

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: 2017

(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	487,628	400,100	87,528	2,349	1,609	740	208	249	118
Manufacturing industries	31-33	314,496	257,227	57,270	1,352	916	436	233	281	131
Food	311	5,563	4,697	865	35	23	12	159	206	71
Beverage and tobacco products	312	1,743	1,076	667	7	4	3	237	246	223
Textile, apparel, and leather products	313-16	1,080	920	160	8	7	1	136	134	147
Wood products	321	176	175	1	3	3	*	54	54	42
Paper	322	1,580	1,322	259	12	8	4	129	170	59
Printing and related support activities	323	235	229	5	3	3	*	78	77	133
Petroleum and coal products	324	370	316	54	3	2	1	126	137	85
Chemicals	325	89,427	74,977	14,450	245	174	70	366	430	206
Basic chemicals	3251	3,133	2,574	560	23	16	7	137	162	80
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	949	628	321	7	4	3	142	158	119
Pesticide, fertilizer, and other agricultural chemicals	3253	1,761 - 1,875	1,376 - 1,475	384 - 401	7	5	2	D	D	D
Pharmaceuticals and medicines	3254	78,178	66,202	11,976	170	127	43	460	521	279
Soap, cleaning compound, and toilet preparation	3256	3,383 - 3,479	2,605 - 2,701	778	18	12	6	D	D	132
Paint, coating, adhesive, and other chemicals	3255, 3259	1,910 - 1,927	1,495	415 - 432	20	11	9	D	139	D
Plastics and rubber products	326	4,656	3,754	902	35	28	7	134	133	134
Nonmetallic mineral products	327	1,515	1,334	181	8	7	2	183	199	115
Primary metals	331	879	749	130	10	8	2	86	94	57
Fabricated metal products	332	2,371	2,206	166	31	26	4	78	83	41
Machinery	333	16,463	13,197	3,266	120	85	35	137	156	92
Agricultural implement	33311	2,137	1,570	567	14	9	5	152	174	113
Semiconductor machinery	333242	4,479	3,694	786	16	10	6	277	371	127
Engine, turbine, and power transmission equipment	3336	2,397 - 2,540	2,080	317 - 460	16	11	5	D	198	D
Other machinery	other 333	7,306 - 7,451	5,853	1,453 - 1,597	74	55	19	D	106	D
Computer and electronic products	334	101,223	78,575	22,648	419	258	160	242	304	141
Communications equipment	3342	15,819	12,687	3,132	75	45	30	212	284	104
Semiconductor and other electronic components	3344	41,046	30,148	10,898	148	88	60	277	343	180

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Navigational, measuring, electromedical, and control instruments	3345	18,350	14,509	3,842	101	69	32	182	210	122
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	3,773	2,696	1,078	20	13	7	190	207	158
Search, detection, navigation, guidance, aeronautical, and nautical system and instrument	334511	8,257	7,297	960	39	33	6	214	224	161
Other measuring and controlling device	other 3345	6,320	4,516	1,804	42	23	19	150	194	96
Other computer and electronic products	other 334	26,007	21,231	4,776	95	57	38	274	374	124
Electrical equipment, appliances, and components	335	6,158	4,291	1,867	60	29	31	102	146	61
Transportation equipment	336	62,114	53,292	8,822	253	172	81	245	311	108
Automobiles, bodies, trailers, and parts	3361-63	30,478	23,881	6,597	131	92	40	232	260	166
Aerospace products and parts	3364	28,436	26,383	2,053	107	67	40	265	393	51
Aircraft, aircraft engine, and aircraft parts	336411-13	26,626	24,576	2,050	95	55	40	280	447	51
Guided missile, space vehicle, and related parts	336414-15, 336419	1,810	1,807	3	12	12	*	149	148	815
Military armored vehicle, tank, and tank component	336992	9	9	0	*	*	0	168	168	0
Other transportation	other 336	3,190	3,018	173	14	13	2	222	238	103
Furniture and related products	337	462	422	40	5	5	*	88	85	141
Miscellaneous manufacturing	339	18,482	15,695	2,787	95	73	22	194	214	127
Medical equipment and supplies	3391	16,079	13,589	2,490	72	53	19	223	255	133
Other miscellaneous manufacturing	3399	2,403	2,106	297	23	20	3	104	106	93
Nonmanufacturing industries	21-23, 42-81	173,132	142,874	30,258	997	693	303	174	206	100
Mining, extraction, and support activities	21	3,479 - 3,486	3,150	329 - 337	15	13	3	D	249	D
Utilities	22	327	317	9	3	3	*	120	121	91
Wholesale trade	42	571	534	37	10	8	1	60	63	32
Electronic shopping and electronic auctions	454111-12	11,873 - 12,096	9,318	2,555 - 2,779	71	41	30	D	227	D
Transportation and warehousing	48-49	1,155	1,147	7	7	7	*	169	169	333
Information	51	94,898	80,252	14,646	438	305	133	217	263	110
Publishing	511	43,169	34,338	8,831	224	135	90	193	255	99
Newspaper, periodical, book, and directory publishers	5111	81	74	7	1	1	*	120	118	141
Software publishers	5112	43,088	34,264	8,824	224	134	90	193	256	99
Telecommunications	517	3,776 - 3,900	3,682 - 3,806	94	32	31	1	D	D	82

