



National Center for Science and
Engineering Statistics

Data Tables Report

Business Enterprise Research and Development: 2024

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General Notes

The Business Enterprise Research and Development (BERD) Survey is the primary source of information on domestic and global research and development (R&D) expenditures and the R&D workforce for companies operating in the 50 U.S. states and the District of Columbia. The survey is conducted annually by the Census Bureau in accordance with an interagency agreement with the National Center for Science and Engineering Statistics (NCSES) within the U.S. National Science Foundation. NCSES has cosponsored an annual business R&D survey since 1953. The Survey of Industrial Research and Development (SIRD) collected data for 1953–2007, and its successor, the Business R&D and Innovation Survey (BRDIS), collected data for 2008–16. Beginning with 2017, the collection of innovation data was moved to the Annual Business Survey, another survey cosponsored with the Census Bureau, and the 2017 and 2018 business R&D data collections reported in this report series were renamed the Business Research and Development Survey (BRDS). Beginning with the data collection for 2019, the survey was renamed to the BERD Survey for international comparability. BERD Survey [questionnaires](#), [reports](#), and [data](#) can be found at <https://ncses.nsf.gov/surveys/business-enterprise-research-development/>.

The results of the survey are used to assess trends in the performance and funding of R&D. Government agencies, corporations, and research organizations use the data to investigate productivity, formulate tax policy, and compare individual company performance with industry averages. Individual researchers in industry and academia use the data to investigate a variety of topics and to prepare professional papers, dissertations, and books. Total R&D expenditure statistics are used by the Bureau of Economic Analysis for inclusion in its System of National Accounts and Foreign Direct Investment programs.

Further, statistics from the BERD Survey make it possible to evaluate more fully the status of R&D in the United States and to compare the R&D activities of the United States with those of other nations. The usefulness of the information collected in this survey is enhanced by linking it to the Census Bureau's Longitudinal Establishment and Enterprise Microdata file, which contains information on the outputs and inputs of companies' manufacturing plants. Response to this survey is mandatory and confidential under Title 13 of the U.S. Code.

For the BERD Survey, data are collected from a probability sample of for-profit companies, which are classified in select manufacturing and nonmanufacturing industries. The BERD Survey is administered both to companies known to have performed R&D and to companies with no known history of R&D activity. The survey is sent to a single coordinator within each company, but it is organized into sections that help the coordinator collect specific types of information from different experts in the company (human resources, accounting, R&D managers, etc.). Foreign-owned companies are instructed to report only for company operations owned by the U.S. subsidiary and, for purposes of the survey, to treat the foreign owners as if they were unrelated third parties.

The target population for the BERD Survey consists of for-profit, publicly or privately held, nonfarm companies that have 10 or more paid employees in the United States, that have at least one establishment located in the United States in business during the survey year, and that are classified in certain industries based on the 2017 North American Industry Classification System (NAICS), with a particular focus on those companies that perform R&D in the United States. A company is defined as one or more establishments under common domestic ownership or control.

The Census Bureau's Business Register contains information on more than 8.7 million establishments with paid employees. It serves as the primary input to the sampling frame from which the sample is selected. For companies with more than one establishment, data are summed to the company level to assign an industry classification code and a measure of size, which are used in designing the sample. Companies are excluded from the frame if they are classified in an industry that is outside the scope of the BERD Survey or if they have fewer than 10 employees, based on their prior year aggregated annual payroll and employment data.

In addition to single-year tables for 2024 ([table 1](#) through [table 56](#), and [table 65](#) through [table 72](#)), the 2024 BERD Survey data includes tables containing statistics for multiple years ([table 57](#) through [table 64](#)). In these tables, most prior year statistics have been revised since they were originally published. Revised statistics include adjustments based on information obtained after the original statistics were prepared. For any given year, after the tables are published, the statistical file used to produce the tables stays open for about 1 year before it is permanently closed. During that year, respondents may provide updated data; also, information from other Census Bureau surveys or publicly available sources may become available. The new data and information are evaluated and tested; if appropriate, revisions are made to the statistical file. The multiyear tables in this report were prepared using the statistical files for the 2024 BERD Survey, the revised 2023 BERD Survey, and the revised BRDIS and BRDS statistical files for 2008–22.

Disclosure avoidance for survey years 2017–21 was handled differently than it had been in prior years' tables. Cell suppression is a disclosure avoidance technique that protects the confidentiality of individual survey units by withholding cell values from release and replacing the cell value with a data code. This technique was used in SIRD, BRDIS, and BRDS tables; data in affected cells were replaced with a "D." For most of the tables in survey years 2017–21, disclosure avoidance was accomplished by replacing cells with an estimate range. Confidentiality was maintained while the usefulness of the statistics was enhanced because most of the completely suppressed cells in past years' tables have been eliminated. For cases where confidentiality cannot be maintained even with the new estimate range technique, a "D" was substituted. Beginning in survey year 2022, estimate ranges were discontinued and all suppressed values were published with a "D."

Terms used in business accounting and incorporated throughout the tables are defined in the Technical Notes available at <https://nces.nsf.gov/surveys/business-enterprise-research-development/2024#methodology>. The information and statistics in this report supersede information and statistics in previously published reports.

NCSES has reviewed this product for unauthorized disclosure of confidential information and approved its release (NCSES-DRN26-042).

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Table 1. Business Enterprise Research and Development Survey aggregate estimates, by questionnaire reference: 2024

(Millions of U.S. dollars and thousands of employees)

Question	Survey item	Aggregate amount
Millions of U.S. dollars		
Company and financial information		
1.12	Worldwide net sales and operating revenues	19,503,626
1.13	Net sales and operating revenues from domestic operations	15,135,435
R&D paid for by the company and performed by the company and others		
2.1	Worldwide R&D paid for by the company (expense), total	965,311
2.3	Worldwide R&D paid for by the company (expense), adjustments	75,309
2.4/ 2.7c	Worldwide R&D paid for by the company and performed by the company and others	890,002
2.7a	Domestic R&D paid for by the company and performed by the company and others	728,519
2.7b	Foreign R&D paid for by the company and performed by the company and others	161,483
2.5	Indirect R&D charges to be recouped from the U.S. federal government (independent R&D [IR&D]) ^a	6,908
2.8m(1)	Domestic R&D paid for by the company and performed by the company and others	728,519
2.8a(1)	Salaries, wages, and fringe benefits	358,050
2.8b(1)	Stock-based compensation	91,483
2.8c(1)	Leased or temporary staffing, including on-site contractors, working on R&D	27,961
2.8d(1)	Expensed equipment (not capitalized)	11,828
2.8e(1)	Materials and supplies	37,867
2.8f(1)	Leased facilities and equipment	11,808
2.8g(1)	Depreciation and amortization on R&D property, plant, equipment, and intangible assets	29,313
2.8h(1)	Royalties and licensing fees	3,924
2.8i(1)	Collaborative R&D payments	7,160
2.8j(1)	Contract R&D	41,988
2.8k(1)	Other purchased services	25,386
2.8l(1)	All other costs	81,752
2.9(3)	Worldwide R&D paid for by the company and performed by others	60,433
2.9(1)	Domestic R&D paid for by the company and performed by others	49,148
2.9(2)	Foreign R&D paid for by the company and performed by others	11,285
2.10(3)	Worldwide R&D paid for and performed by the company	829,569
2.10(1)	Domestic R&D paid for and performed by the company	679,371
2.10(2)	Foreign R&D paid for and performed by the company	150,198
2.9(3) + 2.10(3) + 3.4(3) + 3.5(3)	Worldwide R&D paid for by the company and others and performed by the company and others	1,001,685
2.10(3) + 3.5(3)	Worldwide R&D paid for by the company and others and performed by the company	929,809
2.9(1) + 2.10(1) + 3.4(1) + 3.5(1)	Domestic R&D paid for by the company and others and performed by the company and others	824,765
2.10(1) + 3.5(1)	Domestic R&D paid for by the company and others and performed by the company	765,082
Domestic R&D paid for and performed by the company		
2.14	Performed at largest domestic location	384,400
2.16	Performed at second-largest domestic location	57,805
2.18	Domestic R&D paid for by foreign operations or subsidiaries and performed by the company ^a	39,057
2.19	Foreign R&D paid for by domestic operations or subsidiaries and performed by the company ^a	30,463
Projected worldwide R&D expense paid for and performed by the company in 2025		
2.20(3)	Worldwide R&D to be paid for and performed by the company	971,546
2.20(1)	Domestic R&D to be paid for and performed by the company	805,512
2.20(2)	Foreign R&D to be paid for and performed by the company	166,035
2.21	Projected R&D services and projected payments for collaborative R&D	59,373
3.1j/ 3.2c	Worldwide R&D paid for by others and performed by the company and others	111,682
3.1a	R&D reimbursed by the company's foreign parent or owner	24,752
3.1b	Collaborative R&D reimbursed by business partners	9,800
3.1c	R&D paid for by grants (government or private foundation)	4,847
3.1d	Defense R&D goods or services provided as a prime contractor or subcontractor to the federal government and/ or government contractors	29,137

Table 1. Business Enterprise Research and Development Survey aggregate estimates, by questionnaire reference: 2024

(Millions of U.S. dollars and thousands of employees)

Question	Survey item	Aggregate amount	
3.1e	Medical clinical trial Phase I–III services provided to others not owned by the company	30,676	i
3.1f	Medical R&D services, other than clinical trials, provided to others not owned by the company	5,257	
3.1g	Nondefense custom software development or computer systems designed for others not owned by the company	449	
3.1h	Prototype development, production, and testing for customer's products	769	
3.1i	All other R&D services provided to the federal government or to others not owned by the company	5,996	i
3.2c/ 3.1j	Worldwide R&D paid for by others and performed by the company and others	111,682	
3.2a	Domestic R&D paid for by others and performed by the company and others	96,246	
3.2b	Foreign R&D paid for by others and performed by the company and others	15,436	
3.3m(1)	Domestic R&D paid for by others and performed by the company and others	96,246	
3.3a(1)	Salaries, wages, and fringe benefits	47,712	
3.3b(1)	Stock-based compensation	2,023	
3.3c(1)	Leased or temporary staffing, including on-site contractors	2,046	
3.3d(1)	Expensed equipment (not capitalized)	751	i
3.3e(1)	Materials and supplies	9,384	i
3.3f(1)	Leased facilities and equipment rental payments	1,211	
3.3g(1)	Depreciation and amortization on R&D property, plant, equipment, and intangible assets	2,608	
3.3h(1)	Royalties and licensing fees	438	
3.3i(1)	Collaborative R&D payments	1,385	i
3.3j(1)	Contract R&D	9,151	
3.3k(1)	Other purchased services	4,813	i
3.3l(1)	All other costs	14,725	i
3.4(3)	Worldwide R&D paid for and performed by others	11,442	
3.4(1)	Domestic R&D paid for and performed by others	10,535	
3.4(2)	Foreign R&D paid for and performed by others	907	
3.5(3)	Worldwide R&D paid for by others and performed by the company	100,240	
3.5(1)	Domestic R&D paid for by others and performed by the company	85,711	
3.5(2)	Foreign R&D paid for by others and performed by the company	14,529	
3.8a	Other companies in the United States	27,442	
3.8b	Your company's foreign parent or owner	23,767	
3.8c	Other companies outside the United States	2,519	
3.8d/ 3.11j/ 3.12c	U.S. federal government agencies or laboratories	30,995	
3.8e	U.S. state and local government agencies or laboratories	153	
3.8f	Foreign government agencies or laboratories	171	
3.8g	U.S. universities, colleges, and academic researchers	47	
3.8h	Universities, colleges, and academic researchers outside the United States	7	r
3.8i	All other organizations in the United States	554	
3.8j	All other organizations outside the United States	56	i
3.8d	Federally funded R&D performed by the company	30,995	
3.9/ 3.8a + 3.8b + 3.8c	Domestic R&D paid for by other companies and performed by the company	53,727	
Domestic R&D paid for by others and performed by the company			
3.10/ 3.8k - 3.8d	Domestic R&D paid for by nonfederal sources and performed by the company	54,716	
3.13	Performed at largest domestic location	39,596	
3.15	Performed at second-largest domestic location	6,595	
3.16	Domestic R&D paid for by U.S. federal government agencies or laboratories and performed by others	2,385	
Projected R&D to be paid for by others and performed by the company in 2025			
3.17	Worldwide R&D to be paid for by others and performed by the company	117,337	i
3.18	Domestic R&D to be paid for by others and performed by the company	92,811	i
3.19	Domestic R&D to be paid for by the U.S. federal government and performed by the company	33,888	i
4.1d	Total value of assets owned or leased	14,973,468	
4.1a	Property, plant, and equipment	7,339,111	
4.1b	Goodwill	4,774,062	

Table 1. Business Enterprise Research and Development Survey aggregate estimates, by questionnaire reference: 2024

(Millions of U.S. dollars and thousands of employees)

Question	Survey item	Aggregate amount	
4.1c	Identifiable intangible assets	2,860,295	
4.2c	Worldwide expenditures for capitalized assets	1,349,873	
4.2a	Property, plant, and equipment	1,224,642	
4.2b	Identifiable intangible assets	125,231	
4.3c(1)	Domestic expenditures for capitalized assets	1,107,042	
4.3a(1)	Property, plant, and equipment	998,703	
4.3b(1)	Identifiable intangible assets	108,339	
4.3c(2)	Foreign expenditures for capitalized assets	242,831	
4.3a(2)	Property, plant, and equipment	225,939	
4.3b(2)	Identifiable intangible assets	16,892	i
4.4c/ 4.5g	Domestic capital expenditures for R&D	44,908	
4.4a	Property, plant, and equipment	38,950	
4.4b	Identifiable intangible assets	5,958	
4.5a	Land acquisition	109	
4.5b	Buildings and land improvement	5,743	
4.5c	Machinery and equipment	27,488	
4.5d	Capitalized software	4,153	
4.5e	Other intellectual property	3,368	
4.5f	All other capital expenditures for R&D operations	4,047	
5.1	Worldwide R&D paid for and performed by the company and others directed toward business areas or product lines new to the company	137,828	
5.2/ 2.10(1)	Domestic R&D paid for and performed by the company	679,371	
Type of R&D (character of work)			
5.4b	Basic research	34,856	
5.4a	Applied research	95,812	
5.3b	Development	548,704	
Technology focus areas			
5.5	Software products and software embedded in other projects or products	305,788	i
5.6	Biotechnology	115,278	
5.7	Nanotechnology	36,916	i
5.8	Artificial intelligence	68,501	
5.10c/ 5.9	Foreign R&D paid for and performed by the company	150,198	
5.10a	Research	21,335	
5.10b	Development	128,863	
5.11/ 3.5(1)	Domestic R&D paid for by others and performed by the company	85,711	
Type of R&D (character of work)			
5.13b	Basic research	5,674	
5.13a	Applied research	20,546	
5.12b	Development	59,490	
Technology focus areas			
5.14	Software products and software embedded in other projects or products	16,425	
5.15	Biotechnology	23,358	
5.16	Nanotechnology	2,052	i
5.17	Artificial intelligence	3,430	i
5.18/ 3.8d	Federally funded R&D performed by the company	30,995	
Type of R&D (character of work)			
5.20b	Basic research	2,204	i
5.20a	Applied research	6,132	
5.19b	Development	22,658	
Technology focus areas			
5.21	Federally funded R&D performed by the company for software products and software embedded in other projects or products	5,046	
5.23c/ 5.22	Foreign R&D paid for by others and performed by the company	14,529	

Table 1. Business Enterprise Research and Development Survey aggregate estimates, by questionnaire reference: 2024

(Millions of U.S. dollars and thousands of employees)

Question	Survey item	Aggregate amount	
5.23a	Research	4,723	
5.23b	Development	9,807	
Employees (thousands)			
Worldwide			
1.8/ 1.9(3)/ 6.1c(3)	Total employees	34,779	
6.1b(3)	Non-R&D employees	31,481	
6.1a(3)	R&D employees	3,298	
6.4a(3)	Female	1,000	
6.4b(3)	Male	2,298	
6.5a(3)	Researchers	2,290	
6.5b(3)	Technicians	723	
6.5c(3)	Support staff	286	
Domestic			
1.9(1)/ 6.1c(1)	Total employees	23,145	
6.1b(1)	Non-R&D employees	21,015	
6.1a(1)	R&D employees	2,130	
6.4a(1)	Female	635	
6.4b(1)	Male	1,495	
6.5a(1)	Researchers	1,462	
6.5b(1)	Technicians	470	
6.5c(1)	Support staff	198	
Foreign			
1.9(2)/ 6.1c(2)	Total employees	11,634	
6.1b(2)	Non-R&D employees	10,466	
6.1a(2)	R&D employees	1,168	
6.4a(2)	Female	365	
6.4b(2)	Male	803	
6.5a(2)	Researchers	828	
6.5b(2)	Technicians	252	
6.5c(2)	Support staff	88	
Researchers with PhD			
6.6(3)	Worldwide	201	i
6.6(1)	Domestic	153	
6.6(2)	Foreign	48	i
Full-time equivalent			
6.7d	R&D employees	1,937	
6.7a	Full-time R&D employees	1,668	
6.7b	Full-time employees not solely working on R&D	242	
6.7c	Part-time employees working on R&D	28	
6.8d	Researchers	1,288	
6.8a	Full-time R&D employees	1,140	
6.8b	Full-time employees not solely working on R&D	134	
6.8c	Part-time employees working on R&D	14	i
6.9	Non-U.S. citizens employed as researchers under temporary visa ^a	51	
6.10d(1)	Total leased and temporary employees working on R&D	291	i
6.10a(1)	Researchers	198	i
6.10b(1)	Technicians	61	i
6.10c(1)	Support staff	32	i
U.S. patents (number) ^a			
7.1	Patents applied for, total	151,573	
7.2	Nonprovisional utility patents applied for	102,955	
7.3	Nonprovisional utility patent applications filed or planned in foreign jurisdictions	50,413	

Table 1. Business Enterprise Research and Development Survey aggregate estimates, by questionnaire reference: 2024

(Millions of U.S. dollars and thousands of employees)

Question	Survey item	Aggregate amount	
7.4	Nonprovisional utility patent applications originated from organized R&D activities	83,666	
7.6	Utility patents issued	101,145	
U.S. patents (US\$millions) ^a			
Revenue received			
7.7	From sale of utility patents	698	
7.8	From licensing utility patents	28,899	
Amount paid			
7.10	To purchase patents	2,015	
7.11	To license patents	10,749	

i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%.

^a Statistics are based on companies in the United States that reported to the survey. No systematic item imputation was applied. These statistics include an adjustment to the weight to account for unit nonresponse.

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 \$50,000 or more of R&D.

Source(s):
National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 2. Worldwide, domestic, and foreign R&D paid for by the company and others and performed by the company, by industry and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Worldwide R&D performance			Domestic R&D performance			Foreign R&D performance		
		Total	Paid for by the company	Paid for by others	Total	Paid for by the company	Paid for by others	Total	Paid for by the company	Paid for by others
All industries	21–23, 31–33, 42–81	929,809	829,569	100,240	765,082	679,371	85,711	164,727	150,198	14,529
Manufacturing industries	31–33	495,527	444,976	50,550	405,092	356,431	48,661	90,435	88,546	1,890
Food	311	7,810	7,541	269	6,288	6,020	268	1,523	1,522	1
Beverage and tobacco products	312	2,457	2,457	*	1,459	1,459	*	998	998	0
Textile, apparel, and leather products	313–16	907	901	6	788	783	6	118	118	0
Wood products	321	269	263	6	267	261	6	2	2	0
Paper	322	1,317	1,316	1	1,240	1,238	1	78	78	0
Printing and related support activities	323	260	259	2	255	253	2	5	5	0
Petroleum and coal products	324	1,205	1,203	2	1,006	1,004	2	199	199	*
Chemicals	325	170,685	158,186	12,499	143,745	131,790	11,954	26,941	26,396	545
Basic chemicals	3251	4,041	3,793	248	3,120	2,883	237	921	910	11
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	1,870	1,806	64	1,354	D	D	516	D	D
Pesticide, fertilizer, and other agricultural chemicals	3253	1,421	D	D	1,253	D	D	168	D	D
Pharmaceuticals and medicines	3254	157,749	146,269	11,480	133,627	122,656	10,971	24,122	23,612	509
Soap, cleaning compound, and toilet preparations	3256	3,905	3,634	272	2,956	2,684	272	950	950	0
Paint, coating, adhesive, and other chemicals	3255, 3259	1,699	D	D	1,435	D	D	264	D	D
Plastics and rubber products	326	3,326	3,171	155	2,908	2,767	141	418	404	14
Nonmetallic mineral products	327	1,804	1,782	22	1,578	1,556	22	227	226	*
Primary metals	331	1,352	1,305	47	1,174	1,129	45	178	176	2
Fabricated metal products	332	3,978	3,871	107	3,230	3,137	93	748	734	14
Machinery	333	28,454	26,169	2,285	22,035	19,844	2,191	6,419	6,325	94
Agricultural implement	33311	3,657	D	D	2,561	D	D	1,096	D	D
Semiconductor machinery	333242	8,798	D	D	6,851	D	D	1,947	D	D
Engine, turbine, and power transmission equipment	3336	5,485	5,031	453	4,230	D	D	1,255	D	D
Other machinery	other 333	10,515	10,161	353	8,394	8,060	333	2,121	2,101	20
Computer and electronic products	334	153,232	144,408	8,824	115,599	107,038	8,561	37,633	37,370	263
Communications equipment	3342	16,688	15,898	790	12,839	12,069	771	3,848	3,829	19

Table 2. Worldwide, domestic, and foreign R&D paid for by the company and others and performed by the company, by industry and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Worldwide R&D performance			Domestic R&D performance			Foreign R&D performance		
		Total	Paid for by the company	Paid for by others	Total	Paid for by the company	Paid for by others	Total	Paid for by the company	Paid for by others
Semiconductor and other electronic components	3344	74,100	70,109	3,991	52,358	48,546	3,812	21,742	21,563	179
Navigational, measuring, electromedical, and control instruments	3345	17,442	14,036	3,406	14,083	10,736	3,347	3,359	3,300	59
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	3,793	3,577	216	3,245	3,046	199	548	531	17 i
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	6,645	3,652	2,993	6,161	3,190	2,971	484	463	21
Other measuring and controlling devices	other 3345	7,004	6,807	197	4,677	4,501	177	2,327	2,307	20
Other computer and electronic products	other 334	45,002	44,365	637	36,318	35,687	631	8,683	8,678	6
Electrical equipment, appliances, and components	335	8,880	8,001	879	6,999	6,135	864	1,880 i	1,866 i	14
Transportation equipment	336	79,271	54,192	25,078	71,231	47,039	24,192	8,040	7,153	886
Motor vehicles, bodies, trailers, and parts	3361–63	37,737	35,557	2,180	31,812	D	D	5,925	D	D
Aerospace products and parts	3364	37,835	16,655	21,180	35,904	15,130	20,774 i	1,931	1,525	406
Aircraft, aircraft engine, and aircraft parts	336411–13	26,748	11,593	15,155 i	D	D	D	D	D	D
Guided missile, space vehicle, and related parts	336414–15, 336419	11,087	5,063	6,024	D	D	D	D	D	D
Military armored vehicle, tank, and tank components	336992	33	23	10	33	23	10	0	0	0
Other transportation	other 336	3,665	1,957	1,709	3,481	D	D	184	D	D
Furniture and related products	337	498	497	1 i	450	450	0	47	47	1 i
Miscellaneous	339	29,822	29,454	368	24,840	24,528	312	4,981	4,926	56
Medical equipment and supplies	3391	26,707	26,367	340	22,126	21,840	285	4,582	4,527	55
Other miscellaneous manufacturing	3399	3,114	3,086	28	2,715	2,688	27	399	398	1 i
Nonmanufacturing industries	21–23, 42–81	434,282	384,593	49,690	359,990	322,940	37,050	74,292	61,652	12,640
Mining, quarrying, oil and gas extraction, and support activities	21	2,217	1,554	663 i	1,862	1,224	638 i	355	330	25
Utilities	22	623	D	D	613	D	D	10	10	0
Wholesale trade	42	1,802 i	D	D	1,692 i	D	D	110 i	105 i	5 i

Table 2. Worldwide, domestic, and foreign R&D paid for by the company and others and performed by the company, by industry and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Worldwide R&D performance			Domestic R&D performance			Foreign R&D performance		
		Total	Paid for by the company	Paid for by others	Total	Paid for by the company	Paid for by others	Total	Paid for by the company	Paid for by others
Electronic shopping and electronic auctions	454111-12	10,188	10,188	0	7,898	7,898	0	2,291	2,291	0
Transportation and warehousing	48-49	11,610	D	D	11,341	D	D	270	270	0
Information	51	274,536	273,014	1,521	228,174	226,853	1,322	46,361	46,162	200
Publishing	511	80,509	79,860	649	63,596	63,085	511	16,913	16,775	138
Newspaper, periodical, book, and directory publishers	5111	497	497	0	489	489	0	9	9	0
Software publishers	5112	80,012	79,363	649	63,108	62,597	511	16,904	16,767	138
Telecommunications	517	3,547	D	D	3,323	D	D	224	D	D
Data processing, hosting, and related services	518	72,547	71,785	762	58,772	58,017	755	13,775	13,768	7
Other information	other 51	117,933	D	D	102,484	D	D	15,449	D	D
Finance and insurance	52	29,593	29,422	170	25,463	25,362	101	4,129	4,060	69
Real estate and rental and leasing	53	2,856	2,856	0	2,750	2,750	0	106	106	0
Lessors of nonfinancial intangible assets (except copyrighted works)	533	23	23	0	23	23	0	0	0	0
Other real estate and rental and leasing	other 53	2,833	2,833	0	2,727	2,727	0	106	106	0
Professional, scientific, and technical services	54	94,925	48,169	46,755	74,548	40,134	34,415	20,377	8,036	12,341
Architectural, engineering, and related services	5413	3,931	3,269	662	3,893	3,240	654	37	29	8
Computer systems design and related services	5415	32,634	28,167	4,466	26,764	22,353	4,411	5,870	5,814	56
Scientific research and development services	5417	47,162	6,655	40,507	33,942	5,705	28,237	13,219	949	12,270
Research and development in nanotechnology	541713	568	453	115	548	434	115	19	19	0
Research and development in biotechnology (except nanobiotechnology)	541714	9,580	1,221	8,360	6,751	1,204	5,547	2,830	17	2,812
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	36,299	4,972	31,327	25,931	4,060	21,872	10,368	912	9,456

Table 2. Worldwide, domestic, and foreign R&D paid for by the company and others and performed by the company, by industry and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Worldwide R&D performance			Domestic R&D performance			Foreign R&D performance		
		Total	Paid for by the company	Paid for by others	Total	Paid for by the company	Paid for by others	Total	Paid for by the company	Paid for by others
Research and development in the social sciences and humanities	541720	714	8	706	712	8	704	2	0	2
Other professional, scientific, and technical services	other 54	11,199 i	10,079 i	1,120	9,949 i	8,835 i	1,113	1,250 i	1,243 i	7
Health care services	621–23	2,118	1,986	131	2,020	1,888	131	98 i	98 i	0
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	3,814	3,766	49	3,628	3,579	49	186	186	0
All companies (number of domestic employees)	–	929,809	829,569	100,240	765,082	679,371	85,711	164,727	150,198	14,529
Small companies										
10–19 ^a	–	5,434	4,370	1,064	4,790	3,734	1,056	644	636	8
20–49	–	17,384	15,317	2,066	16,179	14,153	2,026	1,205	1,164	40
Medium companies										
50–99	–	18,251	16,140	2,111	17,078	14,998	2,080	1,173	1,142	31
100–249	–	32,183	29,316	2,867	29,325	26,548	2,777	2,858	2,768	90
Large companies										
250–499	–	33,288	30,529	2,759	28,852	26,185	2,667	4,436	4,344	92
500–999	–	49,792	45,042	4,750	44,697	40,152	4,545	5,095	4,890	205
1,000–4,999	–	152,811	137,920	14,891	123,813	110,612	13,201	28,998	27,308	1,690 i
5,000–9,999	–	76,317	67,394	8,924	62,950	55,804	7,146	13,367	11,590	1,777
10,000–24,999	–	177,871	152,304	25,567	140,348	120,991	19,357	37,522	31,313	6,210
25,000 or more	–	366,479	331,238	35,241	297,050	266,195	30,855	69,429	65,043	4,386 i

* = amount < \$500,000; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%.

NAICS = 2017 North American Industry Classification System.

^a The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):

Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 3. Worldwide R&D paid for by the company and others and performed by the company, by industry, company size, and worldwide R&D program size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	R&D program size					
		All companies	Less than \$1 million	\$1 million–\$9.999 million	\$10 million–\$49.999 million	\$50 million–\$99.999 million	\$100 million or more
All industries	21–23, 31–33, 42–81	929,809	4,710	33,688	51,153	41,550	798,708
Manufacturing industries	31–33	495,527	2,222	14,444	25,326	24,401	429,133
Food	311	7,810	165	863	1,054	691	5,037
Beverage and tobacco products	312	2,457	47	110	51	451	1,799
Textile, apparel, and leather products	313–16	907	24	242	326	140	174
Wood products	321	269	14	114	141	0	0
Paper	322	1,317	10	103	220	61	924
Printing and related support activities	323	260	18	99	56	86	0
Petroleum and coal products	324	1,205	D	D	172	129	D
Chemicals	325	170,685	304	2,736	10,156	9,488	148,001
Basic chemicals	3251	4,041	69	373	606	820	2,172
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	1,870	22	206	171	105	1,365
Pesticide, fertilizer, and other agricultural chemicals	3253	1,421	10	64	249	0	1,099
Pharmaceuticals and medicines	3254	157,749	79	1,527	8,824	8,320	138,999
Soap, cleaning compound, and toilet preparations	3256	3,905	39	171	72	0	3,623
Paint, coating, adhesive, and other chemicals	3255, 3259	1,699	85	395	234	243	743
Plastics and rubber products	326	3,326	154	566	455	672	1,479
Nonmetallic mineral products	327	1,804	44	131	306	0	1,324
Primary metals	331	1,352	26	180	262	161	722
Fabricated metal products	332	3,978	338	1,183	389	751	1,316
Machinery	333	28,454	349	1,971	1,858	2,055	22,222
Agricultural implement	33311	3,657	D	135	105	D	3,228
Semiconductor machinery	333242	8,798	3	51	128	68	8,548
Engine, turbine, and power transmission equipment	3336	5,485	D	70	197	D	5,142
Other machinery	other 333	10,515	D	1,715	1,429	D	5,305
Computer and electronic products	334	153,232	298	2,282	3,589	3,622	143,442
Communications equipment	3342	16,688	37	549	443	392	15,266
Semiconductor and other electronic components	3344	74,100	72	601	1,094	1,382	70,951
Navigational, measuring, electromedical, and control instruments	3345	17,442	158	958	1,666	1,365	13,296
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	3,793	33	268	612	485	2,394
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	6,645	15	114	378	362	5,775
Other measuring and controlling devices	other 3345	7,004	109	575	676	517	5,127
Other computer and electronic products	other 334	45,002	30	174	386	483	43,928
Electrical equipment, appliances, and components	335	8,880	55	458	1,332	1,396	5,638
Transportation equipment	336	79,271	192	1,232	2,493	1,639	73,714
Motor vehicles, bodies, trailers, and parts	3361–63	37,737	128	657	1,462	1,302	34,187
Aerospace products and parts	3364	37,835	33	327	833	175	36,468
Aircraft, aircraft engine, and aircraft parts	336411–13	26,748	30	298	705	175	25,540
Guided missile, space vehicle, and related parts	336414–15, 336419	11,087	3	28	128	0	10,928
Military armored vehicle, tank, and tank components	336992	33	1	33	0	0	0

Table 3. Worldwide R&D paid for by the company and others and performed by the company, by industry, company size, and worldwide R&D program size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	R&D program size					
		All companies	Less than \$1 million	\$1 million–\$9.999 million	\$10 million–\$49.999 million	\$50 million–\$99.999 million	\$100 million or more
Other transportation	other 336	3,665	30	216	199	162	3,059
Furniture and related products	337	498	27	130	118	222	0
Miscellaneous	339	29,822	D	D	2,348	2,836	D
Medical equipment and supplies	3391	26,707	92	1,528	1,741	2,267	21,079
Other miscellaneous manufacturing	3399	3,114	D	D	606	569	D
Nonmanufacturing industries	21–23, 42–81	434,282	2,488	19,243	25,827	17,149	369,575
Mining, quarrying, oil and gas extraction, and support activities	21	2,217	9	72	290	173	1,673
Utilities	22	623	3	97	113	108	302
Wholesale trade	42	1,802	i 335	1,207	i 260	i 0	0
Electronic shopping and electronic auctions	454111–12	10,188	i 17	82	139	139	9,811
Transportation and warehousing	48–49	11,610	D	562	r 224	D	10,671
Information	51	274,536	434	6,530	12,326	8,344	246,902
Publishing	511	80,509	288	2,838	3,922	2,512	70,950
Newspaper, periodical, book, and directory publishers	5111	497	i 6	i 23	0	469	i 0
Software publishers	5112	80,012	282	2,815	3,922	2,044	70,950
Telecommunications	517	3,547	25	209	465	126	2,722
Data processing, hosting, and related services	518	72,547	116	3,179	7,155	5,385	56,712
Other information	other 51	117,933	5	i 305	784	321	116,518
Finance and insurance	52	29,593	7	451	929	1,331	26,874
Real estate and rental and leasing	53	2,856	11	r 74	135	174	2,463
Lessors of nonfinancial intangible assets (except copyrighted works)	533	23	1	i 0	23	0	0
Other real estate and rental and leasing	other 53	2,833	10	r 74	112	174	2,463
Professional, scientific, and technical services	54	94,925	1,554	9,091	9,993	5,808	68,480
Architectural, engineering, and related services	5413	3,931	620	1,269	1,220	472	350
Computer systems design and related services	5415	32,634	564	i 3,793	4,098	2,802	21,377
Scientific research and development services	5417	47,162	123	2,983	3,066	1,793	39,196
Research and development in nanotechnology	541713	568	5	125	172	0	265
Research and development in biotechnology (except nanobiotechnology)	541714	9,580	29	801	648	401	7,701
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	36,299	86	2,033	2,203	1,392	30,586
Research and development in the social sciences and humanities	541720	714	3	25	43	0	644
Other professional, scientific, and technical services	other 54	11,199	i 247	i 1,046	1,608	741	7,557
Health care services	621–23	2,118	44	260	348	497	i 968
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	3,814	D	817	1,071	D	1,431
All companies (number of domestic employees)	–	929,809	4,710	33,688	51,153	41,550	798,708
Small companies							
10–19 ^a	–	5,434	1,122	3,711	537	63	0
20–49	–	17,384	1,532	8,457	4,033	596	2,766
Medium companies							
50–99	–	18,251	750	6,426	7,927	2,352	796

Table 3. Worldwide R&D paid for by the company and others and performed by the company, by industry, company size, and worldwide R&D program size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	R&D program size					
		All companies	Less than \$1 million	\$1 million–\$9.999 million	\$10 million–\$49.999 million	\$50 million–\$99.999 million	\$100 million or more
100–249	–	32,183	621	6,753	11,671	7,592	5,546
Large companies							
250–499	–	33,288	194	3,474	8,863	6,435	14,321
500–999	–	49,792	410	2,306	6,113	7,926	33,037
1,000–4,999	–	152,811	69	2,060	8,479	11,686	130,517
5,000–9,999	–	76,317	3	236	1,955	2,457	71,666
10,000–24,999	–	177,871	4	187	1,024	1,662	174,994
25,000 or more	–	366,479	5	78	551	780	365,064

D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%.

NAICS = 2017 North American Industry Classification System.

^a The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):

Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D. R&D program size classifications are based on R&D performance.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 4. Companies with worldwide, domestic, and foreign R&D paid for by the company and others and performed by the company, by source of funds, industry, and company size: 2024

(Number of companies)

Industry and company size	NAICS code	Worldwide R&D performance			Domestic R&D performance			Foreign R&D performance		
		Total	Paid for by the company	Paid for by others	Total	Paid for by the company	Paid for by others	Total	Paid for by the company	Paid for by others
All industries	21–23, 31–33, 42–81	27,010	25,740	3,670	29,570	25,580	3,600	4,130	4,030	290
Manufacturing industries	31–33	13,010	12,560	1,800	12,780	12,530	1,760	1,670	1,640	170
Food	311	840	830	40	990	830	40	130	130	10
Beverage and tobacco products	312	250	250	10	260	250	10	20	20	0
Textile, apparel, and leather products	313–16	180	180	10	190	180	10	30	30	0
Wood products	321	80	80	10	90	80	10	10	10	0
Paper	322	80	80	10	80	70	10	20	20	0
Printing and related support activities	323	130	130	20	140	130	20	10	10	0
Petroleum and coal products	324	60	60	10	60	60	10	10	10	10
Chemicals	325	2,270	2,190	440	2,250	2,190	430	370	360	50
Basic chemicals	3251	320	310	30	300	310	30	50	50	10
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	120	120	20	130	110	20	20	20	10
Pesticide, fertilizer, and other agricultural chemicals	3253	70	70	10	70	70	10	20	20	10
Pharmaceuticals and medicines	3254	1,180	1,120	320	1,140	1,130	310	260	250	40
Soap, cleaning compound, and toilet preparations	3256	180	180	10	210	180	10	20	20	0
Paint, coating, adhesive, and other chemicals	3255, 3259	420	410	70	420	410	70	30	30	10
Plastics and rubber products	326	690	680	100	650	680	100	70	50	20
Nonmetallic mineral products	327	260	220	60	280	220	60	20	20	10
Primary metals	331	180	170	20	170	170	20	20	10	10
Fabricated metal products	332	1,470	1,380	220	1,480	1,380	220	100	100	10
Machinery	333	1,890	1,850	230	1,980	1,850	230	140	140	20
Agricultural implement	33311	180	170	30	160	170	30	20	20	10
Semiconductor machinery	333242	50	40	10	50	40	10	20	20	10
Engine, turbine, and power transmission equipment	3336	130	130	30	140	130	30	20	20	10
Other machinery	other 333	1,550	1,530	170	1,640	1,520	160	100	100	10
Computer and electronic products	334	1,830	1,750	310	1,710	1,750	300	350	340	40
Communications equipment	3342	320	310	50	300	310	50	100	90	10
Semiconductor and other electronic components	3344	490	460	80	470	460	80	110	100	20
Navigational, measuring, electromedical, and control instruments	3345	850	820	170	810	820	170	90	90	20
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	190	170	50	220	170	50	20	20	10
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	140	140	30	130	140	30	20	20	10
Other measuring and controlling devices	other 3345	530	520	100	470	520	100	60	60	10

Table 4. Companies with worldwide, domestic, and foreign R&D paid for by the company and others and performed by the company, by source of funds, industry, and company size: 2024

(Number of companies)

Industry and company size	NAICS code	Worldwide R&D performance			Domestic R&D performance			Foreign R&D performance		
		Total	Paid for by the company	Paid for by others	Total	Paid for by the company	Paid for by others	Total	Paid for by the company	Paid for by others
Other computer and electronic products	other 334	180	180	20	150	180	20	70	70	10
Electrical equipment, appliances, and components	335	420	390	60	380	390	60	70	70	10 i
Transportation equipment	336	1,110	1,050	190	930	1,050	190	140	140	40
Motor vehicles, bodies, trailers, and parts	3361–63	640	630	90	540	630	90	80	80	20
Aerospace products and parts	3364	290	240	90	260	240	90	40	40	20
Aircraft, aircraft engine, and aircraft parts	336411–13	260	220	80	230	220	80	30	30	10
Guided missile, space vehicle, and related parts	336414–15, 336419	40	30	20	30	30	20	10	10	10
Military armored vehicle, tank, and tank components	336992	20	20	10	20	20	10	0	0	0
Other transportation	other 336	180	180	10	130	180	10	30	30	10
Furniture and related products	337	170	170	10 i	200	170	0	20 i	20 i	10 i
Miscellaneous	339	1,200	1,170	150	1,050	1,170	150	220	210	20 i
Medical equipment and supplies	3391	820	800	140	660	800	130	160	150	20 i
Other miscellaneous manufacturing	3399	390	380	20	390	380	20	60	60	10 i
Nonmanufacturing industries	21–23, 42–81	14,010	13,190	1,880	16,790	13,060	1,850	2,470	2,400	120
Mining, quarrying, oil and gas extraction, and support activities	21	70	70	10	60	70	10	10	10	10 i
Utilities	22	70	70	10	70	70	10	10	10	0
Wholesale trade	42	1,640	1,610	160	2,350	1,580	160	110 i	100 i	10 i
Electronic shopping and electronic auctions	454111–12	110	110	0	270	110	0	10	10	0
Transportation and warehousing	48–49	440 r	440 r	10	490 r	440 r	10	20	20	0
Information	51	3,750	3,670	170	3,750	3,610	150	1,150	1,150	30
Publishing	511	1,730	1,690	70	1,690	1,670	60	430	430	10
Newspaper, periodical, book, and directory publishers	5111	40 i	40 i	0	50 i	40 i	0	10 i	10 i	0
Software publishers	5112	1,690	1,650	70	1,650	1,630	60	430	420	10
Telecommunications	517	160	150	10	150	150	10	20	20	10
Data processing, hosting, and related services	518	1,710	1,670	90	1,680	1,640	90	630	620	10 i
Other information	other 51	170	170	10	240	170	10	80	80	10 i
Finance and insurance	52	230	230	10	220	210	10	90	90	10
Real estate and rental and leasing	53	60	60	0	540	60	0	20	20	0
Lessors of nonfinancial intangible assets (except copyrighted works)	533	10 i	10 i	0	10 i	10 i	0	0	0	0
Other real estate and rental and leasing	other 53	60	60	0	530	50	0	20	20	0
Professional, scientific, and technical services	54	6,960	6,310	1,470	7,560	6,290	1,460	1,020 i	960 i	90

Table 4. Companies with worldwide, domestic, and foreign R&D paid for by the company and others and performed by the company, by source of funds, industry, and company size: 2024

(Number of companies)

Industry and company size	NAICS code	Worldwide R&D performance			Domestic R&D performance			Foreign R&D performance		
		Total	Paid for by the company	Paid for by others	Total	Paid for by the company	Paid for by others	Total	Paid for by the company	Paid for by others
Architectural, engineering, and related services	5413	1,650	1,550	300	1,660	1,550	300	40	40	10
Computer systems design and related services	5415	2,780	2,670	320	2,950	2,650	320	580	580	20
Scientific research and development services	5417	1,300	930	730	1,500	930	730	120	100	40
Research and development in nanotechnology	541713	70	50	40	80	50	40	10	10	0
Research and development in biotechnology (except nanobiotechnology)	541714	340	260	160	420	260	160	40	30	20
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	890	620	520	980	610	520	80	70	30
Research and development in the social sciences and humanities	541720	20	20	10	20	20	10	10	0	10
Other professional, scientific, and technical services	other 54	1,250	1,180	130	1,480	1,170	130	290	260	30
Health care services	621–23	230	190	60	260	190	60	20	20	0
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	510	490	20	1,290	490	20	60	60	0
All companies (number of domestic employees)	–	27,010	25,740	3,670	29,570	25,580	3,600	4,130	4,030	290
Small companies										
10–19 ^a	–	4,760	4,380	890	5,590	4,330	880	740	710	50
20–49	–	7,520	7,230	1,130	7,920	7,190	1,120	630	590	50
Medium companies										
50–99	–	4,720	4,540	500	5,030	4,510	500	500	490	20
100–249	–	4,320	4,110	480	4,540	4,070	480	630	620	20
Large companies										
250–499	–	2,000	1,920	210	2,100	1,910	200	420	420	30
500–999	–	1,670	1,610	170	1,880	1,610	160	350	340	30
1,000–4,999	–	1,410	1,370	180	1,490	1,370	170	570	560	40
5,000–9,999	–	270	260	50	280	260	50	150	140	20
10,000–24,999	–	230	220	70	610	220	60	120	120	30
25,000 or more	–	150	150	40	150	140	40	80	80	30

i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%.

NAICS = 2017 North American Industry Classification System.

^a The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):

Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D. Statistics are based on companies in the United States that reported to the survey. No systematic item imputation was applied.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 5. Worldwide R&D paid for by the company and performed by the company and others, by industry and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Total	Performed by the company	Performed by others
All industries	21–23, 31–33, 42–81	890,002	829,569	60,433
Manufacturing industries	31–33	495,967	444,976	50,990
Food	311	7,920	7,541	379
Beverage and tobacco products	312	2,798	2,457	341
Textile, apparel, and leather products	313–16	910	901	8
Wood products	321	282	263	20
Paper	322	1,325	1,316	9
Printing and related support activities	323	270	259	11
Petroleum and coal products	324	1,493	1,203	290
Chemicals	325	197,022	158,186	38,836
Basic chemicals	3251	4,046	3,793	253
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	1,838	1,806	32
Pesticide, fertilizer, and other agricultural chemicals	3253	D	D	D
Pharmaceuticals and medicines	3254	184,244	146,269	37,976
Soap, cleaning compound, and toilet preparations	3256	4,061	3,634	427
Paint, coating, adhesive, and other chemicals	3255, 3259	D	D	D
Plastics and rubber products	326	3,233	3,171	62
Nonmetallic mineral products	327	1,810	1,782	28
Primary metals	331	1,323	1,305	18
Fabricated metal products	332	3,911	3,871	40
Machinery	333	26,647	26,169	478
Agricultural implement	33311	D	D	D
Semiconductor machinery	333242	D	D	D
Engine, turbine, and power transmission equipment	3336	5,056	5,031	25
Other machinery	other 333	10,312	10,161	151
Computer and electronic products	334	149,206	144,408	4,798
Communications equipment	3342	16,977	15,898	1,079
Semiconductor and other electronic components	3344	70,675	70,109	566
Navigational, measuring, electromedical, and control instruments	3345	14,408	14,036	372
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	3,739	3,577	162
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	3,669	3,652	17
Other measuring and controlling devices	other 3345	7,000	6,807	193
Other computer and electronic products	other 334	47,146	44,365	2,781
Electrical equipment, appliances, and components	335	8,100	8,001	99
Transportation equipment	336	58,375	54,192	4,182
Motor vehicles, bodies, trailers, and parts	3361–63	39,292	35,557	3,734
Aerospace products and parts	3364	17,033	16,655	378
Aircraft, aircraft engine, and aircraft parts	336411–13	11,854	11,593	262
Guided missile, space vehicle, and related parts	336414–15, 336419	5,179	5,063	116
Military armored vehicle, tank, and tank components	336992	24	23	1
Other transportation	other 336	2,026	1,957	70
Furniture and related products	337	501	497	4
Miscellaneous	339	30,842	29,454	1,388
Medical equipment and supplies	3391	27,628	26,367	1,261
Other miscellaneous manufacturing	3399	3,214	3,086	127
Nonmanufacturing industries	21–23, 42–81	394,035	384,593	9,443
Mining, quarrying, oil and gas extraction, and support activities	21	1,737	1,554	183
Utilities	22	1,358	D	D
Wholesale trade	42	D	D	D
Electronic shopping and electronic auctions	454111–12	10,712	10,188	524
Transportation and warehousing	48–49	D	D	D

Table 5. Worldwide R&D paid for by the company and performed by the company and others, by industry and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Total	Performed by the company	Performed by others
Information	51	277,811	273,014	4,797
Publishing	511	81,746	79,860	1,885
Newspaper, periodical, book, and directory publishers	5111	520	i 497	i 23
Software publishers	5112	81,226	79,363	1,863
Telecommunications	517	D	D	D
Data processing, hosting, and related services	518	72,223	71,785	438
Other information	other 51	D	D	D
Finance and insurance	52	30,542	29,422	1,120
Real estate and rental and leasing	53	2,883	2,856	27
Lessors of nonfinancial intangible assets (except copyrighted works)	533	47	23	24
Other real estate and rental and leasing	other 53	2,836	2,833	3
Professional, scientific, and technical services	54	49,564	48,169	1,394
Architectural, engineering, and related services	5413	3,485	3,269	216
Computer systems design and related services	5415	28,830	28,167	663
Scientific research and development services	5417	7,044	6,655	390
Research and development in nanotechnology	541713	465	453	11
Research and development in biotechnology (except nanobiotechnology)	541714	1,350	1,221	129
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	5,221	4,972	249
Research and development in the social sciences and humanities	541720	9	8	*
Other professional, scientific, and technical services	other 54	10,204	10,079	i 125
Health care services	621–23	2,084	1,986	98
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	3,916	3,766	150
All companies (number of domestic employees)	–	890,002	829,569	60,433
Small companies				
10–19 ^a	–	5,305	4,370	935
20–49	–	17,830	15,317	2,513
Medium companies				
50–99	–	18,982	16,140	2,841
100–249	–	33,429	29,316	4,114
Large companies				
250–499	–	33,538	30,529	3,009
500–999	–	47,427	45,042	2,385
1,000–4,999	–	145,933	137,920	8,012
5,000–9,999	–	72,974	67,394	5,581
10,000–24,999	–	166,552	152,304	14,248
25,000 or more	–	348,032	331,238	16,794

* = amount < \$500,000; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse.

NAICS = 2017 North American Industry Classification System.

^a The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):

Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 6. Worldwide R&D paid for by the company and performed by the company and others, by business activity: 2024

(Millions of U.S. dollars)

Business activity ^a	Business code ^b	Amount
All business activities	21100–81000	890,002
Oil and gas extraction	21100	958
Mining	21200	112
Support activities for mining, including oil and gas	21300	667
Utilities	22100	1,355
Construction	23000	778
Food manufacturing	31100	8,023
Beverage manufacturing	31210	1,071
Tobacco manufacturing	31220	1,046
Textile, apparel, and leather products manufacturing	31990	877
Wood products manufacturing	32100	393
Paper manufacturing	32200	1,581
Printing and related support activities	32300	493
Petroleum refineries	32401	626
Asphalt paving, roofing, and saturated materials manufacturing	32402	141
Other petroleum and coal products manufacturing, including motor oil, hydraulic fluid, and charcoal	32403	235
Basic chemicals manufacturing	32510	4,315
Resin, synthetic rubber, and artificial synthetic fibers and filaments manufacturing	32520	1,674
Pesticide, fertilizer, and other agricultural chemicals manufacturing	32530	1,843
Pharmaceutical, medicinal, botanical, and biological products (except diagnostic substances) manufacturing	32541	87,635
In vitro diagnostic substances manufacturing	32542	3,558
Biotechnology-based pharmaceutical and biological products (except diagnostic substances)	32543	90,633
Soap, cleaning compound, and toilet preparations manufacturing	32591	3,019
Paint, adhesive, and other chemical manufacturing	32592	1,904
Plastics and rubber products manufacturing	32600	3,289
Clay and glass products manufacturing	32710	1,677
Cement, concrete, lime, gypsum, and other nonmetallic mineral products manufacturing	32790	343
Primary metal manufacturing	33100	1,241
Fabricated metal products manufacturing	33200	3,940
Agricultural machinery and equipment manufacturing	33311	3,142
Construction machinery manufacturing	33312	2,053
Mining, oil, and gas field machinery and equipment manufacturing	33319	1,284
Semiconductor machinery manufacturing	33321	7,558
Industrial machinery manufacturing (except semiconductor machinery)	33322	1,753
Photographic and photocopying equipment manufacturing	33331	79
Commercial, service industry, temperature control, and air-flow control machinery manufacturing	33332	3,226
Digital cameras manufacturing	33333	314
Engine, turbine, and power transmission equipment manufacturing	33360	4,282
Metalworking and other general purpose machinery manufacturing	33390	3,364
Computers and peripheral equipment manufacturing and magnetic and optical media	33412	45,929
Telephone apparatus manufacturing, including routers, modems, and gateways	33421	12,284
Radio, television, and wireless communication equipment manufacturing	33422	3,894
Other communication equipment manufacturing (except radio, television, and wireless communication equipment)	33429	732
Audio and video equipment manufacturing	33430	2,084
Semiconductor and other electronic components manufacturing	33440	75,172
Electromedical, electrotherapeutic, and irradiation apparatus manufacturing	33451	5,114
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments manufacturing	33452	3,464
Measuring and control instruments manufacturing (not listed elsewhere)	33459	6,883
Electrical equipment, appliances, and components manufacturing	33500	7,671
Motor vehicles manufacturing	33610	32,197
Motor vehicle body and trailer manufacturing	33620	283
Motor vehicle parts manufacturing	33630	7,327

Table 6. Worldwide R&D paid for by the company and performed by the company and others, by business activity: 2024

(Millions of U.S. dollars)

Business activity ^a	Business code ^b	Amount	
Aircraft manufacturing	33641	7,332	
Aircraft engine and engine parts manufacturing	33642	3,108	
Other aircraft parts and auxiliary equipment manufacturing	33643	2,115	
Guided missiles, space vehicles, and related parts manufacturing	33644	3,408	
Railroad rolling stock manufacturing	33651	D	
Ship and boat building	33660	277	
Motorcycle, bicycle, and parts manufacturing	33691	464	
Military armored vehicle, tank, and tank components manufacturing	33692	224	i
All other transportation equipment manufacturing	33699	660	
Furniture and related products manufacturing	33700	528	
Medical equipment and supplies manufacturing	33910	28,516	
Miscellaneous manufacturing not listed elsewhere (games, office supplies, slot machines, etc.)	33990	3,419	
Merchant wholesalers, durable goods	42300	1,174	
Merchant wholesalers, nondurable goods	42400	677	i
Wholesale electronic markets and agents and brokers (business to business)	42500	D	
Retail trade (except electronic shopping and electronic auctions)	44000	895	
Electronic shopping and electronic auctions	45411	8,160	i
Transportation	48000	8,699	
Couriers, messengers, and express delivery services	49200	D	
Warehousing and storage	49300	32	
Newspaper, periodical, book, and directory publishers (except Internet)	51110	410	i
Software publishers (except Internet)	51120	56,386	
Motion picture and sound recording (except Internet)	51200	91	
Broadcasting (except Internet)	51500	D	
Wired telecommunications carriers	51710	543	
Wireless telecommunications carriers (except satellite)	51720	2,817	
Satellite telecommunications	51740	764	
Other telecommunications (not listed elsewhere)	51790	579	
Data processing, hosting, and related services	51800	19,505	
Cloud computing applications and Internet-based software services	51801	67,187	
Other information services, including Internet publishing, broadcasting, and Web search portals	51910	123,525	
Finance: banking and credit intermediation	52200	19,938	
Securities, commodity contracts, and other financial investments and related activities, including funds and trusts	52310	6,618	
Insurance carriers and related activities	52400	3,165	
Real estate	53100	546	
Rental and leasing services	53200	2,487	
Lessors of nonfinancial intangible assets, including patent licensing	53300	59	
Legal, accounting, tax preparation, bookkeeping, and payroll services	54111	5,110	
Architectural, engineering, and related services	54130	4,100	
Specialized design services	54140	95	r
Computer systems design and related services	54150	27,628	
Management, scientific, and technical consulting services	54160	3,972	
Research and development services in the social sciences and humanities	54172	9	
Research and development services in biotechnology	54173	1,353	
Research and development services in the physical, engineering, and life sciences (except biotechnology)	54174	3,838	
Research and development services in nanotechnology	54175	478	
Advertising and related services	54180	1,398	i
Professional, scientific, and technical services (not listed elsewhere)	54190	1,917	
Management of companies and enterprises	55100	39	
Administrative and support services	56100	5,106	
Waste management and remediation services	56200	73	
Offices of physicians	62110	177	
Medical and diagnostic laboratories	62150	2,122	

Table 6. Worldwide R&D paid for by the company and performed by the company and others, by business activity: 2024

(Millions of U.S. dollars)

Business activity ^a	Business code ^b	Amount
Other ambulatory health care services (ambulance, dental, home health care)	62199	401
Hospitals and nursing care facilities	62200	D
Social assistance services	62400	D
Arts, entertainment, and recreation	71000	185
Accommodation and food services	72000	217
Other services (not listed elsewhere)	81000	634
Undistributed ^c	–	0

D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%.

^a Business activity data are tabulated independent of the industry classification of the company. Companies were asked to report their sales and R&D activity in one or more business activity codes.

^b Business codes and descriptions are based on 2017 North American Industry Classification System industry definitions.

^c Undistributed includes data reported that were not allocated to a business activity.

Note(s):
Detail may not add to total because of rounding. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D.

Source(s):
National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 7. Worldwide R&D paid for by others and performed by the company and others, by industry and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Total	Performed by the company	Performed by others
All industries	21–23, 31–33, 42–81	111,682	100,240	11,442
Manufacturing industries	31–33	58,522	50,550	7,971
Food	311	271	269	2
Beverage and tobacco products	312	*	*	0
Textile, apparel, and leather products	313–16	6	6	0
Wood products	321	6	6	0
Paper	322	1	1	0
Printing and related support activities	323	2	2	0
Petroleum and coal products	324	3	2	*
Chemicals	325	17,384	12,499	4,885
Basic chemicals	3251	250	248	2
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	154	64 i	89 i
Pesticide, fertilizer, and other agricultural chemicals	3253	D	D	D
Pharmaceuticals and medicines	3254	16,266	11,480	4,786
Soap, cleaning compound, and toilet preparations	3256	272	272	0
Paint, coating, adhesive, and other chemicals	3255, 3259	D	D	D
Plastics and rubber products	326	155	155	*
Nonmetallic mineral products	327	23	22	* r
Primary metals	331	49	47	2
Fabricated metal products	332	173	107	66
Machinery	333	2,346	2,285	61
Agricultural implement	33311	D	D	D
Semiconductor machinery	333242	D	D	D
Engine, turbine, and power transmission equipment	3336	461	453	8
Other machinery	other 333	361	353	8
Computer and electronic products	334	8,998	8,824	174
Communications equipment	3342	790	790 i	* i
Semiconductor and other electronic components	3344	4,084	3,991	92
Navigational, measuring, electromedical, and control instruments	3345	3,485	3,406	79
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	222	216	6
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	3,057	2,993	64
Other measuring and controlling devices	other 3345	206	197	9 r
Other computer and electronic products	other 334	639	637	2
Electrical equipment, appliances, and components	335	880	879	1
Transportation equipment	336	27,853	25,078	2,775 i
Motor vehicles, bodies, trailers, and parts	3361–63	2,324	2,180	144
Aerospace products and parts	3364	23,807	i 21,180	2,627 i
Aircraft, aircraft engine, and aircraft parts	336411–13	17,769	i 15,155 i	2,614 i
Guided missile, space vehicle, and related parts	336414–15, 336419	6,038	6,024	14
Military armored vehicle, tank, and tank components	336992	10	10	0
Other transportation	other 336	1,712	1,709	3
Furniture and related products	337	1	1 i	* i
Miscellaneous	339	372	368	4
Medical equipment and supplies	3391	344	340	4
Other miscellaneous manufacturing	3399	28	28	*
Nonmanufacturing industries	21–23, 42–81	53,161	49,690	3,471
Mining, quarrying, oil and gas extraction, and support activities	21	663	663 i	*
Utilities	22	D	D	D
Wholesale trade	42	D	D	D
Electronic shopping and electronic auctions	454111–12	2 r	0	2 r
Transportation and warehousing	48–49	D	D	D

Table 7. Worldwide R&D paid for by others and performed by the company and others, by industry and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Total	Performed by the company	Performed by others
Information	51	1,553	1,521	32
Publishing	511	659	649	10
Newspaper, periodical, book, and directory publishers	5111	0	0	0
Software publishers	5112	659	649	10
Telecommunications	517	D	D	D
Data processing, hosting, and related services	518	766	762	4
Other information	other 51	D	D	D
Finance and insurance	52	170	170	0
Real estate and rental and leasing	53	0	0	0
Lessors of nonfinancial intangible assets (except copyrighted works)	533	0	0	0
Other real estate and rental and leasing	other 53	0	0	0
Professional, scientific, and technical services	54	49,851	46,755	3,095 i
Architectural, engineering, and related services	5413	745	662	83
Computer systems design and related services	5415	4,704	4,466	237
Scientific research and development services	5417	43,221	40,507	2,714 i
Research and development in nanotechnology	541713	126	115	11
Research and development in biotechnology (except nanobiotechnology)	541714	8,437	8,360	78
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	33,952	31,327	2,624 i
Research and development in the social sciences and humanities	541720	706	706	1
Other professional, scientific, and technical services	other 54	1,181	1,120	61
Health care services	621–23	179	131	47
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	69	49	20
All companies (number of domestic employees)	–	111,682	100,240	11,442
Small companies				
10–19 ^a	–	1,204	1,064	140
20–49	–	2,640	2,066	574
Medium companies				
50–99	–	2,572	2,111	461
100–249	–	3,300	2,867	433
Large companies				
250–499	–	3,323	2,759	564
500–999	–	5,273	4,750	523
1,000–4,999	–	17,097	14,891	2,206
5,000–9,999	–	10,318	8,924	1,395
10,000–24,999	–	27,214	25,567	1,647
25,000 or more	–	38,740 i	35,241	3,499 i

* = amount < \$500,000; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%.

NAICS = 2017 North American Industry Classification System.

^a The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):

Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 8. Worldwide, domestic, and foreign sales for companies located in the United States that performed or funded R&D, by industry and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Sales					
		R&D performers or funders ^a			Domestic R&D performers ^b		
		Worldwide	Domestic	Foreign	Worldwide	Domestic	Foreign
All industries	21–23, 31–33, 42–81	19,503,626	15,135,435	4,368,191	19,353,994	15,002,888	4,351,106
Manufacturing industries	31–33	10,184,741	7,285,331	2,899,410	10,141,342	7,247,672	2,893,670
Food	311	966,788	769,489	197,299	965,898	768,600	197,299
Beverage and tobacco products	312	353,145	217,242	135,903	353,145	217,242	135,903
Textile, apparel, and leather products	313–16	106,911	72,356	34,555	106,664	72,109	34,555
Wood products	321	76,363	70,913	5,450	76,225	70,775	5,450
Paper	322	127,375	102,775	24,600	127,342	102,742	24,600
Printing and related support activities	323	25,230	22,664	2,566	25,225	22,659	2,566
Petroleum and coal products	324	648,599	401,055	247,543	D	D	D
Chemicals	325	1,750,429	1,259,907	490,522	1,745,713	1,255,592	490,121
Basic chemicals	3251	271,345	184,366	86,979	268,846	182,175	86,671
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	105,040	60,780	44,260	104,753	60,493	44,260
Pesticide, fertilizer, and other agricultural chemicals	3253	105,623	90,418	15,205	103,872	88,760	15,112
Pharmaceuticals and medicines	3254	945,958	724,024	221,935	945,779	723,845	221,935
Soap, cleaning compound, and toilet preparations	3256	216,638	128,439	88,199	216,638	128,439	88,199
Paint, coating, adhesive, and other chemicals	3255, 3259	105,824	71,880	33,944	105,824	71,880	33,944
Plastics and rubber products	326	234,976	187,694	47,282	232,401	185,119	47,282
Nonmetallic mineral products	327	78,778	61,519	17,259	70,487	53,228	17,259
Primary metals	331	155,596	134,825	20,772	149,297	128,526	20,772
Fabricated metal products	332	245,965	215,419	30,546	D	214,665	D
Machinery	333	807,404	515,264	292,139	803,516	513,449	290,067
Agricultural implement	33311	93,362	62,384	30,977	93,362	62,384	30,977
Semiconductor machinery	333242	77,220	29,662	47,558	77,220	29,662	47,558
Engine, turbine, and power transmission equipment	3336	168,956	91,797	77,159	168,956	91,797	77,159
Other machinery	other 333	467,866	331,421	136,445	463,978	329,605	134,373
Computer and electronic products	334	1,542,247	807,047	735,200	1,541,631	806,433	735,198
Communications equipment	3342	157,519	115,196	42,322	157,505	115,183	42,322
Semiconductor and other electronic components	3344	521,653	269,245	252,408	521,653	269,245	252,408
Navigational, measuring, electromedical, and control instruments	3345	198,462	140,257	58,205	197,859	139,656	58,203
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	27,969	20,148	7,821	27,969	20,148	7,821
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	63,335	56,282	7,053	63,327	56,276	7,050
Other measuring and controlling devices	other 3345	107,159	63,827	43,332	106,563	63,232	43,332
Other computer and electronic products	other 334	664,614	282,349	382,265	664,614	282,349	382,265

Table 8. Worldwide, domestic, and foreign sales for companies located in the United States that performed or funded R&D, by industry and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Sales					
		R&D performers or funders ^a			Domestic R&D performers ^b		
		Worldwide	Domestic	Foreign	Worldwide	Domestic	Foreign
Electrical equipment, appliances, and components	335	208,586	162,178	46,408	208,547	162,139	46,408
Transportation equipment	336	1,971,311	1,606,030	365,280	1,969,854	1,604,574	365,280
Motor vehicles, bodies, trailers, and parts	3361–63	1,390,170	1,129,921	260,248	1,388,713	1,128,465	260,248
Aerospace products and parts	3364	468,696	383,543	85,152	468,696	383,543	85,152
Aircraft, aircraft engine, and aircraft parts	336411–13	D	287,610	D	D	287,610	D
Guided missile, space vehicle, and related parts	336414–15, 336419	D	95,933	D	D	95,933	D
Military armored vehicle, tank, and tank components	336992	1,059	1,059	0	1,059	1,059	0
Other transportation	other 336	111,387	91,507	19,880	111,387	91,507	19,880
Furniture and related products	337	46,465	38,766	7,699	D	D	7,684
Miscellaneous	339	838,575	640,188	198,386	837,822	639,519	198,303
Medical equipment and supplies	3391	667,574	524,775	142,799	666,922	524,206	142,716
Other miscellaneous manufacturing	3399	171,001	115,413	55,587	170,901	115,313	55,587
Nonmanufacturing industries	21–23, 42–81	9,318,885	7,850,104	1,468,781	9,212,652	7,755,216	1,457,436
Mining, quarrying, oil and gas extraction, and support activities	21	366,974	214,250	152,724	361,086	211,623	149,463
Utilities	22	404,514	398,679	5,835	340,129	334,293	5,835
Wholesale trade	42	477,561 i	412,445 i	65,116 i	461,334 i	401,958 i	59,377 i
Electronic shopping and electronic auctions	454111–12	772,964	750,006 i	22,959 i	771,672	748,713 i	22,959 i
Transportation and warehousing	48–49	461,123	349,450	111,674	459,468	347,794	111,674
Information	51	2,830,725	2,097,762	732,962	2,826,684	2,094,970	731,714
Publishing	511	634,943	402,492	232,451	632,008	400,525	231,483
Newspaper, periodical, book, and directory publishers	5111	7,636 i	7,636 i	0	7,540 i	7,540 i	0
Software publishers	5112	627,307	394,856	232,451	624,468	392,985	231,483
Telecommunications	517	475,834	463,203	12,631	475,219	462,867	12,352
Data processing, hosting, and related services	518	839,241	722,756	116,484	838,749	722,267	116,483
Other information	other 51	880,708	509,311	371,397	880,708	509,311	371,397
Finance and insurance	52	1,982,285	1,819,292	162,993	1,981,466	1,818,473	162,993
Real estate and rental and leasing	53	73,352	60,424	12,928	73,336	60,408	12,928
Lessors of nonfinancial intangible assets (except copyrighted works)	533	436 i	436 i	0	436 i	436 i	0
Other real estate and rental and leasing	other 53	72,916	59,988	12,928	72,899	59,971	12,928
Professional, scientific, and technical services	54	832,893	688,304	144,589	823,245	679,697	143,547
Architectural, engineering, and related services	5413	149,636	132,139	17,497	148,200	130,704	17,495
Computer systems design and related services	5415	329,074	261,257	67,817	326,242	258,600	67,642
Scientific research and development services	5417	161,139	121,831	39,309	160,232	121,106	39,126
Research and development in nanotechnology	541713	2,433	1,793	640	2,360	1,720	640

Table 8. Worldwide, domestic, and foreign sales for companies located in the United States that performed or funded R&D, by industry and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Sales					
		R&D performers or funders ^a			Domestic R&D performers ^b		
		Worldwide	Domestic	Foreign	Worldwide	Domestic	Foreign
Research and development in biotechnology (except nanobiotechnology)	541714	34,241	29,620	4,621	34,227	29,606	4,621
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	123,187	89,143	34,043	122,365	88,505	33,861
Research and development in the social sciences and humanities	541720	1,279	1,275	4	1,279	1,275	4
Other professional, scientific, and technical services	other 54	193,043	173,078	19,966	188,572	169,287	19,284
Health care services	621–23	119,140	116,565	2,575	119,117	116,542	2,575
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	997,353	942,927	54,426	995,116	940,744	54,372
All companies (number of domestic employees)	–	19,503,626	15,135,435	4,368,191	19,353,994	15,002,888	4,351,106
Small companies							
10–19 ^c	–	31,464	30,319	1,145	29,784	28,824	961
20–49	–	107,203	100,439	6,764	98,762	94,827	3,935
Medium companies							
50–99	–	144,700	129,288	15,412	141,694	127,002	14,692
100–249	–	323,814	302,493	21,321	314,575	295,607	18,968
Large companies							
250–499	–	444,547	394,434	50,113	438,565	388,591	49,974
500–999	–	650,074	573,710	76,363	637,456	561,400	76,056
1,000–4,999	–	2,794,732	2,186,331	608,401	2,757,460	2,159,611	597,849
5,000–9,999	–	2,012,730	1,536,232	476,498	1,957,402	1,480,904	476,498
10,000–24,999	–	4,138,113	2,862,457	1,275,656	4,122,049	2,846,392	1,275,656
25,000 or more	–	8,856,248	7,019,731	1,836,517	8,856,248	7,019,731	1,836,517

D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse.

NAICS = 2017 North American Industry Classification System.

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

^b Statistics are representative of companies located in the United States that performed domestic R&D.

^c The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):

Domestic sales are the amount of sales that originated from domestic operations. Foreign sales are the amount of sales that originated from foreign operations. Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 9. Worldwide, domestic, and foreign sales for companies located in the United States that performed or funded R&D, by business activity: 2024

(Millions of U.S. dollars)

Business activity ^a	Business code ^b	Sales		
		Worldwide	Domestic	Foreign
All business activities	21100–81000	19,503,626	15,135,435	4,368,191
Oil and gas extraction	21100	198,109	129,762	68,347
Mining	21200	11,733	11,575	157
Support activities for mining, including oil and gas	21300	64,928	42,900	22,027
Utilities	22100	421,651	414,946	6,705
Construction	23000	124,828	121,262	3,566
Food manufacturing	31100	973,868	755,290	218,578
Beverage manufacturing	31210	212,509	144,375	68,134
Tobacco manufacturing	31220	84,776	46,047	38,729
Textile, apparel, and leather products manufacturing	31990	89,813	57,165	32,648
Wood products manufacturing	32100	68,371	61,564	6,807
Paper manufacturing	32200	158,204	126,627	31,577
Printing and related support activities	32300	40,007	33,168	6,839
Petroleum refineries	32401	583,521	320,224	263,297
Asphalt paving, roofing, and saturated materials manufacturing	32402	21,677	21,133	545
Other petroleum and coal products manufacturing, including motor oil, hydraulic fluid, and charcoal	32403	12,969	11,559	1,410
Basic chemicals manufacturing	32510	290,892	201,186	89,706
Resin, synthetic rubber, and artificial synthetic fibers and filaments manufacturing	32520	112,507	66,632	45,875
Pesticide, fertilizer, and other agricultural chemicals manufacturing	32530	93,794	75,947	17,848
Pharmaceutical, medicinal, botanical, and biological products (except diagnostic substances) manufacturing	32541	899,307	704,655	194,652
In vitro diagnostic substances manufacturing	32542	22,677	15,125	7,551
Biotechnology-based pharmaceutical and biological products (except diagnostic substances)	32543	209,551	184,249	25,303
Soap, cleaning compound, and toilet preparations manufacturing	32591	177,575	106,854	70,722
Paint, adhesive, and other chemical manufacturing	32592	137,407	89,856	47,551
Plastics and rubber products manufacturing	32600	217,534	161,523	56,011
Clay and glass products manufacturing	32710	41,205	25,768	15,437
Cement, concrete, lime, gypsum, and other nonmetallic mineral products manufacturing	32790	51,166	45,511	5,655
Primary metal manufacturing	33100	173,708	155,107	18,602
Fabricated metal products manufacturing	33200	229,116	180,898	48,217
Agricultural machinery and equipment manufacturing	33311	74,986	48,374	26,613
Construction machinery manufacturing	33312	90,391	64,399	25,992
Mining, oil, and gas field machinery and equipment manufacturing	33319	62,573	33,881	28,692
Semiconductor machinery manufacturing	33321	81,546	28,511	53,035
Industrial machinery manufacturing (except semiconductor machinery)	33322	51,285	35,703	15,582
Photographic and photocopying equipment manufacturing	33331	1,142	976	166
Commercial, service industry, temperature control, and air-flow control machinery manufacturing	33332	161,322	123,617	37,705
Digital cameras manufacturing	33333	1,491	1,382	109
Engine, turbine, and power transmission equipment manufacturing	33360	146,751	81,769	64,982
Metalworking and other general purpose machinery manufacturing	33390	120,450	85,733	34,717
Computers and peripheral equipment manufacturing and magnetic and optical media	33412	550,275	222,097	328,178
Telephone apparatus manufacturing, including routers, modems, and gateways	33421	78,783	45,947	32,836
Radio, television, and wireless communication equipment manufacturing	33422	44,450	37,612	6,838
Other communication equipment manufacturing (except radio, television, and wireless communication equipment)	33429	17,702	12,699	5,002
Audio and video equipment manufacturing	33430	16,420	12,536	3,884

Table 9. Worldwide, domestic, and foreign sales for companies located in the United States that performed or funded R&D, by business activity: 2024

(Millions of U.S. dollars)

Business activity ^a	Business code ^b	Sales		
		Worldwide	Domestic	Foreign
Semiconductor and other electronic components manufacturing	33440	544,914	274,806	270,108
Electromedical, electrotherapeutic, and irradiation apparatus manufacturing	33451	51,990	35,658	16,331
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments manufacturing	33452	68,566	60,537	8,030
Measuring and control instruments manufacturing (not listed elsewhere)	33459	120,881	74,960	45,920
Electrical equipment, appliances, and components manufacturing	33500	213,046	165,182	47,864
Motor vehicles manufacturing	33610	954,746	787,033	167,712
Motor vehicle body and trailer manufacturing	33620	32,084	30,326	1,758
Motor vehicle parts manufacturing	33630	289,303	200,247	89,056
Aircraft manufacturing	33641	139,561	132,075	7,486
Aircraft engine and engine parts manufacturing	33642	81,043	45,630	35,413
Other aircraft parts and auxiliary equipment manufacturing	33643	92,401	76,950	15,451
Guided missiles, space vehicles, and related parts manufacturing	33644	79,793 i	62,189	17,604 i
Railroad rolling stock manufacturing	33651	15,497	9,660	5,837
Ship and boat building	33660	24,612	22,118	2,494
Motorcycle, bicycle, and parts manufacturing	33691	11,430	7,548	3,882
Military armored vehicle, tank, and tank components manufacturing	33692	8,908	8,081	827
All other transportation equipment manufacturing	33699	28,769	24,645	4,124
Furniture and related products manufacturing	33700	47,047	38,973	8,073
Medical equipment and supplies manufacturing	33910	409,051	280,178	128,874
Miscellaneous manufacturing not listed elsewhere (games, office supplies, slot machines, etc.)	33990	113,418	87,128	26,290
Merchant wholesalers, durable goods	42300	357,365	323,214	34,151
Merchant wholesalers, nondurable goods	42400	829,503	730,008	99,494
Wholesale electronic markets and agents and brokers (business to business)	42500	17,144	16,749	395
Retail trade (except electronic shopping and electronic auctions)	44000	864,333	818,546	45,787
Electronic shopping and electronic auctions	45411	355,453 i	331,313 i	24,140 i
Transportation	48000	360,506	267,627	92,879
Couriers, messengers, and express delivery services	49200	D	97,144	D
Warehousing and storage	49300	4,996	4,132	864
Newspaper, periodical, book, and directory publishers (except Internet)	51110	13,925	12,143 i	1,782
Software publishers (except Internet)	51120	361,733	218,910	142,824
Motion picture and sound recording (except Internet)	51200	D	1,235 i	D
Broadcasting (except Internet)	51500	159,090	126,432	32,657
Wired telecommunications carriers	51710	150,459	148,445	2,015
Wireless telecommunications carriers (except satellite)	51720	308,557	303,491	5,066
Satellite telecommunications	51740	13,446	12,105	1,341
Other telecommunications (not listed elsewhere)	51790	26,542	20,833	5,709
Data processing, hosting, and related services	51800	141,922	101,576	40,346
Cloud computing applications and Internet-based software services	51801	522,645	405,193	117,451
Other information services, including Internet publishing, broadcasting, and Web search portals	51910	516,997	265,612	251,385
Finance: banking and credit intermediation	52200	893,661	791,799	101,862
Securities, commodity contracts, and other financial investments and related activities, including funds and trusts	52310	228,930	178,240	50,690
Insurance carriers and related activities	52400	987,948	962,089	25,859 i
Real estate	53100	31,525	31,364	162
Rental and leasing services	53200	90,693	76,736	13,958
Lessors of nonfinancial intangible assets, including patent licensing	53300	11,859	10,252	1,607
Legal, accounting, tax preparation, bookkeeping, and payroll services	54111	53,165	48,435	4,730
Architectural, engineering, and related services	54130	125,636	109,625	16,011
Specialized design services	54140	2,053 r	2,032 r	21

Table 9. Worldwide, domestic, and foreign sales for companies located in the United States that performed or funded R&D, by business activity: 2024

(Millions of U.S. dollars)

Business activity ^a	Business code ^b	Sales		
		Worldwide	Domestic	Foreign
Computer systems design and related services	54150	298,464	252,793	45,671
Management, scientific, and technical consulting services	54160	103,398	83,448	19,950
Research and development services in the social sciences and humanities	54172	1,304	1,299	4
Research and development services in biotechnology	54173	17,335	13,603	3,732
Research and development services in the physical, engineering, and life sciences (except biotechnology)	54174	63,418	48,889	14,528
Research and development services in nanotechnology	54175	2,363	1,721	642
Advertising and related services	54180	D	198,914	D
Professional, scientific, and technical services (not listed elsewhere)	54190	51,760	43,893	7,867
Management of companies and enterprises	55100	15,969	15,893	76
Administrative and support services	56100	119,463	75,543	43,921
Waste management and remediation services	56200	3,998	3,316	681
Offices of physicians	62110	55,713	55,646	67
Medical and diagnostic laboratories	62150	36,760	31,965	4,795 i
Other ambulatory health care services (ambulance, dental, home health care)	62199	13,800	13,182	618
Hospitals and nursing care facilities	62200	36,137	36,037	100
Social assistance services	62400	121	121	0
Arts, entertainment, and recreation	71000	D	32,202 i	D
Accommodation and food services	72000	68,435	62,266	6,169
Other services (not listed elsewhere)	81000	401,797 i	363,800 i	37,996
Less: intersegment eliminations	–	266,080	184,445	81,635
Undistributed ^c	–	0	0	0

D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%.

^a Business activity data are tabulated independent of the industry classification of the company. Companies were asked to report their sales and R&D activity in one or more business activity codes.

^b Business codes and descriptions are based on 2017 North American Industry Classification System industry definitions.

^c Undistributed includes data reported that were not allocated to a business activity.

Note(s):

Domestic sales are the amount of sales that originated from domestic operations. Foreign sales are the amount of sales that originated from foreign operations. Detail may not add to total because of rounding. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 10. Domestic R&D paid for by the company and others and performed by the company, by type of cost, industry, and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Total	Salaries, wages, and fringe benefits	Stock-based compensation	Temporary staffing	Expensed equipment	Materials and supplies	Lease and rental payments	Depreciation	Royalties and licensing fees	Other purchased services (except R&D)	Other
All industries	21–23, 31–33, 42–81	765,082	405,761	93,505	30,007	12,579	47,252	13,019	31,920	4,363	30,199	96,476
Manufacturing industries	31–33	405,092	210,178	29,266	12,509	4,722	38,621	6,162	19,423	3,366	17,618	63,228
Food	311	6,288 i	3,594	68 i	318	19	1,052	155	297	8	137	640
Beverage and tobacco products	312	1,459	818	14	32	1	81	5	78	*	178	252
Textile, apparel, and leather products	313–16	788	549	11 i	20	3	79	8	18	1	21	78
Wood products	321	267	224	* i	5	2	23	*	*	*	D	D
Paper	322	1,240	550	1 i	2	61	499	4	14	1	D	D
Printing and related support activities	323	255	175 i	1 i	8 i	2 i	16 i	1	9 i	*	12 i	30 i
Petroleum and coal products	324	1,006	432	1	39	1	59	3	26	30	D	D
Chemicals	325	143,745	63,544	8,763	7,171	1,092	12,704	2,776	5,094	1,178	11,082	30,340
Basic chemicals	3251	3,120	1,779	69	77	24	314	75	201	D	171	D
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	1,354	946	*	49	1	100	21	111 i	25	69	31
Pesticide, fertilizer, and other agricultural chemicals	3253	1,253	679	5 i	58	5 i	150 i	77	86	D	52 i	D
Pharmaceuticals and medicines	3254	133,627	57,243	8,674	6,907	1,047	11,907	2,554	4,553	1,125	10,695	28,922
Soap, cleaning compound, and toilet preparations	3256	2,956	1,827	15	67	7	153	24	91	D	46	D
Paint, coating, adhesive, and other chemicals	3255, 3259	1,435	1,070	*	14	9	79	25	52	6 i	49	132
Plastics and rubber products	326	2,908	1,737	6	56	117 i	334	22	108	6	75	448
Nonmetallic mineral products	327	1,578 i	1,128 i	20	22 i	9 i	81 i	14 i	85 i	1	64 i	153 i
Primary metals	331	1,174	481	4	24	11	447	2	28	5	91	80
Fabricated metal products	332	3,230	2,094	184	83	22	379	32	110	25	136	164
Machinery	333	22,035	13,124	633	909	193	2,422	203	911	78	779	2,783
Agricultural implement	33311	2,561	1,466	D	88	5	276	12	134	*	D	D
Semiconductor machinery	333242	6,851	3,687	564	46	33	623	109	382	1	D	D
Engine, turbine, and power transmission equipment	3336	4,230	2,616	D	496	36	295 i	10	179	1	231	D
Other machinery	other 333	8,394	5,355	D	279	120	1,228	73	216	76	205	D
Computer and electronic products	334	115,599	62,713	16,638	1,545	2,184	9,274	1,740	7,805	1,287	1,789	10,624
Communications equipment	3342	12,839	7,306	1,514	274	251	288	940	359	13	129	1,763
Semiconductor and other electronic components	3344	52,358	28,425	7,518	774	409	4,718	369	4,138	1,144	847	4,015
Navigational, measuring, electromedical, and control instruments	3345	14,083	8,067	516	200	159	1,907	120	336	35	507	2,235
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	3,245	1,905	218	43	7	235	41	72	9	176	539
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	6,161	3,058	204	65	46	1,242	42	131	18	217	1,139
Other measuring and controlling devices	other 3345	4,677	3,105	94	92	106	431	37	133	9	113	557
Other computer and electronic products	other 334	36,318	18,914	7,089	297	1,366	2,360	311	2,972	94	306	2,610

Table 10. Domestic R&D paid for by the company and others and performed by the company, by type of cost, industry, and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Total	Salaries, wages, and fringe benefits	Stock-based compensation	Temporary staffing	Expensed equipment	Materials and supplies	Lease and rental payments	Depreciation	Royalties and licensing fees	Other purchased services (except R&D)	Other
Electrical equipment, appliances, and components	335	6,999	4,181	448	253	79	484	199	229	154	154	818
Transportation equipment	336	71,231	40,196	1,534	1,206	587	8,706	660	3,915	549	1,743	12,136
Motor vehicles, bodies, trailers, and parts	3361-63	31,812	17,961	1,398	702	349	3,452	468	3,341	487	574	3,079
Aerospace products and parts	3364	35,904	20,034	129	442	203	4,751	148	486	35	1,083	8,594
Aircraft, aircraft engine, and aircraft parts	336411-13	D	13,346	122	250	132	4,042	33	D	D	882	D
Guided missile, space vehicle, and related parts	336414-15, 336419	D	6,688	7	192	72	708	115	D	D	201	D
Military armored vehicle, tank, and tank components	336992	33	20	0	1	5	7	0	*	0	*	1
Other transportation	other 336	3,481	2,182	7	60	29	497	43	88	27	86	462
Furniture and related products	337	450	311	2	8	18	42	4	9	1	13	42
Miscellaneous	339	24,840	14,327	938	809	321	1,939	334	687	41	1,003	4,442
Medical equipment and supplies	3391	22,126	12,413	882	750	269	1,755	271	641	38	941	4,165
Other miscellaneous manufacturing	3399	2,715	1,914	56	58	51	184	63	46	3	62	277
Nonmanufacturing industries	21-23, 42-81	359,990	195,583	64,239	17,498	7,857	8,631	6,858	12,497	997	12,581	33,248
Mining, quarrying, oil and gas extraction, and support activities	21	1,862	961	9	58	57	257	13	110	3	97	297
Utilities	22	613	511	*	39	4	14	*	13	*	11	22
Wholesale trade	42	1,692	1,219	*	98	21	122	12	29	3	44	143
Electronic shopping and electronic auctions	454111-12	7,898	5,659	1,242	46	134	9	32	97	5	40	631
Transportation and warehousing	48-49	11,341	5,527	1,133	222	358	906	321	831	174	324	1,545
Information	51	228,174	114,009	55,643	12,483	5,805	2,216	4,855	7,734	557	8,230	16,641
Publishing	511	63,596	36,622	12,591	2,551	831	1,447	303	684	85	2,456	6,028
Newspaper, periodical, book, and directory publishers	5111	489	332	0	123	0	0	0	*	0	15	18
Software publishers	5112	63,108	36,290	12,591	2,427	831	1,447	303	684	85	2,441	6,009
Telecommunications	517	3,323	2,482	34	573	13	23	89	18	3	D	D
Data processing, hosting, and related services	518	58,772	33,301	12,013	1,397	615	528	804	1,478	366	3,028	5,240
Other information	other 51	102,484	41,604	31,006	7,962	4,347	217	3,660	5,554	103	D	D
Finance and insurance	52	25,463	19,405	1,463	1,759	458	81	218	1,148	13	175	743
Real estate and rental and leasing	53	2,750	1,231	1,093	98	42	5	4	47	*	29	201
Lessors of nonfinancial intangible assets (except copyrighted works)	533	23	14	*	*	*	1	0	4	0	1	2
Other real estate and rental and leasing	other 53	2,727	1,217	1,093	98	42	4	4	43	*	28	199
Professional, scientific, and technical services	54	74,548	43,231	3,252	2,412	914	4,778	1,272	2,385	199	3,450	12,655
Architectural, engineering, and related services	5413	3,893	2,856	7	140	60	208	43	36	3	60	481
Computer systems design and related services	5415	26,764	16,713	1,764	918	250	502	424	625	36	649	4,882
Scientific research and development services	5417	33,942	17,334	383	861	427	3,711	759	1,477	54	2,570	6,367
Research and development in nanotechnology	541713	548	283	13	20	13	97	12	31	1	13	65

Table 10. Domestic R&D paid for by the company and others and performed by the company, by type of cost, industry, and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Total	Salaries, wages, and fringe benefits	Stock-based compensation	Temporary staffing	Expensed equipment	Materials and supplies	Lease and rental payments	Depreciation	Royalties and licensing fees	Other purchased services (except R&D)	Other
Research and development in biotechnology (except nanobiotechnology)	541714	6,751	3,279	90	178	41	876	124	242	12	1,037	871
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	25,931	13,389	255	638	367	2,736	619	1,198	41	1,520	5,169
Research and development in the social sciences and humanities	541720	712	383	26	26	6	2	3	5	*	*	262
Other professional, scientific, and technical services	other 54	9,949	6,327	1,097	493	176	357	47	248	106	171	926
Health care services	621–23	2,020	1,050	226	70	36	155	44	81	31	99	228
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	3,628	2,780	177	213	29	88	85	22	12	81	142
All companies (number of domestic employees)	–	765,082	405,761	93,505	30,007	12,579	47,252	13,019	31,920	4,363	30,199	96,476
Small companies												
10–19 ^a	–	4,790	3,130	96	196	39	347	153	75	24	211	518
20–49	–	16,179	8,760	275	535	153	1,411	336	880	102	2,318	1,409
Medium companies												
50–99	–	17,078	10,366	735	593	159	1,534	373	373	89	1,185	1,672
100–249	–	29,325	17,162	1,712	1,070	308	2,240	788	808	188	1,370	3,679
Large companies												
250–499	–	28,852	16,269	2,096	972	318	1,827	551	873	165	1,229	4,552
500–999	–	44,697	20,038	6,278	1,512	552	2,630	1,978	1,244	269	3,817	6,378
1,000–4,999	–	123,813	66,910	18,340	3,695	1,355	6,244	1,814	3,474	715	5,480	15,784
5,000–9,999	–	62,950	35,932	5,930	1,637	738	3,817	889	3,157	381	2,003	8,466
10,000–24,999	–	140,348	73,109	13,362	5,358	1,968	10,513	1,732	5,747	1,049	6,486	21,024
25,000 or more	–	297,050	154,086	44,682	14,437	6,990	16,689	4,406	15,289	1,379	6,099	32,994

* = amount < \$500,000; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse.

NAICS = 2017 North American Industry Classification System.

^a The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):
Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D.

Source(s):
National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 11. Domestic R&D paid for by the company and others and performed by the company, by industry and company size: 2024

(Millions of U.S. dollars)

Industry	NAICS code	Company size (domestic employees)										
		All companies	10–19 ^a	20–49	50–99	100–249	250–499	500–999	1,000–4,999	5,000–9,999	10,000–24,999	25,000 or more
All industries	21–23, 31–33, 42–81	765,082	4,790	16,179	17,078	29,325	28,852	44,697	123,813	62,950	140,348	297,050
Manufacturing industries	31–33	405,092	1,623	6,336	9,905	16,369	16,967	17,777	61,779	36,830	95,296	142,209
Food	311	6,288 i	4	101	115	278	329	398	1,028	1,589 i	1,513 i	932 i
Beverage and tobacco products	312	1,459	20 r	8	16	28	32	14	193	384	65	698
Textile, apparel, and leather products	313–16	788	0	67 r	11	44	51	32	230	279	74	0
Wood products	321	267	0	4	4	14	8 i	20	38	105	74	0
Paper	322	1,240	0	1 r	4	57	27	96	74	381	355	245
Printing and related support activities	323	255	3	5	15	33	10	16	93	70 i	10	0
Petroleum and coal products	324	1,006	0	D	D	15	12	75	98	2	731	D
Chemicals	325	143,745	882	3,172	6,142	10,136	9,535	7,085	24,802	7,552	47,621	26,817
Basic chemicals	3251	3,120	25 r	25	149	153	407	213	1,148	531	468	0
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	1,354	6	19 r	35	60	62	129	135 i	0	908	0
Pesticide, fertilizer, and other agricultural chemicals	3253	1,253	2	34	D	15	102	0	594	D	D	0
Pharmaceuticals and medicines	3254	133,627	811	3,027	5,853	9,691	8,766	6,611	22,360	6,256	44,858	25,394
Soap, cleaning compound, and toilet preparations	3256	2,956	4 r	10	23	104	36	15	246	541 i	709	1,268
Paint, coating, adhesive, and other chemicals	3255, 3259	1,435	33	58	D	112	162	117	318	D	D	155
Plastics and rubber products	326	2,908	1 r	68	85	161	174	191	687	627	693	222
Nonmetallic mineral products	327	1,578 i	9	D	30	41	44	55	160	254	D	0
Primary metals	331	1,174	15 r	13	36	33	20	18	339	194	507	0
Fabricated metal products	332	3,230	31	256	213	416	259	371	1,119	234	318	14
Machinery	333	22,035	105	578	628	744	839	777	3,168	4,549	5,902	4,745
Agricultural implement	33311	2,561	10	20	13	105	34	36	235	D	D	D
Semiconductor machinery	333242	6,851	*	26	68	57	D	204	1,031	D	D	0
Engine, turbine, and power transmission equipment	3336	4,230	4 r	26 r	6	12	54	44	128	D	D	2,890
Other machinery	other 333	8,394	91	506	541	569	D	493	1,773	D	1,988	D
Computer and electronic products	334	115,599	277	906	1,141	2,267	3,276	2,946	19,120	9,704	27,161	48,800
Communications equipment	3342	12,839	52	173	202 r	304	D	D	3,389	D	D	D
Semiconductor and other electronic components	3344	52,358	88	268	434	866	2,042	1,695	7,829	4,304	22,378	12,452
Navigational, measuring, electromedical, and control instruments	3345	14,083	114	422	446	973	827	479	3,905	2,354	1,274	3,290
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	3,245	50	199	139	290	475	233	276	1,224	361	0
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	6,161	14	47	96	335	61	29	2,040	250	0	3,290
Other measuring and controlling devices	other 3345	4,677	50	177	211	349	291	217	1,590	880	913	0
Other computer and electronic products	other 334	36,318	23	43	59	124	D	D	3,997	D	D	D
Electrical equipment, appliances, and components	335	6,999	65	87	309	513	568	1,175	2,443	611	863	366 i
Transportation equipment	336	71,231	57	189	495	566	556	3,011	3,752	5,689	4,403	52,513
Motor vehicles, bodies, trailers, and parts	3361–63	31,812	D	91	D	287	343	1,907	1,805	4,587	3,321	D

Table 11. Domestic R&D paid for by the company and others and performed by the company, by industry and company size: 2024

(Millions of U.S. dollars)

Industry	NAICS code	Company size (domestic employees)										
		All companies	10–19 ^a	20–49	50–99	100–249	250–499	500–999	1,000–4,999	5,000–9,999	10,000–24,999	25,000 or more
Aerospace products and parts	3364	35,904	D	68	289	194	134	990	1,706	639 i	D	30,961 i
Aircraft, aircraft engine, and aircraft parts	336411–13	D	8	D	D	D	D	656	1,307	639 i	D	D
Guided missile, space vehicle, and related parts	336414–15, 336419	D	D	D	D	D	D	334	399	0	0	D
Military armored vehicle, tank, and tank components	336992	33	0	0	14	*	12	8	0	0	0	0
Other transportation	other 336	3,481	D	30	D	86	67	107	241	463 i	D	D
Furniture and related products	337	450	2	5	16	30	49	30	97	143	78	0
Miscellaneous	339	24,840	151	D	D	991	1,178	1,468	4,339	4,462	D	D
Medical equipment and supplies	3391	22,126	147	824 r	544	650	824	1,224	3,105	4,426	3,712	6,669
Other miscellaneous manufacturing	3399	2,715	4	D	D	342	354	244	1,234	35	D	D
Nonmanufacturing industries	21–23, 42–81	359,990	3,167	9,842	7,173	12,957	11,885	26,920	62,033	26,120	45,052	154,841
Mining, quarrying, oil and gas extraction, and support activities	21	1,862	6	30	70	27	175	606 i	155	84	710	0
Utilities	22	613	1	24 r	0	0	2	8	150	12	397	20
Wholesale trade	42	1,692 i	89	237	213 i	352 i	343 i	193 i	167 i	55 i	43 i	0
Electronic shopping and electronic auctions	454111–12	7,898 i	1 r	15	7	46	124	6	353 i	D	0	D
Transportation and warehousing	48–49	11,341	0	*	467 r	7	85	131	1,121	3,328	5,469 i	731
Information	51	228,174	945	4,780	2,159	5,808	5,675	16,430	38,765	12,208	18,990	122,413
Publishing	511	63,596	526	1,034	867	2,473	1,511	2,065	12,039	2,837	13,788	26,456
Newspaper, periodical, book, and directory publishers	5111	489 i	* i	* i	8 i	9 i	5 i	0	467 i	0	0	0
Software publishers	5112	63,108	525	1,034	860	2,464	1,506	2,065	11,573	2,837	13,788	26,456
Telecommunications	517	3,323	2 r	D	D	140	134	190	D	D	41	D
Data processing, hosting, and related services	518	58,772	411	3,586	1,154	2,780	3,618	4,985	21,324	3,260	5,162 i	12,492
Other information	other 51	102,484	7	D	D	415	412	9,190	D	D	0	D
Finance and insurance	52	25,463	23	17	14	643	886	569	7,246	4,464 i	3,106	8,494
Real estate and rental and leasing	53	2,750	3	21	45	30	15	83	2,439	7	0	109
Lessors of nonfinancial intangible assets (except copyrighted works)	533	23	0	0	23	* i	0	*	0	0	0	0
Other real estate and rental and leasing	other 53	2,727	3	21	22	29	15	83	2,439	7	0	109
Professional, scientific, and technical services	54	74,548	2,087	4,567	4,008	5,611	4,171	8,438	9,742	3,668	16,041	16,214 i
Architectural, engineering, and related services	5413	3,893	221	392	415	607	629	584 r	576	360	109	0
Computer systems design and related services	5415	26,764	548	1,727	1,843	2,296	1,464	5,288	3,265	339	2,992	7,001
Scientific research and development services	5417	33,942	1,176	1,991	1,488	1,970	1,252	1,843	5,164 i	2,308	10,058	6,691 i
Research and development in nanotechnology	541713	548	32	102	132	0	6	266	11	0	0	0
Research and development in biotechnology (except nanobiotechnology)	541714	6,751	380	453	299	425	152	513	323 i	1,666	554	1,985
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	25,931	763	1,421	1,057	1,502	1,090	1,064	4,825 i	0	9,504	4,706 i
Research and development in the social sciences and humanities	541720	712	2	15	0	43	5	0	6	642	0	0
Other professional, scientific, and technical services	other 54	9,949 i	141	457	262	738	827	723	736	661	2,882 i	2,521 i
Health care services	621–23	2,020	5	77	78	181	83	127	1,286	18	*	166

Table 11. Domestic R&D paid for by the company and others and performed by the company, by industry and company size: 2024

(Millions of U.S. dollars)

Industry	NAICS code	Company size (domestic employees)																				
		All companies	10–19 ^a		20–49		50–99		100–249		250–499		500–999		1,000–4,999		5,000–9,999		10,000–24,999		25,000 or more	
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	3,628		7		75		113		251		325		329		610		D		294		D

* = amount < \$500,000; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%.

NAICS = 2017 North American Industry Classification System.

