

TABLE 59

Domestic R&D paid for by the company and others and performed by the company, by industry and company size: 2008–21

(Millions of U.S. dollars)

Industry and company size	NAICS code	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
All industries	21–23, 31–33, 42–81	290,680	282,505	279,289	290,240	302,759	323,107	340,539	355,671	378,590	396,979	443,633	491,434	538,870	602,499
Manufacturing industries	31–33	203,755	196,441	199,147	202,363	208,577	222,718	231,705	236,170	249,999	255,602	274,315	284,673	309,021	326,060
Food	311	2,100	4,099	D	4,393	4,087	5,021	4,854	i 4,828	4,830	4,588	4,595	4,179	5,234 - 5,245	5,266
Beverage and tobacco products	312	780	477	D	D	D	827	920	1,006	1,076 - 1,099	1,098	1,113	1,082	1,169	1,247
Textile, apparel, and leather products	313–16	815	439	482	608	553	662	631	748	1,166	i 959	1,005	903	822	829
Wood products	321	273	280	252	211	280	220	336	i 195	166 - 204	173	203	186	185 - 192	444
Paper	322	NA	NA	1,341	676	752	920	723	766	854	1,327	933	1,059	928	1,139
Printing and related support activities	323	349	210	231	181	256	i 252	i 234	196	i 219	i 231	242	412	i 287	204
Petroleum and coal products	324	NA	NA	D	D	888	281	234	214	268	324	1,269	1,306	0 - 2,641	957
Chemicals	325	58,250	54,753	58,343	55,853	56,748	62,086	66,134	68,032	71,803	75,733	84,367	97,180	101,359	109,490
Basic chemicals	3251	NA	NA	1,810	D	2,705	2,620	2,849	3,042	0 - 5,157	2,544	2,443	2,360	2,697	2,713
Resin, synthetic rubber, and artificial synthetic fibers and filaments	3252	NA	NA	783	798	997	1,197	1,154	1,201	0 - 5,157	541	1,636 - 1,662	1,172	1,233	1,389
Pesticide, fertilizer, and other agricultural chemicals	3253	NA	NA	D	D	D	1,691	i 1,743	i D	0 - 5,157	1,469	1,460	1,822 - 1,846	961 - 1,173	1,157
Pharmaceuticals and medicines	3254	48,131	46,415	49,469	46,308	47,851	52,790	56,482	57,332	62,346 - 67,504	66,870	74,815	87,735	92,050	100,220
Soap, cleaning compound, and toilet preparations	3256	NA	NA	2,400	2,476	2,342	2,434	2,548	2,579	2,800	2,860	2,720	2,760	2,665	2,740
Paint, coating, adhesive, and other chemicals	3255, 3259	NA	NA	D	1,290	D	1,354	1,357	i D	1,500 - 1,523	1,450	1,265 - 1,294	1,302 - 1,334	1,540 - 1,753	1,271
Plastics and rubber products	326	1,817	2,388	2,129	2,278	3,585	3,647	3,614	2,549	3,752	3,722	2,742	2,857	2,616	3,144
Nonmetallic mineral products	327	1,556	1,098	i 1,314	i 1,175	1,327	i 1,329	i 1,445	i 1,259	1,289	1,304	1,385	1,507	i 1,696	i 1,533
Primary metals	331	695	863	681	655	741	618	677	625	592	747	839	663	816	912
Fabricated metal products	332	2,419	2,057	1,727	1,857	1,827	i 2,194	i 2,107	i 2,273	i 2,094	2,234	2,316	2,866	3,390	4,291
Machinery	333	10,104	9,226	10,260	14,725	13,752	12,586	12,106	13,539	12,718	13,341	14,770	15,182	16,243	17,730
Agricultural implement	33311	NA	NA	1,345	1,277	1,546	1,597	1,578	1,531	1,565	1,565	1,872	1,920	1,807 - 1,811	1,867
Semiconductor machinery	333242	NA	NA	2,173	2,351	1,291	3,194	2,941	3,214	3,411	3,737	4,166	4,459	4,809	5,349
Engine, turbine, and power transmission equipment	3336	NA	NA	1,430	4,273	4,336	1,448	2,356	2,515	2,060	649 - 2,579	2,483	1,301	1,653 - 1,657	1,374

