RESEARCH REPORT

CompTIA

Tech Trade Snapshot 2020

U.S. technology export trends and trade-supported jobs analysis

National and statewide data

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INTRODUCTION

The growth of international trade is one of the defining trends of our time. While trade has shaped societies and economies for as long as societies and economies have existed, its impact over the past half century has been nothing short of extraordinary. During this time, trade volumes of goods and services increased 20-fold and topped $25 trillion in 2018[1]. And yet despite this growth, we are continuously reminded of how quickly disruptions can compromise the flow of goods and services between trade partners. The Covid-19 crisis is the most striking example of late. The direct fallout could extend well into 2021 and the indirect repercussions likely much longer.

Technology plays a unique role in the international trade landscape. As a category, it represents one of the largest segments of U.S. trade. This reflects the insatiable demand of consumers and businesses for the latest and greatest in devices, applications, content – and by extension, the underlying digital infrastructure to make it all work. Additionally, as an enabling force, trade in technology goods and services creates its own virtuous cycle. The more technology is put into use, the more businesses and consumers have the tools to communicate, create, and exchange, thereby encouraging even more trade.

$338 billion

Estimated value of U.S. exports of technology products and services in 2019

918,500

Estimated number of U.S. jobs directly supported by U.S. technology exports to overseas customers

60%

Estimated percent of exports that directly support U.S. tech manufacturing jobs

31

Number of states recording positive exports-supported jobs growth in 2018

$1 in $5

Exports account for approximately $1 in every $5 generated in the U.S. tech sector

2nd

Rank of technology services exports among all U.S. services export categories

$41 billion

Estimated U.S. trade surplus in tech services

3rd

Rank of technology product exports among all U.S. goods export categories

ABOUT COMPTIA

The Computing Technology Industry Association (CompTIA) is a leading voice and advocate for the $5.2 trillion global information technology ecosystem; and the more than 75 million industry and tech professionals who design, implement, manage, and safeguard the technology that powers the world's economy. Through education, training, certifications, advocacy, philanthropy, and market research, CompTIA is the hub for advancing the tech industry and its workforce.

CompTIA supports policies that enable the information technology industry to thrive in the global marketplace. We work to promote investment and innovation, market access, robust cybersecurity solutions, commonsense privacy policies, streamlined procurement, and a skilled IT workforce.

To learn more, visit https://www.comptia.org/advocacy

ABOUT THIS REPORT

This report provides data, analysis, and insight into the international trade market for information technology products and services. The underlying import and export statistics are compiled by the Foreign Trade Division of the U.S. Census Bureau, the U.S. International Trade Administration of the Department of Commerce, and the U.S. Bureau of Economic Analysis. The export-supported employment figures are compiled by The Trade Partnership's CDxports database. Additional CompTIA sources referenced in the report include Cyberstates and the IT Industry Outlook.

See Methodology page of this report for additional context, caveats, and details of the NAICS categories used to represent technology products and services. Questions can be directed to the CompTIA Research and Market Intelligence Department at research@comptia.org.

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OVERVIEW

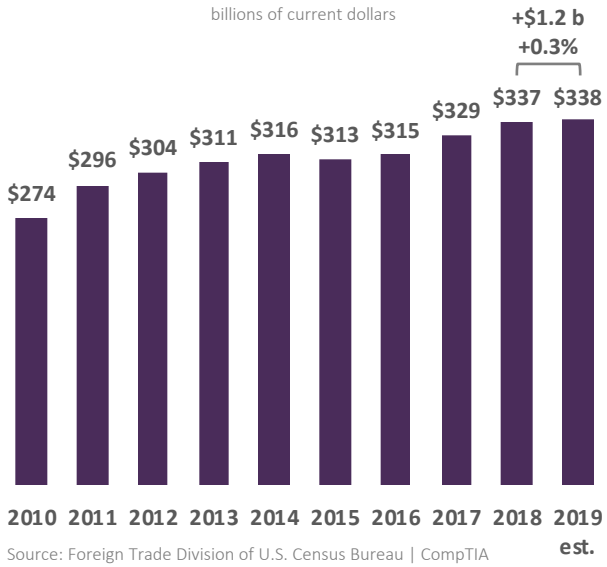
U.S. information technology exports reached an estimated $338 billion in 2019, a slight increase of 0.3 percent over the previous year. Growth slowed compared to the 2017 and 2018 rates of 4.2 and 2.5, respectively. During the decade, 2010-2019, U.S. exports of technology increased approximately $104 billion in value in current dollars, translating to 44 percent growth. Tech services were the primary exports growth driver during the decade, with aggregate growth of nearly 76 percent, compared to 30 percent growth for tech product exports during the 10-year period.

Growth in the tech sector, especially as it relates to international trade, is a function of many factors. Macro technology trends, such as the ongoing push of digital business transformation, combined with economic conditions – are customers in the mood to buy, currency fluctuations, and government trade policies all have a bearing on growth.

Analysis of the export subsectors within the technology category reveal many of these factors. On a percent change basis, the IT services subsector led all technology export categories in growth at 17.1 percent. The Information and data processing services category and R&D services category also performed well, recording growth of 15.8 percent and 6.5 percent, respectively. The growth in tech services and the "everything-as-a-service" model have been driving forces in the tech sector over the past decade. The migration to cloud platforms, the modernization of legacy applications and workflows, and the mission-critical importance of data – and soon artificial intelligence (AI), translate to demand for expertise in integration, software development, data management, cybersecurity and related competencies categorized as technology services.

On the hardware products front, also referred to as manufactured goods, the navigational, measuring, and control equipment category recorded the highest export growth at 1.4 percent. This was followed by semiconductors and components (0.7 percent). As important as tech services, applications, and data have been to growth, these categories can only thrive when there is a large installed base of devices (think users with computers, tablets, mobile phones, etc.) and robust infrastructure that reliably delivers faster, higher capacity, and less costly computing and storage. Emerging technologies such as internet of things (IoT), edge computing, smart cities, and robotics require cutting edge processors and the components that form the "brains" of these intelligent solutions.

U.S. TECH PRODUCT + SERVICES EXPORTS



Source: Foreign Trade Division of U.S. Census Bureau | CompTIA

The one export category that notably lagged was telecommunications. Exports of communications equipment hardware fell -6.5 percent, a loss of $2.5 billion in revenue, while telecommunications services dropped -11.2 percent, a loss of $1.1 billion in revenue compared to the prior year. For context, the overall U.S. telecom market for equipment, services, and employment has been sluggish the past couple of years. In many markets, traditional wired telecom along with segments of wireless telecom, can be considered mature categories. Moreover, as the transition to 5G gets underway, both telecom providers and customers must contend with the uncertainty that comes with any disruptive shift.

18 Number of states that recorded positive growth in exports of tech products in 2019

Like most countries, the U.S. is both a buyer and seller of technology. U.S. businesses and consumers purchased an estimated $478 billion in technology goods and services from overseas sellers in 2019. The net of technology exports from the U.S. and technology imports to the U.S. results in a trade deficit of approximately $140 billion.

In tech services, the U.S. experienced a trade surplus of nearly $41 billion. Tech services have been a U.S. strength for the past decade with aggregate exports reaching nearly $1.1 trillion over the 10-year period, resulting in a trade surplus of $336.5 billion. The software services category contributed the bulk of the positive surplus (69 percent) during this period, followed by telecommunications and information and data processing services.

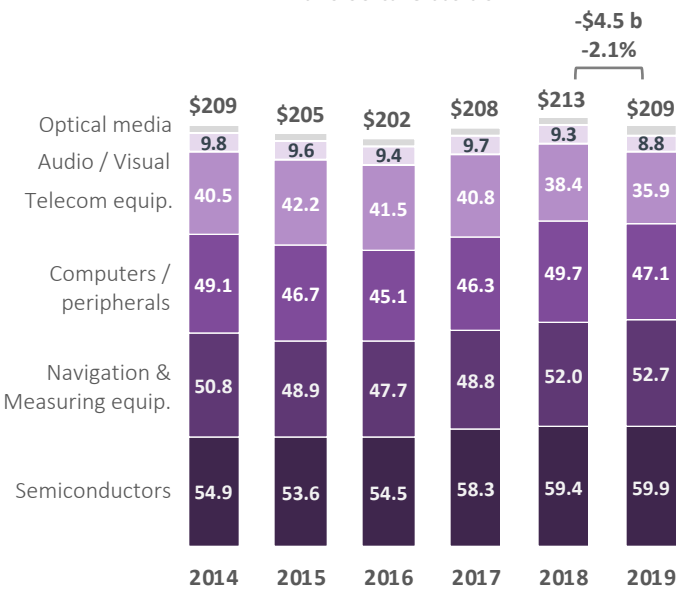
In tech goods, the U.S. experienced a trade deficit of $181 billion in 2019, a gap that narrowed by 9.7 percent, or $19.4 billion, year-over-year. The largest deficit occurred in the communications equipment category, where U.S. buyers purchased $75.7 billion more in goods from overseas buyers than overseas buyers purchased from U.S. providers. The computing equipment category recorded a deficit of -$56.7 billion, followed by semiconductors at -$15.4 billion.

China accounted for 71 percent of the deficit in tech goods trade with the U.S., down from their 2018 rate of 84 percent. During the past decade, China's share of the tech goods trade deficit has fluctuated between a high of 97 percent and a low of 71 percent. The next two largest trade imbalances for tech goods in 2019 belonged to Mexico (12 percent of the total deficit), and Malaysia (also 12 percent). See China Addendum of this report for additional data and analysis covering U.S.-China trade.

Note: because the U.S. runs a trade surplus with the vast majority of its tech goods trading partners (81 percent surplus vs. 19 percent deficit), as a percentage of the total trade balance, some figures may appear to exceed 100 percent, which is a function of offsetting figures in the surplus column.

