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ABSTRACT

This pocket guide contains a collection of graphed data, available in 1994, on science and technology funding patterns within the United States, public attitudes toward science and technology, and international trends in science and technology. Sections contain: (1) national research and development (R&D) funding patterns; (2) academic R&D patterns by sector, source of funds, and field; (3) R&D in U.S. Industry by source of funds, performance by character of work, and share of industrial funding by source and industry; (4) education of scientists and engineers by number of bachelor's, master's, and doctorate degrees awarded; full-time graduate students in all institutions by source and type of major support; and foreign citizen representation in U.S. science and engineering graduate education; (5) working scientists and engineers by field of degree, sector, and percentage total, women, and minorities by sector; (6) public attitudes toward science and technology for impact on quality of life issues and expected results, and preferences for government spending; and (7) international science and technology trends for comparisons of economic growth and national expenditures, and other measures. Lists 52 relevant science resource publications. (LZ)

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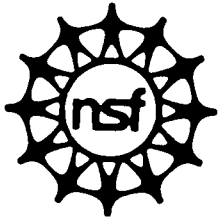

Project Coordinator: **Deborah A. Collins**

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National Science Foundation, *Science and Technology Pocket Data Book, 1994*, NSF 94-323 (Arlington, VA,1994).

Contents

National R&D Funding Patterns

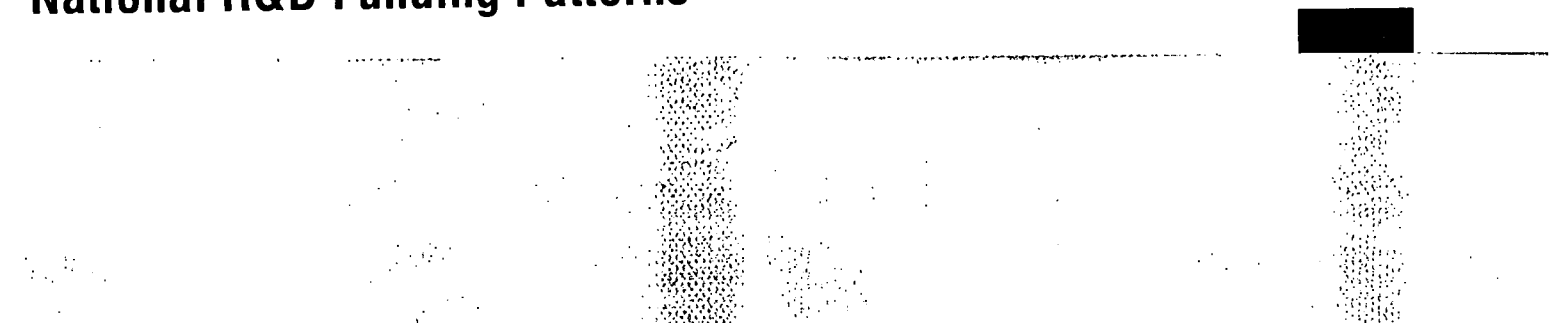
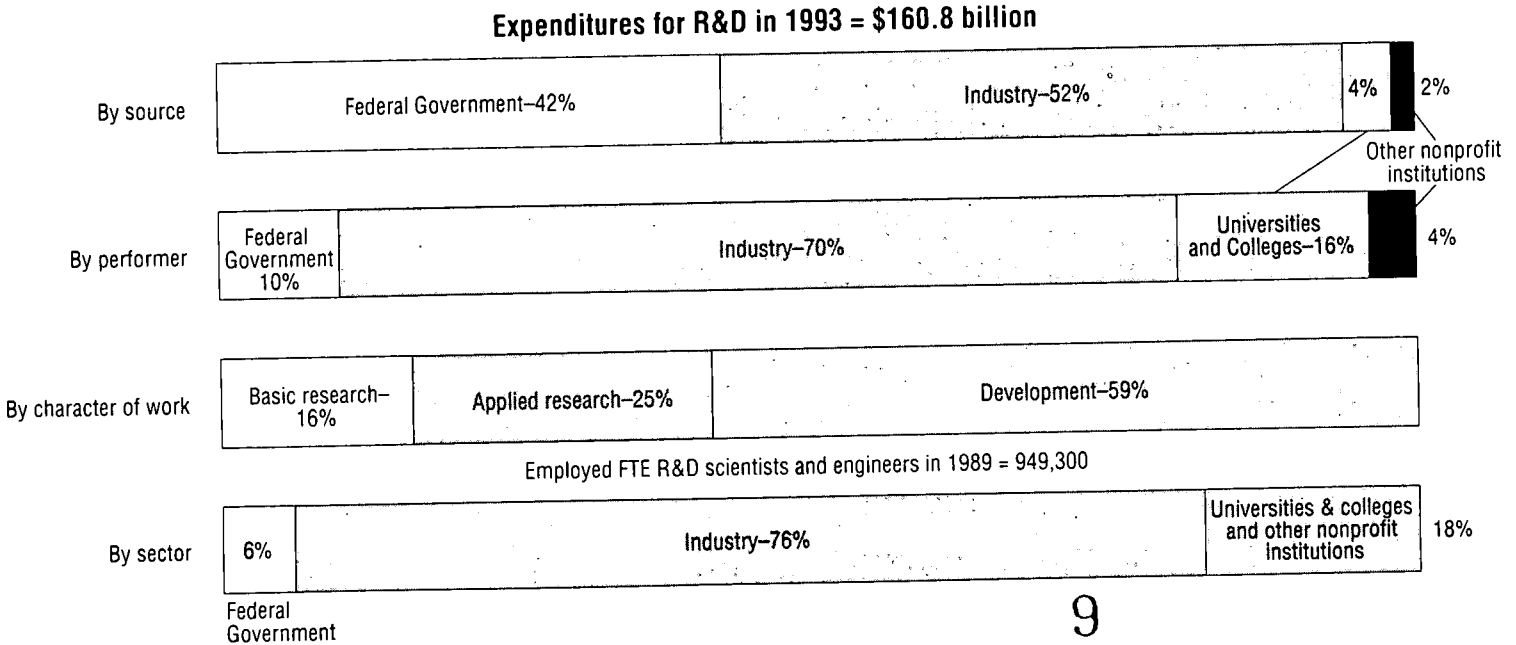
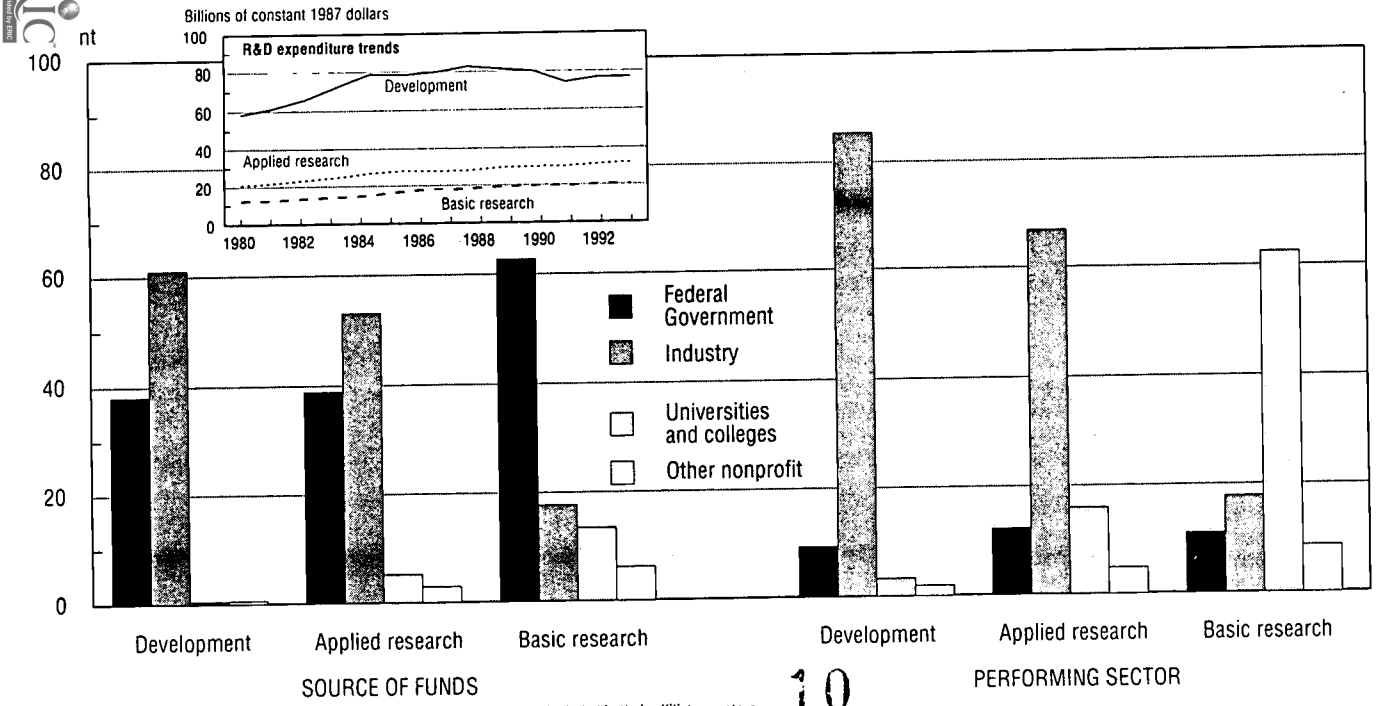


Figure 1. **The national R&D effort**



SOURCE: National Science Foundation, National Science Board, *Science & Engineering Indicators*–1993, NSB 93–1 (Washington DC: NSF, 1993).

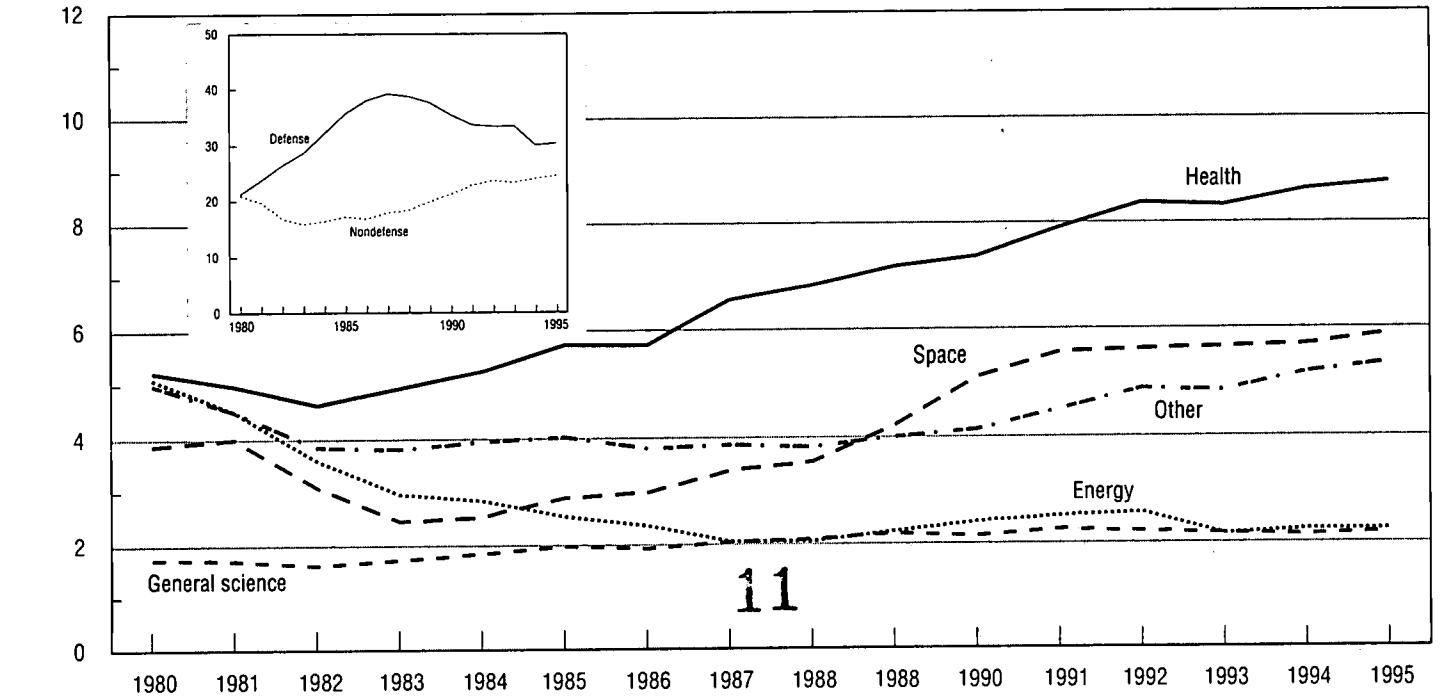
Figure 2. **National R&D expenditures, funders, and performers, by character of work: 1993**



NOTE: Funds for federally funded research and development center performers are included in their affiliates sectors.

SOURCES: National Science Foundation, Division of Science Resources Studies, *National Patterns of R&D Resources: 1992*, NSF 92-330 (Washington, DC: NSF, 1992); and unpublished tabulations.