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Industry and company size	NAICS code	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Other machinery	other 333	NA	NA	5,312	6,824	6,579	6,347	5,229	6,280	5,683	5,459 - 7,388	6,249	7,503	7,969	9,140
Computer and electronic products	334	60,464	55,856	61,623	62,438	66,290	68,629	73,256	72,182	77,451	78,003	83,948	85,571	99,523	101,063
Communications equipment	3342	NA	NA	13,875	12,335	14,352	15,663	18,345	19,424	13,156	12,492	13,090	12,497 - 12,503	12,096	12,557
Semiconductor and other electronic components	3344	22,324	20,023	23,011	24,237	28,218	30,176	31,668	30,451	31,413	30,373	30,232 - 43,377	35,178	43,184	47,396
Navigational, measuring, electromedical, and control instruments	3345	15,460	14,318	15,747	15,852	15,918	15,119	15,871	14,202	14,885	14,325	4,671 - 17,814	17,644	18,505	13,644
Electromedical, electrotherapeutic, and irradiation apparatus	334510, 334517	NA	NA	4,189	4,430	4,413	2,634	3,975	2,676	2,632	2,632	0 - 13,142	3,342	2,874	3,087
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments	334511	NA	NA	8,293	8,066	7,734	8,106	7,861	7,360	7,532	7,379	0 - 13,142	9,662	10,587	5,301
Other measuring and controlling devices	other 3345	NA	NA	3,265	3,356	3,772	4,379	4,035	4,165	4,722	4,314	4,672	4,640	5,044	5,256
Other computer and electronic products	other 334	NA	NA	8,990	10,014	7,801	7,671	7,372	8,105	17,997	20,814	22,811	20,244 - 20,254	25,738	27,465
Electrical equipment, appliances, and components	335	3,143	3,317	3,320	3,624	3,078	4,133	4,323	4,359	4,771	4,319	4,487	5,282	5,029	5,494
Transportation equipment	336	50,552	48,209	42,940	41,094	42,340	43,648	46,977	49,286	51,569	50,698	52,446	45,482	49,223	50,760
Motor vehicles, bodies, trailers, and parts	3361–63	NA	NA	D	D	D	16,733	18,518	19,113	0 - 47,558	23,542	25,393	24,223	23,516 - 23,521	26,391
Aerospace products and parts	3364	36,941	34,563	29,857	26,086	24,874	24,783	26,292	27,440	1,423 - 48,982	24,154	24,301	18,358	22,944	21,468
Aircraft, aircraft engine, and aircraft parts	336411–13	NA	NA	24,777	24,839	23,454	D	25,002	25,793	0 - 47,558	22,629 - 24,155	22,978	16,891	21,291	19,845
Guided missile, space vehicle, and related parts	336414–15, 336419	NA	NA	5,080	1,247	1,420	D	1,290	1,647	1,424	0 - 1,524	1,323	1,467	1,652	1,623
Military armored vehicle, tank, and tank components	336992	NA	NA	D	51	D	9	18	16	3 - 38	9	11	35	11	21 - 25
Other transportation	other 336	NA	NA	D	D	D	2,124	2,148	2,716	2,549 - 2,586	2,993	2,741	2,866	2,748 - 2,753	2,875 - 2,880
Furniture and related products	337	477	395	374	319	360	374	377	452	359	430	409	409	418	426
Miscellaneous	339	NA	NA	D	D	D	15,292	12,757	13,662	14,988	16,370	17,245	18,546	17,431 - 20,077	21,133

