

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: 2016

(Millions of U.S. dollars 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	451,831	374,685	77,146	2,195	1,522	674	206	246	115
Manufacturing industries	31-33	303,241	250,553	52,689	1,318	912	406	230	275	130
Food	311	5,821	4,828	994	38	24	14	154	203	71
Beverages and tobacco products	312	D	D	543	9	6	3	D	D	198
Textiles, apparel, and leather products	313-16	1,246	1,166	81	9	8	1	134	138	93
Wood products	321	203	188	15	3	3	*	67	69	44
Paper	322	929	851	78	8	6	2	119	148	38
Printing and related support activities	323	223	219	4	4	4	*	56	61	10
Petroleum and coal products	324	425	381	44	2	2	*	174	197	88
Chemicals	325	85,888	73,575	12,313	236	173	63	364	426	195
Basic chemicals	3251	3,082	2,545	537	19	14	5	162	180	109
Resins, synthetic rubber, and artificial synthetic fibers and filaments	3252	1,044	711	333	8	5	3	136	153	110
Pesticides, fertilizers, and other agricultural chemicals	3253	D	D	432	7	5	2	D	D	202
Pharmaceuticals and medicines	3254	74,542	64,628	9,914	161	123	39	463	527	257
Soaps, cleaning compounds, and toilet preparations	3256	3,590	2,800	789	21	13	7	174	210	108
Paints, coatings, adhesives, and other chemicals	3255, 3259	D	D	307	20	13	7	D	D	43
Plastics and rubber products	326	4,583	3,752	831	37	29	8	123	127	106
Nonmetallic mineral products	327	1,474	1,289	185	9	7	1	173	177	151
Primary metals	331	662	592	69	8	7	1	86	85	86
Fabricated metal products	332	2,484	2,239	245	33	30	3	75	74	85
Machinery	333	15,764	12,585	3,179	113	78	35	140	161	92
Agricultural implements	33311	2,189	1,565	625	15	9	6	146	175	103
Semiconductor machinery	333242	4,138	3,411	727	14	9	5	306	388	154
Engines, turbines, and power transmission equipment	3336	2,327	1,959	368	12	7	4	199	262	88
Other machinery	other 333	7,109	5,650	1,459	73	53	20	98	106	74
Computer and electronic products	334	98,175	77,385	20,791	424	264	160	232	294	130
Communications equipment	3342	16,075	13,112	2,963	77	48	29	208	273	101

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		Worldwide	Domestic	Foreign	Worldwide	Domestic	Foreign	Worldwide	Domestic	Foreign
Semiconductors and other electronic components	3344	41,695	31,391	10,304	156	96	61	267	328	170
Navigational, measuring, electromedical, and control instruments	3345	18,111	14,885	3,227	100	69	30	182	214	107
Electromedical, electrotherapeutic, and irradiation apparatuses	334510, 334517	3,553	2,632	922	19	12	7	185	214	135
Search, detection, navigation, guidance, aeronautical, and nautical systems and instruments	334511	8,373	7,533	840	33	29	4	254	258	222
Other measuring and controlling devices	other 3345	6,185	4,720	1,465	47	28	20	130	170	75
Other computer and electronic products	other 334	22,294	17,997	4,297	90	50	40	246	357	107
Electrical equipment, appliances, and components	335	6,207	4,771	1,436	51	28	23	122	173	62
Transportation equipment	336	60,326	51,275	9,050	236	168	68	255	305	132
Automobiles, bodies, trailers, and parts	3361-63	29,171	22,042	7,130	135	92	43	216	238	167
Aerospace products and parts	3364	28,462	26,645	1,817	85	61	24	337	438	77
Aircraft, aircraft engines, and aircraft parts	336411-13	27,034	25,221	1,813	73	50	24	368	507	77
Guided missiles, space vehicles, and related parts	336414-15, 336419	1,428 i	1,424 i	4	11	11	*	129	129	60
Military armored vehicles, tanks, and tank components	336992	D	D	0	*	*	0	D	D	0
Other transportation	other 336	D	D	104	17	15	2	D	D	52
Furniture and related products	337	406	366	40	5	5	*	80	79	89
Miscellaneous manufacturing	339	D	D	2,792	92	70	22	D	D	127
Medical equipment and supplies	3391	14,143	11,668	2,475	65	47	17	218	247	142
Other miscellaneous manufacturing	3399	D	D	317 i	27 i	23 i	5 i	D	D	69
Nonmanufacturing industries	21-23, 42-81	148,589	124,132	24,457	878	610	268	169	203	91
Mining, extraction, and support activities	21	3,604	3,296	308	14	12	2	257	282	132