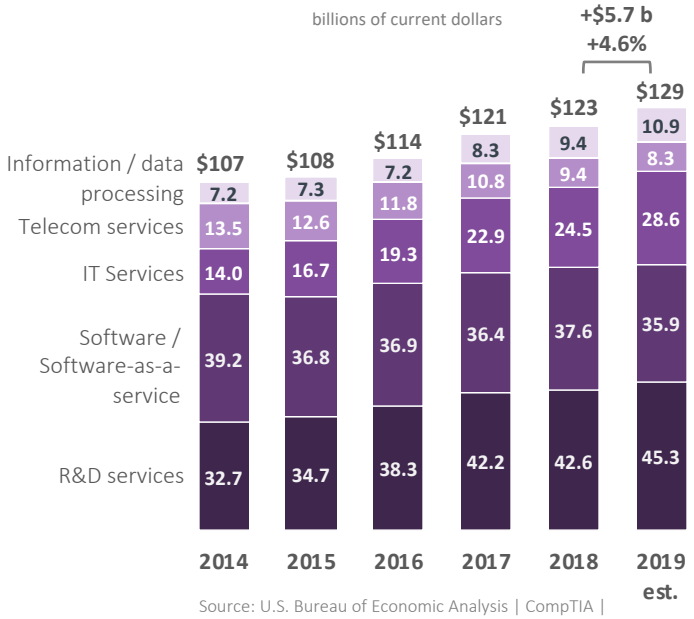
The top destinations for U.S. exports in 2019 were nearly identical to the previous year. The top 8 markets for U.S. tech product exports remained unchanged, while at #9, Singapore moved up one slot, switching places with Taiwan at #10. U.S. tech services exports followed a similar pattern, with the top 10 markets consistent with the prior year. The one notable newcomer to the list was India appearing at #10. See tables on following page.

U.S. TECH PRODUCT EXPORTS



Source: Foreign Trade Division of U.S. Census Bureau | CompTIA | rounding may affect totals percent change calculations

U.S. TECH SERVICES EXPORTS



Source: U.S. Bureau of Economic Analysis | CompTIA | rounding may affect totals percent change calculations

Debate over the meaning of trade deficits has been a topic of discussion since the earliest days of international economic analysis. Given the many complexities of trade, confusion and concern are not uncommon. Because of limitations in how trade statistics are calculated, deficits can be mischaracterized and misinterpreted, which can be especially problematic for technology goods and services.

For example, the iPhone is designed in the U.S. by Apple and then an estimated two hundred suppliers from around the world provide the materials and parts that go into the final product. Lastly, the phone is mostly assembled in China. When shipped back to the U.S. for domestic customers, the entire wholesale value of the device is counted as an import from China. According to the research consultancy IHS Market, Chinese assembly facilities capture only 3 to 6 percent of the total manufacturing costs of an iPhone, meaning nearly all of the value flows to Apple and other suppliers.

As noted by Louis Kuijs, head of Asia economics research at Oxford Economics, "if trade deficits were measured to account for the complex nature of global supply chains for products such as smartphones, the U.S.-China trade deficit would be about 36 percent lower." This is but one example. The same principle applies to many tech product categories. See China Addendum of this report for additional data and analysis covering U.S.-China trade.

LEADING TRADING PARTNERS FOR TECH PRODUCTS

Exports from the U.S.		Imports into the U.S.	
1.	Mexico	1.	China
2.	Canada	2.	Mexico
3.	China	3.	Malaysia
4.	Hong Kong	4.	Taiwan
5.	Germany	5.	Vietnam
6.	Japan	6.	Japan
7.	Netherlands	7.	South Korea
8.	South Korea	8.	Thailand
9.	Singapore	9.	Germany
10.	Taiwan	10.	Canada

Source: Foreign Trade Division of U.S. Census Bureau | CompTIA | 2019 data

Another limitation with trade statistics is the difficulty in accounting for avoidance behaviors. This typically entails sellers in one country shipping their product to an intermediary country that may have more favorable trade terms with the final market destination. For example, tech goods from China sent first to Mexico and then onto the U.S. market. The data indicates Mexico recorded the largest gain of any country exporting tech goods to the U.S. market: +$5.5 billion in new sales or an increase of 9.2 percent. In the aggregate the figures generally hold, but evaluating the trade relationship with any single market can quickly get murky because of these scenarios.

LEADING TRADING PARTNERS FOR TECH SERVICES

Exports from the U.S.		Imports into the U.S.	
1.	Ireland	1.	India
2.	Switzerland	2.	Ireland
3.	Singapore	3.	Canada
4.	United Kingdom	4.	United Kingdom
5.	Canada	5.	Germany
6.	Japan	6.	China
7.	Brazil	7.	Israel
8.	Germany	8.	Singapore
9.	Hong Kong	9.	Japan
10.	India	10.	Netherlands

Source: U.S. Bureau of Economic Analysis | CompTIA | 2018 data

Early assessments of Covid-19 fallout indicate a challenging recovery ahead

At the time of writing, the number of confirmed Covid-19 cases worldwide topped 4.0 million and growing. While some countries were experiencing positive results in "flattening the curve," the overall outlook was dominated by uncertainty and speculation. In April 2020, the IMF downgraded its global GDP forecast for the year to -3.0%, from a +3.3% in January. Similarly, IDC issued a forecast of -2.7% for 2020 global IT spending; the first negative growth rate in 20 years. A CompTIA survey conducted among member technology companies found 8 in 10 expressed some degree of concern over higher manufacturing and logistics costs due to disruptions to global technology supply chains. Governments around the world were in the process of deploying massive fiscal and monetary stimulus, which may soften the economic blow, but the "how much" and "when a return to normalcy" remain very much unknown. See Appendix for more.

TECHNOLOGY IS ONE OF THE LARGEST CATEGORIES OF U.S. EXPORTS

Exports are a measure of buyer perceptions of quality, value for money, and the degree to which the product or service aligns with business or user objectives. With these basic criteria in mind, the data confirms that technology is one of the most desired offerings among all U.S. exports.

In the manufactured goods category, technology ranks third, trailing the transportation and motor vehicle category and the chemicals category. To help put into context, the dollar value of U.S. technology product exports is more than double that of the high profile oil and gas products category.

In the services category tech ranks second, accounting for 15 percent of total U.S. services exports. As noted previously, this affirms the macro trend toward a services orientation in the delivery of technology, as well as the market leading position of many U.S. technology firms.

Analysis of tech exports at the state-level provides additional insights. As depicted in the accompanying chart, for 10 states, tech ranks as the #1 goods export across all categories of state export activity. Interestingly, even though Texas is the largest exporter of tech goods among all states, tech ranks 3rd in the state behind the oil and gas category, and the petroleum and coal products category.

For eight states, tech products exports rank #2, and for 11 other states, rank #3. In the aggregate, 29 states claim technology as a top 3 goods export category, a slight improvement over the 2018 figure of 28.

TOP 5 U.S. SECTORS FOR MFG. GOODS EXPORTS

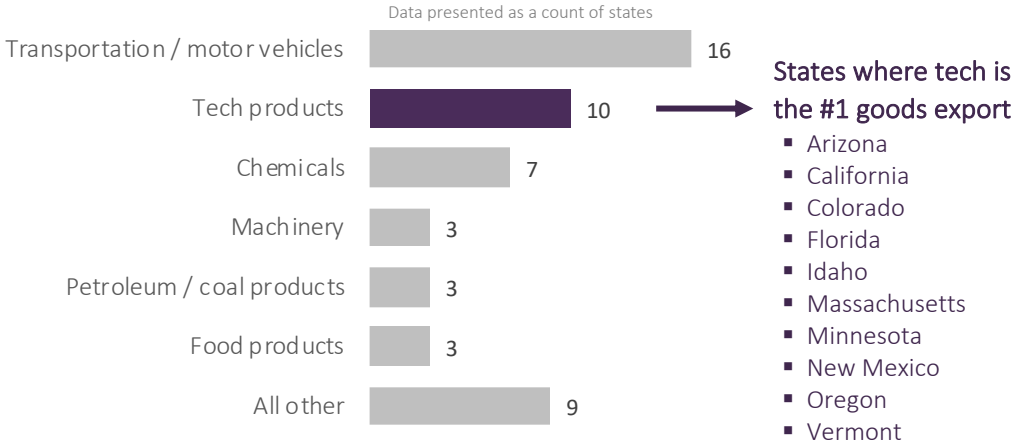
		$ Billions	% of Total
1.	Transportation / motor vehicles	$285	18%
2.	Chemicals	$210	13%
3.	Tech products	$209	13%
4.	Machinery	$137	9%
5.	Oil and gas	$95	6%

TOP 5 U.S. SECTORS FOR SERVICES EXPORTS

		$ Billions	% of Total
1.	Travel services	$210	26%
2.	Tech services	$123	15%
3.	Business & professional services	$123	15%
4.	Financial services	$111	14%
5.	Intellectual property use (not software)	$92	12%

Source: Foreign Trade Division of U.S. Census Bureau | U.S. Bureau of Economic Analysis | CompTIA | Goods data covers 2019 and services data covers 2018 time period

STATE DISTRIBUTION OF TOP GOODS EXPORTS



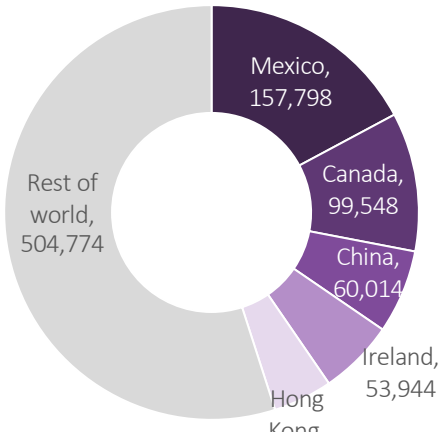
ASSESSING THE EMPLOYMENT IMPACT OF TRADE

U.S. technology exports directly supported an estimated 918,500 American jobs in 2018, the most recent year of available data. During that time period, export-supported jobs grew by 21,620 positions, an increase of 2.4 percent year-over-year. Tech goods accounted for 69 percent of exports-supported jobs, while tech services accounted for the remaining 31 percent. Tech services exports boosted employment in the U.S. by 9,463 jobs, a growth rate of 3.4 percent; in comparison, tech goods exports added 12,157 new jobs for a growth rate of 2.0 percent.

Applying the average wage for these tech industry sectors to the base of employment results in earnings of over $113 billion – that is, the amount of money these workers will then spend in their local community and across the economy, including a portion spent in the form of taxes. These figures are compelling in their own right, but there is more to the story.

Beyond the direct export-supported jobs, there is an additional indirect employment effect associated with trade. Technology development requires many inputs, starting with raw materials, but also various components and software layers. Technology also frequently acts as a platform and enabler, providing users the tool to run applications, pursue business activities, or enjoy entertainment content. The labor behind these inputs or technology 'enhancements' is connected to trade, but not directly. This approach can be taken even further to include workers a step or two removed, such as law firms, shipping companies, marketing firms and so on. For the purposes of this report, only the workers directly supported by technology exports are covered.

