



National Center for Science and
Engineering Statistics

Annual Business Survey: 2021 (Data Year 2020)

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General Notes

This report provides data from the 2021 Annual Business Survey (ABS) (data year 2020). The ABS is the primary source of data on research and development of for-profit, nonfarm businesses with one to nine employees operating in the 50 U.S. states and the District of Columbia. The ABS also collects data on innovation, technology, intellectual property, and business owner characteristics of businesses of all sizes. The ABS is designed to incorporate new content each survey year based on topics of relevance. The 2021 ABS is the fourth year of the ABS. The survey is conducted annually by the Census Bureau for the National Center for Science and Engineering Statistics within the National Science Foundation.

The content and subsequent tables from this report have been reviewed by the Census Bureau's Disclosure Review Board (DRB) and approved. The DRB approval number is CBDRB-FY22-ESMD010-017. This report is initially published with a selection of tables containing the core data of the survey. The report is updated with additional tables, as more detailed data becomes available. In some instances the initial selection of tables may also be updated from a preliminary version to add further data.

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TABLE 1

Annual Business Survey aggregate R&D estimates, by questionnaire reference and by employment size, for companies with 1–9 employees in selected industries: 2020

(Thousands of U.S. dollars)

Company and financial information	All companies	1–4 employees	5–9 employees	
Number of companies	15,868	10,225	5,644	
Total R&D cost	7,522,839	3,623,592	3,899,247	
Foreign R&D costs	778,949	472,583	306,366	
Domestic R&D costs	6,743,889	3,151,009	3,592,881	
Domestic R&D costs for salaries, wages, and benefits	3,511,467	1,573,342	1,938,125	
Domestic R&D costs for expensed machinery and equipment (not capitalized)	257,555	76,780	180,775	
Domestic R&D costs for materials and supplies	679,075	257,179	421,896	
Domestic R&D costs for payments to others for R&D	1,143,221	636,644	506,577	
Domestic R&D costs for depreciation on R&D property and equipment	69,798	24,782	45,016	
Domestic R&D costs for other costs	1,082,773	582,282	500,491	
Domestic R&D performance	5,600,668	2,514,365	3,086,303	
Domestic R&D performance paid for by the company	4,274,137	1,925,583	2,348,554	
Domestic R&D performance paid for by foreign owner	140,976	32,340	108,635	
Domestic R&D performance paid for by another U.S. business	202,765	100,172	102,592	
Domestic R&D performance paid for by other businesses located outside the United States	18,505	8,717	9,788	
Domestic R&D performance paid for by U.S. university or college	26,135	r 5,006	21,128	r
Domestic R&D performance paid for by U.S. nonprofit organization	14,335	8,110	r 6,225	
Domestic R&D performance paid for by U.S. federal government	867,027	390,060	476,968	
Domestic R&D performance paid for by U.S. state or local government	42,281	32,982	9,299	
Domestic R&D performance paid for by all other organizations outside the United States	14,508	11,394	r 3,113	
Domestic R&D performance for basic research	353,143	165,439	187,704	
Domestic R&D performance for applied research	2,282,934	1,001,496	1,281,438	
Domestic R&D performance for development	2,964,591	1,347,430	1,617,161	

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 that performed or funded R&D. Selected industries include 2017 North American Industry Classification System sectors 31, 32, 33, 42, and 51 and industries 5413, 5415, and 5417.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, 2021 Annual Business Survey: Data Year 2020.

TABLE 2

Total R&D cost, by selected industry and employment size, for companies with 1–9 employees: 2020

(Number of companies and thousands of U.S. dollars)

Industry	NAICS code	All companies		1–4 employees		5–9 employees	
		Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount
All selected industries	31–33, 42, 51, 5413, 5415, 5417	15,868	7,522,839	10,225	3,623,592	5,644	3,899,247
Manufacturing industries	31–33	1,974	822,687	1,004	359,533	969	463,154
Food, beverage, and tobacco products	311–12	62	20,378 r	52	16,061 r	11	4,317 r
Textile, apparel, and leather products	313–16	3	472 r	3	472 r	0	0
Wood products	321	0	0	0	0	0	0
Paper	322	0	0	0	0	0	0
Printing and related support activities	323	0	0	0	0	0	0
Petroleum and coal products	324	0	0	0	0	0	0
Chemicals	325	590	201,214	260	96,869	332	104,345
Pharmaceuticals and medicines	3254	153	104,539	97	64,689	56	39,850
Chemicals, excluding pharmaceuticals	other 325	438	96,675	162	32,181	275	64,495
Plastics and rubber products	326	69	23,004	31	18,051	39 r	4,953 r
Nonmetallic mineral products	327	0	133	0	133	0	0
Primary metals	331	13	9,299 r	13	9,299 r	0	0
Fabricated metal products	332	56 r	59,474 r	8	387	47 r	59,087 r
Machinery	333	203	94,664	101	37,612 r	101	57,052
Computer and electronic products	334	674	237,090	373	101,714	300	135,376
Semiconductor and other electronic components	3344	150	40,558	87	24,002	64	16,556
Navigational, measuring, electromedical, and control instruments	3345	432	175,504	243	67,481	188	108,022
Other computer and electronic products	other 334	92	21,029	43	10,231	48	10,798
Electrical equipment, appliances, and components	335	80	32,026 r	56	27,642 r	25 r	4,383
Transportation equipment	336	77	40,780	35	12,035	41	28,745
Aerospace products and parts	3364	48	21,446	26	11,007	21	10,439
Other transportation equipment	other 336	30	19,333 r	10	1,028	20	18,305 r
Furniture and related products	337	2	124	0	0	2	124
Miscellaneous manufacturing	339	144	104,028	74	39,257	70	64,770 r
Selected nonmanufacturing industries	42, 51, 5413, 5415, 5417	13,895	6,700,152	9,222	3,264,059	4,674	3,436,093
Wholesale trade	42	891	517,963	533	188,633	357	329,331 r
Information	51	2,599	829,283	1,631	373,836	969	455,448
Software publishers	5112	1,768	571,286	1,148	242,501	619	328,785
Information, excluding software publishers	51 less 5112	832	257,998	484	131,335	349	126,663
Architectural, engineering, and related services	5413	1,681	628,231	1,153	286,122	527	342,109
Computer systems design and related services	5415	5,285	1,473,927	3,769	879,174	1,515	594,753
Scientific research and development services	5417	3,439	3,250,748	2,135	1,536,295	1,305	1,714,453

TABLE 2

Total R&D cost, by selected industry and employment size, for companies with 1–9 employees: 2020

(Number of companies and thousands of U.S. dollars)

Industry	NAICS code	All companies		1–4 employees		5–9 employees	
		Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount
Research and development in nanotechnology	541713	344	196,107	204	91,949	139	104,158
Research and development in biotechnology (except nanobiotechnology)	541714	1,142	1,548,115	725	757,706	416	790,409
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	1,903	1,479,130	1,169	677,617	734	801,514
Social sciences and humanities research and development	541720	51	27,396	36	9,023	15	18,373

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 that performed or funded R&D.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, 2021 Annual Business Survey: Data Year 2020.

TABLE 3

Total R&D cost, by selected industry and employment size, for companies with 1–9 employees: 2018, 2019, and 2020

(Thousands of U.S. dollars)

Industry	NAICS code	2018			2019			2020		
		All companies	1–4 employees	5–9 employees	All companies	1–4 employees	5–9 employees	All companies	1–4 employees	5–9 employees
All selected industries	31–33, 42, 51, 5413, 5415, 5417	6,467,338	2,644,204	3,823,134	7,245,649	3,215,024	4,030,625	7,522,839	3,623,592	3,899,247
Manufacturing industries	31–33	702,414	283,315	419,098	888,998	413,607	475,391	822,687	359,533	463,154
Food, beverage, and tobacco products	311–12	D	D	0	6,315	4,218 r	2,096 r	20,378 r	16,061 r	4,317 r
Textile, apparel, and leather products	313–16	1,147	D	D	236 r	236 r	0	472 r	472 r	0
Wood products	321	0	0	0	4,065 r	0	4,065 r	0	0	0
Paper	322	0	0	0	0	0	0	0	0	0
Printing and related support activities	323	D	D	0	555	141 r	414	0	0	0
Petroleum and coal products	324	D	0	D	0	0	0	0	0	0
Chemicals	325	149,323	59,785	89,538	345,503	163,854	181,649	201,214	96,869	104,345
Pharmaceuticals and medicines	3254	116,392	34,982	81,410	259,782	110,653	149,129	104,539	64,689	39,850
Chemicals, excluding pharmaceuticals	other 325	32,931	24,803 r	8,128	85,721	53,201	32,520	96,675	32,181	64,495
Plastics and rubber products	326	0	0	0	6,397	3,340	3,057 r	23,004	18,051	4,953
Nonmetallic mineral products	327	5,500 r	D	D	12,945 r	216	12,729 r	133	133	0
Primary metals	331	0	0	0	2,568 r	2,568 r	0	9,299 r	9,299 r	0
Fabricated metal products	332	2,929	D	D	20,594 r	9,950 r	10,644 r	59,474 r	387	59,087 r
Machinery	333	51,732	21,535 r	30,197 r	33,020	23,556	9,464	94,664	37,612 r	57,052
Computer and electronic products	334	349,148	101,257	247,891	279,725	146,657	133,068	237,090	101,714	135,376
Semiconductor and other electronic components	3344	71,181	19,253	51,928	44,841	26,337	18,504	40,558	24,002	16,556
Navigational, measuring, electromedical, and control instruments	3345	226,247	63,345	162,902	205,358	115,084	90,274	175,504	67,481	108,022
Other computer and electronic products	other 334	51,720	18,660	33,060	29,526	5,235	24,291	21,029	10,231	10,798
Electrical equipment, appliances, and components	335	32,218	13,087	19,131 r	11,053	6,214 r	4,839	32,026 r	27,642 r	4,383
Transportation equipment	336	14,537	6,596	7,940	31,730	24,976	6,754	40,780	12,035	28,745
Aerospace products and parts	3364	11,210	4,183	7,027	15,341	10,107	5,234	21,446	11,007	10,439
Other transportation equipment	other 336	D	D	D	16,389 r	14,869 r	1,520	19,333 r	1,028	18,305 r
Furniture and related products	337	0	0	0	0	0	0	124	0	124
Miscellaneous manufacturing	339	91,811	74,866	16,944	134,291	27,680	106,611 r	104,028	39,257	64,770 r
Selected nonmanufacturing industries	42, 51, 5413, 5415, 5417	5,764,924	2,360,889	3,404,035	6,356,651	2,801,417	3,555,234	6,700,152	3,264,059	3,436,093

TABLE 3

Total R&D cost, by selected industry and employment size, for companies with 1–9 employees: 2018, 2019, and 2020

(Thousands of U.S. dollars)

Industry	NAICS code	2018			2019			2020					
		All companies	1–4 employees	5–9 employees	All companies	1–4 employees	5–9 employees	All companies	1–4 employees	5–9 employees			
Wholesale trade	42	232,405	91,329	141,077	407,798	r	105,771	302,027	r	517,963	188,633	329,331	r
Information	51	660,724	249,646	411,078	708,356		314,081	394,274		829,283	373,836	455,448	
Software publishers	5112	497,414	193,662	303,751	396,626		204,864	191,763		571,286	242,501	328,785	
Information, excluding software publishers	51 less 5112	163,311	55,983	107,327	311,729		109,218	202,512		257,998	131,335	126,663	
Architectural, engineering, and related services	5413	488,940	270,447	218,493	507,138		303,242	203,896		628,231	286,122	342,109	
Computer systems design and related services	5415	1,311,905	566,128	745,776	1,848,169		910,750	937,419		1,473,927	879,174	594,753	
Scientific research and development services	5417	3,070,951	1,183,340	1,887,611	2,885,189		1,167,572	1,717,617		3,250,748	1,536,295	1,714,453	
Research and development in nanotechnology	541713	351,183	150,936	200,247	208,661		96,558	112,103		196,107	91,949	104,158	
Research and development in biotechnology (except nanobiotechnology)	541714	1,481,240	512,808	968,432	1,174,781		496,750	678,031		1,548,115	757,706	790,409	
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	1,201,469	513,868	687,601	1,462,437		560,499	901,937		1,479,130	677,617	801,514	
Social sciences and humanities research and development	541720	14,839	2,864	11,976	37,089		11,543	25,546		27,396	9,023	18,373	

D = suppressed to ensure confidentiality of individual companies; 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 that performed or funded R&D.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, 2021 Annual Business Survey: Data Year 2020.