^a The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):
Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D.

Source(s):
National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 12. Domestic R&D paid for by the company and others and performed by the company, by type of R&D, industry, and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Total	Basic research	Applied research	Development
All industries	21–23, 31–33, 42–81	765,082	40,530	116,358	608,194
Manufacturing industries	31–33	405,092	24,254	71,944	308,894
Food	311	6,288 i	357	1,369	4,561
Beverage and tobacco products	312	1,459	182	192	1,085
Textile, apparel, and leather products	313–16	788	68	66	654
Wood products	321	267	88	30	149
Paper	322	1,240	22	321	896
Printing and related support activities	323	255	51	39	165
Petroleum and coal products	324	1,006	168	309	530
Chemicals	325	143,745	13,729	35,020	94,996
Basic chemicals	3251	3,120	467	751	1,902
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	1,354	262	346	746
Pesticide, fertilizer, and other agricultural chemicals	3253	1,253	152	273	827
Pharmaceuticals and medicines	3254	133,627	12,631	32,751	88,245
Soap, cleaning compound, and toilet preparations	3256	2,956	78	495	2,383
Paint, coating, adhesive, and other chemicals	3255, 3259	1,435	139	404	893
Plastics and rubber products	326	2,908	184	476	2,248
Nonmetallic mineral products	327	1,578 i	213 i	340 i	1,025 i
Primary metals	331	1,174	116	168	890
Fabricated metal products	332	3,230	291	483	2,456
Machinery	333	22,035	1,108	3,350	17,578
Agricultural implement	33311	2,561	126	174	2,261
Semiconductor machinery	333242	6,851	238	880	5,733
Engine, turbine, and power transmission equipment	3336	4,230	88	830	3,311
Other machinery	other 333	8,394	656	1,465	6,272
Computer and electronic products	334	115,599	3,759	13,392	98,448
Communications equipment	3342	12,839	450 i	1,105	11,285
Semiconductor and other electronic components	3344	52,358	1,909 i	3,931 i	46,519 i
Navigational, measuring, electromedical, and control instruments	3345	14,083	521	2,674	10,889
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	3,245	83 i	949 i	2,213 i
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	6,161	170	917	5,074
Other measuring and controlling devices	other 3345	4,677	268	808	3,602
Other computer and electronic products	other 334	36,318	880	5,683	29,755
Electrical equipment, appliances, and components	335	6,999	409	1,078	5,512
Transportation equipment	336	71,231	2,593 i	11,764	56,875
Motor vehicles, bodies, trailers, and parts	3361–63	31,812	748	3,409	27,655
Aerospace products and parts	3364	35,904	1,745 i	8,007	26,152
Aircraft, aircraft engine, and aircraft parts	336411–13	D	D	D	18,926
Guided missile, space vehicle, and related parts	336414–15, 336419	D	D	D	7,226
Military armored vehicle, tank, and tank components	336992	33	2	2	30
Other transportation	other 336	3,481	97	346	3,038
Furniture and related products	337	450	41	57	352
Miscellaneous	339	24,840	876	3,490	20,474
Medical equipment and supplies	3391	22,126	559	3,281	18,286
Other miscellaneous manufacturing	3399	2,715	317	209	2,189
Nonmanufacturing industries	21–23, 42–81	359,990	16,276	44,414	299,300
Mining, quarrying, oil and gas extraction, and support activities	21	1,862	63	120	1,679
Utilities	22	613	20	150 i	443 i
Wholesale trade	42	1,692 i	D	D	1,208 i

Table 12. Domestic R&D paid for by the company and others and performed by the company, by type of R&D, industry, and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Total	Basic research	Applied research	Development
Electronic shopping and electronic auctions	454111–12	7,898 i	56 i	3,450 i	4,392 i
Transportation and warehousing	48–49	11,341	170	1,075	10,095
Information	51	228,174	8,688	14,132	205,354
Publishing	511	63,596	2,001	3,146	58,449
Newspaper, periodical, book, and directory publishers	5111	489 i	1 i	2 i	485 i
Software publishers	5112	63,108	2,000	3,144	57,964
Telecommunications	517	3,323	248	606	2,468
Data processing, hosting, and related services	518	58,772	2,291	6,119	50,361
Other information	other 51	102,484	4,147	4,261	94,076
Finance and insurance	52	25,463	1,289	4,149	20,025
Real estate and rental and leasing	53	2,750	123	994	1,633
Lessors of nonfinancial intangible assets (except copyrighted works)	533	23	0	*	23
Other real estate and rental and leasing	other 53	2,727	123	994	1,610
Professional, scientific, and technical services	54	74,548	5,052	19,449	50,047
Architectural, engineering, and related services	5413	3,893	228	980	2,685
Computer systems design and related services	5415	26,764	1,668	6,441	18,655
Scientific research and development services	5417	33,942	2,398	10,044	21,500 i
Research and development in nanotechnology	541713	548	7	332	209
Research and development in biotechnology (except nanobiotechnology)	541714	6,751	802	1,089	4,859 i
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	25,931	934	8,596 i	16,402 i
Research and development in the social sciences and humanities	541720	712	655	27 i	30 i
Other professional, scientific, and technical services	other 54	9,949 i	758 i	1,984 i	7,207 i
Health care services	621–23	2,020	256	228	1,536
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	3,628	D	D	2,888
All companies (number of domestic employees)	–	765,082	40,530	116,358	608,194
Small companies					
10–19 ^a	–	4,790	436	1,219	3,134
20–49	–	16,179	1,325	3,750	11,104
Medium companies					
50–99	–	17,078	1,493	4,105	11,479
100–249	–	29,325	2,757	6,314	20,254
Large companies					
250–499	–	28,852	2,995	5,982	19,875
500–999	–	44,697	5,668	8,653	30,376
1,000–4,999	–	123,813	8,146	18,722	96,945
5,000–9,999	–	62,950	2,938	9,678	50,334
10,000–24,999	–	140,348	7,472	26,556	106,321
25,000 or more	–	297,050	7,300	31,379	258,371

* = amount < \$500,000; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse.

NAICS = 2017 North American Industry Classification System.

^a The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):

Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 13. Domestic R&D paid for by the company and others and performed by the company, by source of funds and state: 2024

(Millions of U.S. dollars)

State	Total	Paid for by the company	Paid for by others		
			Total	Federal	Nonfederal
All states	765,082	679,371	85,711	30,995	54,716
Alabama	4,934 i	2,412	2,523 i	2,442 i	81
Alaska	80	73	7	4	3
Arizona	9,762	7,649	2,114	1,182	932
Arkansas	719	633	86	37 i	49
California	257,566	243,582	13,984	4,984 i	9,000
Colorado	11,675	9,175	2,501 i	2,076 i	424
Connecticut	10,021	7,360	2,661	2,207	453
Delaware	8,345	6,204	2,141	6	2,135
District of Columbia	1,202	1,092	110	90	20
Florida	14,355	10,815	3,540 i	1,404 i	2,137 i
Georgia	10,506	9,208	1,298	348 i	950
Hawaii	372	346	27	22	5
Idaho	3,458	3,190	267	6 i	261
Illinois	20,761	19,566	1,194	238	957
Indiana	17,761	14,745	3,016	334	2,682 i
Iowa	4,757	4,249	508	7	501
Kansas	2,285	1,950	334	11	324
Kentucky	1,389	998	391 i	12	378
Louisiana	722	624	98	64	34
Maine	703	616	87	69	18
Maryland	9,468	6,149	3,318	2,224	1,094
Massachusetts	54,044	47,870	6,174	1,318	4,855
Michigan	25,628	23,226	2,401	201	2,201
Minnesota	9,433	8,536	898	219	679
Mississippi	547	472	75	40	34
Missouri	5,872	5,498	375 i	198 i	176 i
Montana	444	395	49	24 i	24
Nebraska	2,502	2,441	61	6	55
Nevada	2,905	2,554	351	26	324
New Hampshire	4,197	2,043	2,154	1,823	330
New Jersey	24,973	20,872	4,101	733 i	3,368
New Mexico	1,032	855	177	144	33
New York	39,007	36,658	2,349	404	1,945
North Carolina	19,178	14,076	5,103	157	4,946
North Dakota	597	574	23	2	21
Ohio	13,865	10,313	3,552	1,030	2,522
Oklahoma	2,659	2,569	90	52	38
Oregon	11,189	10,887	302	52	250
Pennsylvania	20,601	17,963	2,637 i	420	2,217 i
Rhode Island	700	652	48	33	15
South Carolina	3,606	3,278	329	108	221
South Dakota	298	261	37	4 i	33
Tennessee	4,571	3,391	1,180 i	80	1,100 i
Texas	41,538	34,206	7,332 i	3,558 i	3,774 i
Utah	4,709	4,504	204	37	168
Vermont	805	773	33	12	21
Virginia	9,883	7,345	2,538	1,935	604 i
Washington	59,099	57,853	1,245	470	775
West Virginia	445	392	53	33	20
Wisconsin	9,163	7,582	1,581 i	100	1,480 i
Wyoming	74	71	3	2	2

Table 13. Domestic R&D paid for by the company and others and performed by the company, by source of funds and state: 2024
(Millions of U.S. dollars)

State	Total		Paid for by the company		Paid for by others				
					Total		Federal		Nonfederal
Undistributed ^a	675		623		52		9		43

i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse.

^a Undistributed includes data reported that were not allocated to a specific state by multi-establishment companies. For single-establishment companies, data reported were allocated to the state in the address used to mail the survey form.

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 \$50,000 or more of R&D.

Source(s):
National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 14. Domestic R&D paid for by the company and others and performed by the company, by industry, company size, and domestic R&D program size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	R&D program size					
		All companies	Less than \$1 million	\$1 million–\$9.999 million	\$10 million–\$49.999 million	\$50 million–\$99.999 million	\$100 million or more
All industries	21–23, 31–33, 42–81	765,082	4,687	33,211	50,612	36,345	640,228
Manufacturing industries	31–33	405,092	2,217	14,554	25,214	22,715	340,391
Food	311	6,288 i	164	878	901	840	3,505 i
Beverage and tobacco products	312	1,459	47	92	67	438	815
Textile, apparel, and leather products	313–16	788	24	244	236	138	147
Wood products	321	267	14	112	141	0	0
Paper	322	1,240	9	100	201	61	868
Printing and related support activities	323	255	18	96	54 i	86	0
Petroleum and coal products	324	1,006	D	64	164	D	D
Chemicals	325	143,745	303	2,795	10,319	9,056	121,273
Basic chemicals	3251	3,120	71	385	627	688	1,349
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	1,354	23 i	192	171	60 i	908
Pesticide, fertilizer, and other agricultural chemicals	3253	1,253	9	73	182	0	989
Pharmaceuticals and medicines	3254	133,627	79	1,583	8,941	8,024	114,999
Soap, cleaning compound, and toilet preparations	3256	2,956	37	176	108	105	2,529
Paint, coating, adhesive, and other chemicals	3255, 3259	1,435	85	386	289	179	497
Plastics and rubber products	326	2,908	154	594	512	398	1,250
Nonmetallic mineral products	327	1,578 i	43	146	232	0	1,157 i
Primary metals	331	1,174	26	180	304	61	602
Fabricated metal products	332	3,230	335	1,171	415	582	728
Machinery	333	22,035	349	1,977	1,915	1,865	15,929
Agricultural implement	33311	2,561	D	138	74	D	2,159
Semiconductor machinery	333242	6,851	3	60	141	138	6,509
Engine, turbine, and power transmission equipment	3336	4,230	D	64	189	D	3,902
Other machinery	other 333	8,394	D	1,714	1,511	D	3,359
Computer and electronic products	334	115,599	297	2,284	3,521	3,410	106,086
Communications equipment	3342	12,839	38	512	458	481	11,351
Semiconductor and other electronic components	3344	52,358	73	625	1,027	1,313	49,320
Navigational, measuring, electromedical, and control instruments	3345	14,083	157	962	1,603	1,281	10,080
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	3,245	33	278	565	464	1,905
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	6,161	15	114	427	284	5,321
Other measuring and controlling devices	other 3345	4,677	109	571	610	533	2,854
Other computer and electronic products	other 334	36,318	29	185	434	335	35,336
Electrical equipment, appliances, and components	335	6,999	54	487	1,221	1,280	3,957
Transportation equipment	336	71,231	195	1,236	2,443	1,728	65,629
Motor vehicles, bodies, trailers, and parts	3361–63	31,812	130	653	1,502	1,140	28,387
Aerospace products and parts	3364	35,904	33	342	744	360	34,426
Aircraft, aircraft engine, and aircraft parts	336411–13	D	30	D	617	360	24,547 i
Guided missile, space vehicle, and related parts	336414–15, 336419	D	3	D	127	0	9,878
Military armored vehicle, tank, and tank components	336992	33	1 i	33	0	0	0

Table 14. Domestic R&D paid for by the company and others and performed by the company, by industry, company size, and domestic R&D program size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	R&D program size					
		All companies	Less than \$1 million	\$1 million–\$9.999 million	\$10 million–\$49.999 million	\$50 million–\$99.999 million	\$100 million or more
Other transportation	other 336	3,481	31	209	197	228	2,817
Furniture and related products	337	450	27	123	158	142	0
Miscellaneous	339	24,840	D	1,974	2,407	D	D
Medical equipment and supplies	3391	22,126	92	1,527	1,887	1,794	16,825
Other miscellaneous manufacturing	3399	2,715	D	447	519	D	D
Nonmanufacturing industries	21–23, 42–81	359,990	2,469	18,657	25,398	13,630	299,836
Mining, quarrying, oil and gas extraction, and support activities	21	1,862	9	79	274	165	1,336
Utilities	22	613	4	86	113	108	302
Wholesale trade	42	1,692	i 335	1,116	i 241	i 0	0
Electronic shopping and electronic auctions	454111–12	7,898	i D	85	164	D	7,546 i
Transportation and warehousing	48–49	11,341	D	559	r 222	D	10,410
Information	51	228,174	475	6,248	11,909	6,713	202,829
Publishing	511	63,596	293	2,633	3,583	1,785	55,303
Newspaper, periodical, book, and directory publishers	5111	489	i 6 i	23	0	460	i 0
Software publishers	5112	63,108	287	2,610	3,583	1,326	55,303
Telecommunications	517	3,323	25	219	431	162	2,486
Data processing, hosting, and related services	518	58,772	153	3,113	7,149	4,267	44,090
Other information	other 51	102,484	5	283	747	498	100,951
Finance and insurance	52	25,463	9	437	1,048	969	23,001
Real estate and rental and leasing	53	2,750	10	r 81	118	278	2,263
Lessors of nonfinancial intangible assets (except copyrighted works)	533	23	1 i	0	23	0	0
Other real estate and rental and leasing	other 53	2,727	10 r	81	96	278	2,263
Professional, scientific, and technical services	54	74,548	1,484	8,938	9,863	4,320	49,944
Architectural, engineering, and related services	5413	3,893	615	1,259	1,216	463	340
Computer systems design and related services	5415	26,764	559	3,686	4,179	1,568	16,771
Scientific research and development services	5417	33,942	126	2,989	2,947	1,740	26,140
Research and development in nanotechnology	541713	548	5	136	144	0	264
Research and development in biotechnology (except nanobiotechnology)	541714	6,751	30	792	648	372	4,909
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	25,931	88	2,036	2,113	1,368	20,326 i
Research and development in the social sciences and humanities	541720	712	3	25	43	0	642
Other professional, scientific, and technical services	other 54	9,949	i 183	1,003	1,521	549	6,693 i
Health care services	621–23	2,020	49	249	387	373	963
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	3,628	D	780	1,058	D	1,242
All companies (number of domestic employees)	–	765,082	4,687	33,211	50,612	36,345	640,228
Small companies							
10–19 ^a	–	4,790	1,084	3,277	429	0	0
20–49	–	16,179	1,544	8,165	3,699	353	2,418 i
Medium companies							
50–99	–	17,078	756	6,289	7,320	1,916	796

Table 14. Domestic R&D paid for by the company and others and performed by the company, by industry, company size, and domestic R&D program size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	R&D program size					
		All companies	Less than \$1 million	\$1 million–\$9.999 million	\$10 million–\$49.999 million	\$50 million–\$99.999 million	\$100 million or more
100–249	–	29,325	620	6,851	10,633	7,099	4,123
Large companies							
250–499	–	28,852	194	3,606	8,809	4,836	11,407
500–999	–	44,697	412	2,401	6,801	6,185	28,898
1,000–4,999	–	123,813	65	2,119	9,394	10,347	101,887
5,000–9,999	–	62,950	3	238	1,997	2,657	58,055
10,000–24,999	–	140,348	3	187	1,025	2,130	137,003
25,000 or more	–	297,050	5	78	504	821	295,641

D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%.

NAICS = 2017 North American Industry Classification System.

^a The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):

Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D. R&D program size classifications are based on R&D performance.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 15. Domestic R&D paid for by the company and others and performed by the company, by business activity: 2024

(Millions of U.S. dollars)

Business activity ^a	Business code ^b	Total	Paid for by the company	Paid for by others
All business activities	21100–81000	765,082	679,371	85,711
Oil and gas extraction	21100	639	614	25 i
Mining	21200	110	110	*
Support activities for mining, including oil and gas	21300	1,158	515	642
Utilities	22100	D	618	D
Construction	23000	733	705	27
Food manufacturing	31100	6,291	6,069	222
Beverage manufacturing	31210	912	912	*
Tobacco manufacturing	31220	232	232	0
Textile, apparel, and leather products manufacturing	31990	743	737	6
Wood products manufacturing	32100	363	356	6
Paper manufacturing	32200	1,469	1,468	1
Printing and related support activities	32300	420	419	2
Petroleum refineries	32401	531	530	1
Asphalt paving, roofing, and saturated materials manufacturing	32402	141	141	0
Other petroleum and coal products manufacturing, including motor oil, hydraulic fluid, and charcoal	32403	122	122	* i
Basic chemicals manufacturing	32510	3,345	3,154	192
Resin, synthetic rubber, and artificial synthetic fibers and filaments manufacturing	32520	D	1,143	D
Pesticide, fertilizer, and other agricultural chemicals manufacturing	32530	D	1,304	D
Pharmaceutical, medicinal, botanical, and biological products (except diagnostic substances) manufacturing	32541	63,457	55,976	7,481
In vitro diagnostic substances manufacturing	32542	3,193	3,161	32
Biotechnology-based pharmaceutical and biological products (except diagnostic substances)	32543	65,536	62,529	3,006
Soap, cleaning compound, and toilet preparations manufacturing	32591	2,398	2,093	306
Paint, adhesive, and other chemical manufacturing	32592	D	1,509	D
Plastics and rubber products manufacturing	32600	2,862	2,777	84 i
Clay and glass products manufacturing	32710	1,464 i	1,442 i	22
Cement, concrete, lime, gypsum, and other nonmetallic mineral products manufacturing	32790	350 i	281	69 i
Primary metal manufacturing	33100	1,159	1,097	62
Fabricated metal products manufacturing	33200	3,783	3,367	416
Agricultural machinery and equipment manufacturing	33311	D	2,011	D
Construction machinery manufacturing	33312	1,506	1,484	22
Mining, oil, and gas field machinery and equipment manufacturing	33319	1,063	973	90
Semiconductor machinery manufacturing	33321	D	D	D
Industrial machinery manufacturing (except semiconductor machinery)	33322	1,451	1,281	170
Photographic and photocopying equipment manufacturing	33331	71	71	0
Commercial, service industry, temperature control, and air-flow control machinery manufacturing	33332	2,578	2,507	70
Digital cameras manufacturing	33333	238	238	0
Engine, turbine, and power transmission equipment manufacturing	33360	3,819	3,214	605
Metalworking and other general purpose machinery manufacturing	33390	2,804	2,742	62
Computers and peripheral equipment manufacturing and magnetic and optical media	33412	D	34,449	D
Telephone apparatus manufacturing, including routers, modems, and gateways	33421	9,188	9,185	3
Radio, television, and wireless communication equipment manufacturing	33422	3,292	2,348	945 i
Other communication equipment manufacturing (except radio, television, and wireless communication equipment)	33429	518	497	22
Audio and video equipment manufacturing	33430	1,622	1,577	45
Semiconductor and other electronic components manufacturing	33440	55,353	51,748	3,605
Electromedical, electrotherapeutic, and irradiation apparatus manufacturing	33451	4,466	4,273	193

Table 15. Domestic R&D paid for by the company and others and performed by the company, by business activity: 2024

(Millions of U.S. dollars)

Business activity ^a	Business code ^b	Total	Paid for by the company	Paid for by others
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments manufacturing	33452	6,655	2,919	3,736
Measuring and control instruments manufacturing (not listed elsewhere)	33459	4,517	4,361	156
Electrical equipment, appliances, and components manufacturing	33500	6,548	5,709	839
Motor vehicles manufacturing	33610	25,676	24,962	714
Motor vehicle body and trailer manufacturing	33620	238	238	* i
Motor vehicle parts manufacturing	33630	5,905	5,073	831
Aircraft manufacturing	33641	18,800 i	7,133	11,667 i
Aircraft engine and engine parts manufacturing	33642	4,948	2,387	2,561
Other aircraft parts and auxiliary equipment manufacturing	33643	3,122	1,788	1,334 i
Guided missiles, space vehicles, and related parts manufacturing	33644	6,808 i	2,938	3,870 i
Railroad rolling stock manufacturing	33651	D	217	D
Ship and boat building	33660	D	260	D
Motorcycle, bicycle, and parts manufacturing	33691	390	375	15
Military armored vehicle, tank, and tank components manufacturing	33692	210 i	182 i	28
All other transportation equipment manufacturing	33699	589	576	12
Furniture and related products manufacturing	33700	475	474	1
Medical equipment and supplies manufacturing	33910	21,421	21,157	263
Miscellaneous manufacturing not listed elsewhere (games, office supplies, slot machines, etc.)	33990	2,833	2,775	59
Merchant wholesalers, durable goods	42300	1,091	1,041	50
Merchant wholesalers, nondurable goods	42400	660 i	605 i	55 i
Wholesale electronic markets and agents and brokers (business to business)	42500	60	D	D
Retail trade (except electronic shopping and electronic auctions)	44000	737	737	*
Electronic shopping and electronic auctions	45411	6,048 i	6,048 i	0
Transportation	48000	8,345	8,345	1
Couriers, messengers, and express delivery services	49200	2,287	2,287	0
Warehousing and storage	49300	32	30	2
Newspaper, periodical, book, and directory publishers (except Internet)	51110	336 i	336 i	0
Software publishers (except Internet)	51120	42,990	41,978	1,012
Motion picture and sound recording (except Internet)	51200	48	47	1
Broadcasting (except Internet)	51500	494 i	494 i	0
Wired telecommunications carriers	51710	481	480	1
Wireless telecommunications carriers (except satellite)	51720	2,322	2,263	60
Satellite telecommunications	51740	720	718	2
Other telecommunications (not listed elsewhere)	51790	452	439	13
Data processing, hosting, and related services	51800	16,183	16,159	24
Cloud computing applications and Internet-based software services	51801	54,815	53,800	1,015 i
Other information services, including Internet publishing, broadcasting, and Web search portals	51910	D	105,524	D
Finance: banking and credit intermediation	52200	16,313	16,217	97
Securities, commodity contracts, and other financial investments and related activities, including funds and trusts	52310	5,813	5,809	4
Insurance carriers and related activities	52400	2,732	2,732	0
Real estate	53100	521	521	0
Rental and leasing services	53200	2,395	2,395	*
Lessors of nonfinancial intangible assets, including patent licensing	53300	34	33	*
Legal, accounting, tax preparation, bookkeeping, and payroll services	54111	4,522 i	4,522 i	0
Architectural, engineering, and related services	54130	4,604	3,790	814
Specialized design services	54140	136	94 r	42
Computer systems design and related services	54150	25,311	21,501	3,810
Management, scientific, and technical consulting services	54160	4,820	3,388	1,432

Table 15. Domestic R&D paid for by the company and others and performed by the company, by business activity: 2024

(Millions of U.S. dollars)

Business activity ^a	Business code ^b	Total	Paid for by the company	Paid for by others
Research and development services in the social sciences and humanities	54172	715	8	706
Research and development services in biotechnology	54173	6,164	1,217	4,947
Research and development services in the physical, engineering, and life sciences (except biotechnology)	54174	25,296	3,397	21,900 i
Research and development services in nanotechnology	54175	561	445	115
Advertising and related services	54180	1,050 i	1,046 i	4
Professional, scientific, and technical services (not listed elsewhere)	54190	2,202	1,696	506
Management of companies and enterprises	55100	27	27	0
Administrative and support services	56100	4,800	4,797	3
Waste management and remediation services	56200	63	56	7
Offices of physicians	62110	282	174	107
Medical and diagnostic laboratories	62150	2,604	1,763	841
Other ambulatory health care services (ambulance, dental, home health care)	62199	344	344	0
Hospitals and nursing care facilities	62200	D	D	1
Social assistance services	62400	D	D	0
Arts, entertainment, and recreation	71000	158	158	0
Accommodation and food services	72000	188	188	0
Other services (not listed elsewhere)	81000	585	563	23
Undistributed ^c	–	0	0	0

* = amount < \$500,000; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%.

^a Business activity data are tabulated independent of the industry classification of the company. Companies were asked to report their sales and R&D activity in one or more business activity codes.

^b Business codes and descriptions are based on 2017 North American Industry Classification System industry definitions.

^c Undistributed includes data reported that were not allocated to a business activity.

Note(s):

Detail may not add to total because of rounding. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 16. Domestic R&D paid for by the company and others and performed by the company as a percentage of domestic net sales, by industry and company size: 2024

(Millions of U.S. dollars and percent)

Industry and company size	NAICS code	Domestic R&D (US\$millions)		Percentage of domestic sales of R&D performers or funders ^a	Percentage of domestic sales of R&D performers ^b
All industries	21–23, 31–33, 42–81	765,082		5.1	5.1
Manufacturing industries	31–33	405,092		5.6	5.6
Food	311	6,288	i	0.8	0.8
Beverage and tobacco products	312	1,459		0.7	0.7
Textile, apparel, and leather products	313–16	788		1.1	1.1
Wood products	321	267		0.4	0.4
Paper	322	1,240		1.2	1.2
Printing and related support activities	323	255		1.1	1.1
Petroleum and coal products	324	1,006		0.3	D
Chemicals	325	143,745		11.4	11.4
Basic chemicals	3251	3,120		1.7	1.7
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	1,354		2.2	2.2
Pesticide, fertilizer, and other agricultural chemicals	3253	1,253		1.4	1.4
Pharmaceuticals and medicines	3254	133,627		18.5	18.5
Soap, cleaning compound, and toilet preparations	3256	2,956		2.3	2.3
Paint, coating, adhesive, and other chemicals	3255, 3259	1,435		2.0	2.0
Plastics and rubber products	326	2,908		1.5	1.6
Nonmetallic mineral products	327	1,578	i	2.6	3.0
Primary metals	331	1,174		0.9	0.9
Fabricated metal products	332	3,230		1.5	1.5
Machinery	333	22,035		4.3	4.3
Agricultural implement	33311	2,561		4.1	4.1
Semiconductor machinery	333242	6,851		23.1	23.1
Engine, turbine, and power transmission equipment	3336	4,230		4.6	4.6
Other machinery	other 333	8,394		2.5	2.5
Computer and electronic products	334	115,599		14.3	14.3
Communications equipment	3342	12,839		11.1	11.1
Semiconductor and other electronic components	3344	52,358		19.4	19.4
Navigational, measuring, electromedical, and control instruments	3345	14,083		10.0	10.1
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	3,245		16.1	16.1
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	6,161		10.9	10.9
Other measuring and controlling devices	other 3345	4,677		7.3	7.4
Other computer and electronic products	other 334	36,318		12.9	12.9
Electrical equipment, appliances, and components	335	6,999		4.3	4.3
Transportation equipment	336	71,231		4.4	4.4
Motor vehicles, bodies, trailers, and parts	3361–63	31,812		2.8	2.8
Aerospace products and parts	3364	35,904		9.4	9.4
Aircraft, aircraft engine, and aircraft parts	336411–13	D		D	D
Guided missile, space vehicle, and related parts	336414–15, 336419	D		D	D
Military armored vehicle, tank, and tank components	336992	33		3.2	3.2
Other transportation	other 336	3,481		3.8	3.8
Furniture and related products	337	450		1.2	D
Miscellaneous	339	24,840		3.9	3.9
Medical equipment and supplies	3391	22,126		4.2	4.2
Other miscellaneous manufacturing	3399	2,715		2.4	2.4
Nonmanufacturing industries	21–23, 42–81	359,990		4.6	4.6

Table 16. Domestic R&D paid for by the company and others and performed by the company as a percentage of domestic net sales, by industry and company size: 2024

(Millions of U.S. dollars and percent)

Industry and company size	NAICS code	Domestic R&D (US\$millions)		Percentage of domestic sales of R&D performers or funders ^a	Percentage of domestic sales of R&D performers ^b
Mining, quarrying, oil and gas extraction, and support activities	21	1,862		0.9	0.9
Utilities	22	613		0.2	0.2
Wholesale trade	42	1,692	i	0.4	0.4
Electronic shopping and electronic auctions	454111-12	7,898	i	1.1	1.1
Transportation and warehousing	48-49	11,341		3.2	3.3
Information	51	228,174		10.9	10.9
Publishing	511	63,596		15.8	15.9
Newspaper, periodical, book, and directory publishers	5111	489	i	6.4	6.5
Software publishers	5112	63,108		16.0	16.1
Telecommunications	517	3,323		0.7	0.7
Data processing, hosting, and related services	518	58,772		8.1	8.1
Other information	other 51	102,484		20.1	20.1
Finance and insurance	52	25,463		1.4	1.4
Real estate and rental and leasing	53	2,750		4.6	4.6
Lessors of nonfinancial intangible assets (except copyrighted works)	533	23		5.3	5.3
Other real estate and rental and leasing	other 53	2,727		4.5	4.5
Professional, scientific, and technical services	54	74,548		10.8	11.0
Architectural, engineering, and related services	5413	3,893		2.9	3.0
Computer systems design and related services	5415	26,764		10.2	10.3
Scientific research and development services	5417	33,942		27.9	28.0
Research and development in nanotechnology	541713	548		30.6	31.9
Research and development in biotechnology (except nanobiotechnology)	541714	6,751		22.8	22.8
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	25,931		29.1	29.3
Research and development in the social sciences and humanities	541720	712		55.9	55.9
Other professional, scientific, and technical services	other 54	9,949	i	5.7	5.9
Health care services	621-23	2,020		1.7	1.7
Other nonmanufacturing	23, 44-45 (excluding 454111-12), 55-56, 624, 71-72, 81	3,628		0.4	0.4
All companies (number of domestic employees)	-	765,082		5.1	5.1
Small companies					
10-19 ^c	-	4,790		15.8	16.6
20-49	-	16,179		16.1	17.1
Medium companies					
50-99	-	17,078		13.2	13.4
100-249	-	29,325		9.7	9.9
Large companies					
250-499	-	28,852		7.3	7.4
500-999	-	44,697		7.8	8.0
1,000-4,999	-	123,813		5.7	5.7
5,000-9,999	-	62,950		4.1	4.3
10,000-24,999	-	140,348		4.9	4.9
25,000 or more	-	297,050		4.2	4.2

D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse.

NAICS = 2017 North American Industry Classification System.

^a Statistics used for both the numerator and denominator in the calculation of these percentages are representative of companies located in the United States that performed or funded R&D.

^b Statistics used for both the numerator and denominator in the calculation of these percentages are representative of companies located in the United States that performed R&D. The calculation of percentages in this column excludes R&D and sales of companies that fund R&D but do not perform R&D.

^c The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):

Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 17. Domestic R&D paid for by the company and others and performed by the company and others as a percentage of domestic net sales, by industry and company size: 2024

(Millions of U.S. dollars and percent)

Industry and company size	NAICS code	Domestic R&D (US\$millions)	Percentage of domestic sales of R&D performers or funders ^a	Percentage of domestic sales of R&D performers only ^b
All industries	21–23, 31–33, 42–81	824,765	5.4	5.5
Manufacturing industries	31–33	453,454	6.2	6.3
Food	311	6,568	0.9	0.9
Beverage and tobacco products	312	1,630	0.8	0.8
Textile, apparel, and leather products	313–16	795	1.1	1.1
Wood products	321	287	0.4	0.4
Paper	322	1,246	1.2	1.2
Printing and related support activities	323	256	1.1	1.1
Petroleum and coal products	324	1,222	0.3	D
Chemicals	325	179,323	14.2	14.3
Basic chemicals	3251	3,321	1.8	1.8
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	1,460	2.4	2.4
Pesticide, fertilizer, and other agricultural chemicals	3253	1,326	1.5	1.5
Pharmaceuticals and medicines	3254	168,494	23.3	23.3
Soap, cleaning compound, and toilet preparations	3256	3,258	2.5	2.5
Paint, coating, adhesive, and other chemicals	3255, 3259	1,464	2.0	2.0
Plastics and rubber products	326	2,943	1.6	1.6
Nonmetallic mineral products	327	1,605	2.6	3.0
Primary metals	331	1,195	0.9	0.9
Fabricated metal products	332	3,322	1.5	1.5
Machinery	333	22,452	4.4	4.4
Agricultural implement	33311	D	D	D
Semiconductor machinery	333242	6,879	23.2	23.2
Engine, turbine, and power transmission equipment	3336	D	D	D
Other machinery	other 333	8,521	2.6	2.6
Computer and electronic products	334	119,904	14.9	14.9
Communications equipment	3342	13,873	12.0	12.0
Semiconductor and other electronic components	3344	D	D	D
Navigational, measuring, electromedical, and control instruments	3345	14,453	10.3	10.3
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	3,410	16.9	16.9
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	6,240	11.1	11.1
Other measuring and controlling devices	other 3345	4,803	7.5	7.6
Other computer and electronic products	other 334	D	D	D
Electrical equipment, appliances, and components	335	7,076	4.4	4.4
Transportation equipment	336	77,260	4.8	4.8
Motor vehicles, bodies, trailers, and parts	3361–63	34,822	3.1	3.1
Aerospace products and parts	3364	38,862	10.1	10.1
Aircraft, aircraft engine, and aircraft parts	336411–13	D	D	D
Guided missile, space vehicle, and related parts	336414–15, 336419	D	D	D
Military armored vehicle, tank, and tank components	336992	34	3.2	3.2
Other transportation	other 336	3,542	3.9	3.9
Furniture and related products	337	454	1.2	D
Miscellaneous	339	25,918	4.0	4.1
Medical equipment and supplies	3391	23,122	4.4	4.4
Other miscellaneous manufacturing	3399	2,796	2.4	2.4
Nonmanufacturing industries	21–23, 42–81	371,312	4.7	4.8

Table 17. Domestic R&D paid for by the company and others and performed by the company and others as a percentage of domestic net sales, by industry and company size: 2024

(Millions of U.S. dollars and percent)

Industry and company size	NAICS code	Domestic R&D (US\$millions)		Percentage of domestic sales of R&D performers or funders ^a	Percentage of domestic sales of R&D performers only ^b
Mining, quarrying, oil and gas extraction, and support activities	21	1,975		0.9	0.9
Utilities	22	D		D	D
Wholesale trade	42	1,779	i	0.4	0.4
Electronic shopping and electronic auctions	454111-12	8,408	i	1.1	1.1
Transportation and warehousing	48-49	D		D	D
Information	51	232,200		11.1	11.1
Publishing	511	D		D	D
Newspaper, periodical, book, and directory publishers	5111	499	i	6.5	6.6
Software publishers	5112	D		D	D
Telecommunications	517	D		D	D
Data processing, hosting, and related services	518	59,125		8.2	8.2
Other information	other 51	D		D	D
Finance and insurance	52	26,402		1.5	1.5
Real estate and rental and leasing	53	2,753		4.6	4.6
Lessors of nonfinancial intangible assets (except copyrighted works)	533	24		5.4	5.4
Other real estate and rental and leasing	other 53	2,730		4.6	4.6
Professional, scientific, and technical services	54	78,617		11.4	11.5
Architectural, engineering, and related services	5413	4,174		3.2	3.2
Computer systems design and related services	5415	27,506		10.5	10.6
Scientific research and development services	5417	36,820		30.2	30.4
Research and development in nanotechnology	541713	571		31.8	33.0
Research and development in biotechnology (except nanobiotechnology)	541714	6,931		23.4	23.4
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	28,605		32.1	32.3
Research and development in the social sciences and humanities	541720	713		55.9	55.9
Other professional, scientific, and technical services	other 54	10,116		5.8	5.9
Health care services	621-23	2,139		1.8	1.8
Other nonmanufacturing	23, 44-45 (excluding 454111-12), 55-56, 624, 71-72, 81	3,771		0.4	D
All companies (number of domestic employees)	-	824,765		5.4	5.5
Small companies					
10-19 ^c	-	5,508		18.2	19.0
20-49	-	18,582		18.5	19.5
Medium companies					
50-99	-	19,638		15.2	15.5
100-249	-	32,846		10.9	11.1
Large companies					
250-499	-	31,978		8.1	8.2
500-999	-	47,146		8.2	8.4
1,000-4,999	-	132,680		6.1	6.1
5,000-9,999	-	69,234		4.5	4.7
10,000-24,999	-	152,909		5.3	5.4
25,000 or more	-	314,244		4.5	4.5

D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse.

NAICS = 2017 North American Industry Classification System.

^a Statistics used for both the numerator and denominator in the calculation of these percentages are representative of companies located in the United States that performed or funded R&D.

^b Statistics used for both the numerator and denominator in the calculation of these percentages are representative of companies located in the United States that performed R&D. The calculation of percentages in this column excludes R&D and sales of companies that fund R&D but do not perform R&D.

^c The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):

Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 18. Companies with domestic R&D paid for by the company and others and performed by the company in the software products and embedded software technology focus area, by industry and company size: 2024

(Millions of U.S. dollars and number of companies)

Industry and company size	NAICS code	Domestic R&D		Software products and embedded software R&D											
				Total				Paid for by the company				Paid for by others			
				Companies (number)		Amount		Companies (number)		Amount		Companies (number)		Amount	
		Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount
All industries	21–23, 31–33, 42–81	29,570	765,082	14,360	i 322,214	i 13,660	i 305,788	i 1,510	i 16,425	690	i 5,046				
Manufacturing industries	31–33	12,780	405,092	4,490	i 58,343	i 4,310	i 52,270	i 480	i 6,073	160	1,959				
Food	311	990	6,288	i 120	i 268	i 120	i 265	10	3	0	0				
Beverage and tobacco products	312	260	1,459	20	13	20	13	0	0	0	0				
Textile, apparel, and leather products	313–16	190	788	30	i 22	i 30	i 22	0	0	0	0				
Wood products	321	90	267	30	i 17	i 30	i 17	0	0	0	0				
Paper	322	80	1,240	10	i 2	i 10	i 2	0	0	0	0				
Printing and related support activities	323	140	255	90	i 54	i 90	i 54	0	0	0	0				
Petroleum and coal products	324	60	1,006	10	21	10	21	0	0	0	0				
Chemicals	325	2,250	143,745	260	2,050	250	2,031	20	19	10	7				
Basic chemicals	3251	300	3,120	40	i 53	40	i 53	0	0	0	0				
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	130	1,354	20	D	20	D	10	*	0	0				
Pesticide, fertilizer, and other agricultural chemicals	3253	70	1,253	20	i D	20	i D	10	*	0	0				
Pharmaceuticals and medicines	3254	1,140	133,627	150	1,847	140	1,833	20	14	10	7				
Soap, cleaning compound, and toilet preparations	3256	210	2,956	20	13	20	11	10	3	0	0				
Paint, coating, adhesive, and other chemicals	3255, 3259	420	1,435	40	i D	40	i D	10	2	10	1				
Plastics and rubber products	326	650	2,908	150	i 98	150	i 98	10	*	0	0				
Nonmetallic mineral products	327	280	1,578	i 30	i 161	i 30	i 161	0	0	0	0				
Primary metals	331	170	1,174	30	i 35	i 30	i 35	0	0	0	0				
Fabricated metal products	332	1,480	3,230	520	i 763	470	i 746	90	i 16	i 0	0				
Machinery	333	1,980	22,035	940	i 3,024	900	i 2,833	90	191	60	r 7	i			
Agricultural implement	33311	160	2,561	80	i 378	70	i 352	10	26	10	r D				
Semiconductor machinery	333242	50	6,851	30	554	i 30	D	10	D	10	i *	i			
Engine, turbine, and power transmission equipment	3336	140	4,230	60	i 362	50	i D	10	i D	10	i 1	i			
Other machinery	other 333	1,640	8,394	790	i 1,730	760	i D	80	D	50	r D				
Computer and electronic products	334	1,710	115,599	1,250	i 35,671	i 1,200	i 32,299	i 160	i 3,372	60	579	i			
Communications equipment	3342	300	12,839	240	i D	240	i 7,603	i 10	i D	0	0				
Semiconductor and other electronic components	3344	470	52,358	190	i 13,609	i 180	i 11,056	i 30	2,552	20	25	i			
Navigational, measuring, electromedical, and control instruments	3345	810	14,083	670	i 4,068	650	i 3,355	130	i 713	i 50	D				
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	220	3,245	130	i 691	i 120	i 596	i 30	i 95	10	r 10	r			
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	130	6,161	110	i 1,952	110	i 1,374	20	i 579	i 20	520	i			
Other measuring and controlling devices	other 3345	470	4,677	440	i 1,425	420	i 1,385	80	i 40	30	r D				
Other computer and electronic products	other 334	150	36,318	150	i D	150	i 10,284	10	D	10	D				
Electrical equipment, appliances, and components	335	380	6,999	240	i 1,580	220	i 1,525	30	i 54	i 10	3				

Table 18. Companies with domestic R&D paid for by the company and others and performed by the company in the software products and embedded software technology focus area, by industry and company size: 2024

(Millions of U.S. dollars and number of companies)

Industry and company size	NAICS code	Domestic R&D		Software products and embedded software R&D									
				Total		Paid for by the company		Paid for by others					
								Total		Federally funded			
		Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount
Transportation equipment	336	930	71,231	460	i 11,048	450	i 8,721	i 50	2,327	30	1,332		
Motor vehicles, bodies, trailers, and parts	3361–63	540	31,812	300	i 4,949	300	i 4,806	i 30	143	10	5	i	
Aerospace products and parts	3364	260	35,904	110	i 5,798	100	i 3,614	30	2,184	20	1,327		
Aircraft, aircraft engine, and aircraft parts	336411–13	230	D	90	i 3,675	90	i D	20	D	10	D		
Guided missile, space vehicle, and related parts	336414–15, 336419	30	D	20	2,122	10	D	10	D	10	D		
Military armored vehicle, tank, and tank components	336992	20	33	10	1	10	*	10	*	10	*		
Other transportation	other 336	130	3,481	60	i 300	60	i 300	i 0	0	0	0		
Furniture and related products	337	200	450	40	i 72	40	i 72	i 0	0	0	0		
Miscellaneous	339	1,050	24,840	360	i 3,446	340	3,356	70	i 90	10	31		
Medical equipment and supplies	3391	660	22,126	290	i 2,949	270	i 2,862	60	i 87	10	30		
Other miscellaneous manufacturing	3399	390	2,715	80	498	70	494	10	3	10	*		
Nonmanufacturing industries	21–23, 42–81	16,790	359,990	9,880	i 263,871	i 9,350	i 253,518	i 1,030	i 10,353	540	i 3,087		
Mining, quarrying, oil and gas extraction, and support activities	21	60	1,862	30	307	20	304	10	i 3	0	0		
Utilities	22	70	613	30	348	30	348	i 0	0	0	0		
Wholesale trade	42	2,350	1,692	i 530	i 396	i 530	i 354	i 20	41	i 0	0		
Electronic shopping and electronic auctions	454111–12	270	7,898	i 50	i 5,725	i 50	i 5,725	i 0	0	0	0		
Transportation and warehousing	48–49	490	r 11,341	440	r 7,078	i 440	r 7,078	i 0	0	0	0		
Information	51	3,750	228,174	3,620	i 189,157	i 3,540	i 187,892	i 150	i 1,265	20	55		
Publishing	511	1,690	63,596	1,680	i 43,292	1,650	i 42,781	60	i 511	10	3	i	
Newspaper, periodical, book, and directory publishers	5111	50	i 489	i 20	i 218	i 20	i 218	i 0	0	0	0		
Software publishers	5112	1,650	63,108	1,670	i 43,074	1,630	i 42,563	60	i 511	10	3	i	
Telecommunications	517	150	3,323	120	1,812	120	1,806	10	i 6	i 10	1		
Data processing, hosting, and related services	518	1,680	58,772	1,670	50,846	1,640	50,112	90	i 734	10	51		
Other information	other 51	240	102,484	160	93,207	i 160	93,193	i 10	14	0	0		
Finance and insurance	52	220	25,463	180	24,545	180	24,448	10	97	0	0		
Real estate and rental and leasing	53	540	2,750	40	1,569	40	1,569	0	0	0	0		
Lessors of nonfinancial intangible assets (except copyrighted works)	533	10	i 23	0	0	0	0	0	0	0	0		
Other real estate and rental and leasing	other 53	530	2,727	40	1,569	40	1,569	0	0	0	0		
Professional, scientific, and technical services	54	7,560	74,548	4,740	i 32,240	i 4,300	i 23,293	i 870	i 8,947	530	i 3,032		
Architectural, engineering, and related services	5413	1,660	3,893	670	i 633	600	i 395	150	i 238	100	i 181		
Computer systems design and related services	5415	2,950	26,764	2,770	i 19,443	2,650	i 15,746	320	i 3,697	180	r 987		
Scientific research and development services	5417	1,500	33,942	560	i 5,283	i 350	i 814	i 330	i 4,469	i 210	i 1,387		
Research and development in nanotechnology	541713	80	548	30	i 128	i 30	i 90	i 10	i 38	10	i 37		
Research and development in biotechnology (except nanobiotechnology)	541714	420	6,751	130	i 316	70	i 42	80	i 274	30	i 123		

Table 18. Companies with domestic R&D paid for by the company and others and performed by the company in the software products and embedded software technology focus area, by industry and company size: 2024

(Millions of U.S. dollars and number of companies)

Industry and company size	NAICS code	Software products and embedded software R&D													
		Domestic R&D		Total				Paid for by the company				Paid for by others			
				Total		Paid for by the company		Total		Paid for by others		Total		Federally funded	
		Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	980	25,931	410	i 4,812	260	i 676	240	i 4,136	180	i 1,213				
Research and development in the social sciences and humanities	541720	20	712	10	27	10	6	10	21	10	15	i			
Other professional, scientific, and technical services	other 54	1,480	9,949	i 760	i 6,881	i 710	i 6,338	i 90	543	50	477				
Health care services	621–23	260	2,020	80	i 253	80	i 253	10	*	0	0				
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	1,290	3,628	190	i 2,253	190	i 2,253	0	0	0	0				
All companies (number of domestic employees)	–	29,570	765,082	14,360	i 322,214	i 13,660	i 305,788	i 1,510	i 16,425	690	i 5,046				
Small companies															
10–19 ^a	–	5,590	4,790	2,820	i 1,738	i 2,580	i 1,437	i 410	i 301	180	i 154				
20–49	–	7,920	16,179	4,120	i 5,075	3,950	i 4,533	500	i 542	i 300	i 317				
Medium companies															
50–99	–	5,030	17,078	2,600	i 5,122	2,500	i 4,548	220	i 575	90	319				
100–249	–	4,540	29,325	2,090	i 10,530	1,980	i 9,713	170	i 817	70	493				
Large companies															
250–499	–	2,100	28,852	950	10,289	920	9,569	70	720	20	282				
500–999	–	1,880	44,697	740	i 23,988	720	i 22,524	40	1,465	20	280				
1,000–4,999	–	1,490	123,813	720	57,615	700	53,989	60	3,626	i 20	313	i			
5,000–9,999	–	280	62,950	150	24,783	i 140	24,360	i 20	423	i 10	29				
10,000–24,999	–	610	140,348	130	36,756	i 130	32,718	i 30	4,038	20	668				
25,000 or more	–	150	297,050	100	146,317	i 100	142,398	i 20	i 3,919	20	2,191				

* = amount < \$500,000; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%.

NAICS = 2017 North American Industry Classification System.

^a The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):
Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D. Companies could report R&D in one, more than one, or no application area.

Source(s):
National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 19. Companies with domestic R&D paid for by the company and others and performed by the company in the biotechnology focus area, by industry and company size: 2024

(Millions of U.S. dollars and number of companies)

Industry and company size	NAICS code	Biotechnology R&D											
		Domestic R&D		Total				Paid for by the company				Paid for by others	
		Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount
All industries	21–23, 31–33, 42–81	29,570	765,082	2,980	i 138,636	2,580	i 115,278	790	i 23,358				
Manufacturing industries	31–33	12,780	405,092	1,880	118,658	1,770	110,390	330	8,268				
Food	311	990	6,288	i 160	i 1,182	160	i 1,129	i 10	54				
Beverage and tobacco products	312	260	1,459	10	2	10	2	0	0				
Textile, apparel, and leather products	313–16	190	788	20	i 21	20	i 21	0	0				
Wood products	321	90	267	10	i 5	10	i 5	0	0				
Paper	322	80	1,240	10	1	10	1	0	0				
Printing and related support activities	323	140	255	0	0	0	0	0	0				
Petroleum and coal products	324	60	1,006	10	42	10	42	0	0				
Chemicals	325	2,250	143,745	1,070	110,658	1,020	102,654	230	8,004				
Basic chemicals	3251	300	3,120	70	i 443	70	i 304	10	i 139				
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	130	1,354	30	i D	30	i D	0	0				
Pesticide, fertilizer, and other agricultural chemicals	3253	70	1,253	40	i D	40	i D	10	2				
Pharmaceuticals and medicines	3254	1,140	133,627	910	109,797	860	101,986	220	7,811				
Soap, cleaning compound, and toilet preparations	3256	210	2,956	40	i 130	i 40	i 78	10	i 52	i			
Paint, coating, adhesive, and other chemicals	3255, 3259	420	1,435	10	D	10	D	10	*				
Plastics and rubber products	326	650	2,908	70	i 108	70	i 108	0	0				
Nonmetallic mineral products	327	280	1,578	i 10	*	10	*	10	*				
Primary metals	331	170	1,174	0	0	0	0	0	0				
Fabricated metal products	332	1,480	3,230	10	11	10	11	0	0				
Machinery	333	1,980	22,035	60	53	40	i 47	30	r 6				
Agricultural implement	33311	160	2,561	10	1	10	1	0	0				
Semiconductor machinery	333242	50	6,851	10	*	10	*	0	0				
Engine, turbine, and power transmission equipment	3336	140	4,230	0	0	0	0	0	0				
Other machinery	other 333	1,640	8,394	60	52	40	i 46	30	r 6				
Computer and electronic products	334	1,710	115,599	180	i 2,922	i 160	i 2,846	i 40	i 75	i			
Communications equipment	3342	300	12,839	10	D	10	D	0	0				
Semiconductor and other electronic components	3344	470	52,358	20	i 82	i 20	48	10	i 34	i			
Navigational, measuring, electromedical, and control instruments	3345	810	14,083	160	i 2,832	i 150	i 2,791	i 30	i 42	i			

Table 19. Companies with domestic R&D paid for by the company and others and performed by the company in the biotechnology focus area, by industry and company size: 2024

(Millions of U.S. dollars and number of companies)

Industry and company size	NAICS code	Biotechnology R&D													
		Domestic R&D		Total				Paid for by the company				Paid for by others			
		Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	220	3,245	80	i 1,870	i	70	i	1,843	i	20	r	27	i	
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	130	6,161	10	1		10		1		10		*		
Other measuring and controlling devices	other 3345	470	4,677	90	i 961	i	80	i	947	i	20	i	14		
Other computer and electronic products	other 334	150	36,318	10	i D		10	i	D		0		0		
Electrical equipment, appliances, and components	335	380	6,999	30	i 91	i	30	i	57		10	i	34	i	
Transportation equipment	336	930	71,231	60	r 176		60	r	142	r	10		34		
Motor vehicles, bodies, trailers, and parts	3361–63	540	31,812	10	D		10		D		10	i	6	i	
Aerospace products and parts	3364	260	35,904	60	r D		60	r	D		10		27		
Aircraft, aircraft engine, and aircraft parts	336411–13	230	D	50	r 143	r	50	r	116	r	10		27		
Guided missile, space vehicle, and related parts	336414–15, 336419	30	D	10	D		10		D		0		0		
Military armored vehicle, tank, and tank components	336992	20	33	0	0		0		0		0		0		
Other transportation	other 336	130	3,481	0	0		0		0		0		0		
Furniture and related products	337	200	450	0	0		0		0		0		0		
Miscellaneous	339	1,050	24,840	240	i 3,387	i	230	i	3,325	i	40	i	62		
Medical equipment and supplies	3391	660	22,126	230	i 3,365	i	220	i	3,303	i	40	i	62		
Other miscellaneous manufacturing	3399	390	2,715	20	22		20		22		0		0		
Nonmanufacturing industries	21–23, 42–81	16,790	359,990	1,100	i 19,977	i	820	i	4,888		460	i	15,090	i	
Mining, quarrying, oil and gas extraction, and support activities	21	60	1,862	10	7		10		7		0		0		
Utilities	22	70	613	10	*		10		*		0		0		
Wholesale trade	42	2,350	1,692	i 80	i 153	i	80	i	122	i	10		31	i	
Electronic shopping and electronic auctions	454111–12	270	7,898	i 0	0		0		0		0		0		
Transportation and warehousing	48–49	490	r 11,341	0	0		0		0		0		0		
Information	51	3,750	228,174	30	510		30		510		10	i	*	i	
Publishing	511	1,690	63,596	20	440		20		440		0		0		
Newspaper, periodical, book, and directory publishers	5111	50	i 489	i 0	0		0		0		0		0		
Software publishers	5112	1,650	63,108	20	440		20		440		0		0		

Table 19. Companies with domestic R&D paid for by the company and others and performed by the company in the biotechnology focus area, by industry and company size: 2024

(Millions of U.S. dollars and number of companies)

Industry and company size	NAICS code	Domestic R&D		Biotechnology R&D					
				Total		Paid for by the company		Paid for by others	
		Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount
Telecommunications	517	150	3,323	0	0	0	0	0	0
Data processing, hosting, and related services	518	1,680	58,772	20	70	20	70	10	* i
Other information	other 51	240	102,484	0	0	0	0	0	0
Finance and insurance	52	220	25,463	0	0	0	0	0	0
Real estate and rental and leasing	53	540	2,750	0	0	0	0	0	0
Lessors of nonfinancial intangible assets (except copyrighted works)	533	10 i	23	0	0	0	0	0	0
Other real estate and rental and leasing	other 53	530	2,727	0	0	0	0	0	0
Professional, scientific, and technical services	54	7,560	74,548	920 i	18,464 i	640 i	3,447	450 i	15,018 i
Architectural, engineering, and related services	5413	1,660	3,893	100 i	141 i	90 i	134 i	20 i	7 i
Computer systems design and related services	5415	2,950	26,764	90 i	299 i	40 i	263 i	60 i	35 i
Scientific research and development services	5417	1,500	33,942	680 i	17,682 i	510 i	2,859	340 i	14,823 i
Research and development in nanotechnology	541713	80	548	40 i	138 i	30 i	111 i	20 i	27
Research and development in biotechnology (except nanobiotechnology)	541714	420	6,751	310 i	5,034	240 i	1,104	150	3,931
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	980	25,931	340 i	11,869 i	240 i	1,645 i	170 i	10,224 i
Research and development in the social sciences and humanities	541720	20	712	10	640	0	0	10	640
Other professional, scientific, and technical services	other 54	1,480	9,949 i	60 i	342 i	30 i	189 i	50 i	153 i
Health care services	621–23	260	2,020	70 i	809	70 i	768	10	41
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	1,290	3,628	20 i	34	20 i	34	0	0
All companies (number of domestic employees)	–	29,570	765,082	2,980 i	138,636	2,580 i	115,278	790 i	23,358
Small companies									
10–19 ^a	–	5,590	4,790	650 i	1,489	500 i	1,093	260 i	396 i

Table 19. Companies with domestic R&D paid for by the company and others and performed by the company in the biotechnology focus area, by industry and company size: 2024

(Millions of U.S. dollars and number of companies)

Industry and company size	NAICS code	Biotechnology R&D									
		Domestic R&D		Total		Paid for by the company		Paid for by others			
		Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount		
20–49	–	7,920	16,179	790	i 4,202	680	i 3,486	200	i 716		
Medium companies											
50–99	–	5,030	17,078	540	6,759	470	5,926	130	832		
100–249	–	4,540	29,325	440	i 10,089	420	9,118	90	971		
Large companies											
250–499	–	2,100	28,852	180	8,408	170	7,394	50	1,014		
500–999	–	1,880	44,697	160	i 7,732	150	6,689	30	1,043		
1,000–4,999	–	1,490	123,813	150	22,287	140	18,139	40	4,148	i	
5,000–9,999	–	280	62,950	50	6,247	40	3,278	i 10	2,969		
10,000–24,999	–	610	140,348	40	46,525	40	38,192	20	8,334		
25,000 or more	–	150	297,050	20	24,897	20	21,962	10	i 2,935	i	

* = amount < \$500,000; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%.

NAICS = 2017 North American Industry Classification System.

^a The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):

Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D. Companies could report R&D in one, more than one, or no application area.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 20. Companies with domestic R&D paid for by the company and others and performed by the company in the nanotechnology focus area, by industry and company size: 2024

(Millions of U.S. dollars and number of companies)

Industry and company size	NAICS code	Domestic R&D		Nanotechnology R&D							
				Total		Paid for by the company		Paid for by others			
		Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount
All industries	21–23, 31–33, 42–81	29,570	765,082	920	38,968	760	36,916	250	2,052		
Manufacturing industries	31–33	12,780	405,092	620	32,986	580	31,965	110	1,020		
Food	311	990	6,288	10	D	10	D	10	D		
Beverage and tobacco products	312	260	1,459	10	*	10	*	0	0		
Textile, apparel, and leather products	313–16	190	788	10	4	10	4	0	0		
Wood products	321	90	267	0	0	0	0	0	0		
Paper	322	80	1,240	10	2	10	2	0	0		
Printing and related support activities	323	140	255	0	0	0	0	0	0		
Petroleum and coal products	324	60	1,006	10	8	10	8	0	0		
Chemicals	325	2,250	143,745	220	1,162	210	1,146	10	17		
Basic chemicals	3251	300	3,120	60	335	60	335	10	*	i	
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	130	1,354	10	1	10	1	0	0		
Pesticide, fertilizer, and other agricultural chemicals	3253	70	1,253	20	D	20	D	0	0		
Pharmaceuticals and medicines	3254	1,140	133,627	70	667	70	656	10	11		
Soap, cleaning compound, and toilet preparations	3256	210	2,956	20	8	20	5	10	3		
Paint, coating, adhesive, and other chemicals	3255, 3259	420	1,435	70	D	70	D	10	3		
Plastics and rubber products	326	650	2,908	30	104	30	104	0	0		
Nonmetallic mineral products	327	280	1,578	20	11	20	D	10	D		
Primary metals	331	170	1,174	10	2	10	2	0	0		
Fabricated metal products	332	1,480	3,230	10	17	10	17	0	0		
Machinery	333	1,980	22,035	80	4,981	80	D	30	r	D	
Agricultural implement	33311	160	2,561	0	0	0	0	0	0		
Semiconductor machinery	333242	50	6,851	20	4,915	20	D	10	D		
Engine, turbine, and power transmission equipment	3336	140	4,230	0	0	0	0	0	0		
Other machinery	other 333	1,640	8,394	70	66	60	D	30	r	D	
Computer and electronic products	334	1,710	115,599	180	24,516	160	24,013	40	i	503	i
Communications equipment	3342	300	12,839	10	47	10	47	0	0		
Semiconductor and other electronic components	3344	470	52,358	90	23,931	80	23,598	20	i	332	i
Navigational, measuring, electromedical, and control instruments	3345	810	14,083	90	D	80	D	20	D		
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	220	3,245	30	119	20	D	10	r	D	
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	130	6,161	10	4	10	D	10	D		
Other measuring and controlling devices	other 3345	470	4,677	60	D	60	D	10	i	D	
Other computer and electronic products	other 334	150	36,318	10	D	10	D	10	D		
Electrical equipment, appliances, and components	335	380	6,999	40	433	30	365	20	i	68	i
Transportation equipment	336	930	71,231	20	1,240	10	1,153	10	i	87	i
Motor vehicles, bodies, trailers, and parts	3361–63	540	31,812	10	1,008	10	997	10	i	11	i

Table 20. Companies with domestic R&D paid for by the company and others and performed by the company in the nanotechnology focus area, by industry and company size: 2024

(Millions of U.S. dollars and number of companies)

Industry and company size	NAICS code	Domestic R&D		Nanotechnology R&D									
				Total		Paid for by the company		Paid for by others					
		Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount
Aerospace products and parts	3364	260	35,904	10	232	10	156	10	i	76			
Aircraft, aircraft engine, and aircraft parts	336411–13	230	D	10	D	10	D	10	i	D			
Guided missile, space vehicle, and related parts	336414–15, 336419	30	D	10	i	D	D	10	i	D			
Military armored vehicle, tank, and tank components	336992	20	33	0	0	0	0	0		0			
Other transportation	other 336	130	3,481	0	0	0	0	0		0			
Furniture and related products	337	200	450	0	0	0	0	0		0			
Miscellaneous	339	1,050	24,840	50	i	D	D	20	i	7			
Medical equipment and supplies	3391	660	22,126	50	i	484	40	i	477	20	i	7	
Other miscellaneous manufacturing	3399	390	2,715	10	D	10	D	0		0			
Nonmanufacturing industries	21–23, 42–81	16,790	359,990	300	i	5,983	i	190	i	4,951	150	i	1,032
Mining, quarrying, oil and gas extraction, and support activities	21	60	1,862	10	i	43	i	10	i	43	i	0	0
Utilities	22	70	613	10	*	10	*	0		0			
Wholesale trade	42	2,350	1,692	i	10	1	10	1		10	*		
Electronic shopping and electronic auctions	454111–12	270	7,898	i	0	0	0	0		0			
Transportation and warehousing	48–49	490	r 11,341	0	0	0	0	0		0			
Information	51	3,750	228,174	30	i	3,922	30	i	3,919	10		3	
Publishing	511	1,690	63,596	20	i	3,910	20	i	3,910	0		0	
Newspaper, periodical, book, and directory publishers	5111	50	i 489	i	0	0	0	0		0		0	
Software publishers	5112	1,650	63,108	20	i	3,910	20	i	3,910	0		0	
Telecommunications	517	150	3,323	10	1	0	0	10		1			
Data processing, hosting, and related services	518	1,680	58,772	10	11	i	10	9	i	10		2	
Other information	other 51	240	102,484	0	0	0	0	0		0		0	
Finance and insurance	52	220	25,463	0	0	0	0	0		0		0	
Real estate and rental and leasing	53	540	2,750	0	0	0	0	0		0		0	
Lessors of nonfinancial intangible assets (except copyrighted works)	533	10	i 23	0	0	0	0	0		0		0	
Other real estate and rental and leasing	other 53	530	2,727	0	0	0	0	0		0		0	
Professional, scientific, and technical services	54	7,560	74,548	250	i	1,973	i	140	i	949	140	i	1,024
Architectural, engineering, and related services	5413	1,660	3,893	50	i	52	i	50	i	52	i	0	0
Computer systems design and related services	5415	2,950	26,764	20	i	991	i	20	i	445	10	i	545
Scientific research and development services	5417	1,500	33,942	180	i	882	i	80	i	410	130	i	471
Research and development in nanotechnology	541713	80	548	50	i	390	40	i	349	30		41	
Research and development in biotechnology (except nanobiotechnology)	541714	420	6,751	30	i	23	20	i	20	i	10		2
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	980	25,931	110	i	463	i	30		41	100	i	421
Research and development in the social sciences and humanities	541720	20	712	10	i	6	i	0		0	10	i	6
Other professional, scientific, and technical services	other 54	1,480	9,949	i	20	48	i	10		40	i	10	i
Health care services	621–23	260	2,020	10	i	5	10		5	10	i	1	i

Table 20. Companies with domestic R&D paid for by the company and others and performed by the company in the nanotechnology focus area, by industry and company size: 2024

(Millions of U.S. dollars and number of companies)

Industry and company size	NAICS code	Domestic R&D		Nanotechnology R&D									
				Total				Paid for by the company				Paid for by others	
		Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	1,290	3,628	20	i	38	i	10	i	34	i	10	4
All companies (number of domestic employees)	–	29,570	765,082	920	i	38,968	i	760	i	36,916	i	250	2,052 i
Small companies													
10–19 ^a	–	5,590	4,790	220	i	199		160	i	129	i	100	70
20–49	–	7,920	16,179	230	i	399	i	190	i	306	i	60	93 i
Medium companies													
50–99	–	5,030	17,078	130	i	488		110	i	426		20	62
100–249	–	4,540	29,325	120	i	453	i	100	i	375	i	30	77
Large companies													
250–499	–	2,100	28,852	60		769		50		732		20	37 i
500–999	–	1,880	44,697	60	i	1,151		50		1,067		10	84 i
1,000–4,999	–	1,490	123,813	80		6,201	i	80		5,799	i	10	402 i
5,000–9,999	–	280	62,950	30		4,390	i	20		4,000	i	10	391
10,000–24,999	–	610	140,348	20		15,198	i	20		14,708	i	10	490 i
25,000 or more	–	150	297,050	20	i	9,720	i	10		9,373	i	10	347

* = amount < \$500,000; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%.

NAICS = 2017 North American Industry Classification System.

^a The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):
Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D. Companies could report R&D in one, more than one, or no application area.

Source(s):
National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 21. Companies with domestic R&D paid for by the company and others and performed by the company in the super intelligence technology focus area, by industry and company size: 2024

(Millions of U.S. dollars and number of companies)

Industry and company size	NAICS code	Domestic R&D		Super intelligence R&D ^a							
				Total		Paid for by the company		Paid for by others			
		Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount
All industries	21–23, 31–33, 42–81	29,570	765,082	6,010	i 71,931	5,670	i 68,501	630	i 3,430	i	
Manufacturing industries	31–33	12,780	405,092	1,510	i 24,879	1,460	i 23,572	150	i 1,307	i	
Food	311	990	6,288	i 20	10	20	10	0	0		
Beverage and tobacco products	312	260	1,459	10	1	10	1	0	0		
Textile, apparel, and leather products	313–16	190	788	10	4	10	4	0	0		
Wood products	321	90	267	10	*	10	*	0	0		
Paper	322	80	1,240	10	2	10	2	0	0		
Printing and related support activities	323	140	255	20	i 14	20	i 14	0	0		
Petroleum and coal products	324	60	1,006	10	15	10	14	10	1		
Chemicals	325	2,250	143,745	130	1,394	120	1,377	10	16		
Basic chemicals	3251	300	3,120	20	34	10	25	10	i 9	i	
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	130	1,354	10	1	10	1	0	0		
Pesticide, fertilizer, and other agricultural chemicals	3253	70	1,253	10	2	10	2	0	0		
Pharmaceuticals and medicines	3254	1,140	133,627	80	1,293	80	1,292	10	*		
Soap, cleaning compound, and toilet preparations	3256	210	2,956	10	21	10	15	10	5		
Paint, coating, adhesive, and other chemicals	3255, 3259	420	1,435	30	i 44	30	i 42	10	1		
Plastics and rubber products	326	650	2,908	20	7	20	7	0	0		
Nonmetallic mineral products	327	280	1,578	i 10	1	10	1	10	*		
Primary metals	331	170	1,174	10	1	10	1	0	0		
Fabricated metal products	332	1,480	3,230	110	i 105	110	i 105	10	*		
Machinery	333	1,980	22,035	360	i 448	360	i 443	30	r 5		
Agricultural implement	33311	160	2,561	60	i 95	50	i 93	10	2		
Semiconductor machinery	333242	50	6,851	20	169	i 20	169	i 0	0		
Engine, turbine, and power transmission equipment	3336	140	4,230	10	3	10	3	0	0		
Other machinery	other 333	1,640	8,394	290	i 180	290	i 177	30	r 3	i	
Computer and electronic products	334	1,710	115,599	480	i 19,744	i 460	i 18,954	i 40	790	i	
Communications equipment	3342	300	12,839	30	i 447	30	i 447	0	0		
Semiconductor and other electronic components	3344	470	52,358	190	i 13,986	i 190	i 13,266	i 20	720	i	
Navigational, measuring, electromedical, and control instruments	3345	810	14,083	210	i 989	200	i 964	20	i 25		
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	220	3,245	50	i 122	i 40	i 118	i 20	i 4	i	
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	130	6,161	50	i 680	40	i 661	10	19		
Other measuring and controlling devices	other 3345	470	4,677	120	i 188	i 120	i 186	i 10	i 2		
Other computer and electronic products	other 334	150	36,318	60	i 4,323	60	i 4,277	10	45		
Electrical equipment, appliances, and components	335	380	6,999	80	i 321	i 80	i 287	20	i 33	i	
Transportation equipment	336	930	71,231	70	2,085	60	1,648	i 20	437		
Motor vehicles, bodies, trailers, and parts	3361–63	540	31,812	40	D	40	962	i 10	D		

Table 21. Companies with domestic R&D paid for by the company and others and performed by the company in the super intelligence technology focus area, by industry and company size: 2024

(Millions of U.S. dollars and number of companies)

Industry and company size	NAICS code	Domestic R&D		Super intelligence R&D ^a							
				Total		Paid for by the company		Paid for by others			
		Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount
Aerospace products and parts	3364	260	35,904	30	D	30	D	10	D		
Aircraft, aircraft engine, and aircraft parts	336411–13	230	D	20	823	20	579 i	10			244
Guided missile, space vehicle, and related parts	336414–15, 336419	30	D	10	D	10	D	10			D
Military armored vehicle, tank, and tank components	336992	20	33	0	0	0	0	0			0
Other transportation	other 336	130	3,481	10	D	10	D	10			*
Furniture and related products	337	200	450	10	1	10	1	0			0
Miscellaneous	339	1,050	24,840	250 i	727	220 i	703	50 i			24
Medical equipment and supplies	3391	660	22,126	230 i	697	210 i	673	50 i			24
Other miscellaneous manufacturing	3399	390	2,715	20	30	20	30	10			*
Nonmanufacturing industries	21–23, 42–81	16,790	359,990	4,500 i	47,052	4,220 i	44,929	480 i			2,123 i
Mining, quarrying, oil and gas extraction, and support activities	21	60	1,862	10	13	10	13	0			0
Utilities	22	70	613	20 i	59 i	20 i	59 i	0			0
Wholesale trade	42	2,350	1,692 i	160 i	20 i	160 i	20 i	0			0
Electronic shopping and electronic auctions	454111–12	270	7,898 i	20 i	162 i	20 i	162 i	0			0
Transportation and warehousing	48–49	490 r	11,341	420 r	D	420 r	D	0			0
Information	51	3,750	228,174	1,550 i	32,840	1,530 i	32,783	50 i			57
Publishing	511	1,690	63,596	610 i	5,982	610 i	5,977	10			6
Newspaper, periodical, book, and directory publishers	5111	50 i	489 i	0	0	0	0	0			0
Software publishers	5112	1,650	63,108	610 i	5,982	610 i	5,977	10			6
Telecommunications	517	150	3,323	30	276	30	D	10			D
Data processing, hosting, and related services	518	1,680	58,772	820	10,015 i	790	9,994 i	40 i			21 i
Other information	other 51	240	102,484	110	16,567	110	D	10			D
Finance and insurance	52	220	25,463	70	1,119	70	1,119	0			0
Real estate and rental and leasing	53	540	2,750	10	1,113	10	1,113	0			0
Lessors of nonfinancial intangible assets (except copyrighted works)	533	10 i	23	0	0	0	0	0			0
Other real estate and rental and leasing	other 53	530	2,727	10	1,113	10	1,113	0			0
Professional, scientific, and technical services	54	7,560	74,548	2,200 i	10,182	1,940 i	8,115	430 i			2,066 i
Architectural, engineering, and related services	5413	1,660	3,893	240 i	157 i	220 i	100 i	50 i			57 i
Computer systems design and related services	5415	2,950	26,764	1,320 i	6,158	1,230 i	5,489	190 i			669 i
Scientific research and development services	5417	1,500	33,942	270 i	1,606 i	180 i	411 i	150 i			1,195 i
Research and development in nanotechnology	541713	80	548	20 i	97 i	20 i	84 i	10 i			12
Research and development in biotechnology (except nanobiotechnology)	541714	420	6,751	60 i	93	50 i	19	30 i			74
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	980	25,931	200 i	1,384 i	120 i	306 i	110 i			1,078 i
Research and development in the social sciences and humanities	541720	20	712	10	31	10	1	10			30
Other professional, scientific, and technical services	other 54	1,480	9,949 i	390 i	2,261 i	340 i	2,116 i	70 i			145
Health care services	621–23	260	2,020	20 i	18	20 i	18	0			0

Table 21. Companies with domestic R&D paid for by the company and others and performed by the company in the super intelligence technology focus area, by industry and company size: 2024

(Millions of U.S. dollars and number of companies)

Industry and company size	NAICS code	Domestic R&D		Super intelligence R&D ^a							
				Total		Paid for by the company			Paid for by others		
		Companies (number)	Amount	Companies (number)	Amount	Companies (number)	Amount		Companies (number)	Amount	
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	1,290	3,628	60	i D	60	i D		0		0
All companies (number of domestic employees)	–	29,570	765,082	6,010	i 71,931	5,670	i 68,501		630	i 3,430	i
Small companies											
10–19 ^b	–	5,590	4,790	1,200	i 406	i 1,100	i 323	i	190	i 83	i
20–49	–	7,920	16,179	1,600	i 3,242	i 1,520	i 3,111	i	180	i 131	
Medium companies											
50–99	–	5,030	17,078	1,260	i 1,105	1,200	i 1,018		100	i 87	
100–249	–	4,540	29,325	830	i 2,204	780	i 2,010		70	i 193	
Large companies											
250–499	–	2,100	28,852	340	1,935	330	1,729		30	206	
500–999	–	1,880	44,697	300	i 13,169	280	i 12,900		20	269	
1,000–4,999	–	1,490	123,813	320	11,399	310	10,692		30	707	i
5,000–9,999	–	280	62,950	70	3,815	i 70	3,699	i	10	117	i
10,000–24,999	–	610	140,348	70	13,072	i 70	12,210	i	20	862	i
25,000 or more	–	150	297,050	60	21,584	50	20,808		10	776	

* = amount < \$500,000; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%.

NAICS = 2017 North American Industry Classification System.

^a At the time of the survey, respondents were asked about domestic R&D in the artificial intelligence technology focus area, now referred to as the super intelligence technology focus area.

^b The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):
Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D. Companies could report R&D in one, more than one, or no application area.

Source(s):
National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 22. Foreign R&D paid for by the company and others and performed by the company, by type of R&D, industry, and company size: 2024

Industry and company size	NAICS code	Total foreign R&D performance				Research (basic and applied)			Development			
		Total	Paid for by the company	Paid for by others		Total	Paid for by the company	Paid for by others	Total	Paid for by the company	Paid for by others	
All industries	21–23, 31–33, 42–81	164,727	150,198		14,529	26,058	21,335	4,723	138,669	128,863	9,807	
Manufacturing industries	31–33	90,435	88,546		1,890	14,015	13,646	369	76,420	74,900	1,520	
Food	311	1,523	1,522		1 i	162	162	0	1,361	1,360	1 i	
Beverage and tobacco products	312	998	998		0	203	203	0	795	795	0	
Textile, apparel, and leather products	313–16	118	118		0	18	18	0	100	100	0	
Wood products	321	2	2		0	1	1	0	1	1	0	
Paper	322	78	78		0	56 i	56 i	0	22 i	22 i	0	
Printing and related support activities	323	5	5		0	2	2	0	3	3	0	
Petroleum and coal products	324	199	199		* i	46	46	* i	153	153	* i	
Chemicals	325	26,941	26,396		545	5,953	5,793	161 i	20,987	20,604	384	
Basic chemicals	3251	921	910		11	249	D	D	673	D	D	
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	516	D		D	203	D	D	312	D	D	
Pesticide, fertilizer, and other agricultural chemicals	3253	168	D		D	35	D	D	134	133	* i	
Pharmaceuticals and medicines	3254	24,122	23,612		509	5,212	5,077	134 i	18,910	18,535	375	
Soap, cleaning compound, and toilet preparations	3256	950	950		0	172	172	0	778	778	0	
Paint, coating, adhesive, and other chemicals	3255, 3259	264	D		D	83	83	*	181	D	D	
Plastics and rubber products	326	418	404		14	119	113	6	299	291	8	
Nonmetallic mineral products	327	227 i	226 i		* r	60	60	* r	166 i	166 i	* r	
Primary metals	331	178	176		2	36	35	1	142	141	1	
Fabricated metal products	332	748	734		14 r	181	180	*	567	554	13 r	
Machinery	333	6,419	6,325		94	1,001	982	19	5,418	5,342	76	
Agricultural implement	33311	1,096	D		D	75	75	*	1,021	D	D	
Semiconductor machinery	333242	1,947	D		D	135 i	D	D	1,812	D	D	
Engine, turbine, and power transmission equipment	3336	1,255	D		D	276	D	D	979	D	D	
Other machinery	other 333	2,121	2,101		20	516 i	513 i	3	1,605	1,589	17	
Computer and electronic products	334	37,633	37,370		263	4,159	4,132	27	33,474	33,239	235	
Communications equipment	3342	3,848	3,829		19	464	462	2	3,385	3,368	17	
Semiconductor and other electronic components	3344	21,742	21,563		179	2,315	2,305	10	19,427	19,258	169	
Navigational, measuring, electromedical, and control instruments	3345	3,359	3,300		59	710	696	14	2,649	2,604	45	
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	548	531		17 i	249	247	3 i	298 i	284 i	14 i	
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	484	463		21	196	185	11	288	277	10	
Other measuring and controlling devices	other 3345	2,327	2,307		20	265	264	*	2,063	2,043	20	
Other computer and electronic products	other 334	8,683	8,678		6	670	669	1	8,013	8,009	4	
Electrical equipment, appliances, and components	335	1,880 i	1,866 i		14	247 i	247 i	* i	1,633 i	1,619 i	14	
Transportation equipment	336	8,040	7,153		886	911	761	150	7,129	6,393	736	
Motor vehicles, bodies, trailers, and parts	3361–63	5,925	D		D	331	D	D	5,593	5,148	445	

Table 22. Foreign R&D paid for by the company and others and performed by the company, by type of R&D, industry, and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Total foreign R&D performance				Research (basic and applied)				Development						
		Total	Paid for by the company		Paid for by others	Total	Paid for by the company		Paid for by others	Total	Paid for by the company		Paid for by others			
Aerospace products and parts	3364	1,931		1,525		406		541		407		1,390		1,118		272
Aircraft, aircraft engine, and aircraft parts	336411–13	D		D		D		D		D		D		D		D
Guided missile, space vehicle, and related parts	336414–15, 336419	D		D		D		D		D		D		D		D
Military armored vehicle, tank, and tank components	336992	0		0		0		0		0		0		0		0
Other transportation	other 336	184		D		D		38		D		146		127		19
Furniture and related products	337	47		47		1 i		17		17		* i		31		30
Miscellaneous	339	4,981		4,926		56		841		836		5		4,140		4,089
Medical equipment and supplies	3391	4,582		4,527		55		782		777		5		3,800		3,750
Other miscellaneous manufacturing	3399	399		398		1 i		60		59		* i		340		339
Nonmanufacturing industries	21–23, 42–81	74,292		61,652		12,640		12,043		7,690		4,353		62,249		53,963
Mining, quarrying, oil and gas extraction, and support activities	21	355		330		25		34		34		0		321		296
Utilities	22	10		10		0		4		4		0		6		6
Wholesale trade	42	110 i		105		5 i		10		10		0		101 i		96
Electronic shopping and electronic auctions	454111–12	2,291 i		2,291		0		1,074 i		1,074		0		1,216 i		1,216
Transportation and warehousing	48–49	270		270		0		28		28		0		241		241
Information	51	46,361		46,162		200		3,968		3,938		30		42,393		42,224
Publishing	511	16,913		16,775		138		1,322		1,292		30		15,591		15,483
Newspaper, periodical, book, and directory publishers	5111	9 i		9		0		0		0		0		9 i		9
Software publishers	5112	16,904		16,767		138		1,322		1,292		30		15,582		15,475
Telecommunications	517	224		D		D		21		21		0		203		D
Data processing, hosting, and related services	518	13,775		13,768		7		1,690		D		D		12,086		D
Other information	other 51	15,449		D		D		935 i		D		D		14,514 i		D
Finance and insurance	52	4,129		4,060		69		850		794		55		3,280		3,265
Real estate and rental and leasing	53	106		106		0		41		41		0		65		65
Lessors of nonfinancial intangible assets (except copyrighted works)	533	0		0		0		0		0		0		0		0
Other real estate and rental and leasing	other 53	106		106		0		41		41		0		65		65
Professional, scientific, and technical services	54	20,377		8,036		12,341		6,001		1,733		i	4,267	14,376		6,303
Architectural, engineering, and related services	5413	37		29		8		7		5		2		31		24
Computer systems design and related services	5415	5,870		5,814		56		882		857		25		4,988		4,957
Scientific research and development services	5417	13,219		949		12,270		4,356		117		i	4,239	8,863		832
Research and development in nanotechnology	541713	19		19		0		9		9		0		11		11
Research and development in biotechnology (except nanobiotechnology)	541714	2,830		17		2,812		1,709		3		1,706		1,121		14
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	10,368		912		9,456		2,638		105		i	2,533	7,730 i		807
Research and development in the social sciences and humanities	541720	2		0		2		0		0		0		2		0
Other professional, scientific, and technical services	other 54	1,250 i		1,243		7		756 i		755		i	1	494		489
Health care services	621–23	98 i		98		0		9 i		9		i	0	89 i		89

Table 22. Foreign R&D paid for by the company and others and performed by the company, by type of R&D, industry, and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Total foreign R&D performance			Research (basic and applied)			Development		
		Total	Paid for by the company	Paid for by others	Total	Paid for by the company	Paid for by others	Total	Paid for by the company	Paid for by others
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	186	186		0	24	24	0	163	163
All companies (number of domestic employees)	–	164,727	150,198		14,529	26,058	21,335	4,723	138,669	128,863
Small companies										
10–19 ^a	–	644	636		8	109 i	107 i	2	535	529
20–49	–	1,205	1,164		40	239	234	4 i	966	930
Medium companies										
50–99	–	1,173	1,142		31	266	263	3	907	879
100–249	–	2,858	2,768		90	480	475	5	2,378	2,292
Large companies										
250–499	–	4,436	4,344		92	1,213	1,154	59	3,223	3,190
500–999	–	5,095	4,890		205	1,239	1,147	91	3,856	3,743
1,000–4,999	–	28,998	27,308		1,690 i	5,387	5,045	342 i	23,611	22,264
5,000–9,999	–	13,367	11,590		1,777	3,013	1,611	1,402	10,354	9,979
10,000–24,999	–	37,522	31,313		6,210	6,176	4,481	1,695	31,346	26,832
25,000 or more	–	69,429	65,043		4,386 i	7,937 i	6,819 i	1,118 i	61,491	58,224

* = amount < \$500,000; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%.

NAICS = 2017 North American Industry Classification System.

^a The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):
Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D.

Source(s):
National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 23. Companies that performed foreign R&D, domestic and foreign R&D paid for by the company and others and performed by the company, by type of R&D and selected industry: 2024

(Millions of U.S. dollars)

Industry	NAICS code	Total	Paid for by the company	Paid for by others	Research (basic and applied)			Development											
					Total	Paid for by the company	Paid for by others	Total	Paid for by the company	Paid for by others									
Total domestic R&D performance																			
All industries	21–23, 31–33, 42–81	585,566		535,050		50,516		105,677		90,989		14,688	i	479,888		444,061		35,828	
Manufacturing industries	31–33	305,082		274,775		30,307		64,554		56,919		7,635	i	240,529		217,856		22,672	
Chemicals	325	89,459		86,344		3,115		27,407		26,393		1,014	i	62,052		59,951		2,101	
Pharmaceuticals and medicines	3254	83,034		80,324		2,709		25,314		24,399		915	i	57,720		55,926		1,794	
Other chemicals	other 325	6,426		6,020		406		2,093		1,994		99		4,332		4,025		307	
Computer and electronic products	334	103,710		99,586		4,124		15,343		14,372		970	i	88,367		85,214		3,154	
Semiconductor and other electronic components	3344	46,511		46,230		281		5,103	i	5,072	i	31		41,408	i	41,158	i	250	
Other computer and electronic products	other 334	57,200		53,356		3,844		10,240		9,300		940	i	46,960		44,056		2,904	
Nonmanufacturing industries	21–23, 42–81	280,483		260,274		20,209		41,124		34,070		7,054		239,360		226,204		13,155	i
Information	51	199,860		199,642		218		17,513		17,470		43		182,346		182,172		175	
Software publishers	5112	56,582		56,427		155		3,949		3,922		27		52,632		52,505		127	
Other information	other 51	143,278		143,215		63		13,564		13,548		16		129,714		129,667		47	
Professional, scientific, and technical services	54	43,854		23,998		19,857		14,192		7,185	i	7,007		29,662		16,813		12,850	i
Scientific research and development services	5417	21,304		2,318		18,986		7,129		880	i	6,249		14,175	i	1,439	i	12,736	i
Other professional, scientific, and technical services	other 54	22,551		21,679		871		7,063		6,305		758		15,487		15,374		113	
Total foreign R&D performance																			
All industries	21–23, 31–33, 42–81	164,727		150,198		14,529		26,058		21,335		4,723		138,669		128,863		9,807	
Manufacturing industries	31–33	90,435		88,546		1,890		14,015		13,646		369		76,420		74,900		1,520	
Chemicals	325	26,941		26,396		545		5,953		5,793		161	i	20,987		20,604		384	
Pharmaceuticals and medicines	3254	24,122		23,612		509		5,212		5,077		134	i	18,910		18,535		375	
Other chemicals	other 325	2,819		2,784		35		742		715		26	i	2,077		2,068		9	
Computer and electronic products	334	37,633		37,370		263		4,159		4,132		27		33,474		33,239		235	
Semiconductor and other electronic components	3344	21,742		21,563		179		2,315		2,305		10		19,427		19,258		169	
Other computer and electronic products	other 334	15,891		15,807		84		1,844		1,827		18		14,047		13,981		66	
Nonmanufacturing industries	21–23, 42–81	74,292		61,652		12,640		12,043		7,690		4,353		62,249		53,963		8,287	
Information	51	46,361		46,162		200		3,968		3,938		30		42,393		42,224		169	
Software publishers	5112	16,904		16,767		138		1,322		1,292		30		15,582		15,475		107	
Other information	other 51	29,457		29,395		62		2,646	i	2,646	i	*	i	26,811	i	26,749	i	62	
Professional, scientific, and technical services	54	20,377		8,036		12,341		6,001		1,733	i	4,267		14,376		6,303		8,073	
Scientific research and development services	5417	13,219		949		12,270		4,356		117	i	4,239		8,863		832	i	8,031	
Other professional, scientific, and technical services	other 54	7,157		7,087		71		1,644	i	1,616	i	28		5,513		5,470		43	

* = amount < \$500,000; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse.

NAICS = 2017 North American Industry Classification System.

Note(s):
Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D.

Source(s):
National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 24. Foreign R&D paid for by the company and others and performed by the company, by type of R&D, selected industry, and location: 2024

(Millions of U.S. dollars)

Industry and location	NAICS code	Total foreign R&D performance	Research (basic and applied)	Development
All locations				
All industries	21–23, 31–33, 42–81	164,727	26,058	138,669
Manufacturing industries	31–33	90,435	14,015	76,420
Chemicals	325	26,941	5,953	20,987
Pharmaceuticals and medicines	3254	24,122	5,212	18,910
Computer and electronic products	334	37,633	4,159	33,474
Semiconductor and other electronic components	3344	21,742	2,315	19,427
Nonmanufacturing industries	21–23, 42–81	74,292	12,043	62,249
Information	51	46,361	3,968	42,393
Software publishers	5112	16,904	1,322	15,582
Professional, scientific, and technical services	54	20,377	6,001	14,376
Scientific research and development services	5417	13,219	4,356	8,863
Africa				
All industries	21–23, 31–33, 42–81	616	147	469
Manufacturing industries	31–33	130	24	106 i
Chemicals	325	68	15	53 i
Pharmaceuticals and medicines	3254	61	13	48 i
Computer and electronic products	334	8	1	7 i
Semiconductor and other electronic components	3344	*	*	* i
Nonmanufacturing industries	21–23, 42–81	486	123	363
Information	51	154	12	143
Software publishers	5112	D	D	47
Professional, scientific, and technical services	54	285	92	193
Scientific research and development services	5417	260	88	171
Asia and Pacific				
All industries	21–23, 31–33, 42–81	57,655	7,775	49,880
Manufacturing industries	31–33	32,945	4,275	28,670
Chemicals	325	5,189	1,101	4,088
Pharmaceuticals and medicines	3254	4,457	910	3,547
Computer and electronic products	334	19,379	2,056	17,323
Semiconductor and other electronic components	3344	13,163	1,286 i	11,877
Nonmanufacturing industries	21–23, 42–81	24,709	3,499	21,210
Information	51	15,631	1,250	14,381
Software publishers	5112	7,298	492	6,806
Professional, scientific, and technical services	54	5,933	1,410 i	4,524
Scientific research and development services	5417	3,937	1,019	2,918 i
Canada				
All industries	21–23, 31–33, 42–81	13,227	2,603	10,625
Manufacturing industries	31–33	5,792	1,007	4,785
Chemicals	325	1,009	213	796 i
Pharmaceuticals and medicines	3254	954	202	751 i
Computer and electronic products	334	2,795	339	2,456
Semiconductor and other electronic components	3344	1,542	125	1,417
Nonmanufacturing industries	21–23, 42–81	7,436	1,596	5,840
Information	51	4,543	407	4,136
Software publishers	5112	2,106	183	1,923
Professional, scientific, and technical services	54	2,013	1,015	998
Scientific research and development services	5417	881	578	303
Europe				
All industries	21–23, 31–33, 42–81	75,964	13,106	62,857

Table 24. Foreign R&D paid for by the company and others and performed by the company, by type of R&D, selected industry, and location: 2024

(Millions of U.S. dollars)

Industry and location	NAICS code	Total foreign R&D performance	Research (basic and applied)	Development
Manufacturing industries	31–33	41,131	7,362	33,769
Chemicals	325	18,849	4,217	14,633
Pharmaceuticals and medicines	3254	17,123	3,768	13,355
Computer and electronic products	334	10,035	1,161	8,874
Semiconductor and other electronic components	3344	3,807	494	3,314
Nonmanufacturing industries	21–23, 42–81	34,832	5,744	29,088
Information	51	21,359	1,680	19,679
Software publishers	5112	6,106	528	5,578
Professional, scientific, and technical services	54	10,543	3,164	7,378
Scientific research and development services	5417	7,385	2,499	4,885
Latin America and other Western Hemisphere ^a				
All industries	21–23, 31–33, 42–81	6,353	934	5,419
Manufacturing industries	31–33	4,204	619	3,585
Chemicals	325	1,146	234	912
Pharmaceuticals and medicines	3254	920	184	736
Computer and electronic products	334	1,027	173	854
Semiconductor and other electronic components	3344	364	54	310
Nonmanufacturing industries	21–23, 42–81	2,149	315	1,834
Information	51	1,067	80	987
Software publishers	5112	D	D	D
Professional, scientific, and technical services	54	862	188	674
Scientific research and development services	5417	638	142	496
Middle East				
All industries	21–23, 31–33, 42–81	10,436	1,370	9,066
Manufacturing industries	31–33	5,831	615	5,217
Chemicals	325	480	96	385
Pharmaceuticals and medicines	3254	446	89	357
Computer and electronic products	334	4,377	427	3,950
Semiconductor and other electronic components	3344	2,863	356	2,507
Nonmanufacturing industries	21–23, 42–81	4,605	755	3,850
Information	51	3,569	535	3,035
Software publishers	5112	1,053	85	968
Professional, scientific, and technical services	54	711	127	583
Scientific research and development services	5417	114	28	86
Puerto Rico ^b				
All industries	21–23, 31–33, 42–81	321	76	245
Manufacturing industries	31–33	314	75	239
Chemicals	325	172	69	103
Pharmaceuticals and medicines	3254	D	D	D
Computer and electronic products	334	8	*	7
Semiconductor and other electronic components	3344	D	0	D
Nonmanufacturing industries	21–23, 42–81	7	1	6
Information	51	3	1	3
Software publishers	5112	2	1	2
Professional, scientific, and technical services	54	4	*	3
Scientific research and development services	5417	4	*	3

* = amount < \$500,000; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse.

NAICS = 2017 North American Industry Classification System.

^a Other Western Hemisphere is defined as Argentina, Brazil, Chile, Mexico, and other Latin America.

^b Puerto Rico is not included in the U.S. total due to its classification as a U.S. territory.

Note(s):

Detail within a select location may not add to total because of rounding. Sum of locations does not equal all locations due to the undistributed portion not being published. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 25. Domestic R&D paid for and performed by the company, by type of cost, industry, and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Total	Salaries, wages, and fringe benefits	Stock-based compensation	Temporary staffing	Expensed equipment	Materials and supplies	Lease and rental payments	Depreciation	Royalties and licensing fees	Other purchased services (except R&D)	Other
All industries	21–23, 31–33, 42–81	679,371	358,050	91,483	27,961	11,828	37,867	11,808	29,313	3,924	25,386	81,752
Manufacturing industries	31–33	356,431	182,248	28,102	11,606	4,369	32,566	5,623	18,234	2,961	15,345	55,377
Food	311	6,020	3,427	68	302	18	1,041	148	289	8	134	585
Beverage and tobacco products	312	1,459	818	14	32	1	81	5	78	*	178	252
Textile, apparel, and leather products	313–16	783	545	11	20	3	79	8	18	1	21	77
Wood products	321	261	220	*	5	1	22	*	*	*	D	D
Paper	322	1,238	549	1	2	61	499	4	14	1	2	105
Printing and related support activities	323	253	173	1	8	2	16	1	9	*	12	30
Petroleum and coal products	324	1,004	430	1	38	1	59	3	26	30	D	D
Chemicals	325	131,790	56,496	8,337	6,711	1,039	12,162	2,582	4,635	1,138	9,829	28,860
Basic chemicals	3251	2,883	1,630	69	62	18	292	75	185	D	171	D
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	D	D	*	D	D	D	21	D	25	67	D
Pesticide, fertilizer, and other agricultural chemicals	3253	D	D	5	D	5	D	D	D	D	52	D
Pharmaceuticals and medicines	3254	122,656	50,743	8,248	6,499	1,006	11,489	2,403	4,160	1,088	9,456	27,565
Soap, cleaning compound, and toilet preparations	3256	2,684	1,684	15	60	D	146	D	80	D	37	D
Paint, coating, adhesive, and other chemicals	3255, 3259	D	1,039	*	D	D	75	D	D	6	47	D
Plastics and rubber products	326	2,767	1,644	6	56	117	324	22	100	6	74	419
Nonmetallic mineral products	327	1,556	1,115	20	22	9	77	14	84	1	64	151
Primary metals	331	1,129	467	4	23	5	434	2	28	5	85	74
Fabricated metal products	332	3,137	2,047	184	83	21	370	32	109	14	124	153
Machinery	333	19,844	11,802	D	877	146	2,324	136	808	77	752	D
Agricultural implement	33311	D	D	D	D	3	D	D	D	*	D	D
Semiconductor machinery	333242	D	D	D	D	33	605	D	D	1	D	D
Engine, turbine, and power transmission equipment	3336	D	2,392	*	487	32	D	D	D	1	228	D
Other machinery	other 333	8,060	5,175	D	274	78	1,179	71	205	75	190	D
Computer and electronic products	334	107,038	57,995	16,053	1,426	2,102	8,005	1,592	7,535	1,260	1,596	9,473
Communications equipment	3342	12,069	6,732	1,514	266	249	221	910	356	13	128	1,680
Semiconductor and other electronic components	3344	48,546	26,181	6,974	690	381	4,672	325	3,983	1,117	715	3,507
Navigational, measuring, electromedical, and control instruments	3345	10,736	6,522	513	176	117	811	81	242	35	451	1,788
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	3,046	1,772	218	37	6	214	35	69	9	174	511
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	3,190	1,738	201	50	7	179	11	40	18	170	775
Other measuring and controlling devices	other 3345	4,501	3,012	94	89	104	417	35	132	9	107	502
Other computer and electronic products	other 334	35,687	18,560	7,052	294	1,355	2,302	276	2,955	94	302	2,498
Electrical equipment, appliances, and components	335	6,135	3,706	D	200	67	426	187	215	4	147	D
Transportation equipment	336	47,039	26,371	D	1,000	445	4,695	555	3,593	376	988	D

Table 25. Domestic R&D paid for and performed by the company, by type of cost, industry, and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Total	Salaries, wages, and fringe benefits		Stock-based compensation		Temporary staffing		Expensed equipment		Materials and supplies		Lease and rental payments		Depreciation		Royalties and licensing fees	Other purchased services (except R&D)	Other				
Motor vehicles, bodies, trailers, and parts	3361–63	D	17,082		1,398		650		330		3,294		433		D		347	D	D				
Aerospace products and parts	3364	15,130	8,096		D		308		91		1,115		D		256		D	470	D				
Aircraft, aircraft engine, and aircraft parts	336411–13	D	D		122		173		51		D		D		D		D	D	D				
Guided missile, space vehicle, and related parts	336414–15, 336419	D	D		D		135		40		D		D		D		D	D	D				
Military armored vehicle, tank, and tank components	336992	23	14		0		*		5		3		0		*		0	D	D				
Other transportation	other 336	D	1,180	i	D		41	i	19		284	i	D		D		D	D	D				
Furniture and related products	337	450	311		2		8		18	i	42		4		9		1	13	42				
Miscellaneous	339	24,528	14,130		938		793		312		1,908		329		684		39	988	4,407				
Medical equipment and supplies	3391	21,840	12,232		882		735		261		1,731		266		638		36	926	4,134				
Other miscellaneous manufacturing	3399	2,688	1,898		56		58		51		177		63		46		3	62	273				
Nonmanufacturing industries	21–23, 42–81	322,940	175,802		63,380		16,355		7,459		5,301		6,185		11,079		964	10,041	26,375				
Mining, quarrying, oil and gas extraction, and support activities	21	1,224	D		9		8		10		257		10		24		3	80	D				
Utilities	22	D	D		*		39		3		14		*		13		*	11	22				
Wholesale trade	42	D	1,125	i	*		96	i	21	i	110	i	10	i	D		3	41	i	D			
Electronic shopping and electronic auctions	454111–12	7,898	i	5,659	i	1,242	i	46	i	134	i	9	i	32	i	97	i	5	i	40	i	631	i
Transportation and warehousing	48–49	D	D		1,133		222		352		D		321		D		174	316	D				
Information	51	226,853	113,254		55,334		12,387		5,783		2,195		4,848		7,728		557	8,197	16,571				
Publishing	511	63,085	36,208		12,586		2,538		811		1,430		D		681		85	2,448	D				
Newspaper, periodical, book, and directory publishers	5111	489	i	332	i	0		123	i	0		0	0		*	i	0	15	i	18	i		
Software publishers	5112	62,597	35,877		12,586		2,415		811		1,430		D		681		85	2,433	D				
Telecommunications	517	D	D		33		D		D		D		D		D		3	D	D				
Data processing, hosting, and related services	518	58,017	32,993		11,711		D		D		526		803		D		366	3,003	D				
Other information	other 51	D	D		31,003		D		4,347		D		3,656		D		103	D	D				
Finance and insurance	52	25,362	19,306		1,463		1,757		458		81		218		1,148		13	175	743				
Real estate and rental and leasing	53	2,750	1,231		1,093		98		42		5		4		47		*	29	201				
Lessors of nonfinancial intangible assets (except copyrighted works)	533	23	14		*	i	*	i	*	i	1		0		4		0	1	2				
Other real estate and rental and leasing	other 53	2,727	1,217		1,093		98		42		4		4		43		*	28	199				
Professional, scientific, and technical services	54	40,134	24,933		2,702		1,422		593		1,507		615		1,068		166	i	995	6,132			
Architectural, engineering, and related services	5413	3,240	2,433		7		113		43		157	i	29		32		3	28	392	i			
Computer systems design and related services	5415	22,353	13,719		1,485		790		247		350		302		551		36	489	4,383				
Scientific research and development services	5417	5,705	3,261		113		145		127		689		247		240		21	316	547				
Research and development in nanotechnology	541713	434	208		13		17		13		89		10		31		1	i	4	48			
Research and development in biotechnology (except nanobiotechnology)	541714	1,204	622		46		31		8		175		79		58		9	52	125				
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	4,060	2,425		54		96		106	i	425		158		150		11	260	375				
Research and development in the social sciences and humanities	541720	8	7		*	i	*		*		*		*		1		0	*	i	*	i		

Table 25. Domestic R&D paid for and performed by the company, by type of cost, industry, and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Total	Salaries, wages, and fringe benefits	Stock-based compensation	Temporary staffing	Expensed equipment	Materials and supplies	Lease and rental payments	Depreciation	Royalties and licensing fees	Other purchased services (except R&D)	Other
Other professional, scientific, and technical services	other 54	8,835 i	5,520 i	1,097 i	373	175 i	311 i	37	245 i	106 i	162 i	810 i
Health care services	621–23	1,888	969	226	67	34	147	41	D	31	76	D
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	3,579	2,742	177	213	29	D	85	20	12	80	D
All companies (number of domestic employees)	–	679,371	358,050	91,483	27,961	11,828	37,867	11,808	29,313	3,924	25,386	81,752
Small companies												
10–19 ^a	–	3,734	2,489	81	174	25	258	104	64	21	165	352
20–49	–	14,153	7,579	262	479	95	1,197	290	842	95	2,186	1,127
Medium companies												
50–99	–	14,998	9,012	679	559	149	1,340	342	349	83	1,105	1,381
100–249	–	26,548	15,609	1,663	968	272	1,944	735	764	177	1,179	3,238
Large companies												
250–499	–	26,185	14,674	1,946	937	307	1,602	494	788	142	1,160	4,136
500–999	–	40,152	17,158	6,235	1,247	437	2,350	1,893	1,029	266	3,669	5,870
1,000–4,999	–	110,612	59,786	17,433	3,240	1,238	5,433	1,584	3,037	705	4,321	13,835
5,000–9,999	–	55,804	31,975	5,688	1,560	721	3,592	764	2,866	376	1,045	7,215
10,000–24,999	–	120,991	62,738	12,843	4,760	1,779	8,876	1,426	4,918	747 i	5,407	17,496
25,000 or more	–	266,195	137,030	44,653	14,037	6,805	11,276	4,177	14,654	1,312	5,150	27,101

* = amount < \$500,000; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse.

