

TABLE 16

**Domestic R&D paid for by the company and others and performed by the company, by business activity: 2022**

(Millions of U.S. dollars)

Business activity <sup>a</sup>	Business code <sup>b</sup>	Total	Paid for by the company	Paid for by others
All business activities	21100–81000	691,547	608,058	83,489
Oil and gas extraction	21100	D	342	D
Mining	21200	138 i	138 i	0
Support activities for mining, including oil and gas	21300	786 i	729 i	57
Utilities	22100	D	D	D
Construction	23000	790	729	61 i
Food manufacturing	31100	6,525 i	6,168 i	357
Beverage manufacturing	31210	794	749	45 i
Tobacco manufacturing	31220	213	195	18
Textile, apparel, and leather products manufacturing	31990	D	573	D
Wood products manufacturing	32100	301	297	5
Paper manufacturing	32200	1,337	1,336	* i
Printing and related support activities	32300	337	336	1
Petroleum refineries	32401	432	429	3
Asphalt paving, roofing, and saturated materials manufacturing	32402	92	92	0
Other petroleum and coal products manufacturing, including motor oil, hydraulic fluid, and charcoal	32403	129	128	1
Basic chemicals manufacturing	32510	3,136	2,970	166
Resin, synthetic rubber, and artificial synthetic fibers and filaments manufacturing	32520	1,370	1,290	80 i
Pesticide, fertilizer, and other agricultural chemicals manufacturing	32530	D	1,257	D
Pharmaceutical, medicinal, botanical, and biological products (except diagnostic substances) manufacturing	32541	61,071	54,026	7,045
In vitro diagnostic substances manufacturing	32542	1,777	1,750	28
Biotechnology-based pharmaceutical and biological products (except diagnostic substances)	32543	51,697	47,881	3,816
Soap, cleaning compound, and toilet preparations manufacturing	32591	2,586	2,325	261
Paint, adhesive, and other chemical manufacturing	32592	1,384	1,342	42
Plastics and rubber products manufacturing	32600	3,515	3,354	161
Clay and glass products manufacturing	32710	1,382	1,373	8
Cement, concrete, lime, gypsum, and other nonmetallic mineral products manufacturing	32790	446	374	71 i
Primary metal manufacturing	33100	1,231	1,191	40
Fabricated metal products manufacturing	33200	4,020	3,570	449
Agricultural machinery and equipment manufacturing	33311	D	2,013	D
Construction machinery manufacturing	33312	1,249	1,230	19
Mining, oil, and gas field machinery and equipment manufacturing	33319	1,262	1,127	135
Semiconductor machinery manufacturing	33321	5,466	5,418	48
Industrial machinery manufacturing (except semiconductor machinery)	33322	1,503	1,237	266
Photographic and photocopying equipment manufacturing	33331	D	D	2
Commercial, service industry, temperature control, and air-flow control machinery manufacturing	33332	2,300	2,251	49
Digital cameras manufacturing	33333	194	194	0
Engine, turbine, and power transmission equipment manufacturing	33360	2,568	2,227	341
Metalworking and other general purpose machinery manufacturing	33390	2,767	2,637	129
Computers and peripheral equipment manufacturing and magnetic and optical media	33412	27,905	27,878	27
Telephone apparatus manufacturing, including routers, modems, and gateways	33421	D	7,802	D
Radio, television, and wireless communication equipment manufacturing	33422	3,453	2,560	893 i
Other communication equipment manufacturing (except radio, television, and wireless communication equipment)	33429	595	572	23
Audio and video equipment manufacturing	33430	1,713	1,705	8
Semiconductor and other electronic components manufacturing	33440	50,441	48,501	1,940

TABLE 16

**Domestic R&D paid for by the company and others and performed by the company, by business activity: 2022**

(Millions of U.S. dollars)

