



InfoBrief

Innovation Data from the 2020 Annual Business Survey

NSF 23-310 | December 2022

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Of the estimated 4.9 million for-profit companies with at least one employee, a quarter (25%) introduced an innovation during 2017–19 ([table 1](#)). Eleven percent of these for-profit companies introduced one or more product innovations, and 22% introduced one or more business process innovations.

Data are from the Annual Business Survey (ABS), which provides a comprehensive view of business innovation in the United States. ABS survey questions are based on the *Oslo Manual* (2018 edition), developed by the Organisation for Economic Co-operation and Development (OECD) and Eurostat (the Statistical Office of the European Union). The manual provides internationally recognized definitions and guidelines for measuring innovation.¹ In the Oslo framework, innovation is “the introduction of new or improved products (goods or services) or business processes that differed significantly from the business’s previous products or processes.”

This InfoBrief provides findings from the third year of the ABS and, when appropriate, comparisons to the previous years of data collection. The ABS was developed and is cosponsored by the National Center for Science and Engineering Statistics within the National Science Foundation and by the Census Bureau.

Table 1

Product and business process innovating companies, by industry and company size: 2017–19

(Number and percent)

Industry and company size	NAICS code	Companies (number)	Product or business process innovation		Product innovation		Business process innovation	
			Percent		Percent		Percent	
			Yes	No	Yes	No	Yes	No
Industry								
All industries	11, 21–23, 31–33, 42–81	4,857,473	25.3	74.7	10.9	89.1	21.7	78.3
Manufacturing industries	31–33	217,058	34.0	66.0	16.3	83.7	29.3	70.7
Food	311	18,379	34.3	65.7	13.2	86.8	29.7	70.3
Beverage and tobacco products	312	8,381	42.3	57.7	19.1	80.9	36.3	63.7
Textile, apparel, and leather products	313–16	10,205	33.2	66.8	15.9	84.1	28.4	71.6
Wood products	321	10,340	25.4	74.6	9.3	90.7	22.5	77.5
Paper	322	1,795	32.1	67.9	14.1	85.9	25.2	74.8

Table 1**Product and business process innovating companies, by industry and company size: 2017–19**

(Number and percent)

Industry and company size	NAICS code	Companies (number)	Product or business process innovation		Product innovation		Business process innovation	
			Percent		Percent		Percent	
			Yes	No	Yes	No	Yes	No
Printing and related support activities	323	21,035	31.3	68.7	15.9	84.1	26.3	73.7
Petroleum and coal products	324	693	8.9	91.1	3.9	96.1	8.8	91.2
Chemicals	325	7,759	41.2	58.8	20.2	79.8	34.8	65.2
Pesticide, fertilizer, and other agricultural chemicals	3253	555	35.7	64.3	13.0	87.0	32.6	67.4
Pharmaceuticals and medicines	3254	1,467	45.7	54.3	24.3	75.7	38.5	61.5
Soap, cleaning compound, and toilet preparation	3256	1,772	43.7	56.3	20.5	79.5	37.5	62.5
Other chemicals	other 325	3,966	39.2	60.8	19.5	80.5	32.5	67.5
Plastics and rubber products	326	7,811	36.3	63.7	16.8	83.2	32.1	67.9
Nonmetallic mineral products	327	7,758	30.3	69.7	12.3	87.7	26.9	73.1
Primary metals	331	2,437	33.3	66.7	14.0	86.0	29.7	70.3
Fabricated metal products	332	48,470	30.7	69.3	12.6	87.4	27.5	72.5
Machinery	333	18,350	41.1	58.9	22.8	77.2	35.5	64.5
Computer and electronic products	334	8,851	51.1	48.9	33.1	66.9	41.7	58.3
Communications equipment	3342	938	56.4	43.6	42.0	58.0	45.7	54.3
Semiconductor and other electronic components	3344	2,914	45.1	54.9	24.8	75.2	40.5	59.5
Navigational, measuring, electromedical, and control instruments	3345	3,649	54.6	45.4	37.5	62.5	40.9	59.1
Other computer and electronic products	other 334	1,349	50.6	49.4	32.5	67.5	43.7	56.3
Electrical equipment, appliances, and components	335	3,874	44.5	55.5	26.9	73.1	35.5	64.5
Transportation equipment	336	7,638	34.9	65.1	19.8	80.2	29.1	70.9
Automobiles, bodies, trailers, and parts	3361–63	4,728	32.6	67.4	18.5	81.5	27.2	72.8
Aerospace products and parts	3364	1,099	43.9	56.1	19.5	80.5	37.4	62.6
Other transportation	other 336	1,810	35.5	64.5	23.1	76.9	29.1	70.9
Furniture and related products	337	12,927	26.6	73.4	12.0	88.0	23.2	76.8
Miscellaneous	339	20,251	32.9	67.1	17.5	82.5	27.5	72.5
Medical equipment and supplies	3391	8,014	34.6	65.4	19.2	80.8	27.3	72.7
Other miscellaneous manufacturing	3399	12,237	31.9	68.1	16.3	83.7	27.6	72.4
Nonmanufacturing industries	11, 21–23, 42–81	4,640,414	24.9	75.1	10.7	89.3	21.3	78.7
Agriculture, forestry, fishing, and hunting	11	22,732	17.4	82.6	5.8	94.2	14.9	85.1
Mining, extraction, and support activities	21	15,475	12.3	87.7	3.4	96.6	11.7	88.3
Utilities	22	2,615	20.8	79.2	7.1	92.9	18.8	81.2
Construction	23	627,340	18.0	82.0	6.4	93.6	15.4	84.6
Wholesale trade	42	253,680	34.4	65.6	16.1	83.9	28.7	71.3
Retail trade	44–45	554,596	27.0	73.0	11.7	88.3	22.7	77.3
Transportation and warehousing	48–49	157,728	26.6	73.4	7.5	92.5	24.7	75.3
Information	51	62,834	38.5	61.5	24.8	75.2	31.8	68.2
Publishing	511	18,521	46.6	53.4	31.0	69.0	39.1	60.9
Newspaper, periodical, book, and directory publishers	5111	9,824	35.8	64.2	19.9	80.1	30.3	69.7
Software publishers	5112	8,698	58.8	41.2	43.6	56.4	49.1	50.9
Telecommunications	517	6,907	33.9	66.1	22.0	78.0	27.2	72.8
Data processing, hosting, and related services	518	8,155	49.1	50.9	31.2	68.8	42.9	57.1
Other information	other 51	29,253	31.6	68.4	19.8	80.2	25.1	74.9
Finance and insurance	52	203,913	26.1	73.9	10.5	89.5	22.2	77.8
Real estate and rental and leasing	53	266,098	20.1	79.9	7.0	93.0	17.9	82.1

Table 1**Product and business process innovating companies, by industry and company size: 2017–19**

(Number and percent)

