

CHAPTER 4

Research and Development: U.S. Trends and International Comparisons

List of Appendix Tables

Appendix Table 4-1	U.S. gross domestic product, R&D, and ratio of R&D to gross domestic product (and components): 1953–2015.....	4-3
Appendix Table 4-2	U.S. research and development expenditures, by performing sector and source of funds: 1953–2015	4-8
Appendix Table 4-3	U.S. basic research expenditures, by performing sector and source of funds: 1953–2015	4-17
Appendix Table 4-4	U.S. applied research expenditures, by performing sector and source of funds: 1953–2015	4-26
Appendix Table 4-5	U.S. development expenditures, by performing sector and source of funds: 1953–2015	4-35
Appendix Table 4-6	U.S. R&D expenditures, by source of funds and performing sector: 1953–2015	4-44
Appendix Table 4-7	U.S. basic research expenditures, by source of funds and performing sector: 1953–2015.....	4-52
Appendix Table 4-8	U.S. applied research expenditures, by source of funds and performing sector: 1953–2015.....	4-60
Appendix Table 4-9	U.S. development expenditures, by source of funds and performing sector: 1953–2015.....	4-68
Appendix Table 4-10	U.S. R&D expenditures, by state, performing sector, and funding sector: 2015	4-76
Appendix Table 4-11	U.S. R&D and gross domestic product, by state: 2015	4-81
Appendix Table 4-12	Gross expenditures on R&D and expenditures for R&D as a share of gross domestic product, for selected countries or regions: 1981–2015.....	4-84
Appendix Table 4-13	Funds spent for business R&D performed in the United States, by source of funds and selected industry: 2008–14.....	4-90
Appendix Table 4-14	Federal research and experimentation tax credit claims, by NAICS industry: 2001–13	4-101
Appendix Table 4-15	R&D performed by majority-owned affiliates of foreign companies in the United States, by region, country, or economy of ultimate beneficial owner: 1997–2014.....	4-106
Appendix Table 4-16	R&D performed by majority-owned affiliates of foreign companies in the United States, by NAICS industry of affiliate: 2007–14	4-110
Appendix Table 4-17	R&D performed abroad by majority-owned foreign affiliates of U.S. parent companies, by region, country, or economy: 1997–2014.....	4-113
Appendix Table 4-18	R&D performed abroad by majority-owned foreign affiliates of U.S. parent companies, by selected NAICS industry of affiliate: 2009–14	4-118
Appendix Table 4-19	R&D performed in the United States by U.S. multinational company parent companies, by NAICS industry: 2009–14.....	4-122
Appendix Table 4-20	Difference in federal R&D support, as reported by performers and federal agencies: 1985–2015	4-126



Appendix Table 4-21	Federal obligations for R&D and R&D plant, by type of work: FYs 1953–2016	4-128
Appendix Table 4-22	Federal funding for R&D and R&D plant, budget authority versus obligations: FYs 1953–2016	4-134
Appendix Table 4-23	Federal obligations for R&D and R&D plant, by agency, performer, and type of work: FY 2015	4-140
Appendix Table 4-24	Federal obligations for research, by agency and S&E field: FY 2015	4-151
Appendix Table 4-25	Federal obligations for research, by detailed S&E field: Selected years, FYs 1990–2015	4-157

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

APPENDIX TABLE 4-1

U.S. gross domestic product, R&D, and ratio of R&D to gross domestic product (and components): 1953–2015

(Billions of current and of constant 2009 dollars and R&D-to-GDP ratio)

Year	GDP			Total R&D		R&D/GDP (%)								
	Current \$billions	Constant 2009 \$billions	Deflator ^a (2009 = 1.00000)	Current \$billions	Constant 2009 \$billions	Total	R&D, by performer				R&D, by source of funding			
							Business	Federal ^b	Higher education	Other ^c	Business	Federal	Other ^d	
1953	389.7	2,571.4	0.15155	5.2	34.0	1.32	0.93	0.29	0.07	0.03	0.58	0.71	0.03	
1954	391.1	2,556.9	0.15296	5.6	36.7	1.44	1.04	0.29	0.08	0.03	0.61	0.79	0.04	
1955	426.2	2,739.0	0.15560	6.2	39.7	1.45	1.04	0.30	0.08	0.03	0.59	0.82	0.04	
1956	450.1	2,797.4	0.16090	8.5	52.8	1.89	1.39	0.38	0.09	0.03	0.74	1.11	0.04	
1957	474.9	2,856.3	0.16626	9.9	59.6	2.09	1.54	0.42	0.09	0.04	0.73	1.31	0.04	
1958	482.0	2,835.3	0.17000	10.9	64.2	2.26	1.67	0.45	0.10	0.04	0.77	1.45	0.05	
1959	522.5	3,031.0	0.17239	12.5	72.5	2.39	1.76	0.47	0.11	0.04	0.78	1.56	0.05	
1960	543.3	3,108.7	0.17477	13.7	78.5	2.52	1.85	0.50	0.13	0.05	0.83	1.64	0.05	
1961	563.3	3,188.1	0.17669	14.6	82.4	2.59	1.84	0.55	0.15	0.05	0.84	1.68	0.06	
1962	605.1	3,383.1	0.17886	15.6	87.4	2.58	1.82	0.54	0.16	0.06	0.85	1.68	0.06	
1963	638.6	3,530.4	0.18089	17.5	96.9	2.74	1.91	0.58	0.18	0.06	0.85	1.82	0.07	
1964	685.8	3,734.0	0.18366	19.1	104.0	2.79	1.90	0.62	0.20	0.06	0.86	1.86	0.07	
1965	743.7	3,976.7	0.18701	20.3	108.3	2.72	1.86	0.59	0.21	0.06	0.88	1.77	0.07	
1966	815.0	4,238.9	0.19227	22.1	114.8	2.71	1.86	0.56	0.22	0.07	0.90	1.74	0.07	

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	GDP			Total R&D		R&D/GDP (%)								
	Current \$billions	Constant 2009 \$billions	Deflator ^a (2009 = 1.00000)	Current \$billions	Constant 2009 \$billions	Total	R&D, by performer				R&D, by source of funding			
							Business	Federal ^b	Higher education	Other ^c	Business	Federal	Other ^d	
1967	861.7	4,355.2	0.19786	23.3	118.0	2.71	1.85	0.56	0.24	0.07	0.95	1.69	0.07	
1968	942.5	4,569.0	0.20628	24.7	119.6	2.62	1.81	0.52	0.23	0.06	0.96	1.59	0.07	
1969	1,019.9	4,712.5	0.21642	26.0	120.1	2.55	1.75	0.51	0.22	0.06	0.98	1.49	0.07	
1970	1,075.9	4,722.0	0.22785	26.3	115.3	2.44	1.64	0.52	0.22	0.06	0.97	1.39	0.08	
1971	1,167.8	4,877.6	0.23942	27.0	112.6	2.31	1.53	0.50	0.22	0.06	0.93	1.30	0.08	
1972	1,282.4	5,134.3	0.24977	28.7	115.1	2.24	1.48	0.48	0.21	0.06	0.91	1.25	0.08	
1973	1,428.5	5,424.1	0.26336	31.0	117.5	2.17	1.45	0.45	0.21	0.06	0.93	1.16	0.07	
1974	1,548.8	5,396.0	0.28703	33.4	116.2	2.15	1.44	0.45	0.21	0.06	0.96	1.12	0.08	
1975	1,688.9	5,385.4	0.31361	35.7	113.7	2.11	1.39	0.45	0.21	0.06	0.94	1.10	0.08	
1976	1,877.6	5,675.4	0.33083	39.4	119.2	2.10	1.39	0.44	0.21	0.06	0.94	1.08	0.08	
1977	2,086.0	5,937.0	0.35136	43.3	123.3	2.08	1.38	0.43	0.21	0.06	0.94	1.06	0.08	
1978	2,356.6	6,267.2	0.37602	48.7	129.6	2.07	1.37	0.43	0.21	0.06	0.95	1.04	0.08	
1979	2,632.1	6,466.2	0.40706	55.4	136.0	2.10	1.41	0.42	0.22	0.06	0.99	1.03	0.08	
1980	2,862.5	6,450.4	0.44377	63.2	142.5	2.21	1.51	0.42	0.23	0.06	1.08	1.05	0.08	
1981	3,211.0	6,617.7	0.48521	72.3	149.0	2.25	1.57	0.40	0.22	0.06	1.12	1.05	0.08	
1982	3,345.0	6,491.3	0.51531	80.7	156.7	2.41	1.71	0.42	0.23	0.06	1.22	1.11	0.09	

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	GDP			Total R&D		R&D/GDP (%)								
	Current \$billions	Constant 2009 \$billions	Deflator ^a (2009 = 1.00000)	Current \$billions	Constant 2009 \$billions	Total	R&D, by performer				R&D, by source of funding			
							Business	Federal ^b	Higher education	Other ^c	Business	Federal	Other ^d	
1983	3,638.1	6,792.0	0.53564	89.9	167.9	2.47	1.75	0.44	0.23	0.06	1.24	1.14	0.09	
1984	4,040.7	7,285.0	0.55466	102.2	184.3	2.53	1.81	0.43	0.23	0.06	1.29	1.15	0.09	
1985	4,346.7	7,593.8	0.57240	114.7	200.3	2.64	1.90	0.44	0.24	0.06	1.33	1.21	0.09	
1986	4,590.2	7,860.5	0.58396	120.2	205.9	2.62	1.87	0.43	0.25	0.06	1.33	1.19	0.10	
1987	4,870.2	8,132.6	0.59885	126.4	211.0	2.59	1.85	0.42	0.26	0.06	1.28	1.20	0.11	
1988	5,252.6	8,474.5	0.61981	133.9	216.0	2.55	1.81	0.41	0.27	0.06	1.29	1.14	0.11	
1989	5,657.7	8,786.4	0.64392	141.9	220.4	2.51	1.77	0.40	0.28	0.06	1.33	1.07	0.11	
1990	5,979.6	8,955.0	0.66774	152.0	227.6	2.54	1.80	0.39	0.28	0.07	1.39	1.03	0.12	
1991	6,174.0	8,948.4	0.68996	160.9	233.2	2.61	1.86	0.38	0.29	0.08	1.49	0.98	0.13	
1992	6,539.3	9,266.6	0.70568	165.4	234.3	2.53	1.79	0.37	0.30	0.08	1.47	0.93	0.13	
1993	6,878.7	9,521.0	0.72248	165.7	229.4	2.41	1.68	0.36	0.30	0.08	1.40	0.88	0.13	
1994	7,308.8	9,905.4	0.73786	169.2	229.3	2.32	1.61	0.34	0.30	0.08	1.36	0.83	0.13	
1995	7,664.1	10,174.8	0.75324	183.6	243.8	2.40	1.69	0.33	0.30	0.08	1.45	0.82	0.13	
1996	8,100.2	10,561.0	0.76699	197.3	257.3	2.44	1.76	0.31	0.29	0.08	1.52	0.78	0.13	
1997	8,608.5	11,034.9	0.78012	211.9	271.6	2.46	1.81	0.29	0.29	0.08	1.58	0.75	0.13	
1998	9,089.2	11,525.9	0.78859	225.8	286.3	2.48	1.84	0.28	0.28	0.08	1.63	0.73	0.13	

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	GDP			Total R&D		R&D/GDP (%)							
	Current \$billions	Constant 2009 \$billions	Deflator ^a (2009 = 1.00000)	Current \$billions	Constant 2009 \$billions	Total	R&D, by performer				R&D, by source of funding		
							Business	Federal ^b	Higher education	Other ^c	Business	Federal	Other ^d
1999	9,660.6	12,065.9	0.80065	244.5	305.3	2.53	1.88	0.28	0.28	0.08	1.70	0.69	0.14
2000	10,284.8	12,559.7	0.81887	267.9	327.2	2.61	1.94	0.28	0.29	0.09	1.81	0.65	0.14
2001	10,621.8	12,682.2	0.83754	278.5	332.6	2.62	1.90	0.31	0.31	0.10	1.77	0.69	0.15
2002	10,977.5	12,908.8	0.85039	277.9	326.8	2.53	1.77	0.32	0.33	0.11	1.65	0.72	0.17
2003	11,510.7	13,271.1	0.86735	291.4	335.9	2.53	1.74	0.32	0.35	0.11	1.62	0.74	0.17
2004	12,274.9	13,773.5	0.89120	302.7	339.7	2.47	1.70	0.31	0.35	0.11	1.56	0.74	0.17
2005	13,093.7	14,234.2	0.91988	325.3	353.6	2.48	1.73	0.30	0.35	0.11	1.59	0.73	0.17
2006	13,855.9	14,613.8	0.94814	350.9	370.1	2.53	1.79	0.30	0.34	0.10	1.64	0.72	0.17
2007	14,477.6	14,873.7	0.97337	377.9	388.2	2.61	1.86	0.30	0.34	0.10	1.70	0.73	0.18
2008	14,718.6	14,830.4	0.99246	404.8	407.8	2.75	1.97	0.31	0.35	0.11	1.75	0.80	0.20
2009	14,418.7	14,418.7	1.00000	402.9	402.9	2.79	1.96	0.33	0.38	0.13	1.71	0.87	0.21
2010	14,964.4	14,783.8	1.01222	406.6	401.7	2.72	1.86	0.34	0.39	0.13	1.66	0.85	0.21
2011	15,517.9	15,020.6	1.03311	426.2	412.5	2.75	1.90	0.34	0.39	0.12	1.72	0.82	0.21
2012	16,155.3	15,354.6	1.05215	433.6	412.1	2.68	1.87	0.32	0.38	0.11	1.71	0.77	0.21
2013	16,691.5	15,612.2	1.06913	454.0	424.6	2.72	1.93	0.31	0.37	0.11	1.78	0.72	0.22
2014	17,427.6	16,013.3	1.08832	475.4	436.8	2.73	1.96	0.30	0.36	0.11	1.83	0.68	0.22

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	GDP			Total R&D		R&D/GDP (%)							
	Current \$billions	Constant 2009 \$billions	Deflator ^a (2009 = 1.00000)	Current \$billions	Constant 2009 \$billions	Total	R&D, by performer				R&D, by source of funding		
							Business	Federal ^b	Higher education	Other ^c	Business	Federal	Other ^d
2015 ^e	18,120.7	16,471.5	1.10012	495.1	450.1	2.73	1.96	0.30	0.36	0.11	1.84	0.67	0.23

GDP = gross domestic product.

^a Implicit price deflator for GDP.

^b Includes federal intramural R&D and that by federally funded R&D centers.

^c Includes R&D in the United States performed by nonfederal government and other nonprofit organizations.

^d Includes funding for U.S. R&D by nonfederal government, higher education, and other nonprofit organizations.

^e Data are preliminary and may later be revised.

Note(s)

Detail may not add to total because of rounding.

Source(s)

GDP figures from Bureau of Economic Analysis, National Economic Accounts, Gross Domestic Product, <https://www.bea.gov/national/>, accessed 29 August 2017; R&D figures from National Science Foundation, National Center for Science and Engineering Statistics, National Patterns of R&D Resources (annual series).

Science and Engineering Indicators 2018

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

APPENDIX TABLE 4-2

U.S. research and development expenditures, by performing sector and source of funds: 1953–2015

(Millions of current and of constant 2009 dollars)

Year	All per-formers	All federal	Federal intramural ^a	FFRDCs ^b		Nonfederal govern-ment ^c			Business ^d				Higher education ^e				Other nonprofit organizations ^f					
	All funding sources	Total	Federal	Total	Federal	Total	Own domestic	Federal	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal govern-ment	Busi-ness	Higher education	ONP	Total	Federal	Busi-ness	ONP	
Current \$millions																						
1953	5,160	1,146	1,015	131	131	NA	2,200	1,430	NA	NA	NA	273	149	40	21	37	27	112	58	26	28	
1954	5,621	1,127	963	165	165	NA	2,320	1,750	NA	NA	NA	301	165	45	24	40	29	123	61	31	31	
1955	6,185	1,292	973	319	319	NA	2,460	1,960	NA	NA	NA	342	191	50	27	42	32	132	65	35	32	
1956	8,501	1,692	1,131	561	561	NA	3,277	2,995	NA	NA	NA	391	221	57	32	46	36	146	71	37	38	
1957	9,908	1,985	1,297	688	688	NA	3,396	3,928	NA	NA	NA	433	242	64	37	51	40	167	79	37	51	
1958	10,915	2,163	1,507	657	657	NA	3,630	4,436	NA	NA	NA	491	280	72	39	56	45	195	95	38	62	
1959	12,490	2,470	1,681	789	789	NA	3,983	5,217	NA	NA	NA	586	356	81	40	61	50	234	125	42	67	
1960	13,711	2,711	1,801	910	910	NA	4,428	5,604	NA	NA	NA	705	453	90	40	67	55	264	148	48	68	
1961	14,564	3,074	1,987	1,087	1,087	NA	4,668	5,685	NA	NA	NA	834	557	101	40	75	62	304	169	49	86	
1962	15,636	3,244	2,188	1,056	1,056	NA	5,029	6,008	NA	NA	NA	993	687	112	41	84	70	363	200	54	109	
1963	17,519	3,717	2,559	1,159	1,159	NA	5,360	6,856	NA	NA	NA	1,178	839	125	41	96	78	408	234	55	119	
1964	19,103	4,263	2,966	1,297	1,297	NA	5,792	7,257	NA	NA	NA	1,375	995	138	41	114	88	417	250	55	112	
1965	20,253	4,374	3,157	1,218	1,218	NA	6,445	7,367	NA	NA	NA	1,595	1,167	150	42	136	101	472	286	62	124	
1966	22,072	4,525	3,308	1,217	1,217	NA	7,216	7,977	NA	NA	NA	1,818	1,335	160	45	165	114	537	329	70	138	

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All per-formers	All federal	Federal intramural ^a	FFRDCs ^b		Nonfederal govern-ment ^c	Business ^d						Higher education ^e				Other nonprofit organizations ^f					
	All funding sources	Total	Federal	Total	Federal	Total	Total	Own domestic	Federal	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal govern-ment	Busi-ness	Higher education	ONP	Total	Federal	Busi-ness	ONP
1967	23,347	4,785	3,445	1,340	1,340	NA	15,966	8,020	7,946	NA	NA	NA	2,035	1,491	168	52	200	126	561	342	74	145
1968	24,667	4,870	3,498	1,372	1,372	NA	17,014	8,869	8,145	NA	NA	NA	2,187	1,586	185	58	221	139	596	364	81	151
1969	25,996	5,230	3,790	1,440	1,440	NA	17,844	9,857	7,987	NA	NA	NA	2,280	1,624	208	61	233	155	642	388	93	161
1970	26,271	5,583	4,154	1,430	1,430	NA	17,594	10,288	7,306	NA	NA	NA	2,418	1,686	237	66	259	171	677	410	95	172
1971	26,952	5,849	4,409	1,441	1,441	NA	17,829	10,654	7,175	NA	NA	NA	2,565	1,760	262	72	290	182	709	427	98	184
1972	28,740	6,209	4,676	1,533	1,533	NA	19,004	11,535	7,469	NA	NA	NA	2,757	1,890	282	79	312	195	771	472	101	198
1973	30,952	6,413	4,837	1,576	1,576	NA	20,704	13,104	7,600	NA	NA	NA	2,954	2,009	301	90	344	210	882	566	105	211
1974	33,359	6,916	5,132	1,784	1,784	NA	22,239	14,667	7,572	NA	NA	NA	3,216	2,160	320	105	394	239	988	639	114	235
1975	35,671	7,580	5,561	2,019	2,019	NA	23,460	15,582	7,878	NA	NA	NA	3,570	2,400	348	118	432	272	1,062	675	124	262
1976	39,435	8,291	5,890	2,401	2,401	NA	26,107	17,436	8,671	NA	NA	NA	3,899	2,619	369	131	480	300	1,139	711	135	292
1977	43,338	8,916	6,211	2,704	2,704	NA	28,863	19,340	9,523	NA	NA	NA	4,346	2,893	394	155	569	337	1,213	740	147	326
1978	48,719	10,148	6,962	3,186	3,186	NA	32,222	22,115	10,107	NA	NA	NA	4,996	3,329	443	182	679	364	1,353	830	160	363
1979	55,379	11,038	7,471	3,567	3,567	NA	37,062	25,708	11,354	NA	NA	NA	5,715	3,848	482	215	785	386	1,564	985	174	405
1980	63,224	11,882	7,831	4,052	4,052	NA	43,228	30,476	12,752	NA	NA	NA	6,455	4,335	519	264	920	419	1,658	1,017	189	452
1981	72,292	12,998	8,605	4,393	4,393	NA	50,425	35,428	14,997	NA	NA	NA	7,085	4,670	581	314	1,058	463	1,784	1,075	206	504
1982	80,748	14,065	9,501	4,563	4,563	NA	57,166	40,105	17,061	NA	NA	NA	7,603	4,879	621	363	1,207	534	1,915	1,129	224	561
1983	89,949	15,840	10,830	5,011	5,011	NA	63,683	44,588	19,095	NA	NA	NA	8,251	5,210	658	432	1,357	595	2,175	1,306	244	626
1984	102,244	17,518	11,916	5,602	5,602	NA	73,061	51,404	21,657	NA	NA	NA	9,154	5,748	721	518	1,514	654	2,511	1,548	265	698

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All per-formers	All federal	Federal intramural ^a	FFRDCs ^b		Nonfederal govern-ment ^c	Business ^d						Higher education ^e				Other nonprofit organizations ^f					
	All funding sources	Total	Federal	Total	Federal	Total	Total	Own domestic	Federal	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal govern-ment	Busi-ness	Higher education	ONP	Total	Federal	Busi-ness	ONP
1985	114,671	19,227	13,093	6,134	6,134	NA	82,376	57,043	25,333	NA	NA	NA	10,308	6,388	834	630	1,743	713	2,761	1,694	289	778
1986	120,249	19,909	13,505	6,405	6,405	NA	85,932	59,932	26,000	NA	NA	NA	11,540	7,028	969	745	2,019	780	2,867	1,686	314	867
1987	126,360	20,380	13,588	6,792	6,792	NA	90,160	61,403	28,757	NA	NA	NA	12,807	7,768	1,065	831	2,262	882	3,013	1,704	342	967
1988	133,881	21,555	14,342	7,212	7,212	NA	94,893	66,672	28,221	NA	NA	NA	14,221	8,593	1,165	933	2,527	1,003	3,212	1,762	372	1,078
1989	141,891	22,728	15,231	7,497	7,497	NA	99,860	73,501	26,359	NA	NA	NA	15,634	9,317	1,274	1,061	2,852	1,131	3,669	2,062	405	1,202
1990	151,993	23,524	15,671	7,853	7,853	NA	107,404	81,602	25,802	NA	NA	NA	16,939	9,939	1,399	1,166	3,187	1,249	4,126	2,346	440	1,340
1991	160,876	23,343	15,249	8,093	8,093	NA	114,675	90,580	24,095	NA	NA	NA	18,206	10,667	1,483	1,242	3,458	1,358	4,652	2,679	479	1,494
1992	165,350	24,212	15,853	8,360	8,360	NA	116,757	94,388	22,369	NA	NA	NA	19,388	11,528	1,525	1,320	3,569	1,448	4,993	2,806	521	1,666
1993	165,730	24,534	16,531	8,003	8,003	NA	115,435	94,591	20,844	NA	NA	NA	20,495	12,307	1,557	1,392	3,709	1,531	5,267	2,843	567	1,857
1994	169,207	24,610	16,355	8,254	8,254	NA	117,392	97,131	20,261	NA	NA	NA	21,607	12,996	1,623	1,456	3,938	1,595	5,599	2,911	617	2,071
1995	183,625	25,352	16,904	8,448	8,448	NA	129,830	108,652	21,178	NA	NA	NA	22,617	13,592	1,751	1,548	4,110	1,617	5,827	2,847	671	2,308
1996	197,346	25,049	16,585	8,464	8,464	NA	142,371	121,015	21,356	NA	NA	NA	23,718	14,084	1,861	1,672	4,436	1,666	6,209	2,906	730	2,574
1997	211,894	25,232	16,819	8,413	8,413	NA	155,409	133,611	21,798	NA	NA	NA	24,627	14,317	1,902	1,788	4,852	1,767	6,626	3,014	809	2,804
1998	225,759	25,843	17,362	8,480	8,480	NA	167,102	145,016	22,086	NA	NA	NA	25,583	14,699	1,920	1,898	5,193	1,871	7,232	3,281	859	3,092
1999	244,451	26,846	18,142	8,704	8,704	NA	182,090	161,594	20,496	NA	NA	NA	27,475	15,714	2,036	2,020	5,654	2,050	8,040	3,761	931	3,349
2000	267,950	28,516	19,247	9,269	9,269	NA	199,961	182,844	17,117	NA	NA	NA	29,916	17,095	2,182	2,112	6,270	2,258	9,557	4,510	1,020	4,027
2001	278,539	32,812	22,374	10,438	10,056	NA	202,017	185,118	16,899	NA	NA	NA	32,750	18,976	2,319	2,120	6,874	2,461	10,960	5,488	1,029	4,443
2002	277,911	35,482	23,798	11,684	11,242	NA	193,868	177,467	16,401	NA	NA	NA	36,684	21,655	2,521	2,103	7,673	2,732	11,878	5,778	998	5,102

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All per-formers	All federal	Federal intramural ^a	FFRDCs ^b		Nonfederal govern-ment ^c		Business ^d					Higher education ^e				Other nonprofit organizations ^f					
	All funding sources	Total	Federal	Total	Federal	Total	Total	Own domestic	Federal	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal govern-ment	Busi-ness	Higher education	ONP	Total	Federal	Busi-ness	ONP
2003	291,365	37,235	24,982	12,253	11,841	NA	200,724	182,926	17,798	NA	NA	NA	40,577	24,567	2,756	2,090	8,286	2,879	12,829	5,945	1,020	5,864
2004	302,731	37,685	24,898	12,788	12,471	NA	208,301	188,035	20,266	NA	NA	NA	43,296	26,624	2,896	2,148	8,637	2,993	13,448	6,537	1,041	5,870
2005	325,288	39,568	26,322	13,246	12,894	NA	226,159	204,250	21,909	NA	NA	NA	45,490	27,743	2,945	2,279	9,353	3,170	14,072	6,545	1,107	6,420
2006	350,908	41,610	28,240	13,370	12,969	309	247,669	223,365	24,304	NA	NA	NA	47,369	28,277	3,059	2,464	10,176	3,394	13,952	6,044	1,182	6,726
2007	377,890	44,132	29,859	14,273	13,845	388	269,267	242,682	26,585	NA	NA	NA	49,430	28,725	3,308	2,697	10,933	3,767	14,674	5,980	1,257	7,438
2008	404,773	45,649	29,839	15,810	15,369	491	290,680	225,848	36,360	12,181	15,533	758	52,054	29,635	3,567	2,954	11,738	4,161	15,898	6,236	1,301	8,362
2009	402,931	47,572	30,560	17,013	16,571	606	282,393	221,104	39,573	9,567	11,464	685	54,909	31,741	3,679	3,033	12,056	4,400	17,452	7,097	1,258	9,097
2010	406,580	50,798	31,970	18,828	18,409	691	278,977	218,187	34,199	11,013	14,532	1,046	58,084	34,682	3,673	2,953	12,262	4,515	18,030	7,093	1,265	9,672
2011	426,160	53,524	34,950	18,574	18,176	694	294,092	235,426	31,309	11,124	15,351	882	60,089	35,742	3,615	2,999	13,104	4,630	17,762	6,564	1,333	9,865
2012	433,619	52,144	34,017	18,128	17,727	665	302,251	242,674	30,621	11,624	16,699	633	60,896	34,968	3,560	3,169	14,300	4,899	17,663	6,239	1,366	10,059
2013	453,964	51,086	33,406	17,680	17,296	620	322,528	259,908	29,362	13,450	18,795	1,013	61,546	33,839	3,643	3,375	15,378	5,312	18,185	5,970	1,444	10,770
2014	475,426	52,687	34,783	17,903	17,523	583	340,728	277,272	26,554	13,227	22,544	1,131	62,354	33,121	3,715	3,601	16,217	5,701	19,075	6,135	1,520	11,420
2015 ^g	495,144	54,322	35,673	18,649	18,287	610	355,821	289,892	26,990	14,595	23,102	1,242	64,653	33,546	3,772	3,842	17,334	6,159	19,738	6,189	1,572	11,978
Constant 2009 \$millions																						
1953	34,048	7,562	6,697	864	864	NA	23,952	14,516	9,436	NA	NA	NA	1,798	983	261	135	241	178	736	379	172	185
1954	36,745	7,368	6,293	1,075	1,075	NA	26,608	15,167	11,441	NA	NA	NA	1,968	1,075	291	154	258	190	801	396	203	203
1955	39,748	8,300	6,253	2,047	2,047	NA	28,405	15,809	12,596	NA	NA	NA	2,198	1,227	321	174	270	206	845	415	225	206
1956	52,831	10,513	7,026	3,487	3,487	NA	38,981	20,367	18,614	NA	NA	NA	2,430	1,374	351	196	286	224	907	441	230	236

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All per-formers	All federal	Federal intramural ^a	FFRDCs ^b		Nonfederal govern-ment ^c	Business ^d						Higher education ^e				Other nonprofit organizations ^f					
	All funding sources	Total	Federal	Total	Federal	Total	Total	Own domestic	Federal	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal govern-ment	Busi-ness	Higher education	ONP	Total	Federal	Busi-ness	ONP
1957	59,592	11,936	7,801	4,135	4,135	NA	44,050	20,425	23,625	NA	NA	NA	2,604	1,453	385	220	307	241	1,001	472	223	307
1958	64,206	12,724	8,862	3,862	3,862	NA	47,447	21,353	26,094	NA	NA	NA	2,888	1,647	424	229	326	262	1,147	559	224	365
1959	72,451	14,328	9,751	4,577	4,577	NA	53,369	23,105	30,264	NA	NA	NA	3,399	2,062	467	229	354	287	1,355	722	244	389
1960	78,453	15,509	10,302	5,207	5,207	NA	57,402	25,337	32,065	NA	NA	NA	4,031	2,589	515	229	383	315	1,511	847	275	389
1961	82,428	17,395	11,246	6,149	6,149	NA	58,595	26,419	32,175	NA	NA	NA	4,717	3,150	569	226	422	351	1,721	956	277	487
1962	87,421	18,134	12,230	5,904	5,904	NA	61,708	28,117	33,591	NA	NA	NA	5,549	3,838	626	226	470	389	2,030	1,118	302	609
1963	96,851	20,549	14,144	6,405	6,405	NA	67,534	29,632	37,902	NA	NA	NA	6,512	4,636	691	224	531	431	2,256	1,294	304	658
1964	104,011	23,208	16,146	7,062	7,062	NA	71,048	31,536	39,512	NA	NA	NA	7,484	5,418	749	221	618	479	2,270	1,361	299	610
1965	108,294	23,389	16,878	6,510	6,510	NA	73,855	34,463	39,393	NA	NA	NA	8,526	6,240	799	222	727	537	2,524	1,529	332	663
1966	114,799	23,532	17,205	6,327	6,327	NA	79,020	37,531	41,489	NA	NA	NA	9,456	6,943	832	234	856	590	2,790	1,709	364	718
1967	118,000	24,184	17,412	6,773	6,773	NA	80,695	40,535	40,161	NA	NA	NA	10,285	7,533	849	260	1,008	634	2,835	1,729	374	733
1968	119,577	23,606	16,955	6,651	6,651	NA	82,480	42,995	39,485	NA	NA	NA	10,602	7,689	894	279	1,069	671	2,889	1,765	393	732
1969	120,114	24,166	17,513	6,654	6,654	NA	82,449	45,545	36,904	NA	NA	NA	10,535	7,501	961	280	1,077	716	2,964	1,790	430	744
1970	115,302	24,504	18,231	6,274	6,274	NA	77,218	45,153	32,065	NA	NA	NA	10,610	7,397	1,040	287	1,135	750	2,969	1,797	417	755
1971	112,571	24,431	18,414	6,017	6,017	NA	74,467	44,499	29,968	NA	NA	NA	10,713	7,349	1,094	301	1,209	760	2,959	1,781	409	769
1972	115,066	24,857	18,720	6,138	6,138	NA	76,086	46,182	29,903	NA	NA	NA	11,038	7,567	1,129	316	1,247	779	3,085	1,888	404	793
1973	117,527	24,349	18,365	5,984	5,984	NA	78,614	49,757	28,858	NA	NA	NA	11,215	7,626	1,143	342	1,306	797	3,349	2,149	399	801
1974	116,224	24,097	17,881	6,215	6,215	NA	77,480	51,100	26,381	NA	NA	NA	11,205	7,525	1,113	364	1,371	831	3,442	2,225	398	820

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All per-formers	All federal	Federal intramural ^a	FFRDCs ^b		Nonfederal govern-ment ^c	Business ^d						Higher education ^e				Other nonprofit organizations ^f					
	All funding sources	Total	Federal	Total	Federal	Total	Total	Own domestic	Federal	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal govern-ment	Busi-ness	Higher education	ONP	Total	Federal	Busi-ness	ONP
1975	113,745	24,171	17,733	6,438	6,438	NA	74,807	49,686	25,121	NA	NA	NA	11,382	7,653	1,110	376	1,376	867	3,385	2,152	396	836
1976	119,199	25,060	17,804	7,256	7,256	NA	78,913	52,704	26,210	NA	NA	NA	11,784	7,916	1,115	396	1,451	905	3,442	2,149	409	884
1977	123,345	25,375	17,678	7,697	7,697	NA	82,147	55,044	27,104	NA	NA	NA	12,369	8,232	1,121	440	1,618	958	3,453	2,107	419	928
1978	129,565	26,988	18,515	8,473	8,473	NA	85,692	58,813	26,879	NA	NA	NA	13,285	8,852	1,178	483	1,806	967	3,600	2,207	426	967
1979	136,047	27,117	18,354	8,762	8,762	NA	91,049	63,156	27,893	NA	NA	NA	14,039	9,453	1,183	527	1,928	947	3,843	2,420	428	995
1980	142,470	26,776	17,646	9,130	9,130	NA	97,411	68,675	28,736	NA	NA	NA	14,546	9,767	1,168	594	2,072	944	3,737	2,292	427	1,018
1981	148,990	26,788	17,733	9,054	9,054	NA	103,923	73,015	30,908	NA	NA	NA	14,602	9,624	1,197	647	2,179	954	3,677	2,214	425	1,038
1982	156,699	27,294	18,438	8,855	8,855	NA	110,936	77,828	33,109	NA	NA	NA	14,753	9,467	1,205	704	2,341	1,035	3,716	2,191	435	1,090
1983	167,927	29,572	20,218	9,354	9,354	NA	118,890	83,242	35,649	NA	NA	NA	15,404	9,727	1,228	807	2,532	1,110	4,061	2,437	456	1,169
1984	184,335	31,583	21,483	10,101	10,101	NA	131,722	92,677	39,046	NA	NA	NA	16,503	10,362	1,300	933	2,730	1,178	4,527	2,790	479	1,258
1985	200,332	33,589	22,873	10,716	10,716	NA	143,913	99,656	44,257	NA	NA	NA	18,007	11,160	1,456	1,101	3,045	1,246	4,823	2,959	505	1,359
1986	205,920	34,094	23,126	10,968	10,968	NA	147,154	102,631	44,524	NA	NA	NA	19,762	12,034	1,659	1,276	3,457	1,336	4,910	2,887	538	1,485
1987	211,005	34,032	22,691	11,341	11,341	NA	150,555	102,535	48,020	NA	NA	NA	21,386	12,972	1,778	1,388	3,777	1,472	5,032	2,846	571	1,615
1988	216,002	34,776	23,139	11,637	11,637	NA	153,100	107,568	45,532	NA	NA	NA	22,944	13,864	1,880	1,505	4,077	1,618	5,183	2,843	600	1,740
1989	220,356	35,297	23,653	11,643	11,643	NA	155,082	114,147	40,935	NA	NA	NA	24,280	14,469	1,979	1,647	4,429	1,756	5,698	3,202	628	1,867
1990	227,623	35,229	23,469	11,760	11,760	NA	160,847	122,206	38,641	NA	NA	NA	25,368	14,885	2,095	1,745	4,772	1,870	6,179	3,513	659	2,007
1991	233,168	33,832	22,102	11,730	11,730	NA	166,206	131,284	34,923	NA	NA	NA	26,387	15,460	2,149	1,799	5,011	1,968	6,743	3,883	694	2,166
1992	234,312	34,311	22,465	11,846	11,846	NA	165,452	133,754	31,698	NA	NA	NA	27,474	16,335	2,161	1,870	5,057	2,051	7,075	3,976	738	2,361

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All per-formers	All federal	Federal intramural ^a	FFRDCs ^b		Nonfederal govern-ment ^c		Business ^d					Higher education ^e				Other nonprofit organizations ^f					
	All funding sources	Total	Federal	Total	Federal	Total	Total	Own domestic	Federal	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal govern-ment	Busi-ness	Higher education	ONP	Total	Federal	Busi-ness	ONP
1993	229,392	33,958	22,880	11,077	11,077	NA	159,777	130,926	28,851	NA	NA	NA	28,367	17,034	2,155	1,926	5,133	2,118	7,291	3,935	785	2,571
1994	229,321	33,353	22,166	11,187	11,187	NA	159,098	131,639	27,459	NA	NA	NA	29,283	17,612	2,199	1,973	5,337	2,161	7,588	3,945	836	2,806
1995	243,780	33,657	22,441	11,215	11,215	NA	172,361	144,246	28,116	NA	NA	NA	30,026	18,045	2,325	2,054	5,456	2,146	7,736	3,780	891	3,065
1996	257,299	32,658	21,623	11,035	11,035	NA	185,623	157,779	27,844	NA	NA	NA	30,923	18,363	2,426	2,179	5,783	2,171	8,096	3,788	952	3,355
1997	271,619	32,344	21,560	10,785	10,785	NA	199,213	171,271	27,942	NA	NA	NA	31,568	18,353	2,438	2,293	6,219	2,265	8,494	3,864	1,037	3,594
1998	286,282	32,771	22,017	10,754	10,754	NA	211,900	183,893	28,007	NA	NA	NA	32,441	18,640	2,435	2,407	6,585	2,373	9,170	4,160	1,089	3,921
1999	305,315	33,530	22,659	10,871	10,871	NA	227,427	201,828	25,599	NA	NA	NA	34,315	19,627	2,544	2,524	7,061	2,560	10,042	4,697	1,162	4,183
2000	327,218	34,823	23,504	11,319	11,319	NA	244,190	223,287	20,903	NA	NA	NA	36,533	20,876	2,665	2,579	7,656	2,757	11,671	5,508	1,245	4,918
2001	332,570	39,177	26,715	12,462	12,006	NA	241,204	221,027	20,177	NA	NA	NA	39,103	22,657	2,769	2,531	8,207	2,939	13,086	6,552	1,229	5,305
2002	326,805	41,724	27,984	13,740	13,219	NA	227,976	208,689	19,286	NA	NA	NA	43,138	25,464	2,965	2,473	9,023	3,213	13,967	6,794	1,174	5,999
2003	335,926	42,930	28,803	14,127	13,652	NA	231,422	210,902	20,520	NA	NA	NA	46,782	28,324	3,177	2,410	9,553	3,319	14,791	6,854	1,176	6,761
2004	339,690	42,286	27,937	14,349	13,993	NA	233,732	210,992	22,740	NA	NA	NA	48,582	29,874	3,249	2,410	9,691	3,358	15,090	7,335	1,168	6,587
2005	353,622	43,014	28,615	14,399	14,017	NA	245,858	222,041	23,817	NA	NA	NA	49,452	30,159	3,202	2,477	10,167	3,446	15,297	7,115	1,203	6,980
2006	370,102	43,886	29,784	14,101	13,678	325	261,216	235,583	25,633	NA	NA	NA	49,960	29,823	3,227	2,598	10,732	3,579	14,715	6,374	1,247	7,094
2007	388,229	45,339	30,676	14,663	14,224	399	276,634	249,322	27,312	NA	NA	NA	50,782	29,511	3,399	2,771	11,232	3,870	15,075	6,143	1,291	7,641
2008	407,848	45,995	30,066	15,930	15,485	495	292,888	227,564	36,636	12,274	15,651	764	52,450	29,860	3,594	2,976	11,827	4,193	16,019	6,283	1,310	8,426
2009	402,931	47,572	30,560	17,013	16,571	606	282,393	221,104	39,573	9,567	11,464	685	54,909	31,741	3,679	3,033	12,056	4,400	17,452	7,097	1,258	9,097
2010	401,673	50,185	31,584	18,601	18,187	683	275,610	215,554	33,786	10,880	14,357	1,033	57,383	34,263	3,629	2,917	12,114	4,460	17,812	7,008	1,250	9,555

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All per-formers	All federal	Federal intramural ^a	FFRDCs ^b		Nonfederal govern-ment ^c	Business ^d						Higher education ^e				Other nonprofit organizations ^f					
	All funding sources	Total	Federal	Total	Federal	Total	Total	Own domestic	Federal	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal govern-ment	Busi-ness	Higher education	ONP	Total	Federal	Busi-ness	ONP
2011	412,503	51,809	33,830	17,978	17,593	672	284,667	227,881	30,306	10,768	14,859	854	58,163	34,597	3,499	2,902	12,684	4,482	17,193	6,354	1,290	9,549
2012	412,127	49,560	32,331	17,229	16,849	632	287,271	230,646	29,103	11,048	15,871	602	57,877	33,234	3,384	3,012	13,591	4,656	16,788	5,930	1,298	9,560
2013	424,610	47,783	31,246	16,537	16,178	580	301,673	243,102	27,463	12,580	17,580	947	57,566	31,650	3,407	3,156	14,383	4,969	17,009	5,584	1,351	10,074
2014	436,844	48,411	31,961	16,451	16,101	536	313,077	254,771	24,399	12,154	20,714	1,039	57,293	30,433	3,413	3,309	14,901	5,238	17,527	5,637	1,397	10,493
2015 ^g	450,080	49,378	32,427	16,951	16,622	555	323,437	263,508	24,534	13,267	20,999	1,129	58,768	30,493	3,429	3,492	15,756	5,598	17,942	5,625	1,429	10,888

NA = not available.

FFRDC = federally funded research and development center; HE = higher education; ONP = other nonprofit organization.

^a Includes expenditures for federal intramural R&D as well as costs associated with administering extramural R&D.

^b The R&D expenditures of FFRDCs are chiefly federally funded; the small remainder (\$362 million of the \$18.6 billion total in 2015) reflects funding from state or local government, businesses, other nonprofit organizations, and other sources (see Appendix Table 4-6 for further detail on this nonfederal funding). Before 2001, the data did not distinguish federal and nonfederal funding for FFRDC R&D and are reported as all federal funding. In 1953-54, federal funding for business R&D did not separate out industry-administered FFRDCs, and the data for federal funding to business for these years includes the funding to these FFRDCs. Also in 1953-54, federal funding for other nonprofit organizations did not separate out nonprofit-administered FFRDCs, and the data for federal funding to other nonprofit organizations for these years include the funding to these FFRDCs.

^c State intramural R&D performance includes state agency and department employees and also services performed by others in support of internal R&D projects. Includes funding from both federal and nonfederal government sources (see Appendix Table 4-6 for further detail). Data on state government intramural R&D became available starting in 2006.

^d R&D performed in the domestic United States by all companies with five or more employees, publicly or privately held. In 2008 and later years, the data on business R&D come from the National Science Foundation's (NSF's) annual Business R&D and Innovation Survey (BRDIS). BRDIS distinguishes R&D performed and paid for by the company from R&D performed by the company but paid for by one or more others (i.e., the federal government, state or local government, domestic companies, foreign companies, foreign governments, other organizations inside or outside the United States). Before 2008, the data distinguished only federally and nonfederally funded business R&D; for these years, the own funding data column includes all nonfederal sources of funding. Business R&D performance in the United States paid for by foreign business includes funding from parent or unaffiliated businesses outside the United States (\$16.3 billion in 2015) and funding from U.S. businesses' foreign subsidiaries (\$6.8 billion in 2015). Business R&D performance funded by other sources includes U.S. state government, foreign government, and all other sources in the United States and abroad.

^e Before 2003, higher education R&D covered only S&E fields; in 2003 and later years, R&D in non-S&E fields is also included. (Non-S&E R&D was \$1.4 billion in 2003 and \$3.7 billion in 2015.) In 1998 and later years, the higher education R&D data have been adjusted to eliminate double counting of R&D funds passed through from academic institutions to other academic and nonacademic (businesses, nonprofit organizations, others) subrecipients. (In FY 1998, the total of pass-through funds reported was \$994 million, with \$479 million to other academic recipients and \$337 million nonacademic recipients. In FY 2015, total pass-through was \$5.640 billion, with \$3.107 billion to other academic recipients and \$2.537 billion to nonacademic recipients.) The nonfederal government funding category includes support from state and local government. The other nonprofit funding category includes support from nonprofit organizations and other sources not elsewhere classified (in 2015, \$4.139 billion was from nonprofit organizations, and \$2.020 billion was from these unclassified other sources).

^f The data on other nonprofit R&D funded by the federal government come from NSF's annual Federal Funds for R&D survey. The other nonprofit R&D funded by nonfederal government is included in the ONP category. The 1998-2015 data for other components funded by businesses and by the nonprofit sector itself are estimated, based on parameters from the 1996-97 Survey of R&D Funding and Performance by Nonprofit Organizations.

^g Some data for 2015 are preliminary and may later be revised.

Note(s)



CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Detail may not add to total because of rounding. Constant-dollar estimates are derived from unrounded data. For trend comparisons, use only the historical data reported in this table because some back-year data may have been revised. Except for the nonprofit sector, data are based on annual reports by performers in NSF's annual R&D expenditure surveys: Business R&D and Innovation Survey, Higher Education R&D Survey, Survey of Federal Funds for R&D, FFRDC R&D Expenditures Survey, Survey of State Government R&D. R&D expenditures by business performers—and, before 2001, also industry-administered FFRDCs—are collected on a calendar year basis. Expenditures for other performers are calendar year approximations based on fiscal year data. For federal performers in 1977 and afterwards, the approximation equals 75% of the amount reported in the same fiscal year plus 25% of the amount reported in the subsequent fiscal year. Prior to 1977, the federal fiscal year began on 1 July, not 1 October, and the approximation is 50% of the amount reported in the same fiscal year plus 50% of the amount reported in the subsequent fiscal year. The fiscal year for higher education performers and state government performers generally begins 1 July, and the calendar year approximation is 50% of the amount reported in the same fiscal year plus 50% of the amount reported in the subsequent fiscal year.

Source(s)

National Science Foundation, National Center for Science and Engineering Statistics, National Patterns of R&D Resources (annual series).

