



National Center for Science and
Engineering Statistics

InfoBrief

Microbusinesses Performed \$5.6 Billion of R&D in the United States in 2020

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This InfoBrief presents research and development (R&D) and other data on *microbusinesses*, defined here as businesses with one to nine domestic employees.¹ In 2020, microbusinesses reported \$6.7 billion in R&D expenditures or costs in the United States ([table 1](#)), \$5.6 billion of which was performed by the microbusinesses themselves. R&D costs include the amount that businesses spent of their own money and from other sources on R&D they perform, as well as the amount they paid others to perform R&D. This InfoBrief makes a distinction between all R&D costs and R&D performance costs, which are the costs only for R&D performed by the business.

Data for this InfoBrief are from the Annual Business Survey (ABS), developed and cosponsored by the National Center for Science and Engineering Statistics (NCSES) within the National Science Foundation (NSF) and by the Census Bureau. The ABS is the primary source of information on R&D expenditures by microbusinesses. Additionally, the ABS collects data related to innovation, intellectual property, technology, and business owner characteristics from both microbusinesses and companies with 10 or more employees. This InfoBrief reviews both the R&D totals for the microbusiness population and specifics for selected industries.

The ABS is a single survey that combines efforts that have historically been multiple separate business surveys: the Survey of Business Owners, the Annual Survey of Entrepreneurs, the 2016 Business R&D and Innovation Survey–Microbusiness (BRDI-M), and an innovation survey modeled on Eurostat’s Community Innovation Survey. This InfoBrief and the related full set of detailed statistical tables result from the 4th year of a 5-year collaboration between NCSES and the Census Bureau on the ABS.

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

(Thousands of U.S. dollars)

Company information and questionnaire reference	All companies	1–4 employees	5–9 employees
Companies (number)	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 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 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):

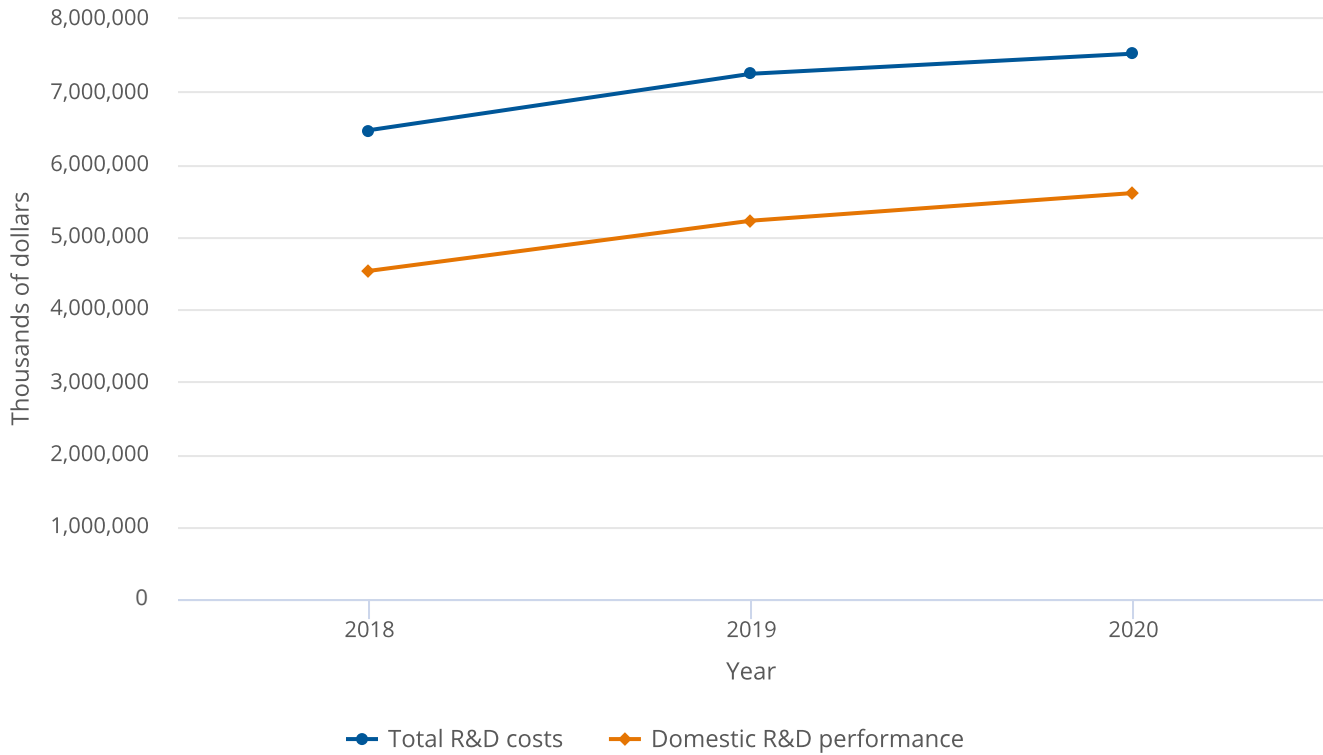
National Center for Science and Engineering Statistics and Census Bureau, 2021 Annual Business Survey: Data Year 2020.