Industry and company size	NAICS code	Companies (number)	Product or business process innovation		Product innovation		Business process innovation	
			Percent		Percent		Percent	
			Yes	No	Yes	No	Yes	No
Lessors of nonfinancial intangible assets (except copyrighted works)	533	2,106	27.4	72.6	15.3	84.7	25.3	74.7
Other real estate and rental and leasing	other 53	263,991	20.1	79.9	7.0	93.0	17.9	82.1
Professional, scientific, and technical services	54	704,191	29.0	71.0	13.3	86.7	25.6	74.4
Legal services	5411	151,977	17.3	82.7	4.6	95.4	15.6	84.4
Accounting, tax preparation, bookkeeping, and payroll services	5412	106,233	20.7	79.3	6.4	93.6	18.9	81.1
Architectural, engineering, and related services	5413	87,739	29.9	70.1	13.2	86.8	26.6	73.4
Specialized design services	5414	27,355	32.0	68.0	15.3	84.7	27.9	72.1
Computer systems design and related services	5415	97,862	43.8	56.2	24.7	75.3	39.4	60.6
Management, scientific, and technical consulting services	5416	137,973	34.0	66.0	16.5	83.5	30.2	69.8
Scientific research and development services	5417	10,517	42.8	57.2	24.9	75.1	36.8	63.2
Advertising, public relations, and related services	5418	27,194	31.8	68.2	15.5	84.5	28.1	71.9
Other professional, scientific, and technical services	5419	57,339	31.1	68.9	17.7	82.3	24.2	75.8
Management of companies and enterprises	55	2,391	21.0	79.0	7.1	92.9	17.6	82.4
Administrative and support and waste management and remediation services	56	285,195	22.4	77.6	9.3	90.7	18.9	81.1
Educational services	61	55,306	33.1	66.9	18.3	81.7	26.9	73.1
Health care and social assistance	62	526,683	24.6	75.4	11.4	88.6	20.7	79.3
Health care services	621–23	462,026	24.5	75.5	11.1	88.9	20.6	79.4
Social assistance	624	64,657	25.9	74.1	13.2	86.8	21.1	78.9
Arts, entertainment, and recreation	71	90,036	22.9	77.1	11.1	88.9	18.3	81.7
Accommodation and food services	72	464,061	24.3	75.7	8.9	91.1	21.4	78.6
Other services	81	345,543	22.4	77.6	11.0	89.0	18.0	82.0
Employment size								
All companies	na	4,857,473	25.3	74.7	10.9	89.1	21.7	78.3
Microbusinesses								
1–4	na	2,701,088	22.1	77.9	10.0	90.0	18.6	81.4
5–9	na	946,725	27.4	72.6	11.9	88.1	23.5	76.5
Small businesses								
10–19	na	590,193	30.1	69.9	12.8	87.2	26.2	73.8
20–49	na	401,365	30.8	69.2	11.3	88.7	27.6	72.4
Medium companies								
50–99	na	118,677	32.0	68.0	12.0	88.0	29.1	70.9
100–249	na	64,454	31.6	68.4	12.0	88.0	27.5	72.5
Large businesses								
250–499	na	19,208	35.1	64.9	14.2	85.8	31.6	68.4
500–999	na	8,130	32.5	67.5	14.2	85.8	29.0	71.0
1,000–4,999	na	6,023	37.8	62.2	19.1	r 80.9	33.4	66.6
5,000–9,999	na	775	45.0	55.0	25.3	74.7	39.2	60.8
10,000–24,999	na	496	51.0	49.0	29.2	70.8	46.2	53.8
25,000 or more	na	335	49.9	50.1	32.2	67.8	40.9	59.1

na = not applicable; 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 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, 2020 Annual Business Survey: Data Year 2019.

ABS Innovation Trends

Among for-profit companies with at least one employee in the United States, overall innovation decreased from 30% of companies in 2016–18 (ABS 2019) to 25% in 2017–19 (ABS 2020). Product innovation decreased from 19% of companies in 2016–18 to 11% in 2017–19, whereas business process innovation increased slightly from 19% of companies in 2016–18 to 22% in 2017–19. These changes in overall innovation rates were not uniform across types of innovation, company size, or economic sector. Questions on innovation have been asked since the inaugural ABS in 2018 (reference period 2015–17). The *Oslo Manual* sets forth a framework to develop a statistical approach to support the measurement of innovation in firms. The definition of innovation and the types of innovation were revised between the *Oslo Manual 2005* and the *Oslo Manual 2018*. Between the ABS 2018 (reference period 2015–17), which used the *Oslo Manual 2005* definition, and the ABS 2019 (reference period 2016–18), which used the *Oslo Manual 2018* definition, the overall rate of innovation decreased from 43% of companies to 30% (table 2). The difference between these 2 years can most likely be attributed to the change in the *Oslo Manual* definition, sampling variation, and changes in the questionnaire.² However, the ABS 2020 (reference period 2017–19) and the ABS 2019 (reference period 2016–18) had the same innovation questions and the sampling procedures, so differences between these two survey cycles cannot be attributable to the same reasoning.

Table 2

Innovating companies, by industry: 2015–17, 2016–18, and 2017–19

(Percent)

Industry and company size	NAICS code	2015–17		2016–18		2017–19	
		Yes	No	Yes	No	Yes	No
Industry							
All industries	11, 21–23, 31–33, 42–81	43.2	56.8	29.7	70.3	25.3	74.7
Manufacturing industries	31–33	57.9	42.1	35.5	64.5	34.0	66.0
Food	311	60.5	39.5	40.0	60.0	34.3	65.7
Beverage and tobacco products	312	74.5	25.5	45.9	54.1	42.3	57.7
Textile, apparel, and leather products	313–16	52.7	47.3	33.1	66.9	33.2	66.8
Wood products	321	49.4	50.6	25.4	74.6	25.4	74.6
Paper	322	61.9	38.1	37.5	62.5	32.1	67.9
Printing and related support activities	323	53.0	47.0	32.4	67.6	31.3	68.7
Petroleum and coal products	324	57.6	42.4	30.4	69.6	8.9	91.1
Chemicals	325	67.4	32.6	41.0	59.0	41.2	58.8
Pesticide, fertilizer, and other agricultural chemicals	3253	62.4	37.6	39.3	60.7	35.7	64.3
Pharmaceuticals and medicines	3254	69.8	30.2	52.1	47.9	45.7	54.3
Soap, cleaning compound, and toilet preparation	3256	70.6	29.4	41.1	58.9	43.7	56.3
Other chemicals	other 325	66.1	33.9	37.4	62.6	39.2	60.8
Plastics and rubber products	326	61.3	38.7	42.3	57.7	36.3	63.7
Nonmetallic mineral products	327	51.0	49.0	30.0	70.0	30.3	69.7
Primary metals	331	55.9	44.1	34.3	65.7	33.3	66.7
Fabricated metal products	332	53.6	46.4	31.0	69.0	30.7	69.3
Machinery	333	61.6	38.4	39.1	60.9	41.1	58.9
Computer and electronic products	334	71.9	28.1	48.3	51.7	51.1	48.9
Communications equipment	3342	77.1	22.9	53.1	46.9	56.4	43.6

Table 2**Innovating companies, by industry: 2015–17, 2016–18, and 2017–19**

(Percent)

