Appendix table 2-1.
Gross domestic product and GDP implicit price deflators: 1940–2004

	Gross domestic product (Billions of dollars)		GDP price deflator (1992 = 100.00)	
Year	Calendar year	Fiscal year	Calendar year	Fiscal year
1940	101.2	96.5	10.75	10.75
1941	126.7	113.9	11.50	11.23
1942	161.6	144.2	12.35	12.04
1943	198.3	180.0	13.02	12.79
1944	219.7	209.0	13.36	13.28
1945	223.2	221.4	13.72	13.63
1946	222.6	222.9	15.37	14.59
1947	244.6	234.9	17.10	16.34
1948	269.7	256.6	18.09	17.66
1949	267.8	271.7	18.09	18.40
1950	294.6	273.6	18.28	18.10
1951	339.7	321.3	19.59	19.17
1952	358.6	348.9	19.93	19.86
1953	379.7	373.1	20.18	20.23
1954	381.3	378.0	20.41	20.44
1955	415.1	395.3	20.74	20.65
1956	438.0	427.6	21.47	21.22
1957	461.0	450.5	22.18	22.01
1958	467.3	460.6	22.71	22.58
1959	507.2	491.8	22.95	23.02
1960	526.6	518.2	23.27	23.23
1961	544.8	530.9	23.54	23.57
1962	585.2	567.5	23.84	23.84
1963	617.4	598.3	24.12	24.12
1964	663.0	640.0	24.48	24.45
1965	719.1	686.7	24.96	24.86
1966	787.8	752.8	25.67	25.43
1967	833.6	811.9	26.49	26.23
1968	910.6	868.1	27.64	27.23
1969	982.2	947.9	28.94	28.43
1970	1,035.6	1,009.0	30.48	29.93
1971	1,125.4	1,077.7	32.06	31.47
1972	1,237.3	1,176.9	33.42	32.97
1973	1,382.6	1,306.8	35.30	34.42
1974	1,496.9	1,438.1	38.47	36.91
1975	1,630.6	1,554.5	42.09	40.71
1976	1,819.0	1,730.4	44.55	43.65
1977	2,026.9	1,971.4	47.43	46.97
1978	2,291.4	2,212.6	50.89	50.28
1979	2,557.5	2,495.9	55.23	54.44
1980	2,784.2	2,718.9	60.33	59.28
1981	3,115.9	3,049.1	66.01	65.12
1982	3,242.1	3,211.3	70.17	69.72
1983	3,514.5	3,421.9	73.16	72.94
1984	3,902.4	3,812.0	75.92	75.76
1985	4,180.7	4,102.1	78.53	78.37
1986	4,422.2	4,374.3	80.58	80.60
1987	4,692.3	4,605.1	83.06	82.93
1988	5,049.6	4,953.5	86.09	85.81
1989	5,438.7	5,351.8	89.72	89.44
1990	5,743.8	5,684.5	93.60	93.15
1991	5,916.7	5,858.8	97.32	97.15
1992	6,244.4	6,143.2	100.00	100.00
1993	6,558.1	6,475.1	102.64	102.64
1994	6,947.0	6,845.7	105.09	105.12
1995	7,269.6	7,197.7	107.51	107.65
1996	7,661.6	7,549.2	109.53	109.76
1997	8,110.9	7,996.5	111.57	111.83

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 2-1.
Gross domestic product and GDP implicit price deflators: 1940–2004

	Gross domestic product (Billions of dollars)		GDP price deflator (1992 = 100.00)	
Year	Calendar year	Fiscal year	Calendar year	Fiscal year
1998	8,508.9	8,404.5	112.70	113.17
1999 projected	8,849.3	8,747.9	114.44	114.64
2000 projected	9,212.1	9,105.8	116.83	116.93
2001 projected	9,599.0	9,485.3	119.32	119.39
2002 projected	10,021.3	9,893.6	121.84	121.90
2003 projected	10,472.3	10,340.0	124.38	124.46
2004 projected	10,943.6	10,810.4	126.99	127.07

SOURCES: Fiscal year GDP and deflators are from the Office of Management and Budget, FY 2000 Budget of the United States. Calendar year GDP and deflators for 1940–98 are from the Bureau of Economic Analysis. Calendar year GDP and deflators projected in 1999–2004 are based on economic assumptions provided in the FY 2000 Budget of the United States.

See figure 2-1 in Volume I.

Appendix table 2-2.
Purchasing power parity and market exchange rates, by selected country: 1981–99
(Units of foreign currency per U.S. dollar)

	Purchasing power parities						Market exchange rates	
Year	Canada	France	Germany	Italy	Japan	United Kingdom	Germany	Japan
1981	1.27	5.70	2.41	891	241	0.53	2.26	221
1982	1.31	6.02	2.36	984	232	0.54	2.43	249
1983	1.31	6.32	2.33	1,084	226	0.54	2.55	238
1984	1.30	6.49	2.27	1,156	221	0.54	2.85	238
1985	1.28	6.64	2.23	1,217	218	0.55	2.94	239
1986	1.29	6.82	2.24	1,281	217	0.55	2.17	169
1987	1.31	6.80	2.20	1,316	210	0.56	1.80	145
1988	1.31	6.75	2.15	1,353	204	0.58	1.76	128
1989	1.32	6.69	2.11	1,378	199	0.59	1.88	138
1990	1.30	6.61	2.09	1,421	195	0.60	1.62	145
1991	1.29	6.51	2.09	1,463	193	0.64	1.66	135
1992	1.28	6.42	2.07	1,459	188	0.62	1.56	127
1993	1.26	6.57	2.10	1,534	184	0.64	1.65	111
1994	1.25	6.62	2.07	1,533	181	0.65	1.62	102
1995	1.19	6.49	2.02	1,556	169	0.66	1.43	94
1996	1.19	6.57	2.03	1,583	166	0.64	1.50	109
1997	1.17	6.52	2.00	1,595	164	0.65	1.73	121
1998	1.16	6.51	2.01	1,621	163	0.66	NA	NA
1999	1.16	6.50	2.01	1,632	160	0.67	NA	NA

NA = not available

SOURCES: Organisation for Economic Co–operation and Development, Main Science and Technology Indicators database (Paris: April, 1999); and International Monetary Fund, *International Financial Statistics Yearbook* (Washington, DC: 1998).

Appendix table 2-3.
U.S. R&D expenditures, by performing sector and source of funds: 1953–98
(Millions of current dollars)

Performing sector:	Total U.S.	Federal Govt.	Industry			Industry FFRDCs	Universities & colleges						U&C FFRDCs	Other nonprofit institutions				Nonprofit FFRDCs
Funding sector:	Total U.S.	Federal Govt.	Total	Federal Govt.[a]	Industry[b]	Federal Govt.[a]	Total	Federal Govt.	Nonfed. Govt.	Industry	U&C	Federal Nonprofit	Federal Govt.[c]	Total	Federal Govt.[a]	Industry	Non-profit	Federal Govt.[a]
Calendar year[d]																		
1953	5,160	1,015	3,630	1,430	2,200		273	149	40	21	37	27	131	112	58	26	28	
1954	5,621	963	4,070	1,750	2,320		301	165	45	24	40	29	161	127	65	31	31	
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	33,365	5,132	22,239	7,572	14,667	648	3,216	2,160	320	104	393	239	926	995	639	115	241	210
1975	35,686	5,561	23,460	7,878	15,582	727	3,570	2,400	348	118	432	272	1,067	1,076	675	125	276	225
1976	39,458	5,890	26,107	8,671	17,436	890	3,899	2,619	369	131	480	300	1,266	1,162	711	135	316	245
1977	43,456	6,211	28,863	9,523	19,340	962	4,346	2,893	394	155	569	337	1,551	1,248	740	150	358	275
1978	48,822	6,962	32,222	10,107	22,115	1,082	4,996	3,329	443	182	679	364	1,826	1,402	830	165	407	333
1979	55,521	7,471	37,062	11,354	25,708	1,164	5,715	3,848	482	215	785	386	2,091	1,629	985	180	464	390
1980	63,332	7,831	43,228	12,752	30,476	1,277	6,455	4,335	519	264	920	419	2,366	1,700	1,000	200	500	475
1981	72,307	8,605	50,425	14,997	35,428	1,385	7,085	4,670	581	314	1,058	463	2,483	1,788	1,038	225	525	538
1982	80,837	9,501	57,166	17,061	40,105	1,484	7,603	4,879	621	363	1,207	534	2,608	1,950	1,175	250	525	525
1983	90,030	10,830	63,683	19,095	44,588	1,585	8,251	5,210	658	432	1,357	595	2,944	2,138	1,313	275	550	600
1984	102,308	11,916	73,061	21,657	51,404	1,739	9,154	5,748	721	518	1,514	654	3,337	2,478	1,550	323	605	625
1985	114,747	13,093	82,376	25,333	57,043	1,863	10,308	6,388	834	630	1,743	713	3,709	2,736	1,700	376	660	663
1986	120,297	13,504	85,932	26,000	59,932	1,891	11,540	7,028	969	745	2,019	780	4,051	2,842	1,700	420	722	538
1987	126,255	13,588	90,160	28,757	61,403	1,995	12,807	7,768	1,065	831	2,262	882	4,369	2,834	1,569	449	816	501
1988	133,903	14,342	94,893	28,221	66,672	2,122	14,219	8,592	1,165	934	2,527	1,003	4,631	3,187	1,762	496	928	510
1989	141,909	15,231	99,860	26,359	73,501	2,195	15,631	9,314	1,274	1,062	2,852	1,131	4,781	3,664	2,062	556	1,046	547

Appendix table 2-3.
U.S. R&D expenditures, by performing sector and source of funds: 1953–98
(Millions of current dollars)

Performing sector:	Total U.S.	Federal Govt.	Industry			Industry FFRDCs	Universities & colleges						U&C FFRDCs	Other nonprofit institutions				Nonprofit FFRDCs
Funding sector:	Total U.S.	Federal Govt.	Total	Federal Govt.[a]	Industry[b]	Federal Govt.[a]	Total	Federal Govt.	Nonfed. Govt.	Industry	U&C	Federal Nonprofit	Federal Govt.[c]	Total	Federal Govt.[a]	Industry	Non-profit	Federal Govt.[a]
Calendar year[d]																		
1990	152,039	15,671	107,404	25,802	81,602	2,323	16,935	9,935	1,399	1,167	3,186	1,249	4,955	4,115	2,345	614	1,156	636
1991	160,863	15,249	114,675	24,095	90,580	2,277	18,201	10,662	1,482	1,243	3,457	1,358	5,163	4,603	2,679	668	1,256	696
1992	165,211	15,853	116,757	22,369	94,388	2,353	19,383	11,523	1,524	1,321	3,568	1,448	5,271	4,847	2,806	703	1,339	748
1993	165,442	16,532	115,435	20,844	94,591	1,965	20,499	12,311	1,550	1,388	3,719	1,533	5,283	4,978	2,839	721	1,418	749
1994	168,854	16,432	117,392	20,261	97,131	2,202	21,626	13,009	1,611	1,448	3,960	1,598	5,317	5,125	2,900	747	1,478	759
1995	183,232	17,133	129,830	21,178	108,652	2,273	22,647	13,604	1,741	1,539	4,139	1,624	5,372	5,165	2,848	814	1,502	812
1996	196,540	16,627	142,371	21,356	121,015	2,297	23,720	14,180	1,839	1,655	4,375	1,672	5,410	5,343	2,906	891	1,546	771
1997	211,268	16,814	155,409	21,798	133,611	2,130	25,001	14,849	1,940	1,773	4,686	1,754	5,466	5,628	3,036	969	1,623	820
1998 .. prelim.	227,173	17,189	168,922	22,216	146,706	2,373	26,343	15,558	2,070	1,896	4,979	1,840	5,517	6,006	3,254	1,051	1,702	823

FFRDCs = Federally Funded Research and Development Centers; U&C = universities and colleges

NOTES: Data are based on annual reports by performers except for the nonprofit sector; R&D expenditures by nonprofit sector performers have been estimated since 1973 on the basis of a survey conducted in that year. The next updates of these data, covering the years 1953–2000, along with technical notes explaining methodological issues of measurement, will be provided in National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources: 2000* (Arlington, VA: forthcoming). Data are preliminary for 1998.

[a]For 1953–54, expenditures of industry FFRDCs were not separated out from total Federal support to the industrial sector. Thus, the figure for Federal support to industry includes support to FFRDCs for those two years. The same is true for expenditures of nonprofit FFRDCs, which are included in Federal support for nonprofit institutions in 1953–54.

[b]Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.

[c]Includes R&D expenditures of FFRDCs administered by academic institutions, nearly all of which are federally funded.

[d]Expenditure levels for academic and Federal Government performers are also in reference to calendar years, unlike the levels typically provided in statistical reports on these institutions alone, which are in reference to fiscal years. These calendar–year expenditure levels are approximations based on fiscal year data.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources* (Arlington, VA: biennial series).

See page 1-33; figures 2-2, 2-11, and 2-12; text table 2-1; and figures 6-1 and 6-2 in Volume I.

Appendix table 2-4.
U.S. R&D expenditures, by performing sector and source of funds: 1953–98
(Millions of constant 1992 dollars)

Performing sector:	Total U.S.	Federal Govt.	Industry			Industry FFRDCs	Universities & colleges						U&C FFRDCs	Other nonprofit institutions				Nonprofit FFRDCs
Funding sector:	Total U.S.	Federal Govt.	Total	Federal Govt.[a]	Industry[b]	Federal Govt.[a]	Total	Federal Govt.	Nonfed. Govt.	Industry	U&C	Federal Nonprofit	Federal Govt.[c]	Total	Federal Govt.[a]	Industry	Non-profit	Federal Govt.[a]
Calendar year[d]																		
1953	25,570	5,030	17,988	7,086	10,902		1,350	738	196	102	181	134	649	553	285	129	139	
1954	27,538	4,716	19,941	8,574	11,367		1,475	806	218	115	194	142	786	620	316	152	152	
1955	30,286	4,690	21,779	9,918	11,861	593	1,649	921	241	130	203	154	902	632	309	169	154	41
1956	39,590	5,265	29,213	13,950	15,263	1,551	1,821	1,029	263	147	214	168	1,011	678	328	172	177	51
1957	44,672	5,849	33,021	17,710	15,311	1,835	1,952	1,089	289	165	230	180	1,202	751	354	167	230	63
1958	48,063	6,634	35,517	19,533	15,984	1,422	2,162	1,233	317	172	244	196	1,389	859	418	167	273	79
1959	54,421	7,325	40,087	22,732	17,355	1,821	2,553	1,549	351	172	266	216	1,521	1,017	542	183	292	96
1960	58,922	7,738	43,111	24,083	19,029	2,050	3,028	1,945	387	172	288	236	1,654	1,135	636	206	292	206
1961	61,870	8,442	43,980	24,150	19,830	2,358	3,541	2,364	427	170	316	263	1,869	1,291	718	208	365	389
1962	65,588	9,176	46,296	25,201	21,095	1,787	4,163	2,880	470	170	352	292	2,097	1,523	839	227	457	545
1963	72,633	10,607	50,647	28,425	22,222	1,716	4,884	3,476	518	168	398	323	2,403	1,692	970	228	493	684
1964	78,034	12,113	53,305	29,645	23,660	1,891	5,615	4,065	562	165	464	359	2,569	1,703	1,021	225	458	837
1965	81,138	12,645	55,337	29,515	25,821	1,494	6,388	4,675	599	166	545	403	2,522	1,891	1,146	248	497	861
1966	85,982	12,885	59,186	31,075	28,111	1,383	7,082	5,201	623	175	641	442	2,538	2,090	1,280	273	538	818
1967	88,133	13,003	60,272	29,996	30,276	1,582	7,682	5,627	634	194	753	474	2,627	2,118	1,291	279	547	849
1968	89,241	12,653	61,556	29,468	32,088	1,501	7,912	5,738	668	208	798	501	2,612	2,156	1,317	293	546	850
1969	89,826	13,097	61,659	27,598	34,060	1,603	7,878	5,610	719	209	805	536	2,526	2,217	1,339	321	556	847
1970	86,192	13,628	57,723	23,970	33,753	1,552	7,931	5,530	778	215	848	561	2,384	2,219	1,344	312	564	755
1971	84,067	13,752	55,611	22,380	33,231	1,532	8,001	5,488	817	225	903	568	2,291	2,210	1,330	306	574	671
1972	85,997	13,991	56,864	22,349	34,515	1,640	8,250	5,655	844	236	932	582	2,349	2,306	1,411	302	592	598
1973	87,681	13,701	58,652	21,530	37,122	1,544	8,365	5,690	854	254	972	596	2,382	2,499	1,603	297	598	538
1974	86,731	13,341	57,809	19,683	38,126	1,684	8,358	5,615	832	270	1,020	621	2,407	2,585	1,660	299	626	546
1975	84,785	13,213	55,738	18,717	37,021	1,727	8,481	5,702	827	280	1,025	646	2,535	2,556	1,604	297	656	535
1976	88,571	13,222	58,602	19,464	39,138	1,998	8,751	5,879	828	294	1,077	672	2,841	2,608	1,596	303	709	550
1977	91,622	13,096	60,854	20,078	40,776	2,028	9,163	6,098	831	326	1,199	709	3,269	2,632	1,561	316	755	580
1978	95,937	13,681	63,317	19,860	43,456	2,126	9,816	6,541	871	357	1,334	714	3,588	2,755	1,631	324	800	653
1979	100,527	13,527	67,105	20,558	46,547	2,108	10,347	6,967	872	388	1,421	698	3,785	2,949	1,783	326	840	706
1980	104,975	12,980	71,653	21,137	50,515	2,117	10,699	7,185	859	437	1,524	695	3,922	2,818	1,658	332	829	787
1981	109,540	13,035	76,390	22,719	53,671	2,098	10,733	7,074	880	476	1,602	701	3,761	2,708	1,572	341	795	814
1982	115,201	13,540	81,468	24,314	57,154	2,115	10,834	6,952	885	517	1,719	760	3,717	2,779	1,675	356	748	748
1983	123,058	14,803	87,046	26,100	60,946	2,166	11,278	7,121	899	590	1,854	813	4,023	2,922	1,794	376	752	820
1984	134,758	15,695	96,234	28,526	67,708	2,291	12,057	7,570	950	682	1,994	861	4,395	3,264	2,042	426	796	823
1985	146,118	16,672	104,897	32,259	72,638	2,372	13,126	8,134	1,061	802	2,220	908	4,723	3,484	2,165	479	840	844
1986	149,289	16,759	106,642	32,266	74,376	2,347	14,321	8,721	1,203	925	2,505	968	5,027	3,526	2,110	521	896	667
1987	152,004	16,360	108,548	34,622	73,926	2,402	15,419	9,352	1,282	1,000	2,723	1,061	5,259	3,412	1,889	541	982	604
1988	155,538	16,659	110,225	32,781	77,445	2,465	16,516	9,980	1,353	1,084	2,935	1,165	5,379	3,702	2,047	577	1,078	592
1989	158,168	16,976	111,302	29,379	81,923	2,447	17,422	10,381	1,419	1,183	3,178	1,261	5,329	4,084	2,298	619	1,166	610

Appendix table 2-4.
U.S. R&D expenditures, by performing sector and source of funds: 1953–98
(Millions of constant 1992 dollars)

Performing sector:	Total U.S.	Federal Govt.	Industry			Industry FFRDCs	Universities & colleges						U&C FFRDCs	Other nonprofit institutions				Nonprofit FFRDCs
Funding sector:	Total U.S.	Federal Govt.	Total	Federal Govt.[a]	Industry[b]	Federal Govt.[a]	Total	Federal Govt.	Nonfed. Govt.	Industry	U&C	Federal Nonprofit	Federal Govt.[c]	Total	Federal Govt.[a]	Industry	Non-profit	Federal Govt.[a]
Calendar year[d]																		
1990	162,435	16,743	114,748	27,566	87,182	2,482	18,093	10,614	1,494	1,246	3,404	1,334	5,294	4,396	2,506	656	1,235	680
1991	165,293	15,669	117,833	24,759	93,074	2,340	18,702	10,956	1,522	1,277	3,552	1,395	5,305	4,730	2,753	686	1,291	715
1992	165,211	15,853	116,757	22,369	94,388	2,353	19,383	11,523	1,524	1,321	3,568	1,448	5,271	4,847	2,806	703	1,339	748
1993	161,186	16,107	112,466	20,308	92,158	1,914	19,972	11,994	1,510	1,352	3,623	1,493	5,147	4,850	2,766	703	1,381	730
1994	160,676	15,637	111,706	19,280	92,426	2,095	20,579	12,379	1,533	1,378	3,768	1,521	5,059	4,877	2,760	710	1,407	723
1995	170,432	15,937	120,761	19,699	101,062	2,114	21,065	12,654	1,619	1,431	3,850	1,511	4,996	4,804	2,649	757	1,397	755
1996	179,439	15,181	129,984	19,498	110,486	2,097	21,656	12,946	1,679	1,511	3,994	1,526	4,939	4,878	2,653	814	1,412	704
1997	189,359	15,071	139,293	19,538	119,755	1,909	22,408	13,309	1,739	1,589	4,200	1,572	4,899	5,044	2,721	869	1,454	735
1998 .. prelim.	201,573	15,252	149,886	19,713	130,174	2,106	23,374	13,805	1,837	1,682	4,418	1,632	4,895	5,330	2,887	932	1,510	731

FFRDCs = Federally Funded Research and Development Centers; U&C = universities and colleges

NOTES: Data are based on annual reports by performers except for the nonprofit sector; R&D expenditures by nonprofit sector performers have been estimated since 1973 on the basis of a survey conducted in that year. The next updates of these data, covering the years 1953–2000, along with technical notes explaining methodological issues of measurement, will be provided in National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources: 2000* (Arlington, VA: forthcoming). Data are preliminary for 1998.

[a]For 1953–54, expenditures of industry FFRDCs were not separated out from total Federal support to the industrial sector. Thus, the figure for Federal support to industry includes support to FFRDCs for those two years. The same is true for expenditures of nonprofit FFRDCs, which are included in Federal support for nonprofit institutions in 1953–54.

[b]Industry sources of industry R&D expenditures include all nonfederal sources of industry R&D expenditures.

[c]Includes R&D expenditures of FFRDCs administered by academic institutions, nearly all of which are federally funded.

[d]Expenditure levels for academic and Federal Government performers are also in reference to calendar years, unlike the levels typically provided in statistical reports on these institutions alone, which are in reference to fiscal years. These calendar–year expenditure levels are approximations based on fiscal year data.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources* (Arlington, VA: biennial series).

See page 1-33 and figure 2-12 in Volume I.

Appendix table 2-5.
U.S. R&D expenditures, by source of funds and performer: 1953–98
(Millions of current dollars)

Funding sector:	Total U.S	Federal Government								Industry				U&Cs	Nonprofit			Non-Fed. govt.[a]
Performing sector:	Total U.S	Total	Federal Govt.	Industry[b]	Industry FFRDCs[b]	U&Cs	U&C FFRDCs[c]	Nonprofit[b]	Nonprofit FFRDCs[b]	Total	Industry[d]	U&Cs	Nonprofit	U&Cs	Total	Nonprofit	U&Cs	U&Cs
Calendar year[e]																		
1953	5,160	2,783	1,015	1,430		149	131	58		2,247	2,200	21	26	37	55	28	27	40
1954	5,621	3,102	963	1,750		165	161	65		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	33,365	17,287	5,132	7,572	648	2,160	926	639	210	14,886	14,667	104	115	393	480	241	239	320
1975	35,686	18,533	5,561	7,878	727	2,400	1,067	675	225	15,825	15,582	118	125	432	548	276	272	348
1976	39,458	20,292	5,890	8,671	890	2,619	1,266	711	245	17,702	17,436	131	135	480	616	316	300	369
1977	43,456	22,155	6,211	9,523	962	2,893	1,551	740	275	19,645	19,340	155	150	569	695	358	337	394
1978	48,822	24,468	6,962	10,107	1,082	3,329	1,826	830	333	22,462	22,115	182	165	679	771	407	364	443
1979	55,521	27,303	7,471	11,354	1,164	3,848	2,091	985	390	26,103	25,708	215	180	785	850	464	386	482
1980	63,332	30,035	7,831	12,752	1,277	4,335	2,366	1,000	475	30,940	30,476	264	200	920	919	500	419	519
1981	72,307	33,714	8,605	14,997	1,385	4,670	2,483	1,038	538	35,967	35,428	314	225	1,058	988	525	463	581
1982	80,837	37,233	9,501	17,061	1,484	4,879	2,608	1,175	525	40,718	40,105	363	250	1,207	1,059	525	534	621
1983	90,030	41,576	10,830	19,095	1,585	5,210	2,944	1,313	600	45,295	44,588	432	275	1,357	1,145	550	595	658
1984	102,308	46,571	11,916	21,657	1,739	5,748	3,337	1,550	625	52,245	51,404	518	323	1,514	1,258	605	654	721
1985	114,747	52,748	13,093	25,333	1,863	6,388	3,709	1,700	663	58,049	57,043	630	376	1,743	1,373	660	713	834
1986	120,297	54,711	13,504	26,000	1,891	7,028	4,051	1,700	538	61,097	59,932	745	420	2,019	1,502	722	780	969
1987	126,255	58,548	13,588	28,757	1,995	7,768	4,369	1,569	501	62,683	61,403	831	449	2,262	1,697	816	882	1,065
1988	133,903	60,179	14,342	28,221	2,122	8,592	4,631	1,762	510	68,102	66,672	934	496	2,527	1,931	928	1,003	1,165
1989	141,909	60,488	15,231	26,359	2,195	9,314	4,781	2,062	547	75,118	73,501	1,062	556	2,852	2,177	1,046	1,131	1,274

Appendix table 2-5.
U.S. R&D expenditures, by source of funds and performer: 1953–98
(Millions of current dollars)

Funding sector:	Total U.S	Federal Government								Industry				U&Cs	Nonprofit			Non-Fed. govt.[a]
Performing sector:	Total U.S	Total	Federal Govt.	Industry[b]	Industry FFRDCs[b]	U&Cs	U&C FFRDCs[c]	Nonprofit[b]	Nonprofit FFRDCs[b]	Total	Industry[d]	U&Cs	Nonprofit	U&Cs	Total	Nonprofit	U&Cs	U&Cs
Calendar year[e]																		
1990	152,039	61,668	15,671	25,802	2,323	9,935	4,955	2,345	636	83,382	81,602	1,167	614	3,186	2,405	1,156	1,249	1,399
1991	160,863	60,821	15,249	24,095	2,277	10,662	5,163	2,679	696	92,490	90,580	1,243	668	3,457	2,614	1,256	1,358	1,482
1992	165,211	60,922	15,853	22,369	2,353	11,523	5,271	2,806	748	96,411	94,388	1,321	703	3,568	2,787	1,339	1,448	1,524
1993	165,442	60,524	16,532	20,844	1,965	12,311	5,283	2,839	749	96,700	94,591	1,388	721	3,719	2,950	1,418	1,533	1,550
1994	168,854	60,881	16,432	20,261	2,202	13,009	5,317	2,900	759	99,326	97,131	1,448	747	3,960	3,076	1,478	1,598	1,611
1995	183,232	63,220	17,133	21,178	2,273	13,604	5,372	2,848	812	111,005	108,652	1,539	814	4,139	3,126	1,502	1,624	1,741
1996	196,540	63,547	16,627	21,356	2,297	14,180	5,410	2,906	771	123,561	121,015	1,655	891	4,375	3,218	1,546	1,672	1,839
1997	211,268	64,912	16,814	21,798	2,130	14,849	5,466	3,036	820	136,353	133,611	1,773	969	4,686	3,377	1,623	1,754	1,940
1998 ..... prelim.	227,173	66,930	17,189	22,216	2,373	15,558	5,517	3,254	823	149,653	146,706	1,896	1,051	4,979	3,541	1,702	1,840	2,070

FFRDCs = Federally Funded Research and Development Centers; U&C = universities and colleges

NOTES: Data are based on annual reports by performers except for the nonprofit sector; R&D expenditures by nonprofit sector performers have been estimated since 1973 on the basis of a survey conducted in that year. The next updates of these data, covering the years 1953–2000, along with technical notes explaining methodological issues of measurement, will be provided in National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources: 2000* (Arlington, VA: forthcoming). Data are preliminary for 1998.

[a]Because of limitations in the survey information, data on non-Federal government funding to other performers are not available, and are consequently included in other sectors' support for their own R&D performance. For example, non-Federal government support to nonprofits is included in nonprofits' support for their own R&D.

[b]For 1953–54, expenditures of industry FFRDCs were not separated out from total Federal support to the industrial sector. Thus, the figure for Federal support to industry includes support to FFRDCs for those two years. The same is true for expenditures of nonprofit FFRDCs, which are included in Federal support for nonprofit institutions in 1953–54.

[c]Includes R&D expenditures of FFRDCs administered by academic institutions, nearly all of which are federally funded.

[d]Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.

[e]Expenditure levels for academic and Federal Government performers are also in reference to calendar years, unlike the levels typically provided in statistical reports on these institutions alone, which are in reference to fiscal years. These calendar–year expenditure levels are approximations based on fiscal year data.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources* (Arlington, VA: biennial series).

See page 1-8 and figures 2-1, 2-2, and 2-3 in Volume I.

Appendix table 2-6.
U.S. R&D expenditures, by source of funds and performer: 1953–98
(Millions of constant 1992 dollars)

Funding sector:	Total U.S	Federal Government								Industry				U&Cs	Nonprofit			Non-Fed. govt.[a]
Performing sector:	Total U.S	Total	Federal Govt.	Industry[b]	Industry FFRDCs[b]	U&Cs	U&C FFRDCs[c]	Nonprofit[b]	Nonprofit FFRDCs[b]	Total	Industry[d]	U &Cs	Nonprofit	U&Cs	Total	Nonprofit	U&Cs	U&Cs
Calendar year[e]																		
1953	25,570	13,788	5,030	7,086		738	649	285		11,132	10,902	102	129	181	273	139	134	196
1954	27,538	15,198	4,716	8,574		806	786	316		11,634	11,367	115	152	194	294	152	142	218
1955	30,286	17,373	4,690	9,918	593	921	902	309	41	12,160	11,861	130	169	203	309	154	154	241
1956	39,590	23,186	5,265	13,950	1,551	1,029	1,011	328	51	15,582	15,263	147	172	214	345	177	168	263
1957	44,672	28,101	5,849	17,710	1,835	1,089	1,202	354	63	15,642	15,311	165	167	230	410	230	180	289
1958	48,063	30,709	6,634	19,533	1,422	1,233	1,389	418	79	16,323	15,984	172	167	244	469	273	196	317
1959	54,421	35,587	7,325	22,732	1,821	1,549	1,521	542	96	17,710	17,355	172	183	266	508	292	216	351
1960	58,922	38,312	7,738	24,083	2,050	1,945	1,654	636	206	19,407	19,029	172	206	288	529	292	236	387
1961	61,870	40,290	8,442	24,150	2,358	2,364	1,869	718	389	20,208	19,830	170	208	316	629	365	263	427
1962	65,588	42,526	9,176	25,201	1,787	2,880	2,097	839	545	21,491	21,095	170	227	352	749	457	292	470
1963	72,633	48,281	10,607	28,425	1,716	3,476	2,403	970	684	22,618	22,222	168	228	398	817	493	323	518
1964	78,034	52,142	12,113	29,645	1,891	4,065	2,569	1,021	837	24,050	23,660	165	225	464	817	458	359	562
1965	81,138	52,859	12,645	29,515	1,494	4,675	2,522	1,146	861	26,236	25,821	166	248	545	899	497	403	599
1966	85,982	55,180	12,885	31,075	1,383	5,201	2,538	1,280	818	28,559	28,111	175	273	641	980	538	442	623
1967	88,133	54,975	13,003	29,996	1,582	5,627	2,627	1,291	849	30,749	30,276	194	279	753	1,021	547	474	634
1968	89,241	54,140	12,653	29,468	1,501	5,738	2,612	1,317	850	32,589	32,088	208	293	798	1,047	546	501	668
1969	89,826	52,620	13,097	27,598	1,603	5,610	2,526	1,339	847	34,591	34,060	209	321	805	1,092	556	536	719
1970	86,192	49,161	13,628	23,970	1,552	5,530	2,384	1,344	755	34,280	33,753	215	312	848	1,125	564	561	778
1971	84,067	47,443	13,752	22,380	1,532	5,488	2,291	1,330	671	33,762	33,231	225	306	903	1,142	574	568	817
1972	85,997	47,993	13,991	22,349	1,640	5,655	2,349	1,411	598	35,054	34,515	236	302	932	1,174	592	582	844
1973	87,681	46,989	13,701	21,530	1,544	5,690	2,382	1,603	538	37,673	37,122	254	297	972	1,194	598	596	854
1974	86,731	44,936	13,341	19,683	1,684	5,615	2,407	1,660	546	38,695	38,126	270	299	1,020	1,248	626	621	832
1975	84,785	44,033	13,213	18,717	1,727	5,702	2,535	1,604	535	37,598	37,021	280	297	1,025	1,302	656	646	827
1976	88,571	45,548	13,222	19,464	1,998	5,879	2,841	1,596	550	39,735	39,138	294	303	1,077	1,382	709	672	828
1977	91,622	46,710	13,096	20,078	2,028	6,098	3,269	1,561	580	41,418	40,776	326	316	1,199	1,464	755	709	831
1978	95,937	48,081	13,681	19,860	2,126	6,541	3,588	1,631	653	44,137	43,456	357	324	1,334	1,514	800	714	871
1979	100,527	49,435	13,527	20,558	2,108	6,967	3,785	1,783	706	47,261	46,547	388	326	1,421	1,538	840	698	872
1980	104,975	49,785	12,980	21,137	2,117	7,185	3,922	1,658	787	51,284	50,515	437	332	1,524	1,523	829	695	859
1981	109,540	51,073	13,035	22,719	2,098	7,074	3,761	1,572	814	54,487	53,671	476	341	1,602	1,497	795	701	880
1982	115,201	53,061	13,540	24,314	2,115	6,952	3,717	1,675	748	58,028	57,154	517	356	1,719	1,508	748	760	885
1983	123,058	56,828	14,803	26,100	2,166	7,121	4,023	1,794	820	61,912	60,946	590	376	1,854	1,564	752	813	899
1984	134,758	61,342	15,695	28,526	2,291	7,570	4,395	2,042	823	68,816	67,708	682	426	1,994	1,657	796	861	950
1985	146,118	67,170	16,672	32,259	2,372	8,134	4,723	2,165	844	73,920	72,638	802	479	2,220	1,748	840	908	1,061
1986	149,289	67,896	16,759	32,266	2,347	8,721	5,027	2,110	667	75,821	74,376	925	521	2,505	1,864	896	968	1,203
1987	152,004	70,489	16,360	34,622	2,402	9,352	5,259	1,889	604	75,468	73,926	1,000	541	2,723	2,043	982	1,061	1,282
1988	155,538	69,903	16,659	32,781	2,465	9,980	5,379	2,047	592	79,105	77,445	1,084	577	2,935	2,243	1,078	1,165	1,353
1989	158,168	67,419	16,976	29,379	2,447	10,381	5,329	2,298	610	83,725	81,923	1,183	619	3,178	2,427	1,166	1,261	1,419

Appendix table 2-6.
U.S. R&D expenditures, by source of funds and performer: 1953–98
(Millions of constant 1992 dollars)

Funding sector:	Total U.S	Federal Government								Industry				U&Cs	Nonprofit			Non-Fed. govt.[a]
Performing sector:	Total U.S	Total	Federal Govt.	Industry[b]	Industry FFRDCs[b]	U&Cs	U&C FFRDCs[c]	Nonprofit[b]	Nonprofit FFRDCs[b]	Total	Industry[d]	U&Cs	Nonprofit	U&Cs	Total	Nonprofit	U&Cs	U&Cs
Calendar year[e]																		
1990	162,435	65,884	16,743	27,566	2,482	10,614	5,294	2,506	680	89,084	87,182	1,246	656	3,404	2,569	1,235	1,334	1,494
1991	165,293	62,496	15,669	24,759	2,340	10,956	5,305	2,753	715	95,037	93,074	1,277	686	3,552	2,686	1,291	1,395	1,522
1992	165,211	60,922	15,853	22,369	2,353	11,523	5,271	2,806	748	96,411	94,388	1,321	703	3,568	2,787	1,339	1,448	1,524
1993	161,186	58,967	16,107	20,308	1,914	11,994	5,147	2,766	730	94,213	92,158	1,352	703	3,623	2,874	1,381	1,493	1,510
1994	160,676	57,932	15,637	19,280	2,095	12,379	5,059	2,760	723	94,515	92,426	1,378	710	3,768	2,927	1,407	1,521	1,533
1995	170,432	58,804	15,937	19,699	2,114	12,654	4,996	2,649	755	103,251	101,062	1,431	757	3,850	2,908	1,397	1,511	1,619
1996	179,439	58,018	15,181	19,498	2,097	12,946	4,939	2,653	704	112,810	110,486	1,511	814	3,994	2,938	1,412	1,526	1,679
1997	189,359	58,181	15,071	19,538	1,909	13,309	4,899	2,721	735	122,213	119,755	1,589	869	4,200	3,027	1,454	1,572	1,739
1998 prelim.	201,573	59,388	15,252	19,713	2,106	13,805	4,895	2,887	731	132,789	130,174	1,682	932	4,418	3,142	1,510	1,632	1,837

FFRDCs = Federally Funded Research and Development Centers; U&C = universities and colleges

NOTES: Data are based on annual reports by performers except for the nonprofit sector; R&D expenditures by nonprofit sector performers have been estimated since 1973 on the basis of a survey conducted in that year. The next updates of these data, covering the years 1953–2000, along with technical notes explaining methodological issues of measurement, will be provided in National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources: 2000* (Arlington, VA: forthcoming). Data are preliminary for 1998.

[a]Because of limitations in the survey information, data on non-Federal government funding to other performers are not available, and are consequently included in other sectors' support for their own R&D performance. For example, non-Federal government support to nonprofits is included in nonprofits' support for their own R&D.

[b]For 1953–54, expenditures of industry FFRDCs were not separated out from total Federal support to the industrial sector. Thus, the figure for Federal support to industry includes support to FFRDCs for those two years. The same is true for expenditures of nonprofit FFRDCs, which are included in Federal support for nonprofit institutions in 1953–54.

[c]Includes R&D expenditures of FFRDCs administered by academic institutions, nearly all of which are federally funded.

[d]Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.

[e]Expenditure levels for academic and Federal Government performers are also in reference to calendar years, unlike the levels typically provided in statistical reports on these institutions alone, which are in reference to fiscal years. These calendar–year expenditure levels are approximations based on fiscal year data.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources* (Arlington, VA: biennial series).

See page 1-8 and figures 2-1 and 2-7 in Volume I.

Appendix table 2-7.
U.S. basic research expenditures, by performing sector and source of funds: 1953–98
(Millions of current dollars)

Performing sector:	Total U.S.	Federal Govt.	Industry			Industry FFRDCs	Universities & colleges						U&C FFRDCs	Other nonprofit institutions				Nonprofit FFRDCs
Funding sector:	Total U.S.	Federal Govt.	Total	Federal Govt.[a]	Industry[b]	Federal Govt.[a]	Total	Federal Govt.	Nonfed. govt.	Industry	U&C	Nonprofit	Federal Govt.[c]	Total	Federal Govt.[a]	Industry	Nonprofit	Federal Govt.[a]
Calendar year[d]																		
1953	460	102	151	19	132		123	82	7	13	6	16	36	48	27	9	12	
1954	509	96	166	23	143		148	97	10	15	8	18	44	55	31	11	13	
1955	579	98	189	27	162		180	117	14	17	12	21	50	63	36	13	14	
1956	718	114	253	37	216		220	143	19	20	15	24	58	74	42	15	17	
1957	814	124	271	41	230		261	167	25	23	20	27	72	87	49	15	23	
1958	944	149	295	43	252		312	202	31	24	24	31	85	103	59	16	28	
1959	1,087	165	320	72	248		388	263	38	24	28	36	95	120	72	18	30	
1960	1,286	184	376	79	297		485	341	45	25	33	41	106	136	85	21	30	
1961	1,512	230	395	81	314		598	432	54	25	40	48	126	164	105	22	37	
1962	1,824	252	488	143	345		737	546	64	25	48	55	148	200	130	24	46	
1963	2,115	285	522	147	375		909	689	75	25	58	63	175	225	150	25	50	
1964	2,396	339	507	123	384	42	1,071	824	84	25	70	68	200	238	166	25	47	
1965	2,664	375	563	157	406	29	1,221	944	94	27	86	70	218	260	179	29	52	
1966	2,930	410	593	142	451	31	1,380	1,066	104	29	106	75	239	278	188	32	58	
1967	3,168	434	595	168	427	34	1,554	1,188	114	34	136	83	263	289	194	34	61	
1968	3,376	482	607	145	462	35	1,681	1,265	131	38	156	91	276	296	196	37	63	
1969	3,491	545	581	123	458	37	1,754	1,288	153	40	171	103	272	302	192	43	67	
1970	3,594	562	566	122	444	36	1,855	1,323	179	43	196	115	265	311	195	44	72	
1971	3,720	581	557	101	456	33	1,968	1,385	194	50	214	127	252	329	207	45	77	
1972	3,850	603	554	91	463	39	2,038	1,437	195	55	216	134	270	347	216	47	84	
1973	4,099	652	595	96	499	36	2,103	1,489	196	59	223	137	343	371	232	49	90	
1974	4,515	715	650	114	536	49	2,282	1,609	204	66	250	153	415	405	245	54	106	
1975	4,880	760	677	104	573	53	2,480	1,768	212	72	264	164	476	435	255	60	120	
1976	5,376	850	750	116	634	69	2,675	1,924	218	75	283	175	556	477	278	64	135	
1977	6,075	943	836	135	701	75	2,967	2,114	232	89	334	198	734	521	301	70	150	
1978	7,001	1,044	941	156	785	94	3,376	2,399	260	107	398	213	945	601	351	80	170	
1979	7,867	1,112	1,054	161	893	104	3,828	2,719	286	128	466	229	1,077	693	413	85	195	
1980	8,825	1,212	1,205	170	1,035	120	4,315	3,061	307	156	544	248	1,201	771	461	95	215	
1981	9,827	1,343	1,477	164	1,313	137	4,737	3,331	338	183	615	269	1,299	835	505	105	225	
1982	10,803	1,522	1,776	253	1,523	128	5,091	3,475	368	215	716	317	1,406	881	551	115	215	
1983	12,018	1,733	2,106	346	1,760	117	5,518	3,689	396	260	816	358	1,587	958	613	125	220	
1984	13,403	1,877	2,472	340	2,132	136	6,145	4,087	436	313	915	395	1,728	1,047	656	149	242	
1985	14,772	1,947	2,731	358	2,373	131	7,025	4,605	515	389	1,076	440	1,821	1,118	681	173	264	
1986	17,152	2,026	3,930	434	3,496	117	7,943	5,121	606	466	1,262	488	1,955	1,182	700	193	289	
1987	18,393	2,047	4,181	598	3,583	142	8,644	5,527	659	514	1,399	545	2,139	1,240	707	207	326	
1988	19,637	2,116	4,163	656	3,507	337	9,343	5,936	705	565	1,529	607	2,299	1,356	756	228	371	24
1989	21,712	2,309	4,818	986	3,832	398	10,216	6,421	765	638	1,713	679	2,390	1,534	860	256	419	46
1990	22,837	2,319	4,629	869	3,760	499	11,123	6,887	846	706	1,928	756	2,512	1,692	947	282	462	65
1991	26,915	2,378	7,376	1,251	6,125	461	12,059	7,421	911	764	2,126	836	2,719	1,846	1,036	307	503	77

Appendix table 2-7.
U.S. basic research expenditures, by performing sector and source of funds: 1953–98
(Millions of current dollars)

Performing sector:	Total U.S.	Federal Govt.	Industry			Industry FFRDCs	Universities & colleges						U&C FFRDCs	Other nonprofit institutions				Nonprofit FFRDCs
Funding sector:	Total U.S.	Federal Govt.	Total	Federal Govt.[a]	Industry[b]	Federal Govt.[a]	Total	Federal Govt.	Nonfed. govt.	Industry	U&C	Nonprofit	Federal Govt.[c]	Total	Federal Govt.[a]	Industry	Nonprofit	Federal Govt.[a]
Calendar year[d]																		
1992	27,258	2,419	6,528	712	5,816	474	12,907	8,056	940	815	2,202	893	2,891	1,973	1,114	323	536	67
1993	28,312	2,623	6,427	466	5,961	492	13,679	8,661	950	850	2,279	939	2,968	2,052	1,153	332	567	72
1994	29,046	2,553	6,514	436	6,078	503	14,472	9,186	988	888	2,429	980	2,870	2,060	1,126	343	591	74
1995	28,909	2,695	5,569	190	5,379	530	15,233	9,683	1,068	945	2,540	997	2,661	2,146	1,170	375	601	76
1996	32,012	2,689	7,498	650	6,848	708	16,129	10,201	1,143	1,028	2,719	1,039	2,632	2,277	1,249	410	619	79
1997	35,499	2,735	9,795	1,029	8,766	625	17,143	10,735	1,224	1,119	2,958	1,107	2,696	2,412	1,317	446	649	95
1998 prelim. ...	37,877	2,920	10,765	1,140	9,625	676	18,100	11,248	1,315	1,205	3,164	1,169	2,721	2,584	1,420	483	681	111

FFRDCs = Federally Funded Research and Development Centers; U&C = universities and colleges

NOTES: Data are based on annual reports by performers except for the nonprofit sector; R&D expenditures by nonprofit sector performers have been estimated since 1973 on the basis of a survey conducted in that year. The next updates of these data, covering the years 1953–2000, along with technical notes explaining methodological issues of measurement, will be provided in National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources: 2000* (Arlington, VA: forthcoming). Data are preliminary for 1998.

[a]For 1953–63, basic research of industry FFRDCs were not separated out from total Federal support to the industrial sector for basic research. Thus, the figure for Federal support to industry for basic research includes support for basic research at industry FFRDCs for those years. The same is true for basic research by nonprofit FFRDCs in 1953–87, which is included in Federal support for basic research at nonprofit institutions for those years.

[b]Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.

[c]Includes R&D expenditures of FFRDCs administered by academic institutions, nearly all of which are federally funded.

[d]Expenditure levels for academic and Federal Government performers are also in reference to calendar years, unlike the levels typically provided in statistical reports on these institutions alone, which are in reference to fiscal years. These calendar–year expenditure levels are approximations based on fiscal year data.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources* (Arlington, VA: biennial series).

See figures 2-2, 2-7, 2-15, and 2-16; text table 2-1; and figures 6-1 and 6-2 in Volume I.