Microbusiness R&D Trend

In 2020, total R&D costs were \$7.5 billion, up from \$7.2 billion in 2019 and \$6.5 billion in 2018. Domestic R&D performance was \$5.6 billion in 2020, compared with \$4.5 billion in 2018—an increase of 24% over the 2-year period. (See [figure 1](#).)

Figure 1

Total R&D costs and domestic R&D performance for companies with 1–9 employees: 2018, 2019, and 2020



Note(s):

Statistics are representative of companies located in the United States that performed or funded R&D.

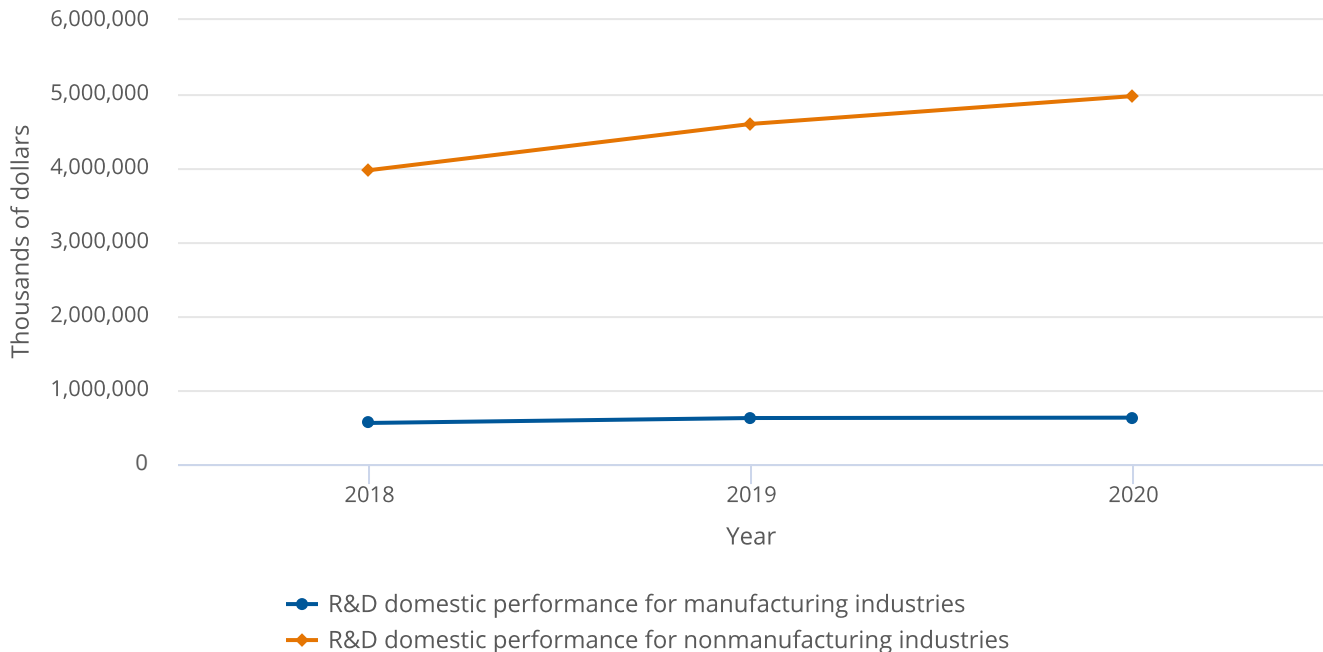
Source(s):

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

The R&D performance costs for manufacturing industries over 2018–20 increased by 13%, while nonmanufacturing industries increased by 25% (figure 2).