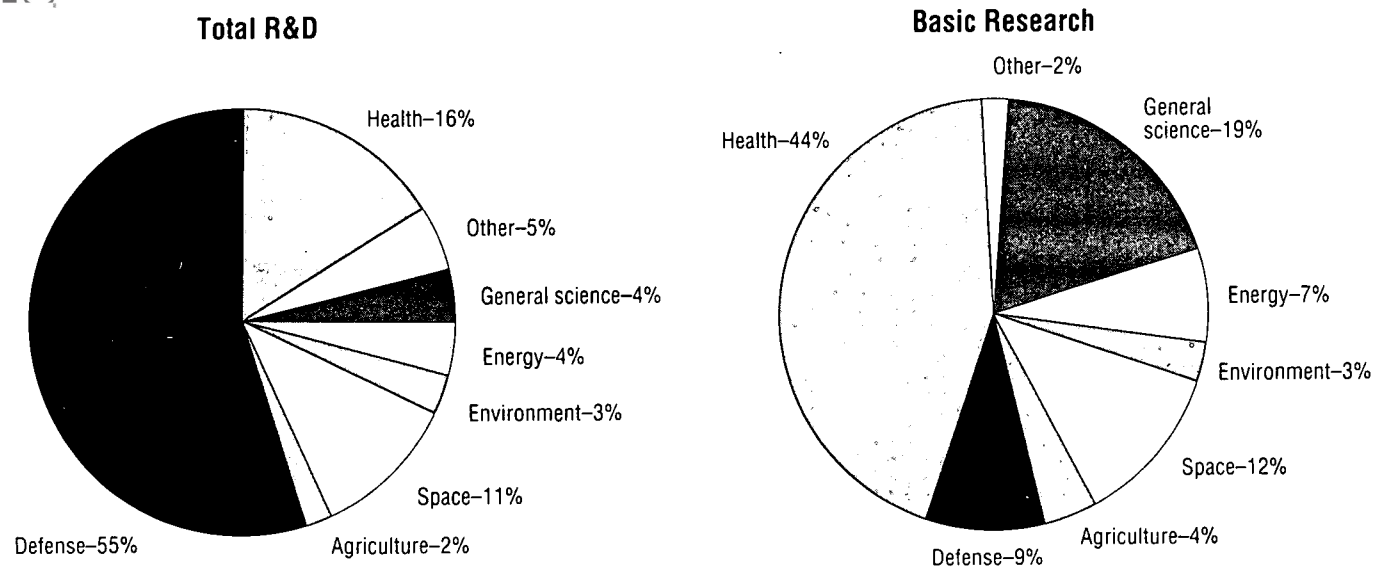
Figure 3. **Federal R&D funding, by budget function**



NOTE: "Other" includes all nondefense functions not separately graphed, such as agriculture and transportation.

SOURCES: National Science Foundation, Division of Science Resources Studies, *Selected Data on Federal R&D Funding by Budget Function: Fiscal Years 1993–95*, NSF 94–319 (Arlington, VA: NSF, 1994).

Figure 4. **Federal R&D budget authority, by function: 1995**



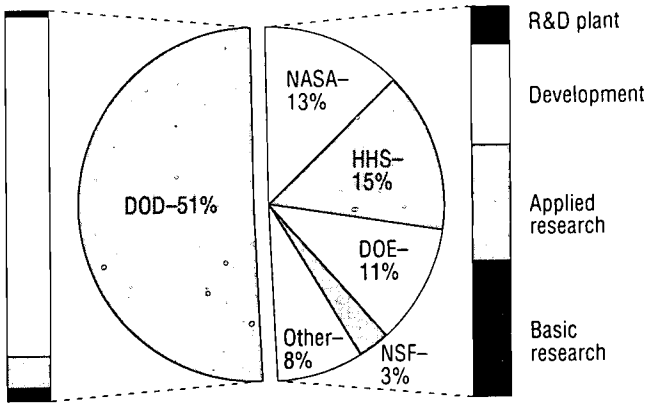
SOURCES: National Science Foundation, Division of Science Resources Studies, *Selected Data on Federal R&D Funding by Budget Function: Fiscal Years 1993–95*, NSF 94–319 (Arlington, VA: NSF, 1994).

Figure 5. Federal obligations, by type of activity

(Millions of dollars)

Year	Basic Research		Applied Research		Development	
	Current dollars	Constant 1987 dollars	Current dollars	Constant 1987 dollars	Current dollars	Constant 1987 dollars
1980	4,674	6,621	6,923	9,806	18,233	25,826
1981	5,041	6,480	7,172	9,218	20,891	26,852
1982	5,482	6,557	7,541	9,020	23,410	28,003
1983	6,260	7,196	7,993	9,188	24,458	28,113
1984	7,067	7,775	7,911	8,703	27,246	29,974
1985	7,819	8,291	8,315	8,817	32,226	34,174
1986	8,153	8,397	8,349	8,598	34,910	35,953
1987	8,944	8,944	8,999	8,999	37,313	37,313
1988	9,474	9,145	9,176	8,857	38,285	36,955
1989	10,602	9,799	10,163	9,393	40,640	37,560
1990	11,286	10,077	10,453	9,333	41,928	37,436
1991	12,171	10,420	11,798	10,101	37,327	31,958
1992	12,490	10,382	12,001	9,976	41,102	34,166
1993 (est.)	13,897	11,253	13,555	10,976	43,993	35,622
1994 (est.)	14,346	11,332	13,778	10,883	43,120	34,060

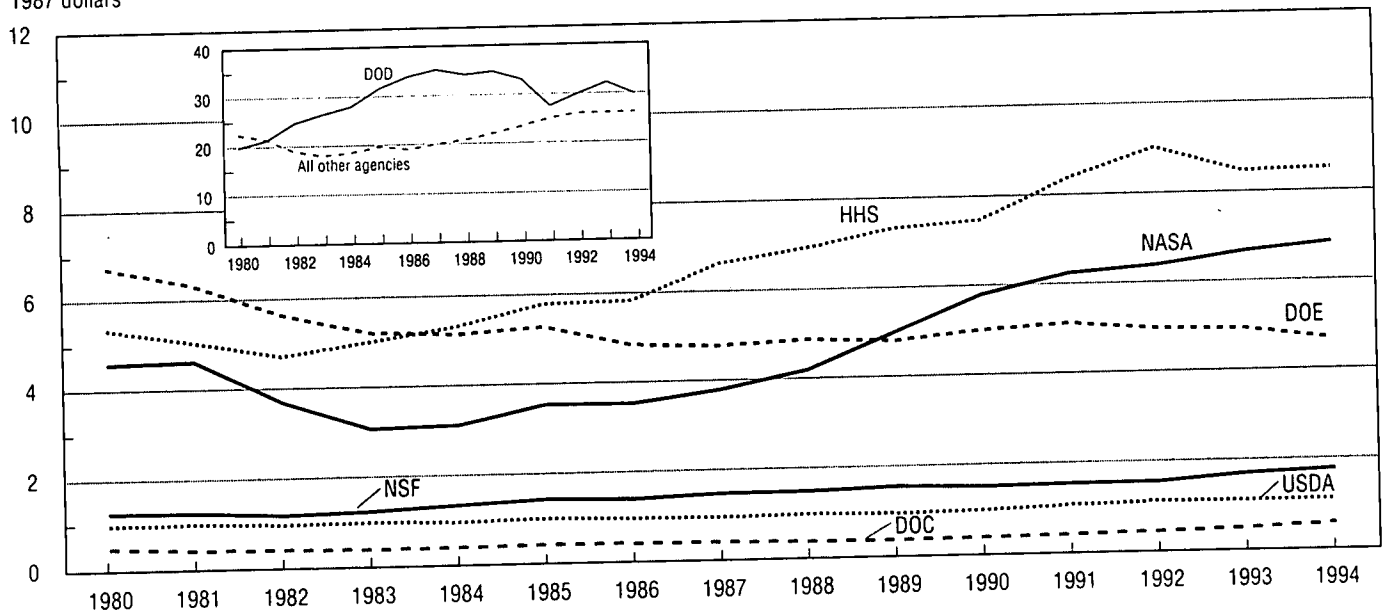
Total obligations for R&D and R&D plant in 1994–$74.4 billion



KEY: HHS=Department of Health and Human Services; NASA=National Aeronautical and Space Administration; DOE=Department of Energy; NSF=National Science Foundation; DOD=Department of Defense

SOURCES: National Science Foundation, Division of Science Resources Studies, *Federal Funds for Research and Development: Fiscal Years 1991, 1992, and 1993*, NSF 93-323 (Washington, DC: NSF, 1993); *Selected Data on Federal Funds for Research and Development: Fiscal Years 1992, 1993, and 1994*, NSF 94-311 (Arlington, VA: NSF, 1994) and Office of Management and Budget, unpublished tabulations.

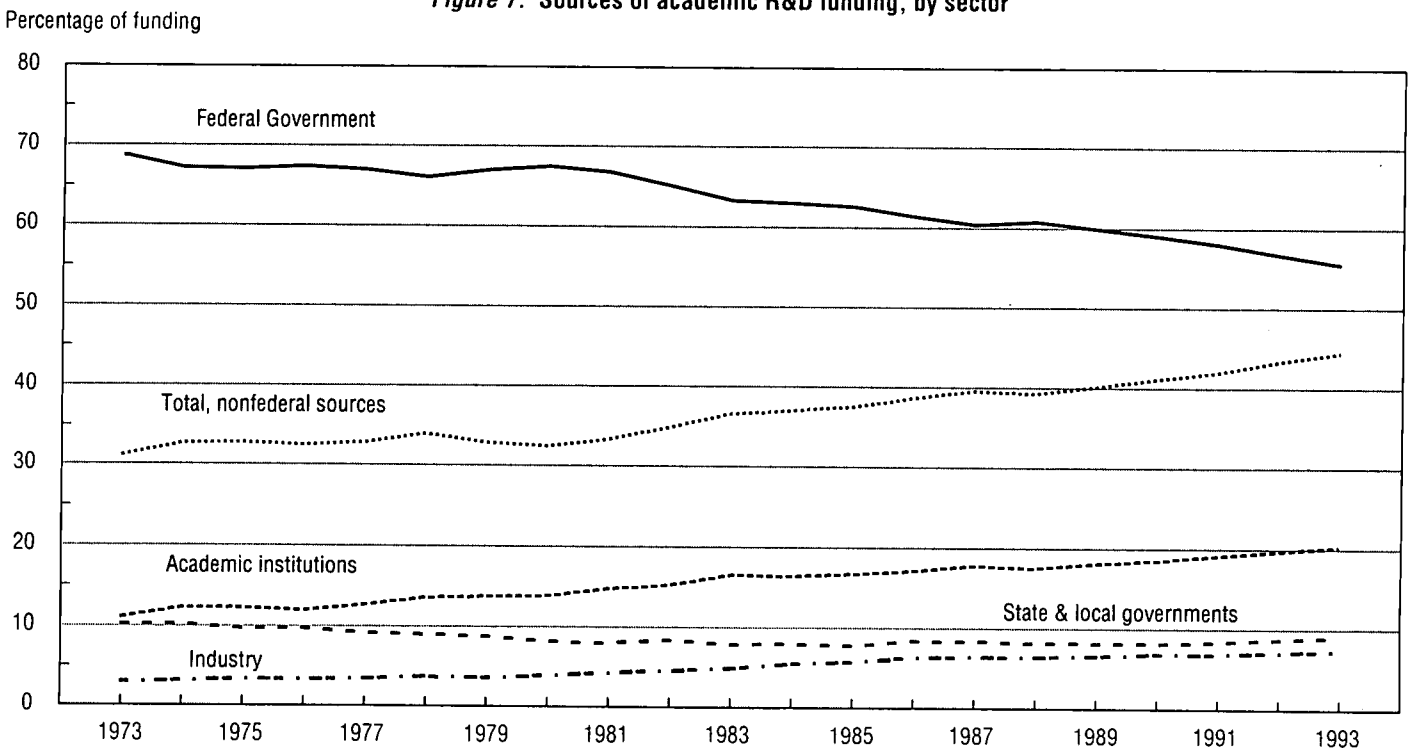
Figure 6. **Federal R&D obligations, by selected agency**



SOURCES: Science Resources Studies Division, National Science Foundation, *Federal Funds for Research and Development: Fiscal Years 1991, 1992, and 1993*, (Washington, DC: NSF, 1993); and Office of Management and Budget, unpublished tabulations.

Academic R&D

Figure 7. **Sources of academic R&D funding, by sector**



NOTE: Data for 1993 are estimates.

SOURCES: National Science Foundation, Division of Science Resources Studies (SRS), *Academic Science and Engineering: R&D Expenditures: Fiscal Year 1991*, Detailed Statistical Tables, NSC 93-308 (Washington, DC: NSF, 1993); and SRS, annual series

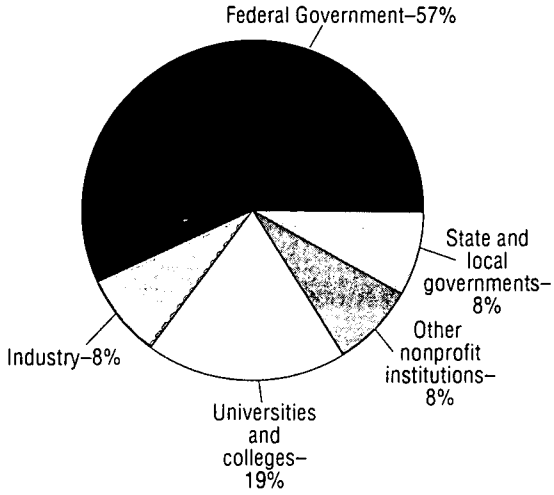
Figure 8. Academic R&D expenditures, by source of funds

(Millions of dollars)

Year	Total	Federal Govt.	State and local govt.s	Industry	U&C	Other nonprofit institutions
1984	8,620	5,430	690	475	1,411	614
1985	9,686	6,063	752	560	1,617	694
1986	10,927	6,710	915	700	1,869	733
1987	12,152	7,342	1,023	790	2,169	828
1988	13,463	8,192	1,106	872	2,357	936
1989	15,019	8,997	1,234	998	2,714	1,076
1990	16,344	9,637	1,339	1,130	3,033	1,195
1991	17,638	10,226	1,484	1,210	3,404	1,313
1992	18,880	11,087	1,506	1,302	3,576	1,409
1993 (est.)	19,950	11,500	1,600	1,550	3,750	1,550