TABLE 4

Domestic R&D performed by the company, by selected industry and employment size, for companies with 1–9 employees: 2020

(Number of companies and thousands of U.S. dollars)

Industry	NAICS code	All companies		1–4 employees		5–9 employees	
		Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount
All selected industries	31–33, 42, 51, 5413, 5415, 5417	15,391	5,600,668	9,892	2,514,365	5,501	3,086,303
Manufacturing industries	31–33	1,913	627,387	967	248,622	946	378,765
Food, beverage, and tobacco products	311–12	52	9,614	41 r	6,031	11	3,583 r
Textile, apparel, and leather products	313–16	3 r	472 r	3 r	472 r	0	0
Wood products	321	0	0	0	0	0	0
Paper	322	0	0	0	0	0	0
Printing and related support activities	323	0	0	0	0	0	0
Petroleum and coal products	324	0	0	0	0	0	0
Chemicals	325	576	160,031	255	69,046	322	90,985
Pharmaceuticals and medicines	3254	147	77,054	95	42,655	50	34,399
Chemicals, excluding pharmaceuticals	other 325	431	82,977	159	26,391	270	56,586
Plastics and rubber products	326	68	18,099	30	13,367	39 r	4,732
Nonmetallic mineral products	327	0	133	0	133	0	0
Primary metals	331	13	9,077 r	13	9,077 r	0	0
Fabricated metal products	332	56 r	37,292 r	8	372	47 r	36,920 r
Machinery	333	192	62,840	101	21,617 r	91	41,223
Computer and electronic products	334	672	189,225	372	77,423	300	111,802
Semiconductor and other electronic components	3344	150	36,372	87	20,311	64	16,061
Navigational, measuring, electromedical, and control instruments	3345	430	135,652	242	48,512	188	87,140
Other computer and electronic products	other 334	92	17,201	43	8,600	48	8,601
Electrical equipment, appliances, and components	335	78	24,958 r	56	21,423 r	24 r	3,534 r
Transportation equipment	336	74	38,247	32	11,415	41	26,832
Aerospace products and parts	3364	45	19,307	23	10,387 r	21	8,920
Other transportation equipment	other 336	30	18,940 r	10	1,028	20	17,912 r
Furniture and related products	337	2	124	0	0	2	124
Miscellaneous manufacturing	339	126	77,276	57	18,247	68	59,029 r
Selected nonmanufacturing industries	42, 51, 5413, 5415, 5417	13,479	4,973,281	8,926	2,265,743	4,554	2,707,538
Wholesale trade	42	877	392,416	521	160,563	354	231,853
Information	51	2,488	689,766	1,525	287,570	963	402,196
Software publishers	5112	1,676	468,557	1,061	186,214	614	282,343
Information, excluding software publishers	51 less 5112	813	221,209	465	101,356	349	119,853
Architectural, engineering, and related services	5413	1,680	574,367	1,152	245,934	527	328,433
Computer systems design and related services	5415	5,062	1,122,622	3,642	654,456	1,419	468,166
Scientific research and development services	5417	3,373	2,194,110	2,084	917,220	1,290	1,276,890

TABLE 4

Domestic R&D performed by the company, by selected industry and employment size, for companies with 1–9 employees: 2020

(Number of companies and thousands of U.S. dollars)

Industry	NAICS code	All companies		1–4 employees		5–9 employees	
		Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount
Research and development in nanotechnology	541713	339	162,996	202	70,143	136	92,853
Research and development in biotechnology (except nanobiotechnology)	541714	1,109	913,514	697	384,226	411	529,288
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	1,885	1,099,371	1,151	455,354	733	644,017
Social sciences and humanities research and development	541720	42	18,229	32	7,498	10	10,731

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 that performed or funded R&D.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, 2021 Annual Business Survey: Data Year 2020.

TABLE 5

Domestic R&D performed by the company, by selected industry and R&D program size, for companies with 1–9 employees: 2020

(Thousands of U.S. dollars)

Industry	NAICS code	R&D program size (total)				
		Total	\$50,000– \$99,999	\$100,000– \$499,999	\$500,000– \$999,999	\$1 million or more
All selected industries	31–33, 42, 51, 5413, 5415, 5417	5,600,668	166,611	1,701,839	1,323,573	2,408,646
Manufacturing industries	31–33	627,387	28,501	164,162	130,828	303,896
Food, beverage, and tobacco products	311–12	9,614	112	3,526 r	3,024 r	2,951 r
Textile, apparel, and leather products	313–16	472 r	0	472 r	0	0
Wood products	321	0	0	0	0	0
Paper	322	0	0	0	0	0
Printing and related support activities	323	0	0	0	0	0
Petroleum and coal products	324	0	0	0	0	0
Chemicals	325	160,031	10,865	49,120	12,991	87,056
Pharmaceuticals and medicines	3254	77,054	847	18,248	7,654 r	50,306
Chemicals, excluding pharmaceuticals	other 325	82,977	10,018	30,872	5,337	36,750 r
Plastics and rubber products	326	18,099	1,817 r	3,434	5,988	6,860 r
Nonmetallic mineral products	327	133	133	0	0	0
Primary metals	331	9,077 r	75	1,285	0	7,717 r
Fabricated metal products	332	37,292 r	372	2,832 r	0	34,088 r
Machinery	333	62,840	851	20,219	19,572 r	22,197 r
Computer and electronic products	334	189,225	12,393	52,027	66,881	57,924 r
Semiconductor and other electronic components	3344	36,372	3,418	12,771	7,350	12,834
Navigational, measuring, electromedical, and control instruments	3345	135,652	7,517	27,816	55,980	44,339 r
Other computer and electronic products	other 334	17,201	1,458	11,439	3,552	752
Electrical equipment, appliances, and components	335	24,958 r	562 r	10,068	2,642 r	11,685 r
Transportation equipment	336	38,247	487	7,108	10,060	20,592 r
Aerospace products and parts	3364	19,307	149	6,244	4,955	7,958 r
Other transportation equipment	other 336	18,940 r	337	864	5,105 r	12,634 r
Furniture and related products	337	124	124	0	0	0
Miscellaneous manufacturing	339	77,276	709	14,072	9,670	52,825 r
Selected nonmanufacturing industries	42, 51, 5413, 5415, 5417	4,973,281	138,109	1,537,676	1,192,746	2,104,750
Wholesale trade	42	392,416	1,893 r	106,228	104,434 r	179,861 r
Information	51	689,766	20,873	322,717	166,512	179,664
Software publishers	5112	468,557	13,561	224,934	85,549	144,513 r
Information, excluding software publishers	51 less 5112	221,209	7,312	97,783	80,963	35,151
Architectural, engineering, and related services	5413	574,367	24,060	217,640	154,471	178,195 r
Computer systems design and related services	5415	1,122,622	72,789	566,725	295,386	187,722
Scientific research and development services	5417	2,194,110	18,493	324,366	471,943	1,379,307

TABLE 5

Domestic R&D performed by the company, by selected industry and R&D program size, for companies with 1–9 employees: 2020

(Thousands of U.S. dollars)

Industry	NAICS code	R&D program size (total)				
		Total	\$50,000– \$99,999	\$100,000– \$499,999	\$500,000– \$999,999	\$1 million or more
Research and development in nanotechnology	541713	162,996	1,803	36,807	48,614	75,771
Research and development in biotechnology (except nanobiotechnology)	541714	913,514	5,804	86,365	160,507	660,838
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	1,099,371	10,421	196,602	258,666	633,682
Social sciences and humanities research and development	541720	18,229	465 r	4,593	4,156	9,015

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 that performed or funded R&D.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, 2021 Annual Business Survey: Data Year 2020.

TABLE 6

Domestic R&D costs, by selected industry and type of cost, for companies with 1–9 employees: 2020

(Thousands of U.S. dollars)

Industry	NAICS code	Total	Salaries, wages, and fringe benefits	Expensed machinery and equipment	Materials and supplies	Payments to others for R&D	Depreciation on R&D property and equipment	All other costs
All selected industries	31–33, 42, 51, 5413, 5415, 5417	6,743,889	3,511,467	257,555	679,075	1,143,221	69,798	1,082,773
Manufacturing industries	31–33	752,930	369,692	32,106	100,275	125,543	17,732	107,583
Food, beverage, and tobacco products	311–12	18,708	6,677	669	1,278	9,094	55	935
Textile, apparel, and leather products	313–16	472	445	0	16	0	0	11
Wood products	321	0	0	0	0	0	0	0
Paper	322	0	0	0	0	0	0	0
Printing and related support activities	323	0	0	0	0	0	0	0
Petroleum and coal products	324	0	0	0	0	0	0	0
Chemicals	325	190,274	91,284	8,429	31,352	30,242	3,737	25,228
Pharmaceuticals and medicines	3254	97,887	35,728	3,794	19,743	20,833	1,994	15,795
Chemicals, excluding pharmaceuticals	other 325	92,387	55,555	4,635	11,609	9,410	1,743	9,433
Plastics and rubber products	326	21,106	9,811	2,089	2,644	3,007	240	3,314
Nonmetallic mineral products	327	133	67	0	67	0	0	0
Primary metals	331	9,299	4,141	3,577	723	223	0	635
Fabricated metal products	332	59,474	23,070	227	1,358	22,182	1,709	10,927
Machinery	333	66,843	39,225	2,771	11,546	4,003	5,365	3,934
Computer and electronic products	334	229,604	124,147	9,798	26,029	40,378	5,221	24,030
Semiconductor and other electronic components	3344	40,448	19,514	2,567	8,144	4,076	738	5,409
Navigational, measuring, electromedical, and control instruments	3345	170,228	92,117	5,282	16,196	34,576	4,275	17,781
Other computer and electronic products	other 334	18,928	12,515	1,949	1,690	1,727	208	840
Electrical equipment, appliances, and components	335	29,119	12,067	1,281	4,591	4,161	546	6,472
Transportation equipment	336	40,380	21,158	829	9,477	2,134	80	6,703
Aerospace products and parts	3364	21,292	11,962	465	5,288	1,985	34	1,557
Other transportation equipment	other 336	19,089	9,196	364	4,189	148	46	5,145
Furniture and related products	337	124	34	0	69	0	0	21
Miscellaneous manufacturing	339	87,395	37,567	2,434	11,124	10,118	778	25,373
Selected nonmanufacturing industries	42, 51, 5413, 5415, 5417	5,990,959	3,141,776	225,449	578,800	1,017,678	52,066	975,190
Wholesale trade	42	488,544	177,230	88,087	46,004	96,128	3,686	77,409
Information	51	716,501	579,885	15,978	10,137	26,735	1,342	82,424
Software publishers	5112	483,848	389,464	8,581	4,634	15,291	859	65,019
Information, excluding software publishers	51 less 5112	232,654	190,421	7,397	5,504	11,444	483	17,405
Architectural, engineering, and related services	5413	620,222	338,355	35,706	101,741	45,856	7,978	90,586

TABLE 6

Domestic R&D costs, by selected industry and type of cost, for companies with 1–9 employees: 2020

(Thousands of U.S. dollars)

Industry	NAICS code	Total	Salaries, wages, and fringe benefits	Expensed machinery and equipment	Materials and supplies	Payments to others for R&D	Depreciation on R&D property and equipment	All other costs
Computer systems design and related services	5415	1,177,772	901,881	15,981	33,389	55,150	7,444	163,927
Scientific research and development services	5417	2,987,920	1,144,425	69,698	387,529	793,810	31,615	560,843
Research and development in nanotechnology	541713	190,087	100,804	5,116	23,117	27,091	3,210	30,749
Research and development in biotechnology (except nanobiotechnology)	541714	1,404,908	431,633	31,844	193,664	491,394	12,072	244,300
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	1,369,996	599,340	32,205	169,598	270,625	16,237	281,990
Social sciences and humanities research and development	541720	22,929	12,647	533 r	1,150 r	4,700	96 r	3,804

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 that performed or funded R&D.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, 2021 Annual Business Survey: Data Year 2020.

TABLE 7

Domestic R&D performed by the company, by selected industry and source of funds, for companies with 1–9 employees: 2020

(Thousands of U.S. dollars)

Industry	NAICS code	Total	Paid for by the company	Foreign owner	Another U.S. company	Other businesses outside the United States	U.S. university or college	U.S. nonprofit organization	U.S. federal government	U.S. state or local government	All other organizations outside the United States
All selected industries	31–33, 42, 51, 5413, 5415, 5417	5,600,668	4,274,137	140,976	202,765	18,505	26,135	14,335	867,027	42,281	14,508
Manufacturing industries	31–33	627,387	495,843	14,201	15,570	1,868	2,356	1,867	84,185	10,993	504
Food, beverage, and tobacco products	311–12	9,614	6,581	0	0	0	288	0	2,457	288	0
Textile, apparel, and leather products	313–16	472	472	0	0	0	0	0	0	0	0
Wood products	321	0	0	0	0	0	0	0	0	0	0
Paper	322	0	0	0	0	0	0	0	0	0	0
Printing and related support activities	323	0	0	0	0	0	0	0	0	0	0
Petroleum and coal products	324	0	0	0	0	0	0	0	0	0	0
Chemicals	325	160,031	121,470	332	5,788	1,378	14	1,399	29,114	536	0
Pharmaceuticals and medicines	3254	77,054	62,164	332	4,891	1,278	14	1,399	6,899	76	0
Chemicals, excluding pharmaceuticals	other 325	82,977	59,306	0	897	100	0	0	22,215	460	0
Plastics and rubber products	326	18,099	11,239	0	0	0	0	0	6,860	0	0
Nonmetallic mineral products	327	133	133	0	0	0	0	0	0	0	0
Primary metals	331	9,077	9,077	0	0	0	0	0	0	0	0
Fabricated metal products	332	37,292	35,574	0	1,667	0	0	0	0	51	0
Machinery	333	62,840	58,453	0	195	0	0	0	4,192	0	0
Computer and electronic products	334	189,225	143,732	2,191	4,575	329	1,974	468	26,218	9,234	504
Semiconductor and other electronic components	3344	36,372	33,512	8	1,168	23	70	209	1,367	0	15
Navigational, measuring, electromedical, and control instruments	3345	135,652	94,672	2,183	3,206	306	1,904	259	23,398	9,234	488
Other computer and electronic products	other 334	17,201	15,547	0	201	0	0	0	1,453	0	0
Electrical equipment, appliances, and components	335	24,958	10,584	11,679	335	160	80	0	2,119	0	0
Transportation equipment	336	38,247	29,872	0	2,891	0	0	0	5,417	66	0
Aerospace products and parts	3364	19,307	14,041	0	2,891	0	0	0	2,308	66	0
Other transportation equipment	other 336	18,940	15,831	0	0	0	0	0	3,109	0	0