NAICS = 2017 North American Industry Classification System.

^a The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):
Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D.

Source(s):
National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 26. Domestic R&D paid for and performed by the company, by industry and company size: 2024

(Millions of U.S. dollars)

Industry	NAICS code	Company size (domestic employees)											
		All companies	10–19 ^a	20–49	50–99	100–249	250–499	500–999	1,000–4,999	5,000–9,999	10,000–24,999	25,000 or more	
All industries	21–23, 31–33, 42–81	679,371	3,734	14,153	14,998	26,548	26,185	40,152	110,612	55,804	120,991	266,195	
Manufacturing industries	31–33	356,431	1,397	5,701	9,060	15,286	15,651	16,061	54,473	32,295	88,296	118,210	
Food	311	6,020	4	D	115	274	294	375	910	D	1,513	932	
Beverage and tobacco products	312	1,459	20	7	16	28	32	14	193	384	65	698	
Textile, apparel, and leather products	313–16	783	0	67	10	44	46	32	230	279	74	0	
Wood products	321	261	0	4	4	14	8	14	38	105	74	0	
Paper	322	1,238	0	1	4	56	27	96	74	381	355	245	
Printing and related support activities	323	253	3	5	15	32	10	16	93	70	10	0	
Petroleum and coal products	324	1,004	0	D	D	15	12	73	98	2	731	D	
Chemicals	325	131,790	777	2,973	5,534	9,576	8,998	6,545	21,744	5,606	43,516	26,522	
Basic chemicals	3251	2,883	25	24	148	141	401	193	1,010	531	409	0	
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	D	D	19	D	D	53	128	D	0	905	0	
Pesticide, fertilizer, and other agricultural chemicals	3253	D	2	32	D	15	102	0	D	D	D	0	
Pharmaceuticals and medicines	3254	122,656	715	2,831	5,252	9,156	8,248	6,094	19,864	4,310	41,088	25,098	
Soap, cleaning compound, and toilet preparations	3256	2,684	4	10	23	100	36	15	239	541	448	1,268	
Paint, coating, adhesive, and other chemicals	3255, 3259	D	D	58	D	D	158	115	D	D	D	155	
Plastics and rubber products	326	2,767	0	64	84	155	165	186	683	627	582	222	
Nonmetallic mineral products	327	1,556	8	D	29	29	41	50	160	254	D	0	
Primary metals	331	1,129	D	11	36	33	18	17	305	D	507	0	
Fabricated metal products	332	3,137	26	222	204	381	256	364	1,117	234	318	14	
Machinery	333	19,844	97	D	611	684	826	735	3,061	D	5,448	4,667	
Agricultural implement	33311	D	10	20	11	93	34	22	235	D	D	D	
Semiconductor machinery	333242	D	*	22	64	D	D	204	1,031	D	D	0	
Engine, turbine, and power transmission equipment	3336	D	1	18	6	11	53	43	119	D	D	2,812	
Other machinery	other 333	8,060	86	D	530	D	D	466	1,676	D	D	D	
Computer and electronic products	334	107,038	221	753	1,015	2,002	2,657	2,267	15,912	8,951	26,885	46,375	
Communications equipment	3342	12,069	D	D	202	265	D	D	D	D	D	D	
Semiconductor and other electronic components	3344	48,546	D	260	D	815	1,584	1,098	5,781	3,893	D	12,452	
Navigational, measuring, electromedical, and control instruments	3345	10,736	D	296	375	798	D	D	3,746	D	1,270	864	
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	3,046	31	165	137	234	414	215	268	1,224	357	0	
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	3,190	13	27	62	236	2	D	1,901	D	0	864	
Other measuring and controlling devices	other 3345	4,501	D	104	176	328	D	D	1,577	880	913	0	
Other computer and electronic products	other 334	35,687	D	D	D	124	D	D	D	D	D	D	
Electrical equipment, appliances, and components	335	6,135	D	D	302	481	528	1,123	2,373	611	279	316	
Transportation equipment	336	47,039	41	155	436	510	516	2,668	3,081	5,230	3,022	31,379	
Motor vehicles, bodies, trailers, and parts	3361–63	D	D	73	68	241	334	1,615	1,583	4,376	2,461	D	
Aerospace products and parts	3364	15,130	D	52	255	183	117	D	1,270	394	D	11,521	

Table 26. Domestic R&D paid for and performed by the company, by industry and company size: 2024

(Millions of U.S. dollars)

Industry	NAICS code	Company size (domestic employees)																	
		All companies	10–19 ^a	20–49	50–99	100–249	250–499	500–999	1,000–4,999	5,000–9,999	10,000–24,999	25,000 or more							
Aircraft, aircraft engine, and aircraft parts	336411–13	D	1	D	D	139	D	626	D	394	D	D							
Guided missile, space vehicle, and related parts	336414–15, 336419	D	D	D	D	44	D	D	D	0	0	D							
Military armored vehicle, tank, and tank components	336992	23	0	0	D	*	12	D	0	0	0	0							
Other transportation	other 336	D	D	30	D	86	53	107	229	460	i	D	D						
Furniture and related products	337	450	2	5	16	30	49	30	97	143	78	0							
Miscellaneous	339	24,528	139	D	D	942	1,166	1,458	4,303	4,435	D	D							
Medical equipment and supplies	3391	21,840	135	783	r	530	603	820	1,221	3,069	4,400	3,624	6,654						
Other miscellaneous manufacturing	3399	2,688	4	D	D	339	346	236	1,234	35	D	D							
Nonmanufacturing industries	21–23, 42–81	322,940	2,337	8,452	5,939	11,262	10,534	24,090	56,139	23,509	32,695	147,984							
Mining, quarrying, oil and gas extraction, and support activities	21	1,224	6	30	67	D	175	9	155	D	678	0							
Utilities	22	D	1	D	0	0	2	8	149	12	397	20							
Wholesale trade	42	D	86	D	204	i	331	i	285	193	i	149	i	55	i	43	i	0	
Electronic shopping and electronic auctions	454111–12	7,898	i	1	r	15	7	46	124	6	353	i	D	0	D				
Transportation and warehousing	48–49	D	0	*	467	r	7	85	129	1,121	D	5,469	i	731					
Information	51	226,853	925	4,673	2,131	5,716	5,556	16,061	38,205	12,208	18,990	122,388							
Publishing	511	63,085	505	1,025	D	2,414	1,474	D	11,943	2,837	13,788	26,431							
Newspaper, periodical, book, and directory publishers	5111	489	i	*	i	*	i	8	i	9	i	5	i	0	467	i	0	0	0
Software publishers	5112	62,597	505	1,025	D	2,405	1,470	D	11,476	2,837	13,788	26,431							
Telecommunications	517	D	2	r	D	D	134	134	190	D	D	41	D						
Data processing, hosting, and related services	518	58,017	411	3,530	1,138	2,753	3,535	4,877	20,860	3,260	5,162	i	12,492						
Other information	other 51	D	7	D	D	415	412	D	D	D	0	D							
Finance and insurance	52	25,362	23	17	14	643	882	569	7,246	4,464	i	3,106	8,397						
Real estate and rental and leasing	53	2,750	3	21	45	30	15	83	2,439	7	0	109							
Lessors of nonfinancial intangible assets (except copyrighted works)	533	23	0	0	23	*	i	0	*	0	0	0	0						
Other real estate and rental and leasing	other 53	2,727	3	21	22	29	15	83	2,439	7	0	109							
Professional, scientific, and technical services	54	40,134	D	3,343	2,816	4,055	3,023	6,582	4,429	D	3,715	i	9,548						
Architectural, engineering, and related services	5413	3,240	D	315	272	501	555	514	r	491	D	108	0						
Computer systems design and related services	5415	22,353	436	1,605	1,533	2,111	1,435	4,800	3,067	339	723	6,305							
Scientific research and development services	5417	5,705	635	1,100	770	836	347	707	137	0	2	1,171							
Research and development in nanotechnology	541713	434	14	60	78	0	6	265	11	0	0	0							
Research and development in biotechnology (except nanobiotechnology)	541714	1,204	228	352	174	314	24	13	20	0	2	75							
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	4,060	392	686	518	522	317	429	100	0	0	1,097							
Research and development in the social sciences and humanities	541720	8	1	2	0	0	0	0	6	0	0	0							
Other professional, scientific, and technical services	other 54	8,835	i	67	323	242	608	686	561	734	661	2,882	i	2,071	i				
Health care services	621–23	1,888	D	D	75	172	69	123	1,282	18	*	96							
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	3,579	7	D	113	D	319	329	610	D	294	D							

* = amount < \$500,000; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%.

NAICS = 2017 North American Industry Classification System.

^a The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):
Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D.

Source(s):
National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 27. Domestic R&D paid for and performed by the company, by type of R&D, industry, and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Total	Basic research	Applied research	Development
All industries	21–23, 31–33, 42–81	679,371	34,856	95,812	548,704
Manufacturing industries	31–33	356,431	20,937	61,956	273,538
Food	311	6,020	330	1,286	4,404
Beverage and tobacco products	312	1,459	182	192	1,085
Textile, apparel, and leather products	313–16	783	68	65	649
Wood products	321	261	88	30	143
Paper	322	1,238	22	321	895
Printing and related support activities	323	253	50	39	164
Petroleum and coal products	324	1,004	167	308	529
Chemicals	325	131,790	12,185	31,732	87,874
Basic chemicals	3251	2,883	424	684	1,775
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	D	257	331	D
Pesticide, fertilizer, and other agricultural chemicals	3253	D	D	D	D
Pharmaceuticals and medicines	3254	122,656	11,182	29,665	81,809
Soap, cleaning compound, and toilet preparations	3256	2,684	50	465	2,170
Paint, coating, adhesive, and other chemicals	3255, 3259	D	D	D	D
Plastics and rubber products	326	2,767	171	429	2,167
Nonmetallic mineral products	327	1,556 i	211 i	338 i	1,007 i
Primary metals	331	1,129	109	147	873
Fabricated metal products	332	3,137	288	477	2,372
Machinery	333	19,844	1,091	3,001	15,753
Agricultural implement	33311	D	126	171	D
Semiconductor machinery	333242	D	237	D	D
Engine, turbine, and power transmission equipment	3336	D	81	D	3,088
Other machinery	other 333	8,060	647	D	D
Computer and electronic products	334	107,038	3,418	12,239	91,380
Communications equipment	3342	12,069	155	1,052	10,861
Semiconductor and other electronic components	3344	48,546	1,901 i	3,583 i	43,062 i
Navigational, measuring, electromedical, and control instruments	3345	10,736	489	1,975	8,272
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	3,046	81 i	916 i	2,049 i
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	3,190	148	265	2,776
Other measuring and controlling devices	other 3345	4,501	260	793	3,447
Other computer and electronic products	other 334	35,687	872	5,629	29,185
Electrical equipment, appliances, and components	335	6,135	337	815	4,983
Transportation equipment	336	47,039	1,312	7,054	38,673
Motor vehicles, bodies, trailers, and parts	3361–63	D	665	2,902 i	D
Aerospace products and parts	3364	15,130	549	3,954	10,627
Aircraft, aircraft engine, and aircraft parts	336411–13	D	D	D	7,880
Guided missile, space vehicle, and related parts	336414–15, 336419	D	D	D	2,747
Military armored vehicle, tank, and tank components	336992	23	2	2	20
Other transportation	other 336	D	96	196	D
Furniture and related products	337	450	41	57	352
Miscellaneous	339	24,528	869	3,426	20,234
Medical equipment and supplies	3391	21,840	552	3,221	18,067
Other miscellaneous manufacturing	3399	2,688	316	205	2,167
Nonmanufacturing industries	21–23, 42–81	322,940	13,918	33,856	275,166
Mining, quarrying, oil and gas extraction, and support activities	21	1,224	63	120	1,041
Utilities	22	D	20	150 i	D
Wholesale trade	42	D	139	305 i	D
Electronic shopping and electronic auctions	454111–12	7,898 i	56 i	3,450 i	4,392 i
Transportation and warehousing	48–49	D	170	1,075	D

Table 27. Domestic R&D paid for and performed by the company, by type of R&D, industry, and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Total	Basic research	Applied research	Development
Information	51	226,853	8,622	13,986	204,244
Publishing	511	63,085	1,962	3,030	58,093
Newspaper, periodical, book, and directory publishers	5111	489 i	1 i	2 i	485 i
Software publishers	5112	62,597	1,961	3,027	57,608
Telecommunications	517	D	241	606	D
Data processing, hosting, and related services	518	58,017	2,273	6,090	49,654
Other information	other 51	D	4,146	4,261	D
Finance and insurance	52	25,362	1,288	4,147	19,928
Real estate and rental and leasing	53	2,750	123	994	1,633
Lessors of nonfinancial intangible assets (except copyrighted works)	533	23	0	*	23
Other real estate and rental and leasing	other 53	2,727	123	994	1,610
Professional, scientific, and technical services	54	40,134	2,824	9,096	28,214
Architectural, engineering, and related services	5413	3,240	201	859	2,180
Computer systems design and related services	5415	22,353	1,392	4,349	16,612
Scientific research and development services	5417	5,705	503	2,011	3,192
Research and development in nanotechnology	541713	434	7	299	128
Research and development in biotechnology (except nanobiotechnology)	541714	1,204	163	464	576
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	4,060	333	1,246	2,481
Research and development in the social sciences and humanities	541720	8	*	2	6
Other professional, scientific, and technical services	other 54	8,835 i	728 i	1,877 i	6,230 i
Health care services	621–23	1,888	212	203	1,473
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	3,579	401	330	2,849
All companies (number of domestic employees)	–	679,371	34,856	95,812	548,704
Small companies					
10–19 ^a	–	3,734	343	898	2,493
20–49	–	14,153	1,145	3,293	9,715
Medium companies					
50–99	–	14,998	1,350	3,764	9,885
100–249	–	26,548	2,431	5,762	18,356
Large companies					
250–499	–	26,185	2,846	5,452	17,887
500–999	–	40,152	5,534	7,144	27,473
1,000–4,999	–	110,612	6,444	17,003	87,164
5,000–9,999	–	55,804	2,167	7,827	45,809
10,000–24,999	–	120,991	7,048	19,990	93,952
25,000 or more	–	266,195	5,547	24,678	235,970

* = amount < \$500,000; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse.

NAICS = 2017 North American Industry Classification System.

^a The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):

Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 28-A. Companies with domestic R&D paid for and performed by the company, by industry, company size, and state (A–M): 2024

(Millions of U.S. dollars and number of companies)

Industry and company size	NAICS code	Companies, U.S. total (number)		United States	Alabama		Alaska		Arizona		Arkansas		California		Colorado		Connecticut		Delaware		District of Columbia		Florida		Georgia		Hawaii		Idaho		Illinois		Indiana		Iowa		Kansas		Kentucky		Louisiana		Maine		Maryland		Massachusetts		Michigan		Minnesota		Mississippi		Missouri		Montana		
All industries	21–23, 31–33, 42–81	25,580		679,371	2,412		73		7,649		633		243,582		9,175		7,360		6,204		1,092		10,815		9,208		346		3,190		19,566		14,745		4,249		1,950		998		624		616		6,149		47,870		23,226		8,536		472		5,498		395		
Manufacturing industries	31–33	12,530		356,431	966		10		5,432		352		115,851		3,970		5,981		3,080		95		3,996		3,150		158		2,710		13,908		13,948		2,393		1,202		681		334		378		3,995		35,912		21,057		6,348		384		3,906		195		
Food	311	830		6,020	3	e	2	e	10		73		453		68		23		429	i	D		49		47		44	i	89		1,044	i	390	i	696	i	122		68		9		1	e	61		69		88	i	408	i	3	e	86		1		
Beverage and tobacco products	312	250		1,459	1	e	*	e	1	e	*	e	65		23		4		*	e	*	e	10		202		*	e	3		16		1	i	*	e	*	e	29		*	e	1	e	*	e	26		2	e	3		*	e	1	e	1		
Textile, apparel, and leather products	313–16	180		783	4		*	e	1	e	*	e	138		12		5		*	e	*	e	19		63		*	e	D		29		1	e	4		1	r	1	e	*	e	1	e	1	e	20		16		13		1	e	3	e	*	e	
Wood products	321	80		261	4		*	e	9	i	2		42		3		*		*		0		12		11		*	e	3		11		2		16		1		2	i	*		*		1		2		3		13		4		3		*		
Paper	322	70		1,238	23		0		32	i	24		13		6		5		2		0		26		109		0		*		19		7		1		8		87		2		35		*		8		14		37		31		1		0		
Printing and related support activities	323	130		253	*	i	*	i	6	i	1	i	7	i	1	i	1	i	1	i	*	i	2	i	3	i	*	i	*		3	i	2	i	1	i	*	i	5		*	i	*		1	i	5		6		17	i	*	i	8		*	i	
Petroleum and coal products	324	60		1,004	*	e	*	e	*	e	*	e	13		*	e	*	e	9		0		*	e	1		0		*	e	7		24		2		7		*	e	6		*	e	*	e	*	e	*	e	3		8		3		11		
Chemicals	325	2,190		131,790	118		1		247		32	i	31,994		457		4,223		2,407		39		744		449		61		14		7,026		9,900		155		337		157		66		24		2,199		26,899		1,051		457		11		2,416		7		
Basic chemicals	3251	310		2,883	5		0		1		7		336		8		80		160		*		4		151		*	e	1		142		22		46		26		5		39		D		9		95		23		7		5		62		D		
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	110		D	D		0		*	e	0		43		*	e	D		D		0		5		26		0		*	e	13		5		4		D		16		14		4		*	e	14		262		10		D		1	i	D		
Pesticide, fertilizer, and other agricultural chemicals	3253	70		D	D		0		2		3		80		8		D		D		0		14		5		*	e	D		8		D		10		D		D		D		D		D		*	e	24		4		4		22		2		
Pharmaceuticals and medicines	3254	1,130		122,656	100		1		237		21	i	31,337		432		3,930		2,061		38		696		222		61		9		6,713		9,855		86		227		26	i	10		19		2,177		26,674		682		227		1		2,264		5		
Soap, cleaning compound, and toilet preparations	3256	180		2,684	D		0		3		1		117		2		107		D		0		11		9		*	e	1		64		D		4		77	i	D		D		*	e	D		75		20	i	149		*	e	4		*	e	
Paint, coating, adhesive, and other chemicals	3255, 3259	410		D	10		*	e	2		*	e	81		7		95		D		*		14		36		0		D		86		17		5		5		110		3		*		13		40		40		61		D		64		*	e	
Plastics and rubber products	326	680		2,767	11		*	e	336		5		121		35		9		14		D		36		41		*	e	1		66		75		14		17		7		68	i	1	e	129		229		83		89		6		12		*	e	
Nonmetallic mineral products	327	220		1,556	i	2		*	e	1	e	*	e	40	i	41		3	i	*	e	*	e	4	e	8		*	e	*	e	36		2	e	1	e	1	e	*	e	1	e	*	e	6		40	i	190		14		23		7		*	e
Primary metals	331	170		1,129	5		0		6		11		23		8		3	r	0		0		6		23		0		*	e	5		71		8		1		11		*	e	*	e	*	e	23		49		33		201		1		*	e	
Fabricated metal products	332	1,380		3,137	26		1	e	127		3	e	366		16		51		1	e	D		64		151		2		5		110		86		20		36		25		9	e	2	e	22		85		106		161		10		45		3	i	
Machinery	333	1,850		19,844	74		0		167		90		4,428		100		140		1		*		241		276		1		40	i	2,090		1,593		789		170		79		64		9		281		1,010		472		761		21	i	421		87	i	

Table 28-A. Companies with domestic R&D paid for and performed by the company, by industry, company size, and state (A–M): 2024

(Millions of U.S. dollars and number of companies)

Industry and company size	NAICS code	Companies, U.S. total (number)		United States	Alabama	Alaska	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	District of Columbia	Florida	Georgia	Hawaii	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine	Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana			
Agricultural implement	33311	170		D	* e 0		2	7	54	19	D	0	0	D	66	0	D	440	D	721	79	* e D	0	5		6		59	159	2 r 10	D			
Semiconductor machinery	333242	40		D	0	0	73 i	0	3,628	D	D	0	0	D	0	0	D	0	0	0	0	0	D	0	0		434 i	0	20	0	0	D		
Engine, turbine, and power transmission equipment	3336	130		D	4	0	24	1	167	D	19	1	*	51	34	0	D	1,177	1,164	2	5	4	D	3	3		8	65	92	1	17	D		
Other machinery	other 333	1,520		8,060	70	0	68	82	579	63	121	1	0	180 i	175 i	1	D	473	D	66	87	75	24	6 i	273		562		348	490	18 i	394	D	
Computer and electronic products	334	1,750		107,038	242 i	4	3,081	53 i	58,106	2,160	343 i	140 i	51	1,464	726	44	2,506	1,156	113	102	124	59	21	64 i	432		3,934		448	787	10	158	57	
Communications equipment	3342	310		12,069	131 i	1	110	12	5,560	283	33	4	20	359	264	18	18	514	44	14	23	12	9	9	223		352		123	92	7	68	8	
Semiconductor and other electronic components	3344	460		48,546	55	2 i	2,795	26 i	22,450	578	131 i	10	22	337	91 i	12 i	2,287		259 i	27 i	11 i	7	40	4 i	43 i	108		1,852		180	179	1	40 i	10 i
Navigational, measuring, electromedical, and control instruments	3345	820		10,736	47	*	78 i	8	4,222	599	164	123 i	1	478 i	137	D	7	129	34	69	29	5 i	4 i	6	70		430		119	324	1	43	37	
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	170		3,046	30	0	11	1 i	2,104	25	31	*	0	51	49	0	0	53	8	23	3	*	*	1	7 i		111		13	73	0	7	1	
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	140		3,190	12	*	3	*	736	325	14	70 i	1	383 i	24	D	*	4	1 e	19	1 i	* e	* i	3	29		12		8	52	* e	17	32	
Other measuring and controlling devices	other 3345	520		4,501	5	* e	64 i	7	1,382	249	119 i	52	*	45	64	7	7	72	24	28 i	25	5 i	3 i	1	34		308		98	199	1	19 i	4 i	
Other computer and electronic products	other 334	180		35,687	8	1	98	7	25,874	699	15 i	3	8	290	233	D	194 i	254	8	7	65	2	4	6	31		1,300		26	192 i	1 i	8	3	
Electrical equipment, appliances, and components	335	390		6,135	6	*	28	3	2,380	79 i	102	2 i	0	28	101	0	19	297 i	50	32	6	41	5	* i	10 i		414		404	42	11	60	4	
Transportation equipment	336	1,050		47,039	421	2	1,175	44	9,551	661	894	59	D	912	627	4	D	939	949	462	345	100	67	41	607		542		16,626	688 i	27	608	12	
Motor vehicles, bodies, trailers, and parts	3361–63	630		D	187	D	245 i	10	6,592	47	7	52	D	194 i	77	* e	D	515	822	D	13	94	1 e	1	52		166		16,330	193	17	25	3	

Table 28-A. Companies with domestic R&D paid for and performed by the company, by industry, company size, and state (A–M): 2024

(Millions of U.S. dollars and number of companies)

Industry and company size	NAICS code	Companies, U.S. total (number)		United States	Alabama	Alaska	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	District of Columbia	Florida	Georgia	Hawaii	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine	Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana																				
Aerospace products and parts	3364	240		15,130	178	D	912	32	2,863	556	880	8	D	676	142	D	D	379	107	D	325	D	60	38	541	370	197	190	8	575	9																				
Aircraft, aircraft engine, and aircraft parts	336411–13	220		D	D	D	D	28	2,452	D	D	D	0	D	D	D	D	D	D	D	319	D	60	6	D	D	D	D	D	573	9																				
Guided missile, space vehicle, and related parts	336414–15, 336419	30		D	D	0	D	4	411	D	D	D	D	D	D	D	D	D	D	D	6	D	*	32	D	D	D	D	D	3	*																				
Military armored vehicle, tank, and tank components	336992	20		23	6	0	1	0	2	0	0	0	0	1	0	0	0	0	0	0	5	0	0	0	1	*	i	8	0	0	0	0																			
Other transportation	other 336	180		D	50	i	D	17	2	e	94	58	7	0	0	40	408	D	*	e	45	21	D	2	D	7	e	1	e	13	5	90	304	i	2	e	8	*	e												
Furniture and related products	337	170		450	3	*	e	1	i	*	i	40	*	i	*	e	*	e	1	4	i	*	e	*	e	4	*	e	3	133	i	33	7	*	e	*	e														
Miscellaneous	339	1,170		24,528	23	e	*	e	205	i	10	e	8,072	300	174	i	15	i	1	378	310	2	e	22	1,051	658	45	23	11	e	13	e	194	243	i	2,603	1,367	2,789	10	e	73	10	e								
Medical equipment and supplies	3391	800		21,840	19	e	*	e	175	i	9	e	7,633	268	149	i	10	i	1	346	264	1	e	6	e	878	640	18	12	e	8	e	9	e	192	238	i	2,490	1,272	2,750	6	e	63	6	e						
Other miscellaneous manufacturing	3399	380		2,688	4	*	e	30	1	e	440	32	25	5	*	32	46	*	16	173	19	27	12	3	e	4	2	i	6	114	95	39	4	10	4																
Nonmanufacturing industries	21–23, 42–81	13,060		322,940	1,446	63	2,217	281	127,731	5,205	1,379	3,124	997	6,819	6,057	187	480	5,659	797	1,857	748	317	291	237	2,154	11,958	2,169	2,188	89	1,592	i	201																			
Mining, quarrying, oil and gas extraction, and support activities	21	70		1,224	*	e	3	6	*	129	23	*	*	e	0	*	4	*	e	*	2	9	D	D	*	e	D	*	e	D	24	3	*	e	*	D	5														
Utilities	22	70		D	*	e	*	e	*	e	4	54	1	e	1	e	*	D	267	D	D	*	e	3	D	*	e	1	r	15	3	D	3	D	16	6	D	*	e												
Wholesale trade	42	1,580		D	9	e	1	e	21	i	3	e	215	i	25	i	12	i	2	e	D	59	135	i	D	D	171	i	31	i	36	i	13	i	D	7	e	D	7	e	27	62	i	52	i	3	e	14	e	1	e
Electronic shopping and electronic auctions	454111–12	110		7898	i	D	*	e	27	i	D	3,002	i	27	i	D	1	i	D	13	i	D	D	D	D	D	142	i	D	D	*	e	D	*	e																
Transportation and warehousing	48–49	440	r	D	9	e	2	e	23	41	4,605	i	45	D	14	9	772	36	14	3	e	170	19	e	8	e	9	8	e	9	e	2	e	D	115	83	16	16	20	1	e										
Information	51	3,610		226,853	1,230	32	1,324	147	96,780	3,992	917	2,289	716	3,572	3,708	124	407	i	2,830	555	1,650	546	195	112	148	907	8,541	1,399	1,067	39	1,021	i	136																		
Publishing	511	1,670		63,085	129	D	428	61	17,239	1,315	83	D	110	960	1,366	47	247	i	979	135	D	111	35	49	i	59	271	3,761	671	380	D	125	32																		
Newspaper, periodical, book, and directory publishers	5111	40	i	489	i	*	e	*	e	*	e	*	e	*	e	*	e	8	i	1	i	*	e	*	e	*	e	*	e	*	e	*	e	461	i	*	e	*	e	*	e	*	e	*	e						
Software publishers	5112	1,630		62,597	129	D	428	61	17,239	1,315	83	D	110	952	1,366	47	247	i	979	135	D	111	35	49	i	59	271	3,300	671	380	D	125	32																		
Telecommunications	517	150		D	5	1	e	60	3	123	120	3	e	*	1	586	76	*	3	41	11	2	e	D	5	11	3	14	27	20	5	1	14	1																	
Data processing, hosting, and related services	518	1,640		58,017	D	D	502	73	27,213	1,503	390	D	249	1,457	917	32	101	988	277	287	168	134	44	68	395	3,138	519	568	19	788	i	81																			

Table 28-A. Companies with domestic R&D paid for and performed by the company, by industry, company size, and state (A–M): 2024

(Millions of U.S. dollars and number of companies)

Industry and company size	NAICS code	Companies, U.S. total (number)		United States	Alabama	Alaska	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	District of Columbia	Florida	Georgia	Hawaii	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine	Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	
Other information	other 51	170		D	D	D	335	10	52,205	1,055	441	D	356	569	1,349	45	57	821	132	D	D	21	9	18	227	1,615	189	115	D	94	22	
Finance and insurance	52	210		25,362	23	* e	221	18	6,704	210	92	741	9	1,062	537	3	5	1,150	28	64	19	14	5	39	162	376	165	265	3	73	3	
Real estate and rental and leasing	53	60		2,750	* e	* e	28	*	1,445	52	1	* e	2	51	24	1	* e	31	* e	2	* e	* i	* e	1	1	31	1	D	* e	109	* e	
Lessors of nonfinancial intangible assets (except copyrighted works)	533	10 i		23	0	0	0	0	18	0	0	0	0	0	0	0	0	0	0	0	0	* i	0	0	0	0	0	0	0	0	0	0
Other real estate and rental and leasing	other 53	50		2,727	* e	* e	28	*	1,427	52	1	* e	2	51	24	1	* e	31	* e	2	* e	* e	* e	1	1	31	1	D	* e	109	* e	
Professional, scientific, and technical services	54	6,290		40,134	169	24	396	66	13,102	761	327	74	253	900	1,531 i	37	50	1,153	117	77	111	63	94	38	531	2,389	409	702	19	281	54	
Architectural, engineering, and related services	5413	1,550		3,240	29	19	22	9	473	187	82	7	13	131	43	18	19	65	37	25	32	11	20 e	12	102	85	89	67	11	91	22	
Computer systems design and related services	5415	2,650		22,353	82	5 e	320	33	6,938	345	166	51	116	550	392	14	22	485	62	40	61	38	27	14	258 e	1,146	175	473	7	144	25	
Scientific research and development services	5417	930		5,705	50 i	* e	34	23	2,356	119	54	13	14	96	35	2 i	6	95	10	6	10	10	3 i	9	97	871	95	61	*	37	3	
Research and development in nanotechnology	541713	50		434	3	0	*	*	150	4	0	7	0	6	0	0	*	3 i	0	0	*	0	0	0	3	107	*	10	0	*	0	
Research and development in biotechnology (except nanobiotechnology)	541714	260		1,204	1 i	* e	* e	3	454	9	9	3	* e	4	3 r	1 i	* e	31	1	5	4	*	* e	*	39	199	20	19	* e	22	* e	
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	610		4,060	47 i	* e	34	19	1,750	106	46	3 i	14	86	32	* i	6	62	9	* i	5	9	3 i	8	55	564	75	32	*	14	3	
Research and development in the social sciences and humanities	541720	20		8	0	0	0	0	2 i	0	0	0	*	0	0	0	0	0	0	0	0	0	0	0	*	*	i	0	0	0	0	

Table 28-A. Companies with domestic R&D paid for and performed by the company, by industry, company size, and state (A–M): 2024

(Millions of U.S. dollars and number of companies)

Industry and company size	NAICS code	Companies, U.S. total (number)	United States	Alabama	Alaska	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	District of Columbia	Florida	Georgia	Hawaii	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine	Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana
Other professional, scientific, and technical services	other 54	1,170	8,835 i	8	* e	21	1 e	3,336 i	111	24 i	2	110	124	1,060 i	4	3	508	7	7	8	5	44	4	74	286	50 i	101	1	10	3
Health care services	621–23	190	1,888	D	* e	92	D	1,048	23	1	* e	1	6	17	*	* e	7	D	* e	6	2 i	46	D	28	137	7	D	* e	13	* e
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	490	3579	5	1	78	2	648	45	20	3	D	118	54	6	8	118	29	17	40	22	3	1	129	173	26	54	1 e	53	1
All companies (number of domestic employees)	–	25,580	679,371	2,412	73	7,649	633	243,582	9,175	7,360	6,204	1,092	10,815	9,208	346	3,190	19,566	14,745	4,249	1,950	998	624	616	6,149	47,870	23,226	8,536	472	5,498	395
Small companies																														
10–19 ^a	–	4,330	3,734	24 e	2 e	64	7 e	939	71	41	14 e	22	142	87 e	3 i	11 e	136	32 e	10 e	19 e	20	13 e	6 i	113	404	85 e	77	3 e	29 e	5 e
20–49	–	7,190	14,153	62 e	10 e	120 e	31 e	4,979	257	146	101	37 e	303 e	199 e	16	27 e	370 e	147 e	67	53 e	43 e	37 e	25	328	1,481	255 e	231	21 e	117	19 e
Medium companies																														
50–99	–	4,510	14,998	62 e	18	109	41	4,531	185	93	44	34	334	237	6 e	40	393	114 e	77	52 e	43 e	47 e	33	393	2,721	276	306	14 e	102	11 e
100–249	–	4,070	26,548	108	5 e	250	42	9,148	816	230	107	163	457	408	20	73	698	206	110	85	47	78	15	377	4,098	507	364	16	150	34
Large companies																														
250–499	–	1,910	26,185	153	1 e	275	24	9,071	677	573	69	26	465	301	8	26	677	349	77	119	93	28	31	475	3,391	623	383	35	176	42
500–999	–	1,610	40,152	72	16	375 i	29	19,096	516	226	170	60	623	412	18	196 i	639	562	115	83	54	23	38	738	3,563	560	654	8	89	21
1,000–4,999	–	1,370	110,612	410	3	1,447	112	39,027	1,845	793	2,286	192	1,765	1,416	34	216	3,146	780	469	260	311	158 i	92	854 i	14,905	1,347	1,485	36	533	69
5,000–9,999	–	260	55,804	163	4	722	151	23,697	584	1,094 i	123	55	610	766	69 i	2,205	1,268	1,009 i	458 i	335	130	25	215	375	1,767	1,931	761	40	249	16
10,000–24,999	–	220	120,991	192	5 i	529	72	46,082 i	1,682 i	897	639 i	40 i	2,701	2,107 i	79	250 i	1,948	9,879	385 i	77	163	61	38	861	6,636 i	1,710	1,861 i	256	1,640	93 i
25,000 or more	–	140	266,195	1,166	10	3,759	125	87,012	2,540	3,267	2,651	464	3,414	3,275	93	147	10,292	1,667	2,483	868	95	153	123	1,635	8,904	15,932	2,413	43	2,413	85

* = amount < \$500,000; D = data withheld to avoid disclosing operations of individual companies; e = more than 50% of value is modeled—see the technical notes section at <https://ncses.nsf.gov/surveys/business-enterprise-research-development/2023#methodology>; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%.

NAICS = 2017 North American Industry Classification System.

^a The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):
Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D. For a given estimate in this table, if the conditions are satisfied for the "i," "r," and "e" flags, the e flag is assigned because the imputation rate and relative standard error may be found in the corresponding tables of imputation rates and relative standard errors (available upon request from the National Center for Science and Engineering Statistics).

Source(s):
National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 28-B. Companies with domestic R&D paid for and performed by the company, by industry, company size, and state (N–Z): 2024

(Millions of U.S. dollars and number of companies)

Industry and company size	NAICS code	Companies, U.S. total (number)	United States	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming
All industries	21–23, 31–33, 42–81	25,580	679,371	2,441	2,554	2,043	20,872	855	36,658	14,076	574	10,313	2,569	10,887	17,963	652	3,278	261	3,391	34,206	4,504	773	7,345	57,853	392	7,582	7
Manufacturing industries	31–33	12,530	356,431	456	1,271	1,139	14,163	537	11,794	7,579	296	7,205	726	7,951	13,166	508	1,370	170	i 1,034	18,105	1,674	585	1,445	9,560	208	4,739	2
Food	311	830	6,020	84	6	17	360	6	69	173	32	193	61	23	188	1	e 11	10	i 61	125	22	2	i 14	70	*	i 121	
Beverage and tobacco products	312	250	1,459	* e	* e	* e	1	e 1	i 417	111	* e	8	* e	2	e 3	e *	e *	e *	1	e 295	1	i *	e 118	69	*	31	
Textile, apparel, and leather products	313–16	180	783	* e	* e	1	8	* e	39	r 65	* e	155	1	22	4	e 7	76	* e	2	e 4	e 6	3	1	e 34	* e	16	
Wood products	321	80	261	2	1	*	1	*	2	15	14	4	*	10	7	*	4	*	6	15	1	*	i 5	14	1	6	
Paper	322	70	1,238	1	*	1	20	* e	33	58	0	23	2	* e	42	2	62	* e	34	33	* e	* e	46	23	*	363	0
Printing and related support activities	323	130	253	* i	10	*	2	i *	i 16	8	* i	4	i *	i *	7	3	2	i *	i 10	8	i 1	i *	i 3	1	i 4	95	
Petroleum and coal products	324	60	1,004	* e	* e	* e	151	* e	* e	5	0	15	18	1	34	* e	* e	* e	* e	648	10	0	*	* e	* e	20	0
Chemicals	325	2,190	131,790	159	28	74	11,672	7	6,975	2,529	21	i 2,521	18	68	9,311	163	125	24	296	1,190	508	45	303	3,055	145	1,009	1
Basic chemicals	3251	310	2,883	95	2	e 2	245	i 2	e 101	51	D	229	11	15	186	1	e 38	21	237	167	7	*	126	17	12	64	
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	110	D	D	0	3	D	0	49	i 22	0	265	D	4	126	3	i 13	i 0	12	r 320	D	D	2	1	e 37	7	0
Pesticide, fertilizer, and other agricultural chemicals	3253	70	D	D	* e	* e	D	D	* e	346	D	34	3	1	1	0	D	D	*	8	3	D	3	3	* e	7	0
Pharmaceuticals and medicines	3254	1,130	122,656	57	20	i 62	10,874	4	6,550	2,062	19	i 517	3	36	8,829	159	60	D	37	634	490	39	163	3,027	94	802	
Soap, cleaning compound, and toilet preparations	3256	180	2,684	3	* e	1	337	i D	264	i 23	0	1,225	D	* e	9	*	D	0	3	40	D	6	* e	1	r 0	115	
Paint, coating, adhesive, and other chemicals	3255, 3259	410	D	2	6	6	78	1	i 10	26	0	250	1	e 11	160	* e	14	1	6	i 22	8	D	9	7	2	14	1
Plastics and rubber products	326	680	2,767	8	1	e 7	13	* e	139	i 98	1	e 396	53	4	166	8	205	* e	25	99	3	1	11	6	i 7	86	1
Nonmetallic mineral products	327	220	1,556	i *	e 1	2	9	* e	959	i 27	i *	e 54	i 1	e 4	34	* e	3	* e	3	5	e 1	* e	1	e 2	8	i 11	
Primary metals	331	170	1,129	* e	* e	5	1	* e	14	11	* e	62	5	26	144	3	1	*	14	134	4	1	i 19	1	i 3	183	
Fabricated metal products	332	1,380	3,137	106	23	69	33	8	79	46	1	e 218	62	22	119	5	40	1	e 38	219	16	1	35	251	1	e 166	1

Table 28-B. Companies with domestic R&D paid for and performed by the company, by industry, company size, and state (N–Z): 2024

(Millions of U.S. dollars and number of companies)

Industry and company size	NAICS code	Companies, U.S. total (number)	United States	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming
Machinery	333	1,850	19,844	35	18	74	82	18	382	658	213	476	287	793	383	24	338	56	i 79	1,405	36	8	99	99	3	e 822	
Agricultural implement	33311	170	D	22	*	*	D	* e	3	39	85	10	D	2	43	0	11	43	i 5	D	D	0	17	12	0	114	
Semiconductor machinery	333242	40	D	0	D	0	D	0	132	*	0	5	0	649	D	0	*	0	0	D	D	0	0	0	0	0	
Engine, turbine, and power transmission equipment	3336	130	D	1	D	1	3	1	75	198	1	22	D	21	D	2	220	5	14	D	*	*	28	5	*	152	
Other machinery	other 333	1,520	8,060	13	D	73	55	17	172	420	127	439	233	121	304	21	107	8	61	735	28	8	55	81	3	e 556	
Computer and electronic products	334	1,750	107,038	37	134	680	833	427	1,710	2,799	4	737	53	6,376	1,166	107	179	18	170	10,974	457	300	405	2,728	10	323	
Communications equipment	3342	310	12,069	7	36	132	287	12	240	966	1	92	18	57	145	11	48	6	58	988	89	8	197	303	5	46	
Semiconductor and other electronic components	3344	460	48,546	17	24	i 284	180	409	509	1,188	i 2	e 237	13	5,761	405	42	i 74	8	62	6,246	143	259	113	i 963	i 3	i 43	i 2
Navigational, measuring, electromedical, and control instruments	3345	820	10,736	11	53	182	318	3	396	i 215	1	361	i 13	180	i 497	12	45	3	34	553	170	22	72	277	1	i 135	
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	170	3,046	* e	2	32	48	0	71	17	*	25	5	4	51	1	3	i *	20	54	81	* e	4	16	i 0	6	
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	140	3,190	6	38	138	92	1	217	i 115	0	51	1	76	314	*	1	2	4	108	50	i 0	48	93	*	86	
Other measuring and controlling devices	other 3345	520	4,501	6	13	12	178	2	108	83	1	e 285	i 7	100	i 132	10	42	*	10	i 391	i 39	i 22	19	169	1	i 42	
Other computer and electronic products	other 334	180	35,687	2	i 21	82	i 48	4	i 564	429	*	i 47	10	i 378	119	42	12	2	16	3,187	56	10	23	i 1,185	1	100	i 0
Electrical equipment, appliances, and components	335	390	6,135	1	e 18	8	174	i 1	142	70	*	e 127	17	27	289	6	52	42	i 23	224	21	1	e 29	214	*	e 519	
Transportation equipment	336	1,050	47,039	14	460	41	308	64	578	545	9	1,733	132	327	554	26	243	15	73	1,989	199	207	287	2,526	20	277	

Table 28-B. Companies with domestic R&D paid for and performed by the company, by industry, company size, and state (N–Z): 2024

(Millions of U.S. dollars and number of companies)

Industry and company size	NAICS code	Companies, U.S. total (number)	United States	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming
Motor vehicles, bodies, trailers, and parts	3361–63	630	D	5	442	15	159	2 i	278	257	1 e	963	7	301	196	3	155	12	30	1,146	96	* e	12	223	* e	90	
Aerospace products and parts	3364	240	15,130	6	9	27	136	63	296	273	7	760	124	20	211	7	74	*	22	784	101	207	136	2,288	16	49	
Aircraft, aircraft engine, and aircraft parts	336411–13	220	D	D	D	24	108	D	D	D	D	680	D	19	D	D	D	*	20	551	100	D	D	2,228	12	47	
Guided missile, space vehicle, and related parts	336414–15, 336419	30	D	D	D	3	28	D	D	D	D	80	D	1	D	D	D	0	2	234	1	D	D	61	4	3	
Military armored vehicle, tank, and tank components	336992	20	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Other transportation	other 336	180	D	3	9 r	* e	14	0	4	15	0	10	* e	6 e	147	17	14	2	21	59	1 e	* e	138	14 e	3	138	
Furniture and related products	337	170	450	* i	*	* e	27 i	* e	8	13	* e	15	* i	5	1	* e	1 i	* e	19	3	30	3	3	1	*	5	
Miscellaneous	339	1,170	24,528	8	571	159	468	5	232	350	1 e	464	14	241	716	151 i	26	3 i	180	735	356	14	66	467	5	685	
Medical equipment and supplies	3391	800	21,840	4 e	9	136	413	4	179	312	1 e	411	7	71	671	22	21	1	167	687	299	2 e	51	265	3 e	639	
Other miscellaneous manufacturing	3399	380	2,688	4	562	22	55	1 e	54	38	* e	52	8	170	45	129 i	5	2 i	13	48	58	12	15	202 i	2	46	
Nonmanufacturing industries	21–23, 42–81	13,060	322,940	1,985	1,283	904	6,709	318	24,865	6,496	278	3,109	1,843	2,936	4,797	145	1,908	91	2,357	16,101	2,830	187	5,900	48,293	184	2,843	4
Mining, quarrying, oil and gas extraction, and support activities	21	70	1,224	* e	48	* e	* e	2	6	* e	2	7	87	* e	82	* e	*	* e	* e	719	1	* e	* e	1	35	4	
Utilities	22	70	D	D	* e	D	3	* e	12	12	2	16	1 e	4	5	* e	*	18	* e	25	106	D	D	2	7	10	
Wholesale trade	42	1,580	D	9	6 i	21 i	71 i	1 e	86 i	25 i	3 i	34	D	10	24 e	6 i	24 i	4	30 i	108	60 i	D	D	D	1 e	20 i	
Electronic shopping and electronic auctions	454111–12	110	7898 i	D	27 i	D	54 i	* i	283 i	D	* i	17 i	D	54 i	30 i	D	D	* e	D	194 i	18	D	D	D	* i	D	
Transportation and warehousing	48–49	440	D	9	11	2 e	46	2 e	548 i	30	2 e	35 e	7 e	26	394 i	D	7 e	1 e	110	621	11 e	D	28	2,714	1 e	21	
Information	51	3,610	226,853	1,573	1,010	537	3,068	221	14,864	3,768	212	1,887	1,668	2,321	2,740	81	1,730	36	1,888	8,930	2,082	113	3,857	37,826	50	1,930	3
Publishing	511	1,670	63,085	D	175	180	587	49	2,412	1,828	195	333	D	875	920	32	160	D	D	2,867	826	57	730	20,129	D	1,564	
Newspaper, periodical, book, and directory publishers	5111	40	489 i	* e	* e	* e	* e	* e	* e	* e	* e	* e	* e	* e	* e	* e	* e	* e	* e	9	* e	* e	* e	* e	* e	5 i	

Table 28-B. Companies with domestic R&D paid for and performed by the company, by industry, company size, and state (N–Z): 2024

(Millions of U.S. dollars and number of companies)

Industry and company size	NAICS code	Companies, U.S. total (number)	United States	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming
Software publishers	5112	1,630	62,597	D	175	180	587	49	2,412	1,828	195	333	D	875	920	32	160	D	D	2,858	826	57	730	20,129	D	1,560	0
Telecommunications	517	150	D	D	2	13	1,189	D	11	127	1 e	16	3	D	8	* e	6	1 e	7	112	14	1	110	376	2 e	21	0
Data processing, hosting, and related services	518	1,640	58,017	286	D	289 i	676	D	3,269	861	D	409	195	477	771	33	D	18	851 i	3,081	703	39	986	4,060	36	253	0
Other information	other 51	170	D	D	D	55	615	D	9,172	951	D	1,129	D	D	1,041	15	D	D	D	2,870	540	16	2,032	13,261	D	91	0
Finance and insurance	52	210	25,362	316	45	114 i	1,522	2	4,715	1,106	1	590	20	96	401	4	34	6	37	1,753	50	3	596	1,312	5	609	0
Real estate and rental and leasing	53	60	2,750	* e	22	* e	30	1	186	D	* e	4	* e	46	69	* e	1	* e	D	82	1	* e	24	492	* e	7	0
Lessors of nonfinancial intangible assets (except copyrighted works)	533	10	23	0	0	0	0	0	0	0	0	0	0	0	* i	0	0	0	0	4	0	0	0	0	0	0	0
Other real estate and rental and leasing	other 53	50	2,727	* e	22	* e	30	1	186	D	* e	4	* e	46	69	* e	1	* e	D	78	1	* e	24	492	* e	7	0
Professional, scientific, and technical services	54	6,290	40,134	51	99	227	1,850 i	68	4,005	1,467	56	464	41	324	926	41	96	21	203 i	2,844	433	68	1,152	1,574	84	188	1
Architectural, engineering, and related services	5413	1,550	3,240	8	12	35	72	21 i	100	57	2 e	119	12	107	250	6	20	2 e	100 i	195	20	7	115	155	15	55	0
Computer systems design and related services	5415	2,650	22,353	32	80	44	615	26	3,414	1,042	31	147	25	176	381	26	60	10	53	2,058	281	57	648	1,005	13	92	4
Scientific research and development services	5417	930	5,705	4	1	141	116	14	117	220	22	151	1	17	108	7	3	7	8	174	52	* e	124 i	218	55	25	0
Research and development in nanotechnology	541713	50	434	0	0	*	* i	0	15	*	0	2	0	1	37	0	0	0	* i	20	5	0	2	4	53	0	0
Research and development in biotechnology (except nanobiotechnology)	541714	260	1,204	1	* e	42	14	* e	18	88	14	16	* e	1	9 i	2 i	* e	7	2	36	3	* e	6	113	1	2	0
Research and development in the physical, engineering, and	541715	610	4,060	3 r	1	99	97	14	83	133	9	133	1	15	63	5	3	*	6	118	45	* e	116 i	102	1 i	23	0

Table 28-B. Companies with domestic R&D paid for and performed by the company, by industry, company size, and state (N–Z): 2024

(Millions of U.S. dollars and number of companies)

Industry and company size	NAICS code	Companies, U.S. total (number)	United States	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming
life sciences (except nanotechnology and biotechnology)																											
Research and development in the social sciences and humanities	541720	20	8	0	0	0	5	0	0	* i	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other professional, scientific, and technical services	other 54	1,170	8,835 i	7	5	8	1,047 i	6	375	148	* e	47 i	3	23	187	3	14	1 i	42	417	80	5	266	195	1	16	0
Health care services	621–23	190	1,888	* e	* e	*	42 i	19	25	19	*	1	* e	3 i	7	7	D	* e	25	227	25	D	18	8	*	D	2
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	490	3,579	26	15	1	24	1	133	59	1	53	10	52	120	4	9	4	59	597	43	1 i	25	626	* e	39	0
All companies (number of domestic employees)	–	25,580	679,371	2,441	2,554	2,043	20,872	855	36,658	14,076	574	10,313	2,569	10,887	17,963	652	3,278	261	3,391	34,206	4,504	773	7,345	57,853	392	7,582	7
Small companies																											
10–19 ^b	–	4,330	3,734	10 e	20	23	123	7 i	168	114	3 e	78 e	13 e	29 e	136	8	22 e	2 e	33 e	215 e	53	4 e	92 e	151	2 e	30 e	1
20–49	–	7,190	14,153	30 e	37 e	66	356	21	420 e	254	18	274 e	44 e	119	431	29	52 e	16	712 i	699	157	15	302 e	404	10 e	142 e	4
Medium companies																											
50–99	–	4,510	14,998	32 e	67	78	330	35	614	286	11 e	247	76	125	462	44	82	12	85 e	785	196	21	260 e	502	11	227	1
100–249	–	4,070	26,548	56	91	85	433	31	1,406	670	29 i	378	43 e	237	642	60	78	12	120	1,181	335	17	378	1,210	13	281	4
Large companies																											
250–499	–	1,910	26,185	136	109	73	539	22 i	1,329	568	4	383	37	177	866	17	96	9	150	934	551	14	420	1,191	48	240	10
500–999	–	1,610	40,152	103	195	421	1,650	59	1,991	547	32	309	73	313	601	32	149	10	157	1,864	479	211	354	852	76	653	5
1,000–4,999	–	1,370	110,612	270	770	425	2,991	76	7,159	3,128	66	1,703	256	984	2,578	334 i	425	105	261	4,940	1,057	318	866	6,686	129	961	14
5,000–9,999	–	260	55,804	183	34	83	2,187	20	1,491	1,619	139	624	271	812	1,155	23	193	15	213	2,302	170	39	525	3,658	6	1,182	5
10,000–24,999	–	220	120,991	363	104	316 i	4,918	22 i	6,975	1,726	132 i	1,118	121	1,249 i	4,292 i	27	635	49 i	512	9,565	752	39	530	3,270	64	3,323	3
25,000 or more	–	140	266,195	1,257	1,129	474	7,343	563	15,106	5,164	140	5,199	1,635	6,842	6,801	78	1,546	32	1,146	11,720	753	96	3,618	39,928	32	544	1

* = amount < \$500,000; D = data withheld to avoid disclosing operations of individual companies; e = more than 50% of value is modeled—see the technical notes section at <https://nces.nsf.gov/surveys/business-enterprise-research-development/2023#methodology>; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%.

NAICS = 2017 North American Industry Classification System.

^a Undistributed includes data reported that were not allocated to a specific state by multi-establishment companies. For single-establishment companies, data reported were allocated to the state in the address used to mail the survey form.

^b The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):
Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D. For a given estimate in this table, if the conditions are satisfied for the "i," "r," and "e" flags, the e flag is assigned because the imputation rate and relative standard error may be found in the corresponding tables of imputation rates and relative standard errors (available upon request from the National Center for Science and Engineering Statistics).

Source(s):
National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 29. Domestic R&D paid for and performed by the company, by industry, company size, and domestic R&D program size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	R&D program size					
		All companies	Less than \$1 million	\$1 million–\$9.999 million	\$10 million–\$49.999 million	\$50 million–\$99.999 million	\$100 million or more
All industries	21–23, 31–33, 42–81	679,371	4,365	29,642	45,735	33,026	566,604
Manufacturing industries	31–33	356,431	2,094	13,372	23,162	21,153	296,650
Food	311	6,020	158	864	771	840	3,386 i
Beverage and tobacco products	312	1,459	46	92	67	438	815
Textile, apparel, and leather products	313–16	783	24	238	236	138	147
Wood products	321	261	14	106	141	0	0
Paper	322	1,238	9	99	201	61	868
Printing and related support activities	323	253	18	95	54 i	86	0
Petroleum and coal products	324	1,004	D	64	162	D	D
Chemicals	325	131,790	286	2,514	9,417	8,311	111,261
Basic chemicals	3251	2,883	70	D	576	533	D
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	D	23 i	D	D	60 i	D
Pesticide, fertilizer, and other agricultural chemicals	3253	D	9	72	181	0	D
Pharmaceuticals and medicines	3254	122,656	71	1,361	8,150	7,434	105,641
Soap, cleaning compound, and toilet preparations	3256	2,684	36	173	102	105	2,269
Paint, coating, adhesive, and other chemicals	3255, 3259	D	77	D	D	179	D
Plastics and rubber products	326	2,767	149	570	512	398	1,139
Nonmetallic mineral products	327	1,556 i	39	128	232	0	1,157 i
Primary metals	331	1,129	26	172	268	61	602
Fabricated metal products	332	3,137	297	1,116	414	582	728
Machinery	333	19,844	333	1,785	1,814	1,711	14,200
Agricultural implement	33311	D	34	119	68	D	D
Semiconductor machinery	333242	D	2	58	D	138	D
Engine, turbine, and power transmission equipment	3336	D	D	D	178	D	D
Other machinery	other 333	8,060	D	D	D	D	D
Computer and electronic products	334	107,038	281	1,973	3,019	3,158	98,606
Communications equipment	3342	12,069	38	483	D	481	D
Semiconductor and other electronic components	3344	48,546	73	535	920	1,294	45,725
Navigational, measuring, electromedical, and control instruments	3345	10,736	142	788	1,317	1,048	7,441
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	3,046	31	220	498	396	1,901
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	3,190	13	92	277	120	2,688
Other measuring and controlling devices	other 3345	4,501	98	476	542	533	2,852
Other computer and electronic products	other 334	35,687	29	167	D	335	D
Electrical equipment, appliances, and components	335	6,135	48	448	1,148	1,132	3,359
Transportation equipment	336	47,039	184	1,101	2,205	1,463	42,086
Motor vehicles, bodies, trailers, and parts	3361–63	D	D	D	1,358	914	27,109
Aerospace products and parts	3364	15,130	D	D	669	334	D
Aircraft, aircraft engine, and aircraft parts	336411–13	D	23	D	D	334	9,684
Guided missile, space vehicle, and related parts	336414–15, 336419	D	D	D	D	0	D
Military armored vehicle, tank, and tank components	336992	23	1 i	22	0	0	0
Other transportation	other 336	D	31	D	177	215	D

Table 29. Domestic R&D paid for and performed by the company, by industry, company size, and domestic R&D program size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	R&D program size					
		All companies	Less than \$1 million	\$1 million–\$9.999 million	\$10 million–\$49.999 million	\$50 million–\$99.999 million	\$100 million or more
Furniture and related products	337	450	27	123	158	142	0
Miscellaneous	339	24,528	D	1,882	2,340	D	D
Medical equipment and supplies	3391	21,840	87	1,449	1,833	1,794	16,676
Other miscellaneous manufacturing	3399	2,688	D	433	507	D	D
Nonmanufacturing industries	21–23, 42–81	322,940	2,270	16,270	22,573	11,873	269,953
Mining, quarrying, oil and gas extraction, and support activities	21	1,224	9	D	D	140	D
Utilities	22	D	4	D	113	108	302
Wholesale trade	42	D	322	1,040	D	0	0
Electronic shopping and electronic auctions	454111–12	7,898	i	D	85	164	D
Transportation and warehousing	48–49	D	D	557	r	222	D
Information	51	226,853	439	6,139	11,560	6,560	202,155
Publishing	511	63,085	271	2,600	3,485	1,638	55,092
Newspaper, periodical, book, and directory publishers	5111	489	i	6	i	23	0
Software publishers	5112	62,597	265	2,577	3,485	1,178	55,092
Telecommunications	517	D	24	212	D	162	2,486
Data processing, hosting, and related services	518	58,017	140	3,045	6,943	4,262	43,626
Other information	other 51	D	5	283	D	498	100,951
Finance and insurance	52	25,362	9	433	1,048	969	22,904
Real estate and rental and leasing	53	2,750	10	r	81	118	278
Lessors of nonfinancial intangible assets (except copyrighted works)	533	23	1	i	0	23	0
Other real estate and rental and leasing	other 53	2,727	10	r	81	96	278
Professional, scientific, and technical services	54	40,134	1,342	6,810	7,493	2,787	21,701
Architectural, engineering, and related services	5413	3,240	567	r	1,040	924	441
Computer systems design and related services	5415	22,353	521	3,348	3,773	1,467	13,244
Scientific research and development services	5417	5,705	78	1,631	1,460	435	2,102
Research and development in nanotechnology	541713	434	4	78	90	0	263
Research and development in biotechnology (except nanobiotechnology)	541714	1,204	24	505	465	129	79
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	4,060	48	1,041	905	306	1,759
Research and development in the social sciences and humanities	541720	8	1	7	0	0	0
Other professional, scientific, and technical services	other 54	8,835	i	176	792	1,336	444
Health care services	621–23	1,888	40	218	342	326	963
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	3,579	D	D	D	D	1,242
All companies (number of domestic employees)	–	679,371	4,365	29,642	45,735	33,026	566,604
Small companies							
10–19 ^a	–	3,734	954	2,433	347	0	0
20–49	–	14,153	1,439	6,830	3,219	247	2,418
Medium companies							
50–99	–	14,998	726	5,832	6,000	1,644	796
100–249	–	26,548	583	6,337	9,337	6,323	3,969

Table 29. Domestic R&D paid for and performed by the company, by industry, company size, and domestic R&D program size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	R&D program size											
		All companies		Less than \$1 million		\$1 million–\$9.999 million		\$10 million–\$49.999 million		\$50 million–\$99.999 million		\$100 million or more	
Large companies													
250–499	–	26,185	185			3,419		8,194		4,000		10,388	
500–999	–	40,152	405	r		2,269		6,258		5,909		25,311	
1,000–4,999	–	110,612	62			2,020		8,970		9,746		89,813	
5,000–9,999	–	55,804	3			237		1,919		2,540		51,104	
10,000–24,999	–	120,991	3			187		1,009		1,893		117,898	
25,000 or more	–	266,195	5			77		483		724		264,906	

D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%.

NAICS = 2017 North American Industry Classification System.

^a The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):

Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D. R&D program size classifications are based on R&D performance.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 30. Domestic R&D paid for and performed by the company as a percentage of domestic net sales, by industry and company size: 2024

(Millions of U.S. dollars and percent)

Industry and company size	NAICS code	Domestic R&D (US\$millions)	Percentage of domestic sales of R&D performers or funders ^a	Percentage of domestic sales of R&D performers ^b
All industries	21–23, 31–33, 42–81	679,371	4.5	4.5
Manufacturing industries	31–33	356,431	4.9	4.9
Food	311	6,020	0.8	0.8
Beverage and tobacco products	312	1,459	0.7	0.7
Textile, apparel, and leather products	313–16	783	1.1	1.1
Wood products	321	261	0.4	0.4
Paper	322	1,238	1.2	1.2
Printing and related support activities	323	253	1.1	1.1
Petroleum and coal products	324	1,004	0.3	D
Chemicals	325	131,790	10.5	10.5
Basic chemicals	3251	2,883	1.6	1.6
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	D	D	D
Pesticide, fertilizer, and other agricultural chemicals	3253	D	D	D
Pharmaceuticals and medicines	3254	122,656	16.9	16.9
Soap, cleaning compound, and toilet preparations	3256	2,684	2.1	2.1
Paint, coating, adhesive, and other chemicals	3255, 3259	D	D	D
Plastics and rubber products	326	2,767	1.5	1.5
Nonmetallic mineral products	327	1,556	2.5	2.9
Primary metals	331	1,129	0.8	0.9
Fabricated metal products	332	3,137	1.5	1.5
Machinery	333	19,844	3.9	3.9
Agricultural implement	33311	D	D	D
Semiconductor machinery	333242	D	D	D
Engine, turbine, and power transmission equipment	3336	D	D	D
Other machinery	other 333	8,060	2.4	2.4
Computer and electronic products	334	107,038	13.3	13.3
Communications equipment	3342	12,069	10.5	10.5
Semiconductor and other electronic components	3344	48,546	18.0	18.0
Navigational, measuring, electromedical, and control instruments	3345	10,736	7.7	7.7
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	3,046	15.1	15.1
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	3,190	5.7	5.7
Other measuring and controlling devices	other 3345	4,501	7.1	7.1
Other computer and electronic products	other 334	35,687	12.6	12.6
Electrical equipment, appliances, and components	335	6,135	3.8	3.8
Transportation equipment	336	47,039	2.9	2.9
Motor vehicles, bodies, trailers, and parts	3361–63	D	D	D
Aerospace products and parts	3364	15,130	3.9	3.9
Aircraft, aircraft engine, and aircraft parts	336411–13	D	D	D
Guided missile, space vehicle, and related parts	336414–15, 336419	D	D	D
Military armored vehicle, tank, and tank components	336992	23	2.2	2.2
Other transportation	other 336	D	D	D
Furniture and related products	337	450	1.2	D
Miscellaneous	339	24,528	3.8	3.8
Medical equipment and supplies	3391	21,840	4.2	4.2
Other miscellaneous manufacturing	3399	2,688	2.3	2.3
Nonmanufacturing industries	21–23, 42–81	322,940	4.1	4.2

Table 30. Domestic R&D paid for and performed by the company as a percentage of domestic net sales, by industry and company size: 2024

(Millions of U.S. dollars and percent)

Industry and company size	NAICS code	Domestic R&D (US\$millions)		Percentage of domestic sales of R&D performers or funders ^a	Percentage of domestic sales of R&D performers ^b
Mining, quarrying, oil and gas extraction, and support activities	21	1,224		0.6	0.6
Utilities	22	D		D	D
Wholesale trade	42	D		D	D
Electronic shopping and electronic auctions	454111-12	7,898	i	1.1	1.1
Transportation and warehousing	48-49	D		D	D
Information	51	226,853		10.8	10.8
Publishing	511	63,085		15.7	15.8
Newspaper, periodical, book, and directory publishers	5111	489	i	6.4	6.5
Software publishers	5112	62,597		15.9	15.9
Telecommunications	517	D		D	D
Data processing, hosting, and related services	518	58,017		8.0	8.0
Other information	other 51	D		D	D
Finance and insurance	52	25,362		1.4	1.4
Real estate and rental and leasing	53	2,750		4.6	4.6
Lessors of nonfinancial intangible assets (except copyrighted works)	533	23		5.3	5.3
Other real estate and rental and leasing	other 53	2,727		4.5	4.5
Professional, scientific, and technical services	54	40,134		5.8	5.9
Architectural, engineering, and related services	5413	3,240		2.5	2.5
Computer systems design and related services	5415	22,353		8.6	8.6
Scientific research and development services	5417	5,705		4.7	4.7
Research and development in nanotechnology	541713	434		24.2	25.2
Research and development in biotechnology (except nanobiotechnology)	541714	1,204		4.1	4.1
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	4,060		4.6	4.6
Research and development in the social sciences and humanities	541720	8		0.7	0.7
Other professional, scientific, and technical services	other 54	8,835	i	5.1	5.2
Health care services	621-23	1,888		1.6	1.6
Other nonmanufacturing	23, 44-45 (excluding 454111-12), 55-56, 624, 71-72, 81	3,579		0.4	0.4
All companies (number of domestic employees)	-	679,371		4.5	4.5
Small companies					
10-19 ^c	-	3,734		12.3	13.0
20-49	-	14,153		14.1	14.9
Medium companies					
50-99	-	14,998		11.6	11.8
100-249	-	26,548		8.8	9.0
Large companies					
250-499	-	26,185		6.6	6.7
500-999	-	40,152		7.0	7.2
1,000-4,999	-	110,612		5.1	5.1
5,000-9,999	-	55,804		3.6	3.8
10,000-24,999	-	120,991		4.2	4.3
25,000 or more	-	266,195		3.8	3.8

D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse.

NAICS = 2017 North American Industry Classification System.

^a Statistics used for both the numerator and denominator in the calculation of these percentages are representative of companies located in the United States that performed or funded R&D.

^b Statistics used for both the numerator and denominator in the calculation of these percentages are representative of companies located in the United States that performed R&D. The calculation of percentages in this column excludes R&D and sales of companies that fund R&D but do not perform R&D.

^c The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):

Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Unless indicated otherwise, statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 31. Domestic R&D paid for by the company and performed by the company and others as a percentage of domestic net sales, by industry and company size: 2024

(Millions of U.S. dollars and percent)

Industry and company size	NAICS code	Domestic R&D (US\$millions)	Percentage of domestic sales of R&D performers or funders ^a	Percentage of domestic sales of R&D performers ^b
All industries	21–23, 31–33, 42–81	728,519	4.8	4.9
Manufacturing industries	31–33	397,593	5.5	5.5
Food	311	6,299	0.8	0.8
Beverage and tobacco products	312	1,630	0.8	0.8
Textile, apparel, and leather products	313–16	789	1.1	1.1
Wood products	321	281	0.4	0.4
Paper	322	1,245	1.2	1.2
Printing and related support activities	323	254	1.1	1.1
Petroleum and coal products	324	1,219	0.3	D
Chemicals	325	163,167	13.0	13.0
Basic chemicals	3251	3,081	1.7	1.7
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	D	D	D
Pesticide, fertilizer, and other agricultural chemicals	3253	D	D	D
Pharmaceuticals and medicines	3254	153,421	21.2	21.2
Soap, cleaning compound, and toilet preparations	3256	2,986	2.3	2.3
Paint, coating, adhesive, and other chemicals	3255, 3259	D	D	D
Plastics and rubber products	326	2,802	1.5	1.5
Nonmetallic mineral products	327	1,583	2.6	3.0
Primary metals	331	1,147	0.9	0.9
Fabricated metal products	332	3,163	1.5	1.5
Machinery	333	20,203	3.9	3.9
Agricultural implement	33311	D	D	D
Semiconductor machinery	333242	D	D	D
Engine, turbine, and power transmission equipment	3336	D	D	D
Other machinery	other 333	8,180	2.5	2.5
Computer and electronic products	334	111,242	13.8	13.8
Communications equipment	3342	13,103	11.4	11.3
Semiconductor and other electronic components	3344	48,919	18.2	18.2
Navigational, measuring, electromedical, and control instruments	3345	11,027	7.9	7.9
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	3,205	15.9	15.9
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	3,204	5.7	5.7
Other measuring and controlling devices	other 3345	4,618	7.2	7.3
Other computer and electronic products	other 334	38,194	13.5	13.5
Electrical equipment, appliances, and components	335	6,211	3.8	3.8
Transportation equipment	336	50,304	3.1	3.1
Motor vehicles, bodies, trailers, and parts	3361–63	D	D	D
Aerospace products and parts	3364	D	D	D
Aircraft, aircraft engine, and aircraft parts	336411–13	D	D	D
Guided missile, space vehicle, and related parts	336414–15, 336419	D	D	D
Military armored vehicle, tank, and tank components	336992	24	2.3	2.3
Other transportation	other 336	D	D	D
Furniture and related products	337	454	1.2	D
Miscellaneous	339	25,602	4.0	4.0
Medical equipment and supplies	3391	22,833	4.4	4.4
Other miscellaneous manufacturing	3399	2,769	2.4	2.4
Nonmanufacturing industries	21–23, 42–81	330,926	4.2	4.3

Table 31. Domestic R&D paid for by the company and performed by the company and others as a percentage of domestic net sales, by industry and company size: 2024

(Millions of U.S. dollars and percent)

Industry and company size	NAICS code	Domestic R&D (US\$millions)		Percentage of domestic sales of R&D performers or funders ^a	Percentage of domestic sales of R&D performers ^b
Mining, quarrying, oil and gas extraction, and support activities	21	1,336		0.6	0.6
Utilities	22	1,347		0.3	D
Wholesale trade	42	D		D	D
Electronic shopping and electronic auctions	454111-12	8,406	i	1.1	1.1
Transportation and warehousing	48-49	D		D	D
Information	51	230,865		11.0	11.0
Publishing	511	64,527		16.0	16.1
Newspaper, periodical, book, and directory publishers	5111	499	i	6.5	6.6
Software publishers	5112	64,028		16.2	16.3
Telecommunications	517	3,871		0.8	0.8
Data processing, hosting, and related services	518	58,367		8.1	8.1
Other information	other 51	104,101		20.4	20.4
Finance and insurance	52	26,301		1.4	1.4
Real estate and rental and leasing	53	2,753		4.6	4.6
Lessors of nonfinancial intangible assets (except copyrighted works)	533	24		5.4	5.4
Other real estate and rental and leasing	other 53	2,730		4.6	4.6
Professional, scientific, and technical services	54	41,208		6.0	6.0
Architectural, engineering, and related services	5413	3,437		2.6	2.6
Computer systems design and related services	5415	22,860		8.7	8.8
Scientific research and development services	5417	5,968		4.9	4.9
Research and development in nanotechnology	541713	445		24.8	25.9
Research and development in biotechnology (except nanobiotechnology)	541714	1,307		4.4	4.4
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	4,208		4.7	4.8
Research and development in the social sciences and humanities	541720	9		0.7	0.7
Other professional, scientific, and technical services	other 54	8,943		5.2	5.3
Health care services	621-23	1,975		1.7	1.7
Other nonmanufacturing	23, 44-45 (excluding 454111-12), 55-56, 624, 71-72, 81	3,702		0.4	D
All companies (number of domestic employees)	-	728,519		4.8	4.9
Small companies					
10-19 ^c	-	4,317		14.2	14.9
20-49	-	16,221		16.2	17.0
Medium companies					
50-99	-	17,114		13.2	13.5
100-249	-	29,691		9.8	10.0
Large companies					
250-499	-	28,753		7.3	7.4
500-999	-	42,131		7.3	7.5
1,000-4,999	-	117,672		5.4	5.4
5,000-9,999	-	60,712		4.0	4.1
10,000-24,999	-	131,958		4.6	4.6
25,000 or more	-	279,950		4.0	4.0

D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse.

NAICS = 2017 North American Industry Classification System.

- ^a Statistics used for both the numerator and denominator in the calculation of these percentages are representative of companies located in the United States that performed or funded R&D.
- ^b Statistics used for both the numerator and denominator in the calculation of these percentages are representative of companies located in the United States that performed R&D. The calculation of percentages in this column excludes R&D and sales of companies that fund R&D but do not perform R&D.
- ^c The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):
Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Unless indicated otherwise, statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D.

Source(s):
National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 32. Domestic R&D paid for by others and performed by the company, by type of cost, industry, and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Total	Salaries, wages, and fringe benefits		Stock-based compensation		Temporary staffing	Expensed equipment		Materials and supplies		Lease and rental payments		Depreciation	Royalties and licensing fees	Other purchased services (except R&D)		Other				
All industries	21–23, 31–33, 42–81	85,711	47,712		2,023		2,046		751 i		9,384 i		1,211		2,608		438		4,813 i		14,725 i	
Manufacturing industries	31–33	48,661	27,930		1,164		903		353		6,055 i		539		1,190		405		2,272		7,851	
Food	311	268	166		*		16		1		11		7 i		8		0		3		55 i	
Beverage and tobacco products	312	*	0		0		0		0		0		0		*		0		0		0	
Textile, apparel, and leather products	313–16	6	4		0		*		i		*		i		*		i		0		2	
Wood products	321	6	4		*		i		*		*		*		*		0		D		D	
Paper	322	1	1		*		i		*		i		*		i		0		*		i	
Printing and related support activities	323	2	2		*		i		*		i		0		*		0		*		i	
Petroleum and coal products	324	2	2		*		i		*		i		*		i		0		*		i	
Chemicals	325	11,954	7,048		426		460		53		542		194		459		41		1,252		1,480 i	
Basic chemicals	3251	237	149		0		15		6		22		* i		16		0		1		29	
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	D	D		0		D		D		D		*		D		0		2		D	
Pesticide, fertilizer, and other agricultural chemicals	3253	D	D		*		i		D		*		i		D		*		i		D	
Pharmaceuticals and medicines	3254	10,971	6,500		426		409		41		418		151		393		37		1,239		1,357 i	
Soap, cleaning compound, and toilet preparations	3256	272	143		0		7		D		7		D		11		3		9		D	
Paint, coating, adhesive, and other chemicals	3255, 3259	D	31		*		D		D		4		D		D		*		2		D	
Plastics and rubber products	326	141	93		0		0		*		9		*		8		0		1		29	
Nonmetallic mineral products	327	22	13		0		*		*		5		*		1		0		0		2	
Primary metals	331	45	13		0		1		6		13		*		*		0		6		6	
Fabricated metal products	332	93	47		0		0		1 i		9 i		*		r		1		12 r		12 i	
Machinery	333	2,191	1,322		D		32		47		r		99		67		103		1		D	
Agricultural implement	33311	D	D		D		D		3		D		D		D		0		7		D	
Semiconductor machinery	333242	D	D		D		D		*		19		D		D		0		2		D	
Engine, turbine, and power transmission equipment	3336	D	224		i		D		10 i		3 i		D		D		D		0		3 i	
Other machinery	other 333	333	180		D		4		42		r		48		2		10		1		D	
Computer and electronic products	334	8,561	4,717		585		119 i		82		1,269		148		270		27		193		1,151	
Communications equipment	3342	771 i	574		i		*		i		8 i		2 i		i		68 i		31 i		3 i	
Semiconductor and other electronic components	3344	3,812	2,244		544		84 i		28 i		46 i		44		155		27		132 i		508	
Navigational, measuring, electromedical, and control instruments	3345	3,347	1,545		3		24		42		1,097		38		94		*		55		447	
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	199	133		*		6		1		20		6		3		0		3		28	
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	2,971	1,320		3		15		39		1,062		31		90		0		47		364	
Other measuring and controlling devices	other 3345	177	92		0		3 i		2		14		2 r		1		*		6 r		55 r	
Other computer and electronic products	other 334	631	353		37		3		11		59		35		17		0		4		112	
Electrical equipment, appliances, and components	335	864	475		D		53		11		58		12		14		150		7		D	
Transportation equipment	336	24,192	13,825		D		206		142 i		4,011 i		105		321		173		755		D	

Table 32. Domestic R&D paid for by others and performed by the company, by type of cost, industry, and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Total	Salaries, wages, and fringe benefits		Stock-based compensation	Temporary staffing	Expensed equipment	Materials and supplies	Lease and rental payments	Depreciation	Royalties and licensing fees	Other purchased services (except R&D)	Other
Motor vehicles, bodies, trailers, and parts	3361–63	D	879		*	52	19	158	35	D	140	D	D
Aerospace products and parts	3364	20,774 i	11,938		D	134	112	3,636 i	D	229	D	612	D
Aircraft, aircraft engine, and aircraft parts	336411–13	D	D		*	78 i	81 i	D	D	D	0	D	D
Guided missile, space vehicle, and related parts	336414–15, 336419	D	D		D	57	31	D	D	D	D	D	D
Military armored vehicle, tank, and tank components	336992	10	6		0	1	0	3	0	*	0	D	D
Other transportation	other 336	D	1,002	i	D	19 i	11 i	214 i	D	D	D	D	D
Furniture and related products	337	0	0		0	0	0	0	0	0	0	0	0
Miscellaneous	339	312	197		0	16	9	30	5	4	2 r	15	35
Medical equipment and supplies	3391	285	181		0	16	9	23	5	3	2 r	15	31
Other miscellaneous manufacturing	3399	27	15		0	*	*	7 i	*	1	0	*	4
Nonmanufacturing industries	21–23, 42–81	37,050	19,782		859	1,143	398	3,330 i	672 i	1,418	34 i	2,540 i	6,874 i
Mining, quarrying, oil and gas extraction, and support activities	21	638 i	D		0	50 i	47 i	1 i	3 i	87 i	0	17 i	D
Utilities	22	D	D		0	*	1	*	0	0	0	0	* i
Wholesale trade	42	D	94	i	0	1	*	12 i	1 i	D	0	3 i	D
Electronic shopping and electronic auctions	454111–12	0	0		0	0	0	0	0	0	0	0	0
Transportation and warehousing	48–49	D	D		0	*	5	D	*	D	0	8	D
Information	51	1,322	755		309	96 i	23	21	8	6	*	33	70
Publishing	511	511	413		4	13	19	17	D	3	*	9	D
Newspaper, periodical, book, and directory publishers	5111	0	0		0	0	0	0	0	0	0	0	0
Software publishers	5112	511	413		4	13	19	17	D	3	*	9	D
Telecommunications	517	D	D		1	D i	D	D	D	D	0	* i	D
Data processing, hosting, and related services	518	755	308		301	D i	D	3	1	D	0	24	D
Other information	other 51	D	D		3	D	0	D	3	D	0	0	D
Finance and insurance	52	101	99		0	2	0	0	0	0	0	0	* i
Real estate and rental and leasing	53	0	0		0	0	0	0	0	0	0	0	0
Lessors of nonfinancial intangible assets (except copyrighted works)	533	0	0		0	0	0	0	0	0	0	0	0
Other real estate and rental and leasing	other 53	0	0		0	0	0	0	0	0	0	0	0
Professional, scientific, and technical services	54	34,415	18,298		550	990	321	3,271 i	657 i	1,317	33 i	2,455 i	6,523 i
Architectural, engineering, and related services	5413	654	423		0	26	17	51	14 r	3	*	32	88
Computer systems design and related services	5415	4,411	2,994		279	128	3	152	121	74	*	160	499
Scientific research and development services	5417	28,237	14,073		271	716 i	300 i	3,022 i	512 i	1,237	33 i	2,255 i	5,820 i
Research and development in nanotechnology	541713	115	75		0	2	*	8	3	*	0	9 r	17
Research and development in biotechnology (except nanobiotechnology)	541714	5,547	2,657		44	147	33	701	45	184	3	986 i	747
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	21,872 i	10,964	i	201	541 i	261 i	2,311 i	461 i	1,048	30 i	1,260 i	4,794 i
Research and development in the social sciences and humanities	541720	704	376		26	25	5	2	3	4	*	0	262

Table 32. Domestic R&D paid for by others and performed by the company, by type of cost, industry, and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Total	Salaries, wages, and fringe benefits		Stock-based compensation		Temporary staffing	Expensed equipment	Materials and supplies	Lease and rental payments	Depreciation	Royalties and licensing fees	Other purchased services (except R&D)	Other
Other professional, scientific, and technical services	other 54	1,113	808		*		120	1	46	10	2	0	9	116
Health care services	621–23	131	81		0		4	1	8	3	D	0	23	D
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	49	39		0		*	0	D	*	2	0	1	D
All companies (number of domestic employees)	–	85,711	47,712		2,023		2,046	751	i 9,384	i 1,211	2,608	438	4,813	i 14,725
Small companies														
10–19 ^a	–	1,056	642		15		22	14	i 89	49	11	4	47	165
20–49	–	2,026	1,181		12		57	57	r 214	46	38	7	132	282
Medium companies														
50–99	–	2,080	1,354		56		34	11	194	31	24	6	79	290
100–249	–	2,777	1,553		49		103	36	296	53	43	11	r 191	441
Large companies														
250–499	–	2,667	1,594		150		35	11	225	58	85	23	70	i 417
500–999	–	4,545	2,880		43		266	115	281	85	216	3	i 148	509
1,000–4,999	–	13,201	7,124		907		455	118	i 811	i 230	437	i 10	i 1,160	i 1,949
5,000–9,999	–	7,146	3,956		242		77	17	225	124	291	5	i 958	i 1,251
10,000–24,999	–	19,357	10,371		520		598	188	i 1,637	i 306	i 829	302	1,079	3,528
25,000 or more	–	30,855	17,056	i	29	i	400	185	i 5,413	i 229	635	67	i 950	5,893

* = amount < \$500,000; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%.

NAICS = 2017 North American Industry Classification System.

^a The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):
Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D.

Source(s):
National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 33. Domestic R&D paid for by others and performed by the company, by industry and company size: 2024

(Millions of U.S. dollars)

Industry	NAICS code	Company size (domestic employees)												
		All companies	10–19 ^a	20–49	50–99	100–249	250–499	500–999	1,000–4,999	5,000–9,999	10,000–24,999	25,000 or more		
All industries	21–23, 31–33, 42–81	85,711		1,056	2,026	2,080	2,777	2,667	4,545	13,201	7,146	19,357	30,855	
Manufacturing industries	31–33	48,661		226	635	846	1,083	1,316	1,715	7,306	4,535	7,000	23,998	
Food	311	268		0	D	0	4 r	35	24	117	D	1	0	
Beverage and tobacco products	312	*		0	*	0	0	0	0	0	0	0	0	
Textile, apparel, and leather products	313–16	6		0	0	1	0	5	0	0	0	0	0	
Wood products	321	6		0	0	0	0	0	6	0	*	0	0	
Paper	322	1		0	0	0	*	1	0	*	0	0	0	
Printing and related support activities	323	2		0	* r	*	1	*	*	0	0	0	0	
Petroleum and coal products	324	2		0	0	*	0	0	1	0	0	1	0	
Chemicals	325	11,954		105 i	199	608	560	536	540	3,058	1,946	4,106	295	
Basic chemicals	3251	237		0	*	1	12	6	20	139	0	59	0	
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	D		D	0	D	D	9	1	D	0	3	0	
Pesticide, fertilizer, and other agricultural chemicals	3253	D		0	2	*	0	0	0	D	0	0	0	
Pharmaceuticals and medicines	3254	10,971		97 i	196	601	535	518	517	2,496	1,946	3,770	295	
Soap, cleaning compound, and toilet preparations	3256	272		0	0	0	4	0	0	7	0	260	0	
Paint, coating, adhesive, and other chemicals	3255, 3259	D		D	1	D	D	4	2	D	0	13	0	
Plastics and rubber products	326	141		1 r	3 r	1 r	7	9	5	4	0	111	0	
Nonmetallic mineral products	327	22		2 r	0	1	12	3	4	0	0	0	0	
Primary metals	331	45		D	2	*	0	2	1	34	D	0	0	
Fabricated metal products	332	93		5	34 r	9 r	35 r	2	7	1	0	0	0	
Machinery	333	2,191		8 r	D	17	60	12	41	107	D	454	78	
Agricultural implement	33311	D		*	* r	2 r	11	0	14 r	0	D	D	*	
Semiconductor machinery	333242	D		*	4	4 i	D	0	0	0	D	0	0	
Engine, turbine, and power transmission equipment	3336	D		3 r	8	0	2 r	1	1	9	D	D	78	
Other machinery	other 333	333		5 r	D	11	D	12	27	98	0	D	0	
Computer and electronic products	334	8,561		56	153	126	265	619	679	3,208	753 i	276	2,426	
Communications equipment	3342	771	i	D	D	*	39	*	D	D	D	0	0	
Semiconductor and other electronic components	3344	3,812		D	9	D	51 r	458	598	2,048	411 i	D	0	
Navigational, measuring, electromedical, and control instruments	3345	3,347		D	125 r	71	175	D	D	159	D	4	2,426	
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	199		18	33 r	2	55	61	18	8	0	4	0	
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	2,971		1	20	34	98	60	D	139	D	0	2,426	
Other measuring and controlling devices	other 3345	177		D	73 r	35	21	D	D	12	*	0	0	
Other computer and electronic products	other 334	631		D	D	D	0	D	0	D	0	D	0	
Electrical equipment, appliances, and components	335	864		D	D	6	32	40	52	70	0	584	50	
Transportation equipment	336	24,192		16	34	59	57	40	343	671	459	1,380	21,133	
Motor vehicles, bodies, trailers, and parts	3361–63	D		D	18	D	46	9	291	222	211	860	D	
Aerospace products and parts	3364	20,774	i	D	16	34	11	17	D	436	244 i	520	19,440 i	

Table 33. Domestic R&D paid for by others and performed by the company, by industry and company size: 2024

(Millions of U.S. dollars)

Industry	NAICS code	Company size (domestic employees)													
		All companies	10–19 ^a	20–49	50–99	100–249	250–499	500–999	1,000–4,999	5,000–9,999	10,000–24,999	25,000 or more			
Aircraft, aircraft engine, and aircraft parts	336411–13	D	7 i	D	D	D	17	30	D	244 i	520	D			
Guided missile, space vehicle, and related parts	336414–15, 336419	D	D	D	D	D	0	D	D	0	0	D			
Military armored vehicle, tank, and tank components	336992	10	0	0	D	0	0	D	0	0	0	0			
Other transportation	other 336	D	0	0	D	*	14	0	12	3	0	D			
Furniture and related products	337	0	0	0	0	0	0	0	0	0	0	0			
Miscellaneous	339	312	12	46	17	49	12	11	36	27	88	15			
Medical equipment and supplies	3391	285	12	41	14	46	4	3	36	27	88	15			
Other miscellaneous manufacturing	3399	27	0	5	3	3	8	8	0	0	0	0			
Nonmanufacturing industries	21–23, 42–81	37,050	830	1,391	1,234	1,694	1,351	2,830	5,895 i	2,611	12,358	6,857 i			
Mining, quarrying, oil and gas extraction, and support activities	21	638 i	0	0	3	D	*	598 i	0	D	32 i	0			
Utilities	22	D	0	D	0	0	0	0	*	*	0	0			
Wholesale trade	42	D	3 r	D	9 r	22 i	59 i	0	18 i	0	0	0			
Electronic shopping and electronic auctions	454111–12	0	0	0	0	0	0	0	0	0	0	0			
Transportation and warehousing	48–49	D	0	0	0	0	0	2	0	D	0	0			
Information	51	1,322	20 r	108	28	92	120	369	560	0	0	25			
Publishing	511	511	20 r	10	D	58	37	D	96	0	0	25			
Newspaper, periodical, book, and directory publishers	5111	0	0	0	0	0	0	0	0	0	0	0			
Software publishers	5112	511	20 r	10	D	58	37	D	96	0	0	25			
Telecommunications	517	D	0	D	D	6	0	0	0	0	0	0			
Data processing, hosting, and related services	518	755	0	57	16	28	83	109	463 i	0	0	0			
Other information	other 51	D	0	D	0	0	0	D	0	0	0	0			
Finance and insurance	52	101	*	0	0	0	4	0	0	0	0	97			
Real estate and rental and leasing	53	0	0	0	0	0	0	0	0	0	0	0			
Lessors of nonfinancial intangible assets (except copyrighted works)	533	0	0	0	0	0	0	0	0	0	0	0			
Other real estate and rental and leasing	other 53	0	0	0	0	0	0	0	0	0	0	0			
Professional, scientific, and technical services	54	34,415	D	1,224	1,191	1,556	1,148	1,857	5,313 i	D	12,326	6,666 i			
Architectural, engineering, and related services	5413	654	D	77	143	106	73	70	85	D	*	0			
Computer systems design and related services	5415	4,411	112	123 r	310	185	29	488	198	0	2,269	696			
Scientific research and development services	5417	28,237	542	891	718	1,134	905	1,136	5,028 i	2,308	10,056	5,520 i			
Research and development in nanotechnology	541713	115	18	42	54	0	0	*	0	0	0	0			
Research and development in biotechnology (except nanobiotechnology)	541714	5,547	151	101	125 r	111	127	500	303 i	1,666	552	1,911			
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	21,872 i	371	735	539	980	773	635	4,725 i	0	9,504	3,609 i			
Research and development in the social sciences and humanities	541720	704	1	13	0	43	5	0	0	642	0	0			
Other professional, scientific, and technical services	other 54	1,113	74	133	20	130	142	162	2	0	0	450			
Health care services	621–23	131	D	D	2	8	14	4	3	0	0	69			
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	49	0	D	0	D	6	0	0	D	0	0			

* = amount < \$500,000; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%.

NAICS = 2017 North American Industry Classification System.

^a The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):
Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D.

Source(s):
National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 34. Domestic R&D paid for by others and performed by the company, by type of R&D, industry, and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Total	Basic research	Applied research	Development
All industries	21–23, 31–33, 42–81	85,711	5,674	20,546	59,490
Manufacturing industries	31–33	48,661	3,317	9,989	35,356
Food	311	268	28 i	83	157
Beverage and tobacco products	312	*	0	*	0
Textile, apparel, and leather products	313–16	6	0	1 i	5
Wood products	321	6	*	*	6
Paper	322	1	1	*	1
Printing and related support activities	323	2	*	*	1
Petroleum and coal products	324	2	1	1	*
Chemicals	325	11,954	1,544	3,288	7,122
Basic chemicals	3251	237	43	67	127
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	D	5 i	15 i	D
Pesticide, fertilizer, and other agricultural chemicals	3253	D	D	D	D
Pharmaceuticals and medicines	3254	10,971	1,449	3,086	6,436
Soap, cleaning compound, and toilet preparations	3256	272	28	30	213
Paint, coating, adhesive, and other chemicals	3255, 3259	D	D	D	D
Plastics and rubber products	326	141	13	47	81
Nonmetallic mineral products	327	22	2	2	17
Primary metals	331	45	6	21	17
Fabricated metal products	332	93	3	6	84
Machinery	333	2,191	17	349	1,825
Agricultural implement	33311	D	* r	2	D
Semiconductor machinery	333242	D	1	D	D
Engine, turbine, and power transmission equipment	3336	D	7	D	223
Other machinery	other 333	333	9	D	D
Computer and electronic products	334	8,561	341 i	1,152	7,067
Communications equipment	3342	771 i	295 i	52 i	424 i
Semiconductor and other electronic components	3344	3,812	7	348 i	3,457 i
Navigational, measuring, electromedical, and control instruments	3345	3,347	31	699	2,617
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	199	2	32	164
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	2,971	22	652	2,298
Other measuring and controlling devices	other 3345	177	8	14	155
Other computer and electronic products	other 334	631	8	53	570
Electrical equipment, appliances, and components	335	864	72	264	529
Transportation equipment	336	24,192	1,281 i	4,710	18,202
Motor vehicles, bodies, trailers, and parts	3361–63	D	83	508	D
Aerospace products and parts	3364	20,774 i	1,196 i	4,053	15,525
Aircraft, aircraft engine, and aircraft parts	336411–13	D	D	D	11,046 i
Guided missile, space vehicle, and related parts	336414–15, 336419	D	D	D	4,479
Military armored vehicle, tank, and tank components	336992	10	0	0	10
Other transportation	other 336	D	1	150	D
Furniture and related products	337	0	0	0	0
Miscellaneous	339	312	7	64	241
Medical equipment and supplies	3391	285	6	60	219
Other miscellaneous manufacturing	3399	27	1	4	22
Nonmanufacturing industries	21–23, 42–81	37,050	2,358	10,558	24,134 i
Mining, quarrying, oil and gas extraction, and support activities	21	638 i	0	*	638 i
Utilities	22	D	*	*	D
Wholesale trade	42	D	D	D	D
Electronic shopping and electronic auctions	454111–12	0	0	0	0
Transportation and warehousing	48–49	D	0	0	D

Table 34. Domestic R&D paid for by others and performed by the company, by type of R&D, industry, and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Total	Basic research	Applied research	Development
Information	51	1,322	66	146	1,110
Publishing	511	511	39	116	356
Newspaper, periodical, book, and directory publishers	5111	0	0	0	0
Software publishers	5112	511	39	116	356
Telecommunications	517	D	8	*	D
Data processing, hosting, and related services	518	755	18	29	707
Other information	other 51	D	1	0	D
Finance and insurance	52	101	1	2	98
Real estate and rental and leasing	53	0	0	0	0
Lessors of nonfinancial intangible assets (except copyrighted works)	533	0	0	0	0
Other real estate and rental and leasing	other 53	0	0	0	0
Professional, scientific, and technical services	54	34,415	2,228	10,354	21,833
Architectural, engineering, and related services	5413	654	27	121	505
Computer systems design and related services	5415	4,411	276	2,092	2,043
Scientific research and development services	5417	28,237	1,895	8,034	18,308
Research and development in nanotechnology	541713	115	*	33	82
Research and development in biotechnology (except nanobiotechnology)	541714	5,547	639	625	4,283
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	21,872	601	7,350	13,920
Research and development in the social sciences and humanities	541720	704	655	26	23
Other professional, scientific, and technical services	other 54	1,113	30	107	977
Health care services	621–23	131	44	25	63
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	49	D	D	38
All companies (number of domestic employees)	–	85,711	5,674	20,546	59,490
Small companies					
10–19 ^a	–	1,056	93	322	641
20–49	–	2,026	180	457	1,389
Medium companies					
50–99	–	2,080	143	342	1,594
100–249	–	2,777	326	552	1,899
Large companies					
250–499	–	2,667	150	529	1,988
500–999	–	4,545	134	1,509	2,903
1,000–4,999	–	13,201	1,701	1,719	9,780
5,000–9,999	–	7,146	771	1,850	4,525
10,000–24,999	–	19,357	424	6,565	12,368
25,000 or more	–	30,855	1,753	6,701	22,401

* = amount < \$500,000; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%.

NAICS = 2017 North American Industry Classification System.