Industry and company size	NAICS code	2015–17		2016–18		2017–19	
		Yes	No	Yes	No	Yes	No
Semiconductor and other electronic components	3344	66.6	33.4	46.0	54.0	45.1	54.9
Navigational, measuring, electromedical, and control instruments	3345	73.9	26.1	49.9	50.1	54.6	45.4
Other computer and electronic products	other 334	75.0	25.0	45.1	54.9	50.6	49.4
Electrical equipment, appliances, and components	335	65.1	34.9	43.6	56.4	44.5	55.5
Transportation equipment	336	62.4	37.6	34.1	65.9	34.9	65.1
Automobiles, bodies, trailers, and parts	3361–63	63.7	36.3	33.5	66.5	32.6	67.4
Aerospace products and parts	3364	65.2	34.8	37.6	62.4	43.9	56.1
Other transportation	other 336	57.6	42.4	33.8	66.2	35.5	64.5
Furniture and related products	337	52.2	47.8	29.6	70.4	26.6	73.4
Miscellaneous	339	59.8	40.2	39.6	60.4	32.9	67.1
Medical equipment and supplies	3391	57.6	42.4	39.7	60.3	34.6	65.4
Other miscellaneous manufacturing	3399	61.1	38.9	39.6	60.4	31.9	68.1
Nonmanufacturing industries	11, 21–23, 42–81	42.5	57.5	29.5	70.5	24.9	75.1
Agriculture, forestry, fishing, and hunting	11	31.5	68.5	20.9	79.1	17.4	82.6
Mining, extraction, and support activities	21	26.0	74.0	16.5	83.5	12.3	87.7
Utilities	22	38.0	62.0	23.4	76.6	20.8	79.2
Construction	23	34.8	65.2	21.2	78.8	18.0	82.0
Wholesale trade	42	50.3	49.7	33.7	66.3	34.4	65.6
Retail trade	44–45	44.9	55.1	30.4	69.6	27.0	73.0
Transportation and warehousing	48–49	43.0	57.0	27.6	72.4	26.6	73.4
Information	51	60.8	39.2	39.5	60.5	38.5	61.5
Publishing	511	66.0	34.0	42.2	57.8	46.6	53.4
Newspaper, periodical, book, and directory publishers	5111	56.3	43.7	31.4	68.6	35.8	64.2
Software publishers	5112	78.6	21.4	55.6	44.4	58.8	41.2
Telecommunications	517	58.7	41.3	36.5	63.5	33.9	66.1
Data processing, hosting, and related services	518	69.7	30.3	46.0	54.0	49.1	50.9
Other information	other 51	54.6	45.4	36.6	63.4	31.6	68.4
Finance and insurance	52	46.1	53.9	37.0	63.0	26.1	73.9
Real estate and rental and leasing	53	36.0	64.0	26.1	73.9	20.1	79.9
Lessors of nonfinancial intangible assets (except copyrighted works)	533	52.4	47.6	22.6	77.4	27.4	72.6
Other real estate and rental and leasing	other 53	35.9	64.1	26.1	73.9	20.1	79.9
Professional, scientific, and technical services	54	46.0	54.0	34.5	65.5	29.0	71.0
Legal services	5411	33.1	66.9	24.2	75.8	17.3	82.7
Accounting, tax preparation, bookkeeping, and payroll services	5412	36.5	63.5	30.9	69.1	20.7	79.3
Architectural, engineering, and related services	5413	47.3	52.7	33.6	66.4	29.9	70.1
Specialized design services	5414	55.8	44.2	32.5	67.5	32.0	68.0
Computer systems design and related services	5415	60.2	39.8	47.2	52.8	43.8	56.2
Management, scientific, and technical consulting services	5416	51.6	48.4	40.3	59.7	34.0	66.0
Scientific research and development services	5417	61.6	38.4	40.8	59.2	42.8	57.2
Advertising, public relations, and related services	5418	55.9	44.1	37.4	62.6	31.8	68.2
Other professional, scientific, and technical services	5419	50.2	49.8	34.3	65.7	31.1	68.9
Management of companies and enterprises	55	31.2	68.8	20.8	79.2	21.0	79.0
Administrative and support and waste management and remediation services	56	41.8	58.2	29.1	70.9	22.4	77.6
Educational services	61	58.1	41.9	41.3	58.7	33.1	66.9
Health care and social assistance	62	43.0	57.0	30.5	69.5	24.6	75.4
Health care services	621–23	42.9	57.1	29.8	70.2	24.5	75.5

Table 2**Innovating companies, by industry: 2015–17, 2016–18, and 2017–19**

(Percent)

Industry and company size	NAICS code	2015–17		2016–18		2017–19	
		Yes	No	Yes	No	Yes	No
Social assistance	624	44.0	56.0	36.1	63.9	25.9	74.1
Arts, entertainment, and recreation	71	45.5	54.5	29.7	70.3	22.9	77.1
Accommodation and food services	72	41.1	58.9	28.1	71.9	24.3	75.7
Other services	81	38.9	61.1	26.2	73.8	22.4	77.6
Employment size							
All companies	na	43.2	56.8	29.7	70.3	25.3	74.7
Microbusinesses							
1–4	na	38.5	61.5	27.9	72.1	22.1	77.9
5–9	na	46.4	53.6	31.6	68.4	27.4	72.6
Small businesses							
10–19	na	49.9	50.1	32.0	68.0	30.1	69.9
20–49	na	52.0	48.0	32.1	67.9	30.8	69.2
Medium businesses							
50–99	na	56.2	43.8	32.7	67.3	32.0	68.0
100–249	na	57.6	42.4	33.0	67.0	31.6	68.4
Large businesses							
250–499	na	60.6	39.4	34.2	65.8	35.1	64.9
500–999	na	58.1	41.9	34.3	65.7	32.5	67.5
1,000–4,999	na	61.8	38.2	39.4	60.6	37.8	62.2
5,000–9,999	na	72.6	27.4	43.1	56.9	45.0	55.0
10,000–24,999	na	66.5	33.5	45.1	54.9	51.0	49.0
25,000 or more	na	71.0	29.0	46.4	53.6	r 49.9	50.1

na = not applicable; r = relative standard error > 50%.

NAICS = 2017 North American Industry Classification System.