Science and Engineering Indicators 2018

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

APPENDIX TABLE 4-3

U.S. basic research expenditures, by performing sector and source of funds: 1953–2015

(Millions of current and of constant 2009 dollars)

Year	All per-formers	All federal	Federal intramural ^a	FFRDCs ^b		Nonfederal govern-ment ^c		Business ^d					Higher education ^e				Other nonprofit organizations ^f					
	All funding sources	Total	Federal	Total	Federal	Total	Own domestic	Federal	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal government	Busi-ness	Higher ed-ucation	ONP	Total	Federal	Busi-ness	ONP	
Current \$millions																						
1953	460	138	102	36	36	NA	151	132	19	NA	NA	NA	123	82	7	13	6	16	48	27	9	12
1954	509	141	96	45	45	NA	166	143	23	NA	NA	NA	148	97	10	15	8	18	55	31	11	13
1955	570	160	98	62	62	NA	169	162	7	NA	NA	NA	180	117	14	17	12	21	62	35	13	14
1956	718	203	114	89	89	NA	223	216	7	NA	NA	NA	220	143	19	20	15	24	73	41	15	17
1957	813	234	124	110	110	NA	234	230	4	NA	NA	NA	261	167	25	23	20	27	86	48	15	23
1958	943	264	149	115	115	NA	266	252	14	NA	NA	NA	312	202	31	24	24	31	102	58	16	28
1959	1,087	298	165	134	134	NA	282	248	34	NA	NA	NA	388	263	38	24	28	36	119	71	18	30
1960	1,286	334	184	150	150	NA	333	297	36	NA	NA	NA	485	341	45	25	33	41	135	84	21	30
1961	1,511	407	230	177	177	NA	344	314	30	NA	NA	NA	598	432	54	25	40	48	163	104	22	37
1962	1,824	441	252	189	189	NA	449	345	104	NA	NA	NA	737	546	64	25	48	55	198	128	24	46
1963	2,115	501	285	216	216	NA	484	375	109	NA	NA	NA	909	689	75	25	58	63	222	147	25	50
1964	2,396	584	339	245	245	NA	507	384	123	NA	NA	NA	1,071	824	84	25	70	68	235	163	25	47
1965	2,664	625	375	250	250	NA	563	406	157	NA	NA	NA	1,221	944	94	27	86	70	256	175	29	52
1966	2,930	683	410	273	273	NA	593	451	142	NA	NA	NA	1,380	1,066	104	29	106	75	274	184	32	58

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All per-formers	All federal	Federal intramural ^a	FFRDCs ^b		Nonfederal govern-ment ^c	Business ^d						Higher education ^e				Other nonprofit organizations ^f					
	All funding sources	Total	Federal	Total	Federal	Total	Total	Own domestic	Federal	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal government	Busi-ness	Higher ed-ucation	ONP	Total	Federal	Busi-ness	ONP
1967	3,168	735	434	301	301	NA	595	427	168	NA	NA	NA	1,554	1,188	114	34	136	83	285	190	34	61
1968	3,376	797	482	315	315	NA	607	462	145	NA	NA	NA	1,681	1,265	131	38	156	91	292	192	37	63
1969	3,491	858	545	313	313	NA	581	458	123	NA	NA	NA	1,754	1,288	153	40	171	103	298	188	43	67
1970	3,594	866	562	304	304	NA	566	444	122	NA	NA	NA	1,855	1,323	179	43	196	115	307	191	44	72
1971	3,720	870	581	289	289	NA	557	456	101	NA	NA	NA	1,968	1,385	194	50	214	127	326	204	45	77
1972	3,850	915	603	313	313	NA	554	463	91	NA	NA	NA	2,038	1,437	195	55	216	134	344	213	47	84
1973	4,099	1,034	652	382	382	NA	595	499	96	NA	NA	NA	2,103	1,489	196	59	223	137	368	229	49	90
1974	4,511	1,182	715	467	467	NA	650	536	114	NA	NA	NA	2,282	1,609	204	66	250	153	397	242	54	102
1975	4,875	1,292	760	533	533	NA	677	573	104	NA	NA	NA	2,480	1,768	212	72	264	164	426	251	59	116
1976	5,373	1,479	850	629	629	NA	750	634	116	NA	NA	NA	2,675	1,924	218	75	283	175	470	274	65	131
1977	6,008	1,689	943	746	746	NA	836	701	135	NA	NA	NA	2,967	2,114	232	89	334	198	517	297	72	148
1978	6,959	2,049	1,044	1,005	1,005	NA	941	785	156	NA	NA	NA	3,376	2,399	260	107	398	213	593	346	79	168
1979	7,836	2,272	1,112	1,160	1,160	NA	1,054	893	161	NA	NA	NA	3,828	2,719	286	128	466	229	683	406	87	190
1980	8,747	2,506	1,212	1,294	1,294	NA	1,205	1,035	170	NA	NA	NA	4,315	3,061	307	156	544	248	721	411	95	215
1981	9,658	2,773	1,343	1,430	1,430	NA	1,477	1,313	164	NA	NA	NA	4,737	3,331	338	183	615	269	671	324	105	243
1982	10,651	3,025	1,522	1,503	1,503	NA	1,776	1,523	253	NA	NA	NA	5,091	3,475	368	215	716	317	759	369	115	275
1983	11,880	3,393	1,733	1,661	1,661	NA	2,106	1,760	346	NA	NA	NA	5,518	3,689	396	260	816	358	863	426	127	311
1984	13,332	3,731	1,877	1,854	1,854	NA	2,472	2,132	340	NA	NA	NA	6,145	4,087	436	313	915	395	984	494	139	351

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All per-formers	All federal	Federal intramural ^a	FFRDCs ^b		Nonfederal government ^c	Business ^d						Higher education ^e				Other nonprofit organizations ^f					
	All funding sources	Total	Federal	Total	Federal	Total	Total	Own domestic	Federal	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal government	Busi-ness	Higher ed-ucation	ONP	Total	Federal	Busi-ness	ONP
1985	14,748	3,884	1,947	1,936	1,936	NA	2,731	2,373	358	NA	NA	NA	7,024	4,606	514	389	1,075	440	1,110	560	153	397
1986	17,154	4,071	2,026	2,045	2,045	NA	3,930	3,496	434	NA	NA	NA	7,943	5,122	606	466	1,262	488	1,210	594	168	449
1987	18,481	4,290	2,047	2,242	2,242	NA	4,181	3,583	598	NA	NA	NA	8,644	5,527	659	514	1,399	545	1,367	675	185	507
1988	19,787	4,749	2,116	2,633	2,633	NA	4,163	3,507	656	NA	NA	NA	9,344	5,937	705	565	1,530	607	1,531	756	203	573
1989	21,891	5,124	2,309	2,815	2,815	NA	4,818	3,832	986	NA	NA	NA	10,219	6,422	766	637	1,714	680	1,730	860	223	647
1990	23,029	5,352	2,319	3,033	3,033	NA	4,629	3,760	869	NA	NA	NA	11,126	6,889	847	705	1,929	756	1,922	947	245	730
1991	27,140	5,573	2,378	3,195	3,195	NA	7,376	6,125	1,251	NA	NA	NA	12,062	7,423	912	764	2,127	836	2,129	1,036	269	825
1992	27,604	5,826	2,419	3,408	3,408	NA	6,528	5,816	712	NA	NA	NA	12,910	8,058	941	814	2,203	893	2,340	1,114	295	931
1993	28,743	6,138	2,621	3,517	3,517	NA	6,427	5,961	466	NA	NA	NA	13,646	8,638	952	851	2,268	936	2,532	1,157	324	1,051
1994	29,651	6,058	2,547	3,512	3,512	NA	6,514	6,078	436	NA	NA	NA	14,401	9,139	992	890	2,406	974	2,678	1,137	356	1,186
1995	29,610	5,996	2,689	3,307	3,307	NA	5,569	5,379	190	NA	NA	NA	15,147	9,634	1,070	945	2,511	987	2,899	1,170	390	1,338
1996	32,799	6,073	2,680	3,393	3,393	NA	7,498	6,848	650	NA	NA	NA	16,042	10,092	1,149	1,032	2,740	1,028	3,187	1,248	428	1,510
1997	36,717	6,150	2,746	3,404	3,404	NA	9,795	8,766	1,029	NA	NA	NA	17,449	10,758	1,233	1,161	3,150	1,147	3,322	1,317	449	1,557
1998	34,842	6,444	3,003	3,441	3,441	NA	5,853	4,851	1,002	NA	NA	NA	18,891	11,567	1,292	1,278	3,495	1,259	3,654	1,461	477	1,717
1999	38,282	7,066	3,347	3,719	3,719	NA	6,645	5,537	1,108	NA	NA	NA	20,462	12,456	1,386	1,375	3,848	1,396	4,110	1,734	517	1,860
2000	42,033	7,801	3,765	4,037	4,037	NA	7,040	6,115	925	NA	NA	NA	22,290	13,469	1,501	1,453	4,314	1,553	4,902	2,099	566	2,236
2001	46,843	8,832	4,260	4,571	4,404	NA	8,053	7,299	754	NA	NA	NA	24,455	14,919	1,606	1,467	4,759	1,704	5,503	2,464	571	2,467
2002	50,789	9,737	4,511	5,227	5,029	NA	7,547	6,659	888	NA	NA	NA	27,543	17,139	1,745	1,456	5,311	1,891	5,962	2,575	554	2,833

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All per-formers	All federal	Federal intramural ^a	FFRDCs ^b		Nonfederal govern-ment ^c	Business ^d						Higher education ^e				Other nonprofit organizations ^f					
	All funding sources	Total	Federal	Total	Federal	Total	Total	Own domestic	Federal	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal government	Busi-ness	Higher ed-ucation	ONP	Total	Federal	Busi-ness	ONP
2003	54,823	9,739	4,664	5,075	4,904	NA	8,330	6,944	1,386	NA	NA	NA	30,217	19,220	1,893	1,436	5,692	1,978	6,537	2,714	567	3,256
2004	56,379	9,672	4,697	4,976	4,852	NA	7,835	6,763	1,072	NA	NA	NA	32,246	20,730	2,000	1,483	5,965	2,067	6,626	2,788	578	3,259
2005	59,904	9,907	4,770	5,136	5,000	NA	8,667	7,559	1,108	NA	NA	NA	34,248	21,786	2,068	1,600	6,568	2,226	7,082	2,903	614	3,565
2006	61,566	9,953	4,716	5,238	5,080	44	8,384	6,940	1,444	NA	NA	NA	35,944	22,270	2,191	1,765	7,288	2,431	7,240	2,849	656	3,735
2007	64,600	8,053	4,621	3,432	3,298	55	11,268	8,488	2,780	NA	NA	NA	37,568	22,546	2,400	1,956	7,932	2,733	7,656	2,829	698	4,130
2008	68,536	8,533	4,957	3,576	3,432	70	12,369	9,741	1,475	484	639	30	39,127	22,954	2,573	2,131	8,467	3,002	8,439	3,073	722	4,643
2009	72,659	10,012	5,441	4,571	4,432	86	14,784	11,999	1,340	662	736	47	38,529	22,909	2,444	1,980	8,199	2,997	9,248	3,498	698	5,051
2010	75,907	11,748	5,111	6,637	6,475	98	16,371	13,239	1,406	722	935	68	38,203	23,412	2,251	1,750	7,882	2,910	9,487	3,414	702	5,370
2011	73,019	11,522	5,047	6,475	6,333	98	13,020	10,585	677	745	954	59	39,080	23,787	2,219	1,767	8,348	2,960	9,298	3,081	740	5,477
2012	73,284	11,150	5,489	5,661	5,530	94	13,294	10,955	644	710	946	39	39,311	23,111	2,176	1,828	9,083	3,113	9,436	3,092	758	5,585
2013	78,485	9,519	5,330	4,188	4,085	88	19,508	14,986	1,196	1,446	1,771	109	39,558	22,313	2,188	1,939	9,765	3,354	9,813	3,031	802	5,980
2014	82,061	9,875	5,705	4,170	4,077	97	21,936	15,805	2,044	1,584	2,367	135	39,878	21,813	2,228	2,057	10,220	3,562	10,275	3,090	844	6,341
2015 ^g	83,462	10,053	5,926	4,127	4,043	100	21,792	15,933	2,038	1,565	2,123	133	40,983	21,888	2,277	2,176	10,880	3,763	10,534	3,010	873	6,651
Constant 2009 \$millions																						
1953	3,032	907	670	238	238	NA	996	871	125	NA	NA	NA	812	538	43	86	40	106	317	178	59	79
1954	3,324	919	628	291	291	NA	1,085	935	150	NA	NA	NA	964	631	62	98	55	118	356	199	72	85
1955	3,663	1,025	627	398	398	NA	1,086	1,041	45	NA	NA	NA	1,154	749	89	109	75	132	398	225	84	90
1956	4,461	1,259	705	553	553	NA	1,384	1,342	42	NA	NA	NA	1,367	886	118	121	96	146	451	252	93	106

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All per-formers	All federal	Federal intramural ^a	FFRDCs ^b		Nonfederal government ^c	Business ^d						Higher education ^e				Other nonprofit organizations ^f					
	All funding sources	Total	Federal	Total	Federal	Total	Total	Own domestic	Federal	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal government	Busi-ness	Higher ed-ucation	ONP	Total	Federal	Busi-ness	ONP
1957	4,893	1,404	746	659	659	NA	1,407	1,383	24	NA	NA	NA	1,567	1,001	149	135	119	162	514	286	90	138
1958	5,548	1,553	876	676	676	NA	1,562	1,482	80	NA	NA	NA	1,835	1,188	183	141	141	182	597	338	94	165
1959	6,305	1,729	954	774	774	NA	1,636	1,439	197	NA	NA	NA	2,251	1,523	218	139	165	206	690	412	104	174
1960	7,356	1,908	1,050	858	858	NA	1,903	1,699	204	NA	NA	NA	2,772	1,948	258	140	192	235	772	481	120	172
1961	8,552	2,301	1,299	1,002	1,002	NA	1,950	1,777	173	NA	NA	NA	3,382	2,442	304	141	225	269	920	586	125	209
1962	10,199	2,466	1,409	1,057	1,057	NA	2,512	1,929	583	NA	NA	NA	4,118	3,050	356	140	267	305	1,104	713	134	257
1963	11,694	2,767	1,573	1,194	1,194	NA	2,678	2,073	604	NA	NA	NA	5,022	3,809	414	135	318	346	1,227	813	138	276
1964	13,046	3,180	1,846	1,334	1,334	NA	2,760	2,091	670	NA	NA	NA	5,829	4,484	459	136	379	370	1,277	885	136	256
1965	14,245	3,339	2,003	1,337	1,337	NA	3,010	2,171	840	NA	NA	NA	6,526	5,045	505	142	460	374	1,369	936	155	278
1966	15,239	3,552	2,132	1,420	1,420	NA	3,084	2,346	739	NA	NA	NA	7,178	5,544	539	151	554	390	1,425	957	166	302
1967	16,009	3,712	2,191	1,521	1,521	NA	3,007	2,158	849	NA	NA	NA	7,852	6,002	575	169	686	419	1,438	958	172	308
1968	16,366	3,861	2,337	1,525	1,525	NA	2,943	2,240	703	NA	NA	NA	8,147	6,132	634	182	757	441	1,416	931	179	305
1969	16,129	3,965	2,519	1,446	1,446	NA	2,685	2,116	568	NA	NA	NA	8,102	5,949	706	183	791	474	1,377	869	199	310
1970	15,773	3,801	2,466	1,334	1,334	NA	2,484	1,949	535	NA	NA	NA	8,141	5,804	787	189	859	503	1,347	838	193	316
1971	15,538	3,632	2,427	1,205	1,205	NA	2,326	1,905	422	NA	NA	NA	8,220	5,783	809	207	893	528	1,360	850	188	322
1972	15,414	3,663	2,412	1,251	1,251	NA	2,218	1,854	364	NA	NA	NA	8,157	5,753	782	220	865	536	1,375	851	188	336
1973	15,566	3,926	2,476	1,450	1,450	NA	2,259	1,895	365	NA	NA	NA	7,985	5,652	746	222	847	518	1,395	868	186	342
1974	15,715	4,117	2,490	1,627	1,627	NA	2,265	1,867	397	NA	NA	NA	7,949	5,606	710	230	871	531	1,384	841	188	355

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All per-formers	All federal	Federal intramural ^a	FFRDCs ^b		Nonfederal government ^c	Business ^d						Higher education ^e				Other nonprofit organizations ^f					
	All funding sources	Total	Federal	Total	Federal	Total	Total	Own domestic	Federal	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal government	Busi-ness	Higher ed-ucation	ONP	Total	Federal	Busi-ness	ONP
1975	15,544	4,121	2,423	1,698	1,698	NA	2,159	1,827	332	NA	NA	NA	7,906	5,638	677	228	840	523	1,358	800	189	368
1976	16,241	4,471	2,569	1,901	1,901	NA	2,267	1,916	351	NA	NA	NA	8,084	5,816	658	227	856	527	1,419	827	197	395
1977	17,100	4,807	2,684	2,123	2,123	NA	2,379	1,995	384	NA	NA	NA	8,443	6,017	660	253	951	562	1,471	845	204	422
1978	18,506	5,450	2,777	2,673	2,673	NA	2,503	2,088	415	NA	NA	NA	8,978	6,380	691	283	1,059	565	1,576	920	210	446
1979	19,252	5,582	2,733	2,849	2,849	NA	2,589	2,194	396	NA	NA	NA	9,403	6,680	702	313	1,145	563	1,677	998	213	466
1980	19,710	5,648	2,732	2,916	2,916	NA	2,715	2,332	383	NA	NA	NA	9,723	6,897	691	351	1,226	559	1,624	925	215	484
1981	19,904	5,714	2,767	2,947	2,947	NA	3,044	2,706	338	NA	NA	NA	9,762	6,865	697	377	1,268	555	1,384	667	216	501
1982	20,668	5,869	2,953	2,917	2,917	NA	3,447	2,956	491	NA	NA	NA	9,880	6,743	714	418	1,390	615	1,473	716	224	533
1983	22,179	6,335	3,235	3,100	3,100	NA	3,932	3,286	646	NA	NA	NA	10,302	6,886	739	485	1,524	668	1,611	795	236	580
1984	24,036	6,726	3,383	3,343	3,343	NA	4,457	3,844	613	NA	NA	NA	11,078	7,368	785	564	1,649	712	1,775	891	251	633
1985	25,766	6,785	3,402	3,383	3,383	NA	4,771	4,146	625	NA	NA	NA	12,271	8,046	899	679	1,879	768	1,939	978	267	693
1986	29,375	6,971	3,469	3,503	3,503	NA	6,730	5,987	743	NA	NA	NA	13,601	8,770	1,037	798	2,161	835	2,072	1,016	288	768
1987	30,861	7,163	3,419	3,745	3,745	NA	6,982	5,983	999	NA	NA	NA	14,434	9,229	1,100	858	2,337	910	2,282	1,128	308	846
1988	31,924	7,661	3,414	4,247	4,247	NA	6,717	5,658	1,058	NA	NA	NA	15,075	9,578	1,138	911	2,468	980	2,471	1,220	327	924
1989	33,996	7,958	3,585	4,372	4,372	NA	7,482	5,951	1,531	NA	NA	NA	15,870	9,973	1,189	990	2,662	1,056	2,686	1,336	346	1,004
1990	34,488	8,015	3,473	4,543	4,543	NA	6,932	5,631	1,301	NA	NA	NA	16,662	10,316	1,268	1,056	2,889	1,132	2,878	1,418	366	1,094
1991	39,336	8,077	3,447	4,631	4,631	NA	10,691	8,877	1,813	NA	NA	NA	17,482	10,759	1,322	1,107	3,083	1,211	3,086	1,501	389	1,195
1992	39,116	8,256	3,427	4,829	4,829	NA	9,251	8,242	1,009	NA	NA	NA	18,294	11,419	1,334	1,154	3,121	1,266	3,316	1,579	418	1,319

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All per-formers	All federal	Federal intramural ^a	FFRDCs ^b		Nonfederal government ^c		Business ^d					Higher education ^e				Other nonprofit organizations ^f					
	All funding sources	Total	Federal	Total	Federal	Total	Total	Own domestic	Federal	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal government	Busi-ness	Higher ed-ucation	ONP	Total	Federal	Busi-ness	ONP
1993	39,783	8,496	3,628	4,868	4,868	NA	8,896	8,251	645	NA	NA	NA	18,888	11,956	1,318	1,178	3,140	1,296	3,504	1,601	448	1,455
1994	40,185	8,211	3,452	4,759	4,759	NA	8,828	8,237	591	NA	NA	NA	19,517	12,385	1,344	1,206	3,261	1,320	3,630	1,541	482	1,607
1995	39,311	7,961	3,570	4,390	4,390	NA	7,393	7,141	252	NA	NA	NA	20,108	12,789	1,420	1,255	3,333	1,311	3,848	1,553	518	1,777
1996	42,763	7,917	3,494	4,424	4,424	NA	9,776	8,928	847	NA	NA	NA	20,915	13,158	1,498	1,346	3,572	1,341	4,155	1,628	559	1,969
1997	47,065	7,883	3,520	4,363	4,363	NA	12,556	11,237	1,319	NA	NA	NA	22,368	13,791	1,581	1,488	4,037	1,471	4,259	1,688	576	1,995
1998	44,183	8,171	3,808	4,363	4,363	NA	7,422	6,151	1,271	NA	NA	NA	23,955	14,668	1,639	1,620	4,432	1,597	4,634	1,852	605	2,177
1999	47,814	8,825	4,180	4,645	4,645	NA	8,299	6,916	1,384	NA	NA	NA	25,556	15,558	1,731	1,718	4,807	1,743	5,133	2,166	645	2,323
2000	51,331	9,527	4,598	4,929	4,929	NA	8,597	7,468	1,130	NA	NA	NA	27,221	16,448	1,833	1,774	5,268	1,897	5,986	2,564	691	2,731
2001	55,929	10,545	5,087	5,458	5,258	NA	9,615	8,715	900	NA	NA	NA	29,199	17,813	1,917	1,752	5,682	2,035	6,570	2,942	682	2,946
2002	59,724	11,451	5,304	6,147	5,914	NA	8,875	7,831	1,044	NA	NA	NA	32,388	20,154	2,052	1,713	6,246	2,224	7,010	3,028	652	3,331
2003	63,208	11,229	5,378	5,851	5,654	NA	9,604	8,006	1,598	NA	NA	NA	34,839	22,159	2,182	1,656	6,562	2,280	7,537	3,130	653	3,754
2004	63,262	10,853	5,270	5,583	5,444	NA	8,792	7,589	1,203	NA	NA	NA	36,183	23,261	2,244	1,665	6,694	2,320	7,435	3,129	649	3,657
2005	65,122	10,770	5,186	5,584	5,435	NA	9,422	8,217	1,205	NA	NA	NA	37,231	23,683	2,248	1,740	7,140	2,420	7,699	3,155	668	3,875
2006	64,933	10,498	4,974	5,524	5,358	46	8,843	7,320	1,523	NA	NA	NA	37,911	23,488	2,311	1,861	7,687	2,564	7,636	3,005	692	3,939
2007	66,368	8,274	4,747	3,526	3,388	56	11,576	8,720	2,856	NA	NA	NA	38,595	23,163	2,466	2,010	8,149	2,808	7,866	2,907	717	4,243
2008	69,057	8,597	4,994	3,603	3,458	70	12,463	9,815	1,486	487	644	30	39,424	23,128	2,593	2,147	8,532	3,024	8,503	3,097	728	4,678
2009	72,659	10,012	5,441	4,571	4,432	86	14,784	11,999	1,340	662	736	47	38,529	22,909	2,444	1,980	8,199	2,997	9,248	3,498	698	5,051
2010	74,991	11,606	5,049	6,557	6,397	97	16,173	13,080	1,389	713	924	68	37,742	23,129	2,223	1,729	7,786	2,874	9,373	3,373	694	5,305

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All per-formers	All federal	Federal intramural ^a	FFRDCs ^b		Nonfederal govern-ment ^c	Business ^d						Higher education ^e				Other nonprofit organizations ^f					
	All funding sources	Total	Federal	Total	Federal	Total	Total	Own domestic	Federal	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal government	Busi-ness	Higher ed-ucation	ONP	Total	Federal	Busi-ness	ONP
2011	70,679	11,153	4,885	6,268	6,130	95	12,603	10,246	655	721	924	57	37,828	23,025	2,148	1,710	8,080	2,865	9,000	2,982	716	5,302
2012	69,652	10,597	5,217	5,381	5,256	89	12,635	10,412	612	675	900	37	37,362	21,965	2,068	1,737	8,633	2,959	8,968	2,939	721	5,308
2013	73,410	8,903	4,986	3,918	3,821	82	18,247	14,017	1,119	1,352	1,656	102	37,000	20,870	2,046	1,813	9,134	3,137	9,179	2,835	750	5,593
2014	75,401	9,074	5,242	3,832	3,746	89	20,156	14,522	1,878	1,456	2,175	124	36,642	20,042	2,047	1,890	9,390	3,273	9,441	2,839	775	5,826
2015 ^g	75,866	9,138	5,387	3,751	3,675	91	19,809	14,483	1,853	1,423	1,929	121	37,253	19,896	2,069	1,978	9,890	3,420	9,575	2,736	793	6,046

NA = not available.

FFRDC = federally funded research and development center; ONP = other nonprofit organization.

^a See Appendix Table 4-2, footnote a.

^b Type-of-R&D data for FFRDC R&D in 1953–54 includes the R&D of only university-administered FFRDCs. Starting in 2001, type-of-R&D data distinguish federally funded from nonfederally funded FFRDC R&D. (See also Appendix Table 4-2, footnote b.)

^c Type-of-R&D data for state intramural R&D are not currently collected by the Survey of State Government R&D. (See also Appendix Table 4-2, footnote c.)

^d Type-of-R&D data for business R&D in 1998–2007 were revised in response to data quality review considerations and are not directly comparable with the data for 1997 and earlier years. For 2008 and later years, the type-of-R&D splits for other than total, own-funded, and federally funded R&D are estimated. (See also Appendix Table 4-2, footnote d.)

^e The type-of-R&D estimation procedure for higher education R&D was revised in 1998 and again in 2010; hence, these data are not directly comparable with data reported for earlier years. Type-of-R&D splits for other than total and federally funded are estimated. (See also Appendix Table 4-2, footnote e.)

^f Type-of-R&D data for R&D by other nonprofit organizations in 1998 and later years are estimated, except for the R&D that is federally funded. (See also Appendix Table 4-2, footnote f.)

^g Some data for 2015 are preliminary and may later be revised.

Note(s)

Detail may not add to total because of rounding. Constant-dollar estimates are derived from unrounded data. For trend comparisons, use only the historical data reported in this table because some back-year data may have been revised. Except for the nonprofit sector, data are based on annual reports by performers in the National Science Foundation's annual R&D expenditure surveys: Business R&D and Innovation Survey, Higher Education R&D Survey, Survey of Federal Funds for R&D, FFRDC R&D Expenditures Survey, and Survey of State Government R&D. R&D expenditures by business performers—and also, before 2001, industry-administered FFRDCs—are collected on a calendar year basis. Expenditures for other performers are calendar year approximations based on fiscal year data. For federal performers in 1977 and afterward, the approximation equals 75% of the amount reported in the same fiscal year plus 25% of the amount reported in the subsequent fiscal year. Before 1977, the federal fiscal year began on 1 July, not 1 October, and the approximation is 50% of the amount reported in the same fiscal year plus 50% of the amount reported in the subsequent fiscal year. The fiscal year for higher education performers and state government performers generally begins 1 July, and the calendar year approximation is 50% of the amount reported in the same fiscal year plus 50% of the amount reported in the subsequent fiscal year.

Source(s)

National Science Foundation, National Center for Science and Engineering Statistics, National Patterns of R&D Resources (annual series).



CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Science and Engineering Indicators 2018

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

APPENDIX TABLE 4-4

U.S. applied research expenditures, by performing sector and source of funds: 1953–2015

(Millions of current and of constant 2009 dollars)

Year	All per-formers	All federal	Federal intramural ^a	FFRDCs ^b		Nonfederal govern-ment ^c		Business ^d					Higher education ^e				Other nonprofit organizations ^f					
	All funding sources	Total	Federal	Total	Federal	Total	Own domestic	Federal	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	Federal	Busi-ness	ONP	
Current \$millions																						
1953	1,289	395	347	48	48	NA	438	288	NA	NA	NA	134	59	30	7	28	10	35	14	11	10	
1954	1,378	388	330	59	59	NA	492	322	NA	NA	NA	137	60	32	8	28	10	40	16	13	11	
1955	1,502	419	333	86	86	NA	560	339	NA	NA	NA	142	63	32	9	27	11	43	18	14	11	
1956	1,929	511	387	125	125	NA	794	430	NA	NA	NA	146	65	33	10	27	11	48	20	14	14	
1957	2,413	595	446	149	149	NA	992	624	NA	NA	NA	147	63	34	12	27	11	57	23	14	20	
1958	2,759	672	516	156	156	NA	1,137	731	NA	NA	NA	152	66	35	12	27	12	68	29	14	25	
1959	2,940	756	577	179	179	NA	1,178	757	NA	NA	NA	167	78	37	13	28	12	82	40	15	27	
1960	3,065	816	615	201	201	NA	1,196	769	NA	NA	NA	186	93	39	13	29	12	99	54	17	28	
1961	3,123	908	668	240	240	NA	1,165	738	NA	NA	NA	199	104	40	13	30	13	114	62	17	35	
1962	3,698	958	709	249	249	NA	1,438	954	NA	NA	NA	216	119	41	14	30	13	132	68	19	45	
1963	3,864	1,084	809	275	275	NA	1,450	952	NA	NA	NA	230	128	42	14	32	14	150	82	19	49	
1964	4,201	1,260	947	313	313	NA	1,560	978	NA	NA	NA	256	142	45	14	37	18	148	82	19	47	
1965	4,374	1,287	994	294	294	NA	1,620	992	NA	NA	NA	304	176	46	13	42	27	171	98	21	52	
1966	4,653	1,302	1,012	290	290	NA	1,804	986	NA	NA	NA	351	208	47	14	48	34	210	129	24	57	

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All per-formers	All federal	Federal intramural ^a	FFRDCs ^b		Nonfederal govern-ment ^c	Business ^d						Higher education ^e				Other nonprofit organizations ^f					
	All funding sources	Total	Federal	Total	Federal	Total	Total	Own domestic	Federal	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	Federal	Busi-ness	ONP
1967	4,848	1,402	1,069	334	334	NA	2,832	1,849	983	NA	NA	NA	389	238	46	16	54	36	226	141	25	60
1968	5,137	1,446	1,112	334	334	NA	3,037	2,081	956	NA	NA	NA	405	250	46	16	55	39	250	160	28	62
1969	5,454	1,565	1,229	336	336	NA	3,192	2,272	920	NA	NA	NA	417	257	48	16	54	43	281	183	32	66
1970	5,752	1,670	1,334	336	336	NA	3,330	2,378	952	NA	NA	NA	451	280	51	18	56	47	302	199	33	70
1971	5,833	1,666	1,355	312	312	NA	3,348	2,441	907	NA	NA	NA	499	306	61	19	67	47	320	212	34	74
1972	6,147	1,792	1,434	358	358	NA	3,407	2,562	845	NA	NA	NA	619	391	74	21	82	52	330	216	35	79
1973	6,655	1,861	1,527	334	334	NA	3,715	2,832	883	NA	NA	NA	725	450	88	26	100	62	355	236	36	83
1974	7,344	1,987	1,652	335	335	NA	4,168	3,263	905	NA	NA	NA	794	477	96	32	118	72	396	266	39	91
1975	8,091	2,295	1,912	384	384	NA	4,431	3,440	991	NA	NA	NA	934	550	113	39	141	92	431	290	42	100
1976	8,976	2,525	2,068	457	457	NA	4,945	3,912	1,033	NA	NA	NA	1,042	596	127	45	166	109	464	310	45	109
1977	9,662	2,621	2,081	540	540	NA	5,424	4,311	1,113	NA	NA	NA	1,126	626	134	51	194	121	492	324	48	120
1978	10,704	2,838	2,242	597	597	NA	6,065	4,870	1,195	NA	NA	NA	1,247	676	151	61	232	128	554	371	52	132
1979	12,097	3,069	2,415	654	654	NA	6,975	5,670	1,305	NA	NA	NA	1,418	793	161	71	263	129	635	436	55	144
1980	13,729	3,295	2,546	749	749	NA	8,175	6,550	1,625	NA	NA	NA	1,622	912	174	88	308	140	637	420	60	158
1981	16,329	3,520	2,731	788	788	NA	10,401	8,359	2,042	NA	NA	NA	1,781	953	199	108	363	159	628	391	64	173
1982	18,218	3,692	2,802	890	890	NA	11,956	9,363	2,593	NA	NA	NA	1,915	1,007	207	121	402	178	655	398	69	189
1983	20,298	3,956	2,991	965	965	NA	13,513	10,286	3,227	NA	NA	NA	2,116	1,122	215	141	443	194	713	433	74	207
1984	22,451	4,137	2,961	1,176	1,176	NA	15,218	11,541	3,677	NA	NA	NA	2,332	1,226	234	168	491	212	764	459	79	226

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All per-formers	All federal	Federal intramural ^a	FFRDCs ^b		Nonfederal govern-ment ^c	Business ^d						Higher education ^e				Other nonprofit organizations ^f					
	All funding sources	Total	Federal	Total	Federal	Total	Total	Own domestic	Federal	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	Federal	Busi-ness	ONP
1985	25,401	4,427	3,135	1,292	1,292	NA	17,625	12,908	4,717	NA	NA	NA	2,527	1,296	262	198	547	224	822	490	85	247
1986	27,240	4,462	3,204	1,258	1,258	NA	19,131	15,082	4,049	NA	NA	NA	2,780	1,393	298	229	620	240	867	506	91	270
1987	27,951	4,594	3,366	1,228	1,228	NA	19,190	15,153	4,037	NA	NA	NA	3,219	1,643	333	260	707	276	948	555	98	295
1988	29,528	4,346	3,362	984	984	NA	20,377	16,531	3,846	NA	NA	NA	3,779	1,958	377	302	818	325	1,026	599	105	322
1989	32,277	4,613	3,566	1,047	1,047	NA	22,317	17,993	4,324	NA	NA	NA	4,188	2,121	417	347	933	370	1,159	695	112	352
1990	34,897	4,808	3,652	1,156	1,156	NA	24,399	18,432	5,967	NA	NA	NA	4,406	2,140	453	377	1,031	404	1,284	780	120	384
1991	38,631	5,539	4,093	1,446	1,446	NA	27,013	21,425	5,588	NA	NA	NA	4,611	2,232	468	392	1,091	428	1,468	921	129	419
1992	37,936	5,866	4,337	1,529	1,529	NA	25,660	21,184	4,476	NA	NA	NA	4,882	2,415	479	414	1,120	454	1,528	933	138	456
1993	37,283	6,338	4,838	1,500	1,500	NA	24,251	19,956	4,295	NA	NA	NA	5,149	2,542	496	443	1,181	487	1,544	900	148	497
1994	36,618	6,581	4,985	1,596	1,596	NA	22,988	19,372	3,616	NA	NA	NA	5,390	2,644	517	464	1,256	509	1,659	960	158	541
1995	40,936	6,666	4,952	1,714	1,714	NA	26,919	23,755	3,164	NA	NA	NA	5,659	2,779	559	494	1,311	516	1,692	934	170	589
1996	43,170	6,495	4,872	1,623	1,623	NA	29,010	25,370	3,640	NA	NA	NA	5,885	2,864	584	524	1,390	522	1,781	960	182	640
1997	46,516	6,675	4,997	1,679	1,679	NA	32,430	29,782	2,648	NA	NA	NA	5,485	2,518	548	515	1,396	508	1,926	1,011	205	711
1998	46,247	6,871	5,146	1,725	1,725	NA	32,208	29,576	2,632	NA	NA	NA	5,108	2,189	515	509	1,393	502	2,061	1,060	218	784
1999	51,853	7,181	5,530	1,651	1,651	NA	36,638	33,821	2,817	NA	NA	NA	5,650	2,571	533	529	1,480	537	2,384	1,300	236	849
2000	56,503	7,856	6,105	1,750	1,750	NA	39,176	36,494	2,682	NA	NA	NA	6,361	3,081	558	540	1,604	578	3,110	1,831	258	1,021
2001	63,956	9,522	7,052	2,469	2,379	NA	44,012	40,409	3,603	NA	NA	NA	6,886	3,411	585	535	1,734	621	3,537	2,150	261	1,126
2002	50,521	10,506	7,487	3,019	2,905	NA	28,533	26,081	2,452	NA	NA	NA	7,670	3,877	636	531	1,937	689	3,812	2,267	253	1,293

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All per-formers	All federal	Federal intramural ^a	FFRDCs ^b		Nonfederal govern-ment ^c		Business ^d					Higher education ^e				Other nonprofit organizations ^f					
	All funding sources	Total	Federal	Total	Federal	Total	Total	Own domestic	Federal	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	Federal	Busi-ness	ONP
2003	61,059	10,933	7,672	3,262	3,152	NA	37,334	32,861	4,473	NA	NA	NA	8,560	4,450	708	537	2,127	739	4,232	2,487	259	1,486
2004	69,132	10,589	7,455	3,135	3,057	NA	45,432	40,657	4,775	NA	NA	NA	8,911	4,682	735	545	2,190	759	4,200	2,448	264	1,488
2005	69,653	10,886	7,557	3,329	3,241	NA	45,284	39,995	5,289	NA	NA	NA	9,144	4,810	719	557	2,283	774	4,339	2,432	280	1,627
2006	76,624	11,075	7,435	3,640	3,531	258	51,173	45,033	6,140	NA	NA	NA	9,522	5,080	712	573	2,368	789	4,596	2,592	300	1,705
2007	85,322	12,697	7,222	5,475	5,293	324	57,570	48,625	8,945	NA	NA	NA	9,945	5,284	745	607	2,461	848	4,786	2,583	318	1,885
2008	76,642	13,356	7,316	6,040	5,843	411	46,864	35,382	5,397	2,815	3,094	175	10,962	5,840	815	675	2,682	951	5,049	2,600	330	2,119
2009	74,236	14,063	7,874	6,189	5,979	506	41,055	29,264	7,797	1,865	1,996	134	12,938	7,263	948	764	2,942	1,021	5,673	3,049	319	2,305
2010	79,258	13,203	8,016	5,187	5,025	578	44,906	34,912	4,705	2,256	2,819	214	14,759	8,762	1,015	778	3,141	1,064	5,813	3,041	321	2,451
2011	82,147	13,251	8,024	5,227	5,057	580	47,186	37,047	4,404	2,413	3,131	191	15,599	9,290	994	796	3,416	1,104	5,531	2,693	338	2,500
2012	87,071	14,328	8,587	5,741	5,566	556	50,755	38,891	4,137	3,336	4,209	182	15,908	9,170	1,007	877	3,693	1,162	5,524	2,629	346	2,549
2013	88,336	15,132	8,309	6,823	6,639	518	51,013	37,385	6,028	3,275	4,078	247	16,112	8,876	1,063	935	3,943	1,296	5,561	2,465	366	2,730
2014	91,890	15,727	8,775	6,952	6,765	473	53,415	38,281	6,445	3,331	5,074	285	16,421	8,706	1,085	997	4,216	1,418	5,853	2,574	385	2,894
2015 ^g	97,150	16,551	9,200	7,351	7,182	496	56,472	43,330	6,102	2,735	4,072	233	17,466	9,094	1,092	1,107	4,567	1,608	6,165	2,731	398	3,036
Constant 2009 \$millions																						
1953	8,505	2,603	2,290	313	313	NA	4,790	2,890	1,900	NA	NA	NA	881	389	199	43	184	66	231	92	73	66
1954	9,009	2,537	2,154	382	382	NA	5,322	3,217	2,105	NA	NA	NA	892	389	206	49	183	65	258	101	85	72
1955	9,650	2,693	2,140	553	553	NA	5,775	3,599	2,176	NA	NA	NA	909	405	208	55	175	67	273	112	90	71
1956	11,986	3,176	2,402	774	774	NA	7,605	4,935	2,670	NA	NA	NA	907	404	206	62	167	68	298	124	87	87

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All per-formers	All federal	Federal intramural ^a	FFRDCs ^b		Nonfederal govern-ment ^c	Business ^d						Higher education ^e				Other nonprofit organizations ^f					
	All funding sources	Total	Federal	Total	Federal	Total	Total	Own domestic	Federal	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	Federal	Busi-ness	ONP
1957	14,514	3,576	2,679	896	896	NA	9,718	5,966	3,751	NA	NA	NA	881	379	204	69	163	66	340	135	84	120
1958	16,229	3,953	3,035	918	918	NA	10,988	6,688	4,299	NA	NA	NA	891	385	208	71	160	68	397	168	82	147
1959	17,053	4,383	3,344	1,038	1,038	NA	11,226	6,834	4,393	NA	NA	NA	969	450	214	73	163	70	476	232	87	157
1960	17,540	4,666	3,516	1,150	1,150	NA	11,246	6,843	4,402	NA	NA	NA	1,061	532	221	74	165	69	566	309	97	160
1961	17,675	5,136	3,781	1,355	1,355	NA	10,770	6,594	4,177	NA	NA	NA	1,123	586	226	74	167	71	645	351	96	198
1962	20,674	5,353	3,961	1,392	1,392	NA	13,375	8,040	5,335	NA	NA	NA	1,208	663	227	75	170	73	738	380	106	252
1963	21,363	5,990	4,472	1,518	1,518	NA	13,278	8,016	5,262	NA	NA	NA	1,269	705	233	77	179	75	826	451	105	271
1964	22,873	6,858	5,153	1,704	1,704	NA	13,819	8,494	5,325	NA	NA	NA	1,391	773	246	74	203	95	806	446	103	256
1965	23,386	6,882	5,312	1,569	1,569	NA	13,967	8,662	5,304	NA	NA	NA	1,623	938	248	70	225	142	914	524	112	278
1966	24,198	6,772	5,264	1,508	1,508	NA	14,511	9,383	5,128	NA	NA	NA	1,826	1,082	245	73	252	174	1,090	668	125	296
1967	24,503	7,086	5,400	1,686	1,686	NA	14,313	9,345	4,968	NA	NA	NA	1,964	1,200	231	78	272	182	1,140	710	126	303
1968	24,903	7,007	5,388	1,619	1,619	NA	14,723	10,088	4,634	NA	NA	NA	1,963	1,210	223	78	267	187	1,210	773	136	301
1969	25,202	7,230	5,680	1,550	1,550	NA	14,749	10,498	4,251	NA	NA	NA	1,927	1,185	222	74	249	196	1,296	843	148	305
1970	25,247	7,329	5,855	1,475	1,475	NA	14,615	10,437	4,178	NA	NA	NA	1,977	1,227	225	77	245	204	1,325	873	145	307
1971	24,363	6,960	5,659	1,301	1,301	NA	13,984	10,195	3,788	NA	NA	NA	2,084	1,278	253	77	280	196	1,334	883	142	309
1972	24,610	7,174	5,741	1,433	1,433	NA	13,640	10,257	3,383	NA	NA	NA	2,476	1,563	297	82	328	206	1,319	863	140	316
1973	25,271	7,068	5,799	1,268	1,268	NA	14,106	10,753	3,353	NA	NA	NA	2,751	1,707	333	99	379	234	1,346	894	137	315
1974	25,587	6,922	5,757	1,165	1,165	NA	14,521	11,368	3,153	NA	NA	NA	2,765	1,660	335	110	411	249	1,379	927	135	317

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All per-formers	All federal	Federal intramural ^a	FFRDCs ^b		Nonfederal govern-ment ^c	Business ^d						Higher education ^e				Other nonprofit organizations ^f					
	All funding sources	Total	Federal	Total	Federal	Total	Total	Own domestic	Federal	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	Federal	Busi-ness	ONP
1975	25,800	7,319	6,096	1,223	1,223	NA	14,129	10,969	3,160	NA	NA	NA	2,978	1,752	362	123	448	293	1,374	923	133	318
1976	27,133	7,633	6,252	1,381	1,381	NA	14,947	11,825	3,122	NA	NA	NA	3,149	1,800	385	135	500	329	1,403	937	135	331
1977	27,500	7,458	5,922	1,537	1,537	NA	15,437	12,270	3,168	NA	NA	NA	3,203	1,780	383	145	552	343	1,401	923	137	342
1978	28,468	7,548	5,962	1,587	1,587	NA	16,129	12,951	3,178	NA	NA	NA	3,316	1,797	402	161	616	339	1,474	987	137	350
1979	29,718	7,540	5,933	1,607	1,607	NA	17,135	13,929	3,206	NA	NA	NA	3,482	1,947	397	175	646	317	1,561	1,070	136	354
1980	30,938	7,425	5,737	1,688	1,688	NA	18,422	14,760	3,662	NA	NA	NA	3,656	2,055	391	199	694	316	1,436	946	134	356
1981	33,654	7,254	5,629	1,625	1,625	NA	21,436	17,227	4,208	NA	NA	NA	3,670	1,963	411	222	747	327	1,294	806	132	356
1982	35,354	7,165	5,437	1,728	1,728	NA	23,202	18,170	5,032	NA	NA	NA	3,716	1,953	403	235	780	345	1,272	772	133	367
1983	37,895	7,386	5,584	1,801	1,801	NA	25,228	19,203	6,025	NA	NA	NA	3,950	2,095	401	264	827	362	1,332	808	138	386
1984	40,477	7,458	5,338	2,120	2,120	NA	27,437	20,807	6,629	NA	NA	NA	4,204	2,211	422	303	886	382	1,378	828	143	408
1985	44,376	7,733	5,477	2,257	2,257	NA	30,791	22,551	8,241	NA	NA	NA	4,415	2,265	457	345	956	391	1,436	855	148	432
1986	46,646	7,641	5,487	2,154	2,154	NA	32,761	25,827	6,934	NA	NA	NA	4,760	2,385	510	392	1,062	411	1,484	866	156	463
1987	46,674	7,671	5,620	2,051	2,051	NA	32,045	25,304	6,741	NA	NA	NA	5,375	2,743	556	434	1,181	461	1,583	927	163	493
1988	47,640	7,011	5,424	1,587	1,587	NA	32,876	26,671	6,205	NA	NA	NA	6,098	3,159	608	487	1,319	524	1,655	966	169	520
1989	50,126	7,164	5,539	1,626	1,626	NA	34,658	27,943	6,715	NA	NA	NA	6,504	3,294	647	539	1,449	575	1,800	1,079	174	546
1990	52,261	7,201	5,469	1,731	1,731	NA	36,540	27,604	8,936	NA	NA	NA	6,598	3,206	678	565	1,544	605	1,922	1,167	180	575
1991	55,991	8,028	5,933	2,095	2,095	NA	39,152	31,053	8,099	NA	NA	NA	6,682	3,235	678	568	1,581	621	2,128	1,335	187	607
1992	53,757	8,312	6,145	2,166	2,166	NA	36,362	30,019	6,343	NA	NA	NA	6,918	3,422	678	587	1,587	644	2,165	1,323	196	646

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All per-formers	All federal	Federal intramural ^a	FFRDCs ^b		Nonfederal govern-ment ^c	Business ^d						Higher education ^e				Other nonprofit organizations ^f					
	All funding sources	Total	Federal	Total	Federal	Total	Total	Own domestic	Federal	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	Federal	Busi-ness	ONP
1993	51,604	8,773	6,697	2,076	2,076	NA	33,566	27,622	5,945	NA	NA	NA	7,127	3,518	686	613	1,635	675	2,138	1,245	205	688
1994	49,627	8,919	6,756	2,162	2,162	NA	31,155	26,254	4,901	NA	NA	NA	7,305	3,583	701	629	1,702	689	2,248	1,300	215	733
1995	54,347	8,850	6,575	2,275	2,275	NA	35,737	31,537	4,201	NA	NA	NA	7,513	3,689	742	656	1,741	685	2,246	1,240	225	781
1996	56,285	8,468	6,352	2,115	2,115	NA	37,823	33,077	4,746	NA	NA	NA	7,672	3,734	761	683	1,813	681	2,322	1,251	237	834
1997	59,628	8,557	6,405	2,152	2,152	NA	41,571	38,176	3,394	NA	NA	NA	7,031	3,227	703	660	1,789	652	2,469	1,296	263	911
1998	58,646	8,713	6,525	2,187	2,187	NA	40,843	37,505	3,338	NA	NA	NA	6,477	2,776	653	646	1,766	636	2,614	1,344	276	994
1999	64,764	8,968	6,907	2,062	2,062	NA	45,760	42,242	3,518	NA	NA	NA	7,057	3,211	666	661	1,849	670	2,978	1,623	295	1,060
2000	69,000	9,593	7,456	2,138	2,138	NA	47,841	44,566	3,275	NA	NA	NA	7,768	3,763	682	660	1,958	705	3,798	2,236	316	1,246
2001	76,363	11,368	8,420	2,948	2,840	NA	52,549	48,247	4,302	NA	NA	NA	8,222	4,073	699	639	2,070	741	4,223	2,567	311	1,345
2002	59,410	12,355	8,805	3,550	3,416	NA	33,553	30,669	2,883	NA	NA	NA	9,019	4,559	748	624	2,277	811	4,483	2,665	297	1,520
2003	70,397	12,606	8,845	3,761	3,634	NA	43,044	37,887	5,157	NA	NA	NA	9,869	5,130	816	619	2,452	852	4,879	2,867	298	1,713
2004	77,572	11,882	8,365	3,518	3,430	NA	50,979	45,621	5,358	NA	NA	NA	9,998	5,254	824	611	2,458	852	4,712	2,747	296	1,669
2005	75,720	11,835	8,216	3,619	3,523	NA	49,228	43,479	5,750	NA	NA	NA	9,940	5,229	782	605	2,482	842	4,717	2,643	305	1,769
2006	80,815	11,680	7,841	3,839	3,724	272	53,972	47,496	6,476	NA	NA	NA	10,043	5,358	751	604	2,497	833	4,848	2,734	316	1,798
2007	87,657	13,044	7,419	5,625	5,438	333	59,145	49,955	9,190	NA	NA	NA	10,217	5,429	765	624	2,528	871	4,917	2,653	327	1,936
2008	77,224	13,457	7,372	6,086	5,887	414	47,220	35,651	5,438	2,837	3,118	177	11,045	5,884	821	680	2,702	958	5,087	2,620	332	2,135
2009	74,236	14,063	7,874	6,189	5,979	506	41,055	29,264	7,797	1,865	1,996	134	12,938	7,263	948	764	2,942	1,021	5,673	3,049	319	2,305
2010	78,302	13,044	7,919	5,125	4,964	571	44,364	34,491	4,648	2,229	2,785	211	14,580	8,656	1,002	769	3,103	1,051	5,743	3,004	317	2,422

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All per-formers	All federal	Federal intramural ^a	FFRDCs ^b		Nonfederal govern-ment ^c	Business ^d						Higher education ^e				Other nonprofit organizations ^f					
	All funding sources	Total	Federal	Total	Federal	Total	Total	Own domestic	Federal	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	Federal	Busi-ness	ONP
2011	79,514	12,826	7,767	5,059	4,895	562	45,674	35,860	4,263	2,336	3,030	185	15,099	8,992	962	770	3,307	1,068	5,354	2,607	327	2,420
2012	82,755	13,618	8,161	5,457	5,290	528	48,239	36,963	3,932	3,171	4,001	173	15,120	8,716	957	834	3,510	1,104	5,250	2,498	329	2,423
2013	82,624	14,153	7,771	6,382	6,209	485	47,714	34,968	5,638	3,063	3,814	231	15,070	8,302	994	874	3,688	1,212	5,201	2,306	342	2,553
2014	84,433	14,451	8,063	6,388	6,216	435	49,080	35,174	5,922	3,060	4,662	262	15,088	7,999	997	916	3,873	1,303	5,378	2,365	354	2,659
2015 ^g	88,309	15,045	8,363	6,682	6,528	451	51,332	39,386	5,547	2,486	3,702	212	15,876	8,266	993	1,006	4,151	1,461	5,604	2,483	362	2,759

NA = not available.