TABLE 7

Domestic R&D performed by the company, by selected industry and source of funds, for companies with 1–9 employees: 2020

(Thousands of U.S. dollars)

Industry	NAICS code	Total	Paid for by the company	Foreign owner	Another U.S. company	Other businesses outside the United States	U.S. university or college	U.S. nonprofit organization	U.S. federal government	U.S. state or local government	All other organizations outside the United States
Furniture and related products	337	124	124	0	0	0	0	0	0	0	0
Miscellaneous manufacturing	339	77,276	68,532	0	119	0	0	0	7,809	817 r	0
Selected nonmanufacturing industries	42, 51, 5413, 5415, 5417	4,973,281	3,778,294	126,774	187,195	16,637	23,778 r	12,467	782,842	31,288	14,004
Wholesale trade	42	392,416	335,440	26,087 r	14,694 r	0	0	0	16,195 r	0	0
Information	51	689,766	644,794	1,127	10,560	1,440	210	113 r	26,486	1,812	3,224 r
Software publishers	5112	468,557	428,059	1,127	9,758	1,440	184	113 r	23,242	1,498	3,135 r
Information, excluding software publishers	51 less 5112	221,209	216,735	0	801	0	26 r	0	3,244	314 r	90
Architectural, engineering, and related services	5413	574,367	384,554	38,036 r	30,583	1,257 r	879 r	1,670 r	115,614 r	1,774 r	0
Computer systems design and related services	5415	1,122,622	886,689	4,358 r	39,726	1,119 r	19,688 r	100 r	165,586	5,196 r	161
Scientific research and development services	5417	2,194,110	1,526,817	57,167	91,633	12,822	3,002	10,585	458,961	22,506	10,618 r
Research and development in nanotechnology	541713	162,996	104,969	20,497	1,984	1,731	180	56 r	30,599	2,788	191
Research and development in biotechnology (except nanobiotechnology)	541714	913,514	698,955	7,310	26,717	1,504	669	3,893	158,797	6,662	9,008 r
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	1,099,371	719,175	29,360	54,882	9,586	2,139	6,636 r	263,231	12,944	1,419
Social sciences and humanities research and development	541720	18,229	3,717	0	8,051	0	13 r	0	6,334 r	112	0

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 that performed or funded R&D.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, 2021 Annual Business Survey: Data Year 2020.

TABLE 8
Domestic R&D performed by the company and funded by the federal government, by selected industry and employment size, for companies with 1–9 employees: 2020

(Thousands of U.S. dollars)

Industry	NAICS code	All companies	1–4 employees	5–9 employees
All selected industries	31–33, 42, 51, 5413, 5415, 5417	867,027	390,060	476,968
Manufacturing industries	31–33	84,185	42,638	41,548
Food, beverage, and tobacco products	311–12	2,457 r	2,457 r	0
Textile, apparel, and leather products	313–16 r	0 r	0	0
Wood products	321	0	0	0
Paper	322	0	0	0
Printing and related support activities	323	0	0	0
Petroleum and coal products	324	0	0	0
Chemicals	325	29,114 r	7,539	21,575 r
Pharmaceuticals and medicines	3254	6,899	4,289 r	2,610 r
Chemicals, excluding pharmaceuticals	other 325	22,215 r	3,250	18,965 r
Plastics and rubber products	326	6,860 r	6,860 r	0
Nonmetallic mineral products	327	0	0	0
Primary metals	331	0	0	0
Fabricated metal products	332 r	0	0 r	0
Machinery	333	4,192 r	2,293 r	1,899 r
Computer and electronic products	334	26,218	17,080	9,138
Semiconductor and other electronic components	3344	1,367	1,367	0
Navigational, measuring, electromedical, and control instruments	3345	23,398	14,261	9,138
Other computer and electronic products	other 334	1,453	1,453	0
Electrical equipment, appliances, and components	335	2,119 r	2,119 r	0
Transportation equipment	336	5,417 r	1,769	3,647 r
Aerospace products and parts	3364	2,308	1,769	539
Other transportation equipment	other 336	3,109 r	0	3,109 r
Furniture and related products	337	0	0	0
Miscellaneous manufacturing	339	7,809	2,520	5,289 r
Selected nonmanufacturing industries	42, 51, 5413, 5415, 5417	782,842	347,422	435,420
Wholesale trade	42	16,195 r	5,582 r	10,613 r
Information	51	26,486	12,132 r	14,354
Software publishers	5112	23,242	10,420 r	12,822
Information, excluding software publishers	51 less 5112	3,244	1,712 r	1,532
Architectural, engineering, and related services	5413	115,614 r	23,235	92,379 r
Computer systems design and related services	5415	165,586	88,989	76,598 r
Scientific research and development services	5417	458,961	217,484	241,476
Research and development in nanotechnology	541713	30,599	14,600	15,998

TABLE 8
Domestic R&D performed by the company and funded by the federal government, by selected industry and employment size, for companies with 1–9 employees: 2020

(Thousands of U.S. dollars)

Industry	NAICS code	All companies	1–4 employees	5–9 employees
Research and development in biotechnology (except nanobiotechnology)	541714	158,797	80,562	78,234
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	263,231	120,697	142,533
Social sciences and humanities research and development	541720	6,334 r	1,625 r	4,710 r

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 that performed or funded R&D. This is a preliminary version of the table and it will be revised to include company counts at a later date.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, 2021 Annual Business Survey: Data Year 2020.

TABLE 9

Domestic R&D performed by the company, by selected industry and type of R&D, for companies with 1–9 employees: 2020

(Thousands of U.S. dollars)

Industry	NAICS code	Total	Basic research	Applied research	Development
All selected industries	31–33, 42, 51, 5413, 5415, 5417	5,600,668	353,143	2,282,934	2,964,591
Manufacturing industries	31–33	627,387	36,251	247,837	343,299
Food, beverage, and tobacco products	311–12	9,614	298	5,022	4,293
Textile, apparel, and leather products	313–16	472	27	0	445
Wood products	321	0	0	0	0
Paper	322	0	0	0	0
Printing and related support activities	323	0	0	0	0
Petroleum and coal products	324	0	0	0	0
Chemicals	325	160,031	11,536	90,771	57,724
Pharmaceuticals and medicines	3254	77,054	5,179	41,866	30,009
Chemicals, excluding pharmaceuticals	other 325	82,977	6,358	48,904	27,715
Plastics and rubber products	326	18,099	545	8,616	8,938
Nonmetallic mineral products	327	133	0	0	133
Primary metals	331	9,077	0	1,956	7,121
Fabricated metal products	332	37,292	218	447	36,627
Machinery	333	62,840	5,305	22,287	35,248
Computer and electronic products	334	189,225	11,993	86,219	91,014
Semiconductor and other electronic components	3344	36,372	4,465	13,785	18,122
Navigational, measuring, electromedical, and control instruments	3345	135,652	6,494	65,204	63,954
Other computer and electronic products	other 334	17,201	1,034	7,230	8,937
Electrical equipment, appliances, and components	335	24,958	320	5,725	18,912
Transportation equipment	336	38,247	4,292	15,128	18,827
Aerospace products and parts	3364	19,307	579	10,968	7,760
Other transportation equipment	other 336	18,940	3,714	4,160	11,067
Furniture and related products	337	124	41	41	41
Miscellaneous manufacturing	339	77,276	1,676	11,624	63,976
Selected nonmanufacturing industries	42, 51, 5413, 5415, 5417	4,973,281	316,892	2,035,097	2,621,292
Wholesale trade	42	392,416	25,088	226,630	140,698
Information	51	689,766	34,648	205,391	449,726
Software publishers	5112	468,557	24,175	144,800	299,582
Information, excluding software publishers	51 less 5112	221,209	10,474	60,591	150,144
Architectural, engineering, and related services	5413	574,367	24,714	237,752	311,900
Computer systems design and related services	5415	1,122,622	118,121	348,258	656,243
Scientific research and development services	5417	2,194,110	114,321	1,017,065	1,062,724
Research and development in nanotechnology	541713	162,996	18,309	82,162	62,525

TABLE 9

Domestic R&D performed by the company, by selected industry and type of R&D, for companies with 1–9 employees: 2020

(Thousands of U.S. dollars)

Industry	NAICS code	Total	Basic research	Applied research	Development
Research and development in biotechnology (except nanobiotechnology)	541714	913,514	31,951	425,572	455,991
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	1,099,371	62,081	501,329	535,961
Social sciences and humanities research and development	541720	18,229	1,980 r	8,003	8,247

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 that performed or funded R&D.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, 2021 Annual Business Survey: Data Year 2020.

TABLE 10

Domestic R&D performed by the company, by selected industry, for companies with 1–9 employees: 2018, 2019, and 2020

(Thousands of U.S. dollars)

Industry	NAICS code	2018	2019	2020
All selected industries	31–33, 42, 51, 5413, 5415, 5417	4,526,838	5,218,911	5,600,668
Manufacturing industries	31–33	555,676	622,220	627,387
Food, beverage, and tobacco products	311–12	D	5,896	9,614
Textile, apparel, and leather products	313–16	859 r	236 r	472 r
Wood products	321	0	4,065 r	0
Paper	322	0	0	0
Printing and related support activities	323	D	555	0
Petroleum and coal products	324	D	0	0
Chemicals	325	86,272	178,170	160,031
Pharmaceuticals and medicines	3,254	54,581	117,508	77,054
Chemicals, excluding pharmaceuticals	other 325	31,691	60,661	82,977
Plastics and rubber products	326	0	6,261	18,099
Nonmetallic mineral products	327	5,159 r	5,860 r	133
Primary metals	331	0	2,353 r	9,077 r
Fabricated metal products	332	2,465 r	20,518 r	37,292 r
Machinery	333	42,431	22,057	62,840
Computer and electronic products	334	303,711	227,158	189,225
Semiconductor and other electronic components	3,344	56,813	38,305	36,372
Navigational, measuring, electromedical, and control instruments	3,345	200,704	161,373	135,652
Other computer and electronic products	other 334	46,194	27,480	17,201
Electrical equipment, appliances, and components	335	27,954	9,592	24,958 r
Transportation equipment	336	12,979	24,577	38,247
Aerospace products and parts	3,364	10,181	11,859	19,307
Other transportation equipment	other 336	D	12,718 r	18,940 r
Furniture and related products	337	0	0	124
Miscellaneous manufacturing	339	69,921	114,922	77,276
Selected nonmanufacturing industries	42, 51, 5413, 5415, 5417	3,971,162	4,596,691	4,973,281
Wholesale trade	42	183,533	225,813	392,416
Information	51	518,090	598,684	689,766
Software publishers	5,112	368,288	327,921	468,557
Information, excluding software publishers	51 less 5112	149,801	270,764	221,209
Architectural, engineering, and related services	5,413	411,987	454,913	574,367
Computer systems design and related services	5,415	1,037,581	1,435,159	1,122,622
Scientific research and development services	5,417	1,819,972	1,882,122	2,194,110
Research and development in nanotechnology	541,713	292,766	175,639	162,996
Research and development in biotechnology (except nanobiotechnology)	541,714	656,579	645,887	913,514

TABLE 10

Domestic R&D performed by the company, by selected industry, for companies with 1–9 employees: 2018, 2019, and 2020

(Thousands of U.S. dollars)

Industry	NAICS code	2018	2019	2020
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541,715	841,697	1,026,911	1,099,371
Social sciences and humanities research and development	541,720	12,008	31,464	18,229

D = suppressed to ensure confidentiality of individual companies; 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 that performed or funded R&D.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, 2021 Annual Business Survey: Data Year 2020.