Appendix table 2-8.
U.S. basic research expenditures, by performing sector and source of funds: 1953–98
(Millions of constant 1992 dollars)

Performing sector:	Total U.S.	Federal Govt.	Industry			Industry FFRDCs	Universities & colleges						U&C FFRDCs	Other nonprofit institutions				Nonprofit FFRDCs
Funding sector:	Total U.S.	Federal Govt.	Total	Federal Govt.[a]	Industry[b]	Federal Govt.[a]	Total	Federal Govt.	Nonfed. govt.	Industry	U&C	Nonprofit	Federal Govt.[c]	Total	Federal Govt.[a]	Industry	Nonprofit	Federal Govt.[a]
Calendar year[d]																		
1953	2,277	503	748	94	654		610	404	32	64	30	79	178	238	134	45	59	
1954	2,491	470	813	113	701		723	473	47	73	41	88	216	269	152	54	64	
1955	2,792	470	911	130	781		865	562	67	82	56	99	241	304	174	63	68	
1956	3,344	529	1,178	172	1,006		1,025	664	89	91	72	109	270	342	193	70	79	
1957	3,668	559	1,222	185	1,037		1,174	751	112	101	89	122	322	390	219	68	104	
1958	4,155	656	1,299	189	1,110		1,374	889	137	106	105	137	374	451	258	70	123	
1959	4,736	717	1,394	314	1,081		1,691	1,144	164	105	124	155	412	523	314	78	131	
1960	5,526	789	1,616	339	1,276		2,082	1,463	193	105	144	176	456	584	365	90	129	
1961	6,421	975	1,678	344	1,334		2,538	1,833	228	106	169	202	533	697	446	93	157	
1962	7,651	1,057	2,047	600	1,447		3,089	2,288	267	105	200	229	619	839	545	101	193	
1963	8,769	1,180	2,164	609	1,555		3,767	2,857	311	102	239	259	726	933	622	104	207	
1964	9,788	1,385	2,071	502	1,569	172	4,373	3,364	345	102	284	278	815	972	678	102	192	
1965	10,673	1,500	2,256	629	1,627	116	4,890	3,780	378	106	345	280	871	1,040	715	116	208	
1966	11,414	1,597	2,310	553	1,757	121	5,376	4,153	403	113	415	292	929	1,081	730	125	226	
1967	11,957	1,636	2,246	634	1,612	128	5,864	4,483	430	126	512	313	993	1,089	730	128	230	
1968	12,214	1,744	2,196	525	1,671	127	6,080	4,577	473	136	565	329	997	1,071	709	134	228	
1969	12,062	1,884	2,008	425	1,583	128	6,059	4,449	528	136	591	354	940	1,044	663	149	232	
1970	11,791	1,844	1,857	400	1,457	118	6,086	4,339	588	141	642	376	868	1,019	638	144	236	
1971	11,604	1,813	1,737	315	1,422	103	6,138	4,318	604	154	667	395	786	1,026	646	140	240	
1972	11,520	1,803	1,658	272	1,385	117	6,097	4,300	585	165	647	401	808	1,038	646	141	251	
1973	11,613	1,847	1,686	272	1,414	102	5,958	4,217	556	166	632	387	972	1,050	656	139	255	
1974	11,736	1,858	1,690	296	1,393	127	5,931	4,182	530	172	650	396	1,077	1,053	637	140	276	
1975	11,594	1,805	1,608	247	1,361	126	5,891	4,201	505	170	626	390	1,130	1,033	606	143	285	
1976	12,067	1,908	1,684	260	1,423	155	6,003	4,319	489	168	636	392	1,248	1,070	623	144	303	
1977	12,809	1,988	1,763	285	1,478	158	6,254	4,457	489	188	705	416	1,546	1,099	635	148	316	
1978	13,757	2,052	1,849	307	1,543	185	6,634	4,714	510	209	783	418	1,856	1,181	690	157	334	
1979	14,245	2,014	1,908	292	1,617	188	6,930	4,923	518	231	844	415	1,950	1,254	747	154	353	
1980	14,627	2,009	1,997	282	1,716	199	7,152	5,073	509	258	902	411	1,991	1,278	765	157	356	
1981	14,887	2,034	2,238	248	1,989	208	7,175	5,046	512	277	932	408	1,967	1,265	765	159	341	
1982	15,396	2,168	2,531	361	2,170	182	7,255	4,952	524	307	1,021	451	2,003	1,256	786	164	306	
1983	16,427	2,368	2,879	473	2,406	160	7,542	5,042	541	355	1,116	489	2,169	1,309	837	171	301	
1984	17,655	2,472	3,256	448	2,808	179	8,093	5,383	574	412	1,205	520	2,275	1,379	864	196	319	
1985	18,811	2,480	3,478	456	3,022	167	8,945	5,864	655	495	1,370	560	2,318	1,424	868	220	336	
1986	21,286	2,514	4,877	539	4,339	145	9,857	6,355	752	578	1,567	605	2,426	1,467	869	240	358	
1987	22,144	2,465	5,034	720	4,314	171	10,406	6,654	793	619	1,685	656	2,575	1,493	851	249	393	
1988	22,809	2,458	4,836	762	4,074	391	10,852	6,895	819	656	1,776	705	2,670	1,575	878	265	431	28
1989	24,199	2,573	5,370	1,099	4,271	444	11,387	7,156	853	711	1,909	757	2,664	1,710	959	285	466	52
1990	24,399	2,477	4,946	928	4,017	533	11,883	7,357	904	754	2,060	807	2,683	1,807	1,012	302	494	69
1991	27,656	2,444	7,579	1,285	6,294	474	12,391	7,625	936	785	2,185	859	2,794	1,896	1,064	316	516	79
1992	27,258	2,419	6,528	712	5,816	474	12,907	8,056	940	815	2,202	893	2,891	1,973	1,114	323	536	67

Appendix table 2-8.
U.S. basic research expenditures, by performing sector and source of funds: 1953–98
(Millions of constant 1992 dollars)

Performing sector:	Total U.S.	Federal Govt.	Industry			Industry FFRDCs	Universities & colleges						U&C FFRDCs	Other nonprofit institutions				Nonprofit FFRDCs
Funding sector:	Total U.S.	Federal Govt.	Total	Federal Govt.[a]	Industry[b]	Federal Govt.[a]	Total	Federal Govt.	Nonfed. govt.	Industry	U&C	Nonprofit	Federal Govt.[c]	Total	Federal Govt.[a]	Industry	Nonprofit	Federal Govt.[a]
Calendar year[d]																		
1993	27,584	2,555	6,262	454	5,808	479	13,327	8,438	925	829	2,220	915	2,892	1,999	1,123	323	553	70
1994	27,639	2,429	6,198	415	5,784	479	13,771	8,741	940	845	2,311	933	2,731	1,961	1,071	327	563	71
1995	26,890	2,507	5,180	177	5,003	493	14,168	9,006	994	879	2,363	927	2,475	1,996	1,088	348	559	70
1996	29,227	2,455	6,846	593	6,252	646	14,726	9,313	1,043	939	2,482	948	2,403	2,079	1,140	374	565	73
1997	31,818	2,451	8,779	922	7,857	560	15,365	9,621	1,098	1,003	2,651	992	2,416	2,162	1,181	400	582	85
1998 prelim. ...	33,609	2,591	9,552	1,012	8,540	600	16,060	9,980	1,167	1,069	2,807	1,037	2,414	2,292	1,260	429	604	99

FFRDCs = Federally Funded Research and Development Centers; U&C = universities and colleges

NOTES: Data are based on annual reports by performers except for the nonprofit sector; R&D expenditures by nonprofit sector performers have been estimated since 1973 on the basis of a survey conducted in that year. The next updates of these data, covering the years 1953–2000, along with technical notes explaining methodological issues of measurement, will be provided in National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources: 2000* (Arlington, VA: forthcoming). Data are preliminary for 1998.

[a]For 1953–63, basic research of industry FFRDCs were not separated out from total Federal support to the industrial sector for basic research. Thus, the figure for Federal support to industry for basic research includes support for basic research at industry FFRDCs for those years. The same is true for basic research by nonprofit FFRDCs in 1953–87, which is included in Federal support for basic research at nonprofit institutions for those years.

[b]Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.

[c]Includes R&D expenditures of FFRDCs administered by academic institutions, nearly all of which are federally funded.

[d]Expenditure levels for academic and Federal Government performers are also in reference to calendar years, unlike the levels typically provided in statistical reports on these institutions alone, which are in reference to fiscal years. These calendar–year expenditure levels are approximations based on fiscal year data.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources* (Arlington, VA: biennial series)

See figure 2-15 in Volume I.

Appendix table 2-9.
U.S. basic research expenditures, by source of funds and performer: 1953–98
(Millions of current dollars)

Funding sector:	Total U.S.	Federal Government								Industry				U&Cs	Nonprofit			Non-Fed. govt.[a]
Performing sector:	Total U.S.	Total	Federal Govt.	Industry[b]	Industry FFRDCs[b]	U&Cs	U&C FFRDCs[c]	Nonprofit[b]	Nonprofit FFRDCs[b]	Total	Industry[d]	U&Cs	Nonprofit	U&Cs	Total	Nonprofit	U&Cs	U&Cs
Calendar year[e]																		
1953	460	265	102	19		82	36	27		154	132	13	9	6	28	12	16	7
1954	509	291	96	23		97	44	31		169	143	15	11	8	31	13	18	10
1955	579	327	98	27		117	50	36		192	162	17	13	12	35	14	21	14
1956	718	393	114	37		143	58	42		251	216	20	15	15	41	17	24	19
1957	814	452	124	41		167	72	49		268	230	23	15	20	50	23	27	25
1958	944	538	149	43		202	85	59		292	252	24	16	24	59	28	31	31
1959	1,087	666	165	72		263	95	72		290	248	24	18	28	66	30	36	38
1960	1,286	794	184	79		341	106	85		343	297	25	21	33	71	30	41	45
1961	1,512	973	230	81		432	126	105		361	314	25	22	40	85	37	48	54
1962	1,824	1,218	252	143		546	148	130		394	345	25	24	48	101	46	55	64
1963	2,115	1,446	285	147		689	175	150		425	375	25	25	58	113	50	63	75
1964	2,396	1,693	339	123	42	824	200	166		434	384	25	25	70	115	47	68	84
1965	2,664	1,900	375	157	29	944	218	179		462	406	27	29	86	122	52	70	94
1966	2,930	2,075	410	142	31	1,066	239	188		512	451	29	32	106	133	58	75	104
1967	3,168	2,280	434	168	34	1,188	263	194		495	427	34	34	136	144	61	83	114
1968	3,376	2,399	482	145	35	1,265	276	196		537	462	38	37	156	154	63	91	131
1969	3,491	2,457	545	123	37	1,288	272	192		541	458	40	43	171	170	67	103	153
1970	3,594	2,501	562	122	36	1,323	265	195		531	444	43	44	196	187	72	115	179
1971	3,720	2,559	581	101	33	1,385	252	207		551	456	50	45	214	204	77	127	194
1972	3,850	2,656	603	91	39	1,437	270	216		565	463	55	47	216	218	84	134	195
1973	4,099	2,847	652	96	36	1,489	343	232		607	499	59	49	223	227	90	137	196
1974	4,515	3,146	715	114	49	1,609	415	245		656	536	66	54	250	259	106	153	204
1975	4,880	3,415	760	104	53	1,768	476	255		705	573	72	60	264	284	120	164	212
1976	5,376	3,793	850	116	69	1,924	556	278		773	634	75	64	283	310	135	175	218
1977	6,075	4,302	943	135	75	2,114	734	301		860	701	89	70	334	348	150	198	232
1978	7,001	4,989	1,044	156	94	2,399	945	351		972	785	107	80	398	383	170	213	260
1979	7,867	5,586	1,112	161	104	2,719	1,077	413		1,106	893	128	85	466	424	195	229	286
1980	8,825	6,225	1,212	170	120	3,061	1,201	461		1,286	1,035	156	95	544	463	215	248	307
1981	9,827	6,778	1,343	164	137	3,331	1,299	505		1,601	1,313	183	105	615	494	225	269	338
1982	10,803	7,334	1,522	253	128	3,475	1,406	551		1,853	1,523	215	115	716	532	215	317	368
1983	12,018	8,084	1,733	346	117	3,689	1,587	613		2,145	1,760	260	125	816	578	220	358	396
1984	13,403	8,823	1,877	340	136	4,087	1,728	656		2,593	2,132	313	149	915	637	242	395	436
1985	14,772	9,543	1,947	358	131	4,605	1,821	681		2,935	2,373	389	173	1,076	704	264	440	515
1986	17,152	10,352	2,026	434	117	5,121	1,955	700		4,155	3,496	466	193	1,262	776	289	488	606
1987	18,393	11,160	2,047	598	142	5,527	2,139	707		4,304	3,583	514	207	1,399	871	326	545	659
1988	19,637	12,124	2,116	656	337	5,936	2,299	756	24	4,300	3,507	565	228	1,529	978	371	607	705

Appendix table 2-9.
U.S. basic research expenditures, by source of funds and performer: 1953–98
(Millions of current dollars)

Funding sector:	Total U.S.	Federal Government								Industry				U&Cs	Nonprofit			Non-Fed. govt.[a]
Performing sector:	Total U.S.	Total	Federal Govt.	Industry[b]	Industry FFRDCs[b]	U&Cs	U&C FFRDCs[c]	Nonprofit[b]	Nonprofit FFRDCs[b]	Total	Industry[d]	U&Cs	Nonprofit	U&Cs	Total	Nonprofit	U&Cs	U&Cs
Calendar year[e]																		
1989	21,712	13,410	2,309	986	398	6,421	2,390	860	46	4,725	3,832	638	256	1,713	1,098	419	679	765
1990	22,837	14,096	2,319	869	499	6,887	2,512	947	65	4,748	3,760	706	282	1,928	1,218	462	756	846
1991	26,915	15,343	2,378	1,251	461	7,421	2,719	1,036	77	7,197	6,125	764	307	2,126	1,338	503	836	911
1992	27,258	15,732	2,419	712	474	8,056	2,891	1,114	67	6,954	5,816	815	323	2,202	1,429	536	893	940
1993	28,312	16,434	2,623	466	492	8,661	2,968	1,153	72	7,143	5,961	850	332	2,279	1,506	567	939	950
1994	29,046	16,748	2,553	436	503	9,186	2,870	1,126	74	7,310	6,078	888	343	2,429	1,572	591	980	988
1995	28,909	17,004	2,695	190	530	9,683	2,661	1,170	76	6,698	5,379	945	375	2,540	1,598	601	997	1,068
1996	32,012	18,208	2,689	650	708	10,201	2,632	1,249	79	8,286	6,848	1,028	410	2,719	1,657	619	1,039	1,143
1997	35,499	19,230	2,735	1,029	625	10,735	2,696	1,317	95	10,331	8,766	1,119	446	2,958	1,756	649	1,107	1,224
1998 prelim. ...	37,877	20,235	2,920	1,140	676	11,248	2,721	1,420	111	11,313	9,625	1,205	483	3,164	1,850	681	1,169	1,315

FFRDCs = Federally Funded Research and Development Centers; U&C = universities and colleges

NOTES: Data are based on annual reports by performers except for the nonprofit sector; R&D expenditures by nonprofit sector performers have been estimated since 1973 on the basis of a survey conducted in that year. The next updates of these data, covering the years 1953–2000, along with technical notes explaining methodological issues of measurement, will be provided in National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources: 2000* (Arlington, VA: forthcoming). Data are preliminary for 1998.

[a]Because of limitations in the survey information, data on non-Federal government funding to other performers are not available, and are consequently included in other sectors' support for their own R&D performance. For example, non-Federal government support to nonprofits is included in nonprofits' support for their own R&D.

[b]For 1953–63, basic research of industry FFRDCs were not separated out from total Federal support to the industrial sector for basic research. Thus, the figure for Federal support to industry for basic research includes support for basic research at industry FFRDCs for those years. The same is true for basic research by nonprofit FFRDCs in 1953–87, which is included in Federal support for basic research at nonprofit institutions for those years.

[c]Includes R&D expenditures of FFRDCs administered by academic institutions, nearly all of which are federally funded.

[d]Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.

[e]Expenditure levels for academic and Federal Government performers are also in reference to calendar years, unlike the levels typically provided in statistical reports on these institutions alone, which are in reference to fiscal years. These calendar–year expenditure levels are approximations based on fiscal year data.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources* (Arlington, VA: biennial series).

See figures 2-16 and 2-17 in Volume I.

Appendix table 2-10.
U.S. basic research expenditures, by source of funds and performer: 1953–98
(Millions of constant 1992 dollars)

Funding sector:	Total U.S.	Federal Government								Industry				U&Cs	Nonprofit			Non-Fed. govt.[a]
Performing sector:	Total U.S.	Total	Federal Govt.	Industry[b]	Industry FFRDCs[b]	U&Cs	U&C FFRDCs[c]	Nonprofit[b]	Nonprofit FFRDCs[b]	Total	Industry[d]	U&Cs	Nonprofit	U&Cs	Total	Nonprofit	U&Cs	U&Cs
Calendar year[e]																		
1953	2,277	1,313	503	94		404	178	134		763	654	64	45	30	139	59	79	32
1954	2,491	1,423	470	113		473	216	152		828	701	73	54	41	152	64	88	47
1955	2,792	1,577	470	130		562	241	174		926	781	82	63	56	166	68	99	67
1956	3,344	1,828	529	172		664	270	193		1,167	1,006	91	70	72	189	79	109	89
1957	3,668	2,036	559	185		751	322	219		1,206	1,037	101	68	89	225	104	122	112
1958	4,155	2,367	656	189		889	374	258		1,286	1,110	106	70	105	260	123	137	137
1959	4,736	2,900	717	314		1,144	412	314		1,264	1,081	105	78	124	285	131	155	164
1960	5,526	3,412	789	339		1,463	456	365		1,472	1,276	105	90	144	305	129	176	193
1961	6,421	4,131	975	344		1,833	533	446		1,534	1,334	106	93	169	359	157	202	228
1962	7,651	5,109	1,057	600		2,288	619	545		1,653	1,447	105	101	200	422	193	229	267
1963	8,769	5,993	1,180	609		2,857	726	622		1,760	1,555	102	104	239	466	207	259	311
1964	9,788	6,916	1,385	502	172	3,364	815	678		1,773	1,569	102	102	284	470	192	278	345
1965	10,673	7,612	1,500	629	116	3,780	871	715		1,849	1,627	106	116	345	489	208	280	378
1966	11,414	8,083	1,597	553	121	4,153	929	730		1,995	1,757	113	125	415	518	226	292	403
1967	11,957	8,605	1,636	634	128	4,483	993	730		1,867	1,612	126	128	512	544	230	313	430
1968	12,214	8,678	1,744	525	127	4,577	997	709		1,941	1,671	136	134	565	557	228	329	473
1969	12,062	8,489	1,884	425	128	4,449	940	663		1,868	1,583	136	149	591	586	232	354	528
1970	11,791	8,207	1,844	400	118	4,339	868	638		1,742	1,457	141	144	642	612	236	376	588
1971	11,604	7,981	1,813	315	103	4,318	786	646		1,717	1,422	154	140	667	635	240	395	604
1972	11,520	7,946	1,803	272	117	4,300	808	646		1,691	1,385	165	141	647	652	251	401	585
1973	11,613	8,065	1,847	272	102	4,217	972	656		1,718	1,414	166	139	632	642	255	387	556
1974	11,736	8,178	1,858	296	127	4,182	1,077	637		1,705	1,393	172	140	650	672	276	396	530
1975	11,594	8,114	1,805	247	126	4,201	1,130	606		1,674	1,361	170	143	626	675	285	390	505
1976	12,067	8,513	1,908	260	155	4,319	1,248	623		1,735	1,423	168	144	636	695	303	392	489
1977	12,809	9,069	1,988	285	158	4,457	1,546	635		1,813	1,478	188	148	705	733	316	416	489
1978	13,757	9,803	2,052	307	185	4,714	1,856	690		1,909	1,543	209	157	783	752	334	418	510
1979	14,245	10,114	2,014	292	188	4,923	1,950	747		2,002	1,617	231	154	844	768	353	415	518
1980	14,627	10,318	2,009	282	199	5,073	1,991	765		2,131	1,716	258	157	902	767	356	411	509
1981	14,887	10,269	2,034	248	208	5,046	1,967	765		2,425	1,989	277	159	932	749	341	408	512
1982	15,396	10,452	2,168	361	182	4,952	2,003	786		2,641	2,170	307	164	1,021	758	306	451	524
1983	16,427	11,049	2,368	473	160	5,042	2,169	837		2,932	2,406	355	171	1,116	790	301	489	541
1984	17,655	11,621	2,472	448	179	5,383	2,275	864		3,416	2,808	412	196	1,205	839	319	520	574
1985	18,811	12,152	2,480	456	167	5,864	2,318	868		3,737	3,022	495	220	1,370	896	336	560	655
1986	21,286	12,847	2,514	539	145	6,355	2,426	869		5,156	4,339	578	240	1,567	964	358	605	752
1987	22,144	13,436	2,465	720	171	6,654	2,575	851		5,181	4,314	619	249	1,685	1,049	393	656	793
1988	22,809	14,082	2,458	762	391	6,895	2,670	878	28	4,995	4,074	656	265	1,776	1,136	431	705	819
1989	24,199	14,946	2,573	1,099	444	7,156	2,664	959	52	5,267	4,271	711	285	1,909	1,224	466	757	853
1990	24,399	15,060	2,477	928	533	7,357	2,683	1,012	69	5,073	4,017	754	302	2,060	1,301	494	807	904
1991	27,656	15,766	2,444	1,285	474	7,625	2,794	1,064	79	7,395	6,294	785	316	2,185	1,375	516	859	936

Appendix table 2-10.
U.S. basic research expenditures, by source of funds and performer: 1953–98
(Millions of constant 1992 dollars)

Funding sector:	Total U.S.	Federal Government								Industry				U&Cs	Nonprofit			Non-Fed. govt.[a]
Performing sector:	Total U.S.	Total	Federal Govt.	Industry[b]	Industry FFRDCs[b]	U&Cs	U&C FFRDCs[c]	Nonprofit[b]	Nonprofit FFRDCs[b]	Total	Industry[d]	U&Cs	Nonprofit	U&Cs	Total	Nonprofit	U&Cs	U&Cs
Calendar year[e]																		
1992	27,258	15,732	2,419	712	474	8,056	2,891	1,114	67	6,954	5,816	815	323	2,202	1,429	536	893	940
1993	27,584	16,011	2,555	454	479	8,438	2,892	1,123	70	6,959	5,808	829	323	2,220	1,468	553	915	925
1994	27,639	15,937	2,429	415	479	8,741	2,731	1,071	71	6,956	5,784	845	327	2,311	1,495	563	933	940
1995	26,890	15,817	2,507	177	493	9,006	2,475	1,088	70	6,230	5,003	879	348	2,363	1,486	559	927	994
1996	29,227	16,624	2,455	593	646	9,313	2,403	1,140	73	7,565	6,252	939	374	2,482	1,513	565	948	1,043
1997	31,818	17,236	2,451	922	560	9,621	2,416	1,181	85	9,259	7,857	1,003	400	2,651	1,574	582	992	1,098
1998 prelim. ...	33,609	17,955	2,591	1,012	600	9,980	2,414	1,260	99	10,038	8,540	1,069	429	2,807	1,641	604	1,037	1,167

FFRDCs = Federally Funded Research and Development Centers; U&C = universities and colleges

NOTES: Data are based on annual reports by performers except for the nonprofit sector; R&D expenditures by nonprofit sector performers have been estimated since 1973 on the basis of a survey conducted in that year. The next updates of these data, covering the years 1953–2000, along with technical notes explaining methodological issues of measurement, will be provided in National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources: 2000* (Arlington, VA: forthcoming). Data are preliminary for 1998.

[a]Because of limitations in the survey information, data on non-Federal government funding to other performers are not available, and are consequently included in other sectors' support for their own R&D performance. For example, non-Federal government support to nonprofits is included in nonprofits' support for their own R&D.

[b]For 1953–63, basic research of industry FFRDCs were not separated out from total Federal support to the industrial sector for basic research. Thus, the figure for Federal support to industry for basic research includes support for basic research at industry FFRDCs for those years. The same is true for basic research by nonprofit FFRDCs in 1953–87, which is included in Federal support for basic research at nonprofit institutions for those years.

[c]Includes R&D expenditures of FFRDCs administered by academic institutions, nearly all of which are federally funded.

[d]Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.

[e]Expenditure levels for academic and Federal Government performers are also in reference to calendar years, unlike the levels typically provided in statistical reports on these institutions alone, which are in reference to fiscal years. These calendar–year expenditure levels are approximations based on fiscal year data.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources* (Arlington, VA: biennial series).

Appendix table 2-11.
U.S. applied research expenditures, by performing sector and source of funds: 1953–98
(Millions of current dollars)

Performing sector:	Total U.S.	Federal Govt.	Industry			Industry FFRDCs	Universities & colleges						U&C FFRDCs	Other nonprofit institutions				Nonprofit FFRDCs
Funding sector:	Total U.S.	Federal Govt.	Total	Federal Govt.[a]	Industry[b]	Federal Govt.[a]	Total	Federal Govt.	Nonfed. govt.	Industry	U&C	Nonprofit	Federal Govt.[c]	Total	Federal Govt.[a]	Industry	Nonprofit	Federal Govt.[a]
Calendar year[d]																		
1953	1,289	347	726	288	438		134	59	30	7	28	10	48	35	14	11	10	
1954	1,378	330	814	322	492		137	60	32	8	28	10	58	40	16	13	11	
1955	1,514	333	928	368	560		142	63	32	9	27	11	68	43	18	14	11	
1956	1,928	387	1,268	474	794		146	65	33	10	27	11	79	49	21	14	14	
1957	2,414	446	1,670	678	992		147	63	34	12	27	11	94	58	24	14	20	
1958	2,758	516	1,911	774	1,137		152	66	35	12	27	12	111	69	30	14	25	
1959	2,940	577	1,991	813	1,178		167	78	37	13	28	12	121	85	43	15	27	
1960	3,065	615	2,029	833	1,196		186	93	39	13	29	12	129	108	63	17	28	
1961	3,123	668	1,977	812	1,165		199	104	40	13	30	13	145	135	83	17	35	
1962	3,698	709	2,449	1,011	1,438		216	119	41	14	30	13	163	162	98	19	45	
1963	3,865	809	2,457	1,007	1,450		230	128	42	14	32	14	186	183	115	19	49	
1964	4,201	947	2,538	978	1,560	62	256	142	45	14	37	18	203	196	130	19	47	
1965	4,374	994	2,612	992	1,620	46	304	176	46	13	42	27	206	213	140	21	52	
1966	4,653	1,012	2,790	986	1,804	53	351	208	47	14	48	34	213	234	153	24	57	
1967	4,848	1,069	2,832	983	1,849	83	389	238	46	16	54	36	225	251	166	25	60	
1968	5,137	1,112	3,037	956	2,081	87	405	250	46	16	55	39	221	276	186	28	62	
1969	5,454	1,229	3,192	920	2,272	95	417	257	48	16	54	43	213	308	210	32	66	
1970	5,752	1,334	3,330	952	2,378	97	451	280	51	18	56	47	213	328	225	33	70	
1971	5,833	1,355	3,348	907	2,441	67	499	306	61	19	67	47	216	349	241	34	74	
1972	6,147	1,434	3,407	845	2,562	107	619	391	74	21	82	52	224	357	243	35	79	
1973	6,655	1,527	3,715	883	2,832	110	725	450	88	26	100	62	203	376	257	36	83	
1974	7,347	1,652	4,168	905	3,263	120	794	477	96	32	118	72	191	423	290	40	93	
1975	8,098	1,912	4,431	991	3,440	139	934	550	113	39	141	92	219	463	315	43	105	
1976	8,990	2,068	4,945	1,033	3,912	167	1,042	596	127	45	166	109	263	506	338	48	120	
1977	9,690	2,081	5,424	1,113	4,311	212	1,126	626	134	51	194	121	305	543	355	53	135	
1978	10,731	2,242	6,065	1,195	4,870	235	1,247	676	151	61	232	128	329	614	409	55	150	
1979	12,148	2,415	6,975	1,305	5,670	250	1,418	793	161	71	263	129	380	710	480	60	170	
1980	13,773	2,546	8,175	1,625	6,550	275	1,622	912	174	88	308	140	421	734	489	65	180	
1981	16,421	2,731	10,401	2,042	8,359	298	1,781	953	199	108	363	159	423	786	521	75	190	
1982	18,303	2,802	11,956	2,593	9,363	367	1,915	1,007	207	121	402	178	439	825	550	85	190	
1983	20,408	2,991	13,513	3,227	10,286	414	2,116	1,122	215	141	443	194	494	880	585	95	200	
1984	22,540	2,961	15,218	3,677	11,541	547	2,332	1,226	234	168	491	212	561	921	594	110	218	
1985	25,437	3,135	17,625	4,717	12,908	630	2,527	1,297	261	198	547	224	573	947	581	128	237	
1986	27,292	3,204	19,131	4,049	15,082	629	2,779	1,393	298	229	620	240	547	1,003	600	143	260	
1987	27,968	3,366	19,190	4,037	15,153	623	3,219	1,643	333	260	707	276	531	1,039	593	153	294	
1988	29,621	3,362	20,377	3,846	16,531	371	3,779	1,957	377	302	818	325	565	1,102	599	169	334	66
1989	32,381	3,566	22,317	4,324	17,993	374	4,188	2,120	417	347	933	370	605	1,260	695	189	377	70
1990	35,095	3,652	24,399	5,967	18,432	386	4,406	2,139	453	378	1,032	404	767	1,404	780	209	416	81
1991	38,764	4,093	27,013	5,588	21,425	433	4,609	2,230	468	392	1,091	428	929	1,600	921	227	452	86
1992	38,066	4,337	25,660	4,476	21,184	507	4,881	2,413	479	415	1,120	455	946	1,654	933	239	482	81

Appendix table 2-11.
U.S. applied research expenditures, by performing sector and source of funds: 1953–98
(Millions of current dollars)

Performing sector:	Total U.S.	Federal Govt.	Industry			Industry FFRDCs	Universities & colleges						U&C FFRDCs	Other nonprofit institutions				Nonprofit FFRDCs
Funding sector:	Total U.S.	Federal Govt.	Total	Federal Govt.[a]	Industry[b]	Federal Govt.[a]	Total	Federal Govt.	Nonfed. govt.	Industry	U&C	Nonprofit	Federal Govt.[c]	Total	Federal Govt.[a]	Industry	Nonprofit	Federal Govt.[a]
Calendar year[d]																		
1993	37,379	4,838	24,251	4,295	19,956	435	5,128	2,529	492	440	1,180	486	969	1,655	900	245	510	103
1994	36,689	5,003	22,988	3,616	19,372	503	5,357	2,625	511	459	1,255	507	980	1,746	960	254	532	112
1995	41,085	5,007	26,919	3,164	23,755	535	5,622	2,758	551	487	1,311	514	1,117	1,753	935	277	541	131
1996	43,156	4,874	29,010	3,640	25,370	231	5,816	2,854	571	514	1,358	519	1,284	1,819	960	303	557	122
1997	47,203	5,079	32,430	2,648	29,782	213	6,022	2,951	587	536	1,417	530	1,413	1,924	1,010	330	584	123
1998 prelim. ...	51,221	5,421	35,566	2,865	32,701	222	6,354	3,130	619	567	1,489	550	1,545	2,010	1,040	357	613	104

FFRDCs = Federally Funded Research and Development Centers; U&C = universities and colleges

NOTES: Data are based on annual reports by performers except for the nonprofit sector; R&D expenditures by nonprofit sector performers have been estimated since 1973 on the basis of a survey conducted in that year. The next updates of these data, covering the years 1953–2000, along with technical notes explaining methodological issues of measurement, will be provided in National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources: 2000* (Arlington, VA: forthcoming). Data are preliminary for 1998.

[a]For 1953–63, applied research of industry FFRDCs were not separated out from total Federal support to the industrial sector for applied research. Thus, the figure for Federal support to industry for applied research includes support for applied research at industry FFRDCs for those years. The same is true for applied research by nonprofit FFRDCs in 1953–87, which is included in Federal support for applied research at nonprofit institutions for those years.

[b]Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.

[c]Includes R&D expenditures of FFRDCs administered by academic institutions, nearly all of which are federally funded.

[d]Expenditure levels for academic and Federal Government performers are also in reference to calendar years, unlike the levels typically provided in statistical reports on these institutions alone, which are in reference to fiscal years. These calendar-year expenditure levels are approximations based on fiscal year data.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources* (Arlington, VA: biennial series).

See figures 2-2, 2-15, and 2-16; text table 2-1; and figures 6-1 and 6-2 in Volume I.

Appendix table 2-12.
U.S. applied research expenditures, by performing sector and source of funds: 1953–98
(Millions of constant 1992 dollars)

Performing sector:	Total U.S.	Federal Govt.	Industry			Industry FFRDCs	Universities & colleges						U&C FFRDCs	Other nonprofit institutions				Nonprofit FFRDCs
Funding sector:	Total U.S.	Federal Govt.	Total	Federal Govt.[a]	Industry[b]	Federal Govt.[a]	Total	Federal Govt.	Nonfed. govt.	Industry	U&C	Nonprofit	Federal Govt.[c]	Total	Federal Govt.[a]	Industry	Nonprofit	Federal Govt.[a]
Calendar year[d]																		
1953	6,388	1,720	3,598	1,427	2,170		662	292	149	32	138	50	235	173	69	55	50	
1954	6,752	1,614	3,988	1,578	2,411		669	292	154	37	137	49	284	196	78	64	54	
1955	7,297	1,606	4,474	1,774	2,700		682	304	156	41	131	51	328	207	87	68	53	
1956	8,978	1,800	5,906	2,208	3,698		680	303	154	47	125	51	366	226	95	65	65	
1957	10,881	2,009	7,529	3,057	4,472		661	284	153	52	122	50	424	259	106	63	90	
1958	12,144	2,272	8,415	3,408	5,007		667	288	155	53	120	51	487	304	132	62	110	
1959	12,808	2,512	8,675	3,542	5,133		728	338	161	54	122	52	525	368	185	65	118	
1960	13,171	2,641	8,719	3,580	5,140		797	400	166	56	124	52	552	462	269	73	120	
1961	13,267	2,838	8,398	3,449	4,949		843	440	170	55	126	53	616	571	350	72	149	
1962	15,510	2,972	10,273	4,241	6,032		906	497	170	57	128	55	682	677	409	80	189	
1963	16,022	3,354	10,187	4,175	6,012		951	529	175	58	134	56	771	759	477	79	203	
1964	17,161	3,866	10,368	3,995	6,373	253	1,044	580	185	55	152	71	829	801	531	78	192	
1965	17,522	3,980	10,465	3,974	6,490	184	1,216	703	186	52	169	106	823	853	561	84	208	
1966	18,124	3,942	10,869	3,841	7,028	206	1,367	810	183	55	189	131	830	910	594	93	222	
1967	18,301	4,034	10,691	3,711	6,980	313	1,467	897	172	59	203	136	849	948	627	94	227	
1968	18,585	4,021	10,988	3,459	7,529	315	1,465	903	166	58	199	139	798	999	673	101	224	
1969	18,847	4,248	11,030	3,179	7,851	328	1,441	886	166	55	186	147	736	1,064	726	111	228	
1970	18,873	4,377	10,925	3,123	7,802	318	1,478	917	168	57	183	153	699	1,076	738	108	230	
1971	18,194	4,226	10,443	2,829	7,614	209	1,556	954	189	58	209	147	672	1,087	750	106	231	
1972	18,393	4,291	10,194	2,528	7,666	320	1,851	1,168	222	61	245	154	670	1,067	726	105	236	
1973	18,854	4,327	10,524	2,501	8,023	312	2,052	1,273	248	74	283	174	574	1,065	728	102	235	
1974	19,099	4,295	10,834	2,352	8,482	312	2,063	1,239	250	82	306	186	495	1,100	754	104	242	
1975	19,239	4,542	10,527	2,354	8,173	330	2,219	1,306	269	91	334	219	520	1,100	748	102	249	
1976	20,180	4,643	11,100	2,319	8,781	375	2,339	1,337	286	100	372	245	589	1,135	758	108	269	
1977	20,429	4,387	11,436	2,347	9,089	447	2,373	1,319	284	108	409	254	642	1,145	748	112	285	
1978	21,087	4,405	11,918	2,348	9,570	462	2,450	1,328	297	119	455	251	647	1,206	803	108	295	
1979	21,995	4,373	12,629	2,363	10,266	453	2,567	1,435	292	129	476	233	688	1,286	869	109	308	
1980	22,829	4,220	13,550	2,694	10,857	456	2,689	1,512	288	146	511	232	698	1,216	810	108	298	
1981	24,876	4,138	15,757	3,093	12,663	451	2,698	1,443	302	163	549	240	642	1,191	790	114	288	
1982	26,084	3,993	17,039	3,695	13,343	523	2,729	1,434	296	172	573	253	626	1,176	784	121	271	
1983	27,895	4,089	18,470	4,411	14,060	566	2,892	1,534	294	193	606	265	675	1,203	800	130	273	
1984	29,689	3,900	20,045	4,843	15,202	720	3,071	1,615	308	221	647	279	739	1,214	782	145	287	
1985	32,391	3,992	22,444	6,007	16,437	802	3,218	1,651	333	252	697	285	730	1,205	740	163	302	
1986	33,870	3,976	23,742	5,025	18,717	781	3,449	1,729	369	284	769	297	678	1,244	745	177	322	
1987	33,671	4,052	23,104	4,860	18,243	750	3,875	1,978	401	313	852	332	639	1,251	714	184	353	
1988	34,407	3,905	23,669	4,467	19,202	431	4,389	2,274	438	351	950	377	656	1,280	695	196	388	76
1989	36,091	3,975	24,874	4,819	20,055	417	4,668	2,363	465	387	1,040	413	675	1,405	774	211	420	78
1990	37,495	3,902	26,067	6,375	19,692	412	4,707	2,285	484	404	1,102	432	819	1,500	833	223	444	87
1991	39,832	4,206	27,757	5,742	22,015	445	4,736	2,291	481	403	1,121	440	955	1,644	946	233	465	89

Appendix table 2-12.
U.S. applied research expenditures, by performing sector and source of funds: 1953–98
(Millions of constant 1992 dollars)

Performing sector:	Total U.S.	Federal Govt.	Industry			Industry FFRDCs	Universities & colleges						U&C FFRDCs	Other nonprofit institutions				Nonprofit FFRDCs
Funding sector:	Total U.S.	Federal Govt.	Total	Federal Govt.[a]	Industry[b]	Federal Govt.[a]	Total	Federal Govt.	Nonfed. govt.	Industry	U&C	Nonprofit	Federal Govt.[c]	Total	Federal Govt.[a]	Industry	Nonprofit	Federal Govt.[a]
Calendar year[d]																		
1992	38,066	4,337	25,660	4,476	21,184	507	4,881	2,413	479	415	1,120	455	946	1,654	933	239	482	81
1993	36,417	4,714	23,627	4,185	19,443	424	4,996	2,464	479	429	1,150	474	944	1,613	876	239	497	100
1994	34,912	4,761	21,875	3,441	18,434	479	5,097	2,498	486	437	1,195	482	933	1,661	913	242	506	106
1995	38,215	4,657	25,039	2,943	22,096	498	5,230	2,566	513	453	1,219	478	1,039	1,630	870	258	503	122
1996	39,401	4,450	26,486	3,323	23,163	211	5,310	2,606	521	469	1,240	474	1,172	1,661	876	277	508	111
1997	42,308	4,552	29,067	2,373	26,694	191	5,397	2,645	526	480	1,270	475	1,266	1,725	906	295	524	110
1998 prelim. ...	45,449	4,810	31,558	2,542	29,016	197	5,638	2,777	549	503	1,321	488	1,371	1,784	923	317	544	92

FFRDCs = Federally Funded Research and Development Centers; U&C = universities and colleges

NOTES: Data are based on annual reports by performers except for the nonprofit sector; R&D expenditures by nonprofit sector performers have been estimated since 1973 on the basis of a survey conducted in that year. The next updates of these data, covering the years 1953–2000, along with technical notes explaining methodological issues of measurement, will be provided in National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources: 2000* (Arlington, VA: forthcoming). Data are preliminary for 1998.

[a]For 1953–63, applied research of industry FFRDCs were not separated out from total Federal support to the industrial sector for applied research. Thus, the figure for Federal support to industry for applied research includes support for applied research at industry FFRDCs for those years. The same is true for applied research by nonprofit FFRDCs in 1953–87, which is included in Federal support for applied research at nonprofit institutions for those years.

[b]Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.

[c]Includes R&D expenditures of FFRDCs administered by academic institutions, nearly all of which are federally funded.

[d]Expenditure levels for academic and Federal Government performers are also in reference to calendar years, unlike the levels typically provided in statistical reports on these institutions alone, which are in reference to fiscal years. These calendar-year expenditure levels are approximations based on fiscal year data.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources* (Arlington, VA: biennial series).

See figure 2-15 in Volume I.

Appendix table 2-13.
U.S. applied research expenditures, by source of funds and performer: 1953–98
(Millions of current dollars)

Funding sector:	Total U.S.	Federal Government								Industry				U&Cs	Nonprofit			Non-Fed. govt.[a]
Performing sector:	Total U.S.	Total	Federal Govt.	Industry[b]	Industry FFRDCs[b]	U&Cs	U&C FFRDCs[c]	Non-profit[b]	Nonprofit FFRDCs[b]	Total	Industry[d]	U&Cs	Nonprofit	U&Cs	Total	Nonprofit	U&Cs	U&Cs
Calendar year[e]																		
1953	1,289	756	347	288		59	48	14		456	438	7	11	28	20	10	10	30
1954	1,378	785	330	322		60	58	16		513	492	8	13	28	21	11	10	32
1955	1,514	850	333	368		63	68	18		583	560	9	14	27	22	11	11	32
1956	1,928	1,025	387	474		65	79	21		818	794	10	14	27	25	14	11	33
1957	2,414	1,304	446	678		63	94	24		1,018	992	12	14	27	31	20	11	34
1958	2,758	1,496	516	774		66	111	30		1,163	1,137	12	14	27	37	25	12	35
1959	2,940	1,630	577	813		78	121	43		1,206	1,178	13	15	28	39	27	12	37
1960	3,065	1,732	615	833		93	129	63		1,226	1,196	13	17	29	40	28	12	39
1961	3,123	1,811	668	812		104	145	83		1,195	1,165	13	17	30	48	35	13	40
1962	3,698	2,098	709	1,011		119	163	98		1,471	1,438	14	19	30	58	45	13	41
1963	3,865	2,245	809	1,007		128	186	115		1,483	1,450	14	19	32	63	49	14	42
1964	4,201	2,462	947	978	62	142	203	130		1,593	1,560	14	19	37	65	47	18	45
1965	4,374	2,553	994	992	46	176	206	140		1,654	1,620	13	21	42	79	52	27	46
1966	4,653	2,625	1,012	986	53	208	213	153		1,842	1,804	14	24	48	91	57	34	47
1967	4,848	2,763	1,069	983	83	238	225	166		1,890	1,849	16	25	54	96	60	36	46
1968	5,137	2,811	1,112	956	87	250	221	186		2,125	2,081	16	28	55	101	62	39	46
1969	5,454	2,924	1,229	920	95	257	213	210		2,320	2,272	16	32	54	109	66	43	48
1970	5,752	3,100	1,334	952	97	280	213	225		2,429	2,378	18	33	56	117	70	47	51
1971	5,833	3,091	1,355	907	67	306	216	241		2,494	2,441	19	34	67	121	74	47	61
1972	6,147	3,243	1,434	845	107	391	224	243		2,618	2,562	21	35	82	131	79	52	74
1973	6,655	3,429	1,527	883	110	450	203	257		2,894	2,832	26	36	100	145	83	62	88
1974	7,347	3,634	1,652	905	120	477	191	290		3,335	3,263	32	40	118	165	93	72	96
1975	8,098	4,125	1,912	991	139	550	219	315		3,522	3,440	39	43	141	197	105	92	113
1976	8,990	4,464	2,068	1,033	167	596	263	338		4,005	3,912	45	48	166	229	120	109	127
1977	9,690	4,691	2,081	1,113	212	626	305	355		4,415	4,311	51	53	194	256	135	121	134
1978	10,731	5,085	2,242	1,195	235	676	329	409		4,986	4,870	61	55	232	278	150	128	151
1979	12,148	5,623	2,415	1,305	250	793	380	480		5,801	5,670	71	60	263	299	170	129	161
1980	13,773	6,268	2,546	1,625	275	912	421	489		6,703	6,550	88	65	308	320	180	140	174
1981	16,421	6,969	2,731	2,042	298	953	423	521		8,542	8,359	108	75	363	349	190	159	199
1982	18,303	7,757	2,802	2,593	367	1,007	439	550		9,569	9,363	121	85	402	368	190	178	207
1983	20,408	8,834	2,991	3,227	414	1,122	494	585		10,522	10,286	141	95	443	394	200	194	215
1984	22,540	9,566	2,961	3,677	547	1,226	561	594		11,819	11,541	168	110	491	430	218	212	234
1985	25,437	10,933	3,135	4,717	630	1,297	573	581		13,233	12,908	198	128	547	461	237	224	261.
1986	27,292	10,422	3,204	4,049	629	1,393	547	600		15,454	15,082	229	143	620	499	260	240	298
1987	27,968	10,792	3,366	4,037	623	1,643	531	593		15,566	15,153	260	153	707	569	294	276	333
1988	29,621	10,766	3,362	3,846	371	1,957	565	599	66	17,002	16,531	302	169	818	659	334	325	377
1989	32,381	11,754	3,566	4,324	374	2,120	605	695	70	18,529	17,993	347	189	933	747	377	370	417
1990	35,095	13,772	3,652	5,967	386	2,139	767	780	81	19,018	18,432	378	209	1,032	820	416	404	453
1991	38,764	14,281	4,093	5,588	433	2,230	929	921	86	22,044	21,425	392	227	1,091	881	452	428	468
1992	38,066	13,693	4,337	4,476	507	2,413	946	933	81	21,838	21,184	415	239	1,120	937	482	455	479
1993	37,379	14,068	4,838	4,295	435	2,529	969	900	103	20,642	19,956	440	245	1,180	997	510	486	492
1994	36,689	13,799	5,003	3,616	503	2,625	980	960	112	20,085	19,372	459	254	1,255	1,039	532	507	511

Appendix table 2-13.
U.S. applied research expenditures, by source of funds and performer: 1953–98
(Millions of current dollars)

Funding sector:	Total U.S.	Federal Government								Industry				U&Cs	Nonprofit			Non-Fed. govt.[a]
Performing sector:	Total U.S.	Total	Federal Govt.	Industry[b]	Industry FFRDCs[b]	U&Cs	U&C FFRDCs[c]	Non-profit[b]	Nonprofit FFRDCs[b]	Total	Industry[d]	U&Cs	Nonprofit	U&Cs	Total	Nonprofit	U&Cs	U&Cs
Calendar year[e]																		
1995	41,085	13,648	5,007	3,164	535	2,758	1,117	935	131	24,519	23,755	487	277	1,311	1,055	541	514	551
1996	43,156	13,964	4,874	3,640	231	2,854	1,284	960	122	26,187	25,370	514	303	1,358	1,076	557	519	571
1997	47,203	13,437	5,079	2,648	213	2,951	1,413	1,010	123	30,648	29,782	536	330	1,417	1,115	584	530	587
1998 prelim. ...	51,221	14,326	5,421	2,865	222	3,130	1,545	1,040	104	33,625	32,701	567	357	1,489	1,163	613	550	619

FFRDCs = Federally Funded Research and Development Centers; U&C = universities and colleges

NOTES: Data are based on annual reports by performers except for the nonprofit sector; R&D expenditures by nonprofit sector performers have been estimated since 1973 on the basis of a survey conducted in that year. The next updates of these data, covering the years 1953–2000, along with technical notes explaining methodological issues of measurement, will be provided in National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources: 2000* (Arlington, VA: forthcoming). Data are preliminary for 1998.

[a]Because of limitations in the survey information, data on non-Federal government funding to other performers are not available, and are consequently included in other sectors' support for their own R&D performance. For example, non-Federal government support to nonprofits is included in nonprofits' support for their own R&D.

[b]For 1953–63, applied research of industry FFRDCs were not separated out from total Federal support to the industrial sector for applied research. Thus, the figure for Federal support to industry for applied research includes support for applied research at industry FFRDCs for those years. The same is true for applied research by nonprofit FFRDCs in 1953–87, which is included in Federal support for applied research at nonprofit institutions for those years.

[c]Includes R&D expenditures of FFRDCs administered by academic institutions, nearly all of which are federally funded.

[d]Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.

[e]Expenditure levels for academic and Federal Government performers are also in reference to calendar years, unlike the levels typically provided in statistical reports on these institutions alone, which are in reference to fiscal years. These calendar–year expenditure levels are approximations based on fiscal year data.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources* (Arlington, VA: biennial series).

See figures 2-16 and 2-17 in Volume I.

