

TABLE 108

Impact of specialized equipment technology on worker types, by industry: 2016–18

(Number and percent)

Industry	NAICS code	Companies (number)	Production workers				Nonproduction workers				Supervisory workers				Nonsupervisory workers				
			Increased	Decreased	Did not change	Did not employ	Increased	Decreased	Did not change	Did not employ	Increased	Decreased	Did not change	Did not employ	Increased	Decreased	Did not change	Did not employ	
All industries	11, 21–23, 31–33, 42–81	853,259	7.6	2.3	60.9	29.2	4.3	1.6	71.3	22.8	4.5	1.2	72.3	22.0	5.1	1.4	71.9	21.6	
Manufacturing industries	31–33	84,450	13.0	5.3	73.5	8.2	7.0	2.1	81.6	9.3	5.5	1.5	82.8	10.2	6.9	2.2	79.3	11.6	
Food	311	5,235	15.0	10.8	65.4	8.8	7.4	2.9	79.1	10.6	8.3	2.0	78.4	11.3	6.7	3.8	76.7	12.8	
Beverage and tobacco products	312	3,427	15.9	4.9	72.0	7.2	11.4	1.9	r 76.0	10.7	8.3	0.6	78.4	12.7	10.9	1.1	76.5	11.5	
Textile, apparel, and leather products	313–16	3,095	8.0	5.1	73.3	13.6	4.4	2.7	r 75.3	17.6	2.1	1.1	74.3	22.5	5.7	1.3	73.8	19.3	
Wood products	321	3,323	11.6	5.7	74.9	7.8	6.2	1.3	83.4	9.1	3.2	2.5	r 85.3	9.0	4.0	2.0	79.6	14.4	
Paper	322	745	34.5	5.0	r 56.9	3.6	r 22.0	r D	73.3	4.0	r 6.7	6.0	r 82.7	4.6	r 16.4	r 1.5	71.8	10.3	r
Printing and related support activities	323	8,083	10.0	5.2	75.5	9.3	5.2	1.6	81.0	12.2	3.7	1.0	80.7	14.6	5.9	1.5	76.9	15.7	
Petroleum and coal products	324	251	12.0	r D	79.7	7.6	r 3.6	r D	90.0	D	1.6	0.0	92.8	D	2.0	D	89.2	8.4	r
Chemicals	325	2,945	14.9	6.4	75.7	3.0	12.3	0.8	82.3	4.6	8.5	0.6	r 87.6	3.3	10.6	1.6	82.6	5.2	
Pesticide, fertilizer, and other agricultural chemical manufacturing	3253	213	22.0	r D	67.8	10.2	r D	0.0	86.9	11.7	r D	0.0	67.1	10.8	r 0.0	0.0	87.0	13.0	r
Pharmaceuticals and medicines	3254	632	14.1	3.0	80.2	2.7	13.3	D	83.7	2.5	r 5.2	0.8	91.9	2.1	r 10.1	0.8	r 86.9	2.2	
Soap, cleaning compound, and toilet preparation manufacturing	3256	586	9.9	10.8	74.7	4.6	8.7	D	82.1	8.2	7.0	D	86.2	6.7	r 7.5	2.7	r 80.8	9.0	
Other chemicals	other 325	1,514	16.2	6.9	75.2	1.7	r 14.8	0.9	r 81.2	3.2	r 8.7	r 0.9	r 89.1	1.3	r 13.3	1.7	81.0	4.0	r
Plastics and rubber products	326	3,851	13.0	5.0	79.0	3.0	11.8	1.9	81.7	4.6	9.8	1.7	83.9	4.6	10.9	1.9	80.8	6.4	
Nonmetallic mineral products	327	2,310	15.5	6.1	71.0	7.4	8.1	1.7	r 77.6	12.6	5.9	1.0	r 82.3	10.8	10.5	3.2	70.5	15.8	
Primary metals	331	1,110	9.0	8.4	r 71.2	11.4	4.3	1.1	82.7	11.9	r 3.8	0.7	r 83.9	11.6	3.6	1.3	81.6	13.5	