FFRDC = federally funded research and development center; ONP = other nonprofit organization.

^a See Appendix Table 4-2, footnote a.

^b Type-of-R&D data for FFRDC R&D in 1953–54 include the R&D of only university-administered FFRDCs. Starting in 2001, type-of-R&D data distinguish federally funded from nonfederally funded FFRDC R&D. (See also Appendix Table 4-2, footnote b.)

^c Type-of-R&D data for state intramural R&D are not currently collected by the Survey of State Government R&D. (See also Appendix Table 4-2, footnote c.)

^d Type-of-R&D data for business R&D in 1998–2007 were revised in response to data quality review considerations and are not directly comparable with the data for 1997 and earlier years. For 2008 and later years, the type-of-R&D splits for other than total, own-funded, and federally funded R&D are estimated. (See also Appendix Table 4-2, footnote d.)

^e The type-of-R&D estimation procedure for higher education R&D was revised in 1998 and again in 2010; hence, these data are not directly comparable with data reported for earlier years. Type-of-R&D splits for other than total and federally funded are estimated. (See also Appendix Table 4-2, footnote e.)

^f Type-of-R&D data for R&D by other nonprofit organizations in 1998 and later years are estimated, except for the R&D that is federally funded. (See also Appendix Table 4-2, footnote f.)

^g Some data for 2015 are preliminary and may later be revised.

Note(s)

Detail may not add to total because of rounding. Constant-dollar estimates are derived from unrounded data. For trend comparisons, use only the historical data reported in this table because some back-year data may have been revised. Except for the nonprofit sector, data are based on annual reports by performers in the National Science Foundation's annual R&D expenditure surveys: Business R&D and Innovation Survey, Higher Education R&D Survey, Survey of Federal Funds for R&D, FFRDC R&D Expenditures Survey, and Survey of State Government R&D. R&D expenditures by business performers—and also, before 2001, industry-administered FFRDCs—are collected on a calendar year basis. Expenditures for other performers are calendar year approximations based on fiscal year data. For federal performers in 1977 and afterward, the approximation equals 75% of the amount reported in the same fiscal year plus 25% of the amount reported in the subsequent fiscal year. Before 1977, the federal fiscal year began on 1 July, not 1 October, and the approximation is 50% of the amount reported in the same fiscal year plus 50% of the amount reported in the subsequent fiscal year. The fiscal year for higher education performers and state government performers generally begins 1 July, and the calendar year approximation is 50% of the amount reported in the same fiscal year plus 50% of the amount reported in the subsequent fiscal year.

Source(s)



CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

National Science Foundation, National Center for Science and Engineering Statistics, National Patterns of R&D Resources (annual series).

Science and Engineering Indicators 2018

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

APPENDIX TABLE 4-5

U.S. development expenditures, by performing sector and source of funds: 1953–2015

(Millions of current and of constant 2009 dollars)

Year	All per-formers	All federal	Federal intramural ^a	FFRDCs ^b		Nonfederal govern-ment ^c	Business ^d						Higher education ^e				Other nonprofit organizations ^f					
	All funding sources	Total	Federal	Total	Federal	Total	Total	Own domestic	Federal	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	Federal	Busi-ness	ONP
Current \$millions																						
1953	3,412	614	567	48	48	NA	2,753	1,630	1,123	NA	NA	NA	16	9	3	1	3	1	29	17	6	6
1954	3,734	599	537	62	62	NA	3,090	1,685	1,405	NA	NA	NA	17	9	3	1	3	1	29	15	7	7
1955	4,113	713	543	171	171	NA	3,352	1,738	1,614	NA	NA	NA	21	12	4	2	3	1	27	12	8	7
1956	5,854	978	631	348	348	NA	4,826	2,267	2,559	NA	NA	NA	25	14	4	2	4	2	26	11	8	7
1957	6,681	1,157	728	429	429	NA	5,474	2,174	3,300	NA	NA	NA	26	12	5	3	4	2	25	9	8	8
1958	7,213	1,227	842	386	386	NA	5,932	2,241	3,691	NA	NA	NA	28	13	6	3	4	2	26	9	8	9
1959	8,463	1,417	940	477	477	NA	6,983	2,557	4,426	NA	NA	NA	31	16	6	3	5	2	33	14	9	10
1960	9,360	1,562	1,003	559	559	NA	7,734	2,935	4,799	NA	NA	NA	35	19	6	3	5	2	30	10	10	10
1961	9,930	1,760	1,090	670	670	NA	8,106	3,189	4,917	NA	NA	NA	38	22	7	2	5	2	28	4	10	14
1962	10,114	1,845	1,227	618	618	NA	8,196	3,246	4,950	NA	NA	NA	40	23	8	2	6	2	34	5	11	18
1963	11,539	2,133	1,465	668	668	NA	9,330	3,535	5,795	NA	NA	NA	40	22	8	2	6	2	37	6	11	20
1964	12,506	2,419	1,680	739	739	NA	10,004	3,848	6,156	NA	NA	NA	49	30	8	2	7	3	35	6	11	18
1965	13,215	2,463	1,789	674	674	NA	10,637	4,419	6,218	NA	NA	NA	71	48	9	2	8	4	45	13	12	20
1966	14,490	2,540	1,886	654	654	NA	11,810	4,961	6,849	NA	NA	NA	87	61	9	2	10	5	53	16	14	23

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All per-formers	All federal	Federal intramural ^a	FFRDCs ^b		Nonfederal govern-ment ^c	Business ^d						Higher education ^e				Other nonprofit organizations ^f					
	All funding sources	Total	Federal	Total	Federal	Total	Total	Own domestic	Federal	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	Federal	Busi-ness	ONP
1967	15,332	2,649	1,943	706	706	NA	12,539	5,744	6,795	NA	NA	NA	93	66	9	3	10	7	51	12	15	24
1968	16,154	2,628	1,904	724	724	NA	13,370	6,326	7,044	NA	NA	NA	102	72	8	4	9	9	55	13	16	26
1969	17,051	2,807	2,016	792	792	NA	14,071	7,127	6,944	NA	NA	NA	110	80	7	5	8	10	63	17	18	28
1970	16,925	3,047	2,258	790	790	NA	13,698	7,466	6,232	NA	NA	NA	112	84	6	5	7	10	68	20	18	30
1971	17,399	3,313	2,473	841	841	NA	13,924	7,757	6,167	NA	NA	NA	98	69	8	4	9	9	64	12	19	33
1972	18,743	3,502	2,639	863	863	NA	15,043	8,510	6,533	NA	NA	NA	101	63	12	4	14	9	98	44	19	35
1973	20,197	3,517	2,657	860	860	NA	16,394	9,773	6,621	NA	NA	NA	126	71	18	5	20	13	160	102	20	38
1974	21,504	3,748	2,765	983	983	NA	17,421	10,868	6,553	NA	NA	NA	141	75	20	7	25	15	195	131	22	42
1975	22,706	3,993	2,890	1,103	1,103	NA	18,352	11,569	6,783	NA	NA	NA	156	83	22	8	27	16	205	135	23	47
1976	25,085	4,286	2,972	1,315	1,315	NA	20,412	12,890	7,522	NA	NA	NA	182	100	24	12	31	16	205	128	25	52
1977	27,667	4,606	3,188	1,418	1,418	NA	22,603	14,328	8,275	NA	NA	NA	254	153	28	15	40	19	204	119	27	58
1978	31,056	5,261	3,676	1,584	1,584	NA	25,216	16,460	8,756	NA	NA	NA	373	254	32	15	49	24	207	113	30	64
1979	35,445	5,697	3,944	1,753	1,753	NA	29,033	19,145	9,888	NA	NA	NA	469	336	34	16	56	28	246	143	32	71
1980	40,748	6,081	4,072	2,009	2,009	NA	33,848	22,891	10,957	NA	NA	NA	518	362	38	19	68	31	301	187	35	79
1981	46,305	6,705	4,530	2,175	2,175	NA	38,547	25,756	12,791	NA	NA	NA	568	386	44	24	80	35	485	360	37	88
1982	51,879	7,348	5,178	2,170	2,170	NA	43,434	29,219	14,215	NA	NA	NA	597	397	46	27	88	39	500	362	40	98
1983	57,771	8,491	6,106	2,385	2,385	NA	48,064	32,542	15,522	NA	NA	NA	617	399	47	31	97	43	599	447	44	109
1984	66,461	9,651	7,078	2,572	2,572	NA	55,371	37,731	17,640	NA	NA	NA	677	435	51	37	108	47	762	594	47	120

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All per-formers	All federal	Federal intramural ^a	FFRDCs ^b		Nonfederal govern-ment ^c	Business ^d						Higher education ^e				Other nonprofit organizations ^f					
	All funding sources	Total	Federal	Total	Federal	Total	Total	Own domestic	Federal	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	Federal	Busi-ness	ONP
1985	74,522	10,916	8,011	2,906	2,906	NA	62,020	41,762	20,258	NA	NA	NA	756	486	57	43	120	49	829	644	51	134
1986	75,855	11,376	8,275	3,101	3,101	NA	62,871	41,354	21,517	NA	NA	NA	818	513	65	50	136	53	790	587	55	149
1987	79,929	11,496	8,176	3,321	3,321	NA	66,789	42,667	24,122	NA	NA	NA	945	599	73	57	155	61	698	474	60	165
1988	84,567	12,460	8,864	3,596	3,596	NA	70,353	46,634	23,719	NA	NA	NA	1,098	698	83	66	180	71	655	407	65	183
1989	87,723	12,991	9,355	3,635	3,635	NA	72,725	51,676	21,049	NA	NA	NA	1,227	773	91	76	205	81	780	507	70	203
1990	94,067	13,363	9,700	3,663	3,663	NA	78,376	59,410	18,966	NA	NA	NA	1,407	910	99	83	226	89	920	619	75	226
1991	95,105	12,230	8,778	3,452	3,452	NA	80,286	63,030	17,256	NA	NA	NA	1,534	1,012	103	86	239	94	1,054	722	82	251
1992	99,811	12,521	9,098	3,423	3,423	NA	84,569	67,388	17,181	NA	NA	NA	1,596	1,055	105	91	246	100	1,125	758	88	279
1993	99,705	12,058	9,071	2,986	2,986	NA	84,757	68,674	16,083	NA	NA	NA	1,700	1,127	109	97	259	107	1,191	787	95	309
1994	102,938	11,970	8,823	3,147	3,147	NA	87,890	71,681	16,209	NA	NA	NA	1,816	1,213	114	102	276	112	1,261	815	103	343
1995	113,079	12,689	9,262	3,427	3,427	NA	97,342	79,518	17,824	NA	NA	NA	1,812	1,180	123	108	288	113	1,236	744	111	381
1996	121,377	12,481	9,033	3,448	3,448	NA	105,863	88,797	17,066	NA	NA	NA	1,791	1,128	128	115	305	115	1,241	698	120	423
1997	128,661	12,407	9,077	3,331	3,331	NA	113,184	95,063	18,121	NA	NA	NA	1,693	1,041	120	113	306	112	1,378	687	155	536
1998	144,669	12,528	9,214	3,314	3,314	NA	129,041	110,589	18,452	NA	NA	NA	1,584	943	113	112	306	110	1,516	760	164	592
1999	154,315	12,600	9,265	3,335	3,335	NA	138,807	122,236	16,571	NA	NA	NA	1,362	686	117	116	325	118	1,546	727	178	641
2000	169,414	12,859	9,377	3,482	3,482	NA	153,745	140,235	13,510	NA	NA	NA	1,265	545	123	119	352	127	1,545	580	195	771
2001	167,740	14,459	11,062	3,397	3,273	NA	149,952	137,410	12,542	NA	NA	NA	1,409	646	128	117	381	136	1,921	874	197	850
2002	176,601	15,238	11,800	3,438	3,308	NA	157,788	144,727	13,061	NA	NA	NA	1,472	639	140	116	425	151	2,104	937	191	976

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All per-formers	All federal	Federal intramural ^a	FFRDCs ^b		Nonfederal govern-ment ^c	Business ^d						Higher education ^e				Other nonprofit organizations ^f					
	All funding sources	Total	Federal	Total	Federal	Total	Total	Own domestic	Federal	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	Federal	Busi-ness	ONP
2003	175,483	16,563	12,646	3,917	3,785	NA	155,060	143,121	11,939	NA	NA	NA	1,799	897	155	118	467	162	2,060	743	195	1,122
2004	177,220	17,424	12,746	4,677	4,561	NA	155,034	140,615	14,419	NA	NA	NA	2,140	1,211	161	120	481	167	2,623	1,300	199	1,123
2005	195,731	18,775	13,994	4,781	4,654	NA	172,208	156,696	15,512	NA	NA	NA	2,098	1,146	158	122	501	170	2,651	1,211	212	1,228
2006	212,719	20,582	16,089	4,493	4,358	7	188,112	171,392	16,720	NA	NA	NA	1,902	927	156	126	520	173	2,116	603	226	1,287
2007	227,967	23,381	18,016	5,365	5,254	9	200,429	185,569	14,860	NA	NA	NA	1,917	894	163	133	540	186	2,231	568	240	1,423
2008	259,595	23,760	17,566	6,194	6,094	11	231,447	180,724	29,488	8,882	11,799	553	1,965	841	179	148	589	209	2,411	562	249	1,600
2009	256,036	23,497	17,245	6,252	6,159	13	226,554	179,841	30,435	7,041	8,732	505	3,441	1,569	288	289	915	381	2,531	550	241	1,740
2010	251,415	25,847	18,844	7,004	6,909	15	217,700	170,036	28,089	8,035	10,778	762	5,122	2,509	408	425	1,240	541	2,730	638	242	1,850
2011	270,995	28,751	21,879	6,872	6,786	15	233,886	187,794	26,228	7,966	11,266	632	5,410	2,666	402	436	1,340	567	2,933	790	255	1,887
2012	273,264	26,666	19,941	6,725	6,631	15	238,202	192,828	25,840	7,578	11,543	413	5,677	2,687	378	464	1,524	625	2,704	518	261	1,925
2013	287,144	26,436	19,767	6,668	6,572	14	252,007	207,537	22,137	8,729	12,946	658	5,877	2,650	393	502	1,670	663	2,811	474	276	2,061
2014	301,475	27,084	20,303	6,781	6,681	13	265,377	223,186	18,065	8,312	15,103	711	6,055	2,602	402	548	1,782	721	2,947	471	291	2,185
2015 ^g	314,532	27,718	20,547	7,171	7,062	14	277,557	230,629	18,850	10,295	16,907	876	6,204	2,565	404	560	1,888	789	3,040	447	301	2,292
Constant 2009 \$millions																						
1953	22,510	4,051	3,738	313	313	NA	18,165	10,755	7,410	NA	NA	NA	106	56	19	7	17	7	188	109	40	40
1954	24,412	3,913	3,511	402	402	NA	20,202	11,016	9,185	NA	NA	NA	111	56	23	7	20	7	186	95	46	46
1955	26,435	4,582	3,486	1,096	1,096	NA	21,544	11,169	10,375	NA	NA	NA	135	74	24	10	21	6	174	77	51	45
1956	36,384	6,078	3,919	2,160	2,160	NA	29,992	14,090	15,903	NA	NA	NA	155	84	27	12	22	9	158	65	50	44

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All per-formers	All federal	Federal intramural ^a	FFRDCs ^b		Nonfederal govern-ment ^c	Business ^d						Higher education ^e				Other nonprofit organizations ^f					
	All funding sources	Total	Federal	Total	Federal	Total	Total	Own domestic	Federal	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	Federal	Busi-ness	ONP
1957	40,185	6,956	4,376	2,580	2,580	NA	32,926	13,076	19,850	NA	NA	NA	156	72	32	15	25	12	147	51	48	48
1958	42,429	7,218	4,950	2,268	2,268	NA	34,897	13,182	21,715	NA	NA	NA	162	74	33	18	26	12	153	53	47	53
1959	49,092	8,217	5,453	2,764	2,764	NA	40,507	14,833	25,674	NA	NA	NA	180	90	35	17	26	12	189	78	52	58
1960	53,557	8,935	5,736	3,199	3,199	NA	44,253	16,794	27,460	NA	NA	NA	197	109	36	14	27	11	172	57	57	57
1961	56,201	9,958	6,166	3,792	3,792	NA	45,875	18,049	27,826	NA	NA	NA	212	122	39	11	29	11	156	20	57	79
1962	56,548	10,315	6,860	3,455	3,455	NA	45,821	18,148	27,673	NA	NA	NA	224	126	43	11	32	11	187	25	62	101
1963	63,794	11,792	8,099	3,693	3,693	NA	51,579	19,543	32,036	NA	NA	NA	221	122	44	11	34	11	202	30	61	111
1964	68,092	13,171	9,147	4,024	4,024	NA	54,469	20,951	33,518	NA	NA	NA	264	161	43	11	36	14	188	30	60	98
1965	70,663	13,167	9,563	3,604	3,604	NA	56,878	23,629	33,249	NA	NA	NA	377	257	46	11	42	21	241	70	64	107
1966	75,361	13,208	9,809	3,399	3,399	NA	61,425	25,803	35,622	NA	NA	NA	452	317	49	10	50	26	276	83	73	120
1967	77,488	13,386	9,820	3,566	3,566	NA	63,375	29,031	34,343	NA	NA	NA	470	331	43	13	51	33	258	61	76	121
1968	78,308	12,737	9,230	3,507	3,507	NA	64,814	30,667	34,148	NA	NA	NA	492	347	38	19	45	44	264	61	78	126
1969	78,784	12,971	9,314	3,657	3,657	NA	65,016	32,931	32,085	NA	NA	NA	506	367	33	23	37	46	291	79	83	129
1970	74,281	13,375	9,910	3,465	3,465	NA	60,119	32,767	27,352	NA	NA	NA	492	366	28	22	31	44	296	86	79	132
1971	72,669	13,838	10,327	3,511	3,511	NA	58,157	32,399	25,758	NA	NA	NA	409	288	33	17	36	36	265	48	79	138
1972	75,042	14,020	10,567	3,453	3,453	NA	60,227	34,071	26,156	NA	NA	NA	404	250	50	14	54	36	390	174	76	140
1973	76,688	13,355	10,090	3,265	3,265	NA	62,249	37,109	25,140	NA	NA	NA	477	268	66	19	76	47	608	387	76	144
1974	74,921	13,058	9,635	3,423	3,423	NA	60,695	37,864	22,831	NA	NA	NA	490	260	70	23	85	52	679	456	75	147

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All per-formers	All federal	Federal intramural ^a	FFRDCs ^b		Nonfederal govern-ment ^c	Business ^d						Higher education ^e				Other nonprofit organizations ^f					
	All funding sources	Total	Federal	Total	Federal	Total	Total	Own domestic	Federal	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	Federal	Busi-ness	ONP
1975	72,402	12,732	9,215	3,517	3,517	NA	58,519	36,890	21,629	NA	NA	NA	498	263	71	26	88	51	653	429	75	149
1976	75,825	12,956	8,983	3,973	3,973	NA	61,699	38,962	22,737	NA	NA	NA	550	301	72	35	94	48	619	385	76	157
1977	78,745	13,110	9,073	4,037	4,037	NA	64,331	40,779	23,552	NA	NA	NA	723	435	79	41	114	53	581	339	78	165
1978	82,591	13,990	9,777	4,214	4,214	NA	67,060	43,774	23,286	NA	NA	NA	991	675	85	39	130	62	549	300	79	171
1979	87,078	13,995	9,688	4,306	4,306	NA	71,324	47,033	24,292	NA	NA	NA	1,153	826	84	38	137	68	605	351	79	175
1980	91,822	13,704	9,177	4,527	4,527	NA	76,274	51,583	24,691	NA	NA	NA	1,167	815	86	44	152	69	678	421	78	179
1981	95,433	13,820	9,337	4,483	4,483	NA	79,443	53,082	26,362	NA	NA	NA	1,170	795	90	49	164	72	1,000	741	77	181
1982	100,677	14,259	10,048	4,211	4,211	NA	84,288	56,702	27,586	NA	NA	NA	1,158	771	88	52	171	76	971	703	78	190
1983	107,854	15,851	11,399	4,453	4,453	NA	89,731	60,753	28,978	NA	NA	NA	1,152	745	88	58	182	80	1,119	835	82	203
1984	119,823	17,399	12,761	4,638	4,638	NA	99,829	68,025	31,803	NA	NA	NA	1,221	784	93	66	194	84	1,374	1,072	85	217
1985	130,191	19,071	13,995	5,076	5,076	NA	108,351	72,959	35,391	NA	NA	NA	1,321	849	100	76	210	86	1,448	1,125	89	234
1986	129,899	19,481	14,170	5,311	5,311	NA	107,664	70,817	36,847	NA	NA	NA	1,400	879	112	86	233	90	1,354	1,004	95	254
1987	133,470	19,198	13,652	5,545	5,545	NA	111,529	71,248	40,281	NA	NA	NA	1,577	1,000	122	95	259	101	1,166	791	100	276
1988	136,439	20,103	14,301	5,802	5,802	NA	113,507	75,239	38,268	NA	NA	NA	1,772	1,127	133	107	290	115	1,057	657	104	296
1989	136,234	20,174	14,529	5,645	5,645	NA	112,942	80,253	32,689	NA	NA	NA	1,906	1,201	142	118	318	126	1,212	787	108	316
1990	140,874	20,013	14,527	5,486	5,486	NA	117,375	88,972	28,403	NA	NA	NA	2,107	1,363	149	124	339	133	1,378	927	113	338
1991	137,842	17,726	12,722	5,004	5,004	NA	116,364	91,354	25,010	NA	NA	NA	2,223	1,466	149	125	347	136	1,528	1,047	118	364
1992	141,438	17,743	12,892	4,851	4,851	NA	119,840	95,493	24,347	NA	NA	NA	2,262	1,495	149	129	348	141	1,594	1,074	125	395

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All per-formers	All federal	Federal intramural ^a	FFRDCs ^b		Nonfederal govern-ment ^c	Business ^d						Higher education ^e				Other nonprofit organizations ^f					
	All funding sources	Total	Federal	Total	Federal	Total	Total	Own domestic	Federal	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	Federal	Busi-ness	ONP
1993	138,005	16,689	12,556	4,133	4,133	NA	117,315	95,054	22,261	NA	NA	NA	2,352	1,560	151	135	359	148	1,649	1,089	132	428
1994	139,508	16,223	11,958	4,265	4,265	NA	119,115	97,147	21,968	NA	NA	NA	2,461	1,644	154	138	374	151	1,709	1,104	139	465
1995	150,123	16,846	12,296	4,550	4,550	NA	129,230	105,567	23,663	NA	NA	NA	2,405	1,566	163	144	382	150	1,641	987	148	506
1996	158,251	16,273	11,777	4,496	4,496	NA	138,024	115,773	22,251	NA	NA	NA	2,336	1,471	167	150	398	150	1,618	910	157	552
1997	164,926	15,904	11,635	4,269	4,269	NA	145,086	121,858	23,229	NA	NA	NA	2,170	1,335	154	145	393	143	1,766	880	198	688
1998	183,453	15,887	11,684	4,203	4,203	NA	163,635	140,237	23,399	NA	NA	NA	2,009	1,196	143	142	388	140	1,922	964	208	750
1999	192,737	15,737	11,572	4,165	4,165	NA	173,367	152,670	20,697	NA	NA	NA	1,702	857	146	145	406	147	1,931	908	222	800
2000	206,886	15,703	11,451	4,252	4,252	NA	187,752	171,254	16,498	NA	NA	NA	1,544	665	150	145	430	155	1,887	708	238	941
2001	200,278	17,263	13,208	4,056	3,907	NA	179,039	164,065	14,975	NA	NA	NA	1,682	771	153	140	454	163	2,293	1,043	235	1,015
2002	207,671	17,919	13,876	4,043	3,890	NA	185,548	170,189	15,359	NA	NA	NA	1,731	752	164	137	500	178	2,474	1,101	225	1,148
2003	202,320	19,096	14,580	4,515	4,364	NA	178,774	165,009	13,765	NA	NA	NA	2,075	1,034	179	136	538	187	2,376	857	225	1,294
2004	198,856	19,551	14,302	5,248	5,118	NA	173,962	157,782	16,179	NA	NA	NA	2,401	1,359	181	134	539	187	2,943	1,459	224	1,260
2005	212,780	20,411	15,213	5,197	5,059	NA	187,208	170,345	16,863	NA	NA	NA	2,280	1,246	172	133	545	185	2,882	1,316	230	1,335
2006	224,354	21,708	16,969	4,738	4,596	7	198,401	180,767	17,635	NA	NA	NA	2,006	977	165	133	548	183	2,232	636	239	1,357
2007	234,205	24,021	18,509	5,512	5,398	9	205,913	190,646	15,267	NA	NA	NA	1,970	919	168	137	555	191	2,292	583	247	1,462
2008	261,567	23,941	17,700	6,241	6,141	11	233,205	182,097	29,712	8,950	11,889	558	1,980	848	180	149	593	210	2,429	567	251	1,612
2009	256,036	23,497	17,245	6,252	6,159	13	226,554	179,841	30,435	7,041	8,732	505	3,441	1,569	288	289	915	381	2,531	550	241	1,740
2010	248,381	25,535	18,616	6,919	6,825	15	215,073	167,984	27,750	7,938	10,648	753	5,060	2,478	403	420	1,225	534	2,697	630	239	1,828

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All per-formers	All federal	Federal intramural ^a	FFRDCs ^b		Nonfederal govern-ment ^c	Business ^d						Higher education ^e				Other nonprofit organizations ^f					
	All funding sources	Total	Federal	Total	Federal	Total	Total	Own domestic	Federal	Other domestic business	Foreign business	Other	Total	Federal	Nonfederal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	Federal	Busi-ness	ONP
2011	262,311	27,830	21,178	6,652	6,568	15	226,391	181,776	25,387	7,711	10,905	611	5,237	2,580	389	422	1,297	549	2,839	765	247	1,827
2012	259,720	25,345	18,953	6,392	6,303	14	226,396	183,271	24,559	7,202	10,971	392	5,396	2,554	359	441	1,448	594	2,570	492	248	1,829
2013	268,577	24,726	18,489	6,237	6,147	13	235,712	194,117	20,706	8,165	12,109	616	5,497	2,479	368	469	1,562	620	2,629	443	258	1,927
2014	277,010	24,886	18,655	6,231	6,138	12	243,841	205,074	16,599	7,638	13,877	653	5,563	2,391	369	504	1,637	662	2,708	433	267	2,008
2015 ^g	285,906	25,195	18,677	6,519	6,419	12	252,296	209,639	17,134	9,358	15,368	796	5,639	2,331	367	509	1,716	717	2,763	406	273	2,083

NA = not available.

FFRDC = federally funded research and development center; ONP = other nonprofit organization.

^a See Appendix Table 4-2, footnote a.

^b Type-of-R&D data for FFRDC R&D in 1953–54 includes the R&D of only university-administered FFRDCs. Starting in 2001, type-of-R&D data distinguish federally funded from nonfederally funded FFRDC R&D. (See also Appendix Table 4-2, footnote b.)

^c Type-of-R&D data for state intramural R&D are not currently collected by the Survey of State Government R&D. (See also Appendix Table 4-2, footnote c.)

^d Type-of-R&D data for business R&D in 1998–2007 were revised in response to data quality review considerations and are not directly comparable with the data for 1997 and earlier years. For 2008 and later years, the type-of-R&D splits for other than total, own-funded, and federally funded R&D are estimated. (See also Appendix Table 4-2, footnote d.)

^e The type-of-R&D estimation procedure for higher education R&D was revised in 1998 and again in 2010; hence, these data are not directly comparable with data reported for earlier years. Type-of-R&D splits for other than total and federally funded are estimated. (See also Appendix Table 4-2, footnote e.)

^f Type-of-R&D data for R&D by other nonprofit organizations in 1998 and later years are estimated, except for the R&D that is federally funded. (See also Appendix Table 4-2, footnote f.)

^g Some data for 2015 are preliminary and may later be revised.

Note(s)

Detail may not add to total because of rounding. Constant-dollar estimates are derived from unrounded data. For trend comparisons, use only the historical data reported in this table, as some back-year data may have been revised. Except for the nonprofit sector, data are based on annual reports by performers in the National Science Foundation's annual R&D expenditure surveys: Business R&D and Innovation Survey, Higher Education R&D Survey, Survey of Federal Funds for R&D, FFRDC R&D Expenditures Survey, and Survey of State Government R&D. R&D expenditures by business performers—and also, before 2001, industry-administered FFRDCs—are collected on a calendar year basis. Expenditures for other performers are calendar year approximations based on fiscal year data. For federal performers in 1977 and afterward, the approximation equals 75% of the amount reported in the same fiscal year plus 25% of the amount reported in the subsequent fiscal year. Before 1977, the federal fiscal year began on 1 July, not 1 October, and the approximation is 50% of the amount reported in the same fiscal year plus 50% of the amount reported in the subsequent fiscal year. The fiscal year for higher education performers and state government performers generally begins 1 July, and the calendar year approximation is 50% of the amount reported in the same fiscal year plus 50% of the amount reported in the subsequent fiscal year.

Source(s)

National Science Foundation, National Center for Science and Engineering Statistics, National Patterns of R&D Resources (annual series).



CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Science and Engineering Indicators 2018

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

APPENDIX TABLE 4-6

U.S. R&D expenditures, by source of funds and performing sector: 1953–2015

(Millions of current and of constant 2009 dollars)

Year	All funding sources		Federal						Nonfederal government					Business					Higher ed-ucation	Other nonprofit organizations				
	All per-formers	Total	Federal intra-mural	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP
Current \$millions																								
1953	5,160	2,783	1,015	131	NA	1,430	149	58	40	NA	NA	NA	40	2,247	NA	2,200	21	26	37	55	NA	NA	27	28
1954	5,621	3,102	963	165	NA	1,750	165	61	45	NA	NA	NA	45	2,375	NA	2,320	24	31	40	60	NA	NA	29	31
1955	6,185	3,507	973	319	NA	1,960	191	65	50	NA	NA	NA	50	2,522	NA	2,460	27	35	42	64	NA	NA	32	32
1956	8,501	4,979	1,131	561	NA	2,995	221	71	57	NA	NA	NA	57	3,346	NA	3,277	32	37	46	74	NA	NA	36	38
1957	9,908	6,233	1,297	688	NA	3,928	242	79	64	NA	NA	NA	64	3,470	NA	3,396	37	37	51	91	NA	NA	40	51
1958	10,915	6,974	1,507	657	NA	4,436	280	95	72	NA	NA	NA	72	3,707	NA	3,630	39	38	56	107	NA	NA	45	62
1959	12,490	8,167	1,681	789	NA	5,217	356	125	81	NA	NA	NA	81	4,065	NA	3,983	40	42	61	117	NA	NA	50	67
1960	13,711	8,915	1,801	910	NA	5,604	453	148	90	NA	NA	NA	90	4,516	NA	4,428	40	48	67	123	NA	NA	55	68
1961	14,564	9,484	1,987	1,087	NA	5,685	557	169	101	NA	NA	NA	101	4,757	NA	4,668	40	49	75	148	NA	NA	62	86
1962	15,636	10,138	2,188	1,056	NA	6,008	687	200	112	NA	NA	NA	112	5,124	NA	5,029	41	54	84	179	NA	NA	70	109
1963	17,519	11,646	2,559	1,159	NA	6,856	839	234	125	NA	NA	NA	125	5,456	NA	5,360	41	55	96	197	NA	NA	78	119
1964	19,103	12,765	2,966	1,297	NA	7,257	995	250	138	NA	NA	NA	138	5,888	NA	5,792	41	55	114	200	NA	NA	88	112
1965	20,253	13,194	3,157	1,218	NA	7,367	1,167	286	150	NA	NA	NA	150	6,549	NA	6,445	42	62	136	225	NA	NA	101	124
1966	22,072	14,165	3,308	1,217	NA	7,977	1,335	329	160	NA	NA	NA	160	7,331	NA	7,216	45	70	165	252	NA	NA	114	138

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All funding sources	Federal							Nonfederal government					Business					Higher ed-ucation	Other nonprofit organizations				
	All per-formers	Total	Federal intra-mural	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP
1967	23,347	14,564	3,445	1,340	NA	7,946	1,491	342	168	NA	NA	NA	168	8,146	NA	8,020	52	74	200	271	NA	NA	126	145
1968	24,667	14,965	3,498	1,372	NA	8,145	1,586	364	185	NA	NA	NA	185	9,008	NA	8,869	58	81	221	290	NA	NA	139	151
1969	25,996	15,228	3,790	1,440	NA	7,987	1,624	388	208	NA	NA	NA	208	10,011	NA	9,857	61	93	233	316	NA	NA	155	161
1970	26,271	14,984	4,154	1,430	NA	7,306	1,686	410	237	NA	NA	NA	237	10,449	NA	10,288	66	95	259	343	NA	NA	171	172
1971	26,952	15,210	4,409	1,441	NA	7,175	1,760	427	262	NA	NA	NA	262	10,824	NA	10,654	72	98	290	366	NA	NA	182	184
1972	28,740	16,039	4,676	1,533	NA	7,469	1,890	472	282	NA	NA	NA	282	11,715	NA	11,535	79	101	312	393	NA	NA	195	198
1973	30,952	16,587	4,837	1,576	NA	7,600	2,009	566	301	NA	NA	NA	301	13,299	NA	13,104	90	105	344	421	NA	NA	210	211
1974	33,359	17,287	5,132	1,784	NA	7,572	2,160	639	320	NA	NA	NA	320	14,886	NA	14,667	105	114	394	474	NA	NA	239	235
1975	35,671	18,533	5,561	2,019	NA	7,878	2,400	675	348	NA	NA	NA	348	15,824	NA	15,582	118	124	432	534	NA	NA	272	262
1976	39,435	20,292	5,890	2,401	NA	8,671	2,619	711	369	NA	NA	NA	369	17,702	NA	17,436	131	135	480	592	NA	NA	300	292
1977	43,338	22,071	6,211	2,704	NA	9,523	2,893	740	394	NA	NA	NA	394	19,642	NA	19,340	155	147	569	662	NA	NA	337	326
1978	48,719	24,414	6,962	3,186	NA	10,107	3,329	830	443	NA	NA	NA	443	22,457	NA	22,115	182	160	679	727	NA	NA	364	363
1979	55,379	27,225	7,471	3,567	NA	11,354	3,848	985	482	NA	NA	NA	482	26,097	NA	25,708	215	174	785	791	NA	NA	386	405
1980	63,224	29,986	7,831	4,052	NA	12,752	4,335	1,017	519	NA	NA	NA	519	30,929	NA	30,476	264	189	920	871	NA	NA	419	452
1981	72,292	33,739	8,605	4,393	NA	14,997	4,670	1,075	581	NA	NA	NA	581	35,948	NA	35,428	314	206	1,058	967	NA	NA	463	504
1982	80,748	37,133	9,501	4,563	NA	17,061	4,879	1,129	621	NA	NA	NA	621	40,692	NA	40,105	363	224	1,207	1,095	NA	NA	534	561
1983	89,949	41,451	10,830	5,011	NA	19,095	5,210	1,306	658	NA	NA	NA	658	45,264	NA	44,588	432	244	1,357	1,220	NA	NA	595	626
1984	102,244	46,470	11,916	5,602	NA	21,657	5,748	1,548	721	NA	NA	NA	721	52,187	NA	51,404	518	265	1,514	1,351	NA	NA	654	698

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All funding sources		Federal						Nonfederal government						Business					Higher ed-ucation		Other nonprofit organizations				
	All per-formers	Total	Federal intra-mural	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP		
1985	114,671	52,641	13,093	6,134	NA	25,333	6,388	1,694	834	NA	NA	NA	834	57,962	NA	57,043	630	289	1,743	1,491	NA	NA	713	778		
1986	120,249	54,622	13,505	6,405	NA	26,000	7,028	1,686	969	NA	NA	NA	969	60,991	NA	59,932	745	314	2,019	1,647	NA	NA	780	867		
1987	126,360	58,609	13,588	6,792	NA	28,757	7,768	1,704	1,065	NA	NA	NA	1,065	62,576	NA	61,403	831	342	2,262	1,849	NA	NA	882	967		
1988	133,881	60,131	14,342	7,212	NA	28,221	8,593	1,762	1,165	NA	NA	NA	1,165	67,977	NA	66,672	933	372	2,527	2,081	NA	NA	1,003	1,078		
1989	141,891	60,465	15,231	7,497	NA	26,359	9,317	2,062	1,274	NA	NA	NA	1,274	74,966	NA	73,501	1,061	405	2,852	2,333	NA	NA	1,131	1,202		
1990	151,993	61,610	15,671	7,853	NA	25,802	9,939	2,346	1,399	NA	NA	NA	1,399	83,208	NA	81,602	1,166	440	3,187	2,589	NA	NA	1,249	1,340		
1991	160,876	60,783	15,249	8,093	NA	24,095	10,667	2,679	1,483	NA	NA	NA	1,483	92,300	NA	90,580	1,242	479	3,458	2,852	NA	NA	1,358	1,494		
1992	165,350	60,915	15,853	8,360	NA	22,369	11,528	2,806	1,525	NA	NA	NA	1,525	96,229	NA	94,388	1,320	521	3,569	3,113	NA	NA	1,448	1,666		
1993	165,730	60,528	16,531	8,003	NA	20,844	12,307	2,843	1,557	NA	NA	NA	1,557	96,549	NA	94,591	1,392	567	3,709	3,388	NA	NA	1,531	1,857		
1994	169,207	60,777	16,355	8,254	NA	20,261	12,996	2,911	1,623	NA	NA	NA	1,623	99,204	NA	97,131	1,456	617	3,938	3,665	NA	NA	1,595	2,071		
1995	183,625	62,969	16,904	8,448	NA	21,178	13,592	2,847	1,751	NA	NA	NA	1,751	110,871	NA	108,652	1,548	671	4,110	3,925	NA	NA	1,617	2,308		
1996	197,346	63,394	16,585	8,464	NA	21,356	14,084	2,906	1,861	NA	NA	NA	1,861	123,417	NA	121,015	1,672	730	4,436	4,239	NA	NA	1,666	2,574		
1997	211,894	64,362	16,819	8,413	NA	21,798	14,317	3,014	1,902	NA	NA	NA	1,902	136,208	NA	133,611	1,788	809	4,852	4,571	NA	NA	1,767	2,804		
1998	225,759	65,908	17,362	8,480	NA	22,086	14,699	3,281	1,920	NA	NA	NA	1,920	147,774	NA	145,016	1,898	859	5,193	4,963	NA	NA	1,871	3,092		
1999	244,451	66,817	18,142	8,704	NA	20,496	15,714	3,761	2,036	NA	NA	NA	2,036	164,545	NA	161,594	2,020	931	5,654	5,399	NA	NA	2,050	3,349		
2000	267,950	67,238	19,247	9,269	NA	17,117	17,095	4,510	2,182	NA	NA	NA	2,182	185,975	NA	182,844	2,112	1,020	6,270	6,285	NA	NA	2,258	4,027		
2001	278,539	73,793	22,374	10,056	NA	16,899	18,976	5,488	2,341	22	NA	NA	2,319	188,408	142	185,118	2,120	1,029	6,874	7,122	218	NA	2,461	4,443		
2002	277,911	78,873	23,798	11,242	NA	16,401	21,655	5,778	2,553	32	NA	NA	2,521	180,704	135	177,467	2,103	998	7,673	8,109	275	NA	2,732	5,102		

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All funding sources		Federal						Nonfederal government						Business					Higher ed-ucation		Other nonprofit organizations				
	All per-formers	Total	Federal intra-mural	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP		
2003	291,365	85,133	24,982	11,841	NA	17,798	24,567	5,945	2,788	32	NA	NA	2,756	186,171	134	182,926	2,090	1,020	8,286	8,988	245	NA	2,879	5,864		
2004	302,731	90,795	24,898	12,471	NA	20,266	26,624	6,537	2,926	31	NA	NA	2,896	191,346	122	188,035	2,148	1,041	8,637	9,028	165	NA	2,993	5,870		
2005	325,288	95,413	26,322	12,894	NA	21,909	27,743	6,545	2,977	32	NA	NA	2,945	207,775	139	204,250	2,279	1,107	9,353	9,771	180	NA	3,170	6,420		
2006	350,908	99,938	28,240	12,969	105	24,304	28,277	6,044	3,293	31	204	NA	3,059	227,182	171	223,365	2,464	1,182	10,176	10,320	200	NA	3,394	6,726		
2007	377,890	105,128	29,859	13,845	135	26,585	28,725	5,980	3,594	32	253	NA	3,308	246,815	180	242,682	2,697	1,257	10,933	11,420	216	NA	3,767	7,438		
2008	404,773	117,615	29,839	15,369	176	36,360	29,635	6,236	4,221	33	315	306	3,567	258,016	199	253,562	2,954	1,301	11,738	13,184	209	452	4,161	8,362		
2009	402,931	125,765	30,560	16,571	224	39,573	31,741	7,097	4,295	40	381	195	3,679	246,610	184	242,135	3,033	1,258	12,056	14,205	218	490	4,400	9,097		
2010	406,580	126,617	31,970	18,409	264	34,199	34,682	7,093	4,302	46	427	156	3,673	248,124	174	243,732	2,953	1,265	12,262	15,275	199	890	4,515	9,672		
2011	426,160	127,015	34,950	18,176	273	31,309	35,742	6,564	4,386	30	421	321	3,615	266,421	189	261,901	2,999	1,333	13,104	15,235	179	561	4,630	9,865		
2012	433,619	123,838	34,017	17,727	266	30,621	34,968	6,239	4,158	42	398	157	3,560	275,717	185	270,997	3,169	1,366	14,300	15,607	173	476	4,899	10,059		
2013	453,964	120,130	33,406	17,296	257	29,362	33,839	5,970	4,244	45	362	194	3,643	297,167	195	292,153	3,375	1,444	15,378	17,045	144	819	5,312	10,770		
2014	475,426	118,363	34,783	17,523	247	26,554	33,121	6,135	4,214	26	336	138	3,715	318,382	218	313,043	3,601	1,520	16,217	18,250	137	993	5,701	11,420		
2015 ^a	495,144	120,933	35,673	18,287	249	26,990	33,546	6,189	4,280	19	361	127	3,772	333,207	205	327,589	3,842	1,572	17,334	19,390	138	1,115	6,159	11,978		
Constant 2009 \$millions																										
1953	34,048	18,360	6,697	864	NA	9,436	983	379	261	NA	NA	NA	261	14,823	NA	14,516	135	172	241	363	NA	NA	178	185		
1954	36,745	20,280	6,293	1,075	NA	11,441	1,075	396	291	NA	NA	NA	291	15,524	NA	15,167	154	203	258	392	NA	NA	190	203		
1955	39,748	22,538	6,253	2,047	NA	12,596	1,227	415	321	NA	NA	NA	321	16,208	NA	15,809	174	225	270	411	NA	NA	206	206		
1956	52,831	30,942	7,026	3,487	NA	18,614	1,374	441	351	NA	NA	NA	351	20,792	NA	20,367	196	230	286	460	NA	NA	224	236		

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All funding sources		Federal						Nonfederal government						Business					Higher ed-ucation		Other nonprofit organizations				
	All per-formers	Total	Federal intra-mural	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP		
1957	59,592	37,486	7,801	4,135	NA	23,625	1,453	472	385	NA	NA	NA	385	20,867	NA	20,425	220	223	307	547	NA	NA	241	307		
1958	64,206	41,024	8,862	3,862	NA	26,094	1,647	559	424	NA	NA	NA	424	21,806	NA	21,353	229	224	326	626	NA	NA	262	365		
1959	72,451	47,376	9,751	4,577	NA	30,264	2,062	722	467	NA	NA	NA	467	23,578	NA	23,105	229	244	354	676	NA	NA	287	389		
1960	78,453	51,011	10,302	5,207	NA	32,065	2,589	847	515	NA	NA	NA	515	25,840	NA	25,337	229	275	383	704	NA	NA	315	389		
1961	82,428	53,676	11,246	6,149	NA	32,175	3,150	956	569	NA	NA	NA	569	26,923	NA	26,419	226	277	422	838	NA	NA	351	487		
1962	87,421	56,681	12,230	5,904	NA	33,591	3,838	1,118	626	NA	NA	NA	626	28,645	NA	28,117	226	302	470	998	NA	NA	389	609		
1963	96,851	64,380	14,144	6,405	NA	37,902	4,636	1,294	691	NA	NA	NA	691	30,160	NA	29,632	224	304	531	1,089	NA	NA	431	658		
1964	104,011	69,499	16,146	7,062	NA	39,512	5,418	1,361	749	NA	NA	NA	749	32,056	NA	31,536	221	299	618	1,089	NA	NA	479	610		
1965	108,294	70,551	16,878	6,510	NA	39,393	6,240	1,529	799	NA	NA	NA	799	35,016	NA	34,463	222	332	727	1,200	NA	NA	537	663		
1966	114,799	73,674	17,205	6,327	NA	41,489	6,943	1,709	832	NA	NA	NA	832	38,129	NA	37,531	234	364	856	1,308	NA	NA	590	718		
1967	118,000	73,607	17,412	6,773	NA	40,161	7,533	1,729	849	NA	NA	NA	849	41,169	NA	40,535	260	374	1,008	1,367	NA	NA	634	733		
1968	119,577	72,544	16,955	6,651	NA	39,485	7,689	1,765	894	NA	NA	NA	894	43,666	NA	42,995	279	393	1,069	1,403	NA	NA	671	732		
1969	120,114	70,362	17,513	6,654	NA	36,904	7,501	1,790	961	NA	NA	NA	961	46,254	NA	45,545	280	430	1,077	1,460	NA	NA	716	744		
1970	115,302	65,764	18,231	6,274	NA	32,065	7,397	1,797	1,040	NA	NA	NA	1,040	45,857	NA	45,153	287	417	1,135	1,505	NA	NA	750	755		
1971	112,571	63,529	18,414	6,017	NA	29,968	7,349	1,781	1,094	NA	NA	NA	1,094	45,209	NA	44,499	301	409	1,209	1,529	NA	NA	760	769		
1972	115,066	64,215	18,720	6,138	NA	29,903	7,567	1,888	1,129	NA	NA	NA	1,129	46,903	NA	46,182	316	404	1,247	1,571	NA	NA	779	793		
1973	117,527	62,982	18,365	5,984	NA	28,858	7,626	2,149	1,143	NA	NA	NA	1,143	50,497	NA	49,757	342	399	1,306	1,599	NA	NA	797	801		
1974	116,224	60,227	17,881	6,215	NA	26,381	7,525	2,225	1,113	NA	NA	NA	1,113	51,862	NA	51,100	364	398	1,371	1,651	NA	NA	831	820		

