

TABLE 54

**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: 2018**

(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	541,412	441,036	100,376	2,564	1,766	797	211	250	126
Manufacturing industries	31–33	338,953	274,075	64,878	1,432	981	450	237	279	144
Food	311	5,518	4,654	864	37	24	13	148	191	67
Beverage and tobacco products	312	1,629	1,113	516	9	6	2	186	177	210
Textile, apparel, and leather products	313–16	1,205	989	216	10	8	2	122	123	120
Wood products	321	206	203	3	3	3	*	77	78	40
Paper	322	1,014	934	80	7	6	2	137	163	48
Printing and related support activities	323	246	242	4	3	3	*	71	72	56
Petroleum and coal products	324	1,460 - 1,463	1,269	192 - 194	8	7	2	D	190	D
Chemicals	325	100,886	84,137	16,749	268	189	79	376	446	211
Basic chemicals	3251	3,046	2,443	603	18	13	5	168	192	113
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	2,427 - 2,445	1,653	774 - 792	13	7	5	D	222	D
Pesticide, fertilizer, and other agricultural chemicals	3253	1,788 - 1,797	1,460	328 - 337	10	8	2	D	183	D
Pharmaceuticals and medicines	3254	88,537	74,592	13,945	191	138	53	463	541	261
Soap, cleaning compound, and toilet preparation	3256	3,557	2,710	847	18	12	6	203	234	142
Paint, coating, adhesive, and other chemicals	3255, 3259	1,512 - 1,531	1,278	235 - 252	19	11	8	D	116	D
Plastics and rubber products	326	3,179	2,751	428	29	25	4	109	110	102
Nonmetallic mineral products	327	1,567	1,385	181	8	6	1	205	217	144
Primary metals	331	990	839	151	11	9	2	93	96	76
Fabricated metal products	332	2,544	2,327	216	30	28	2	85	82	127
Machinery	333	19,319	14,799	4,521	142	93	49	136	159	92
Agricultural implement	33311	2,730	1,872	858	20	12	9	135	161	100
Semiconductor machinery	333242	5,077	4,166	911	18	11	7	281	382	127
Engine, turbine, and power transmission equipment	3336	3,418 - 3,440	2,483	935 - 958	22	13	9	D	193	D
Other machinery	other 333	8,071 - 8,095	6,278	1,793 - 1,817	82	58	24	D	109	D
Computer and electronic products	334	112,020	83,697	28,322	463	277	186	242	303	152

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Communications equipment	3342	16,483	13,107	3,376	77	45	32	213	290	105
Semiconductor and other electronic components	3344	45,540	31,052	14,487	179	100	80	254	311	182
Navigational, measuring, electromedical, and control instruments	3345	20,898	16,727	4,172	108	73	35	193	230	118
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	4,378	3,208	1,169	22	15	7	197	214	162
Search, detection, navigation, guidance, aeronautical, and nautical system and instrument	334511	9,997	8,843	1,154	40	33	8	248	272	149
Other measuring and controlling device	other 3345	6,524	4,675	1,849	46	25	21	143	186	90
Other computer and electronic products	other 334	29,099	22,811	6,287	98	59	39	297	387	161
Electrical equipment, appliances, and components	335	6,180	4,487	1,693	45	24	21	137	184	82
Transportation equipment	336	60,075	52,629	7,446	258	197	61	233	267	123
Motor vehicles, bodies, trailers, and parts	3361-63	32,125	25,586	6,540	160	110	50	201	233	131
Aerospace products and parts	3364	24,977 - 25,002	24,291	686 - 711	84	75	8	D	323	D
Aircraft, aircraft engine, and aircraft parts	336411-13	23,654 - 23,679	22,968	685 - 710	76	68	8	D	340	D
Guided missile, space vehicle, and related parts	336414-15, 336419	1,323	1,323	1	8	8	*	172	173	19
Military armored vehicle, tank, and tank component	336992	11	11	0	*	*	0	160	160	NA
Other transportation	other 336	2,936 - 2,961	2,741	195 - 221	14	12	2	D	232	D
Furniture and related products	337	435	410	25	5	4	*	90	93	62
Miscellaneous	339	20,478 - 20,483	17,209	3,270 - 3,274	95	71	24	D	242	D
Medical equipment and supplies	3391	17,415	14,531	2,884	75	54	21	231	269	135
Other miscellaneous manufacturing	3399	3,063 - 3,068	2,678	386 - 390	20	17	3	D	156	D