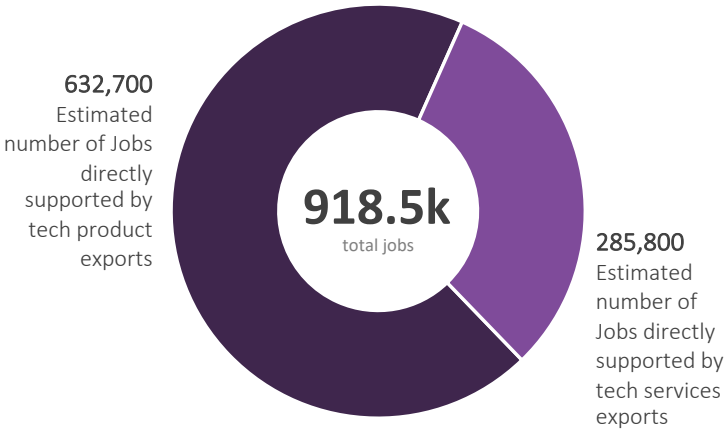
U.S. JOBS DIRECTLY SUPPORTED BY TECH EXPORTS BY MARKET



Source: Trade Partnership CDxports database | CompTIA | Data cover 2018 time period – most recent available data at time of publication

U.S. JOBS DIRECTLY SUPPORTED BY TECH EXPORTS

+2.4% YoY growth | +22K new jobs created

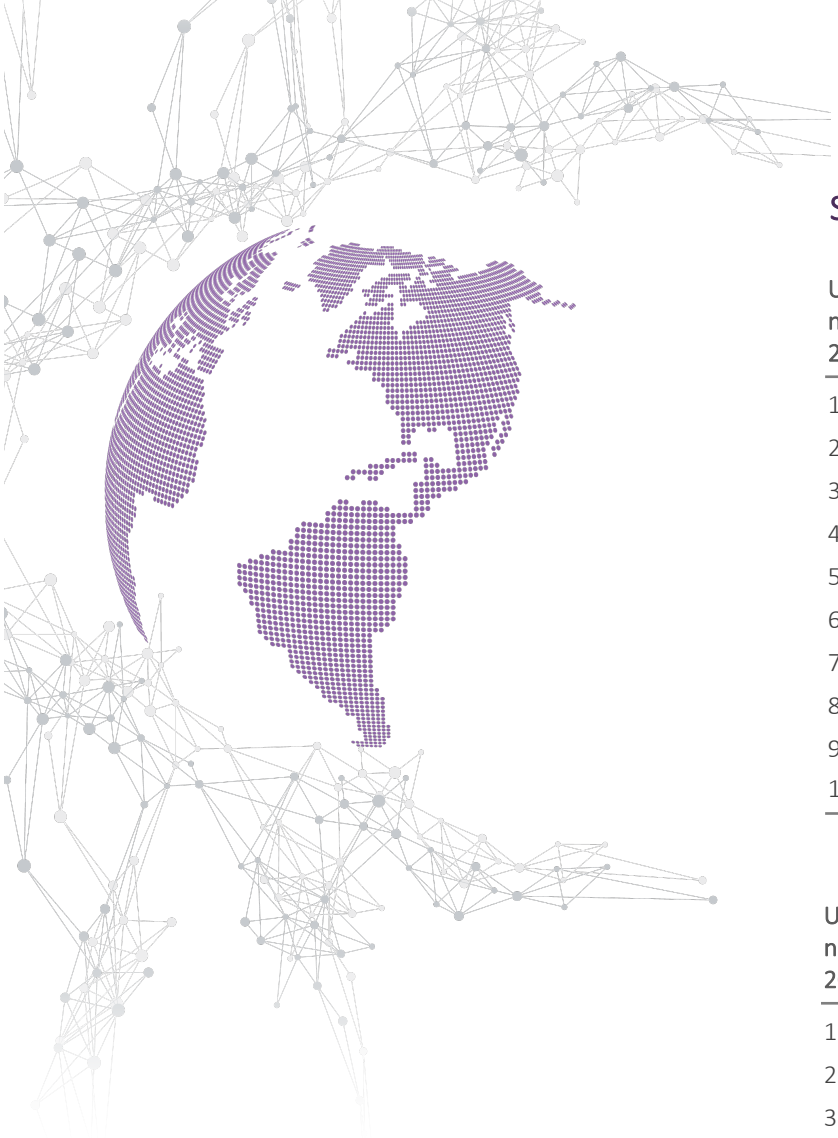


Source: Trade Partnership CDxports database | CompTIA | Data cover 2018 time period – most recent available data at time of publication

Note: there were a number of revisions to government trade statistics for 2017, which impacts the year-over-year comparison of the data. The jobs figures from last year's Tech Trade Snapshot may not be directly comparable to the current report.

On the imports side of the equation, there is a different, and more nuanced, impact on employment. While trade creates jobs, it also inevitably has the opposite effect and can lead to employment shifts or displacements. In 2001, the primary technology manufacturing sector (NAICS 334) employed nearly 1.8 million American workers. By 2018, that figure fell to 1.1 million, a loss of 700,000 jobs. Undoubtedly, a portion of these job losses were due to global competition and offshoring. But, there are other factors at play, including automation, process improvements, domestic competition, changing workforce characteristics, and the shift to often higher-margin software or tech services categories.

The challenge comes in trying to isolate these effects given that many of the variables are interconnected. Research from government agencies, think tanks, academics, and consultancies can vary widely in their assessment of the workforce impact of trade versus other factors. Some assert the trade impact is relatively small, while others believe unfair trade practices are a major culprit of manufacturing job losses.



STATE RANKINGS

	U.S. tech product exports numeric change growth 2018-2019	U.S. tech product exports % change growth 2018-2019
1.	Oregon	District of Columbia
2.	Texas	Oregon
3.	Pennsylvania	New Mexico
4.	New Mexico	Hawaii
5.	Ohio	Alabama
6.	District of Columbia	Wyoming
7.	Kentucky	Pennsylvania
8.	Maryland	Missouri
9.	Kansas	Kansas
10.	Alabama	Maryland

	U.S. tech services exports numeric change growth 2017-2018	U.S. tech services exports % change growth 2017-2018
1.	California	Iowa
2.	Washington	Washington
3.	Massachusetts	Delaware
4.	Virginia	District of Columbia
5.	Colorado	California
6.	Texas	Virginia
7.	New York	Arizona
8.	District of Columbia	Idaho
9.	Arizona	Massachusetts
10.	New Jersey	Colorado

	Tech export-supported jobs numeric change growth 2017-2018	Tech export-supported jobs % change growth 2017-2018
1.	California	Ohio
2.	Ohio	Montana
3.	Texas	Georgia
4.	Georgia	Mississippi
5.	Washington	North Dakota
6.	Virginia	South Carolina
7.	New Jersey	Virginia
8.	Minnesota	Minnesota
9.	Arizona	Nebraska
10.	New York	Vermont

Source: Foreign Trade Division of U.S. Census Bureau | U.S. Bureau of Economic Analysis | Trade Partnership | CompTIA | Jobs data covers employment directly supported by exports

U.S. TECH PRODUCT EXPORTS DETAIL

Rank	State	2018	2019	2018-2019 Change	2018-2019 % Change
1.	Texas	$47,904,293,407	$49,356,204,860	$1,451,911,453	3.0%
2.	California	$45,194,528,092	$40,211,097,613	-$4,983,430,479	-11.0%
3.	Florida	$13,070,223,475	$12,084,108,213	-$986,115,262	-7.5%
4.	Oregon	$7,539,846,521	$10,280,027,615	$2,740,181,094	36.3%
5.	Illinois	$8,591,222,955	$7,760,617,833	-$830,605,122	-9.7%
6.	New York	$7,380,615,206	$7,279,131,952	-$101,483,254	-1.4%
7.	Massachusetts	$7,670,184,495	$6,787,570,576	-$882,613,919	-11.5%
8.	Arizona	$6,341,167,441	$6,241,617,040	-$99,550,401	-1.6%
9.	New Jersey	$5,456,654,924	$5,287,772,876	-$168,882,048	-3.1%
10.	Tennessee	$4,628,456,445	$4,434,063,066	-$194,393,379	-4.2%
11.	Ohio	$3,925,543,864	$4,258,971,574	$333,427,710	8.5%
12.	Pennsylvania	$3,467,138,524	$4,078,665,552	$611,527,028	17.6%
13.	Washington	$4,423,947,670	$4,037,504,195	-$386,443,475	-8.7%
14.	Minnesota	$4,246,379,670	$4,010,442,305	-$235,937,365	-5.6%
15.	Georgia	$3,408,301,009	$3,008,354,554	-$399,946,455	-11.7%
16.	Michigan	$3,063,991,815	$2,888,333,921	-$175,657,894	-5.7%
17.	Wisconsin	$2,830,153,846	$2,611,354,013	-$218,799,833	-7.7%
18.	New Mexico	$2,030,625,821	$2,595,567,928	$564,942,107	27.8%
19.	North Carolina	$2,243,746,061	$2,211,064,322	-$32,681,739	-1.5%
20.	Virginia	$2,501,885,474	$2,184,855,574	-$317,029,900	-12.7%
21.	Nevada	$2,120,866,444	$2,103,955,525	-$16,910,919	-0.8%
22.	Kentucky	$1,868,491,567	$2,038,911,724	$170,420,157	9.1%
23.	Vermont	$1,903,533,236	$1,973,627,965	$70,094,729	3.7%
24.	Colorado	$1,931,680,739	$1,800,071,820	-$131,608,919	-6.8%
25.	Indiana	$1,782,551,329	$1,682,019,977	-$100,531,352	-5.6%
26.	South Carolina	$1,389,955,958	$1,510,511,851	$120,555,893	8.7%
27.	Utah	$1,569,338,719	$1,480,312,461	-$89,026,258	-5.7%
28.	New Hampshire	$1,399,168,960	$1,351,901,067	-$47,267,893	-3.4%
29.	Mississippi	$1,281,190,191	$1,324,512,310	$43,322,119	3.4%
30.	Maryland	$1,036,350,686	$1,179,327,991	$142,977,305	13.8%
31.	Connecticut	$1,260,580,828	$1,176,066,791	-$84,514,037	-6.7%
32.	Idaho	$1,702,936,628	$1,080,398,774	-$622,537,854	-36.6%
33.	Kansas	$763,000,520	$893,045,372	$130,044,852	17.0%
34.	Oklahoma	$894,096,809	$846,775,579	-$47,321,230	-5.3%
35.	Missouri	$631,449,534	$741,898,306	$110,448,772	17.5%
36.	Alabama	$544,575,419	$668,485,573	$123,910,154	22.8%
37.	Iowa	$615,336,544	$640,080,686	$24,744,142	4.0%
38.	Delaware	$522,019,611	$489,748,282	-$32,271,329	-6.2%
39.	District of Columbia	$249,556,944	$477,127,247	$227,570,303	91.2%
40.	Maine	$341,810,842	$321,999,679	-$19,811,163	-5.8%
41.	Nebraska	$250,951,075	$215,724,877	-$35,226,198	-14.0%
42.	Louisiana	$162,410,496	$166,574,907	$4,164,411	2.6%
43.	Rhode Island	$172,657,675	$156,785,255	-$15,872,420	-9.2%
44.	Arkansas	$170,846,381	$135,964,544	-$34,881,837	-20.4%
45.	West Virginia	$121,874,589	$121,148,379	-$726,210	-0.6%
46.	South Dakota	$86,376,768	$85,925,441	-$451,327	-0.5%
47.	North Dakota	$79,715,666	$78,323,487	-$1,392,179	-1.7%
48.	Montana	$45,209,007	$44,652,992	-$556,015	-1.2%
49.	Hawaii	$21,119,757	$26,515,986	$5,396,229	25.6%
50.	Wyoming	$14,059,878	$16,709,665	$2,649,787	18.8%
51.	Alaska	$23,231,220	$15,820,292	-$7,410,928	-31.9%