Appendix table 2-14.
U.S. applied research expenditures, by source of funds and performer: 1953–98
(Millions of constant 1992 dollars)

Funding sector:	Total U.S.	Federal Government								Industry				U&Cs	Nonprofit			Non-Fed. govt.[a]
Performing sector:	Total U.S.	Total	Federal Govt.	Industry[b]	Industry FFRDCs[b]	U&Cs	U&C FFRDCs[c]	Non-profit[b]	Nonprofit FFRDCs[b]	Total	Industry[d]	U&Cs	Nonprofit	U&Cs	Total	Nonprofit	U&Cs	U&Cs
Calendar year[e]																		
1953	6,388	3,744	1,720	1,427		292	235	69		2,257	2,170	32	55	138	99	50	50	149
1954	6,752	3,846	1,614	1,578		292	284	78		2,511	2,411	37	64	137	103	54	49	154
1955	7,297	4,098	1,606	1,774		304	328	87		2,809	2,700	41	68	131	104	53	51	156
1956	8,978	4,772	1,800	2,208		303	366	95		3,810	3,698	47	65	125	116	65	51	154
1957	10,881	5,879	2,009	3,057		284	424	106		4,587	4,472	52	63	122	140	90	50	153
1958	12,144	6,587	2,272	3,408		288	487	132		5,121	5,007	53	62	120	161	110	51	155
1959	12,808	7,102	2,512	3,542		338	525	185		5,253	5,133	54	65	122	170	118	52	161
1960	13,171	7,441	2,641	3,580		400	552	269		5,269	5,140	56	73	124	172	120	52	166
1961	13,267	7,693	2,838	3,449		440	616	350		5,076	4,949	55	72	126	202	149	53	170
1962	15,510	8,800	2,972	4,241		497	682	409		6,168	6,032	57	80	128	243	189	55	170
1963	16,022	9,306	3,354	4,175		529	771	477		6,148	6,012	58	79	134	259	203	56	175
1964	17,161	10,055	3,866	3,995	253	580	829	531		6,505	6,373	55	78	152	263	192	71	185
1965	17,522	10,226	3,980	3,974	184	703	823	561		6,627	6,490	52	84	169	315	208	106	186
1966	18,124	10,224	3,942	3,841	206	810	830	594		7,176	7,028	55	93	189	353	222	131	183
1967	18,301	10,430	4,034	3,711	313	897	849	627		7,133	6,980	59	94	203	362	227	136	172
1968	18,585	10,168	4,021	3,459	315	903	798	673		7,688	7,529	58	101	199	364	224	139	166
1969	18,847	10,103	4,248	3,179	328	886	736	726		8,017	7,851	55	111	186	375	228	147	166
1970	18,873	10,172	4,377	3,123	318	917	699	738		7,968	7,802	57	108	183	382	230	153	168
1971	18,194	9,641	4,226	2,829	209	954	672	750		7,778	7,614	58	106	209	377	231	147	189
1972	18,393	9,704	4,291	2,528	320	1,168	670	726		7,832	7,666	61	105	245	390	236	154	222
1973	18,854	9,715	4,327	2,501	312	1,273	574	728		8,198	8,023	74	102	283	409	235	174	248
1974	19,099	9,447	4,295	2,352	312	1,239	495	754		8,668	8,482	82	104	306	428	242	186	250
1975	19,239	9,801	4,542	2,354	330	1,306	520	748		8,367	8,173	91	102	334	468	249	219	269
1976	20,180	10,020	4,643	2,319	375	1,337	589	758		8,989	8,781	100	108	372	514	269	245	286
1977	20,429	9,889	4,387	2,347	447	1,319	642	748		9,308	9,089	108	112	409	539	285	254	284
1978	21,087	9,993	4,405	2,348	462	1,328	647	803		9,797	9,570	119	108	455	545	295	251	297
1979	21,995	10,181	4,373	2,363	453	1,435	688	869		10,504	10,266	129	109	476	541	308	233	292
1980	22,829	10,389	4,220	2,694	456	1,512	698	810		11,111	10,857	146	108	511	531	298	232	288
1981	24,876	10,557	4,138	3,093	451	1,443	642	790		12,940	12,663	163	114	549	528	288	240	302
1982	26,084	11,055	3,993	3,695	523	1,434	626	784		13,637	13,343	172	121	573	524	271	253	296
1983	27,895	12,074	4,089	4,411	566	1,534	675	800		14,382	14,060	193	130	606	539	273	265	294
1984	29,689	12,600	3,900	4,843	720	1,615	739	782		15,567	15,202	221	145	647	566	287	279	308
1985	32,391	13,922	3,992	6,007	802	1,651	730	740		16,851	16,437	252	163	697	588	302	285	333
1986	33,870	12,933	3,976	5,025	781	1,729	678	745		19,178	18,717	284	177	769	620	322	297	369
1987	33,671	12,993	4,052	4,860	750	1,978	639	714		18,740	18,243	313	184	852	686	353	332	401
1988	34,407	12,505	3,905	4,467	431	2,274	656	695	76	19,749	19,202	351	196	950	765	388	377	438
1989	36,091	13,101	3,975	4,819	417	2,363	675	774	78	20,653	20,055	387	211	1,040	832	420	413	465
1990	37,495	14,714	3,902	6,375	412	2,285	819	833	87	20,319	19,692	404	223	1,102	877	444	432	484
1991	39,832	14,674	4,206	5,742	445	2,291	955	946	89	22,651	22,015	403	233	1,121	905	465	440	481
1992	38,066	13,693	4,337	4,476	507	2,413	946	933	81	21,838	21,184	415	239	1,120	937	482	455	479
1993	36,417	13,706	4,714	4,185	424	2,464	944	876	100	20,111	19,443	429	239	1,150	971	497	474	479

Appendix table 2-14.
U.S. applied research expenditures, by source of funds and performer: 1953–98
(Millions of constant 1992 dollars)

Funding sector:	Total U.S.	Federal Government								Industry				U&Cs	Nonprofit			Non-Fed. govt.[a]
Performing sector:	Total U.S.	Total	Federal Govt.	Industry[b]	Industry FFRDCs[b]	U&Cs	U&C FFRDCs[c]	Non-profit[b]	Nonprofit FFRDCs[b]	Total	Industry[d]	U&Cs	Nonprofit	U&Cs	Total	Nonprofit	U&Cs	U&Cs
Calendar year[e]																		
1994	34,912	13,131	4,761	3,441	479	2,498	933	913	106	19,112	18,434	437	242	1,195	989	506	482	486
1995	38,215	12,695	4,657	2,943	498	2,566	1,039	870	122	22,807	22,096	453	258	1,219	982	503	478	513
1996	39,401	12,749	4,450	3,323	211	2,606	1,172	876	111	23,908	23,163	469	277	1,240	982	508	474	521
1997	42,308	12,043	4,552	2,373	191	2,645	1,266	906	110	27,469	26,694	480	295	1,270	999	524	475	526
1998 .... prelim.	45,449	12,712	4,810	2,542	197	2,777	1,371	923	92	29,836	29,016	503	317	1,321	1,032	544	488	549

FFRDCs = Federally Funded Research and Development Centers; U&C = universities and colleges

NOTES: Data are based on annual reports by performers except for the nonprofit sector; R&D expenditures by nonprofit sector performers have been estimated since 1973 on the basis of a survey conducted in that year. The next updates of these data, covering the years 1953–2000, along with technical notes explaining methodological issues of measurement, will be provided in National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources: 2000* (Arlington, VA: forthcoming). Data are preliminary for 1998.

[a]Because of limitations in the survey information, data on non-Federal government funding to other performers are not available, and are consequently included in other sectors' support for their own R&D performance. For example, non-Federal government support to nonprofits is included in nonprofits' support for their own R&D.

[b]For 1953-63, applied research of industry FFRDCs were not separated out from total Federal support to the industrial sector for applied research. Thus, the figure for Federal support to industry for applied research includes support for applied research at industry FFRDCs for those years. The same is true for applied research by nonprofit FFRDCs in 1953-87, which is included in Federal support for applied research at nonprofit institutions for those years.

[c]Includes R&D expenditures of FFRDCs administered by academic institutions, nearly all of which are federally funded.

[d]Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.

[e]Expenditure levels for academic and Federal Government performers are also in reference to calendar years, unlike the levels typically provided in statistical reports on these institutions alone, which are in reference to fiscal years. These calendar–year expenditure levels are approximations based on fiscal year data.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources* (Arlington, VA: biennial series).

Appendix table 2-15.
U.S. development expenditures, by performing sector and source of funds: 1953–98
(Millions of current dollars)

Performing sector:	Total U.S.	Federal Govt.	Industry			Industry FFRDCs	Universities & colleges						U&C FFRDCs	Other nonprofit institutions				Nonprofit FFRDCs
Funding sector:	Total U.S.	Federal Govt.	Total	Federal Govt.[a]	Industry[b]	Federal Govt.[a]	Total	Federal Govt.	Non-Fed. govt.	Industry	U&C	Nonprofit	Federal Govt.[c]	Total	Federal Govt.[a]	Industry	Nonprofit	Federal Govt.[a]
Calendar year[d]																		
1953	3,412	567	2,753	1,123	1,630		16	9	3	1	3	1	48	29	17	6	6	
1954	3,734	537	3,090	1,405	1,685		17	9	3	1	3	1	59	32	18	7	7	
1955	4,189	543	3,523	1,785	1,738		21	12	4	2	3	1	69	34	19	8	7	
1956	5,855	631	5,084	2,817	2,267		25	14	4	2	4	2	81	35	20	8	7	
1957	6,681	728	5,790	3,616	2,174		26	12	5	3	4	2	101	37	21	8	8	
1958	7,214	842	6,183	3,942	2,241		28	13	6	3	4	2	120	42	25	8	9	
1959	8,463	940	7,307	4,750	2,557		31	16	6	3	5	2	134	51	32	9	10	
1960	9,360	1,003	8,104	5,169	2,935		35	19	6	3	5	2	151	69	49	10	10	
1961	9,930	1,090	8,536	5,347	3,189		38	22	7	2	5	2	170	97	73	10	14	
1962	10,116	1,227	8,527	5,281	3,246		40	23	8	2	6	2	190	132	103	11	18	
1963	11,540	1,465	9,651	6,116	3,535		40	22	8	2	6	2	219	165	134	11	20	
1964	12,506	1,680	10,004	6,156	3,848	359	49	30	8	2	7	3	227	188	159	11	18	
1965	13,215	1,789	10,637	6,218	4,419	298	71	48	9	2	8	4	207	215	183	12	20	
1966	14,490	1,886	11,810	6,849	4,961	271	87	61	9	2	10	5	200	236	199	14	23	
1967	15,332	1,943	12,539	6,795	5,744	302	93	66	9	3	10	7	208	247	208	15	24	
1968	16,154	1,904	13,370	7,044	6,326	293	102	72	8	4	9	9	226	259	217	16	26	
1969	17,051	2,016	14,071	6,944	7,127	332	110	80	7	5	8	10	246	277	231	18	28	
1970	16,925	2,258	13,698	6,232	7,466	340	112	84	6	5	7	10	249	268	220	18	30	
1971	17,399	2,473	13,924	6,167	7,757	391	98	69	8	4	9	9	267	246	194	19	33	
1972	18,743	2,639	15,043	6,533	8,510	402	101	63	12	4	14	9	291	267	213	19	35	
1973	20,197	2,657	16,394	6,621	9,773	399	126	71	18	5	20	13	296	326	268	20	38	
1974	21,503	2,765	17,421	6,553	10,868	479	141	75	20	7	25	15	321	377	314	21	42	
1975	22,708	2,890	18,352	6,783	11,569	535	156	83	22	8	27	16	373	403	330	22	51	
1976	25,092	2,972	20,412	7,522	12,890	654	182	100	24	12	31	16	447	425	341	23	61	
1977	27,691	3,188	22,603	8,275	14,328	675	254	153	28	15	40	19	513	459	359	27	73	
1978	31,090	3,676	25,216	8,756	16,460	753	373	254	32	15	49	24	552	520	403	30	87	
1979	35,506	3,944	29,033	9,888	19,145	810	469	336	34	16	56	28	633	617	483	35	99	
1980	40,734	4,072	33,848	10,957	22,891	882	518	362	38	19	68	31	744	670	525	40	105	
1981	46,059	4,530	38,547	12,791	25,756	950	568	386	44	24	80	35	761	704	549	45	110	
1982	51,730	5,178	43,434	14,215	29,219	989	597	397	46	27	88	39	763	769	599	50	120	
1983	57,603	6,106	48,064	15,522	32,542	1,054	617	399	47	31	97	43	862	900	715	55	130	
1984	66,365	7,078	55,371	17,640	37,731	1,056	677	435	51	37	108	47	1,048	1,135	925	65	145	
1985	74,538	8,011	62,020	20,258	41,762	1,102	756	486	57	43	120	49	1,315	1,334	1,100	75	158	
1986	75,853	8,275	62,871	21,517	41,354	1,145	818	513	65	50	136	53	1,549	1,195	938	84	173	
1987	79,894	8,176	66,789	24,122	42,667	1,230	945	599	73	57	155	61	1,699	1,056	771	90	196	
1988	84,646	8,864	70,353	23,719	46,634	1,414	1,098	698	83	66	179	71	1,767	729	407	99	223	420
1989	87,816	9,355	72,725	21,049	51,676	1,423	1,227	773	92	76	205	81	1,786	869	507	111	251	430
1990	94,107	9,700	78,376	18,966	59,410	1,438	1,407	909	99	83	226	89	1,677	1,019	619	123	277	490
1991	95,184	8,778	80,286	17,256	63,030	1,383	1,533	1,011	103	86	239	94	1,514	1,157	722	134	302	533
1992	99,889	9,098	84,569	17,181	67,388	1,373	1,595	1,054	105	91	246	100	1,435	1,220	758	141	321	599
1993	99,751	9,071	84,757	16,083	68,674	1,039	1,692	1,122	108	97	259	107	1,346	1,271	787	144	340	574

Appendix table 2-15.
U.S. development expenditures, by performing sector and source of funds: 1953–98
(Millions of current dollars)

Performing sector:	Total U.S.	Federal Govt.	Industry			Industry FFRDCs	Universities & colleges						U&C FFRDCs	Other nonprofit institutions				Nonprofit FFRDCs
Funding sector:	Total U.S.	Federal Govt.	Total	Federal Govt.[a]	Industry[b]	Federal Govt.[a]	Total	Federal Govt.	Non-Fed. govt.	Industry	U&C	Nonprofit	Federal Govt.[c]	Total	Federal Govt.[a]	Industry	Nonprofit	Federal Govt.[a]
Calendar year[d]																		
1994	103,119	8,876	87,890	16,209	71,681	1,196	1,798	1,198	112	101	276	111	1,467	1,319	815	149	355	573
1995	113,239	9,431	97,342	17,824	79,518	1,209	1,792	1,163	121	107	288	113	1,593	1,266	743	163	361	606
1996	121,372	9,064	105,863	17,066	88,797	1,358	1,775	1,125	125	113	298	114	1,495	1,247	697	178	371	570
1997	128,565	9,001	113,184	18,121	95,063	1,292	1,837	1,163	129	118	311	116	1,357	1,291	708	194	389	603
1998 .... prelim.	138,075	8,848	122,591	18,211	104,380	1,475	1,888	1,181	136	124	327	121	1,251	1,413	794	210	408	608

FFRDCs = Federally Funded Research and Development Centers; U&C = universities and colleges

NOTES: Data are based on annual reports by performers except for the nonprofit sector; R&D expenditures by nonprofit sector performers have been estimated since 1973 on the basis of a survey conducted in that year. The next updates of these data, covering the years 1953–2000, along with technical notes explaining methodological issues of measurement, will be provided in National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources: 2000* (Arlington, VA: forthcoming). Data are preliminary for 1998.

[a]For 1953-63, development expenditures of industry FFRDCs were not separated out from total Federal support to the industrial sector for development. Thus, the figure for Federal support to industry for development expenditures includes support for development at industry FFRDCs for those years. The same is true for development by nonprofit FFRDCs in 1953-87, which is included in Federal support for development at nonprofit institutions for those years.

[b]Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.

[c]Includes R&D expenditures of FFRDCs administered by academic institutions, nearly all of which are federally funded.

[d]Expenditure levels for academic and Federal Government performers are also in reference to calendar years, unlike the levels typically provided in statistical reports on these institutions alone, which are in reference to fiscal years. These calendar-year expenditure levels are approximations based on fiscal year data.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS) *Nationl Patterns of R&D Resources* (Arlington, VA: biennial series).

See figures 2-2, 2-15, and 2-16 and text table 2-1 in Volume I.

Appendix table 2-16.
U.S. development expenditures, by performing sector and source of funds: 1953–98
(Millions of constant 1992 dollars)

Performing sector:	Total U.S.	Federal Govt.	Industry			Industry FFRDCs	Universities & colleges						U&C FFRDCs	Other nonprofit institutions				Nonprofit FFRDCs
Funding sector:	Total U.S.	Federal Govt.	Total	Federal Govt.[a]	Industry[b]	Federal Govt.[a]	Total	Federal Govt.	Non-Fed. govt.	Industry	U&C	Nonprofit	Federal Govt.[c]	Total	Federal Govt.[a]	Industry	Nonprofit	Federal Govt.[a]
Calendar year[d]																		
1953	16,905	2,807	13,642	5,565	8,077		79	42	14	5	13	5	235	141	82	30	30	
1954	18,295	2,631	15,140	6,884	8,256		83	42	17	5	15	5	287	154	86	34	34	
1955	20,198	2,616	16,986	8,607	8,380		101	55	18	7	15	5	333	162	89	39	34	
1956	27,268	2,937	23,680	13,121	10,559		116	63	21	9	17	7	375	161	91	37	33	
1957	30,122	3,280	26,105	16,303	9,802		117	54	24	11	19	9	455	165	92	36	36	
1958	31,764	3,705	27,226	17,358	9,868		121	55	25	13	19	9	528	183	108	35	40	
1959	36,876	4,096	31,839	20,697	11,142		135	68	26	13	20	9	584	222	139	39	44	
1960	40,223	4,308	34,826	22,213	12,613		148	82	27	11	20	9	647	294	208	43	43	
1961	42,181	4,628	36,262	22,715	13,547		159	91	29	8	22	8	720	412	310	42	59	
1962	42,431	5,147	35,768	22,152	13,616		168	94	32	8	24	8	797	552	430	46	76	
1963	47,842	6,074	40,012	25,357	14,656		166	91	33	8	25	8	906	684	556	46	83	
1964	51,087	6,863	40,866	25,147	15,719	1,467	198	121	32	8	27	10	925	768	650	45	74	
1965	52,945	7,165	42,616	24,912	17,704	1,194	282	192	35	8	32	16	827	859	731	48	80	
1966	56,445	7,347	46,007	26,681	19,326	1,056	339	238	37	8	38	19	779	917	773	55	90	
1967	57,877	7,335	47,335	25,651	21,684	1,140	351	247	32	9	38	25	785	931	783	57	91	
1968	58,442	6,889	48,372	25,485	22,887	1,060	367	259	28	14	34	33	818	937	785	58	94	
1969	58,917	6,965	48,621	23,994	24,627	1,147	378	275	24	17	27	35	850	955	796	62	97	
1970	55,528	7,408	44,941	20,446	24,495	1,115	367	274	21	16	23	33	817	879	722	59	98	
1971	54,269	7,712	43,431	19,236	24,195	1,220	306	215	24	12	27	27	833	767	605	59	103	
1972	56,084	7,897	45,012	19,548	25,464	1,203	302	187	37	10	41	27	871	799	637	57	105	
1973	57,214	7,527	46,442	18,756	27,686	1,130	356	200	50	14	57	35	837	922	758	57	108	
1974	55,897	7,189	45,285	17,034	28,251	1,245	365	194	52	17	64	39	834	979	815	55	109	
1975	53,952	6,866	43,602	16,115	27,486	1,271	371	196	53	19	65	38	885	957	784	52	121	
1976	56,323	6,671	45,818	16,884	28,934	1,468	409	223	54	26	70	36	1,003	954	765	52	137	
1977	58,384	6,721	47,655	17,447	30,209	1,423	536	323	59	31	85	39	1,081	968	757	57	154	
1978	61,092	7,224	49,550	17,206	32,344	1,480	732	499	63	28	96	46	1,085	1,021	791	59	171	
1979	64,288	7,141	52,567	17,903	34,664	1,467	850	609	62	28	101	50	1,147	1,116	874	63	179	
1980	67,519	6,750	56,105	18,162	37,943	1,462	858	600	63	32	112	51	1,233	1,111	870	66	174	
1981	69,776	6,863	58,396	19,377	39,018	1,439	860	585	66	36	121	53	1,152	1,066	831	68	167	
1982	73,721	7,379	61,898	20,258	41,640	1,409	851	566	65	38	126	56	1,088	1,096	853	71	171	
1983	78,736	8,346	65,697	21,217	44,481	1,441	844	546	64	42	133	58	1,179	1,230	977	75	178	
1984	87,415	9,323	72,933	23,235	49,698	1,391	892	573	68	49	142	61	1,381	1,495	1,218	85	191	
1985	94,916	10,201	78,976	25,797	53,180	1,403	963	619	73	55	153	63	1,675	1,698	1,401	96	202	
1986	94,133	10,269	78,023	26,703	51,320	1,421	1,015	637	81	62	169	65	1,923	1,483	1,163	104	215	
1987	96,189	9,843	80,411	29,042	51,369	1,481	1,137	721	88	69	187	73	2,045	1,272	928	108	236	
1988	98,322	10,296	81,720	27,551	54,169	1,642	1,275	811	96	77	208	83	2,053	847	473	115	259	488
1989	97,878	10,427	81,058	23,461	57,597	1,586	1,368	862	102	85	228	91	1,990	969	565	124	280	480
1990	100,542	10,364	83,735	20,263	63,472	1,536	1,503	972	106	89	242	95	1,791	1,089	661	131	296	524
1991	97,805	9,019	82,497	17,731	64,766	1,421	1,575	1,039	105	88	246	97	1,556	1,189	742	137	310	547
1992	99,889	9,098	84,569	17,181	67,388	1,373	1,595	1,054	105	91	246	100	1,435	1,220	758	141	321	599
1993	97,186	8,838	82,577	15,669	66,908	1,012	1,649	1,093	105	94	252	104	1,312	1,238	766	141	332	560

Appendix table 2-16.
U.S. development expenditures, by performing sector and source of funds: 1953–98
(Millions of constant 1992 dollars)

Performing sector:	Total U.S.	Federal Govt.	Industry			Industry FFRDCs	Universities & colleges						U&C FFRDCs	Other nonprofit institutions				Nonprofit FFRDCs
Funding sector:	Total U.S.	Federal Govt.	Total	Federal Govt.[a]	Industry[b]	Federal Govt.[a]	Total	Federal Govt.	Non-Fed. govt.	Industry	U&C	Nonprofit	Federal Govt.[c]	Total	Federal Govt.[a]	Industry	Nonprofit	Federal Govt.[a]
Calendar year[d]																		
1994	98,125	8,446	83,633	15,424	68,209	1,138	1,711	1,140	107	96	262	106	1,396	1,255	775	142	338	546
1995	105,329	8,772	90,542	16,579	73,963	1,125	1,667	1,082	113	100	268	105	1,482	1,178	691	151	335	563
1996	110,811	8,276	96,652	15,581	81,071	1,240	1,621	1,027	114	103	272	104	1,365	1,138	637	163	339	520
1997	115,233	8,068	101,447	16,242	85,205	1,158	1,646	1,042	115	105	279	104	1,217	1,157	635	174	349	540
1998 .... prelim.	122,516	7,851	108,776	16,159	92,618	1,309	1,676	1,048	121	110	290	107	1,110	1,254	705	186	362	540

FFRDCs = Federally Funded Research and Development Centers; U&C = universities and colleges

NOTES: Data are based on annual reports by performers except for the nonprofit sector; R&D expenditures by nonprofit sector performers have been estimated since 1973 on the basis of a survey conducted in that year. The next updates of these data, covering the years 1953–2000, along with technical notes explaining methodological issues of measurement, will be provided in National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources: 2000* (Arlington, VA: forthcoming). Data are preliminary for 1998.

[a]For 1953-63, development expenditures of industry FFRDCs were not separated out from total Federal support to the industrial sector for development. Thus, the figure for Federal support to industry for development expenditures includes support for development at industry FFRDCs for those years. The same is true for development by nonprofit FFRDCs in 1953-87, which is included in Federal support for development at nonprofit institutions for those years.

[b]Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.

[c]Includes R&D expenditures of FFRDCs administered by academic institutions, nearly all of which are federally funded.

[d]Expenditure levels for academic and Federal Government performers are also in reference to calendar years, unlike the levels typically provided in statistical reports on these institutions alone, which are in reference to fiscal years. These calendar-year expenditure levels are approximations based on fiscal year data.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources* (Arlington, VA: biennial series).

See figures 2-15 and 2-16 in Volume I.

Appendix table 2-17.
U.S. development expenditures, by source of funds and performer: 1953–98
(Millions of current dollars)

Funding sector:	Total U.S.	Federal Government								Industry				U&Cs	Nonprofit			Non-Fed. govt.[a]
Performing sector:	Total U.S.	Total	Federal Govt.	Industry[b]	Industry FFRDCs[b]	U&Cs	U&C FFRDCs[c]	Non-profit[b]	Nonprofit FFRDCs[b]	Total	Industry[d]	U&Cs	Nonprofit	U&Cs	Total	Nonprofit	U&Cs	U&Cs
Calendar year[e]																		
1953	3,412	1,762	567	1,123		9	48	17		1,637	1,630	1	6	3	7	6	1	3
1954	3,734	2,027	537	1,405		9	59	18		1,693	1,685	1	7	3	8	7	1	3
1955	4,189	2,427	543	1,785		12	69	19		1,748	1,738	2	8	3	8	7	1	4
1956	5,855	3,561	631	2,817		14	81	20		2,277	2,267	2	8	4	9	7	2	4
1957	6,681	4,477	728	3,616		12	101	21		2,185	2,174	3	8	4	10	8	2	5
1958	7,214	4,941	842	3,942		13	120	25		2,252	2,241	3	8	4	11	9	2	6
1959	8,463	5,872	940	4,750		16	134	32		2,569	2,557	3	9	5	12	10	2	6
1960	9,360	6,390	1,003	5,169		19	151	49		2,948	2,935	3	10	5	12	10	2	6
1961	9,930	6,701	1,090	5,347		22	170	73		3,201	3,189	2	10	5	16	14	2	7
1962	10,116	6,823	1,227	5,281		23	190	103		3,259	3,246	2	11	6	20	18	2	8
1963	11,540	7,956	1,465	6,116		22	219	134		3,548	3,535	2	11	6	22	20	2	8
1964	12,506	8,610	1,680	6,156	359	30	227	159		3,861	3,848	2	11	7	21	18	3	8
1965	13,215	8,742	1,789	6,218	298	48	207	183		4,433	4,419	2	12	8	24	20	4	9
1966	14,490	9,466	1,886	6,849	271	61	200	199		4,977	4,961	2	14	10	28	23	5	9
1967	15,332	9,521	1,943	6,795	302	66	208	208		5,762	5,744	3	15	10	31	24	7	9
1968	16,154	9,756	1,904	7,044	293	72	226	217		6,346	6,326	4	16	9	35	26	9	8
1969	17,051	9,848	2,016	6,944	332	80	246	231		7,150	7,127	5	18	8	38	28	10	7
1970	16,925	9,382	2,258	6,232	340	84	249	220		7,489	7,466	5	18	7	40	30	10	6
1971	17,399	9,561	2,473	6,167	391	69	267	194		7,780	7,757	4	19	9	42	33	9	8
1972	18,743	10,141	2,639	6,533	402	63	291	213		8,533	8,510	4	19	14	44	35	9	12
1973	20,197	10,311	2,657	6,621	399	71	296	268		9,798	9,773	5	20	20	51	38	13	18
1974	21,503	10,506	2,765	6,553	479	75	321	314		10,896	10,868	7	21	25	57	42	15	20
1975	22,708	10,993	2,890	6,783	535	83	373	330		11,599	11,569	8	22	27	67	51	16	22
1976	25,092	12,035	2,972	7,522	654	100	447	341		12,925	12,890	12	23	31	77	61	16	24
1977	27,691	13,162	3,188	8,275	675	153	513	359		14,370	14,328	15	27	40	92	73	19	28
1978	31,090	14,394	3,676	8,756	753	254	552	403		16,505	16,460	15	30	49	111	87	24	32
1979	35,506	16,094	3,944	9,888	810	336	633	483		19,196	19,145	16	35	56	127	99	28	34
1980	40,734	17,542	4,072	10,957	882	362	744	525		22,950	22,891	19	40	68	136	105	31	38
1981	46,059	19,967	4,530	12,791	950	386	761	549		25,825	25,756	24	45	80	145	110	35	44
1982	51,730	22,142	5,178	14,215	989	397	763	599		29,296	29,219	27	50	88	159	120	39	46
1983	57,603	24,658	6,106	15,522	1,054	399	862	715		32,628	32,542	31	55	97	173	130	43	47
1984	66,365	28,182	7,078	17,640	1,056	435	1,048	925		37,833	37,731	37	65	108	192	145	47	51
1985	74,538	32,272	8,011	20,258	1,102	486	1,315	1,100		41,881	41,762	43	75	120	207	158	49	57
1986	75,853	33,937	8,275	21,517	1,145	513	1,549	938		41,488	41,354	50	84	136	226	173	53	65
1987	79,894	36,596	8,176	24,122	1,230	599	1,699	771		42,814	42,667	57	90	155	256	196	61	73
1988	84,646	37,290	8,864	23,719	1,414	698	1,767	407	420	46,800	46,634	66	99	179	294	223	71	83
1989	87,816	35,324	9,355	21,049	1,423	773	1,786	507	430	51,863	51,676	76	111	205	332	251	81	92
1990	94,107	33,799	9,700	18,966	1,438	909	1,677	619	490	59,616	59,410	83	123	226	366	277	89	99
1991	95,184	31,197	8,778	17,256	1,383	1,011	1,514	722	533	63,250	63,030	86	134	239	396	302	94	103
1992	99,889	31,498	9,098	17,181	1,373	1,054	1,435	758	599	67,620	67,388	91	141	246	421	321	100	105
1993	99,751	30,022	9,071	16,083	1,039	1,122	1,346	787	574	68,915	68,674	97	144	259	447	340	107	108

Appendix table 2-17.
U.S. development expenditures, by source of funds and performer: 1953–98
(Millions of current dollars)

Funding sector:	Total U.S.	Federal Government								Industry				U&Cs	Nonprofit			Non-Fed. govt.[a]
Performing sector:	Total U.S.	Total	Federal Govt.	Industry[b]	Industry FFRDCs[b]	U&Cs	U&C FFRDCs[c]	Non-profit[b]	Nonprofit FFRDCs[b]	Total	Industry[d]	U&Cs	Nonprofit	U&Cs	Total	Nonprofit	U&Cs	U&Cs
Calendar year[e]																		
1994	103,119	30,334	8,876	16,209	1,196	1,198	1,467	815	573	71,931	71,681	101	149	276	466	355	111	112
1995	113,239	32,569	9,431	17,824	1,209	1,163	1,593	743	606	79,788	79,518	107	163	288	473	361	113	121
1996	121,372	31,375	9,064	17,066	1,358	1,125	1,495	697	570	89,088	88,797	113	178	298	485	371	114	125
1997	128,565	32,245	9,001	18,121	1,292	1,163	1,357	708	603	95,375	95,063	118	194	311	506	389	116	129
1998 .... prelim.	138,075	32,369	8,848	18,211	1,475	1,181	1,251	794	608	104,715	104,380	124	210	327	529	408	121	136

FFRDCs = Federally Funded Research and Development Centers; U&C = universities and colleges

NOTES: Data are based on annual reports by performers except for the nonprofit sector; R&D expenditures by nonprofit sector performers have been estimated since 1973 on the basis of a survey conducted in that year. The next updates of these data, covering the years 1953–2000, along with technical notes explaining methodological issues of measurement, will be provided in National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources: 2000* (Arlington, VA: forthcoming). Data are preliminary for 1998.

[a]Because of limitations in the survey information, data on non-Federal government funding to other performers are not available, and are consequently included in other sectors' support for their own R&D performance. For example, non-Federal government support to nonprofits is included in nonprofits' support for their own R&D.

[b]For 1953-63, development expenditures of industry FFRDCs were not separated out from total Federal support to the industrial sector for development. Thus, the figure for Federal support to industry for development expenditures includes support for development at industry FFRDCs for those years. The same is true for development by nonprofit FFRDCs in 1953-87, which is included in Federal support for development at nonprofit institutions for those years.

[c]Includes R&D expenditures of FFRDCs administered by academic institutions, nearly all of which are federally funded.

[d]Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.

[e]Expenditure levels for academic and Federal Government performers are also in reference to calendar years, unlike the levels typically provided in statistical reports on these institutions alone, which are in reference to fiscal years. These calendar–year expenditure levels are approximations based on fiscal year data.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources* (Arlington, VA: biennial series).

See figures 2-16 and 2-17 in Volume I.

Appendix table 2-18.
U.S. development expenditures, by source of funds and performer: 1953–98
(Millions of constant 1992 dollars)

Funding sector:	Total U.S.	Federal Government								Industry				U&Cs	Nonprofit			Non-Fed. govt.[a]
Performing sector:	Total U.S.	Total	Federal Govt.	Industry[b]	Industry FFRDCs[b]	U&Cs	U&C FFRDCs[c]	Non-profit[b]	Nonprofit FFRDCs[b]	Total	Industry[d]	U&Cs	Nonprofit	U&Cs	Total	Nonprofit	U&Cs	U&Cs
Calendar year[e]																		
1953	16,905	8,731	2,807	5,565		42	235	82		8,112	8,077	5	30	13	35	30	5	14
1954	18,295	9,929	2,631	6,884		42	287	86		8,295	8,256	5	34	15	39	34	5	17
1955	20,198	11,700	2,616	8,607		55	333	89		8,426	8,380	7	39	15	39	34	5	18
1956	27,268	16,586	2,937	13,121		63	375	91		10,605	10,559	9	37	17	40	33	7	21
1957	30,122	20,185	3,280	16,303		54	455	92		9,849	9,802	11	36	19	45	36	9	24
1958	31,764	21,755	3,705	17,358		55	528	108		9,916	9,868	13	35	19	48	40	9	25
1959	36,876	25,584	4,096	20,697		68	584	139		11,194	11,142	13	39	20	52	44	9	26
1960	40,223	27,458	4,308	22,213		82	647	208		12,667	12,613	11	43	20	52	43	9	27
1961	42,181	28,464	4,628	22,715		91	720	310		13,598	13,547	8	42	22	68	59	8	29
1962	42,431	28,620	5,147	22,152		94	797	430		13,670	13,616	8	46	24	84	76	8	32
1963	47,842	32,983	6,074	25,357		91	906	556		14,710	14,656	8	46	25	91	83	8	33
1964	51,087	35,172	6,863	25,147	1,467	121	925	650		15,772	15,719	8	45	27	84	74	10	32
1965	52,945	35,022	7,165	24,912	1,194	192	827	731		17,760	17,704	8	48	32	96	80	16	35
1966	56,445	36,874	7,347	26,681	1,056	238	779	773		19,388	19,326	8	55	38	109	90	19	37
1967	57,877	35,942	7,335	25,651	1,140	247	785	783		21,750	21,684	9	57	38	115	91	25	32
1968	58,442	35,295	6,889	25,485	1,060	259	818	785		22,959	22,887	14	58	34	127	94	33	28
1969	58,917	34,028	6,965	23,994	1,147	275	850	796		24,706	24,627	17	62	27	131	97	35	24
1970	55,528	30,782	7,408	20,446	1,115	274	817	722		24,570	24,495	16	59	23	131	98	33	21
1971	54,269	29,821	7,712	19,236	1,220	215	833	605		24,267	24,195	12	59	27	129	103	27	24
1972	56,084	30,343	7,897	19,548	1,203	187	871	637		25,531	25,464	10	57	41	132	105	27	37
1973	57,214	29,209	7,527	18,756	1,130	200	837	758		27,756	27,686	14	57	57	143	108	35	50
1974	55,897	27,311	7,189	17,034	1,245	194	834	815		28,322	28,251	17	55	64	148	109	39	52
1975	53,952	26,118	6,866	16,115	1,271	196	885	784		27,558	27,486	19	52	65	159	121	38	53
1976	56,323	27,015	6,671	16,884	1,468	223	1,003	765		29,011	28,934	26	52	70	173	137	36	54
1977	58,384	27,751	6,721	17,447	1,423	323	1,081	757		30,296	30,209	31	57	85	193	154	39	59
1978	61,092	28,284	7,224	17,206	1,480	499	1,085	791		32,432	32,344	28	59	96	217	171	46	63
1979	64,288	29,140	7,141	17,903	1,467	609	1,147	874		34,756	34,664	28	63	101	229	179	50	62
1980	67,519	29,077	6,750	18,162	1,462	600	1,233	870		38,041	37,943	32	66	112	225	174	51	63
1981	69,776	30,248	6,863	19,377	1,439	585	1,152	831		39,122	39,018	36	68	121	219	167	53	66
1982	73,721	31,554	7,379	20,258	1,409	566	1,088	853		41,749	41,640	38	71	126	227	171	56	65
1983	78,736	33,705	8,346	21,217	1,441	546	1,179	977		44,598	44,481	42	75	133	236	178	58	64
1984	87,415	37,121	9,323	23,235	1,391	573	1,381	1,218		49,832	49,698	49	85	142	252	191	61	68
1985	94,916	41,095	10,201	25,797	1,403	619	1,675	1,401		53,331	53,180	55	96	153	264	202	63	73
1986	94,133	42,116	10,269	26,703	1,421	637	1,923	1,163		51,487	51,320	62	104	169	280	215	65	81
1987	96,189	44,059	9,843	29,042	1,481	721	2,045	928		51,546	51,369	69	108	187	309	236	73	88
1988	98,322	43,315	10,296	27,551	1,642	811	2,053	473	488	54,361	54,169	77	115	208	341	259	83	96
1989	97,878	39,371	10,427	23,461	1,586	862	1,990	565	480	57,806	57,597	85	124	228	370	280	91	102
1990	100,542	36,110	10,364	20,263	1,536	972	1,791	661	524	63,692	63,472	89	131	242	391	296	95	106
1991	97,805	32,056	9,019	17,731	1,421	1,039	1,556	742	547	64,991	64,766	88	137	246	406	310	97	105
1992	99,889	31,498	9,098	17,181	1,373	1,054	1,435	758	599	67,620	67,388	91	141	246	421	321	100	105
1993	97,186	29,250	8,838	15,669	1,012	1,093	1,312	766	560	67,142	66,908	94	141	252	436	332	104	105

Appendix table 2-18.
U.S. development expenditures, by source of funds and performer: 1953–98
(Millions of constant 1992 dollars)

Funding sector:	Total U.S.	Federal Government								Industry				U&Cs	Nonprofit			Non-Fed. govt.[a]
Performing sector:	Total U.S.	Total	Federal Govt.	Industry[b]	Industry FFRDCs[b]	U&Cs	U&C FFRDCs[c]	Non-profit[b]	Nonprofit FFRDCs[b]	Total	Industry[d]	U&Cs	Nonprofit	U&Cs	Total	Nonprofit	U&Cs	U&Cs
Calendar year[e]																		
1994	98,125	28,865	8,446	15,424	1,138	1,140	1,396	775	546	68,447	68,209	96	142	262	443	338	106	107
1995	105,329	30,294	8,772	16,579	1,125	1,082	1,482	691	563	74,214	73,963	100	151	268	440	335	105	113
1996	110,811	28,645	8,276	15,581	1,240	1,027	1,365	637	520	81,337	81,071	103	163	272	443	339	104	114
1997	115,233	28,901	8,068	16,242	1,158	1,042	1,217	635	540	85,484	85,205	105	174	279	453	349	104	115
1998 .... prelim.	122,516	28,721	7,851	16,159	1,309	1,048	1,110	705	540	92,914	92,618	110	186	290	470	362	107	121

FFRDCs = Federally Funded Research and Development Centers; U&C = universities and colleges; NA = not available.

NOTES: Data are based on annual reports by performers except for the nonprofit sector; R&D expenditures by nonprofit sector performers have been estimated since 1973 on the basis of a survey conducted in that year. The next updates of these data, covering the years 1953–2000, along with technical notes explaining methodological issues of measurement, will be provided in National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources: 2000* (Arlington, VA: forthcoming). Data are preliminary for 1998.

[a]Because of limitations in the survey information, data on non-Federal government funding to other performers are not available, and are consequently included in other sectors' support for their own R&D performance. For example, non-Federal government support to nonprofits is included in nonprofits' support for their own R&D.

[b]For 1953-63, development expenditures of industry FFRDCs were not separated out from total Federal support to the industrial sector for development. Thus, the figure for Federal support to industry for development includes support for development at industry FFRDCs for those years. The same is true for development by nonprofit FFRDCs in 1953-87, which is included in Federal support for development at nonprofit institutions for those years.

[c]Includes R&D expenditures of FFRDCs administered by academic institutions, nearly all of which are federally funded.

[d]Industry sources of industry R&D expenditures include all non-Federal sources of industry R&D expenditures.

[e]Expenditure levels for academic and Federal Government performers are also in reference to calendar years, unlike the levels typically provided in statistical reports on these institutions alone, which are in reference to fiscal years. These calendar–year expenditure levels are approximations based on fiscal year data.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources* (Arlington, VA: biennial series).

Appendix table 2-19.
Trends in Federal and non–Federal R&D expenditures: 1953–98
(percent)

	Non-Federal	Federal			
Calendar year	Total nonfederal	Total federal	Defense related	Space related	Civilian related
1953	46.1	53.9	48.0	1.0	4.9
1954	44.8	55.2	49.0	1.0	5.2
1955	42.6	57.4	48.7	1.0	7.7
1956	41.4	58.6	49.7	1.0	7.9
1957	37.1	62.9	53.2	0.9	8.8
1958	36.1	63.9	53.1	1.1	9.7
1959	34.6	65.4	54.3	2.6	8.6
1960	35.0	65.0	52.6	3.2	9.3
1961	34.9	65.1	50.4	5.6	9.2
1962	35.2	64.8	45.6	9.1	10.2
1963	33.5	66.5	41.3	15.2	10.0
1964	33.2	66.8	36.8	20.1	10.0
1965	34.9	65.1	32.7	22.0	10.4
1966	35.8	64.2	31.6	21.1	11.5
1967	37.6	62.4	32.3	18.4	11.7
1968	39.3	60.7	31.5	16.9	12.3
1969	41.4	58.6	31.3	14.8	12.4
1970	43.0	57.0	29.7	14.1	13.2
1971	43.6	56.4	29.4	11.8	15.2
1972	44.2	55.8	30.1	10.7	15.0
1973	46.4	53.6	28.7	9.8	15.1
1974	48.2	51.8	26.8	8.9	16.1
1975	48.1	51.9	26.4	8.4	17.2
1976	48.6	51.4	25.8	8.5	17.1
1977	49.0	51.0	25.8	6.9	18.3
1978	49.9	50.1	24.9	6.5	18.8
1979	50.8	49.2	24.0	6.2	18.9
1980	52.6	47.4	23.8	5.1	18.5
1981	53.4	46.6	25.4	4.9	16.3
1982	53.9	46.1	28.1	3.9	14.0
1983	53.8	46.2	29.7	3.1	13.3
1984	54.5	45.5	30.2	3.0	12.3
1985	54.0	46.0	31.1	3.2	11.8
1986	54.5	45.5	31.5	3.0	10.9
1987	53.6	46.4	31.8	3.2	11.4
1988	55.1	44.9	30.5	3.4	11.0
1989	57.4	42.6	27.9	3.7	11.0
1990	59.4	40.6	25.4	4.2	11.0
1991	62.2	37.8	22.6	4.5	10.8
1992	63.1	36.9	21.6	4.3	11.0
1993	63.4	36.6	21.6	4.4	10.6
1994	63.9	36.1	19.9	4.4	11.7
1995	65.5	34.5	18.7	4.6	11.3
1996	67.7	32.3	17.7	4.1	10.5
1997	69.3	30.7	17.0	4.1	9.6
1998	70.5	29.5	16.0	4.0	9.5

NOTES: Data are preliminary for 1998. Details may not sum to totals because of rounding.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources* (Arlington, VA: biennial series).

See figure 2-5 in Volume I.

Appendix table 2-20.
State R&D expenditures, by performing sector and source of funds: 1997
(Millions of current dollars)

Performing sector:		Total R&D	Federal Govt.	Industry			Universities & colleges						U&C FFRDCs	Other nonprofit institutions[a]	Non-profit FFRDCs
Funding sector:		Total R&D	Federal Govt.	Total	Federal Govt.[b]	Industry[b]	Total	Federal Govt.	Non-Federal govt.	Industry	U&C	Nonprofits	Federal Govt.[c]	Federal Govt.	Federal Govt.
State	Rank														
United States, total		211,268	16,814	157,539	23,928	133,611	25,001	14,849	1,940	1,773	4,686	1,754	5,466	3,036	820
Alabama	25	1,637	660	589	189	399	369	231	5	30	85	18	0	19	0
Alaska	48	136	38	24	D	D	71	28	4	13	26	0	0	2	0
Arizona	21	2,410	144	1,854	677	1,177	377	198	10	19	137	13	29	6	0
Arkansas	45	272	49	118	D	D	102	35	29	8	24	6	0	2	0
California	1	41,670	1,454	34,011	5,977	28,034	2,979	2,028	129	160	440	221	2,549	474	203
Colorado	17	3,205	195	2,248	525	1,723	427	290	27	24	50	37	136	50	148
Connecticut	16	3,454	33	3,014	307	2,707	393	242	14	25	76	35	0	15	0
Delaware	31	1,089	10	1,009	8	1,001	65	32	3	3	20	7	0	4	0
District of Columbia	20	2,768	1,733	645	D	D	214	154	1	18	24	16	0	176	0
Florida	12	4,784	649	3,442	1,461	1,981	682	334	89	48	176	34	0	11	0
Georgia	22	2,272	225	1,273	212	1,062	766	347	69	73	252	24	0	7	0
Hawaii	44	275	54	87	55	32	120	72	28	6	13	0	0	13	0
Idaho	30	1,270	24	1,181	D	D	64	18	22	9	15	0	0	0	0
Illinois	8	8,034	77	6,248	163	6,085	930	530	54	50	220	75	725	54	0
Indiana	18	3,149	68	2,677	D	D	400	209	24	33	114	20	0	4	0
Iowa	34	980	29	578	D	D	342	162	53	24	84	19	28	3	0
Kansas	29	1,351	16	1,136	D	D	198	75	45	12	57	9	0	1	0
Kentucky	38	526	7	359	3	356	158	76	7	20	53	2	0	1	0
Louisiana	37	554	48	172	D	D	330	128	75	32	78	17	0	4	0
Maine	47	149	6	83	D	D	33	15	2	6	11	0	0	27	0
Maryland	10	7,395	4,569	1,425	456	970	1,242	927	81	40	114	80	0	155	4
Massachusetts	5	11,097	361	8,300	1,397	6,903	1,268	915	29	103	125	96	353	652	163
Michigan	2	13,991	108	13,009	121	12,888	842	454	51	57	206	75	0	32	0
Minnesota	15	3,605	35	3,116	362	2,754	363	200	51	24	54	34	0	92	0
Mississippi	41	370	165	73	D	D	125	62	29	9	14	10	0	7	0
Missouri	24	1,826	51	1,290	30	1,260	465	261	24	37	111	32	0	21	0
Montana	46	199	33	92	D	D	71	31	14	8	16	1	0	4	0

Appendix table 2-20.
State R&D expenditures, by performing sector and source of funds: 1997
(Millions of current dollars)

Performing sector:		Total R&D	Federal Govt.	Industry			Universities & colleges						U&C FFRDCs	Other nonprofit institutions[a]	Non-profit FFRDCs
Funding sector:		Total R&D	Federal Govt.	Total	Federal Govt.[b]	Industry[b]	Total	Federal Govt.	Non-Federal govt.	Industry	U&C	Nonprofits	Federal Govt.[c]	Federal Govt.	Federal Govt.
State	Rank														
Nebraska	43	275	24	71	D	D	176	60	47	14	49	5	0	5	0
Nevada	39	517	46	380	D	D	88	44	4	5	31	4	0	2	0
New Hampshire	35	799	37	652	D	D	108	67	8	5	15	12	0	2	0
New Jersey	4	12,067	459	11,069	117	10,952	462	224	37	26	140	35	59	16	2
New Mexico	19	3,028	366	1,310	D	D	219	145	15	10	42	7	1,122	10	0
New York	3	12,307	136	9,939	2,078	7,861	1,784	1,152	80	96	245	211	239	209	0
North Carolina	13	4,667	230	3,590	111	3,478	786	439	116	96	106	29	0	61	0
North Dakota	49	116	26	33	0	33	56	24	1	3	26	2	0	0	0
Ohio	11	7,145	681	5,608	604	5,004	764	418	70	83	144	49	0	92	0
Oklahoma	36	644	44	428	45	383	163	71	19	14	45	13	0	9	0
Oregon	27	1,520	90	1,102	28	1,075	291	195	32	10	36	18	0	37	0
Pennsylvania	7	8,209	151	6,609	672	5,937	1,241	808	42	139	183	70	32	175	0
Rhode Island	32	1,040	202	704	D	D	112	79	1	2	27	3	0	22	0
South Carolina	33	1,040	34	783	83	700	219	103	21	9	66	21	0	4	0
South Dakota	51	71	19	26	0	26	25	11	8	1	3	1	0	2	0
Tennessee	26	1,566	78	1,089	D	D	330	199	38	17	53	23	44	26	0
Texas	6	9,487	560	7,265	784	6,481	1,581	845	170	132	270	164	0	80	1
Utah	28	1,381	117	1,027	199	829	234	158	18	14	36	8	0	3	0
Vermont	42	314	7	246	D	D	60	34	3	5	11	6	0	1	0
Virginia	14	4,136	1,655	1,767	851	916	455	270	47	40	74	24	80	37	143
Washington	9	7,543	167	6,610	D	D	508	366	15	41	69	17	0	115	144
West Virginia	40	427	87	233	D	D	64	30	2	4	23	5	33	11	0
Wisconsin	23	2,256	43	1,707	29	1,678	497	284	41	19	98	56	0	9	0
Wyoming	50	87	9	28	0	28	48	15	6	2	24	1	0	2	0
Other/unknown		12,161	704	7,210	6,384	18,898	1,338	753	129	92	276	87	38	269	11

FFRDCs = Federally Funded Research and Development Centers; U&C = universities and colleges; D = data have been withheld to avoid disclosing information about individual companies

NOTES: Data are based on annual reports by performers, except for the nonprofit sector. Details may not sum to totals because of rounding.

[a]State data for nonprofit performance using non-Federal funds are not available. For 1997, total nonprofit performance is estimated at $5,628 million. Industry provided an estimated $969 million to the nonprofit sector, and nonprofit institutions provided an estimated $1,623 million. These non-Federal–support amounts are included in the total R&D column for the rows "total United States" and "other/unknown". This is why, for these two colums, the amounts under "total R&D" are greater than the sum of the components to the right, since those components do not include nonfederal support to nonprofit organizations.

[b]Federal support for industry R&D includes performance at industry FFRDCs; industry support of industry R&D includes all non-Federal sources.

[c]Includes total R&D expenditures of FFRDCs administered by academic institutions.

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Research and Development in Industry: 1997* (Arlington, VA: 1998, forthcoming); NSF/SRS, *Academic Research and Developmnent Expenditures: Fiscal Year 1997*, Detailed Statistical Tables (Arlington, VA: 1998, forthcoming); and NSF/SRS, *Federal Funds for Research and Development: Fiscal Years 1997, 1998, and 1999*, *Detailed Statistical Tables*, NSF 99–333 (Arlington, VA: 1999).

See figure 2-14 in Volume I.