TABLE 11
Domestic sales and domestic R&D performed by the company as a percentage of domestic sales, by selected industry and employment size, for companies with 1–9 employees:
2020

(Thousands of U.S. dollars and percent)

Industry	NAICS code	All companies		1–4 employees		5–9 employees	
		Total sales	R&D as percentage of sales	Total sales	R&D as percentage of sales	Total sales	R&D as percentage of sales
All selected industries	31–33, 42, 51, 5413, 5415, 5417	13,337,245	42	5,905,752	43	7,431,493	42
Manufacturing industries	31–33	2,677,957	23	789,125	32	1,888,832	20
Food, beverage, and tobacco products	311–12	23,693	41 r	8,105	74 r	15,588 r	23 r
Textile, apparel, and leather products	313–16	664 r	71 r	664 r	71 r	0	0
Wood products	321	0	0	0	0	0	0
Paper	322	0	0	0	0	0	0
Printing and related support activities	323	0	0	0	0	0	0
Petroleum and coal products	324	0	0	0	0	0	0
Chemicals	325	783,535	20	312,780	22 r	470,755	19 r
Pharmaceuticals and medicines	3254	263,923	29 r	184,094 r	23 r	79,828	43
Chemicals, excluding pharmaceuticals	other 325	519,612	16 r	128,686	21	390,926	14 r
Plastics and rubber products	326	92,610	20 r	33,904	39	58,706 r	8
Nonmetallic mineral products	327	0	0	0	0	0	0
Primary metals	331	10,914 r	83 r	10,914 r	83 r	0	0
Fabricated metal products	332	85,393 r	44	1,827	20 r	83,567 r	44
Machinery	333	287,891	22	94,173	23 r	193,719	21
Computer and electronic products	334	1,014,015	19 r	195,882	40	818,134 r	14 r
Semiconductor and other electronic components	3344	146,316	25	50,973	40 r	95,342	17
Navigational, measuring, electromedical, and control instruments	3345	776,844 r	17 r	124,625	39	652,219 r	13 r
Other computer and electronic products	other 334	90,856	19	20,284	42 r	70,572	12 r
Electrical equipment, appliances, and components	335	156,305	16 r	60,939 r	35 r	95,366 r	4
Transportation equipment	336	74,792	51 r	28,516	40	46,276	58 r
Aerospace products and parts	3364	54,858	35	24,530	42	30,328	29
Other transportation equipment	other 336	19,934 r	95 r	3,986 r	26 r	15,947 r	112 r
Furniture and related products	337	580	21	0	0	580	21
Miscellaneous manufacturing	339	147,565	52 r	41,422	44 r	106,143	56 r
Selected nonmanufacturing industries	42, 51, 5413, 5415, 5417	10,659,289	47	5,116,627	44	5,542,661	49
Wholesale trade	42	1,433,078	27 r	724,740 r	22 r	708,338 r	33 r
Information	51	2,196,608	31	1,171,158	25 r	1,025,450	39
Software publishers	5112	1,557,475	30 r	1,005,814 r	19 r	551,662	51
Information, excluding software publishers	51 less 5112	639,133	35	165,344	61	473,789	25
Architectural, engineering, and related services	5413	1,207,840	48	534,411	46	673,429	49

TABLE 11
Domestic sales and domestic R&D performed by the company as a percentage of domestic sales, by selected industry and employment size, for companies with 1–9 employees: 2020

(Thousands of U.S. dollars and percent)

Industry	NAICS code	All companies		1–4 employees		5–9 employees	
		Total sales	R&D as percentage of sales	Total sales	R&D as percentage of sales	Total sales	R&D as percentage of sales
Computer systems design and related services	5415	3,742,883	30	1,831,070	36	1,911,813	24
Scientific research and development services	5417	2,078,879	106	855,248	107	1,223,631	104
Research and development in nanotechnology	541713	168,322	97	58,636	120	109,686	85
Research and development in biotechnology (except nanobiotechnology)	541714	655,385	139	301,403	127	353,982	150 r
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	1,236,057	89	482,787	94	753,270	85
Social sciences and humanities research and development	541720	19,115	95	12,423 r	60 r	6,693 r	160 r

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 that performed or funded R&D.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, 2021 Annual Business Survey: Data Year 2020.

TABLE 12

Domestic R&D performed by the company, by state and employment size, for companies with 1–9 employees: 2020

(Number of companies and thousands of U.S. dollars)

State	All companies		1–4 employees		5–9 employees	
	Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount
All states	15,391	5,600,668	9,892	2,514,365	5,501	3,086,303
Alabama	131	59,496	107	48,147	25	11,349
Alaska	4	281	2	179	2	102
Arizona	366	117,036	236	47,643	129	69,393
Arkansas	32	13,506	24	10,856	8	2,650
California	4,409	1,758,934	2,886	778,010	1,524	980,924
Colorado	611	163,113	400	64,753	210	98,361
Connecticut	269	65,202	155	33,869	116	31,333
Delaware	136	51,109	79	21,356	58	29,752
District of Columbia	26	9,259	17	4,985	10	4,274
Florida	654	189,261	370	71,399	286	117,862
Georgia	313	84,661	252	70,881	62	13,780
Hawaii	8	2,738	4	1,092	5	1,645
Idaho	54	11,838	38	4,235	18	7,603
Illinois	455	166,995	257	49,076	199	117,918
Indiana	92	34,136	54	11,173	38	22,964
Iowa	66	22,886	24	7,862	43	15,024
Kansas	61	14,543	48	8,641	14	5,902
Kentucky	62	20,542	37	9,477	26	11,065
Louisiana	78	8,501	19	3,329	59	5,171
Maine	62	6,144	29	3,037	32	3,108
Maryland	413	176,147	270	81,271	144	94,876
Massachusetts	547	264,522	345	118,479	203	146,043
Michigan	352	256,524	247	96,159	107	160,364
Minnesota	285	132,367	222	70,290	64	62,077
Mississippi	14	2,181	11	1,802	2	379
Missouri	157	28,945	89	10,672	67	18,273
Montana	60	14,946	36	9,597	23	5,350
Nebraska	85	12,366	69	7,256	16	5,109
Nevada	124	29,501	85	19,413	38	10,088
New Hampshire	109	33,704	76	11,799	32	21,904
New Jersey	370	167,115	299	118,562	72	48,553
New Mexico	60	26,965	43	9,612	16	17,353
New York	880	342,484	539	88,843	340	253,641

TABLE 12

Domestic R&D performed by the company, by state and employment size, for companies with 1–9 employees: 2020

(Number of companies and thousands of U.S. dollars)

State	All companies		1–4 employees		5–9 employees	
	Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount
North Carolina	368	104,465	193	31,689	175	72,776
North Dakota	14	5,470	8	947	8	4,523
Ohio	419	84,892	218	45,322	202	39,571
Oklahoma	63	18,295	33	5,004	29	13,291
Oregon	244	89,673	161	42,322	84	47,352
Pennsylvania	421	154,531	241	77,340	181	77,191
Rhode Island	34	8,602	27	6,737	7	1,865
South Carolina	82	20,519	68	12,421	15	8,098
South Dakota	24	68,641	10	643	13	67,997
Tennessee	177	34,312	114	14,797	64	19,515
Texas	660	171,867	534	136,462	125	35,404
Utah	161	59,722	103	27,911	56	31,811
Vermont	36	11,494	25	6,459	12	5,035
Virginia	426	126,325	272	49,646	153	76,679
Washington	560	220,878	303	115,606	258	105,272
West Virginia	28	8,575	26	8,468	2	107
Wisconsin	195	48,893	158	31,005	38	17,888
Wyoming	44	23,734	20	1,738	25	21,996
Undistributed	85	51,835	19	6,093	68	45,742

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 that performed or funded R&D.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, 2021 Annual Business Survey: Data Year 2020.

TABLE 13

Domestic R&D performed by the company, by state and source of funds, for companies with 1–9 employees: 2020

(Thousands of U.S. dollars)

State	Total	Paid for by the company		Foreign owner	Another U.S. company	Other businesses outside the United States	U.S. university or college	U.S. nonprofit organization	U.S. federal government	U.S. state or local government	All other organizations outside the United States
All states	5,600,668	4,274,137		140,976	202,765	18,505	26,135	14,335	867,027	42,281	14,508
Alabama	59,496	41,280	r	0	5,094	408	0	0	12,714	0	0
Alaska	281	209		0	0	0	0	0	72	0	0
Arizona	117,036	98,675		717	4,407	0	326	584	12,117	211	0
Arkansas	13,506	12,915		0	0	0	0	0	591	0	0
California	1,758,934	1,397,925		95,701	35,441	5,112	2,218	1,785	204,828	4,469	11,455
Colorado	163,113	102,657		4,212	10,279	682	339	0	43,632	1,064	247
Connecticut	65,202	50,872		0	3,419	0	0	0	10,647	264	0
Delaware	51,109	37,811		0	405	0	0	74	12,271	499	49
District of Columbia	9,259	7,895		0	0	0	0	0	1,363	0	0
Florida	189,261	162,379		7,287	4,102	99	0	0	14,830	459	105
Georgia	84,661	49,289		0	9,099	0	58	0	25,968	247	0
Hawaii	2,738	1,569		0	0	0	0	0	1,056	112	0
Idaho	11,838	5,878		0	752	0	0	0	5,208	0	0
Illinois	166,995	109,213		7,587	4,630	533	19,678	259	24,685	410	0
Indiana	34,136	25,689		0	2,631	0	726	0	5,013	76	0
Iowa	22,886	8,727		0	0	482	0	4,471	8,219	987	0
Kansas	14,543	13,275		0	53	0	0	0	1,215	0	0
Kentucky	20,542	10,587		0	2,476	284	0	0	5,629	1,566	0
Louisiana	8,501	7,519		0	724	52	0	0	206	0	0
Maine	6,144	5,209		0	935	0	0	0	0	0	0
Maryland	176,147	106,170		3,374	7,292	0	99	58	54,184	4,970	0
Massachusetts	264,522	222,648		16	4,592	2,591	140	1,083	32,905	250	296
Michigan	256,524	217,438		0	20,672	9	63	0	17,764	578	0
Minnesota	132,367	120,176	r	2,726	1,580	0	0	0	2,204	4,394	1,286
Mississippi	2,181	1,660	r	0	0	0	0	0	521	0	0
Missouri	28,945	20,682		0	2,422	1,357	259	300	3,926	0	0
Montana	14,946	11,002		0	281	0	0	0	3,536	70	57
Nebraska	12,366	9,946	r	0	67	0	0	0	2,220	133	0
Nevada	29,501	24,883		312	1,444	72	0	0	2,790	0	0
New Hampshire	33,704	21,723		0	7,820	1,246	0	0	2,915	0	0
New Jersey	167,115	148,028		0	6,733	0	58	0	9,243	3,053	0
New Mexico	26,965	22,460		70	1,629	0	0	120	2,543	143	0

TABLE 13

Domestic R&D performed by the company, by state and source of funds, for companies with 1–9 employees: 2020

(Thousands of U.S. dollars)

State	Total	Paid for by the company		Foreign owner	Another U.S. company	Other businesses outside the United States	U.S. university or college	U.S. nonprofit organization	U.S. federal government	U.S. state or local government	All other organizations outside the United States
New York	342,484	292,338		7,953	5,855	1,104	264	56 r	32,667	2,127 r	120
North Carolina	104,465	65,171		2,295	6,989	0	216	225	29,480	89 r	0
North Dakota	5,470	4,987		0	160 r	21	0	0	0	303	0
Ohio	84,892	61,182		623	5,108	0	64 r	0	9,860	8,056 r	0
Oklahoma	18,295	13,514		0	186 r	0	419 r	0	3,359 r	817 r	0
Oregon	89,673	65,503		0	9,762	143 r	290	113 r	13,613	250	0
Pennsylvania	154,531	99,539		2,145	6,698	1,011 r	128	153 r	42,703	1,695	458
Rhode Island	8,602 r	8,602 r		0	0	0	0	0	0	0	0
South Carolina	20,519	14,678		0	736	0	63	0	4,407	635 r	0
South Dakota	68,641 r	6,202		0	0	0	0	131	62,307 r	0	0
Tennessee	34,312	26,166		1,423	2,802	0	0	278 r	3,644 r	0	0
Texas	171,867	139,125		1,442 r	1,122	593 r	572	239 r	26,614	1,801 r	358
Utah	59,722	47,377		0	911	0	0	0	11,433	0	0
Vermont	11,494	6,477 r		0	755 r	0	0	0	4,262 r	0	0
Virginia	126,325	69,693		332	16,015	123	152 r	209	39,220	514 r	67 r
Washington	220,878	179,825		2,759	5,792	2,350	0	2,934	26,752	465 r	0
West Virginia	8,575 r	8,061 r		0	62	0	0	0	447 r	5	0
Wisconsin	48,893	26,229		0	220	100	0	1,263	19,512 r	1,569 r	0
Wyoming	23,734 r	23,039 r		0	0	0	4	0	691	0	0
Undistributed	51,835 r	40,038 r		0	612 r	135 r	0	0	11,040 r	0	11 r

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 that performed or funded R&D.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, 2021 Annual Business Survey: Data Year 2020.