Figure 2

Domestic R&D performance for companies with 1–9 employees: 2018, 2019, and 2020



Note(s):

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.

R&D by Type of Costs

In 2020, 52% of microbusiness domestic R&D costs (which include performance and non-performance expenditures) were for salaries, wages, and benefits. Outsourced R&D—payments to others for R&D, including purchasing R&D services—was 17% of total domestic R&D costs. An additional 16% of microbusiness domestic R&D costs was for such other expenses as consultants, contractors, travel, or rent. Another 10% was spent on materials and supplies, 4% on machinery and equipment, and 1% on depreciation on R&D property and equipment (table 2).

Table 2

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 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

Table 2**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 benefits	Expensed machinery and equipment	Materials and supplies	Payments to others for R&D	Depreciation on R&D property and equipment	All other costs
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 2**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 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 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.

The composition of R&D costs varies across industries. Microbusinesses in the information sector, including software publishers (North American Industry Classification System [NAICS] 51), spent 81% of their domestic R&D expenses on salaries, wages, and benefits and expended 4% on payments to others for R&D. Scientific research and development services (NAICS 5417) spent 38% of their R&D dollars on salaries, wages, and benefits and expended 27% on payments to others for R&D.

Characteristics of Microbusiness R&D Performance

By Industry

As was the case in previous ABS surveys, microbusiness R&D is highly concentrated within a few industries.² In 2020, R&D costs by microbusinesses in the United States were approximately \$6.7 billion (table 1), of which \$1.1 billion was for outsourced R&D and the remaining \$5.6 billion (or 83%) was R&D performed by the microbusinesses themselves. Of this \$5.6 billion in microbusiness R&D performance, selected nonmanufacturing industries accounted for \$5.0 billion (table 3). Over two-thirds (69%) of all microbusiness R&D performance was done by microbusinesses classified by the following three R&D intensive industries: architectural, engineering, and related services (NAICS 5413); computer systems design and related services (NAICS 5415); and scientific research and development services (NAICS 5417).

Table 3

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

Table 3**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
Other transportation equipment	other 336	18,940 r	15,831 r	0	0	0	0	0	3,109 r	0	0
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 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.

By Source of Funds

In 2020, three-fourths (76%) of microbusiness R&D performance was paid from the companies' own funds; 16% was from federal, state, or local governments combined; 4% came from another U.S. company; and 3% was from a foreign owner (table 3). Manufacturing microbusinesses funded more than three-fourths (79%) of their own R&D performance, and selected nonmanufacturing microbusinesses funded three-fourths (75%) of their own R&D performance. There were few differences across industries. In the scientific research and development services industry (NAICS 5417), 70% of microbusiness R&D performance was self-funded and 22% was funded by federal, state, or local governments combined. In 2020, 53% of all government funding went to the scientific research and development services industry compared to 74% of all government funding in 2019.³

By Type of R&D

There are three types of R&D: basic research, applied research, and experimental development.⁴ In 2020, just over half (53%) of microbusiness R&D performance was development or experimental development, while 41% was applied research and 6% was basic research (table 4). The allocation of R&D across the three types was similar between microbusinesses in manufacturing and nonmanufacturing industries.

Table 4

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

Table 4**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
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
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	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 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.

By State

Five states (California, New York, Massachusetts, Michigan, and Washington) accounted for 51% of all microbusiness R&D in 2020 ([table 5](#)). California led all states in microbusiness R&D activity, accounting for 31% (\$1.8 billion) of U.S. microbusiness R&D performance. This was followed by New York with 6% (\$342 million) of U.S. microbusiness R&D performance and Massachusetts with 5% (\$265 million).

