

Appendix table 4-1

Gross domestic product and implicit price deflators: 1953–2010

Year	Calendar year			Federal fiscal year		
	GDP (billions)		GDP price deflator ^a	GDP (billions)		GDP price deflator ^a
	Current \$	Constant 2005 \$		Current \$	Constant 2005 \$	
1953	379.3	2,347.2	0.1616	372.5	2,296.5	0.1622
1954	380.4	2,332.4	0.1631	377.0	2,297.4	0.1641
1955	414.7	2,500.3	0.1659	395.9	2,393.6	0.1654
1956	437.4	2,549.7	0.1715	427.0	2,516.2	0.1697
1957	461.1	2,601.1	0.1773	450.9	2,561.9	0.1760
1958	467.2	2,577.6	0.1813	460.0	2,537.2	0.1813
1959	506.6	2,762.5	0.1834	490.2	2,664.1	0.1840
1960	526.4	2,830.9	0.1859	518.9	2,785.3	0.1863
1961	544.8	2,896.9	0.1881	529.9	2,805.2	0.1889
1962	585.7	3,072.4	0.1906	567.8	2,972.8	0.1910
1963	617.8	3,206.7	0.1927	599.2	3,098.2	0.1934
1964	663.6	3,392.3	0.1956	641.5	3,278.0	0.1957
1965	719.1	3,610.1	0.1992	687.5	3,451.3	0.1992
1966	787.7	3,845.3	0.2048	755.8	3,715.8	0.2034
1967	832.4	3,942.5	0.2111	810.0	3,859.0	0.2099
1968	909.8	4,133.4	0.2201	868.4	3,996.3	0.2173
1969	984.4	4,261.8	0.2310	948.1	4,171.1	0.2273
1970	1,038.3	4,269.9	0.2432	1,012.7	4,228.4	0.2395
1971	1,126.8	4,413.3	0.2553	1,080.0	4,294.2	0.2515
1972	1,237.9	4,647.7	0.2663	1,176.5	4,466.6	0.2634
1973	1,382.3	4,917.0	0.2811	1,310.6	4,767.6	0.2749
1974	1,499.5	4,889.9	0.3067	1,438.5	4,882.9	0.2946
1975	1,637.7	4,879.5	0.3356	1,560.2	4,793.2	0.3255
1976	1,824.6	5,141.3	0.3549	1,738.1	4,981.7	0.3489
1977	2,030.1	5,377.7	0.3775	1,973.5	5,262.7	0.3750
1978	2,293.8	5,677.6	0.4040	2,217.5	5,539.6	0.4003
1979	2,562.2	5,855.0	0.4376	2,501.4	5,783.6	0.4325
1980	2,788.1	5,839.0	0.4775	2,724.2	5,787.6	0.4707
1981	3,126.8	5,987.2	0.5222	3,057.0	5,911.8	0.5171
1982	3,253.2	5,870.9	0.5541	3,223.7	5,834.8	0.5525
1983	3,534.6	6,136.2	0.5760	3,440.7	5,965.2	0.5768
1984	3,930.9	6,577.1	0.5977	3,844.4	6,427.7	0.5981
1985	4,217.5	6,849.3	0.6158	4,146.3	6,714.7	0.6175
1986	4,460.1	7,086.5	0.6294	4,403.9	6,970.4	0.6318
1987	4,736.4	7,313.3	0.6476	4,651.4	7,171.4	0.6486
1988	5,100.4	7,613.9	0.6699	5,008.5	7,482.1	0.6694
1989	5,482.1	7,885.9	0.6952	5,399.5	7,764.6	0.6954
1990	5,800.5	8,033.9	0.7220	5,734.5	7,953.5	0.7210
1991	5,992.1	8,015.1	0.7476	5,930.5	7,925.3	0.7483
1992	6,342.3	8,287.1	0.7653	6,242.0	8,129.7	0.7678
1993	6,667.4	8,523.4	0.7822	6,587.3	8,393.6	0.7848
1994	7,085.2	8,870.7	0.7987	6,976.6	8,705.5	0.8014
1995	7,414.7	9,093.7	0.8154	7,341.1	8,970.1	0.8184
1996	7,838.5	9,433.9	0.8309	7,718.3	9,252.3	0.8342
1997	8,332.4	9,854.3	0.8456	8,211.7	9,666.5	0.8495
1998	8,793.5	10,283.5	0.8551	8,663.0	10,069.7	0.8603
1999	9,353.5	10,779.8	0.8677	9,208.4	10,563.7	0.8717
2000	9,951.5	11,216.4	0.8872	9,821.0	11,048.5	0.8889
2001	10,286.2	11,337.5	0.9073	10,225.3	11,237.8	0.9099
2002	10,642.3	11,543.1	0.9220	10,543.9	11,400.0	0.9249
2003	11,142.2	11,836.4	0.9414	10,979.8	11,628.7	0.9442
2004	11,853.3	12,246.9	0.9679	11,685.6	12,066.9	0.9684
2005	12,623.0	12,623.0	1.0000	12,445.7	12,445.7	1.0000
2006	13,377.2	12,958.5	1.0323	13,224.9	12,787.6	1.0342
2007	14,028.7	13,206.4	1.0623	13,891.8	13,039.0	1.0654

Appendix table 4-1

Gross domestic product and implicit price deflators: 1953–2010

Year	Calendar year			Federal fiscal year		
	GDP (billions)		GDP price deflator ^a	GDP (billions)		GDP price deflator ^a
	Current \$	Constant 2005 \$		Current \$	Constant 2005 \$	
2008	14,291.5	13,161.9	1.0858	14,394.1	13,208.0	1.0898
2009	13,939.0	12,703.1	1.0973	14,097.5	12,766.0	1.1043
2010	14,526.5	13,088.0	1.1099	14,508.2	13,038.7	1.1127

GDP = gross domestic product

^a2005 = 1.0000.

SOURCE: Calendar year figures from Bureau of Economic Analysis, Survey of Current Business, 29 July 2011. Fiscal year figures from the Office of Management and Budget, Budget of the United States Government for Fiscal Year 2012, Historical Tables (Table 10.1), 14 February 2011.

Science and Engineering Indicators 2012

Appendix table 4-2

Purchasing power parity, market exchange rate, ratio of market exchange rate to purchasing power parity, for selected countries: 1981–2009

(Foreign currency/U.S. dollars)

Year	Germany	France	United Kingdom	Japan	China	South Korea
PPP						
1981	1.063	0.867	0.504	233.389	1.789	459.316
1982	1.048	0.915	0.510	223.411	1.614	459.558
1983	1.037	0.964	0.517	216.874	1.568	463.651
1984	1.019	0.996	0.521	212.669	1.586	466.778
1985	1.010	1.020	0.535	208.441	1.697	471.992
1986	1.017	1.051	0.542	207.507	1.739	481.189
1987	1.001	1.049	0.554	201.379	1.777	489.851
1988	0.984	1.045	0.569	195.301	1.926	505.256
1989	0.975	1.041	0.589	192.363	2.014	514.749
1990	0.971	1.028	0.611	189.398	2.052	547.089
1991	0.967	1.018	0.628	187.679	2.117	582.349
1992	0.991	1.016	0.636	186.239	2.239	613.518
1993	1.006	1.009	0.641	183.035	2.521	638.963
1994	1.009	1.002	0.637	179.491	2.978	674.027
1995	1.007	0.995	0.641	174.968	3.318	709.563
1996	0.994	0.989	0.642	170.600	3.466	730.915
1997	0.990	0.974	0.635	168.522	3.457	745.844
1998	0.988	0.967	0.645	166.579	3.389	774.028
1999	0.975	0.960	0.653	162.036	3.298	754.893
2000	0.967	0.939	0.636	154.753	3.295	746.209
2001	0.956	0.919	0.627	149.461	3.289	757.832
2002	0.942	0.905	0.628	143.774	3.255	769.772
2003	0.918	0.938	0.641	139.687	3.267	794.241
2004	0.896	0.940	0.632	134.375	3.403	795.778
2005	0.867	0.923	0.636	129.552	3.448	788.920
2006	0.838	0.903	0.627	124.616	3.465	774.748
2007	0.830	0.892	0.645	120.163	3.623	768.270
2008	0.813	0.887	0.639	116.846	3.822	785.718
2009	0.806	0.878	0.642	114.697	3.764	804.718
MER						
1981	1.156	0.828	0.498	220.540	1.705	681.030
1982	1.241	1.002	0.572	249.080	1.893	731.080
1983	1.305	1.162	0.660	237.510	1.976	775.750
1984	1.455	1.332	0.752	237.520	2.320	805.980
1985	1.505	1.370	0.779	238.540	2.937	870.020
1986	1.110	1.056	0.682	168.520	3.453	881.450
1987	0.919	0.916	0.612	144.640	3.722	822.570
1988	0.898	0.908	0.562	128.150	3.722	731.470
1989	0.961	0.973	0.611	137.960	3.765	671.460
1990	0.826	0.830	0.563	144.792	4.783	707.764
1991	0.849	0.860	0.567	134.707	5.323	733.353
1992	0.798	0.807	0.570	126.651	5.515	780.651
1993	0.845	0.863	0.667	111.198	5.762	802.671
1994	0.830	0.846	0.653	102.208	8.619	803.446
1995	0.733	0.761	0.634	94.060	8.351	771.273
1996	0.769	0.780	0.641	108.779	8.314	804.453
1997	0.887	0.890	0.611	120.991	8.290	951.289
1998	0.900	0.899	0.604	130.905	8.279	1401.440
1999	0.939	0.939	0.618	113.907	8.278	1188.820
2000	1.085	1.085	0.661	107.765	8.279	1130.960
2001	1.118	1.118	0.695	121.529	8.277	1290.990
2002	1.063	1.063	0.667	125.388	8.277	1251.090
2003	0.886	0.886	0.612	115.933	8.277	1191.610

Appendix table 4-2

Purchasing power parity, market exchange rate, ratio of market exchange rate to purchasing power parity, for selected countries: 1981–2009

(Foreign currency/U.S. dollars)

Year	Germany	France	United Kingdom	Japan	China	South Korea
2004	0.805	0.805	0.546	108.193	8.277	1145.320
2005	0.804	0.804	0.550	110.218	8.194	1024.120
2006	0.797	0.797	0.543	116.299	7.973	954.791
2007	0.731	0.731	0.500	117.754	7.608	929.257
2008	0.683	0.683	0.544	103.359	6.949	1102.050
2009	0.720	0.720	0.642	93.570	6.831	1276.930
	MER/PPP					
1981	1.087	0.955	0.988	0.945	0.953	1.483
1982	1.184	1.095	1.122	1.115	1.173	1.591
1983	1.258	1.205	1.277	1.095	1.260	1.673
1984	1.428	1.337	1.443	1.117	1.463	1.727
1985	1.490	1.343	1.456	1.144	1.731	1.843
1986	1.091	1.005	1.258	0.812	1.986	1.832
1987	0.918	0.873	1.105	0.718	2.095	1.679
1988	0.913	0.869	0.988	0.656	1.933	1.448
1989	0.986	0.935	1.037	0.717	1.869	1.304
1990	0.851	0.807	0.921	0.764	2.331	1.294
1991	0.878	0.845	0.903	0.718	2.514	1.259
1992	0.805	0.794	0.896	0.680	2.463	1.272
1993	0.840	0.855	1.041	0.608	2.286	1.256
1994	0.823	0.844	1.025	0.569	2.894	1.192
1995	0.728	0.765	0.989	0.538	2.517	1.087
1996	0.774	0.789	0.998	0.638	2.399	1.101
1997	0.896	0.914	0.962	0.718	2.398	1.275
1998	0.911	0.930	0.936	0.786	2.443	1.811
1999	0.963	0.978	0.946	0.703	2.510	1.575
2000	1.122	1.155	1.039	0.696	2.513	1.516
2001	1.169	1.217	1.108	0.813	2.517	1.704
2002	1.128	1.175	1.062	0.872	2.543	1.625
2003	0.965	0.945	0.955	0.830	2.534	1.500
2004	0.898	0.856	0.864	0.805	2.432	1.439
2005	0.927	0.871	0.865	0.851	2.376	1.298
2006	0.951	0.883	0.866	0.933	2.301	1.232
2007	0.881	0.820	0.775	0.980	2.100	1.210
2008	0.840	0.770	0.851	0.885	1.818	1.403
2009	0.893	0.820	1.000	0.816	1.815	1.587

MER = market exchange rate; PPP = purchasing power parity

NOTES: United States = 1.000. Germany data for 1981–90 are for West Germany.

SOURCE: Organisation for Economic Co-operation and Development, Main Science and Technology Indicators (2011/1).

Appendix table 4-3

U.S. research and development expenditures, by performing sector and source of funds: 1953–2009

Year	All		Federal	Industry				U&C					Nonprofit						
	Performer:	performers		Industry	FFRDCs ^a			U&C ^b		FFRDCs			Other nonprofit		FFRDCs ^c				
	Funding	All	Total	Federal ^a	Industry ^d	Total	Total	Federal	Other	Industry	U&C	Other	Total	Total	Federal ^c	Industry	Other	Total	
	source:	sources	Federal	Federal	Industry	FFRDCs	FFRDCs	FFRDCs	government ^e	Industry	U&C	nonprofit	FFRDCs	FFRDCs	FFRDCs	FFRDCs	FFRDCs	FFRDCs	FFRDCs
Current \$millions																			
1953		5,160	1,015	3,630	1,430	2,200	NA	273	149	40	21	37	27	131	112	58	26	28	NA
1954		5,617	963	4,070	1,750	2,320	NA	301	165	45	24	40	29	161	123	61	31	31	NA
1955		6,281	973	4,517	2,057	2,460	123	342	191	50	27	42	32	187	131	64	35	32	9
1956		8,500	1,130	6,272	2,995	3,277	333	391	221	57	32	46	36	217	146	71	37	38	11
1957		9,908	1,297	7,324	3,928	3,396	407	433	242	64	37	51	40	267	167	79	37	51	14
1958		10,915	1,507	8,066	4,436	3,630	323	491	280	72	39	56	45	316	195	95	38	62	18
1959		12,490	1,681	9,200	5,217	3,983	418	586	356	81	40	61	50	349	234	125	42	67	22
1960		13,711	1,801	10,032	5,604	4,428	477	705	453	90	40	67	55	385	264	148	48	68	48
1961		14,564	1,987	10,353	5,685	4,668	555	834	557	101	40	75	62	440	304	169	49	86	92
1962		15,636	2,188	11,037	6,008	5,029	426	993	687	112	41	84	70	500	363	200	54	109	130
1963		17,519	2,558	12,216	6,856	5,360	414	1,178	839	125	41	96	78	580	408	234	55	119	165
1964		19,103	2,965	13,049	7,257	5,792	463	1,375	995	138	41	114	88	629	417	250	55	112	205
1965		20,252	3,156	13,812	7,367	6,445	373	1,595	1,167	150	42	136	101	630	472	286	62	124	215
1966		22,072	3,308	15,193	7,977	7,216	355	1,818	1,335	160	45	165	114	652	537	329	70	138	210
1967		23,346	3,444	15,966	7,946	8,020	419	2,035	1,491	168	52	200	126	696	561	342	74	145	225
1968		24,666	3,497	17,014	8,145	8,869	415	2,187	1,586	185	58	221	139	722	596	364	81	151	235
1969		25,996	3,790	17,844	7,987	9,857	464	2,280	1,624	208	61	233	155	731	642	388	93	161	245
1970		26,271	4,154	17,594	7,306	10,288	473	2,418	1,686	237	66	259	171	727	677	410	95	172	230
1971		26,952	4,409	17,829	7,175	10,654	491	2,565	1,760	262	72	290	182	735	709	427	98	184	215
1972		28,740	4,676	19,004	7,469	11,535	548	2,757	1,890	282	79	312	195	785	771	472	101	198	200
1973		30,952	4,837	20,704	7,600	13,104	545	2,953	2,009	302	90	343	211	841	882	566	105	211	190
1974		33,359	5,132	22,239	7,572	14,667	648	3,216	2,160	320	104	393	239	926	988	639	114	235	210
1975		35,671	5,561	23,460	7,878	15,582	727	3,570	2,400	348	118	432	272	1,067	1,062	675	124	262	225
1976		39,435	5,890	26,107	8,671	17,436	890	3,899	2,619	369	131	480	300	1,266	1,139	711	135	292	245
1977		43,338	6,211	28,863	9,523	19,340	962	4,346	2,893	394	155	569	337	1,467	1,213	740	147	326	275
1978		48,719	6,962	32,222	10,107	22,115	1,082	4,996	3,329	443	182	679	364	1,772	1,353	830	160	363	333
1979		55,379	7,471	37,062	11,354	25,708	1,164	5,715	3,848	482	215	785	386	2,013	1,564	985	174	405	390
1980		63,224	7,831	43,228	12,752	30,476	1,277	6,455	4,335	519	264	920	419	2,306	1,658	1,017	189	452	469
1981		72,292	8,605	50,425	14,997	35,428	1,385	7,085	4,670	581	314	1,058	463	2,484	1,784	1,075	206	504	524
1982		80,748	9,501	57,166	17,061	40,105	1,484	7,603	4,879	621	363	1,207	534	2,544	1,915	1,129	224	561	536
1983		89,950	10,830	63,683	19,095	44,588	1,585	8,251	5,210	658	432	1,357	595	2,840	2,176	1,306	244	626	585
1984		102,244	11,916	73,061	21,657	51,404	1,739	9,154	5,748	721	518	1,514	654	3,243	2,511	1,548	265	698	620
1985		114,671	13,093	82,376	25,333	57,043	1,863	10,308	6,388	834	630	1,743	713	3,616	2,761	1,694	289	778	655
1986		120,249	13,504	85,932	26,000	59,932	1,891	11,540	7,028	969	745	2,019	780	3,973	2,867	1,686	314	867	541
1987		126,360	13,588	90,160	28,757	61,403	1,995	12,807	7,768	1,065	831	2,262	882	4,287	3,013	1,704	342	967	509
1988		133,881	14,342	94,893	28,221	66,672	2,122	14,221	8,593	1,165	933	2,527	1,003	4,581	3,213	1,762	372	1,078	510
1989		141,891	15,231	99,860	26,359	73,501	2,195	15,634	9,317	1,274	1,061	2,852	1,131	4,756	3,669	2,062	405	1,202	547
1990		151,993	15,671	107,404	25,802	81,602	2,323	16,939	9,939	1,399	1,166	3,187	1,249	4,894	4,126	2,346	440	1,340	636
1991		160,876	15,249	114,675	24,095	90,580	2,277	18,206	10,667	1,483	1,242	3,458	1,358	5,120	4,652	2,679	479	1,494	696

Appendix table 4-3

U.S. research and development expenditures, by performing sector and source of funds: 1953–2009

Year	All		Industry					U&C					Nonprofit						
	Performer:	performers	Federal	Industry		Industry	U&C ^b		U&C		Other nonprofit		Nonprofit						
	Funding	All		Total	FFRDCs ^a	Other	FFRDCs	Other	FFRDCs	Total	Other	FFRDCs ^c							
	source:	sources	Federal	Federal ^a	Industry ^d	Total	Total	Federal	government ^e	Industry	U&C	nonprofit	Total	Total	Federal ^c	Industry	nonprofit	Other	Total
1992		165,350	15,853	116,757	22,369	94,388	2,353	19,388	11,528	1,525	1,320	3,569	1,448	5,259	4,993	2,806	521	1,666	748
1993		165,730	16,531	115,435	20,844	94,591	1,965	20,495	12,307	1,557	1,392	3,709	1,531	5,289	5,267	2,843	567	1,857	749
1994		169,207	16,355	117,392	20,261	97,131	2,202	21,607	12,996	1,623	1,456	3,938	1,595	5,294	5,599	2,911	617	2,071	758
1995		183,625	16,904	129,830	21,178	108,652	2,273	22,617	13,592	1,751	1,548	4,110	1,617	5,367	5,827	2,847	671	2,308	808
1996		197,346	16,585	142,371	21,356	121,015	2,297	23,718	14,084	1,861	1,672	4,436	1,666	5,395	6,209	2,906	730	2,574	772
1997		212,152	16,819	155,409	21,798	133,611	2,130	24,884	14,530	1,922	1,808	4,838	1,786	5,463	6,626	3,014	809	2,804	821
1998		226,457	17,362	167,102	22,086	145,016	2,078	26,181	15,174	1,972	1,950	5,163	1,922	5,559	7,332	3,281	859	3,192	843
1999		245,007	17,851	182,090	20,496	161,594	2,039	28,176	16,264	2,098	2,082	5,619	2,112	5,652	8,207	3,761	931	3,516	993
2000		267,983	18,374	199,961	17,117	182,844	2,001	30,705	17,727	2,247	2,174	6,232	2,326	5,742	9,734	4,510	1,020	4,204	1,465
2001		279,755	22,374	202,017	16,899	185,118	2,020	33,743	19,784	2,397	2,190	6,827	2,546	6,225	11,182	5,488	1,029	4,666	2,192
2002		278,744	23,798	193,868	16,401	177,467	2,263	37,215	22,395	2,557	2,160	7,344	2,758	7,102	12,179	5,778	998	5,404	2,319
2003		291,239	24,982	200,724	17,798	182,926	2,458	40,484	25,129	2,742	2,129	7,650	2,833	7,301	12,796	5,945	1,020	5,831	2,494
2004		302,503	24,898	208,301	20,266	188,035	2,485	43,122	27,168	2,883	2,190	7,936	2,945	7,659	13,394	6,537	1,041	5,816	2,644
2005		324,993	26,322	226,159	21,909	204,250	2,601	45,190	28,254	2,922	2,323	8,578	3,113	7,817	14,077	6,545	1,107	6,425	2,828
2006		350,162	28,240	247,669	24,304	223,365	3,122	46,955	28,810	3,021	2,509	9,285	3,329	7,306	13,928	6,044	1,182	6,702	2,943
2007		376,960	29,859	269,267	26,585	242,682	5,165	49,010	29,351	3,265	2,741	9,959	3,694	5,567	14,777	5,980	1,257	7,541	3,316
2008		403,040	29,839	290,681	36,360	254,321	6,346	51,650	30,341	3,518	3,004	10,707	4,080	4,766	16,035	6,236	1,301	8,498	3,724
2009		400,458	30,901	282,393	39,573	242,820	6,446	54,382	31,575	3,675	3,279	11,436	4,418	4,968	17,531	7,133	1,258	9,141	3,835
Constant 2005 \$millions																			
1953		31,931	6,281	22,463	8,849	13,614	NA	1,686	922	244	127	226	167	811	690	356	161	173	NA
1954		34,437	5,902	24,955	10,730	14,225	NA	1,846	1,009	273	144	242	178	984	751	371	190	190	NA
1955		37,871	5,865	27,234	12,402	14,832	742	2,062	1,152	301	163	253	193	1,127	790	386	211	193	51
1956		49,548	6,590	36,561	17,459	19,102	1,941	2,279	1,288	329	184	268	210	1,265	848	411	216	222	64
1957		55,893	7,318	41,315	22,158	19,157	2,296	2,443	1,362	361	206	288	226	1,503	939	443	209	288	79
1958		60,220	8,312	44,501	24,474	20,027	1,782	2,709	1,545	397	215	306	246	1,741	1,076	524	210	342	99
1959		68,106	9,167	50,168	28,448	21,719	2,279	3,195	1,939	439	215	333	270	1,903	1,273	679	229	365	120
1960		73,737	9,684	53,951	30,137	23,813	2,565	3,789	2,433	484	215	360	296	2,070	1,420	796	258	366	258
1961		77,444	10,567	55,051	30,229	24,821	2,951	4,432	2,959	534	213	396	330	2,340	1,616	899	261	457	487
1962		82,022	11,476	57,897	31,516	26,381	2,235	5,206	3,601	588	212	441	365	2,623	1,904	1,049	283	572	682
1963		90,932	13,280	63,407	35,586	27,821	2,149	6,114	4,352	649	210	498	405	3,008	2,118	1,215	285	618	856
1964		97,653	15,158	66,706	37,098	29,609	2,367	7,026	5,086	703	207	580	450	3,215	2,132	1,278	281	573	1,048
1965		101,672	15,845	69,340	36,985	32,356	1,873	8,005	5,859	751	208	683	505	3,160	2,370	1,436	311	623	1,079
1966		107,747	16,147	74,167	38,941	35,226	1,733	8,875	6,517	781	220	803	554	3,180	2,619	1,604	342	674	1,025
1967		110,576	16,314	75,620	37,635	37,985	1,985	9,638	7,059	796	244	945	594	3,296	2,657	1,620	350	687	1,066
1968		112,063	15,888	77,298	37,004	40,294	1,885	9,936	7,206	838	261	1,002	629	3,280	2,708	1,654	368	686	1,068
1969		112,544	16,409	77,253	34,578	42,674	2,009	9,871	7,029	901	262	1,009	671	3,165	2,777	1,678	403	697	1,061
1970		108,038	17,082	72,353	30,045	42,308	1,945	9,942	6,931	975	269	1,063	703	2,988	2,782	1,684	391	707	946
1971		105,561	17,268	69,830	28,102	41,728	1,923	10,046	6,891	1,026	282	1,134	713	2,877	2,775	1,670	384	721	842
1972		107,905	17,555	71,351	28,042	43,308	2,057	10,351	7,096	1,059	297	1,170	730	2,947	2,893	1,770	379	743	751
1973		110,098	17,204	73,647	27,034	46,612	1,939	10,504	7,144	1,072	318	1,220	749	2,992	3,137	2,013	373	751	676

Appendix table 4-3

U.S. research and development expenditures, by performing sector and source of funds: 1953–2009

Year	All		Industry						U&C			Nonprofit							
	Performer:	performers	Federal	Industry		Industry		U&C ^b			U&C		Other nonprofit		Nonprofit				
	Funding	All		Total	Federal ^a	Industry ^d	FFRDCs ^a		Other			FFRDCs		Other		FFRDCs ^c			
	source:	sources	Federal	Total	Federal ^a	Industry ^d	Total	Federal	government ^e	Industry	U&C	Other nonprofit	Total	Total	Federal ^c	Industry	Other nonprofit	Total	
1974		108,784	16,737	72,522	24,692	47,829	2,113	10,486	7,044	1,044	339	1,280	779	3,020	3,222	2,082	373	767	685
1975		106,282	16,570	69,899	23,472	46,426	2,166	10,635	7,151	1,037	352	1,286	810	3,179	3,163	2,011	370	781	670
1976		111,118	16,597	73,563	24,433	49,131	2,508	10,985	7,380	1,040	369	1,353	844	3,566	3,208	2,003	381	824	690
1977		114,802	16,454	76,458	25,226	51,231	2,548	11,512	7,662	1,044	409	1,506	891	3,887	3,214	1,961	390	864	728
1978		120,589	17,233	79,756	25,017	54,739	2,678	12,365	8,239	1,097	449	1,681	900	4,385	3,350	2,054	396	900	823
1979		126,549	17,073	84,692	25,946	58,747	2,660	13,058	8,793	1,100	490	1,794	881	4,599	3,575	2,251	398	926	891
1980		132,407	16,399	90,531	26,706	63,825	2,674	13,518	9,078	1,086	552	1,926	877	4,829	3,473	2,130	397	946	982
1981		138,425	16,476	96,554	28,716	67,838	2,652	13,566	8,941	1,112	601	2,025	887	4,757	3,417	2,058	395	964	1,003
1982		145,722	17,146	103,165	30,789	72,376	2,678	13,720	8,804	1,121	655	2,177	963	4,590	3,456	2,038	405	1,013	967
1983		156,156	18,800	110,556	33,150	77,406	2,752	14,324	9,045	1,142	750	2,355	1,032	4,931	3,777	2,266	424	1,087	1,016
1984		171,072	19,937	122,244	36,236	86,008	2,910	15,315	9,617	1,206	866	2,533	1,093	5,427	4,202	2,590	444	1,168	1,038
1985		186,227	21,263	133,780	41,141	92,639	3,026	16,740	10,374	1,354	1,023	2,831	1,158	5,872	4,483	2,751	469	1,264	1,063
1986		191,059	21,457	136,534	41,311	95,224	3,005	18,336	11,166	1,540	1,184	3,207	1,239	6,312	4,556	2,678	499	1,378	860
1987		195,108	20,981	139,213	44,403	94,810	3,080	19,775	11,994	1,644	1,283	3,493	1,361	6,620	4,653	2,632	528	1,493	786
1988		199,858	21,410	141,657	42,128	99,528	3,168	21,229	12,828	1,739	1,393	3,772	1,497	6,838	4,796	2,631	555	1,610	761
1989		204,107	21,909	143,647	37,917	105,730	3,157	22,489	13,402	1,833	1,526	4,103	1,627	6,841	5,277	2,966	582	1,729	787
1990		210,515	21,705	148,758	35,737	113,022	3,217	23,461	13,766	1,938	1,614	4,413	1,730	6,778	5,715	3,249	610	1,856	881
1991		215,189	20,398	153,391	32,230	121,161	3,046	24,353	14,268	1,983	1,661	4,625	1,816	6,849	6,223	3,583	641	1,999	931
1992		216,053	20,714	152,559	29,228	123,331	3,075	25,333	15,062	1,993	1,724	4,663	1,891	6,872	6,524	3,666	681	2,177	977
1993		211,865	21,132	147,569	26,646	120,922	2,512	26,200	15,733	1,990	1,779	4,741	1,957	6,761	6,734	3,635	725	2,374	958
1994		211,847	20,477	146,975	25,367	121,608	2,757	27,051	16,270	2,031	1,823	4,930	1,996	6,628	7,009	3,645	772	2,592	949
1995		225,206	20,731	159,229	25,974	133,255	2,788	27,738	16,670	2,148	1,898	5,041	1,983	6,583	7,146	3,492	823	2,831	991
1996		237,513	19,960	171,348	25,703	145,646	2,765	28,545	16,951	2,240	2,012	5,338	2,004	6,493	7,473	3,497	879	3,097	929
1997		250,901	19,891	183,794	25,779	158,015	2,519	29,429	17,183	2,273	2,138	5,722	2,113	6,461	7,837	3,565	956	3,316	971
1998		264,829	20,304	195,416	25,828	169,588	2,430	30,617	17,745	2,306	2,280	6,038	2,247	6,501	8,574	3,837	1,005	3,733	986
1999		282,368	20,573	209,856	23,621	186,235	2,350	32,472	18,744	2,418	2,399	6,476	2,434	6,514	9,458	4,334	1,073	4,052	1,144
2000		302,045	20,710	225,378	19,293	206,085	2,255	34,608	19,980	2,532	2,450	7,024	2,622	6,472	10,971	5,083	1,149	4,739	1,651
2001		308,347	24,661	222,664	18,626	204,038	2,227	37,192	21,806	2,642	2,414	7,525	2,806	6,862	12,325	6,049	1,134	5,142	2,416
2002		302,337	25,812	210,278	17,789	192,488	2,455	40,365	24,291	2,774	2,343	7,965	2,992	7,703	13,210	6,267	1,083	5,861	2,515
2003		309,385	26,539	213,230	18,907	194,323	2,611	43,006	26,695	2,913	2,262	8,127	3,009	7,756	13,594	6,315	1,084	6,194	2,649
2004		312,548	25,724	215,218	20,939	194,279	2,568	44,554	28,070	2,979	2,262	8,200	3,043	7,913	13,839	6,754	1,076	6,009	2,732
2005		324,993	26,322	226,159	21,909	204,250	2,601	45,190	28,254	2,922	2,323	8,578	3,113	7,817	14,077	6,545	1,107	6,425	2,828
2006		339,202	27,356	239,917	23,543	216,374	3,024	45,485	27,908	2,926	2,431	8,995	3,225	7,078	13,492	5,854	1,145	6,492	2,851

Appendix table 4-3

U.S. research and development expenditures, by performing sector and source of funds: 1953–2009

Year	All		Federal	Industry				U&C			Nonprofit								
	Performer:	performers		Total	Federal ^a	Industry ^d	Total	U&C ^b		Total	Other nonprofit		Total						
	Funding source:	All sources						FFRDCs ^a	Other government ^e		Other	FFRDCs		Federal ^c	Industry	Other			
2007		354,864	28,109	253,484	25,027	228,457	4,862	46,137	27,631	3,074	2,580	9,375	3,478	5,241	13,911	5,629	1,183	7,099	3,121
2008		371,184	27,480	267,706	33,486	234,219	5,844	47,568	27,943	3,240	2,767	9,861	3,757	4,389	14,767	5,743	1,198	7,827	3,429
2009		364,951	28,161	257,355	36,064	221,290	5,875	49,561	28,775	3,349	2,988	10,422	4,026	4,528	15,977	6,501	1,146	8,330	3,495

NA = not available, included in figures for federal support to industry and federal support to nonprofit institutions

FFRDC = federally funded research and development center; U&C = universities and colleges.

^aFederal support for industry in 1953–54 did not separate federal support for industry and for industry FFRDCs; thus, the figures for federal support to industry include support to FFRDCs for those years.

^bAdjustments made to U&C R&D for 1998 and later years to eliminate double counting of funds passed through from one academic institution to another. Data for 1998 and later years not directly comparable with data for 1997 and earlier years. For FY 1998, \$479 million in total passthrough funds and \$421 million in federal passthrough funds reported. For FY 2009, \$1,873 million in total passthrough funds and \$1,660 million in federal passthrough funds estimated.

^cFederal support for nonprofit FFRDCs in 1953–54 did not separate federal support for other nonprofits and for nonprofit FFRDCs; thus, the figure for federal support to other nonprofit institutions includes support to FFRDCs for those years.

^dIndustry sources of funding for industry R&D expenditures include all nonfederal sources of funding for industry R&D expenditures.

^eBecause of limitations in survey information, data on other government funding to performers other than U&C not available and consequently included in other sectors' support for their own R&D performance, e.g., other government support to other nonprofits included in other nonprofit support for their own R&D.

NOTES: Technical notes explaining methodological issues of measurement available on request. Data based on annual reports by performers, except for the nonprofit sector (where some figures after 1997 involve estimates). R&D expenditures of FFRDCs are chiefly federal funds, but any nonfederal funds also included in totals. For trend comparisons, use only historical data reported here; do not use data published earlier. Expenditures for industry and, prior to 2001, for industry-administered FFRDCs collected by calendar year. Expenditures for other performers are calendar-year approximations based on fiscal year data. In most cases, the approximation equals 75% of amount reported in same fiscal year plus 25% of amount reported in subsequent fiscal year. However, fiscal year for academic performers generally begins 1 July, not 1 October; also, prior to 1977, federal fiscal year began on 1 July, not 1 October. Therefore, calendar-year approximations for academic performers and federal performers prior to 1977 equal 50% of amount reported in same fiscal year plus 50% of amount reported in subsequent fiscal year. Detail may not add to total because of rounding. Constant-dollar estimates derived from unrounded data. Los Alamos National Laboratory (some \$2 billion in annual R&D expenditures in recent years) became industry administered in June 2006; previously, it was U&C administered. Lawrence Livermore National Laboratory (more than \$1 billion in annual R&D expenditures in recent years) became industry administered in October 2007; previously, it was U&C administered. The tracks of R&D expenditures from 2006 to 2008 for both industry- and U&C-administered FFRDCs reflect these shifts.

SOURCES: National Science Foundation, National Center for Science and Engineering Statistics (NSF/NCSES), National Patterns of R&D Resources (annual series); NSF/NCSES, Business R&D and Innovation Survey, 2009; NSF/NCSES, Survey of R&D Expenditures at Universities and Colleges, FY 2009; NSF/NCSES, Federal Funds for R&D: FY 2009–11; NSF/NCSES, Survey of R&D Expenditures at FFRDCs, FY 2009; and NSF/NCSES, R&D Funding and Performance by Nonprofit Organizations: FY 1996–97. All NSF/NCSES reports available at <http://www.nsf.gov/statistics/>.

Appendix table 4-4

U.S. basic research expenditures, by performing sector and source of funds: 1953–2009

Year	All performers		Federal	Industry				U&C ^c				U&C FFRDCs			Other nonprofit			Nonprofit FFRDCs ^d	
	Performer:	All		Total	Federal ^b	Industry ^e	Total	Total	Federal	Other			Total	Total	Federal ^d	Industry	Other nonprofit	Total	
	Funding source:	sources	Other government ^f							Industry	U&C	Other nonprofit							
	Current \$millions																		
1953		460	102	151	19	132	NA	123	82	7	13	6	16	36	48	27	9	12	NA
1954		509	96	166	23	143	NA	148	97	10	15	8	18	44	55	31	11	13	NA
1955		579	98	189	27	162	NA	180	117	14	17	12	21	50	63	36	13	14	NA
1956		718	114	253	37	216	NA	220	143	19	20	15	24	58	74	42	15	17	NA
1957		814	124	271	41	230	NA	261	167	25	23	20	27	72	87	49	15	23	NA
1958		944	149	295	43	252	NA	312	202	31	24	24	31	85	103	59	16	28	NA
1959		1,087	165	320	72	248	NA	388	263	38	24	28	36	95	120	72	18	30	NA
1960		1,286	184	376	79	297	NA	485	341	45	25	33	41	106	136	85	21	30	NA
1961		1,512	230	395	81	314	NA	598	432	54	25	40	48	126	164	105	22	37	NA
1962		1,824	252	488	143	345	NA	737	546	64	25	48	55	148	200	130	24	46	NA
1963		2,115	285	522	147	375	NA	909	689	75	25	58	63	175	225	150	25	50	NA
1964		2,396	339	507	123	384	42	1,071	824	84	25	70	68	200	238	166	25	47	NA
1965		2,664	375	563	157	406	29	1,221	944	94	27	86	70	218	260	179	29	52	NA
1966		2,930	410	593	142	451	31	1,380	1,066	104	29	106	75	239	278	188	32	58	NA
1967		3,168	434	595	168	427	34	1,554	1,188	114	34	136	83	263	289	194	34	61	NA
1968		3,376	482	607	145	462	35	1,681	1,265	131	38	156	91	276	296	196	37	63	NA
1969		3,491	545	581	123	458	37	1,754	1,288	153	40	171	103	272	302	192	43	67	NA
1970		3,594	562	566	122	444	36	1,855	1,323	179	43	196	115	265	311	195	44	72	NA
1971		3,720	581	557	101	456	33	1,968	1,385	194	50	214	127	252	329	207	45	77	NA
1972		3,850	603	554	91	463	39	2,038	1,437	195	55	216	134	270	347	216	47	84	NA
1973		4,099	652	595	96	499	36	2,103	1,489	196	59	223	137	343	371	232	49	90	NA
1974		4,511	715	650	114	536	49	2,282	1,609	204	66	250	153	415	401	245	54	102	NA
1975		4,875	760	677	104	573	53	2,480	1,768	212	72	264	164	476	430	255	59	116	NA
1976		5,373	850	750	116	634	69	2,675	1,924	218	75	283	175	556	474	278	65	131	NA
1977		6,008	943	836	135	701	75	2,967	2,114	232	89	334	198	667	521	301	72	148	NA
1978		6,959	1,044	941	156	785	94	3,376	2,399	260	107	398	213	906	598	351	79	168	NA
1979		7,836	1,112	1,054	161	893	104	3,828	2,719	286	128	466	229	1,050	689	413	87	190	NA
1980		8,745	1,212	1,205	170	1,035	120	4,315	3,061	307	156	544	248	1,167	726	416	95	215	NA
1981		9,658	1,343	1,477	164	1,313	137	4,737	3,331	338	183	615	269	1,284	671	324	105	243	9
1982		10,651	1,522	1,776	253	1,523	128	5,091	3,475	368	215	716	317	1,366	759	369	115	275	9
1983		11,880	1,733	2,106	346	1,760	117	5,518	3,689	396	260	816	358	1,536	863	426	127	311	8
1984		13,332	1,877	2,472	340	2,132	136	6,145	4,087	436	313	915	395	1,709	984	494	139	351	9
1985		14,748	1,947	2,731	358	2,373	131	7,024	4,606	514	389	1,075	440	1,793	1,110	560	153	397	13
1986		17,154	2,026	3,930	434	3,496	117	7,943	5,122	606	466	1,262	488	1,915	1,210	594	168	449	13
1987		18,481	2,047	4,181	598	3,583	142	8,644	5,527	659	514	1,399	545	2,086	1,367	675	185	507	14
1988		19,787	2,116	4,163	656	3,507	337	9,344	5,937	705	565	1,530	607	2,272	1,531	756	203	573	24
1989		21,891	2,309	4,818	986	3,832	398	10,219	6,422	766	637	1,714	680	2,371	1,730	860	223	647	46
1990		23,029	2,319	4,629	869	3,760	499	11,126	6,889	847	705	1,929	756	2,470	1,922	947	245	730	65
1991		27,140	2,378	7,376	1,251	6,125	461	12,062	7,423	912	764	2,127	836	2,657	2,129	1,036	269	825	77

Appendix table 4-4

U.S. basic research expenditures, by performing sector and source of funds: 1953–2009

Year	All performers		Industry				U&C						Nonprofit						
	Funding source:	All sources	Federal	Industry ^a		FFRDCs ^b		U&C ^c			FFRDCs		Other nonprofit		FFRDCs ^d				
			Federal	Total	Federal ^b	Industry ^e	Total	Total	Federal	Other government ^f	Industry	U&C	Other nonprofit	Total	Federal ^d	Industry	Other nonprofit	Total	
1992		27,604	2,419	6,528	712	5,816	474	12,910	8,058	941	814	2,203	893	2,867	2,340	1,114	295	931	67
1993		28,743	2,621	6,427	466	5,961	492	13,646	8,638	952	851	2,268	936	2,953	2,532	1,157	324	1,051	72
1994		29,651	2,547	6,514	436	6,078	503	14,401	9,139	992	890	2,406	974	2,934	2,678	1,137	356	1,186	75
1995		29,610	2,689	5,569	190	5,379	530	15,147	9,634	1,070	945	2,511	987	2,702	2,899	1,170	390	1,338	75
1996		32,799	2,680	7,498	650	6,848	708	16,042	10,092	1,149	1,032	2,740	1,028	2,606	3,187	1,248	428	1,510	79
1997		36,921	2,746	9,795	1,029	8,766	625	17,654	10,924	1,248	1,175	3,144	1,162	2,671	3,322	1,317	449	1,557	108
1998		35,372	3,003	5,853	1,002	4,851	568	19,365	11,941	1,330	1,315	3,483	1,296	2,660	3,710	1,461	477	1,773	213
1999		38,935	3,347	6,645	1,108	5,537	557	21,022	12,892	1,432	1,421	3,835	1,442	2,765	4,203	1,734	517	1,952	397
2000		42,759	3,765	7,040	925	6,115	547	22,917	13,966	1,550	1,499	4,298	1,604	2,874	5,000	2,099	566	2,334	616
2001		47,751	4,260	8,053	754	7,299	552	25,240	15,553	1,663	1,519	4,737	1,767	3,104	5,626	2,464	571	2,590	915
2002		51,383	4,511	7,547	888	6,659	534	27,970	17,724	1,768	1,494	5,077	1,907	3,714	6,129	2,575	554	3,000	979
2003		54,611	4,664	8,330	1,386	6,944	299	30,023	19,658	1,850	1,438	5,165	1,913	3,747	6,519	2,714	567	3,238	1,029
2004		56,092	4,697	7,835	1,072	6,763	175	31,989	21,150	1,958	1,488	5,392	2,001	3,730	6,596	2,788	578	3,229	1,070
2005		59,686	4,770	8,667	1,108	7,559	136	34,028	22,186	2,042	1,624	5,999	2,177	3,820	7,084	2,903	614	3,568	1,181
2006		61,199	4,716	8,384	1,444	6,940	652	35,635	22,690	2,155	1,791	6,624	2,376	3,344	7,227	2,849	656	3,721	1,242
2007		66,206	4,621	11,268	2,780	8,488	2,258	37,271	23,043	2,363	1,983	7,207	2,674	1,724	7,714	2,829	698	4,187	1,350
2008		70,220	4,957	12,368	1,475	10,893	2,423	38,840	23,500	2,533	2,162	7,708	2,937	1,672	8,514	3,073	722	4,719	1,447
2009		75,969	5,507	14,784	1,340	13,444	2,550	40,543	24,242	2,627	2,344	8,173	3,158	1,808	9,270	3,496	698	5,075	1,508
Constant 2005 \$millions																			
1953		2,843	628	934	118	817	NA	761	504	40	80	37	99	223	297	167	56	74	NA
1954		3,118	589	1,018	141	877	NA	904	592	59	92	52	110	270	337	190	67	80	NA
1955		3,491	588	1,140	163	977	NA	1,082	702	84	102	70	124	301	380	217	78	84	NA
1956		4,185	662	1,475	216	1,259	NA	1,282	831	111	114	90	137	338	428	242	87	99	NA
1957		4,589	699	1,529	231	1,297	NA	1,470	939	140	127	111	152	403	488	274	85	130	NA
1958		5,205	822	1,628	237	1,390	NA	1,721	1,114	171	132	132	171	469	566	323	88	154	NA
1959		5,927	897	1,745	393	1,352	NA	2,116	1,431	205	131	155	194	515	654	393	98	164	NA
1960		6,916	987	2,022	425	1,597	NA	2,606	1,831	242	132	180	220	570	731	457	113	161	NA
1961		8,037	1,220	2,100	431	1,670	NA	3,177	2,294	285	133	212	253	667	872	558	117	197	NA
1962		9,568	1,322	2,560	750	1,810	NA	3,863	2,862	334	131	251	286	774	1,049	682	126	241	NA
1963		10,978	1,477	2,709	763	1,946	NA	4,716	3,576	389	127	299	324	908	1,168	779	130	260	NA
1964		12,248	1,733	2,592	629	1,963	215	5,472	4,210	431	128	356	348	1,020	1,217	849	128	240	NA
1965		13,374	1,880	2,826	788	2,038	146	6,127	4,737	474	133	432	351	1,092	1,303	896	146	261	NA
1966		14,303	2,001	2,895	693	2,202	151	6,737	5,204	505	142	520	366	1,164	1,355	915	156	283	NA
1967		15,002	2,053	2,818	796	2,022	161	7,358	5,624	539	159	642	393	1,246	1,366	916	161	289	NA
1968		15,338	2,190	2,758	659	2,099	159	7,635	5,747	594	170	710	413	1,252	1,345	890	168	286	NA
1969		15,112	2,360	2,515	533	1,983	160	7,591	5,574	662	171	741	444	1,178	1,307	831	186	290	NA
1970		14,780	2,311	2,328	502	1,826	148	7,628	5,439	738	177	805	471	1,088	1,277	800	181	296	NA
1971		14,571	2,276	2,182	396	1,786	129	7,708	5,423	758	194	838	495	987	1,289	811	176	302	NA
1972		14,455	2,262	2,080	342	1,738	146	7,650	5,395	734	206	811	503	1,014	1,303	811	176	315	NA
1973		14,582	2,319	2,116	341	1,775	128	7,481	5,295	698	208	794	486	1,220	1,318	823	174	320	NA

Appendix table 4-4

U.S. basic research expenditures, by performing sector and source of funds: 1953–2009

Year	All		Industry					U&C						Nonprofit					
	Performer:	performers	Federal	Industry ^a		FFRDCs ^b	U&C ^c			FFRDCs	Other nonprofit		FFRDCs ^d						
	Funding	All	Federal	Total	Federal ^b	Industry ^e	Total	Total	Federal	Other	Industry	U&C	Other	Total	Total	Federal ^d	Industry	Other	Total
	source:	sources	Federal	Total	Federal ^b	Industry ^e	Total	Total	Federal	government ^f	Industry	U&C	nonprofit	Total	Total	Federal ^d	Industry	nonprofit	Total
1974		14,709	2,331	2,120	372	1,748	160	7,440	5,247	665	215	816	497	1,352	1,307	799	176	333	NA
1975		14,524	2,264	2,017	310	1,707	158	7,388	5,268	633	213	785	489	1,417	1,281	760	177	344	NA
1976		15,140	2,395	2,113	327	1,786	194	7,536	5,421	613	211	798	492	1,567	1,334	782	184	369	NA
1977		15,916	2,498	2,215	358	1,857	199	7,858	5,600	614	236	885	523	1,766	1,380	798	190	392	NA
1978		17,224	2,585	2,329	386	1,943	233	8,356	5,938	643	264	986	526	2,242	1,480	869	195	415	NA
1979		17,907	2,542	2,409	368	2,041	238	8,746	6,213	653	291	1,065	523	2,398	1,574	943	198	434	NA
1980		18,314	2,539	2,524	356	2,168	251	9,037	6,409	643	326	1,139	519	2,443	1,520	871	200	450	NA
1981		18,492	2,571	2,828	314	2,514	262	9,069	6,378	647	350	1,178	516	2,459	1,286	620	201	465	17
1982		19,221	2,746	3,205	457	2,748	231	9,187	6,270	664	389	1,293	572	2,466	1,370	666	208	496	16
1983		20,624	3,008	3,656	601	3,055	203	9,579	6,403	687	451	1,417	621	2,666	1,498	739	220	539	14
1984		22,306	3,140	4,136	569	3,567	228	10,281	6,837	729	523	1,531	661	2,859	1,647	827	233	588	15
1985		23,951	3,162	4,435	581	3,854	213	11,407	7,479	835	632	1,747	714	2,911	1,802	909	248	645	20
1986		27,255	3,219	6,244	690	5,555	186	12,620	8,137	962	740	2,005	775	3,043	1,923	943	267	713	21
1987		28,536	3,161	6,456	923	5,532	219	13,346	8,533	1,017	794	2,161	842	3,221	2,110	1,043	285	783	22
1988		29,538	3,159	6,215	979	5,235	503	13,948	8,862	1,053	843	2,284	906	3,391	2,286	1,129	303	855	36
1989		31,489	3,321	6,931	1,418	5,512	573	14,700	9,238	1,101	917	2,466	978	3,411	2,488	1,237	320	930	67
1990		31,896	3,212	6,411	1,204	5,208	691	15,410	9,541	1,173	977	2,672	1,047	3,421	2,662	1,312	339	1,012	89
1991		36,302	3,181	9,866	1,673	8,193	617	16,134	9,929	1,220	1,022	2,845	1,118	3,554	2,848	1,386	359	1,103	103
1992		36,068	3,160	8,530	930	7,599	619	16,868	10,529	1,230	1,064	2,878	1,167	3,746	3,058	1,456	385	1,217	87
1993		36,744	3,350	8,216	596	7,620	629	17,445	11,043	1,218	1,088	2,900	1,197	3,775	3,236	1,479	414	1,343	92
1994		37,123	3,189	8,156	546	7,610	630	18,029	11,441	1,241	1,114	3,013	1,220	3,673	3,353	1,423	445	1,485	93
1995		36,315	3,298	6,830	233	6,597	650	18,576	11,815	1,312	1,159	3,079	1,211	3,313	3,555	1,435	479	1,642	93
1996		39,475	3,225	9,024	782	8,242	852	19,306	12,146	1,383	1,242	3,297	1,238	3,136	3,836	1,502	516	1,817	95
1997		43,664	3,247	11,584	1,217	10,367	739	20,878	12,920	1,476	1,390	3,718	1,374	3,159	3,929	1,557	531	1,841	127
1998		41,366	3,511	6,845	1,172	5,673	664	22,647	13,964	1,556	1,538	4,073	1,516	3,111	4,339	1,708	558	2,073	249
1999		44,872	3,857	7,658	1,276	6,381	642	24,228	14,858	1,650	1,637	4,420	1,662	3,186	4,843	1,998	596	2,250	457
2000		48,193	4,243	7,935	1,043	6,892	616	25,830	15,741	1,746	1,690	4,844	1,808	3,239	5,636	2,366	638	2,631	694
2001		52,631	4,696	8,876	831	8,045	609	27,819	17,143	1,833	1,675	5,222	1,947	3,421	6,201	2,716	630	2,855	1,009
2002		55,732	4,892	8,186	963	7,223	580	30,337	19,224	1,918	1,620	5,507	2,068	4,028	6,648	2,793	601	3,254	1,062
2003		58,014	4,955	8,849	1,472	7,377	318	31,894	20,883	1,965	1,527	5,487	2,032	3,980	6,925	2,884	602	3,439	1,093
2004		57,954	4,853	8,095	1,108	6,988	181	33,051	21,853	2,023	1,537	5,571	2,068	3,854	6,815	2,881	597	3,337	1,106
2005		59,686	4,770	8,667	1,108	7,559	136	34,028	22,186	2,042	1,624	5,999	2,177	3,820	7,084	2,903	614	3,568	1,181
2006		59,284	4,568	8,122	1,399	6,723	632	34,520	21,979	2,087	1,735	6,417	2,301	3,239	7,000	2,760	636	3,605	1,203

Appendix table 4-4

U.S. basic research expenditures, by performing sector and source of funds: 1953–2009

Year	All performers		Federal	Industry ^a				U&C ^c			Other nonprofit			Nonprofit FFRDCs ^d					
	Performer:	Funding source:		FFRDCs ^b	U&C ^c		FFRDCs		Other nonprofit										
		All sources	Federal	Total	Federal ^b	Industry ^e	Total	Total	Federal	Other government ^f	Industry	U&C	Other nonprofit	Total	Total	Federal ^d	Industry	Other nonprofit	Total
2007		62,325	4,350	10,608	2,617	7,990	2,126	35,086	21,692	2,225	1,867	6,785	2,517	1,623	7,262	2,663	657	3,941	1,271
2008		64,670	4,565	11,390	1,358	10,032	2,231	35,770	21,643	2,333	1,991	7,099	2,705	1,540	7,841	2,830	665	4,346	1,332
2009		69,234	5,019	13,473	1,221	12,252	2,324	36,948	22,093	2,394	2,136	7,448	2,878	1,647	8,448	3,186	636	4,625	1,375

NA = not available, included in figures for federal support to industry and federal support to nonprofit institutions

FFRDC = federally funded research and development center; U&C = universities and colleges

^aCharacter-of-work estimates for industry revised for 1998 and later years; data are not directly comparable with data for 1997 and earlier years.

^bCharacter-of-work estimates for industry FFRDCs for 1953–63 not separated from federal support for industry; thus, the figure for federal support to industry includes support to FFRDCs for those years.

^cFor 1998 and later years, character-of-work estimation procedure revised, and adjustments made to U&C R&D to eliminate double counting of funds passed through from one academic institution to another. Data for 1998 and later years not directly comparable with data for 1997 and earlier years.

^dCharacter-of-work estimates for nonprofit FFRDCs for 1953–80 not separated from federal support for other nonprofits; thus, the figure for federal support to other nonprofit institutions includes support to FFRDCs for those years.

^eIndustry sources of funds for industry R&D expenditures include all nonfederal sources of industry funds for R&D expenditures.

^fBecause of limitations in survey information, data on other government funding to performers other than U&C are not available and consequently are included in other sectors' support for their own R&D performance, e.g., other government support to other nonprofits included in other nonprofit support for their own R&D.