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Medical equipment and supplies	3391	NA	NA	6,459	7,796	8,333	12,741	10,309	11,353	12,647 - 12,660	13,930	14,559	16,022	16,071	18,438
Other miscellaneous manufacturing	3399	NA	NA	D	D	D	2,551	2,449	2,309	2,329 - 2,340	2,439	2,686	2,524	1,360 - 4,006	2,695
Nonmanufacturing industries	21–23, 42–81	86,926	86,064	80,142	87,877	94,183	100,389	108,834	119,501	128,591	141,377	169,318	206,761	229,849	276,439
Mining, quarrying, oil and gas extraction, and support activities	21	NA	NA	2,545	2,365	3,031	4,000	4,633	4,012	3,296	3,292	1,827	2,716	1,165 - 1,167	1,260 - 1,334
Utilities	22	NA	NA	425	358	348	294	313	480	351	326	275	275	264	168 - 17,997
Wholesale trade	42	NA	NA	1,092	1,556	2,053	452	339	1,698	467	0 - 9,599	851	1,186	1,053	1,745 - 1,855
Electronic shopping and electronic auctions	454111–12	NA	NA	D	949	1,353	1,356	1,388	D	0 - 9,499	0 - 9,599	11,652	17,176	14,518 - 20,878	5,936 - 24,040
Transportation and warehousing	48–49	NA	NA	95	132	178	D	679	403	488	1,214	2,548	9,890	6,180	7,208
Information	51	37,695	35,953	37,088	42,697	46,900	56,608	64,277	65,457	70,946	80,120	94,507	110,665	129,379	147,855
Publishing	511	28,427	26,838	26,957	28,411	29,067	34,365	36,621	33,348	33,459	33,868	32,716	32,973	34,994 - 35,027	39,152
Newspaper, periodical, book, and directory publishers	5111	NA	NA	770	372	219	342	88	98	79	66	131	61	30 - 63	103
Software publishers	5112	NA	NA	26,187	28,039	28,848	34,023	36,533	33,250	33,379	33,802	32,585	32,912	34,964	39,049
Telecommunications	517	1,684	1,523	1,912	2,169	2,729	3,049	3,768	3,607	3,568 - 3,611	3,733	3,696	0 - 46,548	3,411 - 3,444	3,835
Data processing, hosting, and related services	518	6,567	2,741	2,753	5,111	4,914	7,156	9,062	9,355	9,344 - 14,099	16,623	23,472	31,146	41,468	45,192
Other information	other 51	1,016	4,850	5,466	7,006	10,190	12,039	14,826	19,147	19,820 - 24,532	25,896	34,623	46,548	49,473	59,676
Finance and insurance	52	NA	NA	2,101	3,447	3,530	4,412	4,122	5,409	7,331	7,611	7,425	8,906	12,280	20,947
Real estate and rental and leasing	53	NA	NA	330	343	363	191	262	300	475	772 - 852	1,021	1,368	3,249	2,096
Lessors of nonfinancial intangible assets (except copyrighted works)	533	NA	NA	NA	324	342	58	55	68	27	0 - 79	6	45	7	5 - 8
Other real estate and rental and leasing	other 53	NA	NA	NA	19	21	133	207	232	448	773	1,015	1,323	3,242	2,088 - 2,091
Professional, scientific, and technical services	54	37,954	42,380	31,798	33,307	34,121	30,926	31,461	38,601	33,839 - 43,338	36,024	45,575	52,318	53,937	66,496
Architectural, engineering, and related services	5413	3,422	3,258	4,008	3,114	2,483	3,132	3,309	4,100	0 - 9,499	2,525	3,463 - 4,007	4,154	4,202	4,560