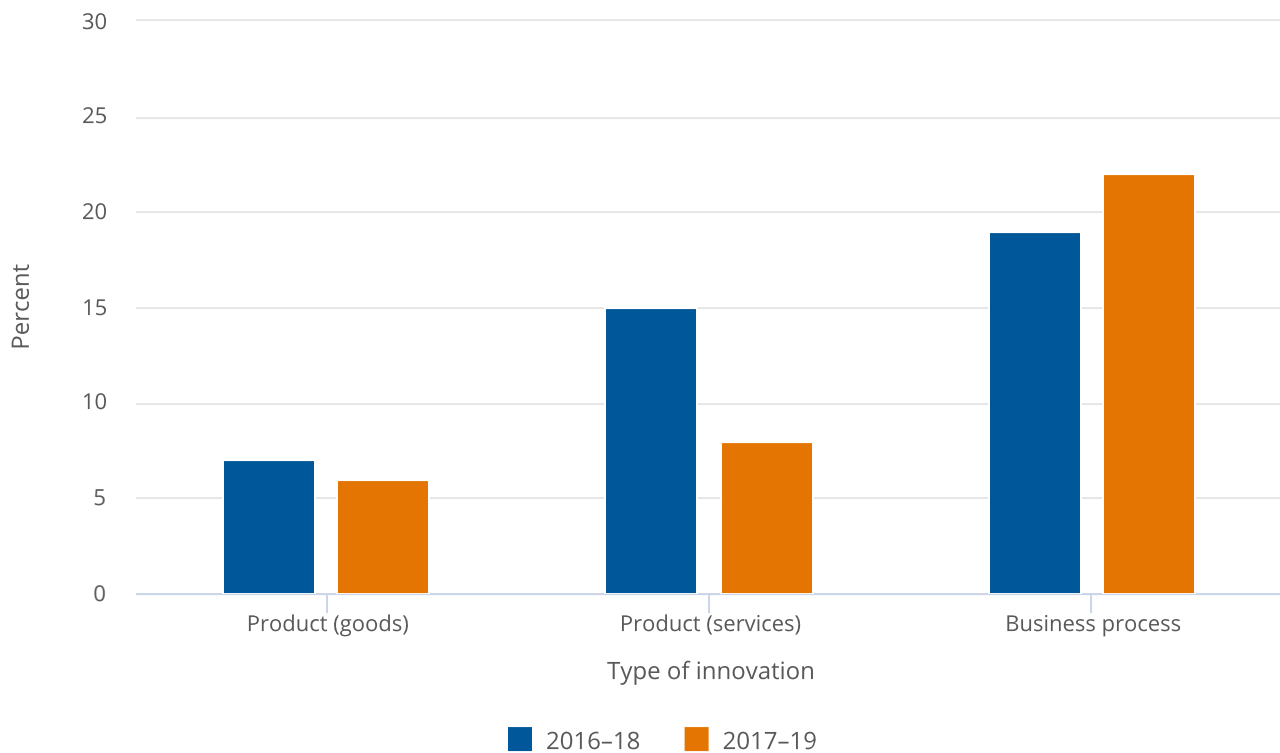
Note(s):

Detail may not add to total because of rounding or unavailable NAICS detail for select records beyond the 4-digit industry classification. Industry classification 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, 2020, 2019, and 2018 Annual Business Survey.

Product innovation includes both innovation in goods and in services. Further examination suggests that it was the services aspect of the product innovation that drove the decrease in innovation rates between the ABS 2019 and the ABS 2020. Among for-profit companies with at least one employee in the United States, goods innovation was steady at 7% of companies in 2016–18 (ABS 2019) and 6% in 2017–19 (ABS 2020), but innovation in services decreased by nearly half, from 15% in 2016–18 to 8% in 2017–19 ([figure 1](#)). [Table 3](#) suggests that the change in the rate of service innovation was concentrated in microbusinesses (businesses with fewer than 10 employees). For microbusinesses, the percentage of companies that were service innovators decreased by approximately half between the ABS 2019 and the ABS 2020. However, for the large companies, the percentages of companies that were service innovators were almost identical across these two survey cycles. These results suggest that the differences in overall innovation are attributed to less frequent reports of service innovation in 2017–19 among smaller companies—companies that are more susceptible to changes in the business environment.

Figure 1**Product innovation (goods vs. services) and business process innovation: 2016–18 and 2017–19****Source(s):**

National Center for Science and Engineering Statistics and Census Bureau, 2020 Annual Business Survey: Data Year 2019.

Table 3**Services and goods innovating companies, by industry and size of company: 2016–18 and 2017–19**

(Percent)

Industry and size of company	Services innovation 2016–18	Services innovation 2017–19	Goods innovation 2016–18	Goods innovation 2017–19
Industry				
All industries	15.1	8.0	7.4	6.4
Manufacturing industries	7.9	7.8	18.7	14.1
Nonmanufacturing industries	15.4	6.0	6.9	6.0
Employment size				
All companies	15.1	8.0	7.4	6.4
Microbusinesses				
1–4	15.9	7.5	6.4	5.5
5–9	15.4	8.6	8.5	7.3
Small businesses				
10–19	13.9	9.2	9.0	7.9
20–49	12.3	8.2	8.2	7.0
Medium businesses				
50–99	12.0	8.3	9.1	7.4
100–249	11.5	7.5	8.6	7.8
Large businesses				
250–499	10.7	9.4	9.3	9.4

Table 3**Services and goods innovating companies, by industry and size of company: 2016–18 and 2017–19**

(Percent)

Industry and size of company	Services innovation 2016–18	Services innovation 2017–19	Goods innovation 2016–18	Goods innovation 2017–19
500–999	12.9	8.6	11.6	10.1
1,000–4,999	14.7	13.0	11.2	11.8
5,000–9,999	16.5	16.1	21.0	17.7
10,000–24,999	22.6	23.0	21.4	19.2
25,000 or more	25.4	26.6	20.7	21.8

r = relative standard error > 50%.

Note(s):

Detail may not add to total because of rounding. Industry classification 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, 2020 Annual Business Survey: Data Year 2019.

Trends in the degree of novelty of innovation also show that the overall decline in the percentage of companies reporting innovation from 2016–18 to 2017–19 was not consistent across all types of innovation. Products that are new to the market are assumed to have a higher degree of novelty than are products that are new only to the business. Four percent of all companies covered by the ABS introduced a product that was considered new to the market during 2017–19 (table 4). This was virtually identical to the figures from 2016–18 (4%). Seven percent of companies introduced product innovations that were new only to the business in both 2017–19 and 2016–18. This was despite the changes in rates of overall innovation among companies over the past two survey cycles.

Table 4**Companies with new to the market and new to the business product innovation, by industry: 2017–19**

(Number and percent)

Industry	NAICS code	Companies (number)	Product innovation new to market		Product innovation only new to the business	
			Percent		Percent	
			Yes	No	Yes	No
All industries	11, 21–23, 31–33, 42–81	4,857,473	4.1	95.9	6.9	93.1
Manufacturing industries	31–33	217,058	7.6	92.4	10.9	89.1
Food	311	18,379	6.5	93.5	9.7	90.3
Beverage and tobacco products	312	8,381	6.6	93.4	16.1	83.9
Textile, apparel, and leather products	313–16	10,205	6.9	93.1	10.9	89.1
Wood products	321	10,340	3.7	96.3	6.1	93.9
Paper	322	1,795	3.7	96.3	12.3	87.7
Printing and related support activities	323	21,035	4.4	95.6	12.4	87.6
Petroleum and coal products	324	693	1.4	98.6	2.6	97.4
Chemicals	325	7,759	9.5	90.5	14.4	85.6
Pesticide, fertilizer, and other agricultural chemicals	3253	555	4.9	95.1	11.2	88.8
Pharmaceuticals and medicines	3254	1,467	12.3	87.7	18.6	81.4
Soap, cleaning compound, and toilet preparation	3256	1,772	7.9	92.1	14.9	85.1
Other chemicals	other 325	3,966	9.8	90.2	13.0	87.0
Plastics and rubber products	326	7,811	8.9	91.1	11.4	88.6
Nonmetallic mineral products	327	7,758	6.7	93.3	7.4	92.6

Table 4**Companies with new to the market and new to the business product innovation, by industry: 2017–19**

(Number and percent)