NOTES: Technical notes explaining methodological issues of measurement available on request. Data based on annual reports by performers, except for the nonprofit sector (where some figures involve estimates). R&D expenditures of FFRDCs are chiefly federal funds, but any nonfederal funds also included in totals. For trend comparisons, use only historical data reported here; do not use data published earlier. Expenditures for industry and, prior to 2001, for industry-administered FFRDCs collected by calendar year. Expenditures for other performers are calendar-year approximations based on fiscal year data. In most cases, the approximation equals 75% of amount reported in same fiscal year plus 25% of amount reported in subsequent fiscal year. However, fiscal year for academic performers generally begins 1 July, not 1 October; also, prior to 1977, federal fiscal year began on 1 July, not 1 October. Therefore, calendar-year approximations for academic performers and federal performers prior to 1977 equal 50% of amount reported in same fiscal year plus 50% of amount reported in subsequent fiscal year. Detail may not add to total because of rounding. Constant-dollar estimates derived from unrounded data. Los Alamos National Laboratory (some \$2 billion in annual R&D expenditures in recent years) became industry administered in June 2006; previously, it was U&C administered. Lawrence Livermore National Laboratory (more than \$1 billion in annual R&D expenditures in recent years) became industry administered in October 2007; previously, it was U&C administered. The tracks of R&D expenditures from 2006 to 2008 for both industry- and U&C-administered FFRDCs reflect these shifts.

SOURCES: National Science Foundation, National Center for Science and Engineering Statistics (NSF/NCSES), National Patterns of R&D Resources (annual series); NSF/NCSES, Business R&D and Innovation Survey, 2009; NSF/NCSES, Survey of R&D Expenditures at Universities and Colleges, FY 2009; NSF/NCSES, Federal Funds for R&D: FY 2009–11; NSF/NCSES, Survey of R&D Expenditures at FFRDCs, FY 2009; and NSF/NCSES, R&D Funding and Performance by Nonprofit Organizations: FY 1996–97. All NSF/NCSES reports available at <http://www.nsf.gov/statistics/>.

Appendix table 4-5

U.S. applied research expenditures, by performing sector and source of funds: 1953–2009

Year	All performers		Federal	Industry ^a			Industry FFRDCs ^b		U&C ^c				U&C FFRDCs		Other nonprofit			Nonprofit FFRDCs ^d	
	Funding source:	All sources		Total	Federal ^b	Industry ^e	Total	Total	Federal	Other government ^f		U&C	Other nonprofit	Total	Total	Federal ^d	Industry	Other nonprofit	Total
	Current \$millions																		
1953		1,289	347	726	288	438	NA	134	59	30	7	28	10	48	35	14	11	10	NA
1954		1,378	330	814	322	492	NA	137	60	32	8	28	10	58	40	16	13	11	NA
1955		1,514	333	928	368	560	NA	142	63	32	9	27	11	68	43	18	14	11	NA
1956		1,928	387	1,268	474	794	NA	146	65	33	10	27	11	79	49	21	14	14	NA
1957		2,414	446	1,670	678	992	NA	147	63	34	12	27	11	94	58	24	14	20	NA
1958		2,758	516	1,911	774	1,137	NA	152	66	35	12	27	12	111	69	30	14	25	NA
1959		2,940	577	1,991	813	1,178	NA	167	78	37	13	28	12	121	85	43	15	27	NA
1960		3,065	615	2,029	833	1,196	NA	186	93	39	13	29	12	129	108	63	17	28	NA
1961		3,123	668	1,977	812	1,165	NA	199	104	40	13	30	13	145	135	83	17	35	NA
1962		3,698	709	2,449	1,011	1,438	NA	216	119	41	14	30	13	163	162	98	19	45	NA
1963		3,865	809	2,457	1,007	1,450	NA	230	128	42	14	32	14	186	183	115	19	49	NA
1964		4,201	947	2,538	978	1,560	62	256	142	45	14	37	18	203	196	130	19	47	NA
1965		4,374	994	2,612	992	1,620	46	304	176	46	13	42	27	206	213	140	21	52	NA
1966		4,653	1,012	2,790	986	1,804	53	351	208	47	14	48	34	213	234	153	24	57	NA
1967		4,848	1,069	2,832	983	1,849	83	389	238	46	16	54	36	225	251	166	25	60	NA
1968		5,137	1,112	3,037	956	2,081	87	405	250	46	16	55	39	221	276	186	28	62	NA
1969		5,454	1,229	3,192	920	2,272	95	417	257	48	16	54	43	213	308	210	32	66	NA
1970		5,752	1,334	3,330	952	2,378	97	451	280	51	18	56	47	213	328	225	33	70	NA
1971		5,833	1,355	3,348	907	2,441	67	499	306	61	19	67	47	216	349	241	34	74	NA
1972		6,147	1,434	3,407	845	2,562	107	619	391	74	21	82	52	224	357	243	35	79	NA
1973		6,655	1,527	3,715	883	2,832	110	725	450	88	26	100	62	203	376	257	36	83	NA
1974		7,344	1,652	4,168	905	3,263	120	794	477	96	32	118	72	191	420	290	39	91	NA
1975		8,091	1,912	4,431	991	3,440	139	934	550	113	39	141	92	219	456	315	42	100	NA
1976		8,976	2,068	4,945	1,033	3,912	167	1,042	596	127	45	166	109	263	492	338	45	109	NA
1977		9,662	2,081	5,424	1,113	4,311	212	1,126	626	134	51	194	121	297	523	355	48	120	NA
1978		10,704	2,242	6,065	1,195	4,870	235	1,247	676	151	61	232	128	324	592	409	52	132	NA
1979		12,097	2,415	6,975	1,305	5,670	250	1,418	793	161	71	263	129	360	680	480	55	144	NA
1980		13,714	2,546	8,175	1,625	6,550	275	1,622	912	174	88	308	140	421	675	458	60	158	NA
1981		16,329	2,731	10,401	2,042	8,359	298	1,781	953	199	108	363	159	422	628	391	64	173	68
1982		18,218	2,802	11,956	2,593	9,363	367	1,915	1,007	207	121	402	178	433	655	398	69	189	91
1983		20,298	2,991	13,513	3,227	10,286	414	2,116	1,122	215	141	443	194	473	713	433	74	207	78
1984		22,451	2,961	15,218	3,677	11,541	547	2,332	1,226	234	168	491	212	548	764	459	79	226	80
1985		25,401	3,135	17,625	4,717	12,908	630	2,527	1,296	262	198	547	224	580	822	490	85	247	82
1986		27,240	3,204	19,131	4,049	15,082	629	2,780	1,393	298	229	620	240	554	867	506	91	270	75
1987		27,951	3,366	19,190	4,037	15,153	623	3,219	1,643	333	260	707	276	532	948	555	98	295	74
1988		29,528	3,362	20,377	3,846	16,531	371	3,779	1,958	377	302	818	325	547	1,026	599	105	322	66
1989		32,277	3,566	22,317	4,324	17,993	374	4,188	2,121	417	347	933	370	603	1,159	695	112	352	70
1990		34,897	3,652	24,399	5,967	18,432	386	4,406	2,140	453	377	1,031	404	689	1,284	780	120	384	81
1991		38,631	4,093	27,013	5,588	21,425	433	4,611	2,232	468	392	1,091	428	927	1,468	921	129	419	86

Appendix table 4-5

U.S. applied research expenditures, by performing sector and source of funds: 1953–2009

Year	All performers		Industry				U&C			Other nonprofit			Nonprofit						
	Performer:	Federal	Industry ^a		FFRDCs ^b	U&C ^c			FFRDCs	Other nonprofit		FFRDCs ^d							
	Funding source:	All sources	Federal	Total	Federal ^b	Industry ^e	Total	Total	Federal	Other government ^f	Industry	U&C	Other nonprofit	Total	Total	Federal ^d	Industry	Other nonprofit	Total
1992		37,936	4,337	25,660	4,476	21,184	507	4,882	2,415	479	414	1,120	454	940	1,528	933	138	456	81
1993		37,283	4,838	24,251	4,295	19,956	435	5,149	2,542	496	443	1,181	487	962	1,544	900	148	497	103
1994		36,618	4,985	22,988	3,616	19,372	503	5,390	2,644	517	464	1,256	509	982	1,659	960	158	541	111
1995		40,936	4,952	26,919	3,164	23,755	535	5,659	2,779	559	494	1,311	516	1,050	1,692	934	170	589	129
1996		43,170	4,872	29,010	3,640	25,370	231	5,885	2,864	584	524	1,390	522	1,270	1,781	960	182	640	122
1997		46,554	4,997	32,430	2,648	29,782	213	5,523	2,550	553	519	1,389	512	1,337	1,926	1,011	205	711	128
1998		46,362	5,146	32,208	2,632	29,576	230	5,197	2,260	526	520	1,378	513	1,372	2,087	1,060	218	809	123
1999		52,007	5,530	36,638	2,817	33,821	274	5,762	2,661	546	542	1,463	550	1,247	2,427	1,300	236	891	130
2000		56,685	6,105	39,176	2,682	36,494	269	6,498	3,196	572	553	1,585	592	1,291	3,155	1,831	258	1,066	190
2001		64,188	7,052	44,012	3,603	40,409	821	7,061	3,558	602	550	1,713	639	1,405	3,593	2,150	261	1,182	244
2002		50,688	7,487	28,533	2,452	26,081	1,090	7,760	4,010	647	546	1,859	698	1,663	3,889	2,267	253	1,369	266
2003		61,135	7,672	37,334	4,473	32,861	1,413	8,644	4,553	731	567	2,038	755	1,600	4,223	2,487	259	1,478	249
2004		69,183	7,455	45,432	4,775	40,657	1,459	8,976	4,781	759	576	2,087	774	1,481	4,186	2,448	264	1,474	194
2005		69,588	7,557	45,284	5,289	39,995	1,414	9,077	4,900	721	573	2,115	768	1,637	4,340	2,432	280	1,628	278
2006		76,277	7,435	51,173	6,140	45,033	1,314	9,440	5,176	710	589	2,182	782	1,827	4,590	2,592	300	1,699	500
2007		83,069	7,222	57,570	8,945	48,625	1,168	9,849	5,396	740	621	2,256	837	1,354	4,812	2,583	318	1,911	1,094
2008		74,321	7,316	46,864	5,397	41,467	1,975	10,875	5,980	808	690	2,460	937	855	5,083	2,600	330	2,154	1,352
2009		71,328	8,006	41,055	7,797	33,258	1,930	11,912	6,577	860	767	2,675	1,033	1,289	5,697	3,062	319	2,317	1,440
Constant 2005 \$millions																			
1953		7,977	2,147	4,493	1,782	2,710	NA	826	365	186	40	172	62	294	217	87	68	62	NA
1954		8,449	2,020	4,991	1,974	3,017	NA	837	365	193	46	172	61	356	245	98	80	67	NA
1955		9,125	2,008	5,595	2,219	3,376	NA	853	380	195	51	164	63	410	259	109	84	66	NA
1956		11,236	2,253	7,391	2,763	4,628	NA	851	379	193	58	157	64	458	283	119	82	82	NA
1957		13,615	2,513	9,421	3,825	5,596	NA	826	355	191	65	153	62	530	324	133	79	113	NA
1958		15,216	2,847	10,543	4,270	6,273	NA	836	361	195	66	150	63	610	381	166	77	138	NA
1959		16,029	3,144	10,857	4,433	6,424	NA	911	423	202	68	153	65	657	461	232	82	147	NA
1960		16,483	3,305	10,912	4,480	6,432	NA	998	500	208	70	155	65	691	578	336	91	151	NA
1961		16,606	3,552	10,512	4,318	6,195	NA	1,055	550	212	69	157	66	771	715	439	90	186	NA
1962		19,396	3,717	12,847	5,303	7,543	NA	1,133	622	213	71	160	68	852	847	511	100	236	NA
1963		20,059	4,199	12,753	5,227	7,526	NA	1,191	662	219	73	168	70	965	950	597	99	254	NA
1964		21,475	4,838	12,974	5,000	7,975	317	1,306	726	231	69	191	89	1,038	1,002	665	97	240	NA
1965		21,956	4,988	13,113	4,980	8,133	231	1,524	881	233	65	211	133	1,032	1,069	703	105	261	NA
1966		22,712	4,940	13,620	4,813	8,807	259	1,713	1,015	230	68	236	164	1,040	1,140	744	117	278	NA
1967		22,962	5,061	13,413	4,656	8,757	393	1,840	1,125	216	73	255	171	1,066	1,189	786	118	284	NA
1968		23,338	5,050	13,798	4,343	9,454	395	1,840	1,134	209	73	250	175	1,002	1,254	845	127	282	NA
1969		23,613	5,322	13,819	3,983	9,836	411	1,805	1,110	208	69	233	184	922	1,333	909	139	286	NA
1970		23,656	5,486	13,694	3,915	9,779	399	1,853	1,149	210	72	230	191	876	1,349	925	136	288	NA
1971		22,846	5,307	13,113	3,552	9,561	262	1,954	1,199	237	72	262	184	844	1,365	942	133	290	NA
1972		23,079	5,384	12,792	3,173	9,619	402	2,322	1,466	279	77	307	193	841	1,338	910	131	297	NA
1973		23,674	5,433	13,215	3,141	10,074	391	2,577	1,599	312	92	355	219	720	1,337	914	128	295	NA

Appendix table 4-5

U.S. applied research expenditures, by performing sector and source of funds: 1953–2009

Year	All		Industry					U&C			Other nonprofit			Nonprofit					
	Performer:	performers	Federal	Industry ^a		FFRDCs ^b	U&C ^c		FFRDCs	Other nonprofit		FFRDCs ^d							
	Funding source:	All sources	Federal	Total	Federal ^b	Industry ^e	Total	Total	Federal	Other government ^f	Industry	U&C	Other nonprofit	Total	Total	Federal ^d	Industry	Other nonprofit	Total
1974		23,949	5,388	13,592	2,951	10,641	391	2,588	1,554	313	103	384	233	621	1,369	946	126	297	NA
1975		24,107	5,696	13,202	2,953	10,249	414	2,783	1,637	338	115	419	274	653	1,360	939	124	298	NA
1976		25,294	5,828	13,934	2,911	11,023	471	2,936	1,678	359	125	467	307	740	1,385	951	126	309	NA
1977		25,595	5,511	14,368	2,948	11,420	562	2,981	1,657	356	135	514	319	787	1,386	940	127	318	NA
1978		26,495	5,549	15,012	2,958	12,054	582	3,086	1,673	374	150	574	316	802	1,465	1,012	128	326	NA
1979		27,643	5,519	15,939	2,982	12,957	571	3,239	1,811	369	163	601	295	822	1,553	1,097	127	329	NA
1980		28,722	5,332	17,121	3,403	13,717	576	3,397	1,910	364	185	645	294	881	1,414	959	125	330	NA
1981		31,267	5,230	19,916	3,910	16,006	571	3,410	1,824	381	206	694	304	808	1,202	749	122	331	130
1982		32,877	5,056	21,576	4,679	16,897	662	3,455	1,816	374	218	725	321	781	1,183	718	124	341	164
1983		35,238	5,193	23,459	5,602	17,857	719	3,673	1,948	373	245	769	337	822	1,238	751	128	359	135
1984		37,564	4,954	25,462	6,152	19,310	915	3,901	2,052	392	281	822	355	918	1,279	768	132	379	135
1985		41,251	5,091	28,623	7,660	20,963	1,023	4,104	2,106	425	321	889	364	941	1,335	795	138	402	133
1986		43,280	5,091	30,397	6,433	23,963	999	4,417	2,213	473	364	986	381	880	1,377	803	145	429	120
1987		43,158	5,197	29,631	6,233	23,397	962	4,970	2,537	514	401	1,092	426	821	1,464	857	151	456	114
1988		44,079	5,019	30,419	5,741	24,678	554	5,642	2,923	563	451	1,221	485	816	1,531	894	156	481	98
1989		46,430	5,130	32,103	6,220	25,883	538	6,024	3,051	600	499	1,342	532	867	1,667	999	161	506	101
1990		48,333	5,058	33,793	8,265	25,529	535	6,102	2,965	627	522	1,428	560	954	1,778	1,080	167	532	113
1991		51,674	5,475	36,133	7,475	28,658	579	6,167	2,985	626	524	1,459	573	1,239	1,964	1,232	172	560	115
1992		49,568	5,667	33,528	5,849	27,680	662	6,379	3,155	626	541	1,463	594	1,229	1,996	1,220	180	596	106
1993		47,661	6,185	31,002	5,491	25,511	556	6,582	3,249	634	566	1,510	623	1,230	1,974	1,150	189	635	131
1994		45,845	6,242	28,781	4,527	24,254	630	6,748	3,310	648	581	1,572	637	1,229	2,077	1,201	198	677	139
1995		50,206	6,074	33,015	3,880	29,134	656	6,940	3,408	685	606	1,608	633	1,288	2,075	1,145	208	722	158
1996		51,957	5,864	34,915	4,381	30,534	278	7,082	3,446	703	631	1,673	629	1,528	2,144	1,155	219	770	147
1997		55,058	5,909	38,353	3,132	35,222	252	6,531	3,016	654	613	1,643	606	1,582	2,278	1,196	242	840	152
1998		54,218	6,017	37,665	3,078	34,587	269	6,077	2,642	615	608	1,611	600	1,604	2,440	1,240	255	946	144
1999		59,938	6,373	42,225	3,247	38,978	316	6,641	3,067	630	625	1,686	634	1,437	2,797	1,498	272	1,027	149
2000		63,890	6,881	44,156	3,023	41,133	303	7,324	3,603	644	624	1,787	667	1,456	3,556	2,064	291	1,201	214
2001		70,748	7,773	48,510	3,971	44,539	905	7,783	3,921	663	606	1,888	704	1,548	3,960	2,370	287	1,303	268
2002		54,979	8,121	30,948	2,660	28,289	1,183	8,417	4,349	702	593	2,016	757	1,804	4,218	2,458	274	1,485	288
2003		64,944	8,149	39,660	4,752	34,908	1,501	9,183	4,837	777	602	2,165	802	1,700	4,486	2,642	275	1,570	264
2004		71,481	7,702	46,941	4,934	42,007	1,508	9,274	4,940	784	595	2,156	800	1,531	4,325	2,529	273	1,523	201
2005		69,588	7,557	45,284	5,289	39,995	1,414	9,077	4,900	721	573	2,115	768	1,637	4,340	2,432	280	1,628	278
2006		73,890	7,202	49,571	5,948	43,623	1,272	9,144	5,014	688	571	2,114	758	1,770	4,446	2,511	290	1,645	484

Appendix table 4-5

U.S. applied research expenditures, by performing sector and source of funds: 1953–2009

Year	All		Industry					U&C			Other nonprofit			Nonprofit					
	Performer:	performers	Federal	Industry ^a		FFRDCs ^b	U&C ^c		FFRDCs	Other nonprofit		FFRDCs ^d							
	Funding source:	All sources	Federal	Total	Federal ^b	Industry ^e	Total	Total	Federal	Other government ^f	Industry	U&C	nonprofit	Total	Total	Federal ^d	Industry	nonprofit	Total
2007		78,200	6,798	54,196	8,421	45,775	1,100	9,271	5,079	696	584	2,124	788	1,275	4,530	2,431	300	1,799	1,030
2008		68,446	6,738	43,160	4,970	38,189	1,819	10,015	5,507	744	636	2,265	863	787	4,682	2,395	304	1,984	1,245
2009		65,004	7,296	37,415	7,106	30,309	1,758	10,856	5,994	783	699	2,438	942	1,175	5,192	2,790	290	2,111	1,312

NA = not available, included in figures for federal support to industry and federal support to nonprofit institutions

FFRDC = federally funded research and development center; U&C = universities and colleges

^aCharacter-of-work estimates for industry revised for 1998 and later years; data are not directly comparable with data for 1997 and earlier years.

^bCharacter-of-work estimates for industry FFRDCs for 1953–63 not separated from federal support for industry; thus, figure for federal support to industry includes support to FFRDCs for those years.

^cFor 1998 and later years, character-of-work estimation procedure revised and adjustments made to U&C R&D to eliminate double counting of funds passed through from one academic institution to another. Data for 1998 and later years not directly comparable with data for 1997 and earlier years.

^dCharacter-of-work estimates for nonprofit FFRDCs for 1953–80 not separated from federal support for other nonprofits; thus, the figure for federal support to other nonprofit institutions includes support to FFRDCs for those years.

^eIndustry sources of funds for industry R&D expenditures include all nonfederal sources of industry funds for R&D expenditures.

^fBecause of limitations in survey information, data on other government funding to performers other than U&C not available and consequently included in other sectors' support for their own R&D performance, e.g., other government support to other nonprofits included in other nonprofit support for their own R&D.

NOTES: Technical notes explaining methodological issues of measurement available on request. Data based on annual reports by performers, except for the nonprofit sector (where some figures involve estimates). R&D expenditures of FFRDCs are chiefly federal funds, but any nonfederal funds also included in totals. For trend comparisons, use only historical data reported here; do not use data published earlier. Expenditures for industry and, prior to 2001, for industry-administered FFRDCs collected by calendar year. Expenditures for other performers are calendar-year approximations based on fiscal year data. In most cases, the approximation equals 75% of amount reported in same fiscal year plus 25% of amount reported in subsequent fiscal year. However, fiscal year for academic performers generally begins 1 July, not 1 October; also, prior to 1977, federal fiscal year began on 1 July, not 1 October. Therefore, calendar-year approximations for academic performers and federal performers prior to 1977 equal 50% of amount reported in same fiscal year plus 50% of amount reported in subsequent fiscal year. Detail may not add to total because of rounding. Constant-dollar estimates derived from unrounded data. Los Alamos National Laboratory (some \$2 billion in annual R&D expenditures in recent years) became industry administered in June 2006; previously, it was U&C administered. Lawrence Livermore National Laboratory (more than \$1 billion in annual R&D expenditures in recent years) became industry administered in October 2007; previously, it was U&C administered. The tracks of R&D expenditures from 2006 to 2008 for both industry- and U&C-administered FFRDCs reflect these shifts.

SOURCES: National Science Foundation, National Center for Science and Engineering Statistics (NSF/NCSES), National Patterns of R&D Resources (annual series); NSF/NCSES, Business R&D and Innovation Survey, 2009; NSF/NCSES, Survey of R&D Expenditures at Universities and Colleges, FY 2009; NSF/NCSES, Federal Funds for R&D: FY 2009–11; NSF/NCSES, Survey of R&D Expenditures at FFRDCs, FY 2009; and NSF/NCSES, R&D Funding and Performance by Nonprofit Organizations: FY 1996–97. All NSF/NCSES reports available at <http://www.nsf.gov/statistics/>.

Appendix table 4-6

U.S. development expenditures, by performing sector and source of funds: 1953–2009

Year	All		Industry					U&C				Other nonprofit			Nonprofit				
	Performer:	performers	Federal	Industry ^a		FFRDCs ^b	U&C ^c			FFRDCs	Other nonprofit		FFRDCs ^d						
	Funding	All		Total	Federal ^b	Industry ^e	Total	Federal	Other	U&C	Other	Total	Total	Federal ^d	Industry	Other	Total		
	source:	sources	Federal	Total	Federal ^b	Industry ^e	Total	Federal	government ^f	Industry	U&C	nonprofit	Total	Total	Federal ^d	Industry	nonprofit	Total	
Current \$millions																			
1953		3,412	567	2,753	1,123	1,630	NA	16	9	3	1	3	1	48	29	17	6	6	NA
1954		3,734	537	3,090	1,405	1,685	NA	17	9	3	1	3	1	59	32	18	7	7	NA
1955		4,189	543	3,523	1,785	1,738	NA	21	12	4	2	3	1	69	34	19	8	7	NA
1956		5,855	631	5,084	2,817	2,267	NA	25	14	4	2	4	2	81	35	20	8	7	NA
1957		6,681	728	5,790	3,616	2,174	NA	26	12	5	3	4	2	101	37	21	8	8	NA
1958		7,214	842	6,183	3,942	2,241	NA	28	13	6	3	4	2	120	42	25	8	9	NA
1959		8,463	940	7,307	4,750	2,557	NA	31	16	6	3	5	2	134	51	32	9	10	NA
1960		9,360	1,003	8,104	5,169	2,935	NA	35	19	6	3	5	2	151	69	49	10	10	NA
1961		9,930	1,090	8,536	5,347	3,189	NA	38	22	7	2	5	2	170	97	73	10	14	NA
1962		10,115	1,227	8,526	5,280	3,246	NA	40	23	8	2	6	2	190	132	103	11	18	NA
1963		11,540	1,465	9,651	6,116	3,535	NA	40	22	8	2	6	2	219	165	134	11	20	NA
1964		12,506	1,680	10,004	6,156	3,848	359	49	30	8	2	7	3	227	188	159	11	18	NA
1965		13,215	1,789	10,637	6,218	4,419	298	71	48	9	2	8	4	207	215	183	12	20	NA
1966		14,490	1,886	11,810	6,849	4,961	271	87	61	9	2	10	5	200	236	199	14	23	NA
1967		15,332	1,943	12,539	6,795	5,744	302	93	66	9	3	10	7	208	247	208	15	24	NA
1968		16,154	1,904	13,370	7,044	6,326	293	102	72	8	4	9	9	226	259	217	16	26	NA
1969		17,051	2,016	14,071	6,944	7,127	332	110	80	7	5	8	10	246	277	231	18	28	NA
1970		16,925	2,258	13,698	6,232	7,466	340	112	84	6	5	7	10	249	268	220	18	30	NA
1971		17,399	2,473	13,924	6,167	7,757	391	98	69	8	4	9	9	267	246	194	19	33	NA
1972		18,743	2,639	15,043	6,533	8,510	402	101	63	12	4	14	9	291	267	213	19	35	NA
1973		20,197	2,657	16,394	6,621	9,773	399	126	71	18	5	20	13	296	326	268	20	38	NA
1974		21,504	2,765	17,421	6,553	10,868	479	141	75	20	7	25	15	321	377	314	22	42	NA
1975		22,706	2,890	18,352	6,783	11,569	535	156	83	22	8	27	16	373	400	330	23	47	NA
1976		25,085	2,972	20,412	7,522	12,890	654	182	100	24	12	31	16	447	418	341	25	52	NA
1977		27,667	3,188	22,603	8,275	14,328	675	254	153	28	15	40	19	503	444	359	27	58	NA
1978		31,056	3,676	25,216	8,756	16,460	753	373	254	32	15	49	24	542	496	403	30	64	NA
1979		35,445	3,944	29,033	9,888	19,145	810	469	336	34	16	56	28	603	586	483	32	71	NA
1980		40,765	4,072	33,848	10,957	22,891	882	518	362	38	19	68	31	719	726	612	35	79	NA
1981		46,305	4,530	38,547	12,791	25,756	950	568	386	44	24	80	35	778	485	360	37	88	447
1982		51,879	5,178	43,434	14,215	29,219	989	597	397	46	27	88	39	745	500	362	40	98	436
1983		57,771	6,106	48,064	15,522	32,542	1,054	617	399	47	31	97	43	832	599	447	44	109	500
1984		66,461	7,078	55,371	17,640	37,731	1,056	677	435	51	37	108	47	986	762	594	47	120	530
1985		74,522	8,011	62,020	20,258	41,762	1,102	756	486	57	43	120	49	1,244	829	644	51	134	560
1986		75,855	8,275	62,871	21,517	41,354	1,145	818	513	65	50	136	53	1,504	790	587	55	149	453
1987		79,929	8,176	66,789	24,122	42,667	1,230	945	599	73	57	155	61	1,670	698	474	60	165	421
1988		84,567	8,864	70,353	23,719	46,634	1,414	1,098	698	83	66	180	71	1,762	655	407	65	183	420
1989		87,723	9,355	72,725	21,049	51,676	1,423	1,227	773	91	76	205	81	1,782	780	507	70	203	430
1990		94,067	9,700	78,376	18,966	59,410	1,438	1,407	910	99	83	226	89	1,735	920	619	75	226	490
1991		95,105	8,778	80,286	17,256	63,030	1,383	1,534	1,012	103	86	239	94	1,537	1,054	722	82	251	533

Appendix table 4-6

U.S. development expenditures, by performing sector and source of funds: 1953–2009

Year	All		Industry					U&C				Other nonprofit			Nonprofit				
	Performer:	performers	Federal	Industry ^a		FFRDCs ^b		U&C ^c		FFRDCs		Other nonprofit		FFRDCs ^d					
	Funding source:	All sources	Federal	Total	Federal ^b	Industry ^e	Total	Total	Federal	Other government ^f	Industry	U&C	Other nonprofit	Total	Total	Federal ^d	Industry	Other nonprofit	Total
1992		99,811	9,098	84,569	17,181	67,388	1,372	1,596	1,055	105	91	246	100	1,452	1,125	758	88	279	599
1993		99,705	9,071	84,757	16,083	68,674	1,038	1,700	1,127	109	97	259	107	1,374	1,191	787	95	309	574
1994		102,938	8,823	87,890	16,209	71,681	1,196	1,816	1,213	114	102	276	112	1,378	1,261	815	103	343	573
1995		113,079	9,262	97,342	17,824	79,518	1,208	1,812	1,180	123	108	288	113	1,616	1,236	744	111	381	603
1996		121,377	9,033	105,863	17,066	88,797	1,358	1,791	1,128	128	115	305	115	1,520	1,241	698	120	423	571
1997		128,677	9,077	113,184	18,121	95,063	1,292	1,708	1,055	121	114	305	112	1,454	1,378	687	155	536	585
1998		144,723	9,214	129,041	18,452	110,589	1,280	1,619	974	116	114	302	113	1,527	1,535	760	164	611	507
1999		154,356	9,265	138,807	16,571	122,236	1,208	1,391	710	120	119	321	121	1,640	1,578	727	178	673	467
2000		169,412	9,377	153,745	13,510	140,235	1,185	1,290	565	125	121	348	130	1,577	1,579	580	195	804	659
2001		167,817	11,062	149,952	12,542	137,410	647	1,442	673	132	121	376	140	1,717	1,963	874	197	893	1,033
2002		176,672	11,800	157,788	13,061	144,727	639	1,485	662	142	120	408	153	1,726	2,161	937	191	1,034	1,074
2003		175,493	12,646	155,060	11,939	143,121	747	1,816	918	161	124	447	166	1,954	2,054	743	195	1,116	1,216
2004		177,228	12,746	155,034	14,419	140,615	851	2,158	1,237	167	126	458	170	2,447	2,612	1,300	199	1,113	1,379
2005		195,720	13,994	172,208	15,512	156,696	1,052	2,085	1,168	158	126	464	169	2,360	2,652	1,211	212	1,229	1,369
2006		212,686	16,089	188,112	16,720	171,392	1,156	1,880	944	156	129	479	172	2,136	2,111	603	226	1,282	1,202
2007		227,685	18,016	200,429	14,860	185,569	1,738	1,891	913	162	136	495	184	2,488	2,251	568	240	1,443	872
2008		258,499	17,566	231,449	29,488	201,961	1,948	1,935	861	177	152	540	206	2,239	2,437	562	249	1,626	925
2009		253,160	17,389	226,554	30,436	196,118	1,967	1,927	756	189	168	587	227	1,872	2,564	575	241	1,749	887
Constant 2005 \$millions																			
1953		21,111	3,506	17,036	6,949	10,087	NA	99	53	18	6	16	6	294	176	102	37	37	NA
1954		22,895	3,293	18,946	8,615	10,331	NA	104	52	21	6	19	6	359	193	107	43	43	NA
1955		25,256	3,271	21,241	10,762	10,479	NA	127	69	23	9	19	6	416	202	112	48	42	NA
1956		34,127	3,675	29,636	16,421	13,215	NA	146	79	26	12	21	9	469	201	114	47	41	NA
1957		37,688	4,104	32,662	20,398	12,264	NA	147	68	30	14	24	11	570	206	116	45	45	NA
1958		39,798	4,643	34,112	21,749	12,364	NA	152	69	31	17	24	11	662	229	135	44	50	NA
1959		46,149	5,126	39,845	25,902	13,943	NA	169	85	33	16	25	11	731	278	174	49	55	NA
1960		50,337	5,391	43,582	27,798	15,784	NA	186	102	34	13	25	11	809	368	261	54	54	NA
1961		52,799	5,793	45,389	28,432	16,957	NA	199	114	37	11	27	11	901	516	388	53	74	NA
1962		53,058	6,436	44,725	27,697	17,028	NA	210	118	40	10	30	10	997	690	538	58	94	NA
1963		59,896	7,604	50,094	31,745	18,348	NA	208	114	41	10	32	10	1,134	856	696	57	104	NA
1964		63,930	8,588	51,140	31,469	19,671	1,835	248	151	41	10	33	13	1,158	961	813	56	92	NA
1965		66,343	8,979	53,401	31,216	22,185	1,496	354	241	43	10	39	20	1,037	1,077	916	60	100	NA
1966		70,733	9,207	57,653	33,435	24,218	1,323	425	298	46	10	47	24	976	1,150	969	68	112	NA
1967		72,615	9,203	59,389	32,183	27,205	1,430	440	310	40	12	47	31	985	1,167	983	71	114	NA
1968		73,389	8,650	60,743	32,002	28,740	1,331	461	325	35	18	42	41	1,027	1,177	986	73	118	NA
1969		73,818	8,727	60,918	30,063	30,855	1,437	474	344	31	22	34	43	1,065	1,197	998	78	121	NA
1970		69,602	9,285	56,332	25,628	30,703	1,398	461	343	27	21	29	41	1,024	1,102	905	74	123	NA
1971		68,144	9,684	54,536	24,154	30,382	1,531	384	270	31	16	34	33	1,046	964	760	74	129	NA
1972		70,372	9,909	56,479	24,528	31,951	1,509	379	235	47	13	51	34	1,093	1,002	800	71	131	NA
1973		71,842	9,452	58,315	23,552	34,764	1,419	446	251	62	18	71	44	1,051	1,158	952	71	135	NA

Appendix table 4-6

U.S. development expenditures, by performing sector and source of funds: 1953–2009

Year	All		Federal	Industry				U&C				U&C				Other nonprofit		Nonprofit	
	Performers:			Industry ^a		FFRDCs ^b		U&C ^c		FFRDCs		Other nonprofit		FFRDCs ^d					
	Funding	All		Total	Federal ^b	Industry ^e	Total	Total	Federal	Other	Industry	U&C	Other	Total	Total	Federal ^d	Industry	Other	Total
	source:	sources								government ^f			nonprofit					nonprofit	
1974		70,126	9,018	56,810	21,369	35,441	1,562	458	243	65	21	80	49	1,047	1,231	1,022	71	138	NA
1975		67,651	8,610	54,679	20,210	34,470	1,594	465	246	66	24	82	48	1,110	1,193	983	70	140	NA
1976		70,684	8,374	57,516	21,195	36,321	1,843	513	280	67	32	88	45	1,260	1,179	961	71	147	NA
1977		73,290	8,445	59,875	21,920	37,955	1,788	673	405	74	38	107	49	1,333	1,177	951	72	153	NA
1978		76,870	9,100	62,414	21,673	40,742	1,864	923	628	79	36	121	58	1,341	1,228	996	73	159	NA
1979		80,998	9,012	66,345	22,596	43,749	1,851	1,073	769	78	36	127	63	1,379	1,339	1,103	73	163	NA
1980		85,372	8,529	70,886	22,947	47,940	1,847	1,084	758	80	41	142	64	1,505	1,520	1,282	72	166	NA
1981		88,665	8,675	73,810	24,492	49,318	1,819	1,087	739	84	45	152	67	1,489	929	689	72	168	856
1982		93,624	9,345	78,383	25,653	52,730	1,785	1,077	717	82	48	159	70	1,344	903	654	73	176	787
1983		100,293	10,600	83,441	26,947	56,494	1,830	1,072	693	82	54	169	74	1,444	1,041	776	76	188	867
1984		111,201	11,843	92,646	29,515	63,131	1,767	1,133	727	86	62	180	78	1,650	1,275	995	79	202	887
1985		121,024	13,009	100,722	32,899	67,822	1,790	1,228	789	93	70	195	80	2,020	1,346	1,046	83	217	909
1986		120,524	13,147	99,894	34,188	65,706	1,819	1,299	816	104	80	216	84	2,389	1,256	932	88	236	719
1987		123,415	12,624	103,126	37,246	65,881	1,899	1,459	924	113	88	240	93	2,578	1,078	731	92	255	650
1988		126,241	13,232	105,023	35,408	69,615	2,111	1,639	1,042	124	99	268	106	2,630	978	608	96	274	627
1989		126,188	13,458	104,614	30,279	74,335	2,047	1,765	1,112	132	110	295	117	2,563	1,122	729	100	293	619
1990		130,286	13,435	108,554	26,269	82,285	1,992	1,949	1,260	138	115	313	123	2,403	1,275	857	104	313	679
1991		127,213	11,741	107,391	23,082	84,310	1,850	2,052	1,353	137	115	320	126	2,055	1,411	966	109	336	713
1992		130,416	11,887	110,501	22,449	88,052	1,793	2,086	1,378	137	119	321	130	1,897	1,470	991	115	364	783
1993		127,460	11,597	108,351	20,560	87,791	1,327	2,173	1,441	139	124	331	137	1,756	1,523	1,006	122	395	734
1994		128,879	11,047	110,039	20,294	89,745	1,497	2,274	1,519	142	128	345	140	1,726	1,579	1,020	129	430	717
1995		138,685	11,359	119,384	21,860	97,524	1,482	2,222	1,447	150	133	353	139	1,982	1,516	912	136	468	740
1996		146,081	10,872	127,410	20,540	106,870	1,634	2,156	1,358	154	138	367	138	1,829	1,494	840	145	510	687
1997		152,179	10,734	133,857	21,431	112,426	1,528	2,020	1,248	143	135	361	133	1,720	1,629	812	183	634	691
1998		169,245	10,775	150,906	21,579	129,328	1,497	1,893	1,139	135	134	354	132	1,786	1,795	889	192	714	593
1999		177,893	10,678	159,974	19,098	140,876	1,392	1,603	819	138	137	370	139	1,890	1,818	838	205	775	538
2000		190,945	10,568	173,287	15,227	158,060	1,336	1,454	637	141	137	392	146	1,778	1,780	653	220	907	743
2001		184,968	12,192	165,278	13,824	151,454	713	1,590	742	146	133	415	155	1,892	2,164	963	217	984	1,139
2002		191,626	12,798	171,144	14,167	156,977	693	1,610	718	154	130	443	166	1,872	2,344	1,016	207	1,121	1,165
2003		186,427	13,434	164,721	12,683	152,038	793	1,929	975	171	132	475	176	2,076	2,182	790	207	1,185	1,292
2004		183,113	13,169	160,182	14,898	145,284	879	2,229	1,278	172	131	473	176	2,529	2,699	1,344	206	1,150	1,425
2005		195,720	13,994	172,208	15,512	156,696	1,052	2,085	1,168	158	126	464	169	2,360	2,652	1,211	212	1,229	1,369
2006		206,029	15,586	182,224	16,197	166,028	1,120	1,821	915	151	125	464	166	2,069	2,045	584	219	1,242	1,164

Appendix table 4-6

U.S. development expenditures, by performing sector and source of funds: 1953–2009

Year	All performers		Federal	Industry ^a			U&C ^c			U&C FFRDCs			Other nonprofit			Nonprofit FFRDCs ^d			
	Funding source:	All sources		Federal ^b	Industry ^e	Total	Other government ^f	Industry	U&C nonprofit	Total	Total	Federal ^d	Industry	Other nonprofit	Total				
	2007		214,339	16,960	188,681	13,989	174,692	1,636	1,780	860	153	128	466	173	2,342	2,119	534	226	1,358
2008		238,067	16,178	213,155	27,157	185,998	1,794	1,782	793	163	140	497	189	2,062	2,244	518	229	1,497	852
2009		230,713	15,847	206,467	27,737	178,729	1,792	1,756	689	172	153	535	207	1,706	2,337	524	219	1,594	808

NA = not available, included in figures for federal support to industry and federal support to nonprofit institutions

FFRDC = federally funded research and development center; U&C = universities and colleges

^aCharacter-of-work estimates for industry revised for 1998 and later years; data are not directly comparable with data for 1997 and earlier years.

^bCharacter-of-work estimates for industry FFRDCs for 1953–63 not separated from federal support for industry; thus, the figure for federal support to industry includes support to FFRDCs for those years.

^cFor 1998 and later years, character-of-work estimation procedure revised and adjustments made to U&C R&D to eliminate double counting of funds passed through from one academic institution to another. Data for 1998 and later years not directly comparable with data for 1997 and earlier years.

^dCharacter-of-work estimates for nonprofit FFRDCs for 1953–80 not separated from federal support for other nonprofits; thus, the figure for federal support to other nonprofit institutions includes support to FFRDCs for those years.

^eIndustry sources of funds for industry R&D expenditures include all nonfederal sources of industry funds for R&D expenditures.

^fBecause of limitations in survey information, data on other government funding to performers other than U&C not available and consequently included in other sectors' support for their own R&D performance, e.g., other government support to other nonprofits included in other nonprofit support for their own R&D.

NOTES: Technical notes explaining methodological issues of measurement available on request. Data based on annual reports by performers, except for the nonprofit sector (where some figures involve estimates). R&D expenditures of FFRDCs are chiefly federal funds, but any nonfederal funds also included in totals. For trend comparisons, use only historical data reported here; do not use data published earlier. Expenditures for industry and, prior to 2001, for industry-administered FFRDCs collected by calendar year. Expenditures for other performers are calendar-year approximations based on fiscal year data. In most cases, the approximation equals 75% of amount reported in same fiscal year plus 25% of amount reported in subsequent fiscal year. However, fiscal year for academic performers generally begins 1 July, not 1 October; also, prior to 1977, federal fiscal year began on 1 July, not 1 October. Therefore, calendar-year approximations for academic performers and federal performers prior to 1977 equal 50% of amount reported in same fiscal year plus 50% of amount reported in subsequent fiscal year. Detail may not add to total because of rounding. Constant-dollar estimates derived from unrounded data. Los Alamos National Laboratory (some \$2 billion in annual R&D expenditures in recent years) became industry administered in June 2006; previously, it was U&C administered. Lawrence Livermore National Laboratory (more than \$1 billion in annual R&D expenditures in recent years) became industry administered in October 2007; previously, it was U&C administered. The tracks of R&D expenditures from 2006 to 2008 for both industry- and U&C-administered FFRDCs reflect these shifts.

SOURCES: National Science Foundation, National Center for Science and Engineering Statistics (NSF/NCSES), National Patterns of R&D Resources (annual series); NSF/NCSES, Business R&D and Innovation Survey, 2009; NSF/NCSES, Survey of R&D Expenditures at Universities and Colleges, FY 2009; NSF/NCSES, Federal Funds for R&D: FY 2009–11; NSF/NCSES, Survey of R&D Expenditures at FFRDCs, FY 2009; and NSF/NCSES, R&D Funding and Performance by Nonprofit Organizations: FY 1996–97. All NSF/NCSES reports available at <http://www.nsf.gov/statistics/>.

Appendix table 4-7

U.S. research and development expenditures, by source of funds and performing sector: 1953–2009

Year	Funding	All sources										Industry			U&C	Other nonprofit		Other government ^a	
	source:	Federal									Industry			U&C	Other nonprofit		Other government ^a		
	Performer:	All performers	Total	Federal	Industry ^b	FFRDCs ^b	U&C ^c	FFRDCs	nonprofit ^d	Nonprofit FFRDCs ^d	Total	Industry ^e	U&C ^c	nonprofit	U&C ^c	Total	nonprofit	U&C ^c	U&C ^c
Current \$millions																			
1953		5,160	2,783	1,015	1,430	NA	149	131	58	NA	2,247	2,200	21	26	37	55	28	27	40
1954		5,617	3,098	963	1,750	NA	165	161	61	NA	2,375	2,320	24	31	40	60	31	29	45
1955		6,281	3,603	973	2,057	123	191	187	64	9	2,522	2,460	27	35	42	64	32	32	50
1956		8,500	4,978	1,130	2,995	333	221	217	71	11	3,346	3,277	32	37	46	74	38	36	57
1957		9,908	6,233	1,297	3,928	407	242	267	79	14	3,470	3,396	37	37	51	91	51	40	64
1958		10,915	6,974	1,507	4,436	323	280	316	95	18	3,707	3,630	39	38	56	107	62	45	72
1959		12,490	8,167	1,681	5,217	418	356	349	125	22	4,065	3,983	40	42	61	117	67	50	81
1960		13,711	8,915	1,801	5,604	477	453	385	148	48	4,516	4,428	40	48	67	123	68	55	90
1961		14,564	9,484	1,987	5,685	555	557	440	169	92	4,757	4,668	40	49	75	148	86	62	101
1962		15,636	10,138	2,188	6,008	426	687	500	200	130	5,124	5,029	41	54	84	179	109	70	112
1963		17,519	11,645	2,558	6,856	414	839	580	234	165	5,456	5,360	41	55	96	197	119	78	125
1964		19,103	12,764	2,965	7,257	463	995	629	250	205	5,888	5,792	41	55	114	200	112	88	138
1965		20,252	13,194	3,156	7,367	373	1,167	630	286	215	6,549	6,445	42	62	136	225	124	101	150
1966		22,072	14,165	3,308	7,977	355	1,335	652	329	210	7,331	7,216	45	70	165	252	138	114	160
1967		23,346	14,563	3,444	7,946	419	1,491	696	342	225	8,146	8,020	52	74	200	271	145	126	168
1968		24,666	14,964	3,497	8,145	415	1,586	722	364	235	9,008	8,869	58	81	221	290	151	139	185
1969		25,996	15,228	3,790	7,987	464	1,624	731	388	245	10,011	9,857	61	93	233	316	161	155	208
1970		26,271	14,984	4,154	7,306	473	1,686	727	410	230	10,449	10,288	66	95	259	343	172	171	237
1971		26,952	15,210	4,409	7,175	491	1,760	735	427	215	10,824	10,654	72	98	290	366	184	182	262
1972		28,740	16,039	4,676	7,469	548	1,890	785	472	200	11,715	11,535	79	101	312	393	198	195	282
1973		30,952	16,587	4,837	7,600	545	2,009	841	566	190	13,299	13,104	90	105	343	422	211	211	302
1974		33,359	17,287	5,132	7,572	648	2,160	926	639	210	14,885	14,667	104	114	393	474	235	239	320
1975		35,671	18,533	5,561	7,878	727	2,400	1,067	675	225	15,824	15,582	118	124	432	534	262	272	348
1976		39,435	20,292	5,890	8,671	890	2,619	1,266	711	245	17,702	17,436	131	135	480	592	292	300	369
1977		43,338	22,071	6,211	9,523	962	2,893	1,467	740	275	19,642	19,340	155	147	569	662	326	337	394
1978		48,719	24,414	6,962	10,107	1,082	3,329	1,772	830	333	22,457	22,115	182	160	679	727	363	364	443
1979		55,379	27,225	7,471	11,354	1,164	3,848	2,013	985	390	26,097	25,708	215	174	785	791	405	386	482
1980		63,224	29,986	7,831	12,752	1,277	4,335	2,306	1,017	469	30,929	30,476	264	189	920	871	452	419	519
1981		72,292	33,739	8,605	14,997	1,385	4,670	2,484	1,075	524	35,948	35,428	314	206	1,058	967	504	463	581
1982		80,748	37,133	9,501	17,061	1,484	4,879	2,544	1,129	536	40,692	40,105	363	224	1,207	1,095	561	534	621
1983		89,950	41,451	10,830	19,095	1,585	5,210	2,840	1,306	585	45,264	44,588	432	244	1,357	1,220	626	595	658
1984		102,244	46,470	11,916	21,657	1,739	5,748	3,243	1,548	620	52,187	51,404	518	265	1,514	1,351	698	654	721
1985		114,671	52,641	13,093	25,333	1,863	6,388	3,616	1,694	655	57,962	57,043	630	289	1,743	1,491	778	713	834
1986		120,249	54,622	13,504	26,000	1,891	7,028	3,973	1,686	541	60,991	59,932	745	314	2,019	1,647	867	780	969
1987		126,360	58,609	13,588	28,757	1,995	7,768	4,287	1,704	509	62,576	61,403	831	342	2,262	1,849	967	882	1,065
1988		133,881	60,131	14,342	28,221	2,122	8,593	4,581	1,762	510	67,977	66,672	933	372	2,527	2,081	1,078	1,003	1,165
1989		141,891	60,466	15,231	26,359	2,195	9,317	4,756	2,062	547	74,966	73,501	1,061	405	2,852	2,333	1,202	1,131	1,274
1990		151,993	61,610	15,671	25,802	2,323	9,939	4,894	2,346	636	83,208	81,602	1,166	440	3,187	2,589	1,340	1,249	1,399
1991		160,876	60,783	15,249	24,095	2,277	10,667	5,120	2,679	696	92,300	90,580	1,242	479	3,458	2,852	1,494	1,358	1,483

Appendix table 4-7

U.S. research and development expenditures, by source of funds and performing sector: 1953–2009

Year	Funding source:	All sources									Industry				U&C	Other nonprofit			Other government ^a
	Performer:	All performers	Total	Federal	Industry ^b	FFRDCs ^b	U&C ^c	U&C	Other nonprofit ^d	Nonprofit	Total	Industry ^e	U&C ^c	Other	U&C ^c	Total	Other	U&C ^c	U&C ^c
		performers																	
1992		165,350	60,915	15,853	22,369	2,353	11,528	5,259	2,806	748	96,229	94,388	1,320	521	3,569	3,113	1,666	1,448	1,525
1993		165,730	60,528	16,531	20,844	1,965	12,307	5,289	2,843	749	96,549	94,591	1,392	567	3,709	3,388	1,857	1,531	1,557
1994		169,207	60,777	16,355	20,261	2,202	12,996	5,294	2,911	758	99,204	97,131	1,456	617	3,938	3,665	2,071	1,595	1,623
1995		183,625	62,969	16,904	21,178	2,273	13,592	5,367	2,847	808	110,871	108,652	1,548	671	4,110	3,925	2,308	1,617	1,751
1996		197,346	63,394	16,585	21,356	2,297	14,084	5,395	2,906	772	123,417	121,015	1,672	730	4,436	4,239	2,574	1,666	1,861
1997		212,152	64,574	16,819	21,798	2,130	14,530	5,463	3,014	821	136,228	133,611	1,808	809	4,838	4,590	2,804	1,786	1,922
1998		226,457	66,383	17,362	22,086	2,078	15,174	5,559	3,281	843	147,825	145,016	1,950	859	5,163	5,114	3,192	1,922	1,972
1999		245,007	67,055	17,851	20,496	2,039	16,264	5,652	3,761	993	164,606	161,594	2,082	931	5,619	5,628	3,516	2,112	2,098
2000		267,983	66,936	18,374	17,117	2,001	17,727	5,742	4,510	1,465	186,038	182,844	2,174	1,020	6,232	6,530	4,204	2,326	2,247
2001		279,755	74,983	22,374	16,899	2,020	19,784	6,225	5,488	2,192	188,337	185,118	2,190	1,029	6,827	7,211	4,666	2,546	2,397
2002		278,744	80,056	23,798	16,401	2,263	22,395	7,102	5,778	2,319	180,625	177,467	2,160	998	7,344	8,162	5,404	2,758	2,557
2003		291,239	86,107	24,982	17,798	2,458	25,129	7,301	5,945	2,494	186,076	182,926	2,129	1,020	7,650	8,664	5,831	2,833	2,742
2004		302,503	91,656	24,898	20,266	2,485	27,168	7,659	6,537	2,644	191,266	188,035	2,190	1,041	7,936	8,761	5,816	2,945	2,883
2005		324,993	96,276	26,322	21,909	2,601	28,254	7,817	6,545	2,828	207,680	204,250	2,323	1,107	8,578	9,538	6,425	3,113	2,922
2006		350,162	100,768	28,240	24,304	3,122	28,810	7,306	6,044	2,943	227,057	223,365	2,509	1,182	9,285	10,031	6,702	3,329	3,021
2007		376,960	105,822	29,859	26,585	5,165	29,351	5,567	5,980	3,316	246,679	242,682	2,741	1,257	9,959	11,235	7,541	3,694	3,265
2008		403,040	117,611	29,839	36,360	6,346	30,341	4,766	6,236	3,724	258,626	254,321	3,004	1,301	10,707	12,578	8,498	4,080	3,518
2009		400,458	124,432	30,901	39,573	6,446	31,575	4,968	7,133	3,835	247,357	242,820	3,279	1,258	11,436	13,559	9,141	4,418	3,675
Constant 2005 \$millions																			
1953		31,931	17,219	6,281	8,849	NA	922	811	356	0	13,902	13,614	127	161	226	340	173	167	244
1954		34,437	18,995	5,902	10,730	NA	1,009	984	371	0	14,559	14,225	144	190	242	368	190	178	273
1955		37,871	21,725	5,865	12,402	742	1,152	1,127	386	51	15,206	14,832	163	211	253	386	193	193	301
1956		49,548	29,018	6,590	17,459	1,941	1,288	1,265	411	64	19,502	19,102	184	216	268	431	222	210	329
1957		55,893	35,159	7,318	22,158	2,296	1,362	1,503	443	79	19,572	19,157	206	209	288	513	288	226	361
1958		60,220	38,477	8,312	24,474	1,782	1,545	1,741	524	99	20,452	20,027	215	210	306	588	342	246	397
1959		68,106	44,535	9,167	28,448	2,279	1,939	1,903	679	120	22,164	21,719	215	229	333	635	365	270	439
1960		73,737	47,944	9,684	30,137	2,565	2,433	2,070	796	258	24,286	23,813	215	258	360	661	366	296	484
1961		77,444	50,431	10,567	30,229	2,951	2,959	2,340	899	487	25,295	24,821	213	261	396	787	457	330	534
1962		82,022	53,182	11,476	31,516	2,235	3,601	2,623	1,049	682	26,876	26,381	212	283	441	936	572	365	588
1963		90,932	60,446	13,280	35,586	2,149	4,352	3,008	1,215	856	28,317	27,821	210	285	498	1,023	618	405	649
1964		97,653	65,251	15,158	37,098	2,367	5,086	3,215	1,278	1,048	30,097	29,609	207	281	580	1,022	573	450	703
1965		101,672	66,236	15,845	36,985	1,873	5,859	3,160	1,436	1,079	32,875	32,356	208	311	683	1,127	623	505	751
1966		107,747	69,147	16,147	38,941	1,733	6,517	3,180	1,604	1,025	35,788	35,226	220	342	803	1,228	674	554	781
1967		110,576	68,974	16,314	37,635	1,985	7,059	3,296	1,620	1,066	38,580	37,985	244	350	945	1,281	687	594	796
1968		112,063	67,985	15,888	37,004	1,885	7,206	3,280	1,654	1,068	40,923	40,294	261	368	1,002	1,315	686	629	838
1969		112,544	65,928	16,409	34,578	2,009	7,029	3,165	1,678	1,061	43,339	42,674	262	403	1,009	1,368	697	671	901
1970		108,038	61,621	17,082	30,045	1,945	6,931	2,988	1,684	946	42,968	42,308	269	391	1,063	1,411	707	703	975
1971		105,561	59,573	17,268	28,102	1,923	6,891	2,877	1,670	842	42,394	41,728	282	384	1,134	1,434	721	713	1,026
1972		107,905	60,219	17,555	28,042	2,057	7,096	2,947	1,770	751	43,984	43,308	297	379	1,170	1,474	743	730	1,059
1973		110,098	59,002	17,204	27,034	1,939	7,144	2,992	2,013	676	47,304	46,612	318	373	1,220	1,499	751	749	1,072

Appendix table 4-7

U.S. research and development expenditures, by source of funds and performing sector: 1953–2009

Year	Funding	All	Federal								Industry				U&C	Other nonprofit			Other
	source:	sources	Total		Industry		U&C		Other nonprofit		Total		Other		Total	Other		government ^a	
	Performer:	performers	Total	Federal	Industry ^b	FFRDCs ^b	U&C ^c	FFRDCs	nonprofit ^d	FFRDCs ^d	Total	Industry ^e	U&C ^c	nonprofit	U&C ^c	Total	nonprofit	U&C ^c	U&C ^c
1974		108,784	56,373	16,737	24,692	2,113	7,044	3,020	2,082	685	48,541	47,829	339	373	1,280	1,547	767	779	1,044
1975		106,282	55,220	16,570	23,472	2,166	7,151	3,179	2,011	670	47,148	46,426	352	370	1,286	1,592	781	810	1,037
1976		111,118	57,177	16,597	24,433	2,508	7,380	3,566	2,003	690	49,881	49,131	369	381	1,353	1,668	824	844	1,040
1977		114,802	58,467	16,454	25,226	2,548	7,662	3,887	1,961	728	52,030	51,231	409	390	1,506	1,755	864	891	1,044
1978		120,589	60,429	17,233	25,017	2,678	8,239	4,385	2,054	823	55,584	54,739	449	396	1,681	1,799	900	900	1,097
1979		126,549	62,213	17,073	25,946	2,660	8,793	4,599	2,251	891	59,635	58,747	490	398	1,794	1,807	926	881	1,100
1980		132,407	62,799	16,399	26,706	2,674	9,078	4,829	2,130	982	64,773	63,825	552	397	1,926	1,824	946	877	1,086
1981		138,425	64,603	16,476	28,716	2,652	8,941	4,757	2,058	1,003	68,834	67,838	601	395	2,025	1,851	964	887	1,112
1982		145,722	67,013	17,146	30,789	2,678	8,804	4,590	2,038	967	73,435	72,376	655	405	2,177	1,976	1,013	963	1,121
1983		156,156	71,960	18,800	33,150	2,752	9,045	4,931	2,266	1,016	78,580	77,406	750	424	2,355	2,119	1,087	1,032	1,142
1984		171,072	77,753	19,937	36,236	2,910	9,617	5,427	2,590	1,038	87,318	86,008	866	444	2,533	2,261	1,168	1,093	1,206
1985		186,227	85,490	21,263	41,141	3,026	10,374	5,872	2,751	1,063	94,131	92,639	1,023	469	2,831	2,422	1,264	1,158	1,354
1986		191,059	86,788	21,457	41,311	3,005	11,166	6,312	2,678	860	96,907	95,224	1,184	499	3,207	2,618	1,378	1,239	1,540
1987		195,108	90,497	20,981	44,403	3,080	11,994	6,620	2,632	786	96,621	94,810	1,283	528	3,493	2,854	1,493	1,361	1,644
1988		199,858	89,764	21,410	42,128	3,168	12,828	6,838	2,631	761	101,476	99,528	1,393	555	3,772	3,107	1,610	1,497	1,739
1989		204,107	86,979	21,909	37,917	3,157	13,402	6,841	2,966	787	107,837	105,730	1,526	582	4,103	3,356	1,729	1,627	1,833
1990		210,515	85,332	21,705	35,737	3,217	13,766	6,778	3,249	881	115,246	113,022	1,614	610	4,413	3,586	1,856	1,730	1,938
1991		215,189	81,304	20,398	32,230	3,046	14,268	6,849	3,583	931	123,462	121,161	1,661	641	4,625	3,815	1,999	1,816	1,983
1992		216,053	79,593	20,714	29,228	3,075	15,062	6,872	3,666	977	125,736	123,331	1,724	681	4,663	4,068	2,177	1,891	1,993
1993		211,865	77,377	21,132	26,646	2,512	15,733	6,761	3,635	958	123,426	120,922	1,779	725	4,741	4,331	2,374	1,957	1,990
1994		211,847	76,093	20,477	25,367	2,757	16,270	6,628	3,645	949	124,204	121,608	1,823	772	4,930	4,589	2,592	1,996	2,031
1995		225,206	77,228	20,731	25,974	2,788	16,670	6,583	3,492	991	135,976	133,255	1,898	823	5,041	4,814	2,831	1,983	2,148
1996		237,513	76,297	19,960	25,703	2,765	16,951	6,493	3,497	929	148,536	145,646	2,012	879	5,338	5,102	3,097	2,004	2,240
1997		250,901	76,368	19,891	25,779	2,519	17,183	6,461	3,565	971	161,109	158,015	2,138	956	5,722	5,428	3,316	2,113	2,273
1998		264,829	77,632	20,304	25,828	2,430	17,745	6,501	3,837	986	172,873	169,588	2,280	1,005	6,038	5,981	3,733	2,247	2,306
1999		282,368	77,280	20,573	23,621	2,350	18,744	6,514	4,334	1,144	189,707	186,235	2,399	1,073	6,476	6,486	4,052	2,434	2,418
2000		302,045	75,444	20,710	19,293	2,255	19,980	6,472	5,083	1,651	209,685	206,085	2,450	1,149	7,024	7,361	4,739	2,622	2,532
2001		308,347	82,647	24,661	18,626	2,227	21,806	6,862	6,049	2,416	207,586	204,038	2,414	1,134	7,525	7,948	5,142	2,806	2,642
2002		302,337	86,832	25,812	17,789	2,455	24,291	7,703	6,267	2,515	195,914	192,488	2,343	1,083	7,965	8,853	5,861	2,992	2,774
2003		309,385	91,472	26,539	18,907	2,611	26,695	7,756	6,315	2,649	197,669	194,323	2,262	1,084	8,127	9,204	6,194	3,009	2,913
2004		312,548	94,700	25,724	20,939	2,568	28,070	7,913	6,754	2,732	197,617	194,279	2,262	1,076	8,200	9,052	6,009	3,043	2,979
2005		324,993	96,276	26,322	21,909	2,601	28,254	7,817	6,545	2,828	207,680	204,250	2,323	1,107	8,578	9,538	6,425	3,113	2,922
2006		339,202	97,614	27,356	23,543	3,024	27,908	7,078	5,854	2,851	219,950	216,374	2,431	1,145	8,995	9,717	6,492	3,225	2,926

Appendix table 4-7

U.S. research and development expenditures, by source of funds and performing sector: 1953–2009

Year	Funding source:	All sources	Federal								Industry				U&C	Other nonprofit			Other government ^a
	Performer:	All performers	Total	Federal	Industry ^b	FFRDCs ^b	U&C ^c	FFRDCs	nonprofit ^d	FFRDCs ^d	Total	Industry ^e	U&C ^c	Other nonprofit	U&C ^c	Total	nonprofit	U&C ^c	U&C ^c
2007		354,864	99,619	28,109	25,027	4,862	27,631	5,241	5,629	3,121	232,220	228,457	2,580	1,183	9,375	10,576	7,099	3,478	3,074
2008		371,184	108,315	27,480	33,486	5,844	27,943	4,389	5,743	3,429	238,184	234,219	2,767	1,198	9,861	11,584	7,827	3,757	3,240
2009		364,951	113,399	28,161	36,064	5,875	28,775	4,528	6,501	3,495	225,425	221,290	2,988	1,146	10,422	12,356	8,330	4,026	3,349

NA = not available, included in figures for federal support to industry and federal support to nonprofit institutions

FFRDC = federally funded research and development center; U&C = universities and colleges

^aBecause of limitations in survey information, data on other government funding to performers other than U&C not available and consequently included in other sectors' support for their own R&D performance, e.g., other government support to other nonprofits included in other nonprofit support for their own R&D.