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Data processing, hosting, and related services	518	18,427	16,155	2,272	110	81	29	167	199	78
Other information	other 51	29,403 - 29,527	25,954 - 26,077	3,450	72	59	13	D	D	271
Finance and insurance	52	8,581	7,616	965	47	36	10	184	209	95
Real estate and rental and leasing	53	909	718	191	7	7	*	128	104	888
Lessors of nonfinancial intangible assets (except copyrighted works)	533	311	138	173	3	3	*	115	52	2,661
Other real estate and rental and leasing	other 53	597	579	18	4	4	*	136	136	119
Professional, scientific, and technical services	54	47,987	36,922	11,064	358	235	123	134	157	90
Architectural, engineering, and related services	5413	2,761	2,708	53	46	45	1	61	60	86
Computer systems design and related services	5415	16,824	13,327	3,498	130	78	52	130	170	68
Scientific research and development services	5417	24,445	17,321	7,124	148	86	62	165	200	115
Biotechnology research and development	541711	6,444	4,449	1,996	32	19	13	202	234	155
Physical, engineering, and life sciences (except biotechnology) research and development	541712	17,038	11,913	5,125	106	57	49	161	210	104
Social sciences and humanities research and development	541720	963	959	4	11	11	*	90	89	287
Other professional, scientific, and technical services	other 54	3,957	3,566	390	34	25	9	116	141	45
Health care services	621-23	1,325 - 1,332	1,101	224 - 231	7	6	*	D	170	D
Other nonmanufacturing	23, 44-45 (excluding 454111- 12), 55-56, 624, 71- 72, 81	1,798 - 2,016	1,799	0 - 217	35	32	4	D	56	D
All companies (number of domestic employees)	-	487,628	400,100	87,528	2,349	1,609	740	208	249	118
Small companies										
10-19 ^a	-	3,447	3,311	136	28	26	2	125	129	73
20-49	-	10,011	9,435	577	85	78	7	118	121	81
Medium companies										
50-99	-	10,623	10,141	482	80	74	6	132	136	80
100-249	-	18,596	17,216	1,380	129	111	18	144	156	76
Large companies										
250-499	-	16,376	14,103	2,272	116	87	29	141	163	77
500-999	-	20,387	17,871	2,516	120	90	30	170	199	83
1,000-4,999	-	80,255	65,112	15,143	411	275	136	195	237	111

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5,000–9,999	–	54,428	40,198	14,230	310	185	125	176	218	114
10,000–24,999	–	87,990	73,485	14,505	367	248	119	240	296	122
25,000 or more	–	185,514	149,227	36,287	704	437	267	264	341	136

* = amount < 500; 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.

NAICS = 2012 North American Industry Classification System.

^a 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. Statistics are representative of companies located in the United States that performed or funded R&D. 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, 2017.