TABLE 14

Domestic R&D employees, by selected industry and employment size, for companies with 1–9 employees: 2020

(Number)

Industry	NAICS code	All companies	1–4 employees	5–9 employees
All selected industries	31–33, 42, 51, 5413, 5415, 5417	39,087	17,460	21,627
Manufacturing industries	31–33	4,776	1,795	2,980
Food, beverage, and tobacco products	311–12	103	74 r	29 r
Textile, apparel, and leather products	313–16	8 r	8 r	0
Wood products	321	0	0	0
Paper	322	0	0	0
Printing and related support activities	323	0	0	0
Petroleum and coal products	324	0	0	0
Chemicals	325	1,177	412	765
Pharmaceuticals and medicines	3254	361	188	174
Chemicals, excluding pharmaceuticals	other 325	816	225	591
Plastics and rubber products	326	133	71	62
Nonmetallic mineral products	327	3	3	0
Primary metals	331	30	30	0
Fabricated metal products	332	298 r	7	291 r
Machinery	333	499	189	310
Computer and electronic products	334	1,658	739	918
Semiconductor and other electronic components	3344	332	146	186
Navigational, measuring, electromedical, and control instruments	3345	1,066	483	583
Other computer and electronic products	other 334	260	111	149
Electrical equipment, appliances, and components	335	225	95	130 r
Transportation equipment	336	262	61	201
Aerospace products and parts	3364	152	48	105
Other transportation equipment	other 336	110	14 r	96
Furniture and related products	337	3	0	3
Miscellaneous manufacturing	339	375	105	271
Selected nonmanufacturing industries	42, 51, 5413, 5415, 5417	34,311	15,664	18,647
Wholesale trade	42	1,928	724	1,203
Information	51	6,767	2,903	3,864
Software publishers	5112	4,644	2,020	2,624
Information, excluding software publishers	51 less 5112	2,123	884	1,240
Architectural, engineering, and related services	5413	4,422	2,061	2,361
Computer systems design and related services	5415	10,277	5,646	4,631
Scientific research and development services	5417	10,917	4,330	6,587
Research and development in nanotechnology	541713	1,145	448	697

TABLE 14

Domestic R&D employees, by selected industry and employment size, for companies with 1–9 employees: 2020

(Number)

Industry	NAICS code	All companies	1–4 employees	5–9 employees
Research and development in biotechnology (except nanobiotechnology)	541714	3,541	1,407	2,133
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	6,131	2,418	3,712
Social sciences and humanities research and development	541720	100	56	45

r = relative standard error > 50%.

NAICS = 2017 North American Industry Classification System.

Note(s):

Detail may not add to total because of rounding. Statistics are representative of companies located in the United States that performed or funded R&D.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, 2021 Annual Business Survey: Data Year 2020.

TABLE 15

Domestic R&D employees, by selected industry and sex, for companies with 1–9 employees: 2020

(Number)

Industry	NAICS code	Total	Male	Female
All selected industries	31–33, 42, 51, 5413, 5415, 5417	39,087	30,961	8,126
Manufacturing industries	31–33	4,776	3,956	820
Food, beverage, and tobacco products	311–12	103	92	11 r
Textile, apparel, and leather products	313–16	8 r	3 r	5 r
Wood products	321	0	0	0
Paper	322	0	0	0
Printing and related support activities	323	0	0	0
Petroleum and coal products	324	0	0	0
Chemicals	325	1,177	845	332
Pharmaceuticals and medicines	3254	361	239	122
Chemicals, excluding pharmaceuticals	other 325	816	606	210
Plastics and rubber products	326	133	118	16
Nonmetallic mineral products	327	3	1	1
Primary metals	331	30	27	3 r
Fabricated metal products	332	298 r	260 r	38 r
Machinery	333	499	451	48
Computer and electronic products	334	1,658	1,425	233
Semiconductor and other electronic components	3344	332	303	29
Navigational, measuring, electromedical, and control instruments	3345	1,066	879	186
Other computer and electronic products	other 334	260	243	18
Electrical equipment, appliances, and components	335	225	210	15 r
Transportation equipment	336	262	245	17
Aerospace products and parts	3364	152	140	13
Other transportation equipment	other 336	110	105	4 r
Furniture and related products	337	3	3	0
Miscellaneous manufacturing	339	375	275	101
Selected nonmanufacturing industries	42, 51, 5413, 5415, 5417	34,311	27,005	7,306
Wholesale trade	42	1,928	1,497	431 r
Information	51	6,767	5,540	1,227
Software publishers	5112	4,644	3,761	883
Information, excluding software publishers	51 less 5112	2,123	1,779	344
Architectural, engineering, and related services	5413	4,422	3,647	775
Computer systems design and related services	5415	10,277	8,653	1,624
Scientific research and development services	5417	10,917	7,669	3,248
Research and development in nanotechnology	541713	1,145	891	254
Research and development in biotechnology (except nanobiotechnology)	541714	3,541	2,169	1,372

TABLE 15

Domestic R&D employees, by selected industry and sex, for companies with 1–9 employees: 2020

(Number)

Industry	NAICS code	Total	Male	Female
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	6,131	4,543	1,588
Social sciences and humanities research and development	541720	100	66	35

r = relative standard error > 50%.

NAICS = 2017 North American Industry Classification System.

Note(s):

Detail may not add to total because of rounding. Statistics are representative of companies located in the United States that performed or funded R&D.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, 2021 Annual Business Survey: Data Year 2020.

TABLE 16

Domestic R&D employees, by selected industry and R&D work activity, for companies with 1–9 employees: 2020

(Number)

Industry	NAICS code	All R&D employees	Researchers (including R&D scientists, engineers, and their managers)	R&D technicians and equivalent staff	R&D support staff (clerical and other)
All selected industries	31–33, 42, 51, 5413, 5415, 5417	39,087	27,029	8,877	3,181
Manufacturing industries	31–33	4,776	3,337	1,047	392
Food, beverage, and tobacco products	311–12	103	99	1	3 r
Textile, apparel, and leather products	313–16	8 r	5 r	3 r	0
Wood products	321	0	0	0	0
Paper	322	0	0	0	0
Printing and related support activities	323	0	0	0	0
Petroleum and coal products	324	0	0	0	0
Chemicals	325	1,177	732	316	129
Pharmaceuticals and medicines	3254	361	223	114	24 r
Chemicals, excluding pharmaceuticals	other 325	816	509	202	105
Plastics and rubber products	326	133	83	42 r	8
Nonmetallic mineral products	327	3	0	1	1
Primary metals	331	30	27	0	3 r
Fabricated metal products	332	298 r	226 r	32 r	40 r
Machinery	333	499	398	67	35 r
Computer and electronic products	334	1,658	1,181	379	98
Semiconductor and other electronic components	3344	332	226	93	12
Navigational, measuring, electromedical, and control instruments	3345	1,066	778	226	61
Other computer and electronic products	other 334	260	177	59	24 r
Electrical equipment, appliances, and components	335	225	172	34	19 r
Transportation equipment	336	262	116	108	38
Aerospace products and parts	3364	152	80	56	17
Other transportation equipment	other 336	110	36	52	22 r
Furniture and related products	337	3	0	1	1
Miscellaneous manufacturing	339	375	297	63	16
Selected nonmanufacturing industries	42, 51, 5413, 5415, 5417	34,311	23,692	7,830	2,790
Wholesale trade	42	1,928	1,314	315	299
Information	51	6,767	4,659	1,546	563
Software publishers	5112	4,644	3,202	1,021	422
Information, excluding software publishers	51 less 5112	2,123	1,457	525	141

TABLE 16

Domestic R&D employees, by selected industry and R&D work activity, for companies with 1–9 employees: 2020

(Number)

Industry	NAICS code	All R&D employees	Researchers (including R&D scientists, engineers, and their managers)	R&D technicians and equivalent staff	R&D support staff (clerical and other)
Architectural, engineering, and related services	5413	4,422	2,966	1,077	379
Computer systems design and related services	5415	10,277	6,496	2,969	812
Scientific research and development services	5417	10,917	8,257	1,923	737
Research and development in nanotechnology	541713	1,145	869	203	73
Research and development in biotechnology (except nanobiotechnology)	541714	3,541	2,597	669	275
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	6,131	4,729	1,023	379
Social sciences and humanities research and development	541720	100	62	29	9

r = relative standard error > 50%.

NAICS = 2017 North American Industry Classification System.

Note(s):

Detail may not add to total because of rounding. Statistics are representative of companies located in the United States that performed or funded R&D.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, 2021 Annual Business Survey: Data Year 2020.

TABLE 17

Domestic R&D researchers with PhDs, by selected industry, for companies with 1–9 employees: 2020

(Number)

Industry	NAICS code	All researchers (including R&D scientists, engineers, and their managers)	Researchers with PhD (excluding MD, JD, and EdD)
All selected industries	31–33, 42, 51, 5413, 5415, 5417	27,029	7,832
Manufacturing industries	31–33	3,337	937
Food, beverage, and tobacco products	311–12	99	40 r
Textile, apparel, and leather products	313–16	5 r	0
Wood products	321	0	0
Paper	322	0	0
Printing and related support activities	323	0	0
Petroleum and coal products	324	0	0
Chemicals	325	732	287
Pharmaceuticals and medicines	3254	223	128
Chemicals, excluding pharmaceuticals	other 325	509	159 r
Plastics and rubber products	326	83	38 r
Nonmetallic mineral products	327	0	0
Primary metals	331	27	0
Fabricated metal products	332	226 r	3 r
Machinery	333	398	63 r
Computer and electronic products	334	1,181	412
Semiconductor and other electronic components	3344	226	36
Navigational, measuring, electromedical, and control instruments	3345	778	344
Other computer and electronic products	other 334	177	32
Electrical equipment, appliances, and components	335	172	29
Transportation equipment	336	116	9
Aerospace products and parts	3364	80	4
Other transportation equipment	other 336	36	5 r
Furniture and related products	337	0	0
Miscellaneous manufacturing	339	297	56
Selected nonmanufacturing industries	42, 51, 5413, 5415, 5417	23,692	6,895
Wholesale trade	42	1,314	271
Information	51	4,659	568
Software publishers	5112	3,202	438
Information, excluding software publishers	51 less 5112	1,457	130

TABLE 17

Domestic R&D researchers with PhDs, by selected industry, for companies with 1–9 employees: 2020

(Number)

Industry	NAICS code	All researchers (including R&D scientists, engineers, and their managers)	Researchers with PhD (excluding MD, JD, and EdD)
Architectural, engineering, and related services	5413	2,966	470
Computer systems design and related services	5415	6,496	1,128
Scientific research and development services	5417	8,257	4,458
Research and development in nanotechnology	541713	869	500
Research and development in biotechnology (except nanobiotechnology)	541714	2,597	1,650
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	4,729	2,265
Social sciences and humanities research and development	541720	62	43

r = relative standard error > 50%.

NAICS = 2017 North American Industry Classification System.

Note(s):

Detail may not add to total because of rounding. Statistics are representative of companies located in the United States that performed or funded R&D.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, 2021 Annual Business Survey: Data Year 2020.

TABLE 18

Domestic full-time equivalent R&D employees, by selected industry and work activity, for companies with 1–9 employees: 2020

(Number)

Industry	NAICS code	R&D employees: full-time equivalent	Researchers: full-time equivalent
All selected industries	31–33, 42, 51, 5413, 5415, 5417	31,358	21,952
Manufacturing industries	31–33	3,665	2,691
Food, beverage, and tobacco products	311–12	75	72
Textile, apparel, and leather products	313–16	4 r	4 r
Wood products	321	0	0
Paper	322	0	0
Printing and related support activities	323	0	0
Petroleum and coal products	324	0	0
Chemicals	325	911	636
Pharmaceuticals and medicines	3254	277	186
Chemicals, excluding pharmaceuticals	other 325	635	450
Plastics and rubber products	326	96	56
Nonmetallic mineral products	327	0	0
Primary metals	331	24	19
Fabricated metal products	332	252 r	223 r
Machinery	333	384	325
Computer and electronic products	334	1,283	935
Semiconductor and other electronic components	3344	244	168
Navigational, measuring, electromedical, and control instruments	3345	856	631
Other computer and electronic products	other 334	183	136
Electrical equipment, appliances, and components	335	102 r	69
Transportation equipment	336	230	98
Aerospace products and parts	3364	123	62
Other transportation equipment	other 336	107	35
Furniture and related products	337	1	0
Miscellaneous manufacturing	339	303	254
Selected nonmanufacturing industries	42, 51, 5413, 5415, 5417	27,693	19,261
Wholesale trade	42	1,452	918
Information	51	5,747	3,898
Software publishers	5112	3,938	2,711
Information, excluding software publishers	51 less 5112	1,809	1,187
Architectural, engineering, and related services	5413	3,543	2,389
Computer systems design and related services	5415	7,730	4,989

TABLE 18

Domestic full-time equivalent R&D employees, by selected industry and work activity, for companies with 1–9 employees: 2020

(Number)

Industry	NAICS code	R&D employees: full-time equivalent	Researchers: full-time equivalent
Scientific research and development services	5417	9,222	7,068
Research and development in nanotechnology	541713	935	714
Research and development in biotechnology (except nanobiotechnology)	541714	3,153	2,383
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	5,044	3,918
Social sciences and humanities research and development	541720	90	53

r = relative standard error > 50%.

NAICS = 2017 North American Industry Classification System.

Note(s):

Detail may not add to total because of rounding. Statistics are representative of companies located in the United States that performed or funded R&D.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, 2021 Annual Business Survey: Data Year 2020.

