

# U.S.-China Economic and Security Review Commission

## Economics and Trade Bulletin



September 10, 2019

### Highlights of This Month’s Edition

- **Bilateral trade:** The U.S. goods deficit with China totaled \$32.8 billion in July, down 11 percent year-on-year.
- **Bilateral policy issues:** The United States and China agreed to resume trade negotiations following a month of tariff escalations; new rounds of tariffs will hit consumer goods the hardest; after months of propping up its value, China’s government allows the currency to weaken to 7 RMB against the U.S. dollar, leading the U.S. government to label China a currency manipulator.
- **Policy trends in China’s economy:** Provincial fiscal data from the first half of 2019 reveal that the tax cuts and stimulus spending Beijing has deployed since the beginning of year have stretched local governments’ ability to balance their budgets; however, Beijing appears unlikely to change course and is preparing to approve another round of infrastructure bonds in December.
- **In focus – China’s surveillance technology:** China’s surveillance technology sector has evolved from making basic equipment to a robust ecosystem spanning cloud computing and artificial intelligence.

### Contents

Bilateral Trade .....	2
U.S.-China Trade Monthly Deficit Shrinks for Seventh Straight Month .....	2
Bilateral Policy Issues .....	2
United States and China Agree to Resume Trade Talks after Tariff Escalations .....	2
U.S. Designates China as a Currency Manipulator after Renminbi Breaks 7 .....	4
Policy Trends in China’s Economy .....	5
Tax Cuts and Stimulus Strain Local Government Budgets .....	5
Sector Focus: China’s Surveillance Technology Market .....	6
Major Chinese Surveillance Companies .....	7
Chinese Surveillance Manufacturers’ Dependency on U.S. Suppliers .....	8
U.S. Imports of Chinese Surveillance Equipment .....	8
The Surveillance Technology Ecosystem: From Hardware to Software .....	8
The Role of the State, Market, and Foreign Capital and Expertise in China’s Surveillance Tech .....	9
China’s Exports of Surveillance Technology .....	10

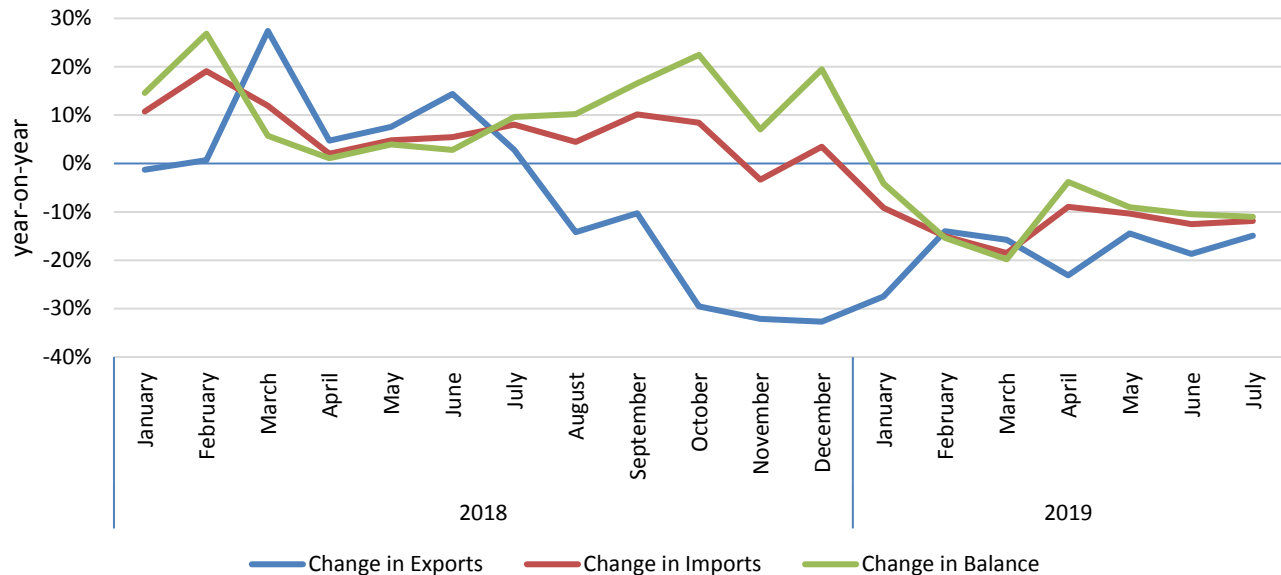
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## Bilateral Trade

### U.S.-China Trade Monthly Deficit Shrinks for Seventh Straight Month

The U.S. deficit in goods with China totaled \$32.8 billion in July 2019, down 11 percent year-on-year (see Figure 1). U.S. exports to China fell to \$8.7 billion, a 14.9 percent year-on-year decrease, while U.S. imports from China contracted 11.9 percent year-on-year to \$41.5 billion.<sup>1</sup>

**Figure 1: U.S. Imports, Exports, and the Trade Deficit with China, January 2018–July 2019**



Source: U.S. Census Bureau, *Trade in Goods with China*, September 4, 2019. <https://www.census.gov/foreign-trade/balance/c5700.html>.

Year-to-date, the U.S. goods deficit with China reached \$199.8 billion, down 10.2 percent from the same time last year.<sup>2</sup> Upcoming tariff increases recently announced by both the United States and China are expected to lead to further contraction in both imports and exports in the months ahead.

