

TABLE 22

## Foreign R&amp;D paid for by the company and others and performed by the company, by type of R&amp;D, industry, and company size: 2016

(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
All industries	21-23, 31-33, 42-81	77,146	70,326	6,820	17,430	15,569	1,861	59,716	54,757	4,959
Manufacturing industries	31-33	52,689	51,421	1,268	12,910	12,685	225	39,779	38,736	1,042
Food	311	994	991	3	227	227	*	766	763	3
Beverages and tobacco products	312	543	543	0	162	162	0	381	381	0
Textiles, apparel, and leather products	313-16	81	81	*	10	10	0	71	70	*
Wood products	321	15	15	0	1	1	0	13	13	0
Paper	322	78	78	0	16	16	0	62	62	0
Printing and related support activities	323	4	4	*	2	2	0	2	2	*
Petroleum and coal products	324	44	44	0	9	9	0	35	35	0
Chemicals	325	12,313	12,146	167	3,944	3,898	47	8,369	8,248	120
Basic chemicals	3251	537	533	4	236	232	3	301	301	*
Resins, synthetic rubbers, and artificial synthetic fibers and filaments	3252	333	333	*	241	241	*	93	92	*
Pesticides, fertilizers, and other agricultural chemicals	3253	432	422	10	D	D	10	D	D	0
Pharmaceuticals and medicines	3254	9,914	9,768	146	2,984	2,952	32	6,930	6,816	114
Soaps, cleaning compounds, and toilet preparations	3256	789	788	1	112	112	*	677	676	1
Paints, coatings, adhesives, and other chemicals	3255, 3259	307	302	5	D	D	*	D	D	5
Plastics and rubber products	326	831	829	2	222	222	*	608	606	2
Nonmetallic mineral products	327	185	185	*	25	25	0	160	160	*
Primary metals	331	69	69	*	34	34	*	35	35	*
Fabricated metal products	332	245	243	1	63	63	0	182	181	1
Machinery	333	3,179	3,164	15	334	329	4	2,845	2,834	11
Agricultural implements	33311	625	623	1	D	D	*	D	D	1
Semiconductor machinery	333242	727	717	10	52	50	2	675	667	8
Engines, turbines, and power transmission equipment	3336	368	368	*	D	D	0	D	D	*
Other machinery	other 333	1,459	1,456	3	191	189	2	1,268	1,267	1
Computer and electronic products	334	20,791	20,530	261	5,830	5,734	96	14,961	14,796	165
Communications equipment	3342	2,963	2,955	8	1,751	1,750	1	1,212	1,205	7
Semiconductors and other electronic components	3344	10,304	10,278	26	2,118	2,114	4	8,186	8,164	22
Navigational, measuring, electromedical, and control instruments	3345	3,227	3,004	223	880	790	90	2,347	2,213	133
Electromedical, electrotherapeutic, and irradiation apparatuses	334510, 334517	922	919	2	124	124	*	797	795	2
Search, detection, navigation, guidance, aeronautical, and nautical systems and instruments	334511	840	636	204	388	D	D	452	D	D