Industry	NAICS code	Companies (number)	Product innovation new to market		Product innovation only new to the business	
			Percent		Percent	
			Yes	No	Yes	No
Primary metals	331	2,437	6.5	93.5	10.2	89.8
Fabricated metal products	332	48,470	5.2	94.8	7.7	92.3
Machinery	333	18,350	12.7	87.3	14.1	85.9
Computer and electronic products	334	8,851	20.8	79.2	20.1	79.9
Communications equipment	3342	938	27.5	72.5	25.4	74.6
Semiconductor and other electronic components	3344	2,914	13.3	86.7	16.3	83.7
Navigational, measuring, electromedical, and control instruments	3345	3,649	25.5	74.5	21.0	79.0
Other computer and electronic products	other 334	1,349	19.7	80.3	22.4	77.6
Electrical equipment, appliances, and components	335	3,874	15.2	84.8	16.6	83.4
Transportation equipment	336	7,638	11.4	88.6	13.8	86.2
Automobiles, bodies, trailers, and parts	3361–63	4,728	12.3	87.7	12.9	87.1
Aerospace products and parts	3364	1,099	10.5	89.5	14.3	85.7
Other transportation	other 336	1,810	9.3	90.7	15.7	84.3
Furniture and related products	337	12,927	5.4	94.6	8.2	91.8
Miscellaneous	339	20,251	8.4	91.6	11.0	89.0
Medical equipment and supplies	3391	8,014	8.3	91.7	12.6	87.4
Other miscellaneous manufacturing	3399	12,237	8.4	91.6	9.8	90.2
Nonmanufacturing industries	11, 21–23, 42–81	4,640,414	3.9	96.1	6.7	93.3
Agriculture, forestry, fishing, and hunting	11	22,732	2.0	98.0	3.3	96.7
Mining, extraction, and support activities	21	15,475	0.9	99.1	2.9	97.1
Utilities	22	2,615	2.3	97.7	4.4	95.6
Construction	23	627,340	1.9	98.1	3.7	96.3
Wholesale trade	42	253,680	8.0	92.0	10.1	89.9
Retail trade	44–45	554,596	4.9	95.1	7.6	92.4
Transportation and warehousing	48–49	157,728	1.8	98.2	4.5	95.5
Information	51	62,834	10.8	89.2	15.4	84.6
Publishing	511	18,521	15.1	84.9	20.1	79.9
Newspaper, periodical, book, and directory publishers	5111	9,824	7.4	92.6	13.5	86.5
Software publishers	5112	8,698	23.7	76.3	27.6	72.4
Telecommunications	517	6,907	8.3	91.7	13.9	86.1
Data processing, hosting, and related services	518	8,155	15.8	84.2	19.5	80.5
Other information	other 51	29,253	7.3	92.7	11.7	88.3
Finance and insurance	52	203,913	3.2	96.8	5.8	94.2
Real estate and rental and leasing	53	266,098	1.8	98.2	4.2	95.8
Lessors of nonfinancial intangible assets (except copyrighted works)	533	2,106	8.7	91.3	7.0	93.0
Other real estate and rental and leasing	other 53	263,991	1.7	98.3	4.2	95.8
Professional, scientific, and technical services	54	704,191	4.8	95.2	8.7	91.3
Legal services	5411	151,977	0.9	99.1	2.7	97.3
Accounting, tax preparation, bookkeeping, and payroll services	5412	106,233	1.6	98.4	3.7	96.3
Architectural, engineering, and related services	5413	87,739	5.0	95.0	8.7	91.3
Specialized design services	5414	27,355	4.1	95.9	10.8	89.2
Computer systems design and related services	5415	97,862	10.5	89.5	16.9	83.1
Management, scientific, and technical consulting services	5416	137,973	6.2	93.8	11.0	89.0

Table 4**Companies with new to the market and new to the business product innovation, by industry: 2017–19**

(Number and percent)

Industry	NAICS code	Companies (number)	Product innovation new to market		Product innovation only new to the business	
			Percent		Percent	
			Yes	No	Yes	No
Scientific research and development services	5417	10,517	17.6	82.4	11.8	88.2
Advertising, public relations, and related services	5418	27,194	5.1	94.9	10.6	89.4
Other professional, scientific, and technical services	5419	57,339	5.6	94.4	11.8	88.2
Management of companies and enterprises	55	2,391	3.4	96.6	3.8	96.2
Administrative and support and waste management and remediation services	56	285,195	2.6	97.4	5.6	94.4
Educational services	61	55,306	7.7	92.3	11.7	88.3
Health care and social assistance	62	526,683	3.8	96.2	7.4	92.6
Health care services	621–23	462,026	3.7	96.3	7.4	92.6
Social assistance	624	64,657	4.5	95.5	7.5	92.5
Arts, entertainment, and recreation	71	90,036	4.3	95.7	7.4	92.6
Accommodation and food services	72	464,061	3.4	96.6	5.2	94.8
Other services	81	345,543	4.1	95.9	6.8	93.2

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 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, 2020 Annual Business Survey: Data Year 2019.

These percentages stay consistent even when we examine changes over the last two cycles of the ABS for the manufacturing and nonmanufacturing industries. Product innovation that was new to the market for manufacturing companies was steady at 8% of companies in 2017–19 and 2016–18, and for nonmanufacturing companies, it was steady at 4% (table 5). Product innovation that was new to the business was similarly consistent.

Table 5**Companies with new to market and new to the business product innovation, by industry and size of company: 2016–18 and 2017–19**

(Percent)

Industry and size of company	NAICS code	Product innovation new to market		Product innovation only new to the business	
		2016–18	2017-19	2016-18	2017-19
Industry					
All industries	11, 21–23, 31–33, 42–81	3.8	4.1	7.4	6.9
Manufacturing industries	31–33	8.4	7.6	11.9	10.9
Nonmanufacturing industries	11, 21–23, 42–81	3.6	3.9	7.2	6.7
Employment size					
All companies	na	3.8	4.1	7.4	6.9
Microbusinesses					
1–4	na	3.3	3.7	6.8	6.1
5–9	na	4.5	4.5	8.4	7.7

Table 5**Companies with new to market and new to the business product innovation, by industry and size of company: 2016–18 and 2017–19**

(Percent)

Industry and size of company	NAICS code	Product innovation new to market		Product innovation only new to the business	
		2016–18	2017-19	2016-18	2017-19
Small businesses					
10–19	na	4.6	4.8	8.1	8.1
20–49	na	4.0	4.3	7.4	7.4
Medium businesses					
50–99	na	4.5	5.0	8.1	8.1
100–249	na	3.9	4.0	8.6	7.3
Large businesses					
250–499	na	4.9	4.4	8.5	10.7
500–999	na	6.2	4.2	12.3	11.0
1,000–4,999	na	6.6	7.4	13.1	r 15.1
5,000–9,999	na	16.6	13.5	17.3	19.2
10,000–24,999	na	17.1	16.9	25.5	23.2
25,000 or more	na	15.6	16.1	22.1	27.5

na = not applicable; 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 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, 2020 Annual Business Survey: Data Year 2019.