## Bilateral Policy Issues

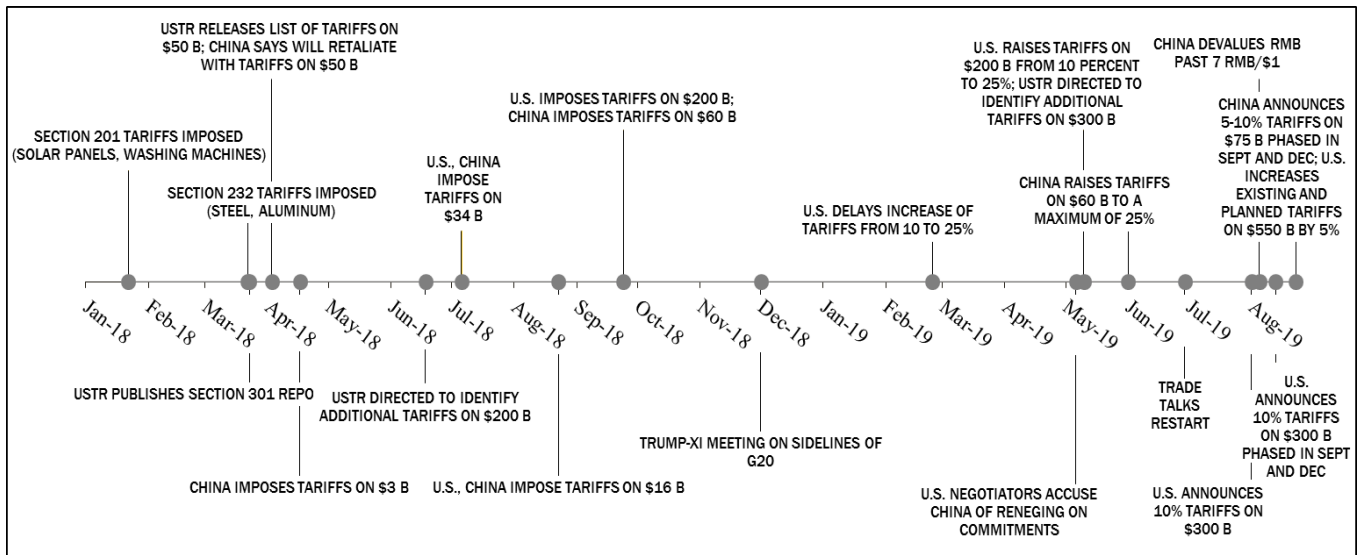
### United States and China Agree to Resume Trade Talks after Tariff Escalations

On September 4, the United States and China agreed to resume trade talks—the first since July 2019—following a month of tariff escalations (see Figure 2).<sup>3</sup>

In August 2019, the Trump Administration announced plans to implement new 10 percent tariffs on \$300 billion worth of imports from China in two stages, hitting about \$112 billion of imports on September 1 and \$160 billion of imports on December 15.\*<sup>4</sup> Products covered by the September 1 tariffs include clothing, footwear, and textiles, while the December 15 tariffs cover consumer electronics, toys, and Christmas ornaments.<sup>5</sup> The timing of the tariffs will help importers avoid tariffs on goods that are commonly purchased during the holiday season.<sup>6</sup> While the existing tariffs on \$250 billion worth of Chinese goods covered about 29 percent of consumer goods imported from China, the September 1 tariffs expand that coverage to 69 percent.<sup>7</sup>

\* On August 1, 2019, President Donald Trump announced the United States will impose 10 percent tariffs on \$300 billion in U.S. imports from China starting on September 1, citing China's failure to meet its commitments to make large purchases of U.S. agricultural goods and curb the flow of fentanyl to the United States.

**Figure 2: Timeline of U.S.-China Trade Tensions, 2018–2019**



Source: Adapted from Chad Bown and Melina Kolb, “Trump’s Trade War Timeline: An Up-to-Date Guide,” *Peterson Institute for International Economics*, August 23, 2019. <https://www.piie.com/blogs/trade-investment-policy-watch/trump-trade-war-china-date-guide>.

China retaliated on August 23 by announcing plans to impose tariffs on \$75 billion of U.S. exports, also to be phased in on September 1 and December 15.<sup>8</sup> U.S. exports covered by the tariffs include automobiles, crude oil, and agricultural products like corn, pork, and soybeans.<sup>9</sup> Later that same day, President Donald Trump said the United States would raise tariffs on \$550 billion worth of Chinese imports by 5 percent, increasing the existing 25 percent tariff on \$250 billion worth of Chinese goods to 30 percent on October 1 and raising the previously announced 10 percent tariffs on \$300 billion worth of Chinese imports to 15 percent.<sup>10</sup>

President Trump also called on U.S. companies to “immediately start looking for an alternative to China” and to make more products in the United States.<sup>11</sup> According to a U.S.-China Business Council survey published in August 2019, “[t]he majority of American companies surveyed remain committed to the China market and few are currently divesting existing operations,” with 87 percent of respondents reporting they have not moved or do not plan to move any operations out of China.<sup>12</sup> In addition, 97 percent of respondents said their China operations were profitable, unchanged from a year ago.<sup>13</sup>