Source: Foreign Trade Division of U.S. Census Bureau | CompTIA

U.S. TECH SERVICES EXPORTS DETAIL

Rank	State	2017	2018	2017-2018 Change	2017-2018 % Change
1.	California	$36,165,380,558	$37,988,751,734	$1,823,371,177	5.0%
2.	Washington	$14,788,636,649	$15,645,010,802	$856,374,153	5.8%
3.	Massachusetts	$8,559,390,627	$8,762,657,706	$203,267,079	2.4%
4.	Texas	$6,182,078,491	$6,253,687,326	$71,608,835	1.2%
5.	New York	$5,899,259,857	$5,966,486,771	$67,226,914	1.1%
6.	North Carolina	$4,550,435,855	$4,568,298,328	$17,862,474	0.4%
7.	Georgia	$3,879,211,839	$3,834,031,696	-$45,180,143	-1.2%
8.	New Jersey	$3,742,104,345	$3,763,484,548	$21,380,203	0.6%
9.	Colorado	$3,394,628,422	$3,473,487,511	$78,859,090	2.3%
10.	Virginia	$3,013,194,858	$3,152,149,630	$138,954,772	4.6%
11.	Pennsylvania	$3,361,522,951	$3,147,223,729	-$214,299,222	-6.4%
12.	Maryland	$2,725,888,767	$2,709,783,622	-$16,105,145	-0.6%
13.	Oregon	$2,468,186,370	$2,484,167,007	$15,980,637	0.6%
14.	Illinois	$2,412,597,626	$2,352,612,894	-$59,984,732	-2.5%
15.	Florida	$2,196,214,113	$2,149,083,848	-$47,130,265	-2.1%
16.	Wisconsin	$1,686,003,098	$1,705,158,071	$19,154,973	1.1%
17.	Utah	$1,679,049,875	$1,699,175,972	$20,126,097	1.2%
18.	Indiana	$1,674,006,241	$1,668,195,972	-$5,810,269	-0.3%
19.	Connecticut	$1,523,681,634	$1,523,483,501	-$198,133	0.0%
20.	Minnesota	$1,364,433,916	$1,266,719,030	-$97,714,886	-7.2%
21.	Arizona	$1,151,718,728	$1,193,213,913	$41,495,186	3.6%
22.	Missouri	$1,082,532,039	$1,068,033,095	-$14,498,943	-1.3%
23.	Michigan	$1,106,585,064	$1,042,825,229	-$63,759,835	-5.8%
24.	District of Columbia	$882,031,376	$928,741,067	$46,709,691	5.3%
25.	Ohio	$907,401,211	$866,186,625	-$41,214,586	-4.5%
26.	New Hampshire	$684,103,965	$684,538,276	$434,310	0.1%
27.	Kansas	$604,035,828	$581,978,403	-$22,057,425	-3.7%
28.	New Mexico	$417,406,226	$409,493,179	-$7,913,047	-1.9%
29.	Alabama	$325,761,353	$313,793,270	-$11,968,084	-3.7%
30.	Iowa	$249,880,342	$265,794,993	$15,914,651	6.4%
31.	South Carolina	$239,331,949	$233,880,125	-$5,451,825	-2.3%
32.	Idaho	$212,488,928	$218,537,401	$6,048,472	2.8%
33.	Tennessee	$220,471,097	$218,446,232	-$2,024,865	-0.9%
34.	Nebraska	$199,271,178	$203,889,867	$4,618,690	2.3%
35.	Rhode Island	$120,970,177	$122,427,666	$1,457,489	1.2%
36.	Arkansas	$115,877,270	$106,404,277	-$9,472,993	-8.2%
37.	Vermont	$111,811,999	$105,694,306	-$6,117,693	-5.5%
38.	Kentucky	$102,807,751	$98,481,989	-$4,325,762	-4.2%
39.	North Dakota	$104,332,554	$95,899,017	-$8,433,537	-8.1%
40.	Oklahoma	$101,377,207	$89,632,396	-$11,744,810	-11.6%
41.	Nevada	$82,558,383	$79,634,126	-$2,924,257	-3.5%
42.	Delaware	$66,520,092	$70,318,195	$3,798,103	5.7%
43.	Maine	$71,237,801	$69,176,849	-$2,060,952	-2.9%
44.	Mississippi	$42,598,887	$39,172,110	-$3,426,777	-8.0%
45.	Louisiana	$34,908,198	$34,332,747	-$575,452	-1.6%
46.	Alaska	$37,368,842	$31,461,994	-$5,906,848	-15.8%
47.	West Virginia	$30,630,170	$27,653,501	-$2,976,670	-9.7%
48.	Montana	$25,735,040	$26,141,028	$405,989	1.6%
49.	Hawaii	$28,218,750	$24,785,163	-$3,433,587	-12.2%
50.	South Dakota	$26,525,769	$24,605,030	-$1,920,739	-7.2%
51.	Wyoming	$3,595,735	$3,178,233	-$417,502	-11.6%

Source: U.S. Bureau of Economic Analysis | CompTIA

U.S. JOBS DIRECTLY SUPPORTED BY TECH EXPORTS

Rank	State	Tech Product Export Jobs 2018	Tech Services Export Jobs 2018	Total Tech Export Jobs 2018	2017-2018 Change	2017-2018 % Change
1.	Alaska	61	38	99	-13	-11.6%
2.	Alabama	1,651	825	2,476	35	1.4%
3.	Arkansas	531	207	738	-90	-10.8%
4.	Arizona	19,462	3,082	22,544	1,194	5.6%
5.	California	135,338	87,088	222,426	10,002	4.7%
6.	Colorado	5,671	8,104	13,775	144	1.1%
7.	Connecticut	3,407	3,455	6,862	376	5.8%
8.	District of Columbia	617	2,284	2,901	100	3.6%
9.	Delaware	1,342	196	1,538	-688	-30.9%
10.	Florida	35,761	4,986	40,747	-145	-0.4%
11.	Georgia	10,425	8,314	18,739	2,488	15.3%
12.	Hawaii	56	54	110	-5	-4.5%
13.	Iowa	1,494	618	2,112	-73	-3.4%
14.	Idaho	5,584	494	6,078	213	3.6%
15.	Illinois	20,770	6,200	26,970	-269	-1.0%
16.	Indiana	5,574	3,773	9,347	-329	-3.4%
17.	Kansas	1,987	1,406	3,394	97	2.9%
18.	Kentucky	5,269	232	5,501	16	0.3%
19.	Louisiana	428	63	491	-59	-10.8%
20.	Massachusetts	22,124	20,159	42,283	930	2.3%
21.	Maryland	2,813	6,778	9,591	-82	-0.8%
22.	Maine	1,081	174	1,255	36	2.9%
23.	Michigan	8,869	2,707	11,576	-1,268	-9.9%
24.	Minnesota	12,169	3,159	15,328	1,436	10.3%
25.	Missouri	1,782	2,912	4,694	-70	-1.5%
26.	Mississippi	3,833	63	3,896	488	14.3%
27.	Montana	120	68	189	30	19.1%
28.	North Carolina	6,858	10,587	17,446	192	1.1%
29.	North Dakota	233	192	425	50	13.3%
30.	Nebraska	750	611	1,361	122	9.9%
31.	New Hampshire	3,885	1,609	5,494	-545	-9.0%
32.	New Jersey	16,367	9,491	25,858	1,455	6.0%
33.	New Mexico	6,847	904	7,751	353	4.8%
34.	Nevada	6,330	205	6,535	469	7.7%
35.	New York	20,849	12,950	33,799	1,151	3.5%
36.	Ohio	12,539	2,176	14,716	4,220	40.2%
37.	Oklahoma	2,626	148	2,774	139	5.3%
38.	Oregon	25,068	5,421	30,489	-4,231	-12.2%
39.	Pennsylvania	9,490	6,470	15,960	-851	-5.1%
40.	Rhode Island	490	383	873	12	1.4%
41.	South Carolina	4,182	531	4,713	504	12.0%
42.	South Dakota	285	40	325	-50	-13.4%
43.	Tennessee	12,949	497	13,447	-3,278	-19.6%
44.	Texas	155,756	15,637	171,393	3,926	2.3%
45.	Utah	4,655	3,908	8,563	-946	-10.0%
46.	Virginia	7,342	9,679	17,021	1,664	10.8%
47.	Vermont	6,283	275	6,558	480	7.9%
48.	Washington	12,228	32,951	45,179	2,119	4.9%
49.	Wisconsin	8,134	3,609	11,743	189	1.6%
50.	West Virginia	324	60	385	-10	-2.6%
51.	Wyoming	36	5	41	-7	-15.1%
	TOTAL	632,724	285,782	918,506	21,620	2.4%

Source: Source: Trade Partnership CDxports database | CompTIA

CHINA TRADE ADDENDUM

Discussions of international trade almost inevitably lead to discussions of China. This may entail discussion of China as a market opportunity given its enormous population of potential buyers and second largest economy on the planet topping $13.6 trillion. Or, it may entail discussion of China as a formidable rival with a workforce nearly five times larger than the U.S. workforce and growing sophistication in production capacity, innovation, and agility.