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			Increased	Decreased	Did not change	Did not employ	Increased	Decreased	Did not change	Did not employ	Increased	Decreased	Did not change	Did not employ	Increased	Decreased	Did not change	Did not employ						
Fabricated metal products	332	20,142	15.0	3.9	73.4	7.7	6.0	2.3	83.8	7.9	5.8	1.2	85.0	8.0	7.1	2.4	81.1	9.4						
Machinery	333	8,503	12.4	4.1	72.9	10.6	8.7	1.8	81.8	7.7	5.8	1.4	82.5	10.3	6.6	1.6	79.2	12.6						
Computer and electronic products	334	4,354	9.6	4.0	76.5	9.9	5.9	2.0	85.4	6.7	4.9	2.2	84.4	8.5	4.8	2.1	85.1	8.0						
Communications equipment	3342	488	11.1	1.6	78.1	9.2	5.1	D	88.3	5.5	r	2.5	D	90.0	6.8	r	5.7	1.2	87.6	5.5	r			
Semiconductor and other electronic components	3344	1,443	10.5	6.7	76.1	6.7	7.1	2.9	r	84.0	6.0	6.5	3.5	r	85.1	4.9	3.7	2.7	r	86.7	6.9			
Navigational, measuring, electromedical, and control instruments	3345	1,930	9.7	3.4	76.1	10.8	6.0	2.2	85.4	6.4	5.0	2.0	r	82.2	10.8	5.9	2.3	83.9	7.9					
Other computer and electronic products	other 334	494	5.9	1.2	r	76.0	16.9	2.8	0.0	86.9	10.3	2.0	D	84.6	12.1	2.0	1.0	82.6	14.4					
Electrical equipment, appliances, and components	335	1,814	18.9	4.2	67.0	9.9	8.3	1.4	r	83.9	6.4	5.8	1.7	r	85.8	6.7	10.1	1.7	80.3	7.9				
Transportation equipment	336	2,777	14.0	6.8	73.1	6.1	6.8	4.2	r	81.6	7.4	7.7	3.1	r	82.0	7.2	8.4	3.2	r	80.2	8.2			
Automobiles, bodies, trailers, and parts	3361–63	1,842	9.3	8.5	r	76.3	5.9	r	4.2	5.8	r	82.7	7.3	4.8	4.1	r	84.0	7.1	4.9	4.2	r	83.4	7.5	
Aerospace products and parts	3364	468	26.6	5.8	63.5	4.1	r	11.5	D	82.5	5.3	10.9	0.6	83.3	5.3	13.7	2.1	r	77.8	6.4	r			
Other transportation	other 336	466	19.3	r	1.1	r	70.9	8.8	12.2	r	1.9	r	75.7	10.1	16.3	r	D	71.5	10.5	17.0	r	D	70.0	12.7
Furniture and related products	337	4,416	9.8	6.4	79.0	4.8	5.3	2.3	r	83.2	9.2	2.7	1.4	r	85.8	10.1	4.4	3.3	82.3	10.0				
Miscellaneous	339	8,067	10.9	5.7	73.6	9.8	4.2	2.4	80.1	13.3	3.9	1.5	81.4	13.2	4.3	2.2	77.8	15.7						
Medical equipment and supplies	3391	3,432	15.2	5.9	69.4	9.5	3.6	1.6	80.1	14.7	5.5	1.1	r	80.8	12.6	4.4	2.6	74.5	18.5					
Other miscellaneous manufacturing	3399	4,635	7.7	5.6	76.7	10.0	4.6	3.0	80.2	12.2	2.7	1.8	r	81.8	13.7	4.3	1.9	r	80.1	13.7				