Meanwhile, the U.S. Department of Commerce announced on August 19 it was extending a reprieve for Huawei for another 90 days,<sup>†</sup> allowing U.S. companies to continue selling to Huawei and its affiliates if the products do not pose a threat to national security.<sup>14</sup> The decision was made in part to minimize disruptions in rural parts of the United States that are dependent on Huawei equipment to provide wireless service. The reprieve would allow Huawei continued access to Google’s Android software, which is used on nearly three-fourths of the world’s mobile phones.<sup>15</sup> Huawei unveiled its own operating system—Harmony—in August, but says it prefers to maintain a single ecosystem and use Google software; Harmony would serve as a “plan B” should the company lose access to licensed Google products and services.<sup>16</sup> The Commerce Department also announced that 46 Huawei subsidiaries were added to its Entity List, bringing the total number of Huawei subsidiaries on the list to over 100.<sup>17</sup>

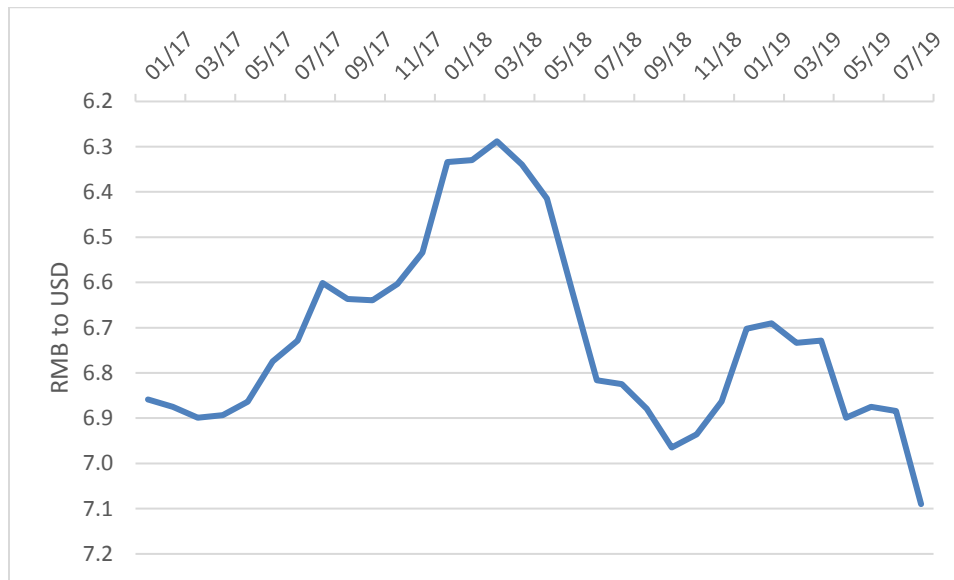
\* The majority of U.S. agricultural products were already covered in previous tariff tranches; those products are now subject to additional duties. Congressional Research Service, “China’s Retaliatory Tariffs on U.S. Agricultural Products,” January 29, 2019. <https://fas.org/sgp/crs/row/IF11085.pdf>; Chad Bown, “U.S.-China Trade War: The Guns of August,” *Peterson Institute for International Economics*, August 26, 2019. <https://www.piie.com/blogs/trade-and-investment-policy-watch/us-china-trade-war-guns-august>.

† Huawei was first placed on the Commerce Department’s Entity List in May 2019 but shortly after received a 90-day grace period that allowed some U.S. sales to Huawei to continue temporarily. U.S. Department of Commerce, *Department of Commerce Adds Dozens of New Huawei Affiliates to the Entity List and Maintains Narrow Exemptions through the Temporary General License*, August 19, 2019. <https://www.commerce.gov/news/press-releases/2019/08/departments-commerce-adds-dozens-new-huawei-affiliates-entity-list-and>.

## U.S. Designates China as a Currency Manipulator after Renminbi Breaks 7

On August 5, China's central bank allowed the renminbi (RMB) to weaken past the psychologically important threshold of 7 RMB to the U.S. dollar for the first time since 2008.<sup>18</sup> A statement released the same day by the People's Bank of China (PBOC) linked the depreciation to "unilateralism, protectionist trade measures, and the imposition of increased tariffs on China."<sup>19</sup> Trade tensions with the United States, slowing economic growth, and monetary policy loosening are applying broader downward pressure on the RMB, which has fallen nearly 6 percent against the dollar since the start of 2019 (see Figure 3).<sup>20</sup> In response to the RMB breaking 7, the U.S. Department of the Treasury labeled China a currency manipulator\* for the first time since 1994, noting in a statement that it "will engage with the International Monetary Fund to eliminate the unfair competitive advantage created by China's latest actions."<sup>21</sup>

**Figure 3: RMB to U.S. Dollar Exchange Rate, January 2017–August 2019**



Source: People's Bank of China via CEIC database.

Treasury's move to label China a currency manipulator received bipartisan support, with some U.S. lawmakers noting that the designation was an overdue response to China's longstanding currency practices.<sup>22</sup> Some economists also argued that the Chinese government "weaponized" the RMB in allowing it to depreciate as retaliation for hiked U.S. tariffs on Chinese goods.<sup>23</sup> In contrast, the International Monetary Fund provided minimal support for the charge in its annual review of China's economic policies, noting that the PBOC took steps to prop up the value of the RMB over the past year and that the currency was "broadly stable."<sup>24</sup>

Brad Setser, economist with the Council on Foreign Relations, noted that the designation is mostly symbolic: existing U.S. laws governing designation of currency manipulation offer inconsistent definitions of its practice and corresponding solutions, including the imposition of tariffs and bilateral negotiations, tactics the United States has already used in its ongoing trade dispute with China.<sup>25</sup>

Chinese officials disputed that the RMB's drop was the result of manipulation undertaken to counter U.S. tariffs. In an August 5 statement PBOC Governor Yi Gang asserted that China would "abide by the spirit of the G20

