

Electronic Products

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Change from 2017 to 2018:

- **U.S. total exports of electronic products: Increased by \$8.4 billion (3.1 percent) to \$277 billion**
- **U.S. general imports of electronic products: Increased by \$21.9 billion (4.5 percent) to \$506 billion**

From 2017 to 2018, U.S. total exports of electronic products grew by \$8.4 billion (3.1 percent) to \$277 billion. During the same period, U.S. electronic products exports increased overall,¹ rising by \$2.5 billion (1.5 percent) to \$162.5 billion, though there were decreases in a few sectors. The growth in exports was due primarily to an increase in exports of measuring, testing, and controlling instruments as well as medical goods. U.S. exports to China posted the largest growth by value, while those to Thailand posted the largest growth by percentage change (table EL.1).

From 2017 to 2018, U.S. imports of electronic products grew by \$21.9 billion (4.5 percent) to \$506 billion. The growth in imports was due primarily to an increase in imports of computers, peripherals, and parts as well as medical goods. U.S. imports of electronic products from Mexico increased the most (up \$6.9 billion, 9.2 percent), followed by those from China (\$4.4 billion, 2.1 percent).

¹ Unless otherwise noted, the export data used in this investigation are for domestic exports. For more information on trade terminology, please refer to USITC, "Special Topic: Trade Metrics," *Shifts in U.S. Merchandise Trade, 2014, 2015*, https://www.usitc.gov/research_and_analysis/trade_shifts_2014/trade_metrics.htm.

Table EL.1 Electronic products: U.S. exports and general imports, by selected trading partners, 2014–18

Country/item	Million \$					Absolute change, 2017 to 2018	% change, 2017 to 2018
	2014	2015	2016	2017	2018		
U.S. exports of domestic merchandise:							
China	14,538	15,184	14,957	14,932	16,374	1,442	9.7
Mexico	21,691	23,295	21,057	19,726	19,169	-558	-2.8
Malaysia	5,221	5,146	4,743	4,733	4,001	-732	-15.5
Japan	10,154	9,583	9,391	9,138	9,223	85	0.9
Canada	17,548	15,907	15,348	15,659	15,908	249	1.6
Germany	8,235	8,199	8,083	8,571	8,867	296	3.5
South Korea	6,856	7,270	6,575	7,148	7,251	103	1.4
Taiwan	3,736	4,229	4,883	4,709	4,787	78	1.7
Thailand	2,355	2,245	2,315	2,120	2,413	293	13.8
Vietnam	696	723	2,060	1,504	1,039	-465	-30.9
All other	78,350	74,380	70,627	71,854	73,517	1,663	2.3
Total domestic exports	169,379	166,162	160,040	160,093	162,549	2,455	1.5
Foreign exports	98,455	97,959	100,386	108,452	114,347	5,895	5.4
Total U.S. exports (domestic and foreign)	267,833	264,121	260,426	268,546	276,896	8,350	3.1
U.S. general imports:							
China	186,705	189,224	180,381	205,604	209,957	4,353	2.1
Mexico	65,064	72,485	73,501	75,760	82,745	6,985	9.2
Malaysia	22,089	25,373	28,544	28,274	29,272	999	3.5
Japan	22,906	21,686	21,214	21,514	22,585	1,072	5.0
Canada	9,114	8,939	8,927	9,286	9,807	521	5.6
Germany	15,256	14,851	14,431	14,986	16,601	1,616	10.8
South Korea	17,379	16,169	16,551	16,813	17,561	747	4.4
Taiwan	17,343	16,330	16,435	17,625	18,980	1,355	7.7
Thailand	12,341	13,343	13,534	13,999	13,775	-225	-1.6
Vietnam	5,579	9,810	11,704	12,360	12,198	-163	-1.3
All other	65,332	61,669	64,639	67,908	72,589	4,682	6.9
Total general imports	439,109	449,879	449,861	484,129	506,070	21,942	4.5

Source: Compiled from official statistics of the U.S. Department of Commerce.

Note: Import values are based on U.S. customs value; export values are based on free alongside ship value, U.S. port of export. Calculations are based on unrounded data. The countries are sorted by those with the largest total U.S. trade (U.S. general imports plus U.S. domestic exports) in these products in the most recent year.