^a The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):

Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 35. Domestic R&D paid for by others and performed by the company, by source of funds, industry, and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Total	Companies in the United States	Companies outside the United States		U.S. federal government agencies	U.S. state government agencies	Foreign government agencies	U.S. universities, colleges, and academic researchers	Foreign universities, colleges, and academic researchers	All other	
				Company's parent	Unaffiliated companies						In the United States	Outside the United States
All industries	21–23, 31–33, 42–81	85,711	27,442	23,767	2,519	30,995	153	171	47	7	554	56
Manufacturing industries	31–33	48,661	7,184	16,344	1,236	23,361	67	160	20	1	253	34
Food	311	268	19	237	11	1	0	0	0	0	1	0
Beverage and tobacco products	312	*	0	0	0	*	0	0	0	0	0	0
Textile, apparel, and leather products	313–16	6	0	0	1	0	0	0	0	0	5	0
Wood products	321	6	0	6	0	*	0	0	0	0	0	0
Paper	322	1	D	D	0	0	0	0	0	0	0	0
Printing and related support activities	323	2	D	D	0	0	* r	0	0	0	0	0
Petroleum and coal products	324	2	D	0	D	1	0	D	0	0	0	0
Chemicals	325	11,954	2,029	8,495	565	684	12	D	17	* i	119	D
Basic chemicals	3251	237	6	152	3	72	*	0	3	0	*	0
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	D	D	D	D	0	0	0	0	0	2	0
Pesticide, fertilizer, and other agricultural chemicals	3253	D	0	D	2	D	D	0	0	0	0	0
Pharmaceuticals and medicines	3254	10,971	2,011	7,654	546	587 i	10	D	14	0	116 i	D
Soap, cleaning compound, and toilet preparations	3256	272	*	271	0	0	0	0	0	0	1	0
Paint, coating, adhesive, and other chemicals	3255, 3259	D	D	D	D	D	D	*	*	* i	*	0
Plastics and rubber products	326	141	21	116	*	2	0	0	0	0	1	0
Nonmetallic mineral products	327	22	D	D	D	2	* r	0	* r	0	* r	* r
Primary metals	331	45	D	0	33	6	2	0	0	0	D	0
Fabricated metal products	332	93	64	14	0	5 r	0	D	0	0	D	0
Machinery	333	2,191	406	1,320	256	161	34	0	*	0	14	0
Agricultural implement	33311	D	* r	D	D	2 r	6	0	*	0	0	0
Semiconductor machinery	333242	D	D	D	D	D	0	0	0	0	0	0
Engine, turbine, and power transmission equipment	3336	D	D	D	D	D	25	0	0	0	8	0
Other machinery	other 333	333	182	33	77	33	3	0	0	0	6 r	0
Computer and electronic products	334	8,561	789 i	4,100	145	3,380	8	75	1	0	62	*
Communications equipment	3342	771 i	D	D	3	D	*	0	*	0	*	0
Semiconductor and other electronic components	3344	3,812	200	3,198	112	243	8	0	1	0	51	*
Navigational, measuring, electromedical, and control instruments	3345	3,347	D	D	30	2,897	*	75	*	0	10	0
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	199	16	138	*	37 r	0	*	*	0	7	0
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	2,971	D	0	D	2,765	*	75	0	0	2	0
Other measuring and controlling devices	other 3345	177	24	D	D	94 r	0	0	0	0	*	0
Other computer and electronic products	other 334	631	D	506	* i	D	0	0	0	0	0	0
Electrical equipment, appliances, and components	335	864	14	769	10	62	1	*	0	1	6 r	*

Table 35. Domestic R&D paid for by others and performed by the company, by source of funds, industry, and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Total	Companies in the United States	Companies outside the United States		U.S. federal government agencies	U.S. state government agencies	Foreign government agencies	U.S. universities, colleges, and academic researchers	Foreign universities, colleges, and academic researchers	All other												
				Company's parent	Unaffiliated companies						In the United States	Outside the United States											
Transportation equipment	336	24,192	3,761	1,179	182	18,950	i	10		84		*		0		26	0						
Motor vehicles, bodies, trailers, and parts	3361-63	D	428	1,125	76	D		D		6	r	0		0		D	0						
Aerospace products and parts	3364	20,774	i	3,312	D	105	i	D		78		D		0		D	0						
Aircraft, aircraft engine, and aircraft parts	336411-13	D	D	D	D	13,802	i	1	r	D		*	r	0		D	0						
Guided missile, space vehicle, and related parts	336414-15, 336419	D	D	0	D	3,414		D		D		D		0		D	0						
Military armored vehicle, tank, and tank components	336992	10	D	0	0	D		0		0		0		0		0	0						
Other transportation	other 336	D	D	D	0	D		0		0		D		0		0	0						
Furniture and related products	337	0	0	0	0	0		0		0		0		0		0	0						
Miscellaneous	339	312	D	D	D	107		*		0		1		0		8	D						
Medical equipment and supplies	3391	285	67	85	D	98		*		0		1		0		8	D						
Other miscellaneous manufacturing	3399	27	D	D	D	9		0		0		0		0		0	0						
Nonmanufacturing industries	21-23, 42-81	37,050		20,258	i	7,422	i	1,283		7,634		86		10		28		6	r	301	22		
Mining, quarrying, oil and gas extraction, and support activities	21	638	i	32	i	603	i	3		*		0		0		*		0		*	0		
Utilities	22	D	*	0	0	D		*		0		0		0		0		0		0	0		
Wholesale trade	42	D	D	108	i	11		D		*		0		0		*		0		0	0		
Electronic shopping and electronic auctions	454111-12	0	0	0	0	0		0		0		0		0		0		0		0	0		
Transportation and warehousing	48-49	D	2	0	0	D		0		0		0		0		0		0		0	0		
Information	51	1,322	587	585	54	60		7		1		*		0		24		4					
Publishing	511	511	102	395	2	3		3		1		0		0		0		4					
Newspaper, periodical, book, and directory publishers	5111	0	0	0	0	0		0		0		0		0		0		0		0	0		
Software publishers	5112	511	102	395	2	3		3		1		0		0		0		4					
Telecommunications	517	D	D	D	0	3		0		0		*		0		*		0					
Data processing, hosting, and related services	518	755	483	i	139	52		53		4		0		0		24		0					
Other information	other 51	D	D	D	0	0		0		0		0		0		0		0					
Finance and insurance	52	101	101	0	0	0		0		0		0		0		0		0					
Real estate and rental and leasing	53	0	0	0	0	0		0		0		0		0		0		0					
Lessors of nonfinancial intangible assets (except copyrighted works)	533	0	0	0	0	0		0		0		0		0		0		0					
Other real estate and rental and leasing	other 53	0	0	0	0	0		0		0		0		0		0		0					
Professional, scientific, and technical services	54	34,415	19,437	i	6,077	i	1,215	i	7,297		78		10		27		6	r		250	17	i	
Architectural, engineering, and related services	5413	654	176	26	8	404		24		3		2		*		10		1					
Computer systems design and related services	5415	4,411	256	2,391	618	1,115		4	r	0		3	r	0		23		0					
Scientific research and development services	5417	28,237	18,813	i	3,620	i	578	i	4,933		49		7		21		6	r		193	i	16	i
Research and development in nanotechnology	541713	115	14	17	0	75		3		0		0		0		5		0					
Research and development in biotechnology (except nanobiotechnology)	541714	5,547	4,167	638	31	641		4		0		3	r	5	r	58		*					

Table 35. Domestic R&D paid for by others and performed by the company, by source of funds, industry, and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Total	Companies in the United States	Companies outside the United States		U.S. federal government agencies	U.S. state government agencies	Foreign government agencies	U.S. universities, colleges, and academic researchers	Foreign universities, colleges, and academic researchers	All other		
				Company's parent	Unaffiliated companies						In the United States	Outside the United States	
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	21,872 i	14,621 i	2,965 i	547 i	3,542	30	3	16	1	130 i	16 i	
Research and development in the social sciences and humanities	541720	704	12	0	0	675	11	4	2	0	*	0	
Other professional, scientific, and technical services	other 54	1,113	192	40	11	844	1	0	1	*	24	0	
Health care services	621–23	131	84	22	1 i	*	1 i	0	0	0	24	*	
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	49	D	27	0	D	*	0	0	0	2	0	
All companies (number of domestic employees)	–	85,711	27,442	23,767	2,519	30,995	153	171	47	7 r	554	56 i	
Small companies													
10–19 ^a	–	1,056	249	158	41	486	14	10	12	5 r	79	4	
20–49	–	2,026	668	372	39	808	40	2	16	1	70	9	
Medium companies													
50–99	–	2,080	621	591	106	703	15	1	3	*	39	1	
100–249	–	2,777	649	751	148	1,089	31	2	6	* i	77	25 i	
Large companies													
250–499	–	2,667	242	1,266	236	878	D	*	6	1	D	0	
500–999	–	4,545	723	2,765	128	853	5	1	*	0	60 i	10 i	
1,000–4,999	–	13,201	5,616 i	5,666	313	1,579	10	*	i 2	0	14	* i	
5,000–9,999	–	7,146	2,229	3,665	83 i	1,150	11	4	2	0	2	0	
10,000–24,999	–	19,357	7,823 i	8,483	734 i	2,108	1	67	1	* i	135 i	6 i	
25,000 or more	–	30,855	8,622	50	692	21,340 i	D	85	*	0	D	0	

* = amount < \$500,000; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%.

NAICS = 2017 North American Industry Classification System.

^a The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):
Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D.

Source(s):
National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 36. Domestic R&D paid for by others and performed by the company as a percentage of domestic net sales, by industry and company size: 2024

(Millions of U.S. dollars and percent)

Industry and company size	NAICS code	Domestic R&D (US\$millions)	Percentage of domestic sales of R&D performers or funders ^a	Percentage of domestic sales of R&D performers ^b
All industries	21–23, 31–33, 42–81	85,711	0.6	0.6
Manufacturing industries	31–33	48,661	0.7	0.7
Food	311	268	*	*
Beverage and tobacco products	312	*	*	*
Textile, apparel, and leather products	313–16	6	*	*
Wood products	321	6	*	*
Paper	322	1	*	*
Printing and related support activities	323	2	*	*
Petroleum and coal products	324	2	*	D
Chemicals	325	11,954	0.9	1.0
Basic chemicals	3251	237	0.1	0.1
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	D	D	D
Pesticide, fertilizer, and other agricultural chemicals	3253	D	D	D
Pharmaceuticals and medicines	3254	10,971	1.5	1.5
Soap, cleaning compound, and toilet preparations	3256	272	0.2	0.2
Paint, coating, adhesive, and other chemicals	3255, 3259	D	D	D
Plastics and rubber products	326	141	0.1	0.1
Nonmetallic mineral products	327	22	*	*
Primary metals	331	45	*	*
Fabricated metal products	332	93	*	*
Machinery	333	2,191	0.4	0.4
Agricultural implement	33311	D	D	D
Semiconductor machinery	333242	D	D	D
Engine, turbine, and power transmission equipment	3336	D	D	D
Other machinery	other 333	333	0.1	0.1
Computer and electronic products	334	8,561	1.1	1.1
Communications equipment	3342	771	i 0.7	0.7
Semiconductor and other electronic components	3344	3,812	1.4	1.4
Navigational, measuring, electromedical, and control instruments	3345	3,347	2.4	2.4
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	199	1.0	1.0
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	2,971	5.3	5.3
Other measuring and controlling devices	other 3345	177	0.3	0.3
Other computer and electronic products	other 334	631	0.2	0.2
Electrical equipment, appliances, and components	335	864	0.5	0.5
Transportation equipment	336	24,192	1.5	1.5
Motor vehicles, bodies, trailers, and parts	3361–63	D	D	D
Aerospace products and parts	3364	20,774	i 5.4	5.4
Aircraft, aircraft engine, and aircraft parts	336411–13	D	D	D
Guided missile, space vehicle, and related parts	336414–15, 336419	D	D	D
Military armored vehicle, tank, and tank components	336992	10	1.0	1.0
Other transportation	other 336	D	D	D
Furniture and related products	337	0	0.0	D
Miscellaneous	339	312	*	*
Medical equipment and supplies	3391	285	0.1	0.1
Other miscellaneous manufacturing	3399	27	*	*
Nonmanufacturing industries	21–23, 42–81	37,050	0.5	0.5

Table 36. Domestic R&D paid for by others and performed by the company as a percentage of domestic net sales, by industry and company size: 2024

(Millions of U.S. dollars and percent)

Industry and company size	NAICS code	Domestic R&D (US\$millions)		Percentage of domestic sales of R&D performers or funders ^a	Percentage of domestic sales of R&D performers ^b
Mining, quarrying, oil and gas extraction, and support activities	21	638	i	0.3	0.3
Utilities	22	D		D	D
Wholesale trade	42	D		D	D
Electronic shopping and electronic auctions	454111-12	0		0.0	0.0
Transportation and warehousing	48-49	D		D	D
Information	51	1,322		0.1	0.1
Publishing	511	511		0.1	0.1
Newspaper, periodical, book, and directory publishers	5111	0		0.0	0.0
Software publishers	5112	511		0.1	0.1
Telecommunications	517	D		D	D
Data processing, hosting, and related services	518	755		0.1	0.1
Other information	other 51	D		D	D
Finance and insurance	52	101		*	*
Real estate and rental and leasing	53	0		0.0	0.0
Lessors of nonfinancial intangible assets (except copyrighted works)	533	0		0.0	0.0
Other real estate and rental and leasing	other 53	0		0.0	0.0
Professional, scientific, and technical services	54	34,415		5.0	5.1
Architectural, engineering, and related services	5413	654		0.5	0.5
Computer systems design and related services	5415	4,411		1.7	1.7
Scientific research and development services	5417	28,237		23.2	23.3
Research and development in nanotechnology	541713	115		6.4	6.7
Research and development in biotechnology (except nanobiotechnology)	541714	5,547		18.7	18.7
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	21,872	i	24.5	24.7
Research and development in the social sciences and humanities	541720	704		55.2	55.2
Other professional, scientific, and technical services	other 54	1,113		0.6	0.7
Health care services	621-23	131		0.1	0.1
Other nonmanufacturing	23, 44-45 (excluding 454111-12), 55-56, 624, 71-72, 81	49		*	*
All companies (number of domestic employees)	-	85,711		0.6	0.6
Small companies					
10-19 ^c	-	1,056		3.5	3.7
20-49	-	2,026		2.0	2.1
Medium companies					
50-99	-	2,080		1.6	1.6
100-249	-	2,777		0.9	0.9
Large companies					
250-499	-	2,667		0.7	0.7
500-999	-	4,545		0.8	0.8
1,000-4,999	-	13,201		0.6	0.6
5,000-9,999	-	7,146		0.5	0.5
10,000-24,999	-	19,357		0.7	0.7
25,000 or more	-	30,855		0.4	0.4

* = amount < \$500,000 or less than 0.05%; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse.

NAICS = 2017 North American Industry Classification System.

- ^a Statistics used for both the numerator and denominator in the calculation of these percentages are representative of companies located in the United States that performed or funded R&D.
- ^b Statistics used for both the numerator and denominator in the calculation of these percentages are representative of companies located in the United States that performed R&D. The calculation of percentages in this column excludes R&D and sales of companies that fund R&D but do not perform R&D.
- ^c The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):
Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Unless indicated otherwise, statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D.

Source(s):
National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 37. Domestic R&D paid for by others and performed by the company and others as a percentage of domestic net sales, by industry and company size: 2024

(Millions of U.S. dollars and percent)

Industry and company size	NAICS code	Domestic R&D (US\$millions)	Percentage of domestic sales of R&D performers or funders ^a	Percentage of domestic sales of R&D performers ^b
All industries	21–23, 31–33, 42–81	96,246	0.6	0.6
Manufacturing industries	31–33	55,860	0.8	0.8
Food	311	270	*	*
Beverage and tobacco products	312	*	*	*
Textile, apparel, and leather products	313–16	6	*	*
Wood products	321	6	*	*
Paper	322	1	*	*
Printing and related support activities	323	2	*	*
Petroleum and coal products	324	3	*	D
Chemicals	325	16,156	1.3	1.3
Basic chemicals	3251	239	0.1	0.1
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	D	D	D
Pesticide, fertilizer, and other agricultural chemicals	3253	D	D	D
Pharmaceuticals and medicines	3254	15,073	2.1	2.1
Soap, cleaning compound, and toilet preparations	3256	272	0.2	0.2
Paint, coating, adhesive, and other chemicals	3255, 3259	D	D	D
Plastics and rubber products	326	141	0.1	0.1
Nonmetallic mineral products	327	22	*	*
Primary metals	331	47	*	*
Fabricated metal products	332	159	0.1	0.1
Machinery	333	2,249	0.4	0.4
Agricultural implement	33311	D	D	D
Semiconductor machinery	333242	D	D	D
Engine, turbine, and power transmission equipment	3336	D	D	D
Other machinery	other 333	341	0.1	0.1
Computer and electronic products	334	8,661	1.1	1.1
Communications equipment	3342	771	0.7	0.7
Semiconductor and other electronic components	3344	D	D	D
Navigational, measuring, electromedical, and control instruments	3345	3,426	2.4	2.5
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	205	1.0	1.0
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	3,036	5.4	5.4
Other measuring and controlling devices	other 3345	185	0.3	0.3
Other computer and electronic products	other 334	D	D	D
Electrical equipment, appliances, and components	335	865	0.5	0.5
Transportation equipment	336	26,956	1.7	1.7
Motor vehicles, bodies, trailers, and parts	3361–63	D	D	D
Aerospace products and parts	3364	D	D	D
Aircraft, aircraft engine, and aircraft parts	336411–13	D	D	D
Guided missile, space vehicle, and related parts	336414–15, 336419	D	D	D
Military armored vehicle, tank, and tank components	336992	10	1.0	1.0
Other transportation	other 336	D	D	D
Furniture and related products	337	0	0.0	D
Miscellaneous	339	316	*	*
Medical equipment and supplies	3391	289	0.1	0.1
Other miscellaneous manufacturing	3399	27	*	*
Nonmanufacturing industries	21–23, 42–81	40,386	0.5	0.5

Table 37. Domestic R&D paid for by others and performed by the company and others as a percentage of domestic net sales, by industry and company size: 2024

(Millions of U.S. dollars and percent)

Industry and company size	NAICS code	Domestic R&D (US\$millions)		Percentage of domestic sales of R&D performers or funders ^a	Percentage of domestic sales of R&D performers ^b
Mining, quarrying, oil and gas extraction, and support activities	21	639		0.3	0.3
Utilities	22	D		D	D
Wholesale trade	42	D		D	D
Electronic shopping and electronic auctions	454111-12	2	r	*	*
Transportation and warehousing	48-49	D		D	D
Information	51	1,335		0.1	0.1
Publishing	511	D		D	D
Newspaper, periodical, book, and directory publishers	5111	0		0.0	0.0
Software publishers	5112	D		D	D
Telecommunications	517	D		D	D
Data processing, hosting, and related services	518	759		0.1	0.1
Other information	other 51	D		D	D
Finance and insurance	52	101		*	*
Real estate and rental and leasing	53	0		0.0	0.0
Lessors of nonfinancial intangible assets (except copyrighted works)	533	0		0.0	0.0
Other real estate and rental and leasing	other 53	0		0.0	0.0
Professional, scientific, and technical services	54	37,409		5.4	5.5
Architectural, engineering, and related services	5413	737		0.6	0.6
Computer systems design and related services	5415	4,646		1.8	1.8
Scientific research and development services	5417	30,852		25.3	25.5
Research and development in nanotechnology	541713	126		7.0	7.2
Research and development in biotechnology (except nanobiotechnology)	541714	5,625		19.0	19.0
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	24,398	i	27.4	27.5
Research and development in the social sciences and humanities	541720	704		55.2	55.2
Other professional, scientific, and technical services	other 54	1,174		0.7	0.7
Health care services	621-23	164		0.1	0.1
Other nonmanufacturing	23, 44-45 (excluding 454111-12), 55-56, 624, 71-72, 81	69		*	*
All companies (number of domestic employees)	-	96,246		0.6	0.6
Small companies					
10-19 ^c	-	1,191		3.9	4.1
20-49	-	2,361		2.4	2.5
Medium companies					
50-99	-	2,524		2.0	2.0
100-249	-	3,155		1.0	1.1
Large companies					
250-499	-	3,226		0.8	0.8
500-999	-	5,014		0.9	0.9
1,000-4,999	-	15,008		0.7	0.7
5,000-9,999	-	8,522		0.6	0.6
10,000-24,999	-	20,952		0.7	0.7
25,000 or more	-	34,294	i	0.5	0.5

* = amount < \$500,000 or less than 0.05%; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%.

NAICS = 2017 North American Industry Classification System.

^a Statistics used for both the numerator and denominator in the calculation of these percentages are representative of companies located in the United States that performed or funded R&D.

^b Statistics used for both the numerator and denominator in the calculation of these percentages are representative of companies located in the United States that performed R&D. The calculation of percentages in this column excludes R&D and sales of companies that fund R&D but do not perform R&D.

^c The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):

Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Unless indicated otherwise, statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 38. Domestic R&D paid for by the U.S. federal government and performed by the company, by type of R&D, industry, and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Total	Basic research	Applied research	Development
All industries	21–23, 31–33, 42–81	30,995	2,204 i	6,132	22,658
Manufacturing industries	31–33	23,361	1,258 i	4,433 i	17,670
Food	311	1	0	* i	1 i
Beverage and tobacco products	312	*	0	* i	0
Textile, apparel, and leather products	313–16	0	0	0	0
Wood products	321	*	*	0	0
Paper	322	0	0	0	0
Printing and related support activities	323	0	0	0	0
Petroleum and coal products	324	1	1 i	0	* i
Chemicals	325	684	67 i	166 i	450
Basic chemicals	3251	72	15	17	39
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	0	0	0	0
Pesticide, fertilizer, and other agricultural chemicals	3253	D	0	0	D
Pharmaceuticals and medicines	3254	587 i	51 i	132 i	404
Soap, cleaning compound, and toilet preparations	3256	0	0	0	0
Paint, coating, adhesive, and other chemicals	3255, 3259	D	1 i	17	D
Plastics and rubber products	326	2	0	0	2
Nonmetallic mineral products	327	2	* r	1	1
Primary metals	331	6	*	2	3
Fabricated metal products	332	5 r	0	0	5 r
Machinery	333	161	9	54 i	99
Agricultural implement	33311	2 r	0	*	2 r
Semiconductor machinery	333242	D	0	0	D
Engine, turbine, and power transmission equipment	3336	D	6	D	71
Other machinery	other 333	33	2 r	D	D
Computer and electronic products	334	3,380	69 i	672	2,639
Communications equipment	3342	D	50 i	D	D
Semiconductor and other electronic components	3344	243	2	19	222
Navigational, measuring, electromedical, and control instruments	3345	2,897	15 i	632	2,250
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	37 r	0	16 r	21 r
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	2,765	12 i	609	2,144
Other measuring and controlling devices	other 3345	94 r	3 r	7	84 r
Other computer and electronic products	other 334	D	3 r	D	D
Electrical equipment, appliances, and components	335	62	7	10	44
Transportation equipment	336	18,950 i	1,104 i	3,488 i	14,358 i
Motor vehicles, bodies, trailers, and parts	3361–63	D	0	D	D
Aerospace products and parts	3364	17,217 i	1,104 i	3,319 i	12,794 i
Aircraft, aircraft engine, and aircraft parts	336411–13	13,802 i	1,090 i	D	D
Guided missile, space vehicle, and related parts	336414–15, 336419	3,414	14	D	D
Military armored vehicle, tank, and tank components	336992	D	0	0	D
Other transportation	other 336	D	0	D	D
Furniture and related products	337	0	0	0	0
Miscellaneous	339	107	1	39	67
Medical equipment and supplies	3391	98	1	39	58
Other miscellaneous manufacturing	3399	9	0	0	9
Nonmanufacturing industries	21–23, 42–81	7,634	947	1,699	4,988
Mining, quarrying, oil and gas extraction, and support activities	21	*	0	* i	0
Utilities	22	D	0	0	D
Wholesale trade	42	D	0	0	D
Electronic shopping and electronic auctions	454111–12	0	0	0	0

Table 38. Domestic R&D paid for by the U.S. federal government and performed by the company, by type of R&D, industry, and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Total	Basic research	Applied research	Development
Transportation and warehousing	48–49	D	0	0	D
Information	51	60	1	D	D
Publishing	511	3	0	D	D
Newspaper, periodical, book, and directory publishers	5111	0	0	0	0
Software publishers	5112	3	0	D	D
Telecommunications	517	3	0	0	3
Data processing, hosting, and related services	518	53	1	4	48
Other information	other 51	0	0	0	0
Finance and insurance	52	0	0	0	0
Real estate and rental and leasing	53	0	0	0	0
Lessors of nonfinancial intangible assets (except copyrighted works)	533	0	0	0	0
Other real estate and rental and leasing	other 53	0	0	0	0
Professional, scientific, and technical services	54	7,297	945	1,690	4,662
Architectural, engineering, and related services	5413	404	22	84	298
Computer systems design and related services	5415	1,115	58	221	836
Scientific research and development services	5417	4,933	839	1,350	2,743
Research and development in nanotechnology	541713	75	*	i 8	67
Research and development in biotechnology (except nanobiotechnology)	541714	641	44	i 187	i 410
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	3,542	170	1,129	2,243
Research and development in the social sciences and humanities	541720	675	626	26	23
Other professional, scientific, and technical services	other 54	844	25	35	784
Health care services	621–23	*	0	* i	0
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	D	0	D	D
All companies (number of domestic employees)	–	30,995	2,204	i 6,132	22,658
Small companies					
10–19 ^a	–	486	31	145	310
20–49	–	808	83	i 155	570
Medium companies					
50–99	–	703	35	99	569
100–249	–	1,089	51	315	723
Large companies					
250–499	–	878	25	259	594
500–999	–	853	34	283	536
1,000–4,999	–	1,579	116	i 287	1,176
5,000–9,999	–	1,150	620	39	492
10,000–24,999	–	2,108	96	i 453	i 1,558
25,000 or more	–	21,340	i 1,113	i 4,098	i 16,130

* = amount < \$500,000; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%.

NAICS = 2017 North American Industry Classification System.

^a The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):

Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 39. Domestic R&D paid for by sources located outside the United States and performed by the company, by source of funds, industry, and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Total	Foreign companies			Foreign government agencies	Foreign universities, colleges, and academic researchers	All other
			Subsidiaries ^a	Company's parent	Unaffiliated companies			
All industries	21–23, 31–33, 42–81	65,576	39,057	23,767	2,519	171	7	56
Manufacturing industries	31–33	45,309	27,534	16,344	1,236	160	1	34
Food	311	471	223	237	11	0	0	0
Beverage and tobacco products	312	0	0	0	0	0	0	0
Textile, apparel, and leather products	313–16	1	0	0	1	0	0	0
Wood products	321	6	0	6	0	0	0	0
Paper	322	D	0	D	0	0	0	0
Printing and related support activities	323	D	0	D	0	0	0	0
Petroleum and coal products	324	D	D	0	D	D	0	0
Chemicals	325	15,526	6,432	8,495	565	D	*	D
Basic chemicals	3251	164	9	152	3	0	0	0
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	D	*	D	D	0	0	0
Pesticide, fertilizer, and other agricultural chemicals	3253	D	*	D	2	0	0	0
Pharmaceuticals and medicines	3254	14,636	6,402	7,654	546	D	0	D
Soap, cleaning compound, and toilet preparations	3256	286	15	271	0	0	0	0
Paint, coating, adhesive, and other chemicals	3255, 3259	D	6	D	D	*	*	0
Plastics and rubber products	326	609	493	116	*	0	0	0
Nonmetallic mineral products	327	D	12	D	D	0	0	*
Primary metals	331	33	0	0	33	0	0	0
Fabricated metal products	332	D	34	14	0	D	0	0
Machinery	333	2,099	523	1,320	256	0	0	0
Agricultural implement	33311	D	2	D	D	0	0	0
Semiconductor machinery	333242	D	3	D	D	0	0	0
Engine, turbine, and power transmission equipment	3336	D	0	D	D	0	0	0
Other machinery	other 333	628	518	33	77	0	0	0
Computer and electronic products	334	21,948	17,627	4,100	145	75	0	*
Communications equipment	3342	D	D	D	3	0	0	0
Semiconductor and other electronic components	3344	D	D	3,198	112	0	0	*
Navigational, measuring, electromedical, and control instruments	3345	D	164	D	30	75	0	0
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	138	0	138	*	*	0	0
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	D	5	0	D	75	0	0
Other measuring and controlling devices	other 3345	217	159	D	D	0	0	0
Other computer and electronic products	other 334	D	D	506	*	0	0	0
Electrical equipment, appliances, and components	335	847	67	769	10	*	1	*
Transportation equipment	336	1,913	469	1,179	182	84	0	0
Motor vehicles, bodies, trailers, and parts	3361–63	1,615	408	1,125	76	6	0	0

Table 39. Domestic R&D paid for by sources located outside the United States and performed by the company, by source of funds, industry, and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Total	Foreign companies						Foreign government agencies	Foreign universities, colleges, and academic researchers	All other		
			Subsidiaries ^a		Company's parent		Unaffiliated companies						
Aerospace products and parts	3364	D	61		D		105	i	78		0		0
Aircraft, aircraft engine, and aircraft parts	336411–13	D	D		D		D		D		0		0
Guided missile, space vehicle, and related parts	336414–15, 336419	D	D		0		D		D		0		0
Military armored vehicle, tank, and tank components	336992	0	0		0		0		0		0		0
Other transportation	other 336	D	0		D		0		0		0		0
Furniture and related products	337	71	71		0		0		0		0		0
Miscellaneous	339	1,377	D		D		D		0		0		D
Medical equipment and supplies	3391	1,273	1,162		85		D		0		0		D
Other miscellaneous manufacturing	3399	104	i	D	D		D		0		0		0
Nonmanufacturing industries	21–23, 42–81	20,267	i	11,523	i	7,422	i	1,283	10		6	r	22
Mining, quarrying, oil and gas extraction, and support activities	21	669	i	63		603	i	3	0		0		0
Utilities	22	0	0		0		0		0		0		0
Wholesale trade	42	119	i	0		108	i	11	0		0		0
Electronic shopping and electronic auctions	454111–12	2	2		0		0		0		0		0
Transportation and warehousing	48–49	0	0		0		0		0		0		0
Information	51	10,669	i	10,025	i	585		54	1		0		4
Publishing	511	857		455		395		2	1		0		4
Newspaper, periodical, book, and directory publishers	5111	0	0		0		0		0		0		0
Software publishers	5112	857		455		395		2	1		0		4
Telecommunications	517	D	0		D		0		0		0		0
Data processing, hosting, and related services	518	D	D		139		52		0		0		0
Other information	other 51	D	D		D		0		0		0		0
Finance and insurance	52	1,137	1,137		0		0		0		0		0
Real estate and rental and leasing	53	0	0		0		0		0		0		0
Lessors of nonfinancial intangible assets (except copyrighted works)	533	0	0		0		0		0		0		0
Other real estate and rental and leasing	other 53	0	0		0		0		0		0		0
Professional, scientific, and technical services	54	7,619	i	294		6,077	i	1,215	i	10	6	r	17 i
Architectural, engineering, and related services	5413	45	7		26		8		3		*		1
Computer systems design and related services	5415	3,258	249		2,391		618		0		0		0
Scientific research and development services	5417	4,259	i	32		3,620	i	578	i	7	6	r	16 i
Research and development in nanotechnology	541713	21	3		17		0		0		0		0
Research and development in biotechnology (except nanobiotechnology)	541714	679	5		638		31		0		5	r	*
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	3,555	i	23		2,965	i	547	i	3	1		16 i
Research and development in the social sciences and humanities	541720	4	0		0		0		4		0		0
Other professional, scientific, and technical services	other 54	58	7		40		11		0		*		0
Health care services	621–23	22	0		22		1	i	0		0		*

Table 39. Domestic R&D paid for by sources located outside the United States and performed by the company, by source of funds, industry, and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Total	Foreign companies						Foreign government agencies	Foreign universities, colleges, and academic researchers	All other	
			Subsidiaries ^a		Company's parent		Unaffiliated companies					
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	29	1		27		0		0		0	
All companies (number of domestic employees)	–	65,576	39,057		23,767		2,519		171		7	r 56
Small companies												
10–19 ^b	–	231	15		158		41		10		5	r 4
20–49	–	464	40		372		39		2		1	9
Medium companies												
50–99	–	954	255		591		106		1		*	1
100–249	–	1,484	559		751		148		2		*	i 25
Large companies												
250–499	–	2,005	503		1,266		236		*		1	0
500–999	–	3,773	868		2,765		128		1		0	10
1,000–4,999	–	9,721	3,742		5,666		313		*	i	0	*
5,000–9,999	–	6,711	2,961		3,665		83	i	4		0	0
10,000–24,999	–	10,307	1,017		8,483		734	i	67		*	i 6
25,000 or more	–	29,925	29,097		50		692		85		0	0

* = amount < \$500,000; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%.

NAICS = 2017 North American Industry Classification System.

^a Statistics are based on companies in the United States that reported to the survey. No systematic item imputation was applied. These statistics include an adjustment to the weight to account for unit nonresponse.

^b The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):
Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D. In all other tables, R&D costs of foreign-company subsidiaries of U.S. companies are included in company-funded U.S. domestic R&D totals. Only in this table are such R&D costs classified as being part of R&D paid for by sources located outside of the United States.

Source(s):
National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 40. Domestic R&D paid for by the company's foreign subsidiaries and performed by the company, by type of R&D, industry, and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Total ^a	Basic research ^b	Applied research ^b	Development ^b
All industries	21–23, 31–33, 42–81	39,057	1,331	4,871	32,855
Manufacturing industries	31–33	27,534	1,245	4,718	21,571
Food	311	223	9	65	148
Beverage and tobacco products	312	0	0	0	0
Textile, apparel, and leather products	313–16	0	0	0	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	D	D	D	D
Chemicals	325	6,432	448	740	5,245
Basic chemicals	3251	9 i	0	1 i	8 i
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	*	*	*	*
Pesticide, fertilizer, and other agricultural chemicals	3253	*	0	0	*
Pharmaceuticals and medicines	3254	6,402	446	735	5,220
Soap, cleaning compound, and toilet preparations	3256	15 i	* i	*	14 i
Paint, coating, adhesive, and other chemicals	3255, 3259	6	1	3	2
Plastics and rubber products	326	493	15	107	370
Nonmetallic mineral products	327	12	3	10	0
Primary metals	331	0	0	0	0
Fabricated metal products	332	34 i	2	4 i	28 i
Machinery	333	523	67	124 i	332 i
Agricultural implement	33311	2	*	*	2
Semiconductor machinery	333242	3	0	*	3
Engine, turbine, and power transmission equipment	3336	0	0	0	0
Other machinery	other 333	518	67	123 i	327 i
Computer and electronic products	334	17,627	569	3,156	13,902
Communications equipment	3342	D	*	D	D
Semiconductor and other electronic components	3344	D	D	D	D
Navigational, measuring, electromedical, and control instruments	3345	164	* i	4	160
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	0	0	0	0
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	5	0	0	5
Other measuring and controlling devices	other 3345	159	* i	4	155
Other computer and electronic products	other 334	D	D	D	D
Electrical equipment, appliances, and components	335	67	5	9	53
Transportation equipment	336	469	46 i	212 i	210 i
Motor vehicles, bodies, trailers, and parts	3361–63	408	45 i	210 i	153 i
Aerospace products and parts	3364	61	1	2	57
Aircraft, aircraft engine, and aircraft parts	336411–13	D	D	*	D
Guided missile, space vehicle, and related parts	336414–15, 336419	D	D	2	D
Military armored vehicle, tank, and tank components	336992	0	0	0	0
Other transportation	other 336	0	0	0	0
Furniture and related products	337	71	7 i	9 i	55 i
Miscellaneous	339	D	D	D	D
Medical equipment and supplies	3391	1,162	16 i	168 i	978 i
Other miscellaneous manufacturing	3399	D	D	D	D
Nonmanufacturing industries	21–23, 42–81	11,523 i	86	153	11,284 i
Mining, quarrying, oil and gas extraction, and support activities	21	63	4	10	48
Utilities	22	0	0	0	0
Wholesale trade	42	0	0	0	0
Electronic shopping and electronic auctions	454111–12	2	0	0	2

Table 40. Domestic R&D paid for by the company's foreign subsidiaries and performed by the company, by type of R&D, industry, and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Total ^a	Basic research ^b	Applied research ^b	Development ^b
Transportation and warehousing	48–49	0	0	0	0
Information	51	10,025	i	74	97
Publishing	511	455	39	42	i
Newspaper, periodical, book, and directory publishers	5111	0	0	0	0
Software publishers	5112	455	39	42	i
Telecommunications	517	0	0	0	0
Data processing, hosting, and related services	518	D	31	47	D
Other information	other 51	D	4	i	7
Finance and insurance	52	1,137	0	8	1,130
Real estate and rental and leasing	53	0	0	0	0
Lessors of nonfinancial intangible assets (except copyrighted works)	533	0	0	0	0
Other real estate and rental and leasing	other 53	0	0	0	0
Professional, scientific, and technical services	54	294	8	38	248
Architectural, engineering, and related services	5413	7	1	0	6
Computer systems design and related services	5415	249	6	27	216
Scientific research and development services	5417	32	1	12	19
Research and development in nanotechnology	541713	3	*	i	2
Research and development in biotechnology (except nanobiotechnology)	541714	5	*	3	3
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	23	1	6	16
Research and development in the social sciences and humanities	541720	0	0	0	0
Other professional, scientific, and technical services	other 54	7	0	0	7
Health care services	621–23	0	0	0	0
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	1	0	*	1
All companies (number of domestic employees)	–	39,057	1,331	4,871	32,855
Small companies					
10–19 ^c	–	15	*	3	12
20–49	–	40	2	11	27
Medium companies					
50–99	–	255	21	21	213
100–249	–	559	54	112	393
Large companies					
250–499	–	503	27	141	335
500–999	–	868	64	i	355
1,000–4,999	–	3,742	369	838	2,535
5,000–9,999	–	2,961	65	282	2,613
10,000–24,999	–	1,017	99	195	723
25,000 or more	–	29,097	630	2,913	25,554

* = amount < \$500,000; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse.

NAICS = 2017 North American Industry Classification System.

^a Statistics are based on companies in the United States that reported to the survey. No systematic item imputation was applied. These statistics include an adjustment to the weight to account for unit nonresponse.

^b Respondent was not asked to report categorical breakouts of research and development paid for by foreign subsidiaries. Rather, ratios of the company's basic research, applied research, and development were calculated as proportions of the overall domestic R&D performance paid for by the company. These ratios were applied to the company's domestic R&D performance paid for by foreign subsidiaries to get estimates of a company's basic research, applied research, and development paid for by foreign subsidiaries.

^c The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):

Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 41. Domestic R&D performance, by performer, source of funds, industry, and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Performed by the company			Performed by others		
		Total	Paid for by the company	Paid for by others	Total	Paid for by the company	Paid for by others
All industries	21–23, 31–33, 42–81	765,082	679,371	85,711	59,683	49,148	10,535
Manufacturing industries	31–33	405,092	356,431	48,661	48,362	41,163	7,199
Food	311	6,288 i	6,020	268	281	279	2
Beverage and tobacco products	312	1,459	1,459	*	171	171	0
Textile, apparel, and leather products	313–16	788	783	6	6	6	0
Wood products	321	267	261	6	20	20	0
Paper	322	1,240	1,238	1	7	7	0
Printing and related support activities	323	255	253	2	1	1	0
Petroleum and coal products	324	1,006	1,004	2	215	215	*
Chemicals	325	143,745	131,790	11,954	35,578	31,377	4,201
Basic chemicals	3251	3,120	2,883	237	201	198	2
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	1,354	D	D	105 i	16	89 i
Pesticide, fertilizer, and other agricultural chemicals	3253	1,253	D	D	73	D	D
Pharmaceuticals and medicines	3254	133,627	122,656	10,971	34,867	30,765	4,102
Soap, cleaning compound, and toilet preparations	3256	2,956	2,684	272	302	302	0
Paint, coating, adhesive, and other chemicals	3255, 3259	1,435	D	D	29	D	D
Plastics and rubber products	326	2,908	2,767	141	35	34	*
Nonmetallic mineral products	327	1,578 i	1,556 i	22	27 i	27 i	*
Primary metals	331	1,174	1,129	45	21	18	2
Fabricated metal products	332	3,230	3,137	93	92	26	66
Machinery	333	22,035	19,844	2,191	417	358	58
Agricultural implement	33311	2,561	D	D	D	D	D
Semiconductor machinery	333242	6,851	D	D	28	D	D
Engine, turbine, and power transmission equipment	3336	4,230	D	D	D	D	5
Other machinery	other 333	8,394	8,060	333	128	120	8
Computer and electronic products	334	115,599	107,038	8,561	4,305	4,205	101
Communications equipment	3342	12,839	12,069	771 i	1,034	1,034	* i
Semiconductor and other electronic components	3344	52,358	48,546	3,812	D	373	D
Navigational, measuring, electromedical, and control instruments	3345	14,083	10,736	3,347	370	291	79
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	3,245	3,046	199	165	159	6
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	6,161	3,190	2,971	79	15	64
Other measuring and controlling devices	other 3345	4,677	4,501	177	126	118	9 r
Other computer and electronic products	other 334	36,318	35,687	631	D	2,507	D
Electrical equipment, appliances, and components	335	6,999	6,135	864	77	76	1
Transportation equipment	336	71,231	47,039	24,192	6,029	3,265	2,764 i
Motor vehicles, bodies, trailers, and parts	3361–63	31,812	D	D	3,010	D	D
Aerospace products and parts	3364	35,904	15,130	20,774 i	2,958 i	D	D
Aircraft, aircraft engine, and aircraft parts	336411–13	D	D	D	D	D	2,613 i
Guided missile, space vehicle, and related parts	336414–15, 336419	D	D	D	D	D	D
Military armored vehicle, tank, and tank components	336992	33	23	10	1	1	0
Other transportation	other 336	3,481	D	D	61	57	3

Table 41. Domestic R&D performance, by performer, source of funds, industry, and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Performed by the company			Performed by others		
		Total	Paid for by the company	Paid for by others	Total	Paid for by the company	Paid for by others
Furniture and related products	337	450	450	0	4	4	0
Miscellaneous	339	24,840	24,528	312	1,077	1,074	4
Medical equipment and supplies	3391	22,126	21,840	285	997	993	4
Other miscellaneous manufacturing	3399	2,715	2,688	27	81	81	*
Nonmanufacturing industries	21–23, 42–81	359,990	322,940	37,050	11,321	7,985	3,336
Mining, quarrying, oil and gas extraction, and support activities	21	1,862	1,224	638	i 112	112	*
Utilities	22	613	D	D	D	D	D
Wholesale trade	42	1,692	i D	D	87	i D	D
Electronic shopping and electronic auctions	454111–12	7,898	i 7,898	i 0	511	i 508	i 2
Transportation and warehousing	48–49	11,341	D	D	D	D	D
Information	51	228,174	226,853	1,322	4,026	4,012	13
Publishing	511	63,596	63,085	511	D	1,442	D
Newspaper, periodical, book, and directory publishers	5111	489	i 489	i 0	11	11	0
Software publishers	5112	63,108	62,597	511	D	1,431	D
Telecommunications	517	3,323	D	D	D	D	D
Data processing, hosting, and related services	518	58,772	58,017	755	354	350	4
Other information	other 51	102,484	D	D	D	D	D
Finance and insurance	52	25,463	25,362	101	938	938	0
Real estate and rental and leasing	53	2,750	2,750	0	3	3	0
Lessors of nonfinancial intangible assets (except copyrighted works)	533	23	23	0	* i	* i	0
Other real estate and rental and leasing	other 53	2,727	2,727	0	3	3	0
Professional, scientific, and technical services	54	74,548	40,134	34,415	4,069	1,074	2,994
Architectural, engineering, and related services	5413	3,893	3,240	654	281	198	83
Computer systems design and related services	5415	26,764	22,353	4,411	742	507	235
Scientific research and development services	5417	33,942	5,705	28,237	2,878	i 263	2,615
Research and development in nanotechnology	541713	548	434	115	23	11	11
Research and development in biotechnology (except nanobiotechnology)	541714	6,751	1,204	5,547	181	103	77
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	25,931	4,060	21,872	i 2,674	i 148	2,526
Research and development in the social sciences and humanities	541720	712	8	704	1	*	1
Other professional, scientific, and technical services	other 54	9,949	i 8,835	i 1,113	168	107	60
Health care services	621–23	2,020	1,888	131	119	87	32
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	3,628	3,579	49	143	123	20
All companies (number of domestic employees)	–	765,082	679,371	85,711	59,683	49,148	10,535
Small companies							
10–19 ^a	–	4,790	3,734	1,056	718	583	135
20–49	–	16,179	14,153	2,026	2,404	2,069	335
Medium companies							
50–99	–	17,078	14,998	2,080	2,560	2,116	444
100–249	–	29,325	26,548	2,777	3,520	3,143	378
Large companies							

Table 41. Domestic R&D performance, by performer, source of funds, industry, and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Performed by the company			Performed by others		
		Total	Paid for by the company	Paid for by others	Total	Paid for by the company	Paid for by others
250–499	–	28,852	26,185	2,667	3,126	2,568	558
500–999	–	44,697	40,152	4,545	2,449	1,980	469
1,000–4,999	–	123,813	110,612	13,201	8,867	7,060	1,807
5,000–9,999	–	62,950	55,804	7,146	6,284	4,908	1,376
10,000–24,999	–	140,348	120,991	19,357	12,561	10,966	1,594
25,000 or more	–	297,050	266,195	30,855	17,194	13,755	3,439 i

* = amount < \$500,000; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%.

NAICS = 2017 North American Industry Classification System.

^a The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):

Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 42. Domestic R&D performance, by source of funds, performer, industry, and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Paid for by the company			Paid for by others					
		Total	R&D performed by others (purchased and collaborative R&D)	R&D performed by the company	Total	R&D performed by others (subcontracted or passed-through R&D costs)	R&D performed by the company			
							Total	Paid for by the U.S. government	Paid for by non-U.S. government sources	
All industries	21–23, 31–33, 42–81	728,519	49,148	679,371	96,246	10,535	85,711	30,995	54,716	
Manufacturing industries	31–33	397,593	41,163	356,431	55,860	7,199	48,661	23,361	25,300	
Food	311	6,299	279	6,020	270	2	268	1	267	
Beverage and tobacco products	312	1,630	171	1,459	*	0	*	*	0	
Textile, apparel, and leather products	313–16	789	6	783	6	0	6	0	6	
Wood products	321	281	20	261	6	0	6	*	6	
Paper	322	1,245	7	1,238	1	0	1	0	1	
Printing and related support activities	323	254	1	253	2	0	2	0	2	
Petroleum and coal products	324	1,219	215	1,004	3	*	2	1	1	
Chemicals	325	163,167	31,377	131,790	16,156	4,201	11,954	684	11,270	
Basic chemicals	3251	3,081	198	2,883	239	2	237	72	165	
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	D	16	D	D	89	i D	0	D	
Pesticide, fertilizer, and other agricultural chemicals	3253	D	D	D	D	D	D	D	D	
Pharmaceuticals and medicines	3254	153,421	30,765	122,656	15,073	4,102	10,971	587	i 10,384	
Soap, cleaning compound, and toilet preparations	3256	2,986	302	2,684	272	0	272	0	272	
Paint, coating, adhesive, and other chemicals	3255, 3259	D	D	D	D	D	D	D	D	
Plastics and rubber products	326	2,802	34	2,767	141	*	141	2	139	
Nonmetallic mineral products	327	1,583	i 27	i 1,556	i 22	*	22	2	19	
Primary metals	331	1,147	18	1,129	47	2	45	6	39	
Fabricated metal products	332	3,163	26	3,137	159	66	93	5	r 88	
Machinery	333	20,203	358	19,844	2,249	58	2,191	161	2,030	
Agricultural implement	33311	D	D	D	D	D	D	2	r D	
Semiconductor machinery	333242	D	D	D	D	D	D	D	D	
Engine, turbine, and power transmission equipment	3336	D	D	D	D	5	D	D	D	
Other machinery	other 333	8,180	120	8,060	341	8	333	33	300	

Table 42. Domestic R&D performance, by source of funds, performer, industry, and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Paid for by the company			Paid for by others							
		Total	R&D performed by others (purchased and collaborative R&D)	R&D performed by the company	Total	R&D performed by others (subcontracted or passed-through R&D costs)	R&D performed by the company					
							Total	Paid for by the U.S. government	Paid for by non-U.S. government sources			
Computer and electronic products	334	111,242	4,205	107,038	8,661	101		8,561	3,380		5,181	
Communications equipment	3342	13,103	1,034	12,069	771	*		771	D		D	
Semiconductor and other electronic components	3344	48,919	373	48,546	D	D		3,812	243		3,570	
Navigational, measuring, electromedical, and control instruments	3345	11,027	291	10,736	3,426	79		3,347	2,897		450	
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	3,205	159	3,046	205	6		199	37	r	161	
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	3,204	15	3,190	3,036	64		2,971	2,765		206	
Other measuring and controlling devices	other 3345	4,618	118	4,501	185	9	r	177	94	r	83	
Other computer and electronic products	other 334	38,194	2,507	35,687	D	D		631	D		D	
Electrical equipment, appliances, and components	335	6,211	76	6,135	865	1		864	62		802	
Transportation equipment	336	50,304	3,265	47,039	26,956	2,764	i	24,192	18,950	i	5,242	
Motor vehicles, bodies, trailers, and parts	3361–63	D	D	D	D	D		D	D		1,652	
Aerospace products and parts	3364	D	D	15,130	D	D		20,774	i	17,217	i	3,557
Aircraft, aircraft engine, and aircraft parts	336411–13	D	D	D	D	2,613	i	D	13,802	i	D	
Guided missile, space vehicle, and related parts	336414–15, 336419	D	D	D	D	D		D	3,414		D	
Military armored vehicle, tank, and tank components	336992	24	1	23	10	0		10	D		D	
Other transportation	other 336	D	57	D	D	3		D	D		D	
Furniture and related products	337	454	4	450	0	0		0	0		0	
Miscellaneous	339	25,602	1,074	24,528	316	4		312	107		205	
Medical equipment and supplies	3391	22,833	993	21,840	289	4		285	98		187	

Table 42. Domestic R&D performance, by source of funds, performer, industry, and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Paid for by the company				Paid for by others					
								R&D performed by the company			
		Total	R&D performed by others (purchased and collaborative R&D)		R&D performed by the company			Total	R&D performed by others (subcontracted or passed-through R&D costs)	Total	Paid for by the U.S. government
Other miscellaneous manufacturing	3399	2,769	81	2,688	27	*	27	9	18		
Nonmanufacturing industries	21–23, 42–81	330,926	7,985	322,940	40,386	3,336	37,050	7,634	29,416		
Mining, quarrying, oil and gas extraction, and support activities	21	1,336	112	1,224	639	*	638	*	638		
Utilities	22	1,347	D	D	D	D	D	D	1		
Wholesale trade	42	D	D	D	D	D	D	D	D		
Electronic shopping and electronic auctions	454111–12	8,406	508	7,898	2	2	0	0	0		
Transportation and warehousing	48–49	D	D	D	D	D	D	D	2		
Information	51	230,865	4,012	226,853	1,335	13	1,322	60	1,262		
Publishing	511	64,527	1,442	63,085	D	D	511	3	508		
Newspaper, periodical, book, and directory publishers	5111	499	11	489	0	0	0	0	0		
Software publishers	5112	64,028	1,431	62,597	D	D	511	3	508		
Telecommunications	517	3,871	D	D	D	D	D	3	D		
Data processing, hosting, and related services	518	58,367	350	58,017	759	4	755	53	702		
Other information	other 51	104,101	D	D	D	D	D	0	D		
Finance and insurance	52	26,301	938	25,362	101	0	101	0	101		
Real estate and rental and leasing	53	2,753	3	2,750	0	0	0	0	0		
Lessors of nonfinancial intangible assets (except copyrighted works)	533	24	*	23	0	0	0	0	0		
Other real estate and rental and leasing	other 53	2,730	3	2,727	0	0	0	0	0		
Professional, scientific, and technical services	54	41,208	1,074	40,134	37,409	2,994	34,415	7,297	27,118		
Architectural, engineering, and related services	5413	3,437	198	3,240	737	83	654	404	249		
Computer systems design and related services	5415	22,860	507	22,353	4,646	235	4,411	1,115	3,295		
Scientific research and development services	5417	5,968	263	5,705	30,852	2,615	28,237	4,933	23,304		
Research and development in nanotechnology	541713	445	11	434	126	11	115	75	39		

Table 42. Domestic R&D performance, by source of funds, performer, industry, and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Paid for by the company				Paid for by others											
								R&D performed by the company									
		Total		R&D performed by others (purchased and collaborative R&D)		R&D performed by the company				R&D performed by others (subcontracted or passed-through R&D costs)		Total		Paid for by the U.S. government		Paid for by non-U.S. government sources	
Research and development in biotechnology (except nanobiotechnology)	541714	1,307		103		1,204		5,625		77		5,547		641		4,906	
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	4,208		148		4,060		24,398		2,526		21,872		3,542		18,330	
Research and development in the social sciences and humanities	541720	9		*		8		704		1		704		675		29	
Other professional, scientific, and technical services	other 54	8,943		107		8,835		1,174		60		1,113		844		269	
Health care services	621–23	1,975		87		1,888		164		32		131		*		131	
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	3,702		123		3,579		69		20		49		D		D	
All companies (number of domestic employees)	–	728,519		49,148		679,371		96,246		10,535		85,711		30,995		54,716	
Small companies																	
10–19 ^a	–	4,317		583		3,734		1,191		135		1,056		486		570	
20–49	–	16,221		2,069		14,153		2,361		335		2,026		808		1,218	
Medium companies																	
50–99	–	17,114		2,116		14,998		2,524		444		2,080		703		1,376	
100–249	–	29,691		3,143		26,548		3,155		378		2,777		1,089		1,689	
Large companies																	
250–499	–	28,753		2,568		26,185		3,226		558		2,667		878		1,789	
500–999	–	42,131		1,980		40,152		5,014		469		4,545		853		3,692	
1,000–4,999	–	117,672		7,060		110,612		15,008		1,807		13,201		1,579		11,621	
5,000–9,999	–	60,712		4,908		55,804		8,522		1,376		7,146		1,150		5,996	
10,000–24,999	–	131,958		10,966		120,991		20,952		1,594		19,357		2,108		17,249	
25,000 or more	–	279,950		13,755		266,195		34,294		3,439		30,855		21,340		9,515	

* = amount < \$500,000; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%.

NAICS = 2017 North American Industry Classification System.

^a The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):

Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 43. R&D paid for by the company and others and performed by the company outside of the United States, by selected location: 2024

(Millions of U.S. dollars)

Location	Total	Paid for by the company	Paid for by others
Total	164,727	150,198	14,529
Puerto Rico ^a	321	302	20
Canada	13,227	12,217	1,010
Latin America and other Western Hemisphere ^b	6,353	5,657	696
Argentina	591	383	209
Brazil	1,967	1,788	179
Chile	272	255	17
Mexico	2,185	1,971	214
Other Latin American and Western Hemisphere locations	1,337	1,260	77
Africa	616	348	269
South Africa	394	214	181
Other African locations	222	134	88
Asia and Pacific	57,655	53,346	4,309
Australia	2,594	2,311	283
China	13,495	12,383	1,112
Hong Kong	426	406	19
India	23,622	22,493	1,129
Indonesia	59	58	1
Japan	4,368	3,644	724
Malaysia	1,075	1,062	13
New Zealand	343	301	42
Singapore	4,186	3,970	216
South Korea	1,913	1,709	203
Taiwan	3,878	3,771	107
Thailand	263	245	19
Other Asian or Pacific locations	1,433	993	440
Europe	75,964	67,890	8,073
Austria	1,193	1,007	186
Belgium	3,977	3,720	257
Czechia	1,260	1,137	123
Denmark	1,068	984	84
Finland	831	764	67
France	4,547	3,898	650
Germany	11,015	10,188	827
Hungary	466	364	102
Ireland	5,088	4,806	282
Italy	2,192	1,802	390
Luxembourg	242	214	28
Netherlands	4,922	4,585	337
Norway	400	373	27
Poland	2,049	1,854	195
Russia	192	128	64
Spain	2,342	1,981	361
Sweden	1,569	1,487	83
Switzerland	8,620	7,858	762
Turkey (Türkiye)	269	217	51
United Kingdom	18,477	15,820	2,657
Other European locations	5,248	4,704	544
Middle East	10,436	10,297	139
Israel	9,818	9,693	125
Other Middle Eastern locations	618	604	14

Table 43. R&D paid for by the company and others and performed by the company outside of the United States, by selected location: 2024

(Millions of U.S. dollars)

Location	Total		Paid for by the company		Paid for by others	
Undistributed ^c	155	i	142	i	13	i

i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse.

^a Puerto Rico is not included in the U.S. total due to its classification as a U.S. territory.
^b Other Western Hemisphere is defined as Argentina, Brazil, Chile, Mexico, and other Latin America.
^c Undistributed includes data reported that were not allocated to a specific country.

Note(s):
Detail may not add to total because of rounding. Country detail was not collected from companies reporting less than \$1 million of R&D paid for by the company or reporting less than \$1 million of R&D paid for by others. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D.

Source(s):
National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 44-A. R&D paid for by the company and others and performed by the company outside of the United States, by selected location, industry, and company size (part A): 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Total outside the United States	Puerto Rico ^a	Canada	Austria	Belgium	Czechia	Denmark	Finland	France	Germany	Hungary	Ireland	Italy	Luxembourg	Netherlands	Norway	Poland	Russia	Spain	Sweden	Switzerland	Turkey (Türkiye)	United Kingdom	Other European locations
All industries	21–23, 31–33, 42–81	164,727	321	13,227	1,193	3,977	1,260	1,068	831	4,547	11,015	466	5,088	2,192	242	4,922	400	2,049	192	2,342	1,569	8,620	269	18,477	5,248
Manufacturing industries	31–33	90,435	314	5,792	550	3,355	335	662	401	2,412	7,756	158	2,419	1,417	202	3,433	254	845	113	1,146	746	5,561	179	6,761	2,430
Food	311	1,523	63	62	5	16	1	4	*	77	100	5	30	12	0	28	*	28	5	39	1	46	6	153	62
Beverage and tobacco products	312	998	0	1	0	21	0	D	0	D	0	0	D	80	0	*	0	D	12	0	6	416	D	141	8
Textile, apparel, and leather products	313–16	118	0	D	2	4	3	0	5	19	6	0	0	2	0	4	0	1	0	0	*	17	0	4	2
Wood products	321	2	0	D	0	0	0	0	0	D	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Paper	322	78	0	12	0	0	*	0	1	3	10	0	0	1	D	1	0	2	2	*	*	D	0	13	1
Printing and related support activities	323	5	0	0	0	1	0	0	0	0	0	0	0	1	0	D	0	0	0	0	0	0	0	0	0
Petroleum and coal products	324	199	0	D	0	D	0	0	0	D	2	0	0	2	0	3	0	0	0	0	0	D	0	64	0
Chemicals	325	26,941	172	1,009	112	2,937	56	231	74	710	1,843	45	972	490	143	2,560	46	163	68	517	150	3,904	109	2,540	1,179
Basic chemicals	3251	921	0	4	2	41	*	D	14	74	74	2	2	70	2	126	3	D	2	25	38	32	4	122	24
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	516	0	D	0	30	0	0	0	5	64	0	0	17	140	48	0	*	*	16	0	3	*	4	*
Pesticide, fertilizer, and other agricultural chemicals	3253	168	D	D	*	1	*	D	0	14	26	*	0	*	0	D	0	*	0	2	0	D	*	4	1
Pharmaceuticals and medicines	3254	24,122	D	954	109	2,757	55	185	56	573	1,437	42	970	384	*	2,356	42	156	65	469	108	3,819	104	2,309	1,126
Soap, cleaning compound, and toilet preparations	3256	950	D	38	0	105	*	0	*	29	192	1	*	4	0	14	0	4	*	3	0	37	1	75	26
Paint, coating, adhesive, and other chemicals	3255, 3259	264	0	6	1	2	0	D	4	16	51	*	0	13	0	D	1	D	*	2	4	D	1	25	2
Plastics and rubber products	326	418	0	3	*	16	1	1	*	58	78	*	5	23	4	29	*	*	1	11	3	15	0	46	*
Nonmetallic mineral products	327	227	0	14	0	0	*	0	0	43	44	0	0	*	0	*	0	6	*	*	0	*	*	1	2
Primary metals	331	178	0	4	0	1	0	0	0	27	4	0	0	16	0	*	1	*	0	2	0	0	0	24	6
Fabricated metal products	332	748	0	41	2	9	8	1	8	11	52	*	0	8	0	8	2	3	*	4	*	16	0	39	*
Machinery	333	6,419	0	291	114	44	10	50	79	304	976	9	10	135	*	115	22	23	1	97	46	97	3	453	84
Agricultural implement	33311	1,096	0	D	D	D	*	12	D	D	D	*	0	D	*	30	*	*	0	13	*	4	*	D	D
Semiconductor machinery	333242	1,947	0	D	D	D	*	3	0	11	122	0	3	D	0	D	0	0	0	0	0	D	0	35	D
Engine, turbine, and power transmission equipment	3336	1,255	0	143	0	D	*	D	2	35	71	D	1	6	0	11	3	2	*	D	1	44	D	241	D
Other machinery	other 333	2,121	0	D	D	D	9	D	D	D	D	D	6	104	0	D	20	21	1	D	45	D	D	D	D
Computer and electronic products	334	37,633	8	2,795	218	158	219	305	172	667	2,467	43	995	278	1	237	134	495	6	316	303	652	17	1,843	510
Communications equipment	3342	3,848	0	649	D	32	25	23	D	69	141	4	185	54	0	50	D	145	0	19	45	45	6	228	102
Semiconductor and other electronic components	3344	21,742	D	1,542	124	64	49	154	110	316	875	18	464	105	0	98	46	289	*	69	124	138	9	538	217
Navigational, measuring, electromedical, and control instruments	3345	3,359	*	217	D	53	D	52	51	115	580	17	29	73	*	27	D	9	D	34	82	296	1	390	145
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	548	0	30	1	14	0	*	7	7	39	0	1	11	0	3	0	0	0	1	9	92	1	137	28
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	484	*	116	*	*	4	*	15	2	3	*	*	5	*	3	8	2	0	*	3	4	*	43	64
Other measuring and controlling devices	other 3345	2,327	0	71	D	39	D	51	29	107	538	16	29	57	*	22	D	7	D	33	70	200	0	211	54
Other computer and electronic products	other 334	8,683	D	387	D	8	D	76	D	166	870	4	316	46	*	62	1	51	D	194	51	174	1	686	46
Electrical equipment, appliances, and components	335	1,880	0	410	44	6	1	1	5	83	147	0	6	67	*	30	3	11	0	2	0	69	3	141	41
Transportation equipment	336	8,040	4	958	5	30	20	D	D	159	1,565	32	D	186	54	256	1	102	*	97	158	55	27	965	304

Table 44-A. R&D paid for by the company and others and performed by the company outside of the United States, by selected location, industry, and company size (part A): 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Total outside the United States	Puerto Rico ^a	Canada	Austria	Belgium	Czechia	Denmark	Finland	France	Germany	Hungary	Ireland	Italy	Luxembourg	Netherlands	Norway	Poland	Russia	Spain	Sweden	Switzerland	Turkey (Türkiye)	United Kingdom	Other European locations
Motor vehicles, bodies, trailers, and parts	3361–63	5,925	4	385	D	28 i	10	D	D	32	1,271	31	D	51	54	240	D	60	0	69	D	D	*	597	283
Aerospace products and parts	3364	1,931	0	541	D	3	D	D	0	111	259	*	D	126	* i	14	D	39	*	1	D	43	27	359	20
Aircraft, aircraft engine, and aircraft parts	336411–13	D	0	D	D	*	5	D	0	D	D	*	*	117	* i	D	D	39	*	1	D	D	27	D	20
Guided missile, space vehicle, and related parts	336414–15, 336419	D	0	D	0	2	D	0	0	D	D	0	D	9	0	D	0	0	0	0	D	D	0	D	0
Military armored vehicle, tank, and tank components	336992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other transportation	other 336	184	0	33	0	*	D	D	0	17	35	0	0	10	0	2	0	3 i	0	27	D	D	0	9	1
Furniture and related products	337	47	0	1	0	0	0	0	0	10	4	0	0	0	0	0	0	0	0	0	1	0	0	11 i	9
Miscellaneous	339	4,981	68 i	145	48	D	18	42	D	240	457	24	357	116 i	D	D	44	D	17	59	78 i	D	D	323	222
Medical equipment and supplies	3391	4,582	67 i	116	47	85 i	17	42	55	239	430	24	357	105 i	0	161	44	8	17	59	68 i	272	13	287	205
Other miscellaneous manufacturing	3399	399	*	29	1	D	1	0	D	1	27	0	0	11	D	D	0	D	0	0	10	D	D	36	16
Nonmanufacturing industries	21–23, 42–81	74,292	7	7,436	643 i	622	925	406	430	2,136	3,259	307	2,669	774	40 i	1,489	146	1,204	79 i	1,196	824	3,059	90	11,716	2,819
Mining, quarrying, oil and gas extraction, and support activities	21	355	0	16	D	8 i	0	0	0	9	60	*	2	147	0	18	13	*	0	*	0	2	0	60	D
Utilities	22	10	0	D	D	0	*	0	0	D	0	0	0	0	0	0	0	D	0	D	0	0	0	D	0
Wholesale trade	42	110 i	0	8 i	0	2	0	0	0	*	15	0	* i	*	0	2	0	0	0	*	0	0	0	19 r	5
Electronic shopping and electronic auctions	454111–12	2291 i	0	138 i	D	* i	4	1 i	D	D	D	* i	428 i	D	D	15	* i	9 i	0	D	D	8	1 i	209 i	D
Transportation and warehousing	48–49	270	0	D	0	*	0	2	D	D	D	*	0	0	0	8	*	0	0	D	D	*	0	1	4
Information	51	46,361	3	4,543	460 i	379	494	314	258	1,270	1,625	145	1,736	286	8	777	97	846	7	731	556	2,232	51	7,247	1,839
Publishing	511	16,913	2	2,106	D	72	304	179	70	401	599	D	389	D	D	D	61	163	1	278	392	176	32 i	1,697	971
Newspaper, periodical, book, and directory publishers	5111	9 i	0	0	0	0	0	0	0	0	0	0	9 i	0	0	0	0	0	0	0	0	0	0	0	0
Software publishers	5112	16,904	2	2,106	D	72	304	179	70	401	599	D	380	D	D	D	61	163	1	278	392	176	32 i	1,697	971
Telecommunications	517	224	0	6	0	8	0	0	0	0	*	0	D	D	0	*	0	0	0	1	0	1	*	D	2
Data processing, hosting, and related services	518	13,775	1	1,595	352 i	D	169	D	D	570	447	87	849	97	D	207	D	465	7	360	97	D	18	1,278	493
Other information	other 51	15,449	*	837	D	D	20	D	D	299	579	D	D	D	*	D	D	218	0	93	67	D	*	D	372
Finance and insurance	52	4,129	*	610	D	11	0	11	0	30	38	47	133	D	1	32	0	46	1	34	55	19	*	788	78
Real estate and rental and leasing	53	106	0	4	0	0	0	0	0	5	2	0	10	D	0	*	0	0	0	D	0	0	0	5	D
Lessors of nonfinancial intangible assets (except copyrighted works)	533	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other real estate and rental and leasing	other 53	106	0	4	0	0	0	0	0	5	2	0	10	D	0	*	0	0	0	D	0	0	0	5	D
Professional, scientific, and technical services	54	20,377	4 i	2,013	181	221	427	77	D	783	1,282	114	335	322	D	636	36	302	66 i	412	183	796	38	3,362	854
Architectural, engineering, and related services	5413	37	0	13	0	0	0	0	0	0	7	0	0	*	0	0	0	*	0	0	1	0	*	6	2
Computer systems design and related services	5415	5,870	0	718	15	25 r	213 i	43 i	19	121	489	27	171	35	*	215	2	98	2	70	14	109	1	735	235
Scientific research and development services	5417	13,219	4 i	881	165	193	192	D	90	602	703	85	159	265	D	380	32	195 i	63 i	324	157	682	34	2,457	577
Research and development in nanotechnology	541713	19	*	*	0	2	0	0	0	*	9	*	0	*	0	0	0	0	0	0	0	*	0	2	0
Research and development in biotechnology (except nanobiotechnology)	541714	2,830	0	186	2	13	5	2	3	67	151	12	3	29	0	15	1	20	5	54	4	610	3	867	52
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	10,368	2 i	694	163	179	187	D	87	535	542	74	156	236	D	365	31	175 i	58 i	270	153	72	30	1,587	525 i
Research and development in the social sciences and humanities	541720	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 44-A. R&D paid for by the company and others and performed by the company outside of the United States, by selected location, industry, and company size (part A): 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Total outside the United States	Puerto Rico ^a	Canada	Austria	Belgium	Czechia	Denmark	Finland	France	Germany	Hungary	Ireland	Italy	Luxembourg	Netherlands	Norway	Poland	Russia	Spain	Sweden	Switzerland	Turkey (Türkiye)	United Kingdom	Other European locations				
Other professional, scientific, and technical services	other 54	1,250	i	*	401	i	2	3	23	D	D	61	84	2	5	23	0	41	3	9	0	18	12	5	3	164	i	40	i
Health care services	621–23	98	i	0	11	0	0	0	*	0	D	0	*	23	i	0	0	D	0	D	4	2	i	0	D	0	16	2	i
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	186		*	D	0	0	*	1	0	D	D	0	*	D	0	D	0	*	*	D	D	D	*	D	D			
All companies (number of domestic employees)	–	164,727	321	13,227	1,193	3,977	1,260	1,068	831	4,547	11,015	466	5,088	2,192	242	4,922	400	2,049	192	2,342	1,569	8,620	269	18,477	5,248				
Small companies																													
10–19 ^b	–	644	*	26	30	*	*	r	1	r	1	7	r	9	0	1	4	*	8	r	1	3	28	r	20	0	99	7	
20–49	–	1,205	*	64	1	r	65	4	59	*	22	61	2	8	*	0	5	*	15	1	16	r	3	4	4	54	42		
Medium companies																													
50–99	–	1,173	*	104	r	17	8	4	11	*	i	21	54	r	2	19	16	0	31	r	0	5	1	11	8	64	8	95	69
100–249	–	2,858	0	369	6	6	16	6	39	i	75	92	15	i	68	100	3	109	0	48	1	21	6	245	2	200	220		
Large companies																													
250–499	–	4,436	2	478	10	17	17	i	29	i	20	89	127	79	140	136	1	203	4	49	1	90	11	87	2	490	202		
500–999	–	5,095	*	488	26	26	23	8	21	151	435	76	108	50	7	99	22	76	*	34	120	111	17	609	311	i			
1,000–4,999	–	28,998	34	3,223	362	i	257	437	i	230	158	1,101	1,959	70	1,102	324	1	486	34	530	22	557	321	1,381	32	i	3,752	1,079	
5,000–9,999	–	13,367	76	758	108	186	41	161	100	421	991	28	310	i	274	54	217	42	126	8	242	132	185	20	i	1,184	283		
10,000–24,999	–	37,522	129	3,013	257	587	166	229	146	1,287	2,205	109	890	600	142	781	101	388	40	664	278	827	44	2,931	1,045				
25,000 or more	–	69,429	79	i	4,705	377	2,825	553	333	345	1,373	5,081	86	2,442	687	34	i	2,985	196	784	117	704	662	5,696	139	9,063	1,990		

* = amount < \$500,000; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%.

NAICS = 2017 North American Industry Classification System.

^a Puerto Rico is not included in the U.S. total due to its classification as a U.S. territory.

^b The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):

Detail may not add to total because of rounding. Country detail was not collected from companies reporting less than \$1 million of R&D paid for by the company or reporting less than \$1 million of R&D paid for by others. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 44-B. R&D paid for by the company and others and performed by the company outside of the United States, by selected location, industry, and company size (part B): 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Total outside the United States	Argentina	Brazil	Chile	Mexico	Other Latin American locations	Australia	China	Hong Kong	India	Indonesia	Japan	Malaysia	New Zealand	Singapore	South Korea	Taiwan	Thailand	Other Asian or Pacific locations	Israel	Other Middle Eastern locations	South Africa	Other African locations	Undistributed ^a
All industries	21–23, 31–33, 42–81	164,727	591	1,967	272	2,185	1,337	2,594	13,495	426	23,622	59	4,368	1,075	343	4,186	1,913	3,878	263	1,433	9,818	618	394	222	155
Manufacturing industries	31–33	90,435	244	1,342	132	1,452	1,033	1,110	9,609	244	10,667	29	2,903	949	194	2,555	1,316	2,466	215	687	5,495	336	103	28	87
Food	311	1,523	26	172	43	95	12	34	224	2	61	8	6	5	8	31	1	1	8	15	2	4	20	3	3
Beverage and tobacco products	312	998	3	16	*	53	6	10	64	11	16	4	14	0	*	27	0	16	14	7	0	11	11	0	0
Textile, apparel, and leather products	313–16	118	0	1	*	5	3	1	16	14	1	*	*	*	0	0	5	0	2	2	0	0	0	0	D
Wood products	321	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*
Paper	322	78	2	3	1	0	5	0	5	0	0	0	0	*	0	*	12	0	0	*	2	D	1	*	D
Printing and related support activities	323	5	0	0	0	*	*	0	0	0	1	0	0	0	0	*	0	2	0	D	0	0	0	0	D
Petroleum and coal products	324	199	0	D	0	0	0	0	24	0	2	0	1	0	0	D	0	0	*	0	0	D	0	0	*
Chemicals	325	26,941	146	383	73	212	331	363	1,719	58	861	8	1,333	34	22	304	208	101	41	136	331	149	54	14	27
Basic chemicals	3251	921	3	28	1	12	7	3	81	1	9	2	10	*	2	33	1	1	3	6	5	18	2	1	*
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	516	2	18	*	5	D	1	82	5	9	*	27	*	0	10	12	1	2	*	0	7	*	D	D
Pesticide, fertilizer, and other agricultural chemicals	3253	168	1	17	*	2	D	1	3	1	7	1	1	*	*	11	D	D	*	1	0	0	1	*	D
Pharmaceuticals and medicines	3254	24,122	135	280	69	130	305	352	1,364	49	816	3	1,270	26	20	143	188	98	34	96	326	120	50	12	D
Soap, cleaning compound, and toilet preparations	3256	950	3	31	*	46	15	5	138	3	5	1	22	7	*	105	4	*	2	22	0	4	D	1	D
Paint, coating, adhesive, and other chemicals	3255, 3259	264	1	9	2	17	2	*	50	*	14	1	3	1	*	2	D	D	*	11	0	*	D	D	*
Plastics and rubber products	326	418	4	12	0	18	1	4	40	1	3	*	16	2	*	2	1	*	5	*	16	*	0	0	1
Nonmetallic mineral products	327	227	0	1	0	4	0	21	23	3	1	0	2	0	*	1	41	12	0	*	8	0	0	0	1
Primary metals	331	178	0	3	0	*	0	33	47	0	2	0	0	1	0	D	0	0	5	D	0	0	0	0	*
Fabricated metal products	332	748	2	3	1	11	1	3	335	0	10	*	76	1	*	2	42	1	*	34	0	8	1	*	3
Machinery	333	6,419	15	171	4	120	2	61	752	4	836	2	211	6	23	300	253	197	22	6	445	18	4	1	3
Agricultural implement	33311	1,096	4	D	0	D	0	1	22	0	D	0	0	*	3	2	0	0	0	0	D	0	*	0	D
Semiconductor machinery	333242	1,947	0	0	0	0	0	0	175	3	301	0	54	D	0	D	235	171	0	D	391	0	0	0	0
Engine, turbine, and power transmission equipment	3336	1,255	*	26	2	21	1	44	173	*	D	2	D	*	D	3	*	*	*	*	5	D	2	1	D
Other machinery	other 333	2,121	11	D	2	D	1	16	381	*	100	0	D	D	D	D	18	25	21	D	D	D	2	0	1
Computer and electronic products	334	37,633	41	210	2	222	551	189	4,544	60	8,024	5	925	882	127	1,675	333	2,066	84	463	4,285	91	7	1	5
Communications equipment	3342	3,848	4	12	0	14	1	51	271	D	1,076	1	4	D	60	18	D	143	D	2	208	D	1	*	D
Semiconductor and other electronic components	3344	21,742	36	D	*	152	D	37	3,024	15	5,756	D	580	614	22	1,252	198	1,211	D	398	2,827	36	0	*	D
Navigational, measuring, electromedical, and control instruments	3345	3,359	*	97	*	D	D	43	283	13	192	D	50	79	D	134	17	12	D	42	100	4	1	1	1
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	548	0	*	0	0	6	2	11	*	41	0	1	0	0	98	7	*	0	0	0	*	0	0	0
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	484	*	94	*	*	*	8	9	*	28	D	2	2	17	2	1	1	D	1	41	3	1	1	1
Other measuring and controlling devices	other 3345	2,327	0	2	*	D	D	33	264	13	122	D	47	77	D	34	9	11	D	41	59	*	0	*	0
Other computer and electronic products	other 334	8,683	1	D	1	D	D	58	966	D	1,000	D	291	D	D	271	D	700	D	21	1,151	D	4	*	D
Electrical equipment, appliances, and components	335	1,880	0	66	0	86	1	1	346	8	91	0	58	0	5	61	13	17	9	*	35	*	*	0	11
Transportation equipment	336	8,040	1	249	1	591	9	230	1,030	3	299	*	84	1	*	62	362	33	17	4	12	3	3	4	20

Table 44-B. R&D paid for by the company and others and performed by the company outside of the United States, by selected location, industry, and company size (part B): 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Total outside the United States	Argentina	Brazil	Chile	Mexico	Other Latin American locations	Australia	China	Hong Kong	India	Indonesia	Japan	Malaysia	New Zealand	Singapore	South Korea	Taiwan	Thailand	Other Asian or Pacific locations	Israel	Other Middle Eastern locations	South Africa	Other African locations	Undistributed ^a									
Motor vehicles, bodies, trailers, and parts	3361–63	5,925	1	240	1	515	5	205	973	3	230	*	84	0	*	54	361	10	16	*	3	0	*	4	20									
Aerospace products and parts	3364	1,931	0	8	0	76	4	23	56	0	61	*	1	1	*	8	1	0	1	3	9	3	2	*	0									
Aircraft, aircraft engine, and aircraft parts	336411–13	D	0	8	0	75	4	D	D	0	D	D	D	*	*	D	D	0	1	*	8	D	2	*	0									
Guided missile, space vehicle, and related parts	336414–15, 336419	D	0	0	0	1	0	D	D	0	D	D	D	1	0	D	D	0	*	3	1	D	0	0	0									
Military armored vehicle, tank, and tank components	336992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0									
Other transportation	other 336	184	0	1	0	*	i	0	1	1	0	8	i	0	0	0	0	23	0	0	0	0	0	0	0									
Furniture and related products	337	47	0	0	0	D	0	0	0	0	5	0	0	0	0	0	0	0	*	2	0	0	0	0	D									
Miscellaneous	339	4,981	4	D	10	D	111	159	440	81	455	2	176	17	8	89	46	20	8	16	359	43	2	3	10	i								
Medical equipment and supplies	3391	4,582	4	35	10	30	110	134	423	3	380	2	153	14	8	86	41	12	7	16	340	43	2	3	8	i								
Other miscellaneous manufacturing	3399	399	0	D	0	D	1	25	17	78	75	0	23	2	0	4	5	8	1	0	19	0	0	0	2	i								
Nonmanufacturing industries	21–23, 42–81	74,292	347	625	140	733	304	1,484	3,886	181	12,955	29	1,466	126	149	1,631	596	1,411	48	746	4,323	282	292	194	68	i								
Mining, quarrying, oil and gas extraction, and support activities	21	355	0	D	0	0	*	D	0	0	*	0	D	0	0	D	0	0	0	2	0	D	D	0	0									
Utilities	22	10	0	D	0	D	0	*	*	0	0	*	0	0	*	0	0	0	*	0	D	0	D	0	0									
Wholesale trade	42	110	i	0	0	0	*	i	11	4	19	i	7	i	*	*	1	0	0	*	0	3	i	0	3	i	0	D	*	5	i	D		
Electronic shopping and electronic auctions	454111–12	2291	i	1	i	D	D	14	i	8	i	D	229	D	D	*	i	D	D	1	D	D	D	D	*	i	D	D	D	D	*	i	*	i
Transportation and warehousing	48–49	270	0	D	0	*	0	7	28	D	9	0	D	D	0	D	0	0	0	*	2	D	0	0	0	0								
Information	51	46,361	104	i	323	117	366	157	816	2,318	84	8,795	25	528	107	87	1,043	317	1,244	18	247	3,438	131	76	79	35	i							
Publishing	511	16,913	D	100	18	83	54	D	1,691	21	4,111	D	132	87	D	390	200	279	D	155	D	D	D	D	D	28	i							
Newspaper, periodical, book, and directory publishers	5111	9	i	0	0	0	0	0	0	0	*	i	0	0	0	0	0	0	0	0	0	0	0	0	0	0								
Software publishers	5112	16,904	D	100	18	83	54	D	1,691	21	4,111	D	132	87	D	390	200	279	D	155	D	D	D	D	D	28	i							
Telecommunications	517	224	0	*	0	D	4	r	*	0	*	D	0	0	0	*	D	0	0	0	D	0	D	0	0	0								
Data processing, hosting, and related services	518	13,775	93	i	D	D	238	81	342	332	D	3,563	D	D	D	40	D	12	D	2	D	1,170	19	48	24	6	i							
Other information	other 51	15,449	D	D	D	D	18	D	295	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	*	i							
Finance and insurance	52	4,129	16	19	*	31	D	52	i	97	10	1,493	1	45	i	*	34	158	14	D	D	28	97	35	r	D	17	D						
Real estate and rental and leasing	53	106	1	D	D	D	1	*	42	D	32	0	D	0	0	1	*	0	0	*	0	0	0	0	0	0	D							
Lessors of nonfinancial intangible assets (except copyrighted works)	533	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0								
Other real estate and rental and leasing	other 53	106	1	D	D	D	1	*	42	D	32	0	D	0	0	1	*	0	0	*	0	0	0	0	0	0	D							
Professional, scientific, and technical services	54	20,377	220	207	21	317	i	97	482	1,154	32	i	2,381	i	3	692	18	27	326	195	130	30	461	643	68	193	93	27	i					
Architectural, engineering, and related services	5413	37	0	*	0	*	*	2	1	0	4	0	0	0	0	0	*	0	0	0	*	1	0	0	0	1	i							
Computer systems design and related services	5415	5,870	6	40	*	122	19	198	180	15	i	1,133	1	i	64	5	9	68	9	50	13	16	489	47	i	6	4	22	i					
Scientific research and development services	5417	13,219	208	148	17	191	i	74	267	961	17	1,096	i	2	i	620	13	18	243	182	74	17	428	103	i	12	176	83	1	i				
Research and development in nanotechnology	541713	19	0	0	0	0	*	0	1	*	3	0	0	0	0	*	0	0	0	0	0	0	0	0	0	0	*	i						
Research and development in biotechnology (except nanobiotechnology)	541714	2,830	36	15	5	27	6	74	202	5	132	1	106	2	3	15	40	14	1	4	32	i	0	6	0	*	i							
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	10,368	172	133	12	i	164	i	67	193	758	12	961	i	1	514	11	14	227	141	61	15	424	71	12	170	83	1	i					
Research and development in the social sciences and humanities	541720	2	0	0	0	0	*	0	0	0	0	0	0	0	0	0	0	0	*	0	0	0	*	0	0	0								

Table 44-B. R&D paid for by the company and others and performed by the company outside of the United States, by selected location, industry, and company size (part B): 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Total outside the United States	Argentina	Brazil	Chile	Mexico	Other Latin American locations	Australia	China	Hong Kong	India	Indonesia	Japan	Malaysia	New Zealand	Singapore	South Korea	Taiwan	Thailand	Other Asian or Pacific locations	Israel	Other Middle Eastern locations	South Africa	Other African locations	Undistributed ^a
Other professional, scientific, and technical services	other 54	1,250	i 5	19	4	3	4	16	13	* r	148	0	9	1	*	15	4	6	0	17 i	51	9	11	6	2 i
Health care services	621–23	98	i 6	*	1 i	1 i	* i	*	0	0	1	0	D	0	0	D	0	0	0	0	24 i	0	0	0	0
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	186	1	D	*	D	D	D	*	D	D	0	0	0	*	*	D	0	*	4	D	D	D	1	D
All companies (number of domestic employees)	–	164,727	591	1,967	272	2,185	1,337	2,594	13,495	426	23,622	59	4,368	1,075	343	4,186	1,913	3,878	263	1,433	9,818	618	394	222	155 i
Small companies																									
10–19 ^b	–	644	* 4	4	0	1	1	10	189 r	4	75 r	*	1	6	0	1	20	7	0	16 r	6	*	1	*	31 i
20–49	–	1,205	7	4	*	40 r	17	23	396 r	3	69	*	9	*	4	6	55 r	23	1	8 i	79	1	* r	3	27 i
Medium companies																									
50–99	–	1,173	1	3	*	9	15	23	196	13	155	1	4	*	1	21	21	36	1	5	92	13	3	*	10 i
100–249	–	2,858	17	47	2	43	26	17	207	17	325	*	12	3	7	25	56	171	1	37	85	70 i	*	1	42
Large companies																									
250–499	–	4,436	9	30	1	100	23	37	202	23	855	2	42	38	24	186	114	145	2	71	212	5	20	1	8 i
500–999	–	5,095	14	47	17	75	10	121	329	9	754	1	114	25	77	119	15	89	14	76	350	9	6	*	8 i
1,000–4,999	–	28,998	73	311	12	244	120	585	1,554	143	4,618	12	445 i	69	52	742	217	476	10	216	1,483	60	52	23	27
5,000–9,999	–	13,367	66	185	43	327	424 i	224	1,220	16	1,392	5	834	174 i	22	864	165	267	86	283 i	720	64	28	9	1 i
10,000–24,999	–	37,522	215	435	20	267	177	443	4,324	42	7,804	11	1,422	231	77	989	612	1,144	63	430	1,602 i	119	144	92	2 i
25,000 or more	–	69,429	188 i	901	176	1,078	524	1,111	4,877	155	7,575	27	1,486	530	79	1,233	637	1,520	86	291	5,189	278	140	93	0

* = amount < \$500,000; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%.

NAICS = 2017 North American Industry Classification System.

^a Undistributed includes data reported that were not allocated to a specific country.

^b The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):

Detail may not add to total because of rounding. Country detail was not collected from companies reporting less than \$1 million of R&D paid for by the company or reporting less than \$1 million of R&D paid for by others. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 45. Worldwide, foreign, and domestic capital expenditures and domestic capital expenditures for R&D paid for and performed by the company, by type of expenditure, industry, and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Worldwide capital assets				Worldwide capital expenditures			Foreign capital expenditures			Domestic capital expenditures			Domestic capital expenditures for R&D			Domestic capital expenditures for R&D (type of property)																			
		Total	Property, plant, and equipment	Goodwill	Identifiable intangible assets	Total	Property, plant, and equipment	Identifiable intangible assets	Total	Property, plant, and equipment	Identifiable intangible assets	Total	Property, plant, and equipment	Identifiable intangible assets	Total	Property, plant, and equipment	Identifiable intangible assets	Land acquisition	Buildings and land improvement	Machinery and equipment	Capitalized software	Other intellectual property	All other														
All industries	21–23, 31–33, 42–81	14,973,468	7,339,111	4,774,062	2,860,295	1,349,873	1,224,642	125,231	242,831	225,939	16,892	i	1,107,042	998,703	108,339	44,908	38,950	5,958	109	5,743	27,488	4,153	3,368	4,047													
Manufacturing industries	31–33	6,876,184	2,986,941	2,364,816	1,524,427	546,940	494,947	51,993	148,677	139,875	8,801		398,263	355,071	43,192	27,213	23,664	3,549	55	4,350	15,707	2,050	2,431	2,620													
Food	311	647,926	243,020	231,020	173,886	41,119	39,804	1,314	5,988	5,918	70	i	35,131	33,887	1,244	563	527	36	1	160	338	35	i	10	18												
Beverage and tobacco products	312	368,776	103,648	130,093	135,035	16,043	15,950	93	5,687	5,687	0		10,356	10,263	93	102	102	*	r	0	25	59	18	*	r	*	r										
Textile, apparel, and leather products	313–16	46,156	24,860	11,894	9,403	3,564	3,364	200	670	668	2	i	2,894	2,697	197	105	99	6	i	*	20	72	6	i	4	i	2										
Wood products	321	31,666	26,783	3,556	1,327	4,116	3,858	258	108	103	4		4,008	3,755	254	50	i	49	i	2	i	*	i	14	i	34	i	1	i	1	i						
Paper	322	110,372	79,133	21,848	9,391	9,226	9,054	172	1,286	1,249	37		7,940	7,805	135	97	97	*	i	0	0	96	*	r	*	i	0										
Printing and related support activities	323	11,576	6,305	3,219	2,052	2,384	2,152	232	71	i	71	i	1	2,312	2,081	231	33	31	2	i	0	*	i	30	1	i	1	i	*	i							
Petroleum and coal products	324	445,653	421,783	14,065	9,805	40,371	38,103	2,268	16,279	i	15,525	754	i	24,092	i	22,578	1,514	52	49	3	0	4	33	3	*	i	12										
Chemicals	325	1,808,717	626,770	606,336	575,611	109,558	101,704	7,854	29,621	28,470	1,151		79,937	73,234	6,703	8,951	7,155	1,795	23	2,157	4,249	339	1,609	575													
Basic chemicals	3251	327,721	233,121	63,614	30,986	33,071	31,838	1,232	11,719	11,326	394		21,351	20,513	839	291	253	38	2	38	200	5	23	23													
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	78,058	59,458	13,961	4,638	8,664	8,312	352	1,907	1,832	75		6,757	6,480	278	196	192	3	i	0	16	160	9	*	i	10											
Pesticide, fertilizer, and other agricultural chemicals	3253	50,477	31,010	12,249	7,218	4,092	3,735	357	137	108	30		3,955	3,627	328	115	101	14	i	1	8	85	8	i	7	i	7										
Pharmaceuticals and medicines	3254	1,110,888	226,303	415,260	469,325	49,692	44,649	5,043	11,334	10,900	434		38,358	33,749	4,609	8,021	6,300	1,720	20	i	2,016	3,589	314	1,565	517												
Soap, cleaning compound, and toilet preparations	3256	173,857	52,123	72,540	49,194	8,723	8,495	228	3,376	3,340	36	i	5,347	5,155	192	184	182	2	i	0	51	120	3	r	1	i	9										
Paint, coating, adhesive, and other chemicals	3255, 3259	67,716	24,754	28,712	14,250	5,316	4,675	641	1,148	964	184		4,168	3,711	457	144	127	18	i	1	28	94	*	13	i	8											
Plastics and rubber products	326	162,500	109,503	34,913	18,084	15,753	13,675	2,078	3,628	2,564	i	1,064	12,125	11,111	1,013	281	272	9	i	*	35	199	4	4	i	39											
Nonmetallic mineral products	327	63,022	49,536	8,613	4,874	7,785	6,943	842	2,869	i	2,467	i	401	4,916	4,475	440	76	70	6	r	*	24	44	*	r	1	6	r									
Primary metals	331	84,736	68,928	10,226	5,583	9,665	9,534	131	1,395	1,394	2		8,270	8,140	130	171	170	*	i	*	29	137	2	1	3												
Fabricated metal products	332	153,482	85,335	44,921	23,226	15,321	12,843	2,478	2,258	1,944	315		13,063	10,899	2,164	623	i	530	i	92	i	*	i	66	i	436	i	51	i	27	i	42					
Machinery	333	445,715	159,766	192,925	93,024	33,054	27,083	5,971	9,053	8,093	959		24,001	18,989	5,012	2,314	2,085	229	*	542	1,387	144	77	164													
Agricultural implement	33311	41,820	19,361	15,927	6,532	3,689	3,382	307	1,293	1,293	1		2,396	2,090	306	114	53	60	0	16	31	D	D	D													
Semiconductor machinery	333242	41,152	22,583	14,004	4,565	3,891	3,791	100	1,694	1,684	9		2,197	2,106	91	1,184	1,162	22	0	D	668	D	*	D													
Engine, turbine, and power transmission equipment	3336	53,179	32,703	14,986	5,490	6,825	6,184	641	2,272	1,935	337		4,553	4,249	304	360	341	19	i	0	49	234	25	D	D												
Other machinery	other 333	309,563	85,120	148,007	76,436	18,649	13,725	4,924	3,793	3,181	612		14,856	10,544	4,312	656	528	128	*	D	454	83	19	D													
Computer and electronic products	334	1,031,508	380,648	470,716	180,144	100,920	93,941	6,979	39,931	i	38,977	i	954	i	60,989	54,964	6,025	i	6,901	6,281	620	4	289	5,138	660	271	540										
Communications equipment	3342	152,344	39,940	88,339	24,065	11,694	8,301	3,393	1,003	i	909	i	94	i	10,691	i	7,392	i	3,299	i	455	399	56	i	2	D	351	35	i	D	D						
Semiconductor and other electronic components	3344	468,641	235,023	178,158	55,460	60,346	59,239	1,106	28,557	i	28,440	i	117	31,789	i	30,799	i	990	3,077	i	2,871	i	206	0	48	i	2,670	i	185	38	137	i					
Navigational, measuring, electromedical, and control instruments	3345	210,525	32,591	119,536	58,398	7,103	6,350	753	2,862	2,626	236	i	4,241	3,724	518	783	612	171	2	i	158	394	50	26	152												
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	27,147	4,112	13,491	9,544	1,002	i	747	255	i	254	i	152	i	102	i	748	i	595	i	153	i	211	i	120	i	90	1	i	28	i	72	i	5	2	102	i
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	55,185	8,886	33,856	12,443	1,167	1,120	47	62	i	46	i	16	i	1,105	1,074	31	213	206	8	0	69	i	126	3	2	13										

Table 45. Worldwide, foreign, and domestic capital expenditures and domestic capital expenditures for R&D paid for and performed by the company, by type of expenditure, industry, and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Worldwide capital assets				Worldwide capital expenditures			Foreign capital expenditures			Domestic capital expenditures			Domestic capital expenditures for R&D			Domestic capital expenditures for R&D (type of property)																									
		Total	Property, plant, and equipment	Goodwill	Identifiable intangible assets	Total	Property, plant, and equipment	Identifiable intangible assets	Total	Property, plant, and equipment	Identifiable intangible assets	Total	Property, plant, and equipment	Identifiable intangible assets	Total	Property, plant, and equipment	Identifiable intangible assets	Land acquisition	Buildings and land improvement	Machinery and equipment	Capitalized software	Other intellectual property	All other																				
Other measuring and controlling devices	other 3345	128,193	19,594	72,189	36,410	4,935	4,483	451	2,546	2,429	118	2,388	2,055	334	359	286	73	1	r	61	196	42	22	37																			
Other computer and electronic products	other 334	199,998	73,093	84,683	42,222	21,777	20,051	1,727	7,509	7,002	508	14,268	13,049	1,219	2,586	2,399	187	0		D	1,723	390	D	D																			
Electrical equipment, appliances, and components	335	130,549	39,016	65,384	26,150	11,645	8,672	2,973	2,223	i	2,108	i	114	i	9,422	6,563	2,859	767	726	41	i	2	81																				
Transportation equipment	336	758,482	410,575	230,185	117,723	89,751	80,452	9,299	16,466	15,674	791	73,286	64,778	8,508	i	4,402	4,195	208	23	703	i	2,325	478	136	738																		
Motor vehicles, bodies, trailers, and parts	3361–63	360,934	291,401	28,875	40,659	70,786	63,133	7,653	i	12,891	12,748	143	57,894	50,384	7,510	i	2,955	2,814	141	D	513	i	1,443	i	438	120	D																
Aerospace products and parts	3364	329,400	93,043	166,808	69,548	15,870	14,276	1,594	3,097	2,452	i	645	12,773	11,824	949	1,188	1,134	54	D	134	749	37	3	i	D																		
Aircraft, aircraft engine, and aircraft parts	336411–13	184,649	D	D	D	11,579	10,726	853	D	D	D	D	D	D	D	805	D	0		40	577	17	2	i	D																		
Guided missile, space vehicle, and related parts	336414–15, 336419	144,751	D	D	D	4,291	3,550	741	D	D	D	D	D	D	D	329	D	D		94	172	20	1	i	D																		
Military armored vehicle, tank, and tank components	336992	818	272	72	474	31	19	12	0	0	0	31	19	12	14	2	12	0		*	i	2	0	12	*	i																	
Other transportation	other 336	67,331	25,859	34,429	7,043	3,064	3,025	40	478	475	3	i	2,587	2,550	36	245	i	244	i	1	i	0	*	i	54	i																	
Furniture and related products	337	25,017	11,173	7,263	6,581	1,403	1,111	291	153	97	56	1,250	1,014	235	27	27	*	i	0	1	19	3	*	i	4																		
Miscellaneous	339	550,330	140,160	277,640	132,530	35,263	26,704	8,559	10,992	i	8,867	i	2,124	i	24,271	17,837	6,434	1,697	1,200	498	1	i	182	616	235	269	395																
Medical equipment and supplies	3391	486,189	118,286	250,355	117,548	27,720	20,282	7,437	8,927	i	7,123	1,804	i	18,793	13,159	5,634	1,465	994	471	*	167	459	201	265	372																		
Other miscellaneous manufacturing	3399	64,141	21,874	27,285	14,982	7,543	6,422	1,121	2,065	i	1,744	i	321	i	5,478	4,677	801	233	206	27	1	i	15	157	33	3	23	i															
Nonmanufacturing industries	21–23, 42–81	8,097,284	4,352,170	2,409,246	1,335,868	802,933	729,695	73,238	94,154	86,063	8,091	i	708,779	643,632	65,147	17,695	15,286	2,409	54	i	1,394	11,781	2,103	937	1,427																		
Mining, quarrying, oil and gas extraction, and support activities	21	477,280	447,288	24,558	5,435	51,669	51,224	446	12,684	i	12,644	i	40	38,985	i	38,580	i	406	203	174	29	*	10	140	1	27	i	26															
Utilities	22	1,601,924	1,536,188	51,521	14,214	176,662	175,335	1,327	635	635	0	176,027	174,700	1,327	3	3	*	0		0	2	0	0	1																			
Wholesale trade	42	121,517	i	62,256	i	35,312	23,949	i	D	D	D	D	10,416	i	8,179	i	2,237	i	198	i	181	i	17	i	5	i	27	i	124	i	20	i	9	i	13	i							
Electronic shopping and electronic auctions	454111–12	331,626	D	30,175	D	D	D	D	D	D	D	D	64,988	D	D	722	i	594	i	128	i	24	i	25	i	461	i	125	i	3	i	84	i										
Transportation and warehousing	48–49	370,271	309,737	49,118	11,415	31,679	31,291	388	i	3,217	3,182	35	i	28,462	28,109	353	i	701	672	29	i	0	343	195	47	1	i	116															
Information	51	3,374,140	1,157,187	1,274,538	942,415	330,801	304,048	26,753	48,221	45,728	2,492	282,581	258,320	24,261	12,081	10,956	1,126	2	377	9,308	962	702	730																				
Publishing	511	805,287	246,704	415,196	143,387	86,880	82,627	4,253	26,051	25,385	666	i	60,828	57,242	3,586	4,390	4,013	378	1	169	3,635	211	238	136																			
Newspaper, periodical, book, and directory publishers	5111	2,184	i	436	i	1,568	i	180	i	69	i	44	i	25	i	9	i	5	i	4	i	60	i	39	i	21	6	i	4	i	1	i	0	*	i	2	i	3	i	*	i	*	i
Software publishers	5112	803,103	246,268	413,628	143,207	86,810	82,583	4,228	26,042	25,380	662	i	60,768	57,203	3,566	4,385	4,008	377	1	169	3,633	207	238	136																			
Telecommunications	517	1,141,957	415,554	184,992	541,411	76,830	68,017	8,813	1,543	1,534	9	75,287	66,483	8,805	375	i	307	i	68	i	0	8	271	i	72	1	23																
Data processing, hosting, and related services	518	637,053	77,389	431,492	128,172	42,676	35,390	7,286	5,019	3,892	1,126	i	37,657	31,497	6,160	2,558	i	2,053	i	505	*	i	66	1,769	i	496	D	D															
Other information	other 51	789,843	417,540	242,858	129,445	124,416	118,015	6,401	15,607	14,917	691	108,809	103,099	5,710	4,757	4,583	175	*	133	3,634	183	D	D																				
Finance and insurance	52	704,487	133,531	458,588	112,367	36,696	24,199	12,497	4,182	3,083	1,100	32,513	21,117	11,397	249	141	107	0	6	68	i	156	4	14																			
Real estate and rental and leasing	53	52,015	45,181	4,922	1,912	6,807	6,763	44	415	414	1	6,392	6,348	43	18	i	18	i	*	i	0	1	i	16	i	1	0	*	i														
Lessors of nonfinancial intangible assets (except copyrighted works)	533	265	i	15	i	233	i	17	8	8	0	0	8	8	0	*	i	*	i	0	0	*	*	i	0	0	*																
Other real estate and rental and leasing	other 53	51,750	45,166	4,689	1,895	6,799	6,755	44	415	414	1	6,384	6,340	43	18	i	18	i	*	i	0	1	i	15	i	1	0	*	i														

Table 45. Worldwide, foreign, and domestic capital expenditures and domestic capital expenditures for R&D paid for and performed by the company, by type of expenditure, industry, and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Worldwide capital assets				Worldwide capital expenditures			Foreign capital expenditures			Domestic capital expenditures			Domestic capital expenditures for R&D			Domestic capital expenditures for R&D (type of property)						
		Total	Property, plant, and equipment	Goodwill	Identifiable intangible assets	Total	Property, plant, and equipment	Identifiable intangible assets	Total	Property, plant, and equipment	Identifiable intangible assets	Total	Property, plant, and equipment	Identifiable intangible assets	Total	Property, plant, and equipment	Identifiable intangible assets	Land acquisition	Buildings and land improvement	Machinery and equipment	Capitalized software	Other intellectual property	All other	
Professional, scientific, and technical services	54	612,794	87,231	380,673	144,890	28,130	17,644	10,487	3,966	3,281	685	24,164	14,362	9,802	3,146	2,246	900	22	588	1,252	698	180	405	
Architectural, engineering, and related services	5413	39,216	16,906	10,103	12,207	3,051	2,114	937	269	215	54	2,783	1,899	883	433	333	101	*	122	160	19	5	127	
Computer systems design and related services	5415	284,191	28,391	197,856	57,944	8,878	4,433	4,444	1,287	798	489	7,591	3,635	3,956	899	545	354	*	118	337	305	68	72	
Scientific research and development services	5417	189,309	25,777	117,862	45,671	9,027	7,212	1,815	2,158	2,069	89	6,869	5,143	1,726	1,286	1,065	221	21	290	612	138	80	146	
Research and development in nanotechnology	541713	4,783	722	2,733	1,328	407	400	7	6	6	0	401	394	7	52	45	6	0	17	20	1	0	13	
Research and development in biotechnology (except nanobiotechnology)	541714	43,570	5,207	23,257	15,105	3,322	2,319	1,003	505	466	39	2,817	1,853	964	194	179	15	12	32	123	1	10	16	
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	140,710	19,624	91,851	29,235	5,266	4,462	804	1,647	1,597	50	3,619	2,866	753	1,039	841	199	9	241	468	136	70	116	
Research and development in the social sciences and humanities	541720	247	224	20	2	32	30	2	0	0	0	32	30	2	1	1	*	0	0	1	*	*	*	
Other professional, scientific, and technical services	other 54	100,078	16,158	54,852	29,068	7,175	3,884	3,290	252	199	53	6,922	3,685	3,237	528	303	225	1	57	143	237	28	60	
Health care services	621–23	55,251	D	20,467	D	3,882	D	D	64	46	19	3,818	D	D	101	86	15	0	5	36	38	1	21	
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	395,979	261,282	79,373	55,325	41,052	36,947	4,105	619	583	36	40,433	36,364	4,069	271	214	57	*	13	178	53	9	17	
All companies (number of domestic employees)	–	14,973,468	7,339,111	4,774,062	2,860,295	1,349,873	1,224,642	125,231	242,831	225,939	16,892	1,107,042	998,703	108,339	44,908	38,950	5,958	109	5,743	27,488	4,153	3,368	4,047	
Small companies																								
10–19 ^a	–	26,647	7,386	4,194	15,067	1,858	1,181	677	84	48	36	1,774	1,133	641	382	239	143	*	22	185	30	52	92	
20–49	–	64,211	46,054	8,621	9,536	24,411	22,165	2,245	975	602	372	23,436	21,563	1,873	2,223	1,986	237	1	131	1,744	88	101	157	
Medium companies																								
50–99	–	137,650	82,390	30,515	24,745	9,563	7,674	1,889	1,315	1,133	181	8,248	6,541	1,708	1,291	1,118	173	12	267	653	128	78	153	
100–249	–	179,840	79,451	64,365	36,025	19,702	15,596	4,106	1,367	982	385	18,334	14,614	3,721	2,100	1,485	615	7	296	977	437	115	267	
Large companies																								
250–499	–	257,699	107,471	92,911	57,317	27,555	18,726	8,829	2,945	2,425	521	24,609	16,301	8,308	1,993	1,489	504	4	386	829	441	138	196	
500–999	–	454,381	189,810	171,897	92,674	36,830	30,062	6,768	4,313	2,888	1,425	32,517	27,174	5,343	2,863	2,261	602	3	398	1,005	457	177	823	
1,000–4,999	–	2,010,053	816,634	755,624	437,795	133,050	111,332	21,718	28,384	24,513	3,871	104,665	86,819	17,846	4,960	4,202	759	8	795	2,840	612	303	402	
5,000–9,999	–	1,728,435	971,226	486,045	271,164	159,034	149,253	9,781	34,536	32,934	1,602	124,498	116,319	8,179	4,163	2,988	1,175	1	378	2,426	276	947	135	
10,000–24,999	–	3,969,070	2,086,909	1,193,394	688,768	316,200	299,794	16,406	55,754	53,158	2,596	260,446	246,637	13,809	6,956	5,852	1,104	12	1,665	3,641	403	871	365	
25,000 or more	–	6,145,482	2,951,780	1,966,497	1,227,206	621,671	568,858	52,814	113,158	107,255	5,903	508,514	461,603	46,911	17,976	17,331	645	60	1,404	13,188	1,280	586	1,458	

* = amount < \$500,000; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%.