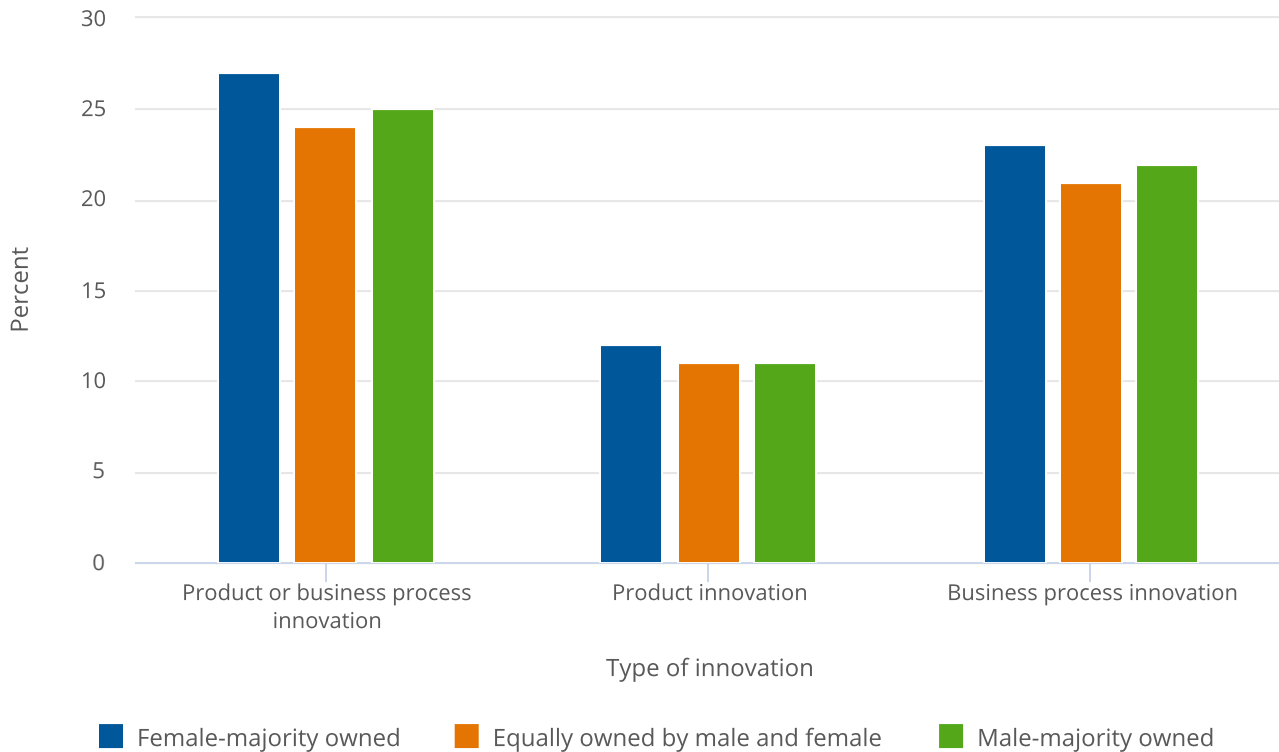
Additional ABS 2020 Findings

By Industry

Substantial differences in innovation incidence exist between manufacturing and nonmanufacturing industries. Although rates of companies reporting innovation generally are higher for manufacturing companies than for nonmanufacturing companies, the absolute number of companies reporting innovation is larger in nonmanufacturing industries. In 2017–19, 34% of the companies classified in manufacturing industries reported any kind of innovation, compared with 25% of companies classified in nonmanufacturing industries. Sixteen percent of manufacturing companies reported product innovations, compared with 11% of nonmanufacturing companies. For business process innovation, 29% of manufacturing industries and 21% of nonmanufacturing industries reported this type of innovation.

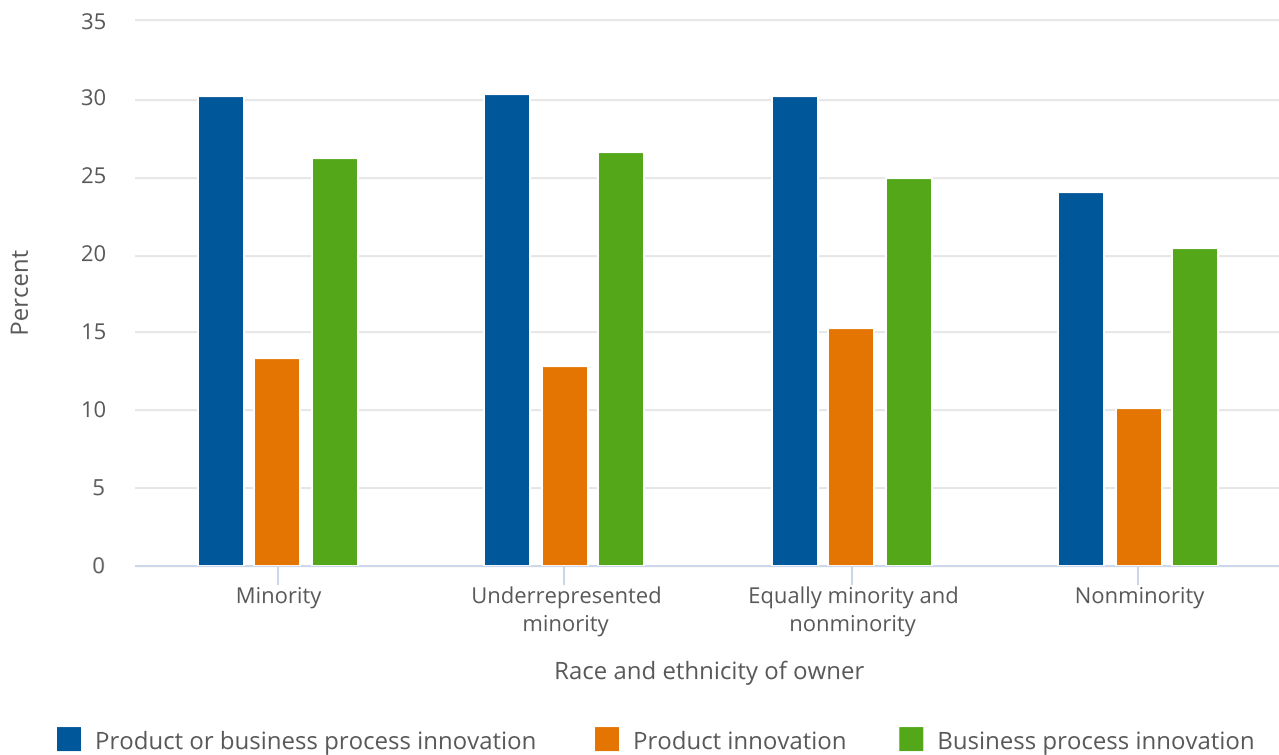
Company Ownership by Sex, Race, and Ethnicity

There were no significant differences in innovation incidence between female- and male-majority-owned companies. A nearly identical proportion of female-majority-owned companies and male-majority-owned companies were product innovators (12% versus 11%) or process innovators (22% versus 23%) ([figure 2](#)).

Figure 2**Innovation incidence rate, by type of innovation and sex of majority owners: 2017–19****Source(s):**

National Center for Science and Engineering Statistics and Census Bureau, 2020 Annual Business Survey: Data Year 2019.

However, the differences in innovation rates with respect to the race and ethnicity of the company's owners are statistically significant. Thirteen percent of companies that were primarily owned by minority owners (any racial or ethnic combination other than White, not Hispanic) and 10% that were primarily owned by nonminority owners (White, not Hispanic) were product innovators. Over a quarter (26%) of companies that were primarily owned by minority owners and a fifth (21%) that were primarily owned by nonminority owners were business process innovators ([figure 3](#)).