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All funding sources		Federal						Nonfederal government						Business					Higher ed-ucation		Other nonprofit organizations				
	All per-formers	Total	Federal intra-mural	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP		
1975	113,745	59,097	17,733	6,438	NA	25,121	7,653	2,152	1,110	NA	NA	NA	1,110	50,459	NA	49,686	376	396	1,376	1,704	NA	NA	867	836		
1976	119,199	61,335	17,804	7,256	NA	26,210	7,916	2,149	1,115	NA	NA	NA	1,115	53,508	NA	52,704	396	409	1,451	1,789	NA	NA	905	884		
1977	123,345	62,818	17,678	7,697	NA	27,104	8,232	2,107	1,121	NA	NA	NA	1,121	55,902	NA	55,044	440	419	1,618	1,886	NA	NA	958	928		
1978	129,565	64,926	18,515	8,473	NA	26,879	8,852	2,207	1,178	NA	NA	NA	1,178	59,722	NA	58,813	483	426	1,806	1,933	NA	NA	967	967		
1979	136,047	66,883	18,354	8,762	NA	27,893	9,453	2,420	1,183	NA	NA	NA	1,183	64,111	NA	63,156	527	428	1,928	1,942	NA	NA	947	995		
1980	142,470	67,571	17,646	9,130	NA	28,736	9,767	2,292	1,168	NA	NA	NA	1,168	69,696	NA	68,675	594	427	2,072	1,962	NA	NA	944	1,018		
1981	148,990	69,534	17,733	9,054	NA	30,908	9,624	2,214	1,197	NA	NA	NA	1,197	74,087	NA	73,015	647	425	2,179	1,992	NA	NA	954	1,038		
1982	156,699	72,060	18,438	8,855	NA	33,109	9,467	2,191	1,205	NA	NA	NA	1,205	78,967	NA	77,828	704	435	2,341	2,125	NA	NA	1,035	1,090		
1983	167,927	77,384	20,218	9,354	NA	35,649	9,727	2,437	1,228	NA	NA	NA	1,228	84,504	NA	83,242	807	456	2,532	2,279	NA	NA	1,110	1,169		
1984	184,335	83,781	21,483	10,101	NA	39,046	10,362	2,790	1,300	NA	NA	NA	1,300	94,088	NA	92,677	933	479	2,730	2,436	NA	NA	1,178	1,258		
1985	200,332	91,965	22,873	10,716	NA	44,257	11,160	2,959	1,456	NA	NA	NA	1,456	101,261	NA	99,656	1,101	505	3,045	2,605	NA	NA	1,246	1,359		
1986	205,920	93,538	23,126	10,968	NA	44,524	12,034	2,887	1,659	NA	NA	NA	1,659	104,445	NA	102,631	1,276	538	3,457	2,821	NA	NA	1,336	1,485		
1987	211,005	97,870	22,691	11,341	NA	48,020	12,972	2,846	1,778	NA	NA	NA	1,778	104,494	NA	102,535	1,388	571	3,777	3,087	NA	NA	1,472	1,615		
1988	216,002	97,015	23,139	11,637	NA	45,532	13,864	2,843	1,880	NA	NA	NA	1,880	109,673	NA	107,568	1,505	600	4,077	3,358	NA	NA	1,618	1,740		
1989	220,356	93,903	23,653	11,643	NA	40,935	14,469	3,202	1,979	NA	NA	NA	1,979	116,422	NA	114,147	1,647	628	4,429	3,623	NA	NA	1,756	1,867		
1990	227,623	92,267	23,469	11,760	NA	38,641	14,885	3,513	2,095	NA	NA	NA	2,095	124,611	NA	122,206	1,745	659	4,772	3,878	NA	NA	1,870	2,007		
1991	233,168	88,097	22,102	11,730	NA	34,923	15,460	3,883	2,149	NA	NA	NA	2,149	133,777	NA	131,284	1,799	694	5,011	4,134	NA	NA	1,968	2,166		
1992	234,312	86,320	22,465	11,846	NA	31,698	16,335	3,976	2,161	NA	NA	NA	2,161	136,362	NA	133,754	1,870	738	5,057	4,412	NA	NA	2,051	2,361		

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All funding sources		Federal						Nonfederal government						Business					Higher ed-ucation		Other nonprofit organizations				
	All per-formers	Total	Federal intra-mural	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP		
1993	229,392	83,778	22,880	11,077	NA	28,851	17,034	3,935	2,155	NA	NA	NA	2,155	133,637	NA	130,926	1,926	785	5,133	4,689	NA	NA	2,118	2,571		
1994	229,321	82,370	22,166	11,187	NA	27,459	17,612	3,945	2,199	NA	NA	NA	2,199	134,448	NA	131,639	1,973	836	5,337	4,967	NA	NA	2,161	2,806		
1995	243,780	83,597	22,441	11,215	NA	28,116	18,045	3,780	2,325	NA	NA	NA	2,325	147,191	NA	144,246	2,054	891	5,456	5,211	NA	NA	2,146	3,065		
1996	257,299	82,653	21,623	11,035	NA	27,844	18,363	3,788	2,426	NA	NA	NA	2,426	160,910	NA	157,779	2,179	952	5,783	5,527	NA	NA	2,171	3,355		
1997	271,619	82,503	21,560	10,785	NA	27,942	18,353	3,864	2,438	NA	NA	NA	2,438	174,600	NA	171,271	2,293	1,037	6,219	5,859	NA	NA	2,265	3,594		
1998	286,282	83,578	22,017	10,754	NA	28,007	18,640	4,160	2,435	NA	NA	NA	2,435	187,390	NA	183,893	2,407	1,089	6,585	6,294	NA	NA	2,373	3,921		
1999	305,315	83,453	22,659	10,871	NA	25,599	19,627	4,697	2,544	NA	NA	NA	2,544	205,514	NA	201,828	2,524	1,162	7,061	6,743	NA	NA	2,560	4,183		
2000	327,218	82,110	23,504	11,319	NA	20,903	20,876	5,508	2,665	NA	NA	NA	2,665	227,111	NA	223,287	2,579	1,245	7,656	7,675	NA	NA	2,757	4,918		
2001	332,570	88,108	26,715	12,006	NA	20,177	22,657	6,552	2,796	27	NA	NA	2,769	224,956	169	221,027	2,531	1,229	8,207	8,504	260	NA	2,939	5,305		
2002	326,805	92,749	27,984	13,219	NA	19,286	25,464	6,794	3,002	38	NA	NA	2,965	212,495	159	208,689	2,473	1,174	9,023	9,535	324	NA	3,213	5,999		
2003	335,926	98,153	28,803	13,652	NA	20,520	28,324	6,854	3,214	37	NA	NA	3,177	214,643	154	210,902	2,410	1,176	9,553	10,363	283	NA	3,319	6,761		
2004	339,690	101,879	27,937	13,993	NA	22,740	29,874	7,335	3,283	34	NA	NA	3,249	214,707	137	210,992	2,410	1,168	9,691	10,130	185	NA	3,358	6,587		
2005	353,622	103,723	28,615	14,017	NA	23,817	30,159	7,115	3,236	35	NA	NA	3,202	225,873	152	222,041	2,477	1,203	10,167	10,622	196	NA	3,446	6,980		
2006	370,102	105,404	29,784	13,678	111	25,633	29,823	6,374	3,473	32	215	NA	3,227	239,609	181	235,583	2,598	1,247	10,732	10,884	210	NA	3,579	7,094		
2007	388,229	108,004	30,676	14,224	138	27,312	29,511	6,143	3,692	33	260	NA	3,399	253,568	185	249,322	2,771	1,291	11,232	11,732	221	NA	3,870	7,641		
2008	407,848	118,508	30,066	15,485	178	36,636	29,860	6,283	4,253	33	318	308	3,594	259,975	201	255,488	2,976	1,310	11,827	13,284	210	455	4,193	8,426		
2009	402,931	125,765	30,560	16,571	224	39,573	31,741	7,097	4,295	40	381	195	3,679	246,610	184	242,135	3,033	1,258	12,056	14,205	218	490	4,400	9,097		
2010	401,673	125,089	31,584	18,187	261	33,786	34,263	7,008	4,250	46	422	154	3,629	245,129	172	240,790	2,917	1,250	12,114	15,091	196	879	4,460	9,555		

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All funding sources	Federal							Nonfederal government					Business					Higher ed-ucation	Other nonprofit organizations				
	All per-formers	Total	Federal intra-mural	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP
2011	412,503	122,944	33,830	17,593	264	30,306	34,597	6,354	4,245	29	407	311	3,499	257,883	183	253,508	2,902	1,290	12,684	14,747	173	543	4,482	9,549
2012	412,127	117,700	32,331	16,849	253	29,103	33,234	5,930	3,952	40	379	149	3,384	262,051	176	257,566	3,012	1,298	13,591	14,833	164	452	4,656	9,560
2013	424,610	112,363	31,246	16,178	241	27,463	31,650	5,584	3,970	42	339	181	3,407	277,952	183	273,262	3,156	1,351	14,383	15,943	134	766	4,969	10,074
2014	436,844	108,758	31,961	16,101	227	24,399	30,433	5,637	3,872	24	309	127	3,413	292,544	200	287,639	3,309	1,397	14,901	16,769	126	912	5,238	10,493
2015 ^a	450,080	109,927	32,427	16,622	226	24,534	30,493	5,625	3,890	17	328	115	3,429	302,881	186	297,774	3,492	1,429	15,756	17,625	125	1,014	5,598	10,888

NA = not available.

FFRDC = federally funded research and development center; ONP = other nonprofit organization.

^a Some data for 2015 are preliminary and may later be revised.

Note(s)

This table reaggregates the R&D performer data in Appendix Table 4-2 according to major categories of R&D funding: federal government, nonfederal government (state and local), business, higher education, and other nonprofit organizations. Business sources of R&D funding in this table include the own funds of domestic R&D performing businesses, funds from other domestic businesses, and funds from foreign businesses. For interpretive detail on the R&D performers listed, see Appendix Table 4-2, footnotes a–f. Detail may not add to total because of rounding. Constant-dollar estimates are derived from unrounded data. For trend comparisons, use only the historical data reported in this table, as some back-year data may have been revised. Except for the nonprofit sector, data are based on annual reports by performers in the National Science Foundation's annual R&D expenditure surveys: Business R&D and Innovation Survey, Higher Education R&D Survey, Survey of Federal Funds for R&D, FFRDC R&D Expenditures Survey, and Survey of State Government R&D. R&D expenditures by business performers—and also, before 2001, industry-administered FFRDCs—are collected on a calendar year basis. Expenditures for other performers are calendar year approximations based on fiscal year data (see Appendix Table 4-2, general notes). The 1998–2015 data for ONP R&D performance funded by businesses and the nonprofit sector itself are estimated, based on parameters from the 1996–97 Survey of R&D Funding and Performance by Nonprofit Organizations.

Source(s)

National Science Foundation, National Center for Science and Engineering Statistics, National Patterns of R&D Resources (annual series).

Science and Engineering Indicators 2018

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

APPENDIX TABLE 4-7

U.S. basic research expenditures, by source of funds and performing sector: 1953–2015

(Millions of current and of constant 2009 dollars)

Year	All funding sources		Federal					Nonfederal government					Business					Higher ed-ucation	Other nonprofit organizations					
	All per-formers	Total	Federal intra-mural	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP
Current \$millions																								
1953	460	265	102	36	NA	19	82	27	7	NA	NA	NA	7	154	NA	132	13	9	6	28	NA	NA	16	12
1954	509	291	96	45	NA	23	97	31	10	NA	NA	NA	10	169	NA	143	15	11	8	31	NA	NA	18	13
1955	570	318	98	62	NA	7	117	35	14	NA	NA	NA	14	192	NA	162	17	13	12	35	NA	NA	21	14
1956	718	392	114	89	NA	7	143	41	19	NA	NA	NA	19	251	NA	216	20	15	15	41	NA	NA	24	17
1957	813	451	124	110	NA	4	167	48	25	NA	NA	NA	25	268	NA	230	23	15	20	50	NA	NA	27	23
1958	943	537	149	115	NA	14	202	58	31	NA	NA	NA	31	292	NA	252	24	16	24	59	NA	NA	31	28
1959	1,087	665	165	134	NA	34	263	71	38	NA	NA	NA	38	290	NA	248	24	18	28	66	NA	NA	36	30
1960	1,286	794	184	150	NA	36	341	84	45	NA	NA	NA	45	343	NA	297	25	21	33	71	NA	NA	41	30
1961	1,511	972	230	177	NA	30	432	104	54	NA	NA	NA	54	361	NA	314	25	22	40	85	NA	NA	48	37
1962	1,824	1,218	252	189	NA	104	546	128	64	NA	NA	NA	64	394	NA	345	25	24	48	101	NA	NA	55	46
1963	2,115	1,446	285	216	NA	109	689	147	75	NA	NA	NA	75	425	NA	375	25	25	58	113	NA	NA	63	50
1964	2,396	1,693	339	245	NA	123	824	163	84	NA	NA	NA	84	434	NA	384	25	25	70	115	NA	NA	68	47
1965	2,664	1,900	375	250	NA	157	944	175	94	NA	NA	NA	94	462	NA	406	27	29	86	122	NA	NA	70	52
1966	2,930	2,075	410	273	NA	142	1,066	184	104	NA	NA	NA	104	512	NA	451	29	32	106	133	NA	NA	75	58

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All funding sources		Federal						Nonfederal government						Business					Higher ed-ucation	Other nonprofit organizations				
	All per-formers	Total	Federal intra-mural	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP	
1967	3,168	2,280	434	301	NA	168	1,188	190	114	NA	NA	NA	114	495	NA	427	34	34	136	144	NA	NA	83	61	
1968	3,376	2,399	482	315	NA	145	1,265	192	131	NA	NA	NA	131	537	NA	462	38	37	156	154	NA	NA	91	63	
1969	3,491	2,457	545	313	NA	123	1,288	188	153	NA	NA	NA	153	541	NA	458	40	43	171	170	NA	NA	103	67	
1970	3,594	2,501	562	304	NA	122	1,323	191	179	NA	NA	NA	179	531	NA	444	43	44	196	187	NA	NA	115	72	
1971	3,720	2,559	581	289	NA	101	1,385	204	194	NA	NA	NA	194	551	NA	456	50	45	214	204	NA	NA	127	77	
1972	3,850	2,656	603	313	NA	91	1,437	213	195	NA	NA	NA	195	565	NA	463	55	47	216	218	NA	NA	134	84	
1973	4,099	2,847	652	382	NA	96	1,489	229	196	NA	NA	NA	196	607	NA	499	59	49	223	227	NA	NA	137	90	
1974	4,511	3,146	715	467	NA	114	1,609	242	204	NA	NA	NA	204	656	NA	536	66	54	250	254	NA	NA	153	102	
1975	4,875	3,415	760	533	NA	104	1,768	251	212	NA	NA	NA	212	704	NA	573	72	59	264	280	NA	NA	164	116	
1976	5,373	3,793	850	629	NA	116	1,924	274	218	NA	NA	NA	218	774	NA	634	75	65	283	305	NA	NA	175	131	
1977	6,008	4,235	943	746	NA	135	2,114	297	232	NA	NA	NA	232	862	NA	701	89	72	334	346	NA	NA	198	148	
1978	6,959	4,950	1,044	1,005	NA	156	2,399	346	260	NA	NA	NA	260	970	NA	785	107	79	398	380	NA	NA	213	168	
1979	7,836	5,558	1,112	1,160	NA	161	2,719	406	286	NA	NA	NA	286	1,107	NA	893	128	87	466	419	NA	NA	229	190	
1980	8,747	6,147	1,212	1,294	NA	170	3,061	411	307	NA	NA	NA	307	1,286	NA	1,035	156	95	544	463	NA	NA	248	215	
1981	9,658	6,591	1,343	1,430	NA	164	3,331	324	338	NA	NA	NA	338	1,600	NA	1,313	183	105	615	512	NA	NA	269	243	
1982	10,651	7,121	1,522	1,503	NA	253	3,475	369	368	NA	NA	NA	368	1,854	NA	1,523	215	115	716	591	NA	NA	317	275	
1983	11,880	7,853	1,733	1,661	NA	346	3,689	426	396	NA	NA	NA	396	2,146	NA	1,760	260	127	816	668	NA	NA	358	311	
1984	13,332	8,651	1,877	1,854	NA	340	4,087	494	436	NA	NA	NA	436	2,584	NA	2,132	313	139	915	746	NA	NA	395	351	

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All funding sources		Federal						Nonfederal government						Business					Higher ed-ucation		Other nonprofit organizations				
	All per-formers	Total	Federal intra-mural	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP		
1985	14,748	9,407	1,947	1,936	NA	358	4,606	560	514	NA	NA	NA	514	2,915	NA	2,373	389	153	1,075	837	NA	NA	440	397		
1986	17,154	10,220	2,026	2,045	NA	434	5,122	594	606	NA	NA	NA	606	4,130	NA	3,496	466	168	1,262	936	NA	NA	488	449		
1987	18,481	11,090	2,047	2,242	NA	598	5,527	675	659	NA	NA	NA	659	4,282	NA	3,583	514	185	1,399	1,052	NA	NA	545	507		
1988	19,787	12,097	2,116	2,633	NA	656	5,937	756	705	NA	NA	NA	705	4,275	NA	3,507	565	203	1,530	1,180	NA	NA	607	573		
1989	21,891	13,392	2,309	2,815	NA	986	6,422	860	766	NA	NA	NA	766	4,692	NA	3,832	637	223	1,714	1,327	NA	NA	680	647		
1990	23,029	14,057	2,319	3,033	NA	869	6,889	947	847	NA	NA	NA	847	4,710	NA	3,760	705	245	1,929	1,486	NA	NA	756	730		
1991	27,140	15,283	2,378	3,195	NA	1,251	7,423	1,036	912	NA	NA	NA	912	7,157	NA	6,125	764	269	2,127	1,660	NA	NA	836	825		
1992	27,604	15,710	2,419	3,408	NA	712	8,058	1,114	941	NA	NA	NA	941	6,925	NA	5,816	814	295	2,203	1,824	NA	NA	893	931		
1993	28,743	16,399	2,621	3,517	NA	466	8,638	1,157	952	NA	NA	NA	952	7,136	NA	5,961	851	324	2,268	1,987	NA	NA	936	1,051		
1994	29,651	16,770	2,547	3,512	NA	436	9,139	1,137	992	NA	NA	NA	992	7,323	NA	6,078	890	356	2,406	2,160	NA	NA	974	1,186		
1995	29,610	16,990	2,689	3,307	NA	190	9,634	1,170	1,070	NA	NA	NA	1,070	6,715	NA	5,379	945	390	2,511	2,326	NA	NA	987	1,338		
1996	32,799	18,063	2,680	3,393	NA	650	10,092	1,248	1,149	NA	NA	NA	1,149	8,309	NA	6,848	1,032	428	2,740	2,539	NA	NA	1,028	1,510		
1997	36,717	19,254	2,746	3,404	NA	1,029	10,758	1,317	1,233	NA	NA	NA	1,233	10,376	NA	8,766	1,161	449	3,150	2,704	NA	NA	1,147	1,557		
1998	34,842	20,473	3,003	3,441	NA	1,002	11,567	1,461	1,292	NA	NA	NA	1,292	6,606	NA	4,851	1,278	477	3,495	2,976	NA	NA	1,259	1,717		
1999	38,282	22,364	3,347	3,719	NA	1,108	12,456	1,734	1,386	NA	NA	NA	1,386	7,429	NA	5,537	1,375	517	3,848	3,255	NA	NA	1,396	1,860		
2000	42,033	24,295	3,765	4,037	NA	925	13,469	2,099	1,501	NA	NA	NA	1,501	8,134	NA	6,115	1,453	566	4,314	3,790	NA	NA	1,553	2,236		
2001	46,843	26,802	4,260	4,404	NA	754	14,919	2,464	1,615	10	NA	NA	1,606	9,400	62	7,299	1,467	571	4,759	4,267	95	NA	1,704	2,467		
2002	50,789	30,141	4,511	5,029	NA	888	17,139	2,575	1,759	14	NA	NA	1,745	8,730	61	6,659	1,456	554	5,311	4,847	123	NA	1,891	2,833		

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All funding sources		Federal						Nonfederal government						Business					Higher ed-ucation	Other nonprofit organizations				
	All per-formers	Total	Federal intra-mural	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP	
2003	54,823	32,889	4,664	4,904	NA	1,386	19,220	2,714	1,906	13	NA	NA	1,893	9,002	55	6,944	1,436	567	5,692	5,335	102	NA	1,978	3,256	
2004	56,379	34,139	4,697	4,852	NA	1,072	20,730	2,788	2,011	12	NA	NA	2,000	8,872	48	6,763	1,483	578	5,965	5,391	64	NA	2,067	3,259	
2005	59,904	35,566	4,770	5,000	NA	1,108	21,786	2,903	2,080	12	NA	NA	2,068	9,828	54	7,559	1,600	614	6,568	5,861	70	NA	2,226	3,565	
2006	61,566	36,374	4,716	5,080	15	1,444	22,270	2,849	2,232	12	29	NA	2,191	9,428	67	6,940	1,765	656	7,288	6,244	78	NA	2,431	3,735	
2007	64,600	36,093	4,621	3,298	19	2,780	22,546	2,829	2,446	10	36	NA	2,400	11,199	57	8,488	1,956	698	7,932	6,930	68	NA	2,733	4,130	
2008	68,536	35,916	4,957	3,432	25	1,475	22,954	3,073	2,641	11	45	12	2,573	13,782	65	10,864	2,131	722	8,467	7,731	68	18	3,002	4,643	
2009	72,659	37,652	5,441	4,432	32	1,340	22,909	3,498	2,524	13	54	13	2,444	16,132	58	13,397	1,980	698	8,199	8,151	69	34	2,997	5,051	
2010	75,907	39,855	5,111	6,475	37	1,406	23,412	3,414	2,339	18	60	10	2,251	17,416	67	14,897	1,750	702	7,882	8,415	77	58	2,910	5,370	
2011	73,019	38,963	5,047	6,333	39	677	23,787	3,081	2,311	11	60	21	2,219	14,858	67	12,284	1,767	740	8,348	8,538	64	38	2,960	5,477	
2012	73,284	37,904	5,489	5,530	38	644	23,111	3,092	2,256	14	56	10	2,176	15,258	61	12,611	1,828	758	9,083	8,784	57	29	3,113	5,585	
2013	78,485	35,991	5,330	4,085	36	1,196	22,313	3,031	2,272	12	51	21	2,188	20,996	53	18,203	1,939	802	9,765	9,461	39	88	3,354	5,980	
2014	82,061	36,770	5,705	4,077	41	2,044	21,813	3,090	2,306	6	56	17	2,228	22,710	53	19,757	2,057	844	10,220	10,055	34	119	3,562	6,341	
2015 ^a	83,462	36,946	5,926	4,043	41	2,038	21,888	3,010	2,354	4	60	14	2,277	22,717	47	19,621	2,176	873	10,880	10,565	32	120	3,763	6,651	
Constant 2009 \$millions																									
1953	3,032	1,749	670	238	NA	125	538	178	43	NA	NA	NA	43	1,016	NA	871	86	59	40	185	NA	NA	106	79	
1954	3,324	1,899	628	291	NA	150	631	199	62	NA	NA	NA	62	1,105	NA	935	98	72	55	203	NA	NA	118	85	
1955	3,663	2,044	627	398	NA	45	749	225	89	NA	NA	NA	89	1,234	NA	1,041	109	84	75	222	NA	NA	132	90	
1956	4,461	2,438	705	553	NA	42	886	252	118	NA	NA	NA	118	1,557	NA	1,342	121	93	96	252	NA	NA	146	106	

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All funding sources		Federal					Nonfederal government					Business					Higher ed-ucation	Other nonprofit organizations					
	All per-formers	Total	Federal intra-mural	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP
1957	4,893	2,715	746	659	NA	24	1,001	286	149	NA	NA	NA	149	1,609	NA	1,383	135	90	119	301	NA	NA	162	138
1958	5,548	3,159	876	676	NA	80	1,188	338	183	NA	NA	NA	183	1,718	NA	1,482	141	94	141	347	NA	NA	182	165
1959	6,305	3,860	954	774	NA	197	1,523	412	218	NA	NA	NA	218	1,682	NA	1,439	139	104	165	380	NA	NA	206	174
1960	7,356	4,541	1,050	858	NA	204	1,948	481	258	NA	NA	NA	258	1,960	NA	1,699	140	120	192	406	NA	NA	235	172
1961	8,552	5,501	1,299	1,002	NA	173	2,442	586	304	NA	NA	NA	304	2,043	NA	1,777	141	125	225	478	NA	NA	269	209
1962	10,199	6,811	1,409	1,057	NA	583	3,050	713	356	NA	NA	NA	356	2,203	NA	1,929	140	134	267	562	NA	NA	305	257
1963	11,694	7,993	1,573	1,194	NA	604	3,809	813	414	NA	NA	NA	414	2,347	NA	2,073	135	138	318	622	NA	NA	346	276
1964	13,046	9,218	1,846	1,334	NA	670	4,484	885	459	NA	NA	NA	459	2,363	NA	2,091	136	136	379	626	NA	NA	370	256
1965	14,245	10,160	2,003	1,337	NA	840	5,045	936	505	NA	NA	NA	505	2,468	NA	2,171	142	155	460	652	NA	NA	374	278
1966	15,239	10,792	2,132	1,420	NA	739	5,544	957	539	NA	NA	NA	539	2,663	NA	2,346	151	166	554	692	NA	NA	390	302
1967	16,009	11,521	2,191	1,521	NA	849	6,002	958	575	NA	NA	NA	575	2,499	NA	2,158	169	172	686	728	NA	NA	419	308
1968	16,366	11,627	2,337	1,525	NA	703	6,132	931	634	NA	NA	NA	634	2,601	NA	2,240	182	179	757	747	NA	NA	441	305
1969	16,129	11,351	2,519	1,446	NA	568	5,949	869	706	NA	NA	NA	706	2,497	NA	2,116	183	199	791	783	NA	NA	474	310
1970	15,773	10,979	2,466	1,334	NA	535	5,804	838	787	NA	NA	NA	787	2,330	NA	1,949	189	193	859	819	NA	NA	503	316
1971	15,538	10,687	2,427	1,205	NA	422	5,783	850	809	NA	NA	NA	809	2,299	NA	1,905	207	188	893	850	NA	NA	528	322
1972	15,414	10,632	2,412	1,251	NA	364	5,753	851	782	NA	NA	NA	782	2,262	NA	1,854	220	188	865	873	NA	NA	536	336
1973	15,566	10,810	2,476	1,450	NA	365	5,652	868	746	NA	NA	NA	746	2,303	NA	1,895	222	186	847	860	NA	NA	518	342
1974	15,715	10,961	2,490	1,627	NA	397	5,606	841	710	NA	NA	NA	710	2,285	NA	1,867	230	188	871	887	NA	NA	531	355

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All funding sources		Federal						Nonfederal government						Business					Higher ed-ucation		Other nonprofit organizations				
	All per-formers	Total	Federal intra-mural	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP		
1975	15,544	10,890	2,423	1,698	NA	332	5,638	800	677	NA	NA	NA	677	2,244	NA	1,827	228	189	840	891	NA	NA	523	368		
1976	16,241	11,464	2,569	1,901	NA	351	5,816	827	658	NA	NA	NA	658	2,340	NA	1,916	227	197	856	923	NA	NA	527	395		
1977	17,100	12,053	2,684	2,123	NA	384	6,017	845	660	NA	NA	NA	660	2,453	NA	1,995	253	204	951	984	NA	NA	562	422		
1978	18,506	13,165	2,777	2,673	NA	415	6,380	920	691	NA	NA	NA	691	2,581	NA	2,088	283	210	1,059	1,011	NA	NA	565	446		
1979	19,252	13,655	2,733	2,849	NA	396	6,680	998	702	NA	NA	NA	702	2,720	NA	2,194	313	213	1,145	1,029	NA	NA	563	466		
1980	19,710	13,852	2,732	2,916	NA	383	6,897	925	691	NA	NA	NA	691	2,898	NA	2,332	351	215	1,226	1,043	NA	NA	559	484		
1981	19,904	13,585	2,767	2,947	NA	338	6,865	667	697	NA	NA	NA	697	3,299	NA	2,706	377	216	1,268	1,056	NA	NA	555	501		
1982	20,668	13,819	2,953	2,917	NA	491	6,743	716	714	NA	NA	NA	714	3,597	NA	2,956	418	224	1,390	1,148	NA	NA	615	533		
1983	22,179	14,661	3,235	3,100	NA	646	6,886	795	739	NA	NA	NA	739	4,007	NA	3,286	485	236	1,524	1,248	NA	NA	668	580		
1984	24,036	15,598	3,383	3,343	NA	613	7,368	891	785	NA	NA	NA	785	4,659	NA	3,844	564	251	1,649	1,345	NA	NA	712	633		
1985	25,766	16,434	3,402	3,383	NA	625	8,046	978	899	NA	NA	NA	899	5,092	NA	4,146	679	267	1,879	1,462	NA	NA	768	693		
1986	29,375	17,501	3,469	3,503	NA	743	8,770	1,016	1,037	NA	NA	NA	1,037	7,072	NA	5,987	798	288	2,161	1,603	NA	NA	835	768		
1987	30,861	18,518	3,419	3,745	NA	999	9,229	1,128	1,100	NA	NA	NA	1,100	7,150	NA	5,983	858	308	2,337	1,757	NA	NA	910	846		
1988	31,924	19,518	3,414	4,247	NA	1,058	9,578	1,220	1,138	NA	NA	NA	1,138	6,896	NA	5,658	911	327	2,468	1,903	NA	NA	980	924		
1989	33,996	20,798	3,585	4,372	NA	1,531	9,973	1,336	1,189	NA	NA	NA	1,189	7,287	NA	5,951	990	346	2,662	2,060	NA	NA	1,056	1,004		
1990	34,488	21,051	3,473	4,543	NA	1,301	10,316	1,418	1,268	NA	NA	NA	1,268	7,054	NA	5,631	1,056	366	2,889	2,226	NA	NA	1,132	1,094		
1991	39,336	22,151	3,447	4,631	NA	1,813	10,759	1,501	1,322	NA	NA	NA	1,322	10,374	NA	8,877	1,107	389	3,083	2,406	NA	NA	1,211	1,195		
1992	39,116	22,263	3,427	4,829	NA	1,009	11,419	1,579	1,334	NA	NA	NA	1,334	9,813	NA	8,242	1,154	418	3,121	2,585	NA	NA	1,266	1,319		

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All funding sources		Federal						Nonfederal government						Business					Higher ed-ucation		Other nonprofit organizations				
	All per-formers	Total	Federal intra-mural	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP		
1993	39,783	22,698	3,628	4,868	NA	645	11,956	1,601	1,318	NA	NA	NA	1,318	9,877	NA	8,251	1,178	448	3,140	2,750	NA	NA	1,296	1,455		
1994	40,185	22,727	3,452	4,759	NA	591	12,385	1,541	1,344	NA	NA	NA	1,344	9,925	NA	8,237	1,206	482	3,261	2,928	NA	NA	1,320	1,607		
1995	39,311	22,555	3,570	4,390	NA	252	12,789	1,553	1,420	NA	NA	NA	1,420	8,914	NA	7,141	1,255	518	3,333	3,088	NA	NA	1,311	1,777		
1996	42,763	23,550	3,494	4,424	NA	847	13,158	1,628	1,498	NA	NA	NA	1,498	10,833	NA	8,928	1,346	559	3,572	3,310	NA	NA	1,341	1,969		
1997	47,065	24,680	3,520	4,363	NA	1,319	13,791	1,688	1,581	NA	NA	NA	1,581	13,301	NA	11,237	1,488	576	4,037	3,466	NA	NA	1,471	1,995		
1998	44,183	25,962	3,808	4,363	NA	1,271	14,668	1,852	1,639	NA	NA	NA	1,639	8,376	NA	6,151	1,620	605	4,432	3,774	NA	NA	1,597	2,177		
1999	47,814	27,932	4,180	4,645	NA	1,384	15,558	2,166	1,731	NA	NA	NA	1,731	9,279	NA	6,916	1,718	645	4,807	4,066	NA	NA	1,743	2,323		
2000	51,331	29,668	4,598	4,929	NA	1,130	16,448	2,564	1,833	NA	NA	NA	1,833	9,933	NA	7,468	1,774	691	5,268	4,628	NA	NA	1,897	2,731		
2001	55,929	32,001	5,087	5,258	NA	900	17,813	2,942	1,929	12	NA	NA	1,917	11,223	74	8,715	1,752	682	5,682	5,094	114	NA	2,035	2,946		
2002	59,724	35,444	5,304	5,914	NA	1,044	20,154	3,028	2,069	17	NA	NA	2,052	10,266	71	7,831	1,713	652	6,246	5,700	145	NA	2,224	3,331		
2003	63,208	37,918	5,378	5,654	NA	1,598	22,159	3,130	2,198	16	NA	NA	2,182	10,379	64	8,006	1,656	653	6,562	6,151	117	NA	2,280	3,754		
2004	63,262	38,307	5,270	5,444	NA	1,203	23,261	3,129	2,257	13	NA	NA	2,244	9,955	53	7,589	1,665	649	6,694	6,049	72	NA	2,320	3,657		
2005	65,122	38,664	5,186	5,435	NA	1,205	23,683	3,155	2,261	13	NA	NA	2,248	10,684	59	8,217	1,740	668	7,140	6,371	76	NA	2,420	3,875		
2006	64,933	38,364	4,974	5,358	16	1,523	23,488	3,005	2,354	13	30	NA	2,311	9,944	71	7,320	1,861	692	7,687	6,585	82	NA	2,564	3,939		
2007	66,368	37,081	4,747	3,388	20	2,856	23,163	2,907	2,513	10	37	NA	2,466	11,505	58	8,720	2,010	717	8,149	7,120	70	NA	2,808	4,243		
2008	69,057	36,188	4,994	3,458	25	1,486	23,128	3,097	2,661	11	45	12	2,593	13,886	66	10,946	2,147	728	8,532	7,790	69	18	3,024	4,678		
2009	72,659	37,652	5,441	4,432	32	1,340	22,909	3,498	2,524	13	54	13	2,444	16,132	58	13,397	1,980	698	8,199	8,151	69	34	2,997	5,051		
2010	74,991	39,374	5,049	6,397	37	1,389	23,129	3,373	2,311	18	60	10	2,223	17,206	66	14,717	1,729	694	7,786	8,313	76	58	2,874	5,305		

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All funding sources		Federal						Nonfederal government						Business					Higher ed-ucation	Other nonprofit organizations				
	All per-formers	Total	Federal intra-mural	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP	
2011	70,679	37,715	4,885	6,130	37	655	23,025	2,982	2,237	10	58	21	2,148	14,382	65	11,890	1,710	716	8,080	8,265	62	36	2,865	5,302	
2012	69,652	36,025	5,217	5,256	36	612	21,965	2,939	2,144	13	54	9	2,068	14,502	58	11,986	1,737	721	8,633	8,348	54	28	2,959	5,308	
2013	73,410	33,664	4,986	3,821	34	1,119	20,870	2,835	2,125	11	48	20	2,046	19,638	49	17,026	1,813	750	9,134	8,849	36	82	3,137	5,593	
2014	75,401	33,786	5,242	3,746	38	1,878	20,042	2,839	2,119	6	51	15	2,047	20,867	49	18,153	1,890	775	9,390	9,239	31	109	3,273	5,826	
2015 ^a	75,866	33,584	5,387	3,675	37	1,853	19,896	2,736	2,140	4	54	12	2,069	20,649	43	17,835	1,978	793	9,890	9,603	29	109	3,420	6,046	

NA = not available.

FFRDC = federally funded research and development center; ONP = other nonprofit organizations.

^a Some data for 2015 are preliminary and may later be revised.

Note(s)

This table reaggregates the R&D performer data in Appendix Table 4-3 according to major categories of R&D funding: federal government, nonfederal government (state and local), business, higher education, and other nonprofit organizations. Business sources of R&D funding in this table include the own funds of domestic R&D performing businesses, funds from other domestic businesses, and funds from foreign businesses. For interpretive detail on the R&D performers listed, see Appendix Table 4-2, footnotes a–f. Detail may not add to total because of rounding. Constant-dollar estimates are derived from unrounded data. For comparisons, use only the historical data reported in this table because some back-year data may have been revised. Except for the nonprofit sector, data are based on annual reports by performers in the National Science Foundation's annual R&D expenditure surveys: Business R&D and Innovation Survey, Higher Education R&D Survey, Survey of Federal Funds for R&D, FFRDC R&D Expenditures Survey, and Survey of State Government R&D. R&D expenditures by business performers—and also, before 2001, industry-administered FFRDCs—are collected on a calendar year basis. Expenditures for other performers are calendar year approximations based on fiscal year data (see Appendix Table 4-3, general notes). The 1998–2015 data for ONP R&D performance funded by businesses and the nonprofit sector itself are estimated, based on parameters from the 1996–97 Survey of R&D Funding and Performance by Nonprofit Organizations. Type-of-R&D data for business R&D in 1998–2007 were revised in response to data quality review considerations and are not directly comparable with the data for 1997 and earlier years. For 2008 and onward, the type-of-R&D splits for other than total, own-funded, and federally funded R&D are estimated (see also Appendix Table 4-2, footnote d). Type-of-R&D data for FFRDC R&D in 1953–54 includes only those of university-administered FFRDCs. Starting in 2001, type-of-R&D data distinguish federally funded from nonfederally funded FFRDC R&D (see also Appendix Table 4-2, footnote b). The type-of-R&D estimation procedure for higher education R&D was revised in 1998 and again in 2010; hence, these data are not directly comparable with data reported for earlier years. Furthermore, the type-of-R&D splits for other than total and federally funded are estimated (see also Appendix Table 4-2, footnote e). Type-of-R&D data for R&D by other nonprofit organizations in 1998 and later years are estimated, except for those that are federally funded (see also Appendix Table 4-2, footnote f). Type-of-R&D data for state intramural R&D are not currently collected by the Survey of State Government R&D (see also Appendix Table 4-2, footnote c).

Source(s)

National Science Foundation, National Center for Science and Engineering Statistics, National Patterns of R&D Resources (annual series).
 Science and Engineering Indicators 2018

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

APPENDIX TABLE 4-8

U.S. applied research expenditures, by source of funds and performing sector: 1953–2015

(Millions of current and of constant 2009 dollars)

Year	All funding sources		Federal						Nonfederal government					Business					Higher ed-ucation		Other nonprofit organizations				
	All per-formers	Total	Federal intra-mural	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP	
Current \$millions																									
1953	1,289	756	347	48	NA	288	59	14	30	NA	NA	NA	30	456	NA	438	7	11	28	20	NA	NA	10	10	
1954	1,378	785	330	59	NA	322	60	16	32	NA	NA	NA	32	513	NA	492	8	13	28	21	NA	NA	10	11	
1955	1,502	838	333	86	NA	339	63	18	32	NA	NA	NA	32	583	NA	560	9	14	27	22	NA	NA	11	11	
1956	1,929	1,026	387	125	NA	430	65	20	33	NA	NA	NA	33	818	NA	794	10	14	27	25	NA	NA	11	14	
1957	2,413	1,304	446	149	NA	624	63	23	34	NA	NA	NA	34	1,018	NA	992	12	14	27	31	NA	NA	11	20	
1958	2,759	1,497	516	156	NA	731	66	29	35	NA	NA	NA	35	1,163	NA	1,137	12	14	27	37	NA	NA	12	25	
1959	2,940	1,630	577	179	NA	757	78	40	37	NA	NA	NA	37	1,206	NA	1,178	13	15	28	39	NA	NA	12	27	
1960	3,065	1,732	615	201	NA	769	93	54	39	NA	NA	NA	39	1,226	NA	1,196	13	17	29	40	NA	NA	12	28	
1961	3,123	1,811	668	240	NA	738	104	62	40	NA	NA	NA	40	1,195	NA	1,165	13	17	30	48	NA	NA	13	35	
1962	3,698	2,098	709	249	NA	954	119	68	41	NA	NA	NA	41	1,471	NA	1,438	14	19	30	58	NA	NA	13	45	
1963	3,864	2,244	809	275	NA	952	128	82	42	NA	NA	NA	42	1,483	NA	1,450	14	19	32	63	NA	NA	14	49	
1964	4,201	2,462	947	313	NA	978	142	82	45	NA	NA	NA	45	1,593	NA	1,560	14	19	37	65	NA	NA	18	47	
1965	4,374	2,553	994	294	NA	992	176	98	46	NA	NA	NA	46	1,654	NA	1,620	13	21	42	79	NA	NA	27	52	
1966	4,653	2,625	1,012	290	NA	986	208	129	47	NA	NA	NA	47	1,842	NA	1,804	14	24	48	91	NA	NA	34	57	

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All funding sources		Federal						Nonfederal government					Business					Higher ed-ucation	Other nonprofit organizations				
	All per-formers	Total	Federal intra-mural	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP
1967	4,848	2,763	1,069	334	NA	983	238	141	46	NA	NA	NA	46	1,890	NA	1,849	16	25	54	96	NA	NA	36	60
1968	5,137	2,811	1,112	334	NA	956	250	160	46	NA	NA	NA	46	2,125	NA	2,081	16	28	55	101	NA	NA	39	62
1969	5,454	2,924	1,229	336	NA	920	257	183	48	NA	NA	NA	48	2,320	NA	2,272	16	32	54	109	NA	NA	43	66
1970	5,752	3,100	1,334	336	NA	952	280	199	51	NA	NA	NA	51	2,429	NA	2,378	18	33	56	117	NA	NA	47	70
1971	5,833	3,091	1,355	312	NA	907	306	212	61	NA	NA	NA	61	2,494	NA	2,441	19	34	67	121	NA	NA	47	74
1972	6,147	3,243	1,434	358	NA	845	391	216	74	NA	NA	NA	74	2,618	NA	2,562	21	35	82	131	NA	NA	52	79
1973	6,655	3,429	1,527	334	NA	883	450	236	88	NA	NA	NA	88	2,894	NA	2,832	26	36	100	145	NA	NA	62	83
1974	7,344	3,634	1,652	335	NA	905	477	266	96	NA	NA	NA	96	3,333	NA	3,263	32	39	118	163	NA	NA	72	91
1975	8,091	4,125	1,912	384	NA	991	550	290	113	NA	NA	NA	113	3,520	NA	3,440	39	42	141	192	NA	NA	92	100
1976	8,976	4,464	2,068	457	NA	1,033	596	310	127	NA	NA	NA	127	4,001	NA	3,912	45	45	166	218	NA	NA	109	109
1977	9,662	4,683	2,081	540	NA	1,113	626	324	134	NA	NA	NA	134	4,410	NA	4,311	51	48	194	241	NA	NA	121	120
1978	10,704	5,080	2,242	597	NA	1,195	676	371	151	NA	NA	NA	151	4,982	NA	4,870	61	52	232	259	NA	NA	128	132
1979	12,097	5,602	2,415	654	NA	1,305	793	436	161	NA	NA	NA	161	5,797	NA	5,670	71	55	263	273	NA	NA	129	144
1980	13,729	6,252	2,546	749	NA	1,625	912	420	174	NA	NA	NA	174	6,698	NA	6,550	88	60	308	298	NA	NA	140	158
1981	16,329	6,905	2,731	788	NA	2,042	953	391	199	NA	NA	NA	199	8,531	NA	8,359	108	64	363	332	NA	NA	159	173
1982	18,218	7,689	2,802	890	NA	2,593	1,007	398	207	NA	NA	NA	207	9,553	NA	9,363	121	69	402	367	NA	NA	178	189
1983	20,298	8,738	2,991	965	NA	3,227	1,122	433	215	NA	NA	NA	215	10,501	NA	10,286	141	74	443	401	NA	NA	194	207
1984	22,451	9,499	2,961	1,176	NA	3,677	1,226	459	234	NA	NA	NA	234	11,788	NA	11,541	168	79	491	438	NA	NA	212	226

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All funding sources		Federal						Nonfederal government					Business					Higher ed-ucation	Other nonprofit organizations				
	All per-formers	Total	Federal intra-mural	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP
1985	25,401	10,930	3,135	1,292	NA	4,717	1,296	490	262	NA	NA	NA	262	13,191	NA	12,908	198	85	547	471	NA	NA	224	247
1986	27,240	10,409	3,204	1,258	NA	4,049	1,393	506	298	NA	NA	NA	298	15,402	NA	15,082	229	91	620	510	NA	NA	240	270
1987	27,951	10,829	3,366	1,228	NA	4,037	1,643	555	333	NA	NA	NA	333	15,511	NA	15,153	260	98	707	571	NA	NA	276	295
1988	29,528	10,749	3,362	984	NA	3,846	1,958	599	377	NA	NA	NA	377	16,938	NA	16,531	302	105	818	647	NA	NA	325	322
1989	32,277	11,753	3,566	1,047	NA	4,324	2,121	695	417	NA	NA	NA	417	18,452	NA	17,993	347	112	933	722	NA	NA	370	352
1990	34,897	13,695	3,652	1,156	NA	5,967	2,140	780	453	NA	NA	NA	453	18,930	NA	18,432	377	120	1,031	788	NA	NA	404	384
1991	38,631	14,280	4,093	1,446	NA	5,588	2,232	921	468	NA	NA	NA	468	21,946	NA	21,425	392	129	1,091	847	NA	NA	428	419
1992	37,936	13,690	4,337	1,529	NA	4,476	2,415	933	479	NA	NA	NA	479	21,736	NA	21,184	414	138	1,120	911	NA	NA	454	456
1993	37,283	14,075	4,838	1,500	NA	4,295	2,542	900	496	NA	NA	NA	496	20,547	NA	19,956	443	148	1,181	984	NA	NA	487	497
1994	36,618	13,800	4,985	1,596	NA	3,616	2,644	960	517	NA	NA	NA	517	19,995	NA	19,372	464	158	1,256	1,049	NA	NA	509	541
1995	40,936	13,543	4,952	1,714	NA	3,164	2,779	934	559	NA	NA	NA	559	24,418	NA	23,755	494	170	1,311	1,104	NA	NA	516	589
1996	43,170	13,958	4,872	1,623	NA	3,640	2,864	960	584	NA	NA	NA	584	26,076	NA	25,370	524	182	1,390	1,162	NA	NA	522	640
1997	46,516	12,852	4,997	1,679	NA	2,648	2,518	1,011	548	NA	NA	NA	548	30,502	NA	29,782	515	205	1,396	1,219	NA	NA	508	711
1998	46,247	12,751	5,146	1,725	NA	2,632	2,189	1,060	515	NA	NA	NA	515	30,303	NA	29,576	509	218	1,393	1,285	NA	NA	502	784
1999	51,853	13,869	5,530	1,651	NA	2,817	2,571	1,300	533	NA	NA	NA	533	34,586	NA	33,821	529	236	1,480	1,385	NA	NA	537	849
2000	56,503	15,450	6,105	1,750	NA	2,682	3,081	1,831	558	NA	NA	NA	558	37,293	NA	36,494	540	258	1,604	1,598	NA	NA	578	1,021
2001	63,956	18,595	7,052	2,379	NA	3,603	3,411	2,150	590	5	NA	NA	585	41,238	33	40,409	535	261	1,734	1,798	52	NA	621	1,126
2002	50,521	18,987	7,487	2,905	NA	2,452	3,877	2,267	644	8	NA	NA	636	26,899	35	26,081	531	253	1,937	2,053	71	NA	689	1,293