\* Treasury has three criteria for determining whether a country is manipulating its currency: (1) a bilateral goods trade surplus with the United States of at least \$20 billion; (2) a currency account surplus equal to at least 3 percent of gross domestic product (GDP); and (3) persistent, one-sided intervention in currency markets, in excess of 2 percent of GDP over a 12-month period. A country has to meet all three criteria to be designated a currency manipulator. Treasury determined that China only met the bilateral surplus criterion in its most recent report, and placed China on its "monitoring list." U.S. Department of the Treasury, *Macroeconomic and Foreign Exchange Policies of Major Trading Partners of the United States*, May 28, 2019, 4–5. <https://home.treasury.gov/system/files/206/2019-05-28-May-2019-FX-Report.pdf>.

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leaders' summit on the exchange rate issue, adhere to the market-determined exchange rate system, not engage in competitive devaluation, and not use the exchange rate for competitive purposes."<sup>26</sup>

The RMB's depreciation amplifies U.S. concerns that the Chinese government may be deliberately allowing its currency to slide to make its exports more competitive and thereby offset the effects of U.S. tariffs. While the devaluation can provide a relief from tariffs, it also presents a range of negative consequences for China's economy. These include the possibility of capital outflows and depressed consumption, with imports becoming more expensive as the RMB declines in value. A weaker RMB also makes it difficult for Chinese companies that borrowed in dollars to repay their debts. According to Victor Shih, an expert on China's economy at UC San Diego, Chinese firms and financial institutions owe international creditors close to \$3 trillion in dollar-denominated debt, the repayment of which is made more expensive if the RMB weakens against the dollar.<sup>27</sup> Analysis from Bloomberg adds that \$650 billion of this foreign debt could mature as soon as 2020, exacerbating this pressure.<sup>28</sup>

Chinese policymakers understand the risks of an extensive depreciation, and are trying to reduce the negative impact of heightened U.S. tariffs, while also mitigating broader economic stress. In August, the PBOC took steps to control RMB weakness by, for example, selling \$4.3 billion worth of short-term RMB-denominated securities in Hong Kong and attempting to set a stronger daily trading midpoint for the RMB in the days after it weakened past 7 RMB to the dollar.<sup>29</sup> PBOC Vice Governor Pan Gongsheng issued signals to this effect in an op-ed, writing that while he sees more currency weakness on the horizon due to "external shocks such as trade friction," the currency will stabilize "after a short period of turbulence," hinting at Chinese preparedness for prolonged trade tensions.<sup>30</sup>

## Policy Trends in China's Economy

### Tax Cuts and Stimulus Strain Local Government Budgets

On August 23, 2019, China's Minister of Finance Liu Kun reported to the National People's Congress that large-scale tax cuts and spending increases caused the government to run a \$17.3 billion (RMB 123.4 billion) deficit in the first half of 2019.<sup>31</sup> This is in line with the deficit target of 2.8 percent of GDP that policymakers set in March.<sup>32</sup> But Minister Liu's report also made it clear that the combination of ambitious tax cuts and fiscal stimulus is straining local governments' ability to balance their budgets.\*

As Premier Li Keqiang outlined in his government work report in March 2019, Beijing has relied on tax cuts and fiscal stimulus targeted toward infrastructure spending as the two major tools to combat slowing economic growth.<sup>33</sup> Minister Liu reported that between January and June 2019, Beijing cut taxes by \$163.7 billion (RMB 1.17 trillion), \$70.8 billion (RMB 506.5 billion) of which came from reductions introduced in 2019.<sup>34</sup> Policymakers simultaneously encouraged local governments to ramp up infrastructure spending by approving special purpose bonds (bonds used to finance specific projects) in December 2018—three months earlier than usual—and raising the special bond quota for 2019 by \$112 billion (RMB 800 billion) for an annual total of \$306.6 billion (RMB 2.19 trillion).<sup>35</sup> To further boost construction, regulators adjusted infrastructure financing rules in June 2019 to count special bond revenue as equity rather than credit (infrastructure projects require at least 20 percent government-provided equity before approval; the remaining 80 percent can come from public or private creditors).<sup>36</sup>

This policy strategy is creating challenges for local government balance sheets, which are now caught between fiscal stimulus and tax cuts. As a result, every province except Shanghai that reported fiscal data for the first half of 2019 expanded its budget deficit compared to the same period in 2018.<sup>37</sup> Additionally, Minister Liu's report notes that revenues in 11 provinces contracted year-on-year in the first half of 2019, and data published by the Ministry of Finance reveal revenue growth decelerations in 12 others.<sup>38</sup> In other words, 23 out of 33 provincial governments are facing revenue pressures. The problem is especially acute in heavily indebted areas such as

