services*, December 28, 2018. <https://www.bayarea.gov.hk/en/opportunities/cepa.html>.
- ⁴⁹ Liang Zhou, “Opportunities and Challenges in the Greater Bay Area of Guangdong, Hong Kong and Macau: Free Flow of Innovation Elements Is the Main Difficulty,” *Jiemian*, February 20, 2019. Translation. <https://www.jiemian.com/article/2878572.html>.
- ⁵⁰ Information Office of the State Council of the People’s Republic of China, *Press Conference on the Greater Bay Area Plan*, February 28, 2019. Translation. http://www.scio.gov.cn/xwfbh/xwfbfh/wqfbh/39595/39957/wz39959/Document/1648004/1648004.htm?mc_cid=175501552c&mc_eid=e0817d5cde.
- ⁵¹ Hong Kong Constitutional and Mainland Affairs Bureau, *Mainland Policies and Measures*, December 28, 2018. <https://www.bayarea.gov.hk/en/resource/mainland-policies-measures.html>.
- ⁵² Wu Shaolong, “Scholars Warn Greater Bay Area: Be Wary of ‘Economic Fiefdoms,’ Respect Market Discipline,” *Securities Times*, February 18, 2019. Translation. <http://news.stcn.com/2019/0218/14869886.shtml>; Zhuo Yong, “They Are the Greater Bay Area Plan’s Founders,” *Securities Times*, June 29, 2018. Translation. <http://news.stcn.com/2018/0629/14351761.shtml>.
- ⁵³ Wang Yufeng, “Greater Bay Area Allows Hong Kong to Explore ‘Re-industrialization,’” *Business Times*, February 19, 2019. Translation. <https://www.businesstimes.cn/articles/152848/20190219/5354957202.htm?page=2>.
- ⁵⁴ Alec Ash, “How China’s Tech Revolution Threatens Silicon Valley,” *Atlantic*, May 14, 2018. <https://www.theatlantic.com/business/archive/2018/05/chinas-silicon-valley/559871/>.
- ⁵⁵ Kimberley Botwright, “Davos Participants Call for Digital Trade Deal,” *World Economic Forum*, January 23, 2019.
- ⁵⁶ Andrei Bribakov, “Cross-Border Privacy Rules in Asia: An Overview,” *Lawfare*, January 3, 2019.
- ⁵⁷ Leika Kihara, “China and U.S. among 76 WTO Members Pushing for New E-Commerce Rules,” *Reuters*, January 25, 2019.
- ⁵⁸ U.S. International Trade Commission, *Digital Trade in the U.S. and Global Economies, Part 2*, 2014, 29.
- ⁵⁹ James Manyika et al., “Digital Globalization: The New Era of Globalization,” *McKinsey Global Institute*, February 2016, 10.
- ⁶⁰ iResearch, “Annual Revenue of the Overall Cloud Service Market in China from 2015 to 2020 (in Billion Yuan)”; Statista, “Cloud Services Market Revenue in the United States from 2016 to 2021 (in Million U.S. Dollars).”
- ⁶¹ iResearch, “Annual Revenue of the Overall Cloud Service Market in China from 2015 to 2020 (in Billion Yuan).”
- ⁶² Hari Kannan and Christopher Thomas, “Public Cloud in China: Big Challenges, Big Upside,” *McKinsey and Company*, July 2018.
- ⁶³ Hari Kannan and Christopher Thomas, “Public Cloud in China: Big Challenges, Big Upside,” *McKinsey and Company*, July 2018.
- ⁶⁴ Greg Pilarowski, Samuel Gintel, and Lu Yue, “China to Strengthen Regulatory Oversight of Cloud Services,” *Pillar Legal*, June 16, 2017.
- ⁶⁵ U.S.-China Economic and Security Review Commission, *2018 Annual Report to Congress*, November 2018, 89.
- ⁶⁶ U.S.-China Economic and Security Review Commission, *2018 Annual Report to Congress*, November 2018, 89.
- ⁶⁷ *Economist*, “Chinese Tech Companies Plan to Steal American Cloud Firms’ Thunder,” January 18, 2018; Synergy Research Group, “Cloud Growth Rate Increased Again in Q1; Amazon Maintains Market Share Dominance,” April 27, 2018.
- ⁶⁸ People’s Republic of China’s Ministry for Industry and Information Technology, *Three-Year Action Plan for Cloud Computing Development (2017–2019)*, April 10, 2017.
- ⁶⁹ Tom Krazit, “Building a Wall around the Cloud: Why China Will Soon Be a Very Important Cloud Computing Market,” *GeekWire*, January 13, 2019.
- ⁷⁰ James Manyika et al., “Digital Globalization: The New Era of Global Plows,” *McKinsey Global Institute*, February 2016.
- ⁷¹ PwC, “*Entertainment and Media Revenue Worldwide in 2009, 2013, and 2018, by Platform (in Billion U.S. Dollars)*.”
- ⁷² National Bureau of Statistics of China, *Number of Internet Users in China*.
- ⁷³ Yuval Atsmon et al., “Meet the 2020 Chinese Consumer,” *McKinsey Consumer and Shopper Insights*, March 2012.
- ⁷⁴ American Chamber of Commerce in China, “2017 AmCham China White Paper: American Business in China,” 296.
- ⁷⁵ American Chamber of Commerce in China, “2017 AmCham China White Paper: American Business in China,” 296.
- ⁷⁶ Beina Xu and Eleanor Albert, “Media Censorship in China,” *Council on Foreign Relations*, February 17, 2017.
- ⁷⁷ U.S. International Trade Commission, *Digital Trade in the U.S. and Global Economies, Part 2*, 2014, 29.
- ⁷⁸ Corey McNair, “Retail and Ecommerce Sales in China 2018,” *eMarketer*, July 18, 2018.
- ⁷⁹ eMarketer, “Alibaba, JD.com Face Increasing Competition in China,” July 11, 2018; eMarketer, “Retail e-Commerce Sales Worldwide from 2014 to 2021 (in Billion U.S. Dollars).”
- ⁸⁰ American Express, “American Express Receives People’s Bank of China’s Preparatory Approval for a Clearing and Settlement License in Mainland China,” November 9, 2018.
- ⁸¹ Tom Mitchell, “China’s Slow Reforms Stack Odds against Multinationals,” *Financial Times*, February 19, 2019.
- ⁸² Stella Yifan Xie, “China Tech Giants’ Costly Wars to Go Cashless,” *Wall Street Journal*, June 10, 2018.
- ⁸³ Mike Faden, “China’s Mobile Payments Phenomenon,” *American Express*.
- ⁸⁴ Yuval Atsmon et al., “Meet the 2020 Chinese Consumer,” *McKinsey Consumer and Shopper Insights*, March 2012.
- ⁸⁵ eMarketer, “Amazon Now Has Nearly 50% of the US E-Commerce Market,” July 13, 2018.