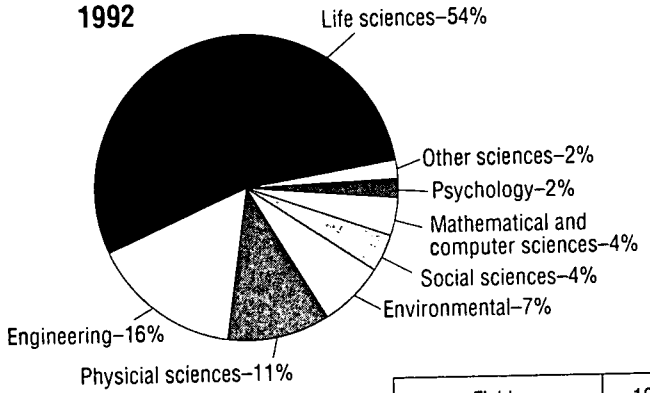
NOTES: Detail may not add to total because of rounding.
U&C = Universities and Colleges

1993



SOURCES: National Science Foundation, Division of Science Resources Studies (SRS). *Selected Data on Academic Science and Engineering: R&D Expenditures: Fiscal Year 1992*, NSF 94-303 (Arlington, VA: NSF, 1994); and SRS unpublished tabulations

Figure 9. Academic R&D expenditures, by field



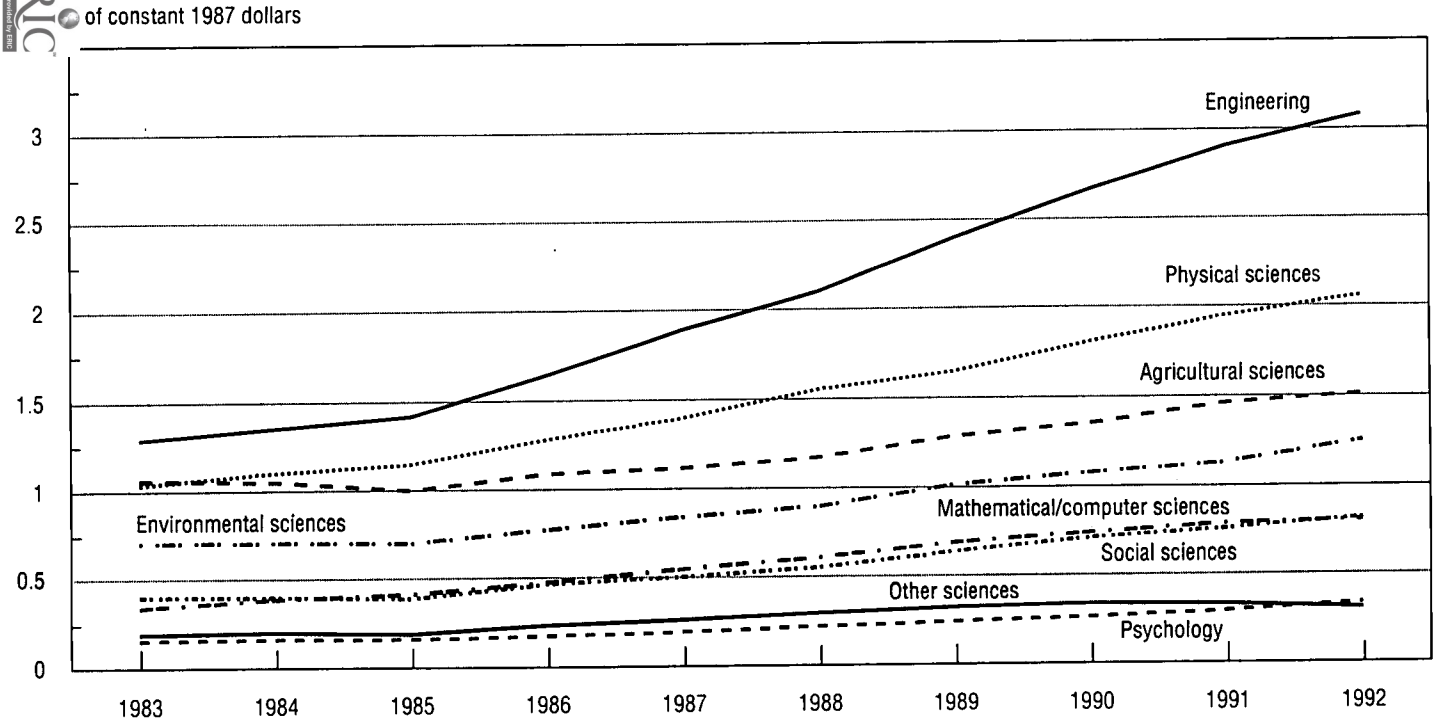
NOTE: Because of rounding, detail may not add to 100.

SOURCES: National Science Foundation, Division of Science Resources Studies (SRS), *Selected Data on Academic Science and Engineering R&D Expenditures: Fiscal Year 1992*, NSF 94–303 (Arlington, VA: NSF, 1994); and SRS unpublished sources.

(Millions of dollars)

Field	1985	1986	1987	1988	1989	1990	1991	1992
Total	9,686	10,927	12,152	13,463	15,019	16,344	17,638	18,880
Physical sciences	1,148	1,286	1,398	1,544	1,649	1,809	1,945	2,058
Mathematics	128	152	177	199	214	221	230	247
Computer sciences	281	321	372	409	472	514	554	556
Environ. sciences	705	776	839	894	1,014	1,080	1,130	1,249
Life sciences	5,279	5,890	6,528	7,257	8,082	8,748	9,496	10,228
Psychology	158	170	187	213	237	258	291	336
Social sciences	383	462	502	552	637	706	755	817
Other sciences	186	228	256	289	316	335	330	307
Engineering	1,418	1,641	1,892	2,096	2,398	2,663	2,907	3,082

Figure 10. **Academic R&D expenditures, by selected field**



SOURCES: National Science Foundation, Division of Science Resources Studies (SRS), *Selected Data on Academic Science and Engineering: R&D Expenditures: Fiscal Year 1992*, NSF 94–303 (Arlington, VA: NSF, 1994); and SRS, unpublished tabulations.

Figure 11. Percent of academic R&D which is federally financed, by field

Percent Federally Financed

Field	1981	1985	1991	1992
Total science & engineering	67	63	58	59
Total sciences	67	63	58	59
Physical sciences	81	78	71	72
Mathematical sciences	78	76	74	74
Computer sciences	72	70	67	68
Environmental sciences	71	67	63	64
Life sciences	64	60	57	58
Psychology	73	67	66	66
Social sciences	51	40	33	34
Other sciences	57	49	34	34
Engineering	69	61	56	57

SOURCE: National Science Foundation, Division of Science Resources Studies, *Selected Data on Academic Science and Engineering: R&D Expenditures: Fiscal Year 1992*, NSF 94-303 (Arlington, VA: NSF, 1994)

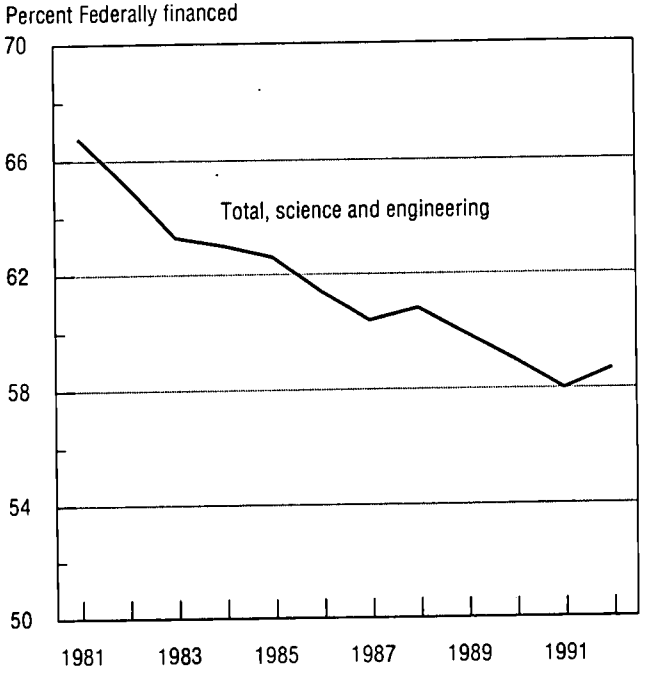
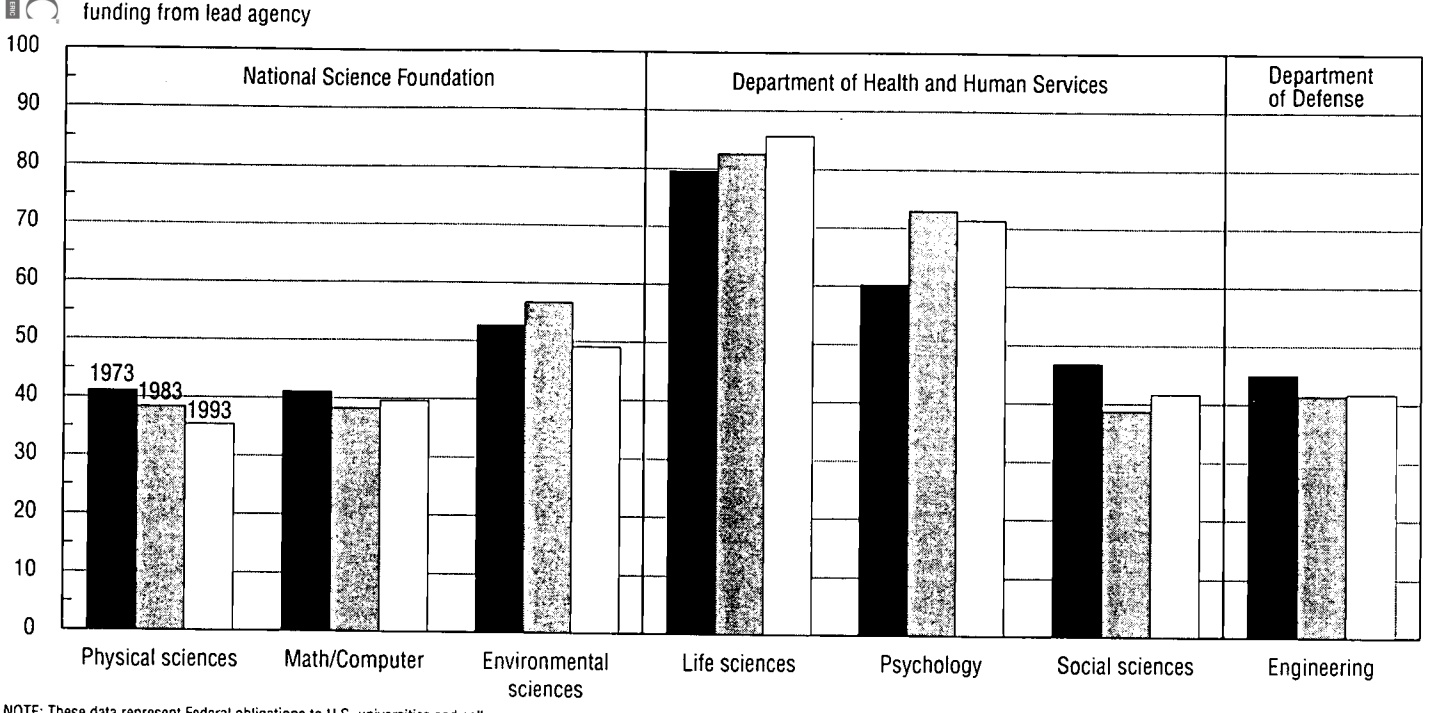


Figure 12. **Academic funding provided by current lead Federal R&D funder, by field R&D in U.S. Industry**



NOTE: These data represent Federal obligations to U.S. universities and colleges.

SOURCE: National Science Foundation, Division of Science Resources Studies. *Selected Data on Federal R&D Funding by Budget Function: Fiscal Years 1993–95,* NSF 94–319 revised (Arlington, VA: NSF, 1994)

R&D in U.S. Industry

Figure 13. **Expenditures for industrial R&D, by source of funds**

(Millions of current dollars)

	1970	1980	1985	1990	1991	1992	1993* (est.)
Total	17,594	43,228	82,376	101,842	99,524	105,100	109,600
Industry	10,288	30,476	57,043	73,980	76,938	79,000	81,300
Federal	7,306	12,752	25,333	27,862	22,586	26,100	28,300