Figure 3**Companies with product or business process innovation, by firm classification of race and ethnicity of majority owners: 2017–19****Note(s):**

Companies may be included in one or more race and ethnicity categories. Companies classified as minority are those companies classified as any race and ethnicity combination other than White, not Hispanic. Underrepresented minority groups include Hispanic or Latino, Black or African Americans, and American Indian or Alaska Native.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, 2020 Annual Business Survey: Data Year 2019.

By State

For the most part, there were only small differences in the percentage of companies that reported innovation among the fifty states and the District of Columbia. Nineteen states and the District of Columbia were estimated to have 25% or more of the companies reporting innovation, whereas only four states had 20% or less of companies reporting innovation ([table 6](#)).³ Examining product innovation among companies, only Hawaii had 13% or more of companies reporting innovation, and seven states and the District of Columbia showed 12% reported innovation. For business process innovation, only Rhode Island and Delaware had more than 25% of companies reporting innovation, and California had at least 24% reporting innovation.

Table 6**Companies with product or business process innovation, by state: 2017–19**

(Number and percent)

State	Companies (number)	Product or business process innovation		Product innovation		Business process innovation	
		Percent		Percent		Percent	
		Yes	No	Yes	No	Yes	No
All states	4,857,473	25.3	74.7	10.9	89.1	21.7	78.3
Alabama	54,897	21.8	78.2	9.0	91.0	18.4	81.6
Alaska	12,324	20.1	79.9	7.5	92.5	16.1	83.9
Arizona	86,622	25.7	74.3	11.5	88.5	22.4	77.6
Arkansas	39,285	19.5	80.5	7.8	92.2	16.4	83.6
California	605,020	28.2	71.8	12.5	87.5	24.1	75.9
Colorado	117,970	26.9	73.1	11.7	88.3	23.2	76.8
Connecticut	53,835	22.2	77.8	8.6	91.4	19.5	80.5
Delaware	14,833	28.5	71.5	12.2	87.8	24.9	75.1
District of Columbia	8,652	27.4	72.6	12.5	87.5	23.2	76.8
Florida	354,038	26.6	73.4	12.0	88.0	22.6	77.4
Georgia	137,931	26.1	73.9	11.2	88.8	22.2	77.8
Hawaii	20,133	28.4	71.6	13.3	86.7	22.8	77.2
Idaho	35,630	23.0	77.0	10.1	89.9	19.8	80.2
Illinois	201,649	25.8	74.2	11.1	88.9	22.1	77.9
Indiana	90,420	24.7	75.3	10.0	90.0	21.4	78.6
Iowa	54,835	23.5	76.5	9.5	90.5	20.0	80.0
Kansas	47,088	20.8	79.2	9.4	90.6	17.8	82.2
Kentucky	52,944	22.3	77.7	9.5	90.5	19.0	81.0
Louisiana	58,558	20.5	79.5	8.0	92.0	18.2	81.8
Maine	25,795	21.6	78.4	7.8	92.2	18.2	81.8
Maryland	85,475	25.2	74.8	11.0	89.0	21.9	78.1
Massachusetts	101,275	25.5	74.5	10.4	89.6	22.2	77.8
Michigan	141,486	26.4	73.6	11.8	88.2	22.6	77.4
Minnesota	101,014	23.6	76.4	10.3	89.7	20.1	79.9
Mississippi	31,156	18.8	81.2	7.0	93.0	16.3	83.7
Missouri	90,016	22.9	77.1	10.4	89.6	19.2	80.8
Montana	28,811	22.2	77.8	9.8	90.2	18.5	81.5
Nebraska	39,923	22.2	77.8	9.8	90.2	18.3	81.7
Nevada	39,166	24.3	75.7	11.2	88.8	21.0	79.0
New Hampshire	23,711	24.4	75.6	9.2	90.8	20.3	79.7
New Jersey	142,840	25.8	74.2	10.6	89.4	22.0	78.0
New Mexico	25,812	22.3	77.7	10.7	89.3	19.4	80.6
New York	310,587	25.0	75.0	10.3	89.7	21.2	78.8
North Carolina	144,596	24.0	76.0	10.6	89.4	20.6	79.4
North Dakota	15,851	22.6	77.4	11.0	89.0	18.3	81.7
Ohio	148,363	25.5	74.5	10.9	89.1	21.5	78.5
Oklahoma	56,340	22.6	77.4	10.2	89.8	18.0	82.0
Oregon	79,884	25.8	74.2	11.2	88.8	22.5	77.5
Pennsylvania	178,025	24.4	75.6	10.4	89.6	20.9	79.1
Rhode Island	17,295	30.0	70.0	12.2	87.8	25.1	74.9
South Carolina	65,829	24.5	75.5	11.0	89.0	20.0	80.0
South Dakota	18,457	18.5	81.5	9.7	90.3	14.9	85.1
Tennessee	73,356	23.6	76.4	9.9	90.1	20.9	79.1
Texas	331,373	26.4	73.6	11.1	88.9	23.0	77.0
Utah	57,798	24.0	76.0	10.5	89.5	21.1	78.9
Vermont	13,662	24.0	76.0	9.1	90.9	20.7	79.3

Table 6**Companies with product or business process innovation, by state: 2017–19**

(Number and percent)

State	Companies (number)	Product or business process innovation		Product innovation		Business process innovation	
		Percent		Percent		Percent	
		Yes	No	Yes	No	Yes	No
Virginia	121,987	26.3	73.7	11.1	88.9	22.8	77.2
Washington	127,883	25.6	74.4	10.9	89.1	22.2	77.8
West Virginia	19,016	19.2	80.8	8.6	91.4	15.7	84.3
Wisconsin	97,562	23.4	76.6	9.3	90.7	20.3	79.7
Wyoming	14,372	21.8	78.2	8.2	91.8	17.9	82.1
Undistributed	42,087	34.7	65.3	15.6	84.4	29.8	70.2

NAICS = 2017 North American Industry Classification System.

Note(s):

Detail may not add to total because of rounding. State is based on the physical location of the business (or the mailing address if the physical location is missing). Firms with establishments operating in more than one state are tabulated as undistributed and counted only once in state and national totals.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, 2020 Annual Business Survey: Data Year 2019.

Product Innovating Companies and Partners

Seventy percent of product innovating companies indicated that they had at least one partner. Three-quarters (75%) of manufacturing companies and 69% of nonmanufacturing companies indicated they had innovation partners ([table 7](#)).