Table 5**Domestic R&D performed by the company, by state and employment size, for companies with 1–9 employees in selected industries: 2020**

(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

Table 5**Domestic R&D performed by the company, by state and employment size, for companies with 1–9 employees in selected industries: 2020**

(Thousands of U.S. dollars)

State	All companies		1–4 employees		5–9 employees	
	Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount
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 r	8,501	19	3,329	59 r	5,171
Maine	62	6,144	29 r	3,037	32 r	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 r
Minnesota	285	132,367 r	222	70,290	64	62,077 r
Mississippi	14	2,181	11	1,802	2	379
Missouri	157	28,945	89 r	10,672	67	18,273
Montana	60	14,946	36	9,597	23	5,350 r
Nebraska	85 r	12,366 r	69 r	7,256 r	16	5,109
Nevada	124	29,501	85	19,413	38	10,088
New Hampshire	109 r	33,704	76 r	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 r
New York	880	342,484	539	88,843	340	253,641 r
North Carolina	368	104,465	193	31,689	175	72,776
North Dakota	14	5,470	8	947	8	4,523 r
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 r	27	6,737 r	7 r	1,865 r
South Carolina	82	20,519	68	12,421	15	8,098
South Dakota	24 r	68,641 r	10 r	643 r	13 r	67,997 r
Tennessee	177	34,312	114 r	14,797 r	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 r	6,459 r	12	5,035 r
Virginia	426	126,325	272	49,646	153	76,679
Washington	560	220,878	303	115,606	258	105,272
West Virginia	28 r	8,575 r	26 r	8,468 r	2 r	107 r
Wisconsin	195	48,893	158	31,005	38	17,888
Wyoming	44 r	23,734 r	20	1,738	25 r	21,996 r
Undistributed	85 r	51,835 r	19	6,093 r	68 r	45,742 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. 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.

Total Employment and R&D Employees

There were just over 39,000 domestic R&D employees (79% male, 21% female) working for microbusinesses in 2020 ([table 6](#)), and 88% of those domestic R&D employees were in the selected nonmanufacturing microbusinesses. Among all domestic R&D employees, the greatest percentages worked in the scientific research and development services industry (NAICS 5417) and in the computer systems design and related services industry (NAICS 5415), 28% and 26%, respectively.

R&D employee occupations included researchers (e.g., R&D scientists, engineers, and their managers), R&D technicians and equivalent staff, and R&D support staff (clerical and other). Among domestic R&D employees in 2020, 69% were researchers and among these approximately 27,000 researchers, 29% have PhDs. Almost 9,000 or 23% of domestic R&D employees were R&D technicians, and the remaining 3,000 or 8% were R&D support staff.

Table 6**Number of domestic R&D employees, by selected industry and sex, for companies with 1–9 employees: 2020**

(Number)

Industry	NAICS code	Total	Male	Female	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	30,961	8,126	27,029	8,877	3,181
Manufacturing industries	31–33	4,776	3,956	820	3,337	1,047	392
Food, beverage, and tobacco products	311–12	103	92	11	99	1	3
Textile, apparel, and leather products	313–16	8	3	5	5	3	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	1,177	845	332	732	316	129
Pharmaceuticals and medicines	3254	361	239	122	223	114	24
Chemicals, excluding pharmaceuticals	other 325	816	606	210	509	202	105
Plastics and rubber products	326	133	118	16	83	42	8
Nonmetallic mineral products	327	3	1	1	0	1	1
Primary metals	331	30	27	3	27	0	3
Fabricated metal products	332	298	260	38	226	32	40
Machinery	333	499	451	48	398	67	35
Computer and electronic products	334	1,658	1,425	233	1,181	379	98
Semiconductor and other electronic components	3344	332	303	29	226	93	12
Navigational, measuring, electromedical, and control instruments	3345	1,066	879	186	778	226	61
Other computer and electronic products	other 334	260	243	18	177	59	24
Electrical equipment, appliances, and components	335	225	210	15	172	34	19
Transportation equipment	336	262	245	17	116	108	38
Aerospace products and parts	3364	152	140	13	80	56	17
Other transportation equipment	other 336	110	105	4	36	52	22
Furniture and related products	337	3	3	0	0	1	1

Table 6**Number of domestic R&D employees, by selected industry and sex, for companies with 1–9 employees: 2020**