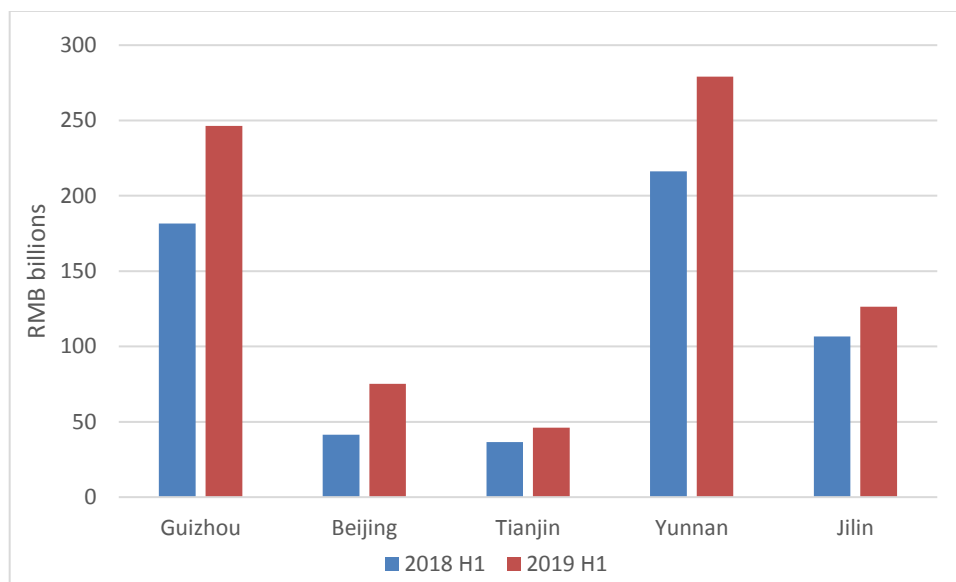
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\* Article 35 of China's revised Budget Law, adopted in 2014, explicitly prohibits local governments from running a deficit. However, in an effort to eliminate the practice of borrowing through local government financing vehicles, the article also allows local governments to issue bonds within limits set by—and with the approval of—the State Council. China's National People's Congress, *Budget Law of the People's Republic of China* (中华人民共和国预算法), November 2, 2014. Translation. [http://www.npc.gov.cn/wxzl/gongbao/2014-11/02/content\\_1892137.htm](http://www.npc.gov.cn/wxzl/gongbao/2014-11/02/content_1892137.htm).



Guizhou, where infrastructure spending has already outpaced demand and projects are largely lossmaking (see Figure 4).<sup>39</sup>

**Figure 4: Budget Deficits in China’s Most Indebted Provinces, H1 2018–H1 2019**



Source: China’s Ministry of Finance via CEIC database; Macro Polo, “China’s Debt Hangover.” <https://macropolo.org/digital-projects/china-local-debt-hangover-map/>.

China’s central government can use intergovernmental fiscal transfers to plug deficits in places like Guizhou, and it did boost overall transfers by 9 percent in the first half (H1) of 2019.<sup>40</sup> But challenges are not just confined to poor or indebted areas. In Guangdong, which has the largest provincial budget and is China’s least debt-laden province, tax revenue growth decelerated sharply from 13.3 percent year-on-year in the first half of 2018 to 2.4 percent over the same period this year.<sup>41</sup> Expenditure, meanwhile, accelerated from 3.4 percent to 13 percent.<sup>42</sup> As a short-term expedient to uphold its balance sheet, Guangdong has joined other provinces in selling off or leasing state-owned assets to raise extra revenues. According to Chinese business and financial journal *Caixin*, Guangdong generated RMB 40 billion this way in the first half of 2019, a 65.4 percent increase over the same period last year.<sup>43</sup>

For now, policymakers appear willing to tolerate the corrosive effect of the current policy strategy on local government budgets. In his report, Minister Liu gave no indication Beijing is considering changing course. Moreover, on September 4, the State Council announced the advance allocation of special bonds for 2020 in a decision that mirrored this year’s frontloaded borrowing.<sup>44</sup> As Beijing continues to prioritize employment and holding firm on its commitment not to unleash monetary stimulus, local governments look set to face another round of belt tightening.

## Sector Focus: China’s Surveillance Technology Market

Today, the UN estimates that more than a million Uyghurs and other ethnic minorities in Xinjiang, or 8 percent of the province’s total ethnic minority population, are being held in internment camps.<sup>45</sup> Detained Uyghurs are routinely forced to denounce their Muslim religious beliefs, apologize for their own actions and the actions of their families, and give thanks to the Chinese Communist Party (CCP). This massive repression campaign has drawn global attention to China’s robust, rapidly evolving surveillance technology industry.\* Through application of

\* In assessing China’s surveillance technology sector, this section defines surveillance technology as any equipment that monitors or tracks individuals or their actions, in physical space or over telecommunications devices; any software or computing techniques that enable devices to monitor and track individuals or their actions; and any supporting infrastructure, such as cloud computing networks, that increases the scale or interoperability of surveillance activities. This broad definition aims to capture the sector’s development as a whole, including the coevolution of related fields that have fed China’s surveillance market.

artificial intelligence (AI), cloud computing, geographic information systems, and other emerging technologies to surveillance, Chinese firms are combining what were once isolated devices or fragmented networks into massive urban management platforms that enable China's government to identify specific individuals, profile ethnic minorities, or track people's movements and activities within some of the world's largest cities.<sup>46</sup> While the effectiveness of Chinese surveillance is often overstated, the Chinese government's intent is clear, and policy objectives serve as a market signal.<sup>47</sup>

## Major Chinese Surveillance Companies

Chinese providers of smart city and public security systems and technology include companies with global brand recognition (e.g., closed-circuit television provider Hikvision, or the facial recognition company SenseTime) and less familiar companies that specialize in technologies like data harvesting software, gait recognition, or smart glasses. The list of select companies in Table 1 illustrates the variety of technologies that can be employed for mass surveillance.