NAICS = 2017 North American Industry Classification System.

^a The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):

Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 46. Worldwide, domestic, and foreign total and R&D employment, by industry and company size: 2024

(Thousands and percent)

Industry and company size	NAICS code	Worldwide employees			Domestic employees			Foreign employees		
		Total	R&D	Percentage of R&D employees	Total	R&D	Percentage of R&D employees	Total	R&D	Percentage of R&D employees
All industries	21–23, 31–33, 42–81	34,779	3,298	9.5	23,145	2,130	9.2	11,634	1,168	10.0
Manufacturing industries	31–33	17,769	1,598	9.0	10,183	1,032	10.1	7,586	566	7.5
Food	311	1,596	42	2.6	1,169	29	2.5	428	13	3.0
Beverage and tobacco products	312	1,038	11	1.1	481	7	1.5	557	4	0.7
Textile, apparel, and leather products	313–16	327	6	1.9	187	5	2.7	140	1	0.9
Wood products	321	173	5	2.7	155	5	2.9	18	*	0.2
Paper	322	322	7	2.1	203	6	2.7	119	1	1.1
Printing and related support activities	323	114	3	2.6	95	3	2.9	18	*	0.7
Petroleum and coal products	324	180	6	3.3	128	4	3.1	52	2	3.8
Chemicals	325	2,415	304	12.6	1,397	227	16.3	1,018	77	7.6
Basic chemicals	3251	320	28	8.7	203	20	10.1	117	7	6.3
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	159	10	6.6	81	6	7.9	78	4	5.1
Pesticide, fertilizer, and other agricultural chemicals	3253	112	4	3.9	69	4	5.3	43	1	1.6
Pharmaceuticals and medicines	3254	1,158	231	19.9	691	176	25.5	467	54	11.6
Soap, cleaning compound, and toilet preparations	3256	416	17	4.1	198	10	5.2	218	7	3.0
Paint, coating, adhesive, and other chemicals	3255, 3259	251	14	5.7	156	10	6.4	95	4	4.4
Plastics and rubber products	326	601	22	3.6	390	18	4.6	211	4	1.8
Nonmetallic mineral products	327	216	11	5.0	132	9	7.1	84	1 i	1.7
Primary metals	331	240	10	4.2	163	8	4.7	76	2	3.1
Fabricated metal products	332	579	36	6.2	430	28	6.6	149	8	5.0
Machinery	333	1,943	166	8.5	996	101	10.2	947	64	6.8
Agricultural implement	33311	183	19	10.2	104	10	10.0	79	8	10.6
Semiconductor machinery	333242	126	31 i	24.7	48	17 i	36.2	78	14 i	17.7
Engine, turbine, and power transmission equipment	3336	365	30	8.2	156	17	11.2	210	13	6.0
Other machinery	other 333	1,269	86	6.8	688	56	8.2	581	29	5.1
Computer and electronic products	334	2,467	527	21.4	1,059	272	25.7	1,408	254	18.1
Communications equipment	3342	324	73	22.6	194	36	18.7	130	37	28.4
Semiconductor and other electronic components	3344	892	244	27.3	291	104	35.8	601	139	23.2

Table 46. Worldwide, domestic, and foreign total and R&D employment, by industry and company size: 2024

(Thousands and percent)

Industry and company size	NAICS code	Worldwide employees			Domestic employees			Foreign employees		
		Total	R&D	Percentage of R&D employees	Total	R&D	Percentage of R&D employees	Total	R&D	Percentage of R&D employees
Navigational, measuring, electromedical, and control instruments	3345	588	88	15.0	320	60	18.7	267	28	10.5
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	76	11	14.6	47	8	18.0	29	3	9.3
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	160	36	22.2	134	29	21.9	26	6	24.0
Other measuring and controlling devices	other 3345	351	41	11.8	139	22	15.9	212	19	9.1
Other computer and electronic products	other 334	663	122	18.4	253	72	28.3	410	50	12.2
Electrical equipment, appliances, and components	335	589	39	6.6	297	25	8.4	291	14	4.8
Transportation equipment	336	3,236	277	8.5	1,929	197	10.2	1,306	79	6.1
Motor vehicles, bodies, trailers, and parts	3361–63	1,890	169	8.9	946	111	11.7	944	58	6.1
Aerospace products and parts	3364	1,088	91	8.4	790	73	9.2	298	19	6.3
Aircraft, aircraft engine, and aircraft parts	336411–13	D	D	D	612	53	8.6	D	D	D
Guided missile, space vehicle, and related parts	336414–15, 336419	D	D	D	178	20	11.1	D	D	D
Military armored vehicle, tank, and tank components	336992	3	*	14.4	3	*	14.4	0	0	NA
Other transportation	other 336	255	16	6.2	191	13	7.0	64	3 i	3.9
Furniture and related products	337	164	4	2.7	130	4	3.0	34	1	1.6
Miscellaneous	339	1,570	124	7.9	841	84	9.9	729	40	5.5
Medical equipment and supplies	3391	1,206	105	8.7	601	69	11.5	605	36	5.9
Other miscellaneous manufacturing	3399	364	18	5.0	240	14	5.9	124	4	3.4
Nonmanufacturing industries	21–23, 42–81	17,011	1,700	10.0	12,962	1,098	8.5	4,049	602	14.9
Mining, quarrying, oil and gas extraction, and support activities	21	D	D	D	118	5	3.9	D	D	D
Utilities	22	351	7	2.0	344	7	2.0	7	*	3.8
Wholesale trade	42	555 i	24 i	4.3	427 i	22 i	5.2	128 i	2 i	1.4
Electronic shopping and electronic auctions	454111–12	D	D	D	1,421	28 i	1.9	D	D	D
Transportation and warehousing	48–49	1,388	36	2.6	1,117	35	3.1	271	1	0.5
Information	51	3,567	839	23.5	2,295	502	21.9	1,272	337	26.5
Publishing	511	903	300	33.2	508	153	30.2	395	146	37.0

Table 46. Worldwide, domestic, and foreign total and R&D employment, by industry and company size: 2024

(Thousands and percent)

Industry and company size	NAICS code	Worldwide employees			Domestic employees			Foreign employees		
		Total	R&D	Percentage of R&D employees	Total	R&D	Percentage of R&D employees	Total	R&D	Percentage of R&D employees
Newspaper, periodical, book, and directory publishers	5111	20	5	25.7	20	5	25.9	*	*	16.3
Software publishers	5112	882	294	33.4	487	148	30.4	395	146	37.0
Telecommunications	517	510	17	3.2	458	15	3.3	53	1	2.7
Data processing, hosting, and related services	518	1,312	310	23.6	735	174	23.7	578	136	23.6
Other information	other 51	842	212	25.2	595	159	26.8	247	53	21.6
Finance and insurance	52	2,233	130	5.8	1,673	90	5.4	560	40	7.2
Real estate and rental and leasing	53	188	6	3.3	162	6	3.5	26	1	2.1
Lessors of nonfinancial intangible assets (except copyrighted works)	533	2	*	3.8	2	*	3.8	*	0	NA
Other real estate and rental and leasing	other 53	186	6	3.3	160	6	3.5	26	1	2.1
Professional, scientific, and technical services	54	2,780	554	19.9	1,782	354	19.9	998	200	20.0
Architectural, engineering, and related services	5413	513	71	13.8	457	70	15.2	56	1	2.1
Computer systems design and related services	5415	963	175	18.1	506	111	22.0	456	63	13.8
Scientific research and development services	5417	618	248	40.1	352	124	35.2	267	124	46.5
Research and development in nanotechnology	541713	9	2	24.9	6	2	30.3	2	*	9.5
Research and development in biotechnology (except nanobiotechnology)	541714	149	61	40.9	109	30	27.2	41	31	77.4
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	449	177	39.4	226	85	37.6	224	92	41.3
Research and development in the social sciences and humanities	541720	11	8	69.3	11	8	69.3	*	*	65.6
Other professional, scientific, and technical services	other 54	686	61	8.8	467	49	10.5	219	11	5.2
Health care services	621–23	467	9	2.0	445	8	1.9	22	1	3.9
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	3,353	45	1.3	3,178	43	1.3	175	2	1.2

Table 46. Worldwide, domestic, and foreign total and R&D employment, by industry and company size: 2024

(Thousands and percent)

Industry and company size	NAICS code	Worldwide employees			Domestic employees			Foreign employees		
		Total	R&D	Percentage of R&D employees	Total	R&D	Percentage of R&D employees	Total	R&D	Percentage of R&D employees
All companies (number of domestic employees)	–	34,779	3,298	9.5	23,145	2,130	9.2	11,634	1,168	10.0
Small companies										
10–19 ^a	–	103	36	34.8	69	26	38.3	34	9	27.6
20–49	–	284	86	30.4	249	74	29.9	35	12	34.2
Medium companies										
50–99	–	405	103	25.5	333	87	26.2	72	16	22.1
100–249	–	841	158	18.7	690	130	18.9	151	27	18.0
Large companies										
250–499	–	1,015	154	15.2	713	112	15.8	302	42	13.9
500–999	–	1,490	166	11.2	1,108	122	11.0	382	44	11.6
1,000–4,999	–	5,294	611	11.5	3,121	381	12.2	2,173	231	10.6
5,000–9,999	–	3,318	307	9.3	1,945	203	10.4	1,373	105	7.6
10,000–24,999	–	6,202	599	9.7	3,560	323	9.1	2,642	276	10.4
25,000 or more	–	15,829	1,077	6.8	11,358	671	5.9	4,470	406	9.1

* = amount < 500 employees; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; NA = not available.

NAICS = 2017 North American Industry Classification System.

^a The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):

Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 47. Worldwide, domestic, and foreign R&D paid for by the company and others and performed by the company, R&D employment, and R&D cost per R&D employee, by industry and company size: 2024

(Millions of U.S. dollars, number of employees in thousands, and cost per employee in thousands of U.S. dollars)

Industry and company size	NAICS code	Company-performed R&D (US\$millions)			R&D employment (thousands)			Company-performed R&D per R&D employee (US\$thousands per employee)		
		Worldwide	Domestic	Foreign	Worldwide	Domestic	Foreign	Worldwide	Domestic	Foreign
All industries	21–23, 31–33, 42–81	929,809	765,082	164,727	3,298	2,130	1,168	281.9	359.2	141.0
Manufacturing industries	31–33	495,527	405,092	90,435	1,598	1,032	566	310.1	392.6	159.7
Food	311	7,810	6,288	1,523	42	29	13	187.0	218.3	117.5
Beverage and tobacco products	312	2,457	1,459	998	11	7	4	221.9	206.4	249.3
Textile, apparel, and leather products	313–16	907	788	118	6	5	1	145.5	158.1	95.1
Wood products	321	269	267	2	5	5	*	58.6	58.7	42.2
Paper	322	1,317	1,240	78	7	6	1	191.1	222.7	58.7
Printing and related support activities	323	260	255	5	3	3	*	89.1	91.1	44.3
Petroleum and coal products	324	1,205	1,006	199	6	4	2	203.0	252.3	102.1
Chemicals	325	170,685	143,745	26,941	304	227	77	560.9	632.9	348.9
Basic chemicals	3251	4,041	3,120	921	28	20	7	145.5	152.7	125.4
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	1,870	1,354	516	10	6	4	179.5	211.0	128.9
Pesticide, fertilizer, and other agricultural chemicals	3253	1,421	1,253	168	4	4	1	326.0	341.5	243.7
Pharmaceuticals and medicines	3254	157,749	133,627	24,122	231	176	54	683.8	758.0	443.3
Soap, cleaning compound, and toilet preparations	3256	3,905	2,956	950	17	10	7	230.9	285.4	144.9
Paint, coating, adhesive, and other chemicals	3255, 3259	1,699	1,435	264	14	10	4	119.9	144.1	62.7
Plastics and rubber products	326	3,326	2,908	418	22	18	4	151.7	161.1	108.2
Nonmetallic mineral products	327	1,804	1,578	227	11	9	1	168.6	169.8	160.5
Primary metals	331	1,352	1,174	178	10	8	2	134.5	152.2	76.2
Fabricated metal products	332	3,978	3,230	748	36	28	8	111.0	114.1	99.5
Machinery	333	28,454	22,035	6,419	166	101	64	171.7	217.2	99.9
Agricultural implement	33311	3,657	2,561	1,096	19	10	8	195.5	246.3	131.9
Semiconductor machinery	333242	8,798	6,851	1,947	31	17	14	282.4	395.6	140.7
Engine, turbine, and power transmission equipment	3336	5,485	4,230	1,255	30	17	13	182.5	242.8	99.3
Other machinery	other 333	10,515	8,394	2,121	86	56	29	122.5	149.0	71.9
Computer and electronic products	334	153,232	115,599	37,633	527	272	254	291.0	424.7	147.9
Communications equipment	3342	16,688	12,839	3,848	73	36	37	228.4	354.5	104.4
Semiconductor and other electronic components	3344	74,100	52,358	21,742	244	104	139	304.3	502.0	156.1
Navigational, measuring, electromedical, and control instruments	3345	17,442	14,083	3,359	88	60	28	197.9	235.0	119.1
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	3,793	3,245	548	11	8	3	340.5	385.7	201.0
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	6,645	6,161	484	36	29	6	186.6	209.6	77.8
Other measuring and controlling devices	other 3345	7,004	4,677	2,327	41	22	19	169.3	211.4	120.9
Other computer and electronic products	other 334	45,002	36,318	8,683	122	72	50	369.1	506.0	173.2
Electrical equipment, appliances, and components	335	8,880	6,999	1,880	39	25	14	228.4	280.1	135.5
Transportation equipment	336	79,271	71,231	8,040	277	197	79	286.6	360.7	101.6
Motor vehicles, bodies, trailers, and parts	3361–63	37,737	31,812	5,925	169	111	58	223.4	286.4	102.4

Table 47. Worldwide, domestic, and foreign R&D paid for by the company and others and performed by the company, R&D employment, and R&D cost per R&D employee, by industry and company size: 2024

(Millions of U.S. dollars, number of employees in thousands, and cost per employee in thousands of U.S. dollars)

Industry and company size	NAICS code	Company-performed R&D (US\$millions)			R&D employment (thousands)			Company-performed R&D per R&D employee (US\$thousands per employee)		
		Worldwide	Domestic	Foreign	Worldwide	Domestic	Foreign	Worldwide	Domestic	Foreign
Aerospace products and parts	3364	37,835	35,904	1,931	91	73	19	414.0	494.2	103.1
Aircraft, aircraft engine, and aircraft parts	336411–13	26,748	D	D	D	53	D	D	D	D
Guided missile, space vehicle, and related parts	336414–15, 336419	11,087	D	D	D	20	D	D	D	D
Military armored vehicle, tank, and tank components	336992	33	33	0	*	*	0	83.6	83.6	NA
Other transportation	other 336	3,665	3,481	184	16	13	3 i	231.3	260.9	73.5
Furniture and related products	337	498	450	47	4	4	1	111.1	113.8	90.7
Miscellaneous	339	29,822	24,840	4,981	124	84	40	241.4	297.4	124.5
Medical equipment and supplies	3391	26,707	22,126	4,582	105	69	36	253.9	319.0	127.9
Other miscellaneous manufacturing	3399	3,114	2,715	399	18	14	4	169.6	191.7	95.2
Nonmanufacturing industries	21–23, 42–81	434,282	359,990	74,292	1,700	1,098	602	255.4	327.7	123.4
Mining, quarrying, oil and gas extraction, and support activities	21	2,217	1,862	355	D	5	D	D	401.5	D
Utilities	22	623	613	10	7	7	*	87.8	90.0	35.4
Wholesale trade	42	1,802 i	1,692 i	110 i	24 i	22 i	2 i	74.9	75.9	61.4
Electronic shopping and electronic auctions	454111–12	10,188 i	7,898 i	2,291 i	D	28 i	D	D	285.9	D
Transportation and warehousing	48–49	11,610	11,341	270	36	35	1	320.1 r	325.0 r	195.5
Information	51	274,536	228,174	46,361	839	502	337	327.3	454.9	137.4
Publishing	511	80,509	63,596	16,913	300	153	146	268.7	414.4	115.7
Newspaper, periodical, book, and directory publishers	5111	497 i	489 i	9 i	5 i	5 i	* i	94.7	94.1	150.6
Software publishers	5112	80,012	63,108	16,904	294	148	146	271.8	425.6	115.7
Telecommunications	517	3,547	3,323	224	17	15	1	214.8	220.1	158.1
Data processing, hosting, and related services	518	72,547	58,772	13,775	310	174	136	233.8	338.0	101.0
Other information	other 51	117,933	102,484	15,449	212	159	53	555.2	644.0	290.0
Finance and insurance	52	29,593	25,463	4,129	130	90	40	227.6	284.1	102.2
Real estate and rental and leasing	53	2,856	2,750	106	6	6	1	454.3	478.8	194.9
Lessors of nonfinancial intangible assets (except copyrighted works)	533	23	23	0	*	*	0	354.4	354.4	NA
Other real estate and rental and leasing	other 53	2,833	2,727	106	6	6	1	455.3	480.2	194.9
Professional, scientific, and technical services	54	94,925	74,548	20,377	554	354	200	171.4	210.6	102.0
Architectural, engineering, and related services	5413	3,931	3,893	37	71	70	1	55.6	56.0	31.7
Computer systems design and related services	5415	32,634	26,764	5,870	175	111	63	186.9	240.2	92.9
Scientific research and development services	5417	47,162	33,942	13,219	248	124	124	190.2	273.8	106.6
Research and development in nanotechnology	541713	568	548	19	2	2	*	261.0	279.4	91.1
Research and development in biotechnology (except nanobiotechnology)	541714	9,580	6,751	2,830	61	30	31	157.1	228.4	90.1
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	36,299	25,931	10,368	177 i	85 i	92 i	205.1	306.0	112.4
Research and development in the social sciences and humanities	541720	714	712	2	8	8	*	91.2	92.4	16.6
Other professional, scientific, and technical services	other 54	11,199 i	9,949 i	1,250 i	61	49	11	185.0	202.4	109.9
Health care services	621–23	2,118	2,020	98 i	9	8	1	229.2	241.1	113.3

Table 47. Worldwide, domestic, and foreign R&D paid for by the company and others and performed by the company, R&D employment, and R&D cost per R&D employee, by industry and company size: 2024

(Millions of U.S. dollars, number of employees in thousands, and cost per employee in thousands of U.S. dollars)

Industry and company size	NAICS code	Company-performed R&D (US\$millions)			R&D employment (thousands)			Company-performed R&D per R&D employee (US\$thousands per employee)		
		Worldwide	Domestic	Foreign	Worldwide	Domestic	Foreign	Worldwide	Domestic	Foreign
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	3,814	3,628	186	45	43	2	84.9	84.8	85.8
All companies (number of domestic employees)	–	929,809	765,082	164,727	3,298	2,130	1,168	281.9	359.2	141.0
Small companies										
10–19 ^a	–	5,434	4,790	644	36	26	9	152.2	181.5	69.1
20–49	–	17,384	16,179	1,205	86	74	12	201.1	217.3	100.6
Medium companies										
50–99	–	18,251	17,078	1,173	103	87	16	176.9	195.9	73.2
100–249	–	32,183	29,325	2,858	158	130	27	204.1	225.0	104.6
Large companies										
250–499	–	33,288	28,852	4,436	154	112	42	215.9	257.0	105.8
500–999	–	49,792	44,697	5,095	166	122	44	299.1	366.2	114.7
1,000–4,999	–	152,811	123,813	28,998	611	381	231	250.0	325.3	125.8
5,000–9,999	–	76,317	62,950	13,367	307	203	105	248.2	310.7	127.5
10,000–24,999	–	177,871	140,348	37,522	599	323	276	297.0	434.4	136.0
25,000 or more	–	366,479	297,050	69,429	1,077	671	406	340.3	442.5	171.1

* = amount < 500 employees; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%; NA = not available.

NAICS = 2017 North American Industry Classification System.

^a The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):
Detail may not add to total because of rounding. Ratios were calculated using unrounded data. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D.

Source(s):
National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 48. Worldwide, domestic, and foreign R&D employment, by sex, industry, and company size: 2024

(Thousands)

Industry and company size	NAICS code	Worldwide			Domestic			Foreign		
		Total	Male	Female	Total	Male	Female	Total	Male	Female
All industries	21–23, 31–33, 42–81	3,298	2,298	1,000	2,130	1,495	635	1,168	803	365
Manufacturing industries	31–33	1,598	1,135	463	1,032	735	297	566	400	166
Food	311	42	23	19	29	16	12	13	6 i	7
Beverage and tobacco products	312	11	6	5	7	4	3	4	2	2
Textile, apparel, and leather products	313–16	6	3	3	5	3	2	1	1	1
Wood products	321	5	4	1	5	4	1	*	*	*
Paper	322	7	5	2	6	4	1	1	1	*
Printing and related support activities	323	3	2	1	3	2	1	*	* i	* i
Petroleum and coal products	324	6	4	2	4	3	1	2	1	1
Chemicals	325	304	153	151	227	116	111	77	37	40
Basic chemicals	3251	28	17	10	20	13	7	7	4	3 i
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	10	8	3	6	5	2	4	3	1
Pesticide, fertilizer, and other agricultural chemicals	3253	4	3	2	4	2	1	1	*	*
Pharmaceuticals and medicines	3254	231	108	122	176	84	92	54	24	30
Soap, cleaning compound, and toilet preparations	3256	17	7	9	10	5	6	7	3	4
Paint, coating, adhesive, and other chemicals	3255, 3259	14	10	5	10	7	3	4	3	1
Plastics and rubber products	326	22	17	5	18	14	4	4	3	1
Nonmetallic mineral products	327	11	8	2 i	9	7	2	1 i	1 i	* i
Primary metals	331	10	9	1	8	7	1	2	2	1
Fabricated metal products	332	36	29	7	28	23	5	8	5	2
Machinery	333	166	138	27	101	86	15	64	52	12
Agricultural implement	33311	19	16	3	10	9	2	8	7	1
Semiconductor machinery	333242	31 i	26 i	5 i	17 i	14 i	3 i	14 i	11 i	2 i
Engine, turbine, and power transmission equipment	3336	30	25	5	17	15	3	13	10	2
Other machinery	other 333	86	71	14	56	48	8	29	23 i	7
Computer and electronic products	334	527	394	133	272	205	67	254	189	66
Communications equipment	3342	73	58	15	36	29	7	37	29	8
Semiconductor and other electronic components	3344	244	177	67 i	104	77	27 i	139	100	40 i
Navigational, measuring, electromedical, and control instruments	3345	88	67	21	60	46	14	28	21	7
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	11	8	4	8	6 i	3 i	3	2	1 i
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	36	28	7	29	23	6	6	5	1
Other measuring and controlling devices	other 3345	41	32	10	22	17	5	19	14	5
Other computer and electronic products	other 334	122	91	31	72	52	19	50	39	11
Electrical equipment, appliances, and components	335	39	31	8	25	20	5	14	11	3 i
Transportation equipment	336	277	226	51	197	162	36	79	64	15
Motor vehicles, bodies, trailers, and parts	3361–63	169	139 i	30	111	91 i	20	58	48	10 i
Aerospace products and parts	3364	91	74	17	73	59 i	13	19	15	4
Aircraft, aircraft engine, and aircraft parts	336411–13	D	53 i	D	53	D	D	D	D	D

Table 48. Worldwide, domestic, and foreign R&D employment, by sex, industry, and company size: 2024

(Thousands)

Industry and company size	NAICS code	Worldwide			Domestic			Foreign		
		Total	Male	Female	Total	Male	Female	Total	Male	Female
Guided missile, space vehicle, and related parts	336414–15, 336419	D	22	D	20	D	D	D	D	D
Military armored vehicle, tank, and tank components	336992	*	*	*	*	*	*	0	0	0
Other transportation	other 336	16	13	3	13	11	2	3 i	2 i	1 i
Furniture and related products	337	4	3	1 i	4	3	1	1	* i	* i
Miscellaneous	339	124	80	44	84	55	29	40	25	15
Medical equipment and supplies	3391	105	68	37	69	45	25	36	23 i	13 i
Other miscellaneous manufacturing	3399	18	12	6	14	10	4	4	2	2
Nonmanufacturing industries	21–23, 42–81	1,700	1,163	537	1,098	761	338	602	402	199
Mining, quarrying, oil and gas extraction, and support activities	21	D	D	2	5	4	1	D	D	1
Utilities	22	7	5	2	7	5	2	*	*	*
Wholesale trade	42	24 i	18 i	6 i	22 i	17 i	6 i	2 i	1 i	1 i
Electronic shopping and electronic auctions	454111–12	D	D	11 i	28 i	20 i	7 i	D	D	4 i
Transportation and warehousing	48–49	36	28	8	35	27	8	1	1	*
Information	51	839	614	224	502	363	139	337	252	86
Publishing	511	300	222	77	153	114	39	146	108	38
Newspaper, periodical, book, and directory publishers	5111	5 i	2 i	3 i	5 i	2 i	3 i	* i	* i	* i
Software publishers	5112	294	220	74	148	112	36	146	108	38
Telecommunications	517	17	11	6	15	10	5	1	1	*
Data processing, hosting, and related services	518	310	220	91	174	119	55	136	101	36
Other information	other 51	212	162	51	159	120	39	53	42	12
Finance and insurance	52	130	83 i	47 i	90	58	32 i	40	25 i	15 i
Real estate and rental and leasing	53	6	4 i	2 i	6	4 i	2 i	1	* i	* i
Lessors of nonfinancial intangible assets (except copyrighted works)	533	*	*	*	*	*	*	0	0	0
Other real estate and rental and leasing	other 53	6	4 i	2 i	6	4 i	2 i	1	* i	* i
Professional, scientific, and technical services	54	554	336	218	354	227	127	200	108	92
Architectural, engineering, and related services	5413	71	53	18	70	52	18	1	1	*
Computer systems design and related services	5415	175	130	44	111	84	28	63	46	17
Scientific research and development services	5417	248	112	136	124	59	65	124	53 i	71
Research and development in nanotechnology	541713	2	1	1	2	1	1	*	*	*
Research and development in biotechnology (except nanobiotechnology)	541714	61	28	33	30	14	16	31	15	17
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	177 i	80 i	97	85 i	42 i	43 i	92 i	38 i	54
Research and development in the social sciences and humanities	541720	8	2	6	8	2	6	*	*	*
Other professional, scientific, and technical services	other 54	61	40 i	20 i	49	33 i	16 i	11	8	4
Health care services	621–23	9	5	5	8	4	4	1	1	*

Table 48. Worldwide, domestic, and foreign R&D employment, by sex, industry, and company size: 2024

(Thousands)

Industry and company size	NAICS code	Worldwide			Domestic			Foreign		
		Total	Male	Female	Total	Male	Female	Total	Male	Female
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	45	34	11	43	32	11	2	2	1
All companies (number of domestic employees)	–	3,298	2,298	1,000	2,130	1,495	635	1,168	803	365
Small companies										
10–19 ^a	–	36	28	8	26	21	6	9	7	3
20–49	–	86	68	19	74	58	16	12	10	2
Medium companies										
50–99	–	103	80	23	87	67	20	16	13	3
100–249	–	158	118	40	130	97	33	27	20	7
Large companies										
250–499	–	154	114	40	112	82	30	42	32	10
500–999	–	166	120	46	122	88	34	44	32	12
1,000–4,999	–	611	423	188	381	261	119	231	162	69
5,000–9,999	–	307	213	94	203	140	62	105	73	32
10,000–24,999	–	599	396	203	323	216	107	276	180	96
25,000 or more	–	1,077	738	339 i	671	464 i	207 i	406	274	132 i

* = amount < 500 employees; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse.

NAICS = 2017 North American Industry Classification System.

^a The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):

Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 49. Worldwide total employment, R&D employment, and level of education of researchers, by work activity, industry, and company size: 2024

(Thousands)

Industry and company size	NAICS code	Total employment		Total R&D employment		Researchers ^a		R&D technicians and equivalent staff	Other R&D supporting staff
						Total	With PhD		
All industries	21–23, 31–33, 42–81	34,779		3,298		2,290	201 i	723	286
Manufacturing industries	31–33	17,769		1,598		1,160	127	275	163
Food	311	1,596		42		22	5 i	12	8
Beverage and tobacco products	312	1,038		11		6	*	2	4
Textile, apparel, and leather products	313–16	327		6		3	*	2	1
Wood products	321	173		5		2	*	2	1
Paper	322	322		7		5	*	2	1
Printing and related support activities	323	114		3		1	*	1	*
Petroleum and coal products	324	180		6		1	*	3	1
Chemicals	325	2,415		304		212	56	47	45
Basic chemicals	3251	320		28		19	3	8	1
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	159		10		7	2	3	1
Pesticide, fertilizer, and other agricultural chemicals	3253	112		4		3	2 i	1	1
Pharmaceuticals and medicines	3254	1,158		231		160	46	30	40
Soap, cleaning compound, and toilet preparations	3256	416		17		14	2	1	1
Paint, coating, adhesive, and other chemicals	3255, 3259	251		14		9	1 i	4	1
Plastics and rubber products	326	601		22		11	1	9	2
Nonmetallic mineral products	327	216		11		6 i	* i	2	3 r
Primary metals	331	240		10		5	1 i	3	2
Fabricated metal products	332	579		36		17	1	14	5
Machinery	333	1,943		166		115	9 i	39	12
Agricultural implement	33311	183		19		15	*	3	1
Semiconductor machinery	333242	126		31 i		23 i	5 i	7	1
Engine, turbine, and power transmission equipment	3336	365		30		23	1	5 i	2 i
Other machinery	other 333	1,269		86		55	3 i	23	8
Computer and electronic products	334	2,467		527		439	33 i	48	39
Communications equipment	3342	324		73		60	2 i	7	5
Semiconductor and other electronic components	3344	892		244		213	18 i	20	10
Navigational, measuring, electromedical, and control instruments	3345	588		88		60	6 i	15	13
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	76		11		8 i	2	2	1
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	160		36		22	1	4	9
Other measuring and controlling devices	other 3345	351		41		30	3 i	8	3
Other computer and electronic products	other 334	663		122		105	8 i	6 i	10
Electrical equipment, appliances, and components	335	589		39		27	3 i	7	5 i
Transportation equipment	336	3,236		277		209	8 i	45	23
Motor vehicles, bodies, trailers, and parts	3361–63	1,890		169		131 i	4 i	25	13 i
Aerospace products and parts	3364	1,088		91		70	4	14	7
Aircraft, aircraft engine, and aircraft parts	336411–13	D		D		47	4	12	D
Guided missile, space vehicle, and related parts	336414–15, 336419	D		D		23 i	* i	2	D

Table 49. Worldwide total employment, R&D employment, and level of education of researchers, by work activity, industry, and company size: 2024

(Thousands)

Industry and company size	NAICS code	Total employment		Total R&D employment		Researchers ^a		R&D technicians and equivalent staff	Other R&D supporting staff
						Total	With PhD		
Military armored vehicle, tank, and tank components	336992	3		*		*	*	*	*
Other transportation	other 336	255		16		8	*	5	3
Furniture and related products	337	164		4		2	i	2	*
Miscellaneous	339	1,570		124		77	9	35	11
Medical equipment and supplies	3391	1,206		105		68	8	28	9
Other miscellaneous manufacturing	3399	364		18		10	1	7	2
Nonmanufacturing industries	21–23, 42–81	17,011		1,700		1,130	73	447	123
Mining, quarrying, oil and gas extraction, and support activities	21	D		D		D	1	2	1
Utilities	22	351		7		4	*	2	1
Wholesale trade	42	555	i	24	i	10	i	9	5
Electronic shopping and electronic auctions	454111–12	D		D		D	1	7	1
Transportation and warehousing	48–49	1,388		36		17	i	16	4
Information	51	3,567		839		622	39	161	56
Publishing	511	903		300		225	13	51	23
Newspaper, periodical, book, and directory publishers	5111	20	i	5	i	2	i	2	*
Software publishers	5112	882		294		223	13	49	23
Telecommunications	517	510		17		8	1	5	3
Data processing, hosting, and related services	518	1,312		310		227	5	57	26
Other information	other 51	842		212		161	20	48	4
Finance and insurance	52	2,233		130		68	i	56	7
Real estate and rental and leasing	53	188		6		5	i	1	*
Lessors of nonfinancial intangible assets (except copyrighted works)	533	2		*		*	*	*	i
Other real estate and rental and leasing	other 53	186		6		5	i	1	*
Professional, scientific, and technical services	54	2,780		554		337	26	176	42
Architectural, engineering, and related services	5413	513		71		50	2	17	4
Computer systems design and related services	5415	963		175		118	10	41	15
Scientific research and development services	5417	618		248		131	i	99	18
Research and development in nanotechnology	541713	9		2		1	1	1	*
Research and development in biotechnology (except nanobiotechnology)	541714	149		61		31	2	30	1
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	449		177	i	98	i	68	11
Research and development in the social sciences and humanities	541720	11		8		2	*	1	6
Other professional, scientific, and technical services	other 54	686		61		38	i	18	5
Health care services	621–23	467		9		4	1	3	1
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	3,353		45		25	*	15	5
All companies (number of domestic employees)	–	34,779		3,298		2,290	201	723	286
Small companies									
10–19 ^b	–	103		36		25	4	7	3
20–49	–	284		86		55	7	24	7

Table 49. Worldwide total employment, R&D employment, and level of education of researchers, by work activity, industry, and company size: 2024

(Thousands)

Industry and company size	NAICS code	Total employment		Total R&D employment		Researchers ^a		R&D technicians and equivalent staff	Other R&D supporting staff
						Total	With PhD		
Medium companies									
50–99	–	405		103		61	7	32	10
100–249	–	841		158		96	11	48	14
Large companies									
250–499	–	1,015		154		102	8	36	16
500–999	–	1,490		166		112	10	38	16
1,000–4,999	–	5,294		611		396	32 i	157	58
5,000–9,999	–	3,318		307		184	17	94	30
10,000–24,999	–	6,202		599		419	39 i	133	47
25,000 or more	–	15,829		1,077		839	64 i	153 i	85

* = amount < 500 employees; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%.

NAICS = 2017 North American Industry Classification System.

^a Researchers includes R&D scientists and engineers and their managers.

^b The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):

Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 50. Domestic total employment, R&D employment, and level of education of researchers, by work activity, industry, and company size: 2024

(Thousands)

Industry and company size	NAICS code	Total employment		Total R&D employment		Researchers ^a		R&D technicians and equivalent staff	Other R&D supporting staff
						Total	With PhD		
All industries	21–23, 31–33, 42–81	23,145		2,130		1,462	153	470	198
Manufacturing industries	31–33	10,183		1,032		718	96	198	116
Food	311	1,169		29		14	3	8	6
Beverage and tobacco products	312	481		7		3	*	1	3
Textile, apparel, and leather products	313–16	187		5		2	*	2	1
Wood products	321	155		5		2	*	2	1
Paper	322	203		6		3	*	2	1
Printing and related support activities	323	95		3		1	*	1	*
Petroleum and coal products	324	128		4		1	*	2	1
Chemicals	325	1,397		227		162	46	36	30
Basic chemicals	3251	203		20		16	2	4	1
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	81		6		4	1	2	1
Pesticide, fertilizer, and other agricultural chemicals	3253	69		4		2	2 i	1	*
Pharmaceuticals and medicines	3254	691		176		124	38	26	26
Soap, cleaning compound, and toilet preparations	3256	198		10		8	1	1	1
Paint, coating, adhesive, and other chemicals	3255, 3259	156		10		6	1 i	3	1
Plastics and rubber products	326	390		18		9	1	7	2
Nonmetallic mineral products	327	132		9		5	*	2	3 r
Primary metals	331	163		8		3	* i	3	2
Fabricated metal products	332	430		28		12	1	12	4
Machinery	333	996		101		64	6 i	28	9
Agricultural implement	33311	104		10		8	*	2	1
Semiconductor machinery	333242	48		17 i		12 i	4 i	5	1
Engine, turbine, and power transmission equipment	3336	156		17		12	1	4	2
Other machinery	other 333	688		56		33	1	18	6
Computer and electronic products	334	1,059		272		218	24 i	28	26
Communications equipment	3342	194		36		29	1 i	4	3
Semiconductor and other electronic components	3344	291		104		89	11 i	10	5
Navigational, measuring, electromedical, and control instruments	3345	320		60		40	5	10	10
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	47		8		6	1	1	1
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	134		29		18	1	4	8
Other measuring and controlling devices	other 3345	139		22		15	2 i	5	2
Other computer and electronic products	other 334	253		72		61	7 i	4 i	7
Electrical equipment, appliances, and components	335	297		25		18	2 i	5	2
Transportation equipment	336	1,929		197		146	6 i	33	18
Motor vehicles, bodies, trailers, and parts	3361–63	946		111		85 i	3 i	16	9 i
Aerospace products and parts	3364	790		73		54	3	12	6
Aircraft, aircraft engine, and aircraft parts	336411–13	612		53		38	3	10	5
Guided missile, space vehicle, and related parts	336414–15, 336419	178		20		17	* i	2	1

Table 50. Domestic total employment, R&D employment, and level of education of researchers, by work activity, industry, and company size: 2024

(Thousands)

Industry and company size	NAICS code	Total employment		Total R&D employment		Researchers ^a		R&D technicians and equivalent staff	Other R&D supporting staff	
						Total	With PhD			
Military armored vehicle, tank, and tank components	336992	3		*		*	*	*	*	
Other transportation	other 336	191		13		7	*	4	3	
Furniture and related products	337	130		4		2	*	2	*	i
Miscellaneous	339	841		84		52	7	24	8	
Medical equipment and supplies	3391	601		69		44	6	19	7	
Other miscellaneous manufacturing	3399	240		14		8	1	5	1	
Nonmanufacturing industries	21–23, 42–81	12,962		1,098		744	57	273	82	
Mining, quarrying, oil and gas extraction, and support activities	21	118		5		3	1	1	1	
Utilities	22	344		7		4	*	2	1	
Wholesale trade	42	427	i	22	i	9	1	8	5	i
Electronic shopping and electronic auctions	454111–12	1,421		28	i	23	1	4	*	i
Transportation and warehousing	48–49	1,117		35		16	1	15	4	
Information	51	2,295		502		376	30	96	29	
Publishing	511	508		153		121	9	23	10	
Newspaper, periodical, book, and directory publishers	5111	20	i	5	i	2	*	2	*	i
Software publishers	5112	487		148		119	9	20	9	
Telecommunications	517	458		15		7	1	5	3	
Data processing, hosting, and related services	518	735		174		128	3	33	13	
Other information	other 51	595		159		120	17	36	3	
Finance and insurance	52	1,673		90		52	3	33	5	
Real estate and rental and leasing	53	162		6		4	*	1	*	
Lessors of nonfinancial intangible assets (except copyrighted works)	533	2		*		*	*	*	i	*
Other real estate and rental and leasing	other 53	160		6		4	*	1	*	
Professional, scientific, and technical services	54	1,782		354		229	19	94	31	
Architectural, engineering, and related services	5413	457		70		49	2	17	4	
Computer systems design and related services	5415	506		111		73	5	27	11	
Scientific research and development services	5417	352		124		76	10	35	13	
Research and development in nanotechnology	541713	6		2		1	*	1	*	
Research and development in biotechnology (except nanobiotechnology)	541714	109		30		17	2	12	1	
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	226		85	i	57	7	22	6	
Research and development in the social sciences and humanities	541720	11		8		2	*	1	5	
Other professional, scientific, and technical services	other 54	467		49		31	2	15	4	
Health care services	621–23	445		8		4	1	3	1	
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	3,178		43		24	*	14	5	
All companies (number of domestic employees)	–	23,145		2,130		1,462	153	470	198	
Small companies										
10–19 ^b	–	69		26		18	3	6	2	
20–49	–	249		74		47	7	21	7	

Table 50. Domestic total employment, R&D employment, and level of education of researchers, by work activity, industry, and company size: 2024

(Thousands)

Industry and company size	NAICS code	Total employment		Total R&D employment		Researchers ^a		R&D technicians and equivalent staff	Other R&D supporting staff
						Total	With PhD		
Medium companies									
50–99	–	333		87		49	6	29	9
100–249	–	690		130		79	9	40	12
Large companies									
250–499	–	713		112		68	7	30	14
500–999	–	1,108		122		82	8	27	13
1,000–4,999	–	3,121		381		253	24 i	91	37
5,000–9,999	–	1,945		203		126	14	54	23
10,000–24,999	–	3,560		323		228	28	67	28
25,000 or more	–	11,358		671		512	46 i	105	54

* = amount < 500 employees; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%.

NAICS = 2017 North American Industry Classification System.

^a Researchers includes R&D scientists and engineers and their managers.

^b The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):

Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 51. Foreign total employment, R&D employment, and level of education of researchers, by work activity, industry, and company size: 2024

(Thousands)

Industry and company size	NAICS code	Total employment		Total R&D employment		Researchers ^a		R&D technicians and equivalent staff	Other R&D supporting staff	
						Total	With PhD			
All industries	21–23, 31–33, 42–81	11,634		1,168		828	48 i	252		88
Manufacturing industries	31–33	7,586		566		442	31 i	78		47
Food	311	428		13		7 i	1 i	4		2 i
Beverage and tobacco products	312	557		4		3	*	1		*
Textile, apparel, and leather products	313–16	140		1		*	*	1		*
Wood products	321	18		*		*	* i	*		*
Paper	322	119		1		1	*	*		*
Printing and related support activities	323	18		*		* i	* i	* i		* i
Petroleum and coal products	324	52		2		*	*	1		*
Chemicals	325	1,018		77		51	11	11		16
Basic chemicals	3251	117		7		3	1 i	4 i		*
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	78		4		3	1	1		*
Pesticide, fertilizer, and other agricultural chemicals	3253	43		1		*	* i	*		*
Pharmaceuticals and medicines	3254	467		54		36	8	4		15
Soap, cleaning compound, and toilet preparations	3256	218		7		6	1	*		*
Paint, coating, adhesive, and other chemicals	3255, 3259	95		4		3	* i	1		*
Plastics and rubber products	326	211		4		2	* i	2		*
Nonmetallic mineral products	327	84		1 i		1 i	* i	*		*
Primary metals	331	76		2		2	* i	* i		* i
Fabricated metal products	332	149		8		4	1	2		1
Machinery	333	947		64		51	3 i	11		3
Agricultural implement	33311	79		8		7	*	1		*
Semiconductor machinery	333242	78		14 i		11 i	1 i	3		*
Engine, turbine, and power transmission equipment	3336	210		13		10	*	1 i		1
Other machinery	other 333	581		29		22 i	1 i	5 i		2
Computer and electronic products	334	1,408		254		221	10 i	20		13
Communications equipment	3342	130		37		31	1 i	3		2
Semiconductor and other electronic components	3344	601		139		124	6 i	10 i		5
Navigational, measuring, electromedical, and control instruments	3345	267		28		21	1 i	5		3
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	29		3		2	*	1		*
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	26		6		4	* i	*		2
Other measuring and controlling devices	other 3345	212		19		15	1 i	3 i		1
Other computer and electronic products	other 334	410		50		44	1 i	2 i		3
Electrical equipment, appliances, and components	335	291		14		9	1 i	2		3 i
Transportation equipment	336	1,306		79		63	1	11 i		5 i
Motor vehicles, bodies, trailers, and parts	3361–63	944		58		46	1 i	9 i		3 i
Aerospace products and parts	3364	298		19		16	1	2		1
Aircraft, aircraft engine, and aircraft parts	336411–13	D		D		9	1	2		D
Guided missile, space vehicle, and related parts	336414–15, 336419	D		D		7 i	*	*		D
Military armored vehicle, tank, and tank components	336992	0		0		0	0	0		0
Other transportation	other 336	64		3 i		1	* i	1 i		1 i

(Thousands)

[illegible]

Table 51. Foreign total employment, R&D employment, and level of education of researchers, by work activity, industry, and company size: 2024

(Thousands)

Industry and company size	NAICS code	Total employment		Total R&D employment		Researchers ^a		R&D technicians and equivalent staff	Other R&D supporting staff	
						Total	With PhD			
250–499	–	302		42		34	1	6	2	
500–999	–	382		44		30	2	11	3	
1,000–4,999	–	2,173		231		144	8 i	66	21	i
5,000–9,999	–	1,373		105		59	3 i	39	7	
10,000–24,999	–	2,642		276		191	12 i	66	20	
25,000 or more	–	4,470		406		326	18 i	48 i	32	

* = amount < 500 employees; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%.

NAICS = 2017 North American Industry Classification System.

- ^a Researchers includes R&D scientists and engineers and their managers.
- ^b The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):
Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D.

Source(s):
National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 52. Domestic full-time equivalent R&D employees and researchers, by work status, industry, and company size: 2024

(Thousands)

Industry and company size	NAICS code	FTE R&D employees ^a						FTE R&D scientists and engineers ^b					
		Total	Full-time R&D employees	Full-time employees working on R&D part time	Part-time employees working on R&D	Total	Full-time R&D employees	Full-time employees working on R&D part time	Part-time employees working on R&D	Total	Full-time R&D employees	Full-time employees working on R&D part time	Part-time employees working on R&D
All industries	21–23, 31–33, 42–81	1,937	1,668	242	28	1,288	1,140	134	14	i			
Manufacturing industries	31–33	956	838	107	11	633	576	52	5	i			
Food	311	25	22	3	*	13	12	1	i	*			i
Beverage and tobacco products	312	6	3	3	* i	3	3	*		*			i
Textile, apparel, and leather products	313–16	4	3	1	*	2	2	*	i	*			
Wood products	321	3	3	1	*	2	2	*		*			
Paper	322	4	3	1	*	3	3	*		*			
Printing and related support activities	323	2	1	1	*	1	1	*		*			i
Petroleum and coal products	324	3	3	*	*	1	1	*		*			
Chemicals	325	223	216	6	1	157	153	4	i	1			
Basic chemicals	3251	20	17	3	*	16	i 14	i 2	i	*			
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	6	5	*	*	4	4	*		*			
Pesticide, fertilizer, and other agricultural chemicals	3253	4	3	*	*	2	2	*		*			
Pharmaceuticals and medicines	3254	175	172	2	1	120	119	1		*			
Soap, cleaning compound, and toilet preparations	3256	10	10	*	*	8	8	*	i	*			
Paint, coating, adhesive, and other chemicals	3255, 3259	9	9	1	* i	6	6	*		*			
Plastics and rubber products	326	15	10	4	1	7	5	1		*			
Nonmetallic mineral products	327	8	7	1	*	4	i 4	i 1		*			i
Primary metals	331	4	2	2	*	2	1	1		*			
Fabricated metal products	332	21	11	9	1	10	7	3		*			
Machinery	333	91	69	21	1	58	43	14		*			
Agricultural implement	33311	10	9	*	*	7	7	*		*			
Semiconductor machinery	333242	17	i 16	i *	i *	11	i 11	i *	i	*			i
Engine, turbine, and power transmission equipment	3336	17	9	8	*	11	4	7		*			
Other machinery	other 333	48	34	13	1	28	21	7		*			
Computer and electronic products	334	257	230	23	3	167	156	8	i	2			i
Communications equipment	3342	35	33	2	*	D	27	D		D			
Semiconductor and other electronic components	3344	102	97	3	2	D	73	i 2	i	D			
Navigational, measuring, electromedical, and control instruments	3345	53	43	9	1	D	32	D		1			
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	8	8	*	*	6	6	*		*			i
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	23	16	7	*	D	13	D		*			
Other measuring and controlling devices	other 3345	21	19	2	*	14	13	1		*			
Other computer and electronic products	other 334	66	57	9	*	D	25	i D		D			
Electrical equipment, appliances, and components	335	23	20	2	*	17	15	i 1		*			
Transportation equipment	336	184	159	23	2	137	i 122	i 14	i	1			i

Table 52. Domestic full-time equivalent R&D employees and researchers, by work status, industry, and company size: 2024

(Thousands)

Industry and company size	NAICS code	FTE R&D employees ^a								FTE R&D scientists and engineers ^b							
		Total		Full-time R&D employees		Full-time employees working on R&D part time		Part-time employees working on R&D		Total		Full-time R&D employees		Full-time employees working on R&D part time		Part-time employees working on R&D	
Motor vehicles, bodies, trailers, and parts	3361–63	106	i	100	i	6		1		82	i	79	i	3		*	i
Aerospace products and parts	3364	64		48		16		1	i	49	i	38	i	11	i	1	i
Aircraft, aircraft engine, and aircraft parts	336411–13	47		32		14	i	1		33	i	24		9	i	*	
Guided missile, space vehicle, and related parts	336414–15, 336419	18		16		2		*	i	16	i	14	i	1		*	i
Military armored vehicle, tank, and tank components	336992	*		*		*		0		*		*		*		0	
Other transportation	other 336	13		11		1	i	*	i	6		5		1	i	*	i
Furniture and related products	337	3		2		1		*		2	i	1	i	*		*	
Miscellaneous	339	79		73		4		1		48		46		1	i	1	
Medical equipment and supplies	3391	67		63		3		1		42		41		1	i	1	
Other miscellaneous manufacturing	3399	12		11		1		*		6		6		1		*	i
Nonmanufacturing industries	21–23, 42–81	981		830		135		17	i	655		564		82	i	8	i
Mining, quarrying, oil and gas extraction, and support activities	21	4		4		*		*		2		2		*		*	r
Utilities	22	3		2		1		*		2		2		*	i	*	i
Wholesale trade	42	18	i	11	i	7	i	*	i	8	i	5	i	2	i	*	i
Electronic shopping and electronic auctions	454111–12	27	i	24	i	2	i	2	i	23	i	20	i	1	i	1	i
Transportation and warehousing	48–49	24		12		12		1	r	11	i	7		5	i	*	i
Information	51	486		451		31		5		360		337		20		2	i
Publishing	511	147		139		8		1	i	115		110		5		*	i
Newspaper, periodical, book, and directory publishers	5111	4	i	3	i	*	i	1	i	2	i	1	i	*	i	*	i
Software publishers	5112	143		135		7		*		113		108		4		*	
Telecommunications	517	14		11	i	3		*		7	i	5	i	2	i	*	
Data processing, hosting, and related services	518	167		150		14		2		120	i	110	i	9		1	i
Other information	other 51	158		151		5		1		118		113		5		1	
Finance and insurance	52	71		57		13		*		36	i	30	i	6		*	i
Real estate and rental and leasing	53	5		5		*	i	*	i	4	i	4	i	*	i	*	i
Lessors of nonfinancial intangible assets (except copyrighted works)	533	*		*		0		0		*		*		0		0	
Other real estate and rental and leasing	other 53	5		5		*	i	*	i	4	i	4	i	*	i	*	i
Professional, scientific, and technical services	54	302		241		54		8	i	185	i	143	i	38	i	4	i
Architectural, engineering, and related services	5413	43		17		24		2		32		13		19		1	
Computer systems design and related services	5415	99		86		12		1		61		54		7		*	
Scientific research and development services	5417	116	i	106	i	5	i	4	i	64	i	59	i	3	i	1	i
Research and development in nanotechnology	541713	2		1		*		*		1		1		*		*	
Research and development in biotechnology (except nanobiotechnology)	541714	29	i	28	i	*		1	i	7		7		*		*	
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	81	i	75	i	4	i	2	i	54	i	50	i	3	i	1	i
Research and development in the social sciences and humanities	541720	3	i	2	i	*	i	1	i	2		1		*	i	*	i

Table 52. Domestic full-time equivalent R&D employees and researchers, by work status, industry, and company size: 2024

(Thousands)

Industry and company size	NAICS code	FTE R&D employees ^a						FTE R&D scientists and engineers ^b					
		Total	Full-time R&D employees	Full-time employees working on R&D part time	Part-time employees working on R&D	Total	Full-time R&D employees	Full-time employees working on R&D part time	Part-time employees working on R&D	Total	Full-time R&D employees	Full-time employees working on R&D part time	Part-time employees working on R&D
Other professional, scientific, and technical services	other 54	44 i	31 i	12 i	1	27 i	17 i	10 i	1 i				
Health care services	621–23	7	6	1	*	3	3	1	*				
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	33	18	14	1	20	11	8	*				
All companies (number of domestic employees)	–	1,937	1,668	242	28	1,288	1,140	134	14	i			
Small companies													
10–19 ^c	–	23	18	5	1	16	13	3	*				
20–49	–	64	47	15	1	42	33	8	*				
Medium companies													
50–99	–	74	49	23	2	43	31	11	1				
100–249	–	107	81	24	3	68	55	11	1				
Large companies													
250–499	–	97	79	16	2	59	50	8	1				
500–999	–	109	91	17	1	72	63	9	*				
1,000–4,999	–	343	292	45	6	227	198	26	3	i			
5,000–9,999	–	180	161	16	3 i	115	106	8 i	1				
10,000–24,999	–	303	282	20 i	2 i	201	187	12 i	1	i			
25,000 or more	–	636	568	62	6 i	446 i	403 i	38 i	5	i			

* = amount < 500 employees; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%.

FTE = full-time equivalent; NAICS = 2017 North American Industry Classification System.

^a FTE R&D employees includes scientists and engineers; their managers; and technicians, technologists, and support staff.

^b FTE R&D scientists and engineers includes scientists and engineers and their managers.

^c The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):
Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D.

Source(s):
National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 53. Domestic employment and R&D employment, by state: 2024

(Thousands)

State	Employees	
	Total	R&D
All states	23,145	2,130
Alabama	263	12
Alaska	22	1
Arizona	445	30
Arkansas	171	5
California	2,935	508
Colorado	409	43
Connecticut	239	21
Delaware	85	9
District of Columbia	56	4
Florida	1,112	60
Georgia	734	40
Hawaii	40	2
Idaho	88	9
Illinois	995	67
Indiana	539	43
Iowa	291	16
Kansas	235	13
Kentucky	318	8
Louisiana	190	5
Maine	63	4
Maryland	337	36
Massachusetts	544	112
Michigan	850	94
Minnesota	496	41
Mississippi	124	2
Missouri	415	21
Montana	33	2
Nebraska	170	9
Nevada	154	10
New Hampshire	97	15
New Jersey	607	69
New Mexico	64	3
New York	900	96
North Carolina	859	69
North Dakota	47	3
Ohio	851	52
Oklahoma	170	9
Oregon	254	30
Pennsylvania	798	68
Rhode Island	44	3
South Carolina	307	13
South Dakota	54	3
Tennessee	487	20
Texas	2,175	141
Utah	241	20
Vermont	27	3
Virginia	617	48
Washington	677	122
West Virginia	65	2
Wisconsin	539	45
Wyoming	18	1

Table 53. Domestic employment and R&D employment, by state: 2024

(Thousands)

State	Employees			
	Total		R&D	
Undistributed ^a	890		70	

^a Undistributed includes data reported that were not allocated to a specific state by multi-establishment companies. For single-establishment companies, data reported were allocated to the state in the address used to mail the survey form.

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 \$50,000 or more of R&D.

Source(s):
National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 54. Foreign employment and R&D employment, by location: 2024

(Thousands)

Location	Employees	
	Total	R&D
Total	11,634	1,168
Puerto Rico ^a	56	2
Canada	593	85
Latin America and other Western Hemisphere ^b	2,170	57
Argentina	71	5
Brazil	388	16
Chile	43	1
Mexico	1,307	27
Other Latin American and Western Hemisphere locations	360	8
Africa	140	6
South Africa	64	4
Other African locations	76	2
Asia and Pacific	4,039	568
Australia	179	14
China	1,071	107
Hong Kong	40	2
India	1,436	326
Indonesia	63	1
Japan	252	22
Malaysia	133	11
New Zealand	20	3
Singapore	147	16
South Korea	86	13
Taiwan	110	26
Thailand	99	5 r
Other Asian or Pacific locations	403	23
Europe	3,331	380
Austria	29	6
Belgium	102	13
Czechia	72	11
Denmark	26	4
Finland	21	5
France	294	26
Germany	495	62
Hungary	60	5
Ireland	174	24
Italy	159	15
Luxembourg	15	2
Netherlands	138	15
Norway	31	3
Poland	228	20
Russia	47	2 i
Spain	159	17
Sweden	44	8
Switzerland	93	17
Turkey (Türkiye)	44	2
United Kingdom	774	89
Other European locations	327	36
Middle East	196	40
Israel	80	37
Other Middle Eastern locations	116	3

Table 54. Foreign employment and R&D employment, by location: 2024

(Thousands)

Location	Employees		
	Total	R&D	
Undistributed ^c	1,110	30	i

i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%.

^a Puerto Rico is not included in the U.S. total due to its classification as a U.S. territory.

^b Other Western Hemisphere is defined as Argentina, Brazil, Chile, Mexico, and other Latin America.

^c Undistributed includes data reported that were not allocated to a specific country.

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 \$50,000 or more of R&D. No systematic item imputation was applied. These statistics include an adjustment to the weight to account for unit nonresponse.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 55. Domestic temporary R&D employment, by work activity, industry, and company size: 2024

(Thousands)

Industry and company size	NAICS code	Total	Researchers ^a	R&D technicians and equivalent staff	Other R&D supporting staff
All industries	21–23, 31–33, 42–81	291 i	198 i	61 i	32 i
Manufacturing industries	31–33	112 i	74 i	22 i	16 i
Food	311	4 i	1 i	1 i	1 i
Beverage and tobacco products	312	*	*	*	*
Textile, apparel, and leather products	313–16	* i	* i	* i	* i
Wood products	321	* i	* i	*	0
Paper	322	*	*	*	*
Printing and related support activities	323	* i	* i	* i	* i
Petroleum and coal products	324	*	* i	*	* i
Chemicals	325	44 i	30 i	7 i	7 i
Basic chemicals	3251	1 i	1 i	* i	* i
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	* i	* i	*	* i
Pesticide, fertilizer, and other agricultural chemicals	3253	1 i	* i	* i	* i
Pharmaceuticals and medicines	3254	40 i	28 i	6 i	7 i
Soap, cleaning compound, and toilet preparations	3256	1 i	1 i	* i	* i
Paint, coating, adhesive, and other chemicals	3255, 3259	*	*	*	*
Plastics and rubber products	326	2 i	1 i	1 i	* i
Nonmetallic mineral products	327	* i	* i	* i	* i
Primary metals	331	* i	* i	*	*
Fabricated metal products	332	1 i	* i	*	*
Machinery	333	18 i	12 i	4 i	2 i
Agricultural implement	33311	* i	*	* i	*
Semiconductor machinery	333242	1 i	*	*	*
Engine, turbine, and power transmission equipment	3336	11 i	7 i	2 i	1 i
Other machinery	other 333	6 i	5 i	1 i	1 i
Computer and electronic products	334	26 i	19 i	4 i	2 i
Communications equipment	3342	2 i	2 i	1 i	* i
Semiconductor and other electronic components	3344	18 i	14 i	2 i	2 i
Navigational, measuring, electromedical, and control instruments	3345	3 i	2 i	1 i	* i
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	* i	* i	* i	* i
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	1 i	1 i	* i	* i
Other measuring and controlling devices	other 3345	2 i	2 i	1 i	* i
Other computer and electronic products	other 334	2 i	1 i	1 i	* i
Electrical equipment, appliances, and components	335	2 i	1 i	* i	* i
Transportation equipment	336	6 i	4 i	1 i	1 i
Motor vehicles, bodies, trailers, and parts	3361–63	3 i	2 i	* i	* i
Aerospace products and parts	3364	3 i	2 i	1 i	* i
Aircraft, aircraft engine, and aircraft parts	336411–13	2 i	1 i	1 i	* i
Guided missile, space vehicle, and related parts	336414–15, 336419	1 i	1 i	*	* i
Military armored vehicle, tank, and tank components	336992	*	*	0	0
Other transportation	other 336	* i	* i	* i	* i
Furniture and related products	337	*	*	*	* i
Miscellaneous	339	9 i	5 i	3 i	1 i
Medical equipment and supplies	3391	6 i	3 i	2 i	1 i
Other miscellaneous manufacturing	3399	3 i	2 i	1 i	* i
Nonmanufacturing industries	21–23, 42–81	178 i	124 i	39 i	16 i
Mining, quarrying, oil and gas extraction, and support activities	21	*	*	*	*
Utilities	22	* i	* i	* i	* i
Wholesale trade	42	2 i	* i	1 i	* i

Table 55. Domestic temporary R&D employment, by work activity, industry, and company size: 2024

(Thousands)

Industry and company size	NAICS code	Total	Researchers ^a	R&D technicians and equivalent staff	Other R&D supporting staff
Electronic shopping and electronic auctions	454111-12	1 i	* i	* i	* i
Transportation and warehousing	48-49	3 i	1 i	2 i	* i
Information	51	122 i	91 i	20 i	11 i
Publishing	511	12 i	6 i	4 i	1 i
Newspaper, periodical, book, and directory publishers	5111	1 i	* i	* i	* r
Software publishers	5112	11 i	6 i	4 i	1 i
Telecommunications	517	* i	* i	* i	* i
Data processing, hosting, and related services	518	13 i	8 i	3 i	2 i
Other information	other 51	98 i	76 i	13 i	8 i
Finance and insurance	52	20 i	14 i	5 i	1 i
Real estate and rental and leasing	53	* i	* i	* i	* i
Lessors of nonfinancial intangible assets (except copyrighted works)	533	0 i	0 i	0 i	0 i
Other real estate and rental and leasing	other 53	* i	* i	* i	* i
Professional, scientific, and technical services	54	27 i	15 i	8 i	3 i
Architectural, engineering, and related services	5413	2 i	1 i	* i	* r
Computer systems design and related services	5415	7 i	4 i	2 i	1 i
Scientific research and development services	5417	12 i	6 i	4 i	2 i
Research and development in nanotechnology	541713	* i	* i	* i	* i
Research and development in biotechnology (except nanobiotechnology)	541714	5 i	3 i	2 i	1 i
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	6 i	3 i	2 i	1 i
Research and development in the social sciences and humanities	541720	* i	* i	* i	* i
Other professional, scientific, and technical services	other 54	6 i	3 i	2 i	1 i
Health care services	621-23	1 i	* i	* i	* i
Other nonmanufacturing	23, 44-45 (excluding 454111-12), 55-56, 624, 71-72, 81	2 i	1 i	1 i	* i
All companies (number of domestic employees)	-	291 i	198 i	61 i	32 i
Small companies					
10-19 ^b	-	3 i	2 i	1 i	1 i
20-49	-	6 i	4 i	1 i	1 i
Medium companies					
50-99	-	6 i	3 i	2 i	1 i
100-249	-	10 i	6 i	3 i	2 i
Large companies					
250-499	-	9 i	5 i	2 i	1 i
500-999	-	13 i	8 i	4 i	2 i
1,000-4,999	-	31 i	18 i	9 i	5 i
5,000-9,999	-	21 i	13 i	4 i	3 i
10,000-24,999	-	43 i	29 i	9 i	5 i
25,000 or more	-	148 i	110 i	27 i	11 i

* = amount < 500 employees; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%.

NAICS = 2017 North American Industry Classification System.

^a Researchers includes R&D scientists and engineers and their managers.

^b The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):

Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 56. R&D costs paid for by the company and others projected for 2025, by industry and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Projected worldwide R&D cost				Projected domestic R&D cost										Projected foreign R&D cost paid for by the company			
						Paid for by the company					Paid for by others								
		Paid for by the company	Paid for by others			Total	Purchased and collaborative R&D		R&D performed by the company		Total	U.S. government		Non-U.S. government sources					
All industries	21–23, 31–33, 42–81	971,546		117,337	i	805,512		59,373		746,138		92,811	i	33,888	i	58,923	i	166,035	
Manufacturing industries	31–33	528,453		62,075		430,033		51,156		378,877		52,477		25,577	i	26,900		98,420	
Food	311	7,802		275		6,225		172	i	6,053		272		1	i	272		1,577	
Beverage and tobacco products	312	2,917		*	i	1,712		195		1,516		*	i	*	i	0		1,205	
Textile, apparel, and leather products	313–16	922		6		793		8		785		6		0		6		129	
Wood products	321	285	i	6		284	i	15		269	i	6		*	i	6		2	i
Paper	322	1,324		1	i	1,235		3	i	1,233		1	i	0		1	i	88	
Printing and related support activities	323	264		1	i	247		1	i	246		1	i	0		1	i	17	
Petroleum and coal products	324	1,520		3		1,250		212	i	1,037	i	3	i	1	i	2	i	271	
Chemicals	325	218,063		20,764	i	185,135		41,147		143,988		15,171	i	1,061		14,109	i	32,928	
Basic chemicals	3251	3,929		269		2,926		69		2,857		232	i	67		165	i	1,003	i
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	1,912	i	139		1,355	i	12		1,343	i	133		0		133		557	i
Pesticide, fertilizer, and other agricultural chemicals	3253	1,109		D		916		104		812		D		*	i	D		193	
Pharmaceuticals and medicines	3254	205,356		19,587	i	175,630		40,622		135,009		14,087	i	970		13,118	i	29,726	
Soap, cleaning compound, and toilet preparations	3256	4,025		277		2,844		334		2,510		277		0		277		1,181	
Paint, coating, adhesive, and other chemicals	3255, 3259	1,732		D		1,464		7		1,457		D		24		D		268	
Plastics and rubber products	326	3,128		180		2,702		60		2,642		167		88		78		426	
Nonmetallic mineral products	327	1,852	i	30		1,601	i	25	i	1,575	i	27		6		21		251	i
Primary metals	331	1,178		63		1,013		26		987		59		9		50		165	
Fabricated metal products	332	4,484		202	i	3,662		49		3,612		117	i	16		101	i	823	
Machinery	333	26,041		2,211		20,300		655		19,645		2,108		163		1,945		5,741	
Agricultural implement	33311	3,678		236		3,070		D		D		228		1	r	227		608	
Semiconductor machinery	333242	7,090		D		5,382		D		D		D		*	i	D		1,707	
Engine, turbine, and power transmission equipment	3336	5,220		305		3,828		11		3,817		272		137		135	i	1,392	
Other machinery	other 333	10,053		D		8,019		381		7,638		D		25		D		2,034	
Computer and electronic products	334	158,709		8,885		118,658	i	3,973	i	114,685	i	8,515		3,638		4,878		40,051	
Communications equipment	3342	17,627		801	i	13,467		628	i	12,839		780	i	D		D		4,161	
Semiconductor and other electronic components	3344	77,487		3,829		54,431		469		53,962		3,634		184	i	3,451		23,056	
Navigational, measuring, electromedical, and control instruments	3345	14,696		3,758		11,064		250		10,814		3,611		3,163		447		3,633	
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	3,519	i	252		2,958	i	113		2,846	i	210		51	r	159		560	i
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	3,772		3,283		3,285		18		3,267		3,204		2,990		214		487	
Other measuring and controlling devices	other 3345	7,406		223		4,820		119		4,701		196		122	r	74		2,586	
Other computer and electronic products	other 334	48,898	i	497		39,697	i	2,627	i	37,070	i	491	i	D		D		9,201	i
Electrical equipment, appliances, and components	335	8,850		930		7,204		114		7,091		929		101		828		1,645	

Table 56. R&D costs paid for by the company and others projected for 2025, by industry and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Projected worldwide R&D cost				Projected domestic R&D cost									Projected foreign R&D cost paid for by the company			
						Paid for by the company				Paid for by others								
		Paid for by the company	Paid for by others	Total	Purchased and collaborative R&D	R&D performed by the company	Total	U.S. government	Non-U.S. government sources									
Transportation equipment	336	58,822		28,083	i	51,119	3,643		47,477		24,757	20,329	i	4,427		7,702		
Motor vehicles, bodies, trailers, and parts	3361–63	40,739		2,104		34,581	3,206		31,374		1,649	D		D		6,159		
Aerospace products and parts	3364	16,082		24,421	i	14,721	289		14,432		21,581	i	18,778	i	2,804	1,361		
Aircraft, aircraft engine, and aircraft parts	336411–13	11,805		20,040	i	D	D		10,708		D	D		D		D		
Guided missile, space vehicle, and related parts	336414–15, 336419	4,277		4,381		D	D		3,724		D	D		D		D		
Military armored vehicle, tank, and tank components	336992	40		6		40	1	i	39		6	D		D		*		
Other transportation	other 336	1,960		1,552		1,778	146		1,632		1,520	D		D		182		
Furniture and related products	337	478	i	*	i	427	i	3	424	i	0	0		0		50		
Miscellaneous	339	31,816		435	i	26,466	854		25,612		339	i	164	i	174	i	5,350	
Medical equipment and supplies	3391	28,334		403	i	23,463	762		22,701		311	i	152	i	159	i	4,871	
Other miscellaneous manufacturing	3399	3,482		32		3,003	92	i	2,911		28	12		15		479		
Nonmanufacturing industries	21–23, 42–81	443,094		55,263	i	375,478	8,218		367,261		40,334	i	8,311		32,024	i	67,615	
Mining, quarrying, oil and gas extraction, and support activities	21	1,716		3,968	i	1,292	59		1,233		3,930	i	*	i	3,930	i	424	
Utilities	22	1,191		2	i	1,180	545		635		2	1		*	i	11		
Wholesale trade	42	1,797	i	D		1,660	i	73	i	1,587	i	D	D		127	i	136	i
Electronic shopping and electronic auctions	454111–12	10,983	i	D		8,688	i	528	i	8,160	i	0	0		0		2,295	i
Transportation and warehousing	48–49	12,581	i	D		12,262	i	294	i	11,968	i	D	D		D		319	i
Information	51	315,866		1,656		264,825	3,606		261,219		1,429	56		1,373		51,042		
Publishing	511	84,616		655		67,662	947		66,715		535	4		532		16,955		
Newspaper, periodical, book, and directory publishers	5111	473	i	0		442	i	1	i	442	i	0	0		0		30	i
Software publishers	5112	84,144		655		67,219	946		66,273		535	4		532		16,924		
Telecommunications	517	4,550		D		4,287	584		3,703		D	4		D		263	i	
Data processing, hosting, and related services	518	84,186		876		68,498	391		68,107		843	47		796		15,687		
Other information	other 51	142,515		D		124,378	1,684	i	122,694		D	0		D		18,137	i	
Finance and insurance	52	31,674		187		27,652	1,025		26,626		119	0		119		4,023		
Real estate and rental and leasing	53	3,242		0		3,098	2	i	3,097		0	0		0		143		
Lessors of nonfinancial intangible assets (except copyrighted works)	533	46		0		23	1	i	23		0	0		0		23		
Other real estate and rental and leasing	other 53	3,195		0		3,075	1	r	3,074		0	0		0		120		
Professional, scientific, and technical services	54	58,192		48,550	i	49,237	1,803		47,435		34,230	i	7,935		26,294	i	8,954	
Architectural, engineering, and related services	5413	3,814		727		3,754	317	i	3,437		634	418		216		60		
Computer systems design and related services	5415	35,618		5,000		29,234	840		28,394		4,627	1,183	i	3,444		6,383		
Scientific research and development services	5417	7,747		41,631	i	6,589	470		6,119		27,790	i	5,459		22,331	i	1,158	i
Research and development in nanotechnology	541713	529		129		505	17		488		126	88		38		24		
Research and development in biotechnology (except nanobiotechnology)	541714	1,398		8,215		1,359	175		1,184		5,384	699		4,685		40		

Table 56. R&D costs paid for by the company and others projected for 2025, by industry and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Projected worldwide R&D cost				Projected domestic R&D cost										Projected foreign R&D cost paid for by the company		
						Paid for by the company					Paid for by others							
		Paid for by the company		Paid for by others		Total	Purchased and collaborative R&D		R&D performed by the company		Total	U.S. government		Non-U.S. government sources				
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	5,810	i	32,768	i	4,715	278		4,437		21,762	i	4,178		17,584	i	1,095	i
Research and development in the social sciences and humanities	541720	10		518		10	*		10		518		494		24		0	
Other professional, scientific, and technical services	other 54	11,013	i	1,192		9,660	i	176	9,484	i	1,178		875		303		1,352	i
Health care services	621–23	2,398		187		2,279		185	2,095		184		D		D		118	i
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	3,456		D		3,306		99	3,207		D		D		38		150	
All companies (number of domestic employees)	–	971,546		117,337	i	805,512	59,373	746,138			92,811	i	33,888	i	58,923	i	166,035	
Small companies																		
10–19 ^a	–	6,433		1,182		5,141	773	4,368			1,058		555		503	i	1,292	
20–49	–	26,202		2,524		24,380	2,527	21,853			2,225		1,039		1,186		1,822	
Medium companies																		
50–99	–	21,375		2,477		19,125	2,561	16,565			2,136		853		1,284		2,249	
100–249	–	34,984		3,537		30,871	3,410	27,461			2,976		1,272		1,704		4,113	
Large companies																		
250–499	–	34,305		3,085		29,518	3,105	26,412			2,797		1,141		1,656		4,788	
500–999	–	60,680		8,836	i	55,017	2,589	52,428			8,123	i	932	i	7,191	i	5,662	
1,000–4,999	–	153,637		21,165	i	123,618	7,189	116,429			17,143	i	1,839		15,303	i	30,019	
5,000–9,999	–	76,708		8,254	i	63,875	4,882	i	58,992		5,749	i	1,014	i	4,735	i	12,833	
10,000–24,999	–	186,914		26,259	i	150,200	19,040	131,160			18,272	i	2,164	i	16,108	i	36,714	
25,000 or more	–	370,309		40,019	i	303,767	13,297	290,470			32,332	i	23,080	i	9,252		66,542	

* = amount < \$500,000; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%.

NAICS = 2017 North American Industry Classification System.

^a The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):
Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D.

Source(s):
National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 57. Worldwide R&D paid for by the company and others and performed by the company, by industry and company size: 2009–24

(Millions of U.S. dollars)

Industry and company size	NAICS code	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
All industries	21–23, 31–33, 42–81	336,571	338,451	359,490	374,916	396,352	416,343	429,174	457,591	484,740	543,369	595,683	648,421	744,338	843,065	874,887	929,809
Manufacturing industries	31–33	236,858	243,611	253,821	261,697	276,110	285,661	287,895	303,044	314,167	339,076	348,904	375,180	411,692	463,253	479,722	495,527
Food	311	4,916	D	5,589	5,163	6,335	6,136	6,058 i	5,824	5,424	5,459	5,014	6,395	6,342	8,610	7,129	7,810
Beverage and tobacco products	312	933	D	D	D	1,358	1,423	1,529	1,076 - 1,654	1,769	1,628	1,755	1,901	2,139	1,395	1,838	2,457
Textile, apparel, and leather products	313–16	519	522	656	605	759	734	818	1,247 i	1,131	1,223	1,060	973	717	762	876	907
Wood products	321	283	254	211	282	222	341 i	198	166 - 751	174	206	193	193 - 200	447	265	261	269
Paper	322	NA	1,665	769	858	1,022	880	867	943	1,594	1,013	1,161	1,021	1,206	1,086	1,308	1,317
Printing and related support activities	323	217	269	212	291 i	258 i	238	198 i	223 i	236	246	422 i	297	221 i	170	341	260
Petroleum and coal products	324	NA	D	1,281	D	327	298	252	312	377	1,460 - 1,463	1,477 - 1,481	165 - 2,807	1,132	1,107	1,123	1,205
Chemicals	325	64,442	72,610	72,068	70,218	74,551	79,428	80,961	84,612	90,236	101,132	115,781	120,665	136,569	150,843	162,421	170,685
Basic chemicals	3251	NA	2,671	5,166	3,400	3,336	3,633	3,677	536 - 5,694	3,101	3,046	3,102	3,454	3,710	3,831	4,131	4,041
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	NA	1,038	1,117	D	1,794	1,842	1,780	332 - 5,490	805	2,435	1,695	1,745	1,969 i	2,031	1,948	1,870
Pesticide, fertilizer, and other agricultural chemicals	3253	NA	D	2,049	D	1,966 i	2,042 i	3,405	0 - 5,157	1,864	1,782 - 1,797	2,272 - 2,297	1,173	1,279	1,344	2,652	1,421
Pharmaceuticals and medicines	3254	53,456	60,537	58,866	58,920	62,480	66,731	D	73,193	79,004	88,776	103,636	108,843	124,493	138,380	148,335	157,749
Soap, cleaning compound, and toilet preparations	3256	NA	3,285	3,386	3,212	3,358	3,501	D	3,589	3,699	3,567	3,517	3,432	3,613	3,803	3,887	3,905
Paint, coating, adhesive, and other chemicals	3255, 3259	NA	D	1,485	D	1,617	1,679 i	1,664	1,806 - 1,830	1,764	1,508 - 1,529	1,531 - 1,562	2,017	1,505	1,456	1,468	1,699
Plastics and rubber products	326	2,982	2,515	2,640	4,446	4,576	4,519	2,906	4,583	4,626	3,170	3,348	3,143	3,750	4,151	3,622	3,326
Nonmetallic mineral products	327	1,153 i	1,596	1,428	1,588 i	1,578	1,599	1,487	1,474	1,485	1,567 i	1,699 i	1,902 i	1,730	1,623	1,564	1,804 i
Primary metals	331	993	802	763	818	700	770	711	662	862	990	721 - 747	848	974	1,139	680	1,352
Fabricated metal products	332	2,174	1,818	1,993	1,949 i	2,303 i	2,329	2,467 i	2,273	2,405	2,533	3,144	3,739	4,423	3,757	3,442	3,978
Machinery	333	11,156	12,403	18,312	17,462	15,420	15,089	16,827	15,958	16,626	19,279	19,283	20,529	23,090	25,324	29,220	28,454
Agricultural implement	33311	NA	D	1,570	2,142	2,243	D	2,152	2,189	2,132	2,730	2,777	2,451	2,774	3,277	3,612	3,657
Semiconductor machinery	333242	NA	2,469	2,727	1,357	3,645	3,434	3,812	4,138	4,530	5,077	5,374	5,836	6,648	7,074	8,294	8,798
Engine, turbine, and power transmission equipment	3336	NA	D	D	D	1,795	2,894	2,920	2,484	2,577	3,418 - 3,440	1,780	2,211	1,920	3,992	5,696	5,485
Other machinery	other 333	NA	6,566	D	D	7,736	D	7,943	7,147	7,387	8,030 - 8,057	9,352	10,031	11,748	10,981	11,618	10,515
Computer and electronic products	334	68,772	75,345	79,145	87,406	90,114	94,199	92,860	98,319	101,910	112,188	110,836	126,055	133,399	145,785	146,251	153,232
Communications equipment	3342	NA	17,069	15,197	18,877	20,392	22,048	23,049	16,124	15,568	16,467	15,814	15,483	15,965	15,167	D	16,688
Semiconductor and other electronic components	3344	26,082	29,354	32,146	38,300	40,611	42,028	40,348	41,789	41,362	45,795	48,175 i	56,207	64,684	75,987	71,135	74,100
Navigational, measuring, electromedical, and control instruments	3345	16,498	17,905	18,242	18,640	18,046	18,993	17,020	18,112	17,965	20,828	21,596	21,616	17,258	16,110	16,935	17,442
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	NA	4,548	4,987	4,999	2,837	5,049	3,599	3,553	3,702	1,167 - 14,309 i	4,621 i	3,371	3,591	5,007	5,357	3,793
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	NA	8,769	8,641	8,312	8,753	8,486	8,033	8,372	8,347	0 - 13,142	10,541	11,271	5,895	5,138	5,188	6,645
Other measuring and controlling devices	other 3345	NA	4,588	4,615	5,329	6,456	5,458	5,387	6,187	5,916	6,520	6,434	6,975	7,771	5,965	6,390	7,004
Other computer and electronic products	other 334	NA	11,017	13,559	11,589	11,065	11,130	12,443	22,294	27,016	29,099	25,251	32,748	35,492	38,521	D	45,002
Electrical equipment, appliances, and components	335	4,475	4,767	5,319	4,140	5,738	5,705	5,710	6,207	6,154	6,179	7,025	6,864	7,320	8,664	8,980	8,880

Table 57. Worldwide R&D paid for by the company and others and performed by the company, by industry and company size: 2009–24

(Millions of U.S. dollars)

Industry and company size	NAICS code	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Transportation equipment	336	56,183	51,362	49,030	50,415	51,547	56,597	57,698	60,161	59,432	59,850	53,518	55,736	62,312	80,141	82,280	79,271
Motor vehicles, bodies, trailers, and parts	3361–63	NA	17,764	D	D	23,610	D	25,735	6,671 - 54,230	30,069	31,869 - 31,899	31,440	29,308	36,862	39,764	38,824	37,737
Aerospace products and parts	3364	36,409	31,627	26,858	D	25,684	D	29,113	3,240 - 50,799	26,189	25,006	18,943 i	23,453	22,313 i	37,173	39,515	37,835
Aircraft, aircraft engine, and aircraft parts	336411–13	NA	D	D	D	D	D	27,463	1,812 - 49,371	24,666	23,683	17,476 i	21,791	20,671 i	25,222	27,724	26,748
Guided missile, space vehicle, and related parts	336414–15, 336419	NA	D	D	1,425	D	D	1,649 i	1,428 i	1,523	1,323	1,467	1,662	1,642	11,951	11,791	11,087
Military armored vehicle, tank, and tank components	336992	NA	D	52	D	9 i	D	16	3 - 38	9	11	35	11	24	31	25	33
Other transportation	other 336	NA	D	D	D	2,245	D	2,834	2,653 - 2,690 i	3,164	2,936 - 2,961	3,100	2,964	3,113	3,172	3,915	3,665
Furniture and related products	337	433	407	347	383	401	422	477	381	470	418 - 444	444	456	466	445	501	498
Miscellaneous	339	NA	9,528	D	D	18,900	14,951	15,869	18,045	19,257	20,515	22,005	21,650 - 24,298	25,455	27,984	27,886	29,822
Medical equipment and supplies	3391	NA	7,461	D	10,311	15,938	12,091	13,166	15,387 - 15,400	16,470	17,443	19,068	19,893	22,394	24,598	24,718	26,707
Other miscellaneous manufacturing	3399	NA	2,066	D	D	2,962	2,860	2,703 i	2,646 - 2,657 i	2,788	3,072	2,937	1,758 - 4,406	3,061	3,386	3,168	3,114
Nonmanufacturing industries	21–23, 42–81	99,713	94,840	105,669	113,220	120,242	130,682	141,279	154,547	170,574	204,293	246,779	273,240	332,646	379,812	395,165	434,282
Mining, quarrying, oil and gas extraction, and support activities	21	NA	2,785	2,597	D	4,452	D	4,348	3,604	3,647	1,990	3,306	1,290 i	1,069 i	1,008 i	1,117	2,217
Utilities	22	NA	442	396	368	317	314	483	353	336	283	284	271	D	D	602	623
Wholesale trade	42	NA	1,145	1,697 i	2,165 i	459 i	D	1,723 i	489 i	12,105	883 i	1,298	1,098	1,852 i	1,751	2,375 i	1,802 i
Electronic shopping and electronic auctions	454111–12	NA	D	D	D	1,845	D	D	0 - 14,624	12,105	11,715 - 15,515 i	69 - 21,372 i	18,875 - 25,758 i	D	D	9,572	10,188 i
Transportation and warehousing	48–49	NA	124	159	186	D	692	416	495	1,221	2,562 i	9,952 i	6,217 i	7,281	9,516	12,515	11,610
Information	51	43,197	45,099	52,341	56,815	68,375	78,013	77,965	84,400	94,412	111,653	129,742	152,284	177,621	215,567	237,092	274,536
Publishing	511	33,171	33,883	36,310	36,947	43,821	46,806	42,190	42,156	42,368	39,890	39,918	42,677 - 42,710	49,218	61,034	67,406	80,509
Newspaper, periodical, book, and directory publishers	5111	NA	826	401	221 i	348 i	92 i	107 i	84 i	72	150	61	30 - 63	100	72	13	497 i
Software publishers	5112	NA	33,058	35,910	36,726	43,473	46,714	42,083	42,073	42,296	39,739	39,857	42,647	49,118	60,961	67,392	80,012
Telecommunications	517	1,609	2,043	2,267	2,787 i	3,112	3,830	3,648	3,617 - 3,659	3,828	3,827 - 3,833	119 - 46,668	3,505 - 3,538	3,912	3,891	3,464	3,547
Data processing, hosting, and related services	518	3,008	2,895	5,450	5,574	7,787	10,356	10,600	14,051 - 14,099	18,893	28,214 - 28,226	37,071	49,620	55,447	61,645	66,881	72,547
Other information	other 51	5,410	6,278	8,313	11,506	13,654	17,022	21,526	24,530	29,323	39,713	6,086 - 52,635	56,449	69,044	88,997	99,341	117,933
Finance and insurance	52	NA	2,568	3,943	4,159	4,999	4,748	6,359	8,468	8,582	8,347	10,081	13,820	22,876	19,844	29,899	29,593
Real estate and rental and leasing	53	NA	367	D	400	202	268	313	477	892	1,072	1,472	3,412	2,199	2,500 i	2,348	2,856
Lessors of nonfinancial intangible assets (except copyrighted works)	533	NA	NA	365	379	D	58	D	27	77	6	48	6 - 13	7	5 i	16 i	23
Other real estate and rental and leasing	other 53	NA	NA	D	21 i	D	210	D	450	814	1,066	1,423	3,399 - 3,406	2,192	2,494 i	2,332	2,833

Table 57. Worldwide R&D paid for by the company and others and performed by the company, by industry and company size: 2009–24

(Millions of U.S. dollars)

Industry and company size	NAICS code	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	
Professional, scientific, and technical services	54	47,709	37,108	39,731	40,843	37,345	37,995	i 46,255	39,585 - 54,209	46,587	58,333	66,987	67,606	84,401	93,230	92,803	94,925	
Architectural, engineering, and related services	5413	3,384	4,156	D	2,541	i 3,173	3,374	4,158	i 56 - 9,557	2,575	4,005	4,192	4,223	4,510	3,920	4,026	3,931	
Computer systems design and related services	5415	15,310	12,458	13,181	13,404	i 10,535	i 12,579	i 17,227	15,483 - 20,617	17,190	20,378	26,357	21,242	24,909	27,119	30,783	32,634	
Scientific research and development services	5417	19,307	16,408	19,295	20,225	18,478	17,870	20,630	20,194	22,635	28,620	30,131	35,171	i 47,138	i 52,704	i 47,277	47,162	
Research and development in nanotechnology	541713	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	179	i 244	312	413	568	
Research and development in biotechnology (except nanobiotechnology)	541714	8,492	6,266	7,985	8,364	5,889	4,898	7,114	i 6,062	6,076	8,428 - 8,442	8,884	8,745 - 9,233	12,856	14,480	12,573	9,580	
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	10,129	9,591	10,697	11,261	11,794	12,291	12,807	13,409	15,680	19,507	20,473	i 25,569	i 33,468	i 37,208	i 33,728	i 36,299	
Research and development in the social sciences and humanities	541720	686	551	613	600	795	682	709	723	879	672 - 683	774	190 - 678	569	704	563	714	
Other professional, scientific, and technical services	other 54	9,708	4,086	D	4,674	5,158	4,172	i 4,240	3,852	4,188	5,330	6,307	6,970	7,844	9,487	10,717	11,199	i
Health care services	621–23	NA	D	D	708	i 535	i 501	i 771	i 1,002	1,132	1,497	2,290	1,485	2,163	2,910	2,831	2,118	
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	NA	NA	D	D	D	D	D	1,054 - 6,188	i 1,665	2,162 - 5,963	0 - 21,303	0 - 6,883	3,523	3,527	4,012	3,814	
All companies (number of domestic employees) ^a	–	336,571	338,451	359,490	374,916	396,352	416,343	429,174	457,591	484,740	543,369	595,683	648,421	744,338	843,065	874,887	929,809	
Micro companies																		
5–9	–	NA	3,792	4,143	3,025	i 3,442	i 3,409	i 3,101	i 1,728	i NA	NA	NA	NA	NA	NA	NA	NA	
Small companies																		
10–19	–	NA	NA	NA	NA	NA	NA	5,750	i 5,031	i 3,532	4,511	5,647	5,352	5,631	5,522	6,233	5,434	
20–49	–	NA	NA	NA	NA	NA	NA	10,654	i 9,972	9,513	11,825	12,753	13,542	15,799	15,615	15,720	17,384	
Medium companies	–																	
50–99		13,785	9,470	9,834	9,728	9,289	10,677	11,946	9,639	10,635	13,095	14,566	13,810	15,232	17,118	16,679	18,251	
100–249	–	14,365	12,989	13,354	13,665	14,980	15,081	14,964	16,160	18,584	20,486	21,707	27,382	25,955	29,926	33,211	32,183	
Large companies																		
250–499	–	12,315	11,439	14,573	12,693	13,379	13,675	14,837	14,751	16,522	21,971	21,517	23,862	28,269	33,674	33,855	33,288	
500–999	–	12,124	11,794	11,388	12,955	13,663	15,422	17,442	16,601	20,173	20,309	26,988	24,460	34,739	36,466	38,905	49,792	
1,000–4,999	–	54,600	60,782	63,801	62,729	69,212	71,679	71,259	79,017	79,494	83,959	92,592	107,102	116,273	128,956	150,381	152,811	
5,000–9,999	–	27,461	34,453	32,578	41,006	43,087	51,305	48,399	49,479	54,572	61,047	62,772	61,221	77,879	75,950	75,014	76,317	
10,000–24,999	–	61,681	50,710	61,593	60,544	60,844	63,818	70,864	81,547	87,965	108,249	111,685	111,585	132,811	150,436	160,251	177,871	
25,000 or more	–	118,424	125,067	132,719	144,097	152,547	155,180	159,959	173,666	183,750	197,916	225,456	260,105	291,751	349,403	344,639	366,479	

D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; NA = not available.

NAICS = 2017 North American Industry Classification System.

^a The Business Enterprise Research and Development Survey did not include companies with fewer than 5 domestic employees from 2008 to 2016 and does not include companies with fewer than 10 domestic employees beginning in 2017.