Appendix table 2-21.
Total R&D and GSP, by state: 1997

Rank in total R&D	State	(Millions of dollars) Total R&D	GSP	Percent R&D/GSP	Rank in R&D/GSP	Percent of U.S. R&D	Cumulative percent of U.S. R&D
TOTAL, U.S		211,268					
1	California	41,670	1,033,016	4.03	9	19.72	19.7
2	Michigan	13,991	272,607	5.13	3	6.62	26.3
3	New York	12,307	651,652	1.89	25	5.83	32.2
4	New Jersey	12,067	294,055	4.10	8	5.71	37.9
5	Massachusetts	11,097	221,009	5.02	4	5.25	43.1
6	Texas	9,487	601,643	1.58	28	4.49	47.6
7	Pennsylvania	8,209	339,940	2.41	15	3.89	51.5
8	Illinois	8,034	393,532	2.04	21	3.80	55.3
9	Washington	7,543	172,253	4.38	6	3.57	58.9
10	Maryland	7,395	153,797	4.81	5	3.50	62.4
11	Ohio	7,145	320,506	2.23	17	3.38	65.8
12	Florida	4,784	380,607	1.26	31	2.26	68.0
13	North Carolina	4,667	218,888	2.13	18	2.21	70.2
14	Virginia	4,136	211,331	1.96	23	1.96	72.2
15	Minnesota	3,605	149,394	2.41	16	1.71	73.9
16	Connecticut	3,454	134,565	2.57	12	1.63	75.5
17	Colorado	3,205	126,084	2.54	13	1.52	77.1
18	Indiana	3,149	161,701	1.95	24	1.49	78.5
19	New Mexico	3,028	45,242	6.69	1	1.43	80.0
20	District of Columbia	2,768	52,372	5.29	2	1.31	81.3
21	Arizona	2,410	121,239	1.99	22	1.14	82.4
22	Georgia	2,272	229,473	0.99	38	1.08	83.5
23	Wisconsin	2,256	147,325	1.53	30	1.07	84.6
24	Missouri	1,826	152,100	1.20	33	0.86	85.4
25	Alabama	1,637	103,109	1.59	27	0.77	86.2
26	Tennessee	1,566	146,999	1.07	36	0.74	87.0
27	Oregon	1,520	98,367	1.54	29	0.72	87.7
28	Utah	1,381	55,417	2.49	14	0.65	88.3
29	Kansas	1,351	71,737	1.88	26	0.64	89.0
30	Idaho	1,270	29,149	4.36	7	0.60	89.6
31	Delaware	1,089	31,585	3.45	11	0.52	90.1
32	Rhode Island	1,040	27,806	3.74	10	0.49	90.6
33	South Carolina	1,040	93,259	1.11	35	0.49	91.1
34	Iowa	980	80,479	1.22	32	0.46	91.5
35	New Hampshire	799	38,106	2.10	19	0.38	91.9
36	Oklahoma	644	76,642	0.84	40	0.30	92.2
37	Louisiana	554	124,350	0.45	50	0.26	92.5
38	Kentucky	526	100,076	0.53	46	0.25	92.7
39	Nevada	517	57,407	0.90	39	0.24	93.0
40	West Virginia	427	38,228	1.12	34	0.20	93.2

Appendix table 2-21.
Total R&D and GSP, by state: 1997

Rank in total R&D	State	(Millions of dollars) Total R&D	GSP	Percent R&D/GSP	Rank in R&D/GSP	Percent of U.S. R&D	Cumulative percent of U.S. R&D
41	Mississippi	370	58,314	0.63	43	0.17	93.3
42	Vermont	314	15,214	2.06	20	0.15	93.5
43	Nebraska	275	48,812	0.56	44	0.13	93.6
44	Hawaii	275	38,024	0.72	42	0.13	93.8
45	Arkansas	272	58,479	0.46	49	0.13	93.9
46	Montana	199	19,160	1.04	37	0.09	94.0
47	Maine	149	30,156	0.49	48	0.07	94.0
48	Alaska	136	24,494	0.55	45	0.06	94.1
49	North Dakota	116	15,786	0.73	41	0.05	94.2
50	Wyoming	87	17,561	0.50	47	0.04	94.2
51	South Dakota	71	20,186	0.35	51	0.03	94.2
Other/unknown[a]		12,161				5.76	100.0

GSP = gross state product

[a]The "other/unknown" category includes R&D performed within the 50 states, or the District of Columbia, but where the specific location of such performance was not provided by survey respondents. It also includes R&D conducted by organizations within the United States, but where actual performance does not take place in a particular state or the District of Columbia, e.g., research conducted on marine vessels, and research in Puerto Rico. Finally, it also includes a small accounting difference due to the total for the U.S. being based on calendar year data, while data by state pertain to the fiscal year for non–industrial performance.

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS). Data were derived from NSF/SRS, *Research and Development in Industry: 1995–96*; NSF/SRS, *Academic Research and Development Expenditures, Fiscal Year 1996*; and NSF/SRS, *Federal Funds for Research and Development: Fiscal Years 1996, 1997, and 1998*; and Department of Commerce, Bureau of Economic Analysis.

See page 2-64 in Volume I.

Appendix table 2-22.
Trends in R&D and Federal outlays: FYs 1970, 1980, 1990, and proposed 2000

Composition of Federal outlays	1970	1980	1990	2000
		Billions of current dollars		
Total Federal outlays	196	591	1,253	1,798
Mandatory programs	61	262	569	991
Net interest	14	53	184	215
Defense discretionary	82	135	300	275
R&D outlays	8	15	42	38
International discretionary	4	13	19	20
R&D outlays	NA	0	0	0
Domestic discretionary	34	129	181	297
R&D outlays	8	17	23	39
Total R&D outlays	16	32	65	77
		Percent of total Federal outlays		
Total Federal outlays	100	100	100	100
Mandatory programs[a]	31.2	44.4	45.4	55.1
Net interest	7.4	8.9	14.7	12.0
Defense discretionary	41.8	22.8	23.9	15.3
R&D outlays	4.2	2.5	3.3	2.1
International discretionary	2.0	2.2	1.5	1.1
R&D outlays	NA	0.0	0.0	0.0
Domestic discretionary	17.5	21.8	14.5	16.5
R&D outlays	3.8	2.8	1.9	2.1
Total R&D outlays	8.1	5.4	5.2	4.3
Federal R&D Outlays as a proportion of discretionary outlays				
		(percent)		
Total R&D / Discretionary outlays	13.1	11.5	13.1	13.0
Defense R&D/defense outlays	10.1	11.1	13.9	14.0
International R&D/international outlays	NA	0.8	2.1	0.9
Domestic R&D/domestic outlays	21.9	13.0	12.9	13.0

[a]These include Social Security, Medicare, Medicaid, and other programs.

NA = not available

SOURCE: American Association for the Advancement of Science, *Research and Development: FY 2000* (Washington, DC: 1999).

See figure 2-19 in Volume I.

Science & Engineering Indicators – 2000

Appendix table 2-23.
Federal R&D budget authority, by budget function: fiscal years 1980–2000

			Non–defense															
Year	Total	National defense	Total non–defense	Health	Space research and tech–nology	General science	Energy	Natural resources and envi–ronment	Trans–portation	Agri–culture	Education, training, employment and social services	Inter–national affairs	Veterans benefits and services	Commerce and housing credit	Community and regional develop–ment	Admin–istration of justice	Income security	General govern–ment
Millions of current dollars																		
1980	29,739	14,946	14,793	3,694	2,738	1,233	3,603	999	887	585	468	125	126	101	119	45	47	22
1981	33,735	18,413	15,322	3,871	3,111	1,340	3,501	1,061	869	659	298	160	143	106	104	34	43	22
1982	36,115	22,070	14,045	3,869	2,584	1,359	3,012	965	791	693	228	165	139	104	63	31	32	10
1983	38,768	24,936	13,832	4,298	2,134	1,502	2,578	952	876	745	189	177	157	107	44	37	32	6
1984	44,214	29,287	14,927	4,779	2,300	1,676	2,581	963	1,040	762	200	192	218	110	46	24	26	8
1985	49,887	33,698	16,189	5,418	2,725	1,862	2,389	1,059	1,030	836	220	210	193	114	50	47	21	17
1986	53,249	36,926	16,323	5,565	2,894	1,873	2,286	1,062	917	815	248	211	183	111	88	41	14	14
1987	57,069	39,152	17,917	6,556	3,398	2,042	2,053	1,133	908	822	267	223	215	110	99	49	25	17
1988	59,106	40,099	19,007	7,076	3,683	2,160	2,126	1,160	896	882	285	224	195	122	108	51	23	17
1989	62,115	40,665	21,450	7,773	4,555	2,373	2,419	1,255	1,064	907	347	279	212	128	74	45	27	15
1990	63,781	39,925	23,856	8,308	5,765	2,410	2,726	1,386	1,045	950	374	375	216	140	67	44	33	17
1991	65,898	39,328	26,570	9,226	6,511	2,635	2,953	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	2,659	3,153	1,688	1,523	1,155	365	371	245	192	95	51	37	4
1993	69,884	41,249	28,635	10,280	6,988	2,691	2,677	1,802	1,703	1,152	348	382	250	220	57	49	36	1
1994	68,331	37,764	30,567	10,993	7,414	2,712	2,873	1,865	1,888	1,193	373	254	265	380	68	46	45	0
1995	68,791	37,204	31,587	11,407	7,916	2,794	2,844	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	2,846	2,521	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	2,944	2,372	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	4,360	948	1,855	1,833	1,249	444	163	587	398	42	72	18	2
1999	76,886	40,387	36,499	15,479	8,239	4,739	1,164	1,928	1,731	1,352	457	165	674	401	49	82	37	2
2000	75,415	37,710	37,704	15,824	8,422	4,951	1,348	1,944	1,840	1,522	491	115	663	448	51	59	24	2
Millions of constant 1992 dollars																		
1980	50,167	25,213	24,954	6,231	4,619	2,080	6,078	1,685	1,496	987	789	211	213	170	201	76	79	37
1981	51,804	28,275	23,529	5,944	4,777	2,058	5,376	1,629	1,334	1,012	458	246	220	163	160	52	66	34
1982	51,800	31,655	20,145	5,549	3,706	1,949	4,320	1,384	1,135	994	327	237	199	149	90	44	46	14
1983	53,151	34,187	18,964	5,893	2,926	2,059	3,534	1,305	1,201	1,021	259	243	215	147	60	51	44	8
1984	58,361	38,658	19,703	6,308	3,036	2,212	3,407	1,271	1,373	1,006	264	253	288	145	61	32	34	11
1985	63,656	42,999	20,657	6,913	3,477	2,376	3,048	1,351	1,314	1,067	281	268	246	145	64	60	27	22
1986	66,066	45,814	20,252	6,904	3,591	2,324	2,836	1,318	1,138	1,011	308	262	227	138	109	51	17	17
1987	68,816	47,211	21,605	7,905	4,097	2,462	2,476	1,366	1,095	991	322	269	259	133	119	59	30	20
1988	68,880	46,730	22,150	8,246	4,292	2,517	2,478	1,352	1,044	1,028	332	261	227	142	126	59	27	20
1989	69,449	45,466	23,983	8,691	5,093	2,653	2,705	1,403	1,190	1,014	388	312	237	143	83	50	30	17
1990	68,471	42,861	25,610	8,919	6,189	2,587	2,926	1,488	1,122	1,020	402	403	232	150	72	47	35	18
1991	67,831	40,482	27,349	9,497	6,702	2,712	3,040	1,628	1,267	1,083	446	389	225	183	91	52	31	4
1992	68,398	40,083	28,315	10,055	6,744	2,659	3,153	1,688	1,523	1,155	365	371	245	192	95	51	37	4
1993	68,087	40,188	27,898	10,016	6,808	2,622	2,608	1,756	1,659	1,122	339	372	244	214	56	48	35	1

Appendix table 2-23.
Federal R&D budget authority, by budget function: fiscal years 1980–2000

			Non–defense															
Year	Total	National defense	Total non–defense	Health	Space research and tech–nology	General science	Energy	Natural resources and envi–ronment	Trans–portation	Agri–culture	Education, training, employment and social services	Inter–national affairs	Veterans benefits and services	Commerce and housing credit	Community and regional develop–ment	Admin–istration of justice	Income security	General govern–ment
								Millions of constant 1992 dollars–continued										
1994	65,003	35,925	29,078	10,458	7,053	2,580	2,733	1,774	1,796	1,135	355	242	252	361	65	44	43	0
1995	63,902	34,560	29,342	10,596	7,353	2,595	2,642	1,847	1,703	1,109	343	267	239	488	65	55	40	1
1996	62,909	34,440	28,469	10,812	7,146	2,593	2,296	1,642	1,635	1,071	302	230	236	393	46	51	15	2
1997	64,073	35,403	28,670	11,330	7,014	2,633	2,121	1,687	1,596	1,076	334	170	239	365	43	53	8	2
1998	65,007	35,189	29,818	11,996	7,244	3,853	838	1,639	1,620	1,104	392	144	519	352	37	64	16	2
1999	67,067	35,230	31,838	13,502	7,187	4,134	1,015	1,682	1,510	1,179	399	144	588	350	43	72	32	2
2000	64,496	32,250	32,245	13,533	7,203	4,234	1,153	1,663	1,573	1,302	420	98	567	383	44	50	21	2

NOTES: Data for 1980–98 are actual budget authority. Data for 1999 and 2000 are preliminary based on the FY 2000 budget. See Appendix table 2-1 for GDP implicit price deflaters used to convert current dollars to constant 1992 dollars. Beginning in FY 1998, a number of Department of Energy programs were reclassified from energy to general science.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Federal R&D Funding by Budget Function: Fiscal Years 1998–2000* (Arlington, VA: forthcoming).

See figure 2-4 in Volume 1.

Appendix table 2-24.
Federal basic research funding, by budget function: FYs 1980, 1985, and 1990–2000

Function	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Millions of current dollars													
Total	4,716	7,810	11,288	12,405	12,973	13,440	13,552	13,772	14,442	14,961	15,523	17,287	18,101
Health	1,761	3,243	4,661	5,021	5,506	5,700	5,889	6,068	6,395	6,852	7,356	8,429	8,590
General science	1,152	1,779	2,306	2,526	2,532	2,553	2,542	2,622	2,662	2,753	4,121	4,471	4,710
Space research and technology	482	498	1,389	1,479	1,499	1,588	1,796	1,614	1,685	1,653	1,610	1,719	1,841
National defense	552	856	964	1,188	1,147	1,323	1,174	1,181	1,165	1,090	1,067	1,158	1,152
Energy	200	428	761	878	921	917	921	930	1,182	1,288	34	36	46
Agriculture	246	406	456	486	528	553	567	565	547	548	571	657	736
Natural resources and environment	136	206	336	389	383	376	224	187	147	153	145	169	175
Transportation	79	255	242	246	266	238	220	389	456	420	411	438	634
Education, training, employment, and social services	61	86	106	115	118	121	145	153	140	142	133	135	144
Commerce and housing credit	15	23	31	39	35	34	38	35	37	34	35	36	38
Veterans' benefits and services	14	15	16	16	16	16	16	16	13	14	23	20	19
Administration of justice	9	4	9	6	5	5	5	9	12	13	16	18	15
Community and regional development	8	6	3	10	11	10	9	3	0	0	0	0	0
General government	–	4	3	0	0	0	0	0	0	0	0	0	0
International affairs	0	4	4	6	6	8	6	0	2	2	1	1	1
Income security	1	0	0	0	0	0	0	0	0	0	0	0	0
Millions of constant 1992 dollars[a]													
Total	7,955	9,966	12,118	12,769	12,973	13,094	12,892	12,793	13,158	13,378	13,717	15,079	15,480
Health	2,971	4,138	5,004	5,168	5,506	5,553	5,602	5,637	5,826	6,128	6,500	7,353	7,346
General science	1,943	2,270	2,476	2,600	2,532	2,487	2,418	2,436	2,425	2,462	3,641	3,900	4,028
Space research and technology	813	635	1,491	1,522	1,499	1,547	1,709	1,499	1,535	1,478	1,423	1,499	1,575
National defense	931	1,092	1,035	1,223	1,147	1,289	1,117	1,097	1,061	975	943	1,010	985
Energy	337	546	817	904	921	893	876	864	1,077	1,152	30	32	39
Agriculture	415	518	490	500	528	539	539	525	498	490	504	573	629
Natural resources and environment	229	263	361	400	383	366	213	174	134	137	128	147	149
Transportation	133	325	260	253	266	232	209	361	415	375	363	382	542
Education, training, employment, and social services	103	110	114	118	118	118	138	142	128	127	118	118	123

Appendix table 2-24.
Federal basic research funding, by budget function: FYs 1980, 1985, and 1990–2000

Function	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Millions of constant 1992 dollars[a] –continued													
Commerce and housing credit	25	29	33	40	35	33	36	33	34	30	31	31	33
Veterans' benefits and services	24	19	17	16	16	16	15	15	12	13	21	17	16
Administration of justice	15	5	10	6	5	5	5	8	11	12	14	16	13
Community and regional development	13	8	3	10	11	10	9	3	0	0	0	0	0
General government	–	5	3	0	0	0	0	0	0	0	0	0	0
International affairs	0	5	4	6	6	8	6	0	2	2	1	1	1
Income security	2	0	0	0	0	0	0	0	0	0	0	0	0

NOTE: Data for 1980–98 are actual budget authority. Data for 1999 and 2000 are preliminary based on the FY 2000 budget. Beginning in FY 1998, a number of Department of Energy programs were reclassified from energy to general science.

[a]See appendix table 2-1 for GDP implicit price deflaters used to convert current dollars to constant 1992 dollars.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Federal R&D Funding by Budget Function: Fiscal Years 1998–2000* (Arlington, VA: forthcoming).

Appendix table 2-25.
Federal obligations for research and development: FY 1967–99
(Millions of current dollars)

Year	Total, all agencies	USDA	DOC	DoD	Education	DOE	HHS	DOI	Justice	DOT	Treasury	Veterans Affairs	EPA	AID	NASA	NSF	NRC	Smithsonian Inst.	Tenn. Valley Authority	All other agencies
1967	16,529	253	75	8,049	NA	NA	NA	170	0	284	1	41	0	NA	4,867	262	NA	14	7	NA
1968	15,921	254	84	7,709	NA	NA	NA	191	1	172	1	45	0	NA	4,429	283	NA	14	8	NA
1969	15,641	260	72	7,696	NA	NA	NA	208	5	232	1	50	0	NA	3,963	274	NA	15	8	NA
1970	15,339	281	122	7,360	NA	NA	NA	157	9	328	1	59	89	NA	3,800	289	NA	18	8	NA
1971	15,543	305	144	7,509	NA	NA	NA	192	10	497	1	63	137	NA	3,258	337	NA	15	9	NA
1972	16,496	350	187	8,318	NA	NA	NA	219	23	311	1	69	122	NA	3,157	455	NA	21	10	NA
1973	16,800	367	191	8,404	NA	NA	NA	244	33	311	1	74	181	NA	3,061	480	NA	24	14	NA
1974	17,410	379	181	8,420	NA	NA	NA	192	35	370	1	85	169	NA	3,002	556	42	25	13	NA
1975	19,039	420	215	9,012	NA	NA	NA	303	44	312	2	95	258	NA	3,064	595	64	25	17	NA
1976	20,780	462	229	9,655	NA	NA	NA	333	34	295	4	98	259	NA	3,447	609	88	26	19	NA
1977	23,450	547	245	10,963	NA	3,536	NA	315	28	355	5	107	295	NA	3,171	697	112	30	26	NA
1978	25,845	621	284	11,554	NA	4,245	NA	359	61	408	10	114	385	NA	3,333	749	134	35	31	NA
1979	28,145	663	309	12,506	166	4,639	3,505	406	43	370	10	127	410	106	3,578	808	149	37	38	NA
1980	29,830	688	343	13,981	139	4,754	3,780	411	42	361	12	133	345	149	3,234	882	183	41	80	NA
1981	33,104	774	328	16,509	105	4,918	3,927	427	27	416	11	144	326	134	3,593	962	220	45	69	NA
1982	36,433	797	336	20,623	128	4,708	3,941	381	27	310	13	137	335	200	3,078	975	220	52	85	NA
1983	38,712	848	335	22,993	112	4,537	4,353	382	31	348	16	161	241	227	2,662	1,062	207	56	63	NA
1984	42,225	866	358	25,373	116	4,674	4,831	411	25	448	14	190	261	237	2,822	1,203	191	64	68	NA
1985	48,360	943	399	29,792	125	4,966	5,451	392	36	429	24	227	320	220	3,327	1,346	150	71	79	NA
1986	51,412	929	399	32,938	121	4,688	5,658	385	36	385	24	186	317	251	3,420	1,353	124	63	78	NA
1987	55,254	948	402	35,232	133	4,757	6,606	404	42	325	27	210	348	218	3,787	1,471	123	72	78	73
1988	56,769	1,017	389	35,249	141	5,036	7,158	417	43	305	26	215	347	204	4,330	1,533	109	75	87	88
1989	61,407	1,038	398	37,577	159	5,193	7,903	469	38	303	26	235	380	279	5,394	1,670	115	80	63	87
1990	63,560	1,108	438	37,268	170	5,631	8,406	509	41	367	26	238	420	335	6,533	1,690	109	84	65	125
1991	61,295	1,237	490	32,135	171	5,983	9,756	593	49	380	31	217	433	378	7,280	1,785	109	98	68	104
1992	65,593	1,327	651	36,130	169	6,172	8,988	609	48	445	25	224	484	366	7,658	1,868	119	98	97	116
1993	67,314	1,328	656	35,849	178	6,262	10,349	619	49	545	17	236	495	382	8,020	1,882	120	102	109	116
1994	67,235	1,400	826	34,553	177	6,048	11,022	694	45	621	19	248	554	254	8,296	2,040	91	124	98	126
1995	68,187	1,380	1,136	33,796	178	6,145	11,455	562	58	727	61	238	552	303	9,015	2,149	88	124	93	127
1996	67,655	1,300	1,068	34,535	174	5,345	11,953	568	77	553	60	256	464	223	8,570	2,188	71	127	6	117
1997	69,830	1,389	1,003	34,788	181	5,604	12,788	580	85	527	60	253	492	206	9,327	2,249	62	130	9	98
1998	72,114	1,442	979	34,833	212	5,833	13,718	613	103	665	74	299	606	184	9,851	2,357	51	134	3	159
1999	73,333	1,426	1,036	34,350	263	6,541	14,821	638	98	768	75	300	610	184	9,201	2,655	53	142	0	173

NA = not applicable, due to the agency in question not existing, or not having the same definition, in prior years; USDA = U.S. Department of Agriculture; NASA = National Aeronautics and Space Administration; NSF = National Science Foundation; NRC = National Research Council; AID = Agency for International Development; DOC = Department of Commerce; DOD = Department of Defense; DOE = Department of Energy; HHS = Health and Human Services; DOI = Department of the Interior; DOT = Department of Transportation; EPA = Environmental Protection Agency

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Federal Funds for Research and Development: Fiscal Years 1997, 1998, and 1999*, NSF 99-333, Project Officer, Ronald L. Meeks (Arlington, VA: 1999); and NSF/SRS, *Federal Funds Survey, Detailed Historical Tables, Fiscal Years 1951-99*, NSF 99-347, Project Officer, Ronald L. Meeks (Arlington, VA: 1999).

Science & Engineering Indicators – 2000

Appendix table 2-26.
Federal obligations for research and development: FY 1967–99
(Millions of constant 1992 dollars)

Year	Total, all agencies	USDA	DOC	DoD	Education	DOE	HHS	DOI	Justice	DOT	Treasury	Veterans Affairs	EPA	AID	NASA	NSF	NRC	Smithsonian Inst.	Tenn. Valley Authority	All other agencies
1967	63,016	965	286	30,686	NA	NA	NA	648	0	1,083	4	156	0	NA	18,555	999	NA	53	27	NA
1968	58,469	933	308	28,311	NA	NA	NA	701	4	632	4	165	0	NA	16,265	1,039	NA	51	29	NA
1969	55,016	915	253	27,070	NA	NA	NA	732	18	816	4	176	0	NA	13,940	964	NA	53	28	NA
1970	51,250	939	408	24,591	NA	NA	NA	525	30	1,096	3	197	297	NA	12,696	966	NA	60	27	NA
1971	49,390	969	458	23,861	NA	NA	NA	610	32	1,579	3	200	435	NA	10,353	1,071	NA	48	29	NA
1972	50,033	1,062	567	25,229	NA	NA	NA	664	70	943	3	209	370	NA	9,575	1,380	NA	64	30	NA
1973	48,809	1,066	555	24,416	NA	NA	NA	709	96	904	3	215	526	NA	8,893	1,395	NA	70	41	NA
1974	47,169	1,027	490	22,812	NA	NA	NA	520	95	1,002	3	230	458	NA	8,133	1,506	114	68	35	NA
1975	46,767	1,032	528	22,137	NA	NA	NA	744	108	766	5	233	634	NA	7,526	1,462	157	61	42	NA
1976	47,606	1,058	525	22,119	NA	NA	NA	763	78	676	9	225	593	NA	7,897	1,395	202	60	44	NA
1977	49,925	1,165	522	23,340	NA	7,528	NA	671	60	756	11	228	628	NA	6,751	1,484	238	64	55	NA
1978	51,402	1,235	565	22,979	NA	8,443	NA	714	121	811	20	227	766	NA	6,629	1,490	267	70	62	NA
1979	51,699	1,218	568	22,972	305	8,521	6,438	746	79	680	18	233	753	195	6,572	1,484	274	68	70	NA
1980	50,321	1,161	579	23,585	234	8,020	6,377	693	71	609	20	224	582	251	5,455	1,488	309	69	135	NA
1981	50,835	1,189	504	25,352	161	7,552	6,030	656	41	639	17	221	501	206	5,518	1,477	338	69	106	NA
1982	52,256	1,143	482	29,580	184	6,753	5,653	546	39	445	19	197	480	287	4,415	1,398	316	75	122	NA
1983	53,074	1,163	459	31,523	154	6,220	5,968	524	43	477	22	221	330	311	3,650	1,456	284	77	86	NA
1984	55,735	1,143	473	33,491	153	6,169	6,377	543	33	591	18	251	345	313	3,725	1,588	252	84	90	NA
1985	61,707	1,203	509	38,015	159	6,337	6,955	500	46	547	31	290	408	281	4,245	1,717	191	91	101	NA
1986	63,787	1,153	495	40,866	150	5,816	7,020	478	45	478	30	231	393	311	4,243	1,679	154	78	97	NA
1987	66,627	1,143	485	42,484	160	5,736	7,966	487	51	392	33	253	420	263	4,567	1,774	148	87	94	88
1988	66,157	1,185	453	41,078	164	5,869	8,342	486	50	355	30	251	404	238	5,046	1,787	127	87	101	103
1989	68,657	1,161	445	42,014	178	5,806	8,836	524	42	339	29	263	425	312	6,031	1,867	129	89	70	97
1990	68,234	1,189	470	40,009	183	6,045	9,024	546	44	394	28	256	451	360	7,013	1,814	117	90	70	134
1991	63,093	1,273	504	33,078	176	6,159	10,042	610	50	391	32	223	446	389	7,494	1,837	112	101	70	107
1992	65,593	1,327	651	36,130	169	6,172	8,988	609	48	445	25	224	484	366	7,658	1,868	119	98	97	116
1993	65,583	1,294	639	34,927	173	6,101	10,083	603	48	531	17	230	482	372	7,814	1,834	117	99	106	113
1994	63,961	1,332	786	32,870	168	5,753	10,485	660	43	590	18	236	527	242	7,892	1,941	86	118	93	120
1995	63,341	1,282	1,055	31,395	165	5,708	10,641	522	54	675	57	221	512	281	8,374	1,997	82	115	86	118
1996	61,639	1,185	973	31,464	158	4,870	10,890	517	70	503	55	233	423	203	7,808	1,994	65	116	6	107
1997	62,443	1,242	897	31,108	162	5,011	11,435	519	76	471	53	226	440	185	8,341	2,011	56	116	8	88
1998	63,722	1,274	865	30,779	187	5,154	12,121	542	91	587	66	264	535	162	8,704	2,083	45	118	3	140
1999	63,968	1,244	903	29,964	229	5,706	12,928	556	85	670	66	262	532	161	8,026	2,316	46	124	0	151

NA = not applicable, due to the agency in question not existing, or not having the same definition, in prior years; USDA = U.S. Department of Agriculture; NASA = National Aeronautics and Space Administration; NSF = National Science Foundation; NRC = National Research Council; AID = Agency for International Development; DOC = Department of Commerce; DOD = Department of Defense; DOE = Department of Energy; HHS = Health and Human Services; DOI = Department of the Interior; DOT = Department of Transportation; EPA = Environmental Protection Agency

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Federal Funds for Research and Development: Fiscal Years 1997, 1998, and 1999*, NSF 99-333, Project Officer, Ronald L. Meeks (Arlington, VA: 1999); and NSF/SRS, *Federal Funds Survey, Detailed Historical Tables, Fiscal Years 1951-99*, NSF 99-347, Project Officer, Ronald L. Meeks (Arlington, VA: 1999).

See figure 2-6 in Volume I.

Appendix table 2-27
Federal obligations for basic research: FY 1970–99
(Millions of current dollars)

Year	Total, all agencies	USDA	DOC	DoD	Education	DOE	HHS	DOI	Justice	DOT	Treasury	Veterans Affairs	EPA	AID	NASA	NSF	NRC	Smithsonian Inst.	Tenn. Valley Authority	All other agencies
1970	1,926	116	18	317	NA	NA	NA	39	0	0	0	5	5	NA	358	245	NA	18	0	NA
1971	1,980	118	16	322	NA	NA	NA	42	0	0	0	3	6	NA	327	273	NA	15	0	NA
1972	2,187	137	8	329	NA	NA	NA	43	0	1	0	3	6	NA	332	368	NA	21	0	NA
1973	2,232	143	7	307	NA	NA	NA	49	2	0	0	3	9	NA	350	392	NA	24	0	NA
1974	2,388	146	8	303	NA	NA	NA	49	2	0	0	4	10	NA	306	415	0	25	0	NA
1975	2,588	154	8	300	NA	NA	NA	55	9	0	0	4	17	NA	309	486	0	25	0	NA
1976	2,767	171	11	327	NA	NA	NA	54	5	0	0	9	14	NA	293	524	0	26	0	NA
1977	3,259	204	12	373	NA	389	NA	64	5	0	0	9	8	NA	414	625	0	30	4	NA
1978	3,699	243	12	410	NA	441	NA	66	15	0	0	9	6	NA	480	678	0	35	4	NA
1979	4,193	256	12	472	21	463	NA	73	8	0	0	10	10	0	513	733	0	37	4	NA
1980	4,674	276	16	540	18	523	1,763	72	10	0	2	14	14	0	559	815	0	41	5	NA
1981	5,041	314	16	604	21	586	1,900	81	5	1	2	15	11	0	531	897	0	45	5	NA
1982	5,482	331	17	687	14	642	2,145	76	3	1	2	13	33	0	536	916	0	52	5	NA
1983	6,260	362	19	786	14	768	2,475	103	4	1	4	14	22	4	617	999	0	56	6	NA
1984	7,067	393	21	848	12	830	2,815	126	5	3	4	16	30	3	755	1,132	0	64	5	NA
1985	7,819	445	23	861	15	943	3,233	138	4	1	5	15	39	2	751	1,262	0	71	6	NA
1986	8,153	433	27	924	5	960	3,339	133	5	1	5	15	38	4	917	1,275	0	63	7	NA
1987	8,942	446	26	908	3	1,069	3,828	135	8	0	5	17	31	3	1,014	1,371	0	72	4	5
1988	9,474	481	31	877	4	1,185	4,081	127	8	0	5	17	27	3	1,113	1,433	0	75	3	4
1989	10,602	485	29	948	4	1,411	4,388	189	7	0	3	17	51	3	1,417	1,563	0	80	3	4
1990	11,286	519	31	948	5	1,505	4,649	205	9	0	3	16	74	5	1,637	1,586	0	84	5	4
1991	12,171	558	34	994	9	1,687	5,050	229	6	0	4	16	91	6	1,706	1,676	0	98	2	5
1992	12,490	595	35	1,099	8	1,736	5,059	231	5	1	4	16	110	6	1,738	1,742	0	98	2	6
1993	13,399	616	37	1,268	5	1,755	5,697	230	5	2	7	13	89	8	1,800	1,744	0	102	10	11
1994	13,524	606	40	1,201	6	1,603	5,884	83	6	3	0	14	101	2	1,964	1,871	0	124	9	6
1995	13,877	595	39	1,248	6	1,634	6,061	55	8	47	0	12	70	2	1,978	1,973	0	124	9	14
1996	14,464	550	38	1,138	4	1,930	6,505	56	13	38	0	13	52	2	1,981	2,007	0	127	0	12
1997	14,942	590	39	1,023	3	1,971	6,852	56	12	38	0	14	51	0	2,095	2,057	0	130	0	12
1998	15,862	598	41	1,016	5	2,077	7,361	57	19	59	0	14	57	1	2,246	2,165	0	134	0	11
1999	16,914	609	43	1,106	8	2,227	7,977	66	26	56	0	16	57	1	2,127	2,442	0	142	0	11

NA = not applicable, due to the agency in question not existing, or not having the same definition, in prior years; USDA = U.S. Department of Agriculture; NASA = National Aeronautics and Space Administration; NSF = National Science Foundation; NRC = National Research Council; AID = Agency for International Development; DOC = Department of Commerce; DOD = Department of Defense; DOE = Department of Energy; HHS = Health and Human Services; DOI = Department of the Interior; DOT = Department of Transportation; EPA = Environmental Protection Agency

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Federal Funds for Research and Development: Fiscal Years 1997, 1998, and 1999*, NSF 99-333, Project Officer, Ronald L. Meeks (Arlington, VA: 1999); and NSF/SRS, *Federal Funds Survey, Detailed Historical Tables, Fiscal Years 1951-99*, NSF 99-347, Project Officer, Ronald L. Meeks (Arlington, VA: 1999).

See figure 2-18 in Volume I.

Appendix table 2-28.
Federal obligations for basic research: FY 1970–99
(Millions of constant 1992 dollars)

Year	Total, all agencies	USDA	DOC	DoD	Education	DOE	HHS	DOI	Justice	DOT	Treasury	Veterans Affairs	EPA	AID	NASA	NSF	NRC	Smithsonian Inst.	Tenn. Valley Authority	All other agencies
1970	6,435	387	61	1,059	NA	NA	NA	132	0	1	0	18	18	NA	1,195	818	NA	61	0	NA
1971	6,292	376	50	1,024	NA	NA	NA	133	0	1	0	10	19	NA	1,040	866	NA	48	0	NA
1972	6,633	416	24	997	NA	NA	NA	131	0	2	0	10	19	NA	1,006	1,115	NA	65	0	NA
1973	6,485	415	19	891	NA	NA	NA	142	6	0	0	9	26	NA	1,018	1,140	NA	70	0	NA
1974	6,469	395	21	821	NA	NA	NA	132	6	1	0	10	26	NA	829	1,125	0	67	0	NA
1975	6,358	379	20	737	NA	NA	NA	135	23	0	0	10	43	NA	760	1,194	0	61	0	NA
1976	6,340	393	25	749	NA	NA	NA	124	10	0	0	20	31	NA	672	1,200	0	59	0	NA
1977	6,938	435	26	795	NA	829	NA	135	11	0	0	19	18	NA	881	1,330	0	63	8	NA
1978	7,356	483	23	816	NA	876	NA	131	29	0	0	18	12	NA	954	1,349	0	69	8	NA
1979	7,701	471	22	866	38	850	NA	133	15	0	0	17	19	0	942	1,347	0	68	8	NA
1980	7,885	465	27	912	30	882	2,973	121	16	0	3	24	23	0	943	1,375	0	69	8	NA
1981	7,742	482	25	928	32	900	NA	124	7	2	4	23	16	0	816	1,377	0	69	7	NA
1982	7,862	474	24	985	20	921	2,726	110	4	1	3	19	47	0	768	1,314	0	75	7	NA
1983	8,583	496	26	1,077	19	1,053	2,940	141	5	1	5	19	30	6	846	1,370	0	77	8	NA
1984	9,329	518	27	1,119	16	1,096	3,267	166	6	5	5	21	39	4	996	1,495	0	84	7	NA
1985	9,977	568	30	1,099	19	1,203	3,591	176	5	1	6	20	49	2	958	1,610	0	91	7	NA
1986	10,115	537	33	1,146	6	1,191	4,011	165	7	1	6	18	48	5	1,137	1,582	0	79	9	NA
1987	10,783	538	31	1,095	4	1,289	4,616	163	10	0	6	20	37	4	1,223	1,653	0	87	5	6
1988	11,041	561	36	1,022	5	1,381	4,756	148	9	0	6	20	31	3	1,297	1,670	0	87	3	5
1989	11,854	542	32	1,060	4	1,578	4,906	211	8	0	3	19	57	3	1,584	1,748	0	89	3	4
1990	12,116	557	33	1,018	5	1,616	4,991	220	10	0	3	17	79	5	1,757	1,703	0	90	5	4
1991	12,528	574	35	1,023	9	1,736	5,198	236	6	0	4	16	94	6	1,756	1,725	0	101	2	5
1992	12,490	595	35	1,099	8	1,736	5,059	231	5	1	4	16	110	6	1,738	1,742	0	98	2	6
1993	13,054	600	36	1,235	5	1,710	5,550	224	5	2	7	13	87	8	1,754	1,699	0	99	10	11
1994	12,865	577	38	1,142	5	1,525	5,597	79	6	3	0	14	96	2	1,868	1,780	0	118	8	6
1995	12,891	553	37	1,160	5	1,518	5,630	51	8	44	0	12	65	2	1,837	1,833	0	115	8	13
1996	13,178	501	34	1,037	3	1,758	5,926	51	11	35	0	11	47	2	1,805	1,829	0	116	0	11
1997	13,362	528	35	915	3	1,762	6,127	50	11	34	0	12	46	0	1,873	1,839	0	116	0	11
1998	14,016	528	36	897	5	1,836	6,504	50	16	52	0	12	50	1	1,984	1,913	0	118	0	10
1999	14,754	531	37	965	7	1,942	6,958	58	23	49	0	14	50	1	1,855	2,130	0	124	0	10

NA = not applicable, due to the agency in question not existing, or not having the same definition, in prior years; USDA = U.S. Department of Agriculture; NASA = National Aeronautics and Space Administration; NSF = National Science Foundation; NRC = National Research Council; AID = Agency for International Development; DOC = Department of Commerce; DOD = Department of Defense; DOE = Department of Energy; HHS = Health and Human Services; DOI = Department of the Interior; DOT = Department of Transportation; EPA = Environmental Protection Agency

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Federal Funds for Research and Development: Fiscal Years 1997, 1998, and 1999*, NSF 99-333, Project Officer, Ronald L. Meeks (Arlington, VA: 1999); and National Science Foundation, Division of Science Resources Studies, *Federal Funds Survey, Detailed Historical Tables, Fiscal Years 1951-99*, NSF 99-347, Project Officer, Ronald L. Meeks (Arlington, VA: 1999).

Science & Engineering Indicators – 2000

Appendix table 2-29.
Federal obligations for applied research: FY 1970–99
(Millions of current dollars)

Year	Total, all agencies	USDA	DOC	DoD	Education	DOE	HHS	DOI	Justice	DOT	Treasury	Veterans Affairs	EPA	AID	NASA	NSF	NRC	Smithsonian Inst.	Tenn. Valley Authority	All other agencies
1970	2,975	156	76	1,013	NA	NA	NA	81	5	83	0	53	48	NA	673	30	NA	0	6	NA
1971	3,143	174	98	987	NA	NA	NA	95	7	97	0	59	48	NA	595	46	NA	0	7	NA
1972	3,361	200	135	1,176	NA	NA	NA	104	12	98	0	64	45	NA	433	60	NA	0	8	NA
1973	3,349	211	124	1,129	NA	NA	NA	111	5	77	0	67	65	NA	444	72	NA	0	13	NA
1974	3,788	219	122	1,131	NA	NA	NA	95	16	62	0	75	87	NA	540	105	42	0	12	NA
1975	4,141	248	136	1,131	NA	NA	NA	179	9	54	0	83	124	NA	626	84	64	0	15	NA
1976	4,852	271	145	1,201	NA	NA	NA	205	14	31	1	76	142	NA	930	72	88	0	16	NA
1977	5,255	320	164	1,343	NA	502	NA	192	12	52	2	83	197	NA	792	63	112	0	19	NA
1978	5,908	352	181	1,414	NA	662	NA	218	31	67	4	91	247	NA	865	65	134	0	10	NA
1979	6,342	376	208	1,543	73	669	1,440	267	21	67	4	102	249	67	938	67	149	0	12	NA
1980	6,923	382	239	1,721	70	754	1,570	283	19	82	4	104	232	80	1,051	58	183	0	11	NA
1981	7,171	427	233	1,997	33	827	1,592	289	15	87	3	113	208	86	876	59	220	0	9	NA
1982	7,541	436	259	2,266	56	1,054	1,461	275	13	66	6	110	211	128	871	57	220	0	8	NA
1983	7,993	456	266	2,437	62	1,193	1,545	255	17	72	7	132	152	153	928	63	207	0	7	NA
1984	7,911	442	276	2,201	69	1,194	1,651	254	13	74	7	156	142	164	955	70	191	0	9	NA
1985	8,315	466	301	2,307	77	1,198	1,796	231	15	70	14	194	176	158	1,033	84	150	0	9	NA
1986	8,349	464	313	2,303	91	1,081	1,851	235	17	68	13	155	179	181	1,152	78	124	0	11	NA
1987	8,998	473	313	2,440	104	1,029	2,194	247	12	69	13	173	246	151	1,256	99	123	0	14	43
1988	9,177	505	312	2,362	107	1,051	2,416	266	10	91	11	179	241	132	1,219	100	109	0	15	53
1989	10,164	517	322	2,708	118	1,021	2,700	253	11	121	13	197	223	216	1,461	108	115	0	12	49
1990	10,337	542	346	2,582	125	1,066	2,818	270	11	119	15	199	242	300	1,424	103	109	0	17	49
1991	11,798	618	415	2,724	123	1,587	3,112	324	15	115	21	178	262	352	1,666	109	109	0	17	52
1992	12,001	666	561	2,975	120	1,676	2,887	340	15	156	17	185	294	294	1,491	127	119	0	22	56
1993	13,491	636	545	3,515	128	1,685	3,496	350	21	224	5	194	272	351	1,749	138	120	0	18	45
1994	13,888	716	678	3,040	131	1,679	3,853	567	20	270	9	209	301	214	1,877	170	91	0	17	45
1995	14,557	704	853	2,950	133	1,826	4,015	477	18	324	49	206	331	270	2,068	176	88	0	17	52
1996	13,796	670	813	2,858	132	1,433	4,041	486	20	337	50	223	329	203	1,897	181	71	0	4	49
1997	14,423	700	769	2,787	135	1,597	4,376	496	20	344	51	217	358	177	2,090	192	62	0	4	49
1998	15,609	741	785	2,864	150	1,671	4,691	526	26	418	63	263	450	141	2,484	192	51	0	1	94
1999	16,079	712	807	2,983	195	1,902	5,005	542	22	440	64	260	453	135	2,217	213	53	0	0	79

NA = not applicable, due to the agency in question not existing, or not having the same definition, in prior years; USDA = U.S. Department of Agriculture; NASA = National Aeronautics and Space Administration; NSF = National Science Foundation; NRC = National Research Council; AID = Agency for International Development; DOC = Department of Commerce; DOD = Department of Defense; DOE = Department of Energy; HHS = Health and Human Services; DOI = Department of the Interior; DOT = Department of Transportation; EPA = Environmental Protection Agency

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See figure 2-18 in Volume I.

Appendix table 2-30.
Federal obligations for applied research: FY 1970–99
(Millions of constant 1992 dollars)

Year	Total, all agencies	USDA	DOC	DoD	Education	DOE	HHS	DOI	Justice	DOT	Treasury	Veterans Affairs	EPA	AID	NASA	NSF	NRC	Smithsonian Inst.	Tenn. Valley Authority	All other agencies
1970	9,939	522	254	3,384	NA	NA	NA	271	18	277	1	175	159	NA	2,248	100	NA	0	21	NA
1971	9,987	552	311	3,137	NA	NA	NA	302	21	307	1	188	152	NA	1,892	145	NA	0	24	NA
1972	10,193	606	411	3,566	NA	NA	NA	316	38	296	1	194	136	NA	1,313	181	NA	0	25	NA
1973	9,731	614	359	3,281	NA	NA	NA	324	14	224	1	193	190	NA	1,289	208	NA	0	36	NA
1974	10,262	595	329	3,065	NA	NA	NA	257	45	167	1	204	235	NA	1,463	285	115	0	31	NA
1975	10,173	609	335	2,778	NA	NA	NA	440	23	132	1	205	305	NA	1,537	206	158	0	36	NA
1976	11,115	621	332	2,751	NA	NA	NA	470	32	71	3	175	325	NA	2,130	165	203	0	38	NA
1977	11,189	680	349	2,858	NA	1,068	NA	410	27	110	5	177	419	NA	1,687	135	239	0	41	NA
1978	11,751	700	360	2,812	NA	1,316	NA	433	62	132	8	180	491	NA	1,721	130	266	0	19	NA
1979	11,650	690	381	2,834	134	1,229	2,644	490	38	123	8	187	457	123	1,724	123	273	0	23	NA
1980	11,679	644	402	2,904	118	1,272	2,649	477	32	139	7	175	391	134	1,772	99	308	0	19	NA
1981	11,013	655	358	3,066	51	1,270	2,444	444	23	134	4	173	319	133	1,345	90	337	0	14	NA
1982	10,816	625	372	3,250	81	1,512	2,095	394	19	94	9	158	302	183	1,250	82	316	0	12	NA
1983	10,959	625	364	3,341	85	1,636	2,119	349	23	98	9	181	209	209	1,272	86	284	0	9	NA
1984	10,443	584	364	2,905	91	1,577	2,180	336	17	98	9	206	188	216	1,260	93	252	0	12	NA
1985	10,610	594	384	2,944	99	1,529	2,291	295	19	90	17	247	225	202	1,318	107	191	0	11	NA
1986	10,359	575	388	2,858	113	1,341	2,296	291	21	84	16	192	222	224	1,430	97	154	0	13	NA
1987	10,850	570	377	2,942	125	1,241	2,646	298	14	83	16	209	297	182	1,515	119	148	0	17	52
1988	10,695	589	364	2,753	125	1,225	2,816	310	12	106	13	209	281	154	1,421	117	127	0	17	62
1989	11,364	578	360	3,028	132	1,142	3,019	283	12	135	15	220	249	242	1,633	121	129	0	13	55
1990	11,097	582	371	2,772	134	1,144	3,025	290	12	128	16	214	260	322	1,529	111	117	0	18	53
1991	12,144	636	427	2,804	127	1,634	3,203	334	15	118	22	183	270	362	1,715	112	112	0	17	54
1992	12,001	666	561	2,975	120	1,676	2,887	340	15	156	17	185	294	294	1,491	127	119	0	22	56
1993	13,144	620	531	3,425	125	1,642	3,406	341	20	218	5	189	265	342	1,704	134	117	0	18	44
1994	13,211	681	645	2,892	125	1,597	3,665	539	19	257	9	199	286	204	1,785	161	86	0	16	43
1995	13,523	654	792	2,740	123	1,696	3,730	443	16	301	45	192	308	251	1,921	163	82	0	16	48
1996	12,569	610	741	2,603	120	1,305	3,682	443	18	307	46	203	300	185	1,728	165	65	0	4	45
1997	12,898	626	687	2,492	121	1,428	3,913	444	18	307	45	194	320	158	1,869	172	56	0	4	44
1998	13,793	655	694	2,531	132	1,477	4,145	465	23	369	55	232	398	125	2,195	169	45	0	1	83
1999	14,025	621	704	2,602	170	1,659	4,365	473	19	383	56	227	395	117	1,934	185	46	0	0	69

NA = not applicable, due to the agency in question not existing, or not having the same definition, in prior years; USDA = U.S. Department of Agriculture; NASA = National Aeronautics and Space Administration; NSF = National Science Foundation; NRC = National Research Council; AID = Agency for International Development; DOC = Department of Commerce; DOD = Department of Defense; DOE = Department of Energy; HHS = Health and Human Services; DOI = Department of the Interior; DOT = Department of Transportation; EPA = Environmental Protection Agency

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Federal Funds for Research and Development: Fiscal Years 1997, 1998, and 1999*, NSF 99-333, Project Officer, Ronald L. Meeks (Arlington, VA: 1999); and NSF/SRS, *Federal Funds Survey, Detailed Historical Tables, Fiscal Years 1951-99*, NSF 99-347, Project Officer, Ronald L. Meeks (Arlington, VA: 1999).