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All funding sources		Federal						Nonfederal government						Business					Higher ed-ucation	Other nonprofit organizations				
	All per-formers	Total	Federal intra-mural	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP	
2003	61,059	22,234	7,672	3,152	NA	4,473	4,450	2,487	716	9	NA	NA	708	33,692	36	32,861	537	259	2,127	2,290	65	NA	739	1,486	
2004	69,132	22,417	7,455	3,057	NA	4,775	4,682	2,448	742	7	NA	NA	735	41,495	30	40,657	545	264	2,190	2,287	40	NA	759	1,488	
2005	69,653	23,329	7,557	3,241	NA	5,289	4,810	2,432	727	8	NA	NA	719	40,867	35	39,995	557	280	2,283	2,447	45	NA	774	1,627	
2006	76,624	24,865	7,435	3,531	88	6,140	5,080	2,592	891	8	170	NA	712	45,952	47	45,033	573	300	2,368	2,549	54	NA	789	1,705	
2007	85,322	29,439	7,222	5,293	113	8,945	5,284	2,583	970	14	212	NA	745	49,627	77	48,625	607	318	2,461	2,824	92	NA	848	1,885	
2008	76,642	27,143	7,316	5,843	147	5,397	5,840	2,600	1,164	15	264	71	815	42,385	89	41,292	675	330	2,682	3,268	93	105	951	2,119	
2009	74,236	32,150	7,874	5,979	188	7,797	7,263	3,049	1,324	19	319	38	948	34,295	88	33,124	764	319	2,942	3,526	104	96	1,021	2,305	
2010	79,258	29,770	8,016	5,025	221	4,705	8,762	3,041	1,421	18	357	32	1,015	41,153	67	39,987	778	321	3,141	3,774	77	182	1,064	2,451	
2011	82,147	29,696	8,024	5,057	228	4,404	9,290	2,693	1,428	13	352	70	994	43,805	81	42,591	796	338	3,416	3,802	77	122	1,104	2,500	
2012	87,071	30,311	8,587	5,566	223	4,137	9,170	2,629	1,403	19	333	45	1,007	47,741	81	46,436	877	346	3,693	3,923	76	137	1,162	2,549	
2013	88,336	32,532	8,309	6,639	215	6,028	8,876	2,465	1,434	22	303	47	1,063	46,133	94	44,738	935	366	3,943	4,294	69	200	1,296	2,730	
2014	91,890	33,466	8,775	6,765	201	6,445	8,706	2,574	1,405	13	273	35	1,085	48,174	107	46,685	997	385	4,216	4,629	67	250	1,418	2,894	
2015 ^a	97,150	34,511	9,200	7,182	202	6,102	9,094	2,731	1,419	9	294	24	1,092	51,738	96	50,137	1,107	398	4,567	4,917	64	209	1,608	3,036	
Constant 2009 \$millions																									
1953	8,505	4,985	2,290	313	NA	1,900	389	92	199	NA	NA	NA	199	3,006	NA	2,890	43	73	184	132	NA	NA	66	66	
1954	9,009	5,132	2,154	382	NA	2,105	389	101	206	NA	NA	NA	206	3,351	NA	3,217	49	85	183	137	NA	NA	65	72	
1955	9,650	5,386	2,140	553	NA	2,176	405	112	208	NA	NA	NA	208	3,743	NA	3,599	55	90	175	138	NA	NA	67	71	
1956	11,986	6,374	2,402	774	NA	2,670	404	124	206	NA	NA	NA	206	5,084	NA	4,935	62	87	167	155	NA	NA	68	87	

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All funding sources		Federal						Nonfederal government					Business					Higher ed-ucation	Other nonprofit organizations				
	All per-formers	Total	Federal intra-mural	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP
1957	14,514	7,841	2,679	896	NA	3,751	379	135	204	NA	NA	NA	204	6,120	NA	5,966	69	84	163	186	NA	NA	66	120
1958	16,229	8,805	3,035	918	NA	4,299	385	168	208	NA	NA	NA	208	6,841	NA	6,688	71	82	160	215	NA	NA	68	147
1959	17,053	9,457	3,344	1,038	NA	4,393	450	232	214	NA	NA	NA	214	6,993	NA	6,834	73	87	163	226	NA	NA	70	157
1960	17,540	9,910	3,516	1,150	NA	4,402	532	309	221	NA	NA	NA	221	7,015	NA	6,843	74	97	165	229	NA	NA	69	160
1961	17,675	10,249	3,781	1,355	NA	4,177	586	351	226	NA	NA	NA	226	6,763	NA	6,594	74	96	167	269	NA	NA	71	198
1962	20,674	11,731	3,961	1,392	NA	5,335	663	380	227	NA	NA	NA	227	8,222	NA	8,040	75	106	170	324	NA	NA	73	252
1963	21,363	12,407	4,472	1,518	NA	5,262	705	451	233	NA	NA	NA	233	8,199	NA	8,016	77	105	179	346	NA	NA	75	271
1964	22,873	13,402	5,153	1,704	NA	5,325	773	446	246	NA	NA	NA	246	8,671	NA	8,494	74	103	203	351	NA	NA	95	256
1965	23,386	13,649	5,312	1,569	NA	5,304	938	524	248	NA	NA	NA	248	8,844	NA	8,662	70	112	225	420	NA	NA	142	278
1966	24,198	13,650	5,264	1,508	NA	5,128	1,082	668	245	NA	NA	NA	245	9,580	NA	9,383	73	125	252	471	NA	NA	174	296
1967	24,503	13,965	5,400	1,686	NA	4,968	1,200	710	231	NA	NA	NA	231	9,550	NA	9,345	78	126	272	485	NA	NA	182	303
1968	24,903	13,625	5,388	1,619	NA	4,634	1,210	773	223	NA	NA	NA	223	10,301	NA	10,088	78	136	267	487	NA	NA	187	301
1969	25,202	13,509	5,680	1,550	NA	4,251	1,185	843	222	NA	NA	NA	222	10,720	NA	10,498	74	148	249	501	NA	NA	196	305
1970	25,247	13,608	5,855	1,475	NA	4,178	1,227	873	225	NA	NA	NA	225	10,658	NA	10,437	77	145	245	511	NA	NA	204	307
1971	24,363	12,910	5,659	1,301	NA	3,788	1,278	883	253	NA	NA	NA	253	10,415	NA	10,195	77	142	280	505	NA	NA	196	309
1972	24,610	12,984	5,741	1,433	NA	3,383	1,563	863	297	NA	NA	NA	297	10,480	NA	10,257	82	140	328	522	NA	NA	206	316
1973	25,271	13,021	5,799	1,268	NA	3,353	1,707	894	333	NA	NA	NA	333	10,989	NA	10,753	99	137	379	549	NA	NA	234	315
1974	25,587	12,662	5,757	1,165	NA	3,153	1,660	927	335	NA	NA	NA	335	11,613	NA	11,368	110	135	411	566	NA	NA	249	317

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All funding sources		Federal						Nonfederal government					Business					Higher ed-ucation	Other nonprofit organizations				
	All per-formers	Total	Federal intra-mural	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP
1975	25,800	13,154	6,096	1,223	NA	3,160	1,752	923	362	NA	NA	NA	362	11,225	NA	10,969	123	133	448	612	NA	NA	293	318
1976	27,133	13,493	6,252	1,381	NA	3,122	1,800	937	385	NA	NA	NA	385	12,094	NA	11,825	135	135	500	660	NA	NA	329	331
1977	27,500	13,329	5,922	1,537	NA	3,168	1,780	923	383	NA	NA	NA	383	12,551	NA	12,270	145	137	552	685	NA	NA	343	342
1978	28,468	13,511	5,962	1,587	NA	3,178	1,797	987	402	NA	NA	NA	402	13,250	NA	12,951	161	137	616	689	NA	NA	339	350
1979	29,718	13,763	5,933	1,607	NA	3,206	1,947	1,070	397	NA	NA	NA	397	14,241	NA	13,929	175	136	646	671	NA	NA	317	354
1980	30,938	14,088	5,737	1,688	NA	3,662	2,055	946	391	NA	NA	NA	391	15,093	NA	14,760	199	134	694	672	NA	NA	316	356
1981	33,654	14,232	5,629	1,625	NA	4,208	1,963	806	411	NA	NA	NA	411	17,581	NA	17,227	222	132	747	683	NA	NA	327	356
1982	35,354	14,922	5,437	1,728	NA	5,032	1,953	772	403	NA	NA	NA	403	18,538	NA	18,170	235	133	780	712	NA	NA	345	367
1983	37,895	16,313	5,584	1,801	NA	6,025	2,095	808	401	NA	NA	NA	401	19,604	NA	19,203	264	138	827	749	NA	NA	362	386
1984	40,477	17,126	5,338	2,120	NA	6,629	2,211	828	422	NA	NA	NA	422	21,253	NA	20,807	303	143	886	790	NA	NA	382	408
1985	44,376	19,095	5,477	2,257	NA	8,241	2,265	855	457	NA	NA	NA	457	23,044	NA	22,551	345	148	956	824	NA	NA	391	432
1986	46,646	17,825	5,487	2,154	NA	6,934	2,385	866	510	NA	NA	NA	510	26,375	NA	25,827	392	156	1,062	873	NA	NA	411	463
1987	46,674	18,083	5,620	2,051	NA	6,741	2,743	927	556	NA	NA	NA	556	25,901	NA	25,304	434	163	1,181	954	NA	NA	461	493
1988	47,640	17,342	5,424	1,587	NA	6,205	3,159	966	608	NA	NA	NA	608	27,327	NA	26,671	487	169	1,319	1,044	NA	NA	524	520
1989	50,126	18,252	5,539	1,626	NA	6,715	3,294	1,079	647	NA	NA	NA	647	28,656	NA	27,943	539	174	1,449	1,121	NA	NA	575	546
1990	52,261	20,510	5,469	1,731	NA	8,936	3,206	1,167	678	NA	NA	NA	678	28,349	NA	27,604	565	180	1,544	1,180	NA	NA	605	575
1991	55,991	20,697	5,933	2,095	NA	8,099	3,235	1,335	678	NA	NA	NA	678	31,807	NA	31,053	568	187	1,581	1,228	NA	NA	621	607
1992	53,757	19,399	6,145	2,166	NA	6,343	3,422	1,323	678	NA	NA	NA	678	30,802	NA	30,019	587	196	1,587	1,290	NA	NA	644	646

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All funding sources		Federal						Nonfederal government						Business					Higher ed-ucation		Other nonprofit organizations				
	All per-formers	Total	Federal intra-mural	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP		
1993	51,604	19,481	6,697	2,076	NA	5,945	3,518	1,245	686	NA	NA	NA	686	28,440	NA	27,622	613	205	1,635	1,362	NA	NA	675	688		
1994	49,627	18,703	6,756	2,162	NA	4,901	3,583	1,300	701	NA	NA	NA	701	27,098	NA	26,254	629	215	1,702	1,422	NA	NA	689	733		
1995	54,347	17,980	6,575	2,275	NA	4,201	3,689	1,240	742	NA	NA	NA	742	32,418	NA	31,537	656	225	1,741	1,466	NA	NA	685	781		
1996	56,285	18,198	6,352	2,115	NA	4,746	3,734	1,251	761	NA	NA	NA	761	33,997	NA	33,077	683	237	1,813	1,516	NA	NA	681	834		
1997	59,628	16,475	6,405	2,152	NA	3,394	3,227	1,296	703	NA	NA	NA	703	39,099	NA	38,176	660	263	1,789	1,562	NA	NA	652	911		
1998	58,646	16,170	6,525	2,187	NA	3,338	2,776	1,344	653	NA	NA	NA	653	38,427	NA	37,505	646	276	1,766	1,630	NA	NA	636	994		
1999	64,764	17,322	6,907	2,062	NA	3,518	3,211	1,623	666	NA	NA	NA	666	43,197	NA	42,242	661	295	1,849	1,730	NA	NA	670	1,060		
2000	69,000	18,867	7,456	2,138	NA	3,275	3,763	2,236	682	NA	NA	NA	682	45,541	NA	44,566	660	316	1,958	1,952	NA	NA	705	1,246		
2001	76,363	22,203	8,420	2,840	NA	4,302	4,073	2,567	705	6	NA	NA	699	49,238	40	48,247	639	311	2,070	2,147	62	NA	741	1,345		
2002	59,410	22,328	8,805	3,416	NA	2,883	4,559	2,665	758	10	NA	NA	748	31,632	41	30,669	624	297	2,277	2,415	84	NA	811	1,520		
2003	70,397	25,634	8,845	3,634	NA	5,157	5,130	2,867	826	10	NA	NA	816	38,845	41	37,887	619	298	2,452	2,641	75	NA	852	1,713		
2004	77,572	25,154	8,365	3,430	NA	5,358	5,254	2,747	833	8	NA	NA	824	46,561	34	45,621	611	296	2,458	2,566	45	NA	852	1,669		
2005	75,720	25,361	8,216	3,523	NA	5,750	5,229	2,643	791	9	NA	NA	782	44,427	38	43,479	605	305	2,482	2,660	49	NA	842	1,769		
2006	80,815	26,225	7,841	3,724	93	6,476	5,358	2,734	939	9	179	NA	751	48,466	49	47,496	604	316	2,497	2,688	57	NA	833	1,798		
2007	87,657	30,245	7,419	5,438	116	9,190	5,429	2,653	997	14	218	NA	765	50,985	79	49,955	624	327	2,528	2,902	94	NA	871	1,936		
2008	77,224	27,349	7,372	5,887	149	5,438	5,884	2,620	1,173	15	266	71	821	42,707	90	41,605	680	332	2,702	3,293	94	105	958	2,135		
2009	74,236	32,150	7,874	5,979	188	7,797	7,263	3,049	1,324	19	319	38	948	34,295	88	33,124	764	319	2,942	3,526	104	96	1,021	2,305		
2010	78,302	29,410	7,919	4,964	218	4,648	8,656	3,004	1,404	18	353	32	1,002	40,656	66	39,504	769	317	3,103	3,729	76	180	1,051	2,422		

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All funding sources		Federal						Nonfederal government					Business					Higher ed-ucation	Other nonprofit organizations				
	All per-formers	Total	Federal intra-mural	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP
2011	79,514	28,744	7,767	4,895	221	4,263	8,992	2,607	1,382	12	340	67	962	42,401	78	41,226	770	327	3,307	3,680	74	118	1,068	2,420
2012	82,755	28,808	8,161	5,290	212	3,932	8,716	2,498	1,334	18	317	43	957	45,374	77	44,135	834	329	3,510	3,729	72	130	1,104	2,423
2013	82,624	30,428	7,771	6,209	201	5,638	8,302	2,306	1,342	20	284	44	994	43,150	88	41,845	874	342	3,688	4,016	65	187	1,212	2,553
2014	84,433	30,751	8,063	6,216	184	5,922	7,999	2,365	1,291	12	251	32	997	44,264	98	42,897	916	354	3,873	4,254	62	230	1,303	2,659
2015 ^a	88,309	31,370	8,363	6,528	184	5,547	8,266	2,483	1,289	8	267	22	993	47,029	87	45,574	1,006	362	4,151	4,469	59	190	1,461	2,759

NA = not available.

FFRDC = federally funded research and development center; ONP = other nonprofit organization.

^a Some data for 2015 are preliminary and may later be revised.

Note(s)

This table reaggregates the R&D performer data in Appendix Table 4-4 according to major categories of R&D funding: federal government, nonfederal government (state and local), business, higher education, and other nonprofit organizations. Business sources of R&D funding in this table include the own funds of domestic R&D performing businesses, funds from other domestic businesses, and funds from foreign businesses. For interpretive detail on the R&D performers listed, see Appendix Table 4-2, footnotes a-f. Detail may not add to total because of rounding. Constant-dollar estimates are derived from unrounded data. For comparisons, use only the historical data reported in this table because some back-year data may have been revised. Except for the nonprofit sector, data are based on annual reports by performers in the National Science Foundation's annual R&D expenditure surveys: Business R&D and Innovation Survey, Higher Education R&D Survey, Survey of Federal Funds for R&D, FFRDC R&D Expenditures Survey, and Survey of State Government R&D. R&D expenditures by business performers—and also, before 2001, industry-administered FFRDCs—are collected on a calendar year basis. Expenditures for other performers are calendar year approximations based on fiscal year data (see Appendix Table 4-4, general notes). The 1998–2015 data for ONP R&D performance funded by businesses and the nonprofit sector itself are estimated, based on parameters from the 1996–97 Survey of R&D Funding and Performance by Nonprofit Organizations. Type-of-R&D data for business R&D in 1998–2007 were revised in response to data quality review considerations and are not directly comparable with the data for 1997 and earlier years. For 2008 and onward, the type-of-R&D splits for other than total, own-funded, and federally funded R&D are estimated (see also Appendix Table 4-2, footnote d). Type-of-R&D data for FFRDC R&D in 1953–54 includes only those of university-administered FFRDCs. Starting in 2001, type-of-R&D data distinguish federally funded from nonfederally funded FFRDC R&D (see also Appendix Table 4-2, footnote b). The type-of-R&D estimation procedure for higher education R&D was revised in 1998 and again in 2010; hence, these data are not directly comparable with data reported for earlier years. Furthermore, the type-of-R&D splits for other than total and federally funded are estimated (see also Appendix Table 4-2, footnote e). Type-of-R&D data for R&D by other nonprofit organizations in 1998 and later years are estimated, except for those that are federally funded (see also Appendix Table 4-2, footnote f). Type-of-R&D data for state intramural R&D are not currently collected by the Survey of State Government R&D (see also Appendix Table 4-2, footnote c).

Source(s)

National Science Foundation, National Center for Science and Engineering Statistics, National Patterns of R&D Resources (annual series).

Science and Engineering Indicators 2018

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

APPENDIX TABLE 4-9

U.S. development expenditures, by source of funds and performing sector: 1953–2015

(Millions of current and of constant 2009 dollars)

Year	All funding sources		Federal						Nonfederal government					Business					Higher ed-ucation		Other nonprofit organizations				
	All per-formers	Total	Federal intra-mural	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP	
Current \$millions																									
1953	3,412	1,762	567	48	NA	1,123	9	17	3	NA	NA	NA	3	1,637	NA	1,630	1	6	3	7	NA	NA	1	6	
1954	3,734	2,027	537	62	NA	1,405	9	15	3	NA	NA	NA	3	1,693	NA	1,685	1	7	3	8	NA	NA	1	7	
1955	4,113	2,351	543	171	NA	1,614	12	12	4	NA	NA	NA	4	1,748	NA	1,738	2	8	3	8	NA	NA	1	7	
1956	5,854	3,561	631	348	NA	2,559	14	11	4	NA	NA	NA	4	2,277	NA	2,267	2	8	4	9	NA	NA	2	7	
1957	6,681	4,477	728	429	NA	3,300	12	9	5	NA	NA	NA	5	2,185	NA	2,174	3	8	4	10	NA	NA	2	8	
1958	7,213	4,940	842	386	NA	3,691	13	9	6	NA	NA	NA	6	2,252	NA	2,241	3	8	4	11	NA	NA	2	9	
1959	8,463	5,871	940	477	NA	4,426	16	14	6	NA	NA	NA	6	2,569	NA	2,557	3	9	5	12	NA	NA	2	10	
1960	9,360	6,390	1,003	559	NA	4,799	19	10	6	NA	NA	NA	6	2,948	NA	2,935	3	10	5	12	NA	NA	2	10	
1961	9,930	6,701	1,090	670	NA	4,917	22	4	7	NA	NA	NA	7	3,201	NA	3,189	2	10	5	16	NA	NA	2	14	
1962	10,114	6,822	1,227	618	NA	4,950	23	5	8	NA	NA	NA	8	3,259	NA	3,246	2	11	6	20	NA	NA	2	18	
1963	11,539	7,955	1,465	668	NA	5,795	22	6	8	NA	NA	NA	8	3,548	NA	3,535	2	11	6	22	NA	NA	2	20	
1964	12,506	8,610	1,680	739	NA	6,156	30	6	8	NA	NA	NA	8	3,861	NA	3,848	2	11	7	21	NA	NA	3	18	
1965	13,215	8,742	1,789	674	NA	6,218	48	13	9	NA	NA	NA	9	4,433	NA	4,419	2	12	8	24	NA	NA	4	20	
1966	14,490	9,466	1,886	654	NA	6,849	61	16	9	NA	NA	NA	9	4,977	NA	4,961	2	14	10	28	NA	NA	5	23	

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All funding sources		Federal						Nonfederal government					Business					Higher ed-ucation		Other nonprofit organizations				
	All per-formers	Total	Federal intra-mural	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP	
1967	15,332	9,521	1,943	706	NA	6,795	66	12	9	NA	NA	NA	9	5,762	NA	5,744	3	15	10	31	NA	NA	7	24	
1968	16,154	9,756	1,904	724	NA	7,044	72	13	8	NA	NA	NA	8	6,346	NA	6,326	4	16	9	35	NA	NA	9	26	
1969	17,051	9,848	2,016	792	NA	6,944	80	17	7	NA	NA	NA	7	7,150	NA	7,127	5	18	8	38	NA	NA	10	28	
1970	16,925	9,382	2,258	790	NA	6,232	84	20	6	NA	NA	NA	6	7,489	NA	7,466	5	18	7	40	NA	NA	10	30	
1971	17,399	9,561	2,473	841	NA	6,167	69	12	8	NA	NA	NA	8	7,780	NA	7,757	4	19	9	42	NA	NA	9	33	
1972	18,743	10,141	2,639	863	NA	6,533	63	44	12	NA	NA	NA	12	8,533	NA	8,510	4	19	14	44	NA	NA	9	35	
1973	20,197	10,311	2,657	860	NA	6,621	71	102	18	NA	NA	NA	18	9,798	NA	9,773	5	20	20	51	NA	NA	13	38	
1974	21,504	10,506	2,765	983	NA	6,553	75	131	20	NA	NA	NA	20	10,896	NA	10,868	7	22	25	57	NA	NA	15	42	
1975	22,706	10,993	2,890	1,103	NA	6,783	83	135	22	NA	NA	NA	22	11,600	NA	11,569	8	23	27	63	NA	NA	16	47	
1976	25,085	12,035	2,972	1,315	NA	7,522	100	128	24	NA	NA	NA	24	12,927	NA	12,890	12	25	31	68	NA	NA	16	52	
1977	27,667	13,153	3,188	1,418	NA	8,275	153	119	28	NA	NA	NA	28	14,370	NA	14,328	15	27	40	76	NA	NA	19	58	
1978	31,056	14,383	3,676	1,584	NA	8,756	254	113	32	NA	NA	NA	32	16,504	NA	16,460	15	30	49	88	NA	NA	24	64	
1979	35,445	16,064	3,944	1,753	NA	9,888	336	143	34	NA	NA	NA	34	19,193	NA	19,145	16	32	56	99	NA	NA	28	71	
1980	40,748	17,587	4,072	2,009	NA	10,957	362	187	38	NA	NA	NA	38	22,945	NA	22,891	19	35	68	110	NA	NA	31	79	
1981	46,305	20,242	4,530	2,175	NA	12,791	386	360	44	NA	NA	NA	44	25,817	NA	25,756	24	37	80	123	NA	NA	35	88	
1982	51,879	22,323	5,178	2,170	NA	14,215	397	362	46	NA	NA	NA	46	29,286	NA	29,219	27	40	88	137	NA	NA	39	98	
1983	57,771	24,859	6,106	2,385	NA	15,522	399	447	47	NA	NA	NA	47	32,617	NA	32,542	31	44	97	151	NA	NA	43	109	
1984	66,461	28,320	7,078	2,572	NA	17,640	435	594	51	NA	NA	NA	51	37,815	NA	37,731	37	47	108	167	NA	NA	47	120	

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All funding sources		Federal						Nonfederal government						Business					Higher ed-ucation		Other nonprofit organizations				
	All per-formers	Total	Federal intra-mural	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP		
1985	74,522	32,304	8,011	2,906	NA	20,258	486	644	57	NA	NA	NA	57	41,857	NA	41,762	43	51	120	183	NA	NA	49	134		
1986	75,855	33,993	8,275	3,101	NA	21,517	513	587	65	NA	NA	NA	65	41,460	NA	41,354	50	55	136	201	NA	NA	53	149		
1987	79,929	36,691	8,176	3,321	NA	24,122	599	474	73	NA	NA	NA	73	42,784	NA	42,667	57	60	155	226	NA	NA	61	165		
1988	84,567	37,285	8,864	3,596	NA	23,719	698	407	83	NA	NA	NA	83	46,765	NA	46,634	66	65	180	254	NA	NA	71	183		
1989	87,723	35,320	9,355	3,635	NA	21,049	773	507	91	NA	NA	NA	91	51,822	NA	51,676	76	70	205	285	NA	NA	81	203		
1990	94,067	33,859	9,700	3,663	NA	18,966	910	619	99	NA	NA	NA	99	59,568	NA	59,410	83	75	226	315	NA	NA	89	226		
1991	95,105	31,220	8,778	3,452	NA	17,256	1,012	722	103	NA	NA	NA	103	63,197	NA	63,030	86	82	239	345	NA	NA	94	251		
1992	99,811	31,514	9,098	3,423	NA	17,181	1,055	758	105	NA	NA	NA	105	67,567	NA	67,388	91	88	246	378	NA	NA	100	279		
1993	99,705	30,055	9,071	2,986	NA	16,083	1,127	787	109	NA	NA	NA	109	68,866	NA	68,674	97	95	259	416	NA	NA	107	309		
1994	102,938	30,208	8,823	3,147	NA	16,209	1,213	815	114	NA	NA	NA	114	71,886	NA	71,681	102	103	276	455	NA	NA	112	343		
1995	113,079	32,436	9,262	3,427	NA	17,824	1,180	744	123	NA	NA	NA	123	79,738	NA	79,518	108	111	288	495	NA	NA	113	381		
1996	121,377	31,373	9,033	3,448	NA	17,066	1,128	698	128	NA	NA	NA	128	89,032	NA	88,797	115	120	305	538	NA	NA	115	423		
1997	128,661	32,256	9,077	3,331	NA	18,121	1,041	687	120	NA	NA	NA	120	95,331	NA	95,063	113	155	306	648	NA	NA	112	536		
1998	144,669	32,684	9,214	3,314	NA	18,452	943	760	113	NA	NA	NA	113	110,865	NA	110,589	112	164	306	702	NA	NA	110	592		
1999	154,315	30,584	9,265	3,335	NA	16,571	686	727	117	NA	NA	NA	117	122,530	NA	122,236	116	178	325	759	NA	NA	118	641		
2000	169,414	27,493	9,377	3,482	NA	13,510	545	580	123	NA	NA	NA	123	140,549	NA	140,235	119	195	352	897	NA	NA	127	771		
2001	167,740	28,396	11,062	3,273	NA	12,542	646	874	136	7	NA	NA	128	137,770	46	137,410	117	197	381	1,057	71	NA	136	850		
2002	176,601	29,745	11,800	3,308	NA	13,061	639	937	149	9	NA	NA	140	145,074	40	144,727	116	191	425	1,208	81	NA	151	976		

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All funding sources		Federal						Nonfederal government						Business					Higher ed-ucation		Other nonprofit organizations				
	All per-formers	Total	Federal intra-mural	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP		
2003	175,483	30,011	12,646	3,785	NA	11,939	897	743	166	10	NA	NA	155	143,477	43	143,121	118	195	467	1,363	78	NA	162	1,122		
2004	177,220	34,238	12,746	4,561	NA	14,419	1,211	1,300	172	11	NA	NA	161	140,978	45	140,615	120	199	481	1,350	60	NA	167	1,123		
2005	195,731	36,517	13,994	4,654	NA	15,512	1,146	1,211	169	11	NA	NA	158	157,080	50	156,696	122	212	501	1,463	65	NA	170	1,228		
2006	212,719	38,699	16,089	4,358	2	16,720	927	603	171	10	5	NA	156	171,802	58	171,392	126	226	520	1,527	67	NA	173	1,287		
2007	227,967	39,595	18,016	5,254	3	14,860	894	568	177	8	6	NA	163	185,989	47	185,569	133	240	540	1,665	56	NA	186	1,423		
2008	259,595	54,556	17,566	6,094	4	29,488	841	562	416	7	7	223	179	201,848	45	201,406	148	249	589	2,186	47	330	209	1,600		
2009	256,036	55,963	17,245	6,159	5	30,435	1,569	550	448	8	8	144	288	196,182	39	195,614	289	241	915	2,529	46	361	381	1,740		
2010	251,415	56,993	18,844	6,909	6	28,089	2,509	638	542	11	9	114	408	189,555	40	188,849	425	242	1,240	3,085	45	649	541	1,850		
2011	270,995	58,355	21,879	6,786	6	26,228	2,666	790	648	6	9	230	402	207,758	41	207,026	436	255	1,340	2,895	39	402	567	1,887		
2012	273,264	55,623	19,941	6,631	6	25,840	2,687	518	499	10	9	102	378	212,718	43	211,949	464	261	1,524	2,900	40	310	625	1,925		
2013	287,144	51,606	19,767	6,572	6	22,137	2,650	474	538	11	8	126	393	230,039	49	229,212	502	276	1,670	3,291	36	532	663	2,061		
2014	301,475	48,127	20,303	6,681	6	18,065	2,602	471	503	7	7	87	402	247,498	58	246,601	548	291	1,782	3,566	36	624	721	2,185		
2015 ^a	314,532	49,476	20,547	7,062	6	18,850	2,565	447	507	6	8	90	404	258,753	62	257,831	560	301	1,888	3,908	42	786	789	2,292		
Constant 2009 \$millions																										
1953	22,510	11,626	3,738	313	NA	7,410	56	109	19	NA	NA	NA	19	10,802	NA	10,755	7	40	17	46	NA	NA	7	40		
1954	24,412	13,249	3,511	402	NA	9,185	56	95	23	NA	NA	NA	23	11,068	NA	11,016	7	46	20	52	NA	NA	7	46		
1955	26,435	15,108	3,486	1,096	NA	10,375	74	77	24	NA	NA	NA	24	11,230	NA	11,169	10	51	21	51	NA	NA	6	45		
1956	36,384	22,130	3,919	2,160	NA	15,903	84	65	27	NA	NA	NA	27	14,152	NA	14,090	12	50	22	53	NA	NA	9	44		

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All funding sources		Federal						Nonfederal government						Business					Higher ed-ucation		Other nonprofit organizations				
	All per-formers	Total	Federal intra-mural	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP		
1957	40,185	26,929	4,376	2,580	NA	19,850	72	51	32	NA	NA	NA	32	13,139	NA	13,076	15	48	25	60	NA	NA	12	48		
1958	42,429	29,059	4,950	2,268	NA	21,715	74	53	33	NA	NA	NA	33	13,247	NA	13,182	18	47	26	65	NA	NA	12	53		
1959	49,092	34,059	5,453	2,764	NA	25,674	90	78	35	NA	NA	NA	35	14,903	NA	14,833	17	52	26	70	NA	NA	12	58		
1960	53,557	36,560	5,736	3,199	NA	27,460	109	57	36	NA	NA	NA	36	16,865	NA	16,794	14	57	27	69	NA	NA	11	57		
1961	56,201	37,926	6,166	3,792	NA	27,826	122	20	39	NA	NA	NA	39	18,117	NA	18,049	11	57	29	91	NA	NA	11	79		
1962	56,548	38,139	6,860	3,455	NA	27,673	126	25	43	NA	NA	NA	43	18,221	NA	18,148	11	62	32	112	NA	NA	11	101		
1963	63,794	43,980	8,099	3,693	NA	32,036	122	30	44	NA	NA	NA	44	19,615	NA	19,543	11	61	34	122	NA	NA	11	111		
1964	68,092	46,879	9,147	4,024	NA	33,518	161	30	43	NA	NA	NA	43	21,022	NA	20,951	11	60	36	112	NA	NA	14	98		
1965	70,663	46,742	9,563	3,604	NA	33,249	257	70	46	NA	NA	NA	46	23,704	NA	23,629	11	64	42	128	NA	NA	21	107		
1966	75,361	49,231	9,809	3,399	NA	35,622	317	83	49	NA	NA	NA	49	25,886	NA	25,803	10	73	50	146	NA	NA	26	120		
1967	77,488	48,121	9,820	3,566	NA	34,343	331	61	43	NA	NA	NA	43	29,120	NA	29,031	13	76	51	154	NA	NA	33	121		
1968	78,308	47,292	9,230	3,507	NA	34,148	347	61	38	NA	NA	NA	38	30,764	NA	30,667	19	78	45	170	NA	NA	44	126		
1969	78,784	45,502	9,314	3,657	NA	32,085	367	79	33	NA	NA	NA	33	33,037	NA	32,931	23	83	37	176	NA	NA	46	129		
1970	74,281	41,178	9,910	3,465	NA	27,352	366	86	28	NA	NA	NA	28	32,868	NA	32,767	22	79	31	176	NA	NA	44	132		
1971	72,669	39,932	10,327	3,511	NA	25,758	288	48	33	NA	NA	NA	33	32,495	NA	32,399	17	79	36	173	NA	NA	36	138		
1972	75,042	40,600	10,567	3,453	NA	26,156	250	174	50	NA	NA	NA	50	34,161	NA	34,071	14	76	54	176	NA	NA	36	140		
1973	76,688	39,150	10,090	3,265	NA	25,140	268	387	66	NA	NA	NA	66	37,204	NA	37,109	19	76	76	192	NA	NA	47	144		
1974	74,921	36,604	9,635	3,423	NA	22,831	260	456	70	NA	NA	NA	70	37,962	NA	37,864	23	75	85	199	NA	NA	52	147		

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All funding sources		Federal						Nonfederal government						Business					Higher ed-ucation		Other nonprofit organizations				
	All per-formers	Total	Federal intra-mural	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP		
1975	72,402	35,053	9,215	3,517	NA	21,629	263	429	71	NA	NA	NA	71	36,990	NA	36,890	26	75	88	200	NA	NA	51	149		
1976	75,825	36,379	8,983	3,973	NA	22,737	301	385	72	NA	NA	NA	72	39,074	NA	38,962	35	76	94	206	NA	NA	48	157		
1977	78,745	37,435	9,073	4,037	NA	23,552	435	339	79	NA	NA	NA	79	40,898	NA	40,779	41	78	114	217	NA	NA	53	165		
1978	82,591	38,251	9,777	4,214	NA	23,286	675	300	85	NA	NA	NA	85	43,891	NA	43,774	39	79	130	233	NA	NA	62	171		
1979	87,078	39,464	9,688	4,306	NA	24,292	826	351	84	NA	NA	NA	84	47,150	NA	47,033	38	79	137	243	NA	NA	68	175		
1980	91,822	39,631	9,177	4,527	NA	24,691	815	421	86	NA	NA	NA	86	51,705	NA	51,583	44	78	152	248	NA	NA	69	179		
1981	95,433	41,718	9,337	4,483	NA	26,362	795	741	90	NA	NA	NA	90	53,208	NA	53,082	49	77	164	253	NA	NA	72	181		
1982	100,677	43,319	10,048	4,211	NA	27,586	771	703	88	NA	NA	NA	88	56,832	NA	56,702	52	78	171	265	NA	NA	76	190		
1983	107,854	46,410	11,399	4,453	NA	28,978	745	835	88	NA	NA	NA	88	60,892	NA	60,753	58	82	182	282	NA	NA	80	203		
1984	119,823	51,058	12,761	4,638	NA	31,803	784	1,072	93	NA	NA	NA	93	68,177	NA	68,025	66	85	194	301	NA	NA	84	217		
1985	130,191	56,437	13,995	5,076	NA	35,391	849	1,125	100	NA	NA	NA	100	73,124	NA	72,959	76	89	210	320	NA	NA	86	234		
1986	129,899	58,212	14,170	5,311	NA	36,847	879	1,004	112	NA	NA	NA	112	70,997	NA	70,817	86	95	233	345	NA	NA	90	254		
1987	133,470	61,269	13,652	5,545	NA	40,281	1,000	791	122	NA	NA	NA	122	71,443	NA	71,248	95	100	259	377	NA	NA	101	276		
1988	136,439	60,155	14,301	5,802	NA	38,268	1,127	657	133	NA	NA	NA	133	75,450	NA	75,239	107	104	290	411	NA	NA	115	296		
1989	136,234	54,852	14,529	5,645	NA	32,689	1,201	787	142	NA	NA	NA	142	80,479	NA	80,253	118	108	318	442	NA	NA	126	316		
1990	140,874	50,706	14,527	5,486	NA	28,403	1,363	927	149	NA	NA	NA	149	89,209	NA	88,972	124	113	339	471	NA	NA	133	338		
1991	137,842	45,249	12,722	5,004	NA	25,010	1,466	1,047	149	NA	NA	NA	149	91,596	NA	91,354	125	118	347	500	NA	NA	136	364		
1992	141,438	44,658	12,892	4,851	NA	24,347	1,495	1,074	149	NA	NA	NA	149	95,747	NA	95,493	129	125	348	536	NA	NA	141	395		

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All funding sources		Federal						Nonfederal government						Business					Higher ed-ucation		Other nonprofit organizations				
	All per-formers	Total	Federal intra-mural	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP		
1993	138,005	41,599	12,556	4,133	NA	22,261	1,560	1,089	151	NA	NA	NA	151	95,320	NA	95,054	135	132	359	576	NA	NA	148	428		
1994	139,508	40,939	11,958	4,265	NA	21,968	1,644	1,104	154	NA	NA	NA	154	97,425	NA	97,147	138	139	374	617	NA	NA	151	465		
1995	150,123	43,062	12,296	4,550	NA	23,663	1,566	987	163	NA	NA	NA	163	105,859	NA	105,567	144	148	382	657	NA	NA	150	506		
1996	158,251	40,904	11,777	4,496	NA	22,251	1,471	910	167	NA	NA	NA	167	116,080	NA	115,773	150	157	398	702	NA	NA	150	552		
1997	164,926	41,348	11,635	4,269	NA	23,229	1,335	880	154	NA	NA	NA	154	122,201	NA	121,858	145	198	393	831	NA	NA	143	688		
1998	183,453	41,446	11,684	4,203	NA	23,399	1,196	964	143	NA	NA	NA	143	140,587	NA	140,237	142	208	388	890	NA	NA	140	750		
1999	192,737	38,199	11,572	4,165	NA	20,697	857	908	146	NA	NA	NA	146	153,038	NA	152,670	145	222	406	947	NA	NA	147	800		
2000	206,886	33,574	11,451	4,252	NA	16,498	665	708	150	NA	NA	NA	150	171,637	NA	171,254	145	238	430	1,096	NA	NA	155	941		
2001	200,278	33,904	13,208	3,907	NA	14,975	771	1,043	162	9	NA	NA	153	164,495	55	164,065	140	235	454	1,262	85	NA	163	1,015		
2002	207,671	34,978	13,876	3,890	NA	15,359	752	1,101	175	11	NA	NA	164	170,598	47	170,189	137	225	500	1,421	95	NA	178	1,148		
2003	202,320	34,600	14,580	4,364	NA	13,765	1,034	857	191	12	NA	NA	179	165,420	49	165,009	136	225	538	1,571	90	NA	187	1,294		
2004	198,856	38,418	14,302	5,118	NA	16,179	1,359	1,459	193	13	NA	NA	181	158,190	50	157,782	134	224	539	1,515	68	NA	187	1,260		
2005	212,780	39,698	15,213	5,059	NA	16,863	1,246	1,316	184	12	NA	NA	172	170,762	55	170,345	133	230	545	1,591	71	NA	185	1,335		
2006	224,354	40,816	16,969	4,596	2	17,635	977	636	180	11	5	NA	165	181,199	61	180,767	133	239	548	1,611	71	NA	183	1,357		
2007	234,205	40,678	18,509	5,398	3	15,267	919	583	182	9	6	NA	168	191,078	48	190,646	137	247	555	1,711	58	NA	191	1,462		
2008	261,567	54,970	17,700	6,141	4	29,712	848	567	420	8	7	225	180	203,381	45	202,935	149	251	593	2,203	48	333	210	1,612		
2009	256,036	55,963	17,245	6,159	5	30,435	1,569	550	448	8	8	144	288	196,182	39	195,614	289	241	915	2,529	46	361	381	1,740		
2010	248,381	56,305	18,616	6,825	6	27,750	2,478	630	535	10	9	112	403	187,267	39	186,569	420	239	1,225	3,048	45	641	534	1,828		

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All funding sources		Federal						Nonfederal government						Business					Higher ed-ucation		Other nonprofit organizations				
	All per-formers	Total	Federal intra-mural	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	ONP	Total	FFRDC	Non-federal govern-ment	Busi-ness	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP	Higher ed-ucation	Total	FFRDC	Busi-ness	Higher ed-ucation	ONP		
2011	262,311	56,485	21,178	6,568	6	25,387	2,580	765	627	6	9	223	389	201,100	39	200,392	422	247	1,297	2,802	37	389	549	1,827		
2012	259,720	52,867	18,953	6,303	6	24,559	2,554	492	474	9	8	97	359	202,175	41	201,445	441	248	1,448	2,756	38	295	594	1,829		
2013	268,577	48,269	18,489	6,147	5	20,706	2,479	443	503	11	8	118	368	215,164	46	214,391	469	258	1,562	3,078	34	498	620	1,927		
2014	277,010	44,221	18,655	6,138	5	16,599	2,391	433	462	6	7	80	369	227,413	53	226,589	504	267	1,637	3,276	33	573	662	2,008		
2015 ^a	285,906	44,973	18,677	6,419	5	17,134	2,331	406	461	5	7	81	367	235,203	56	234,365	509	273	1,716	3,553	38	715	717	2,083		

NA = not available.

FFRDC = federally funded research and development center; ONP = other nonprofit organization.

^a Some data for 2015 are preliminary and may later be revised.

Note(s)

This table reaggregates the R&D performer data in Appendix Table 4-5 according to major categories of R&D funding: federal government, nonfederal government (state and local), business, higher education, and other nonprofit organizations. Business sources of R&D funding in this table include the own funds of domestic R&D performing businesses, funds from other domestic businesses, and funds from foreign businesses. For interpretive detail on the R&D performers listed, see Appendix Table 4-2, footnotes a-f. Detail may not add to total because of rounding. Constant-dollar estimates are derived from unrounded data. For comparisons, use only the historical data reported in this table because some back-year data may have been revised. Except for the nonprofit sector, data are based on annual reports by performers in the National Science Foundation's annual R&D expenditure surveys: Business R&D and Innovation Survey, Higher Education R&D Survey, Survey of Federal Funds for R&D, FFRDC R&D Expenditures Survey, and Survey of State Government R&D. R&D expenditures by business performers—and also, before 2001, industry-administered FFRDCs—are collected on a calendar year basis. Expenditures for other performers are calendar year approximations based on fiscal year data (see Appendix Table 4-5, general notes). The 1998–2015 data for ONP R&D performance funded by businesses and the nonprofit sector itself are estimated, based on parameters from the 1996–97 Survey of R&D Funding and Performance by Nonprofit Organizations. Type-of-R&D data for business R&D in 1998–2007 were revised in response to data quality review considerations and are not directly comparable with the data for 1997 and earlier years. For 2008 and onward, the type-of-R&D splits for other than total, own-funded, and federally funded R&D are estimated (see also Appendix Table 4-2, footnote d). Type-of-R&D data for FFRDC R&D in 1953–54 include only those of university-administered FFRDCs. Starting in 2001, type-of-R&D data distinguish federally funded from nonfederally funded FFRDC R&D (see also Appendix Table 4-2, footnote b). The type-of-R&D estimation procedure for higher education R&D was revised in 1998 and again in 2010; hence, these data are not directly comparable with data reported for earlier years. Furthermore, the type-of-R&D splits for other than total and federally funded are estimated (see also Appendix Table 4-2, footnote e). Type-of-R&D data for R&D by other nonprofit organizations in 1998 and later years are estimated, except for those that are federally funded (see also Appendix Table 4-2, footnote f). Type-of-R&D data for state intramural R&D are not currently collected by the Survey of State Government R&D (see also Appendix Table 4-2, footnote c).

Source(s)

National Science Foundation, National Center for Science and Engineering Statistics, National Patterns of R&D Resources (annual series).

Science and Engineering Indicators 2018

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

APPENDIX TABLE 4-10

U.S. R&D expenditures, by state, performing sector, and funding sector: 2015

(Millions of current dollars)

State	All R&D	R&D rank	Per-former:	Federal	FFRDCs		Business				Higher education ^a						Other nonprofit insti-tutions		State, in-ternal ^b		GDP	GDP rank	R&D intensity ^c	
			Source of funds:	Federal	Total	Federal	Non-federal ^d	Total	Own	Paid by others		Total	Federal	Other govern-ment	Busi-ness	Higher ed-ucation	Non-profit	Other	Federal ^f	Total			Per-cent	Rank
				Federal						Non-federal ^e	Fed-eral													
U.S. total ^g	495,144	na		35,673	18,649	18,287	362	355,821	289,892	38,939	26,990	64,653	33,546	3,772	3,842	17,334	4,139	2,020	6,189	610	18,120,700	na	2.73	na
States total ^g	468,866	na		30,006	18,458	18,097	361	345,317	288,492	29,932	23,931	68,513	37,763	3,808	3,997	16,682	4,236	2,027	5,987	585	17,925,143	na	2.62	na
Alabama	4,195	26		1,698	0	0	0	1,561	875	135	551	903	530	48	61	227	24	13	27	6	199,980	27	2.10	24
Alaska	333	49		91	0	0	0	66	32	26	8	163	92	12	6	50	2	1	4	9	53,384	47	0.62	47
Arizona	7,011	20		327	24	21	3	5,515	4,450	604	461	1,100	487	47	30	356	52	128	37	8	291,448	22	2.41	18
Arkansas	624	41		18	0	0	0	302	271	26	6	293	99	64	13	91	2	25	10	1	118,677	35	0.53	49
California	125,056	1		2,365	5,155	5,042	114	107,982	95,020	6,004	6,957	8,657	4,714	381	554	1,657	794	557	842	55	2,491,619	1	5.02	4
Colorado	6,697	22		419	545	505	40	4,362	3,665	236	461	1,274	930	40	82	124	83	14	88	8	313,329	19	2.14	21
Connecticut	9,918	14		250	0	0	0	8,533	6,441	299	1,793	1,091	625	18	54	311	70	14	21	22	256,306	23	3.87	8
Delaware	2,887	30		4	0	0	0	2,681	2,049	621	11	192	126	11	6	42	4	3	8	2	68,864	42	4.19	7
District of Columbia	3,567	28		2,367	9	9	0	299	198	18	83	559	305	5	11	159	67	13	332	2	121,119	34	2.95	12
Florida	9,456	15		1,066	0	0	0	5,816	3,788	655	1,373	2,389	1,120	191	122	818	99	40	140	45	883,861	4	1.07	36
Georgia	6,877	21		190	0	0	0	4,614	3,821	610	183	2,046	1,211	53	107	570	82	23	25	2	501,522	9	1.37	33
Hawaii	609	42		75	0	0	0	186	123	47	17	332	214	14	7	86	10	2	14	2	80,599	39	0.76	43

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

State	All R&D	R&D rank	Per-former:	Federal	FFRDCs		Business			Higher education ^a						Other nonprofit insti-tutions		State, in-ternal ^b		GDP	GDP rank	R&D intensity ^c		
			Source of funds:	Federal	Total	Federal	Non-federal ^d	Total	Own	Paid by others		Total	Federal	Other govern-ment	Busi-ness	Higher ed-ucation	Non-profit	Other	Federal ^f			Total	Per-cent	Rank
										Non-federal ^e	Fed-eral													
Idaho	2,226	34		41	476	457	19	1,554	1,304	244	6	147	81	30	3	28	2	3	1	6	65,460	43	3.40	9
Illinois	16,502	8		285	1,039	1,008	31	12,710	11,467	1,056	187	2,391	1,379	55	130	610	189	28	75	2	772,182	5	2.14	22
Indiana	7,663	17		85	0	0	0	6,252	5,346	830	76	1,324	542	81	70	502	104	24	2	1	333,363	16	2.30	20
Iowa	3,407	29		56	46	45	1	2,539	1,916	D	D	759	344	54	36	292	30	3	4	4	175,809	30	1.94	28
Kansas	2,716	31		22	0	0	0	2,126	1,515	588	23	562	234	65	51	179	30	4	4	1	151,845	31	1.79	29
Kentucky	1,853	35		26	0	0	0	1,292	763	58	471	533	227	59	16	177	23	31	1	1	191,897	28	0.97	38
Louisiana	1,124	38		50	0	0	0	400	325	35	40	663	266	92	36	215	36	18	1	9	238,075	24	0.47	50
Maine	508	45		13	0	0	0	298	259	13	26	108	51	22	3	28	3	1	87	3	57,332	44	0.89	41
Maryland	20,385	5		10,462	702	702	0	5,136	2,825	517	1,793	3,742	2,943	65	91	451	176	16	342	1	366,242	15	5.57	3
Massachusetts	28,665	2		632	1,374	1,369	5	21,484	17,719	2,899	865	3,674	2,142	52	266	753	300	160	1,490	11	488,100	11	5.87	2
Michigan	19,891	7		372	0	0	0	17,136	15,620	1,233	283	2,335	1,190	48	93	867	97	39	48	1	470,611	13	4.23	6
Minnesota	8,053	16		61	0	0	0	6,820	6,290	252	278	929	494	59	26	295	13	41	240	3	326,833	17	2.46	17
Mississippi	943	40		317	0	0	0	216	186	17	14	408	194	92	22	90	8	2	2	*	105,871	37	0.89	40
Missouri	7,426	18		236	0	0	0	6,078	3,737	D	D	1,074	611	7	71	276	98	10	30	7	292,718	21	2.54	16
Montana	459	47		45	0	0	0	225	200	15	10	182	107	11	3	52	3	5	4	2	45,845	49	1.00	37
Nebraska	1,087	39		38	0	0	0	578	539	29	10	464	184	11	23	209	27	9	7	1	113,458	36	0.96	39
Nevada	566	43		26	0	0	0	381	329	29	23	158	96	16	3	34	2	7	1	*	141,070	33	0.40	51

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

State	All R&D	R&D rank	Per-former:	Federal	FFRDCs		Business				Higher education ^a					Other nonprofit insti-tutions		State, in-ternal ^b		GDP	GDP rank	R&D intensity ^c		
			Source of funds:	Federal	Total	Federal	Non-federal ^d	Total	Own	Paid by others		Total	Federal	Other govern-ment	Busi-ness	Higher ed-ucation	Non-profit	Other	Federal ^f			Total	Per-cent	Rank
										Non-federal ^e	Fed-eral													
New Hampshire	2,333	32		39	0	0	0	1,932	817	283	832	358	241	5	15	77	14	5	4	*	74,269	40	3.14	11
New Jersey	15,865	9		541	81	81	1	14,113	11,627	2,260	226	1,106	588	93	38	294	74	20	21	2	564,360	8	2.81	13
New Mexico	6,078	24		657	4,499	4,427	72	502	254	61	188	391	254	26	9	80	12	10	26	3	93,230	38	6.52	1
New York	22,401	4		224	587	573	14	15,329	11,897	1,767	1,666	5,700	3,026	233	433	1,385	461	162	317	243	1,445,611	3	1.55	30
North Carolina	11,823	12		306	0	0	0	8,572	6,428	1,972	172	2,815	1,600	148	337	540	152	38	116	14	499,741	10	2.37	19
North Dakota	460	46		28	0	0	0	211	191	15	5	218	73	60	14	64	2	5	1	1	55,927	45	0.82	42
Ohio	12,233	11		797	0	0	0	9,044	6,149	1,868	1,027	2,153	1,269	122	185	436	101	39	238	1	607,326	7	2.01	27
Oklahoma	1,311	37		199	0	0	0	661	605	36	21	420	183	62	29	125	11	9	31	*	188,011	29	0.70	45
Oregon	7,208	19		86	0	0	0	6,357	6,103	139	115	720	503	55	30	73	43	15	28	18	216,522	25	3.33	10
Pennsylvania	14,839	10		663	131	131	0	10,354	9,022	1,168	164	3,357	2,179	80	197	603	198	100	327	7	708,402	6	2.09	25
Rhode Island	1,427	36		165	0	0	0	751	679	23	50	453	210	11	6	205	17	5	57	*	55,650	46	2.56	15
South Carolina	2,257	33		143	122	122	0	1,289	1,129	82	78	665	283	34	43	276	21	8	16	22	201,831	26	1.12	35
South Dakota	271	50		14	0	0	0	139	115	12	11	103	50	19	3	22	7	2	14	*	47,073	48	0.58	48
Tennessee	4,369	25		204	1,333	1,305	28	1,570	1,345	179	46	1,076	626	31	52	315	39	12	185	1	316,659	18	1.38	32
Texas	23,668	3		1,076	13	11	1	17,350	14,790	1,446	1,114	5,083	2,016	814	352	1,278	373	249	144	3	1,611,189	2	1.47	31
Utah	4,174	27		147	0	0	0	3,274	2,685	149	441	733	419	45	79	150	35	6	1	18	149,099	32	2.80	14

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

State	All R&D	R&D rank	Per-former:	Federal	FFRDCs		Business				Higher education ^a					Other nonprofit insti-tutions	State, in-ternal ^b	GDP	GDP rank	R&D intensity ^c					
			Source of funds:	Federal	Total	Federal	Non-federal ^d	Total	Own	Paid by others		Total	Federal	Other govern-ment	Busi-ness	Higher ed-ucation	Non-profit			Other	Federal ^f	Total	Per-cent	Rank	
										Non-federal ^e	Fed-eral														
Vermont	374	48		6	0	0	0	247	204	26	17	120	88	0.24	2	23	5	1	0.00	1	30,300	51	1.23	34	
Virginia	10,107	13		2,733	1,372	1,348	24	4,486	2,719	343	1,424	1,411	738	74	62	473	53	12	90	15	481,721	12	2.10	23	
Washington	20,038	6		149	951	942	9	16,940	16,313	415	212	1,549	1,058	80	57	191	114	50	439	10	446,417	14	4.49	5	
West Virginia	546	44		133	0	0	0	201	158	19	23	199	87	14	13	69	4	12	11	2	73,384	41	0.74	44	
Wisconsin	6,132	23		52	0	0	0	4,676	4,052	538	85	1,374	684	95	40	451	71	32	23	7	301,587	20	2.03	26	
Wyoming	253	51		6	0	0	0	177	137	35	5	57	49	3	2	2	1	0	11	2	39,415	50	0.64	46	
U.S. undistributed ^h	14,090	na		3,586	0	0	0	10,504	8,188	D	0	0	0	0	0	0	0	0	0	0	0	na	na	na	na
Puerto Rico ⁱ	137	na		6	0	0	0	NA	NA	NA	NA	127	88	4	4	29	1	1	*	4	103,100	na	NA	na	
Other ^j	263	na		235	0	0	0	0	0	0	0	28	26	*	*	*	*	1	*	na	na	na	na	na	

* = < \$0.5 million; D = data withheld to avoid disclosing operations of individual companies; na = not applicable; NA = not available.