SOURCE: National Science Foundation, SRS

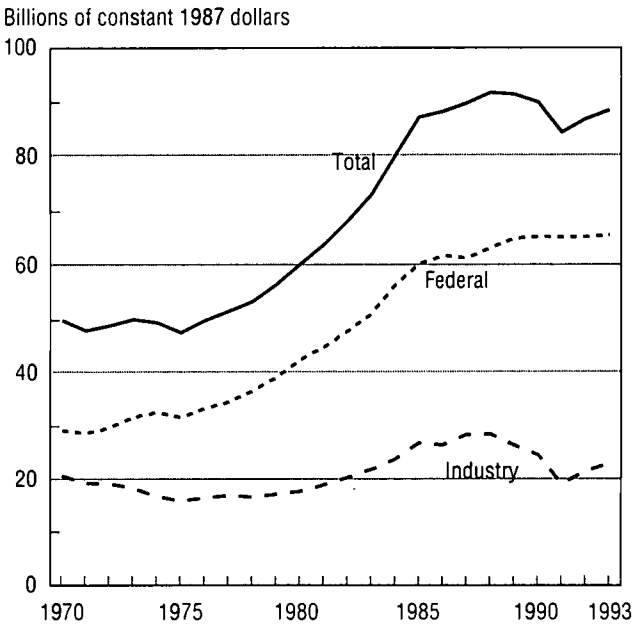


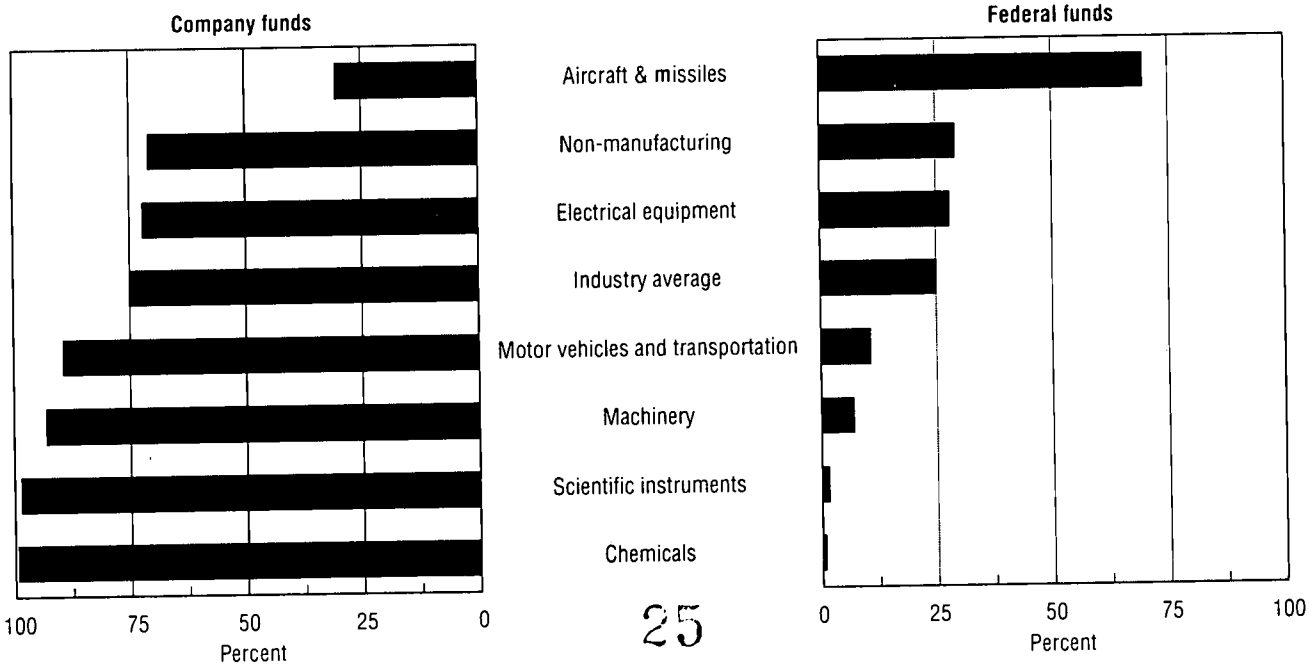
Figure 14. **Industrial R&D performance, by character of work**

(Millions of dollars)

Year	Total	Basic research	Applied research	Development
1986	87,823	4,047	19,760	64,016
1987	92,155	4,323	19,813	68,019
1988	97,889	4,280	20,595	73,014
1989	101,854	4,646	22,388	74,820
1990	104,606	4,909	23,628	76,069
1991	102,246	4,373	24,084	73,789
1992 (prel.)	107,800	4,500	25,400	77,900
1993 (est.)	112,300	4,700	26,500	81,100

SOURCE: National Science Foundation, SRS

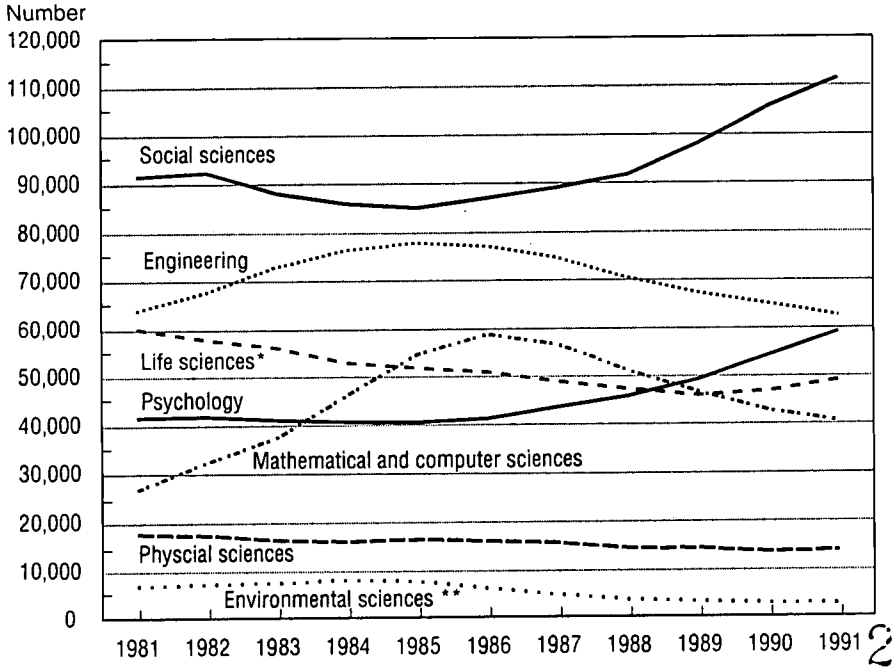
Figure 15. **Share of industrial R&D funding, by source and industry: 1991**



SOURCE: National Science Foundation, SRS

Education of Scientists and Engineers

Figure 16. **Bachelor's degrees awarded in major science and engineering fields**

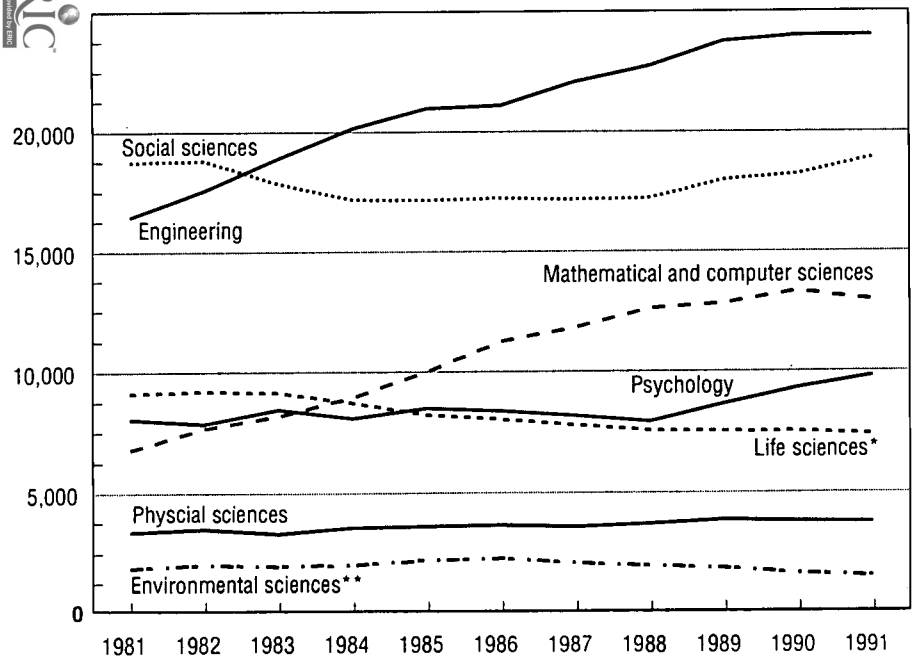


Field	1981	1991
All fields (S/E and non-S/E)	946,877	1,107,997
Science and engineering total	306,792	337,675
Physical sciences	17,446	13,678
Mathematical and computer sciences	26,406	40,194
Environmental sciences	6,694	2,728
Biological and agricultural sciences	59,922	48,783
Psychology	41,364	58,893
Social sciences	91,243	111,212
Engineering	63,717	62,187

* "Life sciences" refers to biological and agricultural sciences only.
** "Environmental sciences" includes earth, atmospheric, and marine sciences.

SOURCE: National Science Foundation, Division of Science Resources Studies, *Science and Engineering Degrees: 1966–91*, Detailed Statistical Tables, NSF 94–305 (Arlington, VA: NSF, 1994)

Figure 17. **Master's degrees awarded in major science and engineering fields**

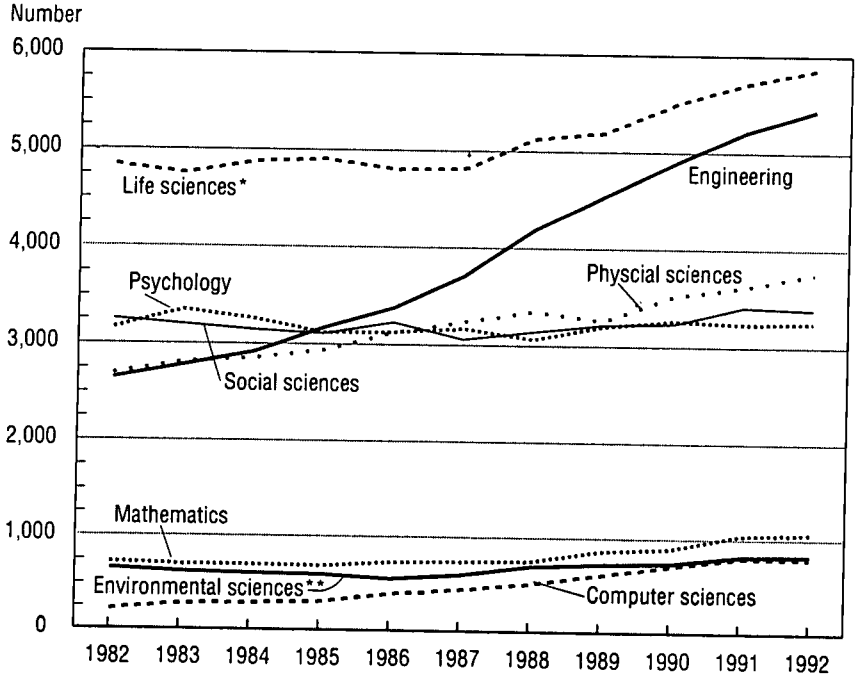


Field	1981	1991
All fields (S/E and non-S/E)	296,798	338,498
Science and engineering total	64,366	78,368
Physical sciences	3,366	3,777
Mathematical and computer sciences	6,787	12,956
Environmental sciences	1,876	1,499
Biological and agricultural sciences	9,107	7,406
Psychology	8,039	9,802
Social sciences	18,740	18,915
Engineering	16,451	24,013

* "Life sciences" refers to biological and agricultural sciences only.
** "Environmental sciences" includes earth, atmospheric, and marine sciences.

SOURCE: National Science Foundation, Division of Science Resources Studies, *Science and Engineering Degrees: 1966–91*, Detailed Statistical Tables, NSF 94-305 (Arlington, VA: NSF, 1994)

Figure 18. Doctorates awarded in major science and engineering fields



Field	1982	1992
All fields (S/E and non-S/E)	31,111	38,814
Science and engineering total	18,017	24,432
Physical sciences	2,694	3,749
Mathematics	720	1,058
Computer sciences	220	789
Environmental sciences	657	824
Biological and agricultural sciences	4,844	5,857
Psychology	3,159	3,252
Social sciences	3,077	3,388
Engineering	2,646	5,437

* "Life sciences" refers to the to biological and agricultural sciences only.
** "Environmental sciences" includes earth, atmospheric, and marine sciences.

SOURCE: National Science Foundation, Division of Science Resources Studies, *Science and Engineering Doctorates: 1960–92*, Detailed Statistical Tables, forthcoming (Arlington, VA: NSF, 1994)

Figure 19. **Full-time science/engineering graduate students in all institutions, by source of major support**

Source of major support	1980	1985	1990	1991	1992
Total, all sources	239,647	258,029	293,686	307,628	323,399
Federal Government	53,150	49,105	59,598	63,391	65,714
Institutional support	88,955	104,326	123,360	125,705	128,055
Other outside support	21,382	26,584	25,854	27,002	27,880
Self-support	76,160	78,014	80,456	91,530	101,750

SOURCE: National Science Foundation, Division of Science Resources Studies, *Selected Data on Graduate Students and Postdoctorates in Science and Engineering, Fall 1992*, NSF 94-301 (Arlington, VA: NSF, 1994)

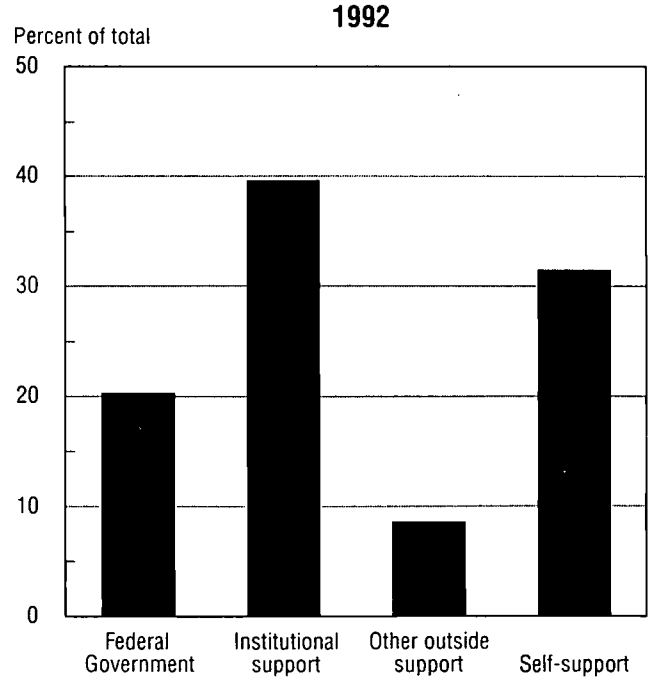


Figure 20. **Full-time science/engineering graduate students in all institutions, by type of major support**

Type of major support	1980	1985	1990	1991	1992
Total, all types	238,868	258,029	293,686	307,628	323,399
Fellowships and traineeships	38,082	36,300	40,568	42,388	44,233
Research assistantships	51,594	61,041	80,682	85,065	87,608
Teaching assistantships	53,913	61,923	65,123	65,390	65,728
Other types of support	95,279	98,765	107,313	114,785	125,750