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		Worldwide	Domestic	Foreign	Worldwide	Domestic	Foreign	Worldwide	Domestic	Foreign
Utilities	22	353	351	1	3	3	*	136	139	20
Wholesale trade	42	465	452	12	12	11	*	40	40	29
Electronic shopping and electronic auctions	454111-12	D	1,569	D	6	5	1	D	319	D
Transportation and warehousing	48-49	495	488	7	3	3	*	168	166	902
Information	51	84,133	70,748	13,384	414	277	137	203	255	98
Publishing	511	42,272	33,574	8,698	241	143	98	175	235	88
Newspaper, periodical, book, and directory publishers	5111	84	79	4	1	1	*	85	86	72
Software publishers	5112	42,188	33,495	8,693	240	142	98	176	236	88
Telecommunications	517	D	D	49	25	24	1	D	D	43
Data processing, hosting, and related services	518	13,666	11,914	1,752	87	62	25	157	193	70
Other information	other 51	D	D	2,886	61	49	13	D	D	228
Finance and insurance	52	8,468	7,331	1,136	47	37	10	179	196	115
Real estate and rental and leasing	53	477	475	2	3	2	*	187	192	22
Lessors of nonfinancial intangible assets (except copyrighted works)	533	27	27	*	*	*	*	107	137	*
Other real estate and rental and leasing	other 53	450	449	2	2	2	*	196	197	86
Professional, scientific, and technical services	54	46,771	37,595	9,176	355	240	114	132	156	80
Architectural, engineering, and related services	5413	3,475	3,412	64	52	46	6	67	74	11
Computer systems design and related services	5415	19,168	15,747	3,421	140	92	48	137	172	71
Scientific research and development services	5417	20,254	14,842	5,412	133	79	55	152	189	99
Biotechnology research and development	541711	6,079	4,464	1,615	35	21	14	172	210	114
Physical, engineering, and life sciences (except biotechnology) research and development	541712	13,452	9,659	3,793	92	52	40	146	186	94
Social sciences and humanities research and development	541720	723	719	4	6	6	*	131	131	402
Other professional, scientific, and technical services	other 54	3,874	3,595	279	30	24	6	131	149	51

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Health care services	621-23	1,002	848	154	4	4	*	252	222	913		
Other nonmanufacturing	23, 44-45 (excluding 454111-12), 55-56, 624, 71-72, 81	D	977	i	D	18	16	2	D	63	D	
All companies (number of domestic employees)	-	451,831	374,685	77,146	2,195	1,522	674	206	246	115		
Micro companies ^a												
5-9	-	1,726	i	1,581	i	145	17	15	2	101	106	64
Small companies												
10-19	-	5,059	i	4,958	i	101	40	37	3	126	133	36
20-49	-	10,000	i	9,662	i	338	82	75	7	122	129	47
Medium companies												
50-99	-	9,662		9,298		364	76	69	7	127	134	56
100-249	-	16,194		14,875		1,319	116	101	15	139	147	88
Large companies												
250-499	-	14,866		13,092		1,774	94	75	18	159	174	96
500-999	-	16,609		14,450		2,159	98	74	24	169	195	88
1,000-4,999	-	79,597		63,971		15,626	440	278	163	181	230	96
5,000-9,999	-	49,620		40,633		8,986	237	159	78	209	255	115
10,000-24,999	-	80,255		65,594		14,661	373	243	130	215	270	113
25,000 or more	-	168,243		136,571		31,672	621	395	226	271	346	140

* = amount < \$500,000 or less than 500 employees or less than \$500 per employee; 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 R&D and Innovation Survey does not include companies with fewer than five 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.

Source(s)

National Science Foundation, National Center for Science and Engineering Statistics, and U.S. Census Bureau, Business R&D and Innovation Survey, 2016.