TABLE 19

Tax credit for research activities, by industry, for companies with R&D expenditures and 1–9 employees: 2020

(Number and percent)

Industry	NAICS code	Total (number)	Yes, filed Form 6765 in 2018 (%)	No, did not file Form 6765 in 2018 (%)	Did not answer (%)	
All selected industries	31–33, 42, 51, 5413, 5415, 5417	15,868	23.3	76.4	0.2	r
Manufacturing industries	31–33	1,974	30.2	69.3	0.6	r
Food, beverage, and tobacco products	311–12	62	58.1	41.9	0.0	r
Textile, apparel, and leather products	313–16	3	0.0	100.0	0.0	r
Wood products	321	0	0.0	0.0	0.0	
Paper	322	0	0.0	0.0	0.0	
Printing and related support activities	323	0	0.0	0.0	0.0	
Petroleum and coal products	324	0	0.0	0.0	0.0	
Chemicals	325	590	19.0	81.0	0.0	
Pharmaceuticals and medicines	3254	153	16.3	83.7	0.0	r
Chemicals, excluding pharmaceuticals	other 325	438	19.4	80.6	0.0	
Plastics and rubber products	326	69	15.9	84.1	0.0	r
Nonmetallic mineral products	327	0	0.0	0.0	0.0	
Primary metals	331	13	38.5	61.5	0.0	r
Fabricated metal products	332	56	69.6	30.4	0.0	r
Machinery	333	203	52.2	47.8	0.0	
Computer and electronic products	334	674	27.9	70.5	1.6	r
Semiconductor and other electronic components	3344	150	24.7	75.3	0.0	
Navigational, measuring, electromedical, and control instruments	3345	432	31.0	66.4	2.5	r
Other computer and electronic products	other 334	92	18.5	81.5	0.0	
Electrical equipment, appliances, and components	335	80	21.2	78.8	0.0	r
Transportation equipment	336	77	40.3	59.7	0.0	
Aerospace products and parts	3364	48	37.5	62.5	0.0	
Other transportation equipment	other 336	30	46.7	53.3	0.0	r
Furniture and related products	337	2	0.0	100.0	0.0	
Miscellaneous manufacturing	339	144	34.0	66.0	0.0	
Selected nonmanufacturing industries	42, 51, 5413, 5415, 5417	13,895	22.4	77.5	0.2	r
Wholesale trade	42	891	23.5	75.3	1.2	r
Information	51	2,599	25.3	74.7	0.0	
Software publishers	5112	1,768	28.8	71.2	0.0	
Information, excluding software publishers	51 less 5112	832	17.7	82.3	0.0	
Architectural, engineering, and related services	5413	1,681	15.2	84.7	0.1	

TABLE 19

Tax credit for research activities, by industry, for companies with R&D expenditures and 1–9 employees: 2020

(Number and percent)

Industry	NAICS code	Total (number)	Yes, filed Form 6765 in 2018 (%)	No, did not file Form 6765 in 2018 (%)	Did not answer (%)
Computer systems design and related services	5415	5,285	17.0	83.0	0.0
Scientific research and development services	5417	3,439	31.5	68.2	0.3 r
Research and development in nanotechnology	541713	344	29.9	68.9	1.2 r
Research and development in biotechnology (except nanobiotechnology)	541714	1,142	40.4	59.6	0.0
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	1,903	27.1	72.6	0.3 r
Social sciences and humanities research and development	541720	51	7.8 r	92.2	0.0

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 that performed or funded R&D.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, 2021 Annual Business Survey: Data Year 2020.

TABLE 20

Domestic employees, by selected industry and employment size, for R&D-active companies with 1–9 employees: 2020

(Number)

Industry	NAICS code	All companies	1–4 employees	5–9 employees
All selected industries	31–33, 42, 51, 5413, 5415, 5417	61,493	23,501	37,992
Manufacturing industries	31–33	9,277	2,701	6,576
Food, beverage, and tobacco products	311–12	160	98	62
Textile, apparel, and leather products	313–16	8 r	8 r	0
Wood products	321	0	0	0
Paper	322	0	0	0
Printing and related support activities	323	0	0	0
Petroleum and coal products	324	0	0	0
Chemicals	325	3,051	748	2,303
Pharmaceuticals and medicines	3254	641	263	378
Chemicals, excluding pharmaceuticals	other 325	2,410	484	1,925
Plastics and rubber products	326	291	87	205 r
Nonmetallic mineral products	327	3	3	0
Primary metals	331	36	36	0
Fabricated metal products	332	335 r	13	322 r
Machinery	333	981	289	693
Computer and electronic products	334	3,043	1,046	1,998
Semiconductor and other electronic components	3344	603	222	381
Navigational, measuring, electromedical, and control instruments	3345	1,983	688	1,295
Other computer and electronic products	other 334	457	136	322
Electrical equipment, appliances, and components	335	313	123	190 r
Transportation equipment	336	387	86	301
Aerospace products and parts	3364	229	65	164
Other transportation equipment	other 336	158	21 r	137
Furniture and related products	337	7	0	7
Miscellaneous manufacturing	339	662	165	496
Selected nonmanufacturing industries	42, 51, 5413, 5415, 5417	52,215	20,800	31,415
Wholesale trade	42	3,873	1,386	2,487
Information	51	10,564	3,994	6,570
Software publishers	5112	7,077	2,831	4,246
Information, excluding software publishers	51 less 5112	3,487	1,163	2,324
Architectural, engineering, and related services	5413	6,021	2,448	3,573
Computer systems design and related services	5415	17,756	7,715	10,041
Scientific research and development services	5417	14,001	5,256	8,744
Research and development in nanotechnology	541713	1,514	526	987

TABLE 20

Domestic employees, by selected industry and employment size, for R&D-active companies with 1–9 employees: 2020

(Number)

Industry	NAICS code	All companies	1–4 employees	5–9 employees
Research and development in biotechnology (except nanobiotechnology)	541714	4,609	1,754	2,855
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	7,722	2,909	4,813
Social sciences and humanities research and development	541720	156	67	88

r = relative standard error > 50%.

NAICS = 2017 North American Industry Classification System.

Note(s):

Detail may not add to total because of rounding. Statistics are representative of companies located in the United States that performed or funded R&D.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, 2021 Annual Business Survey: Data Year 2020.

Technical Notes

Survey Overview (2021 Survey Cycle: Data Year 2020)

Purpose. The Annual Business Survey (ABS) provides information on selected economic and demographic characteristics for businesses and business owners by sex, ethnicity, race, and veteran status. Further, the survey measures research and development for microbusinesses, business topics such as innovation and technology, and other business characteristics. The ABS is conducted jointly by the U.S. Census Bureau and the National Center for Science and Engineering Statistics (NCSES) within the National Science Foundation (NSF). The ABS replaces the quinquennial Survey of Business Owners (SBO) for employer businesses, the Annual Survey of Entrepreneurs (ASE), the Business R&D and Innovation for Microbusinesses Survey (BRDI-M), and the Innovation section of the Business R&D and Innovation Survey (BRDIS).

The ABS is designed to incorporate new content each survey year based on topics of relevance. For the 2021 ABS, new content includes technology & innovation, financing, and management practices. The ABS also collects various data regarding business owners, such as sex, ethnicity, race, veteran status, and other characteristics. R&D data are collected on the ABS for businesses with a W-2 employment range between 1 employee and 9 employees.

Data collection authority. Title 13, U.S. Code, Sections 8(b), 131, and 182; Title 42, U.S. Code, Sections 1861–76 (National Science Foundation Act of 1950, as amended); and Section 505 within the America COMPETES Reauthorization Act of 2010, authorize this collection. Sections 224 and 225 of Title 13 require mandatory response. Office of Management and Budget (OMB) No. 0607-1004.

Survey sponsor. NCSES within NSF.

Survey collection and tabulation agent. The survey is conducted annually by the U.S. Census Bureau in accordance with an interagency agreement with NCSES within NSF.

Key Survey Information

Frequency. Annual.

Initial survey year. 2017; for innovation, the reference period was 2015–17.

Reference period. 2020; for innovation, the reference period is 2018–20.

Response unit. Firm.

Sample or census. Sample.

Population size. 4.9 million employer companies; approximately 511,000 companies with 1–9 employees and in North American Industry Classification System (NAICS) industries 31–33 (manufacturing), 42 (wholesale trade), 51 (information), 5413 (architectural, engineering, and related services), 5415 (computer systems design and related services), or 5417 (scientific research and development services) were in scope for the R&D module.

Sample size. 300,000 employer companies.

Survey Design

Target population. The target population consists of all companies that allocated most of their annual domestic payroll to for-profit entities and had at least one establishment that had paid employees based on the company's Internal Revenue Service Form 941 that covers 12 March 2021, was classified in an in-scope NAICS industry, was physically located in the United States, and was in business at the end of calendar year 2021.

Sampling frame. The sampling universe was constructed from the final 2019 Business Register. The Business Register is the Census Bureau's comprehensive database of U.S. businesses. Business Register data are compiled from a combination of business tax returns, data collected from the economic census, and data from other Census Bureau surveys. The Business Register includes sole proprietorships, partnerships, and corporations reporting business activity to the IRS on any one of the following IRS tax forms: 1040 (Schedule C), "Profit or Loss from Business" (Sole Proprietorship); 1065, "U.S. Return of Partnership Income"; 941, "Employer's Quarterly Federal Tax Return"; 944, "Employer's Annual Federal Tax Return"; or any one of the 1120 corporate tax forms.

The Business Register contains establishments that are out of scope for the ABS sample. These establishments are removed from the sampling universe. They include the following:

- Establishments engaged in the following NAICS industries:
 - 110000, 111, or 112 - Agriculture production
 - 482 - Railroads
 - 491 - U.S. Postal Service
 - 521 - Monetary authorities – central bank
 - 525 - Funds, trusts, and other financial vehicles
 - 813 - Religious, grantmaking, civic, professional, and similar organizations
 - 814 - Private households
 - 92 - Public administration
- Unclassified with legal form of organization as tax-exempt or unknown
- Establishments located in American Samoa, Northern Mariana Islands, Guam, Puerto Rico, or the U.S. Virgin Islands
- Establishments belonging to foreign entities
- Government establishments
- Establishments with zero payroll and zero employment
- Establishments identified as out of business during prior year data review
- Single-unit establishments modeled as likely to be out of business using administrative data from the most recent monthly business register data sets

Information on industry classification, receipts, payroll, and employment was extracted from the Business Register during the frame construction.

The sample is also designed to estimate demographic characteristics of the business owners. To efficiently sample for demographic characteristics, a variety of sources of information are used to estimate the likelihood that a business is a woman- or minority-owned business. Administrative sources include the Decennial Census, the American Community Survey (ACS), and the Numident file, which is the Social Security Administration's (SSA) comprehensive database of information from Social Security applications. Individual business owners are identified through IRS K-1 filings for partnerships and corporations and from the Business Register for sole proprietorships. The owners are matched to the 2000 and 2010 Decennial Censuses to get race, sex, and ethnicity data; to the 2000–19 ACS; and to the Numident file (in that order) through a Protected Identification Key. Country of birth is also identified through the linkages to the ACS or

Numident data. Each firm is then placed in one of the following eight strata for sampling: American Indian or Alaska Native, Asian, Black or African American, Hispanic, non-Hispanic White men, Native Hawaiian and Other Pacific Islander, publicly owned, and women-owned. Businesses are assigned to one and only one stratum, with priority given to the less common race or ethnicity groups.

Sample design. The ABS frame is stratified by state, expected owner race or ethnicity, and industry and is systematically sampled within each stratum. A standard type of estimation for stratified systematic sampling is used. Large companies were selected with certainty based on volume of sales, payroll, or number of paid employees. Specifically for the 2020 ABS, firms were selected with certainty based on the following criteria:

- companies in NAICS 5415 or 5417 with expected employment of fewer than 10 employees that reported at least \$500,000 in R&D expenses in a prior-year ABS, or
- firms in NAICS 5413, 31, 32, 33, 42, or 51 with expected employment of fewer than 10 employees that reported at least \$50,000 in R&D expenses in a prior-year ABS, or
- firms with more than 500 employees,
- firms larger than stratum-specific payroll and receipt cutoffs.

The certainty cutoffs vary by sampling stratum, and each stratum is sampled at varying rates, depending on the number and size of firms in a particular stratum.

The remaining frame is subjected to stratified systematic random sampling. Sampling rates vary by strata and are determined by the following calculations. Note that a systematic sample uses take rate to sample, and the sampling rate is 1/take rate.

The ABS sample consisted of 300,000 employer companies. There were 43,000 selected with certainty. The certainty portion of the sample consisted of

- 4,000 with sufficient R&D expenses in previous cycles of the ABS,
- 17,000 with 500 or more employees,
- 17,000 with payroll above the stratum cutoff, and
- 8,000 with receipts above the stratum cutoff. (Note that payroll cutoffs are applied first so cases above both cutoffs appear in payroll count.)

The remaining 254,000 noncertainty cases were selected using the systematic stratified random sample selection. The maximum sample weight was 40.

Data Collection and Processing Methods

Data collection. Prior to mailing the survey, certain businesses selected were determined to be out of scope and were not contacted. The survey was mailed to 300,000 employer companies in July 2021. Businesses were sent a letter informing them of their requirement to report. The letter also provided instructions on how to access the survey and submit online. There were three mail follow-ups conducted to increase response. Additionally, the Census Bureau conducted e-mail follow-ups to respondents who entered the electronic system but did not submit the questionnaire. The collection period closed in January 2022.

Mode. The 2021 ABS was collected using the electronic instrument.

Check-in rate. The check-in rate is defined as the unweighted number of surveys that were submitted online by in-scope companies, divided by the unweighted total number of all in-scope companies in the sample. Response to individual questions did not factor into this metric. At the close of the collection period in January 2022, there were 190,000 responses submitted (63% of the sample).

There were an additional 1,800 businesses that contacted the Census Bureau via the call center to indicate that the company was no longer in operation or had been sold for the reference year.

Companies selected to report R&D represented 37.2% of those mailed. Of the companies mailed and selected to report R&D, 76,000 companies (or 68%) submitted responses.