SOURCE: National Science Foundation, Division of Science Resources Studies, *Selected Data on Graduate Students and Postdoctorates in Science and Engineering, Fall 1992*, NSF 94-301 (Arlington, VA: NSF, 1994)

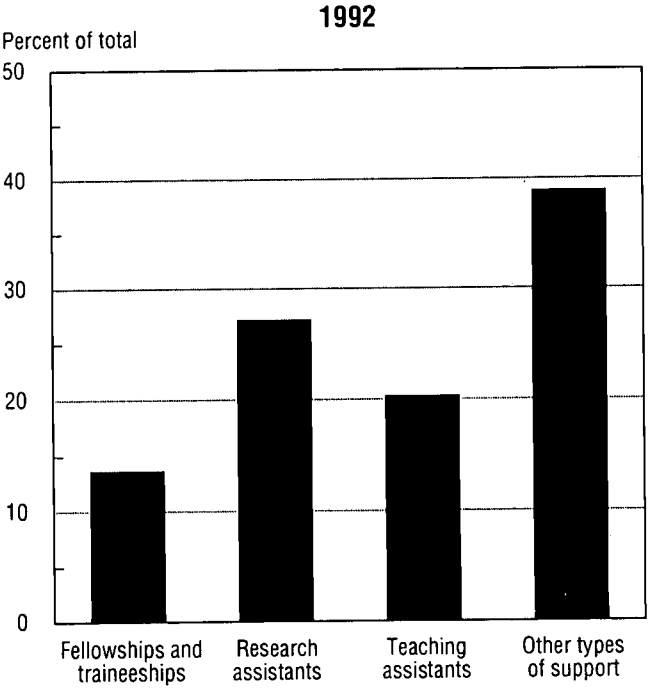
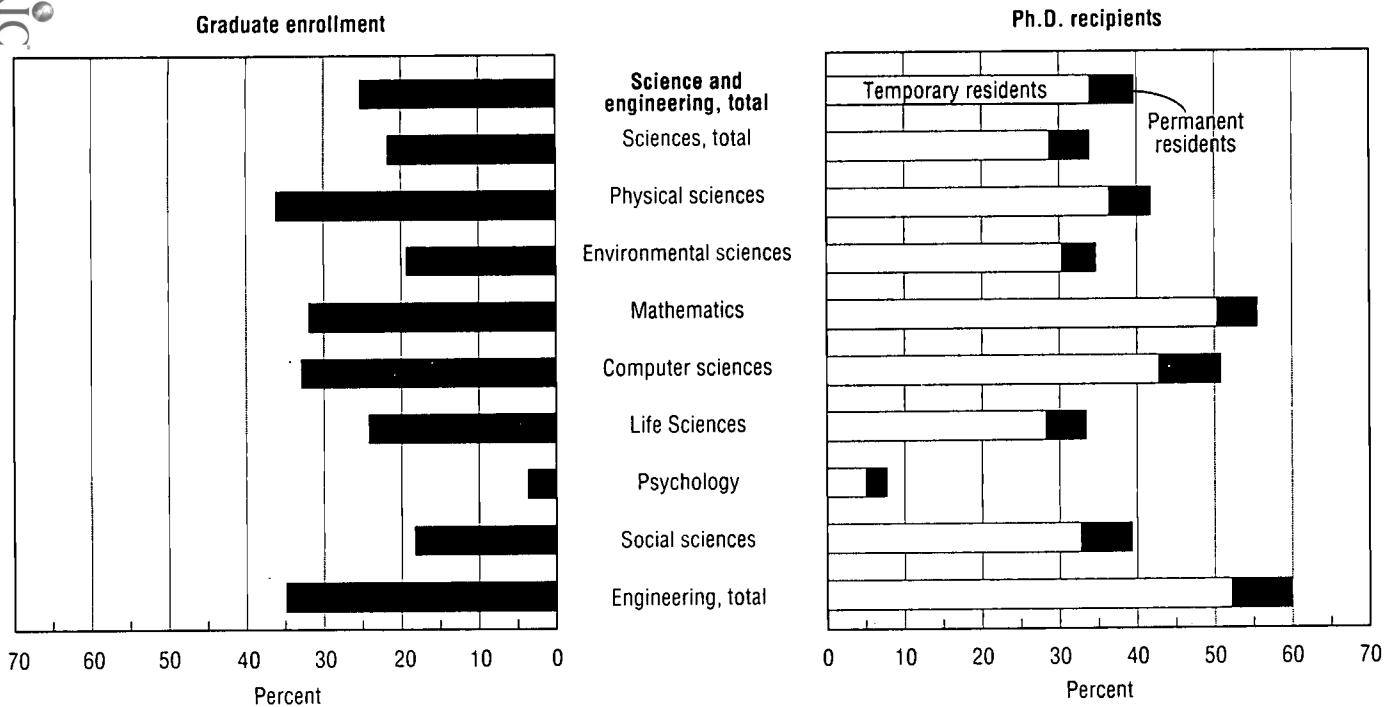


Figure 21. **Foreign citizen representation in 1992 U.S. science and engineering graduate education**



SOURCES: National Science Foundation, Division of Science Resources Studies, *Science and Engineering Doctorates: 1960–92*. Detailed Statistical Tables forthcoming, and *Selected Data on Graduate Students and Postdoctorates in Science and Engineering, Fall 1992*, NSF 94–301 (Arlington, VA: NSF, 1994).

Working Scientists and Engineers

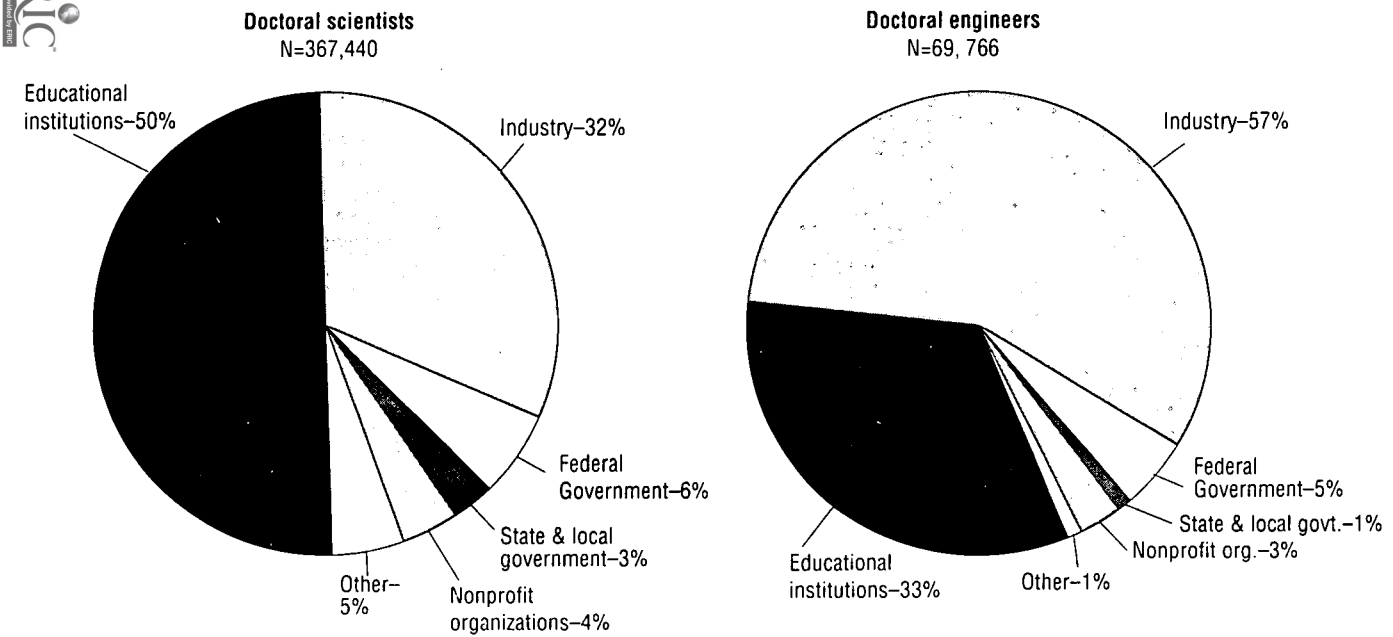
Figure 22. **S&E and in-field employment of 1988 and 1989 S&E graduates, by field of degree: 1990**

Field of degree	Percent Employed			
	S&E occupation		In-field	
	Bachelors	Masters	Bachelors	Masters
Total science and engineering	58	82	38	59
Total sciences	48	77	33	60
Physical sciences	68	86	36	43
Mathematical sciences/statistics	66	83	40	57
Computer science	85	89	82	77
Environmental sciences	77	93	56	69
Life sciences	54	76	38	59
Psychology	27	58	10	48
Social sciences	26	55	14	44
Total engineering	86	92	51	58
Aeronautical/astronomical	78	86	49	*
Chemical	89	100	50	*
Civil	89	95	71	69
Electrical/electronic	88	94	53	58
Industrial	80	73	42	27
Materials	85	100	*	*
Mechanical	89	94	44	60
Petroleum	100	100	*	*

NOTE: * = no rate was computed for groups with fewer than 1,500 individuals in labor force.

SOURCE: National Science Foundation, Division of Science Resources Studies, *Characteristics of Recent Science and Engineering Graduates: 1990*, Detailed Statistical Tables, NSF 92–316 (Washington, DC: NSF, 1992).

Figure 23. **Employed doctoral scientists and engineers, by sector: 1991**



SOURCE: National Science Foundation, Division of Science Resources Studies, *Characteristics of Doctoral Scientists and Engineers in the United States: 1991*, Detailed Statistical Tables, NSF 94–307 (Arlington, VA: NSF, 1994).

Figure 24. **Academic employment and R&D involvement of women and minority doctoral scientists and engineers: 1991**

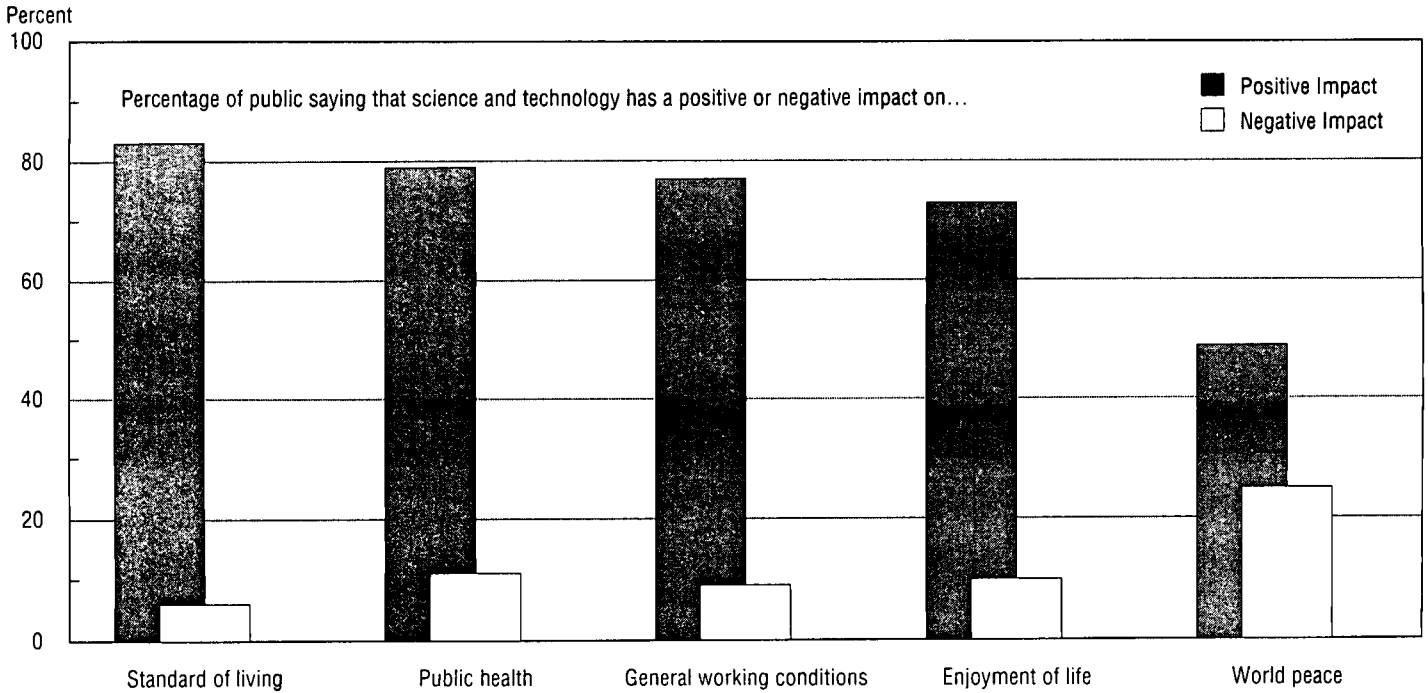
Field	Total Employment	Primary activity in R&D
	Women	
Total sciences	37,456	13,570
Engineering	936	416
	Minorities	
Total sciences		
White	154,126	58,140
Asian	12,427	6,462
Black	4,590	872
Hispanic[1]	3,620	1,590
Native American	384	108
Engineering		
White	18,300	6,584
Asian	3,955	1,693
Black	316	62
Hispanic[1]	523	76
Native American	*	*

1. Includes individuals who may have been included in one of the other race categories.
* Omitted because of small sample size.

SOURCE: National Science Foundation, Division of Science Resources Studies, *Characteristics of Doctoral Scientists and Engineers in the United States: 1991*, Detailed Statistical Tables, NSF 94-307 (Arlington, VA: NSF, 1994).