Note(s):
Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D and are not comparable with estimates published for years prior to 2018. For survey years 2009–13, industry classification was based on the 2007 NAICS. For survey years 2014–19, industry classification was based on the 2012 NAICS. For survey years beginning in 2020, classification was based on the 2017 NAICS. Beginning with survey year 2011, the composition of the other nonmanufacturing industry changed. Most statistics for years prior to 2024 have been revised since original publication. Revised statistics include adjustments based on information obtained after the original statistics were prepared. An estimate range may be displayed in place of a single estimate to avoid disclosing operations of individual companies.

Source(s):
National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey.

Table 58. Domestic R&D paid for by the company and others and performed by the company, by industry and company size: 2008–24

(Millions of U.S. dollars)

Industry and company size	NAICS code	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
All industries	21–23, 31–33, 42–81	290,680	282,505	279,289	290,240	302,759	323,107	340,539	355,671	378,590	396,979	443,633	491,434	538,870	608,429	691,987	723,206	765,082
Manufacturing industries	31–33	203,755	196,441	199,147	202,363	208,577	222,718	231,705	236,170	249,999	255,602	274,315	284,673	309,021	333,362	377,701	394,260	405,092
Food	311	2,100	4,099	D	4,393	4,087	5,021	4,854 i	4,828	4,830	4,588	4,595	4,179	5,234 - 5,245	5,152	7,147	5,827	6,288 i
Beverage and tobacco products	312	780	477	D	D	D	827	920	1,006	1,076 - 1,099	1,098	1,113	1,082	1,169	1,247	766	974	1,459
Textile, apparel, and leather products	313–16	815	439	482	608	553	662	631	748	1,166 i	959	1,005	903	822	630	647	747	788
Wood products	321	273	280	252	211	280	220	336 i	195	166 - 204	173	203	186	185 - 192	444	261	258	267
Paper	322	NA	NA	1,341	676	752	920	723	766	854	1,327	933	1,059	928	1,139	1,005	1,235	1,240
Printing and related support activities	323	349	210	231	181	256 i	252 i	234	196 i	219 i	231	242	412 i	287	194 i	168	333	255
Petroleum and coal products	324	NA	NA	D	D	888	281	234	214	268	324	1,269	1,306	0 - 2,641	957	860	961	1,006
Chemicals	325	58,250	54,753	58,343	55,853	56,748	62,086	66,134	68,032	71,803	75,733	84,367	97,180	101,359	112,806	125,777	137,083	143,745
Basic chemicals	3251	NA	NA	1,810	D	2,705	2,620	2,849	3,042	0 - 5,157	2,544	2,443	2,360	2,697	2,713	2,875	3,200	3,120
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	NA	NA	783	798	997	1,197	1,154	1,201	0 - 5,157	541	1,636 - 1,662	1,172	1,233	1,389 i	1,492	1,412	1,354
Pesticide, fertilizer, and other agricultural chemicals	3253	NA	NA	D	D	D	1,691 i	1,743 i	D	0 - 5,157	1,469	1,460	1,822 - 1,846	961 - 1,173	1,156	1,193	2,054	1,253
Pharmaceuticals and medicines	3254	48,131	46,415	49,469	46,308	47,851	52,790	56,482	57,332	62,346 - 67,504	66,870	74,815	87,735	92,050	103,534	116,108	126,202	133,627
Soap, cleaning compound, and toilet preparations	3256	NA	NA	2,400	2,476	2,342	2,434	2,548	2,579	2,800	2,860	2,720	2,760	2,665	2,742	2,886	2,992	2,956
Paint, coating, adhesive, and other chemicals	3255, 3259	NA	NA	D	1,290	D	1,354	1,357 i	D	1,500 - 1,523	1,450	1,265 - 1,294	1,302 - 1,334	1,540 - 1,753	1,271	1,223	1,224	1,435
Plastics and rubber products	326	1,817	2,388	2,129	2,278	3,585	3,647	3,614	2,549	3,752	3,722	2,742	2,857	2,616	3,143	3,470	3,178	2,908
Nonmetallic mineral products	327	1,556	1,098 i	1,314 i	1,175	1,327 i	1,329 i	1,445 i	1,259	1,289	1,304	1,385	1,507 i	1,696 i	1,532	1,464	1,360	1,578 i
Primary metals	331	695	863	681	655	741	618	677	625	592	747	839	663	816	925	1,120	616	1,174
Fabricated metal products	332	2,419	2,057	1,727	1,857	1,827 i	2,194 i	2,107 i	2,273 i	2,094	2,234	2,316	2,866	3,390	4,044	3,526	3,132	3,230
Machinery	333	10,104	9,226	10,260	14,725	13,752	12,586	12,106	13,539	12,718	13,341	14,770	15,182	16,243	17,747	19,410	22,678	22,035
Agricultural implement	33311	NA	NA	1,345	1,277	1,546	1,597	1,578	1,531	1,565	1,565	1,872	1,920	1,807 - 1,811	1,867	2,287	2,500	2,561
Semiconductor machinery	333242	NA	NA	2,173	2,351	1,291	3,194	2,941	3,214	3,411	3,737	4,166	4,459	4,809	5,349	5,438	6,517	6,851
Engine, turbine, and power transmission equipment	3336	NA	NA	1,430	4,273	4,336	1,448	2,356	2,515	2,060	649 - 2,579	2,483	1,301	1,653 - 1,657	1,374	2,922	4,423	4,230
Other machinery	other 333	NA	NA	5,312	6,824	6,579	6,347	5,229	6,280	5,683	5,459 - 7,388	6,249	7,503	7,969	9,157	8,764	9,238	8,394
Computer and electronic products	334	60,464	55,856	61,623	62,438	66,290	68,629	73,256	72,182	77,451	78,003	83,948	85,571	99,523	101,830	109,104	111,151	115,599
Communications equipment	3342	NA	NA	13,875	12,335	14,352	15,663	18,345	19,424	13,156	12,492	13,090	12,497 - 12,503	12,096	12,555	11,658	D	12,839
Semiconductor and other electronic components	3344	22,324	20,023	23,011	24,237	28,218	30,176	31,668	30,451	31,413	30,373	30,232 - 43,377	35,178 i	43,184	48,134	53,054	50,288	52,358
Navigational, measuring, electromedical, and control instruments	3345	15,460	14,318	15,747	15,852	15,918	15,119	15,871	14,202	14,885	14,325	4,671 - 17,814	17,644	18,505	13,676	13,446	13,975	14,083

Table 58. Domestic R&D paid for by the company and others and performed by the company, by industry and company size: 2008–24

(Millions of U.S. dollars)																			
Industry and company size	NAICS code	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	NA	NA	4,189	4,430	4,413	2,634	3,975	2,676	2,632	2,632	0 - 13,142	3,342	2,874	3,119	4,578	4,860	3,245	
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	NA	NA	8,293	8,066	7,734	8,106	7,861	7,360	7,532	7,379	0 - 13,142	9,662	10,587	5,301	4,815	4,785	6,161	
Other measuring and controlling devices	other 3345	NA	NA	3,265	3,356	3,772	4,379	4,035	4,165	4,722	4,314	4,672	4,640	5,044	5,256	4,053	4,330	4,677	
Other computer and electronic products	other 334	NA	NA	8,990	10,014	7,801	7,671	7,372	8,105	17,997	20,814	22,811	20,244 - 20,254	25,738	27,465	30,946	D	36,318	
Electrical equipment, appliances, and components	335	3,143	3,317	3,320	3,624	3,078	4,133	4,323	4,359	4,771	4,319	4,487	5,282	5,029	5,463	7,089	7,170	6,999	
Transportation equipment	336	50,552	48,209	42,940	41,094	42,340	43,648	46,977	49,286	51,569	50,698	52,446	45,482	49,223	54,651	72,095	73,928	71,231	
Motor vehicles, bodies, trailers, and parts	3361–63	NA	NA	D	D	D	16,733	18,518	19,113	0 - 47,558	23,542	25,393	24,223	23,516 - 23,521	30,144	33,720	32,574	31,812	
Aerospace products and parts	3364	36,941	34,563	29,857	26,086	i 24,874	i 24,783	26,292	i 27,440	1,423 - 48,982	24,154	24,301	18,358	i 22,944	21,602	i 35,354	37,643	35,904	
Aircraft, aircraft engine, and aircraft parts	336411–13	NA	NA	24,777	i 24,839	i 23,454	i D	25,002	i 25,793	0 - 47,558	22,629 - 24,155	22,978	16,891	i 21,291	19,978	i 24,569	27,056	D	
Guided missile, space vehicle, and related parts	336414–15, 336419	NA	NA	5,080	1,247	1,420	D	1,290	i 1,647	i 1,424	i 0 - 1,524	1,323	1,467	1,652	1,623	10,785	10,587	D	
Military armored vehicle, tank, and tank components	336992	NA	NA	D	51	D	9	i 18	16	3 - 38	9	11	35	11	D	30	25	33	
Other transportation	other 336	NA	NA	D	D	D	2,124	2,148	i 2,716	2,549 - 2,586	i 2,993	2,741	2,866	2,748 - 2,753	D	2,992	3,685	3,481	
Furniture and related products	337	477	395	374	319	360	374	377	452	359	430	409	409	418	428	410	470	450	
Miscellaneous	339	NA	NA	D	D	D	15,292	12,757	13,662	14,988	16,370	17,245	18,546	17,431 - 20,077	21,031	23,383	23,159	24,840	
Medical equipment and supplies	3391	NA	NA	6,459	7,796	8,333	12,741	10,309	11,353	12,647 - 12,660	13,930	14,559	16,022	16,071	18,394	20,394	20,355	22,126	
Other miscellaneous manufacturing	3399	NA	NA	D	D	D	2,551	2,449	2,309	i 2,329 - 2,340	i 2,439	2,686	2,524	1,360 - 4,006	2,636	2,989	2,804	2,715	
Nonmanufacturing industries	21–23, 42–81	86,926	86,064	80,142	87,877	94,183	100,389	108,834	119,501	128,591	141,377	169,318	206,761	229,849	275,067	314,286	328,946	359,990	
Mining, quarrying, oil and gas extraction, and support activities	21	NA	NA	2,545	2,365	3,031	4,000	4,633	4,012	3,296	3,292	1,827	2,716	1,165 - 1,167	D	D	1,060	1,862	
Utilities	22	NA	NA	425	358	348	294	313	480	351	326	275	275	264	D	D	587	613	
Wholesale trade	42	NA	NA	1,092	1,556	i 2,053	i 452	i 339	i 1,698	i 467	i 0 - 9,599	851	i 1,186	1,053	D	D	2,198	i 1,692	i
Electronic shopping and electronic auctions	454111–12	NA	NA	D	949	i 1,353	1,356	i 1,388	D	0 - 9,499	i 0 - 9,599	11,652	i 0 - 17,176	i 14,518 - 20,878	i D	D	8,026	i 7,898	i
Transportation and warehousing	48–49	NA	NA	95	132	178	D	679	403	488	1,214	2,548	i 9,890	i 6,180	i 7,208	9,395	12,256	11,341	
Information	51	37,695	35,953	37,088	42,697	46,900	56,608	64,277	65,457	70,946	80,120	94,507	110,665	129,379	148,069	178,314	196,835	228,174	
Publishing	511	28,427	26,838	26,957	28,411	29,067	34,365	36,621	33,348	33,459	33,868	32,716	32,973	34,994 - 35,027	38,935	48,180	53,232	63,596	
Newspaper, periodical, book, and directory publishers	5111	NA	NA	770	372	219	i 342	i 88	i 98	i 79	i 66	131	61	30 - 63	100	72	13	489	i
Software publishers	5112	NA	NA	26,187	28,039	28,848	34,023	36,533	33,250	33,379	33,802	32,585	32,912	34,964	38,835	48,108	53,219	63,108	
Telecommunications	517	1,684	1,523	1,912	2,169	2,729	i 3,049	3,768	3,607	3,568 - 3,611	i 3,733	3,696	0 - 46,548	3,411 - 3,444	3,835	3,690	3,350	3,323	

Table 58. Domestic R&D paid for by the company and others and performed by the company, by industry and company size: 2008–24

(Millions of U.S. dollars)

Industry and company size	NAICS code	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Data processing, hosting, and related services	518	6,567	2,741	2,753	5,111	4,914	7,156	9,062	9,355	9,344 - 14,099	16,623	23,472	31,146	41,468	45,623	49,404	53,297	58,772
Other information	other 51	1,016	4,850	5,466	7,006	10,190	12,039	14,826	19,147	19,820 - 24,532	25,896	34,623	0 - 46,548	49,473	59,676	77,040	86,955	102,484
Finance and insurance	52	NA	NA	2,101	3,447	3,530	4,412	4,122	5,409	7,331	7,611	7,425	8,906	12,280	20,415	17,231	26,183	25,463
Real estate and rental and leasing	53	NA	NA	330	343	363	191	262	300	475	772 - 852	1,021	1,368	3,249	2,096	2,398	2,255	2,750
Lessors of nonfinancial intangible assets (except copyrighted works)	533	NA	NA	NA	324	342	58	55	68	27	0 - 79	6	45	7	D	5	15	23
Other real estate and rental and leasing	other 53	NA	NA	NA	19	21	133	207	232	448	773	1,015	1,323	3,242	D	2,393	2,239	2,727
Professional, scientific, and technical services	54	37,954	42,380	31,798	33,307	34,121	30,926	31,461	38,601	33,839 - 43,338	36,024	45,575	52,318	53,937	65,668	74,142	72,997	74,548
Architectural, engineering, and related services	5413	3,422	3,258	4,008	3,114	2,483	3,132	3,309	4,100	0 - 9,499	2,525	3,463 - 4,007	4,154	4,202	4,471	3,885	3,978	3,893
Computer systems design and related services	5415	12,146	13,351	10,359	10,938	11,006	9,241	11,053	14,334	15,484	13,702	16,553	20,988	17,932	20,295	22,548	25,383	26,764
Scientific research and development services	5417	17,913	16,402	13,712	15,713	16,415	14,219	13,324	16,249	14,778	16,029	20,225	21,218	25,164	33,520	39,058	34,138	33,942
Research and development in nanotechnology	541713	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	175 - 180	228	282	387	548
Research and development in biotechnology (except nanobiotechnology)	541714	NA	7,809	5,537	7,043	7,387	4,492	3,459	5,594	4,445	4,207	5,848	6,119	5,868 - 6,356	8,473	10,387	8,883	6,751
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	NA	7,916	7,628	8,058	8,431	8,935	9,187	9,950	9,613	10,946	13,707	14,333	18,445	24,255	27,686	24,307	25,931
Research and development in the social sciences and humanities	541720	NA	676	547	612	598	792	678	705	719	876	671	766	184 - 676	564	702	562	712
Other professional, scientific, and technical services	other 54	4,474	9,370	3,720	3,542	4,216	4,334	3,775	3,918	3,579	3,770	4,788 - 5,332	5,958	6,639	7,382	8,651	9,498	9,949
Health care services	621–23	NA	NA	1,049	542	672	528	501	758	848	921	1,475	2,266	1,456 - 1,475	D	2,818	2,696	2,020
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	NA	NA	NA	2,181	1,635	D	857	D	1,055	1,503	2,163	0 - 17,176	0 - 6,356	D	3,381	3,853	3,628
All companies (number of domestic employees) ^a	–	290,680	282,505	279,289	290,240	302,759	323,107	340,539	355,671	378,590	396,979	443,633	491,434	538,870	608,429	691,987	723,206	765,082
Micro companies																		
5–9	–	NA	NA	3,614	4,060	2,926	3,390	3,314	2,983	1,583	NA	NA	NA	NA	NA	NA	NA	NA
Small companies																		
10–19	–	NA	NA	NA	NA	NA	NA	NA	5,674	4,930	3,390	4,383	5,509	5,064	5,272	5,262	5,814	4,790
20–49	–	NA	NA	NA	NA	NA	NA	NA	10,281	9,635	9,084	11,255	12,301	12,938	14,892	14,703	14,483	16,179
Medium companies																		
50–99	–	9,351	13,277	8,781	9,295	9,100	8,939	10,130	11,538	9,275	10,164	12,412	13,829	13,014	14,368	16,153	15,612	17,078
100–249	–	14,662	12,791	11,631	12,303	12,454	13,704	13,606	13,586	14,860	17,205	18,611	19,667	25,331	23,580	27,899	30,662	29,325
Large companies																		
250–499	–	10,219	11,330	10,194	13,013	11,387	12,021	12,228	13,686	12,978	14,312	19,775	18,799	20,977	24,611	29,440	29,657	28,852

Table 58. Domestic R&D paid for by the company and others and performed by the company, by industry and company size: 2008–24

(Millions of U.S. dollars)

Industry and company size	NAICS code	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
500–999	–	11,886	10,131	10,053	9,993	11,499	12,013	13,129	15,005	14,441	17,736	17,753	24,062	21,273	29,914	31,799	33,838	44,697
1,000–4,999	–	46,336	44,197	49,108	51,110	50,311	55,974	57,336	57,998	63,431	64,838	68,764	75,990	88,584	95,324	104,505	124,135	123,813
5,000–9,999	–	24,764	21,769	27,546	24,452	30,708	31,657	38,327	38,858	40,530	40,340	45,509	50,852	49,376	62,303	60,410	61,277	62,950
10,000–24,999	–	48,737	51,239	41,853	49,107	50,226	51,103	54,452	59,330	66,032	73,540	86,463	88,144	88,512	104,406	118,903	125,829	140,348
25,000 or more	–	100,820	97,056	99,291	102,222	110,042	119,493	122,533	126,732	140,895	146,369	158,707	182,282	213,801	233,760	282,914	281,898	297,050

D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; NA = not available.

NAICS = 2017 North American Industry Classification System.

^a The Business Enterprise Research and Development Survey did not include companies with fewer than 5 domestic employees from 2008 to 2016 and does not include companies with fewer than 10 domestic employees beginning in 2017.

Note(s):
Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D and are not comparable with estimates published for years prior to 2018. For survey year 2008, industry classification was based on the 2002 NAICS. For survey years 2009–13, industry classification was based on the 2007 NAICS. For survey years 2014–19, industry classification was based on the 2012 NAICS. For survey years beginning in 2020, classification was based on the 2017 NAICS. Beginning with survey year 2011, the composition of the other nonmanufacturing industry changed. Most statistics for years prior to 2024 have been revised since original publication. Revised statistics include adjustments based on information obtained after the original statistics were prepared. An estimate range may be displayed in place of a single estimate to avoid disclosing operations of individual companies.

Source(s):
National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey.

Table 59. Foreign R&D paid for by the company and others and performed by the company, by industry and company size: 2008–24

(Millions of U.S. dollars)

Industry and company size	NAICS code	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
All industries	21–23, 31–33, 42–81	61,475	54,066	59,162	69,251	72,157	73,245	75,804	73,503	79,001	87,761	99,736	104,248	109,551	135,908	151,078	151,681	164,727
Manufacturing industries	31–33	46,572	40,417	44,464	51,458	53,120	53,392	53,955	51,725	53,045	58,565	64,761	64,230	66,159	78,330	85,552	85,462	90,435
Food	311	596	817	1,006	1,195	1,076	1,315	1,282	1,231	994	835	865	835	1,150 - 1,161	1,190	1,463	1,302	1,523
Beverage and tobacco products	312	123	455	783	599	532	531	503	523	0 - 555	671	516	674	732	893	629	864	998
Textile, apparel, and leather products	313–16	367	80	39	49	52	98	103	70	81	172	218	157	152	86	115	129	118
Wood products	321	4	2	3	1	2	2	5	3	0 - 555	1	3	7	8	4	4	3	2
Paper	322	274	257	324	93	106	103	158	102	89	267	80	101	93	67	81	73	78
Printing and related support activities	323	9	7	38	30	35	6	3	2	4	5	4	9	10	27	2	8	5
Petroleum and coal products	324	D	156	D	D	D	46	64	38	44	53	192 - 194	171 - 176	165	175	247	162	199
Chemicals	325	13,990	9,689	14,267	16,215	13,470	12,464	13,294	12,929	12,809	14,503	16,766	18,601	19,305	23,764	25,067	25,338	26,941
Basic chemicals	3251	1,198	797	861	D	695	716	784	636	537	557	603	742	758	997	956	931	921
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	224	260	255	319	D	597	688	579	333	264	774 - 798	523	512	580	539	536	516
Pesticide, fertilizer, and other agricultural chemicals	3253	371	D	D	D	D	275	299	D	0 - 5,157	396	321 - 337	450	0 - 212	123	151	598	168
Pharmaceuticals and medicines	3254	10,862	7,041	11,068	12,557	11,069	9,690	10,249	D	5,688 - 10,846	12,133	13,962	15,900	16,793	20,959	22,272	22,133	24,122
Soap, cleaning compound, and toilet preparations	3256	965	873	884	910	870	924	952	D	789	839	847	757	767	871	917	895	950
Paint, coating, adhesive, and other chemicals	3255, 3259	370	D	D	195	210	263	321	D	307	314	235 - 259	227	264 - 477	234	232	245	264
Plastics and rubber products	326	341	595	386	362	861	929	905	358	831	904	428	491	527	607	682	443	418
Nonmetallic mineral products	327	106	54	282	253	261	249	155	228	185	181	181	192	205	198	159	203	227
Primary metals	331	114	130	121	108	77	82	94	86	69	116	151	58 - 85	32	49	19	64	178
Fabricated metal products	332	188	117	91	135	122	109	222	194	179	171	216	278	349	378	231	310	748
Machinery	333	1,929	1,930	2,143	3,587	3,710	2,833	2,984	3,288	3,239	3,285	4,509	4,101	4,286	5,343	5,914	6,542	6,419
Agricultural implement	33311	399	391	D	293	596	646	D	621	625	566	858	857	640 - 644	907	990	1,111	1,096
Semiconductor machinery	333242	366	285	296	376	66	451	493	599	727	793	911	915	1,027	1,299	1,636	1,777	1,947
Engine, turbine, and power transmission equipment	3336	92	83	D	D	D	347	537	405	424	0 - 1,928	935 - 958	479	554 - 558	546	1,071	1,273	1,255
Other machinery	other 333	1,072	1,170	1,254	D	D	1,389	D	1,664	1,464	0 - 1,928	1,781 - 1,807	1,850	2,062	2,591	2,217	2,380	2,121
Computer and electronic products	334	15,774	12,917	13,722	16,708	21,117	21,485	20,943	20,678	20,868	23,907	28,240	25,264	26,531	31,569	36,681	35,100	37,633
Communications equipment	3342	2,951	2,862	3,194	2,863	4,525	4,730	3,702	3,625	2,967	3,076	3,377	3,312 - 3,316	3,387	3,411	3,509	D	3,848
Semiconductor and other electronic components	3344	7,075	6,058	6,343	7,909	10,082	10,434	10,360	9,896	10,377	10,989	2,418 - 15,563	12,996	13,023	16,550	22,933	20,847	21,742
Navigational, measuring, electromedical, and control instruments	3345	2,308	2,180	2,158	2,390	2,722	2,927	3,122	2,819	3,227	3,640	3,015 - 16,157	3,952	3,112	3,581	2,664	2,961	3,359
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	838	522	360	557	586	202	1,073	923	922	1,069	1,168	1,280	497	472	429	498	548
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	D	508	475	575	578	647	625	673	840	968	0 - 13,142	878	684	594	323	403	484
Other measuring and controlling devices	other 3345	D	1,149	1,324	1,258	1,557	2,077	1,423	1,222	1,465	1,603	1,848	1,794	1,931	2,516	1,912	2,060	2,327

Table 59. Foreign R&D paid for by the company and others and performed by the company, by industry and company size: 2008–24

(Millions of U.S. dollars)

Industry and company size	NAICS code	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Other computer and electronic products	other 334	3,440	1,817	2,027	3,546	3,788	3,395	3,759	4,338	4,297	6,202 i	6,287	4,997 - 5,007 i	7,010	8,027	7,575	D	8,683
Electrical equipment, appliances, and components	335	1,162	1,158	1,447	1,695	1,062	1,605	1,382	1,351	1,436	1,835	1,692	1,742	1,835	1,857	1,575	1,809 i	1,880 i
Transportation equipment	336	10,267	7,974	8,422	7,936	8,075	7,899	9,621	8,412	8,592	8,734	7,404	8,036	6,513	7,662	8,045	8,352	8,040
Motor vehicles, bodies, trailers, and parts	3361–63	8,448	6,023	D	D	D	6,877	D	6,622	6,672	6,527	6,476 - 6,506	7,217	5,787 - 5,792	6,718	6,045	6,249	5,925
Aerospace products and parts	3364	1,816	1,846	1,770	772	D	901	D	1,672	1,817	2,035	705	585	509	711	1,819	1,873	1,931
Aircraft, aircraft engine, and aircraft parts	336411–13	1,742	1,760	D	D	D	D	D	1,670	1,813	511 - 2,036	705	585	500	693	653	669	D
Guided missile, space vehicle, and related parts	336414–15, 336419	74	85	D	D	5	D	D	2	4	0 - 1,524	1	*	10	18	1,166	1,204	D
Military armored vehicle, tank, and tank components	336992	0	D	D	1	0	0	D	0	0	0	0	0	0	D	1	0	0
Other transportation	other 336	3	D	D	D	D	121	D	118	104	171	195 - 221	234	211 - 216	D	181	230	184
Furniture and related products	337	27	38	33	28	23	28	45	25	22	40	9 - 33	35	39	38	36	32	47
Miscellaneous	339	D	4,044	D	D	D	3,608	2,194	2,207	3,057	2,888	3,271	3,459	4,215 - 4,226	4,424	4,601	4,727	4,981
Medical equipment and supplies	3391	766	3,813	1,003	D	1,978	3,197	1,782	1,813	2,739	2,539	2,884	3,046	3,821	4,000	4,204	4,363	4,582
Other miscellaneous manufacturing	3399	D	231	D	D	D	411	412	394 i	317 i	348	386	413	393 - 404	425	397	364	399
Nonmanufacturing industries	21–23, 42–81	14,903	13,648	14,698	17,792	19,037	19,853	21,849	21,778	25,956	29,196	34,975	40,018	43,391	57,578	65,526	66,219	74,292
Mining, quarrying, oil and gas extraction, and support activities	21	D	D	239	232	D	452	D	336	308	355 i	163	589	123 - 125 i	D	D	57	355
Utilities	22	6	13	17	38	21	23	1	3	1	10	8	9	6	D	D	15	10
Wholesale trade	42	509	D	53	141 i	112 i	7	D	25 i	21 i	0 - 2,590	32	112	45	D	D	176 i	110 i
Electronic shopping and electronic auctions	454111–12	NA	NA	D	D	D	490	D	D	0 - 5,132 i	0 - 2,590	63 - 3,863 i	69 - 4,198 i	4,345 - 4,891 i	D	D	1,546 i	2,291 i
Transportation and warehousing	48–49	2	1	29	28 i	8 i	D	13	13	7	7	14	62	37	73	121	258	270
Information	51	7,657	7,243	8,011	9,644	9,915	11,767	13,736	12,508	13,454	14,292	17,146	19,077	22,905	29,552	37,253	40,257	46,361
Publishing	511	6,301	6,332	6,926	7,899	7,880	9,456	10,185	8,842	8,698	8,500	7,174	6,945	7,683	10,284	12,854	14,173	16,913
Newspaper, periodical, book, and directory publishers	5111	27	47	55	29	2 i	6 i	4 i	9	4	6	19	0	0	* i	* i	0	9 i
Software publishers	5112	6,274	6,285	6,871	7,870	7,878	9,450	10,181	8,833	8,693	8,494	7,154	6,945	7,683	10,284	12,854	14,173	16,904
Telecommunications	517	175	86	131	98	59	63	61	41	49	96	131 - 138	120	94	77 i	201	114	224
Data processing, hosting, and related services	518	1,089 i	266	142 i	339	661	631	1,294	1,245	0 - 4,710	2,270	4,742 - 4,753	5,924	8,152	9,824	12,240	13,584	13,775
Other information	other 51	93	559	812	1,308	1,316	1,616	2,196	2,378	0 - 4,710	3,427	5,090	6,087	6,976	9,367 i	11,958	12,386	15,449
Finance and insurance	52	74	518	467	496	628	587	625	950	1,136	971	923	1,175	1,540	2,461	2,613	3,715	4,129
Real estate and rental and leasing	53	65	28	37	D	38	11	6	13	2	40 - 120	51	104	163	103	102 i	93	106
Lessors of nonfinancial intangible assets (except copyrighted works)	533	NA	NA	NA	41	37	D	3	D	*	0 - 79	0	4	0 - 6	D	1 i	* i	0
Other real estate and rental and leasing	other 53	NA	NA	NA	D	* i	D	3	D	2	41	51	101	157 - 164	D	101 i	93	106
Professional, scientific, and technical services	54	6,150	5,328	5,309	6,424	6,723	6,418	6,534	7,653	5,744 - 10,877	10,563	12,758	14,669	13,668 i	18,733 i	19,088 i	19,806	20,377
Architectural, engineering, and related services	5413	200	126	148 i	D	57	41	65	58	57 i	50	0 - 542 i	37	20	39 r	36	48	37
Computer systems design and related services	5415	2,164	1,959	2,099	2,243 i	2,398 i	1,293	1,525 i	2,893	0 - 5,132	3,488	3,825	5,369	3,310	4,614	4,570	5,400	5,870

Table 59. Foreign R&D paid for by the company and others and performed by the company, by industry and company size: 2008–24

(Millions of U.S. dollars)

Industry and company size	NAICS code	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Scientific research and development services	5417	3,544	2,905	2,696	3,581	3,810	4,259	4,546	4,380	5,416	6,606	8,394	8,913 i	10,007 i	13,618 i	13,646 i	13,139 i	13,219
Research and development in nanotechnology	541713	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0 - 4	16	30	26	19
Research and development in biotechnology (except nanobiotechnology)	541714	NA	683	729	942	977	1,398	1,438	1,520	1,616	1,869	2,580 - 2,594	2,764	2,877	4,383	4,093 i	3,691	2,830
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	NA	2,213	1,962	2,638	2,830	2,859	3,103	2,858	3,796	4,733	5,801	6,140 i	7,124 i	9,214 i	9,521 i	9,421 i	10,368
Research and development in the social sciences and humanities	541720	NA	9	5	1	2	3	4 i	3	4	3	1 - 12	8	2 - 6	5	2	1	2
Other professional, scientific, and technical services	other 54	241	338	366	D	458	825	398 i	322	273	418	0 - 542	349	331	463	836	1,219	1,250 i
Health care services	621–23	1	10	D	D	36	7	*	12 i	154	211	22	24	10 - 29	D	93	135	98 i
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	NA	NA	NA	D	D	D	D	D	0 - 5,132	162	0 - 3,800	0 - 4,131	0 - 527	D	146	159	186
All companies (number of domestic employees) ^a	–	61,475	54,066	59,162	69,251	72,157	73,245	75,804	73,503	79,001	87,761	99,736	104,248	109,551	135,908	151,078	151,681	164,727
Micro companies																		
5–9	–	NA	NA	178	83	99 i	52 i	95 i	118 i	145	NA	NA	NA	NA	NA	NA	NA	NA
Small companies																		
10–19	–	NA	NA	NA	NA	NA	NA	NA	76	101	142	128	138	288	359	260	419	644
20–49	–	NA	NA	NA	NA	NA	NA	NA	373	337	429	569	452	604	907	912	1,237	1,205
Medium companies																		
50–99	–	976	509	688 i	539	628	351	547	407	364	471	684	737	796	864	965	1,067	1,173
100–249	–	1,735	1,574	1,358 i	1,051	1,212	1,276	1,475	1,378	1,300	1,379	1,875	2,040	2,052	2,374	2,026	2,549	2,858
Large companies																		
250–499	–	1,178	985	1,245	1,561	1,306	1,359	1,446	1,151	1,773	2,210	2,196	2,718	2,884	3,657	4,235	4,198	4,436
500–999	–	1,753	1,992	1,741	1,396	1,455	1,650	2,293	2,437	2,159	2,437	2,557	2,925	3,187	4,825	4,668	5,067	5,095
1,000–4,999	–	11,350	10,403	11,674	12,691	12,419	13,238	14,343	13,261	15,587	14,656	15,195	16,602	18,518	20,949	24,452	26,246	28,998
5,000–9,999	–	7,000	5,692	6,907	8,126	10,298	11,430	12,979	9,541	8,949	14,232	15,538	11,919	11,845	15,576	15,540	13,737	13,367
10,000–24,999	–	11,785	10,442	8,856	12,485	10,317	9,741	9,366	11,534	15,515	14,425	21,787	23,541	23,073	28,406	31,533	34,421	37,522
25,000 or more	–	24,671	21,368	25,777	30,497	34,056	33,054	32,647	33,226	32,771	37,381	39,208	43,175	46,304	57,991	66,488	62,741	69,429

* = amount < \$500,000; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%; NA = not available.

NAICS = 2017 North American Industry Classification System.

^a The Business Enterprise Research and Development Survey did not include companies with fewer than 5 domestic employees from 2008 to 2016 and does not include companies with fewer than 10 domestic employees beginning in 2017.

Note(s):
Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D and are not comparable with estimates published for years prior to 2018. For survey year 2008, industry classification was based on the 2002 NAICS. For survey years 2009–13, industry classification was based on the 2007 NAICS. For survey years 2014–19, industry classification was based on the 2012 NAICS. For survey years beginning in 2020, classification was based on the 2017 NAICS. Beginning with survey year 2011, the composition of the other nonmanufacturing industry changed. Most statistics for years prior to 2024 have been revised since original publication. Revised statistics include adjustments based on information obtained after the original statistics were prepared. An estimate range may be displayed in place of a single estimate to avoid disclosing operations of individual companies.

Source(s):
National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey.

Table 60. Worldwide R&D paid for by the company and performed by the company and others, by business activity: 2008–24

(Millions of U.S. dollars)																		
Business activity ^a	Business code ^b	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
All business activities	21100–81000	328,040	311,170	316,262	336,629	352,951	376,974	399,656	412,590	440,429	471,440	523,512	570,184	613,845	716,646	801,111	830,806	890,002
Oil and gas extraction	21100	1,215	1,223	1,268	1,379	D	1,487	1,308	1,486	1,089	986	0 - 23,467	902	790	681	524	991	958
Mining	21200	NA	D	75	128	92	114	56	71	63	170	114	0 - 25,025	114	102	i 158	i D	112
Support activities for mining, including oil and gas	21300	NA	993	1,638	1,386	1,814	1,749	1,995	1,831	1,380	1,577	951	i 1,650	i 928	660	881	i 582	667
Utilities	22100	NA	1,607	903	639	686	615	549	726	515	501	0 - 23,467	415	424	740	D	1,161	1,355
Construction	23000	NA	198	918	269	393	i 307	297	700	276	501	691	880	1,069	746	750	789	778
Food manufacturing	31100	2,983	4,039	4,478	4,970	4,635	7,028	6,842	5,892	6,073	5,827	5,806	5,905	6,334	6,397	7,650	7,359	8,023
Beverage manufacturing	31210	605	564	926	668	641	772	753	728	787	i 851	762	723	817	942	894	1,217	1,071
Tobacco manufacturing	31220	D	792	800	717	662	668	672	681	731	853	722	807	821	999	988	1,246	1,046
Textile, apparel, and leather products manufacturing	31990	NA	673	658	712	759	787	780	847	1,333	1,093	1,155	965	918	661	700	815	877
Wood products manufacturing	32100	264	304	239	208	D	244	336	i 251	0 - 7,094	263	297	0 - 25,025	271	506	342	331	393
Paper manufacturing	32200	1,130	1,144	1,231	1,156	1,362	1,588	1,614	D	1,555	1,743	1,592	1,784	1,531	1,840	1,637	1,721	1,581
Printing and related support activities	32300	297	241	244	265	356	i 391	390	321	340	286	359	468	395	360	403	615	493
Petroleum refineries	32401	NA	NA	708	591	807	558	617	526	625	567	640	0 - 25,025	0 - 26,968	537	558	631	626
Asphalt paving, roofing, and saturated materials manufacturing	32402	NA	NA	35	39	45	123	78	75	93	137	134	134	225	174	D	145	141
Other petroleum and coal products manufacturing, including motor oil, hydraulic fluid, and charcoal	32403	NA	NA	403	415	382	488	460	i 416	339	383	258	0 - 25,025	238	220	319	262	235
Basic chemicals manufacturing	32510	3,806	2,978	3,133	3,614	4,271	4,136	4,036	3,505	3,579	3,576	3,540	3,267	3,776	4,033	4,034	4,150	4,315
Resin, synthetic rubber, and artificial synthetic fibers and filaments manufacturing	32520	1,152	1,459	1,444	1,228	1,437	1,383	1,771	1,703	1,401	1,200	1,743	1,803	1,800	1,757	1,833	1,744	1,674
Pesticide, fertilizer, and other agricultural chemicals manufacturing	32530	2,100	1,990	1,722	2,333	2,307	2,364	i 2,508	i D	2,338	i 2,479	i 3,196	i 2,919	1,696	1,829	1,874	1,783	1,843
Pharmaceutical, medicinal, botanical, and biological products (except diagnostic substances) manufacturing ^c	32541	70,016	68,588	71,603	67,688	69,473	68,318	68,846	63,606	69,518	71,762	77,733	80,548	81,181	95,179	88,349	84,845	87,635
In vitro diagnostic substances manufacturing ^c	32542	1,988	1,159	1,207	1,544	1,371	i 1,066	1,159	972	1,286	1,567	1,381	1,582	1,913	2,033	2,198	2,976	3,558
Biotechnology-based pharmaceutical and biological products (except diagnostic substances)	32543	NA	NA	NA	NA	NA	10,356	14,947	23,172	24,458	30,555	36,012	41,733	43,753	54,314	69,411	82,964	90,633
Soap, cleaning compound, and toilet preparations manufacturing	32591	2,787	2,883	3,147	3,472	3,266	3,406	3,493	3,353	3,361	3,257	3,380	3,196	3,053	3,215	3,461	3,321	3,019
Paint, adhesive, and other chemical manufacturing	32592	2,152	2,320	2,238	2,011	2,087	1,979	2,131	D	2,121	2,094	1,666	1,747	1,775	1,765	1,779	1,681	1,904
Plastics and rubber products manufacturing	32600	2,536	2,842	3,128	3,689	3,739	3,586	3,592	3,251	3,926	3,904	3,643	3,491	3,501	3,803	4,109	3,466	3,289
Clay and glass products manufacturing	32710	966	i 312	1,056	i 920	i 1,154	i 1,077	1,130	1,145	1,198	1,345	1,521	1,511	1,647	1,598	1,583	1,483	1,677
Cement, concrete, lime, gypsum, and other nonmetallic mineral products manufacturing	32790	738	555	522	590	621	618	i 800	601	652	443	446	543	432	434	455	338	i 343
Primary metal manufacturing	33100	NA	840	933	783	882	792	853	719	0 - 7,094	714	808	849	987	1,107	1,270	871	1,241
Fabricated metal products manufacturing	33200	2,935	2,438	1,971	2,471	2,517	2,460	2,560	2,521	2,562	2,695	2,798	3,110	3,980	4,662	3,916	3,647	3,940
Agricultural machinery and equipment manufacturing	33311	1,404	1,507	1,523	1,430	1,893	2,055	1,990	1,916	1,977	1,867	2,440	2,458	2,208	2,302	2,848	3,149	3,142

Table 60. Worldwide R&D paid for by the company and performed by the company and others, by business activity: 2008–24

(Millions of U.S. dollars)

Business activity ^a	Business code ^b	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Construction machinery manufacturing	33312	581	653	682	875	816	1,693	1,729	1,556	1,462	1,588	1,880	i 1,871	1,525	1,895	1,910	2,256	2,053
Mining, oil, and gas field machinery and equipment manufacturing	33319	NA	1,629	1,765	2,204	2,589	1,942	i 1,462	2,115	1,528	1,586	1,739	1,300	1,308	1,475	1,549	1,496	1,284
Semiconductor machinery manufacturing	33321	2,553	1,978	2,279	2,574	1,266	i 3,500	3,363	3,459	3,688	3,996	4,465	4,687	5,082	6,409	7,051	7,258	7,558
Industrial machinery manufacturing (except semiconductor machinery)	33322	1,191	853	806	1,128	1,031	1,006	1,237	1,181	893	1,222	0 - 23,467	1,406	1,131	1,394	1,518	1,895	1,753
Photographic and photocopying equipment manufacturing	33331	NA	852	270	757	25	i 108	25	114	59	52	67	0 - 25,025	171	77	D	94	79
Commercial, service industry, temperature control, and air-flow control machinery manufacturing	33332	NA	977	1,268	1,143	1,621	1,661	2,251	1,947	0 - 7,094	2,245	2,263	2,169	1,951	2,400	2,966	3,119	3,226
Digital cameras manufacturing	33333	NA	NA	NA	NA	NA	NA	33	587	i 519	571	274	458	364	i 303	238	264	314
Engine, turbine, and power transmission equipment manufacturing	33360	2,386	1,589	3,481	3,623	4,068	3,870	3,346	2,626	2,641	3,164	2,756	0 - 25,025	2,942	2,761	3,038	4,179	4,282
Metalworking and other general purpose machinery manufacturing	33390	2,039	1,618	1,998	2,359	1,916	2,052	2,585	2,728	2,591	2,547	2,996	2,860	3,222	3,163	3,479	2,917	3,364
Computers and peripheral equipment manufacturing and magnetic and optical media ^d	33412	NA	13,094	12,672	13,319	14,716	15,113	13,437	16,547	23,130	27,553	27,801	25,331	31,371	35,180	37,343	D	45,929
Telephone apparatus manufacturing, including routers, modems, and gateways	33421	6,739	7,758	9,010	9,530	9,335	9,622	10,526	12,366	10,715	10,403	11,487	11,254	10,135	10,475	10,509	D	12,284
Radio, television, and wireless communication equipment manufacturing	33422	5,958	5,181	5,719	4,383	4,773	5,967	5,848	i 3,542	2,839	2,482	0 - 23,467	2,475	2,329	3,916	4,414	4,084	3,894
Other communication equipment manufacturing (except radio, television, and wireless communication equipment)	33429	2,482	1,352	715	1,092	2,111	1,826	1,782	1,844	i 1,660	1,977	0 - 23,467	2,192	2,497	837	811	D	732
Audio and video equipment manufacturing	33430	773	977	1,352	1,019	1,081	1,108	1,282	1,587	1,535	1,252	1,461	1,686	1,667	1,945	2,119	2,336	2,084
Semiconductor and other electronic components manufacturing	33440	29,911	26,118	29,457	32,354	38,109	40,001	41,125	39,810	40,585	41,053	44,130	46,545	55,227	62,242	72,770	67,150	75,172
Electromedical, electrotherapeutic, and irradiation apparatus manufacturing	33451	3,822	2,544	3,046	3,230	3,494	3,816	4,330	3,875	4,053	3,865	4,815	4,646	4,470	4,907	5,440	5,662	5,114
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments manufacturing	33452	1,845	2,229	2,417	2,161	2,337	2,564	2,424	2,033	2,614	2,378	3,136	3,198	2,921	1,898	3,924	3,407	3,464
Measuring and control instruments manufacturing (not listed elsewhere)	33459	3,458	4,425	4,579	4,566	4,871	5,308	5,424	5,637	5,662	5,505	5,469	5,430	5,733	6,091	6,362	6,658	6,883
Electrical equipment, appliances, and components manufacturing	33500	4,687	4,229	4,500	4,768	4,773	5,272	5,501	5,313	5,905	6,177	5,456	6,455	6,511	6,522	7,836	7,825	7,671
Motor vehicles manufacturing	33610	18,296	13,165	14,524	17,011	18,362	17,743	18,984	18,357	20,573	22,481	23,693	21,666	20,639	28,583	D	32,283	32,197
Motor vehicle body and trailer manufacturing	33620	70	96	190	73	98	i 107	i 104	160	118	47	99	0 - 25,025	117	189	218	340	283
Motor vehicle parts manufacturing	33630	5,401	4,158	4,310	4,681	4,736	5,600	7,146	7,285	6,801	7,621	8,852	9,459	9,089	9,414	9,300	8,318	7,327
Aircraft manufacturing	33641	4,053	7,390	4,430	4,512	4,716	i 4,373	4,221	4,859	5,639	4,671	6,467	5,404	4,993	5,342	5,474	6,507	7,332
Aircraft engine and engine parts manufacturing	33642	2,433	1,765	1,978	2,136	D	1,787	2,068	i D	0 - 7,094	1,455	1,759	1,474	1,310	3,223	2,751	2,829	3,108
Other aircraft parts and auxiliary equipment manufacturing	33643	1,222	1,135	1,825	1,752	3,121	3,270	2,980	3,482	3,047	3,239	2,054	1,347	1,412	1,302	2,082	2,443	2,115
Guided missiles, space vehicles, and related parts manufacturing	33644	1,402	1,176	1,132	1,050	659	487	877	1,034	954	1,055	1,210	1,140	1,906	950	2,755	4,315	3,408
Railroad rolling stock manufacturing	33651	195	83	177	165	237	224	363	310	224	251	213	0 - 25,025	299	246	330	307	D
Ship and boat building	33660	151	616	i 608	i 154	143	i 192	489	251	618	157	144	0 - 25,025	154	161	281	362	277

Table 60. Worldwide R&D paid for by the company and performed by the company and others, by business activity: 2008–24

(Millions of U.S. dollars)

Business activity ^a	Business code ^b	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Motorcycle, bicycle, and parts manufacturing	33691	199	194	186	234	197	231	283	320	335	355	429	437	489	547	506	456	464
Military armored vehicle, tank, and tank components manufacturing	33692	107	228	182	118	135	90	159	202	130	367	0 - 23,467	381	275	437	428	303	224
All other transportation equipment manufacturing	33699	176	135	232	367	437	425	361	430	478	505	521	496	546	538	432	701	660
Furniture and related products manufacturing	33700	511	495	402	344	431	433	455	509	411	479	467	517	522	521	475	529	528
Medical equipment and supplies manufacturing	33910	11,587	11,457	13,226	13,701	14,259	15,264	14,317	15,145	15,939	17,055	16,832	18,877	19,383	22,097	24,037	25,768	28,516
Miscellaneous manufacturing not listed elsewhere (games, office supplies, slot machines, etc.)	33990	2,976	2,793	2,341	2,698	D	2,976	2,816	D	3,121	3,130	3,415	3,052	3,744	3,720	3,786	3,366	3,419
Merchant wholesalers, durable goods	42300	449	923	714	711	1,277	589	516	1,551	637	448	771	702	835	1,332	1,164	1,565	1,174
Merchant wholesalers, nondurable goods	42400	257	365	348	605	699	327	209	484	219	273	322	0 - 25,025	529	734	736	842	677
Wholesale electronic markets and agents and brokers (business to business)	42500	14	43	19	70	173	18	D	35	24	0 - 12,866	89	0 - 25,025	61	52	169	258	D
Retail trade (except electronic shopping and electronic auctions)	44000	NA	50	164	74	100	120	65	D	120	119	263	0 - 25,025	0 - 26,968	580	431	903	895
Electronic shopping and electronic auctions	45411	NA	NA	753	D	1,749	1,284	D	D	8,200	0 - 12,866	0 - 23,467	0 - 25,025	0 - 26,968	15,678	15,976	8,216	8,160
Transportation	48000	NA	319	211	111	199	377	412	229	123	722	2,080	9,072	0 - 26,968	5,995	6,883	8,202	8,699
Couriers, messengers, and express delivery services	49200	D	14	6	D	D	90	348	D	394	425	451	290	949	1,172	D	3,963	D
Warehousing and storage	49300	26	17	19	16	17	4	3	D	0	82	79	162	35	24	D	50	32
Newspaper, periodical, book, and directory publishers (except Internet)	51110	180	748	853	408	257	339	103	117	87	99	175	88	74	105	D	14	410
Software publishers (except Internet) ^e	51120	31,369	26,362	28,457	29,992	31,209	35,047	41,052	36,040	34,699	31,400	32,842	31,525	30,456	37,548	46,260	50,306	56,386
Motion picture and sound recording (except Internet)	51200	104	135	93	67	67	38	83	12	20	42	155	0 - 25,025	86	36	102	134	91
Broadcasting (except Internet)	51500	NA	89	100	115	165	179	206	306	347	460	424	500	0 - 26,968	D	452	465	D
Wired telecommunications carriers	51710	673	D	1,499	1,685	1,631	1,012	1,166	1,269	1,180	1,027	476	428	504	598	622	468	543
Wireless telecommunications carriers (except satellite)	51720	532	186	724	815	860	1,732	2,500	1,192	1,458	1,969	2,439	2,641	2,414	2,974	3,065	2,908	2,817
Satellite telecommunications	51740	153	108	229	114	163	176	134	705	746	625	476	486	0 - 26,968	529	640	700	764
Other telecommunications (not listed elsewhere)	51790	501	351	338	462	399	377	330	536	362	381	745	0 - 25,025	501	378	340	574	579
Data processing, hosting, and related services ^e	51800	NA	2,889	3,051	5,293	4,406	4,381	5,402	6,895	7,040	6,975	7,699	9,985	12,675	15,108	13,616	14,993	19,505
Cloud computing applications and Internet-based software services	51801	NA	NA	NA	NA	NA	4,344	6,730	6,801	11,913	19,581	24,607	33,733	47,436	53,479	64,378	64,630	67,187
Other information services, including Internet publishing, broadcasting, and Web search portals ^e	51910	NA	5,519	7,270	9,456	12,998	15,433	17,443	25,330	27,524	32,484	43,287	53,057	60,972	73,561	95,073	109,842	123,525
Finance: banking and credit intermediation	52200	NA	D	1,235	1,703	2,454	3,238	3,553	3,299	5,171	5,657	4,975	5,718	9,013	13,704	12,144	19,982	19,938

Table 60. Worldwide R&D paid for by the company and performed by the company and others, by business activity: 2008–24

(Millions of U.S. dollars)

Business activity ^a	Business code ^b	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	
Securities, commodity contracts, and other financial investments and related activities, including funds and trusts	52310	NA	678	903	1,347	1,110	1,323	1,147	1,597	1,683	1,785	1,445	1,654	2,061	5,133	D	6,017	6,618	
Insurance carriers and related activities	52400	NA	798	611	872	1,429	1,772	1,069	1,573	1,444	1,430	0 - 23,467	2,596	2,967	4,008	2,530	3,143	3,165	
Real estate	53100	20	32	3	13	27	105	199	288	440	253	380	0 - 25,025	372	680	793	342	546	
Rental and leasing services	53200	NA	129	146	51	59	94	80	80	106	i 571	i 699	1,067	2,925	1,525	1,739	2,054	2,487	
Lessors of nonfinancial intangible assets, including patent licensing	53300	80	259	268	369	437	100	97	104	45	97	24	i 71	75	95	D	134	59	
Legal, accounting, tax preparation, bookkeeping, and payroll services	54111	NA	D	505	705	i 535	696	1,128	1,587	1,052	1,130	1,426	2,040	2,611	2,960	3,821	4,097	5,110	
Architectural, engineering, and related services	54130	1,742	1,115	1,390	1,380	1,232	1,495	1,649	2,449	1,975	1,795	2,575	0 - 25,025	2,592	3,007	3,865	3,398	4,100	
Specialized design services	54140	75	76	65	283	157	i 81	42	13	26	133	0 - 23,467	0 - 25,025	0 - 26,968	97	D	50	95	r
Computer systems design and related services ^e	54150	11,476	12,292	11,528	13,673	13,909	i 12,577	13,288	14,090	14,864	13,998	18,287	22,535	17,395	19,970	21,958	24,224	27,628	
Management, scientific, and technical consulting services	54160	1,110	2,246	1,380	1,618	2,066	i 1,428	1,681	1,531	1,668	1,591	2,443	1,689	1,995	3,033	3,467	D	3,972	
Research and development services in the social sciences and humanities	54172	NA	96	8	19	64	36	47	15	0 - 7,094	i 348	27	28	0 - 26,968	38	28	14	9	
Research and development services in biotechnology ^{c,f}	54173	NA	6,850	2,601	6,238	6,294	1,723	1,344	2,387	1,176	930	1,147	1,244	1,633	2,319	3,466	2,412	1,353	
Research and development services in the physical, engineering, and life sciences (except biotechnology)	54174	NA	3,208	1,447	2,751	3,166	2,143	3,040	3,197	2,767	2,226	2,324	2,750	5,706	5,042	5,023	4,318	3,838	
Research and development services in nanotechnology	54175	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	122	i 173	224	313	478	
Advertising and related services	54180	37	1,950	422	97	375	i 390	424	452	373	412	1,160	i 1,262	i 26,968	i 2,493	i 2,395	i 1,454	i 1,398	i
Professional, scientific, and technical services (not listed elsewhere)	54190	439	1,036	543	1,242	1,199	1,627	810	944	622	695	912	1,266	1,574	1,417	2,034	2,048	1,917	
Management of companies and enterprises	55100	11	40	23	43	18	76	43	D	20	71	0 - 23,467	0 - 25,025	51	39	D	54	39	
Administrative and support services	56100	NA	419	640	348	609	589	459	375	588	1,558	2,668	3,575	3,806	3,369	4,422	4,904	5,106	
Waste management and remediation services	56200	NA	15	684	20	D	23	D	D	8	0 - 12,866	0 - 23,467	0 - 25,025	0 - 26,968	513	r 5	31	73	
Offices of physicians	62110	40	37	371	36	42	i 43	39	28	70	102	i 113	196	195	143	D	214	177	
Medical and diagnostic laboratories	62150	903	246	409	287	364	347	410	424	0 - 7,094	i 855	1,739	i 2,104	1,630	i 2,478	3,520	2,179	2,122	
Other ambulatory health care services (ambulance, dental, home health care)	62199	NA	47	145	i 15	45	i 52	37	39	23	70	48	150	83	304	331	668	401	
Hospitals and nursing care facilities	62200	NA	62	i 68	2	2	i 2	2	4	6	18	0 - 23,467	0 - 15,636	0 - 26,968	7	9	7	D	
Social assistance services	62400	NA	D	15	13	36	47	17	2	2	6	13	0 - 25,025	0 - 26,968	D	7	4	D	
Arts, entertainment, and recreation	71000	NA	161	137	85	70	29	103	i 50	45	42	45	479	0 - 26,968	90	D	280	185	

Table 60. Worldwide R&D paid for by the company and performed by the company and others, by business activity: 2008–24

(Millions of U.S. dollars)

Business activity ^a	Business code ^b	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Accommodation and food services	72000	NA	50	119	84	149	i 163	D	106	76	62	126	0 - 25,025	0 - 26,968	456	D	264	217
Other services (not listed elsewhere)	81000	NA	89	465	345	484	405	550	669	0 - 7,094	0 - 12,866	0 - 23,467	507	581	D	8,734	i 663	634
Undistributed ^g	–	10,660	14,175	5,373	i D	491	359	i 69	0	0	0	0	0	0	0	0	0	0

D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%; NA = not available.

^a Business activity data are tabulated independent of the industry classification of the company. Companies were asked to report their sales and R&D activity in one or more business activity codes.

^b Business codes and descriptions are based on 2017 North American Industry Classification System (NAICS) industry definitions.

^c Estimates for this business code may not be comparable to those from prior years due to the introduction of a related business code for survey year 2013 and beyond: 32543, Biotechnology-based pharmaceutical and biological products (except diagnostic substances).

^d Estimates for this business code may not be comparable to those from prior years due to the introduction of a related business code for survey year 2014 and beyond: 33333, Digital cameras manufacturing.

^e Estimates for this business code may not be comparable to those from prior years due to the introduction of a related business code for survey year 2013 and beyond: 51801, Cloud computing applications and Internet-based software services.

^f Estimates for this business code may not be comparable to those from prior years due to the introduction of a related business code for survey year 2020 and beyond: 54175, Research and development services in nanotechnology.

^g Undistributed includes data reported that were not allocated to a business activity.

Note(s):
Detail may not add to total because of rounding. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D and are not comparable with estimates published for years prior to 2018. For survey year 2008, industry classification was based on the 2002 NAICS. For survey years 2009–13, industry classification was based on the 2007 NAICS. For survey years 2014–19, industry classification was based on the 2012 NAICS. For survey years beginning in 2020, classification was based on the 2017 NAICS. Most statistics for years prior to 2024 have been revised since original publication. Revised statistics include adjustments based on information obtained after the original statistics were prepared. An estimate range may be displayed in place of a single estimate to avoid disclosing operations of individual companies.

Source(s):
National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey.

Table 61. Worldwide sales for companies located in the United States that performed or funded R&D, by business activity: 2008–24

(Millions of U.S. dollars)

Business activity ^a	Business code ^b	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
All business activities	21100–81000	10,976,518	10,221,923	12,204,773	12,874,185	12,975,886	13,279,075	13,409,822	12,201,595	12,246,930	12,878,032	14,493,394	14,927,124	14,743,459	17,446,295	18,781,809	18,681,209	19,503,626
Oil and gas extraction	21100	271,493	153,939	212,469	331,320	271,983	250,884	241,227	141,687	117,720	108,940	178,064	58,355 - 1,966,830	119,554	185,348	275,133	192,976	198,109
Mining	21200	NA	D	38,302	57,661	43,857	54,531	D	D	29,976	23,057	44,867	18,307	15,388	85,646	i 37,559	i 11,616	11,733
Support activities for mining, including oil and gas	21300	NA	45,184	61,062	68,523	79,788	100,175	129,989	74,421	44,705	64,412	84,366	89,793	53,234	45,305	229,558	i 51,170	64,928
Utilities	22100	NA	317,243	310,768	348,763	318,893	324,150	356,225	346,925	309,116	407,052	4,778 - 1,152,314	304,369	288,293	344,089	386,357	385,594	421,651
Construction	23000	NA	42,287	93,305	107,286	107,685	94,057	91,507	64,463	52,363	69,900	87,053	93,308	99,450	82,315	95,576	118,718	124,828
Food manufacturing	31100	475,588	630,500	694,763	690,698	688,804	941,309	844,673	744,318	705,021	789,784	718,760	785,374	812,493	918,909	1,066,648	1,050,037	973,868
Beverage manufacturing	31210	143,008	129,396	141,259	180,153	167,003	164,270	166,544	170,059	155,459	146,561	138,524	119,571	151,446	182,652	191,011	228,516	212,509
Tobacco manufacturing	31220	28,970	134,972	133,993	140,998	130,759	69,191	D	D	64,978	72,291	67,629	70,749	72,251	83,747	79,791	98,764	84,776
Textile, apparel, and leather products manufacturing	31990	NA	56,131	68,515	66,416	89,086	70,260	66,546	83,170	109,296	88,817	84,900	24,172 - 1,932,647	80,328	76,154	82,006	86,822	89,813
Wood products manufacturing	32100	34,563	27,826	28,342	24,165	32,908	42,472	51,879	33,713	0 - 373,524	36,180	41,001	41,880	43,544	68,705	73,070	62,614	68,371
Paper manufacturing	32200	139,953	110,534	136,302	144,064	142,335	146,748	148,797	D	129,369	146,927	157,969	0 - 2,264,461	138,023	151,387	158,026	152,316	158,204
Printing and related support activities	32300	26,426	37,743	37,398	32,823	32,152	29,576	34,227	42,885	31,310	47,910	36,015	65,568	i 36,283	35,766	35,531	44,028	40,007
Petroleum refineries	32401	NA	NA	837,945	954,108	911,784	968,046	787,825	512,224	415,433	325,034 - 733,821	586,670	565,849	379,018	588,514	823,334	731,716	583,521
Asphalt paving, roofing, and saturated materials manufacturing	32402	NA	NA	7,566	8,872	8,563	14,504	11,150	10,324	12,322	16,662	17,798	18,422	2,927 - 841,993	24,936	15,145	19,941	21,677
Other petroleum and coal products manufacturing, including motor oil, hydraulic fluid, and charcoal	32403	NA	NA	32,282	43,514	D	23,425	22,348	20,440	15,665	20,790	16,008	11,434	8,950	14,714	24,563	11,798	12,969
Basic chemicals manufacturing	32510	273,809	179,494	243,193	299,476	473,666	i 278,661	270,287	212,951	264,935	231,673	262,007	228,984	168,370 - 731,814	331,610	324,486	324,242	290,892
Resin, synthetic rubber, and artificial synthetic fibers and filaments manufacturing	32520	89,805	94,915	108,693	88,762	97,410	95,249	108,867	92,708	91,399	92,324	128,075	111,483	96,372	133,253	157,685	121,716	112,507
Pesticide, fertilizer, and other agricultural chemicals manufacturing	32530	40,337	71,003	51,940	47,381	57,246	67,823	68,738	72,737	58,476	74,274	83,310	67,388	67,401	78,043	92,610	82,790	93,794
Pharmaceutical, medicinal, botanical, and biological products (except diagnostic substances) manufacturing ^c	32541	582,910	438,687	471,763	577,607	594,394	577,930	569,968	564,398	608,453	636,157	669,845	555,403	707,534	827,580	921,430	860,060	899,307
In vitro diagnostic substances manufacturing ^c	32542	22,317	16,940	20,637	25,005	27,022	13,871	25,365	14,159	7,892 - 171,885	15,915	17,050	9,160 - 594,175	6,845 - 845,912	19,790	22,950	18,307	22,677
Biotechnology-based pharmaceutical and biological products (except diagnostic substances)	32543	NA	NA	NA	NA	NA	40,409	56,454	84,437	0 - 373,524	90,419	110,160	126,736	125,500	157,261	150,939	198,222	209,551

Table 61. Worldwide sales for companies located in the United States that performed or funded R&D, by business activity: 2008–24

(Millions of U.S. dollars)

Business activity ^a	Business code ^b	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Soap, cleaning compound, and toilet preparations manufacturing	32591	142,212	151,565	167,258	170,417	166,942	185,266	196,651	180,201	164,810	179,865	192,314	178,596	181,974	181,438	205,687	195,540	177,575
Paint, adhesive, and other chemical manufacturing	32592	113,118	104,308	103,452	120,242	128,998	113,108	128,730	107,146	118,885	124,026	131,768	122,393	121,528	126,396	144,694	132,220	137,407
Plastics and rubber products manufacturing	32600	162,401	161,057	193,471	243,447	265,623	219,020	241,780	201,164	232,466	229,347	227,659	207,637	238,278	271,443	291,766	238,846	217,534
Clay and glass products manufacturing	32710	36,417	27,803	37,853	34,184	36,960	39,365	34,863	39,676	47,603	41,355	48,534	39,769	34,268	41,720	53,522	44,620	41,205
Cement, concrete, lime, gypsum, and other nonmetallic mineral products manufacturing	32790	48,680	35,530	31,789	32,864	40,193	42,592	35,322	35,377	34,503	29,688	41,567	46,610	43,556	43,959	47,674	40,586	51,166
Primary metal manufacturing	33100	NA	124,478	197,315	179,318	176,544	161,443	128,532	103,093	121,321	100,279	158,304	162,531	106,419	135,248	190,658	182,943	173,708
Fabricated metal products manufacturing	33200	188,359	132,465	161,593	179,228	207,423	199,678	235,784	194,098	165,184	175,986	203,494	183,323	195,877	483,438	288,978	235,342	229,116
Agricultural machinery and equipment manufacturing	33311	48,185	46,695	53,946	43,410	59,651	68,793	63,617	53,559	51,776	60,038	67,224	36,554 - 621,568	57,346	68,446	116,947	91,952	74,986
Construction machinery manufacturing	33312	32,109	23,195	30,685	42,974	43,355	63,344	65,348	56,090	49,267	60,563	74,106	80,257	70,436	76,097	96,335	96,278	90,391
Mining, oil, and gas field machinery and equipment manufacturing	33319	NA	69,074	75,563	101,549	110,356	84,384	76,466	73,725	48,023	65,286	86,513	68,944	55,005	51,221	58,687	60,840	62,573
Semiconductor machinery manufacturing	33321	20,019	10,505	21,588	25,960	9,973	24,420	27,333	24,653	30,749	38,320	47,008	24,628 - 609,643	49,316	67,019	78,428	80,502	81,546
Industrial machinery manufacturing (except semiconductor machinery)	33322	26,984	21,368	30,723	44,666	42,619	39,357	51,615	39,189	37,659	38,252	44,624	38,113	48,714	60,122	45,186	60,792	51,285
Photographic and photocopying equipment manufacturing	33331	NA	7,471	D	D	307 i	7,502	9,162	8,602	6,775 - 170,768	6,849	0 - 1,147,536	836	1,452 - 564,897	1,393	1,504	2,048	1,142
Commercial, service industry, temperature control, and air-flow control machinery manufacturing	33332	NA	49,546	76,811	73,896	90,814	97,984	111,674	101,920	113,832	100,874	116,411	115,647	93,227	113,309	141,183	149,145	161,322
Digital cameras manufacturing	33333	NA	NA	NA	NA	NA	NA	15	D	5,579 i	5,947 i	0 - 1,147,536	3,372	0 - 1,108,164	2,079	1,861	1,764	1,491
Engine, turbine, and power transmission equipment manufacturing	33360	86,660	46,879	84,686	112,562	120,116	146,129	D	85,560	87,887	106,205 i	95,099	55,890 - 640,904	103,427	129,909	131,468	145,501	146,751
Metalworking and other general purpose machinery manufacturing	33390	90,067	66,350	95,017	112,947	125,495	105,487	149,607	140,673	116,838	117,535	124,745	101,458	95,205	123,693	114,298	117,000	120,450
Computers and peripheral equipment manufacturing and magnetic and optical media ^d	33412	NA	273,429	330,020	342,416	304,309	307,523	297,193	282,890	414,641	452,483	479,840	453,517	454,726	544,421	584,411	523,196	550,275
Telephone apparatus manufacturing, including routers, modems, and gateways	33421	48,816	66,123	87,159	64,811	64,652	75,886	72,421	202,399 i	76,218	74,054	80,804	0 - 2,264,461	70,067	72,885	73,402	D	78,783
Radio, television, and wireless communication equipment manufacturing	33422	76,167	64,808	79,675	92,884	136,470	148,680	168,774 i	D	39,937 - 203,930	37,092	0 - 1,147,536	37,124	34,494	44,127	52,144	52,857	44,450

Table 61. Worldwide sales for companies located in the United States that performed or funded R&D, by business activity: 2008–24

(Millions of U.S. dollars)

Business activity ^a	Business code ^b	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Other communication equipment manufacturing (except radio, television, and wireless communication equipment)	33429	17,976	13,324	12,856	21,004	15,949	23,299	14,548	15,997	0 - 373,524	13,808	14,852 - 257,625	15,898	18,845	11,014	12,124	D	17,702
Audio and video equipment manufacturing	33430	13,212	15,041	22,242	11,476	17,926	19,596	18,333	38,954 i	35,473	3,724 - 417,696	11,671	15,984	16,339	12,414	10,567	16,442	16,420
Semiconductor and other electronic components manufacturing	33440	220,272	196,399	296,058	336,789	332,771	320,780	350,779	D	323,512	373,892	464,768	0 - 2,264,461	418,715	456,183	461,776	457,412	544,914
Electromedical, electrotherapeutic, and irradiation apparatus manufacturing	33451	41,395	27,437	29,041	38,560	39,590	43,130	43,537	44,739	46,152	44,317	54,101 i	50,472	45,536	42,143	45,552	54,437	51,990
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments manufacturing	33452	38,474	55,866	68,907	47,701	63,724	66,326	67,154	58,670	59,653	65,730 i	72,999	73,068	78,660	36,394	79,721	57,684	68,566
Measuring and control instruments manufacturing (not listed elsewhere)	33459	57,989	78,228	88,305	84,368	99,774	97,153	102,909	101,098	102,226	91,098	80,604	85,037	94,116	109,875	107,735	115,538	120,881
Electrical equipment, appliances, and components manufacturing	33500	154,206	129,174	160,532	165,156	164,998	182,490	198,505	195,327	213,284	185,233	189,043	219,931	202,458	204,034	212,193	205,813	213,046
Motor vehicles manufacturing	33610	521,541	399,125	476,726	539,595	541,730	615,136	539,139	646,110	693,548	616,741	700,801	618,116	460,577	559,394	D	936,119	954,746
Motor vehicle body and trailer manufacturing	33620	D	15,688	23,105	15,325	34,284	25,913	32,719	23,229	63,232	20,086	26,219	45,941	30,285	40,182	49,714	44,585	32,084
Motor vehicle parts manufacturing	33630	163,993	126,638	242,201	224,450	228,418	269,022	379,492	294,414	238,521	270,643	284,735	291,175	241,892	289,839	305,473	338,522	289,303
Aircraft manufacturing	33641	97,635	75,960	89,235	121,480	97,484 i	154,241	139,924	148,986	136,497	128,861	190,692	144,845	120,777	112,229	110,739	136,269	139,561
Aircraft engine and engine parts manufacturing	33642	42,829	37,086	34,925	42,514	40,376	54,024	48,134	D	38,176	42,340	60,557	54,264	42,789	101,024	61,021	67,168	81,043
Other aircraft parts and auxiliary equipment manufacturing	33643	30,319	36,714	41,704	56,509	44,556	60,520	84,966	97,198	85,111	103,682	67,880	58,258	68,808	59,196	60,730	63,302	92,401
Guided missiles, space vehicles, and related parts manufacturing	33644	D	51,326	D	D	16,554	17,200	30,237	31,776	30,600	37,204	51,013	35,217	43,681	45,508	71,743	94,679	79,793 i
Railroad rolling stock manufacturing	33651	7,248	3,639	9,075 i	8,870	14,255	12,639	19,679	19,353	14,852	13,416	14,083	13,505 i	16,856	14,268	18,751	20,928	15,497
Ship and boat building	33660	16,461	37,439 i	D	D	23,966 i	16,927 i	39,049	15,426	33,496 - 134,100	22,538	16,295	24,056	18,200	20,537	24,871	25,177	24,612
Motorcycle, bicycle, and parts manufacturing	33691	8,423	6,677	6,646	8,948	7,829	11,331	9,142	9,067	9,507	9,107	4,253 - 1,151,789	4,030 - 1,912,506	9,727	13,450	15,838	12,712	11,430
Military armored vehicle, tank, and tank components manufacturing	33692	13,341	10,136	D	6,239	4,893	4,354 i	7,502	D	77 - 229,474	11,306 i	18,524 i	15,404	10,764	17,818 i	9,597	7,764	8,908
All other transportation equipment manufacturing	33699	9,513	6,332	13,008	13,415	18,469	28,933	12,026	14,565	14,435	14,658	21,096	17,727	21,050	18,786	19,353	28,962	28,769
Furniture and related products manufacturing	33700	43,401	35,821	37,487	39,031	43,719	41,407	45,760	43,530	43,362	47,260	48,896	51,330	56,126	53,789	45,065	50,080	47,047
Medical equipment and supplies manufacturing	33910	164,066	159,611	243,406	304,215	217,549	237,729	234,177	235,706	244,748	250,637	271,188	301,591	516,551	353,777	357,512	375,450	409,051

Table 61. Worldwide sales for companies located in the United States that performed or funded R&D, by business activity: 2008–24

(Millions of U.S. dollars)

Business activity ^a	Business code ^b	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	
Miscellaneous manufacturing not listed elsewhere (games, office supplies, slot machines, etc.)	33990	122,669	114,088	101,526	D	118,660	140,793	134,415	D	131,728	135,910	170,909	117,115	99,609 - 663,053	148,001	118,095	113,009	113,418	
Merchant wholesalers, durable goods	42300	412,269	313,095	334,004	214,772	246,702	378,550	180,014	260,038	221,852	165,345	247,956	163,818	180,636	273,549	225,860	263,982	357,365	
Merchant wholesalers, nondurable goods	42400	340,956	273,118	280,982	496,309	587,019	571,742	698,182	547,921	512,867	506,120	633,916	593,435	651,694	1,239,623	1,268,945	952,473	829,503	
Wholesale electronic markets and agents and brokers (business to business)	42500	2,600	8,684	3,347	4,722	i 115,452	i 53,497	86,215	41,905	60,197	50,155	435 - 1,147,971	5,355	20,646	26,930	19,064	D	17,144	
Retail trade (except electronic shopping and electronic auctions)	44000	NA	206,489	223,211	104,922	257,466	156,839	442,527	210,412	296,019	322,049	537,429	662,767	685,526	596,528	706,926	771,306	864,333	
Electronic shopping and electronic auctions	45411	NA	NA	D	D	88,213	96,577	D	130,399	110,617 - 274,610	198,755	191,380 - 434,154	i 168,466 - 753,481	i 212,452 - 775,897	i 276,345	289,387	316,641	i 355,453	i
Transportation	48000	NA	D	182,535	109,842	139,615	95,821	117,267	D	0 - 373,524	278,263	277,801	387,962	41,226 - 880,292	262,513	349,200	316,317	360,506	
Couriers, messengers, and express delivery services	49200	D	D	47,619	D	D	D	170,934	D	187,345	136,436	90,988	2,034	0 - 1,108,164	126,902	136,527	D	D	
Warehousing and storage	49300	31,235	1,536	24,457	22,885	3,983	13,530	2,585	D	4,652	15,714	0 - 1,147,536	15,943	17,093	5,304	9,583	D	4,996	
Newspaper, periodical, book, and directory publishers (except Internet)	51110	17,053	24,528	26,671	30,831	33,557	i 17,955	10,520	7,008	8,704	6,010	0 - 1,147,536	7,146	1,490 - 840,557	7,077	6,811	6,186	13,925	
Software publishers (except Internet) ^e	51120	210,186	195,833	214,359	230,898	237,602	266,587	278,159	272,944	256,293	231,880	244,928	237,538	238,637	265,037	345,346	310,390	361,733	
Motion picture and sound recording (except Internet)	51200	16,774	20,697	18,011	14,964	9,467	20,861	D	7,142	9,353	8,936	37,326	46,569	36,032	37,675	12,874	D	D	
Broadcasting (except Internet)	51500	NA	39,734	53,313	44,029	67,429	81,499	D	74,473	84,879	88,160	151,227	185,522	168,015	161,118	158,036	156,439	159,090	
Wired telecommunications carriers	51710	D	187,439	210,704	268,345	223,829	181,992	230,630	216,588	181,904	222,699	129,766	139,245	150,710	156,939	155,830	151,466	150,459	
Wireless telecommunications carriers (except satellite)	51720	135,248	154,682	138,479	156,696	193,408	D	247,759	D	172,416	201,063	264,219	264,976	254,772	275,173	285,960	292,712	308,557	
Satellite telecommunications	51740	19,330	12,662	i 16,021	2,783	3,056	D	3,581	44,400	61,927	57,588	53,333	51,337	191 - 839,257	34,161	19,759	22,710	13,446	
Other telecommunications (not listed elsewhere)	51790	5,603	9,122	7,737	18,803	17,803	18,504	6,507	14,561	8,524	16,040	12,551 - 255,324	13,862 - 598,877	0 - 1,108,164	15,309	14,002	27,367	26,542	
Data processing, hosting, and related services ^e	51800	NA	36,196	38,523	60,641	95,872	i 58,502	81,059	79,017	76,345	77,859	141,006	97,846	102,549	139,219	124,901	120,846	141,922	
Cloud computing applications and Internet-based software services	51801	NA	NA	NA	NA	NA	27,442	D	33,792	57,770	98,224	167,679	220,609	323,373	368,147	421,299	499,742	522,645	
Other information services, including Internet publishing, broadcasting, and Web search portals ^e	51910	NA	41,660	77,319	39,551	45,729	65,134	102,254	94,541	113,123	160,826	191,042	215,354	0 - 1,108,164	337,362	372,579	441,154	516,997	
Finance: banking and credit intermediation	52200	NA	D	1,068,703	631,129	673,238	i 347,139	364,224	377,622	400,369	472,203	536,280	629,461	634,637	646,408	620,266	690,509	893,661	

Table 61. Worldwide sales for companies located in the United States that performed or funded R&D, by business activity: 2008–24

(Millions of U.S. dollars)

Business activity ^a	Business code ^b	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Securities, commodity contracts, and other financial investments and related activities, including funds and trusts	52310	NA	148,454	148,014	152,435	104,915	107,027	74,030	75,325	72,115	102,310	20,889 - 1,168,425	97,894	129,317	160,108	152,650	198,052	228,930
Insurance carriers and related activities	52400	NA	294,233	281,344	280,278	358,159	397,971	380,117	420,526	372,903	312,922	0 - 1,147,536	37,829 - 1,946,303	914,179	955,635	695,778	840,360	987,948
Real estate	53100	D	7,738	D	D	D	D	D	8,537	9,292	10,114	11,565	222 - 1,908,697	11,838	28,902	41,338	26,522	31,525
Rental and leasing services	53200	NA	32,231	36,299	23,830	29,033	35,488	21,986	29,238	14,235	21,642	3,607 - 1,151,143	12,718	10,152	35,636	52,556	53,585	90,693
Lessors of nonfinancial intangible assets, including patent licensing	53300	D	1,835	1,927	2,709	2,890	11,404	2,125	2,150	1,468	3,513	0 - 1,147,536	1,672	3,190 - 566,635	8,944	2,956	4,388	11,859
Legal, accounting, tax preparation, bookkeeping, and payroll services	54111	NA	D	16,188	D	11,315	14,588	22,315	22,259	19,526	21,336	24,044	28,797	29,251	30,913	35,101	42,789	53,165
Architectural, engineering, and related services	54130	42,680	96,534	147,309	102,126	114,240	i 125,923	134,541	139,846	103,412	84,387	102,795	126,787	95,342	103,770	113,567	119,107	125,636
Specialized design services	54140	D	6,504	3,976	2,581	3,646	i 3,614	2,165	D	706	4,584	i 25,655	12,684	1,441 - 564,885	543	D	D	2,053
Computer systems design and related services ^e	54150	210,916	216,477	224,026	377,919	i 272,065	249,600	272,937	243,790	249,430	223,281	251,167	238,436	225,488	275,540	269,093	288,731	298,464
Management, scientific, and technical consulting services	54160	52,497	60,125	43,190	76,910	85,161	81,834	93,077	92,120	63,143	49,057	69,344	58,335	59,529	72,300	87,305	D	103,398
Research and development services in the social sciences and humanities	54172	NA	980	1,170	827	D	1,301	992	D	1,131	1,185	941	1,233	1,016	1,545	1,439	1,600	1,304
Research and development services in biotechnology ^{c,f}	54173	NA	22,354	i 8,493	8,657	11,316	12,390	17,543	10,962	9,026	9,340	3,772 - 1,151,308	4,159 - 1,912,634	13,755	18,486	16,702	17,268	17,335
Research and development services in the physical, engineering, and life sciences (except biotechnology)	54174	NA	19,858	18,840	23,446	33,296	36,913	32,703	36,038	37,997	37,955	41,855	49,247	54,288	61,532	63,872	71,294	63,418
Research and development services in nanotechnology	54175	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	360	i 317	570	2,151	2,363
Advertising and related services	54180	D	48,883	12,992	i D	52,764	D	D	D	44,669 - 208,661	107,640	140,254	84,187 - 669,202	101,594 - 665,038	260,524	D	D	D
Professional, scientific, and technical services (not listed elsewhere)	54190	19,146	30,323	35,320	50,949	63,254	47,353	32,811	30,775	12,204 - 176,196	31,239	21,496	23,047	2,694 - 841,760	31,870	41,547	43,571	51,760
Management of companies and enterprises	55100	828	2,333	3,613	17,275	5,435	177,880	9,213	16,180	11,794	i 18,180	13,915	13,249	11,906	i 13,680	i 13,637	17,003	15,969
Administrative and support services	56100	NA	35,867	45,135	32,735	50,684	i 44,004	243,644	50,037	55,602	49,518	66,944	27,043 - 1,935,519	63,580	62,343	98,284	82,480	119,463
Waste management and remediation services	56200	NA	6,242	14,172	8,182	6,564	6,245	4,766	24,985	27,470	22,609	88,502	11,624	2,614 - 566,058	18,632	r 1,482	20,689	3,998
Offices of physicians	62110	7,492	25,752	24,133	23,844	35,513	36,233	19,041	36,724	40,586	61,118	50,891	102,827	65,786	43,937	40,322	97,831	55,713

Table 61. Worldwide sales for companies located in the United States that performed or funded R&D, by business activity: 2008–24

(Millions of U.S. dollars)

Business activity ^a	Business code ^b	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Medical and diagnostic laboratories	62150	20,968	15,216	37,950	17,047	21,038	17,914	5,919	20,904	27,539 i	28,636	39,514 i	38,605	52,096	59,027	64,278	50,535	36,760
Other ambulatory health care services (ambulance, dental, home health care)	62199	NA	8,127	8,487	D	3,361 i	10,919	5,274	5,651	0 - 229,395	10,819	176 - 1,147,712	22,636	30,620	34,480	22,231	38,782	13,800
Hospitals and nursing care facilities	62200	NA	D	D	D	D	D	26,866	27,616	32,896	32,276	35,119	25,798	0 - 839,065	19,707	15,173	24,723	36,137
Social assistance services	62400	D	286	448	326	249	1,065	1,338	63	77	112	0 - 1,147,536	0 - 1,908,473	1,826	D	123	148	121
Arts, entertainment, and recreation	71000	NA	17,339	16,089	16,023	18,344	D	D	18,677	17,509 - 181,502	24,540	34,697	37,590	14,473 - 577,917	17,955	33,180	D	D
Accommodation and food services	72000	NA	D	69,474	39,421	88,878 i	107,255	46,228	76,898	66,849	26,196	54,566	84,342	52,991	64,270	61,400	50,913	68,435
Other services (not listed elsewhere)	81000	NA	15,585	43,778	129,084	57,612	142,029	78,365	70,781	237,671	0 - 413,972	0 - 1,147,536	18,845 - 1,927,321	20,962 - 860,028	D	D	D	401,797 i
Less: intersegment eliminations	–	381,031	237,743	234,289	281,460	309,288	301,615	316,930	240,217	226,993	196,040	255,127	182,826	215,518	223,649	228,157	412,725	266,080
Undistributed ^g	–	1,092,275	1,590,109	516,754	598,369 i	167,240 i	D	4,602	9,547 i	0	0	8 i	0	0	0	0	0	0

D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%; NA = not available.

^a Business activity data are tabulated independent of the industry classification of the company. Companies were asked to report their sales and R&D activity in one or more business activity codes.

^b Business codes and descriptions are based on 2017 North American Industry Classification System (NAICS) industry definitions.

^c Estimates for this business code may not be comparable to those from prior years due to the introduction of a related business code for survey year 2013 and beyond: 32543, Biotechnology-based pharmaceutical and biological products (except diagnostic substances).

^d Estimates for this business code may not be comparable to those from prior years due to the introduction of a related business code for survey year 2014 and beyond: 33333, Digital cameras manufacturing.

^e Estimates for this business code may not be comparable to those from prior years due to the introduction of a related business code for survey year 2013 and beyond: 51801, Cloud computing applications and Internet-based software services.

^f Estimates for this business code may not be comparable to those from prior years due to the introduction of a related business code for survey year 2020 and beyond: 54175, Research and development services in nanotechnology.

^g Undistributed includes data reported that were not allocated to a business activity.

Note(s):
Detail may not add to total because of rounding. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D and are not comparable with estimates published for years prior to 2018. For survey year 2008, industry classification was based on the 2002 NAICS. For survey years 2009–13, industry classification was based on the 2007 NAICS. For survey years 2014–19, industry classification was based on the 2012 NAICS. For survey years beginning in 2020, classification was based on the 2017 NAICS. Most statistics for years prior to 2024 have been revised since original publication. Revised statistics include adjustments based on information obtained after the original statistics were prepared. An estimate range may be displayed in place of a single estimate to avoid disclosing operations of individual companies.

Source(s):
National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey.

Table 62. Domestic sales for companies located in the United States that performed or funded R&D, by business activity: 2008–24

(Millions of U.S. dollars)																			
Business activity ^a	Business code ^b	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	
All business activities	21100–81000	7,796,340	7,448,495	8,831,739	9,059,299	9,260,168	9,663,848	9,785,269	9,084,789	9,151,764	9,583,098	10,680,515	11,279,821	11,186,163	13,126,409	14,109,067	14,136,377	15,135,435	
Oil and gas extraction	21100	127,788	61,582	85,797	178,926	i 124,569	120,495	124,534	71,385	58,231	51,790	91,319	0 - 1,908,473	80,519	114,652	163,855	116,611	129,762	
Mining	21200	NA	D	33,072	38,109	24,837	38,270	22,962	37,589	i 19,449	17,583	25,823	16,117	13,997	37,586	i 37,097	i 11,325	11,575	
Support activities for mining, including oil and gas	21300	NA	23,022	34,840	42,645	51,327	72,553	97,302	47,711	25,825	39,547	54,528	52,894	28,321	30,030	142,622	i 34,701	42,900	
Utilities	22100	NA	D	301,613	337,871	309,573	316,082	347,997	336,457	304,643	400,104	0 - 1,147,536	299,495	286,720	340,383	382,037	378,988	414,946	
Construction	23000	NA	27,180	81,641	88,626	64,402	60,516	66,835	49,892	45,660	64,968	79,414	85,005	89,040	77,993	91,023	112,015	121,262	
Food manufacturing	31100	394,404	503,047	501,332	494,683	503,915	693,438	608,765	541,557	520,546	617,230	527,904	570,617	583,246	676,200	798,776	754,522	755,290	
Beverage manufacturing	31210	83,691	78,740	84,764	95,236	83,774	106,580	109,397	D	111,431	96,676	92,210	78,312	104,710	123,816	115,845	148,774	144,375	
Tobacco manufacturing	31220	28,680	32,431	31,357	29,645	27,706	35,864	36,177	31,715	34,196	35,945	35,691	38,302	41,250	46,573	45,648	56,505	46,047	
Textile, apparel, and leather products manufacturing	31990	NA	45,893	56,890	52,532	68,545	55,066	51,532	70,105	89,019	66,734	59,379	0 - 1,908,473	56,466	55,062	61,679	56,818	57,165	
Wood products manufacturing	32100	28,183	26,213	25,241	22,344	28,764	36,703	44,706	28,998	0 - 229,395	31,890	34,871	35,769	40,414	63,407	67,924	56,464	61,564	
Paper manufacturing	32200	100,057	80,030	99,820	103,867	101,033	106,399	106,178	108,659	95,481	110,534	118,261	0 - 1,908,473	104,667	118,818	124,608	119,828	126,627	
Printing and related support activities	32300	22,678	33,532	32,163	26,809	26,267	26,281	29,178	35,056	26,808	39,492	31,019	i 55,231	32,668	30,803	29,184	36,902	33,168	
Petroleum refineries	32401	NA	NA	540,612	581,297	578,075	639,569	521,504	336,271	245,323	325,035	332,542	362,266	235,874	367,550	520,739	457,987	320,224	
Asphalt paving, roofing, and saturated materials manufacturing	32402	NA	NA	7,549	8,781	8,489	13,260	8,873	9,694	9,088	13,350	11,426	0 - 12,622	839,065	20,765	14,050	18,836	21,133	
Other petroleum and coal products manufacturing, including motor oil, hydraulic fluid, and charcoal	32403	NA	NA	21,658	20,509	20,440	13,722	12,852	11,797	10,565	15,821	13,238	10,453	8,479	11,622	19,722	10,631	11,559	
Basic chemicals manufacturing	32510	158,621	103,950	150,240	206,723	i 344,515	198,843	195,066	154,351	205,221	164,502	181,046	0 - 228,985	168,371	229,321	218,413	227,872	201,186	
Resin, synthetic rubber, and artificial synthetic fibers and filaments manufacturing	32520	60,269	61,805	64,684	58,263	68,104	67,845	73,542	61,729	58,345	56,121	76,816	71,460	57,050	76,141	97,331	72,024	66,632	
Pesticide, fertilizer, and other agricultural chemicals manufacturing	32530	28,010	47,317	41,528	33,380	40,317	45,660	55,122	D	41,963	55,687	53,085	55,218	56,536	68,605	77,914	71,218	75,947	
Pharmaceutical, medicinal, botanical, and biological products (except diagnostic substances) manufacturing ^c	32541	445,985	309,750	324,266	414,284	428,486	415,199	414,154	410,983	463,633	486,877	510,204	384,923	539,429	605,058	695,440	678,669	704,655	
In vitro diagnostic substances manufacturing ^c	32542	15,353	9,805	12,835	13,735	14,646	8,141	14,006	6,219	7,893	9,215	8,119	9,161	0 - 839,065	10,874	12,579	11,224	15,125	
Biotechnology-based pharmaceutical and biological products (except diagnostic substances)	32543	NA	NA	NA	NA	NA	36,856	48,419	71,205	0 - 229,395	0 - 90,420	96,814	111,134	114,261	119,302	D	174,198	184,249	
Soap, cleaning compound, and toilet preparations manufacturing	32591	69,942	71,452	81,151	70,851	82,518	87,034	101,458	94,015	83,083	94,133	107,951	98,948	100,249	103,111	114,703	111,093	106,854	
Paint, adhesive, and other chemical manufacturing	32592	63,149	62,724	60,506	64,497	79,372	67,504	73,975	68,020	73,446	78,668	86,077	79,965	78,245	80,283	86,647	85,385	89,856	
Plastics and rubber products manufacturing	32600	118,523	114,191	137,777	173,290	194,568	153,705	165,082	156,033	175,524	162,892	171,981	147,603	177,138	201,836	219,436	184,588	161,523	
Clay and glass products manufacturing	32710	24,394	19,014	25,143	21,754	20,164	22,987	21,577	23,739	30,753	27,302	29,698	24,222	19,882	26,747	32,584	30,272	25,768	

Table 62. Domestic sales for companies located in the United States that performed or funded R&D, by business activity: 2008–24

(Millions of U.S. dollars)

Business activity ^a	Business code ^b	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Cement, concrete, lime, gypsum, and other nonmetallic mineral products manufacturing	32790	43,373	31,599	24,141	24,235	33,359	33,428	25,941	27,882	28,170	25,524	36,064	40,811	37,413	36,806	41,998	34,728	45,511
Primary metal manufacturing	33100	NA	97,493	161,558	148,670	153,926	137,000	104,419	90,956	105,884	82,674	124,934	124,538	82,316	113,960	165,815	157,042	155,107
Fabricated metal products manufacturing	33200	142,788	102,595	119,246	130,090	155,294	i 160,359	168,139	150,860	129,779	128,532	149,664	132,941	146,085	407,226	r 223,708	181,783	180,898
Agricultural machinery and equipment manufacturing	33311	27,543	25,669	29,904	29,258	35,667	45,717	36,857	32,054	30,092	38,891	37,208	36,555	36,338	43,522	87,134	59,195	48,374
Construction machinery manufacturing	33312	18,228	13,180	19,480	25,854	31,853	42,912	41,256	35,668	34,984	39,464	44,655	49,631	44,963	46,512	65,160	69,464	64,399
Mining, oil, and gas field machinery and equipment manufacturing	33319	NA	33,167	39,264	53,050	60,556	46,949	43,531	37,351	21,606	31,187	46,305	41,573	22,622	28,128	33,290	35,918	33,881
Semiconductor machinery manufacturing	33321	9,091	4,765	11,918	15,018	6,839	10,807	11,067	8,215	15,676	20,114	21,685	24,629	26,327	28,909	33,168	30,911	28,511
Industrial machinery manufacturing (except semiconductor machinery)	33322	19,452	15,372	21,762	29,736	31,127	29,265	35,077	32,599	25,317	27,103	31,884	28,414	37,552	47,265	34,493	44,276	35,703
Photographic and photocopying equipment manufacturing	33331	NA	5,392	3,927	i 4,791	i D	6,885	7,246	7,124	6,776	5,993	0 - 1,147,536	710	1,453	1,198	1,310	1,803	976
Commercial, service industry, temperature control, and air-flow control machinery manufacturing	33332	NA	33,493	48,407	43,626	54,363	64,333	71,628	74,207	76,436	68,201	77,939	80,289	66,337	78,381	102,696	107,147	123,617
Digital cameras manufacturing	33333	NA	NA	NA	NA	NA	NA	15	D	0 - 5,580	i 1,423	0 - 1,147,536	i 1,762	0 - 839,065	1,987	1,749	1,662	1,382
Engine, turbine, and power transmission equipment manufacturing	33360	58,560	30,093	46,693	68,243	74,148	89,526	45,367	50,302	51,113	57,548	49,399	55,891	52,429	67,282	71,985	83,882	81,769
Metalworking and other general purpose machinery manufacturing	33390	54,007	43,998	58,532	71,081	86,258	81,492	98,230	99,506	78,310	78,019	86,306	75,128	70,191	85,203	78,176	80,803	85,733
Computers and peripheral equipment manufacturing and magnetic and optical media ^d	33412	NA	136,666	167,290	174,898	143,492	180,146	165,617	153,211	211,415	196,854	214,860	211,233	215,119	239,272	260,030	209,781	222,097
Telephone apparatus manufacturing, including routers, modems, and gateways	33421	26,447	35,592	40,631	32,334	34,783	39,026	40,004	92,411	i 44,009	41,110	44,162	0 - 1,908,473	40,721	40,367	41,702	D	45,947
Radio, television, and wireless communication equipment manufacturing	33422	46,641	46,769	61,641	55,217	82,027	94,606	i 96,564	i D	39,938	i 31,253	0 - 1,147,536	30,685	27,772	36,901	43,965	45,806	37,612
Other communication equipment manufacturing (except radio, television, and wireless communication equipment)	33429	11,185	8,644	8,841	12,452	13,908	16,604	12,801	14,671	0 - 229,395	11,789	14,853	14,423	16,620	8,176	9,153	9,406	12,699
Audio and video equipment manufacturing	33430	10,969	10,929	19,142	7,296	14,633	14,832	13,162	D	25,739	i 0 - 413,972	6,363	7,797	13,077	9,269	7,750	12,533	12,536
Semiconductor and other electronic components manufacturing	33440	119,612	117,302	138,124	151,590	146,764	123,263	162,118	172,062	160,152	182,769	232,283	0 - 1,908,473	238,282	D	215,025	183,421	274,806
Electromedical, electrotherapeutic, and irradiation apparatus manufacturing	33451	28,976	18,709	19,647	25,057	27,605	31,248	28,949	29,150	31,400	24,211	31,286	32,355	28,477	28,086	31,455	38,354	35,658
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments manufacturing	33452	33,348	46,237	57,639	40,372	53,425	52,990	55,142	48,787	47,874	53,371	i 63,110	62,411	62,584	33,473	65,503	52,155	60,537
Measuring and control instruments manufacturing (not listed elsewhere)	33459	37,609	42,753	50,643	49,752	58,909	52,984	55,954	61,158	62,658	60,242	52,440	56,172	62,458	70,193	68,795	72,695	74,960
Electrical equipment, appliances, and components manufacturing	33500	106,551	85,758	105,982	106,576	110,094	133,238	141,600	143,695	139,311	120,116	115,004	145,779	132,963	132,741	155,942	158,387	165,182

Table 62. Domestic sales for companies located in the United States that performed or funded R&D, by business activity: 2008–24

(Millions of U.S. dollars)

Business activity ^a	Business code ^b	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Motor vehicles manufacturing	33610	346,591	274,985	329,874	373,194	375,113	459,721	385,647	526,522	561,193	207,956 - 616,742	580,129	495,402	355,452	424,989	D	730,544	787,033
Motor vehicle body and trailer manufacturing	33620	9,363	15,184	22,168	14,423	31,982	25,726	32,146	23,083	62,848	19,322	25,616	42,353	25,694	35,506	45,345	38,934	30,326
Motor vehicle parts manufacturing	33630	97,433	77,528	146,257	125,593	130,372	155,179	244,948	192,928	148,781	185,890	202,526	195,569	156,265	174,779	188,096	238,523	200,247
Aircraft manufacturing	33641	97,973	69,001	81,666	111,748	91,545	145,641	132,472	139,909	130,676	121,866	181,703	139,087	114,601	D	105,652	128,583	132,075
Aircraft engine and engine parts manufacturing	33642	35,056	24,737	25,563	27,491	26,706	46,618	41,051	D	36,861	40,556	35,583	32,679	29,626	70,560	43,527	38,622	45,630
Other aircraft parts and auxiliary equipment manufacturing	33643	21,141	26,755	31,157	43,898	34,541	47,588	68,545	77,236	68,063	83,469	56,053	47,651	0 - 68,810	50,607	50,344	51,328	76,950
Guided missiles, space vehicles, and related parts manufacturing	33644	38,114	D	25,391	35,889	14,656	14,770	27,872	29,343	30,261	35,725	46,748	32,443	38,371	42,741	69,417	77,999	62,189
Railroad rolling stock manufacturing	33651	6,354	2,763	7,095	7,204	11,800	10,875	16,122	16,100	11,092	8,252	8,576	8,090	9,422	10,639	14,057	13,410	9,660
Ship and boat building	33660	14,880	D	10,531	11,647	22,778	15,008	32,077	13,569	33,497	20,861	14,316	21,987	16,334	18,387	22,844	22,871	22,118
Motorcycle, bicycle, and parts manufacturing	33691	8,078	6,282	6,081	7,422	7,067	10,406	7,777	7,687	6,276	5,423	0 - 1,147,536	0 - 1,908,473	5,569	6,785	9,680	6,791	7,548
Military armored vehicle, tank, and tank components manufacturing	33692	13,092	9,674	9,072	5,755	4,668	4,190	4,895	4,304	0 - 229,395	9,662	15,846	13,847	9,397	16,026	8,797	7,095	8,081
All other transportation equipment manufacturing	33699	7,131	5,438	11,079	11,066	16,258	15,809	D	11,472	11,940	11,554	17,803	16,188	19,170	16,662	16,894	25,213	24,645
Furniture and related products manufacturing	33700	36,218	31,479	32,876	32,881	37,447	35,446	39,675	38,024	37,737	43,394	44,459	46,013	48,923	46,357	40,302	43,652	38,973
Medical equipment and supplies manufacturing	33910	105,647	102,585	169,760	225,177	136,664	160,263	155,890	154,650	166,341	165,204	28,416 - 271,189	200,521	404,214	232,955	233,238	252,181	280,178
Miscellaneous manufacturing not listed elsewhere (games, office supplies, slot machines, etc.)	33990	80,689	84,846	71,000	78,674	80,879	93,078	90,517	95,353	86,197	96,947	104,968	87,408	99,610	100,001	86,121	85,599	87,128
Merchant wholesalers, durable goods	42300	238,101	196,341	206,240	171,815	221,488	353,401	161,500	232,112	194,976	142,659	225,389	147,049	155,289	247,170	207,809	236,710	323,214
Merchant wholesalers, nondurable goods	42400	274,190	239,385	247,311	266,388	349,833	362,965	457,745	387,489	359,871	349,751	454,966	438,340	519,753	1,043,215	1,053,666	829,784	730,008
Wholesale electronic markets and agents and brokers (business to business)	42500	2,481	D	3,331	3,008	65,076	33,264	65,562	21,530	59,653	49,844	0 - 1,147,536	5,104	19,913	26,645	18,782	D	16,749
Retail trade (except electronic shopping and electronic auctions)	44000	NA	D	195,958	70,424	214,728	128,479	400,192	196,896	278,755	305,293	481,549	582,400	608,344	549,530	661,116	729,201	818,546
Electronic shopping and electronic auctions	45411	NA	NA	32,624	40,254	53,712	59,174	43,787	D	110,618	0 - 198,757	191,381	168,467	212,453	D	201,038	217,277	331,313
Transportation	48000	NA	D	95,591	83,912	107,212	87,113	111,576	D	0 - 229,395	223,375	219,221	299,220	0 - 839,065	206,331	268,246	237,078	267,627
Couriers, messengers, and express delivery services	49200	D	D	36,420	D	D	D	123,456	D	141,429	103,001	68,939	2,014	0 - 839,065	D	89,140	83,121	97,144
Warehousing and storage	49300	28,723	1,296	23,982	21,910	3,157	12,235	1,971	2,305	3,358	9,877	0 - 1,147,536	8,407	11,392	D	7,198	11,958	4,132
Newspaper, periodical, book, and directory publishers (except Internet)	51110	12,383	16,369	18,917	22,488	26,549	15,003	8,481	5,743	7,263	4,383	0 - 1,147,536	5,584	839,065	5,389	5,405	4,790	12,143
Software publishers (except Internet) ^e	51120	121,028	118,001	129,649	132,970	136,905	154,237	163,059	159,688	155,068	133,983	148,758	142,948	149,525	164,870	235,489	200,788	218,910
Motion picture and sound recording (except Internet)	51200	10,053	14,356	11,375	9,824	7,281	13,722	D	5,203	6,863	6,353	32,874	43,304	33,951	36,546	11,509	2,127	1,235
Broadcasting (except Internet)	51500	NA	34,110	45,779	39,563	59,926	73,283	59,724	64,390	70,169	71,335	126,122	145,840	131,465	125,374	132,595	125,273	126,432

Table 62. Domestic sales for companies located in the United States that performed or funded R&D, by business activity: 2008–24

(Millions of U.S. dollars)

Business activity ^a	Business code ^b	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Wired telecommunications carriers	51710	99,917	D	209,490	261,484	216,736	181,127	227,778	213,921	179,239	220,350	127,438	137,019	146,787	153,019	152,529	149,269	148,445
Wireless telecommunications carriers (except satellite)	51720	134,162	153,937	138,473	156,525	193,254	205,148	247,714	210,820	172,357	200,979	264,216	264,970	253,127	274,485	280,886	288,135	303,491
Satellite telecommunications	51740	14,005	6,743 i	15,845	2,430	2,822	3,143	3,518	43,812	61,622	57,292	53,242	51,266	0 - 839,065	32,953	19,185	21,188	12,105
Other telecommunications (not listed elsewhere)	51790	4,374	8,108	7,222	15,929	14,610	16,325	5,973	13,669	7,684	14,142	12,552	13,863	0 - 839,065	14,542	13,450	18,674	20,833
Data processing, hosting, and related services ^e	51800	NA	29,903	31,417	51,197	82,997 i	49,201	67,167	64,916	59,491	57,183	114,191	69,067	69,419	91,759	93,537	88,866	101,576
Cloud computing applications and Internet-based software services	51801	NA	NA	NA	NA	NA	19,455	26,461	26,654	44,759	77,556	131,826	171,301	226,651	255,925	306,552	347,059	405,193
Other information services, including Internet publishing, broadcasting, and Web search portals ^e	51910	NA	27,907	47,397	28,424	28,760	36,613	57,405	53,823	75,332	100,436	114,010	121,756	0 - 839,065	184,883	203,462	225,551	265,612
Finance: banking and credit intermediation	52200	NA	D	992,651	601,628	631,902 i	305,994	317,147	312,954	342,319	399,822	479,807	577,362	570,871	D	546,141	604,333	791,799
Securities, commodity contracts, and other financial investments and related activities, including funds and trusts	52310	NA	D	113,669	117,167	88,244	83,913	54,342	60,239	55,068	83,537	0 - 1,147,536	67,833	94,101	127,622	117,786	153,547	178,240
Insurance carriers and related activities	52400	NA	282,640	265,110	265,293	349,252	363,799	347,710	398,746	353,842	294,467	0 - 1,147,536	0 - 1,908,473	883,433	937,882	674,320	811,689	962,089
Real estate	53100	6,053	D	4,615	4,727	8,069	8,227	10,128	8,449	9,235	0 - 10,116	10,982	0 - 1,908,473	11,837	28,901	41,338	26,522	31,364
Rental and leasing services	53200	NA	D	27,719	18,597	21,801	26,614	15,330	23,848	0 - 14,237	13,623	0 - 1,147,536	8,245	6,966	25,954	42,844	41,475	76,736
Lessors of nonfinancial intangible assets, including patent licensing	53300	D	1,484	1,702	2,350	2,125	10,764 i	1,608	1,982	1,386	2,785	0 - 1,147,536	1,615	3,191	7,106	1,807	2,924	10,252
Legal, accounting, tax preparation, bookkeeping, and payroll services	54111	NA	D	14,565	7,394	9,093	11,974	18,498 i	18,538	16,708	18,581	21,142	25,650	26,928	28,216	32,909	38,538	48,435
Architectural, engineering, and related services	54130	37,749	81,565	113,603	65,209	94,868 i	80,859	85,535	90,666	76,622	65,138	84,645	110,265	81,025	87,874	96,865	102,662	109,625
Specialized design services	54140	3,325	D	3,522	2,353	3,301 i	2,714	1,487	769	638	2,356 i	7,284	3,763	1,442	488	6,831	D	2,032 r
Computer systems design and related services ^e	54150	124,832	140,234	143,787	224,144	167,759	158,858	168,793	165,417	176,418	152,680	154,615	152,057	0 - 225,490	195,833	177,200	200,261	252,793
Management, scientific, and technical consulting services	54160	33,588	36,811	28,351	52,489	57,925	59,508	84,830	75,668	55,608	42,098	49,590	50,339	54,262	66,117	69,481	D	83,448
Research and development services in the social sciences and humanities	54172	NA	978	1,168	820	934	1,297	969	1,042	1,124	1,179	934	1,144	1,003	1,544	1,433	1,596	1,299
Research and development services in biotechnology ^{c,f}	54173	NA	18,691 i	7,194	7,388	9,769	10,689	15,872	9,381	6,548	6,476	0 - 1,147,536	0 - 1,908,473	9,660	12,341	11,639	11,436	13,603
Research and development services in the physical, engineering, and life sciences (except biotechnology)	54174	NA	16,041	15,845	19,094	27,670	32,098	27,450	30,843	30,737	28,218	31,661	38,345	41,259	46,131	48,906 i	56,303	48,889
Research and development services in nanotechnology	54175	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	360 i	316	568	1,980	1,721
Advertising and related services	54180	14,574	D	11,336 i	21,227	27,500	34,889	34,379	38,454	44,670	52,884	72,957	84,188	101,595	D	145,766	155,844	198,914
Professional, scientific, and technical services (not listed elsewhere)	54190	15,690	28,298	33,134	46,048	53,969	38,936	24,808	28,026	12,205	29,190	16,673	19,059	0 - 839,065	28,757	37,303	39,907	43,893

Table 62. Domestic sales for companies located in the United States that performed or funded R&D, by business activity: 2008–24

(Millions of U.S. dollars)

Business activity ^a	Business code ^b	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024			
Management of companies and enterprises	55100	752	2,310	3,347	11,847	4,131	176,993	8,497	D	11,172	i	16,588	12,189	13,209	11,701	i	13,575	i	13,616	16,871	15,893
Administrative and support services	56100	NA	29,045	25,660	22,146	38,874	i	26,981	214,331	23,581	27,504	26,915	38,514	0 - 1,908,473	55,368	53,074	85,087	67,831	75,543		
Waste management and remediation services	56200	NA	D	13,971	7,223	6,080	5,650	4,152	23,159	25,561	21,206	84,142	11,343	2,615	18,024	r	1,479	20,603	3,316		
Offices of physicians	62110	7,492	25,751	24,133	23,844	35,513	36,233	19,041	36,724	40,586	61,117	50,891	102,827	65,786	43,937	40,300	97,831	55,646			
Medical and diagnostic laboratories	62150	19,930	14,359	36,288	15,778	19,655	17,027	5,024	19,415	25,614	i	27,361	35,193	34,474	47,851	53,351	56,287	45,133	31,965		
Other ambulatory health care services (ambulance, dental, home health care)	62199	NA	D	8,333	D	3,334	i	10,919	5,274	0 - 229,395	10,363	0 - 1,147,536	22,444	26,984	D	21,688	D	13,182			
Hospitals and nursing care facilities	62200	NA	D	7,831	16,084	870	i	1,227	26,866	27,485	32,609	32,276	35,118	0 - 25,798	0 - 839,065	19,707	15,173	24,723	36,037		
Social assistance services	62400	D	D	448	326	249	1,036	1,336	63	77	112	0 - 1,147,536	0 - 1,908,473	1,826	D	123	148	121			
Arts, entertainment, and recreation	71000	NA	14,265	12,920	12,727	15,248	13,180	12,903	16,137	17,510	18,945	26,563	31,860	14,474	16,076	29,349	29,907	32,202	i		
Accommodation and food services	72000	NA	D	37,218	27,476	54,266	i	57,908	31,664	44,505	32,404	21,272	33,736	56,338	35,128	42,054	56,196	45,599	62,266		
Other services (not listed elsewhere)	81000	NA	9,638	35,994	118,268	44,823	120,458	60,949	51,253	173,078	0 - 413,972	1,147,536	0 - 1,908,473	0 - 839,065	D	D	D	363,800	i		
Less: intersegment eliminations	–	219,384	110,499	132,754	117,417	136,579	136,540	160,374	126,960	129,858	131,717	152,902	117,364	152,867	128,267	142,800	212,721	184,445			
Undistributed ^g	–	756,553	1,137,705	412,892	450,613	i	108,244	i	D	1,945	D	0	0	8	i	0	0	0	0		

D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%; NA = not available.