^bFederal support for industry in 1953–54 did not separate federal support for industry and for industry FFRDCs; thus, the figure for federal support to industry includes support to FFRDCs for those years.

^cAdjustments made to U&C R&D for 1998 and later years to eliminate double counting of funds passed through from one academic institution to another. Data for 1998 and later years are not directly comparable with data for 1997 and earlier years. For FY 1998, \$479 million in total passthrough funds and \$421 million in federal passthrough funds reported. For FY 2009, \$1,873 million in total passthrough funds and \$1,660 million in federal passthrough funds estimated.

^dFederal support for nonprofit FFRDCs in 1953–54 did not separate federal support for other nonprofits and for nonprofit FFRDCs; thus, the figures for federal support to other nonprofit institutions include support to FFRDCs for those years.

^eIndustry sources of funding for industry R&D expenditures include all nonfederal sources of funding for industry R&D expenditures.

NOTES: Technical notes explaining methodological issues of measurement available on request. Data based on annual reports by performers, except for the nonprofit sector (where some figures involve estimates). R&D expenditures of FFRDCs are chiefly federal funds, but any nonfederal funds also included in totals. For trend comparisons, use only historical data reported here; do not use data published earlier. Expenditures for industry and, prior to 2001, for industry-administered FFRDCs collected by calendar year. Expenditures for other performers are calendar-year approximations based on fiscal year data. In most cases, the approximation equals 75% of amount reported in same fiscal year plus 25% of amount reported in subsequent fiscal year. However, fiscal year for academic performers generally begins 1 July, not 1 October; also, prior to 1977, federal fiscal year began on 1 July, not 1 October. Therefore, calendar-year approximations for academic performers and federal performers prior to 1977 equal 50% of amount reported in same fiscal year plus 50% of amount reported in subsequent fiscal year. Detail may not add to total because of rounding. Constant-dollar estimates derived from unrounded data. Los Alamos National Laboratory (some \$2 billion in annual R&D expenditures in recent years) became industry administered in June 2006; previously, it was U&C administered. Lawrence Livermore National Laboratory (more than \$1 billion in annual R&D expenditures in recent years) became industry administered in October 2007; previously, it was U&C administered. The tracks of R&D expenditures from 2006 to 2008 for both industry- and U&C-administered FFRDCs reflect these shifts.

SOURCES: National Science Foundation, National Center for Science and Engineering Statistics (NSF/NCSES), National Patterns of R&D Resources (annual series); NSF/NCSES, Business R&D and Innovation Survey, 2009; NSF/NCSES, Survey of R&D Expenditures at Universities and Colleges, FY 2009; NSF/NCSES, Federal Funds for R&D: FY 2009–11; NSF/NCSES, Survey of R&D Expenditures at FFRDCs, FY 2009; and NSF/NCSES, R&D Funding and Performance by Nonprofit Organizations: FY 1996–97. All NSF/NCSES reports available at <http://www.nsf.gov/statistics/>.

Science and Engineering Indicators 2012

Appendix table 4-8

U.S. basic research expenditures, by source of funds and performing sector: 1953–2009

Year	Funding source:	All sources	Federal								Industry				U&C	Other nonprofit		Other government ^a	
	Performer:	All performers	Total	Federal	Industry ^b	FFRDCs ^c	U&C ^d	FFRDCs	Other nonprofit ^e	FFRDCs ^e	Total	Industry ^f	U&C ^d	Other nonprofit	U&C ^d	Total nonprofit	U&C ^d	U&C ^d	
	Current \$millions																		
1953		460	265	102	19	NA	82	36	27	NA	154	132	13	9	6	28	12	16	7
1954		509	291	96	23	NA	97	44	31	NA	169	143	15	11	8	31	13	18	10
1955		579	327	98	27	NA	117	50	36	NA	192	162	17	13	12	35	14	21	14
1956		718	393	114	37	NA	143	58	42	NA	251	216	20	15	15	41	17	24	19
1957		814	452	124	41	NA	167	72	49	NA	268	230	23	15	20	50	23	27	25
1958		944	538	149	43	NA	202	85	59	NA	292	252	24	16	24	59	28	31	31
1959		1,087	666	165	72	NA	263	95	72	NA	290	248	24	18	28	66	30	36	38
1960		1,286	794	184	79	NA	341	106	85	NA	343	297	25	21	33	71	30	41	45
1961		1,512	973	230	81	NA	432	126	105	NA	361	314	25	22	40	85	37	48	54
1962		1,824	1,218	252	143	NA	546	148	130	NA	394	345	25	24	48	101	46	55	64
1963		2,115	1,446	285	147	NA	689	175	150	NA	425	375	25	25	58	113	50	63	75
1964		2,396	1,693	339	123	42	824	200	166	NA	434	384	25	25	70	115	47	68	84
1965		2,664	1,900	375	157	29	944	218	179	NA	462	406	27	29	86	122	52	70	94
1966		2,930	2,075	410	142	31	1,066	239	188	NA	512	451	29	32	106	133	58	75	104
1967		3,168	2,280	434	168	34	1,188	263	194	NA	495	427	34	34	136	144	61	83	114
1968		3,376	2,399	482	145	35	1,265	276	196	NA	537	462	38	37	156	154	63	91	131
1969		3,491	2,457	545	123	37	1,288	272	192	NA	541	458	40	43	171	170	67	103	153
1970		3,594	2,501	562	122	36	1,323	265	195	NA	531	444	43	44	196	187	72	115	179
1971		3,720	2,559	581	101	33	1,385	252	207	NA	551	456	50	45	214	204	77	127	194
1972		3,850	2,656	603	91	39	1,437	270	216	NA	565	463	55	47	216	218	84	134	195
1973		4,099	2,847	652	96	36	1,489	343	232	NA	607	499	59	49	223	227	90	137	196
1974		4,511	3,146	715	114	49	1,609	415	245	NA	656	536	66	54	250	254	102	153	204
1975		4,875	3,415	760	104	53	1,768	476	255	NA	704	573	72	59	264	280	116	164	212
1976		5,373	3,793	850	116	69	1,924	556	278	NA	774	634	75	65	283	305	131	175	218
1977		6,008	4,235	943	135	75	2,114	667	301	NA	862	701	89	72	334	346	148	198	232
1978		6,959	4,950	1,044	156	94	2,399	906	351	NA	970	785	107	79	398	380	168	213	260
1979		7,836	5,558	1,112	161	104	2,719	1,050	413	NA	1,107	893	128	87	466	419	190	229	286
1980		8,745	6,145	1,212	170	120	3,061	1,167	416	NA	1,286	1,035	156	95	544	463	215	248	307
1981		9,658	6,591	1,343	164	137	3,331	1,284	324	9	1,600	1,313	183	105	615	512	243	269	338
1982		10,651	7,121	1,522	253	128	3,475	1,366	369	9	1,854	1,523	215	115	716	591	275	317	368
1983		11,880	7,853	1,733	346	117	3,689	1,536	426	8	2,146	1,760	260	127	816	668	311	358	396
1984		13,332	8,651	1,877	340	136	4,087	1,709	494	9	2,584	2,132	313	139	915	746	351	395	436
1985		14,748	9,407	1,947	358	131	4,606	1,793	560	13	2,915	2,373	389	153	1,075	837	397	440	514
1986		17,154	10,220	2,026	434	117	5,122	1,915	594	13	4,130	3,496	466	168	1,262	936	449	488	606
1987		18,481	11,090	2,047	598	142	5,527	2,086	675	14	4,282	3,583	514	185	1,399	1,052	507	545	659
1988		19,787	12,097	2,116	656	337	5,937	2,272	756	24	4,275	3,507	565	203	1,530	1,180	573	607	705
1989		21,891	13,392	2,309	986	398	6,422	2,371	860	46	4,692	3,832	637	223	1,714	1,327	647	680	766
1990		23,029	14,057	2,319	869	499	6,889	2,470	947	65	4,710	3,760	705	245	1,929	1,486	730	756	847
1991		27,140	15,283	2,378	1,251	461	7,423	2,657	1,036	77	7,157	6,125	764	269	2,127	1,660	825	836	912

Appendix table 4-8

U.S. basic research expenditures, by source of funds and performing sector: 1953–2009

Year	Funding source:	All sources										Industry				U&C	Other nonprofit		Other government ^a	
	Performer:	All performers	Total	Federal			U&C			Other nonprofit ^e	Total	Industry ^f		Other nonprofit	U&C ^d	Other		U&C ^d	U&C ^d	
				Federal	Industry ^b	FFRDCs ^c	U&C ^d	FFRDCs ^c	U&C			Other	Industry ^f			U&C ^d	Total nonprofit			U&C ^d
1992		27,604	15,710	2,419	712	474	8,058	2,867	1,114	67	6,925	5,816	814	295	2,203	1,824	931	893	941	
1993		28,743	16,399	2,621	466	492	8,638	2,953	1,157	72	7,136	5,961	851	324	2,268	1,987	1,051	936	952	
1994		29,651	16,770	2,547	436	503	9,139	2,934	1,137	75	7,323	6,078	890	356	2,406	2,160	1,186	974	992	
1995		29,610	16,990	2,689	190	530	9,634	2,702	1,170	75	6,715	5,379	945	390	2,511	2,326	1,338	987	1,070	
1996		32,799	18,063	2,680	650	708	10,092	2,606	1,248	79	8,309	6,848	1,032	428	2,740	2,539	1,510	1,028	1,149	
1997		36,921	19,420	2,746	1,029	625	10,924	2,671	1,317	108	10,390	8,766	1,175	449	3,144	2,718	1,557	1,162	1,248	
1998		35,372	20,847	3,003	1,002	568	11,941	2,660	1,461	213	6,643	4,851	1,315	477	3,483	3,069	1,773	1,296	1,330	
1999		38,935	22,799	3,347	1,108	557	12,892	2,765	1,734	397	7,474	5,537	1,421	517	3,835	3,394	1,952	1,442	1,432	
2000		42,759	24,791	3,765	925	547	13,966	2,874	2,099	616	8,181	6,115	1,499	566	4,298	3,939	2,334	1,604	1,550	
2001		47,751	27,603	4,260	754	552	15,553	3,104	2,464	915	9,390	7,299	1,519	571	4,737	4,357	2,590	1,767	1,663	
2002		51,383	30,924	4,511	888	534	17,724	3,714	2,575	979	8,707	6,659	1,494	554	5,077	4,907	3,000	1,907	1,768	
2003		54,611	33,497	4,664	1,386	299	19,658	3,747	2,714	1,029	8,948	6,944	1,438	567	5,165	5,150	3,238	1,913	1,850	
2004		56,092	34,683	4,697	1,072	175	21,150	3,730	2,788	1,070	8,829	6,763	1,488	578	5,392	5,231	3,229	2,001	1,958	
2005		59,686	36,103	4,770	1,108	136	22,186	3,820	2,903	1,181	9,798	7,559	1,624	614	5,999	5,744	3,568	2,177	2,042	
2006		61,199	36,936	4,716	1,444	652	22,690	3,344	2,849	1,242	9,387	6,940	1,791	656	6,624	6,097	3,721	2,376	2,155	
2007		66,206	38,605	4,621	2,780	2,258	23,043	1,724	2,829	1,350	11,169	8,488	1,983	698	7,207	6,861	4,187	2,674	2,363	
2008		70,220	38,547	4,957	1,475	2,423	23,500	1,672	3,073	1,447	13,777	10,893	2,162	722	7,708	7,655	4,719	2,937	2,533	
2009		75,969	40,451	5,507	1,340	2,550	24,242	1,808	3,496	1,508	16,486	13,444	2,344	698	8,173	8,233	5,075	3,158	2,627	
Constant 2005 \$millions																				
1953		2,843	1,640	628	118	NA	504	223	167	NA	953	817	80	56	37	173	74	99	40	
1954		3,118	1,781	589	141	NA	592	270	190	NA	1,036	877	92	67	52	190	80	110	59	
1955		3,491	1,972	588	163	NA	702	301	217	NA	1,158	977	102	78	70	208	84	124	84	
1956		4,185	2,288	662	216	NA	831	338	242	NA	1,460	1,259	114	87	90	236	99	137	111	
1957		4,589	2,547	699	231	NA	939	403	274	NA	1,509	1,297	127	85	111	282	130	152	140	
1958		5,205	2,965	822	237	NA	1,114	469	323	NA	1,611	1,390	132	88	132	326	154	171	171	
1959		5,927	3,629	897	393	NA	1,431	515	393	NA	1,581	1,352	131	98	155	357	164	194	205	
1960		6,916	4,270	987	425	NA	1,831	570	457	NA	1,842	1,597	132	113	180	382	161	220	242	
1961		8,037	5,171	1,220	431	NA	2,294	667	558	NA	1,920	1,670	133	117	212	449	197	253	285	
1962		9,568	6,389	1,322	750	NA	2,862	774	682	NA	2,067	1,810	131	126	251	527	241	286	334	
1963		10,978	7,503	1,477	763	NA	3,576	908	779	NA	2,203	1,946	127	130	299	584	260	324	389	
1964		12,248	8,655	1,733	629	215	4,210	1,020	849	NA	2,219	1,963	128	128	356	588	240	348	431	
1965		13,374	9,539	1,880	788	146	4,737	1,092	896	NA	2,317	2,038	133	146	432	612	261	351	474	
1966		14,303	10,129	2,001	693	151	5,204	1,164	915	NA	2,499	2,202	142	156	520	649	283	366	505	
1967		15,002	10,796	2,053	796	161	5,624	1,246	916	NA	2,342	2,022	159	161	642	682	289	393	539	
1968		15,338	10,897	2,190	659	159	5,747	1,252	890	NA	2,437	2,099	170	168	710	700	286	413	594	
1969		15,112	10,636	2,360	533	160	5,574	1,178	831	NA	2,340	1,983	171	186	741	734	290	444	662	
1970		14,780	10,287	2,311	502	148	5,439	1,088	800	NA	2,184	1,826	177	181	805	767	296	471	738	
1971		14,571	10,022	2,276	396	129	5,423	987	811	NA	2,156	1,786	194	176	838	797	302	495	758	
1972		14,455	9,970	2,262	342	146	5,395	1,014	811	NA	2,121	1,738	206	176	811	818	315	503	734	
1973		14,582	10,127	2,319	341	128	5,295	1,220	823	NA	2,157	1,775	208	174	794	806	320	486	698	

Appendix table 4-8

U.S. basic research expenditures, by source of funds and performing sector: 1953–2009

Year	Funding	All										Industry				U&C	Other nonprofit		Other government ^a				
	source:	sources										Federal				Other				U&C		Other	
	Performer:	All performers	Total	Federal	Industry ^b	FFRDCs ^c	U&C ^d	FFRDCs	nonprofit ^e	FFRDCs ^e	Total	Industry ^f	U&C ^d	nonprofit	U&C ^d	Total	nonprofit	U&C ^d	U&C ^d				
1974		14,709	10,260	2,331	372	160	5,247	1,352	799	NA	2,139	1,748	215	176	816	830	333	497	665				
1975		14,524	10,176	2,264	310	158	5,268	1,417	760	NA	2,097	1,707	213	177	785	833	344	489	633				
1976		15,140	10,687	2,395	327	194	5,421	1,567	782	NA	2,182	1,786	211	184	798	860	369	492	613				
1977		15,916	11,218	2,498	358	199	5,600	1,766	798	NA	2,283	1,857	236	190	885	916	392	523	614				
1978		17,224	12,253	2,585	386	233	5,938	2,242	869	NA	2,402	1,943	264	195	986	941	415	526	643				
1979		17,907	12,702	2,542	368	238	6,213	2,398	943	NA	2,530	2,041	291	198	1,065	957	434	523	653				
1980		18,314	12,869	2,539	356	251	6,409	2,443	871	NA	2,694	2,168	326	200	1,139	969	450	519	643				
1981		18,492	12,621	2,571	314	262	6,378	2,459	620	17	3,065	2,514	350	201	1,178	981	465	516	647				
1982		19,221	12,851	2,746	457	231	6,270	2,466	666	16	3,345	2,748	389	208	1,293	1,067	496	572	664				
1983		20,624	13,634	3,008	601	203	6,403	2,666	739	14	3,726	3,055	451	220	1,417	1,160	539	621	687				
1984		22,306	14,475	3,140	569	228	6,837	2,859	827	15	4,323	3,567	523	233	1,531	1,248	588	661	729				
1985		23,951	15,277	3,162	581	213	7,479	2,911	909	20	4,734	3,854	632	248	1,747	1,359	645	714	835				
1986		27,255	16,238	3,219	690	186	8,137	3,043	943	21	6,562	5,555	740	267	2,005	1,487	713	775	962				
1987		28,536	17,123	3,161	923	219	8,533	3,221	1,043	22	6,611	5,532	794	285	2,161	1,624	783	842	1,017				
1988		29,538	18,059	3,159	979	503	8,862	3,391	1,129	36	6,381	5,235	843	303	2,284	1,761	855	906	1,053				
1989		31,489	19,265	3,321	1,418	573	9,238	3,411	1,237	67	6,749	5,512	917	320	2,466	1,908	930	978	1,101				
1990		31,896	19,469	3,212	1,204	691	9,541	3,421	1,312	89	6,524	5,208	977	339	2,672	2,059	1,012	1,047	1,173				
1991		36,302	20,443	3,181	1,673	617	9,929	3,554	1,386	103	9,574	8,193	1,022	359	2,845	2,221	1,103	1,118	1,220				
1992		36,068	20,528	3,160	930	619	10,529	3,746	1,456	87	9,049	7,599	1,064	385	2,878	2,384	1,217	1,167	1,230				
1993		36,744	20,964	3,350	596	629	11,043	3,775	1,479	92	9,122	7,620	1,088	414	2,900	2,540	1,343	1,197	1,218				
1994		37,123	20,996	3,189	546	630	11,441	3,673	1,423	93	9,169	7,610	1,114	445	3,013	2,705	1,485	1,220	1,241				
1995		36,315	20,837	3,298	233	650	11,815	3,313	1,435	93	8,235	6,597	1,159	479	3,079	2,853	1,642	1,211	1,312				
1996		39,475	21,739	3,225	782	852	12,146	3,136	1,502	95	10,000	8,242	1,242	516	3,297	3,055	1,817	1,238	1,383				
1997		43,664	22,967	3,247	1,217	739	12,920	3,159	1,557	127	12,288	10,367	1,390	531	3,718	3,215	1,841	1,374	1,476				
1998		41,366	24,380	3,511	1,172	664	13,964	3,111	1,708	249	7,769	5,673	1,538	558	4,073	3,589	2,073	1,516	1,556				
1999		44,872	26,276	3,857	1,276	642	14,858	3,186	1,998	457	8,614	6,381	1,637	596	4,420	3,911	2,250	1,662	1,650				
2000		48,193	27,943	4,243	1,043	616	15,741	3,239	2,366	694	9,221	6,892	1,690	638	4,844	4,439	2,631	1,808	1,746				
2001		52,631	30,424	4,696	831	609	17,143	3,421	2,716	1,009	10,349	8,045	1,675	630	5,222	4,803	2,855	1,947	1,833				
2002		55,732	33,542	4,892	963	580	19,224	4,028	2,793	1,062	9,444	7,223	1,620	601	5,507	5,323	3,254	2,068	1,918				
2003		58,014	35,584	4,955	1,472	318	20,883	3,980	2,884	1,093	9,506	7,377	1,527	602	5,487	5,471	3,439	2,032	1,965				
2004		57,954	35,835	4,853	1,108	181	21,853	3,854	2,881	1,106	9,122	6,988	1,537	597	5,571	5,404	3,337	2,068	2,023				
2005		59,686	36,103	4,770	1,108	136	22,186	3,820	2,903	1,181	9,798	7,559	1,624	614	5,999	5,744	3,568	2,177	2,042				
2006		59,284	35,780	4,568	1,399	632	21,979	3,239	2,760	1,203	9,093	6,723	1,735	636	6,417	5,906	3,605	2,301	2,087				

Appendix table 4-8

U.S. basic research expenditures, by source of funds and performing sector: 1953–2009

Year	Funding source:	All sources	Federal								Industry			U&C	Other nonprofit			Other government ^a	
	Performer:	All performers	Total	Federal	Industry ^b	FFRDCs ^c	U&C ^d	FFRDCs	nonprofit ^e	FFRDCs ^e	Total	Industry ^f	U&C ^d	nonprofit	U&C ^d	Total	nonprofit	U&C ^d	U&C ^d
2007		62,325	36,342	4,350	2,617	2,126	21,692	1,623	2,663	1,271	10,514	7,990	1,867	657	6,785	6,459	3,941	2,517	2,225
2008		64,670	35,500	4,565	1,358	2,231	21,643	1,540	2,830	1,332	12,688	10,032	1,991	665	7,099	7,050	4,346	2,705	2,333
2009		69,234	36,864	5,019	1,221	2,324	22,093	1,647	3,186	1,375	15,024	12,252	2,136	636	7,448	7,503	4,625	2,878	2,394

NA = not available, included in figures for federal support to industry and federal support to nonprofit institutions

FFRDC = federally funded research and development center; U&C = universities and colleges

^aBecause of limitations in survey information, data on other government funding to performers other than U&C not available and consequently are included in other sectors' support for their own R&D performance, e.g., other government support to other nonprofits included in other nonprofit support for their own R&D.

^bCharacter-of-work estimates for industry revised for 1998 and later years; data are not directly comparable with data for 1997 and earlier years. Character-of-work estimates for industry FFRDCs for 1953–63 not separated from federal support for industry; thus, figure for federal support to industry includes support to FFRDCs for those years.

^cCharacter-of-work estimates for industry FFRDCs for 1953–63 not separated from federal support for industry; thus, the figure for federal support to industry includes support to FFRDCs for those years.

^dFor 1998 and later years, character-of-work estimation procedure revised and adjustments made to U&C R&D to eliminate double counting of funds passed through from one academic institution to another. Data for 1998 and later years not directly comparable with data for 1997 and earlier years.

^eCharacter-of-work estimates for nonprofit FFRDCs for 1953–80 not separated from federal support for other nonprofits; thus, the figure for federal support to other nonprofit institutions includes support to FFRDCs for those years.

^fIndustry sources of funds for industry R&D expenditures include all nonfederal sources of funds for industry R&D expenditures. Character-of-work estimates for industry revised for 1998 and later years; data not directly comparable with data for 1997 and earlier years.

NOTES: Technical notes explaining methodological issues of measurement available on request. Data based on annual reports by performers, except for the nonprofit sector (where some figures involve estimates). R&D expenditures of FFRDCs are chiefly federal funds, but any nonfederal funds also included in totals. For trend comparisons, use only historical data reported here; do not use data published earlier. Expenditures for industry and, prior to 2001, for industry-administered FFRDCs collected by calendar year. Expenditures for other performers are calendar-year approximations based on fiscal year data. In most cases, the approximation equals 75% of amount reported in same fiscal year plus 25% of amount reported in subsequent fiscal year. However, fiscal year for academic performers generally begins 1 July, not 1 October; also, prior to 1977, federal fiscal year began on 1 July, not 1 October. Therefore, calendar-year approximations for academic performers and federal performers prior to 1977 equal 50% of amount reported in same fiscal year plus 50% of amount reported in subsequent fiscal year. Detail may not add to total because of rounding. Constant-dollar estimates derived from unrounded data. Los Alamos National Laboratory (some \$2 billion in annual R&D expenditures in recent years) became industry administered in June 2006; previously, it was U&C administered. Lawrence Livermore National Laboratory (more than \$1 billion in annual R&D expenditures in recent years) became industry administered in October 2007; previously, it was U&C administered. The tracks of R&D expenditures from 2006 to 2008 for both industry- and U&C-administered FFRDCs reflect these shifts.

SOURCES: National Science Foundation, National Center for Science and Engineering Statistics (NSF/NCSES), National Patterns of R&D Resources (annual series); NSF/NCSES, Business R&D and Innovation Survey, 2009; NSF/NCSES, Survey of R&D Expenditures at Universities and Colleges, FY 2009; NSF/NCSES, Federal Funds for R&D: FY 2009–11; NSF/NCSES, Survey of R&D Expenditures at FFRDCs, FY 2009; and NSF/NCSES, R&D Funding and Performance by Nonprofit Organizations: FY 1996–97. All NSF/NCSES reports available at <http://www.nsf.gov/statistics/>.

Appendix table 4-9

U.S. applied research expenditures, by source of funds and performing sectors: 1953-2009

Year	Funding source:	All sources	Federal								Industry				U&C	Other nonprofit			Other government ^a
	Performer:	All performers	Total	Federal	Industry ^b	FFRDCs ^c	U&C ^d	FFRDCs	Other nonprofit ^e	Nonprofit FFRDCs ^e	Total	Industry ^f	U&C ^d	Other nonprofit	U&C ^d	Total	Other nonprofit	U&C ^d	U&C ^d
	Current \$millions																		
1953		1,289	756	347	288	NA	59	48	14	NA	456	438	7	11	28	20	10	10	30
1954		1,378	785	330	322	NA	60	58	16	NA	513	492	8	13	28	21	11	10	32
1955		1,514	850	333	368	NA	63	68	18	NA	583	560	9	14	27	22	11	11	32
1956		1,928	1,025	387	474	NA	65	79	21	NA	818	794	10	14	27	25	14	11	33
1957		2,414	1,304	446	678	NA	63	94	24	NA	1,018	992	12	14	27	31	20	11	34
1958		2,758	1,496	516	774	NA	66	111	30	NA	1,163	1,137	12	14	27	37	25	12	35
1959		2,940	1,630	577	813	NA	78	121	43	NA	1,206	1,178	13	15	28	39	27	12	37
1960		3,065	1,732	615	833	NA	93	129	63	NA	1,226	1,196	13	17	29	40	28	12	39
1961		3,123	1,811	668	812	NA	104	145	83	NA	1,195	1,165	13	17	30	48	35	13	40
1962		3,698	2,098	709	1,011	NA	119	163	98	NA	1,471	1,438	14	19	30	58	45	13	41
1963		3,865	2,245	809	1,007	NA	128	186	115	NA	1,483	1,450	14	19	32	63	49	14	42
1964		4,201	2,462	947	978	62	142	203	130	NA	1,593	1,560	14	19	37	65	47	18	45
1965		4,374	2,553	994	992	46	176	206	140	NA	1,654	1,620	13	21	42	79	52	27	46
1966		4,653	2,625	1,012	986	53	208	213	153	NA	1,842	1,804	14	24	48	91	57	34	47
1967		4,848	2,763	1,069	983	83	238	225	166	NA	1,890	1,849	16	25	54	96	60	36	46
1968		5,137	2,811	1,112	956	87	250	221	186	NA	2,125	2,081	16	28	55	101	62	39	46
1969		5,454	2,924	1,229	920	95	257	213	210	NA	2,320	2,272	16	32	54	109	66	43	48
1970		5,752	3,100	1,334	952	97	280	213	225	NA	2,429	2,378	18	33	56	117	70	47	51
1971		5,833	3,091	1,355	907	67	306	216	241	NA	2,494	2,441	19	34	67	121	74	47	61
1972		6,147	3,243	1,434	845	107	391	224	243	NA	2,618	2,562	21	35	82	131	79	52	74
1973		6,655	3,429	1,527	883	110	450	203	257	NA	2,894	2,832	26	36	100	145	83	62	88
1974		7,344	3,634	1,652	905	120	477	191	290	NA	3,333	3,263	32	39	118	163	91	72	96
1975		8,091	4,125	1,912	991	139	550	219	315	NA	3,520	3,440	39	42	141	192	100	92	113
1976		8,976	4,464	2,068	1,033	167	596	263	338	NA	4,001	3,912	45	45	166	218	109	109	127
1977		9,662	4,683	2,081	1,113	212	626	297	355	NA	4,410	4,311	51	48	194	241	120	121	134
1978		10,704	5,080	2,242	1,195	235	676	324	409	NA	4,982	4,870	61	52	232	259	132	128	151
1979		12,097	5,602	2,415	1,305	250	793	360	480	NA	5,797	5,670	71	55	263	273	144	129	161
1980		13,714	6,237	2,546	1,625	275	912	421	458	NA	6,698	6,550	88	60	308	298	158	140	174
1981		16,329	6,905	2,731	2,042	298	953	422	391	68	8,531	8,359	108	64	363	332	173	159	199
1982		18,218	7,689	2,802	2,593	367	1,007	433	398	91	9,553	9,363	121	69	402	367	189	178	207
1983		20,298	8,738	2,991	3,227	414	1,122	473	433	78	10,501	10,286	141	74	443	401	207	194	215
1984		22,451	9,499	2,961	3,677	547	1,226	548	459	80	11,788	11,541	168	79	491	438	226	212	234
1985		25,401	10,930	3,135	4,717	630	1,296	580	490	82	13,191	12,908	198	85	547	471	247	224	262
1986		27,240	10,409	3,204	4,049	629	1,393	554	506	75	15,402	15,082	229	91	620	510	270	240	298
1987		27,951	10,829	3,366	4,037	623	1,643	532	555	74	15,511	15,153	260	98	707	571	295	276	333
1988		29,528	10,749	3,362	3,846	371	1,958	547	599	66	16,938	16,531	302	105	818	647	322	325	377
1989		32,277	11,753	3,566	4,324	374	2,121	603	695	70	18,452	17,993	347	112	933	722	352	370	417
1990		34,897	13,695	3,652	5,967	386	2,140	689	780	81	18,930	18,432	377	120	1,031	788	384	404	453
1991		38,631	14,280	4,093	5,588	433	2,232	927	921	86	21,946	21,425	392	129	1,091	847	419	428	468

Appendix table 4-9

U.S. applied research expenditures, by source of funds and performing sectors: 1953-2009

Year	Funding source:	All sources	Federal								Industry				U&C	Other nonprofit			Other government ^a
	Performer:	All performers	Total	Federal	Industry ^b	FFRDCs ^c	U&C ^d	FFRDCs	Other nonprofit ^e	FFRDCs ^e	Total	Industry ^f	U&C ^d	Other nonprofit	U&C ^d	Total	Other nonprofit	U&C ^d	U&C ^d
1992		37,936	13,690	4,337	4,476	507	2,415	940	933	81	21,736	21,184	414	138	1,120	911	456	454	479
1993		37,283	14,075	4,838	4,295	435	2,542	962	900	103	20,547	19,956	443	148	1,181	984	497	487	496
1994		36,618	13,800	4,985	3,616	503	2,644	982	960	111	19,995	19,372	464	158	1,256	1,049	541	509	517
1995		40,936	13,543	4,952	3,164	535	2,779	1,050	934	129	24,418	23,755	494	170	1,311	1,104	589	516	559
1996		43,170	13,958	4,872	3,640	231	2,864	1,270	960	122	26,076	25,370	524	182	1,390	1,162	640	522	584
1997		46,554	12,884	4,997	2,648	213	2,550	1,337	1,011	128	30,506	29,782	519	205	1,389	1,223	711	512	553
1998		46,362	12,822	5,146	2,632	230	2,260	1,372	1,060	123	30,314	29,576	520	218	1,378	1,322	809	513	526
1999		52,007	13,959	5,530	2,817	274	2,661	1,247	1,300	130	34,599	33,821	542	236	1,463	1,441	891	550	546
2000		56,685	15,565	6,105	2,682	269	3,196	1,291	1,831	190	37,306	36,494	553	258	1,585	1,657	1,066	592	572
2001		64,188	18,832	7,052	3,603	821	3,558	1,405	2,150	244	41,220	40,409	550	261	1,713	1,821	1,182	639	602
2002		50,688	19,235	7,487	2,452	1,090	4,010	1,663	2,267	266	26,880	26,081	546	253	1,859	2,067	1,369	698	647
2003		61,135	22,447	7,672	4,473	1,413	4,553	1,600	2,487	249	33,687	32,861	567	259	2,038	2,232	1,478	755	731
2004		69,183	22,594	7,455	4,775	1,459	4,781	1,481	2,448	194	41,496	40,657	576	264	2,087	2,248	1,474	774	759
2005		69,588	23,507	7,557	5,289	1,414	4,900	1,637	2,432	278	40,848	39,995	573	280	2,115	2,396	1,628	768	721
2006		76,277	24,983	7,435	6,140	1,314	5,176	1,827	2,592	500	45,922	45,033	589	300	2,182	2,481	1,699	782	710
2007		83,069	27,761	7,222	8,945	1,168	5,396	1,354	2,583	1,094	49,564	48,625	621	318	2,256	2,748	1,911	837	740
2008		74,321	25,475	7,316	5,397	1,975	5,980	855	2,600	1,352	42,487	41,467	690	330	2,460	3,091	2,154	937	808
2009		71,328	30,100	8,006	7,797	1,930	6,577	1,289	3,062	1,440	34,344	33,258	767	319	2,675	3,350	2,317	1,033	860
Constant 2005 \$millions																			
1953		7,977	4,675	2,147	1,782	NA	365	294	87	NA	2,819	2,710	40	68	172	124	62	62	186
1954		8,449	4,813	2,020	1,974	NA	365	356	98	NA	3,142	3,017	46	80	172	129	67	61	193
1955		9,125	5,125	2,008	2,219	NA	380	410	109	NA	3,512	3,376	51	84	164	130	66	63	195
1956		11,236	5,972	2,253	2,763	NA	379	458	119	NA	4,768	4,628	58	82	157	146	82	64	193
1957		13,615	7,356	2,513	3,825	NA	355	530	133	NA	5,740	5,596	65	79	153	175	113	62	191
1958		15,216	8,254	2,847	4,270	NA	361	610	166	NA	6,416	6,273	66	77	150	201	138	63	195
1959		16,029	8,888	3,144	4,433	NA	423	657	232	NA	6,574	6,424	68	82	153	213	147	65	202
1960		16,483	9,312	3,305	4,480	NA	500	691	336	NA	6,593	6,432	70	91	155	215	151	65	208
1961		16,606	9,630	3,552	4,318	NA	550	771	439	NA	6,354	6,195	69	90	157	253	186	66	212
1962		19,396	11,005	3,717	5,303	NA	622	852	511	NA	7,714	7,543	71	100	160	304	236	68	213
1963		20,059	11,650	4,199	5,227	NA	662	965	597	NA	7,698	7,526	73	99	168	324	254	70	219
1964		21,475	12,583	4,838	5,000	317	726	1,038	665	NA	8,141	7,975	69	97	191	330	240	89	231
1965		21,956	12,814	4,988	4,980	231	881	1,032	703	NA	8,304	8,133	65	105	211	394	261	133	233
1966		22,712	12,812	4,940	4,813	259	1,015	1,040	744	NA	8,992	8,807	68	117	236	442	278	164	230
1967		22,962	13,086	5,061	4,656	393	1,125	1,066	786	NA	8,949	8,757	73	118	255	455	284	171	216
1968		23,338	12,769	5,050	4,343	395	1,134	1,002	845	NA	9,654	9,454	73	127	250	457	282	175	209
1969		23,613	12,658	5,322	3,983	411	1,110	922	909	NA	10,044	9,836	69	139	233	470	286	184	208
1970		23,656	12,750	5,486	3,915	399	1,149	876	925	NA	9,987	9,779	72	136	230	479	288	191	210
1971		22,846	12,106	5,307	3,552	262	1,199	844	942	NA	9,766	9,561	72	133	262	474	290	184	237
1972		23,079	12,176	5,384	3,173	402	1,466	841	910	NA	9,827	9,619	77	131	307	490	297	193	279
1973		23,674	12,199	5,433	3,141	391	1,599	720	914	NA	10,294	10,074	92	128	355	514	295	219	312

Appendix table 4-9

U.S. applied research expenditures, by source of funds and performing sectors: 1953-2009

Year	Funding source:	All sources	Federal								Industry				U&C	Other nonprofit			Other government ^a
	Performer:	All performers	Total	Federal	Industry ^b	FFRDCs ^c	U&C ^d	U&C	Other nonprofit ^e	Nonprofit FFRDCs ^e	Total	Industry ^f	U&C ^d	Other nonprofit	U&C ^d	Total	Other nonprofit	U&C ^d	U&C ^d
	1974		23,949	11,851	5,388	2,951	391	1,554	621	946	NA	10,870	10,641	103	126	384	530	297	233
1975		24,107	12,291	5,696	2,953	414	1,637	653	939	NA	10,488	10,249	115	124	419	572	298	274	338
1976		25,294	12,578	5,828	2,911	471	1,678	740	951	NA	11,274	11,023	125	126	467	616	309	307	359
1977		25,595	12,406	5,511	2,948	562	1,657	787	940	NA	11,682	11,420	135	127	514	637	318	319	356
1978		26,495	12,575	5,549	2,958	582	1,673	802	1,012	NA	12,332	12,054	150	128	574	641	326	316	374
1979		27,643	12,802	5,519	2,982	571	1,811	822	1,097	NA	13,247	12,957	163	127	601	624	329	295	369
1980		28,722	13,062	5,332	3,403	576	1,910	881	959	NA	14,027	13,717	185	125	645	624	330	294	364
1981		31,267	13,222	5,230	3,910	571	1,824	808	749	130	16,334	16,006	206	122	694	635	331	304	381
1982		32,877	13,876	5,056	4,679	662	1,816	781	718	164	17,239	16,897	218	124	725	662	341	321	374
1983		35,238	15,170	5,193	5,602	719	1,948	822	751	135	18,230	17,857	245	128	769	696	359	337	373
1984		37,564	15,894	4,954	6,152	915	2,052	918	768	135	19,723	19,310	281	132	822	733	379	355	392
1985		41,251	17,750	5,091	7,660	1,023	2,106	941	795	133	21,422	20,963	321	138	889	766	402	364	425
1986		43,280	16,539	5,091	6,433	999	2,213	880	803	120	24,472	23,963	364	145	986	810	429	381	473
1987		43,158	16,721	5,197	6,233	962	2,537	821	857	114	23,949	23,397	401	151	1,092	882	456	426	514
1988		44,079	16,045	5,019	5,741	554	2,923	816	894	98	25,285	24,678	451	156	1,221	966	481	485	563
1989		46,430	16,907	5,130	6,220	538	3,051	867	999	101	26,543	25,883	499	161	1,342	1,038	506	532	600
1990		48,333	18,968	5,058	8,265	535	2,965	954	1,080	113	26,218	25,529	522	167	1,428	1,092	532	560	627
1991		51,674	19,101	5,475	7,475	579	2,985	1,239	1,232	115	29,355	28,658	524	172	1,459	1,133	560	573	626
1992		49,568	17,888	5,667	5,849	662	3,155	1,229	1,220	106	28,402	27,680	541	180	1,463	1,190	596	594	626
1993		47,661	17,992	6,185	5,491	556	3,249	1,230	1,150	131	26,267	25,511	566	189	1,510	1,258	635	623	634
1994		45,845	17,278	6,242	4,527	630	3,310	1,229	1,201	139	25,034	24,254	581	198	1,572	1,314	677	637	648
1995		50,206	16,610	6,074	3,880	656	3,408	1,288	1,145	158	29,948	29,134	606	208	1,608	1,354	722	633	685
1996		51,957	16,799	5,864	4,381	278	3,446	1,528	1,155	147	31,383	30,534	631	219	1,673	1,399	770	629	703
1997		55,058	15,238	5,909	3,132	252	3,016	1,582	1,196	152	36,077	35,222	613	242	1,643	1,446	840	606	654
1998		54,218	14,995	6,017	3,078	269	2,642	1,604	1,240	144	35,450	34,587	608	255	1,611	1,546	946	600	615
1999		59,938	16,087	6,373	3,247	316	3,067	1,437	1,498	149	39,875	38,978	625	272	1,686	1,660	1,027	634	630
2000		63,890	17,543	6,881	3,023	303	3,603	1,456	2,064	214	42,047	41,133	624	291	1,787	1,868	1,201	667	644
2001		70,748	20,757	7,773	3,971	905	3,921	1,548	2,370	268	45,432	44,539	606	287	1,888	2,007	1,303	704	663
2002		54,979	20,863	8,121	2,660	1,183	4,349	1,804	2,458	288	29,156	28,289	593	274	2,016	2,242	1,485	757	702
2003		64,944	23,845	8,149	4,752	1,501	4,837	1,700	2,642	264	35,785	34,908	602	275	2,165	2,371	1,570	802	777
2004		71,481	23,344	7,702	4,934	1,508	4,940	1,531	2,529	201	42,874	42,007	595	273	2,156	2,323	1,523	800	784
2005		69,588	23,507	7,557	5,289	1,414	4,900	1,637	2,432	278	40,848	39,995	573	280	2,115	2,396	1,628	768	721
2006		73,890	24,201	7,202	5,948	1,272	5,014	1,770	2,511	484	44,485	43,623	571	290	2,114	2,403	1,645	758	688

Appendix table 4-9

U.S. applied research expenditures, by source of funds and performing sectors: 1953–2009

Year	Funding source:	All sources	Federal								Industry				U&C	Other nonprofit			Other government ^a
	Performer:	All performers	Total	Federal	Industry ^b	FFRDCs ^c	U&C ^d	FFRDCs	Other nonprofit ^e	FFRDCs ^e	Total	Industry ^f	U&C ^d	nonprofit	U&C ^d	Total	nonprofit	U&C ^d	U&C ^d
2007		78,200	26,134	6,798	8,421	1,100	5,079	1,275	2,431	1,030	46,659	45,775	584	300	2,124	2,587	1,799	788	696
2008		68,446	23,461	6,738	4,970	1,819	5,507	787	2,395	1,245	39,129	38,189	636	304	2,265	2,847	1,984	863	744
2009		65,004	27,431	7,296	7,106	1,758	5,994	1,175	2,790	1,312	31,299	30,309	699	290	2,438	3,053	2,111	942	783

NA = not available, included in figures for federal support to industry and federal support to nonprofit institutions

FFRDC = federally funded research and development center; U&C = universities and colleges

^aBecause of limitations in survey information, data on other government funding to performers other than U&C not available and consequently are included in other sectors' support for their own R&D performance, e.g., other government support to other nonprofits included in other nonprofit support for their own R&D.

^bCharacter-of-work estimates for industry revised for 1998 and later years; data not directly comparable with data for 1997 and earlier years. Character-of-work estimates for industry FFRDCs for 1953–63 not separated from federal support for industry; thus, figure for federal support to industry includes support to FFRDCs for those years.

^cCharacter-of-work estimates for industry FFRDCs for 1953–63 not separated from federal support for industry; thus, the figure for federal support to industry includes support to FFRDCs for those years.

^dFor 1998 and later years, character-of-work estimation procedure revised and adjustments made to U&C R&D to eliminate double counting of funds passed through from one academic institution to another. Data for 1998 and later years not directly comparable with data for 1997 and earlier years.

^eCharacter-of-work estimates for nonprofit FFRDCs for 1953–80 not separated from federal support for other nonprofits; thus, the figure for federal support to other nonprofit institutions includes support to FFRDCs for those years.

^fIndustry sources of funds for industry R&D expenditures include all nonfederal sources of funds for industry R&D expenditures. Character-of-work estimates for industry revised for 1998 and later years; data not directly comparable with data for 1997 and earlier years.

NOTES: Technical notes explaining methodological issues of measurement available on request. Data based on annual reports by performers, except for the nonprofit sector (where some figures involve estimates). R&D expenditures of FFRDCs are chiefly federal funds, but any nonfederal funds also included in totals. For trend comparisons, use only historical data reported here; do not use data published earlier. Expenditures for industry and, prior to 2001, for industry-administered FFRDCs collected by calendar year. Expenditures for other performers are calendar-year approximations based on fiscal year data. In most cases, the approximation equals 75% of amount reported in same fiscal year plus 25% of amount reported in subsequent fiscal year. However, fiscal year for academic performers generally begins 1 July, not 1 October; also, prior to 1977, federal fiscal year began on 1 July, not 1 October. Therefore, calendar-year approximations for academic performers and federal performers prior to 1977 equal 50% of amount reported in same fiscal year plus 50% of amount reported in subsequent fiscal year. Detail may not add to total because of rounding. Constant-dollar estimates derived from unrounded data. Los Alamos National Laboratory (some \$2 billion in annual R&D expenditures in recent years) became industry administered in June 2006; previously, it was U&C administered. Lawrence Livermore National Laboratory (more than \$1 billion in annual R&D expenditures in recent years) became industry administered in October 2007; previously, it was U&C administered. The tracks of R&D expenditures from 2006 to 2008 for both industry- and U&C-administered FFRDCs reflect these shifts.

SOURCES: National Science Foundation, National Center for Science and Engineering Statistics (NSF/NCSES), National Patterns of R&D Resources (annual series); NSF/NCSES, Business R&D and Innovation Survey, 2009; NSF/NCSES, Survey of R&D Expenditures at Universities and Colleges, FY 2009; NSF/NCSES, Federal Funds for R&D: FY 2009–11; NSF/NCSES, Survey of R&D Expenditures at FFRDCs, FY 2009; and NSF/NCSES, R&D Funding and Performance by Nonprofit Organizations: FY 1996–97. All NSF/NCSES reports available at <http://www.nsf.gov/statistics/>.