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Other measuring and controlling devices	other 3345	1,465	1,448	17	367	D	D	1,098	D	D
Other computer and electronic products	other 334	4,297	4,293	4	1,081	1,080	1	3,217	3,213	4
Electrical equipment, appliances, and components	335	1,436	1,436	1	207	207	*	1,229	1,229	*
Transportation equipment	336	9,050	8,253	798	1,324	1,249	75	7,726	7,003	722
Automobiles, bodies, trailers, and parts	3361-63	7,130	6,659	470	943	892	51	6,187	5,768	419
Aerospace products and parts	3364	1,817	1,490	327	339	315	24	1,478	1,175	303
Aircraft, aircraft engines, and aircraft parts	336411-13	1,813	1,488	326	337	314	23	1,476	1,173	303
Guided missiles, space vehicles, and related parts	336414-15, 336419	4	2	2	2	*	2	2	2	*
Military armored vehicles, tanks, and tank components	336992	0	0	0	0	0	0	0	0	0
Other transportation	other 336	104	103	*	43	43	0	61	61	*
Furniture and related products	337	40	40	0	16	16	0	24	24	0
Miscellaneous	339	2,792	2,773	20	482	479	3	2,310	2,294	16
Medical equipment and supplies	3391	2,475	2,455	20	401	398	3	2,074	2,058	16
Other miscellaneous manufacturing	3399	317	317	0	81	81	0	236	236	0
Nonmanufacturing industries	21-23, 42-81	24,457	18,905	5,552	4,520	2,884	1,636	19,937	16,021	3,917
Mining, extraction, and support activities	21	308	270	38	60	47	13	248	223	24
Utilities	22	1	1	*	*	*	0	1	1	*
Wholesale trade	42	12	12	0	D	D	0	D	D	0
Electronic shopping and electronic auctions	454111-12	D	D	0	D	D	0	D	D	0
Transportation and warehousing	48-49	7	7	0	*	*	0	7	7	0
Information	51	13,384	13,355	29	1,805	1,800	5	11,580	11,556	24
Publishing	511	8,698	8,686	12	1,392	1,392	0	7,306	7,294	12
Newspaper, periodical, book, and directory publishers	5111	4	4	0	*	*	0	4	4	0
Software publishers	5112	8,693	8,682	12	1,392	1,392	0	7,301	7,289	12
Telecommunications	517	49	49	0	14	14	0	35	35	0
Data processing, hosting, and related services	518	1,752	1,735	17	279	274	5	1,473	1,461	12
Other information	other 51	2,886	2,886	0	120	120	0	2,766	2,766	0
Finance and insurance	52	1,136	1,136	0	46	46	0	1,090	1,090	0
Real estate and rental and leasing	53	2	2	0	*	*	0	2	2	0
Lessors of nonfinancial intangible assets (except copyrighted works)	533	*	*	0	*	*	0	*	*	0

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Other real estate and rental and leasing	other 53	2	2	0	0	0	0	2	2	0
Professional, scientific, and technical services	54	9,176	3,690	5,486	2,446	i 829	i 1,617	i 6,730	i 2,862	i 3,868
Architectural, engineering, and related services	5413	64	23	41	5	5	* i	58	18	41
Computer systems design and related services	5415	3,421	3,332	89	707	i 619	i 88	i 2,714	i 2,713	1
Scientific research and development services	5417	5,412	64	5,348	1,545	i 16	i 1,528	i 3,867	i 47	i 3,820
Biotechnology research and development	541711	1,615	3	i 1,612	247	3	i 244	i 1,368	i *	i 1,368
Physical, engineering, and life sciences (except biotechnology) research and development	541712	3,793	61	3,732	1,294	i 14	i 1,280	i 2,499	i 47	i 2,452
Social sciences and humanities research and development	541720	4	0	4	4	0	4	0	0	0
Other professional, scientific, and technical services	other 54	279	272	7	189	i 188	i *	91	84	7
Health care services	621-23	154	154	0	150	150	0	4	4	0
Other nonmanufacturing	23, 44-45 (excluding 454111-12), 55-56, 624, 71-72, 81	D	D	0	D	D	0	178	178	0
All companies (number of domestic employees)	-	77,146	70,326	6,820	17,430	15,569	1,861	i 59,716	54,757	i 4,959
Micro companies <sup>a</sup>										
5 - 9	-	145	144	1	i 15	14	* i	130	130	1
Small companies										
10 - 19	-	101	77	24	17	i 14	i 2	85	63	22
20 - 49	-	338	326	12	77	75	2	260	251	10
Medium companies										
50 - 99	-	364	354	11	101	i 100	i 2	263	254	9
100 - 249	-	1,319	1,277	43	i 355	316	39	i 965	961	4
Large companies										
250 - 499	-	1,774	1,738	37	374	348	25	1,401	1,389	12
500 - 999	-	2,159	2,146	13	481	479	2	1,678	1,667	12
1,000 - 4,999	-	15,626	14,099	1,527	4,494	i 3,624	870	i 11,132	10,474	657
5,000 - 9,999	-	8,986	8,321	665	i 2,356	1,866	490	i 6,630	6,455	176
10,000 - 24,999	-	14,661	11,910	2,751	2,568	2,515	52	12,093	9,395	2,698
25,000 or more	-	31,672	29,935	1,736	6,594	6,216	377	25,078	23,719	1,359

\* = amount < \$500,000; 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.

<sup>a</sup> 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. 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.