FFRDC = federally funded research and development center; GDP = gross domestic product; HE = higher education.

^a State-level higher education R&D data have not been adjusted to eliminate the double counting of all pass-through funding. At the national level, funds passed through to educational subrecipients accounted for 8.2% of total R&D expenditures reported by universities and colleges in FY 2015.

^b Internal performers include state agency and department employees and also services performed by others in support of an internal R&D project.

^c R&D intensity is the ratio of total R&D performed in a state to its state GDP.

^d Nonfederal sources of R&D expenditures reported by FFRDCs in FY 2015 included state and local governments (\$18 million), business (\$209 million), nonprofit organizations (\$28 million), and all other sources (\$106 million).

^e R&D paid for by nonfederal sources includes funding from other companies located inside (\$15 billion) or outside (\$16 billion) the United States, U.S. state government agencies (\$127 million), foreign government agencies and laboratories (\$572 million), other organizations located inside (\$489 million) or outside (\$54 million) the United States.

^f Other sources of support for nonprofit institutions were unavailable by state. In 2015, total nonprofit performance is estimated at \$19.7 billion. Business provided an estimated \$1.6 billion to the nonprofit sector, and nonprofit institutions provided an estimated \$12.0 billion.

^g States totals differ from U.S. totals for several reasons: (1) some R&D expenditures cannot be allocated to 1 of 50 states or the District of Columbia; (2) nonfederal sources of other nonprofit R&D expenditures could not be allocated by state; (3) state-level higher education data have not been adjusted to eliminate double counting of funds passed through from one academic institution to another; and (4) state-level R&D data are not converted from fiscal years to calendar years.

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

^h Reported data that could not be assigned to 1 of the 50 states or the District of Columbia.

ⁱ Data on business R&D performance in Puerto Rico are not collected.

^j Includes R&D expenditures reported for outlying areas (Guam, Virgin Islands, American Samoa) and offices abroad but excluding Puerto Rico.

Note(s)

Business R&D data refer to calendar years; the data for the other R&D performers refer to fiscal years but are used here as approximations to calendar-year data.

Source(s)

National Science Foundation, National Center for Science and Engineering Statistics, National Patterns of R&D Resources (annual series). State GDP data are from the U.S. Bureau of Economic Analysis, <http://www.bea.gov/regional/index.htm>, accessed 17 June 2017.

Science and Engineering Indicators 2018

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

 APPENDIX TABLE 4-11 
U.S. R&D and gross domestic product, by state: 2015

(Millions of current dollars, R&D-to-GDP ratio, and state rank)

R&D rank	State (listed by R&D rank)	R&D (current \$millions)	GDP (current \$millions)	R&D/ GDP (%)	R&D/ GDP rank	Total state R&D (%)	Cumulative (%)
-	All states	468,866	17,925,143	2.62	-	100.0	-
1	California	125,056	2,491,619	5.02	4	26.7	26.7
2	Massachusetts	28,665	488,100	5.87	2	6.1	32.8
3	Texas	23,668	1,611,189	1.47	31	5.0	37.8
4	New York	22,401	1,445,611	1.55	30	4.8	42.6
5	Maryland	20,385	366,242	5.57	3	4.3	47.0
6	Michigan	19,891	470,611	4.23	6	4.2	51.2
7	Washington	20,038	446,417	4.49	5	4.3	55.5
8	Illinois	16,502	772,182	2.14	22	3.5	59.0
9	New Jersey	15,865	564,360	2.81	13	3.4	62.4
10	Pennsylvania	14,839	708,402	2.09	25	3.2	65.5
11	Ohio	12,233	607,326	2.01	27	2.6	68.2
12	North Carolina	11,823	499,741	2.37	19	2.5	70.7
13	Virginia	10,107	481,721	2.10	23	2.2	72.8
14	Connecticut	9,918	256,306	3.87	8	2.1	74.9
15	Florida	9,456	883,861	1.07	36	2.0	77.0
16	Minnesota	8,053	326,833	2.46	17	1.7	78.7
17	Missouri	7,426	292,718	2.54	16	1.6	80.3
18	Indiana	7,663	333,363	2.30	20	1.6	81.9
19	Oregon	7,208	216,522	3.33	10	1.5	83.4
20	Arizona	7,011	291,448	2.41	18	1.5	84.9
21	Georgia	6,877	501,522	1.37	33	1.5	86.4
22	Colorado	6,697	313,329	2.14	21	1.4	87.8
23	New Mexico	6,078	93,230	6.52	1	1.3	89.1

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

R&D rank	State (listed by R&D rank)	R&D (current \$millions)	GDP (current \$millions)	R&D/ GDP (%)	R&D/ GDP rank	Total state R&D (%)	Cumulative (%)
24	Wisconsin	6,132	301,587	2.03	26	1.3	90.4
25	Alabama	4,195	199,980	2.10	24	0.9	91.3
26	Tennessee	4,369	316,659	1.38	32	0.9	92.3
27	District of Columbia	3,567	121,119	2.95	12	0.8	93.0
28	Utah	4,174	149,099	2.80	14	0.9	93.9
29	Iowa	3,407	175,809	1.94	28	0.7	94.6
30	Delaware	2,887	68,864	4.19	7	0.6	95.2
31	Kansas	2,716	151,845	1.79	29	0.6	95.8
32	New Hampshire	2,333	74,269	3.14	11	0.5	96.3
33	Idaho	2,226	65,460	3.40	9	0.5	96.8
34	South Carolina	2,257	201,831	1.12	35	0.5	97.3
35	Kentucky	1,853	191,897	0.97	38	0.4	97.7
36	Rhode Island	1,427	55,650	2.56	15	0.3	98.0
37	Mississippi	943	105,871	0.89	40	0.2	98.2
38	Louisiana	1,124	238,075	0.47	50	0.2	98.4
39	Oklahoma	1,311	188,011	0.70	45	0.3	98.7
40	Nebraska	1,087	113,458	0.96	39	0.2	98.9
41	Nevada	566	141,070	0.40	51	0.1	99.1
42	Hawaii	609	80,599	0.76	43	0.1	99.2
43	Arkansas	624	118,677	0.53	49	0.1	99.3
44	West Virginia	546	73,384	0.74	44	0.1	99.4
45	Maine	508	57,332	0.89	41	0.1	99.5
46	North Dakota	460	55,927	0.82	42	0.1	99.6
47	Montana	459	45,845	1.00	37	0.1	99.7
48	Vermont	374	30,300	1.23	34	0.1	99.8
49	Alaska	333	53,384	0.62	47	0.1	99.9
50	South Dakota	271	47,073	0.58	48	0.1	99.9

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

R&D rank	State (listed by R&D rank)	R&D (current \$millions)	GDP (current \$millions)	R&D/ GDP (%)	R&D/ GDP rank	Total state R&D (%)	Cumulative (%)
51	Wyoming	253	39,415	0.64	46	0.1	100.0

GDP = gross domestic product.

Note(s)

U.S. total R&D expenditures for 2015 was \$495.1 billion; \$448.9 billion could be allocated to the 50 states and District of Columbia.

Source(s)

National Science Foundation, National Center for Science and Engineering Statistics, National Patterns of R&D Resources (annual series). State GDP data are from the U.S. Bureau of Economic Analysis, <https://www.bea.gov/regional/index.htm>, accessed 17 June 2017.

Science and Engineering Indicators 2018

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

 APPENDIX TABLE 4-12 
Gross expenditures on R&D and expenditures for R&D as a share of gross domestic product, for selected countries or regions: 1981–2015

(PPP in billions and in constant 2005 billions of dollars, GERD-to-GDP ratio, and annual growth rates)

Year	United States	EU ^a	France	Germany	United Kingdom	China	Japan	South Korea	India
GERD (PPP \$billions)									
1981	72.7	na	11.0	18.9	11.6	NA	23.7	NA	NA
1982	81.2	na	12.5	20.5	NA	NA	27.1	NA	NA
1983	90.4	na	13.4	21.8	12.5	NA	30.8	NA	NA
1984	102.9	na	14.8	23.2	NA	NA	34.5	NA	NA
1985	115.2	na	15.9	26.2	14.4	NA	40.0	NA	NA
1986	120.6	na	16.5	27.7	15.3	NA	41.5	NA	NA
1987	126.7	na	17.7	30.0	15.9	NA	45.6	NA	NA
1988	134.2	na	19.1	32.0	16.9	NA	50.9	NA	NA
1989	142.2	na	21.1	34.4	17.9	NA	57.7	NA	NA
1990	152.4	na	23.4	36.0	18.7	NA	64.9	NA	NA
1991	161.4	na	24.4	40.1	18.3	9.1	68.8	7.0	NA
1992	165.8	na	25.4	39.9	18.5	10.7	69.7	8.0	NA
1993	166.1	na	26.3	39.1	19.7	12.0	69.6	9.5	NA
1994	169.6	na	26.9	39.4	20.5	12.5	70.4	11.6	NA
1995	184.1	137.3	27.7	41.0	19.6	12.8	76.6	13.2	NA
1996	197.8	142.7	28.3	42.2	20.1	14.2	83.1	14.9	9.9
1997	212.5	149.4	28.6	44.0	20.7	17.9	87.8	16.3	11.3
1998	226.2	157.1	29.4	46.0	21.4	19.7	91.0	14.6	12.4
1999	245.0	169.0	31.0	50.5	23.3	25.0	92.8	15.8	14.1
2000	268.6	183.1	33.2	53.6	25.1	33.0	98.8	18.5	15.7
2001	279.1	195.3	36.2	56.1	26.4	38.5	103.8	21.3	16.3
2002	278.4	205.7	38.3	58.4	27.9	48.1	108.2	22.5	17.0
2003	292.2	210.1	37.1	60.8	28.6	57.1	112.2	24.1	18.5

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	United States	EU ^a	France	Germany	United Kingdom	China	Japan	South Korea	India
2004	303.8	218.0	38.2	62.8	29.4	70.1	117.6	27.9	21.6
2005	326.2	226.8	39.5	63.9	30.6	86.8	128.7	30.6	26.5
2006	351.7	249.6	42.3	69.3	33.3	105.6	138.6	35.4	29.4
2007	378.5	266.6	44.2	73.3	35.2	124.2	147.6	40.6	33.5
2008	405.4	290.7	46.6	81.1	36.5	146.1	148.7	43.9	37.8
2009	404.2	297.4	49.7	82.8	36.5	185.3	137.0	46.0	40.2
2010	408.5	308.3	51.0	87.1	37.6	213.5	140.6	52.2	43.7
2011	427.1	328.5	53.6	95.8	38.8	247.8	148.4	58.4	48.1
2012	434.3	341.4	55.1	100.5	38.5	292.2	152.3	64.9	NA
2013	454.8	355.8	58.4	102.9	41.5	334.1	164.7	68.2	NA
2014	476.5	372.3	59.5	109.8	44.2	370.1	170.5	73.2	NA
2015	496.6	386.5	60.8	114.8	46.3	408.8	170.0	74.1	50.3
GERD (2009 constant PPP \$billions)									
1981	149.9	na	22.8	38.9	23.9	NA	48.9	NA	NA
1982	157.5	na	24.3	39.9	NA	NA	52.7	NA	NA
1983	168.8	na	25.1	40.6	23.4	NA	57.4	NA	NA
1984	185.5	na	26.6	41.8	NA	NA	62.3	NA	NA
1985	201.3	na	27.8	45.8	25.2	NA	69.9	NA	NA
1986	206.5	na	28.3	47.4	26.2	NA	71.0	NA	NA
1987	211.5	na	29.6	50.1	26.6	NA	76.1	NA	NA
1988	216.5	na	30.8	51.7	27.2	NA	82.2	NA	NA
1989	220.9	na	32.8	53.4	27.8	NA	89.7	NA	NA
1990	228.2	na	35.0	54.0	28.0	NA	97.2	NA	NA
1991	233.9	na	35.4	58.2	26.6	13.3	99.7	10.2	NA
1992	235.0	na	36.0	56.5	26.2	15.2	98.7	11.4	NA
1993	230.0	na	36.4	54.2	27.2	16.5	96.3	13.2	NA
1994	229.9	na	36.4	53.4	27.8	16.9	95.4	15.7	NA

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	United States	EU ^a	France	Germany	United Kingdom	China	Japan	South Korea	India
1995	244.4	182.2	36.7	54.4	26.1	17.0	101.7	17.5	NA
1996	257.9	186.0	36.9	55.0	26.2	18.5	108.3	19.4	12.9
1997	272.4	191.5	36.7	56.4	26.5	22.9	112.5	20.8	14.5
1998	286.9	199.3	37.3	58.4	27.2	25.0	115.4	18.5	15.7
1999	306.0	211.0	38.7	63.1	29.1	31.2	115.9	19.7	17.6
2000	328.0	223.5	40.6	65.5	30.7	40.4	120.6	22.6	19.1
2001	333.2	233.2	43.2	66.9	31.5	46.0	124.0	25.4	19.5
2002	327.4	241.9	45.1	68.7	32.8	56.5	127.2	26.5	20.0
2003	336.8	242.2	42.8	70.1	32.9	65.9	129.4	27.8	21.3
2004	340.9	244.6	42.8	70.5	33.0	78.7	132.0	31.4	24.2
2005	354.6	246.5	43.0	69.4	33.3	94.4	139.9	33.3	28.8
2006	370.9	263.2	44.7	73.1	35.1	111.4	146.1	37.4	31.0
2007	388.9	273.9	45.4	75.3	36.2	127.6	151.6	41.8	34.4
2008	408.5	292.9	46.9	81.7	36.8	147.2	149.8	44.2	38.1
2009	404.2	297.4	49.7	82.8	36.5	185.3	137.0	46.0	40.2
2010	403.5	304.6	50.3	86.1	37.2	210.9	138.9	51.5	43.1
2011	413.4	317.9	51.9	92.7	37.5	239.9	143.6	56.5	46.5
2012	412.8	324.4	52.4	95.5	36.6	277.7	144.8	61.6	NA
2013	425.4	332.8	54.6	96.3	38.8	312.5	154.0	63.8	NA
2014	437.8	342.1	54.7	100.9	40.6	340.1	156.7	67.3	NA
2015	451.4	351.3	55.3	104.3	42.0	371.6	154.5	67.3	45.7
GERD/GDP (%)									
1981	2.27	NA	1.86	2.35	2.24	NA	2.05	NA	NA
1982	2.43	NA	1.94	2.42	NA	NA	2.14	NA	NA
1983	2.48	NA	1.98	2.43	2.06	NA	2.26	NA	NA
1984	2.55	NA	2.07	2.43	NA	NA	2.35	NA	NA
1985	2.65	NA	2.12	2.60	2.09	NA	2.48	NA	NA

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	United States	EU ^a	France	Germany	United Kingdom	China	Japan	South Korea	India
1986	2.63	NA	2.11	2.63	2.10	NA	2.45	NA	NA
1987	2.60	NA	2.15	2.74	2.02	NA	2.52	NA	NA
1988	2.55	NA	2.14	2.73	1.96	NA	2.54	NA	NA
1989	2.51	NA	2.18	2.71	1.95	NA	2.63	NA	NA
1990	2.55	NA	2.26	2.61	1.95	NA	2.70	NA	NA
1991	2.61	NA	2.27	2.40	1.87	0.72	2.68	1.74	NA
1992	2.54	NA	2.27	2.28	1.84	0.73	2.63	1.83	NA
1993	2.42	NA	2.31	2.21	1.86	0.70	2.56	1.98	NA
1994	2.32	NA	2.26	2.13	1.84	0.63	2.52	2.16	NA
1995	2.40	1.59	2.23	2.13	1.68	0.57	2.61	2.20	NA
1996	2.44	1.58	2.21	2.14	1.61	0.56	2.69	2.26	0.63
1997	2.47	1.59	2.14	2.18	1.56	0.64	2.77	2.30	0.67
1998	2.49	1.60	2.08	2.21	1.58	0.65	2.87	2.16	0.69
1999	2.54	1.65	2.10	2.33	1.66	0.75	2.89	2.07	0.71
2000	2.61	1.67	2.08	2.39	1.64	0.89	2.91	2.18	0.74
2001	2.63	1.69	2.13	2.39	1.63	0.94	2.97	2.34	0.72
2002	2.54	1.70	2.17	2.42	1.64	1.06	3.01	2.27	0.71
2003	2.54	1.69	2.11	2.46	1.60	1.12	3.04	2.35	0.71
2004	2.48	1.66	2.09	2.42	1.55	1.21	3.03	2.53	0.74
2005	2.49	1.66	2.04	2.42	1.57	1.31	3.18	2.63	0.81
2006	2.54	1.68	2.05	2.46	1.59	1.37	3.28	2.83	0.80
2007	2.61	1.69	2.02	2.45	1.63	1.37	3.34	3.00	0.81
2008	2.75	1.76	2.06	2.60	1.64	1.44	3.34	3.12	0.87
2009	2.80	1.84	2.21	2.73	1.70	1.66	3.23	3.29	0.84
2010	2.73	1.84	2.18	2.71	1.68	1.71	3.14	3.47	0.82
2011	2.75	1.88	2.19	2.80	1.68	1.78	3.24	3.74	0.83
2012	2.69	1.92	2.23	2.87	1.61	1.91	3.21	4.03	NA

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	United States	EU ^a	France	Germany	United Kingdom	China	Japan	South Korea	India
2013	2.72	1.93	2.24	2.82	1.66	1.99	3.31	4.15	NA
2014	2.73	1.95	2.23	2.88	1.68	2.02	3.40	4.29	NA
2015	2.74	1.96	2.22	2.93	1.70	2.07	3.29	4.23	0.63
GERD, annual growth rates, recent years, current and constant dollars (%)									
Current PPP\$									
CAGR 2000–10	4.3	5.4	4.4	5.0	4.1	20.5	3.6	10.9	10.8
CAGR 2010–15	4.0	4.6	3.6	5.7	4.2	13.9	3.9	7.3	2.9
Constant 2009 PPP\$									
CAGR 2000–10	2.1	3.1	2.2	2.8	1.9	18.0	1.4	8.6	8.5
CAGR 2010–15	2.3	2.9	1.9	3.9	2.5	12.0	2.2	5.5	1.2
GDP, annual growth rates, recent years, current and constant dollars (%)									
Current PPP\$									
CAGR 2000–10	3.8	4.4	3.9	3.7	3.9	12.9	2.8	5.9	9.7
CAGR 2010–15	3.9	3.3	3.2	4.1	3.9	9.6	2.9	3.1	8.4
Constant 2009 PPP\$									
CAGR 2000–10	1.6	2.2	1.7	1.5	1.7	10.6	0.6	3.7	7.4
CAGR 2010–15	2.2	1.6	1.5	2.4	2.2	7.8	1.2	1.4	6.6

NA = not available.

CAGR = compound average annual growth rate; EU = European Union; GDP = gross domestic product; GERD = gross domestic expenditures on R&D; PPP = purchasing power parity.

^a Data include the 28 EU member countries.

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Note(s)

Top 8 R&D performing countries in 2015. Conversions of foreign currencies to U.S. dollars are calculated with each country's GDP implicit price deflator and with Organisation for Economic Co-operation and Development (OECD) PPP exchange rates. Data for the United States in this table reflect international standards for calculating GERD, which vary slightly from the National Science Foundation's protocol for tallying U.S. total R&D. Data for Japan for 1996 onward may not be consistent with earlier data because of changes in methodology. Data for Germany for 1981–90 are for West Germany.

Source(s)

National Science Foundation, National Center for Science and Engineering Statistics, National Patterns of R&D Resources (annual series); OECD, *Main Science and Technology Indicators* (2017/1); United Nations Educational, Scientific and Cultural Organization Institute for Statistics Data Centre, <http://data.uis.unesco.org/>, accessed 13 October 2017.

Science and Engineering Indicators 2018

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

APPENDIX TABLE 4-13

Funds spent for business R&D performed in the United States, by source of funds and selected industry: 2008–14

(Millions of dollars)

Industry and NAICS code	All R&D	Paid for by the company	Paid for by others							
			Total	Federal	Companies			All other organizations ^b		
					Domestic		Foreign ^a			
2014										
All industries, 21–33, 42–81 ^c	340,728	282,570	58,158	26,554	13,227		17,246		1,131	
Manufacturing industries, 31–33	232,815	192,160	40,655	21,303	5,062		13,573		717	
Chemicals, 325	66,301	56,488	9,813	404	1,660		7,674		75	
Pharmaceuticals and medicines, 3254	56,612	47,646	8,966	272	1,600		7,022		72	
Other, 325	9,689	8,842	847	132	60		652		3	
Machinery, 333	12,128	11,458	670	78	199	i	385	i	8	i
Computer and electronic products, 334	73,891	64,695	9,195	4,456	1,467		3,028		244	
Electrical equipment, appliances, and components, 335	4,365	4,178	187	48	15	i	117	i	7	i
Transportation equipment, 336	46,746	27,261	19,485	16,153	1,398		1,666		268	i
Automobiles, trailers, and parts, 3361–63	18,404	15,900	2,504	254	625		1,619		6	
Aerospace products and parts, 3364	26,181	10,300	15,881	14,826	747		47		261	i
Other 336	2,161	1,061	1,100	1,073	26		0		1	
Manufacturing nec, other 31–33	29,384	28,080	1,305	164	323		703		115	

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Industry and NAICS code	All R&D		Paid for by the company		Paid for by others									
					Total		Federal		Companies			All other organizations ^b		
									Domestic		Foreign ^a			
Nonmanufacturing industries, 21–23, 42–81	107,913		90,409		17,504		5,251		8,165		3,673	i	415	i
Information, 51	63,773		62,296		1,477		162		517		775		23	
Software publishers, 5112	36,052		34,781		1,270		99		463		707		1	
Other 51	27,721		27,515		207		63		54		68		22	
Finance and insurance, 52	4,122		4,090		32		0		s		0		s	
Professional, scientific, and technical services, 54	30,975	i	16,061	i	14,914		5,016		7,189		2,391	i	318	i
Computer systems design and related services, 5415	11,019	i	8,644	i	2,375	i	471	i	690	i	1,095	i	119	i
Scientific R&D services, 5417	12,807		2,668		10,139		2,954		6,105		941		139	
Other 54	7,149		4,749		2,400		1,591		394		355		60	
Nonmanufacturing nec, other 21–23, 42–81	9,043		7,962		1,081		73		s		507		s	
2013														
All industries, 21–33, 42–81 ^c	322,528		264,913		57,615		29,362		13,450		13,791		1,012	
Manufacturing industries, 31–33	221,476		181,170		40,306		22,958		5,174		11,427		747	
Chemicals, 325	61,664		54,285		7,379		356		1,389		5,594		40	
Pharmaceuticals and medicines, 3254	52,426		45,891		6,534		167		1,343		4,987		37	
Other 325	9,238		8,394		845		189		46		607		3	
Machinery, 333	12,650		12,092		558		128		110		309		11	

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Industry and NAICS code	All R&D		Paid for by the company		Paid for by others								
					Total		Federal		Companies			All other organizations ^b	
									Domestic		Foreign ^a		
Computer and electronic products, 334	67,205		57,364		9,841		4,866		1,748		s		s
Electrical equipment, appliances, and components, 335	4,136		3,660		475	i	129	i	83		s		s
Transportation equipment, 336	45,972		25,165		20,807	i	17,312		1,328		s		s
Automobiles, trailers, and parts, 3361-63	16,729		14,081		2,647		304	i	565	i	1,772		6
Aerospace products and parts, 3364	27,114		10,042		17,072	i	15,927		758		s		s
Other 336	2,129		1,042		1,088		1,081		5		s		s
Manufacturing nec, other 31-33	29,849		28,604		1,246		167		516		540		23
Nonmanufacturing industries, 21-23, 42-81	101,052		83,742		17,310		6,404		8,276		2,364		266
Information, 51	57,207		56,039		1,168		203		447		512		6
Software publishers, 5112	35,333		34,296		1,037		173		386		474		4
Other 51	21,874		21,743		131		30		61		38		2
Finance and insurance, 52	4,308		4,298		10		0		10		0		0
Professional, scientific, and technical services, 54	31,017		15,617	i	15,400		6,033		7,610		1,525		232
Computer systems design and related services, 5415	9,268		8,107	i	1,161	i	809	i	175	i	157		20
Scientific R&D services, 5417	14,201		2,838		11,363		3,288		6,841		1,127		107
Other 54	7,548		4,672		2,876		1,936		594		241		105
Nonmanufacturing nec, other 21-23, 42-81	8,520		7,788		732		168		209		327		28

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Industry and NAICS code	All R&D	Paid for by the company	Paid for by others							
			Total	Federal	Companies			All other organizations ^b		
					Domestic		Foreign ^a			
2012										
All industries, 21–33, 42–81 ^c	302,250	247,280	54,970	30,621	i	11,624		12,093		632
Manufacturing industries, 31–33	208,415	170,197	38,218	24,059	i	4,553		9,320		286
Chemicals, 325	57,225	50,867	6,359	369	i	1,374		4,605		11
Pharmaceuticals and medicines, 3254	48,146	42,594	5,552	57		1,337		4,153		5
Other 325	9,079	8,273	807	312		37		452		6
Machinery, 333	14,254	13,294	960	385		278		192		105
Computer and electronic products, 334	65,068	56,677	8,391	4,852		1,248		2,167		124
Electrical equipment, appliances, and components, 335	3,087	2,900	187	44	i	10	i	132		1
Transportation equipment, 336	42,305	21,344	20,961	i	18,268	i	1,312	1,359		22
Automobiles, trailers, and parts, 3361–63	s	13,191	s	s		558	i	s		s
Aerospace products and parts, 3364	24,817	7,140	17,677	i	16,895	i	749	s		s
Other 336	s	1,013	s	s		5		s		s
Manufacturing nec, other 31–33	26,476	25,115	1,360	141		331		865		23
Nonmanufacturing industries, 21–23, 42–81	93,835	77,083	16,752	6,562		7,071		2,773		346
Information, 51	46,805	45,851	954	142		351		419		42
Software publishers, 5112	28,745	28,012	733	103		256		367		7

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Industry and NAICS code	All R&D		Paid for by the company		Paid for by others									
					Total		Federal		Companies			All other organizations ^b		
									Domestic		Foreign ^a			
Other 51	18,060		17,839		221		39		95		52		35	
Finance and insurance, 52	3,519		3,507		12		0		11		2		0	
Professional, scientific, and technical services, 54	34,309		20,166		14,143		5,606		6,333		1,947		257	
Computer systems design and related services, 5415	11,251	i	9,163	i	2,088		1,449		435	i	180		24	
Scientific R&D services, 5417	16,544		6,788		9,756		2,596		5,512		1,540		108	
Other 54	6,514		4,215		2,299		1,561		386		227		125	
Nonmanufacturing nec, other 21-23, 42-81	9,202		7,559		1,643		814		376		405		48	
2011														
All industries, 21-33, 42-81 ^c	294,093		238,768		55,324		31,309	i	11,124		12,007		884	
Manufacturing industries, 31-33	201,361		163,340		38,021		24,698	i	4,196		8,870		257	
Chemicals, 325	55,324		49,988		5,337		110		1,320		3,867		40	
Pharmaceuticals and medicines, 3254	45,949		41,111		4,838		52		1,285		3,474		27	
Other 325	9,375		8,877		499		58		35		393		13	
Machinery, 333	14,709		13,578		1,131		522		423		s		s	
Computer and electronic products, 334	62,704		53,664		9,040		5,161		1,087		2,726		66	
Electrical equipment, appliances, and components, 335	3,595		3,417		178		76		24		74		4	
Transportation equipment, 336	40,880		20,275		20,605	i	s		1,086		s		s	

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Industry and NAICS code	All R&D	Paid for by the company	Paid for by others						
			Total	Federal	Companies			All other organizations ^b	
					Domestic		Foreign ^a		
Automobiles, trailers, and parts, 3361-63	s	11,737	s	s	s	s	s	s	
Aerospace products and parts, 3364	26,054	7,585	18,469 i	17,806 i	592		s	s	
Other 336	s	s	s	s	s		s	s	
Manufacturing nec, other 31-33	24,149	22,418	1,730	s	256		s	s	
Nonmanufacturing industries, 21-23, 42-81	92,731	75,428	17,303	6,611	6,928		3,138	626	
Information, 51	41,865	41,014	851	s	321		s	s	
Software publishers, 5112	27,965	27,280	685	136	s		s	s	
Other 51	13,900	13,734	166	s	s		s	s	
Finance and insurance, 52	3,457	3,310	146	0	145		1	0	
Professional, scientific, and technical services, 54	38,219	23,368	14,851	5,848	6,227		2,213	563	
Computer systems design and related services, 5415	13,259	11,706	1,553	598	626		209	120	
Scientific R&D services, 5417	15,301	6,170	9,131	3,226	3,834		1,833	238	
Other 54	9,659	5,492	4,167	2,024	1,767		171	205	
Nonmanufacturing nec, other 21-23, 42-81	9,190	7,736	1,455	s	235		s	s	
2010									
All industries, 21-33, 42-81 ^c	278,977	221,706	57,271	34,199 i	11,013		11,015	1,044	
Manufacturing industries, 31-33	196,712	159,579	37,133	26,739 i	3,655		6,375	364	

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Industry and NAICS code	All R&D		Paid for by the company		Paid for by others								
					Total		Federal		Companies		All other organizations ^b		
									Domestic	Foreign ^a			
Chemicals, 325	58,038		53,555		4,483		180		s		s		s
Pharmaceuticals and medicines, 3254	49,415		45,398		4,017		99		s		s		s
Other 325	8,623		8,157		466		81		s		s		s
Machinery, 333	9,955		9,384		571		98		176		282		15
Computer and electronic products, 334	59,875		51,223		8,652		5,935	i	911		1,767		39
Electrical equipment, appliances, and components, 335	3,321		3,141		180		84		s		s		s
Transportation equipment, 336	42,913		21,076		21,837	i	20,191	i	1,016		541		89
Automobiles, trailers, and parts, 3361-63	s		10,098		s		s		s		s		s
Aerospace products and parts, 3364	29,854		10,152		19,702	i	18,921	i	635		s		s
Other 336	s		826		s		s		s		s		s
Manufacturing nec, other 31-33	22,610		21,200		1,410		251		s		s		s
Nonmanufacturing industries, 21-23, 42-81	82,265		62,127		20,138		7,460		7,358		4,532		788
Information, 51	36,853		36,085		768		152		244		s		s
Software publishers, 5112	26,982		26,387		595		140		134		s		s
Other 51	9,871		9,698		173		12		110		s		s
Finance and insurance, 52	2,109		2,109		0		0		0		0		0
Professional, scientific, and technical services, 54	33,690		15,438		18,252		6,829		6,906		3,801		716

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Industry and NAICS code	All R&D		Paid for by the company		Paid for by others									
					Total		Federal		Companies			All other organizations ^b		
									Domestic		Foreign ^a			
Computer systems design and related services, 5415	11,050		9,416		1,634		712		397		348		177	
Scientific R&D services, 5417	12,140		2,851		11,968		3,279		5,344		3,144		201	
Other 54	10,500		3,171		4,650		2,838		1,165		309		338	
Nonmanufacturing nec, other 21-23, 42-81	9,613		8,495		1,118		479		208		s		s	
2009														
All industries, 21-33, 42-81 ^c	282,393		224,920		57,473		39,573		9,567		7,647		685	
Manufacturing industries, 31-33	195,144		158,225		36,920		28,825		3,345		4,532		218	
Chemicals, 325	53,328		49,876		3,452		207		1,263		1,961		s	
Pharmaceuticals and medicines, 3254	44,936		41,751		3,185		113		1,247		1,813		11	
Other 325	8,392		8,125		267		94		16		148		s	
Machinery, 333	9,138		8,782		356		150		133		67		s	
Computer and electronic products, 334	56,436		48,865		7,571		5,210		738		1,578		s	
Electrical equipment, appliances, and components, 335	3,334		3,105		228		70		55		66		s	
Transportation equipment, 336	48,337		24,223		24,114		23,023		757		251		s	
Automobiles, trailers, and parts, 3361-63	s		10,853		s		s		s		s		s	
Aerospace products and parts, 3364	34,554		12,384		22,170		21,524		596		s		s	
Other 336	s		986		s		s		s		s		s	

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Industry and NAICS code	All R&D		Paid for by the company		Paid for by others								
					Total		Federal		Companies		All other organizations ^b		
									Domestic				Foreign ^a
Manufacturing nec, other 31-33	24,570		23,374		1,199		165		399		609		s
Nonmanufacturing industries, 21-23, 42-81	87,248		66,695		20,553		10,749		6,223		3,115		467
Information, 51	33,806		32,995		811		194		349		233		34
Software publishers, 5112	26,395		25,729		666		176		267		191		32
Other 51	7,411		7,266		145		18		82		42		2
Finance and insurance, 52	1,912		1,904		8		1		6		0		0
Professional, scientific, and technical services, 54	44,946		26,031		18,915		10,461		5,531		2,505		168
Computer systems design and related services, 5415	12,560		10,742		1,818		1,240		449		122		7
Scientific R&D services, 5417	17,270		7,981		9,289		2,657		4,397		2,110		125
Other 54	15,116		7,308		7,808		6,564		685		273		36
Nonmanufacturing nec, other 21-23, 42-81	6,584		5,765		819		93		337		377		265
2008													
All industries, 21-33, 42-81 ^c	290,680		232,505		58,176		36,360		12,181		8,877		758
Manufacturing industries, 31-33	203,755		164,386		39,368		31,102		3,444		4,712		s
Chemicals, 325	58,250		55,042		3,207		197		814		2,182		15
Pharmaceuticals and medicines, 3254	48,131		45,169		2,962		137		796		2,017		11
Other 325	10,119		9,873		245		60		18		165		4

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Industry and NAICS code	All R&D	Paid for by the company	Paid for by others							
			Total	Federal	Companies			All other organizations ^b		
					Domestic		Foreign ^a			
Machinery, 333	10,104	9,846	258	62	95		97	3		
Computer and electronic products, 334	60,464	42,912	7,551	4,646	1,520		1,338	47		
Electrical equipment, appliances, and components, 335	3,143	2,947	196	91	34		66	5		
Transportation equipment, 336	50,552	23,039	27,513	25,941	774		768	s		
Automobiles, trailers, and parts, 3361-63	13,140	12,234	906	s	s		s	s		
Aerospace products and parts, 3364	36,941	10,371	26,570	25,805	i 649		s	s		
Other 336	471	434	37	s	s		s	s		
Manufacturing nec, other 31-33	21,242	30,600	643	165	207		261	s		
Nonmanufacturing industries, 21-23, 42-81	86,926	68,118	18,807	5,258	8,737		4,166	s		
Information, 51	37,695	36,922	772	229	217		s	s		
Software publishers, 5112	28,221	27,665	556	176	117		s	s		
Other 51	9,473	9,257	216	53	100		s	s		
Finance and insurance, 52	1,092	1,084	8	0	7		* i	0		
Professional, scientific, and technical services, 54	37,954	20,539	17,415	4,844	8,221		3,753	s		
Computer systems design and related services, 5415	12,146	8,569	3,577	784	1,183		1,490	120		
Scientific R&D services, 5417	17,913	8,708	9,205	2,115	4,726		2,008	s		
Other 54	7,895	3,262	4,633	1,945	2,312		255	s		

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Industry and NAICS code	All R&D		Paid for by the company		Paid for by others									
					Total		Federal		Companies		All other organizations ^b			
									Domestic				Foreign ^a	
Nonmanufacturing nec, other 21-23, 42-81	10,185		9,573		612		185		292		s		s	

* = amount less than \$500,000; i = more than 50% of value imputed; s = suppressed for reasons of reliability and/or confidentiality.

NAICS = North American Industry Classification System; nec = not elsewhere classified.

^a Includes unaffiliated foreign companies foreign parent companies of U.S. subsidiaries.

^b Includes U.S. state government agencies and laboratories, foreign agencies and laboratories, and all other organizations located inside and outside the United States.

^c Includes companies located in the United States that performed or funded R&D.

Note(s)

Detail may not add to total because of rounding. Industry classification was 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. Excludes data for federally funded R&D centers.

Source(s)

National Science Foundation, National Center for Science and Engineering Statistics, Business R&D and Innovation Survey (BRDIS) (annual series).

Science and Engineering Indicators 2018

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

APPENDIX TABLE 4-14

Federal research and experimentation tax credit claims, by NAICS industry: 2001–13

(Tax credit claims in thousands of dollars and number of corporate returns claiming the R&E tax credit)

Industry	NAICS code	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Tax credit claims (\$thousands)														
All industries	-	6,355,803	5,655,666	5,488,337	5,554,011	6,363,476	7,311,124	8,259,753	8,303,369	7,773,979	8,510,734	9,240,452	10,842,567	11,294,433
Manufacturing	31–33	4,208,607	3,787,025	3,797,439	3,845,792	4,529,302	5,242,803	5,685,322	5,758,082	5,394,673	5,554,490	5,932,503	6,594,799	6,832,297
Food	311	33,716	30,971	49,120	50,836	71,132	82,879	76,498	80,719	74,767	90,844	96,889	90,423	106,684
Beverage and tobacco products	312	12,115	19,204	3,114	5,129	9,952	8,971	25,197	12,844	11,471	12,401	15,069	14,823	21,113
Textile mills and textile product mills	313–14	6,315	11,105	10,160	9,024	5,722	6,025	5,123	5,249	4,919	5,986	9,381	9,976	10,923
Apparel	315	722	283	348	347	417	1,494	1,312	2,315	5,862	5,439	7,911	9,506	7,390
Leather and allied products	316	750	898	1,583	1,807	1,805	1,455	1,272	1,478	1,199	1,313	1,618	1,966	2,281
Wood products	321	1,974	2,073	1,735	1,736	2,163	7,113	7,997	5,016	4,814	5,947	4,079	5,947	7,280
Paper manufacturing	322	54,452	59,862	66,653	52,836	47,380	50,317	65,636	64,226	62,408	75,370	81,405	80,827	86,658
Printing and related support activities	323	5,011	4,427	2,274	2,639	2,484	3,727	2,549	4,417	5,746	6,618	7,491	7,784	9,834
Petroleum and coal products	324	34,959	36,257	39,400	21,545	28,506	25,700	92,216	99,858	160,916	114,821	98,538	79,971	81,783
Chemicals	325	999,405	949,115	1,001,644	989,278	1,147,292	1,136,754	1,492,231	1,489,383	1,439,465	1,344,341	1,305,939	1,416,598	1,507,507
Plastic and rubber products	326	18,884	24,218	21,245	22,596	24,796	23,517	30,419	31,366	27,751	33,588	36,566	55,538	64,530
Nonmetallic mineral products	327	9,735	9,516	9,670	8,587	9,770	9,051	10,285	12,283	17,022	23,802	29,616	36,037	25,220
Primary metals	331	6,010	8,096	8,077	7,756	10,282	19,989	36,863	32,098	24,947	35,312	43,194	55,332	63,233

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Industry	NAICS code	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Fabricated metal products	332	24,243	27,912	59,387	66,597	66,794	72,969	83,261	74,863	65,946	80,987	78,907	98,073	99,027
Machinery	333	154,210	148,668	134,808	182,417	194,382	662,624	292,349	339,851	275,046	328,412	428,932	469,030	424,007
Computer and electronic products	334	1,677,194	1,152,788	1,168,467	1,490,633	1,647,471	1,746,744	1,889,734	1,812,225	1,584,938	1,829,303	2,024,684	2,169,806	2,058,428
Electrical equipment, appliances, and components	335	180,985	163,536	117,260	122,723	188,450	229,079	168,715	217,724	254,081	260,361	298,392	281,109	334,405
Transportation equipment	336	785,699	957,277	896,992	581,824	825,671	906,354	1,107,105	1,180,968	1,071,484	1,009,000	1,091,982	1,419,703	1,638,899
Furniture and related products	337	8,899	10,374	6,610	10,788	18,593	19,622	14,705	11,240	10,178	9,830	10,275	13,857	14,588
Miscellaneous manufacturing	339	193,330	170,444	198,891	216,693	226,240	228,420	281,857	279,958	291,715	282,906	261,637	278,494	268,509
Nonmanufacturing	-	2,147,197	1,868,640	1,690,897	1,708,219	1,834,176	2,068,322	2,574,431	2,545,288	2,379,306	2,956,242	3,307,949	4,247,768	4,462,137
Agriculture, forestry, fishing, and hunting	11	3,024	3,491	4,499	4,220	4,183	4,205	3,934	5,054	7,072	8,476	7,327	8,239	9,605
Mining	21	9,669	7,199	18,137	6,937	5,408	13,583	29,589	29,997	19,841	42,318	49,429	79,614	77,885
Utilities	22	8,546	6,307	4,496	10,241	20,454	32,508	54,410	48,855	52,168	45,659	55,251	51,640	69,471
Construction	23	9,360	11,060	11,002	4,884	3,424	7,353	15,000	10,278	11,060	11,675	18,567	24,074	28,241
Wholesale and retail trade	42, 44, 45	186,162	193,814	198,050	211,484	235,402	284,845	387,167	430,098	424,531	653,580	705,475	769,282	880,115
Transportation and warehousing	48, 49	16,186	13,722	12,681	11,515	9,040	8,473	12,334	10,593	10,838	14,757	18,175	20,444	24,539
Information	51	1,001,296	801,073	633,275	599,795	636,462	733,840	912,435	944,284	854,675	1,013,552	1,174,650	1,747,717	1,856,736
Finance and insurance	52	122,507	94,347	96,757	111,678	124,607	131,405	157,050	142,599	149,219	203,688	182,006	226,544	228,291
Real estate, rental, and leasing	53	3,518	1,903	2,750	1,120	4,445	5,666	7,819	7,453	10,312	18,577	27,423	28,087	35,832
Professional, scientific, and technical services	54	649,801	576,581	549,141	609,019	651,093	725,855	853,119	787,671	733,531	797,473	883,569	1,126,862	1,064,608
Management of companies and enterprises	55	82,295	100,337	94,894	92,007	94,833	76,846	90,557	62,091	47,877	82,301	115,558	85,180	109,077

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Industry	NAICS code	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Administrative/ support and waste management services	56	26,060	25,914	30,788	18,956	11,859	12,405	13,291	22,373	26,847	32,844	37,427	44,822	33,349
Other services	61, 62, 71, 72, 81	28,773	32,892	34,427	26,363	32,966	31,338	37,728	43,942	31,335	31,342	33,092	35,263	44,388
Number of corporate returns claiming the R&E tax credit														
All industries	na	10,389	10,254	10,369	10,244	11,290	10,788	12,548	12,736	12,359	12,941	14,672	15,873	16,624
Manufacturing	31-33	4,766	4,750	4,623	4,686	4,921	5,106	5,636	5,420	5,197	5,808	6,165	6,219	6,241
Food	311	132	135	121	135	162	132	166	163	171	279	228	235	234
Beverage and tobacco products	312	10	10	10	10	10	8	12	18	17	18	23	27	22
Textile mills and textile product mills	313-14	19	17	21	23	15	15	17	22	17	44	22	51	39
Apparel	315	8	8	10	8	9	47	44	55	25	16	25	27	21
Leather and allied products	316	4	5	8	7	6	5	4	6	7	5	6	7	7
Wood products	321	31	23	16	14	15	45	40	14	14	33	32	56	51
Paper manufacturing	322	31	34	32	28	38	51	58	58	58	82	101	78	85
Printing and related support activities	323	47	63	54	57	65	64	39	38	55	74	74	44	45
Petroleum and coal products	324	30	28	29	27	19	21	33	40	43	47	46	54	54
Chemicals	325	650	634	593	600	536	648	700	701	715	722	729	703	812
Plastic and rubber products	326	118	97	116	123	168	189	183	202	233	259	317	278	243
Nonmetallic mineral products	327	27	29	42	39	58	49	54	70	59	60	68	73	74
Primary metals	331	43	43	44	37	78	79	101	116	103	125	123	144	151
Fabricated metal products	332	260	220	273	287	338	336	462	457	450	504	517	620	556

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Industry	NAICS code	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Machinery	333	425	388	344	505	474	501	591	651	640	789	801	886	882
Computer and electronic products	334	1,604	1,663	1,565	1,429	1,343	1,266	1,394	1,319	1,178	1,204	1,296	1,179	1,230
Electrical equipment, appliances, and components	335	411	536	516	497	768	622	726	555	494	533	523	660	590
Transportation equipment	336	186	191	201	192	242	269	289	291	315	362	360	372	390
Furniture and related products	337	32	60	20	21	39	74	78	70	42	27	53	68	56
Miscellaneous manufacturing	339	699	566	608	645	538	685	646	575	560	626	826	660	698
Nonmanufacturing	-	5,622	5,504	5,746	5,558	6,370	5,682	6,912	7,316	7,162	7,133	8,505	9,654	10,383
Agriculture, forestry, fishing, and hunting	11	35	51	60	40	61	72	100	83	81	34	39	59	92
Mining	21	44	20	21	22	19	17	36	36	41	45	50	81	70
Utilities	22	23	18	18	17	37	47	78	129	81	62	89	67	70
Construction	23	15	31	20	21	18	29	59	56	124	96	174	240	341
Wholesale and retail trade	42, 44, 45	693	616	594	812	718	832	829	865	1,003	947	1,287	1,071	1,100
Transportation and warehousing	48, 49	19	17	17	23	43	39	33	58	56	40	81	58	77
Information	51	1,502	1,242	1,149	977	1,076	1,025	1,257	1,132	887	978	1,229	1,583	1,623
Finance and insurance	52	106	191	196	142	143	174	182	237	293	275	303	304	274
Real estate, rental, and leasing	53	18	17	10	8	14	15	45	30	57	75	60	82	68
Professional, scientific, and technical services	54	2,887	2,900	3,446	3,304	3,335	2,961	3,699	3,932	3,913	3,900	4,429	5,280	5,694
Management of companies and enterprises	55	52	55	50	70	326	137	178	276	242	268	366	403	346
Administrative/ support and waste management services	56	47	31	82	23	420	183	197	288	252	270	226	148	319

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Industry	NAICS code	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Other services	61, 62, 71, 72, 81	181	315	83	99	160	151	220	194	132	143	172	278	309

NAICS = North American Industry Classification System; R&E = research and experimentation.