At the time of writing of this report, discussion anxiously focused on Covid-19 and disruptions to global supply chains. This crisis quickly overshadowed the trade turmoil simmering between the United States and China for much of the past two years. As covered in CompTIA's full Tech Trade Snapshot report, the trade relationship with China is complex. Trade statistics alone fail to capture the nuance of interconnected global supply chains, government trade policies, and the inherent difficulty in assessing what is often characterized – rightly or wrongly, as the winners and losers of international trade.

$20 billion

Estimated value of U.S. exports of technology products and services to China in 2018

$190 billion

Estimated value of U.S. imports of technology products and services from China in 2018

60,000

Estimated number of U.S. jobs directly supported by U.S. technology exports to China

5.8%

Growth rate of U.S. technology products exports to China in 2019

89%

Percent of U.S. technology exports to China in the products category vs. 11% in services

19

Number of states recording a positive exports growth rate of technology products to China in 2018

CHINA OVERVIEW

U.S. information technology exports to China reached an estimated $20.3 billion in 2018, the most recent year of available data at the time of writing. Exports grew 5.6 percent year-over-year, generating growth after several flat years. Over the past decade, U.S. exports of technology products and services to China increased 50 percent, or about $6.8 billion in new revenue.

U.S. tech exports to China are dominated by the products category, with a ratio of 89 percent to 11 percent for tech services exports.

China is the third largest market for U.S. technology product exports, trailing only Mexico and Canada. The U.S. agency responsible for compiling trade statistics, the Foreign Trade Division of the Census Bureau, counts exports to the semi-autonomous regions of Hong Kong and Taiwan separately. When all three are combined, U.S. tech product exports to the more expansive grouping ($36.8 billion) moves it into second place ahead of Canada.

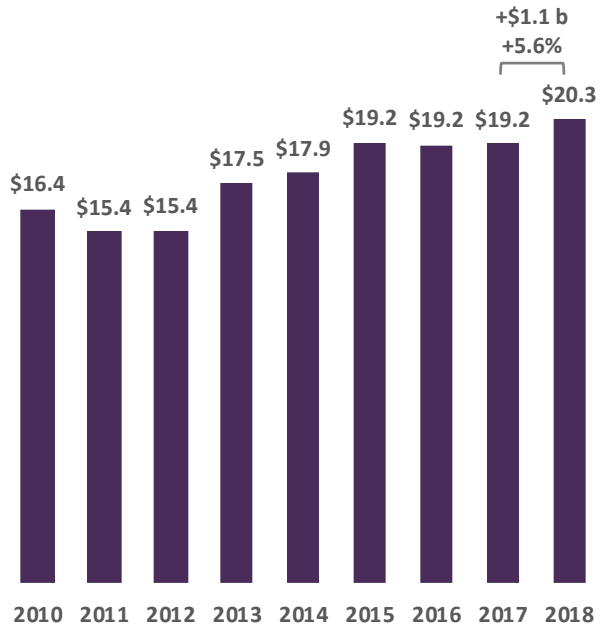
Within the tech products category, the sub-sector covering semiconductors and components accounted for 51 percent of total U.S. tech product exports to China 2019, up from 44 percent during the prior year. On its own, China is the second largest export market for U.S. semiconductors, or the largest when using the grouping described above.

As an enabling technology, semiconductors are found in a wide-range of products, from computers, smartphones, and cloud data centers, to devices increasingly associated with the internet of things (IoT) trends, such as connected autonomous vehicles, smart appliances, digital health devices, smart cities, and more. U.S. semiconductor exports to China may be embedded in any number of product categories during assembly and then shipped to other markets as a finished product. U.S. semiconductor exports generated over $1.8 billion in new revenue in 2019, a growth rate of 23 percent. This was driven heavily by exports from Oregon-based semiconductor companies, which grew their exports by 43 percent.

The remaining categories of tech product exports to China all experienced negative growth during 2019. The category experiencing the most pronounced loss in 2019 was the computer category, falling 19 percent, or -$427 million. Telecommunications equipment was also in double-digit losses, with a drop of -10.8%, or -$133 million.

U.S. TOTAL TECH EXPORTS TO CHINA

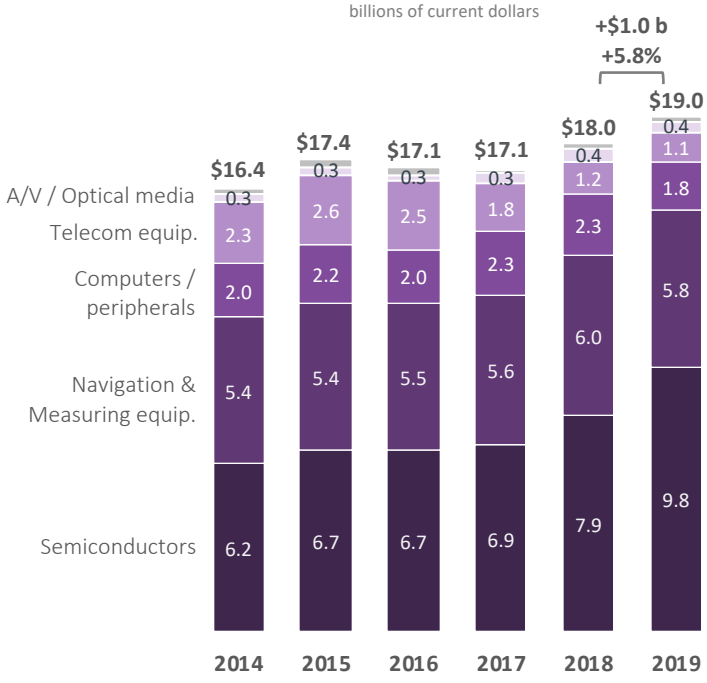
Products + services | billions of current dollars



Source: Foreign Trade Division of U.S. Census Bureau | CompTIA | 2017 is the most recent year of available data for tech services trade, which is used to calculate total trade

U.S. TECH PRODUCT EXPORTS TO CHINA

billions of current dollars



Source: Foreign Trade Division of U.S. Census Bureau | CompTIA

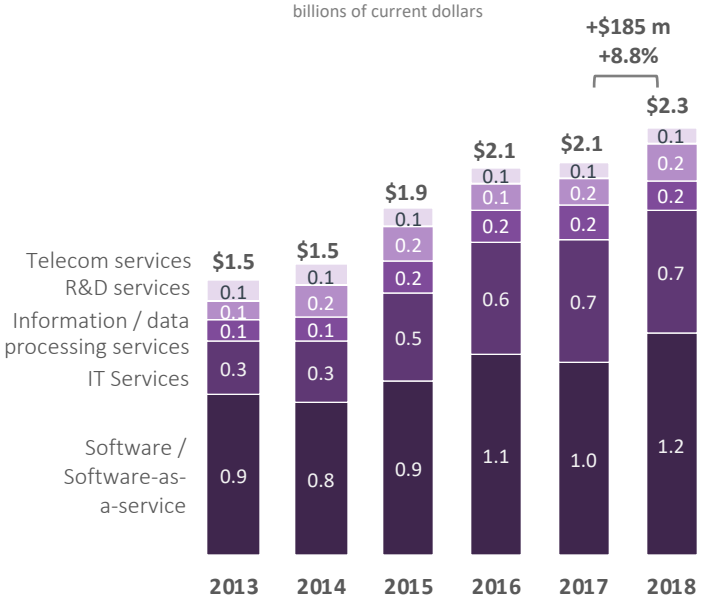
On the tech services front, the U.S. exported $2.3 billion worth of services to China in 2018, the most recent year of available detailed data. Overall, tech services grew by an estimated 8.8 percent in 2018, adding $185 million in new sales. During the past decade, U.S. exports of tech services to China more than doubled (139 percent), adding $1.3 billion in sales to U.S. tech service and software providers.

The software category, increasingly delivered as software-as-a-service (SaaS) is the largest U.S. tech services export to China, accounting for nearly half of the total. Exports of software were increased 14.8 percent in 2018, rebounding from negative growth in 2017. In the Asia-Pacific region, the top markets for U.S. software exports are Singapore, Japan, India, and South Korea, and Australia, with China ranking 6th.

Software tends to go hand-in-hand with IT services. Businesses pursuing a modernization or digital business transformation initiative, may migrate legacy infrastructure or applications to the cloud. This typically entails integrating different applications, databases, devices, or e-commerce platforms. Add cybersecurity, data governance, and the need for ongoing support to the mix, and these types of initiatives may involve significant complexity. IT services firms, which may take the form of solution provider, managed services provider, digital consultant, or related title, serve customers by owning this complexity.

In the Asia Pacific region, the top markets for U.S. IT services exports are Japan, Australia, and India, with China just about tied with South Korea at 4th.

U.S. TECH SERVICES EXPORTS TO CHINA



Source: U.S. Bureau of Economic Analysis (BEA) | CompTIA | 2017 is the most recent year of available data for tech services exports

Top States for Tech Product Exports to China, 2019		Top States for Tech Services Exports to China, 2018*	
1.	Oregon	1.	California
2.	California	2.	Washington
3.	Texas	3.	Massachusetts
4.	New Mexico	4.	Texas
5.	Massachusetts	5.	New York
6.	Washington	6.	Georgia
7.	Arizona	7.	Colorado
8.	Tennessee	8.	North Carolina
9.	Illinois	9.	Virginia
10.	Minnesota	10.	New Jersey

Source: Foreign Trade Division of U.S. Census Bureau | U.S. Bureau of Economic Analysis | CompTIA | *Most recent year of available data for tech services trade

Exports to China are highly concentrated in the top three states. Oregon ($5.6 billion), California ($3.7 billion), and Texas ($1.8 billion) account for 59 percent of U.S. tech product exports to China. This is a function of the significant presence of semiconductor companies in these states, which is the largest tech goods export category from the U.S. to China.