^a Business activity data are tabulated independent of the industry classification of the company. Companies were asked to report their sales and R&D activity in one or more business activity codes.

^b Business codes and descriptions are based on 2017 North American Industry Classification System (NAICS) industry definitions.

^c Estimates for this business code may not be comparable to those from prior years due to the introduction of a related business code for survey year 2013 and beyond: 32543, Biotechnology-based pharmaceutical and biological products (except diagnostic substances).

^d Estimates for this business code may not be comparable to those from prior years due to the introduction of a related business code for survey year 2014 and beyond: 33333, Digital cameras manufacturing.

^e Estimates for this business code may not be comparable to those from prior years due to the introduction of a related business code for survey year 2013 and beyond: 51801, Cloud computing applications and Internet-based software services.

^f Estimates for this business code may not be comparable to those from prior years due to the introduction of a related business code for survey year 2020 and beyond: 54175, Research and development services in nanotechnology.

^g Undistributed includes data reported that were not allocated to a business activity.

Note(s):
Detail may not add to total because of rounding. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D and are not comparable with estimates published for years prior to 2018. For survey year 2008, industry classification was based on the 2002 NAICS. For survey years 2009–13, industry classification was based on the 2007 NAICS. For survey years 2014–19, industry classification was based on the 2012 NAICS. For survey years beginning in 2020, classification was based on the 2017 NAICS. Most statistics for years prior to 2024 have been revised since original publication. Revised statistics include adjustments based on information obtained after the original statistics were prepared. An estimate range may be displayed in place of a single estimate to avoid disclosing operations of individual companies.

Source(s):
National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey.

Table 63. Foreign sales for companies located in the United States that performed or funded R&D, by business activity: 2008–24

(Millions of U.S. dollars)																			
Business activity ^a	Business code ^b	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	
All business activities	21100–81000	3,180,177	2,773,429	3,373,035	3,814,885	3,715,718	3,615,226	3,624,553	3,116,806	3,095,167	3,294,934	3,812,880	3,647,303	3,557,296	4,319,886	4,672,742	4,544,832	4,368,191	
Oil and gas extraction	21100	143,705	92,357	126,671	152,394	147,415	130,389	116,693	70,302	59,489	57,150	86,746	58,356	39,035	70,696	111,278	76,365	68,347	
Mining	21200	NA	D	5,230	19,552	19,020	16,261	D	D	10,528	5,473	19,044	2,191	1,391	48,060	i 462	292	157	
Support activities for mining, including oil and gas	21300	NA	22,162	26,223	25,878	28,461	27,621	32,686	26,711	i 18,880	24,865	i 29,837	36,898	24,913	i 15,275	86,936	i 16,469	22,027	
Utilities	22100	NA	D	9,155	10,892	9,320	8,068	8,229	10,468	4,473	6,948	4,779	4,874	1,573	3,705	4,320	6,606	6,705	
Construction	23000	NA	15,107	11,664	18,660	43,283	33,541	24,672	14,571	6,703	4,932	7,639	8,303	10,410	4,322	4,553	6,703	3,566	
Food manufacturing	31100	81,184	127,453	193,432	196,015	184,889	247,871	235,909	202,761	184,474	172,554	190,856	214,757	229,247	242,709	267,872	295,515	218,578	
Beverage manufacturing	31210	59,317	50,655	56,495	84,916	83,229	57,690	57,147	D	44,029	49,885	46,313	41,260	46,736	58,836	75,166	79,742	68,134	
Tobacco manufacturing	31220	290	102,541	102,636	111,353	103,052	33,327	D	D	30,782	36,346	31,938	32,447	31,001	37,174	34,143	42,259	38,729	
Textile, apparel, and leather products manufacturing	31990	NA	10,239	11,625	13,883	20,542	15,193	15,014	13,065	20,278	22,083	25,521	24,173	23,862	21,091	20,327	30,004	32,648	
Wood products manufacturing	32100	6,381	1,613	3,101	i 1,821	4,144	5,769	7,172	4,715	0 - 163,991	4,290	6,131	6,111	3,130	5,297	5,145	6,150	6,807	
Paper manufacturing	32200	39,895	30,504	36,481	40,196	41,303	40,349	42,619	D	33,888	36,393	39,708	0 - 585,012	33,357	32,569	33,418	32,488	31,577	
Printing and related support activities	32300	3,748	4,212	5,234	6,013	5,885	3,296	5,049	7,829	i 4,501	8,418	4,995	10,337	i 3,615	4,963	6,347	7,127	6,839	
Petroleum refineries	32401	NA	NA	297,333	372,811	333,710	328,477	266,321	175,953	170,110	0 - 408,784	254,128	203,583	143,144	220,963	302,595	273,729	263,297	
Asphalt paving, roofing, and saturated materials manufacturing	32402	NA	NA	17	91	74	i 1,244	2,278	630	3,234	3,312	6,373	5,800	2,928	4,171	1,095	1,105	545	
Other petroleum and coal products manufacturing, including motor oil, hydraulic fluid, and charcoal	32403	NA	NA	10,623	23,005	D	9,703	9,496	8,643	5,100	4,968	2,770	981	471	3,091	4,841	1,167	1,410	
Basic chemicals manufacturing	32510	115,189	75,544	92,953	92,754	129,151	79,818	75,221	58,600	59,714	67,172	80,961	0 - 228,985	0 - 563,442	102,289	106,073	96,370	89,706	
Resin, synthetic rubber, and artificial synthetic fibers and filaments manufacturing	32520	29,537	33,110	44,009	30,499	29,307	27,404	35,325	30,979	33,055	36,203	51,259	40,023	39,322	57,112	60,354	49,692	45,875	
Pesticide, fertilizer, and other agricultural chemicals manufacturing	32530	12,327	23,686	10,412	14,001	16,929	22,163	i 13,617	D	16,513	18,587	30,225	12,170	10,865	9,438	14,696	11,572	17,848	
Pharmaceutical, medicinal, botanical, and biological products (except diagnostic substances) manufacturing ^c	32541	136,925	128,937	147,497	163,323	165,908	162,730	155,814	153,415	144,820	149,280	159,641	170,480	168,105	222,522	225,990	181,391	194,652	
In vitro diagnostic substances manufacturing ^c	32542	6,964	7,135	7,802	11,270	12,376	5,730	11,359	7,940	0 - 163,991	6,700	8,931	i 0 - 585,012	6,846	8,916	10,371	i 7,083	7,551	
Biotechnology-based pharmaceutical and biological products (except diagnostic substances)	32543	NA	NA	NA	NA	NA	3,553	8,035	13,232	0 - 163,991	0 - 90,420	13,346	15,602	11,239	37,959	D	24,024	25,303	
Soap, cleaning compound, and toilet preparations manufacturing	32591	72,271	80,113	86,107	99,565	84,423	98,232	95,193	86,186	81,727	85,732	84,362	79,648	81,725	78,327	90,984	84,447	70,722	
Paint, adhesive, and other chemical manufacturing	32592	49,968	41,584	42,946	55,746	49,627	45,604	54,754	39,126	45,439	45,358	45,691	42,428	43,283	46,113	58,046	46,835	47,551	
Plastics and rubber products manufacturing	32600	43,878	46,866	55,694	70,156	71,055	65,315	76,697	45,131	56,942	66,455	55,679	60,034	61,140	69,608	72,330	54,259	56,011	
Clay and glass products manufacturing	32710	12,023	8,789	12,710	12,430	16,796	16,378	13,287	15,938	16,850	14,053	18,837	15,547	i 14,387	14,973	20,939	14,347	15,437	
Cement, concrete, lime, gypsum, and other nonmetallic mineral products manufacturing	32790	5,307	3,931	7,648	8,629	6,833	9,164	9,381	7,494	6,333	4,163	5,504	5,799	6,143	7,153	5,676	5,858	5,655	
Primary metal manufacturing	33100	NA	26,985	35,756	30,648	22,619	24,443	24,114	12,138	15,437	17,605	33,370	37,994	24,103	21,288	24,843	25,901	18,602	

Table 63. Foreign sales for companies located in the United States that performed or funded R&D, by business activity: 2008–24

(Millions of U.S. dollars)

Business activity ^a	Business code ^b	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Fabricated metal products manufacturing	33200	45,571	29,870	42,347	49,138	52,129	39,319	67,646	43,238	35,404	47,454	53,830	50,382	49,793	76,212	65,269	53,558	48,217
Agricultural machinery and equipment manufacturing	33311	20,642	21,025	24,042	i 14,152	23,984	23,076	26,760	21,505	21,684	21,146	30,017	0 - 585,012	21,007	24,924	29,813	32,757	26,613
Construction machinery manufacturing	33312	13,881	10,015	11,205	17,120	11,502	20,431	24,092	20,423	14,283	21,099	29,451	30,626	25,473	29,585	31,176	26,815	25,992
Mining, oil, and gas field machinery and equipment manufacturing	33319	NA	35,907	36,300	48,499	49,800	37,434	32,935	36,375	26,418	34,098	40,208	27,371	32,383	23,093	25,397	24,922	28,692
Semiconductor machinery manufacturing	33321	10,928	5,740	9,670	10,941	3,134	13,613	16,266	16,438	15,074	18,206	25,323	0 - 585,012	22,989	38,109	45,259	49,591	53,035
Industrial machinery manufacturing (except semiconductor machinery)	33322	7,532	5,996	8,961	14,930	11,492	10,092	16,537	6,590	12,341	11,149	12,740	9,699	11,163	12,857	10,693	16,515	15,582
Photographic and photocopying equipment manufacturing	33331	NA	2,080	D	D	D	618	1,915	1,477	0 - 163,991	857	0 - 242,771	127	0 - 563,442	195	194	245	166
Commercial, service industry, temperature control, and air-flow control machinery manufacturing	33332	NA	16,053	28,404	30,270	36,451	33,652	40,045	27,712	37,396	32,672	38,473	35,358	26,891	34,928	38,488	41,998	37,705
Digital cameras manufacturing	33333	NA	NA	NA	NA	NA	NA	0	D	0 - 5,580	i 4,524	0 - 242,771	1,610	0 - 563,442	92	111	102	109
Engine, turbine, and power transmission equipment manufacturing	33360	28,100	16,787	37,994	44,319	45,968	56,604	D	35,258	36,775	48,658	i 45,700	0 - 585,012	50,998	62,627	59,483	61,620	64,982
Metalworking and other general purpose machinery manufacturing	33390	36,061	22,352	36,485	41,866	39,237	23,995	51,377	41,166	38,528	39,516	38,439	26,329	25,014	38,490	36,122	36,197	34,717
Computers and peripheral equipment manufacturing and magnetic and optical media ^d	33412	NA	136,763	162,729	167,518	160,818	127,377	131,576	129,679	203,226	255,629	264,980	242,284	239,607	305,149	324,380	313,415	328,178
Telephone apparatus manufacturing, including routers, modems, and gateways	33421	22,369	30,531	46,528	32,477	29,869	36,859	32,417	109,988	i 32,209	32,943	36,643	0 - 585,012	29,345	32,518	31,701	D	32,836
Radio, television, and wireless communication equipment manufacturing	33422	29,526	18,039	18,034	37,667	54,443	54,074	i 72,211	i 15,183	0 - 163,991	5,839	0 - 242,771	6,439	i 6,721	7,226	8,179	7,050	6,838
Other communication equipment manufacturing (except radio, television, and wireless communication equipment)	33429	6,791	4,680	4,015	8,552	2,041	6,695	i 1,747	1,326	0 - 163,991	2,019	0 - 242,771	1,476	2,225	2,838	2,971	D	5,002
Audio and video equipment manufacturing	33430	2,243	4,112	3,100	4,180	3,294	4,764	5,171	D	9,734	3,725	5,308	8,187	3,261	3,145	2,817	3,909	3,884
Semiconductor and other electronic components manufacturing	33440	100,661	79,098	157,934	185,199	186,007	197,516	188,661	D	163,360	191,123	232,485	0 - 585,012	180,433	D	246,750	273,991	270,108
Electromedical, electrotherapeutic, and irradiation apparatus manufacturing	33451	12,419	8,728	9,394	13,503	11,985	11,882	14,588	15,589	14,752	20,106	i 22,814	i 18,118	i 17,058	14,056	14,097	16,084	16,331
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments manufacturing	33452	5,126	9,629	11,268	7,329	10,300	13,337	12,013	9,882	i 11,779	12,359	i 9,889	10,658	16,076	2,921	14,218	5,529	8,030
Measuring and control instruments manufacturing (not listed elsewhere)	33459	20,381	35,476	37,663	34,616	40,865	44,169	46,955	39,940	39,568	30,855	28,163	28,865	31,658	39,682	38,940	42,843	45,920
Electrical equipment, appliances, and components manufacturing	33500	47,654	43,416	54,549	58,580	54,904	49,253	56,905	51,633	73,973	65,117	74,039	74,152	69,495	71,293	56,251	47,426	47,864
Motor vehicles manufacturing	33610	174,950	124,140	146,852	166,401	166,616	155,415	153,493	119,588	132,355	0 - 408,784	120,673	122,714	105,124	134,404	D	205,574	167,712
Motor vehicle body and trailer manufacturing	33620	D	504	937	903	2,302	187	573	145	384	763	603	3,589	4,591	4,676	4,370	5,651	1,758
Motor vehicle parts manufacturing	33630	66,559	49,109	95,944	98,857	98,046	113,842	134,544	101,485	89,740	84,753	82,209	95,607	i 85,627	115,060	117,377	99,998	89,056

Table 63. Foreign sales for companies located in the United States that performed or funded R&D, by business activity: 2008–24

(Millions of U.S. dollars)

Business activity ^a	Business code ^b	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	
Aircraft manufacturing	33641	S	6,959	7,569	9,732	i 5,939	8,600	i 7,452	9,077	5,821	6,995	8,989	5,758	6,175	D	5,086	7,686	7,486	
Aircraft engine and engine parts manufacturing	33642	7,773	12,349	9,361	15,023	13,670	7,406	7,083	i D	1,316	1,784	24,974	21,585	13,163	30,464	17,494	28,546	35,413	
Other aircraft parts and auxiliary equipment manufacturing	33643	9,178	9,959	10,547	12,611	10,015	12,933	16,421	19,962	17,048	20,212	11,827	10,607	0 - 68,810	8,589	10,386	11,974	15,451	
Guided missiles, space vehicles, and related parts manufacturing	33644	D	D	D	D	1,899	2,431	2,366	2,434	i 339	1,480	i 4,265	2,774	5,309	2,767	2,326	16,680	i 17,604	i
Railroad rolling stock manufacturing	33651	894	875	1,980	1,666	2,455	1,764	3,557	i 3,253	3,760	5,164	5,507	5,415	i 7,433	3,630	i 4,694	7,518	5,837	
Ship and boat building	33660	1,581	D	D	D	1,188	i 1,919	i 6,971	i 1,858	0 - 100,602	i 1,677	1,979	2,069	1,866	2,150	2,027	2,306	2,494	
Motorcycle, bicycle, and parts manufacturing	33691	345	395	565	1,526	762	926	1,365	1,381	3,231	i 3,684	4,254	4,031	4,158	6,664	6,158	5,921	3,882	
Military armored vehicle, tank, and tank components manufacturing	33692	249	462	D	484	224	164	2,608	D	78	1,644	i 2,678	1,557	1,367	1,793	i 800	669	827	
All other transportation equipment manufacturing	33699	2,382	895	1,929	2,349	2,212	13,125	D	3,093	2,495	3,104	3,294	1,539	1,880	2,124	2,459	3,749	4,124	
Furniture and related products manufacturing	33700	7,183	4,342	4,610	6,151	6,272	5,960	6,085	5,506	5,625	3,866	4,438	5,317	7,203	7,431	4,763	6,428	8,073	
Medical equipment and supplies manufacturing	33910	58,419	57,025	73,646	79,038	80,885	77,466	78,288	81,056	78,407	85,432	0 - 242,771	101,069	112,337	120,823	124,275	123,268	128,874	
Miscellaneous manufacturing not listed elsewhere (games, office supplies, slot machines, etc.)	33990	41,981	29,242	30,526	D	37,781	47,716	43,898	D	45,531	i 38,962	65,941	i 29,707	0 - 563,442	48,001	31,974	27,410	26,290	
Merchant wholesalers, durable goods	42300	174,168	116,754	127,763	42,957	25,213	25,149	i 18,514	27,926	26,876	22,686	22,567	16,769	25,347	26,378	18,051	27,272	34,151	
Merchant wholesalers, nondurable goods	42400	66,765	33,733	33,672	229,921	237,186	208,777	240,437	160,432	152,996	156,369	178,950	155,095	131,942	196,408	215,278	122,688	99,494	
Wholesale electronic markets and agents and brokers (business to business)	42500	119	D	16	1,714	i 50,376	i 20,233	20,653	20,376	544	312	436	251	732	285	282	691	395	
Retail trade (except electronic shopping and electronic auctions)	44000	NA	D	27,253	34,498	42,738	28,360	42,336	13,516	17,264	16,756	55,879	80,367	77,183	46,998	45,811	42,106	45,787	
Electronic shopping and electronic auctions	45411	NA	NA	D	D	34,500	37,403	D	D	0 - 163,991	0 - 198,757	0 - 242,771	i 585,012	0 - 563,442	i D	88,349	99,364	i 24,140	i
Transportation	48000	NA	D	86,945	25,930	32,403	8,708	5,691	D	0 - 163,991	54,889	58,580	88,742	41,227	56,182	80,954	79,239	92,879	
Couriers, messengers, and express delivery services	49200	D	D	11,199	D	0	30,192	47,478	D	45,916	33,435	22,049	20	0 - 563,442	D	47,388	D	D	
Warehousing and storage	49300	2,512	240	474	975	826	1,295	614	D	1,294	5,837	0 - 242,771	7,536	5,701	D	2,385	D	864	
Newspaper, periodical, book, and directory publishers (except Internet)	51110	4,670	8,159	7,754	8,343	7,008	i 2,953	i 2,040	1,265	1,441	1,628	0 - 242,771	1,562	1,491	1,689	1,406	1,396	1,782	
Software publishers (except Internet) ^e	51120	89,158	77,832	84,710	97,929	100,697	112,350	115,101	113,255	101,226	97,898	96,171	94,590	89,112	100,167	109,857	109,602	142,824	
Motion picture and sound recording (except Internet)	51200	6,721	6,341	6,635	5,141	2,185	7,140	D	1,939	2,490	2,583	4,452	3,265	2,081	1,129	1,365	D	D	
Broadcasting (except Internet)	51500	NA	5,624	7,533	4,466	7,504	i 8,215	D	10,083	14,710	16,825	25,106	39,683	36,550	35,744	25,442	31,166	32,657	
Wired telecommunications carriers	51710	D	D	1,214	6,862	7,093	865	2,852	2,667	2,665	2,349	2,328	2,226	3,923	i 3,920	i 3,301	2,198	2,015	
Wireless telecommunications carriers (except satellite)	51720	1,085	745	6	171	154	i D	45	D	59	84	3	5	1,645	i 688	i 5,074	4,577	5,066	
Satellite telecommunications	51740	5,325	5,919	i 176	353	i 234	D	63	587	305	296	90	70	192	1,208	574	1,522	1,341	
Other telecommunications (not listed elsewhere)	51790	1,230	1,015	515	2,875	3,193	i 2,179	534	893	840	1,898	0 - 242,771	0 - 585,012	0 - 563,442	767	552	8,693	5,709	
Data processing, hosting, and related services ^e	51800	NA	6,292	7,107	9,443	12,874	9,301	13,891	14,101	16,853	20,676	26,815	28,779	33,130	47,461	31,364	31,980	40,346	

Table 63. Foreign sales for companies located in the United States that performed or funded R&D, by business activity: 2008–24

(Millions of U.S. dollars)																		
Business activity ^a	Business code ^b	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Cloud computing applications and Internet-based software services	51801	NA	NA	NA	NA	NA	7,987 i	D	7,138	13,012	20,668	35,853	49,309	96,722	112,222	114,748	152,683	117,451
Other information services, including Internet publishing, broadcasting, and Web search portals ^e	51910	NA	13,753	29,921	11,126	16,969	28,521	44,849 i	40,718	37,792	60,390	77,032	93,598	0 - 563,442	152,479	169,117	215,603	251,385
Finance: banking and credit intermediation	52200	NA	45,027	76,052 i	29,501	41,335	41,144	47,077	64,668	58,050	72,381	56,472	52,099	63,767	D	74,125	86,175	101,862
Securities, commodity contracts, and other financial investments and related activities, including funds and trusts	52310	NA	D	34,345	35,268	16,671	23,114	19,687	15,087 i	17,046	18,774	20,890	30,062	35,216	32,486	34,864	44,506	50,690
Insurance carriers and related activities	52400	NA	11,594	16,234	14,985	8,907	34,172 i	32,407 i	21,780 i	19,060 i	18,456 i	0 - 242,771 i	37,830 i	30,746 i	17,753	21,458 i	28,671 i	25,859 i
Real estate	53100	D	D	D	D	D	D	D	88	57	0 - 10,116	583	223	1	1	*	*	162
Rental and leasing services	53200	NA	D	8,580 i	5,232 i	7,232	8,873	6,656	5,390	0 - 14,237	8,019	3,608	4,473	3,186	9,682	9,712	12,110	13,958
Lessors of nonfinancial intangible assets, including patent licensing	53300	D	352	225	359	764	640	517	168	82	729	0 - 80,926 i	56	0 - 563,442	1,838	1,150	1,464	1,607
Legal, accounting, tax preparation, bookkeeping, and payroll services	54111	NA	864 i	1,623	D	2,222	2,614	3,816 i	3,720	2,818	2,755	2,902	3,148	2,323	2,697	2,192	4,251	4,730
Architectural, engineering, and related services	54130	4,931	14,969	33,706	36,917	19,373	45,064	49,007	49,180	26,789	19,248	18,151	16,522	14,317	15,897	16,702	16,445	16,011
Specialized design services	54140	D	D	454	228	345	900	678	D	68	2,229 i	18,371	8,921	0 - 563,442	55	D	D	21
Computer systems design and related services ^e	54150	86,084	76,243	80,239	153,776 i	104,306	90,742	104,143	78,373	73,013	70,600	96,552	86,379	0 - 225,490	79,708	91,892	88,470 i	45,671
Management, scientific, and technical consulting services	54160	18,909	23,315	14,838	24,421	27,236	22,327	8,247	16,452	7,535	6,959	19,754	7,997 i	5,267	6,184	17,824	D	19,950
Research and development services in the social sciences and humanities	54172	NA	2	2	7	D	4	22	D	7	5	7	89	13	1	6	4	4
Research and development services in biotechnology ^{c,f}	54173	NA	3,663 i	1,299	1,269	1,547	1,701	1,671	1,581	2,478 i	2,864	3,773	4,160	4,095	6,144	5,063	5,831	3,732
Research and development services in the physical, engineering, and life sciences (except biotechnology)	54174	NA	3,817	2,994	4,352	5,625	4,814	5,253	5,194	7,260	9,736	10,193 i	10,902 i	13,029 i	15,402 i	14,966 i	14,991 i	14,528
Research and development services in nanotechnology	54175	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	2	2	171	642
Advertising and related services	54180	D	D	1,656	D	25,263	D	D	D	0 - 163,991	54,756	67,297	0 - 585,012	0 - 563,442	D	D	D	D
Professional, scientific, and technical services (not listed elsewhere)	54190	3,456	2,025	2,186	4,901	9,285	8,417	8,004	2,749	0 - 163,991	2,049	4,823	3,988 i	2,695	3,112	4,244	3,664	7,867
Management of companies and enterprises	55100	76	23	266	5,428	1,304	887	716	D	622	1,592	1,726	40	206 i	104 i	21	131	76
Administrative and support services	56100	NA	6,821	19,476	10,588	11,810	17,023	29,314	26,456	28,098	22,603	28,430	27,044	8,212	9,268	13,197	14,649	43,921
Waste management and remediation services	56200	NA	D	201	959	484	595	614	1,827	1,910	1,402	4,360	281	0 - 563,442	608	3	86	681
Offices of physicians	62110	0	* i	0	0	0	0	0	0	0	1	0	0	0	0	22	*	67
Medical and diagnostic laboratories	62150	1,037	857	1,662	1,269	1,383	887	895	1,488 i	1,925 i	1,275	4,320 i	4,132 i	4,245 i	5,676 i	7,991 i	5,402 i	4,795 i
Other ambulatory health care services (ambulance, dental, home health care)	62199	NA	D	154	D	27	0	0	0	0	455	177	193	3,636	D	543	D	618
Hospitals and nursing care facilities	62200	NA	0	D	D	D	D	0	131	287	0	1 i	0	0	0	0	0	100

Table 63. Foreign sales for companies located in the United States that performed or funded R&D, by business activity: 2008–24

(Millions of U.S. dollars)

Business activity ^a	Business code ^b	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Social assistance services	62400	D	D	0	0	0	29	2	0	0	0	0	0	0	0	0	0	0
Arts, entertainment, and recreation	71000	NA	3,074	3,169	3,297	3,096	D	D	2,540	0 - 163,991	5,595	8,134	5,730	0 - 563,442	1,879	3,830	D	D
Accommodation and food services	72000	NA	9,891	32,256	11,945	34,612	49,347	14,564	32,394	34,445	4,924	20,830	28,004	17,863	22,216	5,204	5,314	6,169
Other services (not listed elsewhere)	81000	NA	5,946	7,784	10,816	12,789	21,571	17,416	19,528	64,593	0 - 408,784	0 - 242,771	18,846 i	20,963	D	D	87,632 i	37,996
Less: intersegment eliminations	–	161,647	127,244	101,536	164,044	172,709	165,075	156,556	113,257	97,136	64,324	102,225	65,462	62,651	95,382	85,357	200,004	81,635
Undistributed ^g	–	335,723	452,404	103,862	147,756 i	58,997 i	D	2,657	D	0	0	0	0	0	0	0	0	0

* = amount < \$500,000; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; NA = not available.

^a Business activity data are tabulated independent of the industry classification of the company. Companies were asked to report their sales and R&D activity in one or more business activity codes.

^b Business codes and descriptions are based on 2017 North American Industry Classification System (NAICS) industry definitions.

^c Estimates for this business code may not be comparable to those from prior years due to the introduction of a related business code for survey year 2013 and beyond: 32543, Biotechnology-based pharmaceutical and biological products (except diagnostic substances).

^d Estimates for this business code may not be comparable to those from prior years due to the introduction of a related business code for survey year 2014 and beyond: 33333, Digital cameras manufacturing.

^e Estimates for this business code may not be comparable to those from prior years due to the introduction of a related business code for survey year 2013 and beyond: 51801, Cloud computing applications and Internet-based software services.

^f Estimates for this business code may not be comparable to those from prior years due to the introduction of a related business code for survey year 2020 and beyond: 54175, Research and development services in nanotechnology.

^g Undistributed includes data reported that were not allocated to a business activity.

Note(s):
Detail may not add to total because of rounding. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D and are not comparable with estimates published for years prior to 2018. For survey year 2008, industry classification was based on the 2002 NAICS. For survey years 2009–13, industry classification was based on the 2007 NAICS. For survey years 2014–19, industry classification was based on the 2012 NAICS. For survey years beginning in 2020, classification was based on the 2017 NAICS. Most statistics for years prior to 2024 have been revised since original publication. Revised statistics include adjustments based on information obtained after the original statistics were prepared. An estimate range may be displayed in place of a single estimate to avoid disclosing operations of individual companies.

Source(s):
National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey.

Table 64. Domestic R&D paid for by the company and others and performed by the company, by business activity: 2011–24

(Millions of U.S. dollars)

Business activity ^a	Business code ^b	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	
All business activities	21100–81000	290,240	302,759	323,107	340,539	355,671	378,590	396,979	443,633	491,434	538,870	608,429	691,987	723,206	765,082	
Oil and gas extraction	21100	D	D	D	1,108	D	867	0 - 11,355	i 0 - 16,964	712	681	544	D	852	639	
Mining	21200	83	88	80	54	68	58	121	92	121	104	89	i 138	i D	110	
Support activities for mining, including oil and gas	21300	D	1,860	1,871	2,349	2,076	1,544	1,599	i 836	i 1,364	722	651	i 786	i 584	1,158	
Utilities	22100	298	434	343	343	485	349	323	i 272	274	275	D	D	595	D	
Construction	23000	752	756	244	i 204	i 521	258	i 507	686	868	1,071	749	788	778	733	
Food manufacturing	31100	3,769	3,565	5,156	4,934	i 4,388	i 4,966	4,809	4,678	4,756	5,098	5,120	6,529	i 5,652	6,291	
Beverage manufacturing	31210	D	D	628	D	664	0 - 28,354	i 734	702	654	663	740	794	961	912	
Tobacco manufacturing	31220	D	140	163	D	153	153	175	196	189	217	233	213	275	232	
Textile, apparel, and leather products manufacturing	31990	623	688	687	662	i 794	1,244	i 904	934	831	768	577	D	689	743	
Wood products manufacturing	32100	202	278	234	322	i 227	238	236	261	232	234	476	304	307	363	
Paper manufacturing	32200	755	982	1,166	1,028	D	1,165	1,411	1,302	1,472	1,244	1,534	1,337	1,613	1,469	
Printing and related support activities	32300	244	305	i 389	363	287	304	265	321	439	352	298	340	536	420	
Petroleum refineries	32401	D	596	438	D	443	441	396	491	0 - 17,119	0 - 25,158	392	432	437	531	
Asphalt paving, roofing, and saturated materials manufacturing	32402	38	41	117	i 66	52	i 75	124	107	110	197	138	92	134	141	
Other petroleum and coal products manufacturing, including motor oil, hydraulic fluid, and charcoal	32403	285	218	312	i 279	i 268	202	223	133	106 - 2,076	120	91	129	134	122	
Basic chemicals manufacturing	32510	3,099	3,228	2,925	3,144	3,071	2,946	2,897	2,897	2,638	3,039	3,048	3,151	3,378	3,345	
Resin, synthetic rubber, and artificial synthetic fibers and filaments manufacturing	32520	815	1,093	999	1,054	1,213	930	825	1,262	1,293	1,338	1,375	1,369	1,288	D	
Pesticide, fertilizer, and other agricultural chemicals manufacturing	32530	D	1,951	2,114	i 2,057	i D	1,900	i 1,977	2,384	i 2,094	1,512	1,482	D	D	D	
Pharmaceutical, medicinal, botanical, and biological products (except diagnostic substances) manufacturing ^c	32541	42,381	43,672	42,456	43,748	40,540	43,964	45,846	48,489	55,243	56,811	60,803	61,161	62,999	63,457	
In vitro diagnostic substances manufacturing ^c	32542	1,110	1,044	i 831	729	801	987	1,308	1,151	1,380	1,596	1,621	1,777	2,583	3,193	
Biotechnology-based pharmaceutical and biological products (except diagnostic substances)	32543	NA	NA	7,118	10,337	14,071	16,440	18,629	23,591	29,477	32,452	39,327	51,625	59,514	65,536	
Soap, cleaning compound, and toilet preparations manufacturing	32591	2,344	2,261	2,286	2,365	2,451	2,550	2,492	2,534	0 - 17,119	2,404	2,477	2,586	2,594	2,398	
Paint, adhesive, and other chemical manufacturing	32592	1,552	1,630	1,489	1,562	i D	0 - 28,354	1,636	1,361	1,423	1,472	1,356	1,384	1,370	D	
Plastics and rubber products manufacturing	32600	2,669	3,277	3,010	3,072	i 2,910	3,396	3,264	3,128	2,997	2,921	3,225	3,515	3,013	2,862	
Clay and glass products manufacturing	32710	801	i 987	i 973	i 1,003	i 948	987	1,199	1,333	1,326	i 1,376	i 1,375	1,382	1,256	1,464	i
Cement, concrete, lime, gypsum, and other nonmetallic mineral products manufacturing	32790	303	367	458	i 564	i 393	i 374	378	331	437	374	417	446	365	i 350	i
Primary metal manufacturing	33100	552	750	644	703	596	i 0 - 28,354	608	708	742	915	1,036	1,231	756	1,159	
Fabricated metal products manufacturing	33200	D	2,236	2,535	i 2,280	2,541	2,321	2,650	2,764	3,278	3,895	4,614	4,020	3,668	3,783	
Agricultural machinery and equipment manufacturing	33311	989	1,175	1,193	1,230	1,172	1,194	1,224	1,529	1,549	0 - 25,158	1,531	D	D	D	
Construction machinery manufacturing	33312	655	675	1,340	1,309	1,210	1,209	1,203	1,316	i 1,276	1,254	1,384	1,249	1,737	1,506	
Mining, oil, and gas field machinery and equipment manufacturing	33319	1,735	1,999	1,436	i 1,142	1,431	1,107	1,272	1,324	1,104	1,028	1,222	1,262	1,223	1,063	
Semiconductor machinery manufacturing	33321	2,207	1,308	i 3,146	2,979	3,218	3,374	3,707	4,131	4,396	4,752	5,308	5,466	D	D	
Industrial machinery manufacturing (except semiconductor machinery)	33322	945	850	878	1,158	1,143	900	1,049	971	1,386	1,042	1,432	1,503	1,874	1,451	
Photographic and photocopying equipment manufacturing	33331	656	23	i 458	79	133	92	61	59	i 162	0 - 25,158	70	D	88	71	
Commercial, service industry, temperature control, and air-flow control machinery manufacturing	33332	D	1,182	1,367	1,446	1,380	0 - 28,354	1,780	1,667	1,712	1,440	1,907	2,287	2,544	2,578	
Digital cameras manufacturing	33333	NA	NA	NA	25	491	i 421	i 475	230	409	313	i 273	194	215	238	
Engine, turbine, and power transmission equipment manufacturing	33360	3,257	3,603	2,373	1,847	2,304	2,365	2,543	2,273	2,550	2,466	2,051	2,463	D	3,819	

Table 64. Domestic R&D paid for by the company and others and performed by the company, by business activity: 2011–24

(Millions of U.S. dollars)

Business activity ^a	Business code ^b	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Metalworking and other general purpose machinery manufacturing	33390	1,832	1,607	1,780	2,089	2,292	2,139	2,039	2,468	2,394	2,881	2,530	2,831	2,504	2,804
Computers and peripheral equipment manufacturing and magnetic and optical media ^d	33412	10,311	10,893	11,162	9,651	10,997	18,321	20,751	21,765	19,060 i	22,842	24,769	27,920	D	D
Telephone apparatus manufacturing, including routers, modems, and gateways	33421	7,006	5,101	5,534	7,734	9,529	8,182	7,789	8,550	8,495	7,562	7,912	D	D	9,188
Radio, television, and wireless communication equipment manufacturing	33422	4,182	5,851	7,664	6,325 i	3,387 i	4,108 i	3,942 i	0 - 16,964 i	2,589 i	2,286	3,299	3,446	3,799	3,292
Other communication equipment manufacturing (except radio, television, and wireless communication equipment)	33429	871	1,937	1,729	1,687	1,695 i	1,798	1,536	0 - 16,964	1,686	1,641	681	595	672	518
Audio and video equipment manufacturing	33430	798	865	876	1,018	1,071 i	972	1,058	1,084	1,270	1,285	1,517	1,713	1,895	1,622
Semiconductor and other electronic components manufacturing	33440	24,580	28,983	30,792	31,986	30,805	31,428	30,858	31,240	35,725	44,110	47,620	52,484	49,653	55,353
Electromedical, electrotherapeutic, and irradiation apparatus manufacturing	33451	2,787	2,868 i	3,178 i	3,670	3,409	3,417 i	3,094	4,079	3,973	3,902	4,386	5,107	5,437	4,466
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments manufacturing	33452	5,666	6,403	6,550	6,234	6,503	8,275	6,538	7,819	7,870	8,840 i	3,918	6,258	6,594	6,655
Measuring and control instruments manufacturing (not listed elsewhere)	33459	3,191	3,465	3,901	4,045	4,201	4,222	3,885	3,888	3,911	4,376	4,273	4,185	4,383	4,517
Electrical equipment, appliances, and components manufacturing	33500	3,007	3,391	4,208	4,461	4,378	4,805	4,512	4,362	5,230	5,295	5,389	6,702	6,763	6,548
Motor vehicles manufacturing	33610	9,320	11,314	11,696	12,134	12,502	15,095	16,308	17,447	15,241	15,574	22,120	D	D	25,676
Motor vehicle body and trailer manufacturing	33620	69	91 i	98 i	96	156 i	113	44	93	155	82	137	162	282	238
Motor vehicle parts manufacturing	33630	3,010	D	4,554	6,022	6,158	6,401	6,946	7,800	8,146 i	7,780	7,727	7,688	6,571	5,905
Aircraft manufacturing	33641	5,853	15,380 i	16,607 i	15,632 i	14,757 i	0 - 28,354 i	9,704 i	14,488 i	10,720 i	15,641	9,842 i	17,877 i	19,011	18,800 i
Aircraft engine and engine parts manufacturing	33642	1,636	1,296	1,758	2,294 i	1,580	1,738	1,850	2,226	2,104	2,038	8,245 i	4,396	4,810	4,948
Other aircraft parts and auxiliary equipment manufacturing	33643	1,896	2,655	3,446	4,443	4,919	3,817	4,453	1,887	1,434	1,740	1,490	2,873	3,252	3,122
Guided missiles, space vehicles, and related parts manufacturing	33644	3,526	2,850	2,703	2,826 i	3,011	3,063 i	3,269	3,405	3,496	3,357	2,426	6,685	7,505	6,808 i
Railroad rolling stock manufacturing	33651	136	177	183	295	240	187	0 - 11,355	148	0 - 17,119 i	239	212 i	289	259	D
Ship and boat building	33660	D	D	1,106	1,568 i	D	0 - 28,354 i	1,289	0 - 16,964	0 - 17,119	964	859	960	1,492	D
Motorcycle, bicycle, and parts manufacturing	33691	212 i	176 i	214 i	251	282	286	0 - 11,355	372	368	417	447	454	380	390
Military armored vehicle, tank, and tank components manufacturing	33692	D	122	215	358	335	392	653 i	664 i	541	468	731	657	369 i	210 i
All other transportation equipment manufacturing	33699	415	D	362	428	D	368	564	465	465	552	563	397	638	589
Furniture and related products manufacturing	33700	300	382	383	389	458	364	438	428	458	462	458	432	490	475
Medical equipment and supplies manufacturing	33910	10,141	10,703	11,797	10,987	11,336	12,024	13,299	13,211	14,801	14,638	16,886	18,572	19,197	21,421
Miscellaneous manufacturing not listed elsewhere (games, office supplies, slot machines, etc.)	33990	2,593	D	2,544	2,387	2,455 i	2,597 i	2,575	2,861	2,499	3,032	3,133	3,261	2,941	2,833
Merchant wholesalers, durable goods	42300	505	1,461 i	449 i	414 i	1,507 i	551 i	364	730 i	750	855	1,303 i	1,085	1,675 i	1,091
Merchant wholesalers, nondurable goods	42400	429	651 i	272 i	D	546 i	153 i	207	273 i	0 - 17,119	384	656 i	619	687 i	660 i
Wholesale electronic markets and agents and brokers (business to business)	42500	54	182 i	D	139	D	23	41 i	94 i	37 i	36 i	50	167 r	233 i	60
Retail trade (except electronic shopping and electronic auctions)	44000	52	101 i	96 i	58 i	87	149	69	190	280	216	353	353	736	737
Electronic shopping and electronic auctions	45411	940 i	1,239	993	1,051	1,543 i	0 - 28,354 i	0 - 11,355	0 - 16,964 i	0 - 17,119 i	0 - 25,158 i	11,930 i	12,205 i	6,239 i	6,048 i
Transportation	48000	123	D	D	388	205 i	100	691	2,045 i	9,398 i	0 - 25,158 i	5,929 i	6,816 i	8,133	8,345
Couriers, messengers, and express delivery services	49200	D	D	D	344	D	394	421	446	290	923	1,115	D	3,729	2,287
Warehousing and storage	49300	15	15	15	3	3	0	90	76	128 i	33	17	D	48	32
Newspaper, periodical, book, and directory publishers (except Internet)	51110	345 i	229 i	316 i	89 i	99 i	80 i	83	151	84	0 - 25,158	123 i	D	15	336 i
Software publishers (except Internet) ^e	51120	22,635	23,803	26,661	31,392	29,887 i	26,685	24,362	25,742	24,798	23,520	27,768	34,040	37,485	42,990
Motion picture and sound recording (except Internet)	51200	61	73 i	86	71 i	10	16	27 i	148	72	81	22	D	111	48
Broadcasting (except Internet)	51500	94	36	53	70 i	101 i	0 - 28,354 i	0 - 11,355	186	0 - 2,469	0 - 25,158 i	D	D	453 i	494 i

Table 64. Domestic R&D paid for by the company and others and performed by the company, by business activity: 2011–24

(Millions of U.S. dollars)

Business activity ^a	Business code ^b	2011		2012		2013		2014		2015		2016		2017		2018		2019		2020		2021		2022		2023		2024	
Wired telecommunications carriers	51710	867		1,482	i	951	i	945	i	1,229	i	1,067	i	924		469		424		505		599		624		472		481	
Wireless telecommunications carriers (except satellite)	51720	391	i	739	i	1,768	i	2,481		1,176	i	1,477	i	1,920		2,147		2,306		2,022		2,492		2,582		2,289		2,322	
Satellite telecommunications	51740	D		195		106		107		681	i	699	i	593		451		475		0 - 25,158		510		600		665		720	
Other telecommunications (not listed elsewhere)	51790	495		383		322		255		459		448		413		691		0 - 17,119		427		304		315		496		452	
Data processing, hosting, and related services ^e	51800	4,922		3,997		4,009		4,754		5,839		6,295		6,217		6,809		8,885		11,223		13,119		11,545		12,519		16,183	
Cloud computing applications and Internet-based software services	51801	NA		NA		3,727	i	5,718		5,783		9,981		16,812		20,600		28,631		39,147		43,704		51,466		51,029		54,815	
Other information services, including Internet publishing, broadcasting, and Web search portals ^e	51910	D		11,397		13,485		15,306		21,534		23,962		28,445		37,435		46,171		53,228		63,300		D		D		D	
Finance: banking and credit intermediation	52200	1,365		1,601		1,834		2,451		2,708		4,474		4,819		4,309		4,924		7,917		12,268		10,430		17,439		16,313	
Securities, commodity contracts, and other financial investments and related activities, including funds and trusts	52310	1,148		893		1,153		937		1,352		1,516		1,587		1,248		1,445		1,815		4,409		D		5,424		5,813	
Insurance carriers and related activities	52400	D		1,141		1,573		887		1,364		1,216		1,127		1,673		2,190		2,542		3,655		1,949		2,753		2,732	
Real estate	53100	13		26	i	100		193		280		438		251		377		0 - 17,119		368		674		785		331		521	
Rental and leasing services	53200	27		D		69		59		D		97	i	536	i	639		945		2,766		1,423		1,644		1,956		2,395	
Lessors of nonfinancial intangible assets, including patent licensing	53300	319		369		74		78		79		40		58		23		59		0 - 25,158		14		D		72		34	
Legal, accounting, tax preparation, bookkeeping, and payroll services	54111	578	i	417	i	514	i	826	i	1,283		892		875		1,148		1,901		2,492		2,674		3,239		3,611		4,522	i
Architectural, engineering, and related services	54130	2,028		4,206	i	3,398		3,392		4,143	i	3,259		2,664		4,293		4,421		4,347		D		5,749		4,652		4,604	
Specialized design services	54140	271		207	i	101		97		83		77		198	i	0 - 16,964		163		212		170		122		154		136	
Computer systems design and related services ^e	54150	11,129		12,390	i	11,472	i	13,216	i	13,647		14,159		12,607		16,346		19,604		16,755		18,727		20,470		22,627		25,311	
Management, scientific, and technical consulting services	54160	1,745		2,280		2,030		1,958		1,761		2,137	i	1,903		2,796		2,561		2,671		3,758		4,116		D		4,820	
Research and development services in the social sciences and humanities	54172	D		601		792		745		756		0 - 28,354		1,124		674		764		0 - 25,158		563		703		563		715	
Research and development services in biotechnology ^{c,f}	54173	6,030		7,146		4,145		3,083	i	5,178	i	3,911	i	3,610		5,398		5,564		5,482		8,119		9,463		8,108		6,164	
Research and development services in the physical, engineering, and life sciences (except biotechnology)	54174	7,196		9,427		9,139		9,068		10,907		10,621		11,842		14,904		15,130	i	19,362	i	24,453	i	27,180	i	24,386	i	25,296	
Research and development services in nanotechnology	54175	NA		NA		NA		NA		NA		NA		NA		NA		NA		0 - 25,158	i	232		293		395		561	
Advertising and related services	54180	80		377	i	450	i	435		424		344		381		1,032	i	1,107	i	1,284	i	2,095	i	2,003	i	1,108	i	1,050	i
Professional, scientific, and technical services (not listed elsewhere)	54190	1,316		2,463	i	1,786		1,020		1,228		874		1,113		1,246		1,649		1,883		1,714		2,420		2,265		2,202	
Management of companies and enterprises	55100	20		40		68		25	i	D		28		70		0 - 16,964		0 - 17,119		0 - 25,158		D		D		D		27	
Administrative and support services	56100	338		436		556	i	401	i	202	i	418		1,405		2,302		3,285		3,521		3,264		4,213		4,681		4,800	
Waste management and remediation services	56200	19	i	D		39	i	31		24	i	25		20		20		20		0 - 25,158		530	r	D		49		63	
Offices of physicians	62110	24		73	i	74	i	88	i	79	i	106	i	190		155		508		235		192		D		278		282	
Medical and diagnostic laboratories	62150	764		1,027		959		965		1,204		0 - 28,354	i	1,210		2,049		2,467		2,065		2,849		3,799		2,873		2,604	
Other ambulatory health care services (ambulance, dental, home health care)	62199	11		41	i	51	i	35	i	42	i	24	i	65		46		148		93		297		318		549		344	
Hospitals and nursing care facilities	62200	2		2	i	2		7	i	7		9		0 - 11,355		0 - 10,879		0 - 11,355		0 - 25,158		7		9		D		D	
Social assistance services	62400	7		36		38		16		2		2		0 - 11,355		0 - 16,964		0 - 17,119		0 - 25,158		D		7		4		D	
Arts, entertainment, and recreation	71000	105		108		31		91	i	D		44		48		44		415		0 - 25,158		64	r	D		216		158	
Accommodation and food services	72000	74		131	i	123	i	57		87		61		49		120		80		122		163		104		203		188	
Other services (not listed elsewhere)	81000	366		553		366		576		682		0 - 28,354		0 - 11,355		0 - 16,964		654		0 - 25,158		D		6,955	i	D		585	
Undistributed ^g	–	28,583	i	1,689	i	336	i	63		0		0		0		0		0		0		0		0		0		0	

D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%; NA = not available.

- ^a Business activity data are tabulated independent of the industry classification of the company. Companies were asked to report their sales and R&D activity in one or more business activity codes.
- ^b Business codes and descriptions are based on 2017 North American Industry Classification System (NAICS) industry definitions.
- ^c Estimates for this business code may not be comparable to those from prior years due to the introduction of a related business code for survey year 2013 and beyond: 32543, Biotechnology-based pharmaceutical and biological products (except diagnostic substances).
- ^d Estimates for this business code may not be comparable to those from prior years due to the introduction of a related business code for survey year 2014 and beyond: 33333, Digital cameras manufacturing.
- ^e Estimates for this business code may not be comparable to those from prior years due to the introduction of a related business code for survey year 2013 and beyond: 51801, Cloud computing applications and Internet-based software services.
- ^f Estimates for this business code may not be comparable to those from prior years due to the introduction of a related business code for survey year 2020 and beyond: 54175, Research and development services in nanotechnology.
- ^g Undistributed includes data reported that were not allocated to a business activity.

Note(s):
Detail may not add to total because of rounding. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D and are not comparable with estimates published for years prior to 2018. For survey years 2009–13, industry classification was based on the 2007 NAICS. For survey years 2014–19, industry classification was based on the 2012 NAICS. For survey years beginning in 2020, classification was based on the 2017 NAICS. Most statistics for years prior to 2024 have been revised since original publication. Revised statistics include adjustments based on information obtained after the original statistics were prepared. An estimate range may be displayed in place of a single estimate to avoid disclosing operations of individual companies.

Source(s):
National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey.

Table 65. Domestic R&D paid for by the company and others and performed by the company, depreciation, capital expenditures, and adjusted domestic R&D, by industry and company size: 2024

(Millions of U.S. dollars and percent change)

Industry and company size	NAICS code	Domestic R&D paid for by the company and others and performed by the company	Depreciation	Capital expenditures related to R&D	Adjusted domestic R&D paid for by the company and others and performed by the company	Change	
						Amount	Percent
All industries	21–23, 31–33, 42–81	765,082	31,920	44,908	778,069	12,987	r 1.7
Manufacturing industries	31–33	405,092	19,423	27,213	412,881	7,790	r 1.9
Food	311	6,288	i 297	563	6,553	i 266	4.2
Beverage and tobacco products	312	1,459	78	102	1,483	24	1.7
Textile, apparel, and leather products	313–16	788	18	105	876	87	11.1
Wood products	321	267	*	50	i 318	i 50	i 18.8
Paper	322	1,240	14	97	1,322	i 82	6.6
Printing and related support activities	323	255	9	i 33	279	i 24	9.5
Petroleum and coal products	324	1,006	26	52	1,032	26	2.6
Chemicals	325	143,745	5,094	8,951	147,601	3,856	2.7
Basic chemicals	3251	3,120	201	291	3,210	90	2.9
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	1,354	111	i 196	1,438	84	6.2
Pesticide, fertilizer, and other agricultural chemicals	3253	1,253	86	115	1,281	i 29	i 2.3
Pharmaceuticals and medicines	3254	133,627	4,553	8,021	137,095	3,468	2.6
Soap, cleaning compound, and toilet preparations	3256	2,956	91	184	3,049	93	3.1
Paint, coating, adhesive, and other chemicals	3255, 3259	1,435	52	144	1,528	93	6.4
Plastics and rubber products	326	2,908	108	281	3,081	173	6.0
Nonmetallic mineral products	327	1,578	i 85	i 76	1,569	i -8	i -0.5
Primary metals	331	1,174	28	171	1,316	142	12.1
Fabricated metal products	332	3,230	110	623	i 3,743	i 513	i 15.9
Machinery	333	22,035	911	2,314	23,438	1,403	6.4
Agricultural implement	33311	2,561	134	114	2,540	-21	i -0.8
Semiconductor machinery	333242	6,851	382	1,184	7,653	802	11.7
Engine, turbine, and power transmission equipment	3336	4,230	179	360	4,411	i 181	4.3
Other machinery	other 333	8,394	216	656	8,834	440	5.2
Computer and electronic products	334	115,599	7,805	6,901	114,695	i -904	i -0.8
Communications equipment	3342	12,839	359	455	12,935	95	0.7
Semiconductor and other electronic components	3344	52,358	4,138	3,077	i 51,297	i -1,061	i -2.0
Navigational, measuring, electromedical, and control instruments	3345	14,083	336	783	14,530	447	3.2
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	3,245	72	211	i 3,383	i 139	i 4.3
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	6,161	131	213	6,243	82	1.3
Other measuring and controlling devices	other 3345	4,677	133	359	4,903	226	4.8
Other computer and electronic products	other 334	36,318	2,972	2,586	35,933	-386	-1.1
Electrical equipment, appliances, and components	335	6,999	229	767	7,538	538	7.7
Transportation equipment	336	71,231	3,915	4,402	71,719	i 488	i 0.7
Motor vehicles, bodies, trailers, and parts	3361–63	31,812	3,341	2,955	31,426	-386	i -1.2

Table 65. Domestic R&D paid for by the company and others and performed by the company, depreciation, capital expenditures, and adjusted domestic R&D, by industry and company size: 2024

(Millions of U.S. dollars and percent change)

Industry and company size	NAICS code	Domestic R&D paid for by the company and others and performed by the company	Depreciation	Capital expenditures related to R&D	Adjusted domestic R&D paid for by the company and others and performed by the company	Change	
						Amount	Percent
Aerospace products and parts	3364	35,904	486	1,188	36,607	703	2.0
Aircraft, aircraft engine, and aircraft parts	336411-13	D	D	D	26,543	D	D
Guided missile, space vehicle, and related parts	336414-15, 336419	D	D	D	10,064	D	D
Military armored vehicle, tank, and tank components	336992	33	*	14	48	14	42.7
Other transportation	other 336	3,481	88	245	3,638	157	4.5
Furniture and related products	337	450	9	27	468	18	4.0
Miscellaneous	339	24,840	687	1,697	25,850	1,010	4.1
Medical equipment and supplies	3391	22,126	641	1,465	22,949	824	3.7
Other miscellaneous manufacturing	3399	2,715	46	233	2,901	186	6.9
Nonmanufacturing industries	21-23, 42-81	359,990	12,497	17,695	365,188	5,198	1.4
Mining, quarrying, oil and gas extraction, and support activities	21	1,862	110	203	1,955	93	5.0
Utilities	22	613	13	3	604	-9	-1.5
Wholesale trade	42	1,692	29	198	1,860	169	10.0
Electronic shopping and electronic auctions	454111-12	7,898	97	722	8,523	625	7.9
Transportation and warehousing	48-49	11,341	831	701	11,211	-129	-1.1
Information	51	228,174	7,734	12,081	232,521	4,347	1.9
Publishing	511	63,596	684	4,390	67,303	3,706	5.8
Newspaper, periodical, book, and directory publishers	5111	489	*	6	494	5	1.1
Software publishers	5112	63,108	684	4,385	66,809	3,701	5.9
Telecommunications	517	3,323	18	375	3,680	357	10.7
Data processing, hosting, and related services	518	58,772	1,478	2,558	59,852	1,080	1.8
Other information	other 51	102,484	5,554	4,757	101,687	-797	-0.8
Finance and insurance	52	25,463	1,148	249	24,564	-899	-3.5
Real estate and rental and leasing	53	2,750	47	18	2,722	-28	-1.0
Lessors of nonfinancial intangible assets (except copyrighted works)	533	23	4	*	20	-3	-14.9
Other real estate and rental and leasing	other 53	2,727	43	18	2,702	-25	-0.9
Professional, scientific, and technical services	54	74,548	2,385	3,146	75,309	761	1.0
Architectural, engineering, and related services	5413	3,893	36	433	4,291	398	10.2
Computer systems design and related services	5415	26,764	625	899	27,038	274	1.0
Scientific research and development services	5417	33,942	1,477	1,286	33,752	-190	-0.6
Research and development in nanotechnology	541713	548	31	52	568	20	3.7
Research and development in biotechnology (except nanobiotechnology)	541714	6,751	242	194	6,702	-48	-0.7
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	25,931	1,198	1,039	25,773	-158	-0.6
Research and development in the social sciences and humanities	541720	712	5	1	708	-4	-0.6

Table 65. Domestic R&D paid for by the company and others and performed by the company, depreciation, capital expenditures, and adjusted domestic R&D, by industry and company size: 2024

(Millions of U.S. dollars and percent change)

Industry and company size	NAICS code	Domestic R&D paid for by the company and others and performed by the company		Depreciation		Capital expenditures related to R&D		Adjusted domestic R&D paid for by the company and others and performed by the company	Change	
									Amount	Percent
Other professional, scientific, and technical services	other 54	9,949 i		248 i		528 i		10,229 i	280 i	2.8
Health care services	621–23	2,020		81		101		2,040	20	1.0
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	3,628		22		271 i		3,877	249 i	6.9
All companies (number of domestic employees)	–	765,082		31,920		44,908		778,069	12,987 r	1.7
Small companies										
10–19 ^a	–	4,790		75		382		5,096	306	6.4
20–49	–	16,179		880		2,223 i		17,522	1,343 r	8.3
Medium companies										
50–99	–	17,078		373		1,291		17,996	918 r	5.4
100–249	–	29,325		808		2,100		30,618	1,292 r	4.4
Large companies										
250–499	–	28,852		873		1,993		29,973	1,120	3.9
500–999	–	44,697		1,244		2,863		46,316	1,619	3.6
1,000–4,999	–	123,813		3,474		4,960		125,299	1,486	1.2
5,000–9,999	–	62,950		3,157		4,163		63,956	1,006	1.6
10,000–24,999	–	140,348		5,747		6,956		141,557 i	1,209 i	0.9
25,000 or more	–	297,050		15,289		17,976		299,737	2,687	0.9

* = amount < \$500,000; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error or standard error is more than 50%.

NAICS = 2017 North American Industry Classification System.

^a The Business Enterprise Research and Development (BERD) Survey does not include companies with fewer than 10 domestic employees.

Note(s):

Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D. To enable comparisons between U.S. statistics from the BERD Survey and statistics from other nations, in this table an internationally comparable adjusted domestic R&D estimate is calculated by subtracting depreciation relating to R&D operations, which is included in U.S. R&D from the BERD Survey, and adding capital expenditures relating to R&D operations, which is excluded from U.S. R&D from the BERD Survey.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 66. Domestic R&D paid for and performed by the company, depreciation, capital expenditures, and adjusted domestic R&D, by industry and company size: 2024

(Millions of U.S. dollars and percent change)

Industry and company size	NAICS code	Domestic R&D paid for and performed by the company	Depreciation	Capital expenditures related to R&D	Adjusted domestic R&D paid for and performed by the company	Change	
						Amount	Percent
All industries	21–23, 31–33, 42–81	679,371	29,313	44,908	694,966	15,595	r 2.3
Manufacturing industries	31–33	356,431	18,234	27,213	365,410	8,979	r 2.5
Food	311	6,020	289	563	6,294	i 274	4.6
Beverage and tobacco products	312	1,459	78	102	1,483	25	1.7
Textile, apparel, and leather products	313–16	783	18	105	870	87	11.1
Wood products	321	261	*	50	i 311	i 50	i 19.3
Paper	322	1,238	14	97	1,320	i 82	6.7
Printing and related support activities	323	253	9	i 33	277	i 24	9.6
Petroleum and coal products	324	1,004	26	52	1,030	26	2.6
Chemicals	325	131,790	4,635	8,951	136,105	4,315	3.3
Basic chemicals	3251	2,883	185	291	2,989	106	3.7
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	D	D	196	D	D	D
Pesticide, fertilizer, and other agricultural chemicals	3253	D	D	115	D	D	D
Pharmaceuticals and medicines	3254	122,656	4,160	8,021	126,517	3,861	3.1
Soap, cleaning compound, and toilet preparations	3256	2,684	80	184	2,788	104	3.9
Paint, coating, adhesive, and other chemicals	3255, 3259	D	D	144	D	D	D
Plastics and rubber products	326	2,767	100	281	2,949	181	6.5
Nonmetallic mineral products	327	1,556	i 84	i 76	1,549	i -7	i -0.5
Primary metals	331	1,129	28	171	1,272	142	12.6
Fabricated metal products	332	3,137	109	623	i 3,651	i 514	i 16.4
Machinery	333	19,844	808	2,314	21,350	1,506	7.6
Agricultural implement	33311	D	D	114	D	D	D
Semiconductor machinery	333242	D	D	1,184	D	D	D
Engine, turbine, and power transmission equipment	3336	D	D	360	D	D	D
Other machinery	other 333	8,060	205	656	8,511	451	5.6
Computer and electronic products	334	107,038	7,535	6,901	106,404	-634	i -0.6
Communications equipment	3342	12,069	356	455	12,167	99	0.8
Semiconductor and other electronic components	3344	48,546	3,983	3,077	i 47,641	i -905	i -1.9
Navigational, measuring, electromedical, and control instruments	3345	10,736	242	783	11,277	541	5.0
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	3,046	69	211	i 3,187	i 141	i 4.6
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	3,190	40	213	3,362	173	5.4
Other measuring and controlling devices	other 3345	4,501	132	359	4,728	227	5.0
Other computer and electronic products	other 334	35,687	2,955	2,586	35,318	-369	-1.0
Electrical equipment, appliances, and components	335	6,135	215	767	6,687	552	9.0
Transportation equipment	336	47,039	3,593	4,402	47,848	809	i 1.7
Motor vehicles, bodies, trailers, and parts	3361–63	D	D	2,955	29,760	D	D
Aerospace products and parts	3364	15,130	256	1,188	16,063	i 932	6.2
Aircraft, aircraft engine, and aircraft parts	336411–13	D	D	D	11,595	i D	D

Table 66. Domestic R&D paid for and performed by the company, depreciation, capital expenditures, and adjusted domestic R&D, by industry and company size: 2024

(Millions of U.S. dollars and percent change)

Industry and company size	NAICS code	Domestic R&D paid for and performed by the company	Depreciation	Capital expenditures related to R&D	Adjusted domestic R&D paid for and performed by the company	Change	
						Amount	Percent
Guided missile, space vehicle, and related parts	336414–15, 336419	D	D	D	4,467	D	D
Military armored vehicle, tank, and tank components	336992	23	*	14	38	14	61.6
Other transportation	other 336	D	D	245 i	1,988 i	D	D
Furniture and related products	337	450	9	27	468	18	4.0
Miscellaneous	339	24,528	684	1,697	25,542	1,014	4.1
Medical equipment and supplies	3391	21,840	638	1,465	22,667	827	3.8
Other miscellaneous manufacturing	3399	2,688	46	233	2,875 i	187	7.0
Nonmanufacturing industries	21–23, 42–81	322,940	11,079	17,695	329,556	6,616 r	2.0
Mining, quarrying, oil and gas extraction, and support activities	21	1,224	24	203	1,404	180	14.7
Utilities	22	D	13	3	D	-9	D
Wholesale trade	42	D	D	198 i	D	D	D
Electronic shopping and electronic auctions	454111–12	7,898 i	97 i	722 i	8,523 i	625 i	7.9
Transportation and warehousing	48–49	D	D	701	D	D	D
Information	51	226,853	7,728	12,081	231,206	4,353 r	1.9
Publishing	511	63,085	681	4,390	66,794	3,709	5.9
Newspaper, periodical, book, and directory publishers	5111	489 i	* i	6 i	494 i	5 i	1.1
Software publishers	5112	62,597	681	4,385	66,300	3,704	5.9
Telecommunications	517	D	D	375 i	D	D	D
Data processing, hosting, and related services	518	58,017	D	2,558 i	D	D	D
Other information	other 51	D	D	4,757	D	D	D
Finance and insurance	52	25,362	1,148	249	24,463	-899 i	-3.5
Real estate and rental and leasing	53	2,750	47	18 i	2,722	-28	-1.0
Lessors of nonfinancial intangible assets (except copyrighted works)	533	23	4	* i	20	-3	-14.9
Other real estate and rental and leasing	other 53	2,727	43	18 i	2,702	-25	-0.9
Professional, scientific, and technical services	54	40,134	1,068	3,146	42,211	2,078 r	5.2
Architectural, engineering, and related services	5413	3,240	32	433	3,640	401	12.4
Computer systems design and related services	5415	22,353	551	899	22,701	348	1.6
Scientific research and development services	5417	5,705	240	1,286	6,752	1,046	18.3
Research and development in nanotechnology	541713	434	31	52	454	21	4.7
Research and development in biotechnology (except nanobiotechnology)	541714	1,204	58	194	1,340	136	11.3
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	4,060	150	1,039	4,949	890	21.9
Research and development in the social sciences and humanities	541720	8	1	1	9	*	2.8
Other professional, scientific, and technical services	other 54	8,835 i	245 i	528 i	9,118 i	282 i	3.2
Health care services	621–23	1,888	D	101	D	D	D

Table 66. Domestic R&D paid for and performed by the company, depreciation, capital expenditures, and adjusted domestic R&D, by industry and company size: 2024

(Millions of U.S. dollars and percent change)

Industry and company size	NAICS code	Domestic R&D paid for and performed by the company	Depreciation	Capital expenditures related to R&D	Adjusted domestic R&D paid for and performed by the company	Change	
						Amount	Percent
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	3,579	20	271 i	3,830	251 i	7.0
All companies (number of domestic employees)	–	679,371	29,313	44,908	694,966	15,595 r	2.3
Small companies							
10–19 ^a	–	3,734	64	382	4,051	317	8.5
20–49	–	14,153	842	2,223 i	15,534 i	1,381 r	9.8
Medium companies							
50–99	–	14,998	349	1,291	15,940	942 r	6.3
100–249	–	26,548	764	2,100	27,884	1,336 r	5.0
Large companies							
250–499	–	26,185	788	1,993	27,390	1,205	4.6
500–999	–	40,152	1,029	2,863	41,986	1,835	4.6
1,000–4,999	–	110,612	3,037	4,960	112,535	1,923	1.7
5,000–9,999	–	55,804	2,866	4,163	57,101	1,297	2.3
10,000–24,999	–	120,991	4,918	6,956	123,029	2,038 i	1.7
25,000 or more	–	266,195	14,654	17,976	269,517	3,322	1.2

* = amount < \$500,000; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error or standard error is more than 50%.

NAICS = 2017 North American Industry Classification System.

^a The Business Enterprise Research and Development (BERD) Survey does not include companies with fewer than 10 domestic employees.

Note(s):

Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D. To enable comparisons between U.S. statistics from the BERD Survey and statistics from other nations, in this table an internationally comparable adjusted domestic R&D estimate is calculated by subtracting depreciation relating to R&D operations, which is included in U.S. R&D from the BERD Survey, and adding capital expenditures relating to R&D operations, which is excluded from U.S. R&D from the BERD Survey.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 67. Domestic R&D paid for by others and performed by the company, depreciation, capital expenditures, and adjusted domestic R&D, by industry and company size: 2024

(Millions of U.S. dollars and percent change)

Industry and company size	NAICS code	Domestic R&D paid for by others and performed by the company	Depreciation		Capital expenditures related to R&D ^a	Adjusted domestic R&D paid for by others and performed by the company	Change	
							Amount	Percent
All industries	21–23, 31–33, 42–81	85,711	2,608		0	83,103	-2,608	-3.0
Manufacturing industries	31–33	48,661	1,190		0	47,471	-1,190	-2.4
Food	311	268	8		0	260	-8	-3.1
Beverage and tobacco products	312	*	*		0	0	*	-100.0
Textile, apparel, and leather products	313–16	6	0		0	6	0	0.0
Wood products	321	6	*		0	6	*	-0.7
Paper	322	1	0		0	1	0	0.0
Printing and related support activities	323	2	*		0	2	*	-0.3
Petroleum and coal products	324	2	0		0	2	0	0.0
Chemicals	325	11,954	459		0	11,495	-459	-3.8
Basic chemicals	3251	237	16		0	221	-16	-6.9
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	D	D		0	D	D	D
Pesticide, fertilizer, and other agricultural chemicals	3253	D	D		0	D	D	D
Pharmaceuticals and medicines	3254	10,971	393		0	10,578	-393	-3.6
Soap, cleaning compound, and toilet preparations	3256	272	11		0	261	-11	-4.0
Paint, coating, adhesive, and other chemicals	3255, 3259	D	D		0	D	D	D
Plastics and rubber products	326	141	8		0	133	-8	-5.7
Nonmetallic mineral products	327	22	1		0	21	-1	-4.7
Primary metals	331	45	*		0	45	*	-0.1
Fabricated metal products	332	93	1		0	92	-1	-0.8
Machinery	333	2,191	103		0	2,088	-103	-4.7
Agricultural implement	33311	D	D		0	D	D	D
Semiconductor machinery	333242	D	D		0	D	D	D
Engine, turbine, and power transmission equipment	3336	D	D		0	D	D	D
Other machinery	other 333	333	10		0	323	-10	-3.1
Computer and electronic products	334	8,561	270		0	8,291	-270	-3.2
Communications equipment	3342	771	3	i	0	767	i -3	i -0.4
Semiconductor and other electronic components	3344	3,812	155		0	3,657	-155	-4.1
Navigational, measuring, electromedical, and control instruments	3345	3,347	94		0	3,253	-94	-2.8
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	199	3		0	196	-3	-1.3
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	2,971	90		0	2,881	-90	-3.0
Other measuring and controlling devices	other 3345	177	1		0	175	-1	-0.7
Other computer and electronic products	other 334	631	17		0	614	-17	-2.7
Electrical equipment, appliances, and components	335	864	14		0	850	-14	-1.6
Transportation equipment	336	24,192	321		0	23,871	i -321	i -1.3
Motor vehicles, bodies, trailers, and parts	3361–63	D	D		0	1,666	D	D
Aerospace products and parts	3364	20,774	i 229		0	20,544	i -229	i -1.1

Table 67. Domestic R&D paid for by others and performed by the company, depreciation, capital expenditures, and adjusted domestic R&D, by industry and company size: 2024

(Millions of U.S. dollars and percent change)

Industry and company size	NAICS code	Domestic R&D paid for by others and performed by the company	Depreciation	Capital expenditures related to R&D ^a	Adjusted domestic R&D paid for by others and performed by the company	Change	
						Amount	Percent
Aircraft, aircraft engine, and aircraft parts	336411–13	D	D	0	14,948	D	D
Guided missile, space vehicle, and related parts	336414–15, 336419	D	D	0	5,597	D	D
Military armored vehicle, tank, and tank components	336992	10	*	0	10	*	-0.1
Other transportation	other 336	D	D	0	1,651	D	D
Furniture and related products	337	0	0	0	0	0	NA
Miscellaneous	339	312	4	0	308	-4	-1.2
Medical equipment and supplies	3391	285	3	0	282	-3	-1.1
Other miscellaneous manufacturing	3399	27	1	0	26	-1	-2.3
Nonmanufacturing industries	21–23, 42–81	37,050	1,418	0	35,632	-1,418	-3.8
Mining, quarrying, oil and gas extraction, and support activities	21	638	i 87	i 0	552	i -87	i -13.6
Utilities	22	D	0	0	D	0	D
Wholesale trade	42	D	D	0	D	D	D
Electronic shopping and electronic auctions	454111–12	0	0	0	0	0	NA
Transportation and warehousing	48–49	D	D	0	D	D	D
Information	51	1,322	6	0	1,315	-6	-0.5
Publishing	511	511	3	0	509	-3	-0.5
Newspaper, periodical, book, and directory publishers	5111	0	0	0	0	0	NA
Software publishers	5112	511	3	0	509	-3	-0.5
Telecommunications	517	D	D	0	D	D	D
Data processing, hosting, and related services	518	755	D	0	D	D	D
Other information	other 51	D	D	0	D	D	D
Finance and insurance	52	101	0	0	101	0	0.0
Real estate and rental and leasing	53	0	0	0	0	0	NA
Lessors of nonfinancial intangible assets (except copyrighted works)	533	0	0	0	0	0	NA
Other real estate and rental and leasing	other 53	0	0	0	0	0	NA
Professional, scientific, and technical services	54	34,415	1,317	0	33,098	-1,317	-3.8
Architectural, engineering, and related services	5413	654	3	0	651	-3	-0.5
Computer systems design and related services	5415	4,411	74	0	4,336	-74	-1.7
Scientific research and development services	5417	28,237	1,237	0	27,000	-1,237	-4.4
Research and development in nanotechnology	541713	115	*	0	114	*	-0.3
Research and development in biotechnology (except nanobiotechnology)	541714	5,547	184	0	5,363	-184	-3.3
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	21,872	i 1,048	0	20,824	i -1,048	-4.8
Research and development in the social sciences and humanities	541720	704	4	0	699	-4	-0.6
Other professional, scientific, and technical services	other 54	1,113	2	0	1,111	-2	-0.2
Health care services	621–23	131	D	0	D	D	D

Table 67. Domestic R&D paid for by others and performed by the company, depreciation, capital expenditures, and adjusted domestic R&D, by industry and company size: 2024

(Millions of U.S. dollars and percent change)

Industry and company size	NAICS code	Domestic R&D paid for by others and performed by the company	Depreciation	Capital expenditures related to R&D ^a	Adjusted domestic R&D paid for by others and performed by the company	Change	
						Amount	Percent
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	49	2	0	47	-2	-3.3
All companies (number of domestic employees)	–	85,711	2,608	0	83,103	-2,608	-3.0
Small companies							
10–19 ^b	–	1,056	11	0	1,045	-11	-1.0
20–49	–	2,026	38	0	1,988	-38	-1.9
Medium companies							
50–99	–	2,080	24	0	2,056	-24	-1.1
100–249	–	2,777	43	0	2,734	-43	-1.6
Large companies							
250–499	–	2,667	85	0	2,582	-85	-3.2
500–999	–	4,545	216	0	4,330	-216	-4.7
1,000–4,999	–	13,201	437	i	12,764	-437	-3.3
5,000–9,999	–	7,146	291	0	6,855	-291	-4.1
10,000–24,999	–	19,357	829	0	18,528	-829	-4.3
25,000 or more	–	30,855	635	0	30,221	-635	-2.1

* = -\$500,000 < amount < \$500,000; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; NA = not available.

NAICS = 2017 North American Industry Classification System.

^a Capital expenditures related to R&D are assumed to be \$0 for domestic R&D paid for by others and performed by the company.

^b The Business Enterprise Research and Development (BERD) Survey does not include companies with fewer than 10 domestic employees.

Note(s):

Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D. To enable comparisons between U.S. statistics from the BERD Survey and statistics from other nations, in this table an internationally comparable adjusted domestic R&D estimate is calculated by subtracting depreciation relating to R&D operations, which is included in U.S. R&D from the BERD Survey, and adding capital expenditures relating to R&D operations, which is excluded from U.S. R&D from the BERD Survey.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 68. U.S. patent applications and patents issued to companies located in the United States that performed or funded R&D, by industry and company size: 2024

(Number)

Industry and company size	NAICS code	Applications							Patents issued ^c	
		Total	Nonprovisional utility patents							
			Total	To foreign jurisdictions ^a		From within organized R&D activity ^b				
All industries	21–23, 31–33, 42–81	151,573	102,955	50,413		83,666		101,145		
Manufacturing industries	31–33	109,980	71,013	39,803		57,850		70,687		
Food	311	996	590	247		560		493		
Beverage and tobacco products	312	843	675	375		601		1,078		
Textile, apparel, and leather products	313–16	372	232	135		221		178		
Wood products	321	106	58	41		48		41		
Paper	322	472	248	127		241		389		
Printing and related support activities	323	111	78	1		56		41		
Petroleum and coal products	324	538	283	75		86		352		
Chemicals	325	19,744	10,215	7,759		8,955		8,593		
Basic chemicals	3251	1,413	584	461		512		634		
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	1,114	605	435		573		556		
Pesticide, fertilizer, and other agricultural chemicals	3253	170	93	51		60		70		
Pharmaceuticals and medicines	3254	14,871	7,671	5,916		6,666		5,941		
Soap, cleaning compound, and toilet preparations	3256	1,338	742	527		630		903		
Paint, coating, adhesive, and other chemicals	3255, 3259	839	518	370		513		490		
Plastics and rubber products	326	1,071	515	308		486		558		
Nonmetallic mineral products	327	1,765	i 1,602	i 1,083	i	1,575	i	855	i	
Primary metals	331	549	289	212		271		232		
Fabricated metal products	332	3,424	1,715	1,161		1,559		1,082		
Machinery	333	11,824	7,375	4,105		6,420		7,183		
Agricultural implement	33311	1,599	1,149	576		1,034		1,093		
Semiconductor machinery	333242	3,103	1,208	1,064		1,178		1,421		
Engine, turbine, and power transmission equipment	3336	1,550	1,205	570		1,052		936		
Other machinery	other 333	5,572	3,812	1,895		3,155		3,733		
Computer and electronic products	334	36,527	26,380	10,239		18,971		28,657		
Communications equipment	3342	3,740	2,760	1,054		1,292		2,855		
Semiconductor and other electronic components	3344	21,043	15,190	6,380		10,364		14,432	i	
Navigational, measuring, electromedical, and control instruments	3345	3,611	2,786	1,347		2,081		2,455		
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	1,280	939	418	i	451	i	834		
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	737	622	137		586		490		
Other measuring and controlling devices	other 3345	1,594	1,224	792		1,043		1,131		
Other computer and electronic products	other 334	8,132	i 5,644	i 1,457		5,235	i	8,916		
Electrical equipment, appliances, and components	335	3,109	2,090	1,306		1,860		2,404		
Transportation equipment	336	11,994	9,564	6,152		7,251		8,410		
Motor vehicles, bodies, trailers, and parts	3361–63	4,814	3,597	2,646		3,283		2,970		

Table 68. U.S. patent applications and patents issued to companies located in the United States that performed or funded R&D, by industry and company size: 2024

(Number)

Industry and company size	NAICS code	Applications							Patents issued ^c		
		Total	Nonprovisional utility patents								
			Total	To foreign jurisdictions ^a		From within organized R&D activity ^b					
Aerospace products and parts	3364	6,234		5,340		3,355		3,730		5,190	
Aircraft, aircraft engine, and aircraft parts	336411–13	3,061		2,519		1,386		D		2,353	
Guided missile, space vehicle, and related parts	336414–15, 336419	3,172		2,821		1,969		D		2,837	
Military armored vehicle, tank, and tank components	336992	10		5		4		5		5	
Other transportation	other 336	936		623	i	147		234		245	
Furniture and related products	337	282		99		50		65		113	
Miscellaneous	339	16,253		9,006		6,426		8,622		10,029	
Medical equipment and supplies	3391	13,515		7,791		5,963		7,488		8,874	
Other miscellaneous manufacturing	3399	2,738	i	1,215		464	i	1,134		1,155	i
Nonmanufacturing industries	21–23, 42–81	41,593		31,942		10,610		25,816		30,458	
Mining, quarrying, oil and gas extraction, and support activities	21	824		465		391		421		514	
Utilities	22	91		47		11		46		27	
Wholesale trade	42	962		388	i	143		323		354	i
Electronic shopping and electronic auctions	454111–12	2,184	i	2,042	i	151	i	2,028	i	1,936	i
Transportation and warehousing	48–49	734		553		140		517		297	
Information	51	22,234		16,979		6,835		15,140		15,402	
Publishing	511	7,247		5,557		3,177	i	5,396		5,654	
Newspaper, periodical, book, and directory publishers	5111	7	r	7	r	0		0		0	
Software publishers	5112	7,239		5,550		3,177	i	5,396		5,654	
Telecommunications	517	2,398		2,042		186		905		1,779	
Data processing, hosting, and related services	518	5,818		4,723		619		4,494		3,621	
Other information	other 51	6,772		4,658		2,853		4,344		4,348	
Finance and insurance	52	5,100		4,509		556		2,394		5,285	
Real estate and rental and leasing	53	43		23		14		4		22	
Lessors of nonfinancial intangible assets (except copyrighted works)	533	0		0		0		0		0	
Other real estate and rental and leasing	other 53	43		23		14		4		22	
Professional, scientific, and technical services	54	8,671		6,463		2,119		4,487		6,185	
Architectural, engineering, and related services	5413	773		273		93		152		518	r
Computer systems design and related services	5415	3,964		3,569		675		2,122		3,632	
Scientific research and development services	5417	3,317		2,180		1,240		1,853		1,507	
Research and development in nanotechnology	541713	246		110		59		101		60	
Research and development in biotechnology (except nanobiotechnology)	541714	631		380		223		372		192	
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	2,437		1,690		958		1,381		1,238	
Research and development in the social sciences and humanities	541720	2		1		0		0		18	
Other professional, scientific, and technical services	other 54	617		441		111		359	i	527	i
Health care services	621–23	331		160		127		156		94	

Table 68. U.S. patent applications and patents issued to companies located in the United States that performed or funded R&D, by industry and company size: 2024

(Number)

Industry and company size	NAICS code	Applications						Patents issued ^c	
		Total	Nonprovisional utility patents						
			Total	To foreign jurisdictions ^a		From within organized R&D activity ^b			
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	418	312	123		300		343	
All companies (number of domestic employees)	–	151,573	102,955	50,413		83,666		101,145	
Small companies									
10–19 ^d	–	2,180	1,199	571		937		770	
20–49	–	5,821	3,029	1,104		2,412		2,404	
Medium companies									
50–99	–	4,725	2,740	1,368		2,151		1,733	
100–249	–	7,037	4,614	2,907		4,053		3,537	
Large companies									
250–499	–	5,196	3,188	1,583		2,909		2,656	
500–999	–	7,219	4,016	1,823		3,379		3,765	
1,000–4,999	–	20,690	14,372	7,355		12,889		13,595	
5,000–9,999	–	14,886	8,763	4,745		7,988		9,734	
10,000–24,999	–	31,601	21,172	12,617		17,338		21,089	
25,000 or more	–	52,219	39,862	16,341		29,610		41,861	

D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is imputation to account for nonresponse; r = relative standard error is more than 50%.

NAICS = 2017 North American Industry Classification System.

^a To foreign jurisdictions also includes patent applications for which company planned to apply for in foreign jurisdictions.
^b From within organized R&D activity includes patent applications in which the named inventors were R&D employees.
^c For a small number of companies issued more than 100 patents by the Patent and Trademark Office (USPTO), counts from USPTO.gov were used to supplement survey data.
^d The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):
Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D. Statistics are based on companies in the United States that reported to the survey. No systematic item imputation was applied. These statistics include an adjustment to the weight to account for unit nonresponse. *Total nonprovisional utility patents* can be counted in both *To foreign jurisdictions* and *From within organized R&D activity*, or it can be counted in one of the categories or neither of them. As a result, *To foreign jurisdictions* and *From within organized R&D activity* do not add to *Total nonprovisional utility patents*. *Patents issued* reflect patent applications for 2024 and prior years while the counts in *Total applications* are counts of applications in 2024, therefore *Patents issued* is not a subset of *Total applications*.

Source(s):
National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 69. Total patent licensing revenue of companies located in the United States that performed or funded R&D, by industry and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Revenue ^a	
All industries	21–23, 31–33, 42–81	28,899	
Manufacturing industries	31–33	26,419	
Food	311	62	
Beverage and tobacco products	312	0	
Textile, apparel, and leather products	313–16	4	
Wood products	321	0	
Paper	322	1	
Printing and related support activities	323	0	
Petroleum and coal products	324	113	
Chemicals	325	15,517	
Basic chemicals	3251	12	
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	230	
Pesticide, fertilizer, and other agricultural chemicals	3253	0	
Pharmaceuticals and medicines	3254	15,008	
Soap, cleaning compound, and toilet preparations	3256	0	
Paint, coating, adhesive, and other chemicals	3255, 3259	267	
Plastics and rubber products	326	28	
Nonmetallic mineral products	327	0	
Primary metals	331	3	
Fabricated metal products	332	93	
Machinery	333	229	
Agricultural implement	33311	D	
Semiconductor machinery	333242	D	
Engine, turbine, and power transmission equipment	3336	*	
Other machinery	other 333	176	
Computer and electronic products	334	8,381	
Communications equipment	3342	2	i
Semiconductor and other electronic components	3344	D	
Navigational, measuring, electromedical, and control instruments	3345	41	
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	30	
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	5	
Other measuring and controlling devices	other 3345	5	
Other computer and electronic products	other 334	D	
Electrical equipment, appliances, and components	335	316	
Transportation equipment	336	1,135	i
Motor vehicles, bodies, trailers, and parts	3361–63	629	i
Aerospace products and parts	3364	495	
Aircraft, aircraft engine, and aircraft parts	336411–13	D	
Guided missile, space vehicle, and related parts	336414–15, 336419	D	
Military armored vehicle, tank, and tank components	336992	0	
Other transportation	other 336	11	
Furniture and related products	337	0	
Miscellaneous	339	538	
Medical equipment and supplies	3391	430	
Other miscellaneous manufacturing	3399	108	
Nonmanufacturing industries	21–23, 42–81	2,480	
Mining, quarrying, oil and gas extraction, and support activities	21	*	
Utilities	22	*	
Wholesale trade	42	3	
Electronic shopping and electronic auctions	454111–12	0	
Transportation and warehousing	48–49	0	
Information	51	1,567	

Table 69. Total patent licensing revenue of companies located in the United States that performed or funded R&D, by industry and company size: 2024

(Millions of U.S. dollars)

Industry and company size	NAICS code	Revenue ^a
Publishing	511	930
Newspaper, periodical, book, and directory publishers	5111	0
Software publishers	5112	930
Telecommunications	517	D
Data processing, hosting, and related services	518	573
Other information	other 51	D
Finance and insurance	52	2
Real estate and rental and leasing	53	0
Lessors of nonfinancial intangible assets (except copyrighted works)	533	0
Other real estate and rental and leasing	other 53	0
Professional, scientific, and technical services	54	882
Architectural, engineering, and related services	5413	52 r
Computer systems design and related services	5415	417
Scientific research and development services	5417	380
Research and development in nanotechnology	541713	1
Research and development in biotechnology (except nanobiotechnology)	541714	10
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	368
Research and development in the social sciences and humanities	541720	0
Other professional, scientific, and technical services	other 54	33 r
Health care services	621–23	27
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	*
All companies (number of domestic employees)	–	28,899
Small companies		
10–19 ^b	–	23
20–49	–	350
Medium companies		
50–99	–	351
100–249	–	2,164
Large companies		
250–499	–	1,562
500–999	–	380
1,000–4,999	–	3,122
5,000–9,999	–	675
10,000–24,999	–	16,087
25,000 or more	–	4,185 i

* = amount < \$500,000; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%.

NAICS = 2017 North American Industry Classification System.

^a Amounts received from all patent licensing activities during 2024.