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Nonmanufacturing industries	21-23, 42-81	202,460	166,961	35,498	1,132	785	347	179	213	102
Mining, quarrying, oil and gas extraction, and support activities	21	2,068	1,905	163	15	12	2	142	157	66
Utilities	22	283	275	8	2	2	*	140	147	58
Wholesale trade	42	938	906	32	12	12	1	78	78	64
Electronic shopping and electronic auctions	454111-12	11,715 - 15,516	11,652	63 - 3,864	71 - 99	52	19 - 47	D	223	D
Transportation and warehousing	48-49	956	942	14	6	6	*	147	156	31
Information	51	111,505	94,349	17,156	493	342	151	226	276	113
Publishing	511	39,965	32,770	7,195	184	115	68	217	284	105
Newspaper, periodical, book, and directory publishers	5111	150	131	19	1	1	*	118	120	108
Software publishers	5112	39,815	32,639	7,175	183	114	68	218	285	105
Telecommunications	517	3,827 - 3,833	3,696	131 - 138	23	22	1	D	170	D
Data processing, hosting, and related services	518	28,045	23,306	4,739	164	105	60	171	223	80
Other information	other 51	39,662 - 39,668	34,576	5,086 - 5,092	122	100	22	D	345	D
Finance and insurance	52	8,356	7,471	885	61	47	14	137	160	62
Real estate and rental and leasing	53	1,073	1,022	51	4	4	*	275	278	237
Lessors of nonfinancial intangible assets (except copyrighted works)	533	6	6	0	*	*	0	441	441	NA
Other real estate and rental and leasing	other 53	1,067	1,016	51	4	4	*	275	277	237
Professional, scientific, and technical services	54	58,168	44,860	13,307	405	271	134	144	165	99
Architectural, engineering, and related services	5413	4,017 - 4,027	3,961	56 - 66	52	51	1	D	78	D
Computer systems design and related services	5415	20,287	15,923	4,364	139	92	48	146	174	92
Scientific research and development services	5417	28,555 - 28,564	20,185	8,370 - 8,379	177	97	80	D	208	D
Research and development in biotechnology	541711	8,447	5,857	2,590	56	31	25	151	190	103

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Research and development in the physical, engineering, and life sciences (except biotechnology)	541712	19,435	13,657	5,778	116	61	54	168	223	106
Research and development in the social sciences and humanities	541720	672 - 683	671	1 - 12	5	5	*	D	133	D
Other professional, scientific, and technical services	other 54	5,298	4,791	507	38	32	6	140	152	82
Health care services	621-23	1,498	1,476	22	6	6	*	239	241	141
Other nonmanufacturing	23, 44-45 (excluding 454111-12), 55-56, 624, 71-72, 81	2,102 - 5,904	2,103	0 - 3,801	31 - 59	32	0 - 28	D	66	D
All companies (number of domestic employees)	-	541,412	441,036	100,376	2,564	1,766	797	211	250	126
Small companies										
10-19 <sup>a</sup>	-	4,518	4,390	128	27	25	2	169	176	71
20-49	-	11,821	11,252	569	75	68	7	157	164	81
Medium companies										
50-99	-	13,013	12,321	692	87	80	7	149	154	93
100-249	-	20,420	18,547	1,872	146	126	20	140	147	93
Large companies										
250-499	-	21,824	19,645	2,179	122	102	20	179	192	110
500-999	-	20,214	17,657	2,557	120	91	29	168	195	87
1,000-4,999	-	83,761	68,578	15,184	452	306	146	185	224	104
5,000-9,999	-	60,875	45,337	15,538	308	178	130	198	254	120
10,000-24,999	-	106,777	84,420	22,356	478	304	173	224	277	129
25,000 or more	-	198,190	158,889	39,301	748	486	263	265	327	150

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

NAICS = 2012 North American Industry Classification System.

<sup>a</sup> Business 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. Beginning in survey year 2018, statistics are representative of companies located in the United States that performed or funded \$50,000 or more of R&D. This change has affected the comparability of these estimates with estimates published for years prior to 2018. 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 U.S. Census Bureau, Business Research and Development Survey, 2018.