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			Increased	Decreased	Did not change	Did not employ	Increased	Decreased	Did not change	Did not employ	Increased	Decreased	Did not change	Did not employ	Increased	Decreased	Did not change	Did not employ
Nonmanufacturing industries	11, 21–23, 42–81	768,809	7.0	2.0	59.5	31.5	4.1	1.6	70.0	24.3	4.4	1.1	71.2	23.3	4.9	1.3	71.1	22.7
Agriculture, forestry, fishing, and hunting	11	4,266	3.0 r	4.0	70.2	22.8	4.6	3.6 r	59.0	32.8	D	D	71.2	26.6	D	D	71.5	24.3
Mining, extraction, and support activities	21	2,511	2.3	2.7 r	74.3	20.7	1.4	2.5 r	79.1	17.0	1.2	2.5 r	81.6	14.7	1.5	0.4	85.3	12.8
Utilities	22	684	3.8	0.7	68.1	27.4	2.0	D	72.5	24.6	3.7	0.7	80.2	15.4	2.8	1.3	78.0	17.9
Construction	23	105,445	11.2	2.2	62.1	24.5	4.0	1.7	71.2	23.1	6.5	1.4	72.3	19.8	6.4	1.2	73.3	19.1
Wholesale trade	42	38,117	8.6	3.9	65.4	22.1	6.6	2.1	76.8	14.5	5.9	1.4	78.5	14.2	7.0	1.6	76.7	14.7
Retail trade	44–45	82,447	6.3	2.0	63.0	28.7	3.8	1.6	73.8	20.8	3.8	1.4	74.8	20.0	4.4	1.5	74.6	19.5
Transportation and warehousing	48–49	21,161	6.9	2.2	53.3	37.6	5.4	1.5	65.6	27.5	5.4	0.3 r	68.5	25.8	5.9	2.0	67.3	24.8
Information	51	13,835	5.1	1.7	59.7	33.5	3.7	1.2	68.6	26.5	4.2	0.7	69.5	25.6	4.6	1.1	67.9	26.4
Publishing	511	2,147	7.2	1.4	68.3	23.1	9.3	1.7	73.3	15.7	10.1	1.2	72.2	16.5	9.9	2.3	67.8	20.0
Newspaper, periodical, book, and directory publishers	5111	1,029	2.2	2.8	77.6	17.4	0.8 r	1.9	78.1	19.2	1.1	1.6 r	73.2	24.2	0.8 r	3.8	64.3	31.1
Software publishers	5112	1,119	11.8	0.0	59.9	28.3	17.2	1.3	68.9	12.6	18.5	0.9 r	71.2	9.4	18.2	1.1 r	71.0	9.7
Telecommunications	517	1,650	6.3	2.3 r	62.0	29.4	2.7	3.9 r	76.0	17.4	2.9	2.7 r	77.8	16.6	4.2	3.0 r	75.5	17.3
Data processing, hosting, and related services	518	1,673	10.5	0.9	60.6	28.0	9.7	0.4	66.1	23.8	8.1	D	75.6	16.0	10.3	1.6 r	68.7	19.4
Other information	other 51	8,364	3.3	1.9	56.7	38.1	1.2	0.7	66.6	31.5	2.1	0.2 r	66.0	31.7	2.1	0.4	66.3	31.2
Finance and insurance	52	12,468	7.1	1.1 r	59.0	32.8	6.1	1.7	69.2	23.0	5.6	0.8 r	70.0	23.6	7.1	1.1	66.9	24.9
Real estate and rental and leasing	53	16,228	4.9	1.4 r	52.9	40.8	4.0	1.5	61.1	33.4	4.0	1.3	63.1	31.6	5.0	0.6 r	61.5	32.9
Lessors of nonfinancial intangible assets (except copyrighted works)	533	127 r	0.0	0.0	D	54.3 r	0.0	0.0	45.7 r	D	0.0	0.0	90.6	D	0.0	0.0	90.6	D