Appendix table 4-10

U.S. development expenditures, by source of funds and performing sector: 1953–2009

Year	Funding source:	All sources	Federal								Industry				U&C	Other nonprofit			Other government ^a
	Performer:	All performers	Total	Federal	Industry ^b	FFRDCs ^c	U&C ^d	U&C	Other nonprofit ^e	Nonprofit FFRDCs ^e	Total	Industry ^f	U&C ^d	Other nonprofit	U&C ^d	Total	Other nonprofit	U&C ^d	U&C ^d
	Current \$millions																		
1953		3,412	1,762	567	1,123	NA	9	48	17	NA	1,637	1,630	1	6	3	7	6	1	3
1954		3,734	2,027	537	1,405	NA	9	59	18	NA	1,693	1,685	1	7	3	8	7	1	3
1955		4,189	2,427	543	1,785	NA	12	69	19	NA	1,748	1,738	2	8	3	8	7	1	4
1956		5,855	3,561	631	2,817	NA	14	81	20	NA	2,277	2,267	2	8	4	9	7	2	4
1957		6,681	4,477	728	3,616	NA	12	101	21	NA	2,185	2,174	3	8	4	10	8	2	5
1958		7,214	4,941	842	3,942	NA	13	120	25	NA	2,252	2,241	3	8	4	11	9	2	6
1959		8,463	5,872	940	4,750	NA	16	134	32	NA	2,569	2,557	3	9	5	12	10	2	6
1960		9,360	6,390	1,003	5,169	NA	19	151	49	NA	2,948	2,935	3	10	5	12	10	2	6
1961		9,930	6,701	1,090	5,347	NA	22	170	73	NA	3,201	3,189	2	10	5	16	14	2	7
1962		10,115	6,822	1,227	5,280	NA	23	190	103	NA	3,259	3,246	2	11	6	20	18	2	8
1963		11,540	7,956	1,465	6,116	NA	22	219	134	NA	3,548	3,535	2	11	6	22	20	2	8
1964		12,506	8,610	1,680	6,156	359	30	227	159	NA	3,861	3,848	2	11	7	21	18	3	8
1965		13,215	8,742	1,789	6,218	298	48	207	183	NA	4,433	4,419	2	12	8	24	20	4	9
1966		14,490	9,466	1,886	6,849	271	61	200	199	NA	4,977	4,961	2	14	10	28	23	5	9
1967		15,332	9,521	1,943	6,795	302	66	208	208	NA	5,762	5,744	3	15	10	31	24	7	9
1968		16,154	9,756	1,904	7,044	293	72	226	217	NA	6,346	6,326	4	16	9	35	26	9	8
1969		17,051	9,848	2,016	6,944	332	80	246	231	NA	7,150	7,127	5	18	8	38	28	10	7
1970		16,925	9,382	2,258	6,232	340	84	249	220	NA	7,489	7,466	5	18	7	40	30	10	6
1971		17,399	9,561	2,473	6,167	391	69	267	194	NA	7,780	7,757	4	19	9	42	33	9	8
1972		18,743	10,141	2,639	6,533	402	63	291	213	NA	8,533	8,510	4	19	14	44	35	9	12
1973		20,197	10,311	2,657	6,621	399	71	296	268	NA	9,798	9,773	5	20	20	51	38	13	18
1974		21,504	10,506	2,765	6,553	479	75	321	314	NA	10,896	10,868	7	22	25	57	42	15	20
1975		22,706	10,993	2,890	6,783	535	83	373	330	NA	11,600	11,569	8	23	27	63	47	16	22
1976		25,085	12,035	2,972	7,522	654	100	447	341	NA	12,927	12,890	12	25	31	68	52	16	24
1977		27,667	13,153	3,188	8,275	675	153	503	359	NA	14,370	14,328	15	27	40	76	58	19	28
1978		31,056	14,383	3,676	8,756	753	254	542	403	NA	16,504	16,460	15	30	49	88	64	24	32
1979		35,445	16,064	3,944	9,888	810	336	603	483	NA	19,193	19,145	16	32	56	99	71	28	34
1980		40,765	17,604	4,072	10,957	882	362	719	612	NA	22,945	22,891	19	35	68	110	79	31	38
1981		46,305	20,242	4,530	12,791	950	386	778	360	447	25,817	25,756	24	37	80	123	88	35	44
1982		51,879	22,323	5,178	14,215	989	397	745	362	436	29,286	29,219	27	40	88	137	98	39	46
1983		57,771	24,859	6,106	15,522	1,054	399	832	447	500	32,617	32,542	31	44	97	151	109	43	47
1984		66,461	28,320	7,078	17,640	1,056	435	986	594	530	37,815	37,731	37	47	108	167	120	47	51
1985		74,522	32,304	8,011	20,258	1,102	486	1,244	644	560	41,857	41,762	43	51	120	183	134	49	57
1986		75,855	33,993	8,275	21,517	1,145	513	1,504	587	453	41,460	41,354	50	55	136	201	149	53	65
1987		79,929	36,691	8,176	24,122	1,230	599	1,670	474	421	42,784	42,667	57	60	155	226	165	61	73
1988		84,567	37,285	8,864	23,719	1,414	698	1,762	407	420	46,765	46,634	66	65	180	254	183	71	83
1989		87,723	35,320	9,355	21,049	1,423	773	1,782	507	430	51,822	51,676	76	70	205	285	203	81	91
1990		94,067	33,859	9,700	18,966	1,438	910	1,735	619	490	59,568	59,410	83	75	226	315	226	89	99
1991		95,105	31,220	8,778	17,256	1,383	1,012	1,537	722	533	63,197	63,030	86	82	239	345	251	94	103

Appendix table 4-10

U.S. development expenditures, by source of funds and performing sector: 1953–2009

Year	Funding source:	All sources	Federal										Industry				U&C	Other nonprofit			Other government ^a
	Performer:	All performers	Total	Federal	Industry ^b	FFRDCs ^c	U&C ^d	FFRDCs	U&C	Other nonprofit ^e	Nonprofit FFRDCs ^e	Total	Industry ^f	U&C ^d	Other nonprofit	U&C ^d	Total	Other nonprofit	U&C ^d	U&C ^d	
1992		99,811	31,514	9,098	17,181	1,372	1,055	1,452	758	599	67,567	67,388	91	88	246	378	279	100		105	
1993		99,705	30,054	9,071	16,083	1,038	1,127	1,374	787	574	68,866	68,674	97	95	259	416	309	107		109	
1994		102,938	30,208	8,823	16,209	1,196	1,213	1,378	815	573	71,886	71,681	102	103	276	455	343	112		114	
1995		113,079	32,436	9,262	17,824	1,208	1,180	1,616	744	603	79,738	79,518	108	111	288	495	381	113		123	
1996		121,377	31,373	9,033	17,066	1,358	1,128	1,520	698	571	89,032	88,797	115	120	305	538	423	115		128	
1997		128,677	32,270	9,077	18,121	1,292	1,055	1,454	687	585	95,332	95,063	114	155	305	649	536	112		121	
1998		144,723	32,714	9,214	18,452	1,280	974	1,527	760	507	110,868	110,589	114	164	302	723	611	113		116	
1999		154,356	30,588	9,265	16,571	1,208	710	1,640	727	467	122,533	122,236	119	178	321	793	673	121		120	
2000		169,412	27,452	9,377	13,510	1,185	565	1,577	580	659	140,552	140,235	121	195	348	934	804	130		125	
2001		167,817	28,548	11,062	12,542	647	673	1,717	874	1,033	137,728	137,410	121	197	376	1,033	893	140		132	
2002		176,672	29,897	11,800	13,061	639	662	1,726	937	1,074	145,038	144,727	120	191	408	1,187	1,034	153		142	
2003		175,493	30,163	12,646	11,939	747	918	1,954	743	1,216	143,441	143,121	124	195	447	1,281	1,116	166		161	
2004		177,228	34,380	12,746	14,419	851	1,237	2,447	1,300	1,379	140,941	140,615	126	199	458	1,283	1,113	170		167	
2005		195,720	36,666	13,994	15,512	1,052	1,168	2,360	1,211	1,369	157,034	156,696	126	212	464	1,398	1,229	169		158	
2006		212,686	38,849	16,089	16,720	1,156	944	2,136	603	1,202	171,748	171,392	129	226	479	1,454	1,282	172		156	
2007		227,685	39,456	18,016	14,860	1,738	913	2,488	568	872	185,946	185,569	136	240	495	1,626	1,443	184		162	
2008		258,499	53,589	17,566	29,488	1,948	861	2,239	562	925	202,361	201,961	152	249	540	1,832	1,626	206		177	
2009		253,160	53,881	17,389	30,436	1,967	756	1,872	575	887	196,527	196,118	168	241	587	1,976	1,749	227		189	
Constant 2005 \$millions																					
1953		21,111	10,904	3,506	6,949	NA	53	294	102	NA	10,130	10,087	6	37	16	43	37	6		18	
1954		22,895	12,425	3,293	8,615	NA	52	359	107	NA	10,381	10,331	6	43	19	49	43	6		21	
1955		25,256	14,630	3,271	10,762	NA	69	416	112	NA	10,536	10,479	9	48	19	48	42	6		23	
1956		34,127	20,758	3,675	16,421	NA	79	469	114	NA	13,273	13,215	12	47	21	50	41	9		26	
1957		37,688	25,255	4,104	20,398	NA	68	570	116	NA	12,323	12,264	14	45	24	56	45	11		30	
1958		39,798	27,257	4,643	21,749	NA	69	662	135	NA	12,425	12,364	17	44	24	61	50	11		31	
1959		46,149	32,017	5,126	25,902	NA	85	731	174	NA	14,009	13,943	16	49	25	65	55	11		33	
1960		50,337	34,362	5,391	27,798	NA	102	809	261	NA	15,851	15,784	13	54	25	65	54	11		34	
1961		52,799	35,629	5,793	28,432	NA	114	901	388	NA	17,021	16,957	11	53	27	85	74	11		37	
1962		53,058	35,786	6,436	27,697	NA	118	997	538	NA	17,096	17,028	10	58	30	105	94	10		40	
1963		59,896	41,293	7,604	31,745	NA	114	1,134	696	NA	18,416	18,348	10	57	32	114	104	10		41	
1964		63,930	44,014	8,588	31,469	1,835	151	1,158	813	NA	19,737	19,671	10	56	33	105	92	13		41	
1965		66,343	43,885	8,979	31,216	1,496	241	1,037	916	NA	22,255	22,185	10	60	39	120	100	20		43	
1966		70,733	46,208	9,207	33,435	1,323	298	976	969	NA	24,296	24,218	10	68	47	137	112	24		46	
1967		72,615	45,094	9,203	32,183	1,430	310	985	983	NA	27,288	27,205	12	71	47	144	114	31		40	
1968		73,389	44,321	8,650	32,002	1,331	325	1,027	986	NA	28,831	28,740	18	73	42	159	118	41		35	
1969		73,818	42,634	8,727	30,063	1,437	344	1,065	998	NA	30,955	30,855	22	78	34	165	121	43		31	
1970		69,602	38,584	9,285	25,628	1,398	343	1,024	905	NA	30,798	30,703	21	74	29	164	123	41		27	
1971		68,144	37,446	9,684	24,154	1,531	270	1,046	760	NA	30,472	30,382	16	74	34	163	129	33		31	
1972		70,372	38,073	9,909	24,528	1,509	235	1,093	800	NA	32,035	31,951	13	71	51	165	131	34		47	
1973		71,842	36,676	9,452	23,552	1,419	251	1,051	952	NA	34,853	34,764	18	71	71	180	135	44		62	

Appendix table 4-10

U.S. development expenditures, by source of funds and performing sector: 1953–2009

Year	Funding	All										Industry				U&C	Other nonprofit			Other
	source:	All		Federal		U&C		Other		Nonprofit		Industry		U&C	Other		Other nonprofit		Other	
	source:	performers	Total	Federal	Industry ^b	FFRDCs ^c	U&C ^d	FFRDCs	nonprofit ^e	FFRDCs ^e	Total	Industry ^f	U&C ^d	nonprofit	U&C ^d	Total	nonprofit	U&C ^d	U&C ^d	
1974		70,126	34,262	9,018	21,369	1,562	243	1,047	1,022	NA	35,533	35,441	21	71	80	187	138	49	65	
1975		67,651	32,753	8,610	20,210	1,594	246	1,110	983	NA	34,563	34,470	24	70	82	187	140	48	66	
1976		70,684	33,913	8,374	21,195	1,843	280	1,260	961	NA	36,425	36,321	32	71	88	192	147	45	67	
1977		73,290	34,843	8,445	21,920	1,788	405	1,333	951	NA	38,066	37,955	38	72	107	202	153	49	74	
1978		76,870	35,601	9,100	21,673	1,864	628	1,341	996	NA	40,851	40,742	36	73	121	217	159	58	79	
1979		80,998	36,709	9,012	22,596	1,851	769	1,379	1,103	NA	43,858	43,749	36	73	127	226	163	63	78	
1980		85,372	36,868	8,529	22,947	1,847	758	1,505	1,282	NA	48,053	47,940	41	72	142	230	166	64	80	
1981		88,665	38,760	8,675	24,492	1,819	739	1,489	689	856	49,434	49,318	45	72	152	235	168	67	84	
1982		93,624	40,285	9,345	25,653	1,785	717	1,344	654	787	52,851	52,730	48	73	159	247	176	70	82	
1983		100,293	43,156	10,600	26,947	1,830	693	1,444	776	867	56,624	56,494	54	76	169	262	188	74	82	
1984		111,201	47,384	11,843	29,515	1,767	727	1,650	995	887	63,271	63,131	62	79	180	280	202	78	86	
1985		121,024	52,463	13,009	32,899	1,790	789	2,020	1,046	909	67,976	67,822	70	83	195	297	217	80	93	
1986		120,524	54,010	13,147	34,188	1,819	816	2,389	932	719	65,874	65,706	80	88	216	320	236	84	104	
1987		123,415	56,653	12,624	37,246	1,899	924	2,578	731	650	66,061	65,881	88	92	240	348	255	93	113	
1988		126,241	55,659	13,232	35,408	2,111	1,042	2,630	608	627	69,811	69,615	99	96	268	380	274	106	124	
1989		126,188	50,807	13,458	30,279	2,047	1,112	2,563	729	619	74,545	74,335	110	100	295	410	293	117	132	
1990		130,286	46,895	13,435	26,269	1,992	1,260	2,403	857	679	82,504	82,285	115	104	313	436	313	123	138	
1991		127,213	41,760	11,741	23,082	1,850	1,353	2,055	966	713	84,534	84,310	115	109	320	461	336	126	137	
1992		130,416	41,178	11,887	22,449	1,793	1,378	1,897	991	783	88,286	88,052	119	115	321	494	364	130	137	
1993		127,460	38,421	11,597	20,560	1,327	1,441	1,756	1,006	734	88,037	87,791	124	122	331	532	395	137	139	
1994		128,879	37,820	11,047	20,294	1,497	1,519	1,726	1,020	717	90,001	89,745	128	129	345	570	430	140	142	
1995		138,685	39,781	11,359	21,860	1,482	1,447	1,982	912	740	97,794	97,524	133	136	353	607	468	139	150	
1996		146,081	37,759	10,872	20,540	1,634	1,358	1,829	840	687	107,153	106,870	138	145	367	648	510	138	154	
1997		152,179	38,164	10,734	21,431	1,528	1,248	1,720	812	691	112,744	112,426	135	183	361	767	634	133	143	
1998		169,245	38,257	10,775	21,579	1,497	1,139	1,786	889	593	129,653	129,328	134	192	354	846	714	132	135	
1999		177,893	35,253	10,678	19,098	1,392	819	1,890	838	538	141,218	140,876	137	205	370	914	775	139	138	
2000		190,945	30,942	10,568	15,227	1,336	637	1,778	653	743	158,417	158,060	137	220	392	1,053	907	146	141	
2001		184,968	31,466	12,192	13,824	713	742	1,892	963	1,139	151,804	151,454	133	217	415	1,138	984	155	146	
2002		191,626	32,428	12,798	14,167	693	718	1,872	1,016	1,165	157,314	156,977	130	207	443	1,288	1,121	166	154	
2003		186,427	32,042	13,434	12,683	793	975	2,076	790	1,292	152,378	152,038	132	207	475	1,361	1,185	176	171	
2004		183,113	35,521	13,169	14,898	879	1,278	2,529	1,344	1,425	145,621	145,284	131	206	473	1,325	1,150	176	172	
2005		195,720	36,666	13,994	15,512	1,052	1,168	2,360	1,211	1,369	157,034	156,696	126	212	464	1,398	1,229	169	158	
2006		206,029	37,633	15,586	16,197	1,120	915	2,069	584	1,164	166,372	166,028	125	219	464	1,408	1,242	166	151	

Appendix table 4-10

U.S. development expenditures, by source of funds and performing sector: 1953–2009

Year	Funding source:	All sources	Federal								Industry				U&C	Other nonprofit			Other government ^a
	Performer:	All performers	Total	Federal	Industry ^b	FFRDCs ^c	U&C ^d	U&C	Other nonprofit ^e	FFRDCs ^e	Total	Industry ^f	U&C ^d	nonprofit	U&C ^d	Total	nonprofit	U&C ^d	U&C ^d
2007		214,339	37,143	16,960	13,989	1,636	860	2,342	534	821	175,046	174,692	128	226	466	1,531	1,358	173	153
2008		238,067	49,353	16,178	27,157	1,794	793	2,062	518	852	186,367	185,998	140	229	497	1,687	1,497	189	163
2009		230,713	49,104	15,847	27,737	1,792	689	1,706	524	808	179,102	178,729	153	219	535	1,801	1,594	207	172

NA = not available, included in figures for federal support to industry and federal support to nonprofit institutions

FFRDC = federally funded research and development center; U&C = universities and colleges.

^aBecause of limitations in survey information, data on other government funding to performers other than U&C are not available and consequently are included in other sectors' support for their own R&D performance, e.g., other government support to other nonprofits included in other nonprofit support for their own R&D.

^bCharacter-of-work estimates for industry revised for 1998 and later years; data not directly comparable with data for 1997 and earlier years. Character-of-work estimates for industry FFRDCs for 1953–63 not separated from federal support for industry; thus, the figure for federal support to industry includes support to FFRDCs for those years.

^cCharacter-of-work estimates for industry FFRDCs for 1953–63 not separated from federal support for industry; thus, the figure for federal support to industry includes support to FFRDCs for those years.

^dFor 1998 and later years, character-of-work estimation procedure revised and adjustments made to U&C R&D to eliminate double counting of funds passed through from one academic institution to another. Data for 1998 and later years not directly comparable with data for 1997 and earlier years.

^eCharacter-of-work estimates for nonprofit FFRDCs for 1953–80 not separated from federal support for other nonprofits; thus, the figure for federal support to other nonprofit institutions includes support to FFRDCs for those years.

^fIndustry sources of funds for industry R&D expenditures include all nonfederal sources of funds for industry R&D expenditures. Character-of-work estimates for industry revised for 1998 and later years; data not directly comparable with data for 1997 and earlier years.

NOTES: Technical notes explaining methodological issues of measurement available on request. Data based on annual reports by performers, except for the nonprofit sector (where some figures involve estimates). R&D expenditures of FFRDCs are chiefly federal funds, but any nonfederal funds also included in totals. For trend comparisons, use only historical data reported here; do not use data published earlier. Expenditures for industry and, prior to 2001, for industry-administered FFRDCs collected by calendar year. Expenditures for other performers are calendar-year approximations based on fiscal year data. In most cases, the approximation equals 75% of amount reported in same fiscal year plus 25% of amount reported in subsequent fiscal year. However, fiscal year for academic performers generally begins 1 July, not 1 October; also, prior to 1977, federal fiscal year began on 1 July, not 1 October. Therefore, calendar-year approximations for academic performers and federal performers prior to 1977 equal 50% of amount reported in same fiscal year plus 50% of amount reported in subsequent fiscal year. Detail may not add to total because of rounding. Constant-dollar estimates derived from unrounded data. Los Alamos National Laboratory (some \$2 billion in annual R&D expenditures in recent years) became industry administered in June 2006; previously, it was U&C administered. Lawrence Livermore National Laboratory (more than \$1 billion in annual R&D expenditures in recent years) became industry administered in October 2007; previously, it was U&C administered. The tracks of R&D expenditures from 2006 to 2008 for both industry- and U&C-administered FFRDCs reflect these shifts.

SOURCES: National Science Foundation, National Center for Science and Engineering Statistics (NSF/NCSES), National Patterns of R&D Resources (annual series); NSF/NCSES, Business R&D and Innovation Survey, 2009; NSF/NCSES, Survey of R&D Expenditures at Universities and Colleges, FY 2009; NSF/NCSES, Federal Funds for R&D: FY 2009–11; NSF/NCSES, Survey of R&D Expenditures at FFRDCs, FY 2009; and NSF/NCSES, R&D Funding and Performance by Nonprofit Organizations: FY 1996–97. All NSF/NCSES reports available at <http://www.nsf.gov/statistics/>.

Appendix table 4-11

U.S. R&D expenditures, by state, performing sector, and funding sector: 2008

(Millions of current dollars)

State	Performer:		Federal		FFRDCs			Business				U&C ^a				Other nonprofit institutions		State, internal ^b		R&D intensity ^c				
	Funding source:	All R&D	R&D	rank	Federal	Total	Federal	federal ^d	Total	Own	Paid by others		Total	Federal	Other		Non-profit	Federal ^f	Total	GDP	rank	Percent	Rank	
											Non-federal ^e	Federal			government	Business								U&C
U.S. total ^g	403,040	na	29,839	14,835	NA	NA	290,681	232,505	21,816	36,360	51,650	30,341	3,518	3,004	10,707	4,080	6,236	NA	14,269,835	na	2.82	na		
States total ^g	372,660	na	28,730	14,695	14,251	444	271,671	220,020	19,433	30,644	51,784	31,138	3,409	2,864	10,422	3,951	5,780	NA	14,269,835	na	2.61	na		
Alabama	4,870	24	1,035	0	0	0	3,099	922	125	2,052	708	466	10	23	170	39	29	NA	170,672	25	2.85	12		
Alaska	269	49	78	0	0	0	69	52	10	6	111	97	2	*	0	12	10	NA	49,720	45	0.54	50		
Arizona	7,010	15	855	56	50	6	5,232	3,268	444	1,520	831	417	58	31	276	49	35	NA	261,537	18	2.68	15		
Arkansas	747	43	46	0	0	0	443	399	34	11	247	108	59	13	47	20	11	NA	100,232	34	0.75	45		
California	81,323	1	1,798	3,988	3,858	130	67,532	54,231	4,402	8,900	7,026	4,051	333	420	1,386	836	978	NA	1,925,499	1	4.22	9		
Colorado	5,810	21	295	391	359	32	4,019	3,396	229	394	924	722	20	51	90	42	181	NA	255,226	19	2.28	21		
Connecticut	11,322	12	38	0	0	0	10,518	8,938	D	D	732	503	17	23	96	92	34	NA	222,168	23	5.10	5		
Delaware	1,594	33	4	0	0	0	1,441	1,441	D	D	133	92	8	6	23	5	16	NA	58,357	42	2.73	14		
Dist. of Columbia	5,946	19	4,737	6	6	0	571	155	82	334	369	290	8	8	27	37	264	NA	96,757	35	6.15	2		
Florida	6,515	17	665	0	0	0	4,178	3,009	500	669	1,592	850	177	106	379	80	81	NA	747,803	4	0.87	43		
Georgia	5,232	22	336	0	0	0	3,344	2,501	342	501	1,521	800	92	81	450	99	31	NA	402,097	10	1.30	36		
Hawaii	663	44	91	0	0	0	269	176	29	65	279	200	18	27	28	5	25	NA	66,038	39	1.00	41		
Idaho	1,375	34	60	236	224	12	961	786	166	9	113	67	22	5	17	2	5	NA	55,465	43	2.48	18		
Illinois	11,961	10	127	874	824	50	8,900	7,984	589	327	1,973	1,149	75	77	546	125	88	NA	635,080	5	1.88	27		
Indiana	6,111	18	162	0	0	0	4,991	4,375	407	209	954	436	59	99	292	68	4	NA	263,732	16	2.32	20		
Iowa	2,136	30	58	27	27	0	1,509	1,041	257	211	528	336	54	20	93	24	14	NA	136,007	30	1.57	33		
Kansas	2,029	32	19	0	0	0	1,600	1,111	288	201	404	190	53	11	131	18	6	NA	124,895	32	1.62	30		
Kentucky	1,463	35	23	0	0	0	933	879	42	13	506	242	62	12	144	46	1	NA	155,852	28	0.94	42		
Louisiana	1,193	37	115	0	0	0	411	303	64	44	660	300	118	21	164	57	7	NA	211,459	24	0.56	49		
Maine	516	46	12	0	0	0	308	253	23	32	128	60	12	4	50	2	68	NA	50,462	44	1.02	40		
Maryland	16,605	6	8,621	523	523	0	4,333	2,327	654	1,352	2,747	2,006	63	94	389	196	381	NA	280,509	15	5.92	3		
Massachusetts	20,090	4	891	641	638	4	15,028	12,625	931	1,472	2,272	1,722	17	168	139	226	1,258	NA	363,064	13	5.53	4		
Michigan	15,507	8	135	0	0	0	13,742	12,105	1,261	376	1,594	917	66	74	432	104	37	NA	376,184	12	4.12	10		
Minnesota	6,697	16	47	0	0	0	5,728	5,327	223	178	699	371	63	31	128	106	223	NA	261,951	17	2.56	17		
Mississippi	808	41	146	0	0	0	252	179	20	54	406	262	37	14	85	8	3	NA	95,653	36	0.84	44		
Missouri	3,884	26	46	0	0	0	2,857	2,857	D	D	960	609	34	21	223	74	21	NA	239,703	22	1.62	31		
Montana	401	48	55	0	0	0	148	125	15	8	186	111	28	8	35	4	12	NA	35,818	49	1.12	39		
Nebraska	988	39	41	0	0	0	561	464	83	14	376	147	12	25	161	31	10	NA	84,639	37	1.17	38		
Nevada	913	40	38	0	0	0	677	612	42	23	191	138	12	3	34	3	7	NA	132,133	31	0.69	46		
New Hampshire	2,496	29	21	0	0	0	2,169	876	127	1,166	302	206	7	12	56	21	4	NA	58,808	41	4.24	8		
New Jersey	20,713	2	679	78	78	0	19,054	17,331	1,459	264	877	458	57	42	241	78	25	NA	484,332	7	4.28	7		
New Mexico	5,906	20	561	4,150	4,075	75	735	326	172	238	417	287	25	15	84	6	42	NA	77,959	38	7.58	1		
New York	16,486	7	161	480	459	21	11,455	9,061	876	1,518	4,045	2,461	256	183	791	354	345	NA	1,110,712	3	1.48	34		
North Carolina	8,612	14	259	0	0	0	6,246	4,903	1,076	267	1,981	1,183	185	227	316	69	126	NA	404,386	9	2.13	25		
North Dakota	511	47	26	0	0	0	303	218	81	4	181	97	38	9	31	6	2	NA	31,118	50	1.64	29		
Ohio	10,164	13	750	0	0	0	7,405	5,367	588	1,450	1,827	1,056	169	163	339	101	182	NA	472,285	8	2.15	24		
Oklahoma	1,030	38	77	0	0	0	595	521	47	27	333	144	51	25	100	14	24	NA	151,540	29	0.68	47		

Appendix table 4-11

U.S. R&D expenditures, by state, performing sector, and funding sector: 2008

(Millions of current dollars)

State	Performer:		Federal		FFRDCs			Business				U&C ^a				Other nonprofit institutions	State, internal ^b	R&D intensity ^c					
	Funding source:	All R&D	R&D	rank	Federal	Total	Federal	Non-federal ^d	Total	Paid by others		Total	Federal	Other		Non-profit	Federal ^f	Total	GDP	rank	Percent	Rank	
										Own	Nonfederal ^e			Federal	Other government								Business
Oregon		4,802	25	94	0	0	0	4,074	3,913	112	49	595	425	45	26	66	33	39	NA	169,529	26	2.83	13
Pennsylvania		13,068	9	313	81	67	14	9,735	8,783	643	309	2,604	1,773	137	199	341	155	335	NA	546,145	6	2.39	19
Rhode Island		1,233	36	389	0	0	0	538	489	20	29	237	147	8	9	69	4	69	NA	47,577	46	2.59	16
South Carolina		2,086	31	132	118	118	0	1,221	1,125	65	31	576	273	28	30	219	26	38	NA	159,688	27	1.31	35
South Dakota		254	50	25	0	0	0	133	98	31	4	92	57	17	3	4	11	4	NA	37,973	48	0.67	48
Tennessee		3,871	27	137	1,251	1,206	46	1,608	1,451	113	44	787	519	58	26	138	45	87	NA	246,436	20	1.57	32
Texas		20,316	3	276	18	17	1	16,166	12,830	1,231	2,106	3,744	1,950	457	235	711	390	112	NA	1,196,771	2	1.70	28
Utah		2,522	28	149	0	0	0	1,945	1,326	87	532	426	278	29	22	73	23	3	NA	112,725	33	2.24	22
Vermont		546	45	4	0	0	0	422	380	30	12	117	91	*	2	19	4	3	NA	24,993	51	2.18	23
Virginia		11,472	11	3,684	492	478	14	6,142	2,856	527	2,759	1,053	613	132	47	203	57	102	NA	400,457	11	2.86	11
Washington		16,696	5	258	1,137	1,097	40	13,876	12,724	435	717	1,058	721	61	81	156	39	367	NA	336,315	14	4.96	6
West Virginia		778	42	116	146	146	0	334	272	23	39	171	93	8	5	63	2	11	NA	61,306	40	1.27	37
Wisconsin		4,967	23	33	0	0	0	3,798	3,277	421	100	1,117	619	45	27	326	100	18	NA	241,174	21	2.06	26
Wyoming		154	51	14	0	0	0	63	52	7	4	75	28	6	2	37	1	2	NA	38,894	47	0.40	51
U.S. undistributed ^b		15,349	na	0	0	0	0	15,349	12,482	1,499	1,369	0	0	0	0	0	0	0	NA	na	na	na	na
Puerto Rico ^l		NA	na	9	13	12	0	NA	NA	NA	NA	100	74	6	4	13	3	*	na	92,926	na	NA	na
Other ^l		102	na	78	0	0	0	0	0	0	0	24	18	3	3	0	0	*	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; R&D = research and development; U&C = universities and colleges

^aState-level university R&D data have not been adjusted to eliminate double counting of funds passed through from one academic institution to another. At the national level, funds passed through to educational subrecipients account for 3.3% of total R&D expenditures reported by universities and colleges in FY 2008.^bInternal performers include state agency and department employees, and services performed by others in support of an internal R&D project. NSF's survey of this state R&D spending is conducted every other year; data are not available for FY 2008. In FY 2007, these state R&D expenditures totaled \$309 million.^cR&D intensity is ratio of total R&D performed in a state to its GDP.^dNonfederal sources of R&D expenditures reported by FFRDCs in FY 2008 included state and local governments (\$42 million), industry (\$198 million), FFRDC institutional funds (\$50 million), and other sources (\$155 million).^eR&D paid for by nonfederal sources includes funding from other companies located inside (\$12.181 billion) or outside (\$8.877 billion) the U.S., foreign government agencies and laboratories (\$48 million), and other organizations located inside (\$330 million) or outside (\$70 million) the U.S.^fOther sources of support for nonprofit institutions were unavailable by state. In 2008, total nonprofit performance is estimated at \$16.0 billion. Industry provided an estimated \$1.3 billion to the nonprofit sector, and nonprofit institutions provided an estimated \$8.5 billion.^gStates totals differ from U.S. totals for four reasons: some R&D expenditures cannot be allocated to 1 of 50 states or the District of Columbia; nonfederal sources of other nonprofit R&D expenditures could not be allocated by state; state-level U&C data have not been adjusted to eliminate double counting of funds passed through from one academic institution to another; and state-level R&D data are not converted from fiscal years to calendar years.^hReported data that could not be assigned to 1 of the 50 states or the District of Columbia.ⁱData on business R&D performance in Puerto Rico are not collected.^jIncludes R&D expenditures reported for outlying areas (Guam, Virgin Islands) and offices abroad, but excluding Puerto Rico.

NOTES: Industry R&D data refer to calendar years; other R&D data refer to fiscal years but are used here as approximations to calendar year data.

SOURCES: National Science Foundation, National Center for Science and Engineering Statistics (NSF/NCSES), National Patterns of R&D Resources [annual series]; NSF/NCSES, Business Research and Development and Innovation Survey, 2008; NSF/NCSES, Survey of Research and Development Expenditures at Universities and Colleges, FY 2008; NSF/NCSES, Survey of Federal Funds for Research and Development, FY 2008–10. State GDP data are from the U.S. Bureau of Economic Analysis, <http://www.bea.gov/regional/gsp>, accessed 23 February 2011.

Appendix table 4-12

U.S. R&D and gross domestic product, by state: 2008

State (listed by R&D rank)	R&D (current \$millions)	GDP (current \$millions)	R&D/GDP (%)	Rank in R&D/GDP	% of total state R&D	Cumulative percent
1 California	81,323	1,925,499	4.22	9	21.8	21.8
2 New Jersey	20,713	484,332	4.28	7	5.6	27.4
3 Texas	20,316	1,196,771	1.70	28	5.5	32.8
4 Massachusetts	20,090	363,064	5.53	4	5.4	38.2
5 Washington	16,696	336,315	4.96	6	4.5	42.7
6 Maryland	16,605	280,509	5.92	3	4.5	47.2
7 New York	16,486	1,110,712	1.48	34	4.4	51.6
8 Michigan	15,507	376,184	4.12	10	4.2	55.7
9 Pennsylvania	13,068	546,145	2.39	19	3.5	59.3
10 Illinois	11,961	635,080	1.88	27	3.2	62.5
11 Virginia	11,472	400,457	2.86	11	3.1	65.5
12 Connecticut	11,322	222,168	5.10	5	3.0	68.6
13 Ohio	10,164	472,285	2.15	24	2.7	71.3
14 North Carolina	8,612	404,386	2.13	25	2.3	73.6
15 Arizona	7,010	261,537	2.68	15	1.9	75.5
16 Minnesota	6,697	261,951	2.56	17	1.8	77.3
17 Florida	6,515	747,803	0.87	43	1.7	79.0
18 Indiana	6,111	263,732	2.32	20	1.6	80.7
19 District of Columbia	5,946	96,757	6.15	2	1.6	82.3
20 New Mexico	5,906	77,959	7.58	1	1.6	83.9
21 Colorado	5,810	255,226	2.28	21	1.6	85.4
22 Georgia	5,232	402,097	1.30	36	1.4	86.8
23 Wisconsin	4,967	241,174	2.06	26	1.3	88.2
24 Alabama	4,870	170,672	2.85	12	1.3	89.5
25 Oregon	4,802	169,529	2.83	13	1.3	90.8
26 Missouri	3,884	239,703	1.62	31	1.0	91.8
27 Tennessee	3,871	246,436	1.57	32	1.0	92.8
28 Utah	2,522	112,725	2.24	22	0.7	93.5
29 New Hampshire	2,496	58,808	4.24	8	0.7	94.2
30 Iowa	2,136	136,007	1.57	33	0.6	94.8
31 South Carolina	2,086	159,688	1.31	35	0.6	95.3
32 Kansas	2,029	124,895	1.62	30	0.5	95.9
33 Delaware	1,594	58,357	2.73	14	0.4	96.3
34 Kentucky	1,463	155,852	0.94	42	0.4	96.7
35 Idaho	1,375	55,465	2.48	18	0.4	97.0
36 Rhode Island	1,233	47,577	2.59	16	0.3	97.4
37 Louisiana	1,193	211,459	0.56	49	0.3	97.7
38 Oklahoma	1,030	151,540	0.68	47	0.3	98.0
39 Nebraska	988	84,639	1.17	38	0.3	98.2
40 Nevada	913	132,133	0.69	46	0.2	98.5
41 Mississippi	808	95,653	0.84	44	0.2	98.7
42 West Virginia	778	61,306	1.27	37	0.2	98.9
43 Arkansas	747	100,232	0.75	45	0.2	99.1
44 Hawaii	663	66,038	1.00	41	0.2	99.3
45 Vermont	546	24,993	2.18	23	0.1	99.4
46 Maine	516	50,462	1.02	40	0.1	99.6
47 North Dakota	511	31,118	1.64	29	0.1	99.7
48 Montana	401	35,818	1.12	39	0.1	99.8

Appendix table 4-12

U.S. R&D and gross domestic product, by state: 2008

State (listed by R&D rank)	R&D (current \$millions)	GDP (current \$millions)	R&D/GDP (%)	Rank in R&D/GDP	% of total state R&D	Cumulative percent
49 Alaska	269	49,720	0.54	50	0.1	99.9
50 South Dakota	254	37,973	0.67	48	0.1	100.0
51 Wyoming	154	38,894	0.40	51	0.0	100.0

GDP = gross domestic product

NOTES: U.S. total R&D expenditures for 2008 are estimated to be \$402.0 billion. \$372.7 billion could be allocated to the 50 states and District of Columbia.

SOURCES: National Science Foundation, National Center for Science and Engineering Statistics (NSF/NCSES), National Patterns of R&D Resources [annual series]; NSF/NCSES, Business Research and Development and Innovation Survey, 2008; NSF/NCSES, Survey of Research and Development Expenditures at Universities and Colleges, FY 2008; NSF/NCSES, Survey of Federal Funds for Research and Development, FY 2008–10. State GDP data are from the U.S. Bureau of Economic Analysis, <http://www.bea.gov/regional/gsp>, accessed 23 February 2011.

Science and Engineering Indicators 2012

Appendix table 4-13

Worldwide R&D expense for R&D performed by the company, by industry and company size: 2008

(Millions of U.S. dollars)

Industry and company size	NAICS code	R&D expense for R&D performed by the company		
		Worldwide	Domestic	Foreign
All industries	21-23, 31-33, 42-81	289,403	232,505	56,899
Manufacturing industries	31-33	209,660	164,386	45,274
Food	311	2,659	2,063	596
Beverage and tobacco products	312	900	777	123
Textile, apparel, and leather	313-16	1,169	802	367
Wood products	321	274	270	4
Paper manufacturing	322	1,430	1,156	274
Printing and related support activities	323	321	312	9
Petroleum and coal products	324	D	D	D
Chemicals	325	68,592	55,042	13,549
Basic chemicals	3251	5,206	4,012	1,194
Resin, synthetic rubber, fibers, and filament	3252	950	726	224
Pesticide, fertilizer, and other agricultural chemical manufacturing	3253	1,312	941	370
Pharmaceuticals and medicines	3254	55,648	45,169	10,479
Soap, cleaning compound, and toilet preparation	3256	3,064	2,099	965
Paint, coating, adhesive, and other chemicals manufacturing	3255, 3259	2,412	2,095	317
Plastics and rubber products	326	2,053	1,713	339
Nonmetallic mineral products	327	1,615	1,509	106
Primary metals	331	768	654	114
Fabricated metal products	332	2,550	2,362	188
Machinery	333	11,764	9,846	1,918
Agricultural implement manufacturing	33311	1,580	1,181	399
Semiconductor machinery manufacturing	333295	2,476	2,113	362
Engine, turbine, and power transmission equipment manufacturing	3336	1,372	1,280	92
Other machinery manufacturing	other 333	6,337	5,272	1,065
Computer and electronic products	334	68,331	52,912	15,419
Communications equipment	3342	14,423	11,484	2,939
Semiconductor and other electronic components	3344	28,490	21,588	6,902
Navigational, measuring, electromedical, and control instruments	3345	12,666	10,463	2,203
Electromedical, electrotherapeutic, and irradiation apparatus manufacturing	334510, 334517	5,731	4,896	834
Search, detection, navigation, guidance, aeronautical, and nautical system and instrument manufacturing	334511	D	2,803	D
Other measuring and controlling device manufacturing	other 3345	D	2,764	D
Computer and peripheral equipment and other computer and electronic products	3341, 3343, 3346	12,752	9,377	3,375
Electrical equipment, appliances, and components	335	4,099	2,947	1,152
Transportation equipment	336	32,835	23,039	9,796
Automobiles, bodies, trailers, and parts	3361, 3362, 3363	20,547	12,234	8,313
Aerospace products and parts	3364	11,850	10,371	1,479
Aircraft, aircraft engine, and aircraft parts manufacturing	336411-336413	D	9,698	D
Guided missile, space vehicle, and related parts manufacturing	336414, 336415, 336419	D	673	D
Military armored vehicle, tank, and tank component manufacturing	336992	25	25	0
Other transportation	other 336	413	409	3
Furniture and related products	337	504	477	27
Miscellaneous manufacturing	339	D	D	D
Medical equipment and supplies manufacturing	3391	5,940	5,179	762
Other miscellaneous manufacturing	3399	D	D	D
Nonmanufacturing industries	21-23, 42-81	79,743	68,118	11,625
Mining, extraction, and support activities	21	1,676	1,478	198

Appendix table 4-13

Worldwide R&D expense for R&D performed by the company, by industry and company size: 2008

(Millions of U.S. dollars)

Industry and company size	NAICS code	R&D expense for R&D performed by the company		
		Worldwide	Domestic	Foreign
Utilities	22	197	190	6
Construction	23	D	D	0
Wholesale trade	42	2,442	1,944	499
Retail trade	44-45	D	1,029	D
Electronic shopping and mail-order houses	4541	D	674	D
Other retail trade	other 44-45	354	354	0
Transportation and warehousing	48-49	136	134	2
Information	51	44,524	36,922	7,602
Publishing	511	34,126	27,871	6,255
Newspaper, periodical, book, and directory publishers	5111	233	205	27
Software publishers	5112	33,893	27,665	6,228
Telecommunications	517	1,776	1,601	175
Internet service providers, Web search portals, and data processing services	518	7,572	6,493	1,080
Other information	other 51	1,050	958	93
Finance and insurance	52	1,156	1,084	73
Real estate and rental and leasing	53	311	246	65
Professional, scientific, and technical services	54	23,493	20,539	2,954
Architectural, engineering, and related services	5413	1,495	1,378	117
Computer systems design and related services	5415	10,645	8,569	2,077
Scientific research and development services	5417	9,273	8,708	564
Other professional, scientific, and technical services	other 54	2,080	1,884	196
Health care services	621-23	1,033	1,032	1
Other nonmanufacturing	55-56, 61, 624, 71-72, 81	D	D	D
All companies	21-23, 31-33, 42-81	289,403	232,505	56,899
Small companies (number of employees) ^a				
5-499	-	50,922	46,396	4,526
5-99	-	26,682	24,890	1,792
5-49	-	18,479	17,642	836
5-24	-	10,571	10,333	238
25-49	-	7,907	7,309	598
50-99	-	8,204	7,248	956
100-249	-	14,555	12,933	1,622
250-499	-	9,684	8,572	1,112
Medium and large companies (number of employees)				
500-999	-	11,353	9,673	1,680
1,000-4,999	-	49,638	39,010	10,628
5,000-9,999	-	24,923	20,358	4,565
10,000-24,999	-	54,272	43,049	11,223
25,000 or more	-	98,297	74,020	24,277

D = data withheld to avoid disclosing operations of individual companies

BRDIS = Business R&D and Innovation Survey; NAICS = 2002 North American Industry Classification System

^aUpper bound based on U.S. Small Business Administration's definition of a small business; BRDIS does not include companies with fewer than five domestic employees.

NOTES: Detail may not add to total because of rounding. Industry classification based on dominant business code for domestic R&D performance where available. For companies that did not report business codes, classification used for sampling was assigned.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, and U.S. Census Bureau, Business R&D and Innovation Survey, 2008.

Appendix table 4-14

Domestic and foreign R&D performed by the company, by industry and company size: 2008

(Millions of U.S. dollars)

Industry and company size	NAICS code	Total performance			Domestic performance			Foreign performance		
		Total	Paid for by company	Paid for by others	Total	Paid for by company	Paid for by others	Total	Paid for by company	Paid for by others
All industries	21-23, 31-33, 42-81	352,156	289,404	62,752	290,681	232,505	58,176	61,475	56,899	4,576
Manufacturing industries	31-33	250,326	209,660	40,666	203,754	164,386	39,368	46,572	45,274	1,298
Food	311	2,101	2,659	D	2,100	2,063	37	1	596	*
Beverage and tobacco products	312	903	900	3	780	777	3	123	123	0
Textile, apparel, and leather	313-16	1,181	1,169	12	814	802	12	367	367	0
Wood products	321	277	274	3	273	270	3	4	4	0
Paper manufacturing	322	1,441	1,430	11	1,167	1,156	11	274	274	0
Printing and related support activities	323	D	321	D	349	312	37	*	9	*
Petroleum and coal products	324	D	D	D	D	D	D	D	D	0
Chemicals	325	72,239	68,591	3,648	58,249	55,042	3,207	13,990	13,549	441
Basic chemicals	3251	5,272	5,206	66	4,074	4,012	62	1,198	1,194	4
Resin, synthetic rubber, fibers, and filament	3252	985	950	35	761	726	35	224	224	0
Pesticide, fertilizer, and other agricultural chemical manufacturing	3253	D	1,311	D	D	941	D	D	370	1
Pharmaceuticals and medicines	3254	58,993	55,648	3,345	48,131	45,169	2,962	10,862	10,479	383
Soap, cleaning compound, and toilet preparation	3256	3,073	3,064	9	2,108	2,099	9	965	965	0
Paint, coating, adhesive, and other chemicals manufacturing	3255, 3259	D	2,412	D	D	2,095	D	D	317	53
Plastics and rubber products	326	2,158	2,052	106	1,817	1,713	104	341	339	2
Nonmetallic mineral products	327	D	1,615	D	1,555	1,509	46	*	106	*
Primary metals	331	D	768	D	696	654	42	*	114	*
Fabricated metal products	332	2,608	2,550	58	2,419	2,362	57	189	188	1
Machinery	333	12,033	11,764	269	10,104	9,846	258	1,929	1,918	11
Agricultural implement manufacturing	33311	1,583	1,580	3	1,184	1,181	3	399	399	0
Semiconductor machinery manufacturing	333295	2,538	2,475	63	2,172	2,113	59	366	362	4
Engine, turbine, and power transmission equipment manufacturing	3336	1,435	1,372	63	1,343	1,280	63	92	92	0
Other machinery manufacturing	other 333	6,477	6,337	140	5,405	5,272	133	1,072	1,065	7
Computer and electronic products	334	76,237	68,331	7,906	60,463	52,912	7,551	15,774	15,419	355
Communications equipment	3342	15,854	14,423	1,431	12,903	11,484	1,419	2,951	2,939	12
Semiconductor and other electronic components	3344	29,399	28,490	909	22,324	21,588	736	7,075	6,902	173
Navigational, measuring, electromedical, and control instruments	3345	17,768	12,666	5,102	15,460	10,463	4,997	2,308	2,203	105
Electromedical, electrotherapeutic, and irradiation apparatus manufacturing	334510, 334517	6,853	5,730	1,123	6,015	4,896	1,119	838	834	4
Search, detection, navigation, guidance, aeronautical, and nautical system and instrument manufacturing	334511	D	D	D	D	2,803	3,739	D	D	D
Other measuring and controlling device manufacturing	other 3345	D	D	D	D	2,764	139	D	D	D

Appendix table 4-14

Domestic and foreign R&D performed by the company, by industry and company size: 2008

(Millions of U.S. dollars)

Industry and company size	NAICS code	Total performance			Domestic performance			Foreign performance		
		Total	Paid for by company	Paid for by others	Total	Paid for by company	Paid for by others	Total	Paid for by company	Paid for by others
Computer and peripheral equipment and other computer and electronic products	3341, 3343, 3346	13,216	12,752	464	9,776	9,377	399	3,440	3,375	65
Electrical equipment, appliances, and components	335	4,305	4,099	206	3,143	2,947	196	1,162	1,152	10
Transportation equipment	336	60,819	32,835	27,984	50,552	23,039	27,513	10,267	9,796	471
Automobiles, bodies, trailers, and parts	3361, 3362, 3363	21,587	20,547	1,040	13,140	12,234	906	8,447	8,313	134
Aerospace products and parts	3364	38,757	11,850	26,907	36,941	10,371	26,570	1,816	1,479	337
Aircraft, aircraft engine, and aircraft parts manufacturing	336411-13	D	D	D	D	9,698	21,163	D	D	D
Guided missile, space vehicle, and related parts manufacturing	336414, 336415, 336419	D	D	D	D	673	5,407	D	D	D
Military armored vehicle, tank, and tank component manufacturing	336992	32	25	7	32	25	7	0	0	0
Other transportation	other 336	442	412	30	439	409	30	3	3	0
Furniture and related products	337	D	504	D	D	477	*	D	27	0
Miscellaneous manufacturing	339	D	D	D	D	D	D	D	D	7
Medical equipment and supplies manufacturing	3391	6,067	5,941	126	5,300	5,179	121	767	762	5
Other miscellaneous manufacturing	3399	D	D	D	D	D	D	D	D	3
Nonmanufacturing industries	21-23, 42-81	101,828	79,743	22,085	86,925	68,118	18,807	14,903	11,625	3,278
Mining, extraction, and support activities	21	D	1,676	D	D	1,478	24	D	198	D
Utilities	22	D	196	D	225	190	35	*	6	*
Construction	23	D	D	D	D	D	D	D	0	0
Wholesale trade	42	2,594	2,443	151	2,084	1,944	140	510	499	11
Retail trade	44-45	D	D	2	1,031	1,029	2	D	D	0
Electronic shopping and mail-order houses	4541	D	D	1	675	674	1	D	D	0
Other retail trade	other 44-45	355	354	1	355	354	1	0	0	0
Transportation and warehousing	48-49	D	136	D	D	134	*	D	2	0
Information	51	45,351	44,524	827	37,694	36,922	772	7,657	7,602	55
Publishing	511	34,728	34,126	602	28,427	27,871	556	6,301	6,255	46
Newspaper, periodical, book, and directory publishers	5111	232	232	0	205	205	0	27	27	0
Software publishers	5112	34,495	33,893	602	28,221	27,665	556	6,274	6,228	46
Telecommunications	517	1,859	1,776	83	1,684	1,601	83	175	175	0
Internet service providers, Web search portals, and data processing services	518	7,657	7,573	84	6,568	6,493	75	1,089	1,080	9
Other information	other 51	1,109	1,051	58	1,016	958	58	93	93	0
Finance and insurance	52	1,166	1,157	9	1,092	1,084	8	74	73	1
Real estate and rental and leasing	53	318	311	7	253	246	7	65	65	0
Professional, scientific, and technical services	54	44,104	23,493	20,611	37,954	20,539	17,415	6,150	2,954	3,196
Architectural, engineering, and related services	5413	3,622	1,495	2,127	3,422	1,378	2,044	200	117	83
Computer systems design and related services	5415	14,311	10,646	3,665	12,146	8,569	3,577	2,165	2,077	88

Appendix table 4-14

Domestic and foreign R&D performed by the company, by industry and company size: 2008

(Millions of U.S. dollars)

Industry and company size	NAICS code	Total performance			Domestic performance			Foreign performance		
		Total	Paid for by company	Paid for by others	Total	Paid for by company	Paid for by others	Total	Paid for by company	Paid for by others
Scientific research and development services	5417	21,457	9,272	12,185	17,913	8,708	9,205	3,544	564	2,980
Other professional, scientific, and technical services	other 54	4,715	2,080	2,635	4,474	1,884	2,590	241	196	45
Health care services	621-23	1,315	1,033	282	1,314	1,032	282	1	1	0
Other nonmanufacturing	55-56, 61, 624, 71-72, 81	D	D	D	D	D	D	D	D	D
All companies	21-23, 31-33, 42-81	352,156	289,404	62,752	290,681	232,505	58,176	61,475	56,899	4,576
Small companies (number of employees) ^a										
5-499	-	63,052	50,922	12,130	58,137	46,396	11,741	4,915	4,526	389
5-99	-	35,258	26,682	8,576	33,256	24,890	8,366	2,002	1,792	210
5-49	-	24,931	18,478	6,453	23,905	17,642	6,263	1,026	836	190
5-24	-	14,648	10,571	4,077	14,280	10,333	3,947	368	238	130
25-49	-	10,285	7,907	2,378	9,626	7,309	2,317	659	598	61
50-99	-	10,327	8,204	2,123	9,351	7,248	2,103	976	956	20
100-249	-	16,397	14,555	1,842	14,662	12,933	1,729	1,735	1,622	113
250-499	-	11,396	9,684	1,712	10,218	8,572	1,646	1,178	1,112	66
Medium and large companies (number of employees)										
500-999	-	13,639	11,353	2,286	11,886	9,673	2,213	1,753	1,680	73
1,000-4,999	-	57,687	49,638	8,049	46,337	39,010	7,327	11,350	10,628	722
5,000-9,999	-	31,764	24,923	6,841	24,764	20,358	4,406	7,000	4,565	2,435
10,000-24,999	-	60,522	54,272	6,250	48,737	43,049	5,688	11,785	11,223	562
25,000 or more	-	125,491	98,297	27,194	100,820	74,020	26,800	24,671	24,277	394

* = < \$500,000; D = data withheld to avoid disclosing operations of individual companies

BRDIS = Business R&D and Innovation Survey; NAICS = 2002 North American Industry Classification System

^aUpper bound based on U.S. Small Business Administration's definition of a small business; BRDIS does not include companies with fewer than five domestic employees.

NOTES: Detail may not add to total because of rounding. Industry classification based on dominant business code for domestic R&D performance where available. For companies that did not report business codes, classification used for sampling was assigned.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, and U.S. Census Bureau, Business R&D and Innovation Survey, 2008.

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Appendix table 4-15

Sources of funds for domestic R&D performed by the company, by industry and company size: 2008

(Millions of U.S. dollars)

Industry and company size	NAICS code	Total	R&D paid for by the company	R&D paid for by others		
				Total	U.S. federal government	Nonfederal sources
All industries	21-23, 31-33, 42-81	290,681	232,505	58,176	36,360	21,816
Manufacturing industries	31-33	203,754	164,386	39,368	31,102	8,266
Food	311	2,100	2,063	37	2	35
Beverage and tobacco products	312	780	777	3	0	3
Textile, apparel, and leather	313-16	814	802	12	D	D
Wood products	321	273	270	3	0	3
Paper manufacturing	322	1,167	1,156	11	D	D
Printing and related support activities	323	349	312	37	32	5
Petroleum and coal products	324	D	D	D	*	D
Chemicals	325	58,249	55,042	3,207	197	3,010
Basic chemicals	3251	4,074	4,012	62	33	29
Resin, synthetic rubber, fibers, and filament	3252	761	726	35	12	23
Pesticide, fertilizer, and other agricultural chemical manufacturing	3253	D	941	D	1	D
Pharmaceuticals and medicines	3254	48,131	45,169	2,962	137	2,825
Soap, cleaning compound, and toilet preparation	3256	2,108	2,099	9	6	3
Paint, coating, adhesive, and other chemicals manufacturing	3255, 3259	D	2,095	D	8	D
Plastics and rubber products	326	1,817	1,713	104	4	100
Nonmetallic mineral products	327	1,555	1,509	46	33	13
Primary metals	331	696	654	42	9	33
Fabricated metal products	332	2,419	2,362	57	16	41
Machinery	333	10,104	9,846	258	62	196
Agricultural implement manufacturing	33311	1,184	1,181	3	0	3
Semiconductor machinery manufacturing	333295	2,172	2,113	59	32	27
Engine, turbine, and power transmission equipment manufacturing	3336	1,343	1,280	63	9	54
Other machinery manufacturing	other 333	5,405	5,272	133	21	112
Computer and electronic products	334	60,463	52,912	7,551	4,646	2,905
Communications equipment	3342	12,903	11,484	1,419	D	D
Semiconductor and other electronic components	3344	22,324	21,588	736	D	D
Navigational, measuring, electromedical, and control instruments	3345	15,460	10,463	4,997	3,635	1,362
Electromedical, electrotherapeutic, and irradiation apparatus manufacturing	334510, 334517	6,015	4,896	1,119	1,098	21
Search, detection, navigation, guidance, aeronautical, and nautical system and instrument manufacturing	334511	D	2,803	3,739	2,410	1,329
Other measuring and controlling device manufacturing	other 3345	D	2,764	139	127	12
Computer and peripheral equipment and other computer and electronic products	3341, 3343, 3346	9,776	9,377	399	51	348
Electrical equipment, appliances, and components	335	3,143	2,947	196	91	105
Transportation equipment	336	50,552	23,039	27,513	25,941	1,572
Automobiles, bodies, trailers, and parts	3361, 3362, 3363	13,140	12,234	906	D	D
Aerospace products and parts	3364	36,941	10,371	26,570	25,805	765
Aircraft, aircraft engine, and aircraft parts manufacturing	336411-13	D	9,698	21,163	D	D
Guided missile, space vehicle, and related parts manufacturing	336414, 336415, 336419	D	673	5,407	D	D
Military armored vehicle, tank, and tank component manufacturing	336992	32	25	7	D	D
Other transportation	other 336	439	409	30	D	D
Furniture and related products	337	D	477	*	0	D

Appendix table 4-15

Sources of funds for domestic R&D performed by the company, by industry and company size: 2008

(Millions of U.S. dollars)

Industry and company size	NAICS code	Total	R&D paid for by the company	R&D paid for by others		
				Total	U.S. federal government	Nonfederal sources
Miscellaneous manufacturing	339	D	D	D	54	D
Medical equipment and supplies manufacturing	3391	5,300	5,179	121	20	101
Other miscellaneous manufacturing	3399	D	D	D	34	D
Nonmanufacturing industries	21-23, 42-81	86,925	68,118	18,807	5,258	13,549
Mining, extraction, and support activities	21	D	1,478	24	5	19
Utilities	22	225	190	35	D	D
Construction	23	D	D	D	0	D
Wholesale trade	42	2,084	1,944	140	46	94
Retail trade	44-45	1,031	1,029	2	0	2
Electronic shopping and mail-order houses	4541	675	674	1	0	1
Other retail trade	other 44-45	355	354	1	0	1
Transportation and warehousing	48-49	D	134	*	*	D
Information	51	37,694	36,922	772	229	543
Publishing	511	28,427	27,871	556	176	380
Newspaper, periodical, book, and directory publishers	5111	205	205	0	0	0
Software publishers	5112	28,221	27,665	556	176	380
Telecommunications	517	1,684	1,601	83	35	48
Internet service providers, Web search portals, and data processing services	518	6,568	6,493	75	1	74
Other information	other 51	1,016	958	58	17	41
Finance and insurance	52	1,092	1,084	8	0	8
Real estate and rental and leasing	53	253	246	7	0	7
Professional, scientific, and technical services	54	37,954	20,539	17,415	4,844	12,571
Architectural, engineering, and related services	5413	3,422	1,378	2,044	928	1,116
Computer systems design and related services	5415	12,146	8,569	3,577	784	2,793
Scientific research and development services	5417	17,913	8,708	9,205	2,115	7,090
Other professional, scientific, and technical services	other 54	4,474	1,884	2,590	1,016	1,574
Health care services	621-23	1,314	1,032	282	16	266
Other nonmanufacturing	55-56, 61, 624, 71-72, 81	D	D	D	D	D
All companies	21-23, 31-33, 42-81	290,681	232,505	58,176	36,360	21,816
Small companies (number of employees) ^a						
5-499	-	58,137	46,396	11,741	4,117	7,624
5-99	-	33,256	24,890	8,366	2,667	5,699
5-49	-	23,905	17,642	6,263	1,972	4,291
5-24	-	14,280	10,333	3,947	1,086	2,861
25-49	-	9,626	7,309	2,317	886	1,431
50-99	-	9,351	7,248	2,103	695	1,408
100-249	-	14,662	12,933	1,729	718	1,011
250-499	-	10,218	8,572	1,646	732	914
Medium and large companies (number of employees)						
500-999	-	11,886	9,673	2,213	747	1,466
1,000-4,999	-	46,337	39,010	7,327	2,162	5,165

Appendix table 4-15

Sources of funds for domestic R&D performed by the company, by industry and company size: 2008

(Millions of U.S. dollars)

Industry and company size	NAICS code	Total	R&D paid for by the company	R&D paid for by others		
				Total	U.S. federal government	Nonfederal sources
5,000–9,999	–	24,764	20,358	4,406	1,168	3,238
10,000–24,999	–	48,737	43,049	5,688	3,024	2,664
25,000 or more	–	100,820	74,020	26,800	25,142 i	1,658

* = < \$500,000; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse.