**Table 1: Select Major Chinese Surveillance Technology Companies**

Company	Technology	Company Size	Key Business Segments
Huawei	Safe City Initiative; Security camera chips	Revenue of \$107 billion in 2018; about 188,000 employees	Wireless networks, cloud networks, and software and infrastructure for telecommunications; smartphones, tablets, and wearable and home devices.
Hikvision Digital Technology	Video surveillance	Market capitalization of \$44 billion; about 34,000 employees	Video surveillance products and equipment, including security cameras and drones
SenseTime	Facial recognition	Valued at \$4.5 billion in August 2019; between 100 and 500 employees	Face, image, and text recognition, medical imaging analysis, remote sensing
Megvii Technology	Facial recognition	Issuing IPO; valued at \$4 billion in May 2019	Facial recognition for consumer electronic and smart city applications, Internet of Things [IoT] sensor networks
Meiya Pico	Digital forensics and cybersecurity	Market capitalization of \$2.1 billion; about 3,000 employees	Law enforcement, digital evidence collection and analysis, cybersecurity covering China and BRI countries
iFlytek	Speech recognition	Market capitalization of \$10.8 billion; about 11,000 employees	Intelligent voice recognition and analysis, translation
Dahua Technology	Video surveillance	Market capitalization of \$7.5 billion; about 13,600 employees	Video surveillance products and services, camera systems
Yitu Technology	Facial recognition	Valued at \$2 billion in March 2018	Computer vision, image and facial recognition, intelligent security

Source: Various.<sup>48</sup>

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## Chinese Surveillance Manufacturers' Dependency on U.S. Suppliers

Despite a preference for local surveillance technologies, Chinese surveillance technology producers continue to rely on key U.S.-sourced components, particularly in computer chips and sensors.<sup>49</sup> In some cases, Chinese designers of specialized chips used in surveillance devices, or “edge computing” chips, are on par with foreign chip designers; however, Chinese foundries have limited capability to fabricate these chips domestically.<sup>50</sup> The *Financial Times* reported Hikvision relies on U.S. firms for critical components, including computer processing chips and graphics chips from Intel and Nvidia, and computer vision chips from semiconductor producer Ambarella.<sup>51</sup> The degree of this reliance can be seen in company reactions to recent threats of U.S. export controls that could restrict the flow of U.S. inputs. In July 2019, Hikvision said it had stockpiled components to continue production in the event the company was added to the Entity List, reporting a “90 per cent surge in holdings of components and 30 per cent in finished goods over the past six months.”<sup>52</sup>

Chinese officials have characterized this reliance on foreign providers as a threat. A 2012 *China Daily* article regarding surveillance technology standards cited Chinese government officials saying, “China’s reliance on foreign surveillance equipment, standards, and software may threaten the country’s security.”<sup>53</sup> According to video surveillance researcher Charles Rollet, the Chinese government prevents foreign companies from participating in local Internet of Things (IoT) and AI infrastructure projects.<sup>54</sup> In its recent IPO, Megvii said “foreign-owned entities are prohibited or disadvantaged in the relevant City IoT project bidding process in practice,” noting that Chinese smart city system integrators “would set implicit requirements that the service provider must not have any foreign shareholder, or at least consider foreign ownership as a disadvantage in their decision-making process.”<sup>55</sup>

## U.S. Imports of Chinese Surveillance Equipment

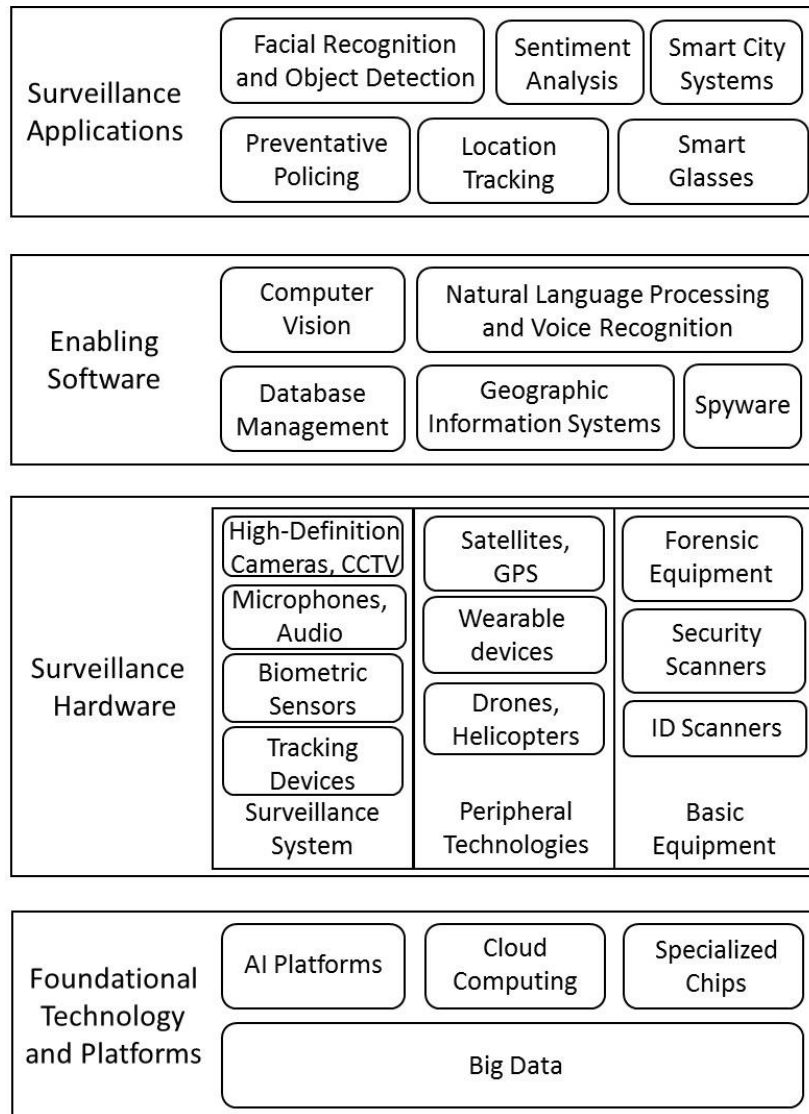
U.S. companies and organizations import surveillance technology from China, though the precise volume of these imports is unclear due to how the data are organized. For instance, Census Bureau data showed \$13.6 billion in U.S. imports of audio and video equipment from China in 2018; while this category includes surveillance equipment (e.g., security cameras), it also covers televisions, computer monitors, stereo equipment, consumer video cameras, and a variety of other products not necessarily used for surveillance.<sup>56</sup> In the security camera market, however, Chinese companies’ products are very common: together, Hikvision and Dahua account for about a third of global market share for video surveillance.<sup>57</sup> Video surveillance researcher John Honovich estimated that the United States accounted for 6 percent of Hikvision’s \$7.4 billion global sales in 2018.<sup>58</sup> Chinese-made equipment can be found in U.S. government facilities: according to reporting by the *Financial Times*, as of July 23, about 1,700 surveillance cameras manufactured by Dahua and Hikvision were connected to U.S. government networks.<sup>59</sup> In addition, beyond the cameras themselves, Huawei’s chip unit Hisilicon remains the largest global surveillance camera chip producer, supplying 60 percent of the global market and widely used by manufacturers in and outside of China.<sup>60</sup>