The top 10 states account for 78 percent of U.S. tech product exports to China, an increase in concentration from the 73 percent figure in 2017. Twenty-six states exported at least $100 million in tech products to buyers in China during 2018.

Tech services concentration follows a similar pattern with the top three states accounting for 55 percent of U.S. tech services exports to China. California ($713 million), Washington ($379 million), and Massachusetts ($176 million) all have significant numbers of large, export-minded software firms based in their states.

29 Number of states with at least $100 million in tech product exports or $25 million in tech services exports to China.

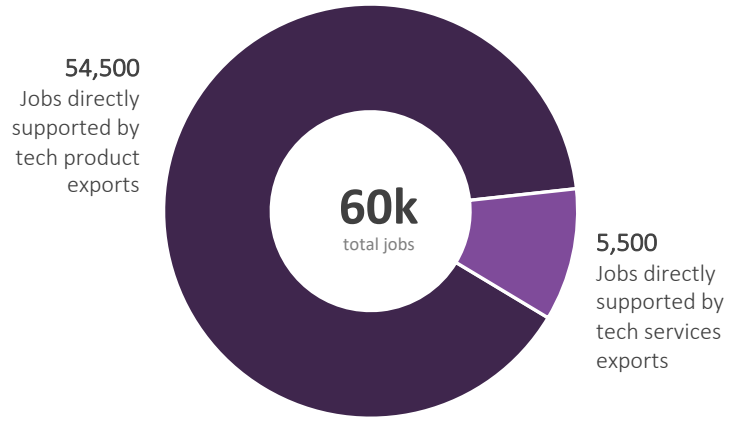
ASSESSING THE EMPLOYMENT IMPACT OF U.S. TRADE WITH CHINA

China is a buyer for 6.0 percent of U.S. exports of technology products and services. As expected, there is a strong relationship between export volume and export-supported employment. In 2018, the most recent year of available data, there were an estimated 59,974 U.S. jobs directly connected to exports of technology products and services to China. This represents 6.5 percent of total tech export-supported employment in the U.S., so closely aligned with the sales volume of exports to China.

Because U.S. exports to China skew heavily towards tech product categories, it follows that employment will also be most concentrated in that area. Approximately 9 in 10 U.S. jobs directly supported by exports to China fall into the technology products category, with the remaining 10 percent allocated to tech services.

U.S. JOBS DIRECTLY SUPPORTED BY TECH EXPORTS TO CHINA

+6.2% YoY growth | +3,500 new jobs created



Source: Trade Partnership CDxports database | CompTIA | Data cover 2018 time period

LEADING TRADING PARTNERS FOR TECH PRODUCTS

	Exports from the U.S.		Imports into the U.S.
1.	Mexico	1.	China
2.	Canada	2.	Mexico
3.	China	3.	Malaysia
4.	Hong Kong	4.	Taiwan
5.	Germany	5.	Vietnam
6.	Japan	6.	Japan
7.	Netherlands	7.	South Korea
8.	South Korea	8.	Thailand
9.	Singapore	9.	Germany
10.	Taiwan	10.	Canada

Source: Foreign Trade Division of U.S. Census Bureau | CompTIA | 2019 data

15 Number of states with 1,000 or more tech jobs directly supported by exports of tech products or services to China

CHINA AND THE IMPACT OF TARIFFS

A tariff is a tax on imported goods or services. As an additional cost, tariffs affect behavior. Businesses selling products or services subject to tariffs may try to pass some or all of the additional cost onto end buyers, which means less money to spend on other items. Buyers in turn may respond by foregoing the purchase or substituting for another option. Businesses may then be forced to absorb the extra cost of the tariff. To avoid the full impact of tariffs, businesses may also seek to change their operations. This may entail shifting production, assembly, or routing to countries with more favorable trade relations.

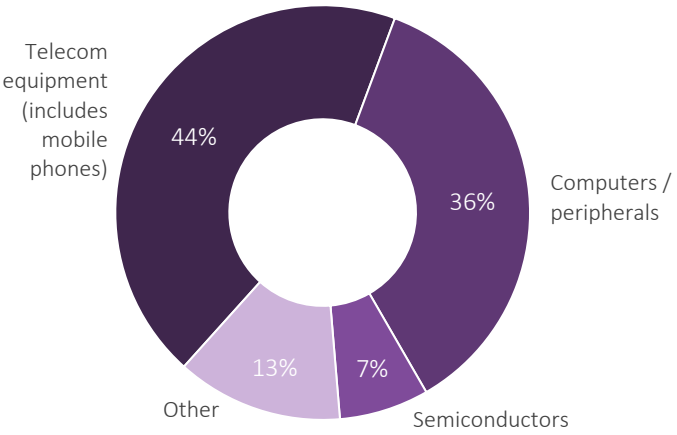
At the time of writing, the multi-year trade war between the U.S. and China had yet to be resolved. A truce – referred to as Phase One, was signed by the two countries on January 15, 2020. Beyond Phase One, it remains unclear the degree to which elevated tariffs for many product categories and friction between buyers and sellers will remain.

Based on analysis from Trade Partnership of government trade statistics, total tariffs paid on technology product imports from China increased 193 percent between 2018 and 2019. The hardest hit category was U.S. semiconductors, where the average tariff rate increased more than five-fold, from 2.8 percent to 18.4 percent.

According to a directional survey conducted by CompTIA in 2019 to a segment of large U.S. technology vendors, a majority of respondents report not being able to pass on tariffs to customers. Instead, most have had to absorb component or production cost increases internally, or pursue other strategies.

Trade statistics indicate there was some degree of U.S. OEMs shifting portions of their manufacturing operations

COMPOSITION OF CHINESE EXPORTS OF TECH PRODUCTS TO THE U.S.



Source: Foreign Trade Division of U.S. Census Bureau | CompTIA

and supply chains away from China (often referred to as de-coupling) to other markets. Vietnam gained the most, increasing its exports of tech products to the U.S. (an import on the U.S. ledger) by 88 percent, or $9.9 billion. The top 5 gainers added $18.7 billion, accounting for 90 percent of all tech product import gains to the U.S. As noted in the table below, there is not a 1:1 relationship between the import losses from China and the import gains from other markets. It is difficult to isolate all the effects that could be at play, but those losses hit someone – sellers and/or buyers of tech products.

Beyond the additional costs of trade turmoil – both hard costs, as well as the cost of loss productivity or opportunity costs, there is the issue of localization. That is, the strategic need to be close to the end customer when developing, producing, and delivering products. A majority of respondents to the CompTIA survey indicate manufacturing in China is an important part of their strategy in selling into the Chinese market and aligning their offerings with the needs of Chinese buyers.

Rank	Country/ Autonomous Region	Tech Product Imports to the U.S 2018	Tech Product Imports to the U.S. 2019	2018-2019 Change	2018-2019 % Change
NA	China	$186,152,260,107	$146,489,976,218	-$39,662,283,889	-21%
Top countries/autonomous regions for import growth to the U.S.					
1.	Vietnam	$11,310,583,204	$21,214,337,356	$9,903,754,152	87.6%
2.	Taiwan	$17,063,549,280	$24,001,781,429	$6,938,232,149	40.7%
3.	Mexico	$64,552,263,229	$65,639,901,876	$1,087,638,647	1.7%
4.	Switzerland	$4,880,629,752	$5,319,768,898	$439,139,146	9.0%
5.	Czech Republic	$798,142,419	$1,094,040,608	$295,898,189	37.1%
6-105.	All others	$39,360,405,263	$41,495,232,419	$2,134,827,156	5.4%
	TOTAL	$137,965,573,147	$158,765,062,586	$20,799,489,439	15.1%

U.S. JOBS DIRECTLY SUPPORTED BY TECH EXPORTS TO CHINA

Rank	State	Tech Product Export Jobs 2018	Tech Services Export Jobs 2018	Total Tech Export Jobs 2018	2017-2018 Change	2017-2018 % Change
1.	California	135,338	87,088	222,426	10,002	4.7%
2.	Texas	155,756	15,637	171,393	3,926	2.3%
3.	Washington	12,228	32,951	45,179	2,119	4.9%
4.	Massachusetts	22,124	20,159	42,283	930	2.3%
5.	Florida	35,761	4,986	40,747	-145	-0.4%
6.	New York	20,849	12,950	33,799	1,151	3.5%
7.	Oregon	25,068	5,421	30,489	-4,231	-12.2%
8.	Illinois	20,770	6,200	26,970	-269	-1.0%
9.	New Jersey	16,367	9,491	25,858	1,455	6.0%
10.	Arizona	19,462	3,082	22,544	1,194	5.6%
11.	Georgia	10,425	8,314	18,739	2,488	15.3%
12.	North Carolina	6,858	10,587	17,446	192	1.1%
13.	Virginia	7,342	9,679	17,021	1,664	10.8%
14.	Pennsylvania	9,490	6,470	15,960	-851	-5.1%
15.	Minnesota	12,169	3,159	15,328	1,436	10.3%
16.	Ohio	12,539	2,176	14,716	4,220	40.2%
17.	Colorado	5,671	8,104	13,775	144	1.1%
18.	Tennessee	12,949	497	13,447	-3,278	-19.6%
19.	Wisconsin	8,134	3,609	11,743	189	1.6%
20.	Michigan	8,869	2,707	11,576	-1,268	-9.9%
21.	Maryland	2,813	6,778	9,591	-82	-0.8%
22.	Indiana	5,574	3,773	9,347	-329	-3.4%
23.	Utah	4,655	3,908	8,563	-946	-10.0%
24.	New Mexico	6,847	904	7,751	353	4.8%
25.	Connecticut	3,407	3,455	6,862	376	5.8%
26.	Vermont	6,283	275	6,558	480	7.9%
27.	Nevada	6,330	205	6,535	469	7.7%
28.	Idaho	5,584	494	6,078	213	3.6%
29.	Kentucky	5,269	232	5,501	16	0.3%
30.	New Hampshire	3,885	1,609	5,494	-545	-9.0%
31.	South Carolina	4,182	531	4,713	504	12.0%
32.	Missouri	1,782	2,912	4,694	-70	-1.5%
33.	Mississippi	3,833	63	3,896	488	14.3%
34.	Kansas	1,987	1,406	3,394	97	2.9%
35.	District of Columbia	617	2,284	2,901	100	3.6%
36.	Oklahoma	2,626	148	2,774	139	5.3%
37.	Alabama	1,651	825	2,476	35	1.4%
38.	Iowa	1,494	618	2,112	-73	-3.4%
39.	Delaware	1,342	196	1,538	-688	-30.9%
40.	Nebraska	750	611	1,361	122	9.9%
41.	Maine	1,081	174	1,255	36	2.9%
42.	Rhode Island	490	383	873	12	1.4%
43.	Arkansas	531	207	738	-90	-10.8%
44.	Louisiana	428	63	491	-59	-10.8%
45.	North Dakota	233	192	425	50	13.3%
46.	West Virginia	324	60	385	-10	-2.6%
47.	South Dakota	285	40	325	-50	-13.4%
48.	Montana	120	68	189	30	19.1%
49.	Hawaii	56	54	110	-5	-4.5%
50.	Alaska	61	38	99	-13	-11.6%
51.	Wyoming	36	5	41	-7	-15.1%
	TOTAL	632,724	285,782	918,506	21,620	2.4%