BRDIS = Business R&D and Innovation Survey; NAICS = 2002 North American Industry Classification System

^aUpper bound based on U.S. Small Business Administration's definition of a small business; BRDIS does not include companies with fewer than five domestic employees.

NOTES: Detail may not add to total because of rounding. Industry classification based on dominant business code for domestic R&D performance where available. For companies that did not report business codes, classification used for sampling was assigned.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, and U.S. Census Bureau, Business R&D and Innovation Survey, 2008.

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Appendix table 4-16

Domestic sales, domestic R&D performed and paid for by the company, and R&D intensity, by industry and company size: 2008

Industry and company size	NAICS code	Domestic sales (US\$millions)	Domestic R&D performed and paid for by the company (US\$millions)	R&D intensity (performance/ sales) (%)
All industries	21-23, 31-33, 42-81	7,796,340	232,505	3.0
Manufacturing industries	31-33	4,681,443	164,386	3.5
Food	311	476,888	2,063	0.4
Beverage and tobacco products	312	130,661	777	0.6
Textile, apparel, and leather	313-16	141,481	802	0.6
Wood products	321	40,999	270	0.7
Paper manufacturing	322	92,642	1,156	1.2
Printing and related support activities	323	16,597	312	1.9
Petroleum and coal products	324	271,430	D	D
Chemicals	325	902,410	55,042	6.1
Basic chemicals	3251	173,503	4,012	2.3
Resin, synthetic rubber, fibers, and filament	3252	180,105	726	0.4
Pesticide, fertilizer, and other agricultural chemical manufacturing	3253	32,021	941	2.9
Pharmaceuticals and medicines	3254	371,760	45,169	12.2
Soap, cleaning compound, and toilet preparation	3256	82,981	2,099	2.5
Paint, coating, adhesive, and other chemicals manufacturing	3255, 3259	62,041	2,095	3.4
Plastics and rubber products	326	162,697	1,713	1.1
Nonmetallic mineral products	327	78,828	1,509	1.9
Primary metals	331	154,706	654	0.4
Fabricated metal products	332	150,564	2,362	1.6
Machinery	333	278,700	9,846	3.5
Agricultural implement manufacturing	33311	35,818	1,181	3.3
Semiconductor machinery manufacturing	333295	7,328	2,113	28.8
Engine, turbine, and power transmission equipment manufacturing	3336	30,863	1,280	4.1
Other machinery manufacturing	other 333	204,691	5,272	2.6
Computer and electronic products	334	522,717	52,912	10.1
Communications equipment	3342	86,150	11,484	13.3
Semiconductor and other electronic components	3344	106,658	21,588	20.2
Navigational, measuring, electromedical, and control instruments	3345	180,705	10,463	5.8
Electromedical, electrotherapeutic, and irradiation apparatus manufacturing	334510, 334517	60,251	4,896	8.1
Search, detection, navigation, guidance, aeronautical, and nautical system and instrument manufacturing	334511	75,426	2,803	3.7
Other measuring and controlling device manufacturing	other 3345	45,028	2,764	6.1
computer and electronic products	3341, 3343, 3346	149,203	9,377	6.3
Electrical equipment, appliances, and components	335	108,730	2,947	2.7
Transportation equipment	336	888,777	23,039	2.6
Automobiles, bodies, trailers, and parts	3361, 3362, 3363	491,483	12,234	2.5
Aerospace products and parts	3364	372,438	10,371	2.8
Aircraft, aircraft engine, and aircraft parts manufacturing	336411-13	316,664	9,698	3.1
Guided missile, space vehicle, and related parts manufacturing	336414-15, 336419	55,774	673	1.2
Military armored vehicle, tank, and tank component manufacturing	336992	2,412	25	1.0
Other transportation	other 336	22,443	409	1.8
Furniture and related products	337	34,174	477	1.4
Miscellaneous manufacturing	339	228,441	D	D
Medical equipment and supplies manufacturing	3391	151,700	5,179	3.4
Other miscellaneous manufacturing	3399	76,742	D	D

Appendix table 4-16

Domestic sales, domestic R&D performed and paid for by the company, and R&D intensity, by industry and company size: 2008

Industry and company size	NAICS code	Domestic sales (US\$millions)	Domestic R&D performed and paid for by the company (US\$millions)	R&D intensity (performance/ sales) (%)
Nonmanufacturing industries	21-23, 42-81	3,114,898	68,118	2.2
Mining, extraction, and support activities	21	409,659	1,478	0.4
Utilities	22	314,855	190	0.1
Construction	23	45,544	D	D
Wholesale trade	42	247,904 i	1,944 i	0.8
Retail trade	44-45	79,571	1,029	1.3
Electronic shopping and mail-order houses	4541	5,030	674	13.4
Other retail trade	other 44-45	74,541	354	0.5
Transportation and warehousing	48-49	126,726	134	0.1
Information	51	776,062	36,922	4.8
Publishing	511	273,765	27,871	10.2
Newspaper, periodical, book, and directory publishers	5111	12,314	205	1.7
Software publishers	5112	261,451	27,665	10.6
Telecommunications	517	349,363	1,601	0.5
Internet service providers, Web search portals, and data processing services	518	104,885	6,493	6.2
Other information	other 51	48,049	958	2.0
Finance and insurance	52	377,279	1,084	0.3
Real estate and rental and leasing	53	18,328	246	1.3
Professional, scientific, and technical services	54	453,444	20,539	4.5
Architectural, engineering, and related services	5413	41,642	1,378	3.3
Computer systems design and related services	5415	204,868	8,569	4.2
Scientific research and development services	5417	136,105	8,708	6.4
Other professional, scientific, and technical services	other 54	70,829	1,884	2.7
Health care services	621-23	29,382	1,032	3.5
Other nonmanufacturing	55-56, 61, 624, 71-72, 81	236,144	D	D
All companies	21-23, 31-33, 42-81	7,796,340	232,505	3.0
Small companies (number of employees) ^a				
5-499	-	737,892	46,396	6.3
5-99	-	270,007	24,890	9.2
5-49	-	147,593	17,642	12.0
5-24	-	73,151	10,333	14.1
25-49	-	74,442	7,309	9.8
50-99	-	122,414	7,248	5.9
100-249	-	242,803	12,933	5.3
250-499	-	225,081	8,572	3.8
Medium and large companies (number of employees)				
500-999	-	328,990	9,673	2.9
1,000-4,999	-	1,076,460	39,010	3.6
5,000-9,999	-	902,756	20,358	2.3
10,000-24,999	-	1,542,122	43,049	2.8
25,000 or more	-	3,208,120	74,020	2.3

D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse.

BRDIS = Business R&D and Innovation Survey; NAICS = 2002 North American Industry Classification System

^aUpper bound based on U.S. Small Business Administration's definition of a small business; BRDIS does not include companies with fewer than five domestic employees.

NOTES: Data are representative of companies that had either positive worldwide R&D expense or positive worldwide R&D costs funded by others in 2008. Detail may not add to total because of rounding. Industry classification based on dominant business code for domestic R&D performance where available. For companies that did not report business codes, classification used for sampling was assigned.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, and U.S. Census Bureau, Business R&D and Innovation Survey, 2008.

Appendix table 4-17

Worldwide R&D expense and domestic R&D performance paid for by the company and by others, by business activity: 2008

(Millions of U.S. dollars)

Business activity	Business code ^a	Worldwide R&D expense	Domestic R&D performance		
			Total	Paid for by company	Paid for by others
All business activities	21100-81390	328,040	290,681	232,505	58,176
Oil and gas extraction	21100	1,215	616	609	7
Coal mining	21210	55	D	52	D
Metal ore mining	21220	67	57	57	0
Nonmetallic mineral mining and quarrying	21230	129	126	126	0
Support activities for oil and gas operations	21300	914	D	706	D
Support activities for solid mineral operations	21310	*	*	*	0
Electric power generation, transmission, and distribution	22110	437	424	237	187
Natural gas distribution	22120	19	1	1	0
Water, sewage, and other systems	22130	10	8	7	1
Construction of buildings	23600	377	373	367	6
Heavy and civil engineering construction	23700	40	31	31	0
Specialty trade contractors	23800	1,123	1,072	1,065	7
Food manufacturing	31100	2,983	2,229	2,196	33
Beverage manufacturing	31210	605	*	437	*
Tobacco manufacturing	31220	D	D	D	3
Textile mill products	31300	474	322	318	4
Apparel manufacturing	31500	448	430	424	6
Leather and allied products manufacturing	31600	65	56	56	0
Wood products manufacturing	32100	264	*	216	*
Paper manufacturing	32200	1,130	897	896	1
Printing and related support activities	32300	297	*	291	*
Petroleum and coal products manufacturing	32400	1,082 i	D	949 i	D
Basic chemicals manufacturing	32510	3,806	2,918	2,871	47
Resin, synthetic rubber, and artificial synthetic fibers and filaments manufacturing	32520	1,152	911	889	22
Pesticide, fertilizer, and other agricultural chemical manufacturing	32530	2,100	D	1,378	D
Pharmaceutical, medicinal, botanical, and biological products (except diagnostic) manufacturing	32541	70,016	44,390	41,593	2,797
In-vitro diagnostic substances manufacturing	32542	1,988	1,051	982	69
Soap, cleaning compound, and toilet preparations manufacturing	32591	2,787	1,985	1,982	3
Paint, adhesive, and other chemical manufacturing	32592	2,152	1,773	1,750	23
Plastics and rubber products manufacturing	32600	2,536	2,175	2,099	76
Clay and glass products manufacturing	32710	966 i	931 i	903 i	28
Cement, concrete, lime, gypsum, and other nonmetallic mineral product manufacturing	32790	738	546	545	1
Iron and steel mills, ferroalloy, and steel product from purchased steel	33110	331	254	250	4
Nonferrous metals production and processing	33130	415	295	292	3
Ferrous and nonferrous foundries	33150	85	*	83	*
Fabricated metal products manufacturing	33200	2,935	2,617	2,474	143
Farm machinery and equipment manufacturing	33311	1,404	861	859	2
Construction machinery manufacturing	33312	581	498	498	0
Mining machinery and equipment manufacturing	33313	1,689	1,443	1,408	35
Oil and gas field machinery and equipment manufacturing	33314	277	255 i	255 i	0
Semiconductor machinery manufacturing	33321	2,553	2,179	2,152	27
Industrial machinery manufacturing, except semiconductor machinery	33322	1,191	850	831	19
Commercial, service industry, temperature control, and airflow control machinery manufacturing	33330	1,110	881	859	22
Engine, turbine, and power transmission equipment manufacturing	33360	2,386	1,982	1,859	123

Appendix table 4-17

Worldwide R&D expense and domestic R&D performance paid for by the company and by others, by business activity: 2008

(Millions of U.S. dollars)

Business activity	Business code ^a	Worldwide R&D expense	Domestic R&D performance		
			Total	Paid for by company	Paid for by others
Metalworking and other general purpose machinery manufacturing	33390	2,039	1,460	1,394	66
Computers and peripheral equipment manufacturing	33410	12,443	9,526	9,223	303
Telephone apparatus manufacturing	33421	6,739	5,445	5,424	21
Radio and television broadcasting and wireless communications equipment manufacturing	33422	5,958	5,042	4,184	858
Communication equipment manufacturing, except broadcasting, wireless, and telephone apparatus	33429	2,482	2,360	1,833	527
Audio and video equipment manufacturing	33430	773	D	610	D
Semiconductor and other electronic components manufacturing	33440	29,911	23,154	22,674	480
Electromedical, electrotherapeutic, and irradiation apparatus manufacturing	33451	3,822	4,752	2,853	1,899
Search, detection, navigation, guidance, aeronautical, and nautical system and instruments manufacturing	33452	1,845	6,525	1,563	4,962
Measuring and control instruments manufacturing (not listed elsewhere)	33459	3,458	2,714	2,614	100
Manufacturing and reproducing magnetic and optical media manufacturing	33460	54	D	53	D
Electrical equipment, appliances, and components manufacturing	33500	4,687	3,128	2,978	150
Motor vehicles manufacturing	33610	18,296	8,970	8,305	665
Motor vehicle body and trailer manufacturing	33620	70	63	62	1
Motor vehicle parts manufacturing	33630	5,401	3,538	3,378	160
Aircraft manufacturing	33641	4,053	9,796	3,915	5,881
Aircraft engine and engine parts manufacturing	33642	2,433	3,530	1,612	1,918
Other aircraft parts and auxiliary equipment manufacturing	33643	1,222	1,705	942	763
Guided missiles, space vehicles, and parts manufacturing	33644	1,402	6,035	1,310	4,725
Railroad rolling stock manufacturing	33651	195	D	146	D
Ship and boat building	33660	151	D	139	D
Motorcycle, bicycle, and parts manufacturing	33691	199	173	173	0
Military armored vehicle, tank, and tank components manufacturing	33692	107	367	111	256
All other transportation equipment manufacturing	33699	176	211	148	63
Furniture and related products manufacturing	33700	511	*	435	*
Medical equipment and supplies manufacturing	33910	11,587	8,690	8,521	169
Miscellaneous manufacturing (not listed elsewhere)	33990	2,976	2,555	2,316	239
Merchant wholesalers, durable goods	42300	449	422	393	29
Merchant wholesalers, nondurable goods	42400	257	175	174	1
Wholesale electronic markets and agents and brokers	42500	14	25	12	13
Motor vehicle and parts dealers	44100	0	1	1	0
Electronics and appliance stores	44300	*	*	*	0
Food and beverage stores	44500	2	3	2	1
Clothing and clothing accessories stores	44800	1	8	8	0
General merchandise stores	45200	34	13	13	0
Electronic shopping and mail-order houses	45410	480	D	D	0
Nonstore retailers, except electronic shopping and mail-order houses	45490	12	1	1	0
Retail trade stores, including gasoline stations (not listed elsewhere)	45990	343	*	336	*
Air transportation	48100	D	D	D	0
Rail transportation	48200	37	*	37	*
Water transportation	48300	5	5	5	0
Truck transportation	48400	20	18	18	0
Transit and ground passenger transportation	48500	1	1	1	0

Appendix table 4-17

Worldwide R&D expense and domestic R&D performance paid for by the company and by others, by business activity: 2008

(Millions of U.S. dollars)

Business activity	Business code ^a	Worldwide R&D expense	Domestic R&D performance		
			Total	Paid for by company	Paid for by others
Pipeline transportation of crude oil, refined petroleum, and miscellaneous products, except natural gas	48610	0	0	0	0
Pipeline transportation of natural gas	48620	3	0	0	0
Scenic and sightseeing transportation	48700	0	0	0	0
Support activities for transportation	48800	36	36	30	6
Couriers and messengers	49200	D	D	D	0
Warehousing and storage	49300	26	*	30	*
Newspaper, periodical, book, and directory publishers (except Internet)	51110	180	156	156	0
Software publishers (except Internet)	51120	31,369	24,227	23,860	367
Motion picture and sound recording (except Internet)	51200	104	94	94	0
Radio and television broadcasting (except Internet)	51510	48	32	32	0
Cable and other subscription programming (except Internet)	51520	D	D	D	0
Internet publishing and broadcasting	51600	188	*	179	*
Wired telecommunications carriers	51710	673	511	511	0
Wireless telecommunications carriers (except satellite)	51720	532 i	295	294	1
Satellite telecommunications	51740	153	D	121	D
Cable and other program distribution	51750	367	295	286	9
Telecommunications services (not listed elsewhere)	51790	501	452	393	59
Internet service providers and Web search portals	51810	4,558	3,725 i	3,718 i	7
Data processing, hosting, and related services	51820	3,515	3,048	3,004	44
Information services (not listed elsewhere)	51900	898	D	815	D
Depository credit intermediation	52210	284 i	282 i	282 i	0
Nondepository credit intermediation	52220	3	2	2	0
Activities related to credit intermediation	52230	430	376	376	0
Securities, commodity contracts, and other financial investments and related activities	52300	389	340	339	1
Insurance carriers	52410	199	145	145	0
Agencies, brokerages, and other insurance-related activities	52420	125 i	125 i	118 i	7
Funds, trusts, and other financial vehicles	52500	101	101	101	0
Real estate	53100	20	19	19	0
Automotive equipment rental and leasing	53210	D	D	D	0
Consumer goods and general rental centers	53220	296	131	131	0
Commercial and industrial machinery and equipment rental and leasing	53240	101	43	43	0
Lessors of nonfinancial intangible assets	53300	80	76	76	0
Legal services	54110	D	D	D	0
Accounting, tax preparation, bookkeeping, and payroll services	54120	676	577	577	0
Architectural, engineering, and related services	54130	1,742	6,923	1,365	5,558
Specialized design services	54140	75	628	58	570
Computer systems design and related services	54150	11,476	11,469	8,384	3,085
Management, scientific, and technical consulting services	54160	1,110	1,637	884	753
Scientific research and development services	54170	12,656	16,557	8,464	8,093
Advertising and related services	54180	37	*	60	*
Professional, scientific, and technical services (not listed elsewhere)	54190	439	1,196	374	822
Management of companies and enterprises	55100	11	*	11	*
Business support services	56140	125	*	83	*
Travel arrangement and reservation services	56150	27	19	19	0
Investigation, security, and services to buildings and dwellings	56160	137	62	61	1
Office administrative, facilities, employment, and other support services	56190	1,139	1,217	1,126	91
Waste collection, treatment, and disposal	56210	7	7	7	0
Remediation and other waste management services	56290	*	*	*	0
Educational services	61100	202	193	185	8

Appendix table 4-17

Worldwide R&D expense and domestic R&D performance paid for by the company and by others, by business activity: 2008

(Millions of U.S. dollars)

Business activity	Business code ^a	Worldwide R&D expense	Domestic R&D performance		
			Total	Paid for by company	Paid for by others
Offices of physicians	62110	40	51	30	21
Offices of dentists and other health practitioners	62120	202	201	201	0
Medical and diagnostic laboratories	62150	903	1,072	781	291
Home health care services	62160	3	3	3	0
Outpatient care centers and other ambulatory health care services	62190	53	12	7	5
General medical and surgical hospitals	62210	13	35	12	23
Psychiatric, substance abuse, and specialty hospitals	62220	0	0	0	0
Nursing and residential care facilities	62300	15	10	10	0
Social assistance (except child day care services)	62400	8	6	6	0
Child day care services	62440	1	1	1	0
Performing arts, spectator sports, and related industries	71100	24	24	24	0
Amusement, gambling, and recreation industries	71300	138	D	78	D
Traveler accommodation services	72100	0	0	0	0
Food services and drinking places	72200	481	480	480	0
Automotive repair and maintenance	81110	307	269	269	0
Repair and maintenance, except automotive	81190	99	55	55	0
Personal care, death care, laundry, and other personal services	81200	37	30	30	0
Business, professional, labor, political, and similar organizations	81390	1	0	0	0
Undistributed	-	10,660	18,547	9,209	9,338

* = < \$500,000; D = data withheld to avoid disclosing operations of individual companies; i = more than 50% of the estimate is a combination of imputation and reweighting to account for nonresponse.

NAICS = North American Industry Classification System

^aBusiness codes and descriptions based on 2002 NAICS industry definitions.

NOTES: Data tabulated independent of the industry classification of the company. Detail may not add to total because of rounding.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, and U.S. Census Bureau, Business R&D and Innovation Survey, 2008.

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Appendix table 4-18

R&D expenditures by majority-owned affiliates of foreign companies in United States, by region/country/economy of ultimate beneficial owner: 1997–2008

(Millions of current U.S. dollars)

Region/country/economy	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Total	17,216	22,375	24,027	26,180	26,463	27,507	29,803	30,083	31,099	34,625	40,967	40,519
Canada	1,668	2,352	2,385	3,693	2,136	1,599	1,380	1,459	1,553	1,581	1,574	1,435
Europe	12,327	16,425	18,055	18,634	19,973	20,532	22,518	22,825	23,389	26,100	31,330	30,276
Belgium	D	D	175	167	108	87	117	137	136	288	353	470
Denmark	97	127	D	D	D	114	100	160	319	371	368	418
Finland	D	D	166	157	601	544	D	D	D	D	371	587
France	1,783	1,881	2,434	2,596	2,662	2,860	3,777	3,800	3,099	3,289	5,589	5,978
Germany	2,923	5,381	6,135	5,603	5,686	5,863	5,976	5,916	6,519	6,857	5,893	5,520
Ireland	D	56	D	D	D	369	D	266	247	207	257	280
Italy	D	D	294	D	D	261	225	230	262	344	358	391
Netherlands	990	964	1,296	1,421	1,660	1,696	1,612	1,319	1,470	1,678	1,729	1,789
Spain	D	D	D	D	26	D	44	D	D	D	40	54
Sweden	687	713	428	373	465	270	261	270	272	344	388	321
Switzerland	2,369	3,076	3,008	2,922	3,107	2,920	3,791	4,185	4,289	5,014	6,395	6,926
United Kingdom	2,984	3,720	3,678	4,632	4,819	5,427	5,723	5,807	5,994	6,924	9,470	7,369
Other	*	1	1	3	3	5	6	6	D	32	119	175
Latin America/OWH	373	396	564	735	1,126	1,066	D	D	D	D	1,666	1,796
South and Central America	D	D	92	D	112	D	D	D	D	D	D	D
Brazil	*	*	*	*	*	0	0	0	0	* e	*	*
Mexico	D	55	D	D	D	45	14 e	17 e	18 e	16 e	6	9
Venezuela	3	0	0	0	0	0	0	*	*	0	0	0
Other	*	*	*	*	*	2	*	3	3	3	D	D
Other Western Hemisphere	D	D	472	D	1,014	D	1,180	1,069	1,121	1,249	D	D
Bermuda	D	D	D	D	D	D	853	873	909	950	D	1,224
United Kingdom Islands, Caribbean	1	1	1	D	D	D	D	D	D	D	D	108
Other	0	0	0	0	0	*	* e	D	D	D	D	D
Africa	D	D	D	D	36	33	31	36	35	35	D	D
South Africa	D	D	D	D	36	33	31	36	35	35	D	D
Other	0	0	0	0	0	0	0	0	0	0	0	D
Middle East	103	132	D	D	177	175	D	D	D	D	306	356
Israel	95	117	D	102	99	89	106	123	135	147	149	201
Saudi Arabia	1	7	9	10	11	D	D	D	D	D	108	107
United Arab Emirates	*	0	0	0	0	0	0	0	0	0	0	0
Other	7	8	7	D	66	D	71 e	41	42	28	49	49
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	5,444
Australia	D	D	32	34	33	36	43 e	42	90	174	170	140
China	D	9	D	D	D	18	5	14	D	D	0	8
Hong Kong	4	1	1	*	D	D	D	D	62	75	D	D
India	na	na	na	na	na	0	* e	0	0	0	6	10
Japan	2,036	2,584	2,535	2,644	2,719	3,159	3,470	3,414	3,576	4,056	4,416	4,637
Singapore	D	16	13	9	1	D	18	20 e	25	42 e	69	120
South Korea	D	D	D	D	D	D	D	D	D	D	215	261

Appendix table 4-18

R&D expenditures by majority-owned affiliates of foreign companies in United States, by region/country/economy of ultimate beneficial owner: 1997–2008

(Millions of current U.S. dollars)

Region/country/economy	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Taiwan	78	73	68	47	43	83	102 e	102 e	122	113 e	110	120
Other	*	*	0	0	0	0	1	1	*	D	D	D
United States	D	D	55	62	69	689	D	D	692	721 e	D	D
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	23,223
OPEC	10	16	19	17	18	18	D	D	D	D	108	D

* = ≤\$500,000; D = suppressed to avoid disclosure of confidential information; e = >50% of value for data cell estimated to account for data not reported by respondents; na = not available

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

^aReflects the country composition of the European Union for the given year.

NOTES: Preliminary estimates for 2008. Data for R&D performance of majority-owned (>50%) 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. Ultimate beneficial owner is person proceeding up U.S. affiliate's ownership chain beginning with and including foreign parent not owned >50% by another person. Detail may not add to total because of rounding.

SOURCE: Bureau of Economic Analysis, Survey of Foreign Direct Investment in the United States (annual series), <http://www.bea.gov/international/index.htm#omc>, accessed 15 February 2011.*Science and Engineering Indicators 2012*

Appendix table 4-19

R&D performed by majority-owned affiliates of foreign companies in United States, by NAICS industry of affiliate: 1997–2001

(Millions of current U.S. dollars)

Industry/sector	NAICS code	1997	1998	1999	2000	2001
All industries	na	17,216	22,375	24,027	26,180	26,463
Manufacturing	31–33	14,270	18,788	19,991	20,990	20,054
Food	311	239	224	205	200	197
Beverages and tobacco products	312	D	52	37	36	35
Textiles, apparel, and leather products	313–16	D	41	43	33	35
Wood products	321	*	*	1	1	7
Paper	322	104	102	98	98	81
Printing and related support activities	323	34	42	76	54	43
Petroleum and coal products	324	272	479	D	D	D
Chemicals	325	6,754	7,770	7,679	7,341	7,563
Basic chemicals	3251	617	623	832	D	D
Resins and synthetic rubber, fibers, and filaments	3252	D	287	D	149	272
Pharmaceuticals and medicines	3254	5,304	6,381	6,191	5,943	6,124
Soap, cleaning compounds, and toilet preparations	3256	D	D	D	D	D
Other	na	260	D	204	238	219
Plastics and rubber products	326	331	349	372	301	305
Nonmetallic mineral products	327	214	146	172	199	206
Primary and fabricated metals	na	263	246	210	280	232
Primary metals	331	60	65	61	67	D
Fabricated metal products	332	203	181	149	213	D
Machinery	333	721	677	898	1,748	D
Agriculture, construction, and mining machinery	3331	103	69	290	237	201
Industrial machinery	3332	83	90	D	119	D
Other	na	535	518	D	1,392	1,408
Computers and electronic products	334	3,413	4,487	5,031	6,152	4,867
Computers and peripheral equipment	3341	120	324	D	D	104
Communications equipment	3342	2,243	3,045	3,431	4,607	2,998
Audio and video equipment	3343	D	D	211	D	D
Semiconductors and other electronic components	3344	586	635	917	1,003	1,077
Navigational, measuring, and other instruments	3345	D	D	D	366	675
Magnetic and optical media	3346	D	10	5	9	D
Electrical equipment, appliances, and components	335	781	885	1,195	823	875
Transportation equipment	336	641	2,762	3,204	3,344	3,193
Motor vehicles, bodies and trailers, and parts	3361, 3362, 3363	500	2,555	D	3,082	2,910
Other	na	141	207	D	262	283
Furniture and related products	337	9	11	D	D	D
Miscellaneous manufacturing	339	392	516	432	238	300
Wholesale trade	42	D	D	D	D	D
Motor vehicles and motor vehicle parts and supplies	4211	325	315	237	283	D
Professional and commercial equipment and supplies	4214	407	202	198	185	184
Electrical goods	4216	328	476	368	533	1,148
Other durable goods	na	135	123	91	123	271
Petroleum and petroleum products	4227	D	D	D	D	D
Other nondurable goods	na	D	D	D	D	D
Retail trade	44-45	3	D	D	D	D
Food and beverage stores	445	*	*	0	0	0
Other	na	3	D	D	D	D
Information	51	260	329	548	790	D
Publishing industries	511	D	D	D	D	D
Motion picture and sound recording industries	512	5	1	*	*	*
Broadcasting and telecommunications	513	7	6	D	D	13
Broadcasting, cable networks, and program distribution	5131, 5132	0	0	0	0	0
Telecommunications	5133	7	6	D	D	13
Information services and data processing services	514	D	D	D	D	180
Finance (except depository institutions) and insurance	52	12	D	D	D	D
Finance, except depository institutions	na	12	D	D	D	D
Insurance carriers and related activities	524	0	2	4	1	1
Real estate and rental and leasing	53	1	12	D	D	D
Real estate	531	*	8	*	*	*
Rental and leasing (except real estate)	532	1	4	D	D	D

Appendix table 4-19

R&D performed by majority-owned affiliates of foreign companies in United States, by NAICS industry of affiliate: 1997–2001

(Millions of current U.S. dollars)

Industry/sector	NAICS code	1997	1998	1999	2000	2001
Professional, scientific, and technical services	54	597	685	836	828	804
Architectural, engineering, and related services	5413	12	13	36	18	13
Computer systems design and related services	5415	281	333	315	314	204
Management, scientific, and technical consulting	5416	*	*	0	0	D
Other	na	303	339	485	495	D
Other industries	na	D	506	453	407	426
Agriculture, forestry, fishing, and hunting	11	71	75	89	90	91
Mining	21	D	254	221	213	D
Utilities	22	11	18	D	D	D
Construction	23	9	D	49	D	D
Transportation and warehousing	48–49	D	18	19	7	6
Management of nonbank companies and enterprises	55	D	D	D	D	D
Administration, support, and waste management	56	0	1	*	D	30
Health care and social assistance	62	D	D	D	D	D
Accommodation and food services	72	*	*	*	*	*
Accommodation	721	0	0	0	0	*
Food services and drinking places	722	*	*	*	*	*
Miscellaneous services	na	*	3	7	D	D

* = ≤\$500,000; D = suppressed to avoid disclosure of confidential information; na = not applicable

NAICS = North American Industry Classification System

NOTES: Data for R&D performance of majority-owned (>50%) 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 performer or for others under contract, and excludes R&D expenditures conducted by others under contract. Industry data are classified by the Bureau of Economic Analysis using the International Survey Industry classification system based on the NAICS. Data for 1997–2001 are based on the 1997 NAICS. Ultimate beneficial owner is person proceeding up U.S. affiliate's ownership chain beginning with and including foreign parent not owned >50% by another person. Detail may not add to total because of rounding.

SOURCE: Bureau of Economic Analysis, Survey of Foreign Direct Investment in the United States (annual series), <http://www.bea.gov/international/index.htm#omc>, accessed 15 February 2011.

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Appendix table 4-20

R&D performed by majority-owned affiliates of foreign companies in United States, by NAICS industry of affiliate: 2002–06

(Millions of current U.S. dollars)

Industry/sector	NAICS code	2002	2003	2004	2005	2006
All industries	na	27,507	29,803	30,083	31,099	34,625
Manufacturing	31–33	20,128	20,988	20,587	21,506	25,114
Food	311	368	166	440	498	462
Beverages and tobacco products	312	80	D	61	43	53
Textiles, apparel, and leather products	313–16	D	30	27	37	39 e
Paper	322	75	67	64	64	57
Printing and related support activities	323	39	50	2 e	2	3 e
Petroleum and coal products	324	D	D	D	D	D
Chemicals	325	7,610	9,957	9,922	9,888	12,866
Basic chemicals	3251	608	589	655	513	604
Resins and synthetic rubber, fibers, and filaments	3252	331	311	131	78	65
Pharmaceuticals and medicines	3254	6,373	8,505	8,678	8,710	11,638
Soap, cleaning compounds, and toilet preparations	3256	74	304	96	99	108
Other	na	224	248	361	489	451
Plastics and rubber products	326	275	423	374	342	490
Nonmetallic mineral products	327	204	198	207	219	219
Primary and fabricated metals	na	254	194	247	270	258
Primary metals	331	46	28	80	90	60
Fabricated metal products	332	208	165	167	181	198
Machinery	333	1,681	1,572	1,638	1,552	1,752
Agriculture, construction, and mining machinery	3331	387	361	258	243	348
Industrial machinery	3332	192	223 e	322	114	124
Other	na	1,103	988	1,058	1,195	1,279
Computers and electronic products	334	4,985	3,340	2,690	2,847	3,055
Computers and peripheral equipment	3341	D	145	159 e	D	D
Communications equipment	3342	2,055	1,403	630	570	600
Semiconductors and other electronic components	3344	D	444	495	547	409
Navigational, measuring, and other instruments	3345	1,734	1,278	1,307 e	1,453	1,760
Other	na	42	70	99 e	D	D
Electrical equipment, appliances, and components	335	380	336	D	D	385
Transportation equipment	336	3,302	3,669	3,707	4,244	4,052
Motor vehicles, bodies and trailers, and parts	3361, 3362, 3363	3,041	3,386	3,279	3,663	3,416
Other	na	261	283	428	581	636
Other	na	708	681	798	855	D
Wholesale trade	42	4,855	6,030	6,674	6,529	5,955
Motor vehicles and motor vehicle parts and supplies	4231	337	466	533	347	383
Electrical goods	4236	1,079	1,554	2,191	2,128	2,210
Petroleum and petroleum products	4247	D	D	D	D	D
Other	na	D	D	D	D	D
Retail trade	44–45	D	D	D	D	16
Food and beverage stores	445	*	* e	0	*	0
Other	na	D	D	D	D	16
Information	51	803	852	986	1,009	996
Publishing industries	511	763	632	692	645	640
Motion picture and sound recording industries	512	3	1	* e	* e	* e
Telecommunications	517	11	9	D	D	D
Other	na	26	210	D	D	D
Finance (except depository institutions) and insurance	52	D	13 e	9 e	6 e	5 e
Finance, except depository institutions	na	D	12 e	9 e	6 e	5 e
Insurance carriers and related activities	524	6	1	0	*	* e
Real estate and rental and leasing	53	9	9	6	11	D
Real estate	531	1	* e	* e	* e	* e
Rental and leasing (except real estate)	532	8	8	6	11	D
Professional, scientific, and technical services	54	1,119	1,379	1,436	1,590	1,954
Architectural, engineering, and related services	5413	86	75	80	166	254
Computer systems design and related services	5415	171	278	219	153	252
Management, scientific, and technical consulting	5416	3	3 e	0	*	0
Other	na	859	1,023	1,137	1,271	1,447
Other industries	na	D	D	D	D	D
Agriculture, forestry, fishing, and hunting	11	82	82	41	62	41
Mining	21	D	333	199	208	414

Appendix table 4-20

R&D performed by majority-owned affiliates of foreign companies in United States, by NAICS industry of affiliate: 2002–06

(Millions of current U.S. dollars)

Industry/sector	NAICS code	2002	2003	2004	2005	2006
Utilities	22	3	5	0	0	*
Construction	23	D	7	6	5 e	11
Transportation and warehousing	48–49	3	0	D	D	D
Management of nonbank companies and enterprises	55	*	* e	1	1	1
Administration, support, and waste management	56	3	4	*	*	* e
Health care and social assistance	62	D	D	33	51	21
Accommodation and food services	72	*	0	*	0	0
Miscellaneous services	na	D	*	D	D	D

* = ≤\$500,000; D = suppressed to avoid disclosure of confidential information; e = >50% of value for data cell estimated to account for data not reported by respondents; na = not applicable

NAICS = North American Industry Classification System

NOTES: Data for R&D performance of majority-owned (>50%) 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 performer or for others under contract, and excludes R&D expenditures conducted by others under contract. Industry data are classified by the Bureau of Economic Analysis using the International Survey Industry classification system based on the NAICS. Data for 2002–06 are based on the 2002 NAICS. Ultimate beneficial owner is person proceeding up U.S. affiliate's ownership chain beginning with and including foreign parent not owned >50% by another person. Detail may not add to total because of rounding.

SOURCE: Bureau of Economic Analysis, Survey of Foreign Direct Investment in the United States (annual series), <http://www.bea.gov/international/index.htm#omc>, accessed 15 February 2011.

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Appendix table 4-21

R&D performed by majority-owned affiliates of foreign companies in United States, by NAICS industry of affiliate: 2007–08

(Millions of current U.S. dollars)

Industry/sector	NAICS code	2007	2008
All industries	na	40,967	40,519
Manufacturing	31–33	30,615	28,190
Food	311	D	557
Beverages and tobacco products	312	54	47
Paper	322	52	43
Petroleum and coal products	324	D	D
Chemicals	325	15,908	14,121
Basic chemicals	3251	603	670
Pharmaceuticals and medicines	3254	14,331	12,537
Other	na	974	914
Plastics and rubber products	326	421	424
Nonmetallic mineral products	327	277	242
Primary and fabricated metals	na	292	364
Primary metals	331	67	112
Fabricated metal products	332	225	252
Machinery	333	1,939	2,535
Computers and electronic products	334	3,838	4,259
Semiconductors and other electronic components	3344	683	783
Navigational, measuring, and other instruments	3345	351	406
Other	na	2,804	3,070
Electrical equipment, appliances, and components	335	446	499
Transportation equipment	336	5,778	4,015
Motor vehicles, bodies and trailers, and parts	3361, 3362, 3363	2,441	1,444
Other	na	3,336	2,571
Other	na	651	D
Wholesale trade	42	6,635	7,404
Motor vehicles and motor vehicle parts and supplies	4231	464	357
Electrical goods	4236	2,146	2,406
Petroleum and petroleum products	4247	D	D
Other	na	D	D
Retail trade	44–45	D	D
Food and beverage stores	445	0	0
Other	na	D	D
Information	51	1,252	2,108
Publishing industries	511	907	1,760
Telecommunications	517	D	D
Other	na	D	D
Finance and insurance	52	10	8
Depository credit intermediation (banking)	5221	0	0
Finance, except depository institutions	na	10	7
Insurance carriers and related activities	524	*	1
Real estate and rental and leasing	53	D	D
Real estate	531	1	D
Rental and leasing (except real estate)	532	D	D
Professional, scientific, and technical services	54	2,021	2,347
Architectural, engineering, and related services	5413	322	279
Computer systems design and related services	5415	390	311
Management, scientific, and technical consulting	5416	5	5
Other	na	1,305	1,752
Other industries	na	387	410
Mining	21	132	170
Utilities	22	1	8
Construction	23	D	15
Transportation and warehousing	48–49	D	D
Administration, support, and waste management	56	D	D

Appendix table 4-21

R&D performed by majority-owned affiliates of foreign companies in United States, by NAICS industry of affiliate: 2007–08

(Millions of current U.S. dollars)

Industry/sector	NAICS code	2007	2008
Health care and social assistance	62	D	D
Accommodation and food services	72	*	*
Miscellaneous services	na	89	87

* = ≤\$500,000; D = suppressed to avoid disclosure of confidential information; e = >50% of value for data cell estimated to account for data not reported by respondents; na = not applicable

NAICS = North American Industry Classification System

NOTES: Data for R&D performance of majority-owned (>50%) 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 performer or for others under contract, and excludes R&D expenditures conducted by others under contract. Industry data are classified by the Bureau of Economic Analysis using the International Survey Industry classification system based on the NAICS. Data for 2007–08 are based on the 2002 NAICS. Ultimate beneficial owner is person proceeding up U.S. affiliate's ownership chain beginning with and including foreign parent not owned >50% by another person. Detail may not add to total because of rounding.

SOURCE: Bureau of Economic Analysis, Survey of Foreign Direct Investment in the United States (annual series), <http://www.bea.gov/international/index.htm#omc>, accessed 15 February 2011.

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Appendix table 4-22

R&D performed abroad by majority-owned foreign affiliates of U.S. parent companies, by region/country/economy: 1997–2008

(Millions of current U.S. dollars)

Region/country/economy	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Total	14,593	14,664	18,144	20,457	19,702	21,063	22,793	25,840	27,653	29,583	34,446	36,991
Canada	1,823	1,750	1,681	2,332	2,131	2,274	2,444	2,729	2,433	2,439	2,712	3,040
Europe	10,003	10,387	12,217	12,870	12,060	13,453	14,890	16,874	18,805	19,326	22,730	24,155
Austria	77	85	82	D	62	52	34	131	191	313	459	488
Belgium	310	320	375	412	407	502	463	373	920	961	1,191	1,259
Czech Republic	NA	NA	6	18	3	11	18	19	65	71	59	90
Denmark	D	D	57	65	D	D	60	147	140	148	145	292
Finland	51	61	59	78	77	72	102	118	187	113	169	187
France	1,281	1,328	1,452	1,465	1,411	1,690	1,777	1,821	2,248	1,518	1,557	2,171
Germany	2,940	3,022	3,377	3,115	3,280	3,598	3,907	4,184	4,609	4,947	6,403	7,039
Greece	7	7	6	11	12	15	16	8	29	41	36	37
Hungary	NA	NA	13	35	17	19	15	38	31	36	39	49
Ireland	320	363	251	465	537	D	583	815	820	1,074	1,510	1,503
Italy	569	584	504	592	541	548	625	707	580	702	619	582
Luxembourg	D	D	D	D	D	D	91	D	D	268	304	D
Netherlands	480	384	374	369	475	419	513	442	392	536	752	1,484
Norway	23	18	26	19	38	35	21	32	100	41	46	50
Poland	NA	NA	34	22	13	29	37	D	54	74	73	109
Portugal	30	34	14	20	19	29	21	9	16	23	80	44
Russia	NA	NA	1	1	*	2	1	17	28	82	100	116
Spain	181	184	D	213	181	209	290	344	257	278	355	379
Sweden	405	445	1,036	1,341	813	1,317	1,398	1,451	1,652	1,524	1,584	1,576
Switzerland	230	223	231	286	392	392	523	760	878	947	1,162	1,123
Turkey	6	6	6	9	11	13	17	15	27	36	54	61
United Kingdom	2,843	3,065	4,000	4,111	3,642	3,856	4,368	5,361	5,406	5,551	6,000	5,157
Other	54	81	1	7	7	9	8	16	D	41	35	D
Latin America/OWH	663	748	613	663	562	785	680	726	841	1,046	1,169	1,465
South America	523	547	366	335	288	389	370	405	453	636	776	983
Argentina	43	56	26	38	43	24	22	25	21	31	64	87
Brazil	437	446	288	253	199	305	316	350	405	574	607	791
Chile	7	6	4	11	8	6	9	11	7	7	48	D
Colombia	12	11	6	10	11	10	7	5	6	7	16	18
Ecuador	1	1	*	*	*	*	*	*	1	*	3	4
Peru	11	11	2	2	2	2	2	2	4	3	D	33
Venezuela	11	14	40	22	24	42	12	12	7	12	20	19
Other	1	2	*	*	2	1	1	1	1	0	D	D
Central America	131	198	240	321	252	287	D	320	D	D	D	363
Costa Rica	4	6	2	D	4	7	6	8	9	8	7	D
Honduras	*	0	0	0	0	0	0	1	0	0	0	4
Mexico	126	191	238	303	248	280	D	D	D	D	303	329
Panama	1	1	*	*	*	*	*	*	*	*	D	1
Other	*	*	*	D	*	*	*	D	*	*	D	D
OWH	8	4	6	6	22	108	D	1	D	D	D	119
Barbados	0	0	*	*	0	D	D	0	0	0	*	*
Bermuda	*	*	1	1	2	2	0	0	0	2	D	D
Dominican Republic	0	*	1	1	1	D	1	*	*	*	*	1
United Kingdom Islands, Caribbean	8	3	4	4	D	D	D	0	D	D	*	3
Other	0	0	0	*	D	2	1	1	D	D	8	D
Africa	26	35	18	25	29	29	31	28	40	67	59	57
Egypt	1	2	3	3	4	5	4	2	4	4	3	5
Nigeria	*	*	0	1	*	*	0	*	0	2	3	4
South Africa	22	30	14	21	24	D	24	23	31	53	47	43
Other	2	3	1	*	1	D	3	2	4	7	5	6
Middle East	208	141	389	630	726	736	687	875	770	840	1,027	1,063
Israel	208	141	389	630	726	736	687	872	767	839	1,025	1,060
Saudi Arabia	*	*	*	*	*	0	0	*	*	*	*	*
United Arab Emirates	*	*	0	0	0	0	*	2	3	1	2	4
Other	0	0	0	0	0	0	0	0	0	0	0	0
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	7,210
Australia	369	290	294	349	286	310	420	474	556	718	1,072	923

Appendix table 4-22

R&D performed abroad by majority-owned foreign affiliates of U.S. parent companies, by region/country/economy: 1997–2008

(Millions of current U.S. dollars)

Region/country/economy	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
China	35	52	319	506	D	645	565	575	668	759	1,173	1,517
Hong Kong	82	66	214	D	289	D	227	213	98	108	93	102
India	22	23	20	D	D	75	81	113	327	337	382	582
Indonesia	5	4	1	2	3	3	4	5	4	11	13	15
Japan	1,089	962	1,523	1,630	1,507	1,541	1,649	1,627	1,717	1,862	1,919	1,872
Malaysia	32	30	161	218	D	D	251	161	201	252	390	360
New Zealand	18	15	9	8	10	6	9	25	35	38	30	26
Philippines	12	10	31	40	48	50	52	44	27	22	45	51
Singapore	73	62	426	551	755	398	514	704	576	845	549	621
South Korea	41	29	101	143	157	169	202	277	456	742	928	966
Taiwan	84	55	122	143	139	69	64	365	68	123	97	102
Thailand	5	4	7	13	18	19	24	24	31	47	54	69
Other	1	1	*	*	*	1	*	*	*	1	3	4
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	22,803
OPEC	18	19	42	25	27	45	17	20	14	26	38	47

* = ≤\$500,000; D = suppressed to avoid disclosure of confidential information; NA = not available

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

^aReflects the country composition of the European Union for the given year.

NOTES: Preliminary estimates for 2008. Data for majority-owned (> 50%) nonbank foreign affiliates of nonbank U.S. parents. 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. Data for the European Union reflect its membership for the given year as calculated by the Bureau of Economic Analysis.

SOURCE: Bureau of Economic Analysis, Survey of U.S. Direct Investment Abroad (annual series), <http://www.bea.gov/international/index.htm#omc>, accessed 15 February 2011.

Appendix table 4-23

R&D performed abroad by majority-owned foreign affiliates of U.S. parent companies, by selected NAICS industry of affiliate: 1999–2003

(Millions of current U.S. dollars)

Industry/sector	NAICS code	1999	2000	2001	2002	2003
All industries	na	18,144	20,457	19,702	21,063	22,793
Mining	21	8	16	10	12	11
Oil and gas extraction	211	4	10	5	8	5
Other	na	4	6	4	4	6
Utilities	22	*	2	1	1	2
Manufacturing	31–33	16,388	18,455	17,383	18,736	19,819
Food	311	367	279	321	341	420
Beverages and tobacco products	312	32	34	12	D	8
Textiles, apparel, and leather products	313–16	37	34	32	56	61
Wood products	321	2	2	*	1	8
Paper	322	265	88	75	81	73
Printing and related support activities	323	3	3	2	2	9
Petroleum and coal products	324	66	63	37	D	44
Chemicals	325	4,340	4,609	4,503	5,141	5,528
Basic chemicals	3251	106	156	143	117	115
Resins and synthetic rubber, fibers, and filaments	3252	173	196	189	218	215
Pharmaceuticals and medicines	3254	3,578	3,882	3,762	4,230	4,630
Soap, cleaning compounds, and toilet preparations	3256	135	87	66	265	181
Other	na	348	289	343	311	386
Plastics and rubber products	326	216	304	261	316	290
Nonmetallic mineral products	327	38	49	57	66	54
Primary and fabricated metals	na	151	184	153	180	228
Primary metals	331	27	23	32	32	35
Fabricated metal products	332	124	161	121	148	193
Machinery	333	748	772	743	634	783
Agriculture, construction, and mining machinery	3331	168	188	179	173	220
Industrial machinery	3332	216	255	237	128	131
Other	na	364	329	327	334	433
Computers and electronic products	334	3,773	5,440	5,697	4,975	4,796
Computers and peripheral equipment	3341	356	342	384	388	402
Communications equipment	3342	2,403	3,853	4,061	3,131	2,987
Audio and video equipment	3343	146	D	D	67	67
Semiconductors and other electronic components	3344	644	854	811	1,043	949
Navigational, measuring, and other instruments	3345	224	316	381	346	391
Magnetic and optical media	3346	0	D	D	0	0
Electrical equipment, appliances, and components	335	214	310	339	425	498
Transportation equipment	336	5,669	5,765	4,690	5,964	6,455
Motor vehicles, bodies and trailers, and parts	3361, 3362, 3363	5,385	5,463	4,321	5,553	5,928
Other	na	284	303	369	410	527
Furniture and related products	337	D	48	D	57	27
Miscellaneous manufacturing	339	D	471	D	432	535
Wholesale trade	42	515	553	739	610	692
Professional and commercial equipment and supplies	4214	272	225	315	233	295
Other durable goods	na	69	138	86	67	70
Petroleum and petroleum products	4227	D	8	6	1	2
Other nondurable goods	na	D	182	331	309	325
Information	51	161	410	410	591	818
Publishing industries	511	D	381	389	556	773
Motion picture and sound recording industries	512	*	1	1	*	*
Broadcasting and telecommunications	513	1	11	3	11	15
Broadcasting, cable networks, and program distribution	5131, 5132	0	1	1	0	1
Telecommunications	5133	1	10	2	11	15
Information services and data processing services	514	D	16	17	24	29
Finance (except depository institutions) and insurance	52	1	3	D	14	1
Finance, except depository institutions	na	0	2	D	13	1
Securities, commodity contracts, and other intermediation and related activities	523	0	1	D	13	*

Appendix table 4-23

R&D performed abroad by majority-owned foreign affiliates of U.S. parent companies, by selected NAICS industry of affiliate: 1999–2003

(Millions of current U.S. dollars)

Industry/sector	NAICS code	1999	2000	2001	2002	2003
Other finance, except depository institutions	na	0	1	0	0	*
Insurance carriers and related activities	524	1	1	1	1	0
Professional, scientific, and technical services	54	1,040	930	1,062	1,019	1,351
Architectural, engineering, and related services	5413	D	73	75	120	51
Computer systems design and related services	5415	305	347	395	447	532
Management, scientific, and technical consulting	5416	D	28	24	23	26
Advertising and related services	5418	0	6	4	1	2
Other	na	519	475	564	428	741
Other industries	na	31	89	D	80	98
Agriculture, forestry, fishing, and hunting	11	5	D	D	D	D
Construction	23	*	*	*	0	*
Retail trade	44–45	1	6	D	D	8
Transportation and warehousing	48–49	0	*	3	1	*
Real estate and rental and leasing	53	1	2	2	2	2
Real estate	531	0	0	0	0	0
Rental and leasing (except real estate)	532	1	2	2	2	2
Management of nonbank companies and enterprises	55	16	50	52	42	D
Administration, support, and waste management	56	0	1	2	6	4
Health care and social assistance	62	*	*	*	*	*
Accommodation and food services	72	*	2	2	3	3
Accommodation	721	0	0	0	0	0
Food services and drinking places	722	*	2	2	3	3
Miscellaneous services	na	8	D	6	5	6

* = ≤\$500,000; D = suppressed to avoid disclosure of confidential information; na = not applicable

NAICS = North American Industry Classification System

NOTES: Data for majority-owned (>50%) nonbank foreign affiliates of nonbank U.S. parents. 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. Industry data are classified by the Bureau of Economic Analysis using the International Survey Industry classification system based on the North American Industry Classification System (NAICS). Data for 1999–2003 are based on the 1997 NAICS.

SOURCE: Bureau of Economic Analysis, Survey of U.S. Direct Investment Abroad (annual series), <http://www.bea.gov/international/index.htm#omc>, accessed 15 February 2011.