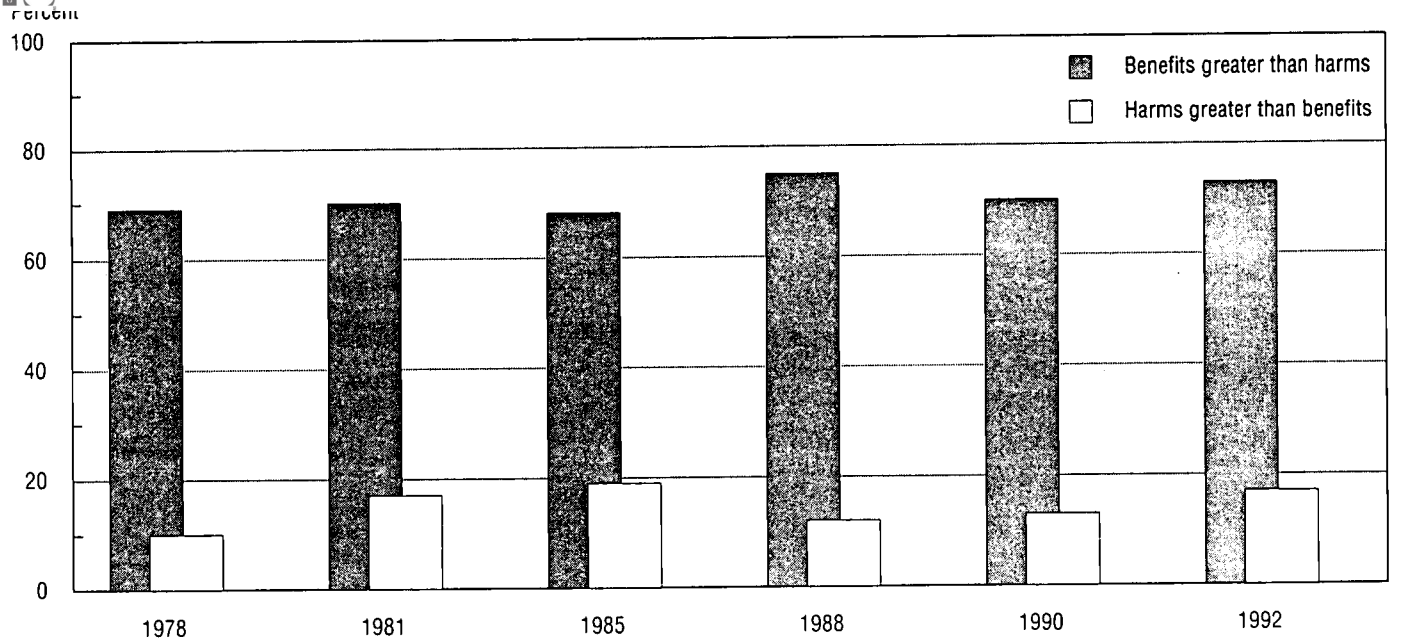
Public Attitudes Toward S&T

Figure 25. **Attitudes on the impact of science and technology on quality of life issues: 1992**



SOURCES: J.D. Miller and L.K. Pifer, *Public Attitudes Toward Science and Technology, 1979–1992, Integrated Codebook* (Chicago: International Center for the Advancement of Scientific Literacy, Chicago Academy of Sciences, 1993), and *Science & Engineering Indicators–1993*, (National Science Board, 1993).

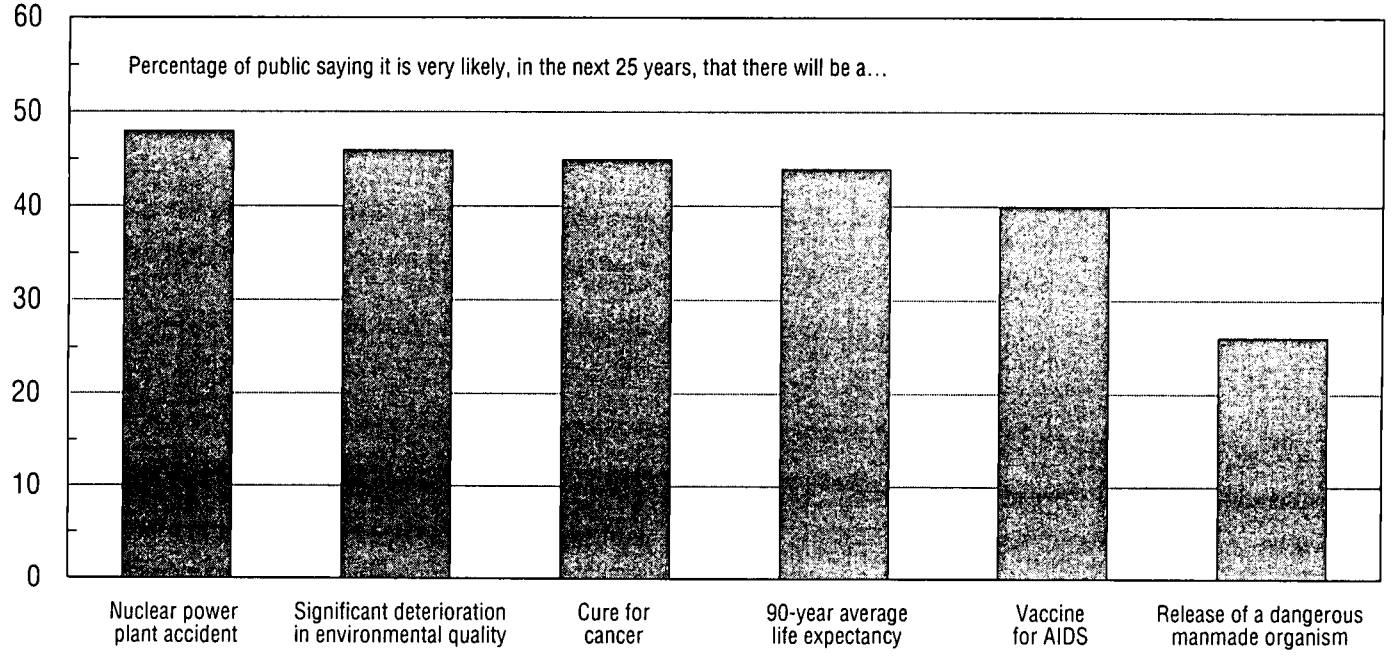
Figure 26. Assessments of scientific research over time



NOTES: Survey was only conducted in years shown. Data reflect responses of people saying that benefits (harms) exceed or strongly exceed harms (benefits).

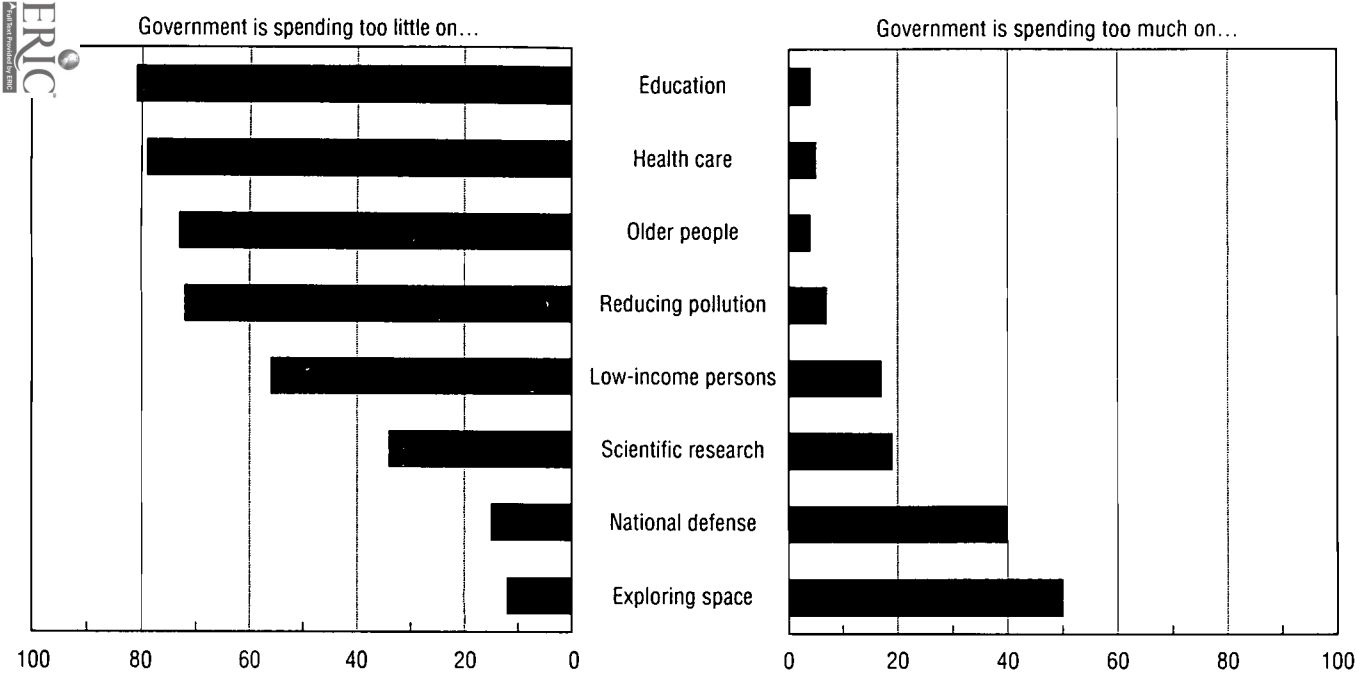
SOURCES: J.D. Miller and L.K. Pifer, *Public Attitudes Toward Science and Technology, 1979–1992, Integrated Codebook* (Chicago: International Center for the Advancement of Scientific Literacy, Chicago Academy of Sciences, 1993), and *Science & Engineering Indicators–1993*, (National Science Board, 1993).

Figure 27. **Expected results from science and technology: 1992**



SOURCES: J.D. Miller and L.K. Pifer, *Attitudes Toward Science and Technology, 1979–1992, Integrated Codebook* (Chicago: International Center for the Advancement of Scientific Literacy, Chicago Academy of Sciences, 1993), and *Science & Engineering Indicators–1993* (National Science Board, 1993).

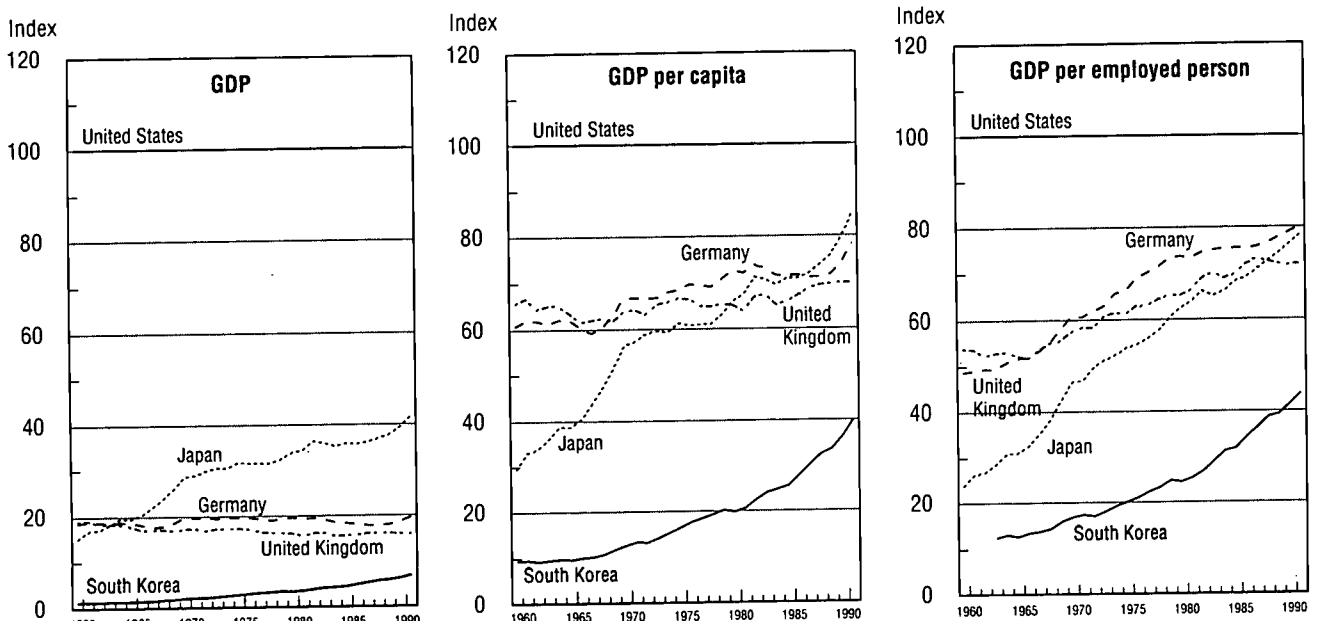
Figure 28. **Preferences for Government spending: 1992**



SOURCES: J.D. Miller and L.K. Pifer, *Public Attitudes Toward Science and Technology, 1979–1992, Integrated Codebook* (Chicago: International Center for the Advancement of Scientific Literacy, Chicago Academy of Sciences, 1993), and *Science & Engineering Indicators–1993* (National Science Board, 1993).

International S&T Trends

Figure 29. **Comparisons of economic growth**



NOTES: Index: United States=100. Country GDPs were calculated using 1985 purchasing power parities. German data are for the former West Germany only.

SOURCE: Bureau of Labor Statistics, unpublished tabulations.