Source: Source: Trade Partnership CDxports database | CompTIA

METHODOLOGY

Sizing the technology industry has become increasingly challenging. This stems from the ongoing blurring of lines between what constitutes tech, as well as how tech is categorized by government statistics agencies. For example, an automobile company exporting its own autonomous vehicle technology or a financial services firm providing fintech data services abroad, some portion of the value of these activities will not be captured by export statistics as currently categorized. Some of the inputs used by automotive companies or financial services companies, such as semiconductors, will be captured in tech manufacturing, but if companies are developing their own software or other technology internally, for example, it will not be captured. Because these scenarios are becoming more prevalent, there is some degree of undercounting of tech products and services exports.

This report relies on a set of categories defined by the NAICS codes used by government agencies. While any categorization system has limitations, relying on established NAICS ensures consistency in tracking data over time and in comparisons across states, regions, and industry sectors.

As it relates to totals, in some cases the sum of the underlying states will not exactly match the reported figure at the national level. This is due to a portion of imports or exports categorized as 'unallocated' and the presence of a small amount of trade attributed to U.S. territories.

As it relates to trade-supported employment figures, the U.S. Office of Trade and Economic Analysis states, "given the data used to estimate jobs supported by state-level exports, care should be taken in the interpretation of the results. The figures presented should best be thought of as representing the number of jobs supported by the exports from a state as opposed to the number of jobs supported by exports within a state."

It is not uncommon for government agencies to issue revisions to past data. In some cases, revisions could span many years. CompTIA's *Tech Trade Snapshot* uses the most current data at time of publication. However, past reports could become outdated due to data revisions.

For additional detail and methodology on state services exports and jobs tied to exports, see The Trade Partnership's CDxports database: http://tradepartnership.com/data/cdxports-and-cdxjobs/

For additional data on manufactured goods exports, see the U.S. International Trade Administration. For additional data on services exports, see U.S. Bureau of Economic Analysis.

NAICS	Manufactured goods categories
334	Computer and Electronic Products
3341	Computer Equipment
3342	Communications Equipment
3343	Audio / Video Equipment
3344	Semiconductors / Components
3345	Navigational / Measuring / Control Instruments
3346	Magnetic / Optical Media

NAICS	Services categories
517	Telecommunications services
518	Data processing, hosting, and related services
5112	Software publishers
5415	IT services / computer systems design services
54171	R&D services / R&D in physical, engineering,

[1]WTO World Trade Statistical Review 2019

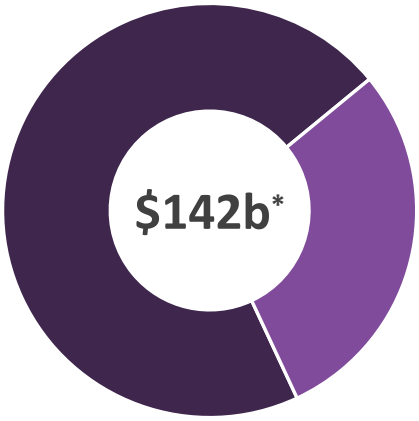
APPENDIX A: WTO ITA AND MONTHLY TRENDING

Top markets for U.S. tech product exports among WTO ITA signatory countries		2019 Export $ Value
1.	Canada	$24,858,482,585
2.	China	$19,027,961,866
3.	Germany	$7,890,969,231
4.	Japan	$7,816,879,927
5.	Netherlands	$7,749,582,192
6.	South Canada	$6,859,347,516
7.	Singapore	$5,835,901,017
8.	Taiwan	$5,711,231,511
9.	United Kingdom	$5,242,434,939
10.	Malaysia	$5,033,084,068

Top markets for U.S. tech product exports growth among WTO ITA signatories		2019 Export $ Change
1.	China	$1,036,439,639
2.	Vietnam	$204,572,986
3.	Switzerland	$171,979,214
4.	Belgium	$168,125,949
5.	Croatia	$148,983,734
6.	United Arab Emirates	$148,303,827
7.	India	$100,532,682
8.	Norway	$82,128,348
9.	Hungary	$81,744,693
10.	Egypt	$77,869,831

TOTAL U.S. TECH EXPORTS OF WTO ITA-COVERED PRODUCTS

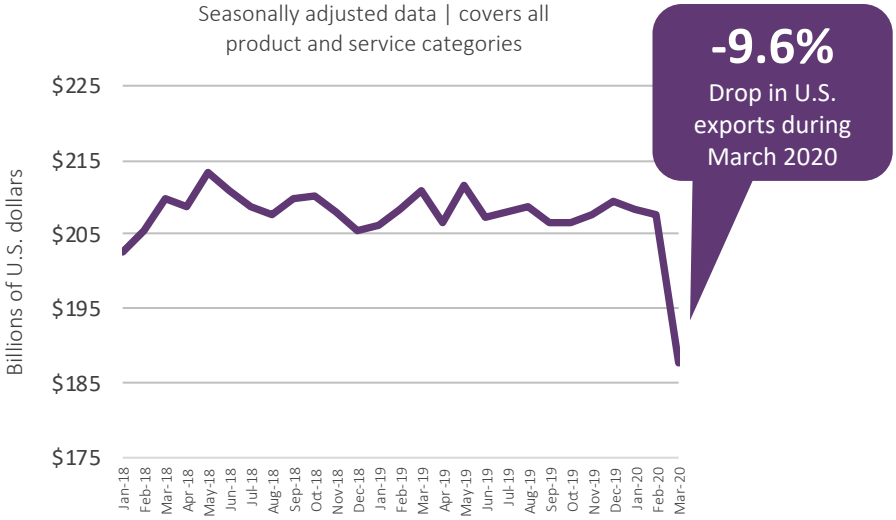
The share was unchanged from 2018 to 2019



*2019 value of U.S. exports of tech goods covered by ITA
Source: Trade Partnership CDxports database | CompTIA

MONTHLY U.S. EXPORTS TRENDING

Seasonally adjusted data | covers all product and service categories



Source: Foreign Trade Division of U.S. Census Bureau | U.S. Bureau of Economic Analysis | CompTIA

418,500 jobs

Estimated number of U.S. tech industry jobs directly supported by tech product exports to WTO ITA signatory markets. About two-thirds of all tech industry jobs directly supported by exports are covered by the WTO ITA.

For more detail on the WTO Information Technology Agreement (ITA), see https://www.wto.org/english/tratop_e/inftec_e/inftec_e.htm

At the time of writing, the effects of Covid-19 were just starting to be seen in government economic statistics. According to the U.S. Commerce Department, total U.S. goods exports (across all categories) fell -6.7 percent or -$9.2 billion in value during March 2020, while services exports (across all categories) fell -15.3% or -$10.8 billion in value. As seen in the chart to the left, the March figures were well off their normal range.

For tech goods and services, the data is not quite comparable due to the lack of seasonally-adjusted monthly data at the detailed NAICS-level. One available source of insight is a year-over-year comparison. For March 2020, U.S. exports of tech products were an estimated $17.3 billion versus $18.8 billion in March 2019, a decrease of -7.9 percent or -$1.5 billion in value.

APPENDIX B: U.S.-WORLD IMPORTS, EXPORTS, AND TRADE BALANCE

TECH EXPORTS FROM U.S.	Type	2015	2016	2017	2018	2019 est.
Computer / peripheral equipment	Product	$46,748,140,492	$45,132,566,351	$46,274,911,143	$49,693,359,519	$47,099,060,931
Communications equipment	Product	$42,156,979,791	$41,540,861,800	$40,775,841,260	$38,350,516,322	$35,866,752,686
Audio / video equipment	Product	$9,613,922,984	$9,397,643,017	$9,738,134,500	$9,273,611,436	$8,779,659,872
Semiconductors / components	Product	$53,647,436,281	$54,497,349,384	$58,314,054,822	$59,424,749,115	$59,858,743,531
Navigational / Measuring / Instruments	Product	$48,869,406,979	$47,733,225,761	$48,842,374,439	$51,959,993,418	$52,673,742,460
Magnetic / Optical Media	Product	$3,659,784,001	$3,632,262,402	$4,066,235,941	$4,667,785,427	$4,613,817,987
IT / computer services	Service	$36,791,000,000	$36,912,000,000	$36,423,000,000	$37,642,000,000	$35,903,000,000
Information / data processing services	Service	$12,587,000,000	$11,781,000,000	$10,828,000,000	$9,354,000,000	$8,304,000,000
R&D and testing services	Service	$16,707,000,000	$19,304,000,000	$22,864,000,000	$24,455,000,000	$28,639,000,000
Telecommunications services	Service	$7,285,000,000	$7,160,000,000	$8,309,000,000	$9,386,000,000	$10,870,000,000
Software / software-as-a-service	Service	$34,743,000,000	$38,300,000,000	$42,232,000,000	$42,555,000,000	$45,330,000,000
Tech product subtotal	Subtotal	$204,695,670,528	$201,933,908,715	$208,011,552,105	$213,370,015,237	$208,891,777,467
Tech services subtotal	Subtotal	$108,113,000,000	$113,457,000,000	$120,656,000,000	$123,392,000,000	$129,046,000,000
Total	Total	$312,808,670,528	$315,390,908,715	$328,667,552,105	$336,762,015,237	$337,937,777,467