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Appendix table 4-24

R&D performed abroad by majority-owned foreign affiliates of U.S. parent companies, by selected NAICS industry of affiliate: 2004–08

(Millions of current U.S. dollars)

Industry/sector	NAICS code	2004	2005	2006	2007	2008
All industries	na	25,840	27,653	29,583	34,446	36,991
Mining	21	12	13	23	63	105
Oil and gas extraction	211	4	3	13	38	51
Other	na	8	9	10	25	54
Utilities	22	4	5	7	*	*
Manufacturing	31–33	22,400	23,508	24,172	27,825	29,385
Food	311	627	358	428	517	482
Beverages and tobacco products	312	23	18	18	37	41
Textiles, apparel, and leather products	313–16	68	44	69	89	65
Wood products	321	5	6	5	5	3
Paper	322	88	63	66	50	63
Printing and related support activities	323	11	12	6	9	8
Petroleum and coal products	324	45	25	27	26	24
Chemicals	325	5,629	6,589	6,442	8,670	8,754
Basic chemicals	3251	135	142	163	165	195
Resins and synthetic rubber, fibers, and filaments	3252	235	237	254	253	259
Pharmaceuticals and medicines	3254	4,770	5,665	5,442	7,502	7,578
Soap, cleaning compounds, and toilet preparations	3256	106	151	139	248	220
Other	na	382	393	444	501	502
Plastics and rubber products	326	201	358	388	455	495
Nonmetallic mineral products	327	378	50	43	47	77
Primary and fabricated metals	na	167	303	327	347	353
Primary metals	331	41	53	60	48	72
Fabricated metal products	332	127	250	267	299	280
Machinery	333	781	938	1,120	1,260	1,457
Agriculture, construction, and mining machinery	3331	245	315	330	355	481
Industrial machinery	3332	93	108	256	312	338
Other	na	443	515	533	593	638
Computers and electronic products	334	5,076	4,822	4,954	4,897	6,354
Computers and peripheral equipment	3341	472	211	154	223	912
Communications equipment	3342	2,757	1,961	2,005	1,767	1,863
Audio and video equipment	3343	D	D	D	D	D
Semiconductors and other electronic components	3344	1,271	1,928	2,014	1,917	2,463
Navigational, measuring, and other instruments	3345	517	546	589	676	D
Magnetic and optical media	3346	D	D	D	D	8
Electrical equipment, appliances, and components	335	533	623	652	474	586
Transportation equipment	336	7,926	8,021	8,505	9,663	9,163
Motor vehicles, bodies and trailers, and parts	3361, 3362, 3363	7,362	7,471	7,911	9,067	8,541
Other	na	564	550	595	596	622
Furniture and related products	337	43	18	17	7	10
Miscellaneous manufacturing	339	798	1,261	1,102	1,275	1,450
Wholesale trade	42	796	931	1,131	1,365	1,461
Professional and commercial equipment and supplies	4234	312	327	466	473	525
Petroleum and petroleum products	4247	2	2	3	3	2
Drugs and druggists' sundries	4242	57	65	148	351	668
Other	na	426	536	515	538	266
Information	51	576	689	1,053	1,618	1,954
Publishing industries	511	547	612	980	D	1,810
Motion picture and sound recording industries	512	0	*	*	0	0
Broadcasting (except Internet) and telecommunications	na	5	D	5	D	D
Broadcasting (except Internet)	515	1	D	1	D	1
Telecommunications	517	4	D	3	5	D
Internet, data processing, and other information services	516, 518, 519	23	D	68	D	D
Finance (except depository institutions) and insurance	52	2	5	1	*	2
Finance, except depository institutions	na	2	4	1	*	1
Securities, commodity contracts, and other intermediation and related activities	523	2	4	1	*	1

Appendix table 4-24

R&D performed abroad by majority-owned foreign affiliates of U.S. parent companies, by selected NAICS industry of affiliate: 2004–08

(Millions of current U.S. dollars)

Industry/sector	NAICS code	2004	2005	2006	2007	2008
Other finance, except depository institutions	na	0	*	*	0	0
Insurance carriers and related activities	524	*	1	*	*	*
Professional, scientific, and technical services	54	1,986	2,371	3,098	3,439	3,963
Architectural, engineering, and related services	5413	D	61	73	D	103
Computer systems design and related services	5415	731	1,218	1,290	987	1,076
Management, scientific, and technical consulting	5416	D	14	D	D	289
Advertising and related services	5418	2	2	2	3	3
Other	na	1,114	1,076	D	2,133	2,492
Other industries	na	65	132	98	135	121
Agriculture, forestry, fishing, and hunting	11	D	9	9	10	11
Construction	23	7	2	7	1	1
Retail trade	44–45	4	16	18	60	D
Transportation and warehousing	48–49	0	*	3	1	1
Real estate and rental and leasing	53	*	1	1	2	2
Real estate	531	0	0	0	0	0
Rental and leasing (except real estate)	532	*	1	1	2	2
Management of nonbank companies and enterprises	55	D	60	8	10	31
Administration, support, and waste management	56	6	33	41	46	D
Health care and social assistance	62	0	0	0	0	0
Accommodation and food services	72	*	3	3	3	3
Accommodation	721	0	0	0	0	0
Food services and drinking places	722	*	3	3	3	3
Miscellaneous services	na	7	7	8	2	1

* = ≤\$500,000; D = suppressed to avoid disclosure of confidential information; na = not applicable; NA = not available

NAICS = North American Industry Classification System

NOTES: Preliminary estimates for 2008. Data for majority-owned (>50%) nonbank foreign affiliates of nonbank U.S. parents. 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 Bureau of Economic Analysis using the International Survey Industry classification system based on the NAICS. Data for 2004–08 are based on the 2002 NAICS. NAICS revisions, for example, affected several industries under information (NAICS 51). In addition, industry 4214 (Professional and commercial equipment and supplies) under 1997 NAICS code was split among several 2002 NAICS codes, including but not limited to the new code for this industry, NAICS 4234. Therefore, data for this industry in appendix table 4-23 are not necessarily comparable with data in the present table.

SOURCE: Bureau of Economic Analysis, Survey of U.S. Direct Investment Abroad (annual series), <http://www.bea.gov/international/index.htm#omc>, accessed 15 February 2011.

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Appendix table 4-25

R&D performed in United States by U.S. multinational company parent companies, by NAICS industry: 1999–2003

(Millions of current U.S. dollars)

Industry/sector	NAICS code	1999	2000	2001	2002	2003
All industries	na	126,291	135,467	143,017	136,977	139,884
Mining	21	212	329	411	274	472
Oil and gas extraction	211	53	46	49	33	25
Other	na	159	284	362	241	447
Utilities	22	81	108	59	53	60
Manufacturing	31–33	104,842	109,744	115,118	110,062	112,681
Food	311	934	890	914	1,370	1,367
Beverages and tobacco products	312	501	467	469	D	448
Textiles, apparel, and leather products	313–16	275	248	125	D	85
Wood products	321	31	D	D	78	84
Paper	322	1,478	1,498	1,358	1,376	1,325
Printing and related support activities	323	129	148	D	157	174
Petroleum and coal products	324	990	977	1,002	1,153	1,266
Chemicals	325	28,198	29,212	31,927	32,273	35,500
Basic chemicals	3251	1,627	1,569	1,742	1,456	1,502
Resins and synthetic rubber, fibers, and filaments	3252	2,784	2,963	2,972	2,530	2,553
Pharmaceuticals and medicines	3254	18,382	20,591	23,169	24,279	26,471
Soap, cleaning compounds, and toilet preparations	3256	1,957	2,249	2,153	1,768	2,683
Other	na	3,449	1,841	1,892	2,239	2,292
Plastics and rubber products	326	1,031	955	929	937	978
Nonmetallic mineral products	327	371	406	339	373	435
Primary and fabricated metals	na	1,320	1,417	1,038	1,340	1,412
Primary metals	331	760	818	484	498	501
Fabricated metal products	332	560	600	554	841	911
Machinery	333	5,252	7,196	8,561	8,405	5,431
Agriculture, construction, and mining machinery	3331	1,340	1,343	1,484	1,733	1,700
Industrial machinery	3332	1,250	1,607	1,579	1,583	1,469
Other	na	2,662	4,247	5,497	5,088	2,263
Computers and electronic products	334	30,298	35,616	38,356	33,948	33,255
Computers and peripheral equipment	3341	5,659	6,952	7,727	7,065	7,064
Communications equipment	3342	13,276	14,614	14,526	11,497	10,359
Audio and video equipment	3343	407	436	359	D	D
Semiconductors and other electronic components	3344	8,997	10,252	11,114	10,620	11,508
Navigational, measuring, and other instruments	3345	1,579	2,960	4,158	4,244	3,824
Magnetic and optical media	3346	381	402	473	D	D
Electrical equipment, appliances, and components	335	2,958	2,511	2,008	1,729	1,350
Transportation equipment	336	29,162	25,834	25,147	23,167	25,565
Motor vehicles, bodies and trailers, and parts	3361, 3362, 3363	17,513	16,223	18,183	16,535	17,251
Other	na	11,649	9,611	6,964	6,632	8,314
Furniture and related products	337	90	D	128	130	116
Miscellaneous manufacturing	339	1,826	2,176	2,570	3,067	3,890
Wholesale trade	42	4,000	3,755	4,032	2,798	2,850
Professional and commercial equipment and supplies	4214	2,635	2,404	2,489	1,388	1,164
Other durable goods	na	774	577	638	628	790
Petroleum and petroleum products	4227	D	231	238	218	195
Other nondurable goods	na	D	543	666	563	701
Information	51	6,763	8,251	9,514	9,679	9,933
Publishing industries	511	4,050	5,510	6,452	6,718	7,202
Motion picture and sound recording industries	512	D	12	12	27	30
Broadcasting and telecommunications	513	869	820	796	625	442
Broadcasting, cable networks, and program distribution	5131, 5132	D	14	14	37	72
Telecommunications	5133	D	806	782	588	369
Information services and data processing services	514	D	1,909	2,254	2,308	2,259
Finance (except depository institutions) and insurance	52	315	510	617	560	369
Finance, except depository institutions	na	240	458	477	430	249
Securities, commodity contracts, and other intermediation and related activities	523	D	254	D	290	126

Appendix table 4-25

R&D performed in United States by U.S. multinational company parent companies, by NAICS industry: 1999–2003

(Millions of current U.S. dollars)

Industry/sector	NAICS code	1999	2000	2001	2002	2003
Other finance, except depository institutions	na	D	204	D	140	123
Insurance carriers and related activities	524	75	52	141	130	120
Professional, scientific, and technical services	54	8,522	10,042	10,348	10,479	10,560
Architectural, engineering, and related services	5413	49	24	18	D	D
Computer systems design and related services	5415	7,453	8,359	8,929	8,917	8,920
Management, scientific, and technical consulting	5416	D	D	D	533	554
Advertising and related services	5418	D	D	D	D	D
Other	na	716	874	802	978	982
Other industries	na	1,556	2,729	2,918	3,073	2,958
Agriculture, forestry, fishing, and hunting	11	2	2	D	D	D
Construction	23	D	D	D	D	D
Retail trade	44–45	D	D	D	D	D
Transportation and warehousing	48–49	26	8	12	5	1
Real estate and rental and leasing	53	D	6	7	D	5
Real estate	531	0	0	0	0	0
Rental and leasing (except real estate)	532	D	6	7	D	5
Management of nonbank companies and enterprises	55	0	0	0	D	0
Administration, support, and waste management	56	6	D	D	D	D
Health care and social assistance	62	D	30	32	31	32
Accommodation and food services	72	25	31	42	29	37
Accommodation	721	0	0	0	0	0
Food services and drinking places	722	25	31	42	29	37
Miscellaneous services	na	15	16	17	128	143

D = suppressed to avoid disclosure of confidential information; na = not applicable

NAICS = North American Industry Classification System

NOTES: Data include R&D performed by parent companies of U.S. multinational companies (MNCs), regardless of funding source, whether for performer itself or others, including R&D performed for federal government; data exclude R&D conducted by others under contract. U.S. MNC parent company is company that resides in United States and owns or controls at least 10% of voting securities or equivalent of foreign business enterprise. Industry data are classified by the Bureau of Economic Analysis using the International Survey Industry classification system based on the North American Industry Classification System (NAICS). Data for 1999–2003 are based on the 1997 NAICS.

SOURCE: Bureau of Economic Analysis, Survey of U.S. Direct Investment Abroad (annual series), <http://www.bea.gov/international/index.htm#omc>, accessed 15 February 2011.

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Appendix table 4-26

R&D performed in United States by U.S. multinational company parent companies, by NAICS industry: 2004–08

(Millions of current U.S. dollars)

Industry/sector	NAICS code	2004	2005	2006	2007	2008
All industries	na	164,189	177,598	184,428	203,678	199,105
Mining	21	D	403	538	644	691
Oil and gas extraction	211	D	D	8	14	16
Other	na	418	D	530	631	675
Utilities	22	26	31	28	29	17
Manufacturing	31–33	129,246	143,335	146,435	159,182	152,507
Food	311	1,636	1,311	1,739	1,862	1,801
Beverages and tobacco products	312	125	502	497	336	368
Textiles, apparel, and leather products	313–16	85	195	216	152	136
Wood products	321	96	113	121	46	74
Paper	322	1,375	1,408	1,596	1,474	1,152
Printing and related support activities	323	132	96	52	45	96
Petroleum and coal products	324	1,327	2,155	2,289	2,583	2,642
Chemicals	325	41,459	45,004	44,832	51,033	49,077
Basic chemicals	3251	1,464	1,381	1,420	1,601	1,695
Resins and synthetic rubber, fibers, and filaments	3252	2,557	2,510	2,417	2,541	2,611
Pharmaceuticals and medicines	3254	32,507	36,352	36,698	41,962	40,013
Soap, cleaning compounds, and toilet preparations	3256	2,612	2,510	2,200	2,780	2,494
Other	na	2,318	2,252	2,097	2,149	2,264
Plastics and rubber products	326	870	1,079	1,287	1,304	1,291
Nonmetallic mineral products	327	377	389	397	406	361
Primary and fabricated metals	na	1,513	1,165	1,082	991	1,101
Primary metals	331	487	544	444	439	474
Fabricated metal products	332	1,026	621	638	553	627
Machinery	333	4,968	5,492	5,892	7,398	8,106
Agriculture, construction, and mining machinery	3331	1,770	1,955	2,359	2,429	2,598
Industrial machinery	3332	1,066	1,210	2,024	2,155	2,016
Other	na	2,132	2,327	1,509	2,815	3,491
Computers and electronic products	334	34,187	36,560	40,124	41,169	37,472
Computers and peripheral equipment	3341	7,176	7,015	8,081	8,027	6,962
Communications equipment	3342	9,253	9,255	9,336	12,043	9,074
Audio and video equipment	3343	315	360	D	D	D
Semiconductors and other electronic components	3344	13,021	15,020	16,748	15,374	15,357
Navigational, measuring, and other instruments	3345	D	4,807	5,478	5,202	5,547
Magnetic and optical media	3346	D	103	D	D	D
Electrical equipment, appliances, and components	335	1,679	1,618	2,748	2,056	2,301
Transportation equipment	336	35,580	41,692	38,809	43,543	41,510
Motor vehicles, bodies and trailers, and parts	3361, 3362, 3363	15,264	18,687	14,840	15,610	13,902
Other	na	20,316	23,005	23,969	27,933	27,609
Furniture and related products	337	133	217	226	244	248
Miscellaneous manufacturing	339	3,703	4,341	4,528	4,540	4,772
Wholesale trade	42	D	5,072	5,428	5,876	6,451
Professional and commercial equipment and supplies	4234	D	1,650	1,621	1,625	2,176
Petroleum and petroleum products	4247	D	D	D	D	D
Drugs and druggists' sundries	4242	287	D	D	D	D
Other	na	3,028	2,889	3,289	3,653	3,652
Information	51	14,657	13,161	15,047	17,981	18,148
Publishing industries	511	11,029	9,504	10,995	12,267	13,784
Motion picture and sound recording industries	512	18	D	D	D	D
Broadcasting (except Internet) and telecommunications	na	587	D	D	D	D
Broadcasting (except Internet)	515	88	D	D	D	D
Telecommunications	517	499	D	236	1,262	D
Internet, data processing, and other information services	516, 518, 519	3,023	3,197	3,762	4,277	2,925
Finance (except depository institutions) and insurance	52	221	228	260	180	107
Finance, except depository institutions	na	103	146	166	D	D
Securities, commodity contracts, and other intermediation and related activities	523	D	D	D	D	D

Appendix table 4-26

R&D performed in United States by U.S. multinational company parent companies, by NAICS industry: 2004–08

(Millions of current U.S. dollars)

Industry/sector	NAICS code	2004	2005	2006	2007	2008
Other finance, except depository institutions	na	D	D	D	D	0
Insurance carriers and related activities	524	118	82	94	D	D
Professional, scientific, and technical services	54	13,216	13,750	15,007	16,162	17,072
Architectural, engineering, and related services	5413	154	D	149	149	151
Computer systems design and related services	5415	8,983	9,133	9,246	10,081	11,070
Management, scientific, and technical consulting	5416	132	115	D	D	24
Advertising and related services	5418	D	D	D	D	1
Other	na	D	4,323	5,537	5,852	5,826
Other industries	na	1,523	1,617	1,684	3,623	4,111
Agriculture, forestry, fishing, and hunting	11	39	46	12	13	8
Construction	23	3	4	4	D	D
Retail trade	44–45	D	D	D	D	D
Transportation and warehousing	48–49	1	D	D	D	D
Real estate and rental and leasing	53	D	D	D	D	D
Real estate	531	0	0	0	0	0
Rental and leasing (except real estate)	532	D	D	D	D	D
Management of nonbank companies and enterprises	55	D	0	0	0	1
Administration, support, and waste management	56	D	D	D	D	D
Health care and social assistance	62	24	D	D	D	D
Accommodation and food services	72	9	D	D	D	57
Accommodation	721	0	0	0	0	0
Food services and drinking places	722	9	D	D	D	57
Miscellaneous services	na	174	189	248	265	298

D = suppressed to avoid disclosure of confidential information; na = not applicable

NAICS = North American Industry Classification System

NOTES: Preliminary estimates for 2008. Industries are classified by the Bureau of Economic Analysis using the International Survey Industry classification system based on the NAICS. Data for 2004–08 data are based on the 2002 NAICS and are not fully comparable with earlier data. NAICS revisions, for example, affected several industries under information (NAICS 51). In addition, industry 4214 (Professional and commercial equipment and supplies) under 1997 NAICS code was split among several 2002 NAICS codes, including but not limited to the new code for this industry (NAICS 4234). Therefore data for this industry in appendix table 4-25 are not necessarily comparable with data in the present table. Data include R&D performed by parent companies of U.S. multinational companies (MNCs), regardless of funding source, whether for performer itself or others, including R&D performed for federal government; data exclude R&D conducted by others under contract. U.S. MNC parent company is company that resides in United States and owns or controls at least 10% of voting securities or equivalent of foreign business enterprise.

SOURCE: Bureau of Economic Analysis, Survey of U.S. Direct Investment Abroad (annual series), <http://www.bea.gov/international/index.htm#omc>, accessed 15 February 2011.

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Appendix table 4-27

U.S. trade in research, development, and testing services, by affiliation and by selected region/country/economy: 2006-09

(Millions of current U.S. dollars)

Category	2006			2007			2008			2009		
	Exports	Imports	Trade balance	Exports	Imports	Trade balance	Exports	Imports	Trade balance	Exports	Imports	Trade balance
Total by affiliation	12,810	9,276	3,534	15,625	13,032	2,593	17,421	16,279	1,142	18,234	15,753	2,481
Unaffiliated	1,664	2,324	-660	2,252	3,260	-1,008	2,865	4,338	-1,473	2,481	3,501	-1,020
Affiliated	11,146	6,953	4,193	13,373	9,772	3,601	14,556	11,941	2,615	15,752	12,252	3,500
Total by region/country/economy												
Canada	535	867	-332	344	1,307	-963	455	1,693	-1,238	457	1,538	-1,081
Europe	8,089	5,782	2,307	9,125	7,387	1,738	9,339	8,328	1,011	9,459	7,577	1,882
Belgium-Luxembourg	172	341	-169	256	336	-80	325	347	-22	274	386	-112
France	D	548	NA	419	760	-341	475	744	-269	606	723	-117
Germany	823	790	33	934	994	-60	1,038	1,083	-45	766	935	-169
Ireland	1,326	235	1,091	2,120	384	1,736	2,183	389	1,794	2,412	405	2,007
Italy	109	168	-59	142	176	-34	169	255	-86	115	199	-84
Netherlands	1,201	829	372	1,229	931	298	1,221	1,081	140	1,087	1,077	10
Norway	95	41	54	137	34	103	103	52	51	112	48	64
Spain	23	92	-69	44	134	-90	68	185	-117	97	208	-111
Sweden	951	104	847	1,020	124	896	907	136	771	886	136	750
Switzerland	1,297	347	950	1,435	331	1,104	1,425	492	933	1,491	334	1,157
United Kingdom	846	1,899	-1,053	776	2,699	-1,923	638	2,895	-2,257	732	2,418	-1,686
Other	D	388	NA	612	484	128	787	668	119	881	709	172
Latin America and OWH	1,676	231	1,445	3,376	381	2,995	3,512	478	3,034	4,203	718	3,485
South and Central America	118	209	-91	133	347	-214	231	460	-229	261	688	-427
Argentina	16	39	-23	15	35	-20	21	40	-19	25	73	-48
Brazil	20	55	-35	35	56	-21	36	76	-40	20	187	-167
Chile	2	5	-3	1	21	-20	1	9	-8	3	19	-16
Mexico	49	80	-31	47	187	-140	108	271	-163	81	310	-229
Venezuela	17	3	14	16	2	14	20	4	16	10	11	-1
Other	14	27	-13	20	46	-26	45	60	-15	122	88	34
Other Western Hemisphere	1,558	22	1,536	3,242	34	3,208	3,281	18	3,263	3,941	30	3,911
Bermuda	754	1	753	2,072	1	2,071	2,161	*	NA	3,021	*	NA
Other	804	21	783	1,170	33	1,137	1,120	17	1,103	920	30	890
Africa	118	195	-77	201	224	-23	354	281	73	231	265	-34
South Africa	11	39	-28	20	47	-27	53	57	-4	34	52	-18
Other	106	156	-50	182	177	5	301	225	76	197	213	-16
Middle East	107	588	-481	237	775	-538	424	939	-515	385	936	-551
Israel	45	557	-512	52	710	-658	158	860	-702	133	890	-757
Saudi Arabia	7	1	6	20	D	NA	62	1	61	19	1	18
Other	55	30	25	165	D	NA	204	79	125	233	46	187
Asia and Pacific	2,235	1,614	621	2,293	2,956	-663	3,283	4,558	-1,275	3,483	4,718	-1,235
Australia	60	153	-93	70	222	-152	117	237	-120	113	234	-121
China	32	92	-60	43	473	-430	62	748	-686	69	850	-781
Hong Kong	9	38	-29	20	42	-22	12	57	-45	34	47	-13
India	28	427	-399	19	923	-904	18	1,511	-1,493	29	1,435	-1,406
Indonesia	17	12	5	62	28	34	61	26	35	48	22	26
Japan	1,795	550	1,245	1,614	773	841	2,258	1,259	999	2,245	1,347	898
Malaysia	9	38	-29	7	103	-96	17	301	-284	40	292	-252
New Zealand	4	5	-1	4	8	-4	2	13	-11	1	13	-12
Philippines	2	7	-5	5	15	-10	8	23	-15	8	17	-9
Singapore	189	119	70	332	147	185	492	74	418	636	187	449
South Korea	43	61	-18	51	78	-27	149	76	73	192	105	87
Taiwan	25	53	-28	25	103	-78	36	190	-154	31	136	-105

Appendix table 4-27

U.S. trade in research, development, and testing services, by affiliation and by selected region/country/economy: 2006–09

(Millions of current U.S. dollars)

Category	2006			2007			2008			2009		
	Exports	Imports	Trade balance	Exports	Imports	Trade balance	Exports	Imports	Trade balance	Exports	Imports	Trade balance
Thailand	17	8	9	21	9	12	35	14	21	22	11	11
Other	5	50	-45	19	32	-13	15	27	-12	15	23	-8
International organizations and unallocated	49	0	49	49	0	49	54	0	54	15	*	NA
Addenda												
European Union ^a	6,642	5,233	1,409	7,478	6,854	624	7,728	7,582	146	7,794	7,009	785

* = ≤\$500,000; D = suppressed to avoid disclosure of confidential information; NA = not available

OWH = other Western Hemisphere

^aReflects the country composition of the European Union for the given year.

NOTE: Trade balance is exports minus imports.

SOURCE: Bureau of Economic Analysis, U.S. International Services, http://www.bea.gov/international/international_services.htm, accessed 4 February 2011.*Science and Engineering Indicators 2012*

Appendix table 4-28

Federal budget authority for R&D, by budget function: FY 1980–2010

Year	All functions	All defense	All nondefense	Health	Space research/technology	Energy	General science	Natural resources/environment	Transportation	Agriculture	Education, training, employment, and social services	International affairs	Veterans benefits/services	Commerce/housing credit	Community/regional development	Administration of justice	Income security	General government
1980	29,739	14,946	14,793	3,694	2,738	3,603	1,233	999	887	585	468	125	126	101	119	45	47	22
1981	33,735	18,413	15,322	3,871	3,111	3,501	1,340	1,061	869	659	298	160	143	106	104	34	43	22
1982	36,115	22,070	14,045	3,869	2,584	3,012	1,359	965	791	693	228	165	139	104	63	31	32	10
1983	38,768	24,936	13,832	4,298	2,134	2,578	1,502	952	876	745	189	177	157	107	44	37	32	6
1984	44,214	29,287	14,927	4,779	2,300	2,581	1,676	963	1,040	762	200	192	218	110	46	24	26	8
1985	49,887	33,698	16,189	5,418	2,725	2,389	1,862	1,059	1,030	836	220	210	193	114	50	47	21	17
1986	53,249	36,926	16,323	5,565	2,894	2,286	1,873	1,062	917	815	248	211	183	111	88	41	14	14
1987	57,069	39,152	17,917	6,556	3,398	2,053	2,042	1,133	908	822	267	223	215	110	99	49	25	17
1988	59,106	40,099	19,007	7,076	3,683	2,126	2,160	1,160	896	882	285	224	195	122	108	51	23	17
1989	62,115	40,642	21,473	7,773	4,555	2,419	2,373	1,255	1,064	907	347	279	212	128	74	45	27	15
1990	63,781	39,925	23,856	8,308	5,765	2,726	2,410	1,386	1,045	950	374	375	216	140	67	44	33	17
1991	65,898	39,328	26,570	9,226	6,511	2,953	2,635	1,582	1,231	1,052	433	378	219	178	88	51	30	4
1992	68,398	40,083	28,315	10,055	6,744	3,099	2,659	1,688	1,523	1,155	365	371	245	192	127	51	37	4
1993	69,884	41,249	28,635	10,280	6,988	2,677	2,691	1,802	1,703	1,152	348	382	250	220	57	49	36	*
1994	68,331	37,764	30,567	10,993	7,414	2,873	2,712	2,062	1,888	1,193	373	254	265	380	68	46	45	0
1995	68,791	37,204	31,587	11,407	7,916	2,844	2,794	1,988	1,833	1,194	369	287	257	525	70	59	43	1
1996	69,049	37,801	31,248	11,867	7,844	2,521	2,846	1,802	1,795	1,176	331	252	259	432	50	56	16	2
1997	71,653	39,591	32,062	12,670	7,844	2,372	2,944	1,886	1,785	1,203	373	190	267	409	48	59	9	2
1998	73,569	39,823	33,746	13,576	8,198	948	4,360	1,855	1,833	1,249	444	163	587	398	42	72	18	2
1999	77,637	41,306	36,331	15,553	8,245	1,131	4,690	1,842	1,725	1,288	403	190	644	432	59	88	38	3
2000	78,664	42,580	36,084	17,869	5,363	996	4,977	1,999	1,636	1,426	418	200	645	406	46	73	25	6
2001	86,756	45,713	41,043	20,758	6,126	1,314	5,468	2,096	1,640	1,657	411	252	719	429	54	88	30	3
2002	97,624	53,016	44,608	23,560	6,270	1,327	5,753	2,160	1,838	1,606	411	279	756	467	50	91	37	3
2003	112,544	63,048	49,496	26,517	7,355	1,403	6,129	2,151	1,869	1,708	430	269	817	463	48	299	38	0
2004	121,867	69,593	52,274	28,251	7,612	1,343	6,466	2,168	1,863	1,750	459	264	866	454	47	684	47	0
2005	126,601	74,047	52,554	28,824	7,300	1,296	6,570	2,168	1,847	1,820	470	255	742	423	45	758	35	0
2006	131,624	78,037	53,587	28,797	8,204	1,195	6,691	2,120	1,711	1,869	495	255	769	390	55	1,008	27	0
2007	138,087	82,272	55,815	29,461	9,024	1,893	7,809	1,936	1,361	1,857	536	246	819	428	49	369	27	0
2008	140,113	84,713	55,400	29,063	8,323	1,986	8,234	2,106	1,394	1,864	497	255	886	450	50	355	27	0
2009	156,009	85,166	70,843	40,389	6,891	3,318	11,840	2,245	1,440	1,935	479	255	943	618	62	335	63	0
Actual	140,903	84,866	56,037	30,827	6,205	2,014	8,885	2,171	1,336	1,935	469	255	943	507	62	335	63	0
ARRA	15,106	300	14,806	9,562	686	1,304	2,955	74	104	0	10	0	0	111	0	0	0	0
2010 preliminary	143,892	86,082	57,810	30,976	6,622	2,138	9,298	2,300	1,427	2,025	525	255	1,162	542	117	313	77	0
Constant FY 2005 \$millions																		
1980	63,180	31,753	31,428	7,848	5,817	7,655	2,620	2,122	1,884	1,243	994	266	268	215	253	96	100	47
1981	65,239	35,608	29,631	7,486	6,016	6,770	2,591	2,052	1,681	1,274	576	309	277	205	201	66	83	43
1982	65,367	39,946	25,421	7,003	4,677	5,452	2,460	1,747	1,432	1,254	413	299	252	188	114	56	58	18
1983	67,212	43,232	23,981	7,451	3,700	4,469	2,604	1,650	1,519	1,292	328	307	272	186	76	64	55	10

Appendix table 4-28

Federal budget authority for R&D, by budget function: FY 1980–2010

Year	All functions	All defense	All nondefense	Health	Space research/technology	Energy	General science	Natural resources/environment	Transportation	Agriculture	Education, training, employment, and social services	International affairs	Veterans benefits/services	Commerce/housing credit	Community/regional development	Administration of justice	Income security	General government
1984	73,924	48,967	24,957	7,990	3,846	4,315	2,802	1,610	1,739	1,274	334	321	364	184	77	40	43	13
1985	80,789	54,572	26,217	8,774	4,413	3,869	3,015	1,715	1,668	1,354	356	340	313	185	81	76	34	28
1986	84,281	58,446	25,836	8,808	4,581	3,618	2,965	1,681	1,451	1,290	393	334	290	176	139	65	22	22
1987	87,988	60,364	27,624	10,108	5,239	3,165	3,148	1,747	1,400	1,267	412	344	331	170	153	76	39	26
1988	88,297	59,903	28,394	10,571	5,502	3,176	3,227	1,733	1,339	1,318	426	335	291	182	161	76	34	25
1989	89,323	58,444	30,879	11,178	6,550	3,479	3,412	1,805	1,530	1,304	499	401	305	184	106	65	39	22
1990	88,462	55,374	33,087	11,523	7,996	3,781	3,343	1,922	1,449	1,318	519	520	300	194	93	61	46	24
1991	88,064	52,556	35,507	12,329	8,701	3,946	3,521	2,114	1,645	1,406	579	505	293	238	118	68	40	5
1992	89,083	52,205	36,878	13,096	8,784	4,036	3,463	2,198	1,984	1,504	475	483	319	250	165	66	48	5
1993	89,047	52,560	36,487	13,099	8,904	3,411	3,429	2,296	2,170	1,468	443	487	319	280	73	62	46	*
1994	85,265	47,123	38,142	13,717	9,251	3,585	3,384	2,573	2,356	1,489	465	317	331	474	85	57	56	0
1995	84,055	45,459	38,596	13,938	9,673	3,475	3,414	2,429	2,240	1,459	451	351	314	641	86	72	53	1
1996	82,773	45,314	37,459	14,226	9,403	3,022	3,412	2,160	2,152	1,410	397	302	310	518	60	67	19	2
1997	84,347	46,605	37,742	14,915	9,234	2,792	3,466	2,220	2,101	1,416	439	224	314	481	57	69	11	2
1998	85,516	46,290	39,226	15,781	9,529	1,102	5,068	2,156	2,131	1,452	516	189	682	463	49	84	21	2
1999	89,064	47,386	41,678	17,842	9,459	1,297	5,380	2,113	1,979	1,478	462	218	739	496	68	101	44	3
2000	88,496	47,902	40,594	20,102	6,033	1,120	5,599	2,249	1,840	1,604	470	225	726	457	52	82	28	7
2001	95,347	50,240	45,107	22,813	6,733	1,444	6,009	2,304	1,802	1,821	452	277	790	471	59	97	33	3
2002	105,551	57,321	48,230	25,473	6,779	1,435	6,220	2,335	1,987	1,736	444	302	817	505	54	98	40	3
2003	119,195	66,774	52,421	28,084	7,790	1,486	6,491	2,278	1,979	1,809	455	285	865	490	51	317	40	0
2004	125,844	71,864	53,980	29,173	7,860	1,387	6,677	2,239	1,924	1,807	474	273	894	469	49	706	49	0
2005	126,601	74,047	52,554	28,824	7,300	1,296	6,570	2,168	1,847	1,820	470	255	742	423	45	758	35	0
2006	127,271	75,456	51,815	27,845	7,933	1,155	6,470	2,050	1,654	1,807	479	247	744	377	53	975	26	0
2007	129,610	77,222	52,389	27,653	8,470	1,777	7,330	1,817	1,277	1,743	503	231	769	402	46	346	25	0
2008	128,568	77,733	50,835	26,668	7,637	1,822	7,556	1,932	1,279	1,710	456	234	813	413	46	326	25	0
2009	141,274	77,122	64,152	36,574	6,240	3,005	10,722	2,033	1,304	1,752	434	231	854	560	56	303	57	0
Actual	127,595	76,270	50,361	27,705	5,577	1,810	7,985	1,951	1,201	1,739	421	229	847	456	56	301	57	0
ARRA	13,679	266	13,132	8,481	608	1,157	2,621	66	92	0	9	0	0	98	0	0	0	0
2010 preliminary	129,318	77,363	51,955	27,839	5,951	1,921	8,356	2,067	1,282	1,820	472	229	1,044	487	105	281	69	0
Budget function share of totals, percent																		
1980	100	50.3	49.7	12.4	9.2	12.1	4.1	3.4	3.0	2.0	1.6	0.4	0.4	0.3	0.4	0.2	0.2	0.1
1981	100	54.6	45.4	11.5	9.2	10.4	4.0	3.1	2.6	2.0	0.9	0.5	0.4	0.3	0.3	0.1	0.1	0.1
1982	100	61.1	38.9	10.7	7.2	8.3	3.8	2.7	2.2	1.9	0.6	0.5	0.4	0.3	0.2	0.1	0.1	0.0
1983	100	64.3	35.7	11.1	5.5	6.6	3.9	2.5	2.3	1.9	0.5	0.5	0.4	0.3	0.1	0.1	0.1	0.0
1984	100	66.2	33.8	10.8	5.2	5.8	3.8	2.2	2.4	1.7	0.5	0.4	0.5	0.2	0.1	0.1	0.1	0.0
1985	100	67.5	32.5	10.9	5.5	4.8	3.7	2.1	2.1	1.7	0.4	0.4	0.4	0.2	0.1	0.1	0.0	0.0
1986	100	69.3	30.7	10.5	5.4	4.3	3.5	2.0	1.7	1.5	0.5	0.4	0.3	0.2	0.2	0.1	0.0	0.0
1987	100	68.6	31.4	11.5	6.0	3.6	3.6	2.0	1.6	1.4	0.5	0.4	0.4	0.2	0.2	0.1	0.0	0.0
1988	100	67.8	32.2	12.0	6.2	3.6	3.7	2.0	1.5	1.5	0.5	0.4	0.3	0.2	0.2	0.1	0.0	0.0

Appendix table 4-28

Federal budget authority for R&D, by budget function: FY 1980–2010

Year	All functions	All defense	All nondefense	Health	Space research/ technology	Energy	General science	Natural resources/ environment	Transportation	Agriculture	Education, training, employment, and social services	International affairs	Veterans benefits/ services	Commerce/ housing credit	Community/ regional development	Administration of justice	Income security	General government
1989	100	65.4	34.6	12.5	7.3	3.9	3.8	2.0	1.7	1.5	0.6	0.4	0.3	0.2	0.1	0.1	0.0	0.0
1990	100	62.6	37.4	13.0	9.0	4.3	3.8	2.2	1.6	1.5	0.6	0.6	0.3	0.2	0.1	0.1	0.1	0.0
1991	100	59.7	40.3	14.0	9.9	4.5	4.0	2.4	1.9	1.6	0.7	0.6	0.3	0.3	0.1	0.1	0.0	0.0
1992	100	58.6	41.4	14.7	9.9	4.5	3.9	2.5	2.2	1.7	0.5	0.5	0.4	0.3	0.2	0.1	0.1	0.0
1993	100	59.0	41.0	14.7	10.0	3.8	3.9	2.6	2.4	1.6	0.5	0.5	0.4	0.3	0.1	0.1	0.1	*
1994	100	55.3	44.7	16.1	10.9	4.2	4.0	3.0	2.8	1.7	0.5	0.4	0.4	0.6	0.1	0.1	0.1	0.0
1995	100	54.1	45.9	16.6	11.5	4.1	4.1	2.9	2.7	1.7	0.5	0.4	0.4	0.8	0.1	0.1	0.1	0.0
1996	100	54.7	45.3	17.2	11.4	3.7	4.1	2.6	2.6	1.7	0.5	0.4	0.4	0.6	0.1	0.1	0.0	0.0
1997	100	55.3	44.7	17.7	10.9	3.3	4.1	2.6	2.5	1.7	0.5	0.3	0.4	0.6	0.1	0.1	0.0	0.0
1998	100	54.1	45.9	18.5	11.1	1.3	5.9	2.5	2.5	1.7	0.6	0.2	0.8	0.5	0.1	0.1	0.0	0.0
1999	100	53.2	46.8	20.0	10.6	1.5	6.0	2.4	2.2	1.7	0.5	0.2	0.8	0.6	0.1	0.1	0.0	0.0
2000	100	54.1	45.9	22.7	6.8	1.3	6.3	2.5	2.1	1.8	0.5	0.3	0.8	0.5	0.1	0.1	0.0	0.0
2001	100	52.7	47.3	23.9	7.1	1.5	6.3	2.4	1.9	1.9	0.5	0.3	0.8	0.5	0.1	0.1	0.0	0.0
2002	100	54.3	45.7	24.1	6.4	1.4	5.9	2.2	1.9	1.6	0.4	0.3	0.8	0.5	0.1	0.1	0.0	0.0
2003	100	56.0	44.0	23.6	6.5	1.2	5.4	1.9	1.7	1.5	0.4	0.2	0.7	0.4	0.0	0.3	0.0	0.0
2004	100	57.1	42.9	23.2	6.2	1.1	5.3	1.8	1.5	1.4	0.4	0.2	0.7	0.4	0.0	0.6	0.0	0.0
2005	100	58.5	41.5	22.8	5.8	1.0	5.2	1.7	1.5	1.4	0.4	0.2	0.6	0.3	0.0	0.6	0.0	0.0
2006	100	59.3	40.7	21.9	6.2	0.9	5.1	1.6	1.3	1.4	0.4	0.2	0.6	0.3	0.0	0.8	0.0	0.0
2007	100	59.6	40.4	21.3	6.5	1.4	5.7	1.4	1.0	1.3	0.4	0.2	0.6	0.3	0.0	0.3	0.0	0.0
2008	100	60.5	39.5	20.7	5.9	1.4	5.9	1.5	1.0	1.3	0.4	0.2	0.6	0.3	0.0	0.3	0.0	0.0
2009	100	54.6	45.4	25.9	4.4	2.1	7.6	1.4	0.9	1.2	0.3	0.2	0.6	0.4	0.0	0.2	0.0	0.0
Actual	100	60.2	39.8	21.9	4.4	1.4	6.3	1.5	0.9	1.4	0.3	0.2	0.7	0.4	0.0	0.2	0.0	0.0
ARRA	100	2.0	98.0	63.3	4.5	8.6	19.6	0.5	0.7	0.0	0.1	0.0	0.0	0.7	0.0	0.0	0.0	0.0
2010 preliminary	100	59.8	40.2	21.5	4.6	1.5	6.5	1.6	1.0	1.4	0.4	0.2	0.8	0.4	0.1	0.2	0.1	0.0

* = ≤\$500,000

ARRA = American Recovery and Reinvestment Act of 2009

NOTES: Detail may not add to total because of rounding. In FY 2009 the National Aeronautics and Space Administration (NASA) adjusted its R&D reporting to more closely match survey data reported to the National Science Foundation. In FY 2007 the Department of Homeland Security (DHS) changed its R&D portfolio to reclassify funding in defense and most administration of justice as general science and basic research. In FY 2004 DHS changed its R&D portfolio to reclassify funding in general science and basic research and in agriculture as administration of justice. In FY 2000 NASA transferred funding for space station program from R&D to R&D plant; this change reflected in budget authority for space research and technology. In FY 2000 National Institutes of Health in the Department of Health and Human Services classified all of their previous development activities as basic research or applied research, with resulting increase in health basic research. In FY 1998 many Department of Energy programs were reclassified from energy to general science and basic research. In FY 1998 Department of Veterans Affairs began reporting medical care support funds as part of its total research budgetary resources; this change reflected in budget authority for veterans benefits and services. 1980–94 data are from agencies' submissions to Office of Management and Budget (OMB), Circular No. A-11, Exhibit 44A, "Research and Development Activities," and supplemental data obtained from agencies' budget offices. 1995–2010 data are from agencies' submissions to OMB per MAX Schedule C, budget justification documents, and supplemental data obtained from agencies' budget offices.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics (NCSES), Federal R&D Funding by Budget Function: FY 2009–11. All NSF/NCSES reports available at <http://www.nsf.gov/statistics/>.

Appendix table 4-29

Federal budget authority for basic research, by budget function: FY 1980–2010

Year	All functions	All defense	All nondefense	Health	Space research/technology	Energy	General science	Natural resources/environment	Transportation	Agriculture	Education, training, employment, and social services	International affairs	Veterans benefits/services	Commerce/housing credit	Community/regional development	Administration of justice	Income security	General government	
																			Current \$millions
1980	4,716	552	4,164	1,761	482	200	1,152	136	79	246	61	0	14	15	8	9	1	*	
1981	5,107	610	4,497	1,951	445	220	1,256	131	89	281	66	12	15	17	5	5	3	3	
1982	5,305	696	4,609	1,953	434	260	1,296	139	102	295	78	10	13	17	7	4	0	2	
1983	6,247	788	5,459	2,475	501	320	1,439	156	117	326	70	10	14	19	6	4	0	3	
1984	7,072	845	6,227	2,813	646	365	1,606	192	125	353	77	3	15	20	5	5	0	3	
1985	7,810	856	6,954	3,243	498	428	1,779	206	255	406	86	4	15	23	6	4	0	4	
1986	8,193	960	7,233	3,324	737	456	1,795	204	184	390	83	5	15	26	6	5	0	5	
1987	9,021	900	8,121	3,851	843	511	1,942	206	231	397	78	3	17	26	4	8	0	4	
1988	9,553	905	8,648	4,087	944	571	2,061	210	197	428	83	3	17	28	7	8	0	5	
1989	10,648	965	9,683	4,413	1,099	703	2,265	331	287	433	92	3	16	29	3	7	0	3	
1990	11,288	964	10,324	4,661	1,389	761	2,306	336	242	456	106	4	16	31	3	9	0	3	
1991	12,405	1,188	11,217	5,021	1,479	878	2,526	389	246	486	115	6	16	39	10	6	0	0	
1992	12,973	1,147	11,826	5,506	1,499	921	2,532	383	266	528	118	6	16	35	11	5	0	0	
1993	13,440	1,323	12,117	5,700	1,588	917	2,553	376	238	553	121	8	16	34	10	5	0	0	
1994	13,552	1,174	12,378	5,889	1,796	921	2,542	224	220	567	145	6	16	38	9	5	0	0	
1995	13,772	1,181	12,591	6,068	1,614	930	2,622	187	389	565	153	0	16	35	3	9	0	0	
1996	14,442	1,165	13,277	6,395	1,685	1,182	2,662	147	456	547	140	2	13	37	0	12	0	0	
1997	14,961	1,090	13,871	6,852	1,653	1,288	2,753	153	420	548	142	2	14	34	0	13	0	0	
1998	15,523	1,067	14,456	7,356	1,610	34	4,121	145	411	571	133	1	23	35	0	16	0	0	
1999	17,433	1,110	16,323	8,634	1,667	36	4,464	142	358	602	99	0	263	41	0	18	0	0	
2000	19,470	1,184	18,286	10,099	1,616	36	4,722	146	542	651	107	42	266	39	0	20	0	0	
2001	21,376	1,303	20,073	11,642	1,695	40	5,187	215	17	749	112	50	289	50	0	27	0	0	
2002	23,848	1,404	22,444	12,957	1,912	45	5,561	471	17	762	115	53	465	56	0	30	0	0	
2003	25,323	1,409	23,914	14,162	2,206	40	5,907	185	23	824	125	18	327	53	1	42	0	0	
2004	26,529	1,380	25,149	14,850	2,473	32	6,198	201	20	780	125	18	347	46	0	58	0	0	
2005	27,678	1,508	26,170	15,826	2,486	31	6,238	195	65	789	130	18	297	53	0	42	0	0	
2006	27,336	1,490	25,846	15,532	2,299	8	6,406	195	0	805	131	18	318	66	0	68	0	0	
2007	28,166	1,533	26,633	15,637	2,318	7	6,887	260	2	821	149	18	335	92	0	106	0	0	
2008	28,740	1,631	27,109	15,909	2,183	16	7,260	210	0	790	146	18	354	98	0	125	0	0	
2009	36,401	1,772	34,629	21,108	932	28	10,727	219	0	799	155	18	375	152	0	115	0	0	
Actual	28,161	1,769	26,392	15,767	900	28	7,913	219	0	799	145	18	375	112	0	115	0	0	
ARRA	8,240	3	8,237	5,341	32	0	2,814	0	0	0	10	0	0	40	0	0	0	0	
2010 preliminary	29,139	1,887	27,252	16,093	884	49	8,268	237	0	876	168	18	464	121	0	73	0	0	
	Constant FY 2005 \$millions																		
1980	10,019	1,173	8,846	3,741	1,024	425	2,447	289	168	523	130	0	30	32	17	19	2	*	
1981	9,876	1,180	8,697	3,773	861	425	2,429	253	172	543	128	23	29	33	10	10	6	6	
1982	9,602	1,260	8,342	3,535	786	471	2,346	252	185	534	141	18	24	31	13	7	0	4	
1983	10,830	1,366	9,464	4,291	869	555	2,495	270	203	565	121	17	24	33	10	7	0	5	

Appendix table 4-29

Federal budget authority for basic research, by budget function: FY 1980–2010

Year	All functions	All defense	All nondefense	Health	Space research/technology	Energy	General science	Natural resources/environment	Transportation	Agriculture	Education, training, employment, and social services	International affairs	Veterans benefits/services	Commerce/housing credit	Community/regional development	Administration of justice	Income security	General government
1984	11,824	1,413	10,411	4,703	1,080	610	2,685	321	209	590	129	5	25	33	8	8	0	5
1985	12,648	1,386	11,262	5,252	806	693	2,881	334	413	657	139	6	24	37	10	6	0	6
1986	12,968	1,519	11,448	5,261	1,167	722	2,841	323	291	617	131	8	24	41	9	8	0	8
1987	13,908	1,388	12,521	5,937	1,300	788	2,994	318	356	612	120	5	26	40	6	12	0	6
1988	14,271	1,352	12,919	6,105	1,410	853	3,079	314	294	639	124	4	25	42	10	12	0	7
1989	15,312	1,388	13,924	6,346	1,580	1,011	3,257	476	413	623	132	4	23	42	4	10	0	4
1990	15,656	1,337	14,319	6,465	1,926	1,055	3,198	466	336	632	147	6	22	43	4	12	0	4
1991	16,578	1,588	14,990	6,710	1,976	1,173	3,376	520	329	649	154	8	21	52	13	8	0	0
1992	16,896	1,494	15,402	7,171	1,952	1,200	3,298	499	346	688	154	8	21	46	14	7	0	0
1993	17,125	1,686	15,440	7,263	2,023	1,168	3,253	479	303	705	154	10	20	43	13	6	0	0
1994	16,910	1,465	15,445	7,348	2,241	1,149	3,172	280	275	708	181	7	20	47	11	6	0	0
1995	16,828	1,443	15,385	7,414	1,972	1,136	3,204	228	475	690	187	0	20	43	4	11	0	0
1996	17,312	1,397	15,916	7,666	2,020	1,417	3,191	176	547	656	168	2	16	44	0	14	0	0
1997	17,612	1,283	16,328	8,066	1,946	1,516	3,241	180	494	645	167	2	16	40	0	15	0	0
1998	18,044	1,240	16,803	8,551	1,871	40	4,790	169	478	664	155	1	27	41	0	19	0	0
1999	19,999	1,273	18,725	9,905	1,912	41	5,121	163	411	691	114	0	302	47	0	21	0	0
2000	21,903	1,332	20,571	11,361	1,818	40	5,312	164	610	732	120	47	299	44	0	22	0	0
2001	23,493	1,432	22,061	12,795	1,863	44	5,701	236	19	823	123	55	318	55	0	30	0	0
2002	25,784	1,518	24,266	14,009	2,067	49	6,013	509	18	824	124	57	503	61	0	32	0	0
2003	26,820	1,492	25,327	14,999	2,336	42	6,256	196	24	873	132	19	346	56	1	44	0	0
2004	27,395	1,425	25,970	15,335	2,554	33	6,400	208	21	805	129	19	358	48	0	60	0	0
2005	27,678	1,508	26,170	15,826	2,486	31	6,238	195	65	789	130	18	297	53	0	42	0	0
2006	26,432	1,441	24,991	15,018	2,223	8	6,194	189	0	778	127	17	307	64	0	66	0	0
2007	26,437	1,439	24,998	14,677	2,176	7	6,464	244	2	771	140	17	314	86	0	99	0	0
2008	26,372	1,497	24,875	14,598	2,003	15	6,662	193	0	725	134	17	325	90	0	115	0	0
2009	32,963	1,605	31,358	19,114	844	25	9,714	198	0	724	140	16	340	138	0	104	0	0
Actual	25,501	1,602	23,899	14,278	815	25	7,166	198	0	724	131	16	340	101	0	104	0	0
ARRA	7,462	3	7,459	4,837	29	0	2,548	0	0	0	9	0	0	36	0	0	0	0
2010 preliminary	26,188	1,696	24,492	14,463	794	44	7,431	213	0	787	151	16	417	109	0	66	0	0
Budget function share of totals, percent																		
1980	100	11.7	88.3	37.3	10.2	4.2	24.4	2.9	1.7	5.2	1.3	0.0	0.3	0.3	0.2	0.2	0.0	*
1981	100	11.9	88.1	38.2	8.7	4.3	24.6	2.6	1.7	5.5	1.3	0.2	0.3	0.3	0.1	0.1	0.1	0.1
1982	100	13.1	86.9	36.8	8.2	4.9	24.4	2.6	1.9	5.6	1.5	0.2	0.2	0.3	0.1	0.1	0.0	0.0
1983	100	12.6	87.4	39.6	8.0	5.1	23.0	2.5	1.9	5.2	1.1	0.2	0.2	0.3	0.1	0.1	0.0	0.0
1984	100	11.9	88.1	39.8	9.1	5.2	22.7	2.7	1.8	5.0	1.1	0.0	0.2	0.3	0.1	0.1	0.0	0.0
1985	100	11.0	89.0	41.5	6.4	5.5	22.8	2.6	3.3	5.2	1.1	0.1	0.2	0.3	0.1	0.1	0.0	0.1
1986	100	11.7	88.3	40.6	9.0	5.6	21.9	2.5	2.2	4.8	1.0	0.1	0.2	0.3	0.1	0.1	0.0	0.1
1987	100	10.0	90.0	42.7	9.3	5.7	21.5	2.3	2.6	4.4	0.9	0.0	0.2	0.3	0.0	0.1	0.0	0.0
1988	100	9.5	90.5	42.8	9.9	6.0	21.6	2.2	2.1	4.5	0.9	0.0	0.2	0.3	0.1	0.1	0.0	0.1

Appendix table 4-29

Federal budget authority for basic research, by budget function: FY 1980–2010

Year	All functions	All defense	All nondefense	Health	Space research/ technology	Energy	General science	Natural resources/ environment	Transportation	Agriculture	Education, training, employment, and social services	International affairs	Veterans benefits/ services	Commerce/ housing credit	Community/ regional development	Administration of justice	Income security	General government
1989	100	9.1	90.9	41.4	10.3	6.6	21.3	3.1	2.7	4.1	0.9	0.0	0.2	0.3	0.0	0.1	0.0	0.0
1990	100	8.5	91.5	41.3	12.3	6.7	20.4	3.0	2.1	4.0	0.9	0.0	0.1	0.3	0.0	0.1	0.0	0.0
1991	100	9.6	90.4	40.5	11.9	7.1	20.4	3.1	2.0	3.9	0.9	0.0	0.1	0.3	0.1	0.0	0.0	0.0
1992	100	8.8	91.2	42.4	11.6	7.1	19.5	3.0	2.1	4.1	0.9	0.0	0.1	0.3	0.1	0.0	0.0	0.0
1993	100	9.8	90.2	42.4	11.8	6.8	19.0	2.8	1.8	4.1	0.9	0.1	0.1	0.3	0.1	0.0	0.0	0.0
1994	100	8.7	91.3	43.5	13.3	6.8	18.8	1.7	1.6	4.2	1.1	0.0	0.1	0.3	0.1	0.0	0.0	0.0
1995	100	8.6	91.4	44.1	11.7	6.8	19.0	1.4	2.8	4.1	1.1	0.0	0.1	0.3	0.0	0.1	0.0	0.0
1996	100	8.1	91.9	44.3	11.7	8.2	18.4	1.0	3.2	3.8	1.0	0.0	0.1	0.3	0.0	0.1	0.0	0.0
1997	100	7.3	92.7	45.8	11.0	8.6	18.4	1.0	2.8	3.7	0.9	0.0	0.1	0.2	0.0	0.1	0.0	0.0
1998	100	6.9	93.1	47.4	10.4	0.2	26.5	0.9	2.6	3.7	0.9	0.0	0.1	0.2	0.0	0.1	0.0	0.0
1999	100	6.4	93.6	49.5	9.6	0.2	25.6	0.8	2.1	3.5	0.6	0.0	1.5	0.2	0.0	0.1	0.0	0.0
2000	100	6.1	93.9	51.9	8.3	0.2	24.3	0.7	2.8	3.3	0.5	0.2	1.4	0.2	0.0	0.1	0.0	0.0
2001	100	6.1	93.9	54.5	7.9	0.2	24.3	1.0	0.1	3.5	0.5	0.2	1.4	0.2	0.0	0.1	0.0	0.0
2002	100	5.9	94.1	54.3	8.0	0.2	23.3	2.0	0.1	3.2	0.5	0.2	1.9	0.2	0.0	0.1	0.0	0.0
2003	100	5.6	94.4	55.9	8.7	0.2	23.3	0.7	0.1	3.3	0.5	0.1	1.3	0.2	0.0	0.2	0.0	0.0
2004	100	5.2	94.8	56.0	9.3	0.1	23.4	0.8	0.1	2.9	0.5	0.1	1.3	0.2	0.0	0.2	0.0	0.0
2005	100	5.4	94.6	57.2	9.0	0.1	22.5	0.7	0.2	2.9	0.5	0.1	1.1	0.2	0.0	0.2	0.0	0.0
2006	100	5.5	94.5	56.8	8.4	0.0	23.4	0.7	0.0	2.9	0.5	0.1	1.2	0.2	0.0	0.2	0.0	0.0
2007	100	5.4	94.6	55.5	8.2	0.0	24.5	0.9	0.0	2.9	0.5	0.1	1.2	0.3	0.0	0.4	0.0	0.0
2008	100	5.7	94.3	55.4	7.6	0.1	25.3	0.7	0.0	2.7	0.5	0.1	1.2	0.3	0.0	0.4	0.0	0.0
2009	100	4.9	95.1	58.0	2.6	0.1	29.5	0.6	0.0	2.2	0.4	0.0	1.0	0.4	0.0	0.3	0.0	0.0
Actual	100	6.3	93.7	56.0	3.2	0.1	28.1	0.8	0.0	2.8	0.5	0.1	1.3	0.4	0.0	0.4	0.0	0.0
ARRA	100	0.0	100.0	64.8	0.4	0.0	34.2	0.0	0.0	0.0	0.1	0.0	0.0	0.5	0.0	0.0	0.0	0.0
2010 preliminary	100	6.5	93.5	55.2	3.0	0.2	28.4	0.8	0.0	3.0	0.6	0.1	1.6	0.4	0.0	0.3	0.0	0.0

* = ≤\$500,000

ARRA = American Recovery and Reinvestment Act of 2009

NOTES: Detail may not add to total because of rounding. In FY 2009 the National Aeronautics and Space Administration (NASA) adjusted its R&D reporting to more closely match survey data reported to the National Science Foundation. In FY 2007 the Department of Homeland Security (DHS) changed its R&D portfolio to reclassify funding in defense and most administration of justice as general science and basic research. In FY 2004 DHS changed its R&D portfolio to reclassify funding in general science and basic research and in agriculture as administration of justice. In FY 2000 NASA transferred funding for space station program from R&D to R&D plant; this change reflected in budget authority for space research and technology. In FY 2000 National Institutes of Health in the Department of Health and Human Services classified all of its previous development activities as basic research or applied research, with resulting increase in health basic research. In FY 1998 many Department of Energy programs were reclassified from energy to general science and basic research. In FY 1998 Department of Veterans Affairs began reporting medical care support funds as part of its total research budgetary resources; this change reflected in budget authority for veteran benefits and services. 1980–94 data are from agencies' submissions to Office of Management and Budget (OMB), Circular No. A-11, Exhibit 44A, "Research and Development Activities," and supplemental data obtained from agencies' budget offices. 1995–2010 data are from agencies' submissions to OMB per MAX Schedule C, budget justification documents, and supplemental data obtained from agencies' budget offices.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics (NCSES), Federal R&D Funding by Budget Function: FY 2009–11. All NSF/NCSES reports available at <http://www.nsf.gov/statistics/>.