U.S. Exports

U.S. total exports of electronic products grew by \$8.4 billion (3.1 percent) to \$277 billion in 2018. Likewise, U.S. electronic products exports increased by \$2.5 billion (1.5 percent) to \$162.5 billion. An increase in exports of measuring, testing, and controlling instruments as well as of medical goods drove the growth in exports in 2018 (table EL.2). U.S. exports to China posted the largest growth by value, increasing by \$1.4 billion (9.7 percent), while those to Thailand grew the most in terms of percentage change, increasing by \$293 million (13.8 percent).

From 2017 to 2018, U.S. exports of measuring, testing, and controlling instruments increased by \$1.8 billion (7.8 percent) to \$24.9 billion (table EL.2). This increase primarily involved exports to China, Germany, and Taiwan. Within this product group, the largest increases in U.S. exports involved scientific measuring instruments,² up \$137 million, and medical devices such as x-ray machines,³ up \$128 million. China was the largest export destination for both of these product groups, due in part to increased demand stemming from changes in Chinese demographics and government policies, as well as swift-moving advances in technology. These changes have resulted in rapid reforms in its healthcare sector and large industrial upgrading initiatives such as Made in China 2025, which rely on a variety of measuring, testing, and controlling instruments.⁴

U.S. exports of medical goods rose by \$1.6 billion (4.9 percent) to \$34.4 billion in 2018. This increase was primarily in exports to the Netherlands, Japan, and China. Within this product group, the largest increases in U.S. exports were of healthcare products such as catheters,⁵ up \$530 million, and medical, surgical, and dental instruments,⁶ up \$226 million. Again, China, the Netherlands, and Japan have been the top three export destinations for these two product groups for the past five years.⁷ U.S. exports of these goods to China grew by roughly \$500 million for both of these groups between 2013 and 2018, driven in part by the reforms in its healthcare sector and large industrial upgrading initiative previously mentioned.⁸

² USITC DataWeb/USDOC, HTS 9015.80.80 (accessed May 29, 2019). HTS 9015.80.80 covers surveying, hydrographic, oceanographic, hydrological, meteorological or geophysical instruments and appliances, not elsewhere specified or included (n.e.s.i.), nonoptical.

³ USITC DataWeb/USDOC, HTS 9030.10.00 (accessed May 29, 2019). HTS 9030.10.00 covers instruments and apparatus for measuring or detecting ionizing radiations.

⁴ Seeking Alpha, "China Sector Analysis: Health Care," 2019; U.S. Chamber of Commerce, *Made in China 2025*, March 16, 2017.

⁵ USITC DataWeb/USDOC, HTS 9018.39.00 (accessed May 29, 2019). HTS 9018.39.00 covers catheters, cannulae and the like, n.e.s.i., used in medical, surgical, dental or veterinary sciences, and parts and accessories thereof.

⁶ USITC DataWeb/USDOC, HTS 9018.90.80 (accessed May 29, 2019). HTS 9018.90.80 covers instruments and appliances used in medical, surgical, dental or veterinary sciences, n.e.s.i., and parts and accessories thereof.

⁷ IHS Markit, Global Trade Atlas database, HS 9018.39 and 9018.90 (accessed May 29, 2019).

⁸ Seeking Alpha, "China Sector Analysis: Health Care," 2019.

Table EL.2 Electronic products: Leading changes in U.S. exports and imports, 2014–18

Industry/commodity group (USITC code)	Million \$					Absolute change, 2017 to 2018	% change, 2017 to 2018
	2014	2015	2016	2017	2018		
U.S. domestic exports:							
Increases:							
Measuring, testing, and controlling instruments (EL025)	25,714	23,928	22,602	23,050	24,859	1,809	7.8
Medical goods (EL022)	33,727	33,204	32,932	32,787	34,392	1,605	4.9
Decreases:							
Telecommunications equipment (EL002)	17,099	17,556	16,665	15,726	14,985	-741	-4.7
Semiconductors and integrated circuits (EL015)	27,446	27,744	27,895	26,531	26,067	-464	-1.7
All other	65,392	63,731	59,944	62,000	62,245	245	0.4
Total	169,379	166,162	160,040	160,093	162,549	2,455	1.5
U.S. general imports:							
Increases:							
Computers, peripherals, and parts (EL017)	121,512	119,620	112,561	124,073	138,092	14,019	11.3
Medical goods (EL022)	36,182	37,826	40,158	42,985	47,343	4,358	10.1
Decreases:							
Telecommunications equipment (EL002)	98,289	105,055	107,863	116,116	111,973	-4,143	-3.6
Semiconductors and integrated circuits (EL015)	39,037	40,134	44,177	43,971	43,609	-362	-0.8
All other	144,089	147,244	145,102	156,983	165,053	8,069	5.1
Total	439,109	449,879	449,861	484,129	506,070	21,942	4.5

Source: Compiled from official statistics of the U.S. Department of Commerce.