Note(s)

Estimates are based on a stratified probability sample of unaudited active returns and are subject to sampling and nonsampling errors. Data are for tax years, which cover accounting periods ending any month between July of the calendar year of reference through June of the following calendar year. Data include returns of active corporations, other than forms 1120S (S corporations), 1120-REIT (Real Estate Investment Trusts), and 1120-RIC (Regulated Investment Companies). Active returns are corporate returns reporting any income or deduction items, including tax-exempt interest.

Source(s)

Internal Revenue Service Statistics of Income, <https://www.irs.gov/uac/SOI-Tax-Stats-Corporation-Research-Credit>, accessed 22 December 2016.

Science and Engineering Indicators 2018

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

APPENDIX TABLE 4-15

R&D performed by majority-owned affiliates of foreign companies in the United States, by region, country, or economy of ultimate beneficial owner: 1997–2014

(Millions of current U.S. dollars)

Region, country, or economy	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total	17,216	22,375	24,027	26,180	26,463	27,507	29,803	30,083	31,099	34,625	40,967	40,727	40,425	42,360	45,177	50,259	54,070	56,904
Canada	1,668	2,352	2,385	3,693	2,136	1,599	1,380	1,459	1,553	1,581	1,574	1,294	1,120	535	590	611	535	509
Europe	12,327	16,425	18,055	18,634	19,973	20,532	22,518	22,825	23,389	26,100	31,330	30,273	29,947	31,443	33,630	37,552	39,992	42,068
Belgium	s	s	175	167	108	87	117	137	136	288	353	506	440	279	248	388	377	406
Denmark	97	127	s	s	s	114	100	160	319	371	368	377	363	412	379	341	376	418
Finland	s	s	166	157	601	544	s	s	s	s	371	588	514	602	618	605	500	317
France	1,783	1,881	2,434	2,596	2,662	2,860	3,777	3,800	3,099	3,289	5,589	5,802	5,020	4,954	4,743	6,508	6,463	6,749
Germany	2,923	5,381	6,135	5,603	5,686	5,863	5,976	5,916	6,519	6,857	5,893	5,696	5,529	5,300	5,640	5,895	6,577	7,080
Ireland	s	56	s	s	s	369	s	266	247	207	257	324	899	1,184	2,028	2,353	2,978	3,426
Italy	s	s	294	s	s	261	225	230	262	344	358	370	386	426	1,675	2,249	s	s
Netherlands	990	964	1,296	1,421	1,660	1,696	1,612	1,319	1,470	1,678	1,729	1,821	1,774	1,892	1,854	2,016	2,385	2,362
Spain	s	s	s	s	26	s	44	s	s	s	40	67	108	112	127	s	113	125
Sweden	687	713	428	373	465	270	261	270	272	344	388	345	504	437	438	516	603	624
Switzerland	2,369	3,076	3,008	2,922	3,107	2,920	3,791	4,185	4,289	5,014	6,395	6,940	8,889	9,299	9,144	9,625	9,781	10,551
United Kingdom	2,984	3,720	3,678	4,632	4,819	5,427	5,723	5,807	5,994	6,924	9,470	7,247	5,304	6,314	6,484	6,823	7,210	7,269
Other	*	1	1	3	3	5	6	6	s	32	119	191	218	232	252	s	s	s

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Region, country, or economy	1997	1998	1999	2000	2001	2002	2003		2004		2005		2006		2007	2008	2009	2010	2011	2012	2013	2014
Latin America and OWH	373	396	564	735	1,126	1,066	s		s		s		s		1,666	1,773	1,656	1,594	1,015	1,046	1,640	1,695
South and Central America	s	s	92	s	112	s	s		s		s		s		s	23	119	69	40	59	68	70
Brazil	*	*	*	*	*	0	0		0		0		* e		*	*	*	s	6	22	25	28
Mexico	s	55	s	s	s	45	14	e	17	e	18	e	16	e	6	s	5	s	s	s	s	s
Venezuela	3	0	0	0	0	0	0		*		*		0		0	0	0	0	0	0	0	0
Other	*	*	*	*	*	2	*		3		3		3		s	s	113	s	s	s	s	s
OWH	s	s	472	s	1,014	s	1,180		1,069		1,121		1,249		s	1,750	1,537	1,525	975	987	1,571	1,626
Bermuda	s	s	s	s	s	s	853		873		909		950		s	1,224	s	61	81	s	s	s
United Kingdom Islands, Caribbean	1	1	1	s	s	s	s		s		s		s		s	s	s	s	s	s	703	733
Other	0	0	0	0	0	*	*	e	s		s		s		s	s	s	s	s	s	s	s
Africa	s	s	s	s	36	33	31		36		35		35		s	9	7	s	s	26	20	20
South Africa	s	s	s	s	36	33	31		36		35		35		s	9	7	s	s	26	20	20
Other	0	0	0	0	0	0	0		0		0		0		0	1	0	0	0	0	0	0
Middle East	103	132	s	s	177	175	s		s		s		s		306	358	465	537	1,005	1,467	1,590	1,676
Israel	95	117	s	102	99	89	106		123		135		147		149	204	306	s	539	s	927	981
Saudi Arabia	1	7	9	10	11	s	s		s		s		s		108	104	98	s	s	s	s	s
United Arab Emirates	*	0	0	0	0	0	0		0		0		0		0	0	9	s	s	s	s	s
Other	7	8	7	s	66	s	71	e	41		42		28		49	50	52	s	47	s	22	9.0
Asia and Pacific	2,642	2,961	2,820	2,864	2,946	3,413	3,763		3,763		4,067		4,698		5,069	5,689	6,047	7,054	8,429	9,143	9,865	10,539

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Region, country, or economy	1997	1998	1999	2000	2001	2002	2003		2004		2005		2006		2007	2008	2009	2010	2011	2012	2013	2014
Australia	s	s	32	34	33	36	43	e	42		90		174		170	155	65	96	149	174	186	196
China	s	9	s	s	s	18	5		14		s		s		0	17	26	165	366	421	449	496
Hong Kong	4	1	1	*	s	s	s		s		62		75		s	147	121	65	83	s	43	68
India	NA	NA	NA	NA	NA	0	*	e	0		0		0		6	23	29	40	46	67	93	96
Japan	2,036	2,584	2,535	2,644	2,719	3,159	3,470		3,414		3,576		4,056		4,416	4,781	5,124	5,924	6,852	7,110	7,856	7,865
Singapore	s	16	13	9	1	s	18		20	e	25		42	e	69	139	253	246	280	294	382	387
South Korea	s	s	s	s	s	s	s		s		s		s		215	259	280	350	388	804	710	1,278
Taiwan	78	73	68	47	43	83	102	e	102	e	122		113	e	110	118	119	134	209	159	96	98
Other	*	*	0	0	0	0	1		1		*		s		s	50	29	35	56	s	52	57
United States	s	s	55	62	69	689	s		s		692		721	e	s	1,330	1,184	s	s	414	428	397
Addenda																						
European Union ^a	9,902	13,326	14,980	15,659	16,787	17,554	18,676		18,570		18,991		21,041		24,854	23,210	20,921	22,008	24,330	27,840	30,136	31,442
OPEC	10	16	19	17	18	18	s		s		s		s		108	105	107	108	s	s	641	685

* = amount ≤ \$500,000; e = > 50% of value for data cell estimated to account for data not reported by respondents; NA = not available; s = suppressed for reasons of reliability and/or confidentiality.

OPEC = Organization of the Petroleum Exporting Countries; OWH = other Western Hemisphere.

^a Reflects the country composition of the European Union for the given year.

Note(s)

Data are for R&D performance of majority-owned (> 50%) U.S. affiliates of foreign parent companies. Data are for nonbank U.S. affiliates for 1997–2006; data are for bank and nonbank U.S. affiliates for 2007 and forward. Total R&D performed refers to R&D expenditures according to who conducts R&D activity, whether for themselves or for others under contract, and excludes R&D expenditures conducted by others under contract. The ultimate beneficial owner is the person proceeding up the U.S. affiliate's ownership chain beginning with and including a foreign parent not owned > 50% by another person. Detail may not add to total because of rounding.



CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Source(s)

Bureau of Economic Analysis, Direct Investment and Multinational Enterprises (annual series), https://www.bea.gov/iTable/index_MNC.cfm, accessed 26 January 2017.

Science and Engineering Indicators 2018

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

 APPENDIX TABLE 4-16 
R&D performed by majority-owned affiliates of foreign companies in the United States, by NAICS industry of affiliate: 2007–14

(Millions of current U.S. dollars)

Industry	NAICS code	2007	2008	2009	2010	2011	2012	2013	2014
All industries	-	40,967	40,727	40,425	42,360	45,177	50,259	54,070	56,904
Manufacturing	31–33	30,615	28,617	28,501	30,858	31,290	35,617	39,161	41,124
Food	311	s	538	518	486	472	555	679	714
Beverage and tobacco products	312	54	47	29	27	24	44	34	44
Paper manufacturing	322	52	43	42	63	55	47	51	52
Petroleum and coal products	324	s	s	s	s	s	s	s	s
Chemicals	325	15,908	14,271	16,075	16,815	16,837	19,587	21,237	22,407
Basic chemicals	3251	603	705	626	597	686	788	728	739
Pharmaceuticals and medicines	3254	14,331	12,650	14,545	15,388	15,338	17,970	19,625	20,750
Other	-	974	916	904	830	813	828	884	917
Plastic and rubber products	326	421	417	385	395	476	501	536	470
Nonmetallic mineral products	327	277	244	223	238	255	317	313	292
Primary and fabricated metals	-	292	372	369	347	340	375	483	572
Primary metals	331	67	114	84	97	106	129	158	174
Fabricated metal products	332	225	259	284	250	234	246	325	397
Machinery	333	1,939	2,568	2,376	2,539	2,541	2,632	2,704	2,835
Computer and electronic products	334	3,838	4,240	4,353	5,210	4,275	4,383	4,862	5,000
Semiconductor and other electronic components	3344	683	802	1,134	1,583	1,188	1,256	1,845	1,791
Navigational, measuring, and other instruments	3345	351	410	1,034	1,168	1,211	1,265	1,330	1,562
Other	-	2,804	3,028	2,185	2,459	1,876	1,862	1,687	1,647
Electrical equipment, appliances, and components	335	446	487	570	627	656	772	926	1070
Transportation equipment	336	5,778	4,109	2,313	2,571	3,963	4,950	5,990	6,295

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Industry	NAICS code	2007	2008	2009	2010	2011	2012	2013	2014
Motor vehicles, bodies and trailers, and parts	3361, 3362, 3363	2,441	1,509	1,596	1,519	3,032	3,983	4,891	5,127
Other	-	3,336	2,600	717	1,052	931	967	1,098	1,168
Other	-	651	s	s	s	s	s	s	s
Wholesale trade	42	6,635	7,165	6,642	6,084	7,235	7,982	8,109	8,407
Motor vehicles and motor vehicle parts and supplies	4231	464	359	363	284	362	500	506	535
Electrical goods	4236	2,146	2,293	1,593	1,336	2,226	2,517	2,329	2,513
Petroleum and petroleum products	4247	s	124	s	s	s	s	134	s
Other	-	s	4,388	s	s	s	s	5,139	s
Retail trade	44-45	s	8	11	s	9	9	9	9
Food and beverage stores	445	0	0	0	0	0	0	*	*
Other	-	s	8	11	s	9	9	9	9
Information	51	1,252	1,586	1,681	1,309	1,483	1,364	1,072	1,235
Publishing	511	907	1,332	1,475	1,007	1,080	980	713	693
Telecommunications	517	s	38	s	139	s	s	s	230
Other	-	s	216	s	162	s	s	s	312
Finance and insurance	52	10	7	28	s	67	s	72	77
Depository credit intermediation (banking)	5221	0	*	*	s	1	s	1	1
Finance (except depository institutions)	-	10	6	s	s	s	s	69	75
Insurance carriers and related activities	524	*	1	s	s	s	s	2	1
Real estate, rental, and leasing	53	s	44	s	s	s	158	152	150
Real estate	531	1	s	*	*	*	s	2	2
Rental and leasing (except real estate)	532	s	s	s	s	s	s	150	148
Professional, scientific, and technical services	54	2,021	2,872	3,051	3,486	4,112	4,135	4,508	4,905
Architectural, engineering, and related services	5413	322	261	92	86	108	141	164	109
Computer system design and related services	5415	390	346	583	989	922	1,102	1,098	1,126

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Industry	NAICS code	2007	2008	2009	2010	2011	2012	2013	2014
Management, scientific, and technical consulting	5416	5	34	44	37	s	s	s	s
Other	-	1,305	2,231	2,332	2,374	s	s	s	s
Other industries	-	387	427	s	461	s	s	988	997
Mining	21	132	174	161	169	492	529	539	559
Utilities	22	1	8	14	8	18	18	19	17
Construction	23	s	18	13	15	32	35	s	s
Transportation and warehousing	48-49	s	s	s	s	s	s	30	30
Administration, support, and waste management	56	s	s	s	s	s	s	s	s
Health care and social assistance	62	s	s	s	s	s	s	s	s
Accommodation and food services	72	*	*	*	*	*	*	*	*
Miscellaneous services	-	89	90	89	108	139	51	62	62

* = amount ≤ \$500,000; s = suppressed for reasons of reliability and/or confidentiality.

NAICS = North American Industry Classification System.

Note(s)

Data are for R&D performance of majority-owned (> 50%) bank and nonbank U.S. affiliates of foreign parent companies. Total R&D performed refers to R&D expenditures according to who conducts R&D activity, whether for themselves or for others under contract, and excludes R&D expenditures conducted by others under contract. Industry data are classified by the U.S. Bureau of Economic Analysis using the international surveys industry classification system based on the NAICS. Data for 2007–08 are based on the 2002 NAICS. The ultimate beneficial owner is the person proceeding up the U.S. affiliate's ownership chain beginning with and including a foreign parent company not owned > 50% by another person. Detail may not add to total because of rounding. For data before 2007, see Appendix Table 4-24 in *Science and Engineering Indicators 2014*, <https://www.nsf.gov/statistics/seind14/index.cfm/appendix/tables.htm>.

Source(s)

Bureau of Economic Analysis, Direct Investment and Multinational Enterprises (annual series), https://www.bea.gov/iTable/index_MNC.cfm, accessed 27 January 2017.

Science and Engineering Indicators 2018

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

APPENDIX TABLE 4-17

R&D performed abroad by majority-owned foreign affiliates of U.S. parent companies, by region, country, or economy: 1997–2014

(Millions of current U.S. dollars)

Region, country, or economy	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total	14,593	14,664	18,144	20,457	19,702	21,063	22,793	25,840	27,653	29,583	34,446	41,699	39,205	39,887	44,684	44,983	49,221	52,174
Canada	1,823	1,750	1,681	2,332	2,131	2,274	2,444	2,729	2,433	2,439	2,712	3,194	2,920	2,765	2,964	2,864	3,160	3,418
Europe	10,003	10,387	12,217	12,870	12,060	13,453	14,890	16,874	18,805	19,326	22,730	26,503	25,044	23,902	27,396	26,742	29,835	30,774
Austria	77	85	82	s	62	52	34	131	191	313	459	488	296	278	289	257	283	314
Belgium	310	320	375	412	407	502	463	373	920	961	1,191	1,199	2,378	2,031	2,431	2,547	2,588	1,151
Czech Republic	NA	NA	6	18	3	11	18	19	65	71	59	86	81	56	60	75	63	103
Denmark	s	s	57	65	s	s	60	147	140	148	145	292	185	199	185	237	510	483
Finland	51	61	59	78	77	72	102	118	187	113	169	196	145	221	224	191	195	389
France	1,281	1,328	1,452	1,465	1,411	1,690	1,777	1,821	2,248	1,518	1,557	2,392	1,943	2,021	2,109	2,031	2,373	2,395
Germany	2,940	3,022	3,377	3,115	3,280	3,598	3,907	4,184	4,609	4,947	6,403	8,139	7,528	6,717	7,230	8,027	8,248	8,344
Greece	7	7	6	11	12	15	16	8	29	41	36	37	32	27	26	21	18	37
Hungary	NA	NA	13	35	17	19	15	38	31	36	39	49	45	65	77	75	89	101
Ireland	320	363	251	465	537	s	583	815	820	1,074	1,510	1,137	1,046	1,431	1,419	1,465	1,874	2,415
Italy	569	584	504	592	541	548	625	707	580	702	619	682	788	596	939	683	796	800
Luxembourg	s	s	s	s	s	s	91	s	s	268	304	s	s	s	s	302	s	311
Netherlands	480	384	374	369	475	419	513	442	392	536	752	1,495	1,022	1,282	1,422	1,489	1,495	1,226

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Region, country, or economy	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Norway	23	18	26	19	38	35	21	32	100	41	46	51	53	136	146	299	279	296
Poland	NA	NA	34	22	13	29	37	s	54	74	73	109	140	135	197	207	201	241
Portugal	30	34	14	20	19	29	21	9	16	23	80	43	36	56	58	52	52	46
Russia	NA	NA	1	1	*	2	1	17	28	82	100	117	68	65	163	130	147	195
Spain	181	184	s	213	181	209	290	344	257	278	355	604	570	361	398	272	285	406
Sweden	405	445	1,036	1,341	813	1,317	1,398	1,451	1,652	1,524	1,584	1,654	1,133	400	544	572	644	711
Switzerland	230	223	231	286	392	392	523	760	878	947	1,162	1,143	1,436	1,588	2,306	2,364	3,749	4,140
Turkey	6	6	6	9	11	13	17	15	27	36	54	61	39	54	61	s	s	58
United Kingdom	2,843	3,065	4,000	4,111	3,642	3,856	4,368	5,361	5,406	5,551	6,000	6,173	5,792	5,788	6,604	5,206	5,364	6,306
Other	54	81	1	7	7	9	8	16	s	41	35	s	s	s	s	s	s	304
Latin America and OWH	663	748	613	663	562	785	680	726	841	1,046	1,169	1,457	1,465	2,553	2,536	2,747	2,785	2,333
South America	523	547	366	335	288	389	370	405	453	636	776	976	1,144	s	1,575	1,569	1,543	1,538
Argentina	43	56	26	38	43	24	22	25	21	31	64	87	92	117	136	161	162	133
Brazil	437	446	288	253	199	305	316	350	405	574	607	784	955	1,389	1,325	1,285	1,220	1,221
Chile	7	6	4	11	8	6	9	11	7	7	48	s	20	21	21	23	25	24
Colombia	12	11	6	10	11	10	7	5	6	7	16	18	26	s	32	37	63	59
Ecuador	1	1	*	*	*	*	*	*	1	*	3	4	1	1	2	2	1	2
Peru	11	11	2	2	2	2	2	2	4	3	s	33	22	8	8	9	30	44
Venezuela	11	14	40	22	24	42	12	12	7	12	20	19	25	27	47	48	38	54

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Region, country, or economy	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Other	1	2	*	*	2	1	1	1	1	0	s	s	3	s	3	3	3	1
Central America	131	198	240	321	252	287	s	320	s	s	s	363	314	365	s	s	s	545
Costa Rica	4	6	2	s	4	7	6	8	9	8	7	s	8	20	s	s	80	40
Honduras	*	0	0	0	0	0	0	1	0	0	0	4	s	3	3	4	4	4
Mexico	126	191	238	303	248	280	s	s	s	s	303	329	281	337	332	405	418	472
Panama	1	1	*	*	*	*	*	*	*	*	s	1	2	2	2	5	s	21
Other	*	*	*	s	*	*	*	s	*	*	s	s	s	2	s	s	s	7
OWH	8	4	6	6	22	108	s	1	s	s	s	118	8	s	s	s	s	250
Barbados	0	0	*	*	0	s	s	0	0	0	*	*	*	*	1	s	s	0
Bermuda	*	*	1	1	2	2	0	0	0	2	s	s	5	s	s	s	s	9
Dominican Republic	0	*	1	1	1	s	1	*	*	*	*	1	2	2	1	1	1	1
United Kingdom Islands, Caribbean	8	3	4	4	s	s	s	0	s	s	*	1	1	2	1	*	*	s
Other	0	0	0	*	s	2	1	1	s	s	8	s	1	1	1	1	1	s
Africa	26	35	18	25	29	29	31	28	40	67	59	57	94	86	102	129	133	102
Egypt	1	2	3	3	4	5	4	2	4	4	3	5	6	6	2	2	3	17
Nigeria	*	*	0	1	*	*	0	*	0	2	3	4	*	3	3	s	s	1
South Africa	22	30	14	21	24	s	24	23	31	53	47	43	83	71	90	102	99	58
Other	2	3	1	*	1	s	3	2	4	7	5	6	5	6	7	s	s	26
Middle East	208	141	389	630	726	736	687	875	770	840	1,027	1,993	1,856	2,016	2,060	2,033	2,182	2,906

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Region, country, or economy	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Israel	208	141	389	630	726	736	687	872	767	839	1,025	1,988	1,845	2,000	2,045	2,012	2,148	2,695
Saudi Arabia	*	*	*	*	*	0	0	*	*	*	*	*	*	1	1	7	s	s
United Arab Emirates	*	*	0	0	0	0	*	2	3	1	2	5	11	15	13	s	s	s
Other	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	s	1.0	s
Asia and Pacific	1,869	1,603	3,226	3,936	4,194	3,786	4,062	4,608	4,764	5,864	6,750	8,494	7,826	8,564	9,626	10,470	11,128	12,639
Australia	369	290	294	349	286	310	420	474	556	718	1,072	940	751	982	1,081	1,153	1,113	1,185
China	35	52	319	506	s	645	565	575	668	759	1,173	1,671	1,579	1,535	1,653	2,012	2,201	3,036
Hong Kong	82	66	214	s	289	s	227	213	98	108	93	102	70	148	164	154	151	158
India	22	23	20	s	s	75	81	113	327	337	382	1,342	1,377	1,716	2,075	2,289	2,557	2,906
Indonesia	5	4	1	2	3	3	4	5	4	11	13	15	23	28	17	18	s	20
Japan	1,089	962	1,523	1,630	1,507	1,541	1,649	1,627	1,717	1,862	1,919	2,001	1,835	1,812	2,169	2,314	2,392	2,521
Malaysia	32	30	161	218	s	s	251	161	201	252	390	395	376	348	390	655	517	440
New Zealand	18	15	9	8	10	6	9	25	35	38	30	27	21	21	37	37	33	86
Philippines	12	10	31	40	48	50	52	44	27	22	45	56	51	54	60	67	53	72
Singapore	73	62	426	551	755	398	514	704	576	845	549	736	706	738	772	509	717	767
South Korea	41	29	101	143	157	169	202	277	456	742	928	980	746	824	854	898	912	946
Taiwan	84	55	122	143	139	69	64	365	68	123	97	128	196	278	242	274	269	387
Thailand	5	4	7	13	18	19	24	24	31	47	54	96	93	75	111	89	104	108
Other	1	1	*	*	*	1	*	*	*	1	3	4	2	2	1	2	s	6

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Region, country, or economy	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Addenda																		
European Union ^a	9,691	10,058	11,900	12,472	11,578	12,941	14,249	16,048	17,768	18,209	21,365	25,130	23,435	22,046	24,706	23,837	25,509	25,956
OPEC	18	19	42	25	27	45	17	20	14	26	38	48	37	49	69	89	98	269

* = amount ≤ \$500,000; NA = not available; s = suppressed for reasons of reliability and/or confidentiality.

OPEC = Organization of the Petroleum Exporting Countries; OWH = other Western Hemisphere.

^a Reflects the country composition of the European Union for the given year.

Note(s)

Data are for majority-owned (> 50%) foreign affiliates of U.S. parent companies. Data are for nonbank U.S. affiliates for 1997–2008; data are for bank and nonbank U.S. affiliates for 2009 and forward. Data include R&D expenditures performed by affiliates, whether for themselves or for others under contract. Data exclude R&D expenditures by others for affiliates under contract. Detail may not add to total because of rounding.

Source(s)

Bureau of Economic Analysis, Direct Investment and Multinational Enterprises (annual series), https://www.bea.gov/iTable/index_MNC.cfm, accessed 27 January 2017.

Science and Engineering Indicators 2018

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

APPENDIX TABLE 4-18

R&D performed abroad by majority-owned foreign affiliates of U.S. parent companies, by selected NAICS industry of affiliate: 2009–14

(Millions of current U.S. dollars)

Industry	NAICS code	2009	2010	2011	2012	2013	2014
All industries	na	39,205	39,887	44,684	44,983	49,221	52,174
Mining	21	119	42	119	304	378	219
Oil and gas extraction	211	s	14	23	98	100	31
Other	na	s	27	97	206	278	188
Manufacturing	31–33	27,141	27,481	30,332	30,497	31,625	32,128
Food	311	514	534	617	520	488	575
Beverage and tobacco products	312	71	86	91	90	63	85
Textile, apparel, and leather products	313–16	68	70	75	69	70	90
Wood products	321	2	2	7	8	9	46
Paper manufacturing	322	66	68	184	89	85	117
Printing and related support activities	323	9	23	14	8	11	32
Petroleum and coal products	324	s	s	s	s	s	s
Chemicals	325	8,757	8,348	9,287	9,153	9,467	8,511
Basic chemicals	3251	174	201	299	297	300	220
Resin, synthetic rubber, fiber, and filament	3252	295	290	277	369	336	376
Pharmaceuticals and medicines	3254	7,436	7,115	7,703	7,165	7,155	6,127
Soap, cleaning compound, and toilet preparation	3256	222	208	303	598	666	728
Other	na	630	534	705	724	1,010	1,059
Plastic and rubber products	326	329	386	552	530	550	542
Nonmetallic mineral products	327	93	109	121	103	62	94
Primary and fabricated metals	na	245	279	352	283	352	356
Primary metals	331	61	108	139	110	144	127
Fabricated metal products	332	184	171	214	172	208	229
Machinery	333	1,361	1,451	2,210	2,214	2,409	2,852

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Industry	NAICS code	2009	2010	2011	2012	2013	2014
Agriculture, construction, and mining machinery	3331	421	477	682	709	856	866
Industrial machinery	3332	280	294	655	671	640	823
Other	na	661	681	874	835	913	1,164
Computer and electronic products	334	6,108	5,922	5,476	7,074	7,452	8,376
Computer and peripheral equipment	3341	963	827	882	850	1,068	1,320
Communication equipment	3342	s	s	968	891	s	1,339
Audio and video equipment	3343	s	s	292	314	s	324
Semiconductor and other electronic components	3344	2,590	2,797	2,478	4,033	3,977	4,158
Navigational, measuring, and other instruments	3345	870	858	856	986	1018	1,234
Magnetic and optical media	3346	*	*	*	*	1.0	*
Electrical equipment, appliances, and components	335	532	700	709	681	569	527
Transportation equipment	336	7,837	7,796	8,400	7,700	7,770	7,723
Motor vehicles, bodies and trailers, and parts	3361, 3362, 3363	7,276	7,249	7,707	7,048	6,993	6,886
Other	na	561	547	694	652	776	836
Furniture and related products	337	7	29	18	27	28	17
Miscellaneous manufacturing	339	s	s	s	s	s	s
Wholesale trade	42	2,074	1,928	2,580	2,510	4,727	4,976
Professional and commercial equipment and supplies	4234	1,165	1,247	1,322	1,254	1,745	1,524
Petroleum and petroleum products	4247	2	2	2	1	s	s
Drugs and druggists' sundries	4242	514	s	800	715	2,320	2,778
Other	na	393	s	456	539	s	s
Retail trade	44-45	s	26	33	29	30	31
General merchandise stores	452	s	1	1	1	1	0
Clothing and clothing accessories stores	448	0	0	1	2	2	*
Other	na	s	25	31	26	27	31
Information	51	1,698	2,618	3,024	3,214	3,401	3,952
Publishing	511	1,407	s	s	s	s	s

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Industry	NAICS code	2009	2010	2011	2012	2013	2014
Motion picture and sound recording industries	512	0	0	0	0	1	0
Broadcasting (except Internet) and telecommunications	na	s	5	12	31	39	24
Broadcasting (except Internet)	515	*	1	1	0	0	1
Telecommunications	517	s	4	11	31	39	23
Data processing, hosting, and related services	518	s	14	27	29	34	36
Other information services	519	252	s	s	s	s	s
Finance and insurance	52	1	6	s	s	s	242
Depository credit intermediation (banking)	5221, 551111	0	*	s	s	s	s
Finance (except depository institutions)	other 522, 523, 525	1	6	6	10	17	s
Insurance carriers and related activities	524	0	0	0	0	0	0
Professional, scientific, and technical services	54	8,080	7,683	8,241	8,065	8,571	10,338
Architectural, engineering, and related services	5413	107	101	s	86	115	493
Computer systems design and related services	5415	2,270	2,049	1,937	2,122	2,365	2,555
Management, scientific, and technical consulting	5416	418	324	412	410	438	641
Advertising and related services	5418	3	1	1	1	1	1
Other	na	5,284	5,208	s	5,447	5,652	6,647
Other industries	na	s	102	s	s	s	287
Agriculture, forestry, fishing, and hunting	11	4	s	s	s	s	s
Construction	23	1	2	3	1	3	3
Utilities	22	1	5	2	12	11	25
Transportation and warehousing	48-49	3	3	2	2	2	4
Real estate, rental, and leasing	53	1	1	2	3	3	2
Management of nonbank companies and enterprises	55 (except 551111)	4	5	4	4	6	35
Administration, support, and waste management	56	23	27	30	48	68	53
Health care and social assistance	62	0	0	*	2	1	4
Accommodation and food services	72	4	s	s	s	s	7
Miscellaneous services	na	s	10	10	11	12	s

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

* = amount \leq \$500,000; na = not applicable; s = suppressed for reasons of reliability and/or confidentiality.

NAICS = North American Industry Classification System.

Note(s)

Data are for majority-owned (> 50%) foreign affiliates (bank and nonbank) of U.S. parent companies. Data include R&D expenditures performed by affiliates, whether for themselves or for others under contract. Data exclude R&D expenditures by others for affiliates under contract. Industries are classified by the U.S. Bureau of Economic Analysis using the international surveys industry classification system based on the NAICS. For data before 2009, see Appendix Table 4-27 in *Science and Engineering Indicators 2014*, <https://www.nsf.gov/statistics/seind14/index.cfm/appendix/tables.htm>.

Source(s)

U.S. Bureau of Economic Analysis, Direct Investment and Multinational Enterprises (annual series), https://www.bea.gov/iTable/index_MNC.cfm, accessed 27 January 2017.

Science and Engineering Indicators 2018

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

APPENDIX TABLE 4-19

R&D performed in the United States by U.S. multinational company parent companies, by NAICS industry: 2009–14

(Millions of current U.S. dollars)

Industry	NAICS code	2009	2010	2011	2012	2013	2014
All industries	-	207,297	205,674	220,279	232,955	242,327	268,787
Mining	21	560	556	712	620	781	832
Oil and gas extraction	211	s	s	s	16	15	s
Other mining	na	s	s	s	604	766	s
Manufacturing	31–33	157,731	152,855	159,646	164,489	167,765	183,435
Food	311	1,927	2,196	2,565	2,623	2,546	2,527
Beverage and tobacco products	312	338	313	289	329	406	477
Textiles, apparel, and leather products	313–16	182	216	203	203	197	204
Wood products	321	80	87	47	s	34	44
Paper manufacturing	322	1,069	1,150	1,229	1,282	1,913	1,930
Printing and related support activities	323	133	74	79	77	74	67
Petroleum and coal products	324	2,924	3,249	2,967	2,988	3,113	2,866
Chemicals	325	47,244	49,878	52,480	55,088	54,374	61,542
Basic chemicals	3251	913	1,014	1,169	1,271	1,124	1,187
Resins and synthetic rubber, fiber, and filament	3252	2,721	3,233	3,428	3,780	3,849	3,744
Pharmaceuticals and medicines	3254	39,576	41,614	44,427	46,969	46,275	53,170
Soap, cleaning compound, and toilet preparation	3256	s	1,936	2,131	1,839	1,968	2,102
Other	na	s	2,081	1,325	1,229	1,159	1,338
Plastic and rubber products	326	1,109	1,249	1,154	1,255	1,018	1,372
Nonmetallic mineral products	327	388	383	429	450	446	446
Primary and fabricated metals	na	1,217	1,224	1,260	1,341	1,164	1,271
Primary metals	331	453	482	520	512	508	627
Fabricated metal products	332	764	743	740	830	656	644
Machinery	333	6,743	7,771	8,344	9,039	9,406	7,857

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Industry	NAICS code	2009	2010	2011	2012	2013	2014
Agriculture, construction, and mining machinery	3331	2,330	2,912	3,531	3,722	3,808	3,954
Industrial machinery	3332	1,690	1,996	1,899	2,124	2,264	2,055
Other machinery	na	2,724	2,863	2,914	3,193	3,335	1,848
Computer and electronic products	334	35,823	34,535	42,305	44,029	44,772	51,312
Computer and peripheral equipment	3341	6,717	4,918	6,472	8,105	8,707	10,968
Communication equipment	3342	7,991	8,059	9,524	7,440	7,500	7,030
Audio and video equipment	3343	s	682	723	684	675	s
Semiconductor and other electronic components	3344	12,893	13,648	15,716	17,367	17,135	19,111
Navigational, measuring, and other instruments	3345	7,557	7,228	9,870	10,433	10,756	13,270
Magnetic and optical media	3346	s	0	0	0	0	s
Electrical equipment, appliances, and components	335	3,040	3,059	3,623	4,215	4,067	4,145
Transportation equipment	336	48,960	40,224	35,307	33,863	36,250	38,077
Motor vehicles, bodies and trailers, and parts	3361, 3362, 3363	10,316	12,387	12,433	12,705	15,124	14,794
Other	na	38,643	27,837	22,874	21,158	21,127	23,282
Furniture and related products	337	237	216	243	235	237	681
Miscellaneous manufacturing	339	6,317	7,030	7,123	s	7,749	8,618
Wholesale trade	42	6,440	6,299	6,921	8,056	8,482	9,684
Professional and commercial equipment and supplies	4234	1,173	1,638	1,915	1,936	2,086	1,913
Petroleum and petroleum products	4247	s	s	s	s	s	s
Drugs and druggists' sundries	4242	1,322	1,363	1,453	1,522	1,597	2,293
Other	na	s	s	s	s	s	s
Retail trade	44-45	s	s	s	s	s	s
General merchandise stores	452	0	0	0	0	0	0
Clothing and clothing accessories stores	448	8	s	8	s	s	25.0
Other	na	s	s	s	s	s	s
Information	51	21,035	22,577	24,996	29,013	31,593	38,655
Publishing	511	14,456	14,713	15,188	16,261	17,000	19,008

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Industry	NAICS code	2009	2010	2011	2012	2013	2014
Motion picture and sound recording industries	512	s	s	s	s	s	0
Broadcasting (except Internet) and telecommunications	na	1,128	1,157	1,443	1,570	1,796	2,689
Broadcasting (except Internet)	515	s	s	70	71	96	35
Telecommunications	517	s	s	1,374	1,499	1,699	2,653
Data processing, hosting, and related services	518	750	805	930	991	1,165	1,600
Other	na	s	s	s	s	s	15,358
Finance and insurance	52	186	384	469	522	596	460
Depository credit intermediation (banking)	5221	0	s	s	s	s	s
Finance (except depository institutions)	na	s	s	s	179	203	135
Insurance carriers and related activities	524	s	71	112	s	s	s
Professional, scientific, and technical services	54	15,931	18,056	21,614	22,466	24,065	24,667
Architectural, engineering, and related services	5413	42	118	s	s	s	s
Computer systems design and related services	5415	10,134	11,135	12,737	13,358	13,650	13,152
Management, scientific, and technical consulting	5416	71	s	s	s	s	s
Advertising and related services	5418	1	s	s	s	s	s
Other	na	5,683	6,715	7,419	7,551	s	s
Other industries	na	s	s	s	s	s	s
Agriculture, forestry, fishing, and hunting	11	s	s	s	s	s	s
Construction	23	4	s	s	112	104	159
Utilities	22	6	12	15	16	29	s
Transportation and warehousing	48-49	68	55	36	72	77	55
Real estate, rental, and leasing	53	s	s	s	s	s	s
Management of nonbank companies and enterprises	55	0	*	*	0	0	0
Administration, support, and waste management	56	s	988	s	s	s	695
Health care and social assistance	62	s	s	s	s	s	s
Accommodation and food services	72	37	51	51	49	35	53
Miscellaneous services	na	344	338	372	202	213	655

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

* = < \$500,000. na = not applicable; data source did not provide a classification. s = suppressed for reasons of reliability and/or confidentiality.

NAICS = North American Industry Classification System.

Note(s)

Data are for all parent companies (bank and nonbank) of U.S. multinational companies (MNCs). (Before 2009, data were for nonbank U.S. MNC parent companies.) A U.S. MNC parent company is defined as a company that resides in the United States and owns or controls at least 10% of voting securities or the equivalent of foreign business enterprise. Industries are classified by the U.S. Bureau of Economic Analysis using the international surveys industry classification system based on the NAICS. Data are for R&D performed regardless of funding source, whether for the performer itself or others, including R&D performed for the federal government; data exclude R&D conducted by others under contract. For data before 2009, see Appendix Table 4-29 in *Science and Engineering Indicators 2014*, <https://www.nsf.gov/statistics/seind14/index.cfm/appendix/tables.htm>.

Source(s)

U.S. Bureau of Economic Analysis, Direct Investment and Multinational Enterprises (annual series), https://www.bea.gov/iTable/index_MNC.cfm, accessed 27 January 2017.

Science and Engineering Indicators 2018

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

 APPENDIX TABLE 4-20 
Difference in federal R&D support, as reported by performers and federal agencies: 1985–2015

(Billions of dollars)

Year	All performers				Business performers ^a			
	Performer reported	Agency reported	Difference (\$billions)	Difference (%)	Performer reported	Agency reported	Difference (\$billions)	Difference (%)
1985	52.6	48.4	4.3	8.9	25.3	21.7	3.6	16.7
1986	54.6	51.4	3.2	6.2	26.0	24.2	1.8	7.4
1987	58.6	55.3	3.4	6.1	28.8	26.8	2.0	7.4
1988	60.1	56.8	3.4	5.9	28.2	26.7	1.5	5.6
1989	60.5	61.4	-0.9	-1.5	26.4	28.6	-2.2	-7.7
1990	61.6	63.6	-2.0	-3.1	25.8	29.4	-3.6	-12.1
1991	60.8	61.3	-0.5	-0.8	24.1	26.4	-2.3	-8.8
1992	60.9	65.6	-4.7	-7.1	22.4	29.8	-7.4	-24.8
1993	60.5	67.3	-6.8	-10.1	20.8	30.2	-9.4	-31.0
1994	60.8	67.2	-6.5	-9.6	20.3	30.5	-10.2	-33.5
1995	63.0	68.2	-5.2	-7.7	21.2	30.2	-9.1	-30.0
1996	63.4	67.7	-4.3	-6.3	21.4	30.4	-9.0	-29.7
1997	64.6	69.8	-5.3	-7.5	21.8	31.4	-9.6	-30.6
1998	66.4	72.1	-5.7	-7.9	22.1	32.0	-9.9	-31.0
1999	67.4	75.3	-8.0	-10.6	20.5	31.9	-11.4	-35.7
2000	67.9	75.9	-8.0	-10.6	17.1	29.4	-12.3	-41.8
2001	74.6	84.5	-9.9	-11.7	16.9	28.2	-11.3	-40.2
2002	79.9	93.7	-13.8	-14.8	16.4	34.6	-18.2	-52.6
2003	86.3	103.5	-17.2	-16.6	17.8	40.7	-22.9	-56.3
2004	92.0	112.1	-20.0	-17.9	20.3	43.8	-23.5	-53.7
2005	96.7	118.8	-22.2	-18.6	21.9	48.9	-27.0	-55.2
2006	101.3	121.7	-20.5	-16.8	24.3	52.8	-28.4	-53.9
2007	106.5	127.3	-20.7	-16.3	26.6	55.3	-28.8	-52.0

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Year	All performers				Business performers ^a			
	Performer reported	Agency reported	Difference (\$billions)	Difference (%)	Performer reported	Agency reported	Difference (\$billions)	Difference (%)
2008	119.1	127.1	-8.0	-6.3	36.4	56.3	-20.0	-35.5
2009	127.4	141.1	-13.7	-9.7	39.6	53.3	-13.7	-25.8
2010	128.4	140.4	-11.9	-8.5	34.2	59.9	-25.7	-42.9
2011	128.9	135.5	-6.6	-4.9	31.3	55.6	-24.2	-43.6
2012	125.8	138.5	-12.7	-9.2	30.6	58.9	-28.3	-48.0
2013	122.1	125.4	-3.3	-2.6	29.4	49.5	-20.2	-40.7
2014	119.8	130.3	-10.5	-8.0	26.6	50.2	-23.7	-47.1
2015	113.1	128.6	-15.5	-12.0	19.5	47.5	-27.9	-58.9

^a Excludes industry-administered federally funded R&D centers.

Note(s)

The performer-reported data are expenditures on a calendar-year basis. The agency-reported data are obligations, as normally reported on a federal fiscal-year basis. Dollar difference is performer-reported R&D minus agency-reported R&D. Percentage difference is dollar difference divided by agency-reported R&D. A negative difference arises when agency-reported R&D is higher than performer-reported R&D.

Source(s)

National Science Foundation, National Center for Science and Engineering Statistics, National Patterns of R&D Resources (annual series), and Survey of Federal Funds for Research and Development.

Science and Engineering Indicators 2018

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

 APPENDIX TABLE 4-21 
Federal obligations for R&D and R&D plant, by type of work: FYs 1953–2016

(Millions of current and of constant 2009 dollars)

Fiscal year	Total, R&D and R&D plant	R&D				R&D plant
		All R&D	Basic	Applied	Development	
Current \$millions						
1953	2,167	1,920	116	NA	NA	248
1954	1,918	1,762	116	NA	NA	156
1955	2,252	2,045	130	NA	NA	207
1956	3,267	2,988	206	646	2,136	279
1957	4,389	3,932	262	662	3,007	457
1958	4,906	4,570	335	744	3,491	336
1959	7,123	6,694	466	874	5,353	429
1960	8,080	7,552	590	1,282	5,679	528
1961	9,607	9,059	815	1,663	6,581	548
1962	11,069	10,290	986	2,018	7,285	779
1963	13,663	12,495	1,152	2,356	8,987	1,168
1964	15,324	14,225	1,303	2,571	10,351	1,099
1965	15,746	14,614	1,435	2,812	10,367	1,132
1966	16,179	15,320	1,579	3,081	10,660	858
1967	17,149	16,529	1,846	2,786	11,898	620
1968	16,525	15,921	1,841	2,941	11,140	604
1969	16,310	15,641	1,945	2,700	10,996	669
1970	15,863	15,339	1,926	2,975	10,438	524
1971	16,154	15,543	1,980	3,143	10,419	611
1972	17,098	16,496	2,187	3,361	10,948	602
1973	17,574	16,800	2,232	3,349	11,219	774
1974	18,176	17,410	2,388	3,788	11,235	766
1975	19,860	19,039	2,588	4,141	12,309	821

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Fiscal year	Total, R&D and R&D plant	R&D				R&D plant
		All R&D	Basic	Applied	Development	
1976	21,616	20,780	2,767	4,852	13,160	837
1977	24,818	23,450	3,259	5,255	14,936	1,367
1978	27,141	25,845	3,699	5,908	16,238	1,296
1979	29,621	28,145	4,193	6,342	17,610	1,475
1980	31,386	29,830	4,674	6,923	18,233	1,556
1981	34,590	33,104	5,041	7,171	20,891	1,486
1982	37,822	36,433	5,482	7,541	23,410	1,390
1983	40,009	38,712	6,260	7,993	24,458	1,297
1984	44,012	42,225	7,067	7,911	27,246	1,787
1985	50,180	48,360	7,819	8,315	32,226	1,821
1986	52,951	51,412	8,153	8,349	34,910	1,539
1987	57,100	55,254	8,942	8,998	37,313	1,846
1988	58,827	56,769	9,474	9,177	38,119	2,057
1989	63,572	61,406	10,602	10,164	40,641	2,165
1990	65,831	63,559	11,286	10,337	41,937	2,272
1991	64,148	61,295	12,171	11,798	37,327	2,853
1992	68,577	65,593	12,490	12,001	41,102	2,985
1993	70,415	67,314	13,399	13,491	40,424	3,101
1994	69,451	67,235	13,523	13,888	39,824	2,215
1995	70,443	68,187	13,877	14,557	39,752	2,256
1996	69,399	67,653	14,464	13,796	39,393	1,746
1997	71,753	69,827	14,942	14,423	40,461	1,927
1998	73,914	72,101	15,613	15,309	41,178	1,813
1999	77,386	75,341	17,444	16,084	41,813	2,046
2000	80,403	75,910	19,570	18,901	37,440	4,493
2001	88,562	84,493	21,958	22,756	39,779	4,070

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Fiscal year	Total, R&D and R&D plant	R&D				R&D plant
		All R&D	Basic	Applied	Development	
2002	98,013	93,709	23,668	24,338	45,702	4,305
2003	107,794	103,527	24,751	26,320	52,455	4,267
2004	116,069	112,074	26,121	27,237	58,717	3,994
2005	122,619	118,848	27,140	26,598	65,110	3,771
2006	123,855	121,730	26,585	26,951	68,194	2,125
2007	129,431	127,263	26,866	27,228	73,169	2,168
2008	129,050	127,106	27,154	26,740	73,212	1,944
2009 ^a	144,758	141,090	32,879	30,813	77,398	3,668
2010 ^a	146,968	140,355	31,795	31,933	76,627	6,613
2011	139,662	135,491	29,314	28,710	77,467	4,171
2012	140,636	138,485	30,959	30,988	76,538	2,151
2013	127,291	125,386	29,779	29,419	66,188	1,905
2014	132,496	130,279	31,588	31,321	67,370	2,218
2015	131,398	128,573	31,527	32,118	64,928	2,825
2016 preliminary	142,555	140,070	33,227	34,533	72,309	2,485
Constant 2009 \$millions						
1953	14,335	12,695	767	NA	NA	1,640
1954	12,536	11,515	758	NA	NA	1,021
1955	14,604	13,259	844	NA	NA	1,344
1956	20,650	18,889	1,305	4,080	13,504	1,762
1957	26,747	23,961	1,599	4,035	18,327	2,786
1958	29,013	27,024	1,978	4,401	20,644	1,989
1959	41,483	38,984	2,714	5,092	31,178	2,499
1960	46,410	43,376	3,391	7,364	32,621	3,034
1961	54,431	51,324	4,615	9,425	37,284	3,107
1962	62,081	57,711	5,532	11,321	40,859	4,370

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Fiscal year	Total, R&D and R&D plant	R&D				R&D plant
		All R&D	Basic	Applied	Development	
1963	75,695	69,222	6,381	13,053	49,788	6,472
1964	83,874	77,862	7,132	14,075	56,655	6,013
1965	84,701	78,613	7,722	15,125	55,767	6,087
1966	85,196	80,676	8,316	16,225	56,135	4,520
1967	87,630	84,461	9,432	14,234	60,796	3,169
1968	81,645	78,662	9,094	14,528	55,040	2,983
1969	77,043	73,882	9,186	12,754	51,941	3,160
1970	71,104	68,754	8,632	13,334	46,787	2,351
1971	68,915	66,308	8,448	13,409	44,451	2,608
1972	69,617	67,166	8,904	13,684	44,577	2,451
1973	68,597	65,574	8,712	13,073	43,789	3,022
1974	66,241	63,448	8,701	13,803	40,943	2,793
1975	65,608	62,897	8,551	13,681	40,664	2,711
1976	66,779	64,194	8,549	14,989	40,656	2,585
1977	71,520	67,580	9,391	15,145	43,044	3,940
1978	73,274	69,776	9,985	15,951	43,840	3,498
1979	74,033	70,345	10,479	15,852	44,014	3,688
1980	72,152	68,576	10,745	15,915	41,915	3,576
1981	72,439	69,328	10,558	15,019	43,751	3,111
1982	74,118	71,394	10,742	14,777	45,876	2,723
1983	75,092	72,657	11,749	15,003	45,905	2,435
1984	79,790	76,550	12,812	14,343	49,395	3,240
1985	88,051	84,856	13,719	14,590	56,547	3,195
1986	90,841	88,201	13,987	14,323	59,890	2,640
1987	95,821	92,723	15,007	15,100	62,616	3,098
1988	95,637	92,293	15,402	14,919	61,972	3,344

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Fiscal year	Total, R&D and R&D plant	R&D				R&D plant
		All R&D	Basic	Applied	Development	
1989	99,393	96,008	16,576	15,890	63,541	3,385
1990	99,323	95,895	17,027	15,596	63,273	3,427
1991	93,469	89,312	17,734	17,190	54,388	4,157
1992	97,535	93,291	17,764	17,068	58,458	4,245
1993	97,825	93,518	18,615	18,743	56,159	4,308
1994	94,427	91,415	18,387	18,882	54,146	3,012
1995	93,786	90,783	18,476	19,381	52,926	3,004
1996	90,706	88,424	18,905	18,031	51,488	2,282
1997	92,157	89,682	19,191	18,525	51,967	2,475
1998	93,776	91,475	19,808	19,423	52,244	2,301
1999	96,951	94,388	21,854	20,150	52,384	2,563
2000	98,691	93,176	24,021	23,200	45,955	5,515
2001	106,164	101,286	26,322	27,278	47,685	4,879
2002	115,623	110,545	27,921	28,711	53,913	5,078
2003	124,776	119,837	28,651	30,467	60,719	4,939
2004	131,107	126,595	29,505	30,766	66,324	4,512
2005	134,289	130,159	29,723	29,129	71,306	4,130
2006	131,369	129,115	28,197	28,586	72,332	2,254
2007	133,655	131,416	27,742	28,116	75,557	2,239
2008	130,551	128,584	27,470	27,051	74,064	1,966
2009 ^a	144,758	141,090	32,879	30,813	77,398	3,668
2010 ^a	145,686	139,130	31,518	31,654	75,958	6,556
2011	135,686	131,634	28,479	27,893	75,262	4,052
2012	134,182	132,130	29,538	29,566	73,026	2,052
2013	119,399	117,612	27,933	27,595	62,084	1,787
2014	122,195	120,150	29,132	28,886	62,132	2,045

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Fiscal year	Total, R&D and R&D plant	R&D				R&D plant
		All R&D	Basic	Applied	Development	
2015	119,562	116,991	28,687	29,225	59,079	2,571
2016 preliminary	127,692	125,466	29,763	30,933	64,770	2,226

NA = not available; data collected for this table were not recorded at that level in that particular fiscal year.