Science & Engineering Indicators – 2000

Appendix table 2-31.
Federal obligations for development: FY 1970–99
(Millions of current dollars)

Year	Total, all agencies	USDA	DOC	DoD	Education	DOE	HHS	DOI	Justice	DOT	Treasury	Veterans Affairs	EPA	AID	NASA	NSF	NRC	Smithsonian Inst.	Tenn. Valley Authority	All other agencies
1970	10,438	9	27	6,030	NA	NA	NA	36	3	245	0	1	36	NA	2,770	14	NA	0	2	NA
1971	10,419	13	30	6,200	NA	NA	NA	55	4	400	0	1	83	NA	2,335	19	NA	0	2	NA
1972	10,948	12	44	6,814	NA	NA	NA	71	11	212	1	2	71	NA	2,393	28	NA	0	2	NA
1973	11,219	12	60	6,968	NA	NA	NA	84	26	233	1	5	106	NA	2,267	16	NA	0	2	NA
1974	11,235	14	51	6,986	NA	NA	NA	49	16	308	1	6	73	NA	2,157	36	0	0	2	NA
1975	12,309	18	71	7,581	NA	NA	NA	69	25	258	1	8	116	NA	2,129	25	0	0	2	NA
1976	13,160	20	73	8,127	NA	NA	NA	74	16	263	2	13	104	NA	2,224	13	0	0	2	NA
1977	14,936	23	69	9,248	NA	2,645	NA	59	10	303	3	15	90	NA	1,965	9	0	0	4	NA
1978	16,238	27	91	9,730	NA	3,143	NA	75	15	342	6	15	132	NA	1,988	5	0	0	18	NA
1979	17,610	31	90	10,492	73	3,507	489	66	14	303	5	16	151	40	2,127	8	0	0	22	NA
1980	18,233	30	88	11,719	52	3,476	447	57	13	279	6	16	100	70	1,624	8	0	0	64	NA
1981	20,891	33	79	13,908	51	3,505	435	57	7	327	6	17	107	48	2,186	6	0	0	55	NA
1982	23,410	31	60	17,670	58	3,012	335	30	10	243	5	14	92	72	1,671	2	0	0	72	NA
1983	24,458	30	50	19,770	36	2,576	332	25	11	275	5	15	66	71	1,117	0	0	0	51	NA
1984	27,246	31	62	22,324	35	2,649	365	31	7	371	3	18	89	70	1,113	0	0	0	54	NA
1985	32,226	32	75	26,623	33	2,825	423	22	17	358	6	18	106	61	1,544	0	0	0	65	NA
1986	34,910	32	60	29,711	25	2,648	468	17	14	317	6	16	100	66	1,351	0	0	0	60	NA
1987	37,313	29	64	31,884	26	2,659	584	22	23	256	10	19	71	64	1,518	0	0	0	60	26
1988	38,119	31	47	32,010	30	2,801	661	24	26	213	10	19	80	69	1,999	0	0	0	69	31
1989	40,641	36	47	33,921	37	2,761	814	27	21	183	9	21	107	60	2,515	0	0	0	48	34
1990	41,937	47	61	33,739	40	3,060	939	33	21	247	7	22	105	29	3,473	0	0	0	43	72
1991	37,327	61	40	28,417	39	2,710	1,594	40	28	265	7	23	80	20	3,909	0	0	0	50	46
1992	41,102	66	55	32,056	42	2,760	1,042	39	28	288	4	23	80	66	4,428	0	0	0	73	53
1993	40,424	76	74	31,066	44	2,822	1,157	39	23	319	6	29	134	23	4,471	0	0	0	81	61
1994	39,824	77	108	30,313	40	2,766	1,285	44	19	347	10	25	151	38	4,456	0	0	0	72	74
1995	39,752	81	244	29,598	39	2,685	1,379	29	32	356	12	19	150	30	4,969	0	0	0	67	62
1996	39,395	80	217	30,540	38	1,983	1,407	26	45	177	10	21	84	18	4,692	0	0	0	2	56
1997	40,464	99	195	30,978	43	2,036	1,560	27	52	146	9	22	83	30	5,142	0	0	0	5	38
1998	40,644	103	153	30,953	57	2,085	1,666	30	58	188	12	23	99	41	5,122	0	0	0	2	54
1999	40,341	105	186	30,262	60	2,413	1,839	30	50	273	11	25	100	49	4,858	0	0	0	0	82

NA = not applicable, due to the agency in question not existing, or not having the same definition, in prior years; USDA = U.S. Department of Agriculture; NASA = National Aeronautics and Space Administration; NSF = National Science Foundation; NRC = National Research Council; AID = Agency for International Development; DOC = Department of Commerce; DOD = Department of Defense; DOE = Department of Energy; HHS = Health and Human Services; DOI = Department of the Interior; DOT = Department of Transportation; EPA = Environmental Protection Agency

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See figure 2-18 in Volume I.

Appendix table 2-32.
Federal obligations for development: FY 1970–99
(Millions of constant 1992 dollars)

Year	Total, all agencies	USDA	DOC	DoD	Education	DOE	HHS	DOI	Justice	DOT	Treasury	Veterans Affairs	EPA	AID	NASA	NSF	NRC	Smithsonian Inst.	Tenn. Valley Authority	All other agencies
1970	34,875	31	92	20,149	NA	NA	NA	121	11	817	1	3	119	NA	9,254	47	NA	0	6	NA
1971	33,109	41	95	19,701	NA	NA	NA	174	12	1,272	1	3	263	NA	7,421	59	NA	0	6	NA
1972	33,207	38	133	20,666	NA	NA	NA	217	33	644	2	6	216	NA	7,257	84	NA	0	6	NA
1973	32,594	36	176	20,244	NA	NA	NA	243	76	678	2	13	309	NA	6,586	46	NA	0	5	NA
1974	30,439	37	139	18,927	NA	NA	NA	133	44	834	2	16	198	NA	5,843	98	0	0	4	NA
1975	30,236	45	174	18,623	NA	NA	NA	170	62	633	3	19	285	NA	5,230	61	0	0	5	NA
1976	30,150	46	168	18,619	NA	NA	NA	169	36	603	5	29	238	NA	5,095	31	0	0	5	NA
1977	31,800	49	146	19,688	NA	5,631	NA	125	21	645	6	31	192	NA	4,183	19	0	0	8	NA
1978	32,296	53	181	19,351	NA	6,250	NA	150	30	680	11	29	262	NA	3,954	10	0	0	36	NA
1979	32,348	57	165	19,273	134	6,442	899	122	26	557	9	29	278	73	3,907	15	0	0	40	NA
1980	30,758	51	149	19,769	87	5,864	755	96	21	470	11	26	169	118	2,740	14	0	0	108	NA
1981	32,081	51	121	21,357	78	5,382	668	88	11	502	9	26	165	73	3,357	9	0	0	84	NA
1982	33,578	44	86	25,344	82	4,320	481	42	15	349	7	21	132	103	2,396	3	0	0	104	NA
1983	33,532	41	69	27,105	49	3,531	455	34	15	377	7	21	91	97	1,531	0	0	0	70	NA
1984	35,964	41	81	29,467	46	3,496	481	40	9	489	4	24	118	93	1,469	0	0	0	71	NA
1985	41,121	41	95	33,971	42	3,605	539	29	21	456	8	22	135	77	1,970	0	0	0	83	NA
1986	43,313	40	74	36,862	32	3,285	581	21	18	394	8	20	123	82	1,676	0	0	0	74	NA
1987	44,993	35	77	38,447	31	3,206	704	27	28	309	12	23	86	77	1,830	0	0	0	72	31
1988	44,423	36	55	37,303	35	3,264	770	28	30	248	12	22	93	80	2,330	0	0	0	80	36
1989	45,439	40	53	37,926	41	3,087	910	30	23	205	10	23	120	67	2,812	0	0	0	54	38
1990	45,021	50	65	36,220	43	3,285	1,008	35	23	265	8	24	113	31	3,728	0	0	0	46	77
1991	38,422	63	41	29,251	40	2,790	1,641	41	29	273	7	24	82	21	4,024	0	0	0	51	47
1992	41,102	66	55	32,056	42	2,760	1,042	39	28	288	4	23	80	66	4,428	0	0	0	73	53
1993	39,384	74	72	30,267	43	2,749	1,127	38	22	311	6	28	131	22	4,356	0	0	0	79	59
1994	37,885	74	103	28,836	38	2,631	1,223	42	18	330	9	23	144	36	4,239	0	0	0	68	70
1995	36,927	76	226	27,495	37	2,494	1,281	27	30	331	12	18	139	28	4,616	0	0	0	62	58
1996	35,892	73	198	27,824	35	1,806	1,282	23	41	162	9	19	76	16	4,275	0	0	0	2	51
1997	36,184	88	174	27,701	39	1,820	1,395	24	47	130	8	19	74	27	4,598	0	0	0	4	34
1998	35,914	91	135	27,351	50	1,842	1,472	27	51	166	10	20	87	36	4,525	0	0	0	2	48
1999	35,189	92	162	26,397	52	2,104	1,604	26	44	238	10	22	87	42	4,237	0	0	0	0	72

NA = not applicable, due to the agency in question not existing, or not having the same definition, in prior years; USDA = U.S. Department of Agriculture; NASA = National Aeronautics and Space Administration; NSF = National Science Foundation; NRC = National Research Council; AID = Agency for International Development; DOC = Department of Commerce; DOD = Department of Defense; DOE = Department of Energy; HHS = Health and Human Services; DOI = Department of the Interior; DOT = Department of Transportation; EPA = Environmental Protection Agency

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Federal Funds for Research and Development: Fiscal Years 1997, 1998, and 1999*, NSF 99-333, Project Officer, Ronald L. Meeks (Arlington, VA: 1999); and NSF/SRS, *Federal Funds Survey, Detailed Historical Tables, Fiscal Years 1951-99*, NSF 99-347, Project Officer, Ronald L. Meeks (Arlington, VA: 1999).

Science & Engineering Indicators – 2000

Appendix table 2-33.
Federal obligations for R&D Plant: FY 1967–99
(Millions of current dollars)

Year	Total, all agencies	USDA	DOC	DoD	Education	DOE	HHS	DOI	Justice	DOT	Treasury	Veterans Affairs	EPA	AID	NASA	NSF	NRC	Smithsonian Inst.	Tenn. Valley Authority	All other agencies
1967	620	8	4	87	NA	NA	NA	32	0	9	0	5	0	NA	121	65	NA	0	0	NA
1968	604	18	4	198	NA	NA	NA	27	0	8	0	3	0	NA	65	67	NA	0	0	NA
1969	669	11	3	194	NA	NA	NA	14	0	6	0	4	0	NA	55	27	NA	0	0	NA
1970	524	5	4	141	NA	NA	NA	11	0	5	0	3	2	NA	33	23	NA	0	0	NA
1971	611	5	9	154	NA	NA	NA	9	0	11	0	15	1	NA	40	28	NA	0	1	NA
1972	602	8	7	175	NA	NA	NA	14	0	26	0	2	1	NA	45	19	NA	0	1	NA
1973	774	3	8	146	NA	NA	NA	22	0	38	0	10	24	NA	69	57	NA	0	5	NA
1974	766	9	12	169	NA	NA	NA	2	0	13	0	2	1	NA	98	12	4	0	10	NA
1975	821	8	10	167	NA	NA	NA	4	0	13	0	2	2	NA	143	23	3	0	12	NA
1976	837	16	7	143	NA	NA	NA	6	0	14	0	12	6	NA	82	53	10	0	10	NA
1977	1,367	13	7	446	NA	561	NA	5	0	23	0	6	2	NA	118	27	7	0	4	NA
1978	1,296	25	4	233	NA	691	NA	15	0	14	0	4	5	NA	162	40	7	0	22	NA
1979	1,475	23	2	270	0	844	53	5	0	23	0	5	2	6	148	30	9	1	51	NA
1980	1,556	57	5	208	0	1,024	31	8	0	23	0	4	0	6	159	19	8	1	1	NA
1981	1,486	21	1	278	0	978	24	3	0	19	0	15	0	8	116	15	8	0	0	NA
1982	1,390	21	1	291	0	914	25	1	0	12	0	3	0	6	114	2	0	0	0	NA
1983	1,297	34	1	313	0	758	48	2	0	22	0	11	0	5	101	3	0	1	0	NA
1984	1,787	39	9	529	0	852	31	5	0	17	0	6	0	8	244	45	0	0	0	NA
1985	1,821	41	4	531	1	868	42	4	0	9	0	3	0	7	234	74	0	2	1	NA
1986	1,539	79	9	286	7	742	38	4	0	12	0	5	0	8	275	53	0	1	1	NA
1987	1,846	112	5	477	21	772	37	12	11	11	0	6	0	7	309	61	0	3	0	1
1988	2,057	135	11	436	5	915	20	9	0	14	0	20	0	6	428	57	0	1	0	0
1989	2,165	89	9	499	2	873	79	11	0	16	0	11	0	0	520	54	0	3	0	0
1990	2,272	102	15	487	9	916	108	14	0	22	0	3	0	0	527	39	0	5	5	19
1991	2,853	145	16	426	4	1,220	86	22	0	18	0	3	0	0	724	160	0	2	5	23
1992	2,985	165	21	397	2	1,321	97	18	0	25	0	6	0	0	818	102	0	4	3	7
1993	3,101	142	25	372	2	1,462	149	23	0	32	0	3	3	0	749	130	0	5	1	1
1994	2,215	126	31	266	2	912	120	9	0	41	0	12	5	0	515	172	0	5	0	0
1995	2,256	143	78	61	2	745	256	7	0	29	0	7	5	0	625	290	0	5	0	5
1996	1,746	128	85	47	0	706	133	2	0	32	0	4	0	0	417	187	0	5	0	0
1997	1,915	184	43	86	0	729	260	7	0	19	0	31	25	0	322	204	0	4	0	0
1998	2,089	107	131	95	0	759	417	2	0	19	0	1	31	0	312	211	0	5	0	0
1999	1,997	103	70	76	0	937	254	2	0	25	0	1	21	0	301	202	0	5	0	0

NA = not applicable, due to the agency in question not existing, or not having the same definition, in prior years; USDA = U.S. Department of Agriculture; NASA = National Aeronautics and Space Administration; NSF = National Science Foundation; NRC = National Research Council; AID = Agency for International Development; DOC = Department of Commerce; DOD = Department of Defense; DOE = Department of Energy; HHS = Health and Human Services; DOI = Department of the Interior; DOT = Department of Transportation; EPA = Environmental Protection Agency

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Federal Funds for Research and Development: Fiscal Years 1997, 1998, and 1999*, NSF 99-333, Project Officer, Ronald L. Meeks (Arlington, VA: 1999); and NSF/SRS, *Federal Funds Survey, Detailed Historical Tables, Fiscal Years 1951-99*, NSF 99-347, Project Officer, Ronald L. Meeks (Arlington, VA: 1999).

See figure 2-18 in Volume I.

Appendix table 2-34.
Federal obligations for R&D Plant: FY 1967–99
(Millions of constant 1992 dollars)

Year	Total, all agencies	USDA	DOC	DoD	Education	DOE	HHS	DOI	Justice	DOT	Treasury	Veterans Affairs	EPA	AID	NASA	NSF	NRC	Smithsonian Inst.	Tenn. Valley Authority	All other agencies
1967	2,364	31	16	331	NA	NA	NA	123	0	34	0	19	0	NA	461	250	NA	1	0	NA
1968	2,218	67	16	728	NA	NA	NA	99	0	30	0	12	0	NA	239	246	NA	1	0	NA
1969	2,353	38	11	682	NA	NA	NA	50	0	20	0	15	0	NA	193	95	NA	0	1	NA
1970	1,752	18	13	470	NA	NA	NA	35	0	18	0	9	7	NA	112	78	NA	0	0	NA
1971	1,942	16	29	488	NA	NA	NA	27	0	34	0	48	3	NA	128	89	NA	0	2	NA
1972	1,826	24	23	530	NA	NA	NA	42	0	78	0	7	2	NA	137	56	NA	0	5	NA
1973	2,250	8	23	425	NA	NA	NA	64	0	111	0	30	71	NA	201	166	NA	0	13	NA
1974	2,076	24	31	458	NA	NA	NA	6	0	36	0	6	3	NA	266	32	10	1	26	NA
1975	2,016	19	23	411	NA	NA	NA	10	0	33	0	5	5	NA	350	57	7	1	30	NA
1976	1,917	37	15	329	NA	NA	NA	14	0	33	0	27	14	NA	188	120	22	1	23	NA
1977	2,911	27	15	949	NA	1,194	NA	11	0	48	0	13	4	NA	251	58	15	0	8	NA
1978	2,577	49	8	463	NA	1,374	NA	30	0	28	0	8	9	NA	323	79	14	0	44	NA
1979	2,710	42	4	496	0	1,551	98	9	0	42	0	9	4	12	271	55	16	2	93	NA
1980	2,624	96	8	351	0	1,728	52	13	0	39	0	7	0	11	268	32	13	2	1	NA
1981	2,281	32	2	426	0	1,502	36	5	0	29	0	23	0	12	178	22	12	1	1	NA
1982	1,993	31	1	417	0	1,311	35	2	0	17	0	4	0	9	163	2	0	1	0	NA
1983	1,779	46	1	428	0	1,039	66	3	0	30	0	14	0	7	138	4	0	1	0	NA
1984	2,359	52	12	699	0	1,125	41	7	0	22	0	8	0	10	322	60	0	0	0	NA
1985	2,323	52	5	677	1	1,108	54	5	0	11	0	4	0	9	299	94	0	2	1	NA
1986	1,909	98	11	355	8	921	47	5	0	15	0	6	0	9	341	66	0	1	1	NA
1987	2,226	135	6	575	25	931	45	14	13	13	0	7	0	8	373	74	0	4	0	1
1988	2,397	157	13	508	6	1,066	23	10	0	16	0	23	0	7	499	66	0	1	0	0
1989	2,421	100	10	558	2	976	88	12	0	18	0	12	0	0	581	60	0	3	0	0
1990	2,439	110	16	523	10	983	116	15	0	24	0	3	0	0	566	42	0	5	5	20
1991	2,937	149	16	438	4	1,256	89	23	0	19	0	3	0	0	745	165	0	2	5	24
1992	2,985	165	21	397	2	1,321	97	18	0	25	0	6	0	0	818	102	0	4	3	7
1993	3,021	138	24	362	2	1,424	145	22	0	31	0	3	3	0	730	127	0	5	1	1
1994	2,107	120	30	253	2	867	114	9	0	39	0	11	5	0	490	164	0	5	0	0
1995	2,096	133	72	56	2	692	238	6	0	27	0	7	4	0	580	269	0	5	0	5
1996	1,591	117	77	43	0	643	121	2	0	29	0	3	0	0	380	171	0	5	0	0
1997	1,712	165	39	76	0	652	233	6	0	17	0	28	22	0	288	182	0	4	0	0
1998	1,846	95	115	84	0	671	368	2	0	16	0	1	27	0	276	186	0	4	0	0
1999	1,742	90	61	66	0	817	221	2	0	22	0	1	18	0	262	176	0	4	0	0

NA = not applicable, due to the agency in question not existing, or not having the same definition, in prior years; USDA = U.S. Department of Agriculture; NASA = National Aeronautics and Space Administration; NSF = National Science Foundation; NRC = National Research Council; AID = Agency for International Development; DOC = Department of Commerce; DOD = Department of Defense; DOE = Department of Energy; HHS = Health and Human Services; DOI = Department of the Interior; DOT = Department of Transportation; EPA = Environmental Protection Agency

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Science & Engineering Indicators – 2000

Appendix table 2-35.
Federal obligations for R&D and R&D Plant: FY 1967–99
(Millions of current dollars)

Year	Total, all agencies	USDA	DOC	DoD	Education	DOE	HHS	DOI	Justice	DOT	Treasury	Veterans Affairs	EPA	AID	NASA	NSF	NRC	Smithsonian Inst.	Tenn. Valley Authority	All other agencies
1967	17,149	261	79	8,136	NA	NA	NA	203	0	293	1	46	0	NA	4,988	328	NA	14	7	NA
1968	16,525	272	88	7,908	NA	NA	NA	218	1	180	1	48	0	NA	4,494	350	NA	14	8	NA
1969	16,310	271	75	7,890	NA	NA	NA	222	5	237	1	54	0	NA	4,018	301	NA	15	8	NA
1970	15,863	286	125	7,501	NA	NA	NA	167	9	333	1	61	90	NA	3,833	312	NA	18	8	NA
1971	16,154	310	153	7,663	NA	NA	NA	200	10	508	1	78	138	NA	3,298	365	NA	15	10	NA
1972	17,098	357	195	8,493	NA	NA	NA	232	23	336	1	71	123	NA	3,202	473	NA	21	12	NA
1973	17,574	369	198	8,551	NA	NA	NA	266	33	349	1	85	205	NA	3,130	537	NA	24	19	NA
1974	18,176	388	192	8,590	NA	NA	NA	195	35	383	1	87	170	NA	3,101	568	46	25	23	NA
1975	19,860	428	225	9,180	NA	NA	NA	307	44	325	2	97	260	NA	3,207	618	67	25	29	NA
1976	21,616	479	235	9,798	NA	NA	NA	339	34	309	4	110	265	NA	3,529	662	98	26	29	NA
1977	24,818	560	252	11,409	NA	4,097	NA	320	28	377	5	113	298	NA	3,289	724	119	30	30	NA
1978	27,141	646	288	11,786	NA	4,936	NA	374	61	422	10	118	389	NA	3,496	788	141	35	53	NA
1979	29,621	686	312	12,776	166	5,483	3,558	411	43	393	10	132	413	113	3,726	838	157	38	89	NA
1980	31,386	744	347	14,189	139	5,778	3,811	419	42	385	12	138	345	156	3,393	900	190	42	81	NA
1981	34,590	795	329	16,786	105	5,896	3,951	431	27	434	11	159	326	142	3,709	976	227	45	69	NA
1982	37,822	819	337	20,913	128	5,622	3,965	382	27	322	13	140	335	206	3,192	977	220	53	85	NA
1983	40,009	881	336	23,305	112	5,294	4,400	385	31	370	16	172	241	232	2,762	1,065	207	57	63	NA
1984	44,012	905	368	25,902	116	5,526	4,862	416	25	465	14	196	261	245	3,066	1,248	191	64	68	NA
1985	50,180	984	403	30,322	126	5,834	5,493	396	36	438	24	230	320	227	3,562	1,419	150	73	80	NA
1986	52,951	1,008	408	33,224	128	5,431	5,695	390	36	398	24	191	317	259	3,695	1,406	124	64	78	NA
1987	57,100	1,060	408	35,709	154	5,529	6,643	416	54	336	27	215	348	224	4,097	1,532	123	74	78	74
1988	58,827	1,152	400	35,685	146	5,951	7,178	426	43	319	26	235	347	211	4,759	1,590	109	76	88	88
1989	63,572	1,128	407	38,076	161	6,066	7,981	480	38	319	26	246	380	279	5,913	1,724	115	84	63	87
1990	65,831	1,211	454	37,756	179	6,547	8,513	523	41	388	26	241	420	335	7,060	1,729	109	89	70	144
1991	64,148	1,381	505	32,561	175	7,203	9,842	615	49	398	31	220	433	378	8,004	1,945	109	100	73	127
1992	68,577	1,492	672	36,526	171	7,493	9,085	628	48	470	25	230	484	366	8,475	1,970	119	102	101	122
1993	70,415	1,470	682	36,221	180	7,724	10,499	642	49	578	17	240	498	382	8,769	2,012	120	107	110	117
1994	69,451	1,526	857	34,819	178	6,960	11,142	703	45	662	19	260	558	254	8,812	2,212	91	129	98	126
1995	70,443	1,524	1,214	33,857	179	6,890	11,711	568	58	756	62	245	556	303	9,640	2,439	88	129	93	132
1996	69,401	1,429	1,152	34,582	174	6,051	12,086	570	77	584	60	260	464	223	8,988	2,376	71	132	6	117
1997	71,745	1,573	1,047	34,874	181	6,333	13,048	587	85	546	60	284	517	206	9,649	2,452	62	134	9	98
1998	74,203	1,549	1,109	34,928	212	6,592	14,135	615	103	683	74	301	637	184	10,163	2,568	51	139	3	159
1999	75,331	1,529	1,106	34,427	263	7,478	15,075	640	98	793	75	301	631	184	9,502	2,857	53	147	0	173

NA = not applicable, due to the agency in question not existing, or not having the same definition, in prior years; USDA = U.S. Department of Agriculture; NASA = National Aeronautics and Space Administration; NSF = National Science Foundation; NRC = National Research Council; AID = Agency for International Development; DOC = Department of Commerce; DOD = Department of Defense; DOE = Department of Energy; HHS = Health and Human Services; DOI = Department of the Interior; DOT = Department of Transportation; EPA = Environmental Protection Agency

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Federal Funds for Research and Development: Fiscal Years 1997, 1998, and 1999*, NSF 99-333, Project Officer, Ronald L. Meeks (Arlington, VA: 1999); and NSF/SRS, *Federal Funds Survey, Detailed Historical Tables, Fiscal Years 1951-99*, NSF 99-347, Project Officer, Ronald L. Meeks (Arlington, VA: 1999).

Science & Engineering Indicators – 2000

Appendix table 2-36.
Federal obligations for R&D and R&D Plant: FY 1967–99
(Millions of constant 1992 dollars)

Year	Total, all agencies	USDA	DOC	DoD	Education	DOE	HHS	DOI	Justice	DOT	Treasury	Veterans Affairs	EPA	AID	NASA	NSF	NRC	Smithsonian Inst.	Tenn. Valley Authority	All other agencies
1967	65,380	995	301	31,017	NA	NA	NA	773	1	1,116	2	175	0	NA	19,015	1,250	NA	53	27	NA
1968	60,687	998	324	29,040	NA	NA	NA	799	4	660	3	176	0	NA	16,505	1,287	NA	51	29	NA
1969	57,369	952	265	27,752	NA	NA	NA	780	17	835	2	191	0	NA	14,133	1,058	NA	52	30	NA
1970	53,002	957	419	25,062	NA	NA	NA	559	29	1,114	2	205	302	NA	12,808	1,043	NA	61	27	NA
1971	51,331	985	486	24,349	NA	NA	NA	636	33	1,614	3	248	438	NA	10,480	1,159	NA	48	31	NA
1972	51,859	1,084	590	25,759	NA	NA	NA	705	71	1,020	4	216	373	NA	9,713	1,436	NA	65	35	NA
1973	51,059	1,073	577	24,842	NA	NA	NA	772	96	1,014	3	246	596	NA	9,094	1,560	NA	70	55	NA
1974	49,245	1,050	521	23,272	NA	NA	NA	527	94	1,038	3	236	462	NA	8,400	1,539	125	68	62	NA
1975	48,783	1,051	552	22,549	NA	NA	NA	755	109	798	4	238	638	NA	7,878	1,518	165	62	71	NA
1976	49,522	1,096	539	22,447	NA	NA	NA	777	78	707	9	251	608	NA	8,085	1,516	225	60	66	NA
1977	52,837	1,192	536	24,290	NA	8,723	NA	681	59	803	10	240	634	NA	7,002	1,542	254	64	64	NA
1978	53,979	1,285	572	23,441	NA	9,816	NA	744	121	840	20	235	774	NA	6,952	1,568	280	70	106	NA
1979	54,410	1,259	573	23,469	305	10,072	6,536	755	79	721	18	243	758	207	6,844	1,540	289	70	164	NA
1980	52,946	1,256	586	23,936	235	9,747	6,428	706	70	649	20	232	582	262	5,724	1,519	321	71	136	NA
1981	53,117	1,220	506	25,778	161	9,055	6,067	661	41	667	17	244	500	218	5,695	1,499	349	70	106	NA
1982	54,249	1,174	484	29,996	184	8,064	5,688	548	38	462	19	201	481	295	4,578	1,401	316	76	122	NA
1983	54,852	1,208	460	31,951	153	7,259	6,033	528	43	507	21	236	330	318	3,787	1,460	284	78	87	NA
1984	58,094	1,195	485	34,190	153	7,294	6,417	549	32	614	18	259	345	323	4,047	1,647	252	84	90	NA
1985	64,030	1,255	514	38,691	161	7,445	7,009	505	46	559	31	293	409	290	4,544	1,811	191	93	102	NA
1986	65,696	1,250	507	41,221	159	6,738	7,066	483	45	493	30	237	394	321	4,584	1,745	154	79	97	NA
1987	68,853	1,278	492	43,059	186	6,667	8,010	502	65	405	33	259	420	270	4,940	1,847	148	89	94	89
1988	68,555	1,343	466	41,586	170	6,935	8,365	496	50	372	30	274	404	246	5,546	1,853	127	89	103	103
1989	71,078	1,261	455	42,572	180	6,782	8,923	537	42	357	29	275	425	312	6,611	1,928	129	94	70	97
1990	70,672	1,300	487	40,532	192	7,028	9,139	561	44	417	28	259	451	360	7,579	1,856	117	96	75	155
1991	66,030	1,422	520	33,516	180	7,414	10,131	633	50	410	32	226	446	389	8,239	2,002	112	103	75	131
1992	68,577	1,492	672	36,526	171	7,493	9,085	628	48	470	25	230	484	366	8,475	1,970	119	102	101	122
1993	68,604	1,432	664	35,289	175	7,525	10,229	625	48	563	17	234	485	372	8,543	1,960	117	104	107	114
1994	66,068	1,451	816	33,123	170	6,621	10,599	669	43	629	18	247	531	242	8,382	2,104	86	123	93	120
1995	65,437	1,415	1,127	31,451	167	6,400	10,879	528	54	702	57	228	517	281	8,955	2,266	82	120	86	123
1996	63,230	1,302	1,050	31,507	158	5,513	11,011	519	70	532	55	237	423	203	8,188	2,164	65	120	6	107
1997	64,155	1,406	936	31,185	162	5,663	11,668	525	76	488	53	254	462	185	8,628	2,193	56	120	8	88
1998	65,568	1,369	980	30,863	187	5,825	12,490	544	91	604	66	266	563	162	8,980	2,269	45	122	3	140
1999	65,710	1,334	964	30,030	229	6,523	13,150	558	85	692	66	263	550	161	8,289	2,492	46	128	0	151

NA = not applicable, due to the agency in question not existing, or not having the same definition, in prior years; USDA = U.S. Department of Agriculture; NASA = National Aeronautics and Space Administration; NSF = National Science Foundation; NRC = National Research Council; AID = Agency for International Development; DOC = Department of Commerce; DOD = Department of Defense; DOE = Department of Energy; HHS = Health and Human Services; DOI = Department of the Interior; DOT = Department of Transportation; EPA = Environmental Protection Agency

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Federal Funds for Research and Development: Fiscal Years 1997, 1998, and 1999*, NSF 99-333, Project Officer, Ronald L. Meeks (Arlington, VA: 1999); and NSF/SRS, *Federal Funds Survey, Detailed Historical Tables, Fiscal Years 1951-99*, NSF 99-347, Project Officer, Ronald L. Meeks (Arlington, VA: 1999).

Science & Engineering Indicators – 2000

Appendix table 2-37.
Federal obligations for R&D, by character of work and performer: FYs 1987–97

Character of work and performer	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998 (est.)	1999 (est.)
							Millions of current dollars						
Total R&D	55,253	56,769	61,407	63,560	61,295	65,593	67,314	67,235	68,187	67,655	69,830	72,114	73,333
Federal intramural[a]	13,413	14,115	15,025	15,849	15,138	15,583	16,663	16,132	17,025	16,540	16,720	17,098	17,463
Industrial firms excluding FFRDCs	26,768	26,719	28,548	29,371	26,421	29,745	30,219	30,455	30,236	30,374	31,418	32,313	31,831
FFRDCs administered by industry	1,860	1,911	2,056	2,327	2,168	2,117	1,451	1,294	1,202	1,137	1,128	1,227	1,326
Universities and colleges excluding FFRDCs	7,337	7,828	8,672	9,138	10,169	10,271	11,208	11,797	11,928	11,980	12,561	13,273	14,171
FFRDCs administered by universities	3,210	3,474	3,497	3,450	3,604	3,856	3,614	3,293	3,562	3,447	3,701	3,571	3,894
Nonprofit institutions excluding FFRDCs	1,711	1,683	2,000	2,248	2,637	2,804	2,812	2,937	2,834	2,886	2,962	3,257	3,245
FFRDCs administered by nonprofit institutions	511	506	522	622	679	746	753	736	825	755	821	817	842
State and local government	148	142	167	214	215	184	320	325	317	247	261	310	328
Foreign	296	392	919	343	264	288	272	267	259	288	258	248	234
Basic research	8,942	9,474	10,602	11,286	12,171	12,490	13,399	13,524	13,877	14,464	14,942	15,862	16,914
Federal intramural[a]	2,046	2,050	2,313	2,295	2,392	2,338	2,662	2,498	2,694	2,677	2,689	2,872	3,064
Industrial firms excluding FFRDCs	467	597	733	888	950	920	896	1,110	1,214	1,109	1,167	1,374	1,279
FFRDCs administered by industry	120	133	224	247	264	247	244	238	240	273	295	324	336
Universities and colleges excluding FFRDCs	4,666	4,868	5,221	5,548	6,065	6,332	6,834	6,992	6,944	7,444	7,696	8,067	8,763
FFRDCs administered by universities	907	990	1,098	1,227	1,306	1,394	1,403	1,336	1,439	1,521	1,600	1,585	1,755
Nonprofit institutions excluding FFRDCs	658	729	839	924	1,016	1,097	1,165	1,133	1,148	1,235	1,290	1,401	1,476
FFRDCs administered by nonprofit institutions	13	18	42	59	81	66	71	74	75	76	88	113	105
State and local government	38	43	44	50	49	42	72	75	79	80	68	73	81
Foreign	29	46	47	48	49	54	53	68	45	51	50	53	56
Applied research	8,998	9,176	10,164	10,337	11,798	12,001	13,491	13,888	14,557	13,796	14,423	15,609	16,079
Federal intramural[a]	3,392	3,288	3,584	3,515	4,063	4,186	4,790	4,983	4,991	4,837	4,979	5,378	5,547
Industrial firms excluding FFRDCs	1,982	2,046	2,102	2,304	2,457	2,531	3,028	2,954	3,485	3,160	3,226	3,631	3,507
FFRDCs administered by industry	314	322	381	368	446	438	556	500	572	423	465	480	514
Universities and colleges excluding FFRDCs	1,975	2,155	2,572	2,588	2,803	2,729	3,059	3,299	3,410	3,263	3,477	3,748	3,958
FFRDCs administered by universities	564	575	605	564	855	958	897	845	795	864	999	1,081	1,200
Nonprofit institutions excluding FFRDCs	550	571	681	736	910	953	876	969	930	944	1,005	1,026	1,084
FFRDCs administered by nonprofit institutions	77	65	67	78	90	75	102	104	132	119	129	104	102
State and local government	53	60	78	76	80	67	140	156	143	107	76	96	104
Foreign	93	94	95	107	94	66	44	77	100	77	68	66	63
Development	37,313	38,119	40,641	41,937	37,327	41,102	40,424	39,824	39,752	39,395	40,464	40,644	40,341
Federal intramural	7,975	8,776	9,128	10,039	8,684	9,060	9,212	8,651	9,340	9,027	9,053	8,847	8,852
Industrial firms excluding FFRDCs	24,320	24,077	25,673	26,178	23,014	26,294	26,295	26,391	25,537	26,105	27,026	27,309	27,045
FFRDCs administered by industry	1,426	1,456	1,452	1,713	1,459	1,432	652	556	390	441	369	423	477
Universities and colleges excluding FFRDCs	697	805	879	1,001	1,301	1,211	1,316	1,505	1,574	1,274	1,388	1,458	1,449
FFRDCs administered by universities	1,739	1,909	1,794	1,658	1,443	1,504	1,315	1,112	1,328	1,062	1,102	905	939
Nonprofit institutions excluding FFRDCs	503	383	480	588	712	754	771	835	755	707	667	831	685
FFRDCs administered by nonprofit institutions	421	423	412	484	509	606	580	558	618	560	603	600	634
State and local government	58	39	46	88	86	75	109	95	95	59	117	142	144
Foreign	173	251	777	188	121	168	175	122	114	161	139	129	115

Appendix table 2-37.
Federal obligations for R&D, by character of work and performer: FYs 1987–97

Character of work and performer	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998 (est.)	1999 (est.)
	Millions of constant 1992 dollars												
Total R&D	66,626	66,157	68,657	68,233	63,093	65,593	65,583	63,961	63,341	61,639	62,443	63,722	63,968
Federal intramural	16,174	16,449	16,799	17,014	15,582	15,583	16,235	15,346	15,815	15,070	14,951	15,108	15,233
Industrial firms excluding FFRDCs	32,278	31,137	31,918	31,531	27,196	29,745	29,442	28,972	28,087	27,673	28,094	28,553	27,766
FFRDCs administered by industry	2,243	2,227	2,299	2,498	2,232	2,117	1,414	1,230	1,116	1,036	1,009	1,084	1,157
Universities and colleges excluding FFRDCs	8,847	9,122	9,696	9,809	10,467	10,271	10,920	11,222	11,080	10,915	11,232	11,729	12,361
FFRDCs administered by universities	3,871	4,048	3,910	3,703	3,710	3,856	3,521	3,133	3,308	3,141	3,309	3,155	3,397
Nonprofit institutions excluding FFRDCs	2,063	1,961	2,236	2,414	2,715	2,804	2,740	2,794	2,633	2,630	2,649	2,878	2,831
FFRDCs administered by nonprofit institutions	616	590	584	667	699	746	734	700	766	688	734	722	734
State and local government	178	165	187	230	221	184	312	310	294	225	233	274	286
Foreign	357	457	1,028	368	272	288	265	254	241	263	230	219	204
Basic research	10,783	11,041	11,854	12,116	12,528	12,490	13,054	12,865	12,891	13,178	13,362	14,016	14,754
Federal intramural	2,467	2,389	2,587	2,463	2,462	2,338	2,593	2,376	2,502	2,439	2,404	2,538	2,672
Industrial firms excluding FFRDCs	563	696	820	953	978	920	873	1,056	1,128	1,010	1,043	1,214	1,116
FFRDCs administered by industry	145	155	250	265	272	247	237	226	223	249	264	286	293
Universities and colleges excluding FFRDCs	5,626	5,673	5,838	5,956	6,242	6,332	6,658	6,652	6,450	6,782	6,882	7,128	7,644
FFRDCs administered by universities	1,094	1,154	1,228	1,318	1,345	1,394	1,367	1,271	1,337	1,386	1,431	1,400	1,531
Nonprofit institutions excluding FFRDCs	793	850	938	992	1,045	1,097	1,135	1,078	1,067	1,125	1,153	1,238	1,288
FFRDCs administered by nonprofit institutions	16	21	47	64	83	66	69	71	70	69	79	100	92
State and local government	46	50	49	54	51	42	70	72	73	73	61	64	70
Foreign	35	54	53	51	51	54	52	64	41	46	45	47	48
Applied research	10,850	10,693	11,363	11,097	12,144	12,001	13,144	13,211	13,523	12,569	12,898	13,793	14,025
Federal intramural[a]	4,090	3,832	4,007	3,774	4,182	4,186	4,667	4,741	4,636	4,406	4,452	4,752	4,839
Industrial firms excluding FFRDCs	2,390	2,384	2,350	2,474	2,529	2,531	2,950	2,811	3,237	2,879	2,884	3,208	3,059
FFRDCs administered by industry	379	375	425	395	459	438	541	475	531	386	416	424	448
Universities and colleges excluding FFRDCs	2,382	2,511	2,875	2,779	2,885	2,729	2,980	3,139	3,168	2,973	3,110	3,312	3,453
FFRDCs administered by universities	680	670	677	606	880	958	874	804	738	787	893	955	1,047
Nonprofit institutions excluding FFRDCs	663	665	761	790	937	953	854	922	864	860	899	906	945
FFRDCs administered by nonprofit institutions93	76	75	84	93	75	100	99	123	109	116	92		89
State and local government	64	70	87	82	83	67	136	148	133	98	68	85	91
Foreign	112	110	106	115	97	66	43	73	93	71	61	58	55
Development	44,993	44,423	45,439	45,021	38,422	41,102	39,384	37,885	36,927	35,892	36,184	35,914	35,189
Federal intramural[a]	9,617	10,227	10,205	10,777	8,939	9,060	8,975	8,230	8,676	8,224	8,095	7,818	7,722
Industrial firms excluding FFRDCs	29,326	28,059	28,704	28,103	23,689	26,294	25,619	25,105	23,723	23,783	24,167	24,131	23,591
FFRDCs administered by industry	1,720	1,697	1,623	1,838	1,501	1,432	635	529	362	402	330	374	416
Universities and colleges excluding FFRDCs	840	938	983	1,075	1,339	1,211	1,282	1,432	1,462	1,160	1,241	1,288	1,264
FFRDCs administered by universities	2,097	2,225	2,005	1,780	1,485	1,504	1,281	1,058	1,234	968	986	800	819
Nonprofit institutions excluding FFRDCs	607	446	537	631	732	754	751	794	702	644	597	734	598
FFRDCs administered by nonprofit institutions	508	493	461	520	523	606	565	530	574	510	540	530	553
State and local government	70	45	52	94	88	75	106	90	88	54	105	125	125
Foreign	209	293	869	202	124	168	170	116	106	146	125	114	101

FFRDCs = Federally Funded Research and Development Centers

NOTE: See Appendix table 2-1 for GDP implicit price deflators used to convert current dollars to constant 1992 dollars.

[a]Federal intramural activities cover costs associated with the planning and administration of intramural and extramural programs by federal personnel and actual intramural performance.

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Federal Funds for Research and Development, Detailed Historical Tables: Fiscal Years 1951–1998*, NSF 98–328 (Arlington, VA: 1998); and NSF/SRS, *Federal Funds for Research and Development: Fiscal Years 1997, 1998, and 1999, Detailed Statistical Tables*, NSF 99–333 (Arlington, VA: 1999).

Appendix table 2-38.
Estimated Federal obligations for R&D, by selected agency, performer, and character of work: FY 1999
(Millions of current dollars)

Agency	Total	Federal intramural	Industrial firms	FFRDCs administered by industry	Universities and colleges	FFRDCs administered by U&C	Other nonprofit	FFRDCs administered by nonprofits	State and local govt.	Foreign
Total R&D										
Total, all agencies	73,333	17,463	31,831	1,326	14,171	3,894	3,245	842	328	234
Dept. of Agriculture	1,426	995	12	0	403	0	10	0	2	3
Dept. of Commerce	1,036	695	243	0	78	*	13	0	6	1
Dept. of Defense	34,350	7,828	24,027	144	1,373	212	156	516	1	93
Dept. of Energy	6,541	756	1,441	979	598	2,404	65	292	4	2
Dept. of Health & Human Services	14,821	3,080	749	182	8,355	43	2,185	21	153	54
Dept. of the Interior	638	565	17	0	48	0	1	0	6	2
Dept. of Transportation	768	289	306	2	58	5	22	5	82	0
Environmental Protection Agency	610	291	84	0	179	0	53	0	1	1
National Aeronautics & Space Admin	9,201	2,300	4,719	4	719	1,063	341	5	2	47
National Science Foundation	2,655	16	132	0	2,150	156	182	1	7	12
All other agencies	1,288	649	102	15	210	12	216	2	64	18
Basic research										
Total, all agencies	16,914	3,064	1,279	336	8,763	1,755	1,476	105	81	55
Dept. of Agriculture	609	415	5	0	183	0	4	0	1	2
Dept. of Commerce	43	39	0	0	4	0	0	0	0	0
Dept. of Defense	1,106	347	103	2	618	7	22	1	0	8
Dept. of Energy	2,227	99	124	228	463	1,192	29	91	0	1
Dept. of Health & Human Services	7,977	1,321	332	105	4,939	22	1,159	11	60	29
Dept. of the Interior	66	62	0	0	4	0	0	0	0	0
Dept. of Transportation	56	35	13	1	0	5	1	0	1	0
Environmental Protection Agency	57	27	8	0	17	0	5	0	0	0
National Aeronautics & Space Admin	2,127	532	613	1	520	373	79	2	1	6
National Science Foundation	2,442	16	78	0	2,006	156	169	1	6	10
All other agencies	204	172	2	0	11	0	9	0	10	0

Appendix table 2-38.
Estimated Federal obligations for R&D, by selected agency, performer, and character of work: FY 1999
(Millions of current dollars)

Agency	Total	Federal intramural	Industrial firms	FFRDCs administered by industry	Universities and colleges	FFRDCs administered by U&C	Other nonprofit	FFRDCs administered by nonprofits	State and local govt.	Foreign
Applied research										
Total, all agencies	16,079	5,547	3,507	514	3,958	1,200	1,084	102	104	63
Dept. of Agriculture	712	479	7	0	217	0	6	0	1	1
Dept. of Commerce	807	608	126	0	68	3	4	0	1	0
Dept. of Defense	2,982	1,020	1,312	15	465	86	65	12	0	8
Dept. of Energy	1,902	292	118	426	90	877	24	72	1	1
Dept. of Health & Human Services	5,005	1,328	310	55	2,508	18	701	9	58	19
Dept. of the Interior	542	476	15	0	44	0	1	0	5	2
Dept. of Transportation	440	198	156	1	46	0	16	5	17	0
Environmental Protection Agency	453	216	62	0	133	0	40	0	1	1
National Aeronautics & Space Admin	2,217	554	1,281	1	76	207	82	2	0	12
National Science Foundation	212	0	54	0	144	0	12	0	0	2
All other agencies	807	376	67	15	168	9	133	2	18	17
Development										
Total, all agencies	40,341	8,852	27,045	477	1,449	939	685	634	144	115
Dept. of Agriculture	105	101	0	0	4	0	0	0	0	0
Dept. of Commerce	186	48	116	0	6	0	9	0	6	0
Dept. of Defense	30,262	6,461	22,613	127	291	119	69	503	1	78
Dept. of Energy	2,413	365	1,199	325	45	335	12	129	3	1
Dept. of Health & Human Services	1,839	431	107	23	908	3	326	1	34	6
Dept. of the Interior	29	27	2	0	0	0	0	0	0	0
Dept. of Transportation	273	56	136	0	12	0	6	0	63	0
Environmental Protection Agency	100	48	14	0	29	0	9	0	0	0
National Aeronautics & Space Admin	4,858	1,214	2,825	2	123	483	180	0	1	29
National Science Foundation	0	0	0	0	0	0	0	0	0	0
All other agencies	277	101	33	0	32	0	74	0	36	0

* = less than $500,000; FFRDCs = Federally Funded Research and Development Centers; U&C = universities and colleges

NOTES: These figures reflect funding levels as reported by federal agencies in March through August 1998.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Federal Funds for Research and Development: Fiscal Years 1997, 1998, and 1999, Detailed Statistical Tables*, NSF 99–333 (Arlington, VA: 1999).

Appendix table 2-39.
Federal R&D obligations for Federal intramural performance, by selected agency: FYs 1980–99
(Millions of current dollars)

Year	All agencies	Defense	Energy	NASA	HHS	USDA	Commerce	Interior	All other agencies
1980	7,632	3,796	474	965	820	457	226	242	653
1981	8,426	4,281	451	1,044	872	511	237	274	756
1982	9,141	5,139	176	1,166	946	531	242	261	680
1983	10,582	6,401	258	1,134	1,034	559	252	274	670
1984	11,572	7,257	216	1,043	1,066	589	256	334	811
1985	12,945	8,324	224	1,171	1,147	628	280	342	830
1986	13,535	8,881	206	1,217	1,236	630	285	332	749
1987	13,413	8,336	248	1,414	1,293	649	320	355	799
1988	14,115	8,880	245	1,335	1,408	694	316	353	883
1989	15,121	9,295	248	1,733	1,529	689	325	394	907
1990	16,003	9,639	307	1,968	1,662	737	336	424	929
1991	15,238	8,157	381	2,112	1,975	824	400	490	900
1992	15,690	8,601	336	2,210	1,783	862	512	513	872
1993	16,556	8,742	517	2,295	2,033	868	500	522	1,080
1994	16,139	8,017	562	2,271	2,206	931	597	595	959
1995	17,343	8,907	491	2,254	2,485	915	665	492	1,135
1996	16,596	8,148	489	2,258	2,595	900	675	500	1,032
1997	16,720	8,156	425	2,332	2,673	916	664	519	1,035
1998 (est.)	17,098	7,751	535	2,463	2,957	955	695	542	1,200
1999 (est.)	17,463	7,828	756	2,300	3,080	995	695	565	1,246

HHS = Department of Health and Human Services; NASA = National Aeronautics and Space Administration; USDA = Department of Agriculture

NOTE: Intramural activities cover costs associated with the planning and administration of intramural and extramural R&D programs by federal personnel and actual intramural R&D performance.

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Federal Funds for Research and Development, Detailed Historical Tables: Fiscal Years 1951–1998*, NSF 98–328 (Arlington, VA: 1998); and NSF/SRS, *Federal Funds for Research and Development: Fiscal Years 1997, 1998, and 1999,* Detailed Statistical Tables, NSF 99–333 (Arlington, VA: 1999).

Science & Engineering Indicators – 2000

Appendix table 2-40.
Federal R&D obligations to FFRDCs, by administering sector and selected sponsoring agency: FYs 1987–99
(Millions of current dollars)

	All agencies	Defense	Energy	NASA	All other agencies
Total					
1987	5,580	1,462	3,410	476	233
1988	5,891	1,541	3,572	560	217
1989	6,075	1,386	3,728	633	328
1990	6,425	1,494	3,895	622	415
1991	6,451	1,396	3,948	738	369
1992	6,718	1,537	3,996	793	392
1993	5,871	1,239	3,521	688	424
1994	5,322	856	3,310	778	378
1995	5,610	823	3,296	1,048	443
1996	5,339	831	3,017	1,107	384
1997	5,650	844	3,289	1,115	403
1998 (est.)	5,614	840	3,406	969	399
1999 (est.)	6,062	872	3,676	1,072	443
FFRDCs administered by industry					
1987	1,860	325	1,475	0	61
1988	1,911	316	1,536	0	60
1989	2,056	309	1,588	0	160
1990	2,327	419	1,718	0	190
1991	2,168	316	1,690	0	162
1992	2,117	335	1,607	0	175
1993	1,451	202	1,094	0	156
1994	1,294	116	1,011	0	167
1995	1,204	93	936	0	175
1996	1,137	82	873	12	170
1997	1,128	94	853	4	177
1998 (est.)	1,227	133	907	4	182
1999 (est.)	1,326	144	979	4	199
FFRDCs administered by universities and colleges					
1987	3,210	737	1,839	475	158
1988	3,474	829	1,945	560	141
1989	3,497	686	2,033	630	148
1990	3,466	658	2,020	619	168
1991	3,604	637	2,072	736	159
1992	3,856	668	2,227	791	169
1993	3,667	545	2,205	685	232
1994	3,293	275	2,077	771	170
1995	3,574	262	2,057	1,044	212
1996	3,448	252	1,934	1,090	172
1997	3,701	251	2,156	1,106	189
1998 (est.)	3,571	213	2,207	961	190
1999 (est.)	3,894	212	2,404	1,063	215
FFRDCs administered by other nonprofit institutions					
1987	511	400	96	1	14
1988	506	397	91	1	16
1989	522	391	107	3	20
1990	632	416	157	2	57
1991	679	442	186	2	49
1992	746	534	163	2	47
1993	753	492	222	2	37
1994	736	466	222	7	41
1995	831	468	303	4	57
1996	755	496	211	5	42
1997	821	500	280	5	37
1998 (est.)	817	494	292	5	27
1999 (est.)	842	516	292	5	29

FFRDCs = Federally Funded Research and Development Centers; NASA = National Aeronautics and Space Administration

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Federal Funds for Research and Development, Detailed Historical Tables: Fiscal Years 1951–1998*, NSF 98–328 (Arlington, VA: 1998); NSF/SRS, *Federal Funds for Research and Development: Fiscal Years 1997, 1998, and 1999, Detailed Statistical Tables*, NSF 99–333 (Arlington, VA: 1999); and unpublished tabulations.