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Other real estate and rental and leasing	other 53	16,100	4.9	1.4	r 53.0	40.7	4.0	1.5	61.3	33.2	4.0	1.3	62.9	31.8	5.1	0.6	r 61.2	33.1
Professional, scientific, and technical services	54	105,874	6.3	1.3	57.4	35.0	4.7	1.2	69.6	24.5	4.4	0.6	69.6	25.4	5.1	1.2	69.0	24.7
Legal services	5411	8,791	3.9	0.7	r 45.7	49.7	3.2	1.4	r 58.0	37.4	4.5	0.7	r 58.3	36.5	4.6	1.9	r 59.8	33.7
Accounting, tax preparation, bookkeeping, and payroll services	5412	9,401	6.3	1.3	45.5	46.9	4.6	1.5	61.2	32.7	0.8	r 0.9	r 64.6	33.7	3.0	D	64.7	31.5
Architectural, engineering, and related services	5413	28,964	5.8	1.6	64.7	27.9	3.6	1.6	75.3	19.5	3.8	0.3	76.8	19.1	4.5	0.9	75.5	19.1
Specialized design services	5414	4,237	3.4	r 1.4	r 56.4	38.8	3.8	D	62.2	33.9	3.7	D	59.5	36.7	4.0	D	57.4	38.6
Computer systems design and related services	5415	14,332	7.3	1.1	r 60.5	31.1	6.1	0.7	71.7	21.5	5.0	1.0	72.4	21.6	6.0	1.4	71.3	21.3
Management, scientific, and technical consulting services	5416	12,934	9.5	1.2	r 51.6	37.7	7.9	1.0	r 67.5	23.6	7.5	1.2	r 63.9	27.4	8.2	1.6	62.5	27.7
Scientific research and development services	5417	3,892	8.7	1.3	60.7	29.3	6.9	1.3	79.1	12.7	6.4	0.9	80.3	12.4	8.1	1.2	77.4	13.3
Advertising, public relations, and related services	5418	3,993	8.9	3.7	61.2	26.2	5.7	3.0	r 67.2	24.1	2.9	2.0	r 68.4	26.7	5.4	2.6	r 66.6	25.4
Other professional, scientific, and technical services	5419	19,328	4.7	0.7	58.3	36.3	3.4	0.7	70.7	25.2	4.2	D	68.8	26.9	4.0	0.9	70.0	25.1
Management of companies and enterprises	55	394	0.0	D	77.9	D	D	0.0	64.7	D	0.0	D	78.2	D	D	0.0	78.2	D
Administrative and support and waste management and remediation services	56	46,344	11.6	2.5	56.6	29.3	5.5	2.4	65.9	26.2	6.6	1.6	68.2	23.6	6.4	2.3	66.0	25.3

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Educational services	61	6,368	4.1	1.4	r	44.6	50.0	3.9	D	66.4	29.0	4.6	D	64.6	30.2	5.3	D	64.4	28.8		
Health care and social assistance	62	162,430	4.4	0.7		56.2	38.7	3.3	0.9	71.0	24.8	3.0	0.6	71.7	24.7	3.7	0.7	73.0	22.6		
Health care services	621–23	158,942	4.4	0.7		56.4	38.5	3.3	0.9	71.1	24.7	3.0	0.6	71.7	24.7	3.6	0.7	73.2	22.5		
Social assistance	624	3,488	7.1	D		43.2	48.1	3.6	D	62.5	32.7	4.8	r	0.0	70.6	24.6	7.1	D	66.7	24.6	
Arts, entertainment, and recreation	71	13,917	2.3	2.3		47.6	47.8	1.7	r	2.2	60.2	35.9	3.7	2.0	r	57.8	36.5	4.1	1.7	61.0	33.2
Accommodation and food services	72	50,999	8.8	5.5		63.2	22.5	4.5	3.4	70.4	21.7	4.9	3.4	74.0	17.7	5.4	3.2	71.5	19.9		
Other services	81	85,324	6.4	2.1		62.5	29.0	2.5	1.5	68.7	27.3	2.7	0.7	68.6	28.0	3.6	1.2	68.4	26.8		

D = withheld to avoid disclosing data for individual companies; data are included in higher-level totals. r = relative standard error > 50%.

NAICS = 2017 North American Industry Classification System.

Note(s):

Detail may not add to total because of rounding or unavailable NAICS detail for select records beyond the 4-digit industry classification. Industry classification is based on dominant establishment payroll. Statistics are representative of companies located in the United States.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, 2019 Annual Business Survey: Data Year 2018.