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Computer systems design and related services	5415	12,146	13,351	10,359	10,938	11,006	i 9,241	i 11,053	i 14,334	15,484	13,702	16,553	20,988	17,932	20,409
Scientific research and development services	5417	17,913	16,402	13,712	15,713	16,415	14,219	13,324	16,249	14,778	16,029	20,225	21,218	25,164	34,142
Research and development in nanotechnology	541713	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	175 - 180	i 228
Research and development in biotechnology (except nanobiotechnology)	541714	NA	7,809	5,537	7,043	7,387	4,492	3,459	5,594	i 4,445	4,207	5,848	6,119	5,868 - 6,356	9,039
Research and development in the physical, engineering, and life sciences (except nanotechnology and biotechnology)	541715	NA	7,916	7,628	8,058	8,431	8,935	9,187	9,950	9,613	10,946	13,707	14,333	i 18,445	i 24,312
Research and development in the social sciences and humanities	541720	NA	676	547	612	598	792	678	705	719	876	671	766	184 - 676	563
Other professional, scientific, and technical services	other 54	4,474	9,370	3,720	3,542	4,216	4,334	3,775	3,918	3,579	3,770	4,788 - 5,332	5,958	6,639	7,385
Health care services	621–23	NA	NA	1,049	542	672	i 528	i 501	i 758	i 848	921	1,475	2,266	1,456 - 1,475	2,060 - 2,138
Other nonmanufacturing	23, 44–45 (excluding 454111–12), 55–56, 624, 71–72, 81	NA	NA	NA	2,181	1,635	D	857	i D	1,055	i 1,503	2,163	0 - 17,176	0 - 6,356	2,564 - 3,199
All companies (number of domestic employees) ^a	–	290,680	282,505	279,289	290,240	302,759	323,107	340,539	355,671	378,590	396,979	443,633	491,434	538,870	602,499
Micro companies															
5–9	–	NA	NA	3,614	4,060	2,926	i 3,390	i 3,314	i 2,983	i 1,583	i NA	NA	NA	NA	NA
Small companies															
10–19	–	NA	NA	NA	NA	NA	NA	NA	5,674	i 4,930	i 3,390	4,383	5,509	5,064	5,477
20–49	–	NA	NA	NA	NA	NA	NA	NA	10,281	i 9,635	i 9,084	11,255	12,301	12,938	15,061
Medium companies															
50–99	–	9,351	13,277	8,781	9,295	9,100	i 8,939	10,130	i 11,538	9,275	10,164	12,412	13,829	13,014	14,540
100–249	–	14,662	12,791	11,631	12,303	12,454	13,704	13,606	13,586	14,860	17,205	18,611	19,667	25,331	24,023
Large companies															
250–499	–	10,219	11,330	10,194	13,013	11,387	12,021	12,228	13,686	12,978	14,312	19,775	18,799	20,977	23,932
500–999	–	11,886	10,131	10,053	9,993	11,499	12,013	13,129	15,005	14,441	17,736	17,753	24,062	21,273	27,432
1,000–4,999	–	46,336	44,197	49,108	51,110	50,311	55,974	57,336	57,998	63,431	64,838	68,764	75,990	88,584	94,615

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5,000–9,999	–	24,764	21,769	27,546	24,452	30,708	31,657	38,327	38,858	40,530	40,340	45,509	50,852	49,376	62,817
10,000–24,999	–	48,737	51,239	41,853	49,107	50,226	51,103	54,452	59,330	66,032	73,540	86,463	88,144	88,512	104,607
25,000 or more	–	100,820	97,056	99,291	102,222	110,042	119,493	122,533	126,732	140,895	146,369	158,707	182,282	213,801	229,995

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; NA = not available.

NAICS = 2017 North American Industry Classification System.

^a The Business Enterprise Research and Development Survey did not include companies with fewer than 5 domestic employees from 2008 to 2016 and does not include fewer than 10 domestic employees beginning in 2017.

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 \$50,000 or more of R&D and are not comparable with estimates published for years prior to 2018. For survey year 2008, industry classification was based on the 2002 NAICS. For survey years 2009–13, industry classification was based on the 2007 NAICS. For survey years 2014–19, industry classification was based on the 2012 NAICS. For survey years beginning in 2020, classification was based on the 2017 NAICS. Beginning with survey year 2011, the composition of the Other nonmanufacturing industry changed. Most statistics for years prior to 2021 have been revised since original publication. Revised statistics include adjustments based on information obtained after the original statistics were prepared. 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 Census Bureau, Business Enterprise Research and Development Survey.