Appendix table 2-41.
Federal obligations for R&D to federally funded research and development centers, by individual FFRDC and agency: FY 1997
(Thousands of dollars)

FFRDC	Total	Commerce	Defense	Energy	HHS	NASA	NSF	Other agencies
TOTAL, ALL FFRDCs	5,650,207	80	844,165	3,288,799	212,722	1,114,610	131,801	58,030
FFRDCs administered by industrial firms	1,128,234	0	93,508	853,307	156,946	4,046	0	20,427
Idaho National Engineering Laboratory	62,770	0	4,801	50,693	0	90	0	7,186
NCI Frederick Cancer R&D Center	156,946	0	0	0	156,946	0	0	0
Oak Ridge National Laboratory	233,785	0	4,910	220,061	0	3,050	0	5,764
Sandia National Laboratories	657,549	0	83,788	565,378	0	906	0	7,477
Savannah River Technology Center	17,184	0	9	17,175	0	0	0	0
FFRDCs administered by universities & colleges	3,701,010	80	250,754	2,155,640	37,706	1,105,958	131,260	19,612
Ames Laboratory	20,448	0	1,563	18,885	0	0	0	0
Argonne National Laboratory	243,714	3	3,346	234,043	0	264	0	6,058
Brookhaven National Laboratory	222,326	13	677	211,221	3,845	30	1,148	5,392
Ernest Orlando Lawrence Berkeley National Laboratory	231,110	75	2,284	210,512	16,799	1,341	174	0
Fermi National Accelerator Laboratory	184,468	0	0	184,468	0	0	0	0
Jet Propulsion Laboratory	1,123,854	0	24,753	0	0	1,099,005	96	0
Lawrence Livermore National Laboratory	563,586	0	29,262	528,405	3,339	1,903	128	549
Lincoln Laboratory	155,294	0	155,144	0	0	150	0	0
Los Alamos National Laboratory	564,135	3	15,628	527,382	13,446	65	96	7,515
National Astronomy & Ionosphere Center	8,244	0	0	0	0	0	8,244	0
National Center for Atmospheric Research	60,560	53	160	0	0	3,200	57,147	0
National Optical Astronomy Observatories	33,264	0	0	0	0	0	33,264	0
National Radio Astronomy Observatory	30,813	0	0	0	0	0	30,813	0
Oak Ridge Institute for Science & Education	9,526	8	0	8,993	277	0	150	98
Princeton Plasma Physics Laboratory	52,595	0	242	52,353	0	0	0	0
Software Engineering Institute	16,395	0	16,395	0	0	0	0	0
Stanford Linear Accelerator Center	118,244	0	0	118,244	0	0	0	0

Appendix table 2-41.
Federal obligations for R&D to federally funded research and development centers, by individual FFRDC and agency: FY 1997
(Thousands of dollars)

FFRDC	Total	Commerce	Defense	Energy	HHS	NASA	NSF	Other agencies
Thomas Jefferson National Accelerator Facility	62,434	0	1,300	61,134	0	0	0	0
FFRDCs administered by other nonprofit institutions	820,963	0	499,903	279,852	18,070	4,606	541	17,991
Aerospace FFRDC	215,125	0	213,867	0	0	1,107	151	0
Arroyo Center	16,779	0	16,779	0	0	0	0	0
C3I Federally Funded Research & Development Center	163,010	0	162,532	0	350	0	128	0
Center for Advanced Aviation System Development	8,605	0	3,015	0	0	0	0	5,590
Center for Naval Analyses	41,767	0	41,675	0	0	0	92	0
Critical Technologies Institute	60	0	60	0	0	0	0	0
Institute for Defense Analyses Studies & Analyses FFRDC	32,061	0	31,923	0	0	0	138	0
Logistics Management Institute	4,963	0	1,689	0	0	3,274	0	0
National Defense Research Institute	11,822	0	1,135	0	10,617	70	0	0
National Renewable Energy Laboratory	148,404	0	50	148,354	0	0	0	0
Pacific Northwest National Laboratory	145,928	0	4,739	131,498	7,103	155	32	2,401
Project Air Force	21,000	0	21,000	0	0	0	0	0
Tax Systems Modernization Institute	10,000	0	0	0	0	0	0	10,000

FFRDC = Federally Funded Research and Development Center; HHS = Department of Health and Human Services; NASA = National Aeronautics and Space Administration; NSF = National Science Foundation

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), Federal Funds for Research and Development: Fiscal Years 1997, 1998, and 1999, Detailed Statistical Tables, NSF 99–333 (Arlington, VA: 1999).

Appendix table 2-42.
Federal R&D laboratory campuses, by agency and state: FY 1995

Federal agency	Number of laboratory campuses	1995 (millions)
Total	515	26,578.8
Department of Agriculture	185	733.4
Agricultural Research Service	107	556.1
Forest Service	78	177.3
Department of Commerce	38	430.3
Nat. Inst. of Standards & Tech.	2	199.9
Nat. Oceanic & Atmos. Admin.	36	230.4
Department of Defense	68	9,150.8
Dept. of the Air Force	11	1,824.0
Dept. of the Army	29	2,076.3
Dept. of the Navy	21	4,668.2
Other Defense agencies	7	582.3
Department of Education	10	41.0
Department of Energy	33	8,080.7
Defense Programs	3	3,203.3
Energy research	16	2,670.6
Energy efficiency & renewable	1	237.6
Environmental management	3	904.0
Fossil energy	6	445.7
Naval reactors	2	585.0
Nonproliferation	1	5.0
Office of the Sec. of Energy	1	29.5
Dept. of Health & Human Services	19	1,371.4
Centers for Disease Ctrl. & Prev.	6	108.6
Food and Drug Administration	3	40.2
National Institutes of Health	10	1,222.6
Department of the Interior	20	547.4
Bureau of Reclamation	1	71.3
National Biological Service	16	105.1
U.S. Geological Survey	3	371.0
Department of Justice—DEA	2	1.0
Department of Transportation	6	536.2
Federal Aviation Administration	3	211.7
Federal Highway Administration	1	125.5
Nat. Highway Traf. Safety Admin.	1	0.8
Research & Spec Prog Admin.	1	198.2
Department of the Treasury—IRS	1	1.5
Department of Veterans Affairs	102	270.0
Environ. Protection Agency (R&D)	11	348.2
Nat. Aeronautics & Space Admin.	10	4,833.7
Aeronautics	4	1,370.7
Mission to Planet Earth	1	646.5
Space flight	4	2,032.8
Space science	1	783.7
National Science Foundation	5	173.4
Nuclear Regulatory Commission	1	16.0
Smithsonian Institution	2	17.5
Tennessee Valley Authority	2	27.3

State	Number of laboratory campuses	1995 (millions)
Total	515	26,578.8
Alabama	11	992.3
Alaska	10	33.8
Arizona	8	125.2
Arkansas	7	32.1
California	46	4,119.7
Colorado	13	575.3
Connecticut	5	18.6
Delaware	1	1.0
Florida	21	848.6
Georgia	14	132.8
Hawaii	6	21.2
Idaho	8	816.9
Illinois	15	727.7
Indiana	3	11.3
Iowa	4	64.8
Kansas	3	6.8
Kentucky	2	2.6
Louisiana	8	39.8
Maine	1	0.4
Maryland	25	2,921.2
Massachusetts	15	1,005.3
Michigan	8	101.8
Minnesota	7	33.9
Mississippi	13	285.1
Missouri	8	71.4
Montana	6	21.0
Nebraska	4	19.9
Nevada	3	28.4
New Hampshire	3	31.4
New Jersey	8	592.1
New Mexico	9	2,693.5
New York	19	680.1
North Carolina	13	240.4
North Dakota	5	24.6
Ohio	12	705.2
Oklahoma	10	142.3
Oregon	14	83.3
Pennsylvania	14	578.7
Rhode Island	5	416.3
South Carolina	10	122.2
South Dakota	2	2.2
Tennessee	8	844.9
Texas	22	910.6
Utah	7	75.2
Vermont	2	3.8
Virginia	19	3,964.4
Washington	19	617.9
West Virginia	9	228.0
Wisconsin	9	42.0
Wyoming	3	4.7
Washington, D.C.	9	487.3
Puerto Rico	4	15.8
Foreign countries[b]	5	14.0

DEA = Drug Enforcement Administration; IRS = Internal Revenue Service

NOTES: Data for the Department of Defense and the National Aeronautics and Space Administration are from their FY 1994 operating budgets; data for the Department of Education are from its FY 1996 operating budget.

[a]Data for the Food and Drug Administration exclude product testing activities.

[b]The Agricultural Research Service has R&D laboratories in Argentina, France, and Panama. The Navy has medical labs in Egypt and Indonesia.

SOURCE: U.S. General Accounting Office, *Federal R&D Laboratories*, GAO/RCED/NSIAD–96–78R (Washington, DC: 1996).

Appendix table 2-43.
Independent research and development (IR&D) support: FYs 1963–98
(Millions of current dollars)

Year	Incurred by industry[a]	Accepted by government IR&D program: Total accepted	DOD share	NASA share	Not reimbursed	Not accepted under IR&D program	DOD and NASA IR&D reimbursement	R&D obligations[b]: DOD to Industry	NASA to industry	IR&D as a percent of federal R&D to industry[c]: DOD & NASA (1)	DOD (2)
1963	439	255	197	24	34	184	221	5,173	2,307	3.0	3.8
1964	419	272	199	50	23	147	249	4,880	3,369	3.0	4.1
1965	439	300	198	60	42	139	258	4,362	3,853	3.1	4.5
1966	502	357	224	69	64	145	293	4,557	3,928	3.5	4.9
1967	591	439	277	58	104	152	335	5,428	3,798	3.6	5.1
1968	776	579	338	61	180	197	399	5,090	3,382	4.7	6.6
1969	808	653	410	43	200	155	453	5,157	2,899	5.6	8.0
1970	753	597	376	44	177	156	420	4,524	2,521	6.0	8.3
1971	703	567	354	41	172	136	395	4,629	2,077	5.9	7.6
1972	936	725	392	40	293	211	432	5,108	1,960	6.1	7.7
1973	1,164	876	441	40	395	288	481	5,138	1,961	6.8	8.6
1974	1,175	921	467	39	415	254	506	5,173	1,785	7.3	9.0
1975	1,224	1,010	493	40	477	214	533	5,640	1,792	7.2	8.7
1976	1,388	1,061	544	41	476	327	585	6,019	2,042	7.3	9.0
1977	1,560	1,199	598	46	555	361	644	6,997	2,002	7.2	8.5
1978	1,788	1,365	643	49	673	423	692	7,317	2,043	7.4	8.8
1979	2,104	1,517	708	54	755	587	762	7,695	2,270	7.6	9.2
1980	2,373	1,728	812	57	859	645	869	9,022	1,924	7.9	9.0
1981	2,796	2,039	1,056	66	917	757	1,122	10,826	2,096	8.7	9.8
1982	3,654	2,821	1,338	67	1,416	833	1,405	13,795	1,433	9.2	9.7
1983	4,017	2,961	1,601	78	1,282	1,056	1,679	14,541	1,030	10.8	11.0
1984	5,173	3,897	1,884	86	1,927	1,276	1,970	15,967	1,263	11.4	11.8
1985	5,036	3,500	2,099	88	1,313	1,536	2,187	18,944	1,576	10.7	11.1
1986	5,042	3,537	2,198	77	1,262	1,505	2,275	21,502	1,584	9.9	10.2
1987	4,885	3,544	2,186	67	1,291	1,341	2,253	23,934	1,463	8.9	9.1
1988	4,825	3,694	2,181	89	1,424	1,131	2,270	23,295	1,962	9.0	9.4
1989	4,866	3,798	2,233	110	1,455	1,068	2,343	24,734	2,426	8.6	9.0
1990	4,910	3,766	2,158	131	1,477	1,144	2,289	24,443	3,285	8.3	8.8
1991	5,099	4,327	2,203	133	1,991	772	2,336	21,034	3,667	9.5	10.5
1992	4,903	4,320	2,117	84	2,119	583	2,201	24,107	3,765	7.9	8.8
1993	3,337	3,085	1,904	151	1,030	252	2,055	23,654	4,112	7.4	8.0
1994	3,068	2,842	1,746	167	929	226	1,913	23,408	4,305	6.9	7.5
1995	2,848	2,720	1,619	167	934	128	1,786	22,645	4,687	6.5	7.1

Appendix table 2-43.
Independent research and development (IR&D) support: FYs 1963–98
(Millions of current dollars)

		Accepted by government IR&D program						R&D obligations[b]		IR&D as a percent of federal R&D to industry[c]	
Year	Incurred by industry[a]	Total accepted	DOD share	NASA share	Not reimbursed	Not accepted under IR&D program	DOD and NASA IR&D reimbursement	DOD to Industry	NASA to industry	DOD & NASA (1)	DOD (2)
1996	3,009	2,850	1,736	172	942	159	1,908	23,716	4,200	6.8	7.3
1997	2,822	2,675	1,678	NA	NA	147	NA	24,390	4,770	NA	6.9
1998	2,885	2,735	1,628	NA	NA	150	NA	24,518	5,289	NA	6.6

NA = not available; DOD = Department of Defense; IR&D = independent research and development; NASA = National Aeronautics and Space Administration

NOTES: The significant decrease in reported statistics between FYs 1992 and 1993 is primarily due to (1) change in the Federal Acquisition Regulations definition of "major contractor" and (2) change in the Defense Contract Audit Agency criteria used in determining contractors to be reported. Previously, these criteria included contractors with auditable costs of $40 million or more; the current threshold is $70 million or more. The increase in the percentage of IR&D costs accepted is due to an expansion of the activities eligible for reimbursement.

[a]IR&D costs incurred by industry would be reported as R&D funding from industry's own sources, not as Federal R&D support.

[b]Includes R&D performed by Federally Funded Research and Development Centers administered by the industrial sector.

[c]Percentages were calculated as follows: numerator in (1) is total DOD and NASA IR&D reimbursements, and denominator is total DOD and NASA R&D obligations to industry, excluding IR&D; numerator in (2) is total DOD IR&D reimbursements, and denominator is DOD R&D obligations to industry, excluding IR&D.

SOURCES: Defense Contract Audit Agency, *Independent Research and Development and Bid and Proposal Costs Incurred by Major Defense Contractors 1976–98* (Washington, DC: annual series); NASA, unpublished tabulations; J. Reppy, "Defense Department Payments for 'Company–Financed' R&D," Research Policy Vol. 6, No. 4 (October 1977): p. 403; National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Federal Funds for Research and Development, Detailed Historical Tables: Fiscal Years 1951–1999*, NSF 99–347 (Arlington, VA: 1999); and NSF/SRS, *Federal Funds for Research and Development: Fiscal Years 1997, 1998, and 1999, Detailed Statistical Tables*, NSF 99–333 (Arlington, VA: 1999).

Appendix table 2-44.
Small Business Innovation Research awards, by award type and agency: FYs 1983–97
(Millions of current dollars)

Award type and agency	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	Cumulative 1983–97
Total[a]	45	108	199	298	351	389	432	461	483	508	698	718	865	916	1,107	7,578
By type																
Phase I awards	45	48	69	99	110	102	108	118	128	128	154	220	232	229	278	2,068
Phase II awards	0	60	130	199	241	285	322	342	336	371	491	474	602	646	789	5,288
By agency																
Defense	20	45	78	151	194	208	233	241	241	242	385	354	414	479	569	3,854
Health and Human Services	7	23	45	57	67	73	79	84	93	102	126	133	181	189	252	1,511
National Aeronautics and Space Administration	5	13	29	36	32	47	52	62	69	79	86	116	118	114	121	979
Energy	5	16	26	29	28	30	33	39	39	43	50	53	70	62	75	598
National Science Foundation	5	7	10	15	17	17	19	20	22	23	29	34	42	41	54	355
Agriculture	1	2	3	4	4	4	4	4	5	6	7	7	9	9	10	79
Transportation	*	2	3	4	3	3	4	4	6	3	4	7	10	7	8	68
Environmental Protection Agency	*	1	2	3	3	3	3	3	4	4	5	5	7	5	6	54
Education	*	1	1	2	2	2	2	2	3	2	3	3	3	3	4	33
Nuclear Regulatory Commission	*	1	1	1	1	1	1	1	0	1	2	1	2	0	0	13
Commerce	0	0	0	1	2	1	1	1	1	2	2	4	8	6	7	36
Interior	*	1	*	0	0	0	0	0	0	0	0	0	0	0	0	1

* = less than $500,000

[a]Totals are Small Business Innovation Research award obligations that include award modifications. The details by award type and agency do not necessarily contain subsequent year revisions and may not sum to totals.

SOURCE: U.S. Small Business Administration, *Small Business Innovation Development Act* (Washington, DC: annual series).

Science & Engineering Indicators – 2000

Appendix table 2-45.
Budgetary impact of the Federal research and experimentation tax credit: FYs 1981–99
(Millions of dollars)

Year	Outlay equivalent cost of credit (current $)[a]	Total Federal R&D outlays (current $)	Ratio of credit outlays to R&D (%)	Outlay equivalent cost of credit (constant $)[a]
1981	205	32,459	0.63	314
1982	640	34,391	1.86	917
1983	1,010	36,659	2.76	1,384
1984	3,360	39,691	8.47	4,433
1985	2,430	44,171	5.50	3,099
1986	2,295	50,609	4.53	2,847
1987	2,715	51,612	5.26	3,275
1988	1,240	54,739	2.27	1,445
1989	1,590	59,450	2.67	1,779
1990	1,625	62,135	2.62	1,744
1991	1,070	61,130	1.75	1,101
1992	1,850	62,934	2.94	1,850
1993	1,900	65,241	2.91	1,852
1994	2,110	66,151	3.19	2,008
1995	1,820	66,371	2.74	1,691
1996	1,245	65,910	1.89	1,134
1997	1,360	68,897	1.97	1,216
1998	3,270	69,849	4.68	2,889
1999	2,550	71,112	3.59	2,225

NOTES: Tax expenditure estimates are prepared by the U.S. Treasury Department, based on the income tax law enacted as of December 31 of the year for which the expenditures are reported. Expenditures for the years 1998–99 are estimated based on the income tax law enacted as of December 31, 1998. See appendix table 2-1 for GDP implicit price deflators used to convert current dollars to constant 1992 dollars.

[a] "Outlay equivalent" estimates are comparable to taxable outlay figures reported in the budget. This allows for a comparison of the resource cost of the tax credit with the cost of direct federal R&D expenditure support.

SOURCE: U.S. Office of Management and Budget, *Budget of the United States Government* (Washington, DC: U.S. Government Printing Office, annual series).

See figure 2-10 in Volume I.

Appendix table 2–46.
Estimated Federal obligations for research, by agency and field of science and engineering: FY 1997
(Thousands of current dollars)

Agency	Total	Life sciences	Psychology	Physical sciences	Environmental sciences	Math & computer sciences	Engineering	Social sciences	Other sciences
Total, all agencies	29,365,587	12,661,324	545,366	4,148,717	3,045,653	1,671,848	5,690,260	696,298	906,121
Dept. of Agriculture	1,290,106	988,828	356	93,359	12,781	14,177	59,873	117,507	3,225
Dept. of Commerce	808,058	139,420	406	107,499	257,275	78,946	169,957	18,225	36,330
Dept. of Defense	3,809,817	291,299	77,171	379,532	374,358	605,184	1,933,425	886	147,962
Dept. of Education	138,077	9,631	6,311	0	0	996	6,643	114,496	0
Dept. of Energy	3,567,697	220,896	0	1,756,798	350,843	411,502	802,536	0	25,122
Dept. of Health & Human Services	11,228,052	9,721,330	392,026	166,615	32165	103,322	152,259	165,743	494,592
Dept. of Housing & Urban Development	11,265	0	0	0	38	211	279	9,265	1472
Dept. of the Interior	552,655	140,234	0	41,555	316,872	18,613	21,177	14,204	0
Dept. of Justice	32,485	1,000	1100	600	0	0	400	23,298	6,087
Dept. of Labor	21,747	0	0	0	0	109	0	21,638	0
Dept. of State	976	0	0	0	0	0	0	976	0
Dept. of Transportation	381,205	8,966	29,616	49,291	11,298	14,563	223,662	11,099	32,710
Dept. of the Treasury	50,861	79	295	1,862	0	10,120	3	38502	0
Dept. of Veterans Affairs	230,981	217,508	13,345	0	0	0	128	0	0
Advisory Com. on Intergov. Relations, Agency for International Development	176,664	159,242	0	0	0	0	0	15,099	2,323
Appalachian Regional Commission	900	0	0	0	0	0	0	900	0
Environmental Protection Agency	409,109	113,098	0	0	175,075	0	120,936	0	0
Federal Communications Commission	3,099	0	0	85	0	112	1,536	1366	0
Federal Trade Commission	696	0	0	0	0	0	0	696	0
International Trade Commission	5,677	0	0	0	0	0	0	5,677	0
Library of Congress	796	0	0	0	0	0	0	0	796
National Aeronautics & Space Administration	4,184,887	268,165	19,451	1,034,197	1,061,120	80,702	1,692,628	386	28,238
National Archives & Records Administration	120	0	0	120	0	0	0	0	0
National Science Foundation	2,248,520	330,477	5,234	477,926	445,719	333,291	442,504	87,997	125,372
Nuclear Regulatory Commission	62,102	0	0	0	0	0	62,102	0	0
Smithsonian Institution	130,000	49,472	0	38,204	5,988	0	0	34,594	1,742
Tennessee Valley Authority	3,987	1,546	0	696	1,695	0	0	0	0
U.S. Arms Control & Disarmament Agency	1,200	60	0	378	426	0	60	126	150
United States Information Agency	152	0	0	0	0	0	152	0	0

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Federal Funds for Research and Development: Fiscal Years 1997, 1998, and 1999* (Arlington, VA: NSF 99-333).

Science & Engineering Indicators – 2000

Appendix table 2-47.
Federal obligations for basic research, by agency and field of science and engineering: FYs 1985–99

Field	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	Preliminary 1998	Preliminary 1999
	Millions of current dollars[a]														
Total, all fields	7,819	8,153	8,942	9,474	10,602	11,286	12,171	12,490	13,399	13,524	13,877	14,464	14,942	15,862	16,914
Life sciences	3,787	3,859	4,362	4,502	4,916	5,178	5,434	5,842	6,289	6,472	6,601	6,879	7,204	7,688	8,322
Biological & agricultural, total	2,516	2,543	2,870	2,855	3,103	3,219	3,375	3,518	3,788	3,752	3,837	3,922	3,945	NA	NA
Biological (excl. environmental)	2,106	2,152	2,462	2,415	2,647	2,742	2,869	2,982	3,223	3,139	3,248	3,387	3,391	NA	NA
Environmental biology	126	126	141	147	157	168	187	202	223	242	221	206	206	NA	NA
Agricultural	284	266	268	294	298	309	319	334	342	371	368	330	348	NA	NA
Medical sciences, total	1,145	1,197	1,341	1,573	1,708	1,850	1,858	2,131	2,381	2,610	2,616	2,741	3,035	NA	NA
Other life sciences	126	119	151	73	104	109	201	193	120	110	149	216	223	NA	NA
Psychology	133	133	147	178	187	215	226	123	247	246	278	292	294	304	332
Physical sciences	1,815	1,914	2,096	2,200	2,507	2,662	2,882	2,951	2,907	2,827	2,865	2,863	2,976	3,127	3,305
Astronomy	401	453	505	459	525	580	612	730	663	725	732	709	754	NA	NA
Chemistry	425	433	445	471	505	502	539	557	544	540	559	551	518	NA	NA
Physics	960	1,003	1,072	1,206	1,395	1,147	1,645	1,608	1,601	1,502	1,507	1,546	1,562	NA	NA
Other physical sciences	30	25	74	65	82	105	86	58	99	60	66	57	143	NA	NA
Environmental sciences	700	749	781	873	1,017	1,275	1,264	1,304	1,534	1,517	1,468	1,554	1,543	1,641	1,675
Atmospheric science	209	240	244	281	316	444	449	435	635	698	688	671	680	NA	NA
Geological	250	266	266	267	335	440	499	527	555	488	452	390	388	NA	NA
Oceanography	219	224	250	269	294	300	198	210	207	190	188	309	304	NA	NA
Other environmental sciences	21	19	21	55	72	92	118	132	136	140	139	184	172	NA	NA
Mathematics & computer sciences	260	293	306	313	346	407	426	481	511	522	603	640	661	700	787
Mathematics	130	142	158	165	168	176	164	228	222	248	164	163	238	NA	NA
Computer sciences	116	131	129	126	160	225	224	248	284	262	317	377	390	NA	NA
Other mathematics & computer sciences	14	20	20	22	18	5	38	6	5	12	122	100	34	NA	NA
Social sciences	141	114	130	147	155	146	161	140	194	184	207	213	221	239	266
Anthropology	16	11	12	12	12	13	13	11	10	10	15	13	15	NA	NA
Economics	34	26	29	35	38	37	37	39	46	38	45	39	46	NA	NA
Political science	6	4	6	5	5	6	7	6	6	5	7	6	5	NA	NA
Sociology	32	30	34	37	38	24	28	10	11	13	14	13	8	NA	NA
Other social sciences	52	42	48	58	61	66	76	73	121	118	126	141	147	NA	NA
Other sciences.	100	122	131	256	292	302	546	399	510	466	407	413	459	468	514

Appendix table 2-47.
Federal obligations for basic research, by agency and field of science and engineering: FYs 1985–99

Field	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	Preliminary 1998	Preliminary 1999
Millions of current dollars															
Engineering	884	969	990	1,006	1,184	1,102	1,234	1,250	1,207	1,290	1,449	1,612	1,583	1,696	1,713
Aeronautical	192	226	237	231	328	270	256	245	246	276	271	262	269	NA	NA
Astronautical	42	53	49	48	59	62	70	94	54	60	66	72	70	NA	NA
Chemical	74	73	78	89	50	76	102	105	73	71	67	60	68	NA	NA
Civil	44	45	46	46	52	47	59	53	39	38	70	53	45	NA	NA
Electrical	145	156	175	154	174	147	143	165	203	206	205	202	173	NA	NA
Mechanical	88	84	87	84	101	91	116	114	143	142	165	113	105	NA	NA
Metallurgy & materials	212	229	210	230	255	260	295	274	241	330	369	502	463	NA	NA
Other engineering	88	103	108	124	166	148	194	199	209	168	237	349	390	NA	NA
Millions of constant 1992 dollars[a]															
Total, all fields	9,977	10,115	10,783	11,040	11,854	12,116	12,528	12,490	13,054	12,865	12,891	13,178	13,361	14,016	14,754
Life sciences	4,832	4,788	5,260	5,246	5,496	5,558	5,593	5,842	6,127	6,157	6,132	6,267	6,442	6,793	7,259
Biological & agricultural, total	3,210	3,155	3,461	3,327	3,469	3,456	3,474	3,518	3,690	3,569	3,564	3,574	3,528	NA	NA
Biological (excl. environmental)	2,687	2,670	2,968	2,814	2,960	2,944	2,953	2,982	3,140	2,986	3,017	3,086	3,032	NA	NA
Environmental biology	161	156	170	171	176	181	192	202	217	230	205	187	184	NA	NA
Agricultural	362	330	323	342	334	331	329	334	333	353	341	300	311	NA	NA
Medical sciences, total	1,461	1,485	1,617	1,833	1,910	1,986	1,912	2,131	2,320	2,483	2,430	2,497	2,714	NA	NA
Other life sciences	161	148	182	85	117	117	207	193	117	105	138	197	200	NA	NA
Psychology	170	165	177	207	209	231	232	123	240	234	258	266	263	269	290
Physical sciences	2,316	2,375	2,527	2,563	2,802	2,857	2,966	2,951	2,832	2,689	2,661	2,608	2,662	2,763	2,883
Astronomy	512	562	608	534	587	623	630	730	646	689	680	646	674	NA	NA
Chemistry	542	537	537	549	564	539	555	557	530	514	520	502	463	NA	NA
Physics	1,225	1,244	1,293	1,405	1,560	1,158	1,693	1,608	1,559	1,429	1,400	1,408	1,397	NA	NA
Other physical sciences	38	31	89	76	92	113	88	58	97	57	62	52	128	NA	NA
Environmental sciences	893	929	942	1,017	1,137	1,369	1,301	1,304	1,494	1,443	1,363	1,416	1,380	1,450	1,462
Atmospheric science	267	298	294	327	354	476	462	435	619	664	639	612	608	NA	NA
Geological	319	330	321	312	374	472	514	527	541	464	420	355	347	NA	NA
Oceanography	279	278	301	314	328	322	203	210	202	181	175	282	271	NA	NA
Other environmental sciences	27	24	26	64	81	98	121	132	132	133	129	167	154	NA	NA

Appendix table 2-47.
Federal obligations for basic research, by agency and field of science and engineering: FYs 1985–99

Field	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	Preliminary 1998	Preliminary 1999
	Millions of constant 1992 dollars[a]														
Mathematics & computer sciences	332	364	369	365	387	437	439	481	498	496	560	583	591	618	686
Mathematics	166	176	191	193	188	189	169	228	216	236	152	148	213	NA	NA
Computer sciences	148	163	155	146	178	242	230	248	277	250	295	343	348	NA	NA
Other mathematics & computer sciences	18	25	24	26	21	6	39	6	5	11	113	91	30	NA	NA
Social sciences	180	141	156	171	173	157	166	140	189	175	192	194	198	211	232
Anthropology	20	14	15	14	14	13	13	11	10	9	14	12	13	NA	NA
Economics.	43	32	35	40	42	40	38	39	45	37	42	36	41	NA	NA
Political science	8	5	7	6	6	7	7	6	6	5	7	5	4	NA	NA
Sociology	41	37	41	43	43	26	29	10	11	12	13	12	7	NA	NA
Other social sciences	66	52	58	68	68	71	78	73	117	112	117	129	131	NA	NA
Other sciences	128	151	158	298	326	325	562	399	497	443	378	376	411	413	448
Engineering	1,128	1,202	1,193	1,173	1,323	1,183	1,270	1,250	1,176	1,228	1,346	1,469	1,416	1,499	1,494
Aeronautical	245	280	286	269	367	289	264	245	240	262	252	238	241	NA	NA
Astronautical	54	66	59	56	66	67	72	94	52	57	62	65	62	NA	NA
Chemical	94	91	93	103	56	81	105	105	71	67	62	54	61	NA	NA
Civil	56	56	55	54	58	51	61	53	38	36	65	48	41	NA	NA
Electrical	185	194	212	179	194	158	147	165	198	196	190	184	155	NA	NA
Mechanical	112	104	105	97	113	98	119	114	139	135	153	103	94	NA	NA
Metallurgy & materials	271	284	253	268	285	279	303	274	235	314	342	457	414	NA	NA
Other engineering	112	128	130	145	185	159	200	199	204	160	220	318	349	NA	NA

NA = not available

[a] See Appendix table 2-1 for GDP implicit price deflators used to convert current dollars to constant 1992 dollars.

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Federal Funds for Research and Development, Detailed Historical Tables: Fiscal Years 1951–98*, NSF 98–328 (Arlington, VA: 1998); and NSF/SRS, *Federal Funds for Research and Development: Fiscal Years 1997, 1998, and 1999*; *Detailed Statistical Tables,* NSF 99–333 (Arlington, VA: 1999).

See figure 2-20 in Volume I.

Appendix table 2-48.
Federal obligations for applied research, by agency and field of science and engineering: FYs 1985–99

Field	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	Preliminary 1998	Preliminary 1999
	Millions of current dollars														
Total, all fields	8,315	8,349	8,999	9,176	10,163	10,337	11,798	12,001	13,491	13,888	14,557	13,796	14,423	15,609	16,079
Life sciences	2,576	2,606	2,980	3,223	3,579	3,652	4,188	4,069	4,483	4,812	5,210	5,185	5,458	5,933	6,064
Biological & agricultural, total	1,240	1,318	1,488	1,718	1,917	1,959	2,223	2,116	2,272	2,351	2,566	2,708	2,599	NA	NA
Biological (excl. environmental)	779	842	1,041	1,267	1,336	1,403	1,589	1,453	1,567	1,607	1,677	1,923	1,929	NA	NA
Environmental biology	135	138	149	154	210	174	273	309	333	388	586	498	376	NA	NA
Agricultural.	326	338	299	297	371	383	361	353	371	357	303	287	293	NA	NA
Medical sciences, total	1,223	1,164	1,324	1,368	1,514	1,533	1,603	1,779	2,024	2,252	2,356	2,233	2,498	NA	NA
Other life sciences	113	123	168	137	148	160	363	174	188	209	287	245	361	NA	NA
Psychology	194	201	222	212	235	234	257	176	304	302	345	234	252	274	280
Physical sciences	1,231	1,155	1,157	1,118	1,199	1,147	1,354	1,488	1,520	1,427	1,414	1,060	1,172	1,208	1,273
Astronomy	14	15	18	12	17	17	19	9	23	23	33	20	21	NA	NA
Chemistry	225	229	235	232	278	260	290	340	300	334	304	330	328	NA	NA
Physics	856	803	781	770	795	781	816	971	1,038	941	944	446	506	NA	NA
Other physical sciences	135	108	122	103	108	90	229	168	160	129	133	264	318	NA	NA
Environmental sciences	704	733	731	734	756	899	886	904	1,075	1,322	1,387	1,466	1,502	1,647	1,585
Atmospheric science	277	281	309	307	272	330	354	332	349	397	447	415	485	NA	NA
Geological	179	178	176	174	208	221	230	209	243	350	397	394	304	NA	NA
Oceanography	179	205	178	191	198	220	201	249	260	307	219	265	294	NA	NA
Other environmental sciences	69	68	68	62	78	128	102	114	223	268	324	392	420	NA	NA
Mathematics & computer sciences	315	322	334	330	390	434	478	679	714	780	976	932	1,010	1,131	1,468
Mathematics	53	42	46	52	68	65	63	91	69	95	95	92	63	NA	NA
Computer sciences	164	171	169	167	205	337	361	524	542	568	697	743	875	NA	NA
Other mathematics & computer sciences	97	109	119	110	116	32	53	64	103	117	185	97	72	NA	NA
Social sciences	319	302	351	339	396	484	566	550	481	463	472	442	475	585	617
Anthropology	2	2	3	2	2	2	3	3	4	7	7	6	6	NA	NA
Economics	125	105	120	125	129	160	150	172	159	155	162	155	158	NA	NA
Political science	9	8	6	7	8	7	10	16	23	21	15	11	10	NA	NA
Sociology	34	37	40	45	56	92	156	71	66	55	34	28	18	NA	NA
Other social sciences	149	150	183	160	202	223	247	288	230	226	255	243	284	NA	NA
Other sciences	242	261	307	271	350	362	358	409	622	593	495	408	447	437	480

Appendix table 2-48.
Federal obligations for applied research, by agency and field of science and engineering: FYs 1985–99

Field	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	Preliminary 1998	Preliminary 1999
Millions of current dollars															
Engineering	2,733	2,770	2,917	2,950	3,258	3,125	3,711	3,727	4,292	4,189	4,260	4,069	4,107	4,394	4,310
Aeronautical	547	549	573	571	659	658	760	630	947	947	977	988	1,084	NA	NA
Astronautical	383	474	576	527	619	519	583	536	440	439	480	455	526	NA	NA
Chemical	180	173	138	169	92	166	203	193	173	167	179	155	167	NA	NA
Civil	173	158	159	169	178	270	246	277	213	240	269	247	230	NA	NA
Electrical	482	518	611	577	669	493	587	594	678	536	552	468	449	NA	NA
Mechanical	179	153	146	157	157	177	220	223	324	237	248	181	150	NA	NA
Metallurgy & materials	227	217	152	227	266	294	416	454	454	521	447	487	398	NA	NA
Other engineering	563	529	562	553	619	548	695	822	1,062	1,102	1,107	1,088	1,103	NA	NA
Millions of constant 1992 dollars[a]															
Total, all fields	10,610	10,359	10,851	10,693	11,363	11,097	12,144	12,001	13,144	13,211	13,523	12,569	12,898	13,793	14,025
Life sciences	3,287	3,233	3,593	3,756	4,002	3,921	4,311	4,069	4,368	4,578	4,840	4,724	4,880	5,243	5,290
Biological & agricultural, total	1,582	1,635	1,794	2,002	2,143	2,103	2,288	2,116	2,213	2,237	2,384	2,467	2,324	NA	NA
Biological (excl. environmental)	994	1,045	1,255	1,477	1,494	1,506	1,636	1,453	1,527	1,528	1,558	1,752	1,725	NA	NA
Environmental biology	172	171	180	179	235	187	281	309	325	369	545	454	337	NA	NA
Agricultural	416	419	361	346	415	411	371	353	361	339	281	261	262	NA	NA
Medical sciences, total	1,561	1,444	1,597	1,594	1,693	1,645	1,650	1,779	1,971	2,142	2,189	2,034	2,233	NA	NA
Other life sciences	144	153	203	160	165	172	374	174	183	199	267	223	323	NA	NA
Psychology	248	249	268	247	263	251	264	176	296	287	320	213	225	242	244
Physical sciences	1,571	1,433	1,395	1,303	1,341	1,232	1,394	1,488	1,481	1,357	1,313	966	1,048	1,068	1,110
Astronomy	18	19	22	14	19	18	20	9	22	22	31	18	18	NA	NA
Chemistry	287	284	283	270	311	279	298	340	292	318	282	301	293	NA	NA
Physics	1,092	996	942	897	889	838	840	971	1,011	895	877	406	452	NA	NA
Other physical sciences	172	134	147	120	121	96	236	168	156	122	123	241	285	NA	NA
Environmental sciences	898	909	881	855	845	965	912	904	1,047	1,257	1,288	1,335	1,343	1,455	1,383
Atmospheric science	353	349	373	358	304	354	364	332	340	377	416	378	434	NA	NA
Geological	228	221	212	203	233	238	236	209	236	333	368	359	271	NA	NA
Oceanography	228	254	215	223	221	237	207	249	254	292	204	242	263	NA	NA
Other environmental sciences	88	84	82	72	87	137	105	114	218	255	301	357	375	NA	NA

Appendix table 2-48.
Federal obligations for applied research, by agency and field of science and engineering: FYs 1985–99

Field	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	Preliminary 1998	Preliminary 1999
	Millions of constant 1992 dollars[a]														
Mathematics & computer sciences	402	400	403	385	436	466	492	679	696	742	907	849	904	1,000	1,281
Mathematics	68	52	55	61	76	70	65	91	67	90	88	84	57	NA	NA
Computer sciences	209	212	204	195	229	362	372	524	528	540	647	677	783	NA	NA
Other mathematics & computer sciences	124	135	143	128	130	34	54	64	101	112	172	88	64	NA	NA
Social sciences	407	375	423	395	443	520	583	550	468	441	438	403	425	517	538
Anthropology	3	2	4	2	2	2	3	3	4	6	6	5	6	NA	NA
Economics	159	130	145	146	144	172	155	172	155	147	150	141	141	NA	NA
Political science	11	10	7	8	9	7	10	16	22	20	14	10	9	NA	NA
Sociology	43	46	48	52	63	99	160	71	64	52	31	25	16	NA	NA
Other social sciences	190	186	221	186	226	240	254	288	224	215	237	221	254	NA	NA
Other sciences	309	324	370	316	391	388	368	409	606	564	460	372	400	386	419
Engineering	3,487	3,437	3,517	3,438	3,643	3,355	3,820	3,727	4,182	3,985	3,957	3,707	3,673	3,882	3,760
Aeronautical	698	681	691	665	737	706	782	630	922	901	908	900	969	NA	NA
Astronautical	489	588	695	614	692	557	601	536	429	418	446	414	471	NA	NA
Chemical	230	215	166	197	103	178	209	193	168	159	167	142	149	NA	NA
Civil.	221	196	192	197	199	290	253	277	208	228	250	225	206	NA	NA
Electrical	615	643	737	672	748	529	605	594	661	510	512	427	402	NA	NA
Mechanical	228	190	176	183	176	190	226	223	316	225	230	165	134	NA	NA
Metallurgy & materials	290	269	183	265	297	316	428	454	443	496	415	444	356	NA	NA
Other engineering	718	656	678	644	692	589	716	822	1,034	1,048	1,028	991	986	NA	NA

NA = not available

[a] See Appendix table 2-1 for GDP implicit price deflators used to convert current dollars to constant 1992 dollars.

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Federal Funds for Research and Develoment, Detailed Historical Tables: Fiscal Years 1951–98*, NSF 98–328 (Arlington, VA: 1998); and NSF/SRS, *Federal Funds for Research and Development: Fiscal Years 1997, 1998, and 1999*; *Detailed Statistical Tables,* NSF 99–333 (Arlington, VA: NSF, forthcoming).

See figure 2-20 in Volume I.

Appendix table 2-49.
R&D associated primarily with chemistry (nonmedical) and chemical engineering: 1985–97

Year	Total	Federal obligations for research in chemistry and chemical engineering	Academic R&D (not federally funded) in chemistry and chemical engineering	Company–funded R&D in industrial chemicals and other chemicals (but not drugs and medicines)
		Millions of current dollars		
1985	5,909	905	175	4,829
1986	6,115	905	204	5,007
1987	6,490	912	228	5,350
1988	7,138	951	258	5,928
1989	7,669	944	294	6,431
1990	8,615	1,036	328	7,251
1991	8,993	1,148	353	7,492
1992	8,687	1,167	363	7,157
1993	8,987	1,095	366	7,526
1994	8,415	1,112	369	6,934
1995	8,619	1,106	378	7,135
1996	9,239	1,092	396	7,751
1997	NA	NA	NA	7,042
		Millions of constant 1992 dollars		
1985	7,525	1,152	223	6,149
1986	7,589	1,123	253	6,214
1987	7,813	1,098	274	6,441
1988	8,291	1,105	300	6,886
1989	8,548	1,053	328	7,168
1990	9,204	1,107	351	7,747
1991	9,240	1,180	362	7,698
1992	8,687	1,167	363	7,157
1993	8,756	1,067	357	7,332
1994	8,007	1,058	351	6,598
1995	8,017	1,029	351	6,637
1996	8,435	997	361	7,077
1997	NA	NA	NA	6,312

NA = not available

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *1997 U.S. Industrial R&D Performers*, NSF 99–355, by Raymond M. Wolfe (Arlington, VA: 1998); NSF/SRS, *Federal Funds for Research and Development: Fiscal Years 1997, 1998 and 1999*, NSF–333, Project Officer, Ronald Meeks (Arlington,VA: 1999); and NSF/SRS, *Academic Research and Development Expenditures: Fiscal Year 1997*, NSF 99–336, Project Officer, M. Marge Machen (Arlington, VA: 1999).

See figure 2-21 in Volume I.

Appendix table 2-50.
R&D associated primarily with the life sciences

Year	Total	Federal obligations for research in the life sciences	Development expenditures by Dept. of Health and Human Services and Dept. of Veterans Affairs	Development expenditures by USDA	Academic R&D (not federally funded) in the life sciences and bioengineering/ biomedical engineering	Company–funded R&D in food, kindred and tobacco products	Company–funded R&D in drugs and medicines
Millions of current collars							
1985	13,733	6,389	451	32	2,244	1,136	3,481
1986	14,711	6,684	514	31	2,544	1,280	3,657
1987	16,200	7,438	623	30	2,811	1,204	4,095
1988	17,845	7,917	719	32	3,104	1,173	4,900
1989	19,700	8,578	867	39	3,460	1,244	5,512
1990	21,216	9,028	1,125	51	3,848	1,248	5,917
1991	23,629	9,694	1,479	62	4,170	1,277	6,947
1992	24,985	10,126	1,095	69	4,375	1,386	7,934
1993	27,274	10,900	1,216	76	4,604	1,345	9,132
1994	28,845	11,416	1,332	78	4,918	1,476	9,625
1995	30,346	11,874	1,406	81	5,217	1,566	10,202
1996	30,644	12,214	1,466	85	5,547	1,564	9,769
1997	NA	NA	NA	NA	NA	1,787	11,586
Millions of constant 1992 dollars							
1985	17,487	8,135	575	41	2,857	1,447	4,433
1986	18,257	8,295	638	39	3,158	1,588	4,538
1987	19,504	8,955	750	36	3,385	1,450	4,930
1988	20,729	9,197	835	37	3,605	1,363	5,692
1989	21,957	9,561	966	43	3,856	1,387	6,144
1990	22,667	9,645	1,201	54	4,111	1,333	6,322
1991	24,279	9,961	1,519	64	4,284	1,312	7,138
1992	24,985	10,126	1,095	69	4,375	1,386	7,934
1993	26,573	10,620	1,185	74	4,486	1,310	8,897
1994	27,448	10,863	1,267	75	4,680	1,405	9,159
1995	28,227	11,045	1,308	75	4,853	1,457	9,489
1996	27,978	11,151	1,339	77	5,064	1,428	8,919
1997	NA	NA	NA	NA	NA	1,602	10,385

NA = not available

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *1997 U.S. Industrial R&D Performers,* NSF 99–355, by Raymond M. Wolfe (Arlington, VA: 1998); NSF/SRS, *Federal Funds for Research and Development: Fiscal Years 1997, 1998 and 1999,* NSF–333, Project Officer, Ronald Meeks (Arlington,VA: 1999); and NSF/SRS, *Academic Research and Development Expenditures: Fiscal Year 1997*, NSF 99–336, Project Officer, M. Marge Machen (Arlington, VA: 1999).

See figure 2-22 in Volume I.

Appendix table 2-51.
R&D associated primarily with mathematics, computer sciences, and communication and electrical equipment (excluding DOD–supported development of military equipment): 1985–97

Year	Total	Academic R&D in mathematics (not federally funded)	Federal obligations for research in mathematics and in computer science	Academic research in computer science (not federally funded)	Federal obligations for research in electrical engineering	Academic R&D in electrical engineering (not federally funded)	Company–funded R&D in office, computing and accounting machines	Company–funded R&D in electrical equipment
				Millions of current collars				
1985	19,155	34	585	87	639	122	8,418	9,271
1986	19,760	41	621	102	702	147	8,380	9,767
1987	20,389	47	641	117	773	169	8,193	10,449
1988	21,128	53	666	134	759	194	9,347	9,975
1989	22,293	59	762	161	792	220	10,725	9,575
1990	22,249	60	857	178	662	237	10,988	9,267
1991	21,479	62	968	179	737	249	10,419	8,865
1992	22,590	67	1,177	180	790	247	10,614	9,516
1993	19,194	73	1,244	185	847	246	4,917	11,682
1994	20,264	76	1,371	194	745	262	4,078	13,537
1995	24,625	78	1,577	197	735	279	4,699	17,060
1996	31,325	84	1,597	198	658	300	8,132	20,356
1997	NA	NA	NA	NA	NA	NA	12,787	22,747
				Millions of constant 1992 dollars				
1985	24,392	43	745	111	813	155	10,719	11,806
1986	24,522	51	771	126	871	182	10,400	12,121
1987	24,547	57	772	141	930	203	9,864	12,580
1988	24,542	62	774	156	882	225	10,857	11,587
1989	24,848	66	849	179	883	245	11,954	10,672
1990	23,770	64	915	190	708	253	11,739	9,901
1991	22,070	64	995	184	757	256	10,706	9,109
1992	22,590	67	1,177	180	790	247	10,614	9,516
1993	18,700	71	1,212	180	825	240	4,791	11,382
1994	19,282	72	1,305	184	709	250	3,880	12,881
1995	22,905	72	1,467	183	683	260	4,371	15,868
1996	28,599	77	1,458	181	601	274	7,424	18,585
1997	NA	NA	NA	NA	NA	NA	11,461	20,388

NA = not available

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *1997 U.S. Industrial R&D Performers*, NSF 99–355, by Raymond M. Wolfe (Arlington, VA: 1998); NSF/SRS, *Federal Funds for Research and Development: Fiscal Years 1997, 1998 and 1999*, NSF–333, Project Officer, Ronald Meeks (Arlington,VA: 1999); and NSF/SRS, *Academic Research and Development Expenditures: Fiscal Year 1997*, NSF 99–336, Project Officer, M. Marge Machen (Arlington, VA: 1999).

See figures 2-23 and 2-29 in Volume I.