## The Surveillance Technology Ecosystem: From Hardware to Software

China’s emerging global leadership in surveillance technology grows out of a robust ecosystem of complementary capabilities, including basic hardware and communications infrastructure (see Figure 5). China’s surveillance technology is moving from foundational capabilities in equipment manufacturing to encompass increasingly precise and versatile means of monitoring individuals on one end, and highly complex systems that integrate streams of information from devices and applications (e.g., video images, geographic location, analysis of text or speech, etc.) on the other end.<sup>61</sup>



**Figure 5: China's Surveillance Technology Ecosystem**



Source: Various.<sup>62</sup>

### The Role of the State, Market, and Foreign Capital and Expertise in China's Surveillance Tech

China's development of capabilities in basic surveillance equipment has followed a similar trajectory to its manufacturing capacity in consumer electronics. In the late 1990s and early 2000s, Chinese factories assembled low-value electronics like cameras, monitors, and microphones for foreign producers that located facilities in China to take advantage of lower labor costs.<sup>63</sup> Foreign producers also had an interest in establishing joint ventures to gain a foothold in China's consumer market, as market access was often preconditioned on locating production facilities in China.<sup>64</sup> Domestic competitors—many of them spinoffs from state-owned enterprises (SOEs) or joint ventures controlled by SOEs like Hikvision—at first produced low-cost gear of inferior quality.<sup>65</sup> However, as domestic supply chains for components in surveillance equipment improved, these firms continued to enjoy economies of scale in production while increasing product quality to compete with foreign producers, while foreign designers increasingly sought to prototype more cutting-edge equipment in China.<sup>66</sup>

This multidecade path to technological mastery was achieved through robust government intervention, guidance, and support, as security bureaus' procurement of local equipment, market access for foreign producers preconditioned on establishing joint ventures controlled by Chinese firms, and unique Chinese standards-setting worked against foreign equipment manufacturers.<sup>67</sup>

In contrast to much of the electronics sector, in which early growth was chiefly driven by manufacturing for export, Chinese surveillance equipment enjoyed strong domestic demand from local law enforcement.<sup>68</sup> This guaranteed market further spurred the sector's growth. Not bound by constraints on civil liberties, firms outside of surveillance equipment manufacturing also became involved in surveillance even when China's surveillance state was comparatively low-tech, such as China's telecom operators working on automated telephone monitoring systems with voice recognition software developers.<sup>69</sup>

There is a fine line between surveillance technology for legitimate uses (such as policing, health, and security needs) and surveillance state abuses, which makes crafting policy for governing the sale of such technology complex. Foreign corporations have consistently aided incremental advances in China's surveillance capabilities from the earliest deployment of surveillance equipment in China. For example, a closed-circuit television network in Tian'anmen Square used to track down protest leaders was built with equipment provided by United Kingdom electronics firm Siemens Plessey and purchased with a World Bank loan.<sup>70</sup> In the 1990s and 2000s, Canadian telecommunications firm Nortel was involved in helping Chinese law enforcement implement a phone monitoring system, and both Nortel and U.S. networking firm Cisco contributed to the Golden Shield project, which manages China's "Great Firewall" internet censorship system.<sup>\*</sup> <sup>71</sup> More recently, a data breach exposing an extensive system for tracking Uyghurs in Xinjiang Province revealed that Microsoft's Azure cloud services were being used in facial recognition processing.<sup>72</sup> *New York Times* also reported in February 2019 that Chinese police were using equipment from U.S. medical device maker Thermo Fisher to build a DNA database for Uyghurs.<sup>73</sup>