^b The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):

Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 70. Importance of types of intellectual property protections to companies located in the United States that performed or funded R&D, by industry and company size: 2024

(Percent)

Industry and company size	NAICS code	Utility patents			Design patents			Trademarks			Copyrights			Trade secrets			Mask works		
		Very important	Somewhat important	Not important	Very important	Somewhat important	Not important	Very important	Somewhat important	Not important	Very important	Somewhat important	Not important	Very important	Somewhat important	Not important	Very important	Somewhat important	Not important
All industries	21–23, 31–33, 42–81	26.0	20.3	53.7	16.4	23.1	60.6	33.6	32.6	33.9	23.6	29.2	47.2	45.5	23.8	30.7	4.2	10.2	85.7
Manufacturing industries	31–33	33.0	17.4	49.6	21.8	24.6	53.6	36.3	31.4	32.3	22.7	28.9	48.4	49.2	22.7	28.1	5.2	11.0	83.8
Food	311	16.3	8.8	75.0	15.0	12.5	72.5	43.8	25.0	31.3	22.5	23.8	53.8	48.1	21.5	30.4	6.3	5.0	88.8
Beverage and tobacco products	312	7.7	11.5	80.8	7.7	30.8	61.5	61.5	15.4	23.1	34.6	11.5	53.8	50.0	12.5	37.5	0.0	20.0	80.0
Textile, apparel, and leather products	313–316	23.5	29.4	47.1	35.3	29.4	35.3	47.1	29.4	23.5	31.3	37.5	31.3	43.8	31.3	25.0	6.3	12.5	81.3
Wood products	321	22.2	22.2	55.6	12.5	25.0	62.5	33.3	33.3	33.3	22.2	22.2	55.6	37.5	25.0	37.5	11.1	11.1	77.8
Paper	322	25.0	12.5	62.5	12.5	25.0	62.5	37.5	25.0	37.5	14.3	28.6	57.1	37.5	50.0	12.5	11.1	11.1	77.8
Printing and related support activities	323	23.1	23.1	53.8	15.4	30.8	53.8	23.1	38.5	38.5	23.1	30.8	46.2	38.5	23.1	38.5	7.7	7.7	84.6
Petroleum and coal products	324	28.6	28.6	42.9	14.3	28.6	57.1	42.9	28.6	28.6	28.6	28.6	42.9	57.1	14.3	28.6	14.3	14.3	71.4
Chemicals	325	42.7	15.5	41.7	13.2	19.5	67.3	38.0	34.1	27.8	20.0	29.3	50.7	59.4	20.3	20.3	2.9	7.8	89.2
Basic chemicals	3251	28.6	10.7	60.7	10.7	10.7	78.6	31.0	31.0	37.9	13.8	27.6	58.6	48.3	20.7	31.0	3.6	7.1	89.3
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	41.7	16.7	41.7	16.7	25.0	58.3	41.7	25.0	33.3	25.0	33.3	41.7	50.0	16.7	33.3	9.1	9.1	81.8
Pesticide, fertilizer, and other agricultural chemicals	3253	37.5	37.5	25.0	22.2	33.3	44.4	55.6	22.2	22.2	33.3	33.3	33.3	75.0	12.5	12.5	11.1	22.2	66.7
Pharmaceuticals and medicines	3254	58.9	14.0	27.1	14.3	20.0	65.7	38.1	34.3	27.6	22.9	28.6	48.6	60.0	21.9	18.1	3.8	9.4	86.8
Soap, cleaning compound, and toilet preparations	3256	22.2	16.7	61.1	11.8	29.4	58.8	44.4	27.8	27.8	17.6	23.5	58.8	38.9	33.3	27.8	5.9	5.9	88.2
Paint, coating, adhesive, and other chemicals	3255, 3259	20.0	20.0	60.0	10.0	20.0	70.0	34.1	43.9	22.0	17.1	34.1	48.8	68.3	17.1	14.6	2.5	7.5	90.0
Plastics and rubber products	326	28.1	17.2	54.7	18.5	32.3	49.2	24.6	40.0	35.4	12.5	35.9	51.6	44.6	26.2	29.2	4.6	13.8	81.5
Nonmetallic mineral products	327	18.2	13.6	68.2	13.6	13.6	72.7	30.4	30.4	39.1	13.6	31.8	54.5	34.8	21.7	43.5	4.5	13.6	81.8
Primary metals	331	22.2	27.8	50.0	12.5	31.3	56.3	23.5	35.3	41.2	11.8	35.3	52.9	41.2	29.4	29.4	6.3	18.8	75.0
Fabricated metal products	332	20.0	20.0	60.0	15.7	23.1	61.2	23.0	27.4	49.6	14.1	26.7	59.3	31.3	20.1	48.5	3.0	6.7	90.4
Machinery	333	31.3	22.3	46.4	21.8	32.4	45.8	29.6	37.4	33.0	20.5	30.7	48.9	43.0	28.5	28.5	4.5	11.9	83.5
Agricultural implement	33311	44.4	16.7	38.9	29.4	29.4	41.2	38.9	27.8	33.3	27.8	27.8	44.4	44.4	22.2	33.3	5.6	11.1	83.3
Semiconductor machinery	333242	60.0	20.0	20.0	40.0	20.0	40.0	33.3	33.3	33.3	33.3	33.3	33.3	60.0	20.0	20.0	40.0	20.0	40.0
Engine, turbine, and power transmission equipment	3336	53.8	7.7	38.5	14.3	14.3	71.4	35.7	42.9	21.4	23.1	46.2	30.8	61.5	15.4	23.1	7.1	7.1	85.7
Other machinery	other 333	27.2	24.5	48.3	21.9	34.9	43.2	27.9	38.1	34.0	18.2	30.1	51.7	40.8	30.6	28.6	4.2	13.2	82.6
Computer and electronic products	334	43.5	17.9	38.7	30.4	25.6	44.0	45.5	31.7	22.8	35.1	31.0	33.9	60.5	21.0	18.6	13.7	19.3	67.1
Communications equipment	3342	37.0	14.8	48.1	25.9	29.6	44.4	40.7	40.7	18.5	35.7	35.7	28.6	51.9	29.6	18.5	12.0	16.0	72.0
Semiconductor and other electronic components	3344	48.9	17.0	34.0	36.2	19.1	44.7	43.5	23.9	32.6	40.4	23.4	36.2	61.7	14.9	23.4	23.9	21.7	54.3
Navigational, measuring, electromedical, and control instruments	3345	42.5	20.0	37.5	30.4	26.6	43.0	47.5	35.0	17.5	33.8	32.5	33.8	62.5	20.0	17.5	10.5	15.8	73.7
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	55.6	22.2	22.2	27.8	38.9	33.3	38.9	44.4	16.7	21.1	47.4	31.6	58.8	23.5	17.6	5.6	16.7	77.8
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	50.0	14.3	35.7	42.9	14.3	42.9	42.9	28.6	28.6	42.9	21.4	35.7	66.7	13.3	20.0	7.1	35.7	i 57.1
Other measuring and controlling devices	other 3345	37.3	21.6	41.2	30.0	24.0	46.0	52.0	34.0	14.0	37.3	29.4	33.3	60.8	21.6	17.6	12.8	12.8	74.5
Other computer and electronic products	other 334	44.4	16.7	38.9	22.2	33.3	44.4	42.1	26.3	31.6	23.5	35.3	41.2	61.1	27.8	11.1	10.5	31.6	57.9
Electrical equipment, appliances, and components	335	47.4	15.8	36.8	35.9	23.1	41.0	36.8	28.9	34.2	26.3	34.2	39.5	60.5	21.1	18.4	18.4	18.4	63.2
Transportation equipment	336	25.7	20.8	53.5	28.0	22.0	50.0	33.7	27.7	38.6	22.0	27.0	51.0	49.0	21.0	30.0	4.0	15.0	81.0
Motor vehicles, bodies, trailers, and parts	3361, 3362, 3363	23.7	16.9	59.3	31.0	19.0	50.0	34.5	25.9	39.7	26.3	22.8	50.9	44.8	20.7	34.5	3.4	17.2	79.3

Table 70. Importance of types of intellectual property protections to companies located in the United States that performed or funded R&D, by industry and company size: 2024

(Percent)

Industry and company size	NAICS code	Utility patents						Design patents						Trademarks						Copyrights						Trade secrets						Mask works					
		Very important		Somewhat important		Not important		Very important		Somewhat important		Not important		Very important		Somewhat important		Not important		Very important		Somewhat important		Not important		Very important		Somewhat important		Not important							
Aerospace products and parts	3364	22.2		33.3		44.4		14.8		29.6		55.6		18.5		37.0		44.4		11.1		37.0		51.9		59.3		25.9		14.8		3.7		14.8		81.5	
Aircraft, aircraft engine, and aircraft parts	336411–13	20.8		33.3		45.8		16.0		32.0		52.0		16.7		37.5		45.8		12.0		36.0		52.0		56.0		28.0		16.0		4.2		16.7		79.2	
Guided missile, space vehicle, and related parts	336414–15, 336419	40.0		20.0		40.0		25.0		25.0		50.0		33.3		33.3		33.3		25.0		25.0		50.0		50.0		25.0		25.0		20.0		20.0		60.0	
Military armored vehicle, tank, and tank components	336992	33.3		33.3		33.3		33.3		33.3		33.3		33.3		33.3		33.3		33.3		33.3		33.3		33.3		33.3		33.3		0.0		33.3		66.7	
Other transportation	other 336	37.5		18.8		43.8		37.5		25.0		37.5		56.3		18.8		25.0		25.0		25.0		50.0		41.2		17.6		41.2		12.5		6.3		81.3	
Furniture and related products	337	17.6		17.6		64.7		22.2		27.8		50.0		29.4		23.5		47.1		18.8		18.8		62.5		23.5		29.4		47.1		5.9		11.8		82.4	
Miscellaneous	339	50.9		15.2		33.9		36.3		28.3		35.4		47.3		30.4		22.3		32.1		27.7		40.2		53.6		24.1		22.3		3.6		7.1		89.3	
Medical equipment and supplies	3391	60.5		11.8		27.6		40.8		28.9		30.3		48.7		36.8		14.5		34.7		28.0		37.3		57.9		25.0		17.1		3.9		6.6		89.5	
Other miscellaneous manufacturing	3399	31.6		21.1		47.4		27.0		27.0		45.9		43.6		17.9		38.5		26.3		28.9		44.7		42.1		23.7		34.2		5.3		10.5		84.2	
Nonmanufacturing industries	21–23, 42–81	19.4		23.1		57.6		11.2		21.6		67.2		30.9		33.7		35.4		24.3		29.6		46.1		41.9		24.8		33.3		3.2		9.3		87.5	
Mining, quarrying, oil and gas extraction, and support activities	21	37.5		25.0		37.5		12.5		37.5		50.0		28.6		42.9		28.6		25.0		37.5		37.5		37.5		37.5		25.0		12.5		25.0		62.5	
Utilities	22	28.6		14.3		57.1		12.5		25.0		62.5		37.5		12.5		50.0		25.0		25.0		50.0		37.5		37.5		25.0		12.5		12.5		75.0	
Wholesale trade	42	17.9		30.2		51.9		19.4		28.1		52.5		41.6		24.8		33.5		29.8		22.4		47.8		41.6		31.1		27.3		3.8		10.6		85.6	
Electronic shopping and electronic auctions	454111–12	16.7		41.7		41.7		16.7		58.3		25.0		46.2		38.5		15.4		16.7		41.7		41.7		16.7		41.7		41.7		8.3		8.3		83.3	
Transportation and warehousing	48–49	25.0		25.0		50.0		14.3		14.3		71.4		25.0		25.0		50.0		25.0		25.0		50.0		25.0		25.0		50.0		12.5		12.5		75.0	
Information	51	18.5		22.8		58.7		8.5		23.9		67.6		37.3		36.4		26.4		30.5		30.8		38.7		43.4		24.4		32.2		2.7		8.5		88.8	
Publishing	511	17.3		22.0		60.7		8.0		22.7		69.3		41.1		36.4		22.5		36.8		28.9		34.2		44.4		27.5		28.1		2.0		7.9		90.1	
Newspaper, periodical, book, and directory publishers	5111	0.0		0.0		100.0	i	0.0		50.0	i	50.0	i	40.0	i	40.0	i	20.0		40.0	i	40.0	i	20.0	i	25.0	i	25.0	i	50.0	i	0.0		0.0		100.0	i
Software publishers	5112	17.7		22.4		59.9		8.1		22.3		69.6		41.2		36.5		22.3		36.5		29.1		34.5		44.7		28.0		27.3		2.0		8.1		89.9	
Telecommunications	517	26.7		13.3		60.0		6.7		26.7		66.7		33.3		26.7		40.0		13.3		33.3		53.3		33.3		20.0		46.7		6.3		12.5		81.3	
Data processing, hosting, and related services	518	19.2		23.8		57.0		9.2		24.3		66.4		33.3		37.3		29.4		26.3		31.6		42.1		44.4		20.3		35.3		3.9		7.9		88.2	
Other information	other 51	17.6		29.4		52.9		11.8		35.3		52.9		41.2		41.2		17.6		31.3		37.5		31.3		31.3		37.5		31.3		6.3		18.8		75.0	
Finance and insurance	52	20.0		10.0		70.0		9.5		19.0		71.4		33.3		38.1		28.6		25.0		35.0		40.0		35.0		35.0		30.0		4.8		14.3		81.0	
Real estate and rental and leasing	53	28.6		14.3		57.1		16.7		16.7		66.7		28.6		28.6		42.9		20.0		20.0		60.0		28.6		28.6		42.9		14.3		14.3		71.4	
Lessors of nonfinancial intangible assets (except copyrighted works)	533	50.0		0.0		50.0	i	33.3		33.3	i	33.3	i	50.0		50.0	i	0.0		33.3		33.3	i	33.3	i	50.0	i	50.0	i	50.0		0.0		0.0		50.0	i
Other real estate and rental and leasing	other 53	16.7		16.7		66.7		20.0		20.0		60.0		33.3		16.7		50.0		20.0		20.0		60.0		16.7		33.3		50.0		16.7		16.7		66.7	
Professional, scientific, and technical services	54	20.4		22.6		57.0		10.9		18.5		70.6		24.8		35.5		39.7		21.0		30.9		48.1		42.9		23.2		33.9		3.5		9.6		86.8	
Architectural, engineering, and related services	5413	13.9		31.0		55.1		6.3		15.2		78.5		14.6		40.5		44.9		13.9		19.0		67.1		25.9		22.2		51.9		3.8		5.8		90.4	
Computer systems design and related services	5415	16.1		22.2		61.7		13.1		20.8		66.0		33.1		36.2		30.8		28.4		35.2		36.4		46.0		26.1		28.0		2.7		12.5		84.7	
Scientific research and development services	5417	43.1		23.6		33.3		15.7		24.0		60.3		27.3		35.5		37.2		18.2		33.9		47.9		55.4		23.1		21.5		6.7		11.8		81.5	
Research and development in nanotechnology	541713	50.0		25.0		25.0		25.0		37.5		37.5		28.6		42.9		28.6		25.0		37.5		37.5		50.0		25.0		25.0		14.3		14.3		71.4	
Research and development in biotechnology (except nanobiotechnology)	541714	46.7		26.7		26.7		16.7		23.3		60.0		33.3		30.0		36.7		20.0		30.0		50.0		58.6		20.7		20.7		7.1		14.3		78.6	
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	41.9		22.1		36.0		15.3		23.5		61.2		25.6		37.2		37.2		17.6		35.3		47.1		53.5		24.4		22.1		6.0		11.9		82.1	
Research and development in the social sciences and humanities	541720	25.0		25.0		50.0		0.0		33.3		66.7		33.3		33.3		33.3		33.3		33.3		33.3		33.3		33.3		33.3		0.0		33.3		66.7	
Other professional, scientific, and technical services	other 54	14.4		9.3		76.3		7.1		11.2		81.6		16.3		25.5		58.2		18.6		34.0		47.4		46.4		17.5		36.1		3.1		6.2		90.7	
Health care services	621–23	19.0		14.3		66.7		9.1		18.2		72.7		23.8		23.8		52.4		14.3		23.8		61.9		31.8		22.7		45.5		4.8		9.5		85.7	

Table 70. Importance of types of intellectual property protections to companies located in the United States that performed or funded R&D, by industry and company size: 2024

(Percent)

Industry and company size	NAICS code	Utility patents						Design patents						Trademarks						Copyrights						Trade secrets						Mask works					
		Very important		Somewhat important		Not important		Very important		Somewhat important		Not important		Very important		Somewhat important		Not important		Very important		Somewhat important		Not important		Very important		Somewhat important		Not important		Very important		Somewhat important		Not important	
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	17.0		14.9		68.1		12.8		19.1		68.1		31.9		23.4		44.7		15.2		28.3		56.5		34.0		21.3		44.7		4.3		6.5		89.1	
All companies (number of domestic employees)	–	26.0		20.3		53.7		16.4		23.1		60.6		33.6		32.6		33.9		23.6		29.2		47.2		45.5		23.8		30.7		4.2		10.2		85.7	
Small companies ^a																																					
10–19	–	22.2		20.2		57.6		12.8		21.6		65.6		31.3		31.1		37.7		23.7		29.2		47.0		49.3		18.7		31.9		4.3		9.0		86.7	
20–49	–	24.3		17.6		58.1		14.5		21.4		64.2		27.4		34.5		38.1		22.9		29.7		47.5		44.6		26.8		28.6		3.4		11.4		85.3	
Medium companies																																					
50–99	–	23.5		21.5		54.9		17.3		26.4		56.3		33.7		30.4		35.9		21.1		28.0		50.9		44.7		24.1		31.2		3.6		10.2		86.2	
100–249	–	25.2		17.0		57.9		17.2		22.6		60.2		33.7		32.4		33.9		22.4		27.6		50.0		42.5		24.5		33.0		5.0		8.5		86.5	
Large companies																																					
250–499	–	30.5		20.9		48.6		19.2		24.9		55.9		37.6		33.1		29.2		23.9		31.3		44.9		44.4		24.7		30.9		5.1		11.3		83.6	
500–999	–	27.2		37.1		35.8		18.7		18.0		63.3		35.3		44.0		20.7		24.0		24.0		52.0		37.7		20.5		41.7		4.7		10.0		85.3	
1,000–4,999	–	41.0		21.4		37.6		22.4		28.4		49.1		53.8		25.6		20.5		31.6		35.0		33.3		52.1		25.6		22.2		6.8		12.0		81.2	
5,000–9,999	–	52.2		21.7		26.1		29.2		37.5		33.3		62.5		25.0		12.5		37.5		37.5		25.0		58.3		25.0		16.7		8.7		17.4		73.9	
10,000–24,999	–	57.9		21.1		21.1		38.9		33.3		27.8		72.2		16.7		11.1		42.1		42.1		15.8		63.2		21.1		15.8		11.1		16.7		72.2	
25,000 or more	–	58.3		16.7		25.0		33.3		41.7		25.0		75.0		16.7		8.3		46.2		38.5		15.4		61.5		23.1		15.4		8.3		16.7		75.0	

i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse.

NAICS = 2017 North American Industry Classification System.

^a The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):
Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D. Statistics are based on companies in the United States that reported to the survey. No systematic item imputation was applied.

Source(s):
National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 71. Companies located in the United States that performed or funded R&D and engaged in intellectual property transfer activities, by type of activity and industrial sector: 2024

(Number)

Type of IP transfer activity	Industrial sector			
	All	Manufacturing	Nonmanufacturing	
Transferred IP to others not owned by your company through participation in technical assistance or know-how agreements	660	430	230	
Received IP from others not owned by your company through participation in technical assistance or know-how agreements	890	510	390	
Transferred IP to a spin-off or spin-out of your company	180	80	100	
Received IP from a parent company as part of a spin-off or spin-out	60	40	30	
Acquired more than 50% ownership in another company for the primary purpose of acquiring its IP	400	120	290	
Acquired any financial interest in another company in order to gain access to its IP	220	130	100	
Participated in cross-licensing agreements—the agreements in which two or more parties grant a license to each other for the use of the subject matter claimed in one or more of the patents owned by each party	540	340	200	
Allowed free use of patents or other IP owned by your company (e.g., allowing free use of software patents by the open-source community)	640	210	430	
Made use of open-source patents or other freely available IP not owned by your company	2,520	850	1,680	

IP = intellectual property.

Note(s):

Detail may not add to total because of rounding. Industrial sector is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D. Statistics are based on companies in the United States that reported to the survey. No systematic item imputation was applied.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table 72. Tax credit filings for research activities for companies with R&D expenditures, by industry and company size: 2024

(Number and percent)

Industry	NAICS code	Total (number)	Yes, filed Form 6765 in 2024 (%)	No, did not file Form 6765 in 2024 (%)
All industries	21–23, 31–33, 42–81	25,880	45.9	54.1
Manufacturing industries	31–33	12,540	50.6	49.4
Food	311	810	37.8	62.2
Beverage and tobacco products	312	240	28.0	72.0
Textile, apparel, and leather products	313–16	170	38.9	61.1
Wood products	321	80	55.6	44.4
Paper	322	80	62.5	37.5
Printing and related support activities	323	120	38.5	61.5
Petroleum and coal products	324	60	50.0	50.0
Chemicals	325	2,180	49.8	50.2
Basic chemicals	3251	320	50.0	50.0
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	120	33.3	66.7
Pesticide, fertilizer, and other agricultural chemicals	3253	80	55.6	44.4
Pharmaceuticals and medicines	3254	1,110	54.1	45.9
Soap, cleaning compound, and toilet preparations	3256	180	38.9	61.1
Paint, coating, adhesive, and other chemicals	3255, 3259	410	43.9	56.1
Plastics and rubber products	326	670	58.8	41.2
Nonmetallic mineral products	327	260	26.9	73.1
Primary metals	331	170	55.6	44.4
Fabricated metal products	332	1,430	56.9	43.1
Machinery	333	1,820	53.3	46.7
Agricultural implement	33311	170	50.0	50.0
Semiconductor machinery	333242	50	60.0	40.0
Engine, turbine, and power transmission equipment	3336	130	53.8	46.2
Other machinery	other 333	1,490	54.0	46.0
Computer and electronic products	334	1,750	52.3	47.7
Communications equipment	3342	290	53.3	46.7
Semiconductor and other electronic components	3344	470	52.1	47.9
Navigational, measuring, electromedical, and control instruments	3345	820	50.6	49.4
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	180	50.0	50.0
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	140	40.0	60.0
Other measuring and controlling devices	other 3345	520	53.8	46.2
Other computer and electronic products	other 334	180	61.1	38.9
Electrical equipment, appliances, and components	335	400	57.5	42.5
Transportation equipment	336	1,060	56.6	43.4
Motor vehicles, bodies, trailers, and parts	3361–63	620	54.0	46.0
Aerospace products and parts	3364	270	57.1	42.9
Aircraft, aircraft engine, and aircraft parts	336411–13	240	58.3	41.7
Guided missile, space vehicle, and related parts	336414–15, 336419	30	50.0	50.0
Military armored vehicle, tank, and tank components	336992	20	50.0	50.0
Other transportation	other 336	160	64.7	35.3
Furniture and related products	337	170	47.1	52.9
Miscellaneous	339	1,160	45.3	54.7
Medical equipment and supplies	3391	770	47.4	52.6
Other miscellaneous manufacturing	3399	390	42.5	57.5
Nonmanufacturing industries	21–23, 42–81	13,350	41.4	58.6
Mining, quarrying, oil and gas extraction, and support activities	21	70	57.1	42.9
Utilities	22	80	75.0	25.0

Table 72. Tax credit filings for research activities for companies with R&D expenditures, by industry and company size: 2024

(Number and percent)

Industry	NAICS code	Total (number)	Yes, filed Form 6765 in 2024 (%)	No, did not file Form 6765 in 2024 (%)
Wholesale trade	42	1,640	37.0	63.0
Electronic shopping and electronic auctions	454111–12	110	45.5	54.5
Transportation and warehousing	48–49	440	11.4	88.6
Information	51	3,480	48.9	51.1
Publishing	511	1,610	45.3	54.7
Newspaper, periodical, book, and directory publishers	5111	40	40.0	60.0
Software publishers	5112	1,570	45.6	54.4
Telecommunications	517	160	50.0	50.0
Data processing, hosting, and related services	518	1,580	50.0	50.0
Other information	other 51	150	68.8	31.3
Finance and insurance	52	220	68.2	31.8
Real estate and rental and leasing	53	50	50.0	50.0
Lessors of nonfinancial intangible assets (except copyrighted works)	533	10	50.0	50.0
Other real estate and rental and leasing	other 53	50	60.0	40.0
Professional, scientific, and technical services	54	6,610	38.4	61.6
Architectural, engineering, and related services	5413	1,650	42.8	57.2
Computer systems design and related services	5415	2,700	40.2	59.8
Scientific research and development services	5417	1,290	37.2	62.8
Research and development in nanotechnology	541713	70	37.5	62.5
Research and development in biotechnology (except nanobiotechnology)	541714	320	42.4	57.6
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	890	36.0	64.0
Research and development in the social sciences and humanities	541720	20	33.3	66.7
Other professional, scientific, and technical services	other 54	990	28.3	71.7
Health care services	621–23	220	31.8	68.2
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	490	57.1	42.9
All companies (number of domestic employees)	–	25,880	45.9	54.1
Small companies				
10–19 ^a	–	4,640	34.3	65.7
20–49	–	7,200	42.6	57.4
Medium companies				
50–99	–	4,520	45.5	54.5
100–249	–	4,210	46.6	53.4
Large companies				
250–499	–	1,880	56.4	43.6
500–999	–	1,580	47.8	52.2
1,000–4,999	–	1,310	69.5	30.5
5,000–9,999	–	250	84.0	16.0
10,000–24,999	–	210	85.7	14.3
25,000 or more	–	130	78.6	21.4

i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse; r = relative standard error is more than 50%.

NAICS = 2017 North American Industry Classification System.

^a The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):

Detail may not add to total because of rounding. Industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D and are not comparable with estimates published for years prior to 2018. Statistics are based on companies in the United States that reported to the survey. No systematic item imputation was applied. These statistics include an adjustment to the weight to account for unit nonresponse.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Technical Notes

Survey Overview (2024 Survey Cycle)

Purpose. The Business Enterprise Research and Development (BERD) Survey, successor to the Business Research and Development Survey (BRDS) (2017–18), the Business R&D and Innovation Survey (BRDIS) (2008–16), and the Survey of Industrial Research and Development (SIRD) (1953–2007), is the primary source of information on research and development (R&D) expenditures and R&D employees of for-profit, publicly or privately held, nonfarm businesses with 10 or more employees in the United States that performed or funded R&D either domestically (in the 50 states and the District of Columbia) or abroad.

Data collection authority. The information collected by the BERD Survey is solicited under the authority of the National Science Foundation Act of 1950, as amended, and the America COMPETES Reauthorization Act of 2010. Response to this annual survey is mandatory and confidential; the Census Bureau collects the data under the authority of Title 13, Section 8, of the U.S. Code. The Office of Management and Budget control number is 0607-0912. The National Center for Science and Engineering Statistics (NCSES) has reviewed this product for unauthorized disclosure of confidential information and approved its release (NCSES-DRN26-042).

Survey sponsors. The BERD Survey is cosponsored by the NCSES within the U.S. National Science Foundation and the Census Bureau.

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

Key Survey Information

Frequency. Annual.

Initial survey year. BERD Survey data collection began for 2019. BRDS collected data for 2017–18, BRDIS collected data for 2008–16, and SIRD collected data for 1953–2007.

Reference period. Calendar year 2024.

Response unit. Company.

Sample or census. Sample.

Population size. A total of 1,171,000 companies.

Sample size. A total of 45,500 companies, which included companies with known positive R&D activity (approximately 21,500) and with unknown R&D activity (approximately 24,000).

Survey Design

The survey is administered both to companies known to have performed R&D and to companies with no known history of R&D activity. The BERD Survey has been designed to provide detailed statistics on global and domestic R&D expenditures of companies located in the United States and on these companies' R&D employees.

The survey is sent to a single coordinator within each company, but it is organized into sections that help the coordinator collect specific types of information from different experts in the company (human resources, accounting, R&D managers, etc.). Foreign-owned companies are instructed to report only for company operations owned by the U.S. subsidiary and, for purposes of the survey, to treat the U.S. subsidiary's foreign owners as if they were unrelated third parties.

Target Population

The target population for the BERD Survey consists of for-profit, publicly or privately held, nonfarm companies that have 10 or more paid employees in the United States, that have at least one establishment located in the United States that is in business during the survey year, and that are classified in certain industries based on the 2017 NAICS, with a particular focus on those companies that perform R&D in the United States.

The Business Register, a Census Bureau compilation that contains information on more than 8.7 million establishments with paid employees, serves as the primary input to the sampling frame from which the BERD Survey sample is selected. For a given company with more than one establishment, the prior year's annual payroll and employment data for its active establishments are summed to the company level.

Sampling Frame

The scope of the 2024 BERD Survey is limited to companies that (1) are in business primarily to make a profit, publicly or privately held, nonfarm; (2) are classified within a specific set of 2017 NAICS industries; (3) have 10 or more paid employees in the United States, based on employment on 12 March 2023; (4) have at least one establishment that is physically located in the United States and is in business at the end of calendar year 2024 (the time at which the Census Bureau finished the 2023 Business Register Processing); and (5) are not federally funded R&D centers.

Single-unit company records were extracted from the 2023 Business Register if the company had at least 10 paid employees in 2023 or, when employment information was unavailable, if the company's 2023 payroll was greater than or equal to \$500,000. Companies were removed from the sampling frame if their NAICS codes were designated as agriculture, forestry, fishing, and hunting (NAICS 11); postal service (NAICS 491); educational services (NAICS 61); private households (NAICS 814); or public administration (NAICS 92); or if they were no longer in business or were nonprofits. Companies were also removed from the sampling frame if they were not located in the 50 U.S. states or the District of Columbia.

Records for active establishments from multiunit companies were extracted from the 2023 Business Register if the given establishment's 2023 payroll was greater than zero or if the establishment employed at least one person in 2023. Prior to creating records for multiunit companies from these establishments, establishments classified as postal service (NAICS 491), private households (NAICS 814), or public administration (NAICS 92) were removed, as were those that were not physically located in the 50 U.S. states or the District of Columbia. Unlike single-unit companies, establishments classified as agriculture, forestry, fishing, and hunting (NAICS 11) or educational services (NAICS 61) were not initially removed during the construction of multiunit company records. Establishments classified in NAICS 11 or NAICS 61 contributed to the classification of the multiunit companies, and their payroll could have been included in determining the company's measure of size. From the resulting set of multiunit companies, companies were removed from the sampling frame if they had fewer than 10 paid employees or if the payroll associated with their nonprofit establishments was greater than the payroll of their for-profit establishments.

For each company on the sampling frame, a measure of size was assigned. The measure of size for a given company was based on R&D, if R&D data from the past 5 years were available from (1) the BERD Survey, (2) online financial databases, (3) the Report of Organization conducted as part of the Company Organization Survey (in years not ending in "2" or "7") or as a supplement to the Economic Census (in years ending in "2" or "7"), or (4) qualified R&D expenses from the Internal Revenue Service (IRS). For all other companies, the measure of size was based on total annual payroll for 2023 from the Business Register.

Industry Classification for Sampling

Each company was assigned to 1 of 60 industry sampling strata based on the reported business segment in which the company performed the largest amount of total domestic R&D, as reported within the previous 5 years (2019–23 BERD Survey), if available. If these business segment data were not reported for a given company, assignment was based on the NAICS codes of its establishments in the Business Register using the following method, with some adjustments made to account for vertical integration of related business activities within the company. The company was first assigned to the economic sector, defined by a two-digit NAICS code that accounted for the highest percentage of its aggregated annual payroll. Then the company was assigned to a subsector, defined by a three-digit NAICS code that accounted for the highest percentage of its annual payroll within the economic sector. Next, the company was assigned a four-digit NAICS code within the subsector, again based on the highest percentage of its aggregated annual payroll within the subsector. Finally, the company was assigned a six-digit NAICS code within the four-digit NAICS code, based on the highest percentage of its aggregated annual payroll within the four-digit NAICS code. Companies with an assigned six-digit NAICS code beginning with 11 or 61 were removed from the sampling frame at this point. The industry used for sampling purposes was not necessarily the same code used for publication; see section “[Postsampling Industry Classification](#).”

Stratification of the Sampling Frame

The frame was first stratified by industry classification for sampling. Within each industry sampling group, the frame was split into the following two major groups:

- **Known positives:** Companies with past reported R&D greater than zero.
- **Unknowns:** Companies whose R&D activity was unknown. All companies within the unknown strata are assigned a measure of size based on total company payroll. Beginning in survey year 2021, companies with known zero R&D were combined with the unknown R&D group.

The motivation behind using these strata is that each contains companies that exhibit unique characteristics. Companies in the known positive stratum are likely to have R&D, whereas R&D is a rare characteristic for the unknown R&D stratum. For the 2024 BERD Survey, 33,500 companies were in the known positive group and 1,137,000 companies were in the unknown group, for a total of 1,171,000 companies ([table A-1](#)).

Sample Selection

Across both groups (known positive and unknown), companies in select industries and companies that exhibited characteristics of having large R&D amounts, including those with the largest annual payroll, were selected for the sample with certainty (i.e., the probability of selection was equal to 1). The probability of selection for other companies in the known positive R&D and unknown R&D groups depended on their size, the number of companies selected, and the total size or number of companies in their strata. In the known positive R&D group, Pareto probability-proportional-to-size (PPS) sampling was used within each noncertainty industry stratum, where the probability of selection was proportional to the company’s measure of size. In the unknown R&D group, Pareto PPS sampling was used within most industry strata; simple random sampling (SRS) was used instead of Pareto PPS for industries in which the number of companies in the sampling frame was high and the likelihood of R&D was low. For both the known positive and unknown groups, a separate stratum was created for companies with fewer than 25 employees, regardless of industry. Pareto PPS sampling was used within these strata. Each sampling stratum had a certainty and noncertainty portion ([table A-2](#)). The number of companies selected was based on a coefficient of variation constraint on the estimated sample total for the stratum and was adjusted, if necessary, to ensure that the minimum probability of selection is 0.05 for the known positive R&D group and one of six values for the unknown R&D group: 0.004, 0.01, or 0.02 for nonmanufacturing industries (NAICS other than 31–33) and incomplete manufacturers (incomplete NAICS beginning with 3), depending on the population size and likelihood of R&D; 0.04 for printing and related support activities manufacturing (NAICS 323), furniture and related product manufacturing (NAICS 337),

and computer systems design and related services (NAICS 5415); 0.02 for the remaining manufacturing (NAICS 31–33) industries; and 0.05 for the companies with fewer than 25 employees. Within the unknown R&D group, a total of 31,500 companies had a known zero value for the measure of size based on R&D from prior survey response. The probability of selection for those companies was set to zero.

Once selected, each company was assigned a sampling weight equal to the reciprocal of its probability of selection for the sample. Companies that were selected for the sample with certainty were assigned sampling weights equal to 1, and companies that were selected using SRS or Pareto PPS sampling were assigned weights ranging from 1 to 250. A complete and detailed description of the sample design and estimation methodology is given in the annual BERD Survey methodology report available from NCSES.

Sample Size

Using the sample design parameters detailed above, a total of 45,500 companies were selected, of which 21,500 companies were in the known positive R&D group, and 24,000 companies were in the unknown R&D group ([table A-3](#) and [table A-4](#)).

During the survey's annual contact update procedures, 200 large R&D performers from the 2023 sample were found that were not included on the 2024 sampling frame. The primary reasons for this were mergers, acquisitions, or other company structure changes that cause a difference between a company's current Business Register ID and its prior year survey ID—in this case, its ID in the 2023 BERD Survey file. To follow up with these companies, they were added to the 2024 sample with certainty, and 150 companies were sent the same survey invitation as the other companies in the sample. Because it was expected that many of these records would not contribute to 2024 BERD Survey tabulations due to changes in company structure, these companies are not included in sampling frame counts or sample sizes ([table A-5](#)). A complete and detailed description of the selection of additional sampling units is given in the annual BERD Survey methodology report available from NCSES.

Data Collection and Processing

Starting in the 2017 cycle, an initial letter was mailed to all companies instructing them to report via the Census Bureau's Centurion data collection instrument. Beginning in survey year 2020, in addition to the initial physical mailing, an initial electronic message was sent to a subset of sampled companies. Beginning in survey year 2022, the BERD Survey stopped mailing paper questionnaires by request of the company and stopped mailing a paper questionnaire during a later nonresponse follow-up for companies that had not yet responded. All responses starting with the 2022 survey were submitted electronically.

In survey year 2024, approximately 2,500 cases were sent an initial email and were not mailed an initial letter. Those 2,500 cases are included in the total counts of survey letters mailed in [table A-5](#), [table A-6](#), and [table A-7](#).

Questionnaires

Beginning with the 2017 cycle, all companies received the same questionnaire, BRD-1, which combines the standard form BRDI-1 and the abbreviated form BRDI-1(S) used in prior cycles ([table A-6](#)). Companies that reported less than \$1 million in R&D paid for by the company or less than \$1 million in R&D funded by others completed abbreviated worksheets in lieu of more detailed questions asked of companies with \$1 million or more in R&D. As was the case in previous cycles, some companies with decentralized records requested a special reporting arrangement with the Census Bureau. Under this arrangement, the survey form was sent to multiple operating units within the same company, and each Alternate Reporting Unit (ARU) completed the survey individually. The data for these ARUs were also tabulated separately in published estimates and were not consolidated at the company level ([table A-7](#)).

Because of the potential compartmentalization of organizational knowledge within companies (particularly in larger companies), the BERD Survey questionnaire is organized into sections based on the subject matter of the questions. These sections include the following:

Section 1. Company information. Includes basic questions about company ownership, lines of business, sales, and employee data.

Section 2. R&D paid for by your company. Includes geographic location and accounting questions about the company's R&D expenses.

Section 3. Costs paid for by others. Includes accounting questions about R&D paid for by others, such as the company's customers or grant-giving organizations.

Section 4. Assets. Includes questions on total assets, total capital expenditures, and capital expenditures for R&D operations.

Section 5. Management and strategy of R&D. Includes questions related to the characteristics and focus of the company's R&D. This section was targeted toward company employees responsible for managing R&D departments or programs.

Section 6. Human resources. Includes questions related to the human resources involved in the company's R&D activities.

Section 7. Intellectual Property and Technology Transfer. Includes questions on the company's production, use, acquisition, and disposition of intellectual property related to science and technology with a focus on patents.

Section 8. Tax topics. Includes questions on filing federal and state tax credits for research activities.

For specific differences among the BERD Survey questionnaires, see section [“Data Comparability \(Changes\).”](#)

Response Rates

Unit Response Rates

Of the companies surveyed for the 2024 survey, 33% did not submit any response, and an additional 1% did not provide enough information to be treated as responses. Nonresponse studies are conducted periodically to assess reasons for nonresponse and possible nonresponse bias. Three metrics used by NCSES and the Census Bureau to measure unit response to the BERD Survey were check-in rates, unit response rates (URRs), and coverage rates.

Check-in rate. The check-in rate is defined as the unweighted number of surveys that were either submitted online or mailed in 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.

Coverage rate. Managers of the BERD Survey track the survey coverage using a rate that is a weighted estimate of survey response based on the measure of size at the time of sample selection. The estimate measures how much of the weighted measure of size for in-scope companies in the sample is accounted for by respondents to the survey.

Unit response rate (URR). The URR is the unweighted number of responding companies with positive data for at least one of the survey's key items (i.e., worldwide R&D expenses or R&D costs funded by others, worldwide or domestic sales, or worldwide or domestic employees), divided by the unweighted total number of in-scope companies in the sample.

For the 2024 BERD Survey, the check-in rate was 67% and the URR was 66%. The estimate of coverage rate for the 2024 BERD Survey was 93% for the known positive R&D group and 64% for the unknown R&D group ([table A-8](#) and [table A-9](#)).

Item Response Rates

The BERD Survey collects data for over 500 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.

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. The TQRR for total R&D performed in the United States in 2024 was 70%.

Total quantity nonresponse rate (TQNR). For a given published estimate, TQNR, defined as 100% minus TQRR, is calculated for each tabulation cell from the BERD Survey, 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 BERD Survey estimate. TQNR tables giving imputation rates corresponding to each data table are available from NCSES. Also see section “[Item Nonresponse](#).”

Data Editing

Given the size and complexity of the BERD Survey, many survey responses included errors that required correction or had unusual patterns that required validation. Several hundred automated edit checks were programmed to improve the efficiency of analyst data review and correction ([table A-10](#)).

Approximately two-thirds of these edit checks were designed to catch arithmetic errors and logically inconsistent responses (*balance edits*). The remaining edit checks were designed to flag outliers for further analyst review (*analytical edits*). Descriptions of the data edits and edit failure rates are in annual methodology reports that are available from NCSES.

During the editing and review process, several cases were identified where companies reported zero R&D or a relatively small amount of R&D, even though subject-matter experts expected large amounts of R&D to be reported. Some of these companies were contract research organizations or federal contractors that did not account for the costs they incurred while conducting customer-sponsored research as R&D; instead, they accounted for these as the cost of sales. The largest of these companies were contacted by analysts and asked to resubmit their surveys. In rare cases, if no response could be elicited from a company and public information was available related to costs for customer-sponsored R&D, those data were used to impute an R&D estimate for that company.

Techniques for Handling Unit and Item Nonresponse

For various reasons, many firms chose to return the survey questionnaire with one or more blank items. For some firms, internal accounting systems and procedures may not have allowed quantification of specific expenditures. Others may have refused to answer any questions as a matter of company policy. Weighted estimates produced from the BERD Survey include adjustments to account for companies that did not respond to the survey (*unit nonresponse*) and for companies that did respond but left some questions blank (*item nonresponse*).

Unit Nonresponse

The BERD Survey accounts for unit nonresponse by multiplying each company’s sampling weight by a nonresponse adjustment factor. To calculate the adjustment factors, each company in the sample that responded is assigned to one (and only one) adjustment cell. The adjustment cells are based on the two R&D groups, which are subdivided according to R&D size and certainty status and also on the industry sampling strata described in the section “[Stratification of the Sampling Frame](#)” that are updated using information on industry classification reported in the BERD Survey. For a given adjustment cell, the nonresponse adjustment factor is the ratio of the sum of the weighted measure of size for all companies in the cell to the sum of the weighted measure of size for all companies in the cell with reported or imputed data. The measure of size used to

select the sample for the 2024 BERD Survey (see section “[Sampling Frame](#)”) was also used to adjust for unit nonresponse. For companies in the known positive R&D stratum, the measure of size was based on R&D in the United States. For companies in the unknown R&D stratum, the measure of size was based on total annual payroll in the United States. Beginning in survey year 2018, this unit nonresponse adjustment was also applied to counts, patents, patent licensing agreements, and intellectual property protection. In previous survey years, no such adjustment was applied to those items.

R&D estimates for geographic areas that are dominated by a relatively small number of companies are particularly sensitive to changes in survey response because these areas may not be similarly represented by companies in the same adjustment cell.

Item Nonresponse

Item nonresponse for a given company is handled by item imputation. For account manager companies, large companies, and special cases, analysts impute these data using direct substitution of available company data (e.g., data from the company’s website, annual Form 10-K report, or administrative sources) or other methods determined appropriate by NCSES’s and the Census Bureau’s subject-matter experts. For other cases, including cases where analysts were unable to provide an estimate, data are imputed by programmed item imputation procedures. Depending on the particular item being imputed for a company, these procedures are based on a combination of (1) direct substitution of available company data, (2) ratio imputation using the company’s survey data for both the current and prior year, and (3) ratio imputation using survey data from both the company and other similar companies, which reported both the survey item being imputed for the company and the other survey item used in the ratio. Tables of imputation rates corresponding to each data table are available from NCSES.

Estimation

The general methodology used to produce estimates from the BERD Survey involves sums of weighted data (reported or imputed) in which the weights are the product of the sampling weight and the nonresponse adjustment factor. However, there are some exceptions, which are described below.

Weighting

Estimates published for the BERD Survey are computed as sums of weighted data for sample companies that reported to the survey or for sample companies for which data could be imputed based on prior reports or other information. Two types of weights are used for estimates of R&D: sampling weights and nonresponse adjustment factors. The *sampling weight* for a given company is calculated as the reciprocal of the company’s probability of inclusion in the sample. *Nonresponse adjustment factors* are used to represent companies in the sample that did not provide sufficient response data to be directly tabulated and whose data could not be imputed. For information on the calculation of the nonresponse adjustment factors, see section “[Unit Nonresponse](#).”

Beginning in survey year 2018, the nonresponse adjustment factor was also applied to estimates of counts, patents, and patent licensing agreements. In prior survey years, the adjustment was not applied to those items.

Postsampling Industry Classification

As mentioned in the section “[Industry Classification for Sampling](#),” the industry classification assigned to companies for sampling was based on either reported BERD Survey business segment data from prior years or annual payroll. To produce more accurate estimates for the current survey year, a company’s reported business code, if available for the current survey year, was used to assign an updated industry code for tabulations. The company’s response to the domestic R&D performance questions from the current survey year was used to classify each company into the business code that accounted for the largest amount of total domestic R&D performance. The business codes reported by companies with large amounts of R&D were validated, and in some cases corrected, by survey staff. If no business code data were available for a company’s domestic R&D performance, the industry code used for sampling was also used for tabulations.

R&D, by State

The estimation methodology for state estimates takes the form of a hybrid estimator, combining the unweighted reported amount, by state, with a weighted amount apportioned (or raked) across states with relevant industrial activity. The hybrid estimator smooths the estimate over states with R&D activity, by industry, and accounts for real observed change within a state. For more information on the state estimation methodology, please see the annual BERD Survey methodology report.

R&D, by Business Segment Code

To provide increased granularity on R&D activities, the BERD Survey includes questions asking companies to report data for business units below the company level. To support subcompany reporting, a list of business codes based on NAICS was provided in the BERD Survey for companies to use to categorize their business operations. The list of business codes for the 2024 cycle of the BERD Survey was based on the 2017 NAICS. To assist companies in selecting appropriate business codes, likely business codes were provided to respondents by prepopulating them on the online version of the survey. For companies that reported to the 2022 or 2023 BERD Survey, the most recent business codes reported by the company were used to provide the business codes for the 2024 survey. For companies that did not report to the 2022 or 2023 BERD Survey, establishment payroll data from the Business Register were used to provide the business codes for the 2024 survey.

Company Counts

The BERD Survey is designed primarily to produce valid, useful estimates of *money amounts* related to the performance and funding of R&D. Because this is the survey's focus, estimation of meaningful *company counts* is difficult. Consequently, throughout the history of the survey there have been various efforts to calculate frequencies more precisely. Following is a summary of the results of recent efforts.

Beginning in survey year 2019, company count estimates reflect a change in rounding methodology. Beginning in survey year 2018, a weight adjustment to account for unit nonresponse was implemented for company counts; as a result, company count estimates are not comparable with survey years prior to 2018.

The company count estimates for 2017 are not comparable with those for 2016 for two reasons. First, the target population for 2017 was restricted to companies with 10 or more domestic employees, whereas the 2016 survey population included companies with 5 or more employees. Second, no adjustment is applied to count estimates to correct for unit nonresponse, and overall response to the survey declined from 2016 to 2017.

The company count estimates for 2014 and onward are not comparable with estimates published for previous years. BRDIS review and correction procedures were amended beginning in survey year 2014 to include a more systematic analysis of companies reporting small amounts of R&D (less than \$10,000) and no R&D employees. Many of these responses were determined to be reporting errors (false-positive R&D), and their R&D was set to zero. These corrections had a negligible impact on BRDIS R&D estimates compared to earlier years. But because these companies tended to have high sample weights, these corrections had a large impact on the estimate of R&D-active companies compared to prior years (when fewer such corrections were made).

Tabulation Eligibility

Beginning in survey year 2018, companies that performed or funded less than \$50,000 of R&D were excluded from tabulation. In prior years, companies that performed or funded any amount of R&D were tabulated. This change has affected the comparability of these estimates to those published for years prior to 2018. These companies in aggregate represented a very small share of total R&D expenditures in prior years, but they accounted for a larger share of count estimates. Had the companies under this threshold been included in the 2024 estimates, they would have contributed approximately \$70 million to overall R&D expenditures and would have added approximately 5,400 companies to the estimated count of U.S. companies with R&D expenditures.

Survey Quality Measures

Sampling and Nonsampling Errors

The estimates produced from the BERD Survey are subject to both sampling and nonsampling errors. Sampling error is the difference between estimates obtained from the sample and results theoretically obtainable from a comparable complete enumeration of the sampling frame. For published estimates from the BERD Survey, standard errors are produced for estimated percentages, while relative standard errors (RSEs) are produced for all other estimates. Tables of the estimated measures of sampling variability corresponding to each data table are available from NCSES.

Beginning in survey year 2021, a data flag denoted by “r” was added to the data tables to denote any data estimates that had RSEs greater than 50%. If estimates required both an “r” and “i” flag (where an “i” flag indicates that more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse), the estimate “r” flag was assigned. This is because the “r” flag indicates the data is of lower quality than the “i” flag.

Potential nonsampling errors include coverage error, error induced during data processing, and various response and operational errors, such as errors during data collection, reporting errors, transcription errors, and bias due to nonresponse. These are errors that could also occur if a complete enumeration of the sampling frame had been conducted under the same conditions as the sample survey. Most of the important operational errors were detected and corrected during the course of reviewing the data for reasonableness and consistency. Although nonsampling error is not measured directly, quality control procedures were employed throughout the survey process to minimize this type of error.

Measurement Error

Variations in respondent interpretations of the definitions of R&D activities and variations in accounting procedures are of particular concern—specifically, the characterization and reporting of R&D activities by large defense contractors funded by the U.S. federal government, the reporting of R&D activities by companies classified in the scientific R&D services industry (NAICS 5417), and the method used by companies, in general, to count and report numbers of employees in various categories, such as the number of employees who work full time versus part time on R&D. The sophistication and comprehensiveness of a company’s accounting and personnel tracking systems often depend on its size and activities and on its willingness to accommodate government-sponsored surveys. Although no metric of measurement error is produced, ongoing efforts to minimize measurement error include 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.

Data Comparability (Changes)

The statistics resulting from this survey are intended primarily as *indicators* of absolute levels of R&D spending and personnel. Nevertheless, the statistics are often taken to be a continuous time series prepared using the same collection, processing, and tabulation methods. Although estimating the business portion of the nation’s R&D enterprise accurately has always been the goal, such strict uniformity has not been the case. Since the survey was first fielded, improvements have been made to increase the reliability of the statistics and to make the survey results more useful. To that end, past practices have been changed and new procedures have been instituted. Preservation of the comparability of the statistics has, however, been an important consideration in making these improvements. Nonetheless, changes to survey coverage and definitions, the industry classification system, estimation methods, and the procedure used to assign industry codes to multi-establishment companies, which are documented in the annual reports, may have affected the comparability of the statistics.

Changes in respondent reporting practices

Some of the variation in BERD R&D estimates across survey years is due to changes in individual respondent reporting practices. During the 2023 BERD data collection of 2023 R&D expenditures and projected 2024 R&D expenditures, some respondents revised their reporting practices and eliminated expenditures that did not meet the BERD definition of R&D. This has resulted in a meaningful decrease in the 2023 R&D performance compared to the amount of 2023 R&D performance that would have been estimated based on respondent reporting practices used in 2022 and earlier.

Revised respondent reporting practices are reflected in the 2023 published BERD R&D data. Users should be aware that no revisions will be made to the R&D expenditure estimates published for the 2022 or earlier BERD Surveys. This change has affected the comparability of the 2023 and 2024 estimates to those published for years prior to 2023.

Differences between the 2023 and 2024 BERD Survey Questionnaires

The following changes were made to the 2024 BERD Survey from the 2023 BERD Survey:

- Question on details of R&D performed by others was cycled off.
- Question on activities with academia was cycled off.
- Question on business code or codes in which the company performed R&D and was paid for by others was cycled off.
- Question on federal R&D by government agency was cycled off.
- Question on federal R&D by types of agreements was cycled off.
- Questions on asset accumulated depreciation and amortization; asset impairment charges, disposals, or retirement; book value of assets acquired through mergers and acquisitions; and whether capital expenditures for R&D operations were funded, paid for, or reimbursed by others were cycled off.
- Questions on R&D application areas were cycled off.
- Questions on patents, intellectual property, and technology transfer were rotated back on. The questions were last asked in survey year 2022, and there were no changes to the questions in survey year 2024.

Differences between the 2022 and 2023 BERD Survey Questionnaires

The following changes were made to the 2023 BERD Survey from the 2022 BERD Survey:

- Question on details of R&D performed by others was rotated back on.
- Question on activities with academia was rotated back on.
- Question on business code or codes in which the company performed R&D and was paid for by others was rotated back on.
- Question on federal R&D by government agency was rotated back on.
- Question on federal R&D by types of agreements was rotated back on.
- Questions on R&D application areas were rotated back on.
- Questions on patents, intellectual property, and technology transfer were cycled off.

Differences between the 2021 and 2022 BERD Survey Questionnaires

The following changes were made to the 2022 BERD Survey from the 2021 BERD Survey:

- Question on details of R&D performed by others was cycled off.

- Question on activities with academia was cycled off.
- Question on business code or codes in which the company performed R&D and was paid for by others was cycled off.
- Question on federal R&D by government agency was cycled off.
- Question on federal R&D by types of agreements was cycled off.
- Questions on R&D application areas were cycled off.
- Questions on patents, intellectual property, and technology transfer were rotated back on. The questions were last asked in survey year 2020, and there were no changes to the questions in survey year 2022.

Differences between the 2020 and 2021 BERD Survey Questionnaires

The following changes were made to the 2021 BERD Survey from the 2020 BERD Survey:

- Question on details of R&D performed by others was rotated back on.
- Question on activities with academia was rotated back on.
- Question on business code or codes in which the company performed R&D and was paid for by others was rotated back on.
- Question on federal R&D by government agency was rotated back on.
- Question on federal R&D by types of agreements was rotated back on.
- Questions on assets were added to section 4. The capital expenditures questions were expanded, and the section was also renamed from “Capital Expenditures” to “Assets.”
- Questions on R&D application areas were rotated back on.
- Questions on patents, intellectual property, and technology transfer were cycled off.

Differences between the 2019 and 2020 BERD Survey Questionnaires

The following changes were made to the 2020 BERD Survey from the 2019 BERD Survey:

- Questions on the contact information of the person primarily responsible for completing each section were added to the end of each section.
- A follow-up question was added to the ownership question asking whether the new owner of the sampled company is a holding company or a private equity firm.
- Question on details of R&D performed by others was cycled off.
- Question on activities with academia was cycled off.
- Question on business code or codes in which the company performed R&D and was paid for by others was cycled off.
- Question on federal R&D by government agency was cycled off.
- Question on federal R&D by types of agreements was cycled off.
- Question on source of funds for domestic R&D funded by others was added to the section 3 worksheet.
- Questions on R&D application areas were cycled off.
- Questions on patents, intellectual property, and technology transfer were rotated back on.

Differences between the 2018 BRDS and 2019 BERD Survey Questionnaires

The following changes were made to the 2019 BERD Survey from the 2018 BRDS:

- Questions on patents, intellectual property, and technology transfer were cycled off.
- A question on filing for state tax credit for research activities in 2019 was added.

Differences between the 2017 and 2018 BRDS Questionnaires

The following changes were made to the 2018 BRDS from the 2017 BRDS:

- A question on land acquisition capital expenditures for R&D operations was added.
- Questions related to R&D on artificial intelligence (AI) were added.
- Questions asking for country and state location of employees and R&D employees were added.
- A question asking for counts of temporary and leased employees working on R&D was added.

Differences between the 2016 BRDIS and 2017 BRDS Questionnaires

The following changes were made to the 2017 BRDS from the 2016 BRDIS:

- Questions on product and process innovation were removed.
- A question on whether R&D paid for by the company included customer-sponsored R&D was added.
- Questions on R&D funded by foreign governments or agencies and R&D funded by universities and colleges located outside the United States were added.
- A question on whether any capital expenditures for R&D were funded, paid for, or reimbursed by others not owned by your company was added.

Differences between the 2015 and 2016 BRDIS Questionnaires

The following changes were made to the 2016 BRDIS from the 2015 BRDIS:

- Questions on royalties and licensing fees were added to both the R&D paid for by the company and the R&D paid for by others type-of-cost sections.
- Questions on the type of worldwide R&D paid for by the company were added to Form BRDI-1(S).
- Questions on the type of worldwide R&D paid for by others were added to Form BRDI-1(S).
- A question on all other contract R&D services paid for by customers was added to Form BRDI-1(S).
- A question on R&D performed by universities, colleges, and academic researchers located inside the United States was added, while a question on R&D performed by foreign governments was removed.
- A question on R&D funded by universities, colleges, and academic researchers located inside the United States was added, while a question on R&D funded by foreign governments was removed.
- A question on whether utility patent sales and licensing revenues were received from companies or organizations outside the United States was added to Form BRDI-1.
- A question on whether utility patent purchases and licensing payments were made to companies or organizations outside the United States was added to Form BRDI-1.

- A question on whether the company filed for the tax credit for increasing research activities (IRS Form 6765) in tax year 2016 was added to Form BRDI-1.
- Questions on the importance of intellectual property protections were removed.

Differences between the 2014 and 2015 BRDIS Questionnaires

The following changes were made to the 2015 BRDIS from the 2014 BRDIS:

- A question on phase IV clinical trials was added to Form BRDI-1.
- A question on R&D performed by others that was paid for by U.S. federal government agencies or laboratories was added to Form BRDI-1.
- Questions on the type of foreign R&D paid for and performed by the company were added to Form BRDI-1.
- Questions on the type of foreign R&D performed by the company but paid for by others were added to Form BRDI-1.
- A question on nonprovisional utility patents was added to Form BRDI-1.
- Questions related to R&D in photonics and optics application areas were removed from Form BRDI-1.

Differences between the 2013 and 2014 BRDIS Questionnaires

The following changes were made to the 2014 BRDIS from the 2013 BRDIS:

- A question on monetary gifts to universities or colleges restricted to supporting R&D was added to Form BRDI-1.
- A question on revenue received from patent licensing was added to Form BRDI-1.
- A question on purchasing patents from others was added to Form BRDI-1.
- A question on licensing patents from others was added to Form BRDI-1.
- One business code was added to the list of business codes collected on the survey: 33333, digital cameras manufacturing. In prior years, this line of business was included in the business code 33412, computers and peripheral equipment manufacturing and magnetic and optical media.
- Questions related to patenting were removed from Form BRDI-1(S).
- Questions related to innovation were added to Form BRDI-1(S).

Differences between the 2012 and 2013 BRDIS Questionnaires

The following changes were made to the 2013 BRDIS from the 2012 BRDIS:

- The list of countries for which foreign R&D performance data were collected was expanded by three: Hungary, Luxembourg, and Norway.
- A question was restored asking the amount of R&D that the company plans to recoup through indirect charges on U.S. federal government contracts (independent R&D). This question was last asked on the 2010 BRDIS.
- Questions on R&D for software products and R&D for embedded software were combined.
- A question on R&D for software products and embedded software paid for by the federal government was added.
- A question related to the educational attainment of scientists and engineers was restored. This question was last asked on the 2010 BRDIS.

- Two business codes were added to the list of business codes collected on the survey: 32542, biotechnology-based pharmaceutical and biological products (except diagnostics), and 51801, cloud computing applications and Internet-based software services.
- Delinquent companies in the known positive R&D stratum for the past two survey cycles were sent Form BRD-1(S) to see if they would report at least the high-level numbers.

Differences between the 2011 and 2012 BRDIS Questionnaires

For 2012, a much shorter (8-page) version of the short form, BRD-1(S), was implemented. The form included 19 high-level-detail items on worldwide sales; domestic sales; R&D expenses funded both by the company and by others; employment both worldwide and domestic, including R&D employment; and patents applied for and issued. Companies that reported \$1 million or more of domestic R&D performance were then sent the long form (BRDI-1) for additional details. The BRD-1(S) form was sent to companies in the unknown and known zero R&D strata. In section 2, the questionnaire collected the additional detail categories for capital expenditures. In section 3, four agencies were added to the type of agency question so as to reduce the amount reported in the all other category. In section 4, the percentage of R&D that was directed toward business areas or product lines new to the respondent's company and also the percentages that pertain to defense applications, health or medical applications, or agricultural applications were added for R&D funded by the company and R&D funded by others.

Differences between the 2010 and 2011 BRDIS Questionnaires

For the 2011 data collection, the innovation questions and instructions in section 1 were changed based on the results of the 2010 experiment. Cycling continued for data items that were not needed every year. The survey was expanded in several ways to address data gaps: the list of countries in which companies could report foreign R&D performance was expanded, a question was added to collect intracompany R&D transactions, and questions were added about companies' second-largest R&D location. In addition, questions pertaining to full-time equivalent (FTE) R&D scientists and engineers were revised to improve respondent understanding of survey concepts.

Differences between the 2009 and 2010 BRDIS Questionnaires

For the 2010 data collection, the most notable changes made to the questionnaire were the inclusion of a one-time section (section 7) on R&D time frame and R&D product life, the inclusion of an experiment testing the impact of different innovation questions and instructions, and the addition of a survey supplement to collect detailed information from companies reporting R&D paid for by others. In addition, questions and instructions about company ownership were expanded to clarify, especially for foreign-owned companies, the information that should be reported on the survey. Cycling began for data items that were not needed every year from every company. These items will be returned to the questionnaire cyclically, depending on the demand for and quality of the collected data. Finally, data items that were poorly reported during the first two cycles of BRDIS were deleted.

The section titled "R&D Time Frame and R&D Product Life" was added for the 2010 cycle to aid in estimating the depreciation of R&D when it is treated as an investment in the U.S. System of National Accounts.

An experiment testing the impact of different innovation questions and instructions used two versions of the BRDIS short form. The innovation questions on the 2010 Form BRDI-1A were identical to questions used on the 2009 Form BRDI-1A, and the 2010 Form BRDI-1B altered the questions and instructions to replicate innovation questions on the European Union's Community Innovation Survey. The experiment did not produce statistically significant differences in measured rates of innovation.

Differences between the 2008 and 2009 BRDIS Questionnaires

Several changes were made to the 2009 BRDIS questionnaire—in part, to address reporting errors observed during the 2008 survey cycle. These changes included the following:

- A screening question at the beginning of the form asking companies whether they had R&D activity during the reporting period was removed.
- Exclusion instructions in the main R&D expense question were replaced with a series of targeted questions. This approach was based on the premise that the economic concepts requested by BRDIS do not always conform to the R&D measures tracked by companies. Rather than directly asking for concepts that may diverge from respondent preconceptions about R&D, the approach in 2009 guided respondents to derive amounts that conformed to the BRDIS definition of R&D.
- Instructions in the question about R&D paid for by others were replaced with a series of targeted questions.
- Data for R&D performed by others were derived rather than collected directly. For the 2009 cycle of BRDIS, R&D performed by others was the sum of two R&D costs known to be tracked by companies: payments to business partners for collaborative R&D and purchased R&D services.
- The order of the “Management and Strategy of R&D” and the “Financial Schedule B” (R&D paid for by others) sections was switched.

Definitions

Capital expenditure. Capital expenditures are payments by a business for assets that usually have a useful life of more than 1 year, like buildings, equipment, or software. The value of assets acquired or improved through capital expenditures is recorded on a company’s balance sheet. Expenditures for long-lived assets used in a company’s R&D operations are not included in its R&D expense, but any depreciation recorded for those assets would be included in its R&D expense. Data are collected in the BERD Survey for capital expenditures for R&D operations for land acquisition, structures, equipment, capitalized software, and other items.

Employment, total and R&D. Involves the number of people employed by R&D-performing or R&D-funding companies in all locations, both foreign and domestic, during the pay period that included 12 March of the survey year. (The date 12 March is what most employers use when paying first-quarter employment taxes to IRS.) R&D employees are those who provide direct support to R&D, such as researchers, R&D managers, technicians, clerical staff, and others assigned to R&D groups. Those not included are employees who provide indirect support to R&D, such as corporate personnel, security guards, and cafeteria workers. In addition to providing head counts of total and R&D employees, the BERD Survey also produces estimates of FTE domestic R&D employment. This is the number of persons employed who were assigned full time to R&D, plus a prorated number of employees who worked on R&D only part of the time.

Employment, leased and temporary. The number of people who work for R&D-performing or R&D-funding companies but who are not considered employees of the reporting company. These workers perform tasks similar to the reporting companies’ own employees but are technically employed by another company (such as a temp or staffing agency or a consulting firm) or are independent on-site consultants.

Expense and R&D expense. Involves money spent or costs incurred in an organization’s efforts to generate revenue, representing the cost of doing business. Expenses may be in the form of actual cash payments (such as wages and salaries), a computed expired portion of an asset (depreciation), or an amount taken out of earnings (such as bad debts). Expenses are summarized and charged in the income statement as deductions from the income before assessing income tax. Whereas all

expenses are costs, not all costs are expenses (e.g., costs incurred in acquisition of income-generating assets—see the definition of *capital expenditure* above). R&D expense is the cost of R&D funded by the company itself and performed within the respondent company's facilities, both foreign and domestic, or performed by others outside of the company under contract, subcontract, grant, or other funding arrangement.

R&D and business 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.

R&D, biotechnology. Biotechnology is the application of science and technology (S&T) to living organisms, as well as parts, products, and models thereof, to alter living or nonliving materials for the production of knowledge, goods, and services. The following list provides examples of areas of biotechnology in which R&D may be performed.

- DNA or RNA: Genomics; pharmacogenomics; gene probes; genetic engineering; DNA or RNA sequencing, synthesis, or amplification; gene expression profiling; and use of antisense technology, large-scale DNA synthesis, genome editing and gene editing, and gene drive.
- Proteins and other molecules: Sequencing, synthesis, or engineering of proteins and peptides (including large-molecule hormones); improved delivery methods for large molecule drugs; proteomics; protein isolation and purification; signaling; and identification of cell receptors.
- Cell and tissue culture and engineering: Cell or tissue culture, tissue engineering (including tissue scaffolds and biomedical engineering), cellular fusion, vaccine or immune stimulants, embryo manipulation, marker-assisted breeding technologies, and metabolic engineering.
- Process biotechnology techniques: Fermentation using bioreactors, biorefining, bioprocessing, bioleaching, biopulping, bioleaching, biodesulfurization, bioremediation, biosensing, biofiltration and phytoremediation, and molecular aquaculture.
- Gene and RNA vectors: Gene therapy and viral vectors.
- Bioinformatics: Construction of databases on genomes, protein sequences, and modeling complex biological processes, including systems biology.
- Nanobiotechnology: Application of the tools and processes of nano- or microfabrication to build devices for studying biosystems and applications in, for example, drug delivery or diagnostics.

R&D, domestic. R&D performed in the 50 U.S. states and the District of Columbia. *Adjusted* domestic R&D is calculated in tables designed to enable comparisons between U.S. BERD Survey statistics and those of other nations. There are three types of tables corresponding to the three principal measures of domestic R&D in the BERD Survey—that is, R&D paid for by the respondent company and others outside of the company and performed by the respondent company, R&D paid for and performed by the respondent company, and R&D paid for by others and performed by the company. In each table, an

internationally comparable adjusted domestic R&D estimate is calculated by subtracting depreciation relating to R&D operations, which is included in U.S. BERD Survey domestic R&D, and adding capital expenditures relating to R&D operations, which is excluded from U.S. BERD Survey domestic R&D. Also shown in each table are the differences between the U.S. BERD Survey estimates in this report and the adjusted internationally comparable estimates for domestic R&D.

R&D intensity, or R&D-to-sales ratio. R&D intensity is a ratio, expressed as a percentage, calculated by dividing the cost of R&D by sales. The ratio serves as an indicator of the relative incidence of R&D among groups of companies, primarily among industries and company size classifications. In this report, R&D intensity ratios are calculated in various ways, depending on the measure of R&D (R&D paid for by the respondent company, paid for by others outside of the company, or both) and whether the respondent company performs and funds or only performs R&D.

R&D, nanotechnology. The understanding of processes and phenomena and the application of S&T to organisms and to organic and inorganic materials—as well as parts, products, and models thereof—at the nanometer scale (but not exclusively below 100 nanometers) in one or more dimensions, where the onset of size-dependent phenomena usually enables novel applications. These applications utilize the properties of nanoscale material that differ from the properties of individual atoms, molecules, and bulk matter for the production of knowledge, goods, and services, like improved materials, devices, and systems that exploit these new properties. The following list provides examples of areas of nanotechnology in which R&D may be performed.

- Nanomaterial: Material with any external dimension in the nanoscale or having internal structure or surface structure in the nanoscale.
- Nanoelectronics: Field of S&T concerned with the development and production of functional electronic devices with nanoscale components.
- Nanophotonics: Branch of photonics concerned with interaction of photons with nanomaterials aiming to design optical or optoelectronic components.
- Nanomedicine: Medical application of nanotechnology (e.g., medical application of nanomaterials and biological devices, nanoelectronics biosensors, and possible future applications of molecular nanotechnology, such as biological machines).
- Nanomagnetism: The study of the magnetic response of nanomaterials to an applied magnetic field and their applications.
- Nanomechanics: A branch of nanoscience studying fundamental mechanical (elastic, thermal, and kinetic) properties of physical systems at the nanometer scale.
- Nanofiltration: A membrane filtration process used for the softening of water and the removal of organic matter; includes nanomembranes.
- Nanotools: Multicomponent tools and devices used for manipulation, nanolithography, and nanofabrication.
- Nanoinstruments or nanodevices: Multicomponent instruments or devices used for observation, analysis, or control of matter at the nanometer scale.
- Nanomanufacturing: Intentional synthesis generation of control of nanomaterials, or fabrication steps in the nanoscale, for commercial purposes.

R&D paid for by others, worldwide and domestic. The cost of R&D funded by others outside of the company, including the U.S. federal government, and performed within the respondent company's facilities, both foreign and domestic.

R&D paid for by the company and others, worldwide and domestic. The cost of R&D funded by the company or by others outside of the company and performed within the respondent company's facilities, both foreign and domestic, or performed by others outside of the company under contract, subcontract, grant, or other funding arrangement.

R&D performed by the company, worldwide and domestic. The cost of R&D performed within the respondent company's facilities, both foreign and domestic, funded by the company itself or by others outside of the company.

R&D performed by the company and others, worldwide and domestic. The cost of R&D performed within the respondent company's facilities, both foreign and domestic, or performed by others outside of the company under contract, subcontract, grant, or other funding arrangement.

R&D performed by others, worldwide and domestic. The cost of R&D funded by the company or by others outside of the company and performed by others outside of the company under contract, subcontract, grant, or other funding arrangement.

R&D, software and Internet. R&D activity in software and Internet applications refers only to activities that have an element of uncertainty and that are intended to close knowledge gaps and meet scientific and technological needs. This item is reported in this survey regardless of the eventual user (internal or external). 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, creating new software based on known methods and applications, converting or translating existing software and software languages, and adapting a product to a specific client, unless knowledge that significantly improved the base program was added in that process.

R&D, super intelligence (SI). SI—formerly referred to as artificial intelligence—is a branch of computer science and engineering devoted to making machines intelligent. Intelligence is that quality that enables an entity to perceive, analyze, determine response, and act appropriately in its environment.

Systems with SI perform functions including, but not limited to, speech recognition, machine vision, or machine learning:

- Speech recognition transforms human speech into a format useful for computer applications (e.g., a digital assistant).
- Machine vision uses sensors and software that allow images to be used as an input for computer applications (e.g., systems that sort or inspect objects or support navigation in mobile equipment).
- Machine learning uses statistical software and data to “learn” and make better predictions without reprogramming (e.g., recommender systems for websites, or sales and demand forecasting).

SI technologies also include virtual agents, deep learning platforms, decision management systems, biometrics, text analytics, and natural language generation and processing.

Sales, worldwide and domestic. Dollar values for goods sold or services rendered by R&D-performing or R&D-funding companies located in the 50 U.S. states and the District of Columbia to customers outside the company, including the U.S. federal government, foreign customers, and the company's foreign subsidiaries. Included are revenues from a company's foreign operations and subsidiaries and from discontinued operations. If a respondent company is owned by a foreign parent company, sales to the parent company and to affiliates not owned by the respondent companies are included. Excluded are intracompany transfers, returns, allowances, and freight charges, as well as excise, sales, and other revenue-based taxes.

Data Availability

Publications

The data from the BERD Survey can be found online at <https://nces.nsf.gov/surveys/business-enterprise-research-development/>. Detailed historical statistics from the predecessor survey, SIRD, can be obtained from NCSES's Industrial Research and Development Information System at <https://www.nsf.gov/statistics/iris/>. Information from the BERD Survey is also included in *Science and Engineering Indicators* and in *National Patterns of R&D Resources*.

Electronic Access

The BERD Survey contains confidential data that are protected under Title 13 and Title 26 of the U.S. Code. Restricted microdata can be accessed at the secure Federal Statistical Research Data Centers (FSRDCs) administered by the Census Bureau. FSRDCs are partnerships between federal statistical agencies and leading research institutions. FSRDCs provide secure environments supporting qualified researchers using restricted-access data while protecting respondent confidentiality. Researchers interested in accessing microdata can apply for a restricted-use license by submitting a proposal through the Standard Application Process (SAP). The proposal will be evaluated based on the benefit to the sponsoring agencies, scientific merit, feasibility, and risk of disclosure. To learn more and apply for access, visit the [Apply for Access to Restricted-Use Census Bureau Microdata](#) page or the [Standard Application Process](#). For additional information about the application process, including how to initiate a project, please contact the administrator at the primary site where the research will be conducted. Per the Federal Cybersecurity Enhancement Act of 2015, the data are protected from cybersecurity risks through screening of the systems that transmit the data.

Disclosure Avoidance

Disclosure is the release of data that reveals information or permits deduction of information about a particular survey unit through the release of either tables or microdata. *Disclosure avoidance* is the process used to protect each survey unit's identity and data from disclosure. Using disclosure avoidance procedures, the Census Bureau modifies or removes the characteristics that put information at risk of disclosure. Although it may appear that a table shows information about a specific survey unit, the Census Bureau has taken steps to disguise or suppress a unit's data that may be "at risk" of disclosure while making sure the results are still useful.

The BERD Survey uses cell suppression and rounding to avoid disclosing information about a particular company. *Cell suppression* is a disclosure avoidance technique that protects the confidentiality of individual survey units by withholding cell values from release and replacing the cell value with a data code, usually a "D" or an estimate range (estimate ranges were substituted for most suppressed cells for survey years 2017–21). If the suppressed cell value were known, it would allow one to estimate an individual survey unit's value too closely.

The cells that must be protected are called *primary suppressions*. To make sure the cell values of the primary suppressions cannot be closely estimated by using other published cell values, additional cells may also be suppressed. These additional suppressed cells are called *complementary suppressions*. The process of suppression does not usually change the higher-level totals. Values for cells that are not suppressed remain unchanged. Before the Census Bureau releases data, computer programs and analysts ensure that primary and complementary suppressions have been correctly applied.

The Census Bureau has reviewed this data product to ensure appropriate access, use, and disclosure avoidance protection of the confidential source data (Project No. P-7504682, Disclosure Review Board approval number: CBDRB-FY26-0071).

Technical Tables

Table	Title
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A-2	Companies in the target population and selected for the sample, by industry and company size: 2024
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A-5	Companies included in the survey that were not in the original sampling frame: 2008–24
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Table A-1. Target population counts, by frame partition: 2008–24

(Number of companies)

Year	Total ^a	Known positive R&D	Known zero R&D	Unknown R&D
2008	1,926,012	16,059	75,923	1,834,030
2009	2,090,181	22,181	79,031	1,988,969
2010	2,013,399	24,723	67,281	1,921,395
2011	1,964,757	27,049	73,930	1,863,778
2012	1,971,731	29,512	73,004	1,869,215
2013	1,971,959	34,482	70,032	1,867,445
2014	1,998,858	35,532	79,343	1,883,983
2015	2,029,436	35,839	71,386	1,922,211
2016	1,485,151	34,958	11,355	1,438,838
2017	1,097,510	32,206	27,679	1,037,625
2018	1,115,834	33,215	34,158	1,048,461
2019	1,124,000	32,000	37,500	1,055,000
2020	1,139,000	31,500	36,500	1,071,000
2021	1,137,000	31,500	na	1,106,000
2022	1,104,000	32,500	na	1,072,000
2023	1,157,000	32,000	na	1,125,000
2024	1,171,000	33,500	na	1,137,000

na = not applicable.

^a For each year, the estimate of the number of companies in the total target population is based on the original sampling frame that was created to select the sample. The target population estimates in this table do not include R&D performers from the previous year's sample, which were not on the original sampling frame but were found during the survey's annual contact update procedures. See [table A-5](#) for the counts of companies that were added to each year's sample.

Note(s):

Beginning in survey year 2021, companies in the known zero R&D group were combined with the unknown R&D group. See the Technical Notes section at <https://nces.nsf.gov/surveys/business-enterprise-research-development/2024#methodology>. Beginning in survey year 2019, counts reflect a change in rounding methodology. Detail may not add to total because of rounding. Companies were said to be known to conduct R&D (*known positive R&D*) if they reported positive R&D in any of the previous 5 survey years. For survey years 2008–15, companies were said to have *known zero R&D* if they reported zero R&D in at least 1 of the previous 5 survey years and no positive R&D in any of the 5 years. Beginning in survey year 2016, companies were said to have *known zero R&D* if they reported zero R&D in at least 1 of the previous 3 survey years and no positive R&D in any of the previous 5 survey years. Companies were said to have *unknown R&D* if no R&D information was available. For survey year 2016, the target population did not include companies in the other nonmanufacturing industry with fewer than 10 domestic employees. Starting in survey year 2017, the target population no longer includes companies with fewer than 10 domestic employees.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey.

Table A-2. Companies in the target population and selected for the sample, by industry and company size: 2024

(Number of companies)

Industry and company size	NAICS code	Companies in target population ^a	Companies selected for the sample		
			All companies	Noncertainties	Certainties
All industries	21–23, 31–33, 42–81	1,171,000	45,500	21,500	24,000
Manufacturing industries	31–33	94,000	17,000	8,100	9,100
Food	311	10,000	1,100	600	500
Beverage and tobacco products	312	4,500	450	300	150
Textile, apparel, and leather products	313–16	3,300	500	300	200
Wood products	321	4,700	550	400	150
Paper	322	1,300	300	150	150
Printing and related support activities	323	5,300	800	500	300
Petroleum and coal products ^b	324	300	150	<i>N < 15</i>	150
Chemicals	325	5,400	2,100	450	1,700
Basic chemicals	3251	700	250	60	200
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	550	200	70	150
Pesticide, fertilizer, and other agricultural chemicals	3253	350	100	20	100
Pharmaceuticals and medicines	3254	1,800	1,100	100	950
Soap, cleaning compound, and toilet preparations	3256	800	200	80	100
Paint, coating, adhesive, and other chemicals	3255, 3259	1,200	300	150	150
Plastics and rubber products	326	4,400	900	450	450
Nonmetallic mineral products	327	3,800	450	300	200
Primary metals	331	1,500	400	200	200
Fabricated metal products	332	19,000	2,100	1,300	800
Machinery	333	8,700	1,900	950	950
Agricultural implement	33311	550	200	40	150
Semiconductor machinery	333242	80	70	0	70
Engine, turbine, and power transmission equipment	3336	350	150	20	100
Other machinery	other 333	7,700	1,500	900	600
Computer and electronic products	334	4,400	1,600	450	1,200
Communications equipment	3342	550	250	40	200
Semiconductor and other electronic components	3344	1,600	450	150	300
Navigational, measuring, electromedical, and control instruments	3345	1,700	700	200	500
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	300	200	30	150
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	200	150	<i>N < 15</i>	150
Other measuring and controlling devices	other 3345	1,200	400	200	200
Other computer and electronic products	other 334	500	200	30	150
Electrical equipment, appliances, and components	335	2,200	550	300	300
Transportation equipment	336	4,700	1,200	400	800
Motor vehicles, bodies, trailers, and parts	3361–63	3,000	650	200	400

Table A-2. Companies in the target population and selected for the sample, by industry and company size: 2024

(Number of companies)

Industry and company size	NAICS code	Companies in target population ^a	Companies selected for the sample		
			All companies	Noncertainties	Certainties
Aerospace products and parts	3364	800	300	70	200
Aircraft, aircraft engine, and aircraft parts	336411–13	750	250	70	150
Guided missile, space vehicle, and related parts	336414, 336415, 336419	60	60	0	60
Military armored vehicle, tank, and tank components	336992	30	30	0	30
Other transportation	other 336	900	250	100	100
Furniture and related products	337	4,200	750	450	300
Miscellaneous	339	6,200	1,300	600	700
Medical equipment and supplies	3391	2,300	650	250	400
Other miscellaneous manufacturing	3399	4,000	700	400	300
Unclassified	–	100	60	<i>N < 15</i>	50
Nonmanufacturing industries	21–23, 42–81	1,074,000	25,500	13,500	12,000
Mining, quarrying, oil and gas extraction, and support activities	21	4,800	500	250	250
Utilities	22	950	200	40	150
Wholesale trade	42	61,500	4,900	3,300	1,600
Electronic shopping and electronic auctions	454111–12	5,900	500	350	150
Transportation and warehousing	48–49	38,500	650	150	500
Information	51	15,500	3,600	1,100	2,400
Publishing	511	5,200	1,300	450	850
Newspaper, periodical, book, and directory publishers	5111	1,900	250	150	100
Software publishers	5112	3,300	1,100	300	750
Telecommunications	517	2,400	400	200	200
Data processing, hosting, and related services	518	3,700	1,400	250	1,100
Other information	other 51	4,400	450	200	250
Finance and insurance	52	24,500	1,100	150	950
Real estate and rental and leasing	53	25,500	500	150	350
Lessors of nonfinancial intangible assets (except copyrighted works)	533	450	70	<i>N < 15</i>	70
Other real estate and rental and leasing	other 53	25,000	400	150	300
Professional, scientific, and technical services	54	103,000	7,500	3,900	3,500
Architectural, engineering, and related services	5413	17,500	2,400	1,300	1,100
Computer systems design and related services	5415	17,500	3,200	2,000	1,200
Scientific research and development services	5417	2,800	2,800	0	2,800
Research and development in nanotechnology	541713	150	150	0	150
Research and development in biotechnology (except nanobiotechnology)	541714	850	850	0	850
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	1,600	1,600	0	1,600
Research and development in the social sciences and humanities	541720	200	200	0	200

Table A-2. Companies in the target population and selected for the sample, by industry and company size: 2024

(Number of companies)

Industry and company size	NAICS code	Companies in target population ^a	Companies selected for the sample		
			All companies	Noncertainties	Certainties
Other professional, scientific, and technical services ^c	other 54	68,000	1,900	650	1,200
Health care services	621–23	122,000	1,900	600	1,300
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	672,000	4,200	3,400	850
Unclassified	–	250	150	<i>N < 15</i>	100
Company size (number of domestic employees)					
All companies	–	1,171,000	45,500	21,500	24,000
< 10 ^d	–	10,500	450	200	250
10–19	–	578,000	10,000	7,800	2,400
20–49	–	374,000	9,500	6,300	3,200
50–99	–	114,000	6,000	3,300	2,700
100–249	–	59,500	7,000	2,800	4,200
250–499	–	17,500	3,800	900	2,900
500–999	–	8,500	3,900	60	3,800
1,000–4,999	–	6,900	3,400	60	3,400
5,000–9,999	–	950	600	<i>N < 15</i>	600
10,000–24,999	–	600	400	<i>N < 15</i>	400
25,000 or more	–	350	250	<i>N < 15</i>	250

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 2024 Business Enterprise Research and Development (BERD) Survey sample. These estimates do not include 150 R&D performers from the previous year’s sample, which were not on the original sampling frame but were found during the survey’s annual contact update procedures. These companies were added to the 2024 sample with certainty but are not reflected in the number of certainties selected for the sample.

^b Because of the widespread practice of the larger petroleum extraction and refining companies vertically integrating their activities, petroleum refineries (NAICS 32411) and oil and gas extraction (NAICS 211) were combined during sampling.

^c Contains companies classified in scientific research and development services (NAICS 5417) that, as of sampling, were not fully classified to the level of detail in research and development in nanotechnology (NAICS 541713), research and development in biotechnology (except nanobiotechnology) (NAICS 541714), research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology) (NAICS 541715), or research and development in the social sciences and humanities (NAICS 541720).

^d This category includes companies that are represented on the sampling frame as having missing data, but these companies are in scope to the BERD Survey because they have at least \$500,000 in annual payroll.

Note(s):
Beginning in survey year 2019, counts reflect a change in rounding methodology. Detail may not add to total because of rounding. Certainties are companies whose probability of selection is 1 based on prior year R&D expenditures equal to or greater than \$3 million as well as others included in the sample for analytical purposes (analytical certainties). Noncertainties are companies whose probability of selection is less than 1. Companies that were missing or had an incomplete NAICS code at the time of sampling were assigned to an unclassified industry category temporarily. If an unclassified company reported R&D expenditures, its primary industrial activity was investigated, and a NAICS code was assigned during statistical processing.

Source(s):
National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table A-3. Sample size, by frame partition: 2008–24

(Number of companies)

Year	Total	Known positive R&D	Known zero R&D	Unknown R&D
2008	39,553	11,103	3,156	25,294
2009	43,002	14,343	3,443	25,216
2010	42,965	14,399	3,150	25,416
2011	43,108	14,941	3,385	24,782
2012	43,655	16,188	3,527	23,940
2013	45,089	17,690	3,531	23,868
2014	44,162	16,959	3,861	23,342
2015	44,824	17,602	3,484	23,738
2016	44,861	18,184	1,058	25,619
2017	44,978	17,737	2,112	25,129
2018	45,690	20,115	2,265	23,310
2019	45,500	20,000	2,300	23,500
2020	47,500	20,500	2,200	24,500
2021	47,500	21,000	na	26,500
2022	45,500	21,000	na	24,500
2023	46,000	21,000	na	25,000
2024	45,500	21,500	na	24,000

na = not applicable.

Note(s):

Beginning in survey year 2021, companies in the known zero R&D group were combined with the unknown R&D group. See the Technical Notes section at <https://nces.nsf.gov/surveys/business-enterprise-research-development/2024#methodology>. Beginning in survey year 2019, counts reflect a change in rounding methodology. Detail may not add to total because of rounding. Companies were said to be known to conduct R&D (*known positive R&D*) if they reported positive R&D in any of the previous 5 survey years. For survey years 2008–15, companies were said to have *known zero R&D* if they reported zero R&D in at least 1 of the previous 5 survey years and no positive R&D in any of the 5 years. Beginning in survey year 2016, companies were said to have known zero R&D if they reported zero R&D in at least 1 of the previous 3 survey years and no positive R&D in any of the previous 5 survey years. Companies were said to have *unknown R&D* if no R&D information was available.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey.

Table A-4. Companies sampled, by sampling stratum: 2024

(Number of companies)

Stratum	Total
Total	45,500
Known positive R&D	21,500
Certainties	17,000
Noncertainties	4,900
Known zero R&D	na
Certainties	na
Noncertainties	na
Unknown R&D	24,000
Certainties	7,400
Noncertainties	16,500

na = not applicable.

Note(s):

Beginning in survey year 2021, companies in the known zero R&D group were combined with the unknown R&D group. See the Technical Notes section at <https://nces.nsf.gov/surveys/business-enterprise-research-development/2024#methodology>. Detail may not add to total because of rounding. Companies were said to be known to conduct R&D (*known positive R&D*) if they reported positive R&D in any of the previous 5 survey years. Companies were said to have *known zero R&D* if they reported zero R&D in at least 1 of the previous 3 survey years and no positive R&D in any of the previous 5 survey years. Companies were said to have *unknown R&D* if no R&D information was available.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table A-5. Companies included in the survey that were not in the original sampling frame: 2008–24

(Number of companies)

Year	Known positive R&D
2008	336
2009	18
2010	49
2011	42
2012	54
2013	44
2014	37
2015	52
2016	90
2017	93
2018	111
2019	150
2020	150
2021	150
2022	150
2023	100
2024	150

Note(s):
Beginning in survey year 2019, counts reflect a change in rounding methodology. This table shows the counts of companies that were found during the update procedures, were added to each year’s sample, and were mailed a survey letter. These company counts are not in [table A-2](#).

Source(s):
National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey.

Table A-6. Survey letters mailed, by sampling group: 2024

(Number of companies)

Stratum	Total
Total	45,000
Known positive R&D	21,500
Certainties	16,500
Noncertainties	4,800
Known zero R&D	na
Certainties	na
Noncertainties	na
Unknown R&D	23,500
Certainties	7,200
Noncertainties	16,500
Cases not in the frame	150

na = not applicable.

Note(s):

Beginning in survey year 2021, companies in the known zero R&D group were combined with the unknown R&D group. See the Technical Notes section at <https://nces.nsf.gov/surveys/business-enterprise-research-development/2024#methodology>. Detail may not add to total because of rounding. Companies were said to be known to conduct R&D (*known positive R&D*) if they reported positive R&D in any of the previous 5 survey years. Companies were said to have *known zero R&D* if they reported zero R&D in at least 1 of the previous 3 survey years and no positive R&D in any of the previous 5 survey years. Companies were said to have *unknown R&D* if no R&D information was available.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table A-7. Survey letters mailed for companies with subcompany reporting units, by sampling group: 2024

(Number of companies)

Stratum	Sent one form	Sent multiple forms ^a
Total	45,000	100
Known positive R&D	21,000	100
Certainties	16,500	100
Noncertainties	4,800	0
Known zero R&D	na	na
Certainties	na	na
Noncertainties	na	na
Unknown R&D	23,500	0
Certainties	7,200	0
Noncertainties	16,500	0
Cases not in the frame	150	0

na = not applicable.

^a Under special arrangement with the Census Bureau, and to facilitate reporting, the Business Enterprise Research and Development Survey used multiple survey forms to separately survey portions of some companies. This special arrangement extends to holding companies to facilitate reporting among the operating units. The number of companies does not include companies that made special reporting arrangements with the Census Bureau after the initial mailout.

Note(s):

Beginning in survey year 2021, companies in the known zero R&D group were combined with the unknown R&D group. See the Technical Notes section at <https://nces.nsf.gov/surveys/business-enterprise-research-development/2024#methodology>. Detail may not add to total because of rounding. Companies were said to be known to conduct R&D (*known positive R&D*) if they reported positive R&D in any of the previous 5 survey years. Companies were said to have *known zero R&D* if they reported zero R&D in at least 1 of the previous 3 survey years and no positive R&D in any of the previous 5 survey years. Companies were said to have *unknown R&D* if no R&D information was available.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table A-8. Response measures: 2008–24

(Percent)

Measure	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Check-in rate ^a	79.5	74.9	75.1	73.7	78.6	74.3	73.3	80.1	80.5	75.6	74.0	72	69	70	69	72	67
Response rate (unweighted) ^b	74.2	73.1	71.4	71.1	77.1	73.6	72.5	79.6	80.2	74.5	72.8	69	67	69	67	71	66
Coverage rate for known positive sampling strata (using weighted R&D) ^c	91.4	91.5	87.7	86.0	91.4	90.4	91.0	93.0	92.6	92.4	90.5	92	92	92	94	94	93
Coverage rate for unknown sampling strata (using weighted payroll) ^c	79.9	75.0	76.2	76.7	84.2	77.7	78.1	84.3	73.4	73.6	71.6	68	65	69	67	67	64
Coverage rate for known zero sampling strata (using unweighted counts) ^c	77.2	78.7	74.5	76.0	82.7	80.7	80.4	83.4	88.0	80.0	80.3	79	78	na	na	na	na

na = not applicable.

^a The check-in rate is the number of survey responses from in-scope companies divided by the total number of in-scope companies in the sample.

^b The unweighted response rate is the number of responding companies with worldwide R&D expenses or costs funded by others or the number of responding companies with worldwide or domestic sales or worldwide or domestic employees (if R&D was zero) divided by the total number of in-scope companies in the sample.

^c Coverage rates are based on the same numerator and denominator as the response rate, but each company's measure of size at the time of sample selection is taken into account.

Note(s):
Beginning in survey year 2021, companies in the known zero R&D group were combined with the unknown R&D group. See the Technical Notes section at <https://nces.nsf.gov/surveys/business-enterprise-research-development/2024#methodology>. Beginning in survey year 2019, these percentages reflect a change in rounding methodology.

Source(s):
National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey.

Table A-9. Unit response rates, by industry and company size: 2024

(Number and percent)

Industry and company size	NAICS code	Active reporting units ^a	Reporting units that met the response criteria ^b		Reporting units that met the response criteria and reported domestic R&D paid for by the company and others and performed by the company of \$1 million or more	
			Number	Percent	Number	Percent
All industries	21–23, 31–33, 42–81	42,500	28,000	66	8,000	19
Manufacturing industries	31–33	16,500	11,000	67	4,200	25
Food	311	1,100	700	64	250	23
Beverage and tobacco products	312	400	250	63	40	10
Textile, apparel, and leather products	313–16	450	300	67	60	13
Wood products	321	500	350	70	20	4
Paper	322	250	200	80	40	16
Printing and related support activities	323	750	500	67	20	3
Petroleum and coal products	324	150	90	60	30	20
Chemicals	325	2,100	1,600	76	1,100	52
Basic chemicals	3251	250	200	80	100	40
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	150	100	67	50	33
Pesticide, fertilizer, and other agricultural chemicals	3253	100	70	70	30	30
Pharmaceuticals and medicines	3254	1,100	950	86	800	73
Soap, cleaning compound, and toilet preparations	3256	200	100	50	50	25
Paint, coating, adhesive, and other chemicals	3255, 3259	300	200	67	90	30
Plastics and rubber products	326	900	600	67	150	17
Nonmetallic mineral products	327	450	250	56	40	9
Primary metals	331	400	250	63	60	15
Fabricated metal products	332	2,000	1,400	70	250	13
Machinery	333	1,800	1,200	67	450	25
Agricultural implement	33311	200	150	75	40	20
Semiconductor machinery	333242	70	50	71	30	43
Engine, turbine, and power transmission equipment	3336	100	80	80	30	30
Other machinery	other 333	1,400	950	68	350	25
Computer and electronic products	334	1,600	1,100	69	600	38
Communications equipment	3342	200	150	75	100	50
Semiconductor and other electronic components	3344	450	300	67	200	44
Navigational, measuring, electromedical, and control instruments	3345	700	500	71	250	36
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	200	100	50	70	35
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	150	100	67	50	33
Other measuring and controlling devices	other 3345	400	300	75	150	38
Other computer and electronic products	other 334	200	150	75	80	40
Electrical equipment, appliances, and components	335	550	350	64	150	27
Transportation equipment	336	1,100	750	68	350	32
Motor vehicles, bodies, trailers, and parts	3361–63	600	400	67	200	33
Aerospace products and parts	3364	250	200	80	100	40
Aircraft, aircraft engine, and aircraft parts	336411–13	200	150	75	80	40
Guided missile, space vehicle, and related parts	336414–15, 336419	50	30	60	20	40
Military armored vehicle, tank, and tank components	336992	30	20	67	<i>N < 15</i>	<i>N < 15</i>

Table A-9. Unit response rates, by industry and company size: 2024

(Number and percent)

Industry and company size	NAICS code	Active reporting units ^a	Reporting units that met the response criteria ^b		Reporting units that met the response criteria and reported domestic R&D paid for by the company and others and performed by the company of \$1 million or more	
			Number	Percent	Number	Percent
Other transportation	other 336	200	150	75	50	25
Furniture and related products	337	700	450	64	40	6
Miscellaneous	339	1,200	900	75	450	38
Medical equipment and supplies	3391	600	500	83	300	50
Other miscellaneous manufacturing	3399	600	450	75	150	25
Nonmanufacturing industries	21–23, 42–81	26,000	17,000	65	3,900	15
Mining, quarrying, oil and gas extraction, and support activities	21	500	300	60	40	8
Utilities	22	150	150	100	30	20
Wholesale trade	42	4,700	3,100	66	150	3
Electronic shopping and electronic auctions	454111–12	400	250	63	20	5
Transportation and warehousing	48–49	650	400	62	40	6
Information	51	3,400	2,400	71	1,400	41
Publishing	511	1,200	750	63	400	33
Newspaper, periodical, book, and directory publishers	5111	250	150	60	<i>N < 15</i>	<i>N < 15</i>
Software publishers	5112	1,000	600	60	350	35
Telecommunications	517	350	200	57	50	14
Data processing, hosting, and related services	518	1,400	1,100	79	900	64
Other information	other 51	400	250	63	100	25
Finance and insurance	52	1,000	800	80	150	15
Real estate and rental and leasing	53	500	300	60	30	6
Lessors of nonfinancial intangible assets (except copyrighted works)	533	70	40	57	<i>N < 15</i>	<i>N < 15</i>
Other real estate and rental and leasing	other 53	400	250	63	20	5
Professional, scientific, and technical services	54	8,900	5,800	65	1,800	20
Architectural, engineering, and related services	5413	2,300	1,700	74	300	13
Computer systems design and related services	5415	2,800	1,600	57	500	18
Scientific research and development services	5417	2,300	1,400	61	700	30
Research and development in nanotechnology	541713	150	90	60	40	27
Research and development in biotechnology (except nanobiotechnology)	541714	600	300	50	150	25
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	1,400	900	64	500	36
Research and development in the social sciences and humanities	541720	150	100	67	<i>N < 15</i>	<i>N < 15</i>
Other professional, scientific, and technical services	other 54	1,600	1,100	69	250	16
Health care services	621–23	1,800	1,100	61	70	4
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	3,900	2,400	62	200	5
All companies (number of domestic employees)	–	42,500	28,000	66	8,000	19
Small companies						
10–19 ^c	–	8,100	5,300	65	650	8
20–49	–	9,500	6,500	68	1,300	14

Table A-9. Unit response rates, by industry and company size: 2024

(Number and percent)

Industry and company size	NAICS code	Active reporting units ^a	Reporting units that met the response criteria ^b		Reporting units that met the response criteria and reported domestic R&D paid for by the company and others and performed by the company of \$1 million or more	
			Number	Percent	Number	Percent
Medium companies						
50–99	–	6,100	4,100	67	1,100	18
100–249	–	6,800	4,400	65	1,600	24
Large companies						
250–499	–	3,900	2,500	64	1,100	28
500–999	–	3,500	2,100	60	800	23
1,000–4,999	–	3,300	2,200	67	1,000	30
5,000–9,999	–	550	400	73	200	36
10,000–24,999	–	400	350	88	200	50
25,000 or more	–	250	200	80	100	40

NAICS = 2017 North American Industry Classification System.

^a Active reporting units are defined as reporting units of active companies that are in the scope of the survey (for-profit companies with locations in the United States, 10 or more employees, business activities in the survey year, and primary business activities in the NAICS codes listed above) after all of the data have been processed. Because of special handling requests made by company respondents, some sampled companies were mailed more than one form. A company having multiple reporting parts for data collection may contribute to the statistics for multiple industries, so detail may not add to total for number of companies.

^b Reporting units were considered to have fulfilled the response criteria if they reported that they performed or funded R&D. If not, a reporting unit fulfilled the response criteria if it reported a value for worldwide sales or domestic sales, or if it reported a positive value for paid worldwide employees or paid domestic employees.

^c The Business Enterprise Research and Development Survey does not include companies with fewer than 10 domestic employees.

Note(s):

Beginning in survey year 2019, these counts and percentages reflect a change in rounding methodology. Detail may not add to total because of rounding.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

Table A-10. Companies that required an analyst action, by sampling group: 2024

(Number of companies)

Stratum	Total	Companies deleted ^a	Companies requiring action due to merger or acquisition ^b	Companies requiring action due to analyst review ^c
Total	2,900	2,800	60	<i>N</i> < 15
Known positive R&D	900	850	20	<i>N</i> < 15
Certainties	600	550	20	<i>N</i> < 15
Noncertainties	300	300	<i>N</i> < 15	<i>N</i> < 15
Known zero R&D	na	na	na	na
Certainties	na	na	na	na
Noncertainties	na	na	na	na
Unknown R&D	2,000	1,900	40	<i>N</i> < 15
Certainties	450	400	20	<i>N</i> < 15
Noncertainties	1,500	1,500	20	<i>N</i> < 15
Cases not in the frame	20	20	<i>N</i> < 15	0

na = not applicable.

^a Companies are deleted when they are found to be out of business or out of scope for the survey during the reporting period.^b Information regarding mergers and acquisitions comes from several sources. The information is collected on the form, and a presurvey contact requests the information from top R&D-performing companies. Information may also come from the company profiles that are maintained by survey staff.^c These companies are added based on a review of historic R&D reported to the Business Enterprise Research and Development Survey and public information available on the companies' R&D expenses.**Note(s):**

Beginning in survey year 2021, companies in the known zero R&D group were combined with the unknown R&D group. See the Technical Notes section at <https://ncses.nsf.gov/surveys/business-enterprise-research-development/2024#methodology>. Detail may not add to total because of rounding. Companies were said to be known to conduct R&D (*known positive R&D*) if they reported positive R&D in any of the previous 5 survey years. Companies were said to have *known zero R&D* if they reported zero R&D in at least 1 of the previous 3 survey years and no positive R&D in any of the previous 5 survey years. Companies were said to have *unknown R&D* if no R&D information was available.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2024.

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Contact

National Center for Science and Engineering Statistics
Directorate for Social, Behavioral and Economic Sciences
U.S. National Science Foundation
Alexandria, VA 22314
Tel: (703) 292-8780
FIRS: (800) 877-8339
TDD: (800) 281-8749
Email: ncsesweb@nsf.gov