Figure 30. National expenditures on R&D, by selected countries

(Billions of constant 1987 dollars)

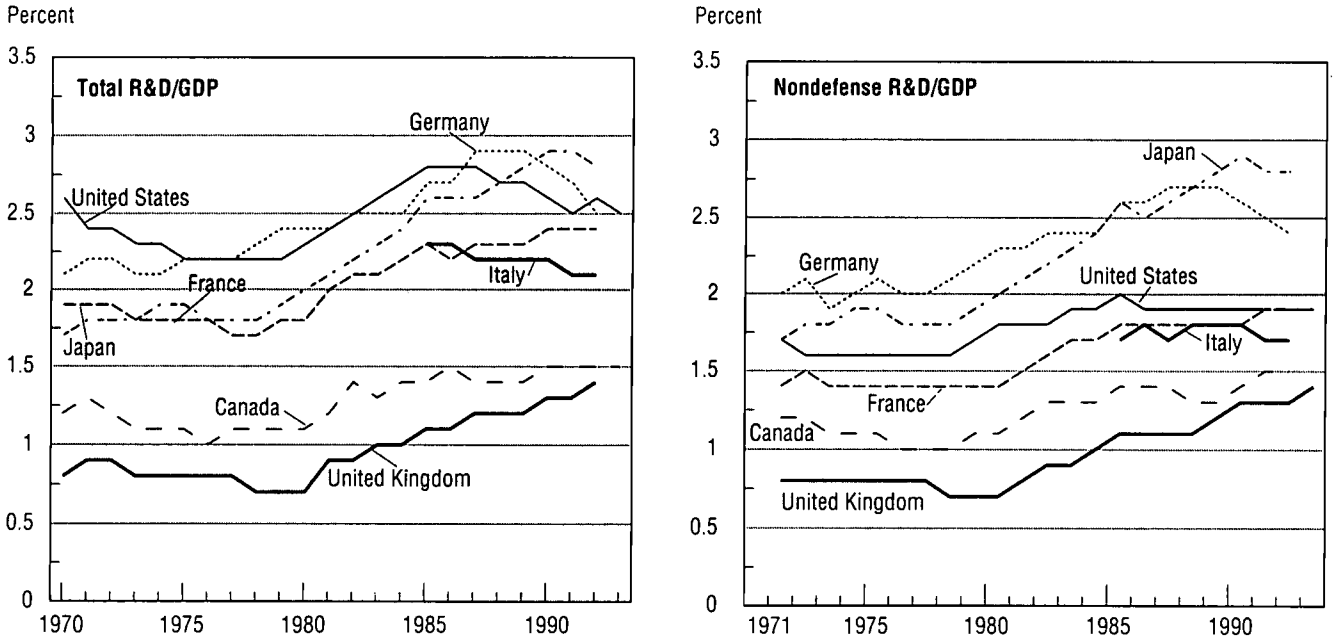
Year	United States	Japan[1]	Germany[2]	France	United Kingdom
1970	74.2	14.7	13.8	10.1	NA
1971	71.9	15.7	15.2	10.5	NA
1972	73.4	17.4	15.9	10.7	11.6
1973	74.4	19.1	15.8	10.7	NA
1974	73.2	19.6	16.2	11.2	NA
1975	71.6	19.9	16.7	11.3	12.2
1976	74.6	20.6	17.0	11.5	NA
1977	76.5	21.3	17.4	11.8	NA
1978	79.8	22.3	18.7	12.1	13.5
1979	83.8	24.6	20.5	12.9	NA
1980	87.3	26.9	21.4	13.3	NA
1981	91.1	28.7	20.5	14.1	14.7
1982	95.5	30.9	21.1	15.0	NA
1983	102.2	33.5	21.4	15.5	14.4
1984	111.1	36.0	21.8	16.4	NA
1985	120.6	40.0	24.0	17.0	15.6
1986	123.4	40.6	24.5	17.2	16.5
1987	125.4	43.4	26.1	17.9	16.8
1988	128.7	46.9	27.0	18.7	17.0
1989	129.7	51.3	28.0	19.8	17.6
1990	129.2	55.5	28.2	21.0	17.7
1991	123.5	57.2	30.3	21.3	16.1
1992	127.6	56.5	30.0	20.8	16.5
1993	129.3	NA	NA	NA	NA

1. Japanese data for 1970–74 are NSF estimates. The Japanese data have been revised from estimates previously published in NSF reports.
2. Data after 1990 are for Unified Germany.

NOTES: NA = Not available. Conversions of foreign currencies to U.S. dollars are calculated with Organisation for Economic Co-operation and Development purchasing power parity exchange rates. Constant 1987 dollars are based on U.S. Department of Commerce GDP implicit price deflators.

SOURCE: National Science Foundation, Division of Science Resources Studies, Organisation for Economic Co-operation and Development, and national sources.

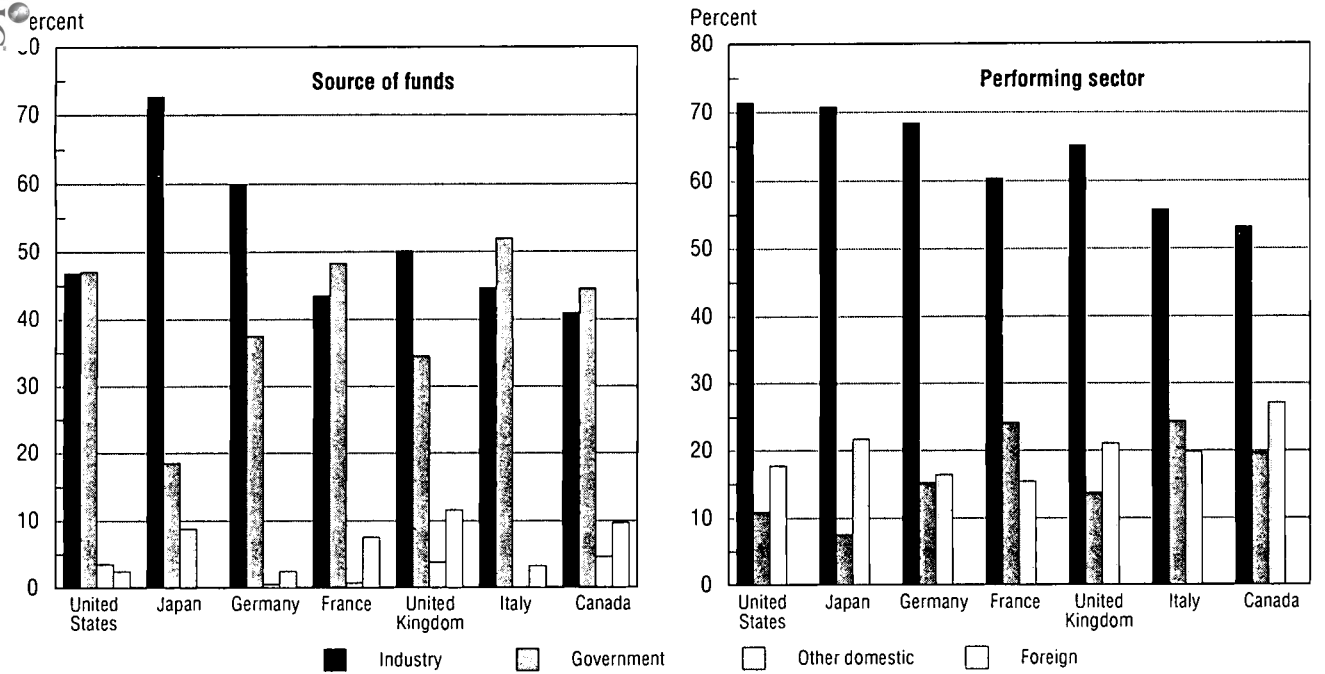
Figure 31. **R&D as a percentage of GDP, by country**



NOTES: After 1990, data are for Unified Germany. Japanese data for 1970–74 and 1992 are NSF estimates; the Japanese data have been revised from previously published NSF reports.

SOURCES: National Science Foundation and Organisation for Economic Co-operation and Development

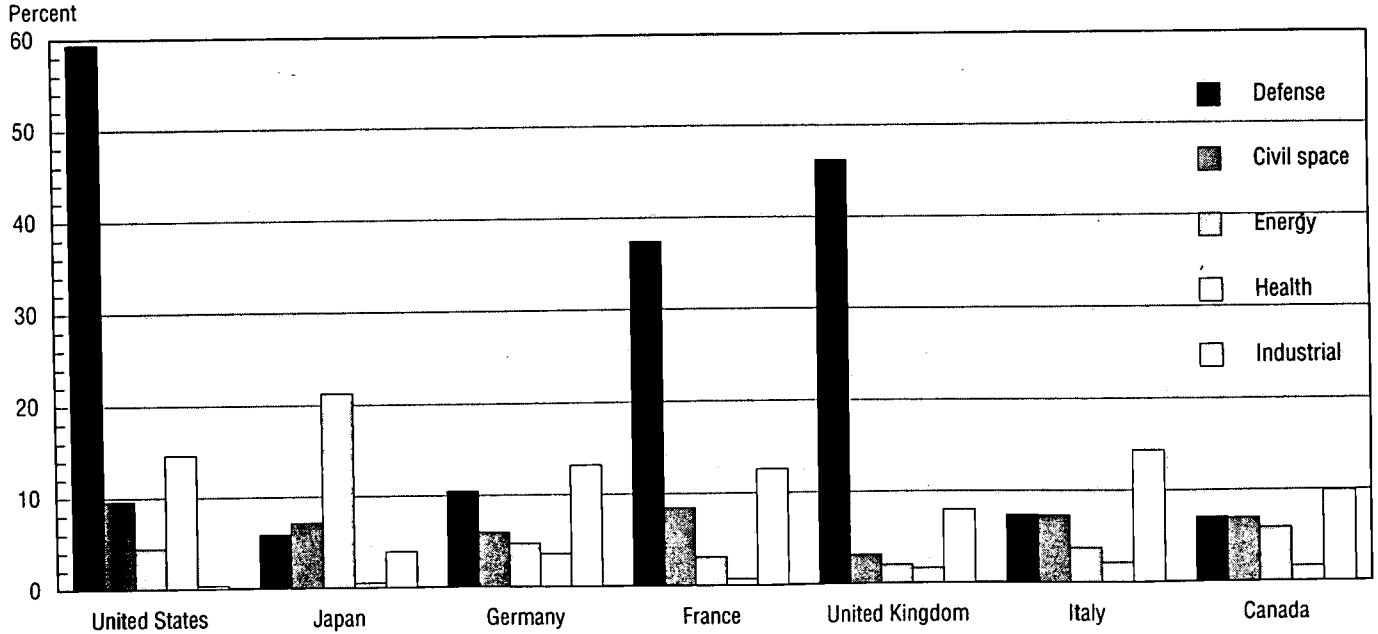
Figure 32. **R&D expenditures, by country, source, and performer: 1991**



NOTES: German data are for the former West Germany only. Foreign performers are included in the "industry" and "other domestic" sectors.

SOURCES: National Science Foundation, Division of Science Resources Studies, unpublished tabulations; Organisation for Economic Co-operation and Development, unpublished tabulations; and U.S. Bureau of Economic Analysis, unpublished tabulations.

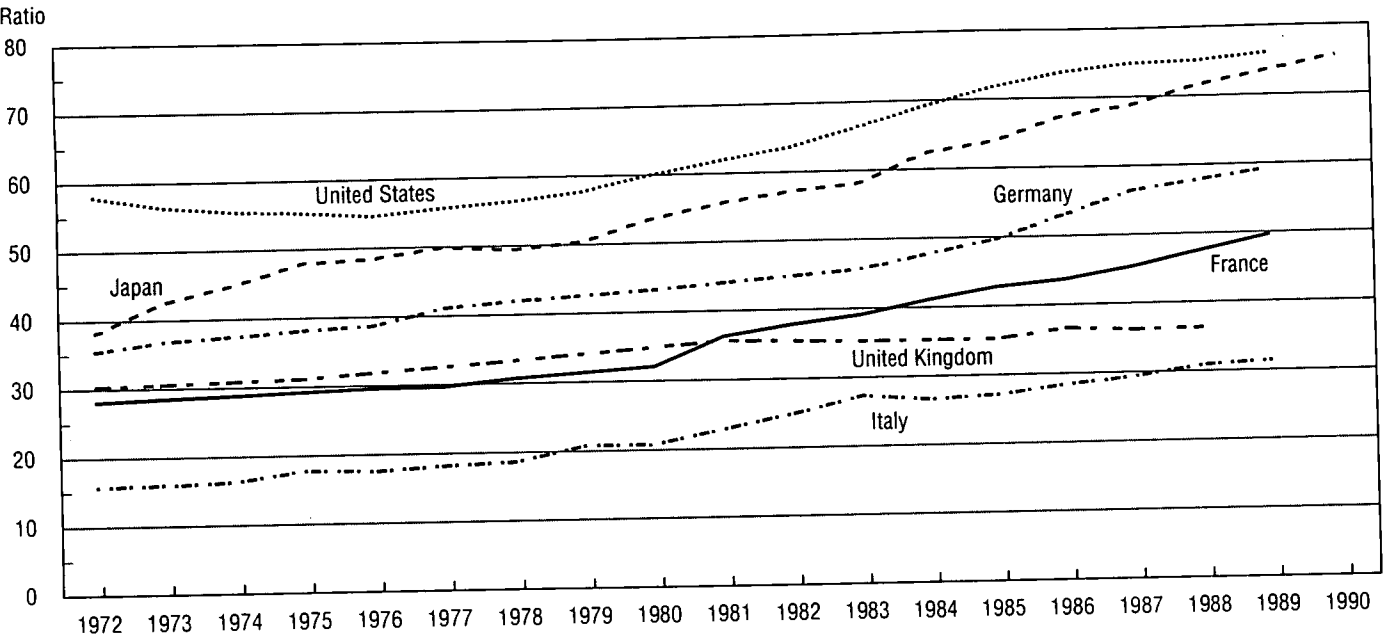
Figure 33. **Government R&D support, by country and socioeconomic objective: 1992**



NOTES: German data are for the former West Germany only. Detail do not add to 100% because funding for some objectives (for example, advancement of knowledge) is not graphed. R&D is classified according to its *primary* government objective, although it may support any number of complementary goals. For example, defense R&D with commercial spin-offs is classified as supporting defense, not industrial development.

SOURCE: National Science Foundation, SRS; Organisation for Economic Co-operation and Development; and national sources.

Figure 34. **Ratio of R&D scientists and engineers per 10,000 workers in the general labor force, by country**



NOTE: German data are for the former West Germany only.

SOURCES: National Science Foundation, SRS; Organisation for Economic Co-operation and Development; and national sources.