Appendix table 4-30

Federal obligations for research and development, by character of work and R&D plant: FY 1953–2009

Fiscal year	Total	Total R&D	Basic research	Applied		R&D plant
				research	Development	
Current \$thousands						
1953	2,167,456	1,919,543	115,997	NA	NA	247,913
1954	1,918,046	1,761,840	116,033	NA	NA	156,206
1955	2,251,894	2,044,593	130,068	NA	NA	207,301
1956	3,266,903	2,988,203	206,441	645,506	2,136,256	278,700
1957	4,389,237	3,932,001	262,348	662,199	3,007,454	457,236
1958	4,906,015	4,569,722	334,543	744,264	3,490,915	336,293
1959	7,122,610	6,693,510	465,981	874,272	5,353,257	429,100
1960	8,080,015	7,551,746	590,374	1,282,135	5,679,237	528,269
1961	9,607,023	9,058,623	814,513	1,663,431	6,580,679	548,400
1962	11,069,059	10,289,947	986,314	2,018,481	7,285,152	779,112
1963	13,662,879	12,494,611	1,151,753	2,356,150	8,986,708	1,168,268
1964	15,323,870	14,225,354	1,303,000	2,571,452	10,350,902	1,098,516
1965	15,745,852	14,614,249	1,435,469	2,811,761	10,367,019	1,131,603
1966	16,178,640	15,320,334	1,579,181	3,081,066	10,660,087	858,306
1967	17,149,186	16,529,099	1,845,847	2,785,543	11,897,709	620,087
1968	16,525,038	15,921,208	1,840,562	2,940,500	11,140,146	603,830
1969	16,309,900	15,640,888	1,944,773	2,700,117	10,995,998	669,012
1970	15,863,385	15,338,937	1,925,908	2,974,890	10,438,139	524,448
1971	16,153,756	15,542,512	1,980,141	3,143,030	10,419,341	611,244
1972	17,097,951	16,495,895	2,186,937	3,360,759	10,948,199	602,056
1973	17,574,486	16,800,153	2,232,006	3,349,423	11,218,724	774,333
1974	18,176,457	17,410,128	2,387,681	3,787,559	11,234,888	766,329
1975	19,859,548	19,038,818	2,588,427	4,141,281	12,309,110	820,730
1976	21,616,382	20,779,658	2,767,454	4,851,878	13,160,326	836,724
1977	24,817,577	23,450,377	3,258,640	5,255,475	14,936,262	1,367,200
1978	27,140,849	25,845,137	3,698,604	5,908,154	16,238,379	1,295,712
1979	29,620,597	28,145,142	4,192,665	6,342,340	17,610,137	1,475,455
1980	31,386,095	29,830,432	4,674,156	6,923,222	18,233,054	1,555,663
1981	34,589,634	33,103,924	5,041,295	7,171,485	20,891,144	1,485,710
1982	37,822,363	36,432,589	5,481,605	7,540,580	23,410,404	1,389,774
1983	40,009,032	38,711,537	6,260,131	7,993,394	24,458,012	1,297,495
1984	44,012,149	42,224,865	7,067,359	7,911,414	27,246,092	1,787,284
1985	50,180,369	48,359,565	7,818,682	8,314,739	32,226,144	1,820,804
1986	52,951,181	51,412,364	8,153,076	8,349,123	34,910,165	1,538,817
1987	57,099,656	55,253,693	8,942,425	8,998,096	37,313,172	1,845,963
1988	58,826,512	56,769,425	9,473,618	9,176,527	38,119,280	2,057,087
1989	63,571,605	61,406,484	10,602,011	10,163,520	40,640,953	2,165,121
1990	65,831,189	63,559,471	11,285,593	10,336,771	41,937,107	2,271,718
1991	64,147,951	61,295,152	12,170,794	11,797,583	37,326,775	2,852,799
1992	68,577,184	65,592,590	12,489,864	12,000,734	41,101,992	2,984,594
1993	70,414,697	67,314,025	13,399,121	13,491,376	40,423,528	3,100,672
1994	69,450,776	67,235,390	13,523,476	13,887,733	39,824,181	2,215,386
1995	70,442,935	68,186,798	13,877,031	14,557,365	39,752,402	2,256,137
1996	69,399,164	67,653,047	14,464,035	13,795,729	39,393,283	1,746,117
1997	71,753,430	69,826,779	14,941,892	14,423,397	40,461,490	1,926,651
1998	73,913,988	72,100,724	15,613,012	15,309,257	41,178,455	1,813,264
1999	77,386,368	75,340,622	17,443,653	16,083,861	41,813,108	2,045,746
2000	80,403,169 r	75,910,322 r	19,569,849	18,900,781	37,439,692 r	4,492,847
2001	88,562,348 r	84,492,520 r	21,958,136	22,755,600	39,778,784 r	4,069,828
2002	98,013,347 r	93,708,604 r	23,668,345	24,338,366	45,701,893 r	4,304,743
2003	107,793,778 r	103,527,260 r	24,751,441	26,320,402	52,455,417 r	4,266,518
2004	116,068,604 r	112,074,452 r	26,120,663	27,237,148	58,716,641 r	3,994,152
2005	122,618,991 r	118,847,864 r	27,140,335	26,597,910	65,109,619 r	3,771,127
2006	123,854,731 r	121,729,949 r	26,584,592	26,951,058	68,194,299 r	2,124,782
2007	129,431,246 r	127,262,861 r	26,865,786	27,227,779	73,169,296 r	2,168,385
2008	129,049,527	127,105,666	27,153,966	26,739,712	73,211,988	1,943,861

Appendix table 4-30

Federal obligations for research and development, by character of work and R&D plant: FY 1953–2009

Fiscal year	Total	Total R&D	Basic research	Applied research	Development	R&D plant
2009 ^a	136,996,492	133,348,969	32,877,860	30,830,948	69,640,161	3,647,524
Constant FY 2005 \$thousands						
1953	13,362,861	11,834,420	715,148	NA	NA	1,528,440
1954	11,688,275	10,736,380	707,087	NA	NA	951,895
1955	13,614,837	12,361,505	786,385	NA	NA	1,253,331
1956	19,251,049	17,608,739	1,216,506	3,803,807	12,588,427	1,642,310
1957	24,938,847	22,340,915	1,490,614	3,762,494	17,087,807	2,597,932
1958	27,060,204	25,205,306	1,845,245	4,105,152	19,254,909	1,854,898
1959	38,709,837	36,377,772	2,532,505	4,751,478	29,093,788	2,332,065
1960	43,370,988	40,535,405	3,168,943	6,882,099	30,484,364	2,835,582
1961	50,857,718	47,954,595	4,311,874	8,805,881	34,836,840	2,903,123
1962	57,953,188	53,874,068	5,163,948	10,567,963	38,142,157	4,079,120
1963	70,645,703	64,605,021	5,955,290	12,182,782	46,466,949	6,040,683
1964	78,302,862	72,689,596	6,658,150	13,139,765	52,891,681	5,613,265
1965	79,045,442	73,364,704	7,206,170	14,115,266	52,043,268	5,680,738
1966	79,541,003	75,321,209	7,763,918	15,147,817	52,409,474	4,219,794
1967	81,701,696	78,747,494	8,793,935	13,270,810	56,682,749	2,954,202
1968	76,047,115	73,268,329	8,470,143	13,531,983	51,266,203	2,778,785
1969	71,754,949	68,811,650	8,555,974	11,879,089	48,376,586	2,943,300
1970	66,235,428	64,045,666	8,041,370	12,421,253	43,583,044	2,189,762
1971	64,229,646	61,799,252	7,873,324	12,497,137	41,428,791	2,430,394
1972	64,912,494	62,626,784	8,302,722	12,759,146	41,564,916	2,285,710
1973	63,930,469	61,113,689	8,119,338	12,184,151	40,810,200	2,816,781
1974	61,698,768	59,097,515	8,104,823	12,856,616	38,136,076	2,601,253
1975	61,012,436	58,490,992	7,952,157	12,722,829	37,816,006	2,521,444
1976	61,955,810	59,557,633	7,931,940	13,906,214	37,719,478	2,398,177
1977	66,180,205	62,534,339	8,689,707	14,014,600	39,830,032	3,645,867
1978	67,801,272	64,564,419	9,239,580	14,759,316	40,565,523	3,236,852
1979	68,486,929	65,075,473	9,694,023	14,664,370	40,717,080	3,411,457
1980	66,679,615	63,374,617	9,930,223	14,708,354	38,736,040	3,304,999
1981	66,891,576	64,018,418	9,749,168	13,868,662	40,400,588	2,873,158
1982	68,456,766	65,941,338	9,921,457	13,648,109	42,371,772	2,515,428
1983	69,363,786	67,114,315	10,853,209	13,858,173	42,402,933	2,249,471
1984	73,586,606	70,598,336	11,816,350	13,227,577	45,554,409	2,988,270
1985	81,263,755	78,315,085	12,661,833	13,465,164	52,188,087	2,948,670
1986	83,810,036	81,374,429	12,904,520	13,214,820	55,255,089	2,435,608
1987	88,035,239	85,189,166	13,787,273	13,873,105	57,528,788	2,846,073
1988	87,879,462	84,806,431	14,152,402	13,708,585	56,945,444	3,073,031
1989	91,417,321	88,303,831	15,245,917	14,615,358	58,442,555	3,113,490
1990	91,305,394	88,154,606	15,652,695	14,336,714	58,165,197	3,150,788
1991	85,724,911	81,912,538	16,264,592	15,765,847	49,882,099	3,812,373
1992	89,316,468	85,429,265	16,267,080	15,630,026	53,532,159	3,887,202
1993	89,723,110	85,772,203	17,073,294	17,190,846	51,508,063	3,950,907
1994	86,661,812	83,897,417	16,874,814	17,329,340	49,693,263	2,764,395
1995	86,073,967	83,317,202	16,956,294	17,787,592	48,573,316	2,756,766
1996	83,192,477	81,099,313	17,338,810	16,537,676	47,222,828	2,093,164
1997	84,465,486	82,197,503	17,589,043	16,978,690	47,629,770	2,267,982
1998	85,916,527	83,808,816	18,148,334	17,795,254	47,865,227	2,107,711
1999	88,776,377	86,429,531	20,011,074	18,451,143	47,967,314	2,346,846
2000	90,452,434	85,398,045	22,015,805	21,263,113	42,119,127	5,054,390
2001	97,331,957	92,859,127	24,132,472	25,008,902	43,717,754	4,472,830
2002	105,971,832	101,317,552	25,590,167	26,314,592	49,412,794	4,654,279
2003	114,164,137	109,645,478	26,214,193	27,875,876	55,555,409	4,518,659
2004	119,856,055	115,731,570	26,973,010	28,125,927	60,632,632	4,124,486
2005	122,618,991	118,847,864	27,140,335	26,597,910	65,109,619	3,771,127
2006	119,758,974	117,704,457	25,705,465	26,059,812	65,939,179	2,054,518

Appendix table 4-30

Federal obligations for research and development, by character of work and R&D plant: FY 1953–2009

Fiscal year	Total	Total R&D	Basic research	Applied research	Development	R&D plant
2007	121,486,058	119,450,780	25,216,619	25,556,391	68,677,770	2,035,278
2008	118,415,789	116,632,103	24,916,467	24,536,348	67,179,288	1,783,686
2009 ^a	124,057,314	120,754,296	29,772,580	27,918,997	63,062,719	3,303,019

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.

^aIncludes obligations from the additional federal R&D funding appropriated by the American Recovery and Reinvestment Act of 2009.

NOTES: Beginning in FY 2000, Department of the Air Force did not report BA 6.7 Operational Systems Development data because the agency misunderstood reporting requirements. During the Volume 57 data collection cycle, 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 FY 2000–06 data.

In FY 2000, National Aeronautics and Space Administration (NASA) reclassified 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, Stratospheric Observatory for Infrared Astronomy, and the James Webb Space Telescope previously reported as R&D plant. In FY 2000, National Institutes of Health reclassified all its development activities as research.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, Survey of Federal Funds for Research and Development: FY 2009–11.

Science and Engineering Indicators 2012

Appendix table 4-31

Estimated federal obligations for R&D and R&D plant, by selected agency, performer, and character of work: FY 2009

(Millions of current dollars)

Agency	Extramural performers									
	All federal obligations	Federal intramural	Business firms	United States and U.S. territories						Foreign
				Industry FFRDC	Universities and colleges	University FFRDCs	Other nonprofits	Nonprofit FFRDCs	State, local governments	
Department of Veterans Affairs	203.3	203.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Agency for International Development	0.6	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0
Environmental Protection Agency	83.7	63.2	10.0	0.0	7.8	0.0	2.3	0.0	0.1	0.2
National Aeronautics and Space Administration	1,021.6	153.2	264.9	0.7	327.4	193.4	78.4	2.3	0.3	1.2
National Science Foundation	5,623.9	20.7	126.0	0.0	4,748.4	138.4	557.2	1.3	17.4	14.4
Smithsonian Institution	152.0	152.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All other agencies	9.6	1.9	0.2	0.0	5.7	0.0	1.8	0.0	0.0	0.0
Applied research										
All agencies	30,830.9	7,802.0	4,653.1	2,392.2	11,939.9	183.8	3,013.3	402.9	249.2	194.5
Department of Agriculture	1,154.0	684.0	16.3	0.0	430.4	0.0	14.1	0.0	7.6	1.5
Department of Commerce	820.8	587.0	41.2	0.0	176.9	2.2	12.7	0.3	0.6	0.0
Department of Defense	5,071.4	1,549.7	2,557.7	56.7	660.5	29.1	157.7	30.5	0.7	28.9
Department of Education	198.4	9.6	8.3	0.0	145.1	0.0	35.4	0.0	0.0	0.0
Department of Energy	3,127.2	478.6	147.3	1,902.3	162.0	88.7	56.2	283.7	8.5	0.0
Department of Health and Human Services	16,717.7	2,840.0	992.0	374.0	9,683.1	31.8	2,521.8	30.5	97.9	146.6
Department of Homeland Security	245.9	116.2	50.0	40.1	18.1	5.9	7.5	6.9	0.8	0.3
Department of the Interior	610.5	497.2	40.0	0.0	60.8	0.0	2.1	0.0	9.2	1.1
Department of Justice	71.5	9.0	16.6	0.0	33.1	0.0	7.3	0.0	5.5	0.0
Department of Transportation	586.7	171.0	185.1	1.6	50.5	6.6	33.4	22.9	115.3	0.3
Department of Veterans Affairs	274.0	274.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Agency for International Development	159.6	10.6	10.9	0.0	29.7	0.0	101.2	0.0	0.0	7.2
Environmental Protection Agency	384.4	286.8	47.8	0.0	37.2	0.0	11.1	0.0	0.5	0.8
National Aeronautics and Space Administration	681.8	190.1	357.8	0.1	91.3	12.6	24.7	4.2	0.7	0.4
National Science Foundation	471.3	1.3	104.6	0.0	345.8	0.1	13.6	3.4	0.1	2.6
Smithsonian Institution	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All other agencies	255.8	97.0	77.5	17.4	15.4	6.9	14.4	20.7	1.8	4.7
Development										
All agencies	69,640.2	17,116.4	47,017.1	983.9	1,390.5	1,214.4	546.7	1,126.1	46.2	198.8
Department of Agriculture	191.7	172.7	0.0	0.0	17.4	0.0	1.2	0.0	0.1	0.3
Department of Commerce	187.8	145.3	18.2	0.0	22.5	0.0	1.1	0.0	0.7	0.0
Department of Defense	61,306.5	15,377.6	43,466.3	255.6	774.5	287.0	275.3	669.8	7.7	192.7
Department of Education	119.7	5.8	12.4	0.0	69.3	0.0	31.8	0.0	0.5	0.0
Department of Energy	2,701.8	451.5	878.2	700.5	126.1	103.4	63.6	369.9	8.7	0.0
Department of Health and Human Services	94.1	32.4	0.0	0.0	25.3	0.0	33.1	0.0	3.3	0.0
Department of Homeland Security	325.3	113.3	63.0	27.7	16.6	6.3	43.7	52.8	2.0	0.0
Department of the Interior	74.8	62.5	1.5	0.0	6.9	0.0	0.5	0.0	3.4	0.0
Department of Justice	22.5	16.1	0.0	0.0	0.3	0.0	0.0	0.0	6.1	0.0
Department of Transportation	239.2	55.4	128.0	0.0	12.2	0.0	7.0	23.0	13.2	0.5
Department of Veterans Affairs	32.7	32.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Agency for International Development	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Environmental Protection Agency	84.7	64.0	10.2	0.0	7.9	0.0	2.4	0.0	0.1	0.2
National Aeronautics and Space Administration	4,233.5	573.1	2,428.0	0.2	311.7	817.7	86.6	10.7	0.5	5.1
National Science Foundation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Smithsonian Institution	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All other agencies	25.7	13.9	11.2	0.0	0.0	0.0	0.5	0.0	0.0	0.0
R&D plant										
All agencies	3,647.5	804.6	375.8	127.7	606.9	706.6	154.4	868.3	1.2	2.0
Department of Agriculture	77.5	77.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Department of Commerce	386.4	333.3	0.0	0.0	47.6	0.0	5.5	0.0	0.0	0.0

Appendix table 4-31

Estimated federal obligations for R&D and R&D plant, by selected agency, performer, and character of work: FY 2009

(Millions of current dollars)

Agency	Extramural performers									
	All federal obligations	Federal intramural	Business firms	United States and U.S. territories						Foreign
				Industry FFRDC	Universities and colleges	University FFRDCs	Other nonprofits	Nonprofit FFRDCs	State, local governments	
Department of Defense	117.2	17.5	99.6	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Department of Education	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Department of Energy	1,672.3	5.4	80.5	127.4	10.8	614.3	0.0	834.0	0.0	0.0
Department of Health and Human Services	151.9	96.8	0.0	0.0	37.7	0.0	17.4	0.0	0.0	0.0
Department of Homeland Security	311.1	153.1	119.3	0.3	0.3	0.0	2.8	34.3	0.9	*
Department of the Interior	6.4	0.0	6.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Department of Justice	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Department of Transportation	20.3	0.0	20.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Department of Veterans Affairs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Agency for International Development	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Environmental Protection Agency	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
National Aeronautics and Space Administration	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
National Science Foundation	829.6	46.3	49.2	0.0	510.4	92.3	128.7	0.0	0.0	0.0
Smithsonian Institution	74.7	74.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All other agencies	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.3	2.0

FFRDC = federally funded research and development center

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

NOTES: Detail may not add to total because of rounding. Agencies with total annual R&D of \$100 million or more. Includes obligations from the additional federal R&D funding appropriated by the American Recovery and Reinvestment Act of 2009. All other agencies includes Department of Housing and Urban Development, Department of Labor, Department of State, Department of the Treasury, Appalachian Regional Commission, Federal Communications Commission, Federal Trade Commission, Library of Congress, National Archives and Records Commission, Nuclear Regulatory Commission, Social Security Administration.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, Federal Funds for Research and Development: FY 2009–11.

Science and Engineering Indicators 2012

Appendix table 4-32

Discrepancy between federal R&D support, as reported by performers and federal agencies: 1985–2009

(Billions of dollars)

Year	All performers			Business performers ^a		
	Performer reported	Agency reported	Difference	Performer reported	Agency reported	Difference
1985	52.6	48.4	4.2	25.3	21.7	3.6
1986	54.6	51.4	3.2	26.0	24.2	1.8
1987	58.6	55.3	3.3	28.8	26.8	2.0
1988	60.1	56.8	3.3	28.2	26.7	1.5
1989	60.5	61.4	-0.9	26.4	28.6	-2.2
1990	61.6	63.6	-2.0	25.8	29.4	-3.6
1991	60.8	61.3	-0.5	24.1	26.4	-2.3
1992	60.9	65.6	-4.7	22.4	29.8	-7.4
1993	60.5	67.3	-6.8	20.8	30.2	-9.4
1994	60.8	67.2	-6.4	20.3	30.5	-10.2
1995	63.0	68.2	-5.2	21.2	30.2	-9.0
1996	63.4	67.7	-4.3	21.4	30.4	-9.0
1997	64.6	69.8	-5.2	21.8	31.4	-9.6
1998	66.4	72.1	-5.7	22.1	32.0	-9.9
1999	67.1	75.3	-8.2	20.5	31.9	-11.4
2000	66.9	75.9	-9.0	17.1	29.4	-12.3
2001	75.0	84.5	-9.5	16.9	28.2	-11.3
2002	80.1	93.7	-13.6	16.4	34.6	-18.2
2003	86.1	103.5	-17.4	17.8	40.7	-22.9
2004	91.7	112.1	-20.4	20.3	43.8	-23.5
2005	96.3	118.9	-22.6	21.9	48.9	-27.0
2006	100.8	121.7	-20.9	24.3	52.8	-28.5
2007	105.8	127.3	-21.5	26.6	55.3	-28.7
2008	117.6	127.1	-9.5	36.4	56.3	-19.9
2009	124.4	133.3	-8.9	39.6	53.3	-13.7

^aExcludes industry-administered federally funded research and development centers.

NOTE: Performer-reported data are expenditures; agency-reported data are obligations.

SOURCES: National Science Foundation, National Center for Science and Engineering Statistics (NSF/NCSES), National Patterns of R&D Resources (annual series); and NSF/NCSES, Federal Funds for Research and Development: FY 2009–11.

Science and Engineering Indicators 2012

Appendix table 4-33

Federally funded research and development centers, R&D expenditures: FY 2008 and FY 2009

(Thousands of current dollars)

FFRDC	FY 2008		FY 2009		Sponsoring agency	Location
	Total	Federal funding	Total	Federal funding		
All FFRDCs	14,707,088	14,262,947	15,220,621	14,784,361	na	na
University-administered FFRDCs	4,701,645	4,550,332	4,958,944	4,811,485	na	na
Ames Laboratory	27,306	27,306	29,012	29,012	Department of Energy	Ames, IA
Argonne National Laboratory	533,530	487,641	543,169	498,847	Department of Energy	Argonne, IL
Fermi National Accelerator Laboratory	340,486	336,123	376,791	374,668	Department of Energy	Batavia, IL
Jet Propulsion Laboratory	1,733,597	1,733,597	1,711,528	1,711,528	NASA	Pasadena, CA
Lawrence Berkeley National Laboratory	573,917	519,756	611,711	555,842	Department of Energy	Berkeley, CA
MA Institute of Technology Lincoln Laboratory	641,386	637,879	706,555	704,050	DOD, Department of the Air Force	Lexington, MA
National Astronomy and Ionosphere Center	12,586	12,418	14,738	14,032	NSF	Arecibo, PR
National Center for Atmospheric Research	161,130	139,667	203,627	177,877	NSF	Boulder, CO
National Optical Astronomy Observatory	55,922	50,165	56,972	52,089	NSF	Tucson, AZ
National Radio Astronomy Observatory	146,098	145,953	151,396	149,960	NSF	Green Bank, WV
Princeton Plasma Physics Laboratory	78,154	78,039	81,113	80,985	Department of Energy	Princeton, NJ
SLAC National Accelerator Laboratory	234,316	234,316	294,421	294,421	Department of Energy	Stanford, CA
Software Engineering Institute	80,963	66,721	89,077	80,618	DOD, Office of the Secretary of Defense	Pittsburgh, PA
Thomas Jefferson National Accelerator Facility	82,254	80,751	88,834	87,556	Department of Energy	Newport News, VA
Nonprofit-administered FFRDCs	3,689,108	3,536,795	3,827,802	3,687,331	na	na
Aerospace FFRDC	38,940	16,349	41,470	14,386	DOD, Department of the Air Force	El Segundo, CA
Arroyo Center	23,852	23,852	27,692	27,692	DOD, Department of the Army	Santa Monica, CA
Brookhaven National Laboratory	480,455	459,348	569,240	545,267	Department of Energy	Upton, NY
C3I FFRDC	52,053	52,053	46,790	46,790	DOD, Office of the Secretary of Defense	Bedford, MA/McLean, VA
Center for Advanced Aviation System Development	7,470	7,470	10,575	10,575	FAA	McLean, VA
Center for Communications and Computing	59,500	59,500	66,293	66,293	National Security Agency	Alexandria, VA
Center for Enterprise Modernization ^a	9,679	9,679	7,458	7,458	IRS	McLean, VA
Center for Naval Analyses	106,967	94,552	109,694	95,128	DOD, Department of the Navy	Alexandria, VA
Center for Nuclear Waste Regulatory Analyses	17,960	17,169	16,614	15,715	Nuclear Regulatory Commission	San Antonio, TX
Homeland Security Institute ^b	27,400	27,400	na	na	Department of Homeland Security	Arlington, VA
Homeland Security Studies and Analysis Institute ^b	na	na	32,173	32,173	Department of Homeland Security	Arlington, VA
Homeland Security Systems Engineering and Development Institute ^b	na	na	1,559	1,559	Department of Homeland Security	McLean, VA
National Biodefense Analysis and Countermeasures Center ^c	12,979	12,979	19,934	19,934	Department of Homeland Security	Frederick, MD
National Defense Research Institute	40,051	40,051	42,265	42,265	DOD, Office of the Secretary of Defense	Santa Monica, CA
National Renewable Energy Laboratory	229,399	219,296	273,640	264,828	Department of Energy	Golden, CO
Oak Ridge National Laboratory	1,251,336	1,205,784	1,259,259	1,217,301	Department of Energy	Oak Ridge, TN
Pacific Northwest National Laboratory	1,136,773	1,097,019	1,086,884	1,063,705	Department of Energy	Richland, WA
Project Air Force	41,794	41,794	45,162	45,162	DOD, Department of the Air Force	Santa Monica, CA
The Science and Technology Policy Institute	6,000	6,000	5,100	5,100	NSF	Washington, DC
Studies and Analyses Center	146,500	146,500	166,000	166,000	DOD, Office of the Secretary of Defense	Alexandria, VA
Industry-administered FFRDCs	6,316,335	6,175,820	6,433,875	6,285,545	na	na
Idaho National Engineering and Environmental Laboratory	236,037	224,273	388,062	372,502	Department of Energy	Idaho Falls, ID

Appendix table 4-33

Federally funded research and development centers, R&D expenditures: FY 2008 and FY 2009

(Thousands of current dollars)

FFRDC	FY 2008		FY 2009		Sponsoring agency	Location
	Total	Federal funding	Total	Federal funding		
Lawrence Livermore National Laboratory ^d	1,301,874	1,248,594	1,321,633	1,261,769	Department of Energy	Livermore, CA
Los Alamos National Laboratory ^e	2,073,538	2,051,550	2,172,179	2,141,950	Department of Energy	Los Alamos, NM
NCI Frederick Cancer R&D Center	509,700	509,700	378,200	378,200	NIH	Frederick, MD
Sandia National Laboratory	2,076,786	2,023,303	2,043,509	2,000,832	Department of Energy	Albuquerque, NM
Savannah River Technology Center	118,400	118,400	130,292	130,292	Department of Energy	Aiken, SC

na = not applicable

DOD = Department of Defense; FAA = Federal Aviation Administration; FFRDC = federally funded research and development center; IRS = Internal Revenue Service; NASA = National Aeronautics and Space Administration; NCI = National Cancer Institute; NIH = National Institutes of Health; NSF = National Science Foundation

^aIn prior year tables the Center for Enterprise Modernization was listed as the Internal Revenue Service FFRDC.

^bOn 5 March 2009 Homeland Security Studies and Analysis Institute and Homeland Security Systems Engineering and Development Institute were created. These new FFRDCs replaced Homeland Security Institute.

^cNational Biodefense Analysis and Countermeasures Center was established as an FFRDC by Department of Homeland Security on 20 December 2006.

^dPrior to FY 2008, Lawrence Livermore National Laboratory was administered by University of California. On 1 October 2007 administration was transferred to Lawrence Livermore National Security LLC.

^ePrior to FY 2007 Los Alamos National Laboratory was administered by University of California. On 1 June 2006 administration was transferred to Los Alamos National Security LLC.

NOTES: Totals differ from those reported in tables 4-1 and 4-3 for FFRDCs because data in tables 4-1 and 4-3 have been adjusted from a fiscal-year basis to a calendar-year basis.

More information about the FFRDCs can be found on NSF website, <http://www.nsf.gov/statistics/ffrdc/>.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, Survey of Research and Development Expenditures at FFRDCs, FY 2009.

Science and Engineering Statistics 2012

Appendix table 4-34

Federal obligations for research, by agency and S&E field: FY 2009

Agency	All federal obligations	Environmental sciences	Life sciences	Mathematics and computer	Physical sciences	Psychology	Social sciences	Other sciences, nec	Engineering
				sciences					
Current \$thousands									
All agencies	63,708,807	3,751,416	33,267,736	3,612,518	5,823,381	2,086,663	1,159,294	3,713,351	10,294,449
Departments									
Department of Agriculture	2,077,954	19,339	1,737,019	9,608	105,838	0	160,130	0	46,019
Department of Commerce	959,104	316,256	115,249	84,502	204,357	615	19,104	18,313	200,708
Department of Defense	6,806,471	390,476	923,807	913,224	832,854	69,367	38,921	144,988	3,492,833
Department of Education	202,641	0	12,486	0	0	11,183	172,621	0	6,351
Department of Energy	7,188,114	373,426	349,151	1,002,197	2,612,466	0	0	375,244	2,475,629
Department of Health and Human Services	35,489,910	544,843	27,929,657	187,062	296,785	1,904,199	293,782	2,579,461	1,754,122
Department of Homeland Security	347,202	4,249	91,496	49,293	42,679	10,940	18,041	21,216	109,288
Department of Housing and Urban Development	11,651	0	0	0	0	0	11,589	36	26
Department of Interior	657,608	421,941	210,350	8,970	1,647	0	6,922	268	7,511
Department of Justice	80,864	0	5,980	25,408	3,053	0	36,870	0	9,552
Department of Labor	29,198	0	0	0	0	0	24,740	4,458	0
Department of State	3,724	0	0	0	0	0	3,724	0	0
Department of Transportation	586,739	34,573	36,249	34,056	95	18,727	11,724	44,269	407,046
Department of the Treasury	67,042	0	0	0	2,134	0	0	64,908	0
Department of Veterans Affairs	477,300	0	401,060	0	0	54,263	0	0	21,977
Other agencies									
Agency for International Development	160,129	3,212	140,976	0	0	0	10,060	5,881	0
Appalachian Regional Commission	991	0	0	0	0	0	991	0	0
Environmental Protection Agency	468,074	162,648	219,247	11,321	12,901	0	2,300	0	59,657
Federal Communications Commission	6,879	0	0	525	1,050	0	1,884	0	3,420
Federal Trade Commission	2,389	0	0	0	0	0	2,389	0	0
Library of Congress	483	0	0	0	483	0	0	0	0
National Aeronautics and Space Administration	1,703,453	395,168	96,740	28,855	468,501	6,316	314	87,096	620,463
National Archives and Records Administration	4,620	50	0	4,500	70	0	0	0	0
National Science Foundation	6,095,193	1,078,815	933,678	1,252,996	1,181,285	11,053	252,761	365,957	1,018,649
Nuclear Regulatory Commission	61,198	0	0	0	0	0	0	0	61,198
Smithsonian Institution	152,000	6,419	64,592	0	57,182	0	22,550	1,257	0
Social Security Administration	67,878	0	0	0	0	0	67,878	0	0
Share by field, percent									
All agencies	100.0	5.9	52.2	5.7	9.1	3.3	1.8	5.8	16.2
Departments									
Department of Agriculture	100.0	0.9	83.6	0.5	5.1	0.0	7.7	0.0	2.2
Department of Commerce	100.0	33.0	12.0	8.8	21.3	0.1	2.0	1.9	20.9
Department of Defense	100.0	5.7	13.6	13.4	12.2	1.0	0.6	2.1	51.3
Department of Education	100.0	0.0	6.2	0.0	0.0	5.5	85.2	0.0	3.1
Department of Energy	100.0	5.2	4.9	13.9	36.3	0.0	0.0	5.2	34.4
Department of Health and Human Services	100.0	1.5	78.7	0.5	0.8	5.4	0.8	7.3	4.9
Department of Homeland Security	100.0	1.2	26.4	14.2	12.3	3.2	5.2	6.1	31.5

Appendix table 4-34

Federal obligations for research, by agency and S&E field: FY 2009

Agency	All federal obligations	Environmental sciences	Life sciences	Mathematics and computer 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	99.5	0.3	0.2
Department of Interior	100.0	64.2	32.0	1.4	0.3	0.0	1.1	0.0	1.1
Department of Justice	100.0	0.0	7.4	31.4	3.8	0.0	45.6	0.0	11.8
Department of Labor	100.0	0.0	0.0	0.0	0.0	0.0	84.7	15.3	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	5.9	6.2	5.8	0.0	3.2	2.0	7.5	69.4
Department of the Treasury	100.0	0.0	0.0	0.0	3.2	0.0	0.0	96.8	0.0
Department of Veterans Affairs	100.0	0.0	84.0	0.0	0.0	11.4	0.0	0.0	4.6
Other agencies									
Agency for International Development	100.0	2.0	88.0	0.0	0.0	0.0	6.3	3.7	0.0
Appalachian Regional Commission	100.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0
Environmental Protection Agency	100.0	34.7	46.8	2.4	2.8	0.0	0.5	0.0	12.7
Federal Communications Commission	100.0	0.0	0.0	7.6	15.3	0.0	27.4	0.0	49.7
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	23.2	5.7	1.7	27.5	0.4	0.0	5.1	36.4
National Archives and Records Administration	100.0	1.1	0.0	97.4	1.5	0.0	0.0	0.0	0.0
National Science Foundation	100.0	17.7	15.3	20.6	19.4	0.2	4.1	6.0	16.7
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	4.2	42.5	0.0	37.6	0.0	14.8	0.8	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

NOTES: Research includes basic research and applied research. Includes obligations from the additional federal R&D funding appropriated by the American Recovery and Reinvestment Act of 2009.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, Federal Funds for Research and Development: FY 2009–11

Science and Engineering Indicators 2012

Appendix table 4-35

Federal obligations for research, by detailed S&E field: Selected years, FY 1989–2009

Field of science and engineering	1989	1994	1999	2004	2005	2006	2007	2008	2009	Average annual growth rates in major fields		
										1989–2009	1999–2009	2004–09
										Percent		
	Current \$millions											
Total, all fields	20,765.5	27,411.2	33,527.5	53,357.8	53,738.2	53,535.7	54,093.6	53,893.7	63,708.8	5.8	6.6	3.6
Environmental sciences	1,773.2	2,838.2	3,095.3	3,741.6	3,502.6	3,430.6	3,170.5	2,984.6	3,751.4	3.8	1.9	0.1
Atmospheric sciences	588.0	1,095.0	1,176.5	1,259.7	1,185.1	1,166.9	964.6	884.5	1,018.2	–	–	–
Geological sciences	542.8	838.0	660.2	704.5	673.5	653.9	638.0	517.5	754.2	–	–	–
Oceanography	491.9	496.8	656.6	809.1	771.5	745.8	787.8	788.7	834.2	–	–	–
Environmental sciences, nec	150.5	408.5	602.0	968.4	872.5	864.0	780.1	793.9	1,144.8	–	–	–
Life sciences	8,495.1	11,284.3	15,422.5	27,728.5	28,127.8	27,927.7	29,463.6	28,918.8	33,267.7	7.1	8.0	3.7
Biological and agricultural	5,020.0	6,103.0	8,047.7	14,848.7	15,144.8	15,485.6	16,326.3	na	na	–	–	–
Agricultural	669.0	727.2	849.4	1,086.8	1,094.2	1,108.2	1,139.4	1,020.3	1,120.4	–	–	–
Biological (excluding environmental)	3,983.2	4,745.8	6,477.6	13,091.9	13,351.6	13,690.8	14,429.7	14,443.1	17,377.0	–	–	–
Environmental biology	367.8	629.9	720.6	670.0	699.0	686.6	757.2	858.0	963.7	–	–	–
Medical sciences	3,222.5	4,862.1	6,801.2	10,898.8	10,862.1	10,592.2	10,790.7	10,387.3	11,392.7	–	–	–
Clinical medical	na	na	na	na	na	na	na	na	na	–	–	–
Other medical	na	na	na	na	na	na	na	na	na	–	–	–
Life sciences, nec	252.6	319.3	573.6	1,981.0	2,120.9	1,849.9	2,346.5	2,210.1	2,414.0	–	–	–
Mathematics and computer sciences	735.4	1,301.6	1,980.6	2,949.4	2,983.4	2,814.9	2,945.7	3,047.3	3,612.5	8.3	6.2	4.1
Computer sciences	364.6	830.2	1,516.1	2,144.9	2,157.1	1,987.8	2,077.7	2,053.0	2,422.5	–	–	–
Mathematics	236.1	342.3	345.3	617.8	686.6	669.2	708.6	782.9	928.1	–	–	–
Mathematics and computer sciences, nec	134.8	129.1	119.2	186.7	139.7	157.9	159.4	211.4	261.8	–	–	–
Physical sciences	3,705.2	4,253.5	4,066.2	5,211.1	5,493.7	5,351.1	5,136.1	5,072.6	5,823.4	2.3	3.7	2.2
Astronomy	541.9	747.6	757.9	920.8	884.9	792.5	655.9	527.9	671.6	–	–	–
Chemistry	782.6	874.4	814.9	1,191.0	1,197.5	1,126.4	1,149.9	1,148.4	1,274.4	–	–	–
Physics	2,190.8	2,443.1	2,221.9	2,598.6	3,041.3	3,001.8	2,939.2	2,968.9	3,357.8	–	–	–
Physical sciences, nec	189.9	188.3	271.4	500.8	370.0	430.5	391.1	427.4	519.6	–	–	–
Psychology	421.7	548.4	632.6	1,854.9	1,891.8	1,747.3	1,837.9	1,740.8	2,086.7	8.3	12.7	2.4
Biological aspects	121.8	48.1	18.0	6.0	2.3	3.0	3.8	21.8	2.2	–	–	–
Social aspects	149.9	116.8	66.6	51.7	46.6	40.9	36.8	18.8	50.9	–	–	–
Psychological sciences, nec	149.9	383.4	547.9	1,797.2	1,842.8	1,703.4	1,797.3	1,700.3	2,033.7	–	–	–
Social sciences	551.0	647.4	854.9	1,089.6	1,097.1	1,123.9	1,147.1	977.0	1,159.3	3.8	3.1	1.2
Anthropology	13.9	16.2	18.3	15.0	18.0	15.1	16.1	17.4	29.4	–	–	–
Economics	166.8	193.3	216.6	204.6	215.9	202.6	250.0	212.3	232.6	–	–	–
Political science	13.5	25.4	20.2	18.7	32.7	44.6	41.2	29.2	24.6	–	–	–
Sociology	94.1	68.1	83.8	120.1	70.2	144.2	217.6	95.2	138.8	–	–	–
Social sciences, nec	262.8	344.4	516.0	731.2	760.4	717.4	622.2	622.9	733.9	–	–	–
History	na	na	na	na	na	na	na	na	na	–	–	–
Linguistics	na	na	na	na	na	na	na	na	na	–	–	–
Other social sciences	na	na	na	na	na	na	na	na	na	–	–	–
Other sciences, nec	641.6	1,058.4	1,212.1	1,916.3	2,088.9	2,461.3	1,403.1	2,177.1	3,713.4	9.2	11.8	14.1
Engineering	4,442.2	5,479.4	6,263.4	8,866.4	8,552.9	8,678.7	8,989.7	8,975.5	10,294.4	4.3	5.1	3.0
Aeronautical	986.8	1,222.7	1,609.7	1,640.8	1,276.3	1,229.2	929.2	810.3	910.7	–	–	–

Appendix table 4-35

Federal obligations for research, by detailed S&E field: Selected years, FY 1989–2009

Field of science and engineering	1989	1994	1999	2004	2005	2006	2007	2008	2009	Average annual growth rates in major fields			
										1989–2009	1999–2009	2004–09	
Astronautical	677.4	499.1	620.6	664.9	494.1	476.3	341.0	288.1	371.1	–	–	–	
Chemical	142.2	238.2	203.2	318.8	283.8	294.6	353.8	345.6	447.1	–	–	–	
Civil	229.8	277.9	328.5	330.3	279.2	352.7	461.5	488.0	678.9	–	–	–	
Electrical	843.1	741.8	698.7	890.9	1,033.5	1,035.5	1,027.5	1,046.5	1,255.1	–	–	–	
Mechanical	257.4	378.1	240.4	301.9	323.7	298.2	337.2	292.4	314.5	–	–	–	
Metallurgy and materials	521.0	851.4	788.0	1,037.2	1,184.1	1,250.0	1,479.8	1,623.9	1,723.4	–	–	–	
Engineering, nec	784.5	1,270.2	1,774.3	3,681.6	3,678.3	3,742.3	4,059.8	4,080.8	4,593.5	–	–	–	
	Constant FY 2005 \$millions												
Total, all fields	29,861.2	34,204.1	38,462.2	55,098.9	53,738.2	51,765.3	50,773.0	49,452.8	57,691.6	3.3	4.1	0.9	
Environmental sciences	2,549.9	3,541.6	3,550.9	3,863.7	3,502.6	3,317.2	2,975.9	2,738.7	3,397.1	1.4	-0.4	-2.5	
Atmospheric sciences	845.6	1,366.4	1,349.7	1,300.8	1,185.1	1,128.3	905.4	811.6	922.0	–	–	–	
Geological sciences	780.6	1,045.7	757.4	727.5	673.5	632.3	598.8	474.9	683.0	–	–	–	
Oceanography	707.4	619.9	753.2	835.5	771.5	721.1	739.4	723.7	755.4	–	–	–	
Environmental sciences, nec	216.4	509.7	690.6	1,000.0	872.5	835.4	732.2	728.5	1,036.7	–	–	–	
Life sciences	12,216.1	14,080.7	17,692.4	28,633.3	28,127.8	27,004.2	27,655.0	26,535.9	30,125.6	4.6	5.5	1.0	
Biological and agricultural	7,218.9	7,615.4	9,232.2	15,333.2	15,144.8	14,973.5	15,324.1	na	na	–	–	–	
Agricultural	962.0	907.4	974.4	1,122.3	1,094.2	1,071.6	1,069.5	936.2	1,014.6	–	–	–	
Biological (excluding environmental)	5,727.9	5,921.9	7,431.0	13,519.1	13,351.6	13,238.1	13,543.9	13,253.0	15,735.8	–	–	–	
Environmental biology	528.9	786.0	826.7	691.9	699.0	663.9	710.7	787.3	872.7	–	–	–	
Medical sciences	4,634.0	6,067.0	7,802.2	11,254.4	10,862.1	10,241.9	10,128.3	9,531.4	NA	–	–	–	
Clinical medical	na	na	na	na	na	na	na	na	na	–	–	–	
Other medical	na	na	na	na	na	na	na	na	na	–	–	–	
Life sciences, nec	363.2	398.4	658.0	2,045.6	2,120.9	1,788.7	2,202.5	2,028.0	2,186.0	–	–	–	
Mathematics and computer sciences	1,057.5	1,624.2	2,272.1	3,045.6	2,983.4	2,721.8	2,764.9	2,796.2	3,271.3	5.8	3.7	1.4	
Computer sciences	524.3	1,035.9	1,739.2	2,214.9	2,157.1	1,922.1	1,950.2	1,883.8	2,193.7	–	–	–	
Mathematics	339.5	427.1	396.1	638.0	686.6	647.1	665.1	718.4	840.4	–	–	–	
Mathematics and computer sciences, nec	193.8	161.1	136.7	192.8	139.7	152.7	149.6	194.0	237.1	–	–	–	
Physical sciences	5,328.2	5,307.6	4,664.7	5,381.1	5,493.7	5,174.1	4,820.8	4,654.6	5,273.4	-0.1	1.2	-0.4	
Astronomy	779.3	932.9	869.5	950.8	884.9	766.3	615.6	484.4	608.2	–	–	–	
Chemistry	1,125.4	1,091.1	934.8	1,229.9	1,197.5	1,089.2	1,079.3	1,053.8	1,154.0	–	–	–	
Physics	3,150.4	3,048.5	2,548.9	2,683.4	3,041.3	2,902.5	2,758.8	2,724.3	3,040.7	–	–	–	
Physical sciences, nec	273.1	235.0	311.3	517.1	370.0	416.3	367.1	392.2	470.5	–	–	–	
Psychology	606.4	684.3	725.7	1,915.4	1,891.8	1,689.5	1,725.1	1,597.4	1,889.6	5.8	10.0	-0.3	
Biological aspects	175.2	60.0	20.6	6.2	2.3	2.9	3.6	20.0	2.0	–	–	–	
Social aspects	215.6	145.7	76.4	53.4	46.6	39.5	34.5	17.3	46.1	–	–	–	
Psychological sciences, nec	215.6	478.4	628.5	1,855.8	1,842.8	1,647.1	1,687.0	1,560.2	1,841.6	–	–	–	
Social sciences	792.3	807.8	980.7	1,125.2	1,097.1	1,086.7	1,076.7	896.5	1,049.8	1.4	0.7	-1.4	
Anthropology	20.0	20.2	21.0	15.5	18.0	14.6	15.1	16.0	26.6	–	–	–	
Economics	239.9	241.2	248.5	211.3	215.9	195.9	234.7	194.8	210.6	–	–	–	
Political science	19.4	31.7	23.2	19.3	32.7	43.1	38.7	26.8	22.3	–	–	–	
Sociology	135.3	85.0	96.1	124.0	70.2	139.4	204.2	87.4	125.7	–	–	–	

Appendix table 4-35

Federal obligations for research, by detailed S&E field: Selected years, FY 1989–2009

Field of science and engineering	1989	1994	1999	2004	2005	2006	2007	2008	2009	Average annual growth rates in major fields		
										1989–2009	1999–2009	2004–09
Social sciences, nec	377.9	429.7	591.9	755.1	760.4	693.7	584.0	571.6	664.6	–	–	–
History	na	na	na	na	na	na	na	na	na	–	–	–
Linguistics	na	na	na	na	na	na	na	na	na	–	–	–
Other social sciences	na	na	na	na	na	na	na	na	na	–	–	–
Other sciences, nec	922.6	1,320.7	1,390.5	1,978.8	2,088.9	2,379.9	1,317.0	1,997.7	3,362.7	6.7	9.2	11.2
Engineering	6,388.0	6,837.3	7,185.3	9,155.7	8,552.9	8,391.7	8,437.9	8,235.9	9,322.1	1.9	2.6	0.4
Aeronautical	1,419.0	1,525.7	1,846.6	1,694.3	1,276.3	1,188.6	872.2	743.5	824.7	–	–	–
Astronautical	974.1	622.8	711.9	686.6	494.1	460.5	320.1	264.4	336.0	–	–	–
Chemical	204.5	297.2	233.1	329.2	283.8	284.9	332.1	317.1	404.9	–	–	–
Civil	330.5	346.8	376.8	341.1	279.2	341.0	433.2	447.8	614.8	–	–	–
Electrical	1,212.4	925.6	801.5	920.0	1,033.5	1,001.3	964.4	960.3	1,136.6	–	–	–
Mechanical	370.1	471.8	275.8	311.8	323.7	288.3	316.5	268.3	284.8	–	–	–
Metallurgy and materials	749.2	1,062.4	904.0	1,071.0	1,184.1	1,208.7	1,389.0	1,490.1	1,560.6	–	–	–
Engineering, nec	1,128.1	1,585.0	2,035.4	3,801.7	3,678.3	3,618.5	3,810.6	3,744.5	4,159.6	–	–	–

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

NOTES: During the Volume 45 (FY 1995–97) survey cycle, National Aeronautics and Space Administration (NASA) made a statistical adjustment to the 1994 and 1995 field of science and engineering values to diminish a computational error introduced by its software. In FY 2000, NASA reclassified 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; and National Institutes of Health reclassified all its development activities as research. Figures for FY 2009 include obligations from the additional federal R&D funding appropriated by the American Recovery and Reinvestment Act.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, Survey of Federal Funds for Research and Development: FY 2009–11.

Science and Engineering Indicators 2012

Appendix table 4-36

Federal research and experimentation tax credit claims, by NAICS industry: 1998–2008

(Thousands of current U.S. dollars)

Industry	NAICS code	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
All industries	na	5,208,204	5,280,612	7,078,533	6,355,803	5,655,666	5,488,337	5,554,011	6,363,476	7,311,124	8,259,753	8,303,369
Manufacturing	31–33	3,394,758	3,890,851	4,854,499	4,208,607	3,787,025	3,797,439	3,845,792	4,529,302	5,242,803	5,685,322	5,758,082
Food	311	26,618	28,274	37,091	33,716	30,971	49,120	50,836	71,132	82,879	76,498	80,719
Beverage and tobacco products	312	16,433	8,486	7,877	12,115	19,204	3,114	5,129	9,952	8,971	25,197	12,844
Textiles, apparel, and leather	313–16	6,676	8,992	7,828	7,787	12,286	12,091	11,179	7,944	8,973	7,707	9,042
Wood products	321	1,352	1,596	1,999	1,974	2,073	1,735	1,736	2,163	7,113	7,997	5,016
Paper, printing, and support activities	322, 323	47,729	34,566	34,822	59,463	64,289	68,927	55,476	49,864	54,044	68,185	68,643
Petroleum and coal products	324	20,447	9,532	NA	34,959	36,257	39,400	21,545	28,506	25,700	92,216	99,858
Chemicals	325	861,290	960,698	1,070,257	999,405	949,115	1,001,644	989,278	1,147,292	1,136,754	1,492,231	1,489,383
Pharmaceuticals and medicines	3254	628,384	713,343	800,555	805,558	777,856	736,269	757,626	915,201	901,555	1,224,825	1,199,930
Plastics and rubber products	326	20,934	26,256	25,050	18,884	24,218	21,245	22,596	24,796	23,517	30,419	31,366
Nonmetallic mineral products	327	11,249	10,714	8,441	9,735	9,516	9,670	8,587	9,770	9,051	10,285	12,283
Primary metals	331	6,768	6,548	6,191	6,010	8,096	8,077	7,756	10,282	19,989	36,863	32,098
Fabricated metal products	332	23,808	24,698	23,403	24,243	27,912	59,387	66,597	66,794	72,969	83,261	74,863
Machinery	333	178,546	130,311	148,768	154,210	148,668	134,808	182,417	194,382	662,624	292,349	339,851
Computer and electronic products	334	1,144,966	1,566,081	2,209,996	1,677,194	1,152,788	1,168,467	1,490,633	1,647,471	1,746,744	1,889,734	1,812,225
Computers and peripheral equipment	3341	345,842	587,412	691,381	487,777	380,276	386,140	312,726	304,176	344,322	498,230	523,865
Communications equipment	3342	362,243	432,632	650,859	433,269	220,147	212,289	213,885	285,865	386,090	393,950	333,570
Semiconductor and other electronic components	3344	338,138	426,997	739,597	567,390	411,723	461,353	841,903	917,103	855,986	824,571	771,314
Navigational, measuring, electromedical, and control instruments	3345	67,640	81,700	72,234	138,872	100,472	72,156	84,895	102,219	113,202	127,835	146,251
Electrical equipment, appliances, and components	335	119,076	136,135	177,767	180,985	163,536	117,260	122,723	188,450	229,079	168,715	217,724
Transportation equipment	336	747,814	778,059	902,710	785,699	957,277	896,992	581,824	825,671	906,354	1,107,105	1,180,968
Motor vehicles, trailers, and parts	3361–63	612,475	663,472	761,718	638,560	590,750	649,790	458,674	680,488	725,902	596,233	494,280
Aerospace products and parts	3364	108,370	95,697	122,514	130,821	348,498	220,374	105,060	129,979	169,710	486,733	659,976
Furniture and related products	337	7,256	6,217	7,497	8,899	10,374	6,610	10,788	18,593	19,622	14,704	11,240
Miscellaneous manufacturing	339	153,797	153,688	161,798	193,330	170,444	198,891	216,693	226,240	228,420	281,857	279,958
Medical equipment and supplies	3391	130,882	132,983	137,501	155,124	146,312	171,825	181,375	198,289	201,431	241,958	241,822
Nonmanufacturing	na	1,813,446	1,389,761	2,224,034	2,147,196	1,868,642	1,690,898	1,708,219	1,834,174	2,068,321	2,574,431	2,545,288
Agriculture, forestry, fishing, and hunting	11	11,859	10,494	3,927	3,024	3,491	4,499	4,220	4,183	4,205	3,934	5,054
Mining, extraction, and support activities	21	9,163	3,700	14,650	9,669	7,199	18,137	6,937	5,408	13,583	29,589	29,997
Utilities	22	21,916	18,403	10,340	8,546	6,307	4,496	10,241	20,454	32,508	54,410	48,855
Construction	23	2,286	6,744	13,031	9,360	11,060	11,002	4,884	3,424	7,353	15,000	10,278
Wholesale trade and retail trade	42, 44, 45	139,605	123,894	186,537	186,162	193,814	198,050	211,484	235,402	284,845	387,167	430,098
Transportation and warehousing	48, 49	14,237	13,664	20,840	16,186	13,722	12,681	11,515	9,040	8,473	12,334	10,593
Information	51	1,019,710	634,298	1,146,524	1,001,296	801,073	633,275	599,795	636,462	733,840	912,435	944,284
Publishing	511	698,709	277,080	707,071	623,170	493,094	357,528	275,870	285,544	361,218	492,719	579,940
Software	5112	686,171	263,723	685,882	603,049	477,847	336,344	261,122	273,545	351,279	482,232	558,749
Broadcasting and telecommunications	515–17	198,150	187,928	211,282	184,987	171,659	159,731	180,412	201,791	140,571	162,183	150,860
Finance, insurance, and real estate	52, 53	93,988	111,181	141,445	126,025	96,250	99,507	112,798	129,052	137,071	164,868	150,052
Professional, scientific, and technical services	54	419,791	417,648	611,640	649,801	576,581	549,141	609,019	651,093	725,855	853,119	787,671
Architectural, engineering, and related services	5413	14,567	33,776	42,999	43,499	28,175	23,408	33,804	42,384	37,566	46,980	50,604
Computer systems design and related services	5415	230,416	170,514	261,491	231,064	177,596	156,691	147,257	170,262	167,017	230,015	228,503
Scientific R&D services	5417	149,916	174,422	254,308	307,839	320,343	315,495	376,084	378,617	445,760	481,052	465,043

Appendix table 4-36

Federal research and experimentation tax credit claims, by NAICS industry: 1998–2008

(Thousands of current U.S. dollars)

Industry	NAICS code	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Management of companies and enterprises	55	43,108	12,537	36,706	82,295	100,337	94,894	92,007	94,833	76,846	90,557	62,091
Administrative and waste services	56	NA	NA	NA	26,060	25,914	30,788	18,956	11,859	12,405	13,291	22,373
Health care and social assistance	62	NA	NA	NA	22,102	24,105	29,356	20,796	23,609	22,526	28,478	36,625

na = not applicable; NA = not available

NAICS = North American Industry Classification System

NOTES: 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: Internal Revenue Service (IRS) Statistics of Income (SOI), special tabulations (2011).