(Number)

Industry	NAICS code	Total	Male	Female	Researchers (including R&D scientists, engineers, and their managers)	R&D technicians and equivalent staff	R&D support staff (clerical and other)
Miscellaneous manufacturing	339	375	275	101	297	63	16
Selected nonmanufacturing industries	42, 51, 5413, 5415, 5417	34,311	27,005	7,306	23,692	7,830	2,790
Wholesale trade	42	1,928	1,497	431	r 1,314	315	299
Information	51	6,767	5,540	1,227	4,659	1,546	563
Software publishers	5112	4,644	3,761	883	3,202	1,021	422
Information, excluding software publishers	51 less 5112	2,123	1,779	344	1,457	525	141
Architectural, engineering, and related services	5413	4,422	3,647	775	2,966	1,077	379
Computer systems design and related services	5415	10,277	8,653	1,624	6,496	2,969	812
Scientific research and development services	5417	10,917	7,669	3,248	8,257	1,923	737
Research and development in nanotechnology	541713	1,145	891	254	869	203	73
Research and development in biotechnology (except nanobiotechnology)	541714	3,541	2,169	1,372	2,597	669	275
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	6,131	4,543	1,588	4,729	1,023	379
Social sciences and humanities research and development	541720	100	66	35	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 or unavailable NAICS detail for select records beyond the 4-digit industry classification. 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.

Survey Information and Data Availability

In this InfoBrief, R&D costs and performance are expressed in current U.S. dollars and are not adjusted for inflation. For ABS, a microbusiness is defined as a business organization located in the United States, either U.S.-owned or a U.S. affiliate of a foreign parent company, of one or more establishments under common ownership or control, with one to nine domestic employees.

The survey was administered to companies whether or not they were known to have R&D activity. ABS collected detailed statistics from microbusinesses located in the United States on R&D expenditures, R&D employees, intellectual property, company and primary owner characteristics, and innovation activities.

Only microbusinesses (those businesses with one to nine employees) are asked the R&D questions, and only those microbusinesses are presented in this InfoBrief.

The statistics from the survey are based on a sample; as such, they are subject to both sampling and nonsampling errors (see “Technical Notes” in the data tables reports at <https://www.nsf.gov/statistics/srvyabs/>). Microbusinesses with less than \$50,000 in R&D are excluded from the ABS national estimates and this InfoBrief.

For the full 2021 ABS, 300,000 companies were sampled to represent the population of 4.9 million companies. For the full 2021 ABS, the unit response rate was 68.8%.

The full set of data tables on R&D, company demographics, innovation, technology, and patent and intellectual property protection from this survey will be available in the report *Annual Business Survey: 2021 (Data Year 2020)* (<https://www.nsf.gov/statistics/srvyabs/>). Individual data tables and tables with relative standard errors and imputation rates from the ABS 2021 are available in advance of the full report.

Notes

- 1 Employees are individuals who worked for the business and received a W-2 issued by the business for salary or wages.
- 2 R&D questions were asked only of manufacturers and certain selected nonmanufacturing industries that in previous NCSES surveys (2017 ABS, BRDI-M, and Business R&D Innovation Survey) represented almost all R&D of microbusinesses in the United States.
- 3 Kindlon A; National Center for Science and Engineering Statistics (NCSES). 2022. *Microbusinesses Performed \$5.2 billion of R&D in the U.S. in 2019*. NSF 22-333. Alexandria, VA: National Science Foundation. Available at <https://nces.nsf.gov/pubs/nsf22333>.
- 4 As defined by the Frascati Manual (7th ed., OECD 2015) basic research is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts, without any particular application or use in view. Applied research is original investigation undertaken in order to acquire new knowledge. It is, however, directed primarily towards a specific, practical aim or objective. Experimental development is systematic work, drawing on knowledge gained from research and practical experience and producing additional knowledge, which is directed to producing new products or processes or to improving existing products or processes. See Organisation for Economic Co-operation and Development (OECD). 2015. *Frascati Manual: Guidelines for Collecting and Reporting Data on Research and Experimental Development*. The Measurement of Scientific, Technological and Innovation Activities. Paris: OECD Publishing.

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