Unit response rate (URR). The URR is the unweighted number of responding companies for the survey. For the ABS, *response* is defined as a company providing the number of owners, number of paid owners, and number of employees; or a company responding that it ceased operations prior to 2020.

For the ABS, the URR was 68.8%. The URR for businesses eligible to report the R&D module was 73.1%

Item response rates (IRR). The 2021 ABS collected data on approximately 650 variables, and the distribution of values reported by sample companies is highly skewed. Thus, rather than report unweighted item response rates, total quantity response rates are calculated, which are based on weighted data. The survey skip patterns vary for respondents; therefore, it is not possible to know an exact denominator for item response calculations.

Total quantity response rate (TQRR). For a given published estimate other than count or ratio estimates, TQRR is the percentage of the weighted estimate based on data that were reported by units in the sample or on data that were obtained from other sources and were determined to be equivalent in quality to reported data and weighted only by sampling but not nonresponse weights. The TQRR for total sales in the United States in 2020 was 72.9%.

Total quantity nonresponse rate (TQNR). For a given published estimate, TQNR, defined as 100% minus TQRR, is calculated for each tabulation cell from the ABS, except for cells that contain count or ratio estimates. TQNR measures the combined effect of the procedures used to handle unit and item nonresponse on the weighted ABS estimate. Detailed imputation rates are available on request from the survey manager.

Data editing. Prior to tabulating the data, response data were reviewed and edited to correct reporting errors. R&D data were tabulated for records reporting \$50,000 or more in R&D expenditures.

Additionally, R&D data were only tabbed for records classified in the following NAICS industries:

- 31–33 - Manufacturing
- 42 - Wholesale trade
- 51 - Information
- 5413 - Architectural, engineering, and related services
- 5415 - Computer systems design and related services
- 5417 - Scientific research and development services

Survey analysts reviewed the R&D reported by the survey respondents. Research was done by evaluating the reported business descriptions, reported R&D-to-sales ratio, and company website information. The majority of corrections involved false-positive reports or data reported using incorrect units (such as whole dollars instead of thousands of dollars). For NAICS industries 5415 and 5417, it is difficult to differentiate R&D from other technical work based solely on company website information. Due to this difficulty and the large number of companies sampled in these industries, it was not feasible to review each case individually; thus, relatively few corrections were made for false-positive reports. Unlike years past, we were able to review all cases in these industries that had greater than \$50,000 in R&D expenses.

Additional data errors were detected and corrected through mass corrections and an automated data edit system designed to review the data for reasonableness and consistency. The editing process interactively performed corrections by using standard procedures to fix detectable errors. Quality control techniques were used to verify that operating procedures were carried out as specified.

Unit nonresponse. Unit nonresponse is handled by adjusting weighted reported data as follows. Each company's sampling weight is multiplied by a nonresponse adjustment factor. To calculate the adjustment factors, each company in the sample that is eligible for tabulation is assigned to one (and only one) adjustment cell. The adjustment cells are based on employment size and NAICS sector. For employment size, there are five categories: 1–4 employees, 5–9 employees, 10–49 employees, 50–249 employees, and 250 or more employees. For a given adjustment cell, the nonresponse adjustment factor is the ratio of the sum of the sampling weights for all companies in the cell to the sum of the sampling weights for all companies in the cell with reported data. The nonresponse adjustment factor for adjustment cell h was calculated as:

$$NAF_h = \frac{\sum_{r+nr} wgt}{\sum_r wgt}$$

where

r is the partial and complete respondents (RESP in ("CR," "PR")),

nr is the complete nonrespondents (RESP = "NR"),

wgt is the TAB_WGT value,

h is the adjustment cell (SECTOR × EMPSIZE_COLLAPSE), and

NAF_h is the nonresponse adjust factor for cell h .

For the nonresponse adjustment, a company is considered a respondent if it responded to either the R&D module, innovation module, or technology module of the survey.

Tabulation. Though as many firms as possible were identified as out of scope during sampling, additional out-of-scope firms were identified with either response or updated administrative data not available at the time of sampling. These 21,000 firms were removed for tabulations and include

- firms reporting zero employment,
- firms that responded as having gone out of business before 2020,
- nonprofit organizations,
- firms that responded as being owned by a domestic parent company, and
- firms with unclassified NAICS industry.

Industry classification. The industry classifications of firms are based on the 2017 NAICS (<https://www.census.gov/naics/>). Firms with more than one domestic establishment are assigned a single industry classification using a hierarchal system based on the largest payroll sector, largest payroll 3-digit NAICS (within the largest sector), largest payroll 4-digit NAICS (within the largest 3-digit), and largest payroll 6-digit NAICS (within the largest 4-digit). For tabulation, industry classification was based on administrative data for 2017.

Geography. Firms with establishments operating in more than one state are tabulated as unclassified geography and counted only once in state and national totals.

Variance estimation. The ABS uses the delete-a-group jackknife variance estimator. Note that certainty cases do not contribute to the sampling variance. The delete-a-group jackknife variance estimator requires that every sampling stratum contains at least two sampled firms. Sampling strata that do not meet this requirement are collapsed as needed to create a new set of variance estimation strata that satisfies this requirement.

Detailed relative standard errors are available on request from the survey manager.

Survey Quality Measures

The estimates produced from the ABS are subject to both sampling and nonsampling errors.

Sampling error. The sampling error is described above in the variance estimation section.

Coverage error. Coverage error occurs when the frame fails to completely enumerate the population of interest. There can be both *undercoverage error*, where units are not included in the frame, and *overcoverage error*, where units included in the frame are actually out of scope for the population of interest. The ABS uses the prior-year Business Register to construct the frame, so any changes in businesses that would change the inclusion or exclusion of the business to the survey scope could be sources of coverage error. Prior to tabulation, survey units' information is updated with the most recent available Business Register data to mitigate this source of error.

Measurement error. Expected sources of measurement error include differences in respondent interpretations of the definitions of R&D activities and differences in how companies count and report numbers of employees in various categories, including whether they work on R&D full time or part time. Little public information exists for most of the small businesses surveyed by the ABS, so it is difficult to determine whether companies are reporting R&D that satisfies the survey's definitions, particularly where the development of software and internet applications are concerned. Although quantitative metrics of measurement error are not available, there are ongoing efforts to minimize measurement error, including questionnaire pretesting, improvement of questionnaire wording and format, inclusion of more cues and examples in the questionnaire instructions, in-person and telephone interviews and consultations with respondents, and post-survey evaluations. The most common source of measurement error was reporting in different units (e.g., reporting whole dollars rather than thousands of dollars).

Data Comparability

Some estimates from the 2021 ABS may not be directly comparable to prior ABS results due to changes in survey methodology. Sources of possible incomparability include changes to questionnaire wording and instructions, changes to data editing and tabulation, and changes to imputation and nonresponse adjustments.

Changes in survey coverage and population. There were no changes to survey coverage and population for the 2021 ABS.

Changes to questionnaire. The survey section that collected information on R&D from businesses (section D) had nearly identical question wording and instructions for both the 2020 ABS and the 2019 ABS questionnaires. The 2021 ABS collected additional detail from businesses on the location of R&D performance and explicitly highlighted the concept of "domestic R&D performance." For the 2020 ABS, detailed questions about R&D expenditures (types of costs, funding sources, and R&D categories) were tied to domestic R&D performance (a subset of total R&D costs), whereas the 2019 ABS asked similar questions tied to total R&D costs.

The following are survey changes in the questionnaire from 2020 ABS to 2021 ABS; question numbers reference the 2021 ABS:

- A.12 question on sources of domestic sales and revenues question is new.
- Section C on research activities at nonprofit organizations replaced section on goods, services, and business processes.

- Section E on technology, operation, and innovation replaced section on domestic and foreign transactions.
- Section F on financing is new.
- Section G on management practices is new.
- Section H on R&D and the Coronavirus Pandemic is new.

Changes in reporting procedures or classification. There were no changes to reporting procedures or classification.

Changes to data editing and tabulation. For data collected in the R&D section of the ABS, every response with \$50,000 or more in R&D costs was reviewed for reasonableness. All positive R&D cases were reviewed in industries with high rates of false-positive reports. Outside of the review for potential false-positive R&D cases, the editing of R&D data was performed similarly in previous years' ABS. There have been no major changes to the edits from year to year.

Changes in imputation methods. In 2019, a change was made in how item nonresponse is treated in ABS. Item nonresponse occurs when a company responds to the survey but leaves some items blank. In 2018, item nonresponse was treated using a combination of mode and donor imputation. For 2019 and future years (including 2021), no imputation was performed to treat item nonresponse, and missing items were included as no or zero in the estimates. For most of the estimates in 2019 (91%), this change in methods did not yield a change in the estimates. For an additional 9% of estimates, there was a difference in the estimate; the difference, however, was not statistically significant. In 2021, the imputation method was updated to exclude out-of-scope firms as donors and recipients. In previous ABS years, all sampled firms were included in imputation and out-of-scope firms were later removed.

Changes in collection methods. During the 2021 ABS collection period, all initial and reminder letters were mailed to respondents using U.S. Postal Service. A paper questionnaire was not mailed to respondents during the 2021 ABS, which collected data electronically.

Definitions

- *Affiliated (company or business).* An entity that is owned 10% or more (based on voting interest or an equivalent interest) directly or indirectly by your company.
- *Business processes.* Business process includes the following: (1) methods for producing goods or providing services, (2) distribution and logistics, (3) marketing and sales, (4) information and communication systems, (5) administration and management activities, and (6) product and business process development (including activities to identify, develop, or adapt products or a firm's processes).
- *Core production activity.* This term refers to your primary business activities. For manufacturing companies, core production typically involves production of physical goods. For service companies and other companies, core production refers to the main services or activities provided by your business, such as information and communications technology services, marketing services, etc.
- *Domestic or U.S.-located.* Refers to a location in any of the U.S. 50 states and the District of Columbia.
- *Employment.* Paid employment consists of full- and part-time employees, including salaried officers and executives of corporations who were on the payroll in the pay period including March 12. Included are employees on sick leave, holidays, and vacations; not included are proprietors and partners of unincorporated businesses.
- *Ethnicity.* Based on OMB's guidance, there are two minimum categories for ethnicity: Hispanic or Latino and Not Hispanic or Latino. OMB considers race and Hispanic origin to be two separate and distinct concepts. Hispanics and Latinos may be of any race.

- *Exported goods.* Value of goods, including the value of equipment, supplies, materials, etc. This should equal the amounts reported in the Automated Export System's Electronic Export Information filed with U.S. Customs and Border Protection plus the cost of transporting the goods to customers located in foreign destinations (i.e., outside the United States).
- *Exported services.* An exported service is a service-related product (i.e., services performed, including digital service, license agreement) that is sold or transferred to, or performed for, customers (individual, government, business establishment, etc.) located in foreign destinations (i.e., outside the United States).
- *Firm.* A business organization or entity consisting of one or more domestic establishment locations under common ownership or control.
- *Foreign affiliate.* A foreign affiliate is an entity located outside the United States that is owned at least 10% (based on voting interest or an equivalent interest) directly or indirectly by the U.S. reporter.
- *Foreign parent (of a U.S.-located business).* The first entity outside the United States in an affiliate's ownership chain that has a direct or indirect investment interest of more than 50% of the affiliate's voting securities.
- *Goods.* Usually a tangible object (such as a smartphone, furniture, or packaged software) but also includes digital goods (such as downloadable software, music and film). Exclude the simple resale of new goods and changes of a solely aesthetic nature.
- *Imported goods.* The value of goods purchased from customers located in foreign destinations (i.e., outside the United States) as indicated in import declarations filed with the U.S. Customs and Border Protection.
- *Imported services.* An imported service is a service-related product (i.e., service performed, including digital service, license agreement) that is purchased from customers located in foreign destinations (i.e., outside the United States).
- *Innovation.* A business innovation is a new or improved product or business process (or combination thereof) that differs significantly from the firm's previous products or business processes and that has been introduced on the market or brought into use by the firm.
- *Intellectual property.* Includes patents, processes, and trade secrets; books and music; trademarks; recorded performances and events, such as radio and television programs and motion pictures; broadcast and recorded live performances and events and their content; general use computer software; franchise fees; and other (e.g., digital media).
- *Noise infusion.* A method of disclosure avoidance in which values are perturbed prior to tabulation by applying a random noise multiplier to the magnitude data, such as the sales and receipts for all firms. Disclosure protection is accomplished in a manner that causes the vast majority of cell values to be perturbed by, at most, a few percentage points.
- *North American Industry Classification System (NAICS).* NAICS is the standard used by federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy. This system is used by the United States, Canada, and Mexico.
- *Race.* The data on race were derived from answers to the race question. Race data are collected in accordance with the guidelines provided by OMB, and these data are based on self-identification. The racial categories included in the questionnaire generally reflect a social definition of race recognized in this country and not an attempt to define race biologically, anthropologically, or genetically. In addition, it is recognized that the categories of the race question include race and national origin or sociocultural groups. OMB requires that race data be collected for a minimum of five groups: White, Black or African American, American Indian or Alaska Native, Asian, and Native Hawaiian or Other Pacific Islander. Respondents may report more than one race.
- *Receipts.* Includes the total sales, shipments, receipts, revenue, or grants for domestic operations, excluding foreign subsidiaries.