TECH IMPORTS INTO U.S.	Type	2015	2016	2017	2018	2019 est.
Computer / peripheral equipment	Product	$91,761,230,070	$86,731,865,238	$96,875,236,432	$105,787,606,932	$103,801,487,721
Communications equipment	Product	$114,257,343,252	$116,365,960,390	$125,275,947,936	$121,773,845,303	$111,617,216,134
Audio / video equipment	Product	$36,806,046,053	$34,110,235,675	$31,953,388,587	$31,261,308,812	$30,485,664,005
Semiconductors / components	Product	$72,152,679,185	$74,257,090,315	$81,094,803,511	$85,915,905,921	$75,207,750,208
Navigational / Measuring / Instruments	Product	$54,195,101,018	$52,995,092,122	$54,318,027,066	$57,512,061,044	$57,592,892,216
Magnetic / Optical Media	Product	$6,865,400,319	$8,203,683,310	$10,614,884,042	$11,296,663,996	$10,961,342,284
IT / computer services	Service	$6,795,000,000	$7,596,000,000	$9,969,000,000	$10,333,000,000	$11,652,000,000
Information / data processing services	Service	$6,281,000,000	$5,535,000,000	$5,329,000,000	$5,747,000,000	$5,622,000,000
R&D and testing services	Service	$27,940,000,000	$29,551,000,000	$31,764,000,000	$32,864,000,000	$33,721,000,000
Telecommunications services	Service	$2,483,000,000	$2,332,000,000	$2,536,000,000	$2,579,000,000	$3,813,000,000
Software / software-as-a-service	Service	$32,256,000,000	$34,083,000,000	$35,231,000,000	$34,618,000,000	$33,550,000,000
Tech product subtotal	Subtotal	$376,037,799,897	$372,663,927,050	$400,132,287,574	$413,547,392,008	$389,666,352,568
Tech services subtotal	Subtotal	$75,755,000,000	$79,097,000,000	$84,829,000,000	$86,141,000,000	$88,358,000,000
Total	Total	$451,792,799,897	$451,760,927,050	$484,961,287,574	$499,688,392,008	$478,024,352,568

TRADE BALANCE (exports - imports)	Type	2015	2016	2017	2018	2019 est.
Computer / peripheral equipment	Product	-$45,013,089,578	-$41,603,181,975	-$50,599,897,587	-$56,094,076,894	-$56,701,979,063
Communications equipment	Product	-$72,100,168,263	-$74,823,409,567	-$84,498,852,974	-$83,422,534,820	-$75,749,716,644
Audio / video equipment	Product	-$27,191,679,086	-$24,712,239,407	-$22,215,012,223	-$21,986,787,755	-$21,705,233,482
Semiconductors / components	Product	-$18,504,979,286	-$19,939,288,424	-$22,780,042,891	-$26,490,849,222	-$15,348,718,205
Navigational / Measuring / Instruments	Product	-$5,325,047,628	-$5,255,895,116	-$5,474,869,323	-$5,551,211,739	-$4,917,953,550
Magnetic / Optical Media	Product	-$3,205,519,112	-$4,571,296,455	-$6,548,526,834	-$6,628,761,701	-$6,347,413,632
IT / computer services	Service	$29,996,000,000	$29,316,000,000	$26,454,000,000	$27,309,000,000	$24,251,000,000
Information / data processing services	Service	$6,306,000,000	$6,246,000,000	$5,499,000,000	$3,607,000,000	$2,682,000,000
R&D and testing services	Service	-$11,233,000,000	-$10,247,000,000	-$8,900,000,000	-$8,409,000,000	-$5,082,000,000
Telecommunications services	Service	$4,802,000,000	$4,828,000,000	$5,773,000,000	$6,807,000,000	$7,057,000,000
Software / software-as-a-service	Service	$2,487,000,000	$4,217,000,000	$7,001,000,000	$7,937,000,000	$11,780,000,000
Tech product subtotal	Subtotal	-$171,340,482,953	-$170,905,310,944	-$192,117,201,832	-$200,174,222,131	-$180,771,014,576
Tech services subtotal	Subtotal	$32,358,000,000	$34,360,000,000	$35,827,000,000	$37,251,000,000	$40,688,000,000
Total	Total	-$138,982,482,953	-$136,545,310,944	-$156,290,201,832	-$162,923,222,131	-$140,083,014,576

Source: Foreign Trade Division of U.S. Census Bureau | U.S. Bureau of Economic Analysis | CompTIA

APPENDIX C: U.S.-CHINA IMPORTS, EXPORTS, AND TRADE BALANCE

TECH EXPORTS FROM U.S. TO CHINA	Type	2015	2016	2017	2018	2019
Computer / peripheral equipment	Product	$2,204,163,535	$1,973,425,027	$2,313,763,142	$2,253,405,193	$1,826,096,035
Communications equipment	Product	$2,560,846,887	$2,504,620,334	$1,778,167,024	$1,230,542,729	$1,097,906,512
Audio / video equipment	Product	$226,825,998	$207,778,250	$191,794,814	$189,766,066	$178,002,186
Semiconductors / components	Product	$6,694,231,981	$6,686,199,475	$6,887,259,196	$7,944,685,390	$9,789,488,042
Navigational / Measuring / Instruments	Product	$5,403,445,540	$5,465,374,221	$5,578,786,823	$5,954,186,301	$5,755,247,575
Magnetic / Optical Media	Product	$307,962,079	$270,217,704	$347,309,679	$418,936,548	$381,221,516
IT / computer services	Service	$463,000,000	$606,000,000	$659,000,000	$661,000,000	NA
Information / data processing services	Service	$180,000,000	$140,000,000	$152,000,000	$193,000,000	NA
R&D and testing services	Service	$175,000,000	$171,000,000	$173,000,000	$161,000,000	NA
Telecommunications services	Service	$100,000,000	$86,000,000	$89,000,000	$91,000,000	NA
Software / software-as-a-service	Service	$932,000,000	$1,067,000,000	$1,027,000,000	$1,179,000,000	NA
Tech product subtotal	Subtotal	$17,397,476,020	$17,107,615,011	$17,097,080,678	$17,991,522,227	$19,027,961,866
Tech services subtotal	Subtotal	$1,850,000,000	$2,070,000,000	$2,100,000,000	$2,285,000,000	NA
Total	Total	$19,247,476,020	$19,177,615,011	$19,197,080,678	$20,276,522,227	NA

TECH IMPORTS FROM CHINA TO U.S.	Type	2015	2016	2017	2018	2019
Computer / peripheral equipment	Product	$57,820,551,906	$52,182,439,566	$58,525,159,256	$59,796,587,873	$52,951,956,969
Communications equipment	Product	$67,380,798,801	$65,739,211,463	$78,236,066,637	$77,484,423,485	$64,580,984,802
Audio / video equipment	Product	$14,965,358,389	$14,021,378,589	$12,572,822,541	$13,608,988,065	$11,437,564,878
Semiconductors / components	Product	$19,635,142,347	$18,926,880,465	$23,182,528,165	$24,482,227,318	$10,704,233,858
Navigational / Measuring / Instruments	Product	$7,918,226,159	$7,263,432,263	$6,980,117,068	$6,674,838,489	$4,638,840,695
Magnetic / Optical Media	Product	$2,830,743,857	$3,099,854,932	$4,546,738,784	$4,105,194,877	$2,176,395,016
IT / computer services	Service	$685,000,000	$684,000,000	$655,000,000	$510,000,000	NA
Information / data processing services	Service	$51,000,000	$36,000,000	$36,000,000	$37,000,000	NA
R&D and testing services	Service	$2,364,000,000	$2,543,000,000	$2,479,000,000	$2,849,000,000	NA
Telecommunications services	Service	$192,000,000	$179,000,000	$152,000,000	$161,000,000	NA
Software / software-as-a-service	Service	$48,000,000	$47,000,000	NA	$55,000,000	NA
Tech product subtotal	Subtotal	$170,550,821,459	$161,233,197,278	$184,043,432,451	$186,152,260,107	$146,489,976,218
Tech services subtotal	Subtotal	$3,340,000,000	$3,489,000,000	$3,322,000,000	$3,612,000,000	NA
Total	Total	$173,890,821,459	$164,722,197,278	$187,365,432,451	$189,764,260,107	NA

U.S. TRADE BALANCE WITH CHINA	Type	2015	2016	2017	2018	2019
Computer / peripheral equipment	Product	-$55,616,388,371	-$50,209,014,539	-$56,211,396,114	-$57,543,182,680	-$51,125,860,934
Communications equipment	Product	-$64,819,951,914	-$63,234,591,129	-$76,457,899,613	-$76,253,880,756	-$63,483,078,290
Audio / video equipment	Product	-$14,738,532,391	-$13,813,600,339	-$12,381,027,727	-$13,419,221,999	-$11,259,562,692
Semiconductors / components	Product	-$12,940,910,366	-$12,240,680,990	-$16,295,268,969	-$16,537,541,928	-$914,745,816
Navigational / Measuring / Instruments	Product	-$2,514,780,619	-$1,798,058,042	-$1,401,330,245	-$720,652,188	$1,116,406,880
Magnetic / Optical Media	Product	-$2,522,781,778	-$2,829,637,228	-$4,199,429,105	-$3,686,258,329	-$1,795,173,500
IT / computer services	Service	-$222,000,000	-$78,000,000	$4,000,000	$151,000,000	NA
Information / data processing services	Service	$129,000,000	$104,000,000	$116,000,000	$156,000,000	NA
R&D and testing services	Service	-$2,189,000,000	-$2,372,000,000	-$2,306,000,000	-$2,688,000,000	NA
Telecommunications services	Service	-$92,000,000	-$93,000,000	-$63,000,000	-$70,000,000	NA
Software / software-as-a-service	Service	$884,000,000	$1,020,000,000	NA	$1,124,000,000	NA
Tech product subtotal	Subtotal	-$153,153,345,439	-$144,125,582,267	-$166,946,351,773	-$168,160,737,880	-$127,462,014,352
Tech services subtotal	Subtotal	-$1,490,000,000	-$1,419,000,000	-$2,249,000,000	-$1,327,000,000	NA
Total	Total	-$154,643,345,439	-$145,544,582,267	-$169,195,351,773	-$169,487,737,880	NA

Source: Foreign Trade Division of U.S. Census Bureau | U.S. Bureau of Economic Analysis | CompTIA |
2018 is the most year of available data for tech services trade

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