Appendix table 2-52.
Manufacturing and nonmanufacturing R&D expenditures: 1970–97

Year	All industries			All manufacturing industries			All nonmanufacturing industries		
	Total	Company support	Federal support	Total	Company support	Federal support	Total	Company support	Federal support
	Millions of current dollars								
1970	18,067	10,288	7,779	17,362	10,063	7,299	705	225	480
1971	18,320	10,654	7,666	17,616	10,402	7,214	704	252	452
1972	19,552	11,535	8,017	18,845	11,258	7,587	707	277	430
1973	21,249	13,104	8,145	20,534	12,805	7,729	715	299	416
1974	22,887	14,667	8,220	22,119	14,362	7,757	768	305	463
1975	24,187	15,582	8,605	23,452	15,157	8,295	735	425	310
1976	26,997	17,436	9,561	26,152	16,965	9,187	845	471	374
1977	29,825	19,340	10,485	28,867	18,799	10,068	958	541	417
1978	33,304	22,115	11,189	32,075	21,413	10,662	1,229	702	527
1979	38,226	25,708	12,518	36,686	24,849	11,837	1,540	859	681
1980	44,505	30,476	14,029	42,690	29,439	13,251	1,815	1,037	778
1981	51,810	35,428	16,382	49,904	34,380	15,524	1,906	1,048	858
1982	58,650	40,105	18,545	56,178	38,633	17,545	2,472	1,472	1,000
1983	65,268	44,588	20,680	61,931	42,504	19,427	3,337	2,084	1,253
1984	74,800	51,404	23,396	69,895	48,152	21,743	4,905	3,252	1,653
1985	84,239	57,403	27,196	77,525	52,642	24,883	6,714	4,401	2,313
1986	87,823	59,932	27,891	80,377	55,192	25,185	7,446	4,740	2,706
1987	92,155	61,403	30,752	84,311	56,259	28,052	7,844	5,144	2,700
1988	97,015	66,672	30,343	86,503	59,415	27,088	10,513	7,257	3,256
1989	102,055	73,501	28,554	88,024	63,199	24,826	14,031	10,302	3,729
1990	109,727	81,602	28,125	88,934	65,251	23,683	20,793	16,351	4,442
1991	116,952	90,580	26,372	88,506	67,639	20,867	28,446	22,941	5,505
1992	119,110	94,388	24,722	90,177	71,025	19,152	28,933	23,363	5,570
1993	117,400	94,591	22,809	86,569	69,901	16,669	30,831	24,690	6,140
1994	119,595	97,131	22,463	90,749	73,375	17,373	28,846	23,756	5,090
1995	132,103	108,652	23,451	100,067	81,236	18,831	32,036	27,415	4,620
1996	144,667	121,015	23,653	111,864	91,845	20,020	32,803	29,170	3,633
1997	157,539	133,611	23,928	121,025	101,202	19,826	36,514	32,409	4,105

Appendix table 2-52.
Manufacturing and nonmanufacturing R&D expenditures: 1970–97

Year	All industries			All manufacturing industries			All nonmanufacturing industries		
	Total	Company support	Federal support	Total	Company support	Federal support	Total	Company support	Federal support
	Millions of constant 1992 dollars[a]								
1970	59,275	33,753	25,522	56,962	33,015	23,947	2,313	738	1,575
1971	57,143	33,231	23,911	54,947	32,445	22,502	2,196	786	1,410
1972	58,504	34,515	23,989	56,388	33,686	22,702	2,115	829	1,287
1973	60,195	37,122	23,074	58,170	36,275	21,895	2,025	847	1,178
1974	59,493	38,126	21,367	57,497	37,333	20,164	1,996	793	1,204
1975	57,465	37,021	20,444	55,719	36,011	19,708	1,746	1,010	737
1976	60,599	39,138	21,461	58,703	38,081	20,622	1,897	1,057	840
1977	62,882	40,776	22,106	60,862	39,635	21,227	2,020	1,141	879
1978	65,443	43,456	21,987	63,028	42,077	20,951	2,415	1,379	1,036
1979	69,212	46,547	22,665	66,424	44,992	21,432	2,788	1,555	1,233
1980	73,769	50,515	23,254	70,761	48,797	21,964	3,008	1,719	1,290
1981	78,488	53,671	24,817	75,601	52,083	23,518	2,887	1,588	1,300
1982	83,583	57,154	26,429	80,060	55,056	25,004	3,523	2,098	1,425
1983	89,213	60,946	28,267	84,651	58,097	26,554	4,561	2,849	1,713
1984	98,525	67,708	30,817	92,064	63,425	28,639	6,461	4,283	2,177
1985	107,270	73,097	34,631	98,720	67,034	31,686	8,550	5,604	2,945
1986	108,989	74,376	34,613	99,748	68,493	31,255	9,241	5,882	3,358
1987	110,950	73,926	37,024	101,506	67,733	33,773	9,444	6,193	3,251
1988	112,690	77,445	35,246	100,480	69,015	31,465	12,212	8,430	3,782
1989	113,748	81,923	31,826	98,110	70,440	27,671	15,639	11,482	4,156
1990	117,230	87,182	30,048	95,015	69,713	25,302	22,215	17,469	4,746
1991	120,173	93,074	27,098	90,943	69,502	21,442	29,229	23,573	5,657
1992	119,110	94,388	24,722	90,177	71,025	19,152	28,933	23,363	5,570
1993	114,380	92,158	22,222	84,342	68,103	16,240	30,038	24,055	5,982
1994	113,802	92,426	21,375	86,354	69,821	16,532	27,449	22,605	4,843
1995	122,875	101,062	21,813	93,077	75,561	17,516	29,798	25,500	4,297
1996	132,080	110,486	21,595	102,131	83,854	18,278	29,949	26,632	3,317
1997	141,202	119,755	21,447	108,475	90,707	17,770	32,727	29,048	3,679

NOTES: As a result of a new sample design, statistics for 1988–91 have been revised. These statistics now better reflect R&D performance among firms in nonmanufacturing industries and small firms in all industries.

[a]See appendix table 2-1 for GDP implicit price deflators used to convert current dollars to constant 1992 dollars.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Research and Development in Industry: 1997* (Arlington, VA: 1998, NSF 99-358).

See figure 2-13 in Volume I.

Appendix table 2-53.
Total expenditures for industrial R&D (financed by company, Federal, and other funds), by industry and size of company: 1985–97
(Millions of current dollars)

Industry	SIC code	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Total		84,239	87,823	92,155	97,015	102,055	109,727	116,952	119,110	117,400	119,595	132,103	144,667	157,539
Manufacturing		77,525	80,377	84,311	86,503	88,024	88,934	88,506	90,177	86,569	90,749	100,067	111,864	121,025
Food, kindred, and tobacco products	20,21	D	D	1,206	D	D	D	1,277	1,386	1,345	1,476	1,566	1,564	1,787
Textiles and apparel	22,23	D	D	D	D	D	D	D	D	D	D	D	D	D
Lumber, wood products, and furniture	24,25	147	144	137	D	192	216	D	D	D	D	D	D	348
Paper and allied products	26	D	D	D	D	879	1,059	D	D	D	D	D	D	D
Chemicals and allied products	28	8,540	8,843	9,635	11,067	12,069	13,291	14,648	15,381	D	D	17,547	D	D
Industrial chemicals	281–82,286	3,498	3,552	3,716	4,172	4,451	5,010	5,390	5,165	D	D	D	D	D
Drugs and medicines	283	D	3,658	D	4,906	D	D	D	7,944	9,146	9,633	10,215	9,773	11,589
Other chemicals	284–85,287–89	D	1,633	D	1,989	D	D	D	2,272	D	D	D	2,505	D
Petroleum refining and extraction	13,29	D	D	1,897	1,997	2,180	2,306	2,498	2,277	2,152	1,950	1,760	1,654	D
Rubber products	30	D	D	D	D	D	D	D	D	D	D	D	D	D
Stone, clay, and glass products	32	D	950	995	D	D	D	D	D	538	591	448	468	608
Primary metals	33	D	D	730	637	686	739	714	522	669	690	593	D	988
Ferrous metals and products	331–32,3398–99	D	D	D	253	D	D	D	D	289	D	D	D	D
Nonferrous metals and products	333–36	416	458	D	384	D	D	D	D	380	D	D	D	D
Fabricated metal products	34	829	895	783	881	904	939	974	1,017	1,158	1,111	1,023	D	1,798
Machinery	35	12,216	D	D	D	D	14,446	14,775	14,938	8,381	8,110	D	13,455	18,499
Office, computing, and accounting machines	357	D	D	D	D	D	D	D	D	4,950	4,106	D	D	12,840
Other machinery, except electrical	351–56,358–59	D	2,396	2,428	2,682	2,729	D	D	D	3,431	4,004	5,041	D	5,659
Electrical equipment	36	14,432	14,980	15,848	14,128	13,318	13,400	13,415	13,360	13,349	15,338	18,751	22,498	24,585
Radio and TV receiving equipment	365	D	133	139	149	96	114	D	D	D	D	D	D	D
Communication equipment	366	9,397	9,669	10,184	8,427	7,071	5,928	4,787	D	D	D	D	D	D
Electronic components	367	3,385	D	4,286	4,133	4,025	3,914	D	3,567	5,311	6,032	D	D	D
Other electrical equipment	361–64,369	D	D	1,239	1,419	2,126	3,444	D	D	D	D	D	D	4,909
Transportation equipment	37	D	31,275	34,246	34,775	33,859	31,361	27,428	27,494	27,258	28,087	32,441	32,737	31,993
Motor vehicles and motor vehicles equipment	371	6,984	D	D	D	D	D	D	D	11,718	D	D	D	D
Other transportation equipment	373–75,379	D	D	D	D	D	D	D	D	483	D	D	D	D
Aircraft and missiles	372,376	22,231	21,050	24,458	24,168	22,331	20,635	16,629	17,158	15,056	14,260	16,951	16,224	16,296
Professional and scientific instruments	38	5,013	5,103	5,222	5,530	5,992	7,055	8,705	9,542	10,119	11,441	11,976	12,149	13,458
Scientific and mechanical measuring instruments	381–82	D	D	D	1,959	2,366	3,346	D	5,156	5,681	6,952	7,146	D	8,135
Optical, surgical, photographic, and other instruments	384–87	D	D	D	3,571	3,626	3,709	D	4,386	4,438	4,489	4,831	D	5,323
Other manufacturing industries	27,31,39	D	382	D	D	D	D	D	D	D	D	D	D	2,798
Nonmanufacturing		6,714	7,446	7,844	10,513	14,031	20,793	28,446	28,933	30,831	28,846	32,036	32,803	36,514

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 2-53.
Total expenditures for industrial R&D (financed by company, Federal, and other funds), by industry and size of company: 1985–97
(Millions of current dollars)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Size of company													
Fewer than 500 employees	5,866	7,071	7,163	S	7,809	S	13,172	13,557	14,620	13,966	16,662	20,249	24,063
500 to 999	1,648	1,902	1,725	1,669	1,825	2,154	8,000	7,958	3,230	3,608	4,693	4,637	4,966
1,000 to 4,999	4,022	4,251	4,501	5,245	5,756	6,746	8,049	8,258	9,135	8,912	9,532	11,537	14,266
5,000 to 9,999	6,240	7,472	7,262	7,622	7,881	8,411	10,453	11,886	13,334	14,617	16,960	18,273	19,590
10,000 to 24,999	11,109	10,493	12,043	11,506	10,450	12,486	15,770	15,744	15,421	15,972	17,071	20,164	21,510
25,000 or more	55,354	56,991	59,461	63,694	68,335	71,030	61,508	61,707	61,659	62,519	67,185	69,808	73,144

D = data have been withheld to avoid disclosing operations of individual companies; S = imputation of more than 50 percent (for years prior to 1993, data have been withheld);
SIC = Standard Industrial Classification

NOTES: As a result of a new sample design, to better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries, data for 1991 and later years are not directly comparable with data for 1990 and earlier years.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS) , *Research and Development in Industry: 1997* (Arlington, VA: 1999)

See figures 2-8 and 2-41 in Volume I.

Appendix table 2-54.
Company and other (except Federal) funds for industrial R&D performance, by industry and size of company: 1985–97
(Millions of current dollars)

Industry	SIC code	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Total		57,043	59,932	61,403	66,672	73,501	81,602	90,580	94,388	94,591	97,131	108,652	121,015	133,611
Manufacturing		52,642	55,192	56,259	59,415	63,199	65,251	67,639	71,025	69,901	73,375	81,236	91,845	101,202
Food, kindred, and tobacco products	20,21	1,136	1,280	1,204	1,173	1,244	1,248	1,277	1,386	1,345	1,476	1,566	1,564	1,787
Textiles and apparel	22,23	218	246	243	215	S	260	236	261	286	316	381	414	476
Lumber, wood products, and furniture	24,25	147	144	137	165	192	216	200	234	196	201	229	634	348
Paper and allied products	26	576	538	604	752	879	1,059	1,174	1,182	1,191	1,263	1,404	1,534	1,456
Chemicals and allied products	28	8,310	8,664	9,445	10,828	11,943	13,168	14,439	15,091	16,658	16,559	17,337	17,520	18,628
Industrial chemicals	281–82,286	3,281	3,374	3,531	3,939	4,340	4,902	5,225	4,911	5,165	4,780	5,139	5,246	4,970
Drugs and medicines	283	3,481	3,657	4,095	4,900	5,512	5,917	6,947	7,934	9,132	9,625	10,202	9,769	11,586
Other chemicals	284–85,287–89	1,548	1,633	1,819	1,989	2,091	2,349	2,267	2,246	2,361	2,154	1,996	2,505	2,072
Petroleum refining and extraction	13,29	2,194	1,971	1,883	1,975	2,162	2,289	2,487	2,268	2,138	1,939	1,754	1,630	1,612
Rubber products	30	659	655	596	718	867	1,056	D	1,256	1,059	1,432	1,210	1,269	1,372
Stone, clay, and glass products	32	825	941	985	697	615	538	455	479	529	553	441	463	606
Primary metals	33	730	786	711	620	666	717	706	514	646	672	580	637	767
Ferrous metals and products	331–32,3398–99	323	336	249	252	244	231	225	221	272	241	217	214	414
Nonferrous metals and products	333–36	407	450	462	368	422	486	481	293	374	431	363	422	353
Fabricated metal products	34	780	800	633	718	726	736	748	723	936	868	937	1,322	1,669
Machinery	35	10,721	10,701	10,577	11,929	13,342	13,575	13,720	13,903	8,295	8,011	9,676	13,338	18,393
Office, computing, and accounting machines	357	8,418	8,380	8,193	9,347	10,725	10,988	10,419	10,614	4,917	4,078	4,699	8,132	12,787
Other machinery, except electrical	351–56,358–59	2,303	2,321	2,384	2,582	2,618	2,587	3,301	3,289	3,378	3,933	4,976	5,206	5,606
Electrical equipment	36	9,271	9,767	10,449	9,975	9,575	9,267	8,865	9,516	11,682	13,537	17,060	20,356	22,747
Radio and TV receiving equipment	365	350	133	139	149	96	114	D	93	87	64	114	140	152
Communication equipment	366	5,174	5,117	5,455	4,798	4,159	3,584	S	3,381	3,954	4,939	3,845	4,359	7,377
Electronic components	367	2,826	3,357	3,630	3,684	3,655	3,496	3,177	3,320	5,105	5,870	9,628	12,497	10,786
Other electrical equipment	361–64,369	921	1,160	1,225	1,345	1,664	2,073	D	2,722	2,537	2,664	3,473	3,360	4,432
Transportation equipment	37	12,092	13,567	13,462	13,910	14,596	14,264	14,858	16,292	16,640	17,695	19,311	20,535	19,742
Motor vehicles and motor vehicles equipment	371	6,164	7,171	7,167	7,783	8,756	8,594	9,063	9,132	10,659	11,950	13,590	14,528	13,758
Other transportation equipment	373–75,379	279	330	356	361	337	283	262	289	297	279	232	298	307
Aircraft and missiles	372,376	5,649	6,066	5,939	5,766	5,503	5,387	5,533	6,871	5,684	5,466	5,489	5,710	5,677
Professional and scientific instruments	38	4,622	4,752	4,950	5,339	5,729	6,318	6,840	7,321	7,542	8,058	8,516	8,207	8,958
Scientific and mechanical measuring instruments	381–82	1,596	1,521	1,598	1,863	2,205	2,696	3,017	3,013	3,196	3,687	3,787	3,283	3,719
Optical, surgical, photographic, and other instruments	384–87	3,026	3,231	3,352	3,476	3,524	3,621	3,823	4,308	4,346	4,371	4,729	4,924	5,240
Other manufacturing industries	27,31,39	361	380	380	401	438	541	D	599	758	796	835	2,423	2,642
Nonmanufacturing		4,401	4,740	5,144	7,257	10,302	16,351	22,941	23,363	24,690	23,756	27,415	29,170	32,409

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 2-54.
Company and other (except Federal) funds for industrial R&D performance, by industry and size of company: 1985–97
(Millions of current dollars)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Size of company													
Fewer than 500 employees	5,127	6,203	6,200	S	S	S	11,285	11,532	13,006	12,802	14,684	17,948	21,854
500 to 999	1,531	1,765	1,610	1,748	1,934	2,144	7,819	7,807	3,048	3,426	4,468	4,418	4,590
1,000 to 4,999	5,249	6,243	6,281	6,820	7,546	8,363	9,403	10,865	12,219	13,533	16,162	17,761	19,049
5,000 to 9,999	3,350	3,455	3,753	4,075	4,509	4,997	7,233	7,495	8,371	8,087	9,289	11,068	13,655
10,000 to 24,999	8,366	8,489	9,681	10,512	11,631	12,890	12,397	12,328	12,606	13,625	15,125	19,133	20,597
25,000 or more	33,420	33,777	33,878	36,785	40,703	45,106	42,443	44,361	45,340	45,658	48,924	50,686	53,866

D = data have been withheld to avoid disclosing operations of individual companies; S = imputation of more than 50 percent (for years prior to 1993, data have been withheld); SIC = Standard Industrial Classification

NOTES: Company funds include funds for industrial R&D work performed within company facilities from all sources except the Federal Government. The funds may be the companies' own or from outside organizations such as research institutions, universities and colleges, nonprofit organizations, other companies, and state governments. Company–financed R&D not performed within the company is excluded.

As a result of a new sample design, to better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries, data for 1991 and later years are not directly comparable with data for 1990 and earlier years.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Research and Development in Industry: 1997* (Arlington, VA: 1999).

See figure 2-8 in Volume I.

Appendix table 2-55.
Federal funds for industrial R&D performance, by industry and size of company: 1985–97
(Millions of current dollars)

	SIC code	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Industry														
Total		27,196	27,891	30,752	30,343	28,554	28,125	26,372	24,722	22,809	22,463	23,451	23,653	23,928
Manufacturing		24,883	25,185	28,052	27,088	24,826	23,683	20,867	19,152	16,669	17,373	18,831	20,020	19,823
Food, kindred, and tobacco products	20,21	D	D	2	D	D	D	0	0	0	0	0	0	0
Textiles and apparel	22,23	D	D	D	D	D	D	S	D	D	D	D	D	D
Lumber, wood products, and furniture	24,25	0	0	0	D	0	0	D	D	D	D	D	D	0
Paper and allied products	26	D	D	D	D	0	0	D	D	D	D	D	D	D
Chemicals and allied products	28	230	179	190	238	126	123	209	S	D	D	210 S	D	D
Industrial chemicals	281–82,286	217	178	185	232	111	109	165	S	D	D	D	D	D
Drugs and medicines	283	D	1	D	6	D	D	D	S	15	8	14	3	3 S
Other chemicals	284–85,287–89	D	0	D	0	D	D	D	S	D	D	D	0	D
Petroleum refining and extraction	13,29	D	D	14	22	S	S	11	9	14	10	6	24	D
Rubber products	30	D	D	D	D	D	D	D	D	D	D	D	D	D
Stone, clay, and glass products	32	D	9	10	D	D	D	D	D	9	38	6	5	2
Primary metals	33	D	D	19	17	22	D	8	S	23	17	13	D	221
Ferrous metals and products	331–32,3398–99	D	D	D	1	D	D	1	D	17	D	D	D	D
Nonferrous metals and products	333–36	9	8	D	16	D	D	7	D	6	D	D	D	D
Fabricated metal products	34	49	95	150	163	178	203	226	294	222	243	86	D	129
Machinery	35	1,495	D	D	D	D	871	1,055	1,035	86	99	D	117	106
Office, computing, and accounting machines	357	D	D	D	D	D	D	D	D	33	28	D	D	53
Other machinery, except electrical	351–56,358–59	D	75	44	101	112	D	D	D	53	71	64	D	53
Electrical equipment	36	5,161	5,213	5,399	4,153	3,743	4,133	4,550	3,844	1,667	1,801	1,690	2,143	1,839
Radio and TV receiving equipment	365	D	0	0	0	0	0	0	D	D	D	D	D	D
Communication equipment	366	4,223	4,552	4,729	3,630	2,911	2,344	D	D	D	D	D	D	D
Electronic components	367	559	D	656	449	369	418	D	247	206	162	D	D	D
Other electrical equipment	361–64,369	D	D	14	74	463	1,371	D	D	D	D	D	D	477
Transportation equipment	36	D	17,708	20,784	20,865	19,262	17,097	12,570	11,202	10,617	10,392	13,130	12,202	12,251
Motor vehicles and motor vehicles equipment	371	820	D	D	D	D	D	D	D	D	D	D	D	D
Other transportation equipment	373–75,379	D	D	D	D	D	D	D	D	D	D	D	D	D
Aircraft and missiles	372–376	16,582	14,984	18,519	18,402	16,828	15,248	11,096	S	9,372	8,794	11,462	10,515	10,619
Professional and scientific instruments	38	391	351	272	191	263	737	1,865	2,221	2,577	3,384	3,460 S	3,942	4,499
Scientific and mechanical measuring instruments	381–82	D	D	D	S	S	S	D	2,143	2,484	3,266	3,358 S	D	4,416
Optical, surgical, photographic, and other instruments	384–87	D	D	D	95	101	87	D	78	92	118	102	D	84
Other manufacturing industries	27,31,39	D	2	D	D	D	D	D	61	D	D	D	D	156
Nonmanufacturing industries		2,313	2,706	2,700	3,256	3,729	4,442	5,505	5,570	6,140	5,090	4,620	3,633	4,150

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 2-55.
Federal funds for industrial R&D performance, by industry and size of company: 1985–97
(Millions of current dollars)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Size of company													
Fewer than 500 employees	739	868	963	816	901	895	1,887	2,025	1,614	1,164	1,978	2,301	2,209
500 to 999	117	137	115	131	117	S	181	151	182	182	225	219	376
1,000 to 4,999	991	1,229	981	1,093	958	881	1,050	S	1,115	1,083	798	512	540
5,000 to 9,999	672	796	748	864	740	257	816	763	764	825	243	468	612
10,000 to 24,999	2,743	2,004	2,362	1,705	1,129	1,526	3,373	3,416	2,816	2,348	1,946 S	1,031 S	913
25,000 or more	21,934	23,213	25,583	25,734	24,709	24,436	19,065	17,346	16,319	16,862	18,261	19,122	19,277

D = data have been withheld to avoid disclosing operations of individual companies; S = imputation of more than 50 percent (for years prior to 1993, data have been withheld); SIC = Standard Industrial Classification

NOTE: As a result of a new sample to better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries, data for 1991 and later years are not directly comparable to data for 1990 and earlier years.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Research and Development in Industry: 1997* (Arlington, VA: 1999).

See figure 2-8 in Volume I.

Appendix table 2-56.
Concentration of total, Federal, company, and other R&D funds and net sales of R&D–performing companies, by size of R&D program: 1985–97

Companies ranked by size of R&D program	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Percent of total (company, Federal, and other) R&D funds													
First 4 (1–4)	18	19	19	18	19	18	16	15	17	15	16	15	14
Next 4 (5–8)	12	11	12	12	13	13	8	8	7	8	8	8	8
Next 12 (9–20)	17	14	16	17	16	15	12	13	13	14	13	13	13
Next 20 (21–40)	13	13	12	12	12	12	11	11	12	13	12	12	11
Next 60 (41–100)	16	15	14	15	15	16	15	15	16	15	14	14	14
Next 100 (101–200)	9	10	8	8	8	9	12	12	8	9	8	9	9
Next 200 (201–400)	5	8	6	7	6	7	6	6	7	7	7	7	8
Percent of Federal R&D funds													
First 4 (1–4)	29	30	31	31	36	38	14	11	23	26	35	37	40
Next 4 (5–8)	15	16	18	18	15	16	21	18	17	19	19	20	23
Next 12 (9–20)	27	28	27	27	30	26	21	27	32	32	27	23	18
Next 20 (21–40)	16	15	15	15	11	12	15	13	16	13	8	7	7
Next 60 (41–100)	7	7	7	6	6	6	13	11	5	7	5	5	5
Next 100 (101–200)	2	2	1	3	1	1	3	4	5	2	3	4	3
Next 200 (201–400)	0	1	0	0	0	0	2	2	2	1	3	4	4
Percent of company and other (except Federal) R&D funds													
First 4 (1–4)	23	20	20	21	22	21	17	17	17	16	16	15	13
Next 4 (5–8)	7	7	7	7	7	7	7	8	7	7	7	7	7
Next 12 (9–20)	12	12	12	12	13	12	10	12	12	12	11	11	11
Next 20 (21–40)	12	10	11	12	12	13	10	11	11	11	11	10	11
Next 60 (41–100)	18	16	16	16	16	17	16	17	14	14	14	14	13
Next 100 (101–200)	10	10	10	10	10	10	15	14	9	9	9	10	10
Next 200 (201–400)	7	8	8	8	8	8	7	7	8	8	8	8	9
Percent of net sales ranked by size of total R&D funds													
First 4 (1–4)	8	8	7	7	6	8	7	8	8	8	8	6	6
Next 4 (5–8)	4	5	5	5	5	4	3	3	3	2	2	3	2
Next 12 (9–20)	5	5	5	5	5	5	4	4	4	5	6	6	5
Next 20 (21–40)	8	7	7	6	5	5	4	4	4	5	4	4	5
Next 60 (41–100)	12	10	11	11	12	12	12	12	11	10	9	8	7
Next 100 (101–200)	13	10	8	9	8	9	9	9	8	8	8	11	8
Next 200 (201–400)	15	9	12	10	11	12	11	11	10	10	10	11	13

NOTES: Companies were ranked individually for each year; therefore, particular companies comprising the size groups may have changed from year to year.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Research and Development in Industry: 1997* (Arlington, VA: 1999).

Appendix table 2-57.
Company and other (except Federal) R&D funds as a percentage of net sales by industry and size of company: 1985–97
(Percentages)

Industry	SIC code	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Total		NA	NA	NA	NA	NA	NA	NA	NA	NA	2.7	2.8	3.0	2.9
Manufacturing		3.0	3.2	3.1	3.1	3.1	3.1	3.2	3.3	3.1	2.9	2.9	3.3	3.3
Food, kindred, and tobacco products	20,21	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5
Textiles and apparel	22,23	0.5	0.5	0.4	0.4	0.5	0.6	0.6	0.6	0.6	0.6	0.9	0.8	0.9
Lumber, wood products, and furniture	24,25	0.8	0.6	0.6	0.6	0.6	0.6	0.9	0.9	0.7	0.6	0.7	1.4	0.9
Paper and allied products	26	0.8	0.7	0.6	0.8	0.8	1.0	1.1	1.0	1.1	1.0	1.0	1.2	1.1
Chemicals and allied products	28	4.9	5.1	5.2	5.2	5.4	5.3	5.3	5.4	6.0	5.1	4.7	5.3	5.3
Industrial chemicals	281–82,286	4.2	4.4	4.4	4.2	4.1	4.4	4.4	4.4	4.4	3.3	3.9	3.7	3.5
Drugs and medicines	283	8.0	8.4	8.7	8.8	8.9	8.8	8.9	9.6	12.5	10.2	10.4	10.1	10.5
Other chemicals	284–85,287–89	3.1	3.3	3.3	3.4	3.9	3.4	3.0	2.7	2.7	2.5	1.4	2.7	2.1
Petroleum refining and extraction	13,29	0.9	1.1	1.0	1.0	0.9	0.9	1.0	0.9	0.9	0.8	0.7	0.7	0.6
Rubber products	30	1.8	1.7	1.6	1.7	1.9	2.1	2.3	2.3	2.1	2.3	1.6	1.8	1.4
Stone, clay, and glass products	32	2.3	2.4	2.5	2.0	1.8	1.7	1.6	1.6	1.5	1.5	1.5	1.2	1.8
Primary metals	33	0.9	1.0	0.9	0.7	0.7	0.8	0.8	0.6	0.7	0.6	0.5	0.6	0.6
Ferrous metals and products	331–32,3398–99	0.5	0.7	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.3	0.3	0.4	0.6
Nonferrous metals and products	333–36	1.4	1.5	1.3	1.0	1.0	1.2	1.2	0.7	1.2	0.9	0.7	1.0	0.6
Fabricated metal products	34	1.4	1.4	1.2	1.1	1.2	1.1	1.2	1.1	1.1	1.0	1.1	1.4	1.5
Machinery	35	6.7	7.3	7.1	6.8	7.3	7.2	7.5	7.3	4.5	3.8	3.6	5.1	5.6
Office, computing, and accounting machines	357	12.4	12.4	12.3	11.2	13.1	14.4	14.9	13.7	9.8	7.9	8.1	9.9	9.2
Other machinery, except electrical	351–56,358–59	2.6	2.9	3.0	2.8	2.6	2.3	2.9	2.9	2.5	2.5	2.4	2.9	3.0
Electrical equipment	36	4.8	5.1	5.4	5.3	5.2	4.5	4.3	4.0	5.4	5.2	5.4	6.1	5.7
Radio and TV receiving equipment	365	4.3	3.6	3.2	2.4	1.8	1.6	1.0	0.6	4.0	1.0	1.6	2.0	2.6
Communication equipment	366	5.4	5.2	5.5	6.1	6.8	6.1	S	7.0	10.1	10.3	8.0	8.5	8.0
Electronic components	367	8.2	9.2	8.5	8.0	7.7	7.4	7.2	7.0	7.8	7.3	8.0	8.5	8.1
Other electrical equipment	361–64,369	2.0	2.2	2.6	2.3	2.3	2.2	2.2	2.1	2.3	2.1	2.5	2.6	2.7
Transportation equipment	37	3.4	3.6	3.4	3.5	3.5	3.4	4.0	4.2	3.9	3.7	3.6	4.1	3.8
Motor vehicles and motor vehicles equipment	371	3.1	3.3	3.4	3.4	3.7	3.7	4.1	4.0	3.7	3.4	3.6	4.2	3.8
Other transportation equipment	373–75,379	2.3	2.7	2.5	2.6	2.5	2.1	2.1	2.1	1.9	1.2	0.9	1.2	2.2
Aircraft and missiles	372,376	3.9	4.0	3.6	3.9	3.3	3.1	4.0	4.7	4.7	5.3	4.2	4.5	3.9
Professional and scientific instruments	38	8.3	8.2	7.5	7.1	6.8	7.1	7.1	7.2	7.2	6.5	7.3	7.7	7.7
Scientific and mechanical measuring instruments	381–82	8.4	8.4	8.1	7.6	6.9	6.9	6.3	6.2	6.4	5.8	6.6	6.7	6.5
Optical, surgical, photographic, and other instruments	384–87	8.1	8.0	7.2	7.1	7.1	7.5	8.0	8.2	7.9	7.2	8.0	8.6	8.9
Other manufacturing industries	27,31,39	1.0	1.2	1.1	1.0	0.9	0.9	0.8	1.3	1.3	1.1	1.2	2.5	2.0
Nonmanufacturing industries		NA	NA	NA	NA	NA	NA	NA	NA	NA	2.2	2.4	2.2	2.2

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 2-57.
Company and other (except Federal) R&D funds as a percentage of net sales by industry and size of company: 1985–97
(Percentages)

Size of company	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Fewer than 500 employees	3.4	4.0	3.8	3.7	3.5	3.3	3.2	3.2	3.6	2.5	3.9	5.3	5.7
500 to 999	2.2	2.2	2.2	1.7	1.7	1.7	2.4	2.7	2.7	2.5	3.0	3.0	2.8
1,000 to 4,999	2.4	2.4	2.4	2.3	2.1	1.9	2.4	2.7	2.5	2.5	2.6	2.9	2.6
5,000 to 9,999	1.8	2.0	2.0	2.0	2.1	2.8	2.9	2.8	2.8	2.2	2.0	2.6	2.4
10,000 to 24,999	2.5	2.6	2.5	2.6	2.5	2.5	3.0	2.6	2.5	2.5	2.0	2.4	2.5
25,000 or more	3.5	3.7	3.8	3.7	3.7	3.6	3.8	4.0	3.7	3.6	3.1	2.9	2.9

NA = not available; SIC = Standard Industrial Classification

NOTES: As a result of a new sample design, to better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries, data for 1991 and later years are not directly comparable with data for 1990 and earlier years. Beginning with data from the 1995 survey (in which 1994 data were also collected), this table includes both manufacturing and nonmanufacturing companies. Only manufacturing companies were included in prior years. Beginning in 1996 manufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year–to–year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries". Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries". As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" after 1995 are not comparable with statistics for prior years.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Research and Development in Industry: 1997* (Arlington, VA: 1999).

Appendix table 2-58.
The 100 leading industrial R&D companies, ranked by size of R&D expenditures in 1997

Rank	Company	R&D expenditures (millions)	Sales (millions)	Number of Employees	Percent Change in R&D From the Previous Year	Industrial Category
1	General Motors Corp	8,200.0	168,190	608,000	–7.87	Motor vehicles & motor vehicle equipment
2	Ford Motor Co	6,327.0	153,627	363,892	–7.24	Motor vehicles & motor vehicle equipment
3	Intl Business Machines Corp	4,307.0	78,508	269,465	9.48	Electronic computers and computer terminals
4	Lucent Technologies Inc	3,100.6	26,360	134,000	68.69	Modems & other wired telephone equipment
5	Hewlett–Packard Co	3,078.0	42,895	121,900	13.25	Electronic computers and computer terminals
6	Motorola Inc	2,748.0	29,794	150,000	14.79	Radio, TV, cell phone, and satellite communication equip.
7	Intel Corp	2,347.0	25,070	63,700	29.81	Electronic components (semiconductors, coils…)
8	Johnson & Johnson	2,140.0	22,629	90,500	12.34	Drugs: pharmaceutical preparations
9	Pfizer Inc	1,928.0	12,504	49,200	14.49	Drugs: pharmaceutical preparations
10	Microsoft Corp	1,925.0	11,358	22,232	34.43	Prepackaged software
11	Boeing Co	1,924.0	45,800	238,000	60.33	Aircraft, guided missiles & space vehicles
12	Chrysler Corp	1,700.0	58,622	121,000	6.25	Motor vehicles & motor vehicle equipment
13	Merck & Co	1,683.7	23,637	53,800	13.21	Drugs: pharmaceutical preparations
14	American Home Products Corp	1,558.0	14,196	60,523	9.02	Drugs: pharmaceutical preparations
15	General Electric Co	1,480.0	88,540	276,000	4.15	Electrical equipment (industrial & household)
16	Bristol Myers Squibb	1,385.0	16,701	53,600	8.54	Drugs: pharmaceutical preparations
17	Lilly (ELI) & Co	1,382.0	8,518	31,100	16.18	Drugs: pharmaceutical preparations
18	Abbott Laboratories	1,302.4	11,883	54,487	8.10	Drugs: pharmaceutical preparations
19	Proctor & Gamble Co	1,282.0	35,764	106,000	5.00	Other chem. (soaps, ink, paints, fertilizers, explosives…)
20	Pharmacia & Upjohn Inc	1,217.0	6,710	30,000	–3.87	Drugs: pharmaceutical preparations
21	United Technologies Corp	1,187.0	24,713	180,100	5.79	Aircraft, guided missiles & space vehicles
22	Du Pont (E I) De Nemours	1,142.2	39,911	98,000	10.68	Industrial chem.; plastic and other synthetic materials
23	Xerox Corp	1,079.0	18,166	91,400	3.35	Opthalmic goods, photogrph. equip. & clocks
24	Texas Instruments Inc	1,075.0	9,750	44,140	8.70	Electronic components (semiconductors, coils…)
25	Eastman Kodak Co	1,047.7	14,538	97,500	1.92	Opthalmic goods, photogrph. equip. & clocks
26	Digital Equipment	1,014.0	13,047	54,900	–4.54	Computer storage devices
27	Minnesota Mining & MFG Co	1,002.0	15,070	75,639	5.81	Paper & allied products
28	Monsanto Co	939.0	7,514	21,900	28.98	Industrial chem.; plastic and other synthetic materials
29	Schering–Plough	847.0	6,778	22,700	17.18	Drugs: pharmaceutical preparations
30	AT&T Corp	829.0	51,319	127,800	0.85	Communicatons serv. (phone, statellite, radio/TV, cable…)
31	Sun Microsystems Inc	826.0	8,598	21,500	25.70	Electronic computers and computer terminals
32	Compaq Computer Corp	817.0	24,584	32,565	100.74	Electronic computers and computer terminals
33	Lockheed Martin Corp	788.0	28,069	173,000	0.51	Aircraft, guided missiles & space vehicles
34	Dow Chemical	785.0	20,065	42,861	3.15	Industrial chem.; plastic and other synthetic materials

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 2-58.
The 100 leading industrial R&D companies, ranked by size of R&D expenditures in 1997

Rank	Company	R&D expenditures (millions)	Sales (millions)	Number of Employees	Percent Change in R&D From the Previous Year	Industrial Category
35	Oracle Corp	719.1	7,144	36,802	29.46	Prepackaged software
36	Rockwell Intl Corp	714.0	7,762	45,000	3.33	Electrical equipment (industrial & household)
37	Cisco Systems Inc	698.2	6,440	11,000	74.86	Computer networking communications equip.
38	Warner–Lambert Co	672.2	8,180	40,000	21.16	Drugs: pharmaceutical preparations
39	TRW Inc	650.0	10,831	79,700	16.91	Motor vehicles & motor vehicle equipment
40	Amgen Inc	630.8	2,401	5,308	19.40	Drugs: biological products, except diagnostic substances
41	3COM Corp	581.6	5,420	12,920	73.47	Computer networking communications equip.
42	Applied Materials Inc	567.6	4,074	13,924	17.91	Machinery (indus., farm, services, mining & construction)
43	Philip Morris Cos Inc	533.0	56,114	152,000	3.50	Food & kindred products; tobacco products
44	Exxon Corp	529.0	120,279	80,000	1.73	Oil and gas extraction; petrol. reflining and related ind.
45	Caterpillar Inc	528.0	18,925	59,863	28.78	Machinery (indus., farm, services, mining & construction)
46	ITT Industries Inc	496.9	8,777	58,500	–7.16	Motor vehicles & motor vehicle equipment
47	Schlumberger LTD	486.2	10,648	63,500	7.42	Oil and gas extraction; petrol. reflining and related ind.
48	Apple Computer Inc	485.0	7,081	10,176	–19.70	Electronic computers and computer terminals
49	National Semiconductor Corp	482.0	2,537	13,000	29.54	Electronic components (semiconductors, coils…)
50	Silicon Graphics Inc	479.1	3,663	10,930	35.55	Electronic computers and computer terminals
51	Advanced Micro Devices	467.9	2,356	12,800	16.77	Electronic components (semiconductors, coils…)
52	Seagate Technology	462.2	8,940	111,000	9.94	Computer storage devices
53	NCR Corp	447.0	6,589	38,300	0.68	Electronic computers and computer terminals
54	Honeywell Inc	446.6	8,028	57,500	26.41	Laboratory controlling & measuring instruments
55	Emerson Electric Co	445.1	12,299	100,700	11.64	Laboratory controlling & measuring instruments
56	Raytheon Co–CL B	415.1	13,673	119,200	28.41	Search & navigation equipment
57	Deere & Co	412.3	12,636	34,400	11.34	Machinery (indus., farm, services, mining & construction)
58	Genentech Inc	403.3	948	3,242	–7.09	Drugs: pharmaceutical preparations
59	Baxter International Inc	392.0	6,138	41,000	15.29	Medical instruments
60	Goodyear Tire & Rubber Co	384.1	13,155	95,302	2.56	Rubber and misc. plastic prod. (tires, plastic footwear…)
61	Computer Associates Intl Inc	369.0	4,719	NA	–15.56	Prepackaged software
62	Alliedsignal Inc	349.0	14,472	70,500	1.16	Aircraft, guided missiles & space vehicles
63	Quantum Corp	321.7	5,805	6,219	10.42	Computer storage devices
64	Amp Inc	319.6	5,745	46,526	1.43	Electronic components (semiconductors, coils…)
65	Eaton Corp	319.0	7,563	49,000	19.48	Electrical equipment (industrial & household)
66	Unisys Corp	302.3	6,636	32,600	–11.84	Electronic computers and computer terminals
67	Medtronic Inc	297.2	2,605	13,954	6.06	Medical instruments
68	Automatic Data Processing	296.5	4,112	30,000	18.77	Multiple & miscellaneous computer & data processing services

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 2-58.
The 100 leading industrial R&D companies, ranked by size of R&D expenditures in 1997

Rank	Company	R&D expenditures (millions)	Sales (millions)	Number of Employees	Percent Change in R&D From the Previous Year	Industrial Category
69	Chiron Corp	296.5	1,056	6,482	10.92	Drugs: in vitro, in vivo diagnostic substances
70	Novell Inc	282.7	1,007	4,770	2.57	Prepackaged software
71	Bay Networks Inc	269.8	2,093	NA	26.35	Computer networking communications equip.
72	Northrop Grumman Corp	256.0	9,153	52,000	0.39	Search & navigation equipment
73	DSC Communications Corp	252.1	1,575	6,681	20.00	Modems & other wired telephone equipment
74	Corning Inc.	250.7	4,129	20,500	31.05	Stone, clay, glass, & concrete products
75	PPG Industries Inc	250.0	7,379	31,900	4.56	Other chem. (soaps, ink, paints, fertilizers, explosives…)
76	Cummins Engine	250.0	5,625	26,300	6.38	Machinery (indus., farm, services, mining & construction)
77	Qualcomm Inc	235.9	2,096	9,000	45.31	Radio, TV, cell phone, and satellite communication eq.
78	Mobil Corp	234.0	58,399	42,700	13.59	Oil and gas extraction; petrol. reflining and related ind.
79	Johnson Controls Inc	232.0	11,145	72,300	40.61	Lumber, wood products, & furniture
80	LSI Logic Corp	229.1	1,290	4,443	24.21	Electronic components (semiconductors, coils…)
81	Textron Inc	222.0	10,544	64,000	20.00	Aircraft, guided missiles & space vehicles
82	EMC Corp/Ma	220.9	2,938	6,400	37.13	Computer storage devices
83	Ingersoll–Rand Co	215.5	7,103	46,567	2.96	Machinery (indus., farm, services, mining & construction)
84	Gillette Co	212.0	10,062	44,000	3.92	Fabricated metal products, except machinery & transp. eq.
85	Kimberly–Clark Corp	211.8	12,547	57,000	1.88	Paper & allied products
86	Storage Technology CP–CL A	209.5	2,145	8,300	18.75	Computer storage devices
87	Micron Technology Inc	208.9	3,516	12,200	8.86	Electronic components (semiconductors, coils…)
88	Guidant Corp	208.3	1,328	6,017	36.59	Medical instruments
89	General Instrument Corp	207.8	1,764	7,350	–0.70	Radio, TV, cell phone, and satellite communication eq.
90	Rohm & Haas Co	201.0	3,999	11,592	7.49	Industrial chem.; plastic and other synthetic materials
91	Shell Oil Co	199.0	28,268	19,904	15.03	Oil and gas extraction; petrol. reflining and related ind.
92	Boston Scientific Corp	196.7	1,872	11,000	–7.35	Medical instruments
93	Analog Devices	196.1	1,243	7,500	10.31	Electronic components (semiconductors, coils…)
94	Case Corp	196.0	6,024	18,300	1.55	Machinery (indus., farm, services, mining & construction)
95	Imation Corp	194.9	2,202	9,800	6.44	Opthalmic goods, photogrph. equip. & clocks
96	Dana Corp	193.0	8,769	47,900	17.68	Motor vehicles & motor vehicle equipment
97	Thermo Electron Corp	191.6	3,558	22,400	24.05	Laboratory controlling & measuring instruments
98	Eastman Chemical Co	191.0	4,678	16,076	3.80	Industrial chem.; plastic and other synthetic materials
99	Cabletron Systems	181.8	1,377	6,887	12.45	Computer networking communications equip.
100	Whirlpool Corp	181.0	8,617	61,370	–8.12	Electrical equipment (industrial & household)

NA = not available

SOURCE: Carl Shepherd and Steven Payson, *U.S. Corporate R&D, Volume II*, a report jointly prepared by the U.S. Department of Commerce/Office of Technology Policy and the National Science Foundation, Division of Science Resources Studies, NSF 00-302 (Arlington, VA: 1999).

Appendix table 2-59.
Discrepancy between Federal R&D support as reported by performers and by federal agencies: 1980–98
(Billions of dollars)

	All performers			Industrial performers		
Year	Performer–reported	Agency–reported	Difference	Performer–reported	Agency–reported	Difference
1980	30.0	29.8	0.2	12.8	13.0	–0.2
1981	33.7	33.1	0.6	15.0	14.9	0.1
1982	37.2	36.4	0.8	17.1	17.2	–0.1
1983	41.6	38.7	2.9	19.1	17.0	2.1
1984	46.6	42.2	4.4	21.7	18.6	3.1
1985	52.7	48.4	4.3	25.3	21.7	3.6
1986	54.7	51.4	3.3	26.0	24.2	1.8
1987	58.5	55.3	3.2	28.8	26.8	2.0
1988	60.2	56.8	3.4	28.2	26.7	1.5
1989	60.5	61.4	–0.9	26.4	28.5	–2.1
1990	61.7	63.6	–1.9	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	29.7	–7.3
1993	60.5	67.3	–6.8	20.8	30.2	–9.4
1994	60.9	67.2	–6.3	20.3	30.5	–10.2
1995	63.2	68.2	–5.0	21.2	30.2	–9.0
1996	63.5	67.7	–4.2	21.4	30.4	–9.0
1997	64.9	69.8	–4.9	21.8	31.4	–9.6
1998 preliminary	66.9	72.1	–5.2	22.2	32.3	–10.1

NOTES: Performer–reported data are expenditures, and agency–reported data are obligations. Data for 1998 are preliminary. The differences in the two series are derived from unrounded data, not shown in the table.

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources: 1998*, NSF 99–335, by Steven Payson (Arlington, VA: 1999) and NSF/SRS, *Federal Funds for Research and Development: Fiscal Years 1997, 1998, and 1999, Detailed Statistical Tables,* NSF 99–333, Project Officer, Ronald L. Meeks (Arlington, VA: 1999).

See figure 2-35 in Volume I.

Appendix table 2-60.
Indicators of Federal technology transfer activities: FYs 1987–98

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Number of active CRADA projects, by Federal agencies												
All Agencies	34	98	271	460	731	1,078	1,628	2,471	3,121	3,688	3,239	3,201
Agriculture	9	51	98	128	177	172	172	208	229	244	273	288
Commerce	0	9	44	82	115	177	292	368	407	406	377	337
Defense	3	10	36	113	193	277	365	563	845	1,086	1,360	1,424
Air Force	0	2	7	13	26	6	25	32	66	223	251	246
Army	3	8	27	80	115	212	260	389	549	531	740	817
Navy	0	0	2	20	52	59	80	142	230	332	369	361
Energy	0	0	0	1	43	250	582	1,094	1,392	1,677	963	868
EPA	0	0	2	11	31	30	28	35	30	35	34	37
HHS	22	28	89	110	144	146	149	147	152	158	161	163
Interior	0	0	1	12	11	1	3	9	15	22	23	30
NASA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Transportation	0	0	0	1	9	17	30	38	37	43	36	39
VA	0	0	1	2	8	8	7	9	14	17	12	15
Patent applications on Federal inventions												
All Agencies	848	1,131	1,466	1,673	1,900	1,817	1,838	1,661	1,740	1,666	1,789	1,844
Agriculture	44	50	71	76	110	70	68	40	80	91	56	64
Commerce	8	15	28	28	18	53	43	41	35	60	49	66
Defense	343	447	616	807	919	850	835	732	759	716	735	755
Air Force	49	47	122	145	178	155	161	122	148	108	100	116
Army	177	203	216	236	274	260	246	232	218	204	192	219
Navy	117	197	278	426	467	435	428	378	393	404	443	420
Energy	252	336	382	366	397	432	497	543	571	564	705	751
EPA	4	5	5	6	8	12	15	15	24	18	13	11
HHS	98	145	225	239	261	224	193	171	166	147	148	132
Interior	5	4	11	15	21	1	2	2	2	2	2	5
NASA	94	129	125	127	165	175	185	116	101	66	79	55
Transportation	0	0	0	1	1	0	0	1	2	2	1	3
VA	NA	NA	3	8	NA	0	0	0	0	0	1	2
Inventions disclosed by Federal laboratory inventors												
All Agencies	2,662	3,047	3,168	3,772	4,213	3,901	3,538	3,753	4,016	4,153	3,842	3,503
Agriculture	83	144	127	158	127	83	110	111	133	129	260	208
Commerce	43	31	49	46	30	55	66	51	65	71	58	40
Defense	953	1,147	1,153	1,383	1,383	1,283	1,189	1,172	1,168	1,115	1,150	1,028
Air Force	83	90	169	160	102	160	140	140	200	190	138	121
Army	248	348	276	376	463	438	413	388	363	338	312	264
Navy	622	709	708	847	959	685	636	644	605	587	700	643
Energy	857	1,003	1,053	1,335	1,666	1,698	1,443	1,588	1,758	1,886	1,500	1,313
EPA	0	0	0	12	20	9	22	19	15	20	9	14

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 2-60.
Indicators of Federal technology transfer activities: FYs 1987–98

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Inventions disclosed by Federal laboratory inventors–continued												
HHS	194	226	209	215	215	311	282	307	307	305	268	287
Interior	3	6	3	26	26	1	2	2	2	2	5	5
NASA	496	462	532	538	570	416	384	457	532	550	550	554
Transportation	0	0	0	1	2	1	1	1	0	4	2	4
VA	33	28	42	58	33	44	39	45	36	71	40	50
Invention patent licenses granted by Federal agency to industry												
All Agencies	128	129	150	164	206	239	260	337	408	462	502	510
Agriculture	30	24	23	33	29	31	28	9	21	26	22	23
Commerce	0	0	1	0	2	5	3	3	4	10	11	17
Defense	10	10	14	15	25	12	17	16	22	22	34	34
Air Force	1	2	2	4	1	1	3	3	4	6	7	5
Army	3	6	2	3	9	7	3	12	12	19	14	13
Navy	6	2	10	8	15	11	14	13	18	16	13	16
Energy	37	43	57	62	75	81	96	118	140	154	175	162
EPA	0	0	0	1	2	2	2	9	1	2	1	0
HHS	35	42	48	47	69	96	99	151	176	193	208	215
Interior	3	3	0	0	0	0	0	8	3	0	0	0
NASA	13	7	7	6	4	5	12	11	29	36	51	58
Transportation	0	0	0	0	0	0	0	0	0	0	0	1
VA	0	0	0	0	0	0	0	0	0	0	0	0
Income from invention patent licenses by Federal agencies and laboratories in thousands of current dollars												
All Agencies	4,925	6,348	7,337	9,429	18,163	14,070	18,570	26,641	27,922	36,969	50,234	57,563
Agriculture	133	120	420	559	836	1,044	1,483	1,450	1,635	2,091	2,300	2,400
Commerce	34	81	62	52	26	0	0	0	0	0	196	241
Defense	44	49	211	239	286	331	567	1,081	646	836	924	1,560
Air Force	27	31	27	44	43	47	90	59	102	142	190	212
Army	10	5	41	58	113	78	77	110	100	335	256	430
Navy	7	13	143	137	130	206	400	912	444	359	478	918
Energy	346	545	1,499	2,560	3,193	2,369	2,703	2,915	3,455	4,122	8,009	10,536
EPA	0	0	0	3	74	60	75	230	110	300	60	100
HHS	4,245	5,434	4,804	5,839	13,384	10,133	13,584	18,654	19,727	27,277	35,692	39,500
Interior	46	38	61	41	58	0	0	2,000	2,000	2,000	2,000	2,000
NASA	73	79	84	113	292	133	158	311	349	343	1,053	1,226
Transportation	0	0	163	7	14	0	0	0	0	0	0	0
VA	4	2	33	16	0	0	0	0	0	0	0	0

CRADA = cooperative research and development agreement; EPA = Environmental Protection Agency; HHS = Health and Human Services; NASA = National Aeronautics and Space Administration

NA = Not available.