Business activity <sup>a</sup>	Business code <sup>b</sup>	Total	Paid for by the company	Paid for by others
Electromedical, electrotherapeutic, and irradiation apparatus manufacturing	33451	5,106	4,714	392
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments manufacturing	33452	5,584	2,854	2,730
Measuring and control instruments manufacturing (not listed elsewhere)	33459	4,182	4,102	80
Electrical equipment, appliances, and components manufacturing	33500	6,700	6,290	411 i
Motor vehicles manufacturing	33610	24,738	23,852	886
Motor vehicle body and trailer manufacturing	33620	162	162	0
Motor vehicle parts manufacturing	33630	7,687	6,565	1,122
Aircraft manufacturing	33641	17,879 i	5,389	12,490 i
Aircraft engine and engine parts manufacturing	33642	4,396	2,231	2,165
Other aircraft parts and auxiliary equipment manufacturing	33643	2,873	1,767	1,106
Guided missiles, space vehicles, and related parts manufacturing	33644	6,684	2,620	4,064
Railroad rolling stock manufacturing	33651	289	289	0
Ship and boat building	33660	960	279	681
Motorcycle, bicycle, and parts manufacturing	33691	454	431	24
Military armored vehicle, tank, and tank components manufacturing	33692	660	367 i	293
All other transportation equipment manufacturing	33699	397	385	13
Furniture and related products manufacturing	33700	432	430	2
Medical equipment and supplies manufacturing	33910	18,572	18,297	275
Miscellaneous manufacturing not listed elsewhere (games, office supplies, slot machines, etc.)	33990	3,261	3,069	192
Merchant wholesalers, durable goods	42300	1,145 i	1,115 i	30
Merchant wholesalers, nondurable goods	42400	662	645	17
Wholesale electronic markets and agents and brokers (business to business)	42500	168 r	166 r	2 r
Retail trade (except electronic shopping and electronic auctions)	44000	354	354	1 r
Electronic shopping and electronic auctions	45411	12,205 i	12,205 i	0
Transportation	48000	6,816 i	6,815 i	2
Couriers, messengers, and express delivery services	49200	1,671	1,671	0
Warehousing and storage	49300	D	D	D
Newspaper, periodical, book, and directory publishers (except Internet)	51110	94	93	1
Software publishers (except Internet)	51120	34,695	33,582	1,113
Motion picture and sound recording (except Internet)	51200	D	D	D
Broadcasting (except Internet)	51500	D	428 i	D
Wired telecommunications carriers	51710	624	615	9
Wireless telecommunications carriers (except satellite)	51720	2,582	2,517	65
Satellite telecommunications	51740	600	589	10
Other telecommunications (not listed elsewhere)	51790	315	267	48
Data processing, hosting, and related services	51800	11,506	11,481	25
Cloud computing applications and Internet-based software services	51801	51,438	51,079	359
Other information services, including Internet publishing, broadcasting, and Web search portals	51910	D	83,375	D
Finance: banking and credit intermediation	52200	10,424	10,379	45
Securities, commodity contracts, and other financial investments and related activities, including funds and trusts	52310	4,674	4,670	4
Insurance carriers and related activities	52400	1,948	1,948	0
Real estate	53100	785	785	0
Rental and leasing services	53200	1,644	1,644	*
Lessors of nonfinancial intangible assets, including patent licensing	53300	D	D	*
Legal, accounting, tax preparation, bookkeeping, and payroll services	54111	3,238	3,238	0
Architectural, engineering, and related services	54130	5,748	3,579	2,168

TABLE 16

**Domestic R&D paid for by the company and others and performed by the company, by business activity: 2022**

(Millions of U.S. dollars)

Business activity <sup>a</sup>	Business code <sup>b</sup>	Total	Paid for by the company	Paid for by others
Specialized design services	54140	122	D	D
Computer systems design and related services	54150	20,455	17,406	3,048
Management, scientific, and technical consulting services	54160	4,158	3,203	955
Research and development services in the social sciences and humanities	54172	699	27	673
Research and development services in biotechnology	54173	9,309	2,934	6,374 i
Research and development services in the physical, engineering, and life sciences (except biotechnology)	54174	27,923 i	5,311	22,612 i
Research and development services in nanotechnology	54175	293	182	111
Advertising and related services	54180	2,003 i	2,003 i	1
Professional, scientific, and technical services (not listed elsewhere)	54190	2,442	1,828	614
Management of companies and enterprises	55100	D	D	0
Administrative and support services	56100	4,195	4,180	15
Waste management and remediation services	56200	D	5	D
Offices of physicians	62110	D	132	D
Medical and diagnostic laboratories	62150	3,828	2,957	871
Other ambulatory health care services (ambulance, dental, home health care)	62199	317	317	0
Hospitals and nursing care facilities	62200	9	9	* i
Social assistance services	62400	7	7	0
Arts, entertainment, and recreation	71000	D	D	0
Accommodation and food services	72000	104	104	0
Other services (not listed elsewhere)	81000	6,960 i	6,854 i	105
Undistributed	-	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% .

<sup>a</sup> 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.

<sup>b</sup> Business codes and descriptions are based on 2017 North American Industry Classification System industry definitions.

**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.

**Source(s):**

National Center for Science and Engineering Statistics and Census Bureau, Business Enterprise Research and Development Survey, 2022.