^a Includes obligations from the additional federal R&D funding authorized by the American Recovery and Reinvestment Act of 2009.

Note(s)

Beginning in FY 2000, the Department of the Air Force did not report Budget Activity (BA) 6.7 Operational Systems Development data because the agency misunderstood reporting requirements. During the Volume 57 data collection cycle, the Department of the Air Force edited prior-year data from FY 2000– to 207 to include BA 6.7 Operational Systems Development data. These data revisions were derived from FY 2007 distribution percentages that were then applied backward to revise FYs 2000–06 data. In FY 2000, the National Aeronautics and Space Administration (NASA) reclassified the Space Station as a physical asset, reclassified Space Station Research as equipment, and transferred funding for the program from R&D to R&D plant. In FY 2006, NASA reclassified operational costs funding for Space Operations, the Hubble Space Telescope, the Stratospheric Observatory for Infrared Astronomy, and the James Webb Space Telescope previously reported as R&D plant. In FY 2000, the National Institutes of Health reclassified all its development activities as research.

Source(s)

National Science Foundation, National Center for Science and Engineering Statistics, Survey of Federal Funds for Research and Development.

Science and Engineering Indicators 2018

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

 APPENDIX TABLE 4-22 
Federal funding for R&D and R&D plant, budget authority versus obligations: FYs 1953–2016

(Millions of current and of constant 2009 dollars)

Fiscal year	Federal budget authority			Federal obligations		
	Total, R&D and R&D plant	R&D	R&D plant	Total, R&D and R&D plant	R&D	R&D plant
Current \$millions						
1953	NA	NA	NA	2,167	1,920	248
1954	NA	NA	NA	1,918	1,762	156
1955	NA	2,533	NA	2,252	2,045	207
1956	NA	2,988	NA	3,267	2,988	279
1957	NA	3,932	NA	4,389	3,932	457
1958	NA	4,570	NA	4,906	4,570	336
1959	NA	6,694	NA	7,123	6,694	429
1960	NA	7,552	NA	8,080	7,552	528
1961	NA	9,059	NA	9,607	9,059	548
1962	NA	10,290	NA	11,069	10,290	779
1963	NA	12,495	NA	13,663	12,495	1,168
1964	NA	14,225	NA	15,324	14,225	1,099
1965	NA	14,614	NA	15,746	14,614	1,132
1966	NA	15,320	NA	16,179	15,320	858
1967	NA	16,529	NA	17,149	16,529	620
1968	NA	15,921	NA	16,525	15,921	604
1969	NA	15,641	NA	16,310	15,641	669
1970	NA	15,339	NA	15,863	15,339	524
1971	NA	15,543	NA	16,154	15,543	611
1972	NA	16,496	NA	17,098	16,496	602
1973	NA	16,800	NA	17,574	16,800	774
1974	NA	17,410	NA	18,176	17,410	766
1975	NA	19,039	NA	19,860	19,039	821

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Fiscal year	Federal budget authority			Federal obligations		
	Total, R&D and R&D plant	R&D	R&D plant	Total, R&D and R&D plant	R&D	R&D plant
1976	NA	20,780	NA	21,616	20,780	837
1977	NA	23,450	NA	24,818	23,450	1,367
1978	NA	25,976	NA	27,141	25,845	1,296
1979	NA	28,208	NA	29,621	28,145	1,475
1980	NA	29,739	NA	31,386	29,830	1,556
1981	NA	33,735	NA	34,590	33,104	1,486
1982	NA	36,115	NA	37,822	36,433	1,390
1983	NA	38,768	NA	40,009	38,712	1,297
1984	NA	44,214	NA	44,012	42,225	1,787
1985	NA	49,887	NA	50,180	48,360	1,821
1986	NA	53,249	NA	52,951	51,412	1,539
1987	NA	57,069	NA	57,100	55,254	1,846
1988	NA	59,106	NA	58,827	56,769	2,057
1989	NA	62,115	NA	63,572	61,406	2,165
1990	NA	63,781	NA	65,831	63,559	2,272
1991	NA	65,898	NA	64,148	61,295	2,853
1992	NA	68,398	NA	68,577	65,593	2,985
1993	NA	69,884	NA	70,415	67,314	3,101
1994	NA	68,331	NA	69,451	67,235	2,215
1995	NA	68,791	NA	70,443	68,187	2,256
1996	NA	69,049	NA	69,399	67,653	1,746
1997	NA	71,653	NA	71,753	69,827	1,927
1998	NA	73,569	NA	73,914	72,101	1,813
1999	NA	77,637	NA	77,386	75,341	2,046
2000	83,581	78,664	4,917	80,403	75,910	4,493
2001	91,505	86,756	4,749	88,562	84,493	4,070

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Fiscal year	Federal budget authority			Federal obligations		
	Total, R&D and R&D plant	R&D	R&D plant	Total, R&D and R&D plant	R&D	R&D plant
2002	103,057	97,624	5,433	98,013	93,709	4,305
2003	118,065	112,544	5,521	107,794	103,527	4,267
2004	126,270	121,867	4,403	116,069	112,074	3,994
2005	131,259	126,601	4,658	122,619	118,848	3,771
2006	136,019	131,624	4,395	123,855	121,730	2,125
2007	141,890	138,087	3,803	129,431	127,263	2,168
2008	144,391	140,113	4,278	129,050	127,106	1,944
2009 ^a	164,292	156,009	8,283	144,758	141,090	3,668
2010 ^a	148,962	146,596	2,366	146,968	140,355	6,613
2011	144,379	142,457	1,922	139,662	135,491	4,171
2012	143,737	141,450	2,287	140,636	138,485	2,151
2013	132,477	130,861	1,616	127,291	125,386	1,905
2014	136,159	133,547	2,612	132,496	130,279	2,218
2015	138,544	136,090	2,454	131,398	128,573	2,825
2016 (preliminary)	148,999	146,425	2,574	142,555	140,070	2,485
2009 constant \$millions						
1953	NA	NA	NA	14,335	12,695	1,640
1954	NA	NA	NA	12,536	11,515	1,021
1955	NA	16,427	NA	14,604	13,259	1,344
1956	NA	18,887	NA	20,650	18,889	1,762
1957	NA	23,961	NA	26,747	23,961	2,786
1958	NA	27,025	NA	29,013	27,024	1,989
1959	NA	38,987	NA	41,483	38,984	2,499
1960	NA	43,377	NA	46,410	43,376	3,034
1961	NA	51,326	NA	54,431	51,324	3,107
1962	NA	57,712	NA	62,081	57,711	4,370

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Fiscal year	Federal budget authority			Federal obligations		
	Total, R&D and R&D plant	R&D	R&D plant	Total, R&D and R&D plant	R&D	R&D plant
1963	NA	69,224	NA	75,695	69,222	6,472
1964	NA	77,860	NA	83,874	77,862	6,013
1965	NA	78,612	NA	84,701	78,613	6,087
1966	NA	80,674	NA	85,196	80,676	4,520
1967	NA	84,461	NA	87,630	84,461	3,169
1968	NA	78,661	NA	81,645	78,662	2,983
1969	NA	73,883	NA	77,043	73,882	3,160
1970	NA	68,754	NA	71,104	68,754	2,351
1971	NA	66,310	NA	68,915	66,308	2,608
1972	NA	67,166	NA	69,617	67,166	2,451
1973	NA	65,574	NA	68,597	65,574	3,022
1974	NA	63,448	NA	66,241	63,448	2,793
1975	NA	62,897	NA	65,608	62,897	2,711
1976	NA	64,195	NA	66,779	64,194	2,585
1977	NA	67,579	NA	71,520	67,580	3,940
1978	NA	70,130	NA	73,274	69,776	3,498
1979	NA	70,502	NA	74,033	70,345	3,688
1980	NA	68,366	NA	72,152	68,576	3,576
1981	NA	70,649	NA	72,439	69,328	3,111
1982	NA	70,772	NA	74,118	71,394	2,723
1983	NA	72,763	NA	75,092	72,657	2,435
1984	NA	80,156	NA	79,790	76,550	3,240
1985	NA	87,536	NA	88,051	84,856	3,195
1986	NA	91,352	NA	90,841	88,201	2,640
1987	NA	95,769	NA	95,821	92,723	3,098
1988	NA	96,092	NA	95,637	92,293	3,344

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Fiscal year	Federal budget authority			Federal obligations		
	Total, R&D and R&D plant	R&D	R&D plant	Total, R&D and R&D plant	R&D	R&D plant
1989	NA	97,115	NA	99,393	96,008	3,385
1990	NA	96,230	NA	99,323	95,895	3,427
1991	NA	96,019	NA	93,469	89,312	4,157
1992	NA	97,281	NA	97,535	93,291	4,245
1993	NA	97,088	NA	97,825	93,518	4,308
1994	NA	92,904	NA	94,427	91,415	3,012
1995	NA	91,587	NA	93,786	90,783	3,004
1996	NA	90,248	NA	90,706	88,424	2,282
1997	NA	92,028	NA	92,157	89,682	2,475
1998	NA	93,338	NA	93,776	91,475	2,301
1999	NA	97,265	NA	96,951	94,388	2,563
2000	102,591	96,556	6,035	98,691	93,176	5,515
2001	109,692	103,999	5,693	106,164	101,286	4,879
2002	121,572	115,163	6,409	115,623	110,545	5,078
2003	136,665	130,274	6,391	124,776	119,837	4,939
2004	142,630	137,656	4,973	131,107	126,595	4,512
2005	143,751	138,650	5,101	134,289	130,159	4,130
2006	144,271	139,610	4,662	131,369	129,115	2,254
2007	146,520	142,593	3,927	133,655	131,416	2,239
2008	146,071	141,743	4,328	130,551	128,584	1,966
2009 ^a	164,292	156,009	8,283	144,758	141,090	3,668
2010 ^a	147,663	145,317	2,345	145,686	139,130	6,556
2011	140,269	138,402	1,867	135,686	131,634	4,052
2012	137,141	134,958	2,182	134,182	132,130	2,052
2013	124,263	122,747	1,516	119,399	117,612	1,787
2014	125,573	123,164	2,409	122,195	120,150	2,045

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Fiscal year	Federal budget authority			Federal obligations		
	Total, R&D and R&D plant	R&D	R&D plant	Total, R&D and R&D plant	R&D	R&D plant
2015	126,064	123,831	2,233	119,562	116,991	2,571
2016 (preliminary)	133,464	131,158	2,306	127,692	125,466	2,226

NA = not available; data collected for this table were not recorded at that level in that particular fiscal year. r = data significantly revised; replaces previously published data.

^a Includes obligations from the additional federal R&D funding authorized by the American Recovery and Reinvestment Act of 2009.

Note(s)

Beginning in FY 2000, the Department of the Air Force did not report Budget Activity (BA) 6.7 Operational Systems Development data because the agency misunderstood reporting requirements. During the Volume 57 data collection cycle, the Department of the Air Force edited prior-year data from FY 2000 to FY 2007 to include BA 6.7 Operational Systems Development data. These data revisions were derived from FY 2007 distribution percentages that were then applied backward to revise FYs 2000–06 data. In FY 2000, the National Aeronautics and Space Administration (NASA) reclassified the Space Station as a physical asset, reclassified Space Station Research as equipment, and transferred funding for the program from R&D to R&D plant. In FY 2006, NASA reclassified as operational costs funding for Space Operations, the Hubble Space Telescope, the Stratospheric Observatory for Infrared Astronomy, and the James Webb Space Telescope previously reported as R&D plant. In FY 2000, the National Institutes of Health reclassified all its development activities as research.

Source(s)

National Science Foundation, National Center for Science and Engineering Statistics, Survey of Federal Funds for Research and Development, Federal Research and Development Funding by Budget Function

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

APPENDIX TABLE 4-23

Federal obligations for R&D and R&D plant, by agency, performer, and type of work: FY 2015

(Millions of current dollars)

Agency	All federal obligations	Federal intramural ^a	Extramural performers							
			Business firms	United States and U.S. territories						Foreign
				Industry FFRDCs	Universities and colleges	University FFRDCs	Other nonprofits	Nonprofit FFRDCs	State and local governments	
Total R&D and R&D plant										
All agencies	131,398.2	36,342.2	47,730.8	4,037.5	27,706.9	4,288.1	6,287.5	3,482.0	487.1	1,036.1
Department of Agriculture	2,352.0	1,517.7	38.1	0.0	758.2	0.0	25.7	0.0	8.7	3.6
Department of Commerce	1,519.4	1,131.4	61.7	0.0	269.5	3.4	30.8	6.2	15.0	1.4
Department of Defense	61,683.0	20,327.3	35,860.9	336.4	2,429.1	337.4	521.3	1,240.3	7.9	622.5
Department of Education	251.3	10.7	6.4	0.0	178.1	0.0	56.1	0.0	0.0	0.0
Department of Energy	12,343.0	1,072.9	2,274.0	3,234.7	1,167.6	2,316.7	239.0	2,016.1	20.1	1.9
Department of Health and Human Services	30,425.5	6,789.6	1,519.0	421.7	16,875.4	21.7	4,320.9	25.1	186.0	266.2
Department of Homeland Security	1,645.2	1,247.1	190.7	30.0	71.0	8.3	5.0	81.8	0.0	11.2
Department of the Interior	808.7	692.2	25.6	0.0	59.2	0.0	5.3	0.0	26.0	0.2

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Agency	All federal obligations	Federal intramural ^a	Extramural performers							
			Business firms	United States and U.S. territories						Foreign
				Industry FFRDCs	Universities and colleges	University FFRDCs	Other nonprofits	Nonprofit FFRDCs	State and local governments	
Department of Justice	149.7	20.4	15.8	0.0	54.6	0.0	45.5	0.0	13.4	0.0
Department of Transportation	884.5	231.1	266.2	0.2	80.4	0.0	48.1	67.2	190.4	0.9
Department of Veterans Affairs	661.6	661.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Agency for International Development	212.2	10.9	32.2	0.0	50.0	0.0	34.2	0.0	0.0	84.9
Environmental Protection Agency	520.7	260.7	190.8	0.5	68.0	0.6	0.0	0.1	0.0	0.2
National Aeronautics and Space Administration	11,413.1	1,831.6	6,784.2	1.0	979.9	1,375.5	399.0	21.6	3.8	16.5
National Science Foundation	5,989.7	115.9	412.4	0.0	4,655.0	220.5	542.9	5.1	15.8	22.1
Smithsonian Institution	229.0	229.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All other agencies	309.7	192.2	52.9	13.1	10.9	3.9	13.5	18.6	0.0	4.6
R&D										
All agencies	128,573.2	34,925.1	47,455.2	3,935.8	27,414.7	3,911.7	6,136.2	3,271.4	487.0	1,036.0

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Agency	All federal obligations	Federal intramural ^a	Extramural performers							
			Business firms	United States and U.S. territories						Foreign
				Industry FFRDCs	Universities and colleges	University FFRDCs	Other nonprofits	Nonprofit FFRDCs	State and local governments	
Agency for International Development	212.2	10.9	32.2	0.0	50.0	0.0	34.2	0.0	0.0	84.9
Environmental Protection Agency	515.6	260.7	185.6	0.5	68.0	0.6	0.0	0.1	0.0	0.2
National Aeronautics and Space Administration	11,360.7	1,818.3	6,758.4	1.0	979.9	1,362.3	399.0	21.6	3.8	16.5
National Science Foundation	5,669.7	89.8	412.3	0.0	4,510.7	220.5	393.5	5.1	15.8	22.0
Smithsonian Institution	195.7	195.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All other agencies	309.7	192.2	52.9	13.1	10.9	3.9	13.5	18.6	0.0	4.6
Basic research										
All agencies	31,527.1	5,813.7	2,536.5	507.0	15,295.5	2,920.5	2,985.7	1,200.2	61.2	206.7
Department of Agriculture	924.5	635.4	0.0	0.0	274.7	0.0	11.0	0.0	1.6	1.9
Department of Commerce	232.4	192.3	12.0	0.0	24.7	0.0	3.1	0.0	0.0	0.3
Department of Defense	2,133.4	464.5	383.1	7.4	1,055.8	3.9	163.3	5.3	1.3	48.8

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Agency	All federal obligations	Federal intramural ^a	Extramural performers							
			Business firms	United States and U.S. territories						Foreign
				Industry FFRDCs	Universities and colleges	University FFRDCs	Other nonprofits	Nonprofit FFRDCs	State and local governments	
National Aeronautics and Space Administration	3,209.7	460.1	942.4	0.9	558.9	956.8	268.0	13.2	2.2	7.2
National Science Foundation	4,973.9	89.4	267.9	0.0	4,041.2	220.5	313.6	5.1	14.6	21.7
Smithsonian Institution	195.7	195.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All other agencies	0.2	0.2	0.0	0.0	0.0	0.0	-0.0	0.0	-0.0	0.0
Applied research										
All agencies	32,118.2	9,192.8	5,573.8	2,591.0	10,666.6	306.3	2,724.9	416.7	359.1	287.0
Department of Agriculture	1,203.9	673.8	38.1	0.0	470.6	0.0	12.8	0.0	7.0	1.5
Department of Commerce	921.5	653.7	44.2	0.0	177.8	1.3	24.1	6.2	13.2	1.1
Department of Defense	4,558.1	1,696.0	2,022.0	58.4	506.7	72.3	130.5	31.3	0.6	40.4
Department of Education	137.4	6.0	2.4	0.0	102.0	0.0	26.9	0.0	0.0	0.0
Department of Energy	4,181.1	569.9	527.6	2,295.9	193.1	113.7	146.6	326.5	7.5	0.3
Department of Health and Human Services	15,119.9	3,400.7	832.6	202.4	8,261.2	11.0	2,116.0	14.4	140.7	140.8

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Agency	All federal obligations	Federal intramural ^a	Extramural performers							
			Business firms	United States and U.S. territories						Foreign
				Industry FFRDCs	Universities and colleges	University FFRDCs	Other nonprofits	Nonprofit FFRDCs	State and local governments	
All other agencies	284.2	179.1	42.7	13.1	10.9	3.9	11.3	18.6	0.0	4.6
Development										
All agencies	64,927.8	19,918.5	39,344.9	837.8	1,452.6	684.9	425.6	1,654.5	66.7	542.3
Department of Agriculture	212.7	197.5	0.0	0.0	13.0	0.0	1.8	0.0	0.0	0.3
Department of Commerce	177.4	148.5	5.5	0.0	15.8	2.1	3.6	0.0	1.8	0.0
Department of Defense	54,822.1	18,019.3	33,433.8	270.7	866.6	261.2	227.4	1,203.7	6.0	533.3
Department of Education	91.6	3.5	3.8	0.0	59.5	0.0	24.8	0.0	0.0	0.0
Department of Energy	2,749.5	217.4	1,313.7	557.9	161.2	111.4	62.2	313.1	12.6	0.0
Department of Health and Human Services	75.4	30.3	3.6	0.0	25.3	0.0	11.9	0.0	4.3	0.0
Department of Homeland Security	525.4	251.0	161.2	9.1	20.5	6.4	0.8	68.1	0.0	8.4
Department of the Interior	119.7	102.0	2.8	0.0	10.8	0.0	0.7	0.0	3.5	0.0
Department of Justice	21.3	14.6	0.0	0.0	0.0	0.0	0.0	0.0	6.7	0.0

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Agency	All federal obligations	Federal intramural ^a	Extramural performers							
			Business firms	United States and U.S. territories						Foreign
				Industry FFRDCs	Universities and colleges	University FFRDCs	Other nonprofits	Nonprofit FFRDCs	State and local governments	
Environmental Protection Agency	5.1	0.0	5.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
National Aeronautics and Space Administration	52.4	13.3	25.8	0.0	0.0	13.3	0.0	0.0	0.0	0.0
National Science Foundation	320.0	26.1	0.1	0.0	144.3	0.0	149.5	0.0	0.0	0.1
Smithsonian Institution	33.2	33.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All other agencies	0.0	0.0	-0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

FFRDC = federally funded research and development center.

^a Includes costs associated with administration of intramural and extramural programs by federal personnel and actual intramural performance.

Note(s)

Detail may not add to total because of rounding. Agencies included have total annual R&D obligations of \$100 million or more. All other agencies include Department of Housing and Urban Development, Department of Labor, Department of State, Department of the Treasury, Appalachian Regional Commission, Consumer Product Safety Commission, Federal Communications Commission, Federal Trade Commission, Library of Congress, National Archives and Records Administration, Nuclear Regulatory Commission, and Social Security Administration.

Source(s)

National Science Foundation, National Center for Science and Engineering Statistics, Survey of Federal Funds for Research and Development, FY 2015.

Science and Engineering Indicators 2018

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

 APPENDIX TABLE 4-24 
Federal obligations for research, by agency and S&E field: FY 2015

(Millions of current dollars and percent share)

Agency	All federal obligations	Computer sciences and mathematics	Environmental sciences	Life sciences	Physical sciences	Psychology	Social sciences	Other sciences nec	Engineering
Current \$millions									
All agencies	63,645	3,863	4,414	30,473	6,510	1,995	1,136	3,299	11,956
Departments									
Department of Agriculture	2,128	8	18	1,756	83	0	211	0	53
Department of Commerce	1,154	162	356	89	241	1	34	54	217
Department of Defense	6,691	1,276	177	785	788	70	19	864	2,714
Department of Education	160	0	0	0	0	0	43	117	0
Department of Energy	8,642	1,017	326	394	2,741	0	0	449	3,715
Department of Health and Human Services	30,197	191	454	25,165	109	1,769	228	792	1,489
Department of Homeland Security	217	12	13	32	24	5	16	69	46
Department of Housing and Urban Development	38	0	0	0	0	0	37	1	0
Department of the Interior	680	2	367	230	35	0	23	2	22
Department of Justice	128	5	0	2	1	0	115	0	5
Department of Labor	10	0	0	0	0	0	10	0	0

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Agency	All federal obligations	Computer sciences and mathematics	Environmental sciences	Life sciences	Physical sciences	Psychology	Social sciences	Other sciences nec	Engineering
Department of State	2	0	0	0	0	0	2	0	0
Department of Transportation	663	36	35	9	12	18	26	86	441
Department of the Treasury	73	1	0	0	9	0	63	0	0
Department of Veterans Affairs	643	0	0	536	0	77	0	0	31
Other agencies									
Agency for International Development	212	0	8	188	0	0	16	0	0
Appalachian Regional Commission	0	0	0	0	0	0	0	0	0
Consumer Product Safety Commission	2	0	1	0	0	0	0	0	0
Environmental Protection Agency	440	9	182	174	11	0	3	0	62
Federal Communications Commission	5	0	0	0	1	0	2	0	2
Federal Trade Commission	2	0	0	0	0	0	2	0	0
Library of Congress	1	0	0	0	1	0	0	0	0
National Aeronautics and Space Administration	5,539	96	1,270	318	1,490	21	1	275	2,068

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Agency	All federal obligations	Computer sciences and mathematics	Environmental sciences	Life sciences	Physical sciences	Psychology	Social sciences	Other sciences nec	Engineering
National Archives and Records Administration	1	1	0	0	0	0	0	0	0
National Science Foundation	5,670	1,047	1,199	702	911	34	187	591	998
Nuclear Regulatory Commission	92	0	0	0	0	0	0	0	92
Smithsonian Institution	196	0	9	93	53	0	40	1	0
Social Security Administration	59	0	0	0	0	0	59	0	0
Share by field (%)									
All agencies	100.0	6.1	6.9	47.9	10.2	3.1	1.8	5.2	18.8
Departments									
Department of Agriculture	100.0	0.4	0.8	82.5	3.9	0.0	9.9	0.0	2.5
Department of Commerce	100.0	14.0	30.8	7.7	20.9	0.1	3.0	4.6	18.8
Department of Defense	100.0	19.1	2.6	11.7	11.8	1.0	0.3	12.9	40.6
Department of Education	100.0	0.0	0.0	0.0	0.0	0.0	26.7	73.3	0.0
Department of Energy	100.0	11.8	3.8	4.6	31.7	0.0	0.0	5.2	43.0
Department of Health and Human Services	100.0	0.6	1.5	83.3	0.4	5.9	0.8	2.6	4.9
Department of Homeland Security	100.0	5.7	5.8	14.8	11.1	2.2	7.3	31.7	21.3

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Agency	All federal obligations	Computer sciences and mathematics	Environmental sciences	Life sciences	Physical sciences	Psychology	Social sciences	Other sciences nec	Engineering
Department of Housing and Urban Development	100.0	0.0	0.0	0.0	0.0	0.0	96.5	2.9	0.5
Department of the Interior	100.0	0.3	54.0	33.8	5.1	0.0	3.4	0.2	3.2
Department of Justice	100.0	4.0	0.0	1.8	0.5	0.0	89.5	0.0	4.2
Department of Labor	100.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0
Department of State	100.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0
Department of Transportation	100.0	5.5	5.3	1.3	1.9	2.7	3.9	13.0	66.5
Department of the Treasury	100.0	0.8	0.0	0.0	12.3	0.0	86.9	0.0	0.0
Department of Veterans Affairs	100.0	0.0	0.0	83.3	0.0	11.9	0.0	0.0	4.8
Other agencies									
Agency for International Development	100.0	0.0	3.8	88.5	0.0	0.0	7.7	0.0	0.0
Appalachian Regional Commission	100.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0
Consumer Product Safety Commission	100.0	0.0	75.0	0.0	25.0	0.0	0.0	0.0	0.0
Environmental Protection Agency	100.0	2.1	41.2	39.5	2.4	0.0	0.6	0.0	14.2

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Agency	All federal obligations	Computer sciences and mathematics	Environmental sciences	Life sciences	Physical sciences	Psychology	Social sciences	Other sciences nec	Engineering
Federal Communications Commission	100.0	3.7	0.0	0.0	15.5	0.0	44.2	0.0	36.6
Federal Trade Commission	100.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0
Library of Congress	100.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0
National Aeronautics and Space Administration	100.0	1.7	22.9	5.7	26.9	0.4	0.0	5.0	37.3
National Archives and Records Administration	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
National Science Foundation	100.0	18.5	21.1	12.4	16.1	0.6	3.3	10.4	17.6
Nuclear Regulatory Commission	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
Smithsonian Institution	100.0	0.0	4.8	47.3	26.9	0.0	20.3	0.6	0.0
Social Security Administration	100.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0

nec = not elsewhere classified.

Note(s)

Research includes basic research and applied research.

Source(s)

National Science Foundation, National Center for Science and Engineering Statistics, Survey of Federal Funds for Research and Development, FY 2015.



CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

Science and Engineering Indicators 2018

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

APPENDIX TABLE 4-25

Federal obligations for research, by detailed S&E field: Selected years, FYs 1990–2015

(Millions of current and of constant 2009 dollars and percent share by field)

S&E field	1990	1995	2000	2005	2010	2012	2014	2015	Average annual growth rate		
									1990–2000	2000–10	2010–15
Current \$millions									Percent		
Total, all fields	21,622.4	28,434.4	38,470.6	53,738.2	63,728.0	61,945.2	62,908.8	63,645.3	5.9	5.2	-0.0
Computer sciences and mathematics	840.7	1,579.1	2,205.6	2,983.4	3,411.8	3,527.5	3,883.2	3,862.7	10.1	4.5	2.5
Computer sciences	562.1	1,013.9	1,659.6	2,157.1	2,362.0	2,392.2	2,612.8	2,645.6	-	-	-
Mathematics	241.3	258.6	432.9	686.6	835.5	925.3	979.3	1,005.9	-	-	-
Other computer sciences and mathematics	37.3	306.6	113.1	139.7	214.4	210.1	291.0	211.2	-	-	-
Environmental sciences	2,174.1	2,854.4	3,328.8	3,502.6	3,338.9	3,884.3	4,365.8	4,413.7	4.4	0.0	5.7
Atmospheric sciences	773.4	1,135.6	1,104.3	1,185.1	953.8	1,469.2	1,567.5	1,567.9	-	-	-
Geological sciences	661.1	848.3	639.2	673.5	530.4	725.7	561.0	643.3	-	-	-
Oceanography	520.1	407.3	673.0	771.5	743.7	813.5	848.0	726.0	-	-	-
Other environmental sciences	219.5	463.3	912.2	872.5	1,111.0	875.8	1,389.3	1,476.5	-	-	-
Life sciences	8,829.8	11,811.0	17,964.7	28,127.8	33,909.1	30,965.0	30,668.2	30,473.0	7.4	6.6	-2.1
Biological and agricultural	5,178.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-
Agricultural sciences	691.4	670.3	895.0	1,094.2	1,131.9	942.7	1,004.2	1,320.3	-	-	-
Biological sciences (excluding environmental biology)	4,144.6	4,925.4	10,740.0	13,351.6	17,213.9	15,458.3	15,310.6	14,839.7	-	-	-

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

S&E field	1990	1995	2000	2005	2010	2012	2014	2015	Average annual growth rate		
									1990-2000	2000-10	2010-15
Environmental biology	342.3	806.9	740.0	699.0	816.4	796.7	820.6	819.1	-	-	-
Medical sciences	3,382.4	4,972.2	4,463.8	10,862.1	11,677.0	11,037.4	11,002.7	10,934.7	-	-	-
Clinical medical	na	na	na	na	na	na	na	na	-	-	-
Other medical	na	na	na	na	na	na	na	na	-	-	-
Other life sciences	269.1	436.3	1,125.9	2,120.9	3,070.0	2,729.9	2,530.0	2,559.2	-	-	-
Physical sciences	3,808.7	4,278.3	4,788.0	5,493.7	5,870.8	6,407.5	6,483.1	6,510.3	2.3	2.1	2.1
Astronomy	597.2	764.5	880.3	884.9	559.9	1,099.4	1,191.6	1,230.2	-	-	-
Chemistry	761.7	863.5	1,225.6	1,197.5	1,310.6	1,103.0	1,012.7	967.7	-	-	-
Physics	2,254.9	2,451.2	2,405.4	3,041.3	3,470.1	3,708.3	3,565.2	3,040.2	-	-	-
Other physical sciences	195.0	199.2	276.7	370.0	530.2	496.7	713.6	1,272.2	-	-	-
Psychology	448.6	622.6	1,626.7	1,891.8	2,155.6	2,086.6	1,968.0	1,994.9	13.7	2.9	-1.5
Biological aspects	130.6	58.8	8.2	2.3	13.6	14.2	15.0	19.1	-	-	-
Social aspects	177.5	156.3	56.0	46.6	74.5	61.7	59.5	58.5	-	-	-
Other psychological sciences	140.5	407.5	1,562.5	1,842.8	2,067.4	2,010.8	1,893.5	1,917.2	-	-	-
Social sciences	630.0	678.7	1,050.4	1,097.1	1,197.3	1,124.5	1,435.1	1,136.3	5.2	1.3	-1.0
Anthropology	14.4	21.7	15.9	18.0	24.7	30.2	26.5	29.9	-	-	-
Economics	197.2	206.5	249.5	215.9	274.0	343.5	344.3	336.8	-	-	-
Political science	13.1	22.3	22.6	32.7	14.2	12.9	13.4	16.0	-	-	-

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

S&E field	1990	1995	2000	2005	2010	2012	2014	2015	Average annual growth rate		
									1990-2000	2000-10	2010-15
Sociology	116.2	47.8	90.6	70.2	132.3	154.7	157.7	128.2	-	-	-
Other social sciences	289.1	380.3	671.8	760.4	752.0	583.2	893.2	625.3	-	-	-
History	na	na	na	na	na	na	na	na	-	-	-
Linguistics	na	na	na	na	na	na	na	na	-	-	-
Other social sciences	na	na	na	na	na	na	na	na	-	-	-
Other sciences nec	663.7	901.8	1,160.2	2,088.9	2,763.2	2,546.3	2,217.9	3,298.8	5.7	9.1	3.6
Engineering	4,226.6	5,708.4	6,346.4	8,552.9	11,081.2	11,403.4	11,887.5	11,955.6	4.1	5.7	1.5
Aeronautical engineering	927.1	1,248.3	1,463.9	1,276.3	830.1	1,814.9	1,833.0	1,825.1	-	-	-
Astronautical engineering	580.8	546.5	515.0	494.1	389.9	690.2	668.7	660.6	-	-	-
Chemical engineering	241.9	246.1	196.5	283.8	509.7	349.6	535.4	374.6	-	-	-
Civil engineering	317.7	339.4	239.2	279.2	699.8	513.6	445.1	457.6	-	-	-
Electrical engineering	640.0	756.3	744.8	1,033.5	1,360.9	1,324.6	1,240.2	883.3	-	-	-
Mechanical engineering	268.3	412.5	289.3	323.7	363.6	372.2	502.7	309.6	-	-	-
Metallurgy and materials engineering	554.5	815.3	918.1	1,184.1	1,758.8	1,699.2	1,768.7	1,756.9	-	-	-
Other engineering	696.3	1,344.0	1,979.6	3,678.3	5,168.4	4,639.1	4,893.6	5,688.0	-	-	-
Constant 2009 \$millions									Percent		
Total, all fields	32,622.8	37,857.0	47,220.6	58,852.5	63,172.1	59,102.4	58,017.9	57,912.0	3.8	3.0	-1.7
Computer sciences and mathematics	1,268.5	2,102.4	2,707.3	3,267.3	3,382.0	3,365.6	3,581.3	3,514.7	7.9	2.3	0.8

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

S&E field	1990	1995	2000	2005	2010	2012	2014	2015	Average annual growth rate		
									1990-2000	2000-10	2010-15
Computer sciences	848.1	1,349.9	2,037.1	2,362.4	2,341.4	2,282.4	2,409.7	2,407.3	-	-	-
Mathematics	364.1	344.3	531.4	751.9	828.2	882.8	903.2	915.3	-	-	-
Other computer sciences and mathematics	56.2	408.2	138.8	153.0	212.5	200.5	268.4	192.2	-	-	-
Environmental sciences	3,280.2	3,800.3	4,085.9	3,835.9	3,309.8	3,706.0	4,026.4	4,016.1	2.2	-2.1	3.9
Atmospheric sciences	1,166.9	1,511.9	1,355.5	1,297.9	945.5	1,401.8	1,445.6	1,426.7	-	-	-
Geological sciences	997.5	1,129.4	784.6	737.6	525.8	692.4	517.4	585.4	-	-	-
Oceanography	784.7	542.3	826.1	844.9	737.2	776.2	782.1	660.6	-	-	-
Other environmental sciences	331.1	616.8	1,119.7	955.5	1,101.3	835.6	1,281.3	1,343.5	-	-	-
Life sciences	13,322.0	15,724.9	22,050.7	30,804.7	33,613.3	29,543.9	28,283.9	27,727.9	5.2	4.3	-3.8
Biological and agricultural	7,812.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-
Agricultural sciences	1,043.2	892.4	1,098.6	1,198.3	1,122.0	899.4	926.1	1,201.4	-	-	-
Biological sciences (excluding environmental biology)	6,253.2	6,557.6	13,182.8	14,622.3	17,063.7	14,748.9	14,120.3	13,502.9	-	-	-
Environmental biology	516.5	1,074.3	908.3	765.5	809.3	760.1	756.8	745.3	-	-	-
Medical sciences	5,103.1	6,619.9	5,479.1	11,895.8	11,575.1	10,530.9	10,147.3	9,949.7	-	-	-
Clinical medical	na	na	na	na	na	na	na	na	-	-	-
Other medical	na	na	na	na	na	na	na	na	-	-	-
Other life sciences	406.0	580.9	1,382.0	2,322.7	3,043.2	2,604.6	2,333.3	2,328.7	-	-	-
Physical sciences	5,746.4	5,696.0	5,877.0	6,016.5	5,819.6	6,113.4	5,979.1	5,923.8	0.2	-0.1	0.4

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

S&E field	1990	1995	2000	2005	2010	2012	2014	2015	Average annual growth rate		
									1990-2000	2000-10	2010-15
Astronomy	901.0	1,017.8	1,080.5	969.1	555.0	1,048.9	1,099.0	1,119.4	-	-	-
Chemistry	1,149.2	1,149.6	1,504.4	1,311.5	1,299.2	1,052.4	934.0	880.5	-	-	-
Physics	3,402.1	3,263.5	2,952.5	3,330.7	3,439.8	3,538.1	3,288.0	2,766.3	-	-	-
Other physical sciences	294.1	265.2	339.6	405.2	525.6	473.9	658.1	1,157.6	-	-	-
Psychology	676.8	828.9	1,996.7	2,071.8	2,136.8	1,990.8	1,815.0	1,815.2	11.4	0.7	-3.2
Biological aspects	197.1	78.3	10.1	2.5	13.5	13.5	13.8	17.4	-	-	-
Social aspects	267.7	208.1	68.7	51.0	73.9	58.9	54.9	53.2	-	-	-
Other psychological sciences	212.0	542.5	1,917.9	2,018.2	2,049.4	1,918.5	1,746.3	1,744.5	-	-	-
Social sciences	950.5	903.6	1,289.3	1,201.5	1,186.9	1,072.9	1,323.5	1,033.9	3.1	-0.8	-2.7
Anthropology	21.7	28.9	19.5	19.7	24.5	28.8	24.4	27.2	-	-	-
Economics	297.5	274.9	306.2	236.4	271.6	327.7	317.5	306.5	-	-	-
Political science	19.8	29.7	27.7	35.8	14.1	12.3	12.4	14.6	-	-	-
Sociology	175.3	63.6	111.2	76.9	131.1	147.6	145.4	116.7	-	-	-
Other social sciences	436.2	506.3	824.6	832.8	745.4	556.4	823.8	569.0	-	-	-
History	na	na	na	na	na	na	na	na	-	-	-
Linguistics	na	na	na	na	na	na	na	na	-	-	-
Other social sciences	na	na	na	na	na	na	na	na	-	-	-
Other sciences nec	1,001.4	1,200.6	1,424.1	2,287.7	2,739.1	2,429.4	2,045.5	3,001.6	3.6	6.8	1.8

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

S&E field	1990	1995	2000	2005	2010	2012	2014	2015	Average annual growth rate		
									1990-2000	2000-10	2010-15
Engineering	6,376.9	7,600.1	7,789.9	9,366.9	10,984.5	10,880.1	10,963.3	10,878.6	2.0	3.5	-0.2
Aeronautical engineering	1,398.8	1,662.0	1,796.9	1,397.8	822.9	1,731.6	1,690.5	1,660.7	-	-	-
Astronautical engineering	876.3	727.6	632.1	541.1	386.5	658.5	616.7	601.1	-	-	-
Chemical engineering	364.9	327.7	241.2	310.8	505.3	333.6	493.8	340.9	-	-	-
Civil engineering	479.3	451.9	293.6	305.8	693.7	490.0	410.5	416.4	-	-	-
Electrical engineering	965.7	1,006.9	914.2	1,131.9	1,349.0	1,263.8	1,143.8	803.7	-	-	-
Mechanical engineering	404.8	549.2	355.1	354.5	360.4	355.1	463.6	281.7	-	-	-
Metallurgy and materials engineering	836.6	1,085.5	1,126.9	1,296.8	1,743.5	1,621.2	1,631.2	1,598.6	-	-	-
Other engineering	1,050.6	1,789.4	2,429.9	4,028.4	5,123.3	4,426.2	4,513.1	5,175.6	-	-	-
Share by field (%)									Percent		
Total, all fields	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	-	-	-
Computer sciences and mathematics	3.9	5.6	5.7	5.6	5.4	5.7	6.2	6.1	-	-	-
Computer sciences	2.6	3.6	4.3	4.0	3.7	3.9	4.2	4.2	-	-	-
Mathematics	1.1	0.9	1.1	1.3	1.3	1.5	1.6	1.6	-	-	-
Other computer sciences and mathematics	0.2	1.1	0.3	0.3	0.3	0.3	0.5	0.3	-	-	-
Environmental sciences	10.1	10.0	8.7	6.5	5.2	6.3	6.9	6.9	-	-	-
Atmospheric sciences	3.6	4.0	2.9	2.2	1.5	2.4	2.5	2.5	-	-	-
Geological sciences	3.1	3.0	1.7	1.3	0.8	1.2	0.9	1.0	-	-	-

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

S&E field	1990	1995	2000	2005	2010	2012	2014	2015	Average annual growth rate		
									1990-2000	2000-10	2010-15
Oceanography	2.4	1.4	1.7	1.4	1.2	1.3	1.3	1.1	-	-	-
Other environmental sciences	1.0	1.6	2.4	1.6	1.7	1.4	2.2	2.3	-	-	-
Life sciences	40.8	41.5	46.7	52.3	53.2	50.0	48.8	47.9	-	-	-
Biological and agricultural	23.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-
Agricultural sciences	3.2	2.4	2.3	2.0	1.8	1.5	1.6	2.1	-	-	-
Biological sciences (excluding environmental biology)	19.2	17.3	27.9	24.8	27.0	25.0	24.3	23.3	-	-	-
Environmental biology	1.6	2.8	1.9	1.3	1.3	1.3	1.3	1.3	-	-	-
Medical sciences	15.6	17.5	11.6	20.2	18.3	17.8	17.5	17.2	-	-	-
Clinical medical	na	na	na	na	na	na	na	na	-	-	-
Other medical	na	na	na	na	na	na	na	na	-	-	-
Other life sciences	1.2	1.5	2.9	3.9	4.8	4.4	4.0	4.0	-	-	-
Physical sciences	17.6	15.0	12.4	10.2	9.2	10.3	10.3	10.2	-	-	-
Astronomy	2.8	2.7	2.3	1.6	0.9	1.8	1.9	1.9	-	-	-
Chemistry	3.5	3.0	3.2	2.2	2.1	1.8	1.6	1.5	-	-	-
Physics	10.4	8.6	6.3	5.7	5.4	6.0	5.7	4.8	-	-	-
Other physical sciences	0.9	0.7	0.7	0.7	0.8	0.8	1.1	2.0	-	-	-
Psychology	2.1	2.2	4.2	3.5	3.4	3.4	3.1	3.1	-	-	-
Biological aspects	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

S&E field	1990	1995	2000	2005	2010	2012	2014	2015	Average annual growth rate		
									1990-2000	2000-10	2010-15
Social aspects	0.8	0.5	0.1	0.1	0.1	0.1	0.1	0.1	-	-	-
Other psychological sciences	0.6	1.4	4.1	3.4	3.2	3.2	3.0	3.0	-	-	-
Social sciences	2.9	2.4	2.7	2.0	1.9	1.8	2.3	1.8	-	-	-
Anthropology	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-
Economics	0.9	0.7	0.6	0.4	0.4	0.6	0.5	0.5	-	-	-
Political science	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	-	-	-
Sociology	0.5	0.2	0.2	0.1	0.2	0.2	0.3	0.2	-	-	-
Other social sciences	1.3	1.3	1.7	1.4	1.2	0.9	1.4	1.0	-	-	-
History	na	na	na	na	na	na	na	na	-	-	-
Linguistics	na	na	na	na	na	na	na	na	-	-	-
Other social sciences	na	na	na	na	na	na	na	na	-	-	-
Other sciences nec	3.1	3.2	3.0	3.9	4.3	4.1	3.5	5.2	-	-	-
Engineering	19.5	20.1	16.5	15.9	17.4	18.4	18.9	18.8	-	-	-
Aeronautical engineering	4.3	4.4	3.8	2.4	1.3	2.9	2.9	2.9	-	-	-
Astronautical engineering	2.7	1.9	1.3	0.9	0.6	1.1	1.1	1.0	-	-	-
Chemical engineering	1.1	0.9	0.5	0.5	0.8	0.6	0.9	0.6	-	-	-
Civil engineering	1.5	1.2	0.6	0.5	1.1	0.8	0.7	0.7	-	-	-
Electrical engineering	3.0	2.7	1.9	1.9	2.1	2.1	2.0	1.4	-	-	-

CHAPTER 4 | Research and Development: U.S. Trends and International Comparisons

S&E field	1990	1995	2000	2005	2010	2012	2014	2015	Average annual growth rate		
									1990-2000	2000-10	2010-15
Mechanical engineering	1.2	1.5	0.8	0.6	0.6	0.6	0.8	0.5	-	-	-
Metallurgy and materials engineering	2.6	2.9	2.4	2.2	2.8	2.7	2.8	2.8	-	-	-
Other engineering	3.2	4.7	5.1	6.8	8.1	7.5	7.8	8.9	-	-	-

na = not applicable; data collected for this table were not recorded at that level in that particular fiscal year, or the agency or subagency did not exist as such or in that organization in that year.

nec = not elsewhere classified.

Note(s)

Detail may not add to total because of rounding.

Source(s)

National Science Foundation, National Center for Science and Engineering Statistics, Survey of Federal Funds for Research and Development.

Science and Engineering Indicators 2018