Note: Import values are based on U.S. customs value; export values are based on free alongside ship value, U.S. port of export. Calculations are based on unrounded data.

Although U.S. exports of electronics products increased by \$2.5 billion between 2017 and 2018, there were declines in exports of telecommunications equipment of \$741 million (4.7 percent) to \$14.9 billion, and in those of semiconductors and integrated circuits of \$464 million (1.7 percent) to \$26 billion. The largest decrease in exports of telecom equipment was in communication satellites,⁹ down \$464 million, and cellphones,¹⁰ down \$334 million. The largest decrease in exports of semiconductors and integrated

⁹ USITC DataWeb/USDOC, HTS 8802.60.30 (accessed May 29, 2019). HTS 8802.60.30 covers communication satellites.

¹⁰ USITC DataWeb/USDOC, HTS 8517.12.00 (accessed May 29, 2019). HTS 8517.12.00 covers telephones for cellular networks or for other wireless networks.

circuits was in integrated circuits and systems on a chip,¹¹ down \$482 million, and memory chips,¹² down \$366 million. U.S. exports of electronic products to Malaysia and Vietnam saw the largest decrease in percentage and value.

As discussed further below, the decrease in U.S. exports of semiconductors and integrated circuits coincided with a decrease in U.S. imports of semiconductors and integrated circuits, reflecting a general downward production trend in the global semiconductor industry in the second half of 2018 as prices of memory chips fell due to oversupply. The semiconductor industry is subject to well-documented cyclical behavior, and a downturn beginning in the fourth quarter of 2018 led to a period of decreasing sales and orders as companies processed their existing inventory and certain subsegments of the market experienced oversupply.¹³ Industry analysts also stated that U.S. firms that produce semiconductors, particularly manufacturers of memory chips, saw a decrease in sales to China after the various trade actions put in place by the United States and China.¹⁴

U.S. Imports

U.S. imports of electronic products grew by \$21.9 billion (4.5 percent) to \$506 billion in 2018. The growth in imports was due primarily to an increase in imports of computers, peripherals, and parts as well as medical goods (table EL.2). U.S. imports of electronic products from Mexico increased the most (\$7.0 billion, 9.2 percent), followed by those from China (\$4.4 billion, 2.1 percent).

In 2017–18, U.S. imports of computers, peripherals, and parts increased from \$124 billion to \$138 billion (\$14 billion, 11.3 percent). Within this product group, the largest increases in U.S. imports were of desktop computers and servers,¹⁵ up \$8.2 billion (35 percent) and printed circuit board assemblies,¹⁶ up \$4.7 billion (27 percent), reflecting increased U.S. demand for these products. Printed circuit board assemblies are incorporated in nearly all electronic devices, including computers, servers, and phones, as well as in cloud computing.¹⁷ Mexico—which benefits from a well-educated and growing population and low labor costs, proximity to the United States, and large U.S. consumer electronic firms—has emerged as a hub for electronics assembly and manufacturing in recent years. China remains a major location for the manufacture and assembly of intermediate and final electronic products.¹⁸

U.S. imports of medical goods increased from \$43.0 billion to \$47.3 billion (10.1 percent) from 2017 to 2018, reflecting growing demand for healthcare services.¹⁹ Within this product group, the largest

¹¹ USITC DataWeb/USDOC, HTS 8542.31.00 (accessed May 29, 2019). HTS 8542.31.00 covers processors and controllers, whether or not combined with memories, converters, logic circuits, amplifiers, clock, and timing circuits.

¹² USITC DataWeb/USDOC, HTS 8542.32.00 (accessed May 29, 2019). HTS 8542.32.00 covers memories.

¹³ Witkowski, “Chip Companies Face Worst Downturn in a Decade,” 2019.

¹⁴ IDC, “Worldwide DRAM Market Shares, 2018,” 2019, 5.