Science and Engineering Indicators 2012

Appendix table 4-37

Corporate tax returns claiming the federal research and experimentation tax credit, by NAICS industry: 1998–2008

(Number)

Industry	NAICS code	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
All industries	na	9,849	10,019	10,495	10,389	10,254	10,369	10,244	11,290	10,788	12,548	12,736
Manufacturing	31–33	4,990	4,721	4,826	4,766	4,750	4,623	4,686	4,921	5,106	5,636	5,420
Food	311	105	99	122	132	135	121	135	162	132	166	163
Beverage and tobacco products	312	10	8	7	10	10	10	10	10	8	12	18
Textiles, apparel, and leather	313–16	41	41	36	31	30	39	38	30	67	65	83
Wood products	321	34	29	26	31	23	16	14	15	45	40	14
Paper, printing, and support activities	322, 323	127	101	110	78	97	86	86	104	114	97	96
Petroleum and coal products	324	26	27	NA	30	28	29	27	19 *	21 *	33	40
Chemicals	325	711	580	564	650	634	593	600	536	648	700	701
Pharmaceuticals and medicines	3254	381	250	247	297	275	267	314	264	292	347	343
Plastics and rubber products	326	163	113	108	118	97	116	123	168	189	183	202
Nonmetallic mineral products	327	42	36	36	27	29	42	37	58	49	54	70
Primary metals	331	31	36	55	43	43	44	39	78	79	101	116
Fabricated metal products	332	368	310	271	260	220	273	287	338	336	462	457
Machinery	333	446	417	450	425	388	344	505	474	501	591	651
Computer and electronic products	334	1,623	1,626	1,617	1,604	1,663	1,565	1,429	1,343	1,266	1,394	1,319
Computers and peripheral equipment	3341	279	252	245	346	320	256	265	279	158	199	212
Communications equipment	3342	424	377	285	345	312	287	234	235	272	238	210
Semiconductor and other electronic components	3344	555	539	596	552	564	482	492	494	408	471	400
Navigational, measuring, electromedical, and control instruments	3345	291	304	331	209	318	408	331	272	325	400	357
Electrical equipment, appliances, and components	335	418	401	397	411	536	516	497	768	622	726	555
Transportation equipment	336	162	125	195	186	191	201	192	242	269	289	291
Motor vehicles, trailers, and parts	3361–63	80	72	84	83	117	130	133	158	166	182	175
Aerospace products and parts	3364	43	34	47	53	46	44	43	65	81	84	82
Furniture and related products	337	43	38	57	32	60	20	21	39	74	78	70
Miscellaneous manufacturing	339	639	734	751	699	566	608	645	538	685	646	575
Medical equipment and supplies	3391	382	488	433	431	353	380	428	376	443	420	347
Nonmanufacturing	na	4,859	5,298	5,669	5,623	5,504	5,746	5,558	6,369	5,682	6,912	7,316
Agriculture, forestry, fishing, and hunting	11	55	36	39	35	51	60	40	61	72	100	83
Mining, extraction, and support activities	21	15	12	15	44	20	21	22	19	17	36	36
Utilities	22	44	34	29	23	18	18	17	37	47	78	129
Construction	23	31	33	11	15	31	20	21	18	29	59	56
Wholesale trade and retail trade	42, 44, 45	392	751	608	693	616	594	812	718	832	829	865
Transportation and warehousing	48, 49	18	17	21	19	17	17	23	43	39	33	58
Information	51	953	1,466	1,506	1,502	1,242	1,149	977	1,076	1,025	1,257	1,132
Publishing	511	635	858	913	975	835	761	689	592	611	544	699
Software	5112	612	840	890	952	816	442	656	565	583	515	673
Broadcasting and telecommunications	515–17	111	206	182	179	203	167	144	229	203	220	169
Finance, insurance, and real estate	52, 53	109	98	109	124	208	206	150	157	189	227	267
Professional, scientific, and technical services	54	2,383	2,645	2,959	2,887	2,900	3,446	3,304	3,335	2,961	3,699	3,932
Architectural, engineering, and related services	5413	142	211	163	136	98	326	377	415	238	452	637
Computer systems design and related services	5415	741	1,193	1,329	1,204	1,230	1,340	1,219	1,215	927	1,279	1,442
Scientific R&D services	5417	1,298	929	1,122	1,190	1,200	1,276	1,435	1,431	1,467	1,587	1,476

Appendix table 4-37

Corporate tax returns claiming the federal research and experimentation tax credit, by NAICS industry: 1998–2008

(Number)

Industry	NAICS code	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Management of companies and enterprises	55	55	39	66	52	55	50	70	326	137	178	276
Administrative and waste services	56	NA	NA	NA	47	31	82	23	420	183	197	288
Health care and social assistance	62	NA	NA	NA	137	73	64	70	106	80	80	81

* = Estimate should be used with caution because of the small number of returns on which it was based; na = not applicable; NA = not available

NAICS = North American Industry Classification System

NOTES: 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: Internal Revenue Service (IRS) Statistics of Income (SOI), special tabulations (2011).

Science and Engineering Indicators 2012

Appendix table 4-38

Federal technology transfer activity indicators, U.S. agencies with federal labs: FY 2001–09

Agency	2001	2002	2003	2004	2005	2006	2007	2008	2009
Invention disclosures and patenting									
All 10 agencies									
Inventions disclosed	3,962	4,149	5,106	5,454	4,771	5,193	4,486	4,365	4,422
Patent applications filed	2,175	2,130	2,318	1,768	1,745	1,912	1,825	1,938	2,080
Patents issued	1,610	1,511	1,631	1,391	1,012	1,284	1,405	1,272	1,494
USDA									
Inventions disclosed	118	151	121	142	125	105	126	133	153
Patent applications filed	83	90	60	81	88	83	114	123	117
Patents issued	64	53	64	50	27	39	37	30	21
DOC									
Inventions disclosed	26	17	21	25	21	14	32	40	49
Patent applications filed	12	12	5	12	12	5	8	21	19
Patents issued	21	20	9	12	10	7	3	2	7
DOD									
Inventions disclosed	1,005	1,122	1,332	1,369	534	1,056	838	1,018	831
Patent applications filed	809	829	810	517	354	691	597	590	690
Patents issued	619	617	619	426	191	472	425	462	404
DOE									
Inventions disclosed	1,527	1,498	1,469	1,617	1,776	1,694	1,575	1,460	1,439
Patent applications filed	792	711	866	661	812	726	693	904	919
Patents issued	605	551	627	520	467	438	441	370	520
EPA									
Inventions disclosed	17	16	14	18	12	12	16	9	8
Patent applications filed	14	14	23	12	13	13	15	6	3
Patents issued	12	9	8	11	9	10	10	4	9
HHS									
Inventions disclosed	434	431	472	461	452	442	447	437	389
Patent applications filed	255	262	279	216	230	166	261	164	156
Patents issued	119	116	136	167	154	164	379	278	397
DHS									
Inventions disclosed	na	na	na	NA	NA	NA	NA	10	32
Patent applications filed	na	na	na	NA	NA	NA	NA	0	2
Patents issued	na	na	na	NA	NA	NA	NA	1	2
DOI									
Inventions disclosed	6	14	9	6	4	5	7	7	4
Patent applications filed	17	12	8	6	3	2	5	7	8
Patents issued	7	13	5	9	9	5	6	1	4
NASA									
Inventions disclosed	696	775	1,485	1,612	1,682	1,713	1,487	1,297	1,373
Patent applications filed	152	166	231	207	209	219	193	166	128
Patents issued	159	128	155	189	139	146	108	135	114
DOT									
Inventions disclosed	2	0	0	0	4	3	2	3	3
Patent applications filed	3	0	0	2	5	3	2	0	1
Patents issued	0	0	0	0	2	0	3	2	1
VA									
Inventions disclosed	131	125	183	204	165	157	175	164	150
Patent applications filed	38	34	36	54	26	27	25	13	37
Patents issued	4	4	8	7	10	5	8	10	15
Licensing									
All 10 agencies									
All licenses, total active in the FY	4,391	6,063	6,497	7,567	9,577	10,186	10,352	11,098	10,913
Invention licenses	3,140	3,588	3,747	3,804	4,236	4,163	3,935	4,172	4,226
Other intellectual property licenses	1,254	2,475	2,771	3,775	5,341	6,023	6,405	6,972	6,730
USDA									
All licenses, total active in the FY	255	267	270	296	320	332	339	328	316
Invention licenses	255	267	270	296	320	332	339	328	316

Appendix table 4-38

Federal technology transfer activity indicators, U.S. agencies with federal labs: FY 2001–09

Agency	2001	2002	2003	2004	2005	2006	2007	2008	2009
Other intellectual property licenses	0	0	0	0	0	0	0	0	0
DOC									
All licenses, total active in the FY	40	41	101	125	133	111	222	29	40
Invention licenses	40	41	101	125	133	111	222	29	40
Other intellectual property licenses	0	0	0	0	0	0	0	0	0
DOD									
All licenses, total active in the FY	285	471	364	369	412	444	495	365	432
Invention licenses	283	350	361	364	406	438	460	351	386
Other intellectual property licenses	5	121	3	5	6	6	35	14	46
DOE									
All licenses, total active in the FY	2,005	3,459	3,687	4,345	5,677	5,916	5,842	6,196	5,752
Invention licenses	1,162	1,327	1,223	1,362	1,535	1,420	1,354	1,418	1,452
Other intellectual property licenses	843	2,132	2,464	2,983	4,142	4,496	4,488	4,748	4,300
EPA									
All licenses, total active in the FY	16	23	32	38	39	35	38	37	40
Invention licenses	16	23	32	38	39	35	38	37	40
Other intellectual property licenses	0	0	0	0	0	0	0	0	0
HHS									
All licenses, total active in the FY	1,367	1,356	1,423	1,424	1,532	1,535	1,418	1,675	1,584
Invention licenses	1,007	1,213	1,350	1,173	1,237	1,213	915	1,376	1,304
Other intellectual property licenses	360	143	82	251	295	322	460	352	327
DHS									
All licenses, total active in the FY	na	na	na	NA	NA	NA	NA	18	63
Invention licenses	na	na	na	NA	NA	NA	NA	0	0
Other intellectual property licenses	na	na	na	NA	NA	NA	NA	18	63
DOI									
All licenses, total active in the FY	8	8	11	13	20	21	15	19	21
Invention licenses	8	8	10	12	19	20	15	18	18
Other intellectual property licenses	0	0	1	1	1	1	0	1	1
NASA									
All licenses, total active in the FY	328	357	521	861	1,340	1,680	2,035	2,337	2,497
Invention licenses	292	290	312	338	443	482	474	486	504
Other intellectual property licenses	36	67	209	523	897	1,198	1,561	1,851	1,993
DOT									
All licenses, total active in the FY	1	0	0	1	5	5	5	5	2
Invention licenses	1	0	0	1	5	5	1	5	3
Other intellectual property licenses	0	0	0	0	0	0	0	0	0
VA									
All licenses, total active in the FY	86	81	88	95	101	112	130	153	163
Invention licenses	76	69	88	95	101	112	130	153	163
Other intellectual property licenses	10	12	12	12	0	0	0	0	0
Collaborative R&D relationships									
All 10 agencies									
CRADAs, total active in FY	3,676	5,377	5,603	6,015	5,947	7,268	7,326	6,923	7,733
Traditional CRADAs	2,837	2,858	2,316	3,546	3,962	3,666	3,819	3,664	4,219
Other collaborative R&D relationships	NA	NA	8,162	7,454	11,767	9,738	10,164	11,411	16,319
USDA									
CRADAs, total active in FY	219	225	229	205	199	195	230	252	233
Traditional CRADAs	217	222	212	185	171	163	184	202	191
Other collaborative R&D relationships	NA	NA	2,769	1,166	5,028	3,477	4,084	5,466	9,960
DOC									
CRADAs, total active in FY	247	1,883	1,903	1,969	1,906	3,008	2,778	2,390	2,386
Traditional CRADAs	188	139	92	67	80	149	154	131	77
Other collaborative R&D relationships	1,575	1,694	1,814	2,301	2,714	2,769	3,414	3,476	3,608
DOD									
CRADAs, total active in FY	1,965	1,913	2,134	2,833	3,210	2,999	2,971	2,596	2,870
Traditional CRADAs	1,418	1,376	1,523	2,425	2,736	2,424	2,383	1,993	2,247

Appendix table 4-38

Federal technology transfer activity indicators, U.S. agencies with federal labs: FY 2001–09

Agency	2001	2002	2003	2004	2005	2006	2007	2008	2009
Other collaborative R&D relationships	0	0	0	0	0	0	0	3	1
DOE									
CRADAs, total active in FY	558	680	661	610	644	631	697	711	744
Traditional CRADAs	558	680	661	610	644	631	697	711	744
Other collaborative R&D relationships	0	0	0	0	0	0	0	0	0
EPA									
CRADAs, total active in FY	48	59	91	104	107	94	84	112	155
Traditional CRADAs	45	55	77	82	95	83	67	74	51
Other collaborative R&D relationships	0	0	0	0	0	0	0	0	0
HHS									
CRADAs, total active in FY	498	470	427	220	215	164	284	453	457
Traditional CRADAs	289	261	254	119	117	92	206	295	284
Other collaborative R&D relationships	0	0	0	0	0	0	0	0	0
DHS									
CRADAs, total active in FY	na	na	na	NA	NA	NA	NA	23	23
Traditional CRADAs	na	na	na	NA	NA	NA	NA	21	22
Other collaborative R&D relationships	na	na	na	NA	NA	NA	NA	3	5
DOI									
CRADAs, total active in FY	56	52	51	61	70	82	170	170	248
Traditional CRADAs	41	42	51	45	49	31	20	33	36
Other collaborative R&D relationships	0	0	0	0	0	0	0	0	0
NASA									
CRADAs, total active in FY	1	1	0	0	1	1	1	1	1
Traditional CRADAs	1	1	0	0	1	1	1	1	1
Other collaborative R&D relationships	1,053	2,659	3,579	3,987	4,038	3,509	2,887	2,750	2,743
DOT									
CRADAs, total active in FY	82	92	96	0	57	59	36	23	22
Traditional CRADAs	78	80	96	0	55	59	36	23	0
Other collaborative R&D relationships	0	0	0	0	0	0	0	0	2
VA									
CRADAs, total active in FY	2	2	11	13	14	37	82	221	606
Traditional CRADAs	2	2	11	13	14	33	74	207	566
Other collaborative R&D relationships	0	0	0	0	0	0	0	0	0

na = not applicable; NA = data not available

CRADA = cooperative research and development agreement; DHS = Department of Homeland Security; DOC = Department of Commerce; DOD = Department of Defense; DOE = Department of Energy; DOI = Department of the Interior; DOT = Department of Transportation; EPA = Environmental Protection Agency; HHS = Department of Health and Human Services; NASA = National Aeronautics and Space Administration; USDA = Department of Agriculture; VA = Department of Veterans Affairs

NOTES: The Department of Homeland Security started to operate in early 2003; it did not start to provide technology transfer statistics until FY 2008. Invention licenses refers to inventions which are patented or could be patented. Other Intellectual Property refers to IP protected through mechanisms other than a patent, e.g., copyright. Total CRADAs refers to all agreements executed under CRADA authority (15 USC 3710a). Traditional CRADAs are collaborative R&D partnerships between a federal lab and one or more nonfederal organizations. (Nontraditional CRADAs are established for special purposes, such as material transfer or technical assistance that may result in protected information.) Federal agencies have varying authorities for other kinds of collaborative R&D relationships.

SOURCES: National Institute of Standards and Technology, *Federal Laboratory Technology Transfer, Fiscal Year 2009 Summary Report to the President and the Congress*, March 2011 (<http://www.nist.gov/tpo/publications/upload/Federal-Lab-TT-Report-FY2009.pdf>). U.S. Department of Commerce, Office of the Secretary, *Summary Report on Federal Laboratory Technology Transfer: FY 2003 Activity Metrics and Outcomes, Report to the President and the Congress*, December 2004 (<http://www.nist.gov/tpo/publications/upload/summaryreportfy2003.pdf>)

Appendix table 4-39

SBIR and STTR awards, by type of award: FY 1983–2008

Fiscal year	SBIR			STTR		
	Phase I	Phase II	Total	Phase I	Phase II	Total
1983	686	0	686	NA	NA	NA
1984	999	338	1,337	NA	NA	NA
1985	1,397	407	1,804	NA	NA	NA
1986	1,945	564	2,509	NA	NA	NA
1987	2,189	768	2,957	NA	NA	NA
1988	2,013	711	2,724	NA	NA	NA
1989	2,137	749	2,886	NA	NA	NA
1990	2,346	837	3,183	NA	NA	NA
1991	2,553	788	3,341	NA	NA	NA
1992	2,559	916	3,475	NA	NA	NA
1993	2,898	1,141	4,039	NA	NA	NA
1994	3,102	928	4,030	198	0	198
1995	3,085	1,263	4,348	238	22	260
1996	2,841	1,191	4,032	238	88	326
1997	3,371	1,404	4,775	260	89	349
1998	3,022	1,320	4,342	208	109	317
1999	3,334	1,256	4,590	251	78	329
2000	3,166	1,330	4,496	233	95	328
2001	3,215	1,533	4,748	244	93	337
2002	4,243	1,577	5,820	356	114	470
2003	4,465	1,759	6,224	397	111	508
2004	4,638	2,013	6,651	667	193	860
2005	4,300	1,871	6,171	611	221	832
2006	3,836	2,026	5,862	644	234	878
2007	3,814	1,542	5,356	634	213	847
2008	3,626	1,771	5,397	483	251	734

NA = not available

SBIR = Small Business Innovation Research program; STTR = Small Business Technology Transfer program

SOURCE: Small Business Administration, SBIR and STTR Annual Reports.

Science and Engineering Indicators 2012

Appendix table 4-40

SBIR award funding, by type of award and federal agency: FY 1983–2008

(Millions of current dollars)

Fiscal year	All	Phase I	Phase II	DOD	HHS	NASA	DOE	NSF	DHS ^a	USDA	DOT	EPA	ED	DOC
1983	44.5	44.5	0.0	20	7	5	5	5	NA	1	*	*	*	0
1984	108.4	48.0	60.4	45	23	13	16	7	NA	2	2	1	1	0
1985	199.1	69.1	130.0	78	45	29	26	10	NA	3	3	2	1	0
1986	297.9	98.5	199.4	151	57	36	29	15	NA	4	4	3	2	1
1987	350.5	109.6	240.9	194	67	32	28	17	NA	4	3	3	2	2
1988	389.1	101.9	248.9	208	73	47	30	17	NA	4	3	3	2	1
1989	431.9	107.7	321.7	233	79	52	33	19	NA	4	4	3	2	1
1990	460.7	118.1	341.8	241	84	62	39	20	NA	4	4	3	2	1
1991	483.1	127.9	335.9	241	93	69	39	22	NA	5	6	4	3	1
1992	508.4	127.9	371.2	242	102	79	43	23	NA	6	3	4	2	2
1993	698.0	154.0	490.7	385	126	86	50	29	NA	7	4	5	3	2
1994	717.6	220.4	473.6	354	133	116	53	34	NA	7	7	5	3	4
1995	834.5	232.2	601.9	414	181	118	70	42	NA	9	10	7	3	8
1996	916.3	228.9	645.8	479	189	114	62	41	NA	9	7	5	3	6
1997	1,106.9	277.6	789.1	569	252	121	75	54	NA	10	8	6	4	7
1998	1,066.7	262.3	804.4	540	267	96	76	53	NA	13	6	5	5	7
1999	1,096.5	299.5	797.0	514	314	89	81	60	NA	13	6	5	5	7
2000	1,190.2	302.0	888.2	549	355	93	86	65	NA	15	6	8	6	7
2001	1,294.3	317.0	977.3	576	412	106	87	72	NA	16	6	6	7	7
2002	1,434.7	411.4	1,023.3	621	487	110	96	78	NA	17	6	6	8	7
2003	1,670.3	455.3	1,215.0	804	531	109	94	90	NA	17	3	6	8	8
2004	1,867.6	498.8	1,368.8	929	572	106	104	90	19	19	4	8	9	9
2005	1,865.9	461.2	1,404.7	926	580	113	100	79	22	19	4	6	8	9
2006	1,883.2	411.2	1,472.0	940	573	104	104	90	30	17	3	7	9	7
2007	1,644.8	447.3	1,197.4	825	489	97	109	68	16	18	4	7	11	2
2008	1,783.7	438.2	1,345.5	896	542	99	130	62	17	19	1	3	10	6

* = ≤\$500,000; NA = not available

DHS = Department of Homeland Security; DOC = Department of Commerce; DOD = Department of Defense; DOE = Department of Energy; DOT = Department of Transportation; ED = Department of Education; EPA = Environmental Protection Agency; HHS = Department of Health and Human Services; NASA = National Aeronautics and Space Administration; NSF = National Science Foundation; SBIR = Small Business Innovation Research program; USDA = U.S. Department of Agriculture

^aDHS, established by Homeland Security Act of 2002 and formed in January 2003, held first SBIR competition in FY 2004.

NOTE: Detail may not add to total because of rounding.

SOURCE: Small Business Administration, SBIR Annual Reports.

Science and Engineering Indicators 2012

Appendix table 4-41

Small Business Technology Transfer Program award funding, by type of award and federal agency: FY 1994–2008

(Millions of current dollars)

Fiscal year	All	Phase I	Phase II	DOD	HHS	NASA	DOE	NSF	DHS ^a
1994	18.9	18.9	0.0	9	5	2	2	1	NA
1995	33.8	23.0	10.8	15	9	3	5	2	NA
1996	64.4	22.7	41.8	29	18	9	5	3	NA
1997	69.0	24.1	44.8	37	13	12	4	3	NA
1998	64.8	19.7	45.1	33	17	6	5	3	NA
1999	65.0	24.3	41.0	31	20	6	5	3	NA
2000	70.0	24.0	46.0	33	22	6	5	5	NA
2001	71.4	25.4	46.0	27	25	6	5	8	NA
2002	91.6	36.3	55.3	43	31	7	6	6	NA
2003	92.1	41.1	51.0	43	31	6	6	6	NA
2004	184.6	76.8	107.8	89	67	13	11	10	NA
2005	220.3	74.0	146.3	114	73	13	12	9	NA
2006	226.2	74.0	152.3	119	70	13	13	11	1
2007	243.0	83.0	159.0	115	77	10	15	23	2
2008	240.0	61.0	178.0	108	74	12	18	27	NA

NA = not available

DHS = Department of Homeland Security; DOD = Department of Defense; DOE = Department of Energy; HHS = Department of Health and Human Services; NASA = National Aeronautics and Space Administration; NSF = National Science Foundation

^aDHS, established by Homeland Security Act of 2002 and formed in January 2003, held first Small Business Technology Transfer (STTR) competition in FY 2006.

NOTE: Detail may not add to total because of rounding.

SOURCE: Small Business Administration, Small Business Technology Transfer Program Annual Reports.

Science and Engineering Indicators 2012

Appendix table 4-42

Technology Innovation Program summary data: FY 2008–10

Characteristic	2008	2009	2010
	Number		
Participants	31	38	9
Small businesses	12	25	9
Medium-sized businesses	5	4	0
Large businesses	0	1	0
Universities	11	6	0
Nonprofit organizations/other	3	2	0
Awards	9	20	9
JV, by type of JV lead	7	9	0
Small businesses	1	4	0
Medium-sized businesses	2	1	0
Universities	4	4	0
Single applicants	2	11	9
Small businesses	2	10	9
Medium-sized businesses	0	1	0
Universities	0	0	0
	Current \$millions		
Awards funding			
Total project funding	89	146	46
TIP share	43	71	22
To joint ventures	38	45	0
Led by small businesses	4	18	0
Led by medium-sized businesses	10	8	0
Led by universities	24	19	0
To single applicants	5	26	22
Small businesses	5	23	22
Medium-sized businesses	0	3	0
Universities	0	0	0
Industry cost-share	46	75	24
From joint ventures	42	48	0
Led by small businesses	6	20	0
Led by medium-sized businesses	10	9	0
Led by universities	26	19	0
From single applicants	4	27	24
Small businesses	4	24	24
Medium-sized businesses	0	3	0
Universities	0	0	0

JV = joint ventures; TIP = Technology Innovation Program

NOTES: Small businesses are those with <500 employees. Medium-sized businesses have ≥500 employees but revenues below Fortune 1000 firms. For multiyear projects, total funding is attributed to year award made. Participants include single applicants, JV leaders, and JV members and exclude subcontractors and informal collaborators.

SOURCE: National Institute of Standards and Technology, Technology Innovation Program, special tabulations (2011).

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Appendix table 4-43

Gross expenditures for R&D and expenditures for R&D as share of gross domestic product, for selected countries:
1981–2009

Year	United States	EU	Germany	France	United Kingdom	Japan	China	South Korea
GERD PPP \$billions								
1981	72.7	na	18.3	11.0	11.9	25.6	NA	NA
1982	81.2	na	19.9	12.5	NA	29.2	NA	NA
1983	90.4	na	21.0	13.4	12.9	33.1	NA	NA
1984	102.9	na	22.5	14.7	NA	37.1	NA	NA
1985	115.2	na	25.4	15.8	14.9	42.7	NA	NA
1986	120.6	na	26.8	16.4	15.9	44.3	NA	NA
1987	126.7	na	29.2	17.6	16.6	48.8	NA	NA
1988	134.2	na	31.2	19.1	17.6	54.4	NA	NA
1989	142.2	na	33.4	21.0	18.8	61.4	NA	NA
1990	152.4	na	35.1	23.3	19.6	69.1	NA	NA
1991	161.4	na	39.2	24.4	19.3	73.4	7.5	7.1
1992	165.8	na	39.0	25.4	19.4	74.7	8.8	8.1
1993	166.1	na	38.4	26.2	20.6	74.9	9.8	9.6
1994	169.6	na	38.6	26.7	21.5	75.7	10.3	11.7
1995	184.1	138.3	40.2	27.5	21.9	82.3	10.5	13.3
1996	197.8	143.8	41.4	28.1	22.3	83.0	11.7	14.9
1997	212.7	151.0	43.3	28.5	23.1	87.8	14.7	16.3
1998	226.9	158.7	45.2	29.3	24.0	91.1	16.3	14.6
1999	245.5	170.2	49.4	30.8	25.9	92.8	20.6	15.8
2000	268.6	184.1	52.3	33.0	27.9	98.9	27.2	18.6
2001	280.3	196.2	54.4	35.8	29.2	104.0	31.7	21.3
2002	279.2	205.8	56.7	38.2	30.6	108.2	39.6	22.5
2003	292.0	210.1	59.4	36.8	31.0	112.3	47.1	24.0
2004	303.6	218.1	61.3	38.0	32.0	117.5	57.8	27.9
2005	325.9	229.9	64.3	39.2	34.1	128.7	71.1	30.6
2006	350.9	253.5	70.2	42.0	37.0	138.6	86.7	35.3
2007	377.6	270.4	74.1	44.0	38.8	147.8	102.4	40.7
2008	403.7	294.2	81.8	46.3	40.1	148.7	120.8	43.9
2009	401.6	297.9	82.7	48.0	40.3	137.9	154.1	NA
GERD constant 2000 PPP \$billions								
1981	123.6	na	30.0	19.1	21.2	43.9	NA	NA
1982	130.0	na	30.8	20.4	NA	47.1	NA	NA
1983	139.3	na	31.3	21.1	20.7	51.4	NA	NA
1984	152.7	na	32.2	22.4	NA	55.5	NA	NA
1985	166.0	na	35.4	23.3	22.3	61.9	NA	NA
1986	169.9	na	36.6	23.7	23.4	62.9	NA	NA
1987	173.4	na	38.6	24.7	23.7	67.3	NA	NA
1988	177.6	na	39.9	25.8	24.3	72.5	NA	NA
1989	181.3	na	41.2	27.4	25.0	78.9	NA	NA
1990	187.1	na	41.6	29.3	25.1	85.4	NA	NA
1991	191.3	na	44.9	29.6	23.9	87.6	8.9	8.5
1992	192.0	na	43.7	30.1	23.5	87.1	10.2	9.4
1993	188.3	na	42.1	30.4	24.3	85.5	11.1	10.9
1994	188.3	na	41.4	30.3	24.8	84.7	11.4	13.0
1995	200.2	151.4	42.3	30.5	24.8	90.2	11.4	14.5
1996	211.0	154.1	42.8	30.6	24.5	89.2	12.4	15.9
1997	223.0	158.6	44.4	30.3	24.3	92.7	15.4	17.1
1998	235.3	164.5	46.0	30.6	25.1	95.1	16.8	15.2
1999	250.8	174.5	49.5	31.9	26.9	95.5	21.0	16.1
2000	268.6	184.1	52.3	33.0	27.9	98.9	27.2	18.6
2001	274.1	190.5	53.1	34.3	28.1	101.7	31.0	20.8
2002	268.7	194.0	53.8	35.2	28.7	103.3	38.1	21.7
2003	275.1	195.5	54.3	34.6	28.8	105.9	44.4	23.0
2004	278.1	197.6	54.2	35.2	28.6	107.7	53.0	26.0

Appendix table 4-43

Gross expenditures for R&D and expenditures for R&D as share of gross domestic product, for selected countries:
1981–2009

Year	United States	EU	Germany	France	United Kingdom	Japan	China	South Korea
2005	288.9	202.8	54.6	35.0	30.0	115.2	63.5	28.1
2006	301.3	213.4	57.4	35.7	31.2	120.5	75.0	31.9
2007	314.9	220.9	58.9	36.2	32.6	124.8	86.1	35.7
2008	329.5	231.3	63.1	36.8	32.5	123.1	99.4	38.3
2009	324.6	230.0	62.4	37.6	32.3	113.2	125.7	NA
	GERD/GDP (%)							
1981	2.34	na	2.35	1.90	2.35	2.29	NA	NA
1982	2.51	na	2.42	1.99	NA	2.38	NA	NA
1983	2.58	na	2.43	2.03	2.17	2.52	NA	NA
1984	2.64	na	2.43	2.12	NA	2.61	NA	NA
1985	2.75	na	2.60	2.17	2.20	2.73	NA	NA
1986	2.72	na	2.63	2.15	2.22	2.70	NA	NA
1987	2.70	na	2.74	2.19	2.15	2.78	NA	NA
1988	2.65	na	2.73	2.19	2.10	2.79	NA	NA
1989	2.61	na	2.71	2.23	2.11	2.88	NA	NA
1990	2.65	na	2.61	2.32	2.10	2.95	NA	NA
1991	2.72	na	2.47	2.32	2.03	2.93	0.73	1.80
1992	2.64	na	2.35	2.33	1.99	2.89	0.74	1.89
1993	2.51	na	2.28	2.38	2.02	2.83	0.70	2.06
1994	2.41	na	2.18	2.32	1.97	2.78	0.64	2.26
1995	2.50	1.66	2.19	2.29	1.91	2.91	0.57	2.30
1996	2.54	1.66	2.19	2.27	1.83	2.80	0.57	2.36
1997	2.55	1.66	2.24	2.19	1.77	2.87	0.64	2.41
1998	2.58	1.67	2.27	2.14	1.76	3.00	0.65	2.26
1999	2.63	1.72	2.40	2.16	1.82	3.02	0.76	2.17
2000	2.70	1.74	2.45	2.15	1.81	3.04	0.90	2.30
2001	2.72	1.76	2.46	2.20	1.79	3.12	0.95	2.47
2002	2.62	1.77	2.49	2.23	1.79	3.17	1.07	2.40
2003	2.62	1.76	2.52	2.17	1.75	3.20	1.13	2.49
2004	2.56	1.73	2.49	2.15	1.68	3.17	1.23	2.68
2005	2.58	1.74	2.49	2.10	1.73	3.32	1.32	2.79
2006	2.62	1.77	2.53	2.10	1.75	3.40	1.39	3.01
2007	2.69	1.77	2.53	2.07	1.78	3.44	1.40	3.21
2008	2.82	1.84	2.68	2.11	1.77	3.44	1.47	3.36
2008	2.88	1.90	2.78	2.21	1.85	3.33	1.70	NA

na = not applicable; NA = not available

EU = European Union; GDP = gross domestic product; GERD = gross expenditures for R&D; OECD = Organisation for Economic Co-operation and Development

NOTES: Conversions of foreign currencies to U.S. dollars calculated with each country's GDP implicit price deflator and with OECD purchasing power parity exchange rates. Data for United States in this table reflect international standards for calculating gross expenditures on R&D, which vary slightly from NSF protocol for tallying U.S. total R&D. EU data for all years are based on current 27 EU member countries. Data for Germany, 1981–90, are for West Germany. Data for Japan for 1996 onward may not be consistent with earlier data due to changes in methodology.

SOURCES: OECD, Main Science and Technology Indicators (2011/1).

Science and Engineering Indicators 2012

Appendix table 4-44

Gross expenditures on R&D, by performing and funding sectors, for selected countries: 2008

(Millions of current PPP dollars)

Country/R&D performer	Source of R&D funds						Performers, % distribution
	All sources	Business	Government	Higher education	Private nonprofit	Abroad	
United States	403,668	249,631	118,239	14,225	12,578	8,995	100.0
Business	290,681	245,326	36,360	0	0	8,995	72.0
Government	45,246	0	45,246	0	0	NA	11.2
Higher education	51,650	3,004	30,341	14,225	4,080	NA	12.8
Private nonprofit	16,091	1,301	6,292	0	8,498	NA	4.0
Sources, % distribution	99.9	61.8	29.3	3.5	3.1	2.2	na
Germany	81,849	55,062	23,247	0	255	3,285	99.9
Business	56,680	51,929	2,550	0	97	2,104	69.2
Government	11,499	1,064	9,653	0	158	624	14.0
Higher education	13,670	2,069	11,044	**	**	557	16.7
Private nonprofit	0	**	**	**	**	**	0.0
Sources, % distribution	100.0	67.3	28.4	0.0	0.3	4.0	na
France	46,263	23,474	18,002	576	487	3,724	99.9
Business	29,039	22,694	3,305	10	22	3,008	62.8
Government	7,375	505	6,401	22	45	402	15.9
Higher education	9,272	199	8,212	528	70	263	20.0
Private nonprofit	577	76	84	16	350	51	1.2
Sources, % distribution	99.9	50.7	38.9	1.2	1.1	8.0	na
United Kingdom	40,095	18,213	12,295	496	1,976	7,115	100.1
Business	24,857	17,338	1,635	**	38	5,846	62.0
Government	3,671	291	3,097	33	128	122	9.2
Higher education	10,624	488	7,194	449	1,480	1,013	26.5
Private nonprofit	943	96	369	14	330	134	2.4
Sources, % distribution	99.9	45.4	30.7	1.2	4.9	17.7	na
Japan	148,717	116,257	23,229	7,647	1,022	562	100.0
Business	116,687	114,991	1,073	11	93	519	78.5
Government	12,386	88	12,225	17	40	16	8.3
Higher education	17,306	517	8,973	7,615	188	13	11.6
Private nonprofit	2,338	661	958	4	701	14	1.6
Sources, % distribution	100.0	78.2	15.6	5.1	0.7	0.4	na
China	120,775	86,645	28,490	NA	NA	1,496	100.1
Business	88,480	82,083	3,807	NA	NA	1,261	73.3
Government	22,087	1,033	18,783	NA	NA	109	18.3
Higher education	10,208	3,529	5,900	NA	NA	126	8.5
Private nonprofit	NA	NA	NA	NA	NA	NA	0.0
Sources, % distribution	96.5	71.7	23.6	NA	NA	1.2	na
South Korea	43,906	31,999	11,155	442	174	136	100.0
Business	33,091	31,031	1,951	19	8	82	75.4
Government	5,294	186	5,049	4	38	17	12.1
Higher education	4,893	588	3,803	418	50	34	11.1
Private nonprofit	628	194	352	1	78	3	1.4
Sources, % distribution	100.0	72.9	25.4	1.0	0.4	0.3	na

** = included in other categories; NA = not available; na = not applicable

PPP = purchasing power parity

NOTES: Top seven R&D performing countries globally. Foreign currencies converted to dollars through purchasing power parities. Data for United States reflect international standards for calculating gross expenditures on R&D, which vary slightly from NSF protocol for tallying U.S. total R&D.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, National Patterns of R&D Resources (annual series); Organisation for Economic Co-operation and Development, special tabulations (June 2011).

Appendix table 4-45

Government budget appropriations or outlays for R&D, by socioeconomic objectives, selected countries: 2009

Socioeconomic objective	United States	Germany	France ^b	United Kingdom	Japan	China	South Korea
	Current U.S. PPP \$millions						
All objectives	164,292	25,858	16,172	15,146	31,073	NA	13,210
Defense	84,771	1,466	4,578	2,766	1,149	–	2,200
Nondefense	79,522	24,392	11,594	12,380	29,923	NA	11,010
Exploration and exploitation of Earth	1,677	477	146	407	587	–	292
Environment	565	791	438	404	305	–	606
Exploration and exploitation of space	9,060	1,317	1,451	283	2,238	–	403
Transport, telecommunication, and other infrastructures	1,536	457	156	199	1,265	–	271
Energy	3,794	1,082	964	157	4,091	–	984
Industrial production and technology	963	3,285	1,389	369	2,603	–	3,497
Health	43,927	1,244	1,154	2,749	1,255	–	1,152
Agriculture	2,629	787	303	427	1,177	–	979
Education	464	240	na	99	74	–	NA
Culture, recreation, religion, and mass media	25	277	na	290	109	–	NA
Political and social systems, structures, and processes	754	495	417	313	111	–	NA
General advancement of knowledge: R&D financed from GUF ^a	na	9,669	4,517	3,730	10,622	–	**
General advancement of knowledge: R&D financed from sources other than GUF	14,128	4,429	741	2,953	5,486	–	2,513
	Percent						
Share of all objectives	100.0	100.0	100.0	100.0	100.0	NA	100.0
Defense	51.6	5.7	28.3	18.3	3.7	–	16.7
Nondefense	48.4	94.3	71.7	81.7	96.3	–	83.3
Share of nondefense objectives	99.9	100.6	100.8	100.0	100.0	NA	97.3
Exploration and exploitation of Earth	2.1	2.0	1.3	3.3	2.0	–	2.7
Environment	0.7	3.2	3.8	3.3	1.0	–	5.5
Exploration and exploitation of space	11.4	5.4	12.5	2.3	7.5	–	3.7
Transport, telecommunication, and other infrastructures	1.9	1.9	1.3	1.6	4.2	–	2.5
Energy	4.8	4.4	8.3	1.3	13.7	–	8.9
Industrial production and technology	1.2	13.5	12.0	3.0	8.7	–	31.8
Health	55.2	5.1	10.0	22.2	4.2	–	10.5
Agriculture	3.3	3.2	2.6	3.4	3.9	–	8.9
Education	0.6	1.0	na	0.8	0.2	–	NA
Culture, recreation, religion, and mass media	0.0	1.1	na	2.3	0.4	–	NA

Appendix table 4-45

Government budget appropriations or outlays for R&D, by socioeconomic objectives, selected countries: 2009

Socioeconomic objective	United States	Germany	France ^b	United Kingdom	Japan	China	South Korea
Political and social systems, structures, and processes	0.9	2.0	3.6	2.5	0.4	–	NA
General advancement of knowledge: R&D financed from GUF ^a	na	39.6	39.0	30.1	35.5	–	**
General advancement of knowledge: R&D financed from sources other than GUF	17.8	18.2	6.4	23.9	18.3	–	22.8

** = included in other categories; na = not applicable; NA = not available

GUF = general university funds; PPP = purchasing power parity

^aUnited States and South Korea do not have a category equivalent to general university funds (GUF).

^bData for France are for 2008, the most recent year available.

NOTES: United States data are based on federal budget authority. Socioeconomic objective categories reflect the new NABS 2007 classifications (Nomenclature for the Analysis and Comparison of Scientific Programs and Budgets). Conversions of foreign currencies to U.S. dollars are based on purchasing power parity exchange rates. Because of GUF and slight differences in accounting practices, distribution of government budgets among socioeconomic objectives may not completely reflect actual distribution of government-funded research in particular objectives. Detail may not add to total because of rounding.

SOURCES: National Science Foundation, National Center for Science and Engineering Statistics, Federal R&D Budget Authority by Spending Category, FY 2009–11; Organization for Economic Co-operation and Development, special tabulations (2011).

Science and Engineering Indicators 2012

Appendix table 4-46

Share of business expenditures for R&D, by industry and selected country/economy: 2007–10

(Percent)

Industry	ISIC	Australia	Austria	Belgium	Czech	France	Germany	Greece	Hungary	Israel	Italy	Japan	South	Mexico
		2010	2007	2007	Republic	2007	2008	2007	2008	2010	2010	2009	Korea	2007
Total business enterprise		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Manufacturing	15–37	26.6	69.8	68.1	65.8	83.6	89.0	46.0	73.1	32.9	73.0	87.1	88.6	69.3
Food products, beverages, and tobacco	15–16	2.7	0.6	2.1	0.9	2.1	0.6	2.5	1.2	NA	1.6	2.0	1.3	10.9
Textiles, textile products, leather, and footwear	17–19	0.2	0.7	1.2	0.8	0.7	0.4	0.5	0.0	NA	3.7	1.0	0.6	4.7
Wood, paper, printing, and publishing	20–22	1.4	0.9	0.5	0.1	0.4	0.5	0.6	0.5	NA	0.6	0.7	0.2	0.7
Chemical, rubber, plastics, and fuel products	23–25	5.4	11.2	34.7	8.2	24.0	16.6	15.7	41.0	NA	11.6	19.0	9.6	18.7
Coke, refined petroleum products, and nuclear fuel	23	0.6	0.2	0.4	0.0	0.9	0.2	0.0	2.4	NA	0.1	0.4	0.4	2.3
Chemicals and chemical products	24	4.3	8.7	31.7	6.4	20.0	14.4	13.9	37.7	NA	9.3	16.3	7.4	13.8
Chemicals excluding pharmaceuticals	24 (minus 2423)	1.9	2.9	7.0	2.8	5.7	7.0	10.2	2.2	NA	3.4	6.3	5.0	7.9
Pharmaceuticals	2423	2.4	5.8	24.7	3.6	14.3	7.4	3.7	35.6	NA	5.9	10.0	2.4	5.9
Rubber and plastics products	25	0.5	2.2	2.6	1.8	3.1	2.0	1.7	0.9	NA	2.1	2.3	1.7	2.6
Other nonmetallic mineral products	26	0.7	1.5	1.1	1.0	1.1	0.6	2.2	0.3	NA	0.8	1.2	0.6	2.2
Basic metals	27	3.8	2.4	2.2	0.6	1.2	0.9	1.1	0.5	NA	0.9	2.5	2.0	6.6
Fabricated metal products (excluding machinery and equipment)	28	1.0	2.1	1.5	1.7	1.0	1.3	7.0	0.4	NA	1.8	0.6	0.9	7.2
Machinery and equipment, instruments, and transportation equipment	29–35	11.2	48.9	24.5	52.0	52.2	67.7	16.3	29.0	NA	51.1	59.0	73.1	18.0
Machinery and equipment, nec	29	1.9	11.4	5.8	8.5	4.6	10.9	1.2	5.3	NA	12.9	9.2	6.2	2.3
Computers, office and accounting machines	30	0.3	0.4	0.6	0.2	0.7	1.5	0.0	NA	NA	0.4	3.7	1.0	0.8
Electrical machinery and apparatus, nec	31	0.5	13.4	4.1	4.2	4.4	3.1	0.4	3.3	NA	2.4	8.0	2.2	3.2
Communication, TV, and radio equipment	32	1.7	9.6	7.7	2.8	10.4	7.1	12.9	6.2	NA	7.5	16.8	45.7	1.5
Instruments, watches, and clocks	33	2.2	3.3	2.5	6.2	6.3	7.1	1.0	2.5	NA	5.4	5.0	2.6	0.1
Motor vehicles	34	3.4	8.3	1.9	24.7	14.0	32.8	0.8	11.5	NA	11.0	15.6	13.2	10.0
Other transportation equipment	35	1.2	2.5	2.0	5.4	11.9	5.1	0.1	NA	NA	11.4	0.7	2.1	0.2
Building and repairing ships and boats	351	0.3	0.0	0.0	0.0	0.4	NA	NA	NA	NA	0.5	0.1	1.8	0.0
Aircraft and spacecraft	353	0.3	0.3	2.0	1.7	10.8	NA	NA	NA	NA	9.9	0.5	0.1	0.0
Railroad and other transportation equipment, nec	352+359	0.6	2.2	0.0	3.7	0.7	NA	NA	NA	NA	1.0	0.2	0.2	0.2
Furniture, manufacturing, nec	36	0.2	1.6	0.3	0.5	0.8	0.3	0.0	0.2	NA	1.0	1.0	0.3	0.3
Recycling	37	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	NA	0.0	NA	0.1	0.0
Electricity, gas, and water	40–41	1.8	0.2	0.2	0.2	1.6	0.3	0.5	0.2	1.8	0.8	0.5	1.0	0.4
Construction	45	5.2	0.4	1.3	1.2	0.4	0.1	0.1	0.3	NA	0.9	1.0	2.5	0.2
Services	50–99	42.3	29.4	29.8	32.2	12.3	10.3	52.7	24.6	65.2	23.7	11.2	7.9	29.5
Wholesale and retail trade, repairs	50–52	6.3	4.6	1.7	2.6	NA	NA	2.3	7.4	NA	1.6	0.4	0.5	0.0
Hotels and restaurants	55	0.2	0.0	0.0	0.0	NA	NA	0.0	0.0	NA	0.0	NA	0.0	0.0
Transport, storage, and communication	60–64	5.2	1.1	3.9	1.3	3.3	0.5	0.7	0.4	NA	8.5	2.6	1.7	1.4
Financial intermediation	65–67	12.2	0.2	1.9	1.5	NA	NA	0.0	0.2	0.9	1.6	0.0	0.0	4.1
Real estate, renting, and business activities	70–74	16.9	23.3	21.4	24.8	8.8	8.9	49.3	14.0	64.3	11.2	8.2	5.5	2.3
Computer and related activities	72	6.3	5.3	4.9	10.3	7.0	NA	41.1	6.8	31.7	2.2	2.1	3.4	0.8
Software consultancy and supply	722	6.0	4.1	2.9	7.8	4.8	NA	29.9	2.4	NA	1.9	NA	2.8	0.8
Other computer and related activities, nec	72 (minus 722)	0.3	1.2	2.0	2.4	2.2	NA	11.1	4.4	NA	0.3	NA	0.6	0.0
R&D	73	4.6	9.4	9.7	9.7	0.2	2.7	3.4	0.3	32.7	7.0	5.6	0.4	1.5
Other business activities	74	6.0	8.6	6.8	4.7	1.7	2.6	4.9	6.5	NA	2.0	0.5	1.6	0.1
Community, social, and personal services	75–99	1.6	0.2	0.8	2.1	0.2	NA	0.3	2.6	NA	0.7	NA	0.1	21.6
All other industries	–	24.1	0.2	0.6	0.6	2.1	0.3	0.7	1.8	NA	1.6	0.2	0.0	0.6

Appendix table 4-46

Share of business expenditures for R&D, by industry and selected country/economy: 2007–10

(Percent)

Industry	ISIC	New Zealand	Norway	Portugal	Slovak Republic	Slovenia	Turkey	United Kingdom	United States ^a	China	Russian Federation	Singapore	South Africa	Taiwan
		2007	2008	2008	2009	2008	2008	2008	2008	2008	2009	2009	2008	2007
Total business enterprise		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Manufacturing	15–37	48.4	43.2	34.6	67.3	85.9	64.1	73.8	67.1	84.0	12.0	73.2	38.9	92.4
Food products, beverages, and tobacco	15–16	12.8	4.2	1.9	0.8	0.4	2.0	1.9	1.5	3.6	0.0	0.5	2.0	0.7
Textiles, textile products, leather, and footwear	17–19	0.8	0.3	1.5	0.0	1.2	1.8	0.1	0.3	2.5	0.0	0.0	0.1	1.5
Wood, paper, printing, and publishing	20–22	0.3	1.6	2.3	0.0	1.2	0.4	0.3	NA	1.4	0.0	0.0	1.4	0.3
Chemical, rubber, plastics, and fuel products	23–25	10.8	7.7	NA	17.7	40.0	7.1	33.0	NA	13.2	0.7	2.5	14.3	6.1
Coke, refined petroleum products, and nuclear fuel	23	NA	0.0	NA	NA	0.0	0.0	1.4	NA	0.9	0.0	0.0	NA	0.4
Chemicals and chemical products	24	NA	7.3	8.3	8.1	38.3	5.6	31.1	18.5	10.3	0.6	2.0	NA	4.6
Chemicals excluding pharmaceuticals	24 (minus 2423)	NA	5.0	1.3	NA	3.6	NA	3.9	2.6	7.1	0.5	1.4	NA	3.2
Pharmaceuticals	2423	NA	2.2	6.9	NA	34.7	NA	27.2	15.9	3.2	0.1	0.6	NA	1.4
Rubber and plastics products	25	NA	0.4	NA	9.6	1.7	1.6	0.5	0.9	2.0	0.0	0.4	NA	1.1
Other nonmetallic mineral products	26	0.4	0.4	1.8	0.6	1.2	1.5	0.3	0.5	1.9	0.0	0.1	1.3	0.1
Basic metals	27	0.2	2.0	1.1	3.2	1.8	0.6	0.4	0.2	10.0	0.2	0.2	3.0	1.0
Fabricated metal products (excluding machinery and equipment)	28	2.1	1.1	1.7	2.6	3.3	0.9	0.5	0.9	1.6	0.0	3.0	4.1	0.6
Machinery and equipment, instruments, and transportation equipment	29–35	19.3	25.2	13.0	42.4	36.3	49.1	37.1	NA	49.2	10.8	66.9	12.0	81.6
Machinery and equipment, nec	29	NA	9.8	2.4	5.0	8.9	10.4	5.2	3.5	12.3	1.5	2.4	NA	2.8
Computers, office, and accounting machines	30	NA	0.0	0.2	0.0	0.5	0.0	0.5	3.3	NA	0.3	NA	NA	16.2
Electrical machinery and apparatus, nec	31	NA	2.5	1.7	6.1	9.6	2.0	3.6	1.1	9.4	0.7	0.4	1.6	3.1
Communication, TV, and radio equipment	32	NA	4.2	3.7	5.2	8.5	9.2	4.2	12.5	NA	1.9	59.4	3.6	53.1
Instruments, watches, and clocks	33	NA	4.6	0.4	1.4	4.4	0.7	3.7	NA	NA	1.2	2.0	1.5	3.0
Motor vehicles	34	NA	1.3	4.3	NA	3.8	23.5	7.9	4.6	NA	0.5	1.6	5.4	1.7
Other transportation equipment	35	NA	2.9	0.3	8.7	0.7	3.3	12.0	10.2	NA	4.6	1.1	NA	1.7
Building and repairing ships and boats	351	NA	2.7	0.3	NA	0.5	NA	1.0	NA	NA	1.5	0.1	NA	0.0
Aircraft and spacecraft	353	NA	0.1	NA	NA	0.0	NA	10.8	9.7	NA	2.7	0.9	NA	NA
Railroad and other transportation equipment, nec	352+359	NA	0.0	NA	NA	0.2	NA	0.2	0.5	NA	0.4	0.1	NA	1.6
Furniture, manufacturing, nec	36	1.8	0.5	0.6	NA	0.6	0.7	0.2	NA	NA	0.3	0.1	0.6	0.5
Recycling	37	0.0	0.1	0.1	NA	0.0	0.0	0.0	NA	NA	0.0	0.0	0.0	0.0
Electricity, gas, and water	40–41	NA	2.2	6.0	0.0	0.1	0.2	0.2	NA	2.5	0.0	0.0	16.2	0.2
Construction	45	NA	1.4	1.7	0.2	0.1	0.4	0.1	NA	1.3	0.0	0.1	0.1	0.1
Services	50–99	43.6	40.9	57.2	31.5	13.0	34.8	24.7	32.3	7.3	85.8	26.7	36.3	7.3
Wholesale and retail trade, repairs	50–52	6.7	2.9	2.2	0.0	0.5	2.2	0.5	NA	NA	0.0	6.7	5.2	0.3
Hotels and restaurants	55	NA	0.0	0.0	0.0	0.0	0.0	NA	NA	NA	0.0	0.0	NA	0.0
Transport, storage, and communication	60–64	NA	3.6	13.5	1.4	0.3	4.1	9.0	NA	NA	0.2	1.0	4.7	1.3
Financial intermediation	65–67	NA	4.6	14.4	0.0	0.1	5.7	3.1	0.5	NA	0.0	2.1	22.0	0.6
Real estate, renting, and business activities	70–74	36.8	29.7	26.0	29.7	12.1	22.2	11.9	NA	NA	84.6	15.6	NA	3.8
Computer and related activities	72	16.6	15.4	10.8	1.5	3.7	13.9	9.4	14.2	NA	0.3	2.0	NA	3.0
Software consultancy and supply	722	NA	13.7	9.3	1.2	0.4	NA	NA	9.9	NA	0.2	0.4	NA	NA
Other computer and related activities, nec	72 (minus 722)	NA	1.8	1.6	0.3	3.4	NA	NA	4.3	NA	0.1	1.6	NA	NA
R&D	73	6.4	4.0	1.7	25.4	2.3	7.5	2.5	6.9	NA	82.0	9.5	NA	0.5

Appendix table 4-46

Share of business expenditures for R&D, by industry and selected country/economy: 2007–10

(Percent)

Industry	ISIC	New Zealand	Norway	Portugal	Slovak Republic	Slovenia	Turkey	United Kingdom	United States ^a	China	Russian Federation	Singapore	South Africa	Taiwan
		2007	2008	2008	2009	2008	2008	2008	2008	2009	2009	2008	2007	2009
Other business activities	74	13.8	10.3	13.4	2.8	5.8	0.8	NA	NA	NA	2.3	3.7	NA	0.4
Community, social, and personal services	75–99	NA	0.1	1.1	0.4	0.1	0.6	0.2	NA	NA	1.0	1.3	4.4	1.1
All other industries	–	NA	12.3	0.5	1.0	0.9	0.5	1.2	NA	4.9	2.2	0.0	8.5	0.0

NA = not available; nec = not elsewhere classified

ISIC = International Standard Industrial Classification, Rev. 3; OECD = Organisation for Economic Co-operation and Development

^aSource data for U.S. business R&D in this figure are preliminary (NSF 2010a); final statistics were used for other business R&D analyses in Chapter 4.

NOTES: Data years are in parentheses. Because OECD and National Science Foundation analysts adjust country data to achieve internationally comparable estimates, these data may differ from individual countries' survey estimates. Detail may not sum to total.

SOURCE: OECD, Analytical Business Enterprise R&D (ANBERD)-Statistical Analysis Database (STAN)-R&D Expenditure in Industry, http://www.oecd.org/document/17/0,3746,en_2649_34451_1822033_1_1_1_1,00.html, accessed July 27, 2011, and NSF Business R&D and Innovation Survey: 2008.*Science and Engineering Indicators 2012*