- *Research and development (R&D)*. R&D is planned, creative work aimed at discovering new knowledge or devising new applications of available knowledge. This includes (1) activities aimed at acquiring new knowledge or understanding without specific immediate commercial applications or uses (basic research); (2) activities aimed at solving a specific problem or meeting a specific commercial objective (applied research); and (3) systematic use of research and practical experience and resulting in additional knowledge, which is directed to producing new or improved goods, services, or processes (development). R&D includes both direct costs, such as salaries of researchers, and administrative and overhead costs clearly associated with the company's R&D. However, R&D does not include expenditures for routine product testing, quality control, and technical services unless they are an integral part of an R&D project. R&D also does not include market research; efficiency surveys or management studies; literary, artistic, or historical projects, such as films, music, or books and other publications; and prospecting or exploration for natural resources.
 - *Basic research*. Activities aimed at acquiring new knowledge or understanding without specific immediate commercial applications or uses.
 - *Applied research*. Activities aimed at solving a specific problem or meeting a specific commercial objective.
 - *Development*. Systematic work, drawing on research and practical experience and resulting in additional knowledge, which is directed to producing new products or processes or to improving existing products or processes.
- R&D activity in software includes
 - software development or improvement activities that expand scientific or technological knowledge, and
 - construction of new theories and algorithms in the field of computer science.
- R&D activity in software excludes
 - software development that does not depend on a scientific or technological advance, such as
 - supporting or adapting existing systems,
 - adding functionality to existing application programs,
 - routine debugging of existing systems and software, and
 - creation of new software based on known methods and applications;
 - conversion or translation of existing software and software languages; and
 - adaptation of a product to a specific client, unless knowledge that significantly improved the base program was added in that process.
- *Services*. Intangible activities, such as retailing, insurance, educational courses, air travel, consulting, etc.; also includes digital services. (Exclude the simple resale of new services.)
- *Sex*. For the purposes of the ABS, sex refers to a person's biological sex. The sex question wording very specifically intends to capture a person's biological sex and not gender.
- *Unaffiliated (company or business)*. Entity that is owned less than 10%, directly or indirectly, by your company (i.e., independent contractors and suppliers).
- *Worldwide sales*. Worldwide and domestic sales and operating revenues, including grants.

Technical Tables

Table	Title
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A-1	Companies in the target population and selected for the sample, by industry: 2020
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A-2	Response measures: 2020
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A-3	Unit response rates, by industry: 2020
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TABLE A-1

Companies in the target population and selected for the sample, by industry: 2020

(Number of companies)

Industry	NAICS code	Companies in target population ^a	Companies selected for the sample		
			All companies	Noncertainties	Certainties
All industries	11, 21–23, 31–33, 42–81	5,434,000	300,000	254,000	45,500
Manufacturing industries	31–33	232,000	52,000	39,500	12,500
Food	311	21,500	4,900	3,700	1,300
Beverage and tobacco products	312	9,600	2,700	2,200	500
Textile, apparel, and leather products	313–16	12,000	2,800	2,200	600
Wood products	321	11,500	2,600	2,100	550
Paper	322	2,200	600	250	300
Printing and related support activities	323	21,500	4,200	3,500	700
Petroleum and coal products	324	700	150	60	100
Chemicals	325	9,000	3,400	2,300	1,100
Pesticide, fertilizer, and other agricultural chemicals	3253	650	200	150	50
Pharmaceuticals and medicines	3254	1,900	1,000	650	350
Soap, cleaning compound, and toilet preparation	3256	1,900	700	500	200
Other chemicals	other 325	4,600	1,500	950	500
Plastics and rubber products	326	8,200	2,300	1,600	650
Nonmetallic mineral products	327	8,500	2,400	1,800	600
Primary metals	331	2,800	1,100	750	350
Fabricated metal products	332	47,500	5,900	4,800	1,100
Machinery	333	18,500	3,500	2,600	900
Computer and electronic products	334	9,400	3,800	2,600	1,200
Communications equipment	3342	1,000	450	250	200
Semiconductor and other electronic components	3344	3,000	1,200	800	350
Navigational, measuring, electromedical, and control instruments	3345	3,900	1,500	1,000	550
Other computer and electronic products	other 334	1,600	650	450	200
Electrical equipment, appliances, and components	335	4,200	1,400	1,000	400
Transportation equipment	336	8,400	2,900	1,900	950
Automobiles, bodies, trailers, and parts	3361–63	5,200	1,600	1,000	550
Aerospace products and parts	3364	1,200	650	450	200
Other transportation	other 336	2,100	650	450	150
Furniture and related products	337	13,000	2,800	2,200	550
Miscellaneous	339	22,000	4,300	3,600	750
Medical equipment and supplies	3391	8,100	1,700	1,400	350
Other miscellaneous manufacturing	3399	13,500	2,600	2,200	400
Nonmanufacturing industries	11, 21–23, 42–81	5,179,000	244,000	211,000	32,500
Agriculture, forestry, fishing, and hunting	11	25,500	950	850	100
Mining, extraction, and support activities	21	17,500	2,800	2,200	650
Utilities	22	3,400	1,300	900	400
Construction	23	699,000	22,500	21,000	1,600
Wholesale trade	42	272,000	17,500	14,500	3,200
Retail trade	44–45	600,000	21,500	19,000	2,300
Transportation and warehousing	48–49	183,000	13,500	11,000	2,200
Information	51	73,500	16,000	12,000	4,100
Publishing	511	20,000	5,100	3,800	1,400

TABLE A-1

Companies in the target population and selected for the sample, by industry: 2020

(Number of companies)

Industry	NAICS code	Companies in target population ^a	Companies selected for the sample		
			All companies	Noncertainties	Certainties
Newspaper, periodical, book, and directory publishers	5111	9,700	2,300	2,000	350
Software publishers	5112	10,000	2,800	1,800	1,000
Telecommunications	517	10,500	2,800	2,100	700
Data processing, hosting, and related services	518	9,200	3,000	2,100	900
Other information	other 51	34,000	5,300	4,100	1,200
Finance and insurance	52	225,000	8,000	6,700	1,300
Real estate and rental and leasing	53	313,000	10,500	9,900	400
Lessors of nonfinancial intangible assets (except copyrighted works)	533	2,200	70	60	D
Other real estate and rental and leasing	other 53	310,000	10,500	9,900	400
Professional, scientific, and technical services	54	782,000	57,000	47,500	9,100
Legal services	5411	165,000	7,700	6,800	850
Accounting, tax preparation, bookkeeping, and payroll services	5412	110,000	5,000	4,500	450
Architectural, engineering, and related services	5413	90,000	11,000	8,800	2,000
Specialized design services	5414	32,000	1,400	1,300	50
Computer systems design and related services	5415	112,000	9,400	7,500	2,000
Management, scientific, and technical consulting services	5416	164,000	8,000	7,000	1,100
Scientific research and development services	5417	13,000	5,700	4,100	1,600
Advertising, public relations, and related services	5418	31,500	5,800	4,900	950
Other professional, scientific, and technical services	5419	64,000	3,000	2,700	250
Management of companies and enterprises	55	3,500	150	100	30
Administrative and support and waste management and remediation services	56	332,000	13,000	10,500	2,500
Educational services	61	66,500	2,400	2,200	200
Health care and social assistance	62	577,000	21,000	19,000	2,000
Health care services	621-23	492,000	17,500	16,000	1,700
Social assistance	624	84,500	3,100	2,800	250
Arts, entertainment, and recreation	71	107,000	3,800	3,400	400
Accommodation and food services	72	517,000	19,500	17,500	2,000
Other services	81	382,000	12,500	12,500	200
Unclassified	00	22,000	4,500	4,200	400

D = suppressed to ensure confidentiality of individual companies.

NAICS = 2017 North American Industry Classification System.

^a Estimates of the number of companies in the target population are based on the original sampling frame that was created to select the 2021 Annual Business Survey.**Note(s):**

Certainties were companies with a probability of selection of 1 because they had previously reported R&D costs, 500 or more employees, or high payroll or receipts defined by stratum specific cutoffs. Noncertainties are companies with a probability of selection of less than 1.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, 2021 Annual Business Survey: Data Year 2020.

TABLE A-2

Response measures: 2020

(Percent)

Measure	2020
Check-in rate ^a	63.5
Response rate (unweighted) ^b	68.8

^a The number of survey responses from sampled companies divided by the total number of companies in the sample. This includes companies that contacted the Census Bureau to indicate they were out of business and companies that were later determined to be inactive or otherwise out of scope for tabulations.

^b The number of active and in-scope companies responding to the number of owners and number of W2 employees, divided by the total number of in-scope and active companies in the sample.

Source(s):

National Center for Science and Engineering Statistics and U.S. Census Bureau, 2021 Annual Business Survey: Data Year 2020.

TABLE A-3

Unit response rates, by industry: 2020

(Number and percent)

Industry	NAICS code	In-scope units (number) ^a	Reporting units that met the response criteria (%) ^b
All industries	11, 21–23, 31–33, 42–81	266,000	69
Manufacturing industries	31–33	47,000	70
Food	311	4,500	67
Beverage and tobacco products	312	2,400	75
Textile, apparel, and leather products	313–16	2,500	64
Wood products	321	2,300	70
Paper	322	500	70
Printing and related support activities	323	3,800	71
Petroleum and coal products	324	150	60
Chemicals	325	3,000	70
Pesticide, fertilizer, and other agricultural chemicals	3253	150	67
Pharmaceuticals and medicines	3254	900	67
Soap, cleaning compound, and toilet preparation	3256	600	67
Other chemicals	other 325	1,300	73
Plastics and rubber products	326	2,100	71
Nonmetallic mineral products	327	2,200	68
Primary metals	331	950	68
Fabricated metal products	332	5,500	73
Machinery	333	3,200	72
Computer and electronic products	334	3,400	74
Communications equipment	3342	400	75
Semiconductor and other electronic components	3344	1,000	75
Navigational, measuring, electromedical, and control instruments	3345	1,400	79
Other computer and electronic products	other 334	550	73
Electrical equipment, appliances, and components	335	1,300	73
Transportation equipment	336	2,600	69
Automobiles, bodies, trailers, and parts	3361–63	1,400	71
Aerospace products and parts	3364	600	67
Other transportation	other 336	550	64
Furniture and related products	337	2,600	69
Miscellaneous	339	4,000	70
Medical equipment and supplies	3391	1,500	73
Other miscellaneous manufacturing	3399	2,400	71
Nonmanufacturing industries	11, 21–23, 42–81	219,000	68
Agriculture, forestry, fishing, and hunting	11	750	73
Mining, extraction, and support activities	21	2,400	71
Utilities	22	1,000	75
Construction	23	20,500	66
Wholesale trade	42	16,000	72
Retail trade	44–45	20,000	63
Transportation and warehousing	48–49	11,500	66
Information	51	14,000	69
Publishing	511	4,500	71
Newspaper, periodical, book, and directory publishers	5111	2,100	71
Software publishers	5112	2,400	71
Telecommunications	517	2,500	56

TABLE A-3

Unit response rates, by industry: 2020

(Number and percent)

Industry	NAICS code	In-scope units (number) ^a	Reporting units that met the response criteria (%) ^b
Data processing, hosting, and related services	518	2,600	73
Other information	other 51	4,400	73
Finance and insurance	52	7,100	73
Real estate and rental and leasing	53	9,000	68
Lessors of nonfinancial intangible assets (except copyrighted works)	533	60	67
Other real estate and rental and leasing	other 53	9,000	67
Professional, scientific, and technical services	54	51,500	77
Legal services	5411	7,200	79
Accounting, tax preparation, bookkeeping, and payroll services	5412	4,500	80
Architectural, engineering, and related services	5413	9,800	82
Specialized design services	5414	1,200	83
Computer systems design and related services	5415	8,500	74
Management, scientific, and technical consulting services	5416	7,200	74
Scientific research and development services	5417	5,000	72
Advertising, public relations, and related services	5418	5,200	73
Other professional, scientific, and technical services	5419	2,700	74
Management of companies and enterprises	55	100	70
Administrative and support and waste management and remediation services	56	11,500	66
Educational services	61	2,000	70
Health care and social assistance	62	19,000	71
Health care services	621–23	16,500	70
Social assistance	624	2,700	63
Arts, entertainment, and recreation	71	3,200	69
Accommodation and food services	72	17,500	55
Other services	81	11,500	63

NAICS = 2017 North American Industry Classification System.

^a In-scope units are determined using response data and final frame data after all data have been processed.^b Reporting units were considered to have fulfilled the response criteria if they provided the number of owners and number of W-2 employees.**Source(s):**

National Center for Science and Engineering Statistics and Census Bureau, 2021 Annual Business Survey: Data Year 2020.

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Contact Us

Report Author

Audrey E. Kindlon
Survey Manager
NCSES
Tel: (703) 292-2332
E-mail: akindlon@nsf.gov

NCSES

National Center for Science and Engineering Statistics
Directorate for Social, Behavioral and Economic Sciences
National Science Foundation
2415 Eisenhower Avenue, Suite W14200
Alexandria, VA 22314
Tel: (703) 292-8780
FIRS: (800) 877-8339
TDD: (800) 281-8749
E-mail: ncsesweb@nsf.gov