Table 7**Product innovating companies and partners, by company size: 2017–19**

(Number and percent)

Industry	NAICS code	All companies	Any cooperation partner	Parent, affiliated, or subsidiary business	Suppliers	Other businesses	Federal, state, or local government	Customers	Consultants or commercial laboratories	Universities, colleges, or other institutions of higher education	Nonprofit organizations	Households or individuals
Industry												
All industries	11, 21–23, 31–33, 42–81	530,124	69.7	12.1	40.8	31.3	7.0	40.1	12.9	6.4	6.4	17.7
Manufacturing industries	31–33	35,277	75.1	11.1	46.1	33.6	5.5	48.8	13.1	7.1	4.0	10.8
Nonmanufacturing industries	11, 21–23, 42–81	494,848	69.3	12.2	40.4	31.1	7.1	39.5	12.9	6.3	6.6	18.2
Employment size												
All companies	na	530,124	69.7	12.1	40.8	31.3	7.0	40.1	12.9	6.4	6.4	17.7
Microbusinesses												
1–4	na	269,460	68.5	11.0	36.4	31.5	6.3	41.2	12.5	6.2	6.6	18.5
5–9	na	112,592	68.9	10.5	43.6	30.5	7.3	36.9	12.0	6.8	6.2	18.5
Small businesses												
10–19	na	75,348	70.1	12.4	44.3	29.7	7.1	38.3	12.0	5.4	5.4	16.4
20–49	na	45,233	74.1	14.9	48.5	32.6	9.0	43.1	15.6	7.0	7.5	16.1
Medium businesses												
50–99	na	14,269	75.3	18.9	46.9	35.2	8.2	45.3	17.1	7.8	7.2	16.9
100–249	na	7,734	71.2	23.2	49.5	28.2	10.4	33.0	15.5	7.2	5.3	10.3
Large businesses												
250–499	na	2,732	83.8	41.5	57.5	41.2	7.1 r	48.1	25.5	6.6	5.6 r	8.1
500–999	na	1,156	77.9	34.9	54.0	24.7	10.6 r	44.7 r	26.7 r	6.0	2.8	12.1 r
1,000–4,999	na	1,152	80.2 r	48.9	49.4 r	40.5 r	18.0 r	43.9 r	26.2	17.4 r	13.5 r	10.6 r
5,000–9,999	na	196	89.3	65.3	55.6	37.8	18.9	46.9	40.3	20.4	8.2	9.2
10,000–24,999	na	145	90.3	77.2	64.1	56.6	20.7	55.9	42.8	25.5	13.1	13.1
25,000 or more	na	108	87.0	72.2	63.9	62.0	22.2	54.6	54.6	22.2	10.2	16.7

na = not applicable; r = relative standard error > 50%.

Note(s):

Detail may not add to total because of rounding. Statistics are representative of companies located in the United States.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, 2020 Annual Business Survey: Data Year 2019.

Companies were also asked to characterize their innovation partners. The most frequently noted partners were suppliers and customers (estimated at 41% and 40%, respectively). This is followed by other businesses (31%), not including parent or affiliated or subsidiary businesses, and households and individuals (18%).

Although most industries have a similar distribution with respect to innovation partners, some differences are worth highlighting. Among the scientific research and development services industry (North American Industry Classification System [NAICS] code 5417), 85% of companies cited an innovation partner. Only 6% of all companies cited universities or colleges as innovation partners, whereas 35% of the scientific research and development services industry companies cited universities or colleges as innovation partners.

Larger companies reported greater incidences of partnering. Approximately four out of five (82%) companies with 250 or more employees reported at least one partner ([table 7](#)). Companies reported greater incidences of partners residing in the United States than in other countries regardless of company size.

Barriers to Innovation

Businesses were asked about 11 potential barriers to innovation. The lack of partners and lack of access to external knowledge were cited as being very discouraging by 73% of businesses. These barriers were followed by difficulties in obtaining government grants or subsidies (72%) and lack of credit or private equity (69%). Uncertain market demand for ideas and different priorities within this business were each cited by 67% of businesses as being very discouraging ([table 8](#)).

Table 8

Companies reporting barriers of innovation: 2017–19

(Number and percent)

Barriers of innovation	All companies	Very discouraging	Somewhat discouraging	A little discouraging	Not at all discouraging	Did not answer
Lack of internal finance for innovation	4,857,473	61.9	13.5	9.3	14.3	1.0
Lack of credit or private equity	4,857,473	68.5	12.1	6.9	11.4	1.1
Difficulties in obtaining government grants or subsidies	4,857,473	71.5	9.2	8.9	9.3	1.1
Costs too high	4,857,473	55.5	13.6	13.4	16.5	1.1
Lack of skilled employees within the business	4,857,473	61.4	14.5	9.1	14.0	1.1
Lack of collaboration partners	4,857,473	73.4	11.6	4.7	9.1	1.1
Lack of access to external knowledge	4,857,473	73.1	12.6	4.1	9.1	1.1
Uncertain market demand for your ideas	4,857,473	67.3	14.2	5.5	11.9	1.1
Too much competition in your market	4,857,473	61.2	15.9	8.3	13.5	1.1
Different priorities within this business	4,857,473	67.3	14.0	6.2	11.5	1.1
Government regulations	4,857,473	66.4	12.0	9.7	10.8	1.1

Note(s):

Detail may not add to total because of rounding. Statistics are representative of companies located in the United States.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, 2020 Annual Business Survey: Data Year 2019.

Innovation and Government Aid

Although some businesses do partner with governments on innovation, few businesses use government programs to aid in innovation activities. Overall, 4% of companies use tax incentives or tax credit programs to aid in innovation activities, whereas only 1% each use grants and contribution programs, training and hiring programs, procurement, or other government programs.

Survey Information and Data Availability

The ABS is a sample survey, designed to collect a wide range of data on business R&D, intellectual property, company and primary owner characteristics, and innovation activities in the United States. The ABS was developed and is cosponsored by the National Center for Science and Engineering Statistics within the National Science Foundation and by the Census Bureau. The statistics from the survey are based on a sample, and as such, they are subject to both sampling and nonsampling errors (see the Technical Notes in the data tables report Annual Business Survey: 2020 (Data Year 2019) that are available at <https://nces.nsf.gov/pubs/nsf22344/>).

For the 2020 ABS, a total of 300,000 employer companies were sampled to represent the population of 4.9 million employer companies. For the 2020 ABS, the unit response rate was 71.7%.

The full set of data tables on innovation, R&D, company demographics, technology, and patent and intellectual property protection from this survey are available in the report Annual Business Survey: 2020 (Data Year 2019) (<https://nces.nsf.gov/pubs/nsf22344/>). Individual data tables and tables with relative standard errors and imputation rates from the 2020 survey are available in advance of the full report.

The estimates in this InfoBrief are based on responses from a sample of the population and may differ from actual values because of sampling variability or other factors. As a result, apparent differences between the estimates for two or more groups may not be statistically significant. All comparative statements in this InfoBrief have undergone statistical testing and are significant at the 90% confidence level unless otherwise noted. The ABS used the extended delete-a-group jackknife variance estimator.

Notes

- 1 Organisation for Economic Co-operation and Development (OECD) and Statistical Office of the European Communities (Eurostat). 2018. *Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data*, 4th edition, Paris.
- 2 Kindlon AE, Jankowski J; National Center for Science and Engineering Statistics (NCSES). 2022. *Innovation Data from the 2019 Annual Business Survey*. NSF 22-325. Alexandria, VA: National Science Foundation. Available at <https://nces.nsf.gov/pubs/nsf22325/>.
- 3 Only 10 states were statistically significantly over 25%, and no states were statistically significantly below 20%. The data in the text does not include sampling variability.

Suggested Citation

Kindlon A; National Center for Science and Engineering Statistics (NCSES). 2022. *Innovation Data from the 2020 Annual Business Survey*. NSF 23-310. Alexandria, VA: National Science Foundation. Available at <https://nces.nsf.gov/pubs/nsf23310>.

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