SOURCE: Department of Commerce, Technology Administration (unpublished tabulations).

See figure 2-24 in Volume I.

Appendix table 2-61.
Advanced Technology Program awards: 1990–98

	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
Number of awards	11	28	21	29	88	103	8	64	79	431
Single applicants	6	18	18	24	50	62	6	49	52	285
Joint ventures	5	10	3	5	38	41	2	15	27	146
Total participants[a]	35	83	32	50	211	318	12	101	168	1,010
Resubmittals	NA	3	7	6	4	17	2	18	12	69
Funding ($ millions)	98	202	97	118	640	827	37	304	460	2,783
ATP share	46	93	48	60	309	414	19	162	235	1,386
To joint ventures	38	65	19	19	216	304	9	75	143	888
To single applicants	8	28	29	41	93	110	10	87	92	498
Industry share	52	109	49	58	331	413	18	142	225	1,397
From joint ventures	45	83	19	20	233	340	10	81	157	988
From single applicants	7	26	30	38	98	73	8	61	68	409

NA = not available; ATP = Advanced Technology Program

NOTE: Funding of each award is the total in a period of two to five years.

[a]Total participants include single applicants, joint venture leads, and joint venture participants. This category excludes subcontractors, informal collaborators with joint ventures, and collaborators and strategic partners of single applicants.

SOURCE: U.S. Department of Commerce, Advanced Technology Program, unpublished tabulations.

See figure 2-26 in Volume I.

Science & Engineering Indicators – 2000

Appendix table 2-62.
Number of new joint research filings, by year and by selected industry: 1985–98

Year	Total	Petroleum	Chemicals	Machinery	Electrical Equip.	Transportation	Communication Services	All Others
1985	50	2	4	1	6	18	8	11
1986	17	2	3	0	1	3	0	8
1987	26	3	1	1	3	4	6	8
1988	31	4	5	0	5	4	8	5
1989	27	6	1	1	6	2	7	4
1990	46	7	8	1	6	1	16	7
1991	61	17	8	3	4	9	17	3
1992	59	15	4	2	4	5	17	12
1993	73	13	4	5	12	5	21	13
1994	63	10	3	1	16	13	8	12
1995	115	17	9	7	32	15	11	24
1996	97	17	7	10	12	21	9	21
1997	45	5	4	1	6	11	1	17
1998	31	4	4	6	7	4	2	4
Totals	741	122	65	39	120	115	131	149

NOTE: Data based on industry filings to the National Cooperative Research and Production Act, listed in the Federal Register.

SOURCE: A.N. Link, University of North Carolina–Greensboro (unpublished tabulations from CORE database).

See figure 2-25 in Volume I.

Appendix table 2-63.
International R&D expenditures and R&D as a percentage of GDP: 1981–98

Year	United States	Japan[a]	Germany[b]	France	United Kingdom	Italy	Canada
Total R&D expenditures in billions of constant 1992 U.S. dollars[c]							
1981	109.5	NA	23.4	16.6	17.3	6.9	5.3
1982	115.2	36.9	24.2	17.7	NA	7.1	5.7
1983	123.1	40.0	24.7	18.3	16.9	7.6	5.8
1984	134.8	43.5	25.5	19.5	NA	8.3	6.3
1985	146.1	48.3	28.3	20.3	18.4	9.6	6.9
1986	149.3	49.0	29.1	20.6	19.3	9.9	7.2
1987	152.0	52.5	31.3	21.5	19.7	10.7	7.2
1988	155.5	56.6	32.4	22.5	20.3	11.4	7.4
1989	158.2	62.0	33.7	23.9	20.9	12.0	7.6
1990	162.4	67.3	34.1	25.4	21.3	12.8	8.0
1991	165.3	68.8	36.6	25.7	19.6	12.4	8.1
1992	165.2	69.2	36.8	26.4	20.6	12.3	8.3
1993	161.2	67.4	35.5	25.8	20.7	11.2	8.8
1994	160.7	66.4	35.5	25.2	20.7	10.8	9.1
1995	170.4	73.6	36.6	25.7	20.1	10.7	9.7
1996	179.4	77.9	36.4	25.4	20.4	11.0	9.9
1997	189.4	80.9	37.6	25.0	20.3	11.9	10.3
1998	201.6	NA	38.6	NA	NA	12.3	10.6
R&D expenditures as a percentage of GDP							
1981	2.32	NA	2.43	1.97	2.37	0.88	1.25
1982	2.49	2.22	2.52	2.06	NA	0.91	1.40
1983	2.56	2.35	2.52	2.11	2.19	0.95	1.37
1984	2.62	2.43	2.51	2.21	NA	1.01	1.41
1985	2.74	2.58	2.72	2.25	2.23	1.13	1.45
1986	2.72	2.55	2.73	2.23	2.25	1.13	1.49
1987	2.69	2.62	2.88	2.27	2.19	1.19	1.44
1988	2.65	2.66	2.86	2.28	2.14	1.22	1.39
1989	2.61	2.77	2.87	2.33	2.15	1.24	1.39
1990	2.65	2.85	2.75	2.41	2.18	1.30	1.47
1991	2.72	2.82	2.61	2.41	2.11	1.24	1.53
1992	2.65	2.76	2.48	2.42	2.13	1.20	1.54
1993	2.52	2.68	2.42	2.45	2.15	1.14	1.60
1994	2.43	2.63	2.32	2.38	2.11	1.06	1.60
1995	2.52	2.77	2.31	2.34	2.02	1.01	1.58
1996	2.57	2.83	2.30	2.32	1.95	1.02	1.60
1997	2.60	2.92	2.31	2.23	1.87	1.08	1.60
1998	2.67	NA	2.33	NA	NA	1.11	1.60

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 2-63.
International R&D expenditures and R&D as a percentage of GDP: 1981–98

Year	United States	Japan[a]	Germany[b]	France	United Kingdom	Italy	Canada
Total R&D expenditures in billions of constant 1990 units of national currency[d]							
1981	102.5	NA	47.3	104.2	9.9	9,288.60	6.5
1982	107.8	6,867.70	48.6	111.3	NA	9,619.30	7.0
1983	115.2	7,428.90	49.5	114.9	9.6	10,246.30	7.1
1984	126.1	7,982.30	50.7	121.5	NA	11,158.20	7.7
1985	136.8	8,857.70	55.8	126.4	10.4	12,765.80	8.4
1986	139.7	9,008.60	57.4	128.3	10.9	13,208.30	8.8
1987	142.3	9,629.50	61.4	133.5	11.1	14,287.60	8.9
1988	145.6	10,367.40	63.4	139.4	11.4	15,193.50	9.0
1989	148.0	11,331.20	65.9	148.2	11.8	15,929.90	9.2
1990	152.0	12,277.50	66.7	157.2	12.0	17,001.20	9.8
1991	154.7	12,587.50	71.2	157.9	11.4	16,395.80	9.9
1992	154.6	12,446.70	68.9	160.4	11.4	15,933.00	10.2
1993	150.9	12,119.50	66.6	160.6	11.8	14,970.30	10.8
1994	150.4	11,994.40	65.6	159.6	12.0	14,286.00	11.3
1995	159.5	12,780.60	66.1	160.4	11.8	13,969.10	11.4
1996	168.0	13,594.70	66.5	161.5	11.7	14,269.80	11.6
1997	177.2	14,217.60	68.5	159.0	11.6	15,354.90	12.1
1998	188.7	NA	70.8	NA	NA	15,912.50	12.5

NA = not available

[a]Due to changes in methodology, data on Japanese R&D in 1996 and later years may not be consistent with data in earlier years.

[b]German data before 1991 are for West Germany only.

[c]Conversions of foreign currencies to U.S. dollars are calculated with purchasing power parity exchange rates. Constant 1992 dollars are based on U.S. GDP implicit price deflators. (See appendix tables 2-1 and 2-2.)

[d]Constant foreign currencies are based on deflation with each country's GDP implicit price deflator.

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources: 1998,* NSF 99-335, by Steven Payson (Arlington, VA: 1999); and Organization for Economic Co-operation and Development, Main Science and Technology Indicators database (Paris: April 1999).

See figures 2-27, 2-28, and 2-30 in Volume I.

Appendix table 2-64.
International nondefense R&D expenditures and R&D as a percentage of GDP: 1981–98

Year	United States	Japan[a]	Germany[b]	France	United Kingdom	Italy	Canada
Total nondefense R&D expenditures in billions of constant 1992 U.S. dollars[c]							
1981	81.7	NA	22.6	13.2	13.5	6.7	5.1
1982	82.8	37.4	23.4	14.3	NA	7.0	5.5
1983	86.5	40.3	23.8	15.1	13.0	7.4	5.6
1984	94.1	43.3	24.6	16.1	NA	8.0	6.1
1985	100.8	48.0	27.0	16.8	14.5	9.1	6.6
1986	102.2	48.6	27.9	16.9	15.6	9.4	6.9
1987	103.7	52.1	29.9	17.5	16.2	10.3	7.0
1988	108.1	56.1	31.0	18.3	17.1	10.8	7.2
1989	114.0	61.5	32.3	19.7	17.6	11.4	7.3
1990	121.2	66.7	32.5	20.5	18.0	12.4	7.8
1991	128.0	68.2	35.2	21.2	16.6	11.9	7.9
1992	129.5	68.4	35.5	22.3	17.8	11.9	NA
1993	126.4	66.6	34.4	22.0	17.9	10.7	8.6
1994	128.6	65.6	34.4	21.8	18.0	10.3	NA
1995	138.6	72.6	35.4	22.4	17.7	10.4	9.5
1996	147.7	77.1	35.0	22.2	18.0	10.9	NA
1997	157.2	NA	36.3	NA	17.9	11.7	10.1
1998	169.4	NA	NA	NA	NA	NA	10.4
Nondefense R&D expenditures as a percentage of GDP							
1981	1.73	NA	2.34	1.57	1.84	0.85	1.21
1982	1.79	2.21	2.44	1.66	NA	0.89	1.35
1983	1.80	2.34	2.43	1.74	1.69	0.93	1.32
1984	1.83	2.41	2.42	1.82	NA	0.97	1.35
1985	1.89	2.56	2.60	1.87	1.76	1.07	1.40
1986	1.86	2.53	2.61	1.84	1.82	1.08	1.43
1987	1.83	2.60	2.75	1.85	1.79	1.15	1.38
1988	1.84	2.63	2.74	1.85	1.80	1.15	1.34
1989	1.88	2.75	2.75	1.92	1.81	1.18	1.34
1990	1.97	2.83	2.62	1.95	1.84	1.26	1.41
1991	2.11	2.79	2.51	1.98	1.79	1.19	1.48
1992	2.07	2.73	2.39	2.04	1.84	1.15	NA
1993	1.98	2.65	2.34	2.10	1.86	1.09	1.56
1994	1.95	2.60	2.25	2.05	1.84	1.01	NA
1995	2.05	2.73	2.23	2.04	1.78	0.98	1.55
1996	2.11	2.80	2.21	2.03	1.72	1.01	NA
1997	2.16	NA	2.23	NA	1.65	1.07	1.57
1998	2.24	NA	NA	NA	NA	NA	1.57

NA = not available

[a]Due to changes in methodology, data on Japanese R&D in 1996 and later years may not be consistent with data in earlier years.

[b]German data before 1991 are for West Germany only.

[c]Conversions of foreign currencies to U.S. dollars are calculated with purchasing power parity exchange rates. Constant 1992 dollars are based on U.S. GDP implicit price deflators. (See appendix tables 2-1 and 2-2.)

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *National Patterns of R&D Resources: 1998,* NSF 99-335, by Steven Payson (Arlington, VA: 1999); and Organisation for Economic Co-operation and Development, Main Science and Technology Indicators database (Paris: April 1999).

See figures 2-27 and 2-30 in Volume I.

Appendix table 2-65.
International R&D expenditures, by performing sector and source of funds: 1996–98

Country and R&D performer	Total	Sources of R&D funds: Industry	Government	Higher education	Private nonprofit	Abroad	Percent distribution, performers
Millions of Canadian dollars							
Canada, 1998 total	13,893	6,864	4,434	287	450	1,858	100.0
Industry	8,882	6,449	630	–	–	1,803	63.9
Government	1,856	55	1,794	–	–	7	13.4
Higher education	2,995	339	1,960	287	373	36	21.6
Private nonprofit	160	21	50	–	77	12	1.2
Percent distribution, sources	100.0	49.4	31.9	2.1	3.2	13.4	
Millions of francs							
France, 1996 total	182,588	88,589	75,765	1,392	1,614	15,228	100.0
Industry	112,373	84,901	14,669	12	31	12,760	61.5
Government	37,008	2,292	33,116	67	36	1,497	20.3
Higher education	30,747	980	27,668	1,180	162	757	16.8
Private nonprofit	2,460	416	312	133	1,385	214	1.3
Percent distribution, sources	100.0	48.5	41.5	0.8	0.9	8.3	
Millions of Deutsch marks							
Germany, 1998 total	90,440	57,960	30,670	0	205	1,605	100.0
Industry	62,500	56,310	4,850	–	40	1,300	69.1
Government	12,500	450	11,730	–	165	155	13.8
Higher education	15,440	1,200	14,090	–	–	150	17.1
Private nonprofit	–	–	–	–	–	–	0.0
Percent distribution, sources	100.0	64.1	33.9	0.0	0.2	1.8	
Billions of lire							
Italy, 1998 total	22,501	9,782	11,412	0	0	1,308	100.0
Industry	12,081	9,442	1,603	–	–	1,036	53.7
Government	4,707	120	4,409	–	–	178	20.9
Higher education	5,713	219	5,400	–	–	94	25.4
Private nonprofit	–	–	–	–	–	–	0.0
Percent distribution, sources	100.0	43.5	50.7	0.0	0.0	5.8	
Billions of yen							
Japan, 1996 total	14,155	10,386	2,645	1,012	97	14	100.0
Industry	10,058	9,916	115	0.25	15	12	71.1
Government	1,329	23	1,305	0.32	0.22	0.02	9.4
Higher education	2,089	49	1,026	1,010	3	0.37	14.8
Private nonprofit	679	398	200	0.87	79	1	4.8
Percent distribution, sources	100.0	73.4	18.7	7.1	0.7	0.1	
Billions of rubles							
Russia, 1997 total[a]	24,453	7,487	14,900	57	204	1,805	100.0
Industry	16,217	6,697	8,131	9	7	1,373	66.3
Government	6,909	485	5,819	8	193	405	28.3
Higher education	1,312	300	943	40	3	26	5.4
Private nonprofit	15	5	8	–	1	2	0.1
Percent distribution, sources	100.0	30.6	60.9	0.2	0.8	7.4	
Millions of pounds							
United Kingdom, 1996 total	14,339	6,786	4,564	120	546	2,323	100.0
Industry	9,301	6,401	885	–	5	2,010	64.9
Government	2,069	164	1,796	3	36	71	14.4
Higher education	2,792	188	1,856	116	406	226	19.5
Private nonprofit	177	32	28	1	99	17	1.2
Percent distribution, sources	100.0	47.3	31.8	0.8	3.8	16.2	

Appendix table 2-65.
International R&D expenditures, by performing sector and source of funds: 1996–98

Country and R&D performer	Total	Sources of R&D funds: Industry	Government	Higher education	Private nonprofit	Abroad	Percent distribution, performers
	Millions of U.S. dollars						
United States, 1996 total[b]	196,540	108,558	65,386	4,375	3,218	15,003	100.0
Industry	142,371	106,012	21,356	–	–	15,003	72.4
Government	25,105	–	25,105	–	–		12.8
Higher education	23,721	1,655	16,019	4,375	1,672	–	12.1
Private nonprofit	5,343	891	2,906	–	1,546	–	2.7
Percent distribution, sources	100.0	55.2	33.3	2.2	1.6	7.6	

– = Assumed negligible or no data available

[a]Data for Russia were compiled according to OECD guidelines to be consistent with those presented for the G–7 countries.

[b]For the United States, government as a source of funds includes Federal Government support to all sectors plus state and local governments' support to higher education. Government as a performer includes R&D undertaken in intramural government laboratories plus R&D performance by all federally funded R&D centers (FFRDCs). Sources from abroad represent funding from companies in the United States with foreign ownership of 50 percent or more.

SOURCES: Organisation for Economic Co-operation and Development, unpublished tabulations; Center for Science Research and Statistics; National Science Foundation, Division of Science Resources Studies, *National Patterns of R&D Resources: 1998*, NSF 99-335, by Steven Payson (Arlington, VA: 1999); and U.S. Bureau of Economic Analysis, unpublished tabulations.

See figure 2-31 in Volume I.

Appendix table 2-66.
Distribution of government R&D budget appropriations, by socioeconomic objective: 1997 or 1998
(percentages)

Objective	Country (year of coverage)						
	United States (1998)	Japan[a] (1997)	Germany (1997)	France (1997)	United Kingdom (1997)	Italy (1997)	Canada (1998)
Total (millions of U.S. dollars[b])	73,569	18,309	15,619	13,178	8,887	6,211	3,395
Agriculture, forestry, and fishing	2.1	3.4	2.6	3.6	4.4	2.3	11.7
Industrial development	0.5	6.6	12.8	5.2	1.8	9.1	13.3
Energy	1.3	20.2	3.5	4.8	0.7	4.0	5.7
Infrastructure	2.5	2.7	1.6	0.6	1.7	0.4	4.2
Transport and telecommunications	2.5	1.4	0.8	NA	0.3	NA	4.2
Urban and rural planning	0.1	1.3	0.8	NA	1.4	NA	0.0
Environmental protection	0.8	0.6	3.7	2.0	2.2	2.5	3.3
Health	19.3	4.0	3.4	5.3	14.5	8.5	9.5
Social development and services	1.0	0.9	2.4	0.9	2.0	4.5	3.6
Earth and atmosphere	1.3	1.3	2.0	0.7	1.7	1.4	4.9
Advancement of knowledge	5.9	48.2	53.6	35.7	30.3	59.6	27.1
Advancement of research	5.9	10.8	15.6	19.2	11.8	12.1	8.4
General university funds	–	37.4	38.1	16.5	18.5	47.4	18.7
Civil space	11.1	6.3	4.8	11.0	2.7	4.0	9.2
Defense	54.1	5.8	9.6	27.7	37.7	3.5	5.0
Not elsewhere classified	0.0	0.0	0.0	2.4	0.4	0.0	2.6

NA=not separately available but included in subtotal; – = the United States does not have an equivalent to general university funds

NOTES: Percentages may not add to 100 because of rounding. U.S. data are based on budget authority. For all countries, because of the inclusion of general university funds and slight differences in accounting practices, the distribution of government budgets among socioeconomic objectives may not completely reflect the actual distribution of government–funded research in particular fields.

[a]Japanese data are based on science and technology budget data, which include items other than R&D. Such items are a small proportion of the budget; therefore, the data may still be used as an approximate indicator of relative government emphasis on R&D by objective.

[b]Conversions of foreign currencies to U.S. dollars are calculated with OECD purchasing power parity exchange rates. (See appendix table 2-2.)

SOURCES: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Federal R&D Funding by Budget Function: Fiscal Years 1998–2000*, NSF 00-303 (Arlington, VA: 2000); Organisation for Economic Co–operation and Development, *Basic Science and Technology Statistics* (unpublished tabulations).

See figure 2-34 in Volume I.

Appendix table 2-67.
International Strategic Technology Alliances: 1980–98
(counts)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
TOTAL	209	200	272	260	345	437	491	488	544	580	434	371	507	556	609	805	704	582	564
Information technology	49	60	96	107	157	164	189	177	200	197	219	203	237	220	253	338	298	227	272
Biotechnology	31	38	54	42	65	113	103	112	100	71	50	40	101	134	165	164	177	172	120
All other, of which	129	102	122	111	123	160	199	199	244	312	165	128	169	202	191	303	229	183	172
New materials	9	23	27	35	28	58	87	65	60	47	35	21	38	59	33	46	36	27	37
Aerospace & defense	22	8	11	11	30	14	27	25	26	45	54	41	56	37	37	52	45	23	19
Automotive	19	7	9	8	8	20	26	22	45	56	12	3	4	15	26	32	37	44	17
Chemicals (non–biotech.)	40	26	30	29	25	32	19	38	58	84	47	40	39	68	52	60	28	42	53
Other	39	38	45	28	32	36	40	49	55	80	17	23	32	23	43	113	83	47	46
USA	139	126	200	177	234	235	292	318	367	357	312	287	394	444	497	639	578	497	477
Information technology	31	39	76	76	105	87	118	133	145	139	174	163	194	196	229	298	262	194	236
Biotechnology	24	28	45	27	51	68	77	78	67	50	32	36	83	116	133	131	148	162	108
All other	84	59	79	74	78	80	97	107	155	168	106	88	117	132	135	210	168	141	133
Europe	102	94	127	111	166	240	242	236	266	320	203	166	233	235	257	330	281	224	245
Information technology	20	28	48	34	75	96	105	84	91	96	81	73	92	67	60	85	75	81	87
Biotechnology	11	14	15	20	24	59	35	51	50	37	28	21	58	59	93	89	102	59	59
All other	71	52	64	57	67	85	102	101	125	187	94	72	83	109	104	156	104	84	99
Japan	53	68	89	97	100	137	160	130	113	126	85	79	79	78	84	111	103	60	70
Information technology	15	18	35	44	55	40	53	31	33	35	46	50	40	40	46	51	47	28	40
Biotechnology	7	11	17	11	11	31	30	26	11	12	9	2	8	15	14	15	21	15	8
All other	31	39	37	42	34	66	77	73	69	79	30	27	31	23	24	45	35	17	22
Across regions	107	114	171	138	179	213	233	242	280	338	210	178	245	273	285	352	332	252	257
Information technology	18	29	71	53	87	69	94	81	91	103	100	88	103	100	99	130	123	101	109
Biotechnology	14	19	26	16	24	52	41	50	37	36	28	22	58	66	87	81	110	73	58
All other, of which	75	66	74	69	68	92	98	111	152	199	82	68	84	107	99	141	99	78	90
New materials	4	15	16	20	15	26	33	30	32	23	24	9	18	31	12	25	11	11	23
Aerospace & defense	12	4	5	6	9	6	7	6	8	20	17	21	28	27	20	25	17	10	9
Automotive	10	3	5	6	5	14	17	17	34	43	3	1	0	7	14	14	16	16	5
Chemicals (non–biotech.)	26	22	22	19	17	24	11	29	45	62	29	26	22	32	31	35	18	21	30
Other	23	22	26	18	22	22	30	29	33	51	9	11	16	10	22	42	37	20	23
USA–Europe	42	33	68	46	76	84	108	116	116	120	93	92	128	135	160	185	177	146	168
Information technology	7	11	31	13	32	27	45	48	41	41	42	38	53	47	45	52	46	53	58
Biotechnology	5	6	9	7	14	22	24	28	21	16	11	18	40	42	62	59	75	49	47
All other	30	16	28	26	30	35	39	40	54	63	40	36	35	46	53	74	56	44	63
USA–Japan	32	35	60	61	58	56	59	54	62	73	48	50	47	46	46	61	56	44	39
Information technology	6	7	26	28	35	20	25	18	19	25	32	34	26	30	29	35	31	19	23
Biotechnology	6	8	12	7	7	16	14	11	6	6	4	1	5	10	7	6	13	14	6
All other	20	20	22	26	16	20	20	25	37	42	12	15	16	6	10	20	12	11	10

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 2-67.
International Strategic Technology Alliances: 1980–98
(counts)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
USA–Others	14	14	17	7	11	15	13	17	36	34	21	9	27	37	30	41	45	29	15
Information technology	0	1	5	3	2	5	2	5	11	10	10	3	9	10	12	22	22	15	10
Biotechnology	3	2	1	0	2	3	0	3	4	5	4	1	5	7	6	6	7	6	2
All other	11	11	11	4	7	7	11	9	21	19	7	5	13	20	12	13	16	8	3
Europe–Japan	11	20	16	18	21	35	36	26	24	30	25	19	24	20	23	29	25	9	21
Information technology	4	7	6	6	11	12	17	5	9	7	8	11	10	6	8	9	9	4	10
Biotechnology	0	1	2	2	0	7	1	4	1	6	4	0	3	4	6	6	6	1	2
All other	7	12	8	10	10	16	18	17	14	17	13	8	11	10	9	14	10	4	9
Europe–Others	5	10	7	6	10	20	12	21	36	61	22	5	17	31	20	28	20	20	11
Information technology	0	2	2	3	6	5	4	5	10	18	7	1	4	5	1	8	11	7	6
Biotechnology	0	2	1	0	0	3	1	1	4	3	5	1	5	3	6	2	7	3	1
All other	5	6	4	3	4	12	7	15	22	40	10	3	8	23	13	18	2	10	4
Japan–Others	3	2	3	0	3	3	5	8	6	20	1	3	2	4	6	8	9	4	3
Information technology	1	1	1	0	1	0	1	0	1	2	1	1	1	2	4	4	4	3	2
Biotechnology	0	0	1	0	1	1	1	3	1	0	0	1	0	0	0	2	2	0	0
All other	2	1	1	0	1	2	3	5	4	18	0	1	1	2	2	2	3	1	1
Within Regions	102	86	101	122	166	224	258	246	264	242	224	193	262	283	324	453	372	330	307
Information technology	31	31	25	54	70	95	95	96	109	94	119	115	134	120	154	208	175	126	163
Biotechnology	17	19	28	26	41	61	62	62	63	35	22	18	43	68	78	83	67	99	62
All other, of which	54	36	48	42	55	68	101	88	92	113	83	60	85	95	92	162	130	105	82
New materials	5	8	11	15	13	32	54	35	28	24	11	12	20	28	21	21	25	16	14
Aerospace & defense	10	4	6	5	21	8	20	19	18	25	37	20	28	10	17	27	28	13	10
Automotive	9	4	4	2	3	6	9	5	11	13	9	2	4	8	12	18	21	28	12
Chemicals (non–biotech.)	14	4	8	10	8	8	8	9	13	22	18	14	17	36	21	25	10	21	23
Other	16	16	19	10	10	14	10	20	22	29	8	12	16	13	21	71	46	27	23
Intra–USA	51	44	55	63	89	80	112	131	153	130	150	136	192	226	261	352	300	278	255
Information technology	18	20	14	32	36	35	46	62	74	63	90	88	106	109	143	189	163	107	145
Biotechnology	10	12	23	13	28	27	39	36	36	23	13	16	33	57	58	60	53	93	53
All other	23	12	18	18	25	18	27	33	43	44	47	32	53	60	60	103	84	78	57
Intra–Europe	44	31	36	41	59	101	86	73	90	109	63	50	64	49	54	88	59	49	45
Information technology	9	8	9	12	26	52	39	26	31	30	24	23	25	9	6	16	9	17	13
Biotechnology	6	5	3	11	10	27	9	18	24	12	8	2	10	10	19	22	14	6	9
All other	29	18	24	18	23	22	38	29	35	67	31	25	29	30	29	50	36	26	23
Intra–Japan	7	11	10	18	18	43	60	42	21	3	11	7	6	8	9	13	13	3	7
Information technology	4	3	2	10	8	8	10	8	4	1	5	4	3	2	5	3	3	2	5
Biotechnology	1	2	2	2	3	7	14	8	3	0	1	0	0	1	1	1	0	0	0
All other	2	6	6	6	7	28	36	26	14	2	5	3	3	5	3	9	10	1	2

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 2-67.
International Strategic Technology Alliances: 1980–98
(counts)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Data Addenda[a]																			
USA–Interregion	88	82	145	114	145	155	180	187	214	227	162	151	202	218	236	287	278	219	222
Information technology	13	19	62	44	69	52	72	71	71	76	84	75	88	87	86	109	99	87	91
Biotechnology	14	16	22	14	23	41	38	42	31	27	19	20	50	59	75	71	95	69	55
All other	61	47	61	56	53	62	70	74	112	124	59	56	64	72	75	107	84	63	76
Europe–Interregion	58	63	91	70	107	139	156	163	176	211	140	116	169	186	203	242	222	175	200
Information technology	11	20	39	22	49	44	66	58	60	66	57	50	67	58	54	69	66	64	74
Biotechnology	5	9	12	9	14	32	26	33	26	25	20	19	48	49	74	67	88	53	50
All other	42	34	40	39	44	63	64	72	90	120	63	47	54	79	75	106	68	58	76
Japan–Interregion	46	57	79	79	82	94	100	88	92	123	74	72	73	70	75	98	90	57	63
Information technology	11	15	33	34	47	32	43	23	29	34	41	46	37	38	41	48	44	26	35
Biotechnology	6	9	15	9	8	24	16	18	8	12	8	2	8	14	13	14	21	15	8
All other	29	33	31	36	27	38	41	47	55	77	25	24	28	18	21	36	25	16	20

[a] Counts of these inter–regional strategic technology alliances are included in the totals for across regions listed above. For example, the USA–Interregion totals are the sum of USA–Europe plus USA–Japan plus USA–Others. Total USA alliances are the sum of Intra-USA plus USA-Interregion.

SOURCE: J. Hagedoorn, Maastricht Economic Research Institute on Innovation and Technology (MERIT), Cooperative Agreements and Technology Indicators (CATI) database, unpublished tabulations.

See figure 2-36 and text table 2-18 in Volume I.

Appendix table 2-68.
Company-financed R&D performed abroad by U.S. companies and their foreign subsidiaries, by industry: 1985–97

Industry	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Millions of current U.S. dollars													
Total	3,650	4,624	5,226	6,208	6,706	7,952	9,147	10,063	9,565	9,395	13,052	14,050	13,107
Food, kindred, and tobacco products	75	69	37	27	42	41	66	88	112	117	142	155	148
Chemicals and allied products	843	1,071	1,243	1,548	1,532	2,007	2,401	2,676	2,833	2,456	4,194	3,801	3,867
Industrial and other chemicals	444	579	625	855	609	720	1,009	1,045	1,318	917	1,632	1,720	1,454
Drugs and medicines	399	492	618	693	923	1,287	1,392	1,631	1,561	1,539	2,562	2,082	2,413
Petroleum refining and extraction	47	40	47	59	47	76	107	119	104	111	76	78	91
Stone, clay, and glass products	D	D	D	D	D	59	38	41	38	27	31	32	17
Primary metals	D	D	18	23	24	26	20	18	12	15	26	29	20
Fabricated metal products	21	26	40	D	D	95	86	109	119	125	111	133	132
Machinery	689	951	1,233	1,326	1,432	1,451	1,476	1,439	340	308	501	1,404	1,819
Electrical equipment	591	D	432	591	573	770	651	568	525	495	872	959	981
Transportation equipment	1,025	D	D	1,750	1,916	2,055	2,402	D	D	D	D	D	D
Professional and scientific instruments	169	212	317	404	474	611	656	685	751	900	988	960	1,201
Nonmanufacturing industries	18	27	64	146	256	415	778	835	1,770	1,500	2,206	2,510	1,364
Millions of constant 1992 U.S. dollars[a]													
Total	4,648	5,738	6,292	7,211	7,474	8,496	9,399	10,063	9,319	8,940	12,140	12,828	11,748
Food, kindred, and tobacco products	96	86	45	31	47	44	68	88	109	111	132	142	133
Chemicals and allied products	1,073	1,329	1,497	1,798	1,708	2,144	2,467	2,676	2,760	2,337	3,901	3,470	3,466
Industrial and other chemicals	565	719	752	993	679	769	1,037	1,045	1,284	873	1,518	1,570	1,303
Drugs and medicines	508	611	744	805	1,029	1,375	1,430	1,631	1,521	1,464	2,383	1,901	2,163
Petroleum refining and extraction	60	50	57	69	52	81	110	119	101	106	71	71	82
Stone, clay, and glass products	D	D	D	D	D	63	39	41	37	26	29	29	15
Primary metals	D	D	22	27	27	28	21	18	12	14	24	26	18
Fabricated metal products	27	32	48	D	D	101	88	109	116	119	103	121	118
Machinery	877	1,180	1,484	1,540	1,596	1,550	1,517	1,439	331	293	466	1,282	1,630
Electrical equipment	753	D	520	686	639	823	669	568	511	471	811	876	879
Transportation equipment	1,305	D	D	2,033	2,136	2,196	2,468	D	D	D	D	D	D
Professional and scientific instruments	215	263	382	469	528	653	674	685	732	856	919	876	1,076
Nonmanufacturing industries	23	34	77	170	285	443	799	835	1,724	1,427	2,052	2,292	1,223

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 2-68.
Company–financed R&D performed abroad by U.S. companies and their foreign subsidiaries, by industry: 1985–97

Industry	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
						Percentage of domestic funding							
Total	6.4	7.7	8.5	9.3	9.1	9.7	10.1	10.7	10.1	9.7	12.0	11.6	9.8
Food, kindred, and tobacco products	6.6	5.4	3.1	2.3	3.4	3.3	5.2	6.3	8.3	7.9	9.1	9.9	8.3
Chemicals and allied products	10.1	12.4	13.2	14.3	12.8	15.2	16.6	17.7	17.0	14.8	24.2	21.7	20.8
Industrial and other chemicals	9.2	11.6	11.7	14.4	9.5	9.9	13.5	14.6	17.5	13.2	22.9	22.2	20.6
Drugs and medicines	11.5	13.5	15.1	14.1	16.7	21.8	20.0	20.6	17.1	16.0	25.1	21.3	20.8
Petroleum refining and extraction	2.1	2.0	2.5	3.0	2.2	3.3	4.3	5.2	4.9	5.7	4.3	4.8	5.6
Stone, clay, and glass products	D	D	D	D	D	11.0	8.4	8.6	7.2	4.9	7.0	6.9	2.8
Primary metals	D	D	2.5	3.7	3.6	3.6	2.8	3.5	1.9	2.2	4.5	4.6	2.6
Fabricated metal products	2.7	3.3	6.3	D	D	12.9	11.5	15.1	12.7	14.4	11.8	10.1	7.9
Machinery	6.4	8.9	11.7	11.1	10.7	10.7	10.8	10.4	4.1	3.8	5.2	10.5	9.9
Electrical equipment	6.4	D	4.1	5.9	6.0	8.3	7.3	6.0	4.5	3.7	5.1	4.7	4.3
Transportation equipment	8.5	D	D	12.6	13.1	14.4	16.2	D	D	D	D	D	D
Professional and scientific instruments	3.7	4.5	6.4	7.6	8.3	9.7	9.6	9.4	10.0	11.2	11.6	11.7	13.4
Nonmanufacturing industries	0.4	0.6	1.2	2.0	2.5	2.5	3.4	3.6	7.2	6.3	8.0	8.6	4.2

D = withheld to avoid disclosing operations of individual companies

[a]See appendix table 2-1 for GDP implicit price deflators used to convert current dollars to constant 1992 dollars.

SOURCE: National Science Foundation, Division of Science Resources Studies (NSF/SRS), *Research and Development in Industry: 1997,* NSF 99-358 (Arlington, VA: 1999).

See figure 2-39 in Volume I.

Appendix table 2-69.
Expenditures for R&D performance by majority–owned nonbank foreign affiliates of U.S. parent companies, by region/country: 1982, 1989, and 1994–96
(Millions of U.S. dollars)

Region/country	1982	1989	1994	1995	1996
Total	3,851	7,922	11,877	12,582	14,181
Canada	505	975	836	1,068	1,582
Europe	2,892	5,475	8,676	9,144	9,651
Belgium	223	313	469	292	369
France	332	521	1,372	1,271	1,326
Germany	1,079	1,726	2,849	3,068	3,061
Ireland	9	156	396	171	193
Italy	150	393	365	346	553
Netherlands	65	367	415	495	545
Spain	40	58	D	288	317
Sweden	28	31	72	691	439
Switzerland	60	59	191	242	189
United Kingdom	824	1,718	2,158	1,935	2,133
Other European countries	82	133	D	345	526
Asia and Pacific	238	1,272	1,775	1,865	2,073
Japan	112	1,000	1,130	1,286	1,337
Australia	114	190	230	287	409
Singapore	D	24	167	63	88
Other Asian and Pacific countries	D	58	248	229	239
Latin America and other Western Hemisphere	169	155	477	389	687
Brazil	97	92	238	249	489
Mexico	30	37	183	58	119
Other Latin America	42	26	56	82	79
Middle East	11	33	98	97	166
Israel	11	29	96	97	166
Other Middle East countries	D	4	2	D	D
Africa	25	11	15	19	21
South Africa	23	9	14	17	18
Other African countries	2	2	1	2	3

D = withheld to avoid disclosing operations of individual companies

NOTES: Includes expenditures for R&D conducted by affiliates, whether for themselves or for others under contract. They exclude expenditures for R&D conducted by others for affiliates under a contract. (These data series differ from those reported in previous *Science & Engineering Indicators* reports.) Benchmark survey statistics are reported for 1982, 1989, and 1994. Expenditures reported here differ from the National Science Foundation data reported in appendix table 2-68.

SOURCE: U.S. Bureau of Economic Analysis, *U.S. Direct Investment Abroad: Operations of U.S. Parent Companies and Their Foreign Affiliates* (Washington, DC: U.S. Government Printing Office, annual series).

See figures 2-37 and 2-40 in Volume I.

Science & Engineering Indicators – 2000

Appendix table 2-70.
Foreign R&D expenditures in the United States, by industry and region/country: 1980–96
(Millions of current dollars)

Industry and region/country	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Total	1,946	3,110	3,744	4,164	4,738	5,240	5,804	6,521	7,834	9,465	11,522	11,872	13,864	14,199	15,566	17,542	17,150
Expenditures by industry																	
Petroleum	D	253	255	310	366	388	380	311	364	387	520	438	586	428	407	403	436
Manufacturing	D	2,645	3,133	3,553	4,058	4,478	5,011	5,573	6,903	8,398	9,868	10,177	11,383	11,842	12,970	14,756	13,807
Food and kindred products	19	32	39	44	43	51	54	58	106	187	192	195	245	266	294	360	353
Chemicals and allied products	834	1,580	1,870	2,037	2,349	2,627	2,782	3,220	3,719	4,371	5,243	5,755	D	6,580	7,003	8,263	7,366
Industrial chemicals	454	1,085	1,329	1,397	1,620	1,836	1,657	1,899	2,126	2,284	2,498	2,391	D	1,906	1,993	2,531	958
Other chemicals	146	179	170	181	200	228	167	230	276	252	372	427	490	442	504	530	560
Drugs and medicines	234	316	371	459	529	563	958	1,091	1,318	1,835	2,373	2,937	3,211	4,232	4,506	5,201	5,849
Primary metal industries	24	71	79	59	66	102	97	91	102	155	166	189	173	201	170	161	156
Fabricated metal products	21	20	28	82	54	64	76	67	106	209	152	145	D	172	178	161	131
Machinery, except electrical	189	284	297	350	355	342	286	476	692	1,070	1,190	1,094	1,098	1,019	954	1136	935
Office and computing machines	NA	NA	NA	NA	NA	NA	NA	370	497	622	794	788	774	624	479	595	402
Other	NA	NA	NA	NA	NA	NA	NA	106	195	448	396	306	324	395	475	541	533
Electrical equipment	318	385	505	613	799	977	1,366	1,105	1,389	1,371	1,817	1,647	1,953	2,168	2,613	2,855	2,954
Transportation equipment	101	136	150	92	95	83	124	76	225	265	193	207	D	266	375	424	454
Professional and scientific instruments	32	52	47	42	42	58	112	279	242	366	420	472	D	581	671	691	720
Nonmanufacturing industries	D	212	356	301	314	374	413	637	567	680	1,134	1,257	1,895	1,929	2,189	2,383	2,907
Services	37	43	41	51	60	54	77	243	69	108	384	358	744	932	996	749	996
Other	D	169	315	250	254	320	336	394	498	572	750	899	1,151	997	1,193	1,108	1,911
Expenditures by region/country																	
Canada	135	777	1,032	1,212	1,405	1,550	1,542	1,666	1,804	1,758	1,944	2,060	2,113	2,159	2,332	1,395	1,397
Europe	1,544	1,936	2,229	2,324	2,632	2,918	3,450	3,881	4,754	6,022	7,520	7,785	8,993	9,362	10,313	13,201	12,516
United Kingdom	312	405	520	559	664	748	764	833	1,171	1,645	1,889	2,046	2,177	2,211	2,499	2,428	2,525
Germany	380	436	529	591	602	671	851	1,139	1,242	1,503	1,764	1,720	2,100	2,209	2,425	3,869	3,084
France	146	204	232	215	261	166	352	366	435	572	812	953	1,204	1,235	1,449	1,604	1,712
Netherlands	299	373	397	387	432	514	517	542	618	703	784	663	696	697	736	818	948
Switzerland	338	416	447	463	546	625	744	765	962	1,195	1,669	1,849	2,064	2,423	2,444	3,092	3,375
Sweden	36	53	54	62	63	116	141	128	166	214	281	237	308	200	289	781	276
Other European countries	33	49	50	47	64	78	81	108	160	190	321	317	444	387	471	609	596
Japan	88	142	141	171	210	267	292	307	571	822	1,307	1,353	1,709	1,801	1,790	1,874	2,070
Latin America	D	D	D	401	423	427	427	391	352	400	386	397	580	539	637	323	386
All other countries	D	D	D	56	68	78	93	276	353	463	365	277	469	338	494	768	781

D = withheld to avoid disclosing operations of individual companies; NA = not available

NOTES: The data include foreign direct investments of nonbank U.S. affiliates with 10 percent or more foreign ownership and exclude expenditures for R&D conducted for others under a contract.

SOURCE: U.S. Bureau of Economic Analysis, *Foreign Direct Investment in the United States: Operations of U.S. Affiliates of Foreign Companies* (Washington, DC: U.S. Government Printing Office, annual series).

Appendix table 2-71.
R&D expenditures in the United States by majority–owned nonbank U.S. affiliates of foreign companies, by industry of affiliate and country of ultimate beneficial owner: 1980 and 1987–96
(Millions of current dollars)

Industry and region/country	1980	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Total	1,517	4,497	5,485	6,720	8,511	9,127	10,745	11,262	12,671	14,846	15,003
Expenditures by industry											
Petroleum	175	283	339	378	D	D	551	420	400	399	430
Manufacturing	1,245	3,809	4,773	5,915	7,282	7,839	9,056	9,560	10,855	12,828	12,553
Food and kindred products	19	58	105	185	189	190	240	260	283	355	348
Chemicals and allied products	733	D	D	D	3,832	4,266	4,692	5,167	5,654	7,185	6,760
Industrial and other chemicals	501	D	D	D	1,465	D	D	D	1,429	2,904	1,357
Drugs and medicines	232	1,075	1,293	1,806	2,367	D	D	D	4,225	4,281	5,403
Rubber products	8	50	98	117	155	150	305	216	210	209	229
Stone, clay, and glass products	10	32	61	62	114	102	113	106	151	D	157
Primary metal industries	D	38	37	75	69	82	79	83	77	62	69
Fabricated metal products	D	62	100	201	138	132	136	155	165	150	106
Machinery, except electrical	92	D	446	556	645	602	609	529	551	673	651
Computer and office equipment	28	D	285	295	380	341	328	247	203	286	268
Other	65	79	161	260	264	261	281	282	348	388	383
Electrical and electronic equipment	285	D	1,114	1,078	1,533	1,562	1,880	2,061	2,549	2,743	2,863
Household audio & video, and comm. equip.	66	555	777	721	971	959	1,129	1,133	1,345	1,570	1,627
Electronic components and other	219	D	337	357	562	603	752	928	1,204	254	280
Transportation equipment	10	D	D	D	106	159	203	231	331	381	416
Professional and scientific instruments	28	254	210	295	333	411	556	524	578	606	637
Nonmanufacturing industries	97	405	373	427	D	D	1,138	1,282	1,416	1,619	2,020
Services	5	59	42	77	D	D	211	420	455	308	361
Wholesale trade	69	312	300	297	571	682	803	745	839	1178	1,533
Motor vehicles and equipment	D	86	67	71	283	277	252	220	182	285	370
Electrical goods	5	71	107	D	145	224	220	157	236	338	498
Other	23	34	31	53	D	D	124	117	122	555	665

See explanatory notes, if any, and SOURCE at end of table.

Appendix table 2-71.
R&D expenditures in the United States by majority–owned nonbank U.S. affiliates of foreign companies, by industry of affiliate and country of ultimate beneficial owner: 1980 and 1987–96
(Millions of current dollars)

Industry and region/country	1980	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Expenditures by region/country											
Canada	113	D	D	D	D	D	D	D	D	1,337	1,380
Europe	1,217	3,458	4,241	5,414	6,762	7,275	8,325	8,628	9,487	11,442	11,245
France	39	332	402	510	766	913	1,230	1,190	1,383	1,529	1,514
Germany	281	824	963	1,216	1,435	1,596	1,855	2,003	2,147	3,563	2,748
Italy	D	D	73	93	151	143	91	132	157	172	127
Netherlands	D	540	615	690	757	642	685	674	719	786	930
Sweden	D	124	160	205	271	225	322	180	263	D	253
Switzerland	329	D	D	1,060	1,455	1,637	1,873	2,117	2,127	2,490	2,717
United Kingdom	247	790	1,085	1,568	1,809	1,987	2,090	2,139	2,428	2,316	2,442
Other European countries	16	47	D	72	118	132	179	193	263	D	514
Asia and Pacific	D	179	345	412	796	834	1,080	1,232	1,397	1,611	1,863
Japan	D	133	282	369	709	741	938	1,112	1,200	1,259	1,491
Other	D	46	63	43	87	93	142	120	197	352	372
Latin America & other Western Hemisphere	155	329	302	352	314	330	534	D	610	317	353
Middle East	2	14	9	10	9	9	20	38	62	72	95
Africa	D	D	D	D	D	D	4	5	2	D	D

D = withheld to avoid disclosing operations of individual companies

NOTES: The data include foreign direct investments of nonbank U.S. affiliates with 50 percent or more foreign ownership. These R&D expenditures are a subset of total foreign R&D expenditures reported in appendix table 2–70. The data exclude expenditures for R&D conducted for others under a contract.

SOURCE: U.S. Bureau of Economic Analysis, unpublished tabulations.

See figures 2-37, 2-41, and 2-42 in Volume I.

Appendix table 2-72.
Proportion of industrial R&D expenditures financed from foreign sources, by selected country: 1980-98
(Percentages)

	Canada	France	Germany[a]	Italy	Japan	United Kingdom
1980	5.8	6.5	NA	4.0	0.1	NA
1981	7.4	7.0	1.2	4.3	0.1	8.7
1982	10.7	4.8	1.3	4.7	0.1	NA
1983	16.6	4.6	1.4	4.3	0.1	6.8
1984	17.1	6.5	1.5	6.2	0.1	NA
1985	14.3	6.9	1.4	6.1	0.1	11.1
1986	13.6	8.0	1.4	7.3	0.1	12.2
1987	16.8	8.7	1.5	6.9	0.1	12.0
1988	18.0	9.2	2.1	6.6	0.1	12.0
1989	16.7	10.9	2.7	6.5	0.1	13.4
1990	17.4	11.1	2.7	7.3	0.1	15.5
1991	18.2	11.4	2.6	9.6	0.1	16.0
1992	NA	12.0	2.5	6.3	0.1	15.0
1993	17.7	11.3	1.9	6.8	0.1	15.4
1994	NA	11.2	2.0	9.5	0.1	16.0
1995	20.8	11.1	2.2	8.1	0.1	18.9
1996	NA	11.4	2.2	7.9	0.1	21.6
1997	20.7	NA	2.2	8.4	NA	NA
1998	20.3	NA	2.1	NA	NA	NA

NA = not available

[a]German data before 1991 are for West Germany only.

SOURCE: Organisation for Economic Co-Operation and Development, Main Science and Technology Indicators database (Paris: April 1999).

See figure 2-32 in Volume I.

Science & Engineering Indicators – 2000