¹⁵ USITC DataWeb/USDOC, HTS 8471.50.01 (accessed May 29, 2019). HTS 8471.50.01 covers processing units other than those of subheading 8471.41 and 8471.49, not elsewhere specified or included (n.e.s.o.i).

¹⁶ USITC DataWeb/USDOC, HTS 8473.30.11 (accessed May 29, 2019). HTS 8473.30.11 covers printed circuit assemblies, not incorporating a cathode ray tube, of the machines classified in HTS 8471.

¹⁷ CTA, “Comment on Section 301 Tariffs,” 2018, 5.

¹⁸ Donahue, “Mexico: A New Hub for Electronics Manufacturing,” 2018; Torsekar and VerWey, “EAP’s Participation in Electronics GVC,” 2019.

¹⁹ AMN Healthcare, “Healthcare Industry Forecast: High Demand,” 2017.

increases in U.S. imports were of medical, surgical, and dental instruments,²⁰ up \$940 million, and prosthetics,²¹ up \$411 million. Imports of medical, surgical, and dental instruments from Mexico totaled \$2.1 billion in 2018, while Ireland was the leading supplier of prosthetics, totaling \$1.5 billion in 2018.²² Both countries feature large and growing medical device industries bolstered by the availability of cost-competitive (Mexico) and skilled (Ireland) labor pools, transportation infrastructure, and tax preferences.²³

From 2017 to 2018, the electronic product sectors that recorded the most notable declines in imports were telecommunications equipment, and semiconductors and integrated circuits. U.S. imports of telecom equipment declined by \$4.1 billion (3.6 percent) to \$112 billion. Within the telecommunications product group, imports of cellphones declined \$3.1 billion and imports of radio transceivers were down \$808 million. U.S. imports of telecom equipment declined the most from South Korea, Malaysia, and China. Major electronics manufacturers maintain facilities in South Korea (e.g., Samsung), Malaysia (e.g., Murata), and China (e.g., Foxconn).²⁴ After several years of increases, industry analysts predict slower growth in demand for telecommunications equipment in the upcoming years, which partially explains the decline in imports of these products.²⁵

Meanwhile, imports of semiconductors and integrated circuits declined by \$362 million (0.8 percent) to \$43.6 billion. Within the semiconductors and integrated circuits product group, the largest decrease in imports by value was of diodes,²⁶ down \$2 billion, and LEDs,²⁷ down \$97 million. Imports of semiconductors and integrated circuits declined the most from Ireland, Vietnam, and Israel. The U.S. chipmaker Intel maintains manufacturing facilities in Ireland and Israel, which account for the majority of U.S. imports from those countries.²⁸ The decline in imports of semiconductors and integrated circuits from Ireland, Vietnam, and Israel also partially reflects the downturn that this industry now faces.²⁹

²⁰ USITC DataWeb/USDOC, HTS 9018.90.80 (accessed May 29, 2019). HTS 9018.90.80 covers instruments and appliances used in medical, surgical, dental or veterinary sciences, n.e.s.i., and parts and accessories thereof.

²¹ USITC DataWeb/USDOC, HTS 9021.31.00 (accessed May 29, 2019). HTS 9021.31.00 covers artificial joints and parts and accessories thereof.

²² USITC DataWeb/USDOC, HTS 9021.31.00 (accessed May 29, 2019).

²³ Araiza Diaz, "Medical Device Industry in Mexico," 2018; Keena, "Ireland Second Only to Germany," 2018.

²⁴ Samsung, "Manufacturing Centers," 2019; Murata Group, "About Murata Malaysia," 2019; Hille, "Foxconn: Why the World's Tech Factory Faces Its Biggest Tests," June 10, 2019.

²⁵ S&P Global Ratings, "Industry Top Trends 2019: Telecommunications," November 15, 2018.

²⁶ USITC DataWeb/USDOC, HTS 8541.40.60 (accessed May 29, 2019). HTS 8541.40.60 covers diodes for semiconductor devices, other than light-emitting diodes, n.e.s.i.

²⁷ USITC DataWeb/USDOC, HTS 8541.40.20 (accessed May 29, 2019). HTS 8541.40.20 covers light-emitting diodes (LEDs).

²⁸ Both facilities expect to expand in the coming years in spite of the declines in trade in 2018. Clarke, "Intel Plans for More Manufacturing," 2018.

²⁹ Jewell, "Semiconductor Market Downturn in 2019," 2019.

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