In the past three years, foreign participation in the development of surveillance capabilities is characterized by the rapid influx of foreign capital into China's AI security market. In 2017, China overtook the United States as the largest market for equity investment in AI, accounting for 48 percent of global fundraising versus 38 percent in the United States.<sup>74</sup> Facial recognition constituted the majority of this funding because of steep valuations for leading Chinese startups SenseTime, Megvii, and CloudWalk, and remains the focus for leading Chinese AI startups: of the six Chinese firms listed in market research firm CB Insights' top hundred global AI startups, three are directly involved in facial recognition, and one designs specialized chips for the computing processes underlying image recognition.<sup>75</sup> U.S. venture capital groups, including Sequoia and the investment arms of Fidelity and Qualcomm, are substantial investors in China's facial recognition market.<sup>76</sup>

Importantly, foreign venture capital groups are not guiding China's surveillance market development, but are typically minority investors in startups chiefly financed by Chinese technology conglomerates like Tencent, Alibaba, and Baidu and venture funds guided by the Chinese government to fulfill policy objectives.<sup>77</sup> For example, CloudWalk, a Chinese security AI firm spun off from a Chinese Academy of Sciences incubator, received investments from the Guangzhou municipal government and China Reform Holdings, a fund under the State Council.<sup>78</sup>

## China's Exports of Surveillance Technology

China's digital infrastructure exports have prompted concern about other governments' adoption of surveillance technologies.<sup>79</sup> In October 2018, Freedom House reported that 18 countries<sup>†</sup> have adopted high-tech surveillance tools supplied by Chinese companies, including Yitu, Hikvision, and CloudWalk.<sup>80</sup> In addition, 36 countries have sent officials and media elites to China for seminars on new media or information management, which have included

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<sup>\*</sup> China's Golden Shield is an internet censorship and surveillance system launched by China's Ministry of Public Security in 2000. As initially envisioned, the project was to serve as a comprehensive, centralized database linking every individual's data as well as all municipal security information in one platform. In implementation, MPS has prioritized building a nation-wide internet content filter, but reducing information silos within various levels of law enforcement and government remains a security objective. Human Rights Watch, "China's Algorithms of Repression: Reverse Engineering a Xinjiang Police Mass Surveillance App," May 2019, 10-12. [https://www.hrw.org/sites/default/files/report\\_pdf/china0519\\_web.pdf](https://www.hrw.org/sites/default/files/report_pdf/china0519_web.pdf); Ping Punyakumpol, "The Great Firewall of China: Background," *Torfox*, June 1, 2011. <https://cs.stanford.edu/people/eroberts/cs181/projects/2010-11/FreedomOfInformationChina/author/pingp/index.html>.

<sup>†</sup> These countries include Armenia, Azerbaijan, Ecuador, Germany, Kazakhstan, Kenya, Kyrgyzstan, Malaysia, Pakistan, Rwanda, Singapore, Sri Lanka, Ukraine, the United Arab Emirates, Uzbekistan, Venezuela, Zambia, and Zimbabwe. Adrian Shahbaz, "Freedom on the New 2018: The Rise of Digital Authoritarianism," *Freedom House*, October 2018, 8. [https://freedomhouse.org/sites/default/files/FOTN\\_2018\\_Final%20Booklet\\_11\\_1\\_2018.pdf](https://freedomhouse.org/sites/default/files/FOTN_2018_Final%20Booklet_11_1_2018.pdf).

topics like “big data public opinion management systems” and “positive energy public-opinion guidance.”<sup>81</sup> A few example cases illustrate how this technology is being employed:

- *CloudWalk facial recognition deal with Zimbabwe:* In April 2018, the government of Zimbabwe signed a strategic partnership with facial recognition company CloudWalk to roll out a mass facial recognition initiative, enabling smart security applications in the country’s security cameras, airports, rail, and bus systems; a smart financial system; and a nationwide facial recognition database.<sup>82</sup> This partnership has been backed by China’s Belt and Road Initiative.<sup>83</sup> Access to Zimbabwean biometric data will allow CloudWalk to build greater diversity and accuracy into its AI-powered facial recognition services, also in use by China’s domestic police force.<sup>84</sup>
- *Huawei smart security camera deal with Ecuador:* In 2011, Huawei and state-controlled China National Electronics Import and Export Corporation installed a system of 4,300 security cameras around Ecuador called ECU-911, capable of tracking mobile phones as well as collecting video footage.<sup>85</sup> The system then sends footage back to domestic police as well as Ecuador’s domestic intelligence agency, which has been cause for concern: the *New York Times* has reported that under the prior administration of Rafael Correa, domestic intelligence tracked, intimidated, and attacked political opponents.<sup>86</sup> In 2016, Beijing donated \$14 million in new equipment for the security system.<sup>87</sup> Bolivia and Venezuela have since installed similar networks.<sup>88</sup>
- *Yitu facial recognition deal with Malaysia:* In February 2018, a Malaysian police unit began using Yitu wearable devices to assist security at ports and other public facilities.<sup>89</sup> In 2018, the Singaporean government agency GovTech announced a program to install cameras equipped with facial recognition technology on the city’s 110,000 lampposts.<sup>90</sup> Yitu and SenseTime have reportedly both weighed submitting bids.<sup>91</sup>

**Disclaimer:** The U.S.-China Economic and Security Review Commission was created by Congress to report on the national security implications of the bilateral trade and economic relationship between the United States and the People’s Republic of China. For more information, visit [www.uscc.gov](http://www.uscc.gov) or follow the Commission on Twitter at @USCC\_GOV.

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

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