Figure 35. Scientists and engineers engaged in R&D, by country

(In thousands)

Year	France	Italy	Japan[2]	Sweden[1]	United Kingdom	United States	Germany[1]
1975	65.3	37.9	253.6	13.2	80.5	527.4	103.7
1976	67.0	37.9	263.2	NA	NA	535.2	104.5
1977	68.0	39.7	264.8	14.1	NA	560.6	111.0
1978	70.9	40.8	272.8	14.5	87.7	586.6	113.9
1979	72.9	46.4	291.2	14.8	NA	614.5	116.9
1980	74.9	47.0	303.2	16.3	NA	651.1	120.7
1981	85.5	52.1	311.0	17.9	95.7	683.2	124.7
1982	90.1	56.7	321.0	18.5	NA	711.8	127.7
1983	92.7	63.0	347.4	19.2	94.1	751.6	130.8
1984	98.2	62.0	357.4	20.5	96.3	797.6	137.1
1985	102.3	63.8	380.8	21.9	124.8	841.2	143.6
1986	105.0	67.8	393.0	22.3	128.2	882.3	156.0
1987	109.4	70.6	415.6	22.7	128.2	910.2	165.6
1988	115.2	74.9	434.6	24.2	130.2	927.3	171.0
1989	120.4	76.1	457.5	25.6	134.0	949.3	176.4
1990	123.9	77.9	477.9	26.1	130.0	NA	NA
1991	129.2	75.2	491.1	26.5	126.0	NA	NA
1992	NA	NA	511.4	NA	123.0	NA	NA

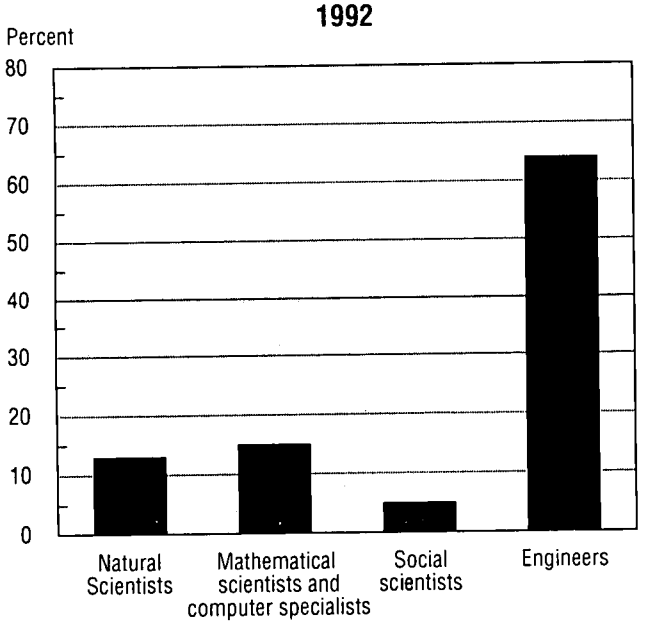
1. Beginning in 1978, figures for Germany and Sweden in even numbered ears have been imputed by the National Science Foundation.
2. The Japanese data have been revised from estimates previously published in NSF reports.

NOTES: Table includes all scientists and engineers engaged in R&D on a full-time basis, except for Japan, which reflects persons primarily employed in R&D in the natural sciences and engineering. British data exclude the private non-profit sector (about 2–5% of total). Because of ongoing improvements in methodology and measurement, there are several major breaks in the continuity of the following time series: France (between 1980–81), Germany (between 1978–79), Japan (1974–75), United Kingdom (1984–85), and Sweden (1980–81).

KEY: NA = Not available.

SOURCE: National Science Foundation, Division of Science Resources Studies; Organisation for Economic Co-operation and Development; and national sources.

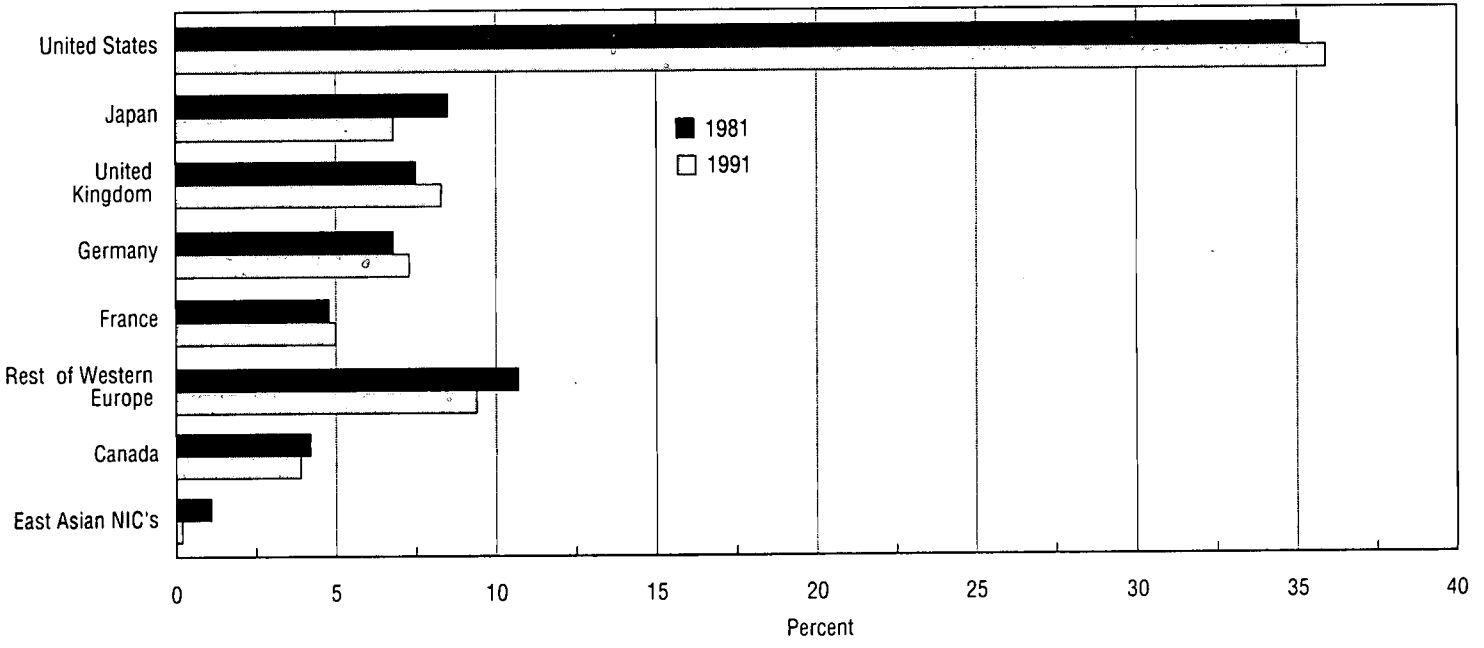
Figure 36. **Immigrant scientists and engineers in the U.S. by occupation**



	1990	1991	1992
Total, all scientists and engineers	12,659	14,111	22,871
Natural scientists	1,231	1,298	2,796
Mathematical scientists and computer specialists	1,613	1,722	3,402
Social scientists	528	599	1,088
Engineers	9,287	10,492	15,585

SOURCES: National Science Foundation, Division of Science Resources Studies, *Immigrant Scientists and Engineers: 1990*, Detailed Statistical Tables, NSF 93–317 (Washington, DC: NSF, 1993) and unpublished tabulations.

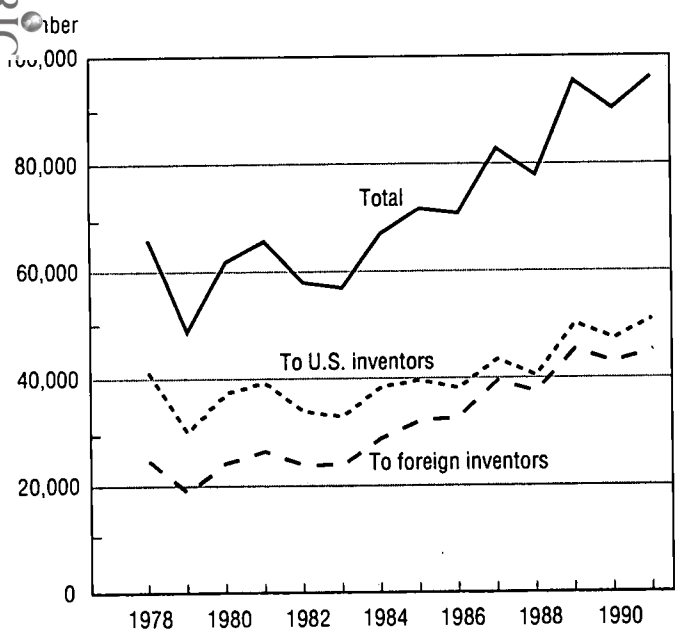
Figure 37. **Contributions of selected countries/regions to world scientific and technical literature**

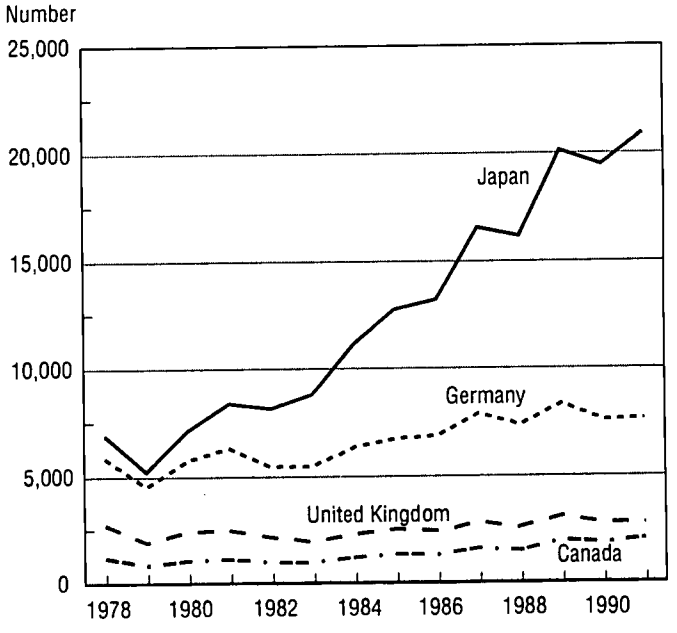


NOTE: NICS=Newly Industrialized Countries.

SOURCE: CHI Research, Inc., *Science & Engineering Indicators* Literature Database, 1993, special tabulations.

Figure 38. **U.S. patents granted, by nationality of inventor**

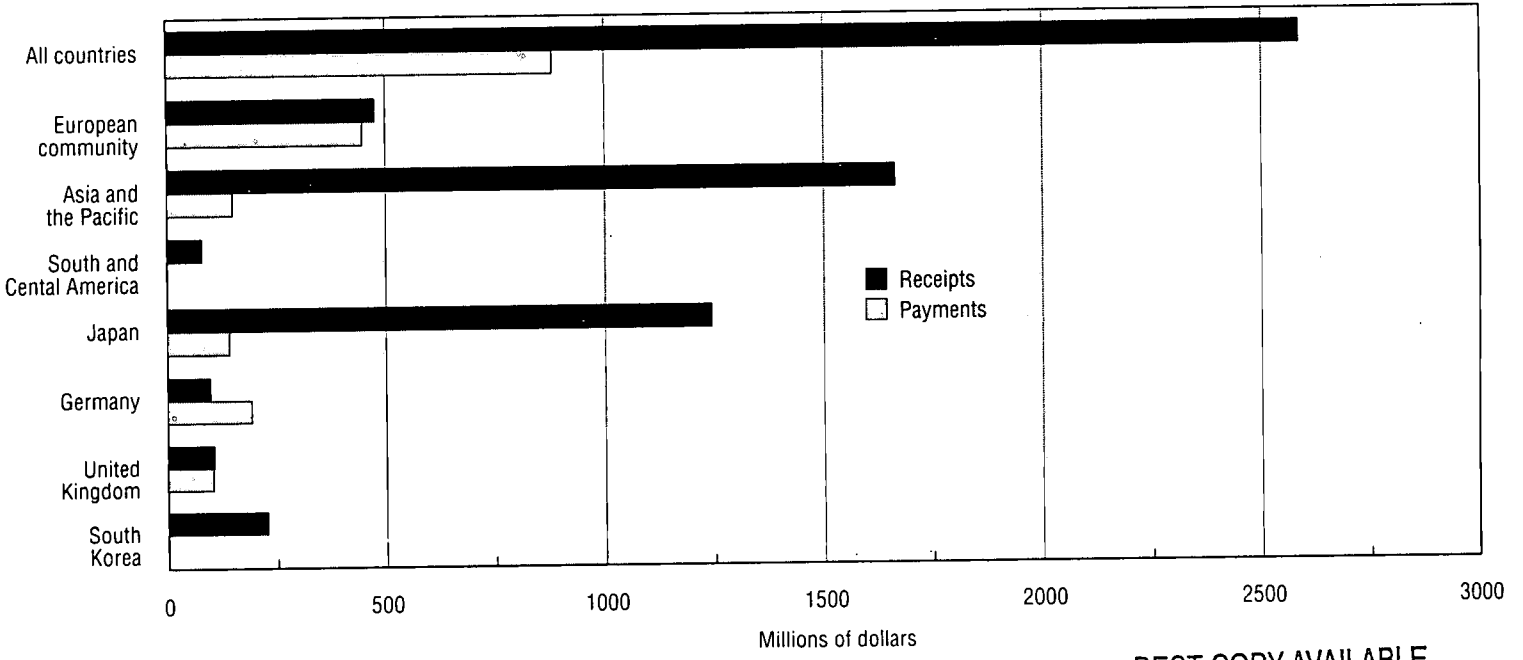




NOTE: German data are for the former West Germany only.

SOURCE: U.S. Patent and Trademark Office, *Patenting Trends in the United States, 1962–91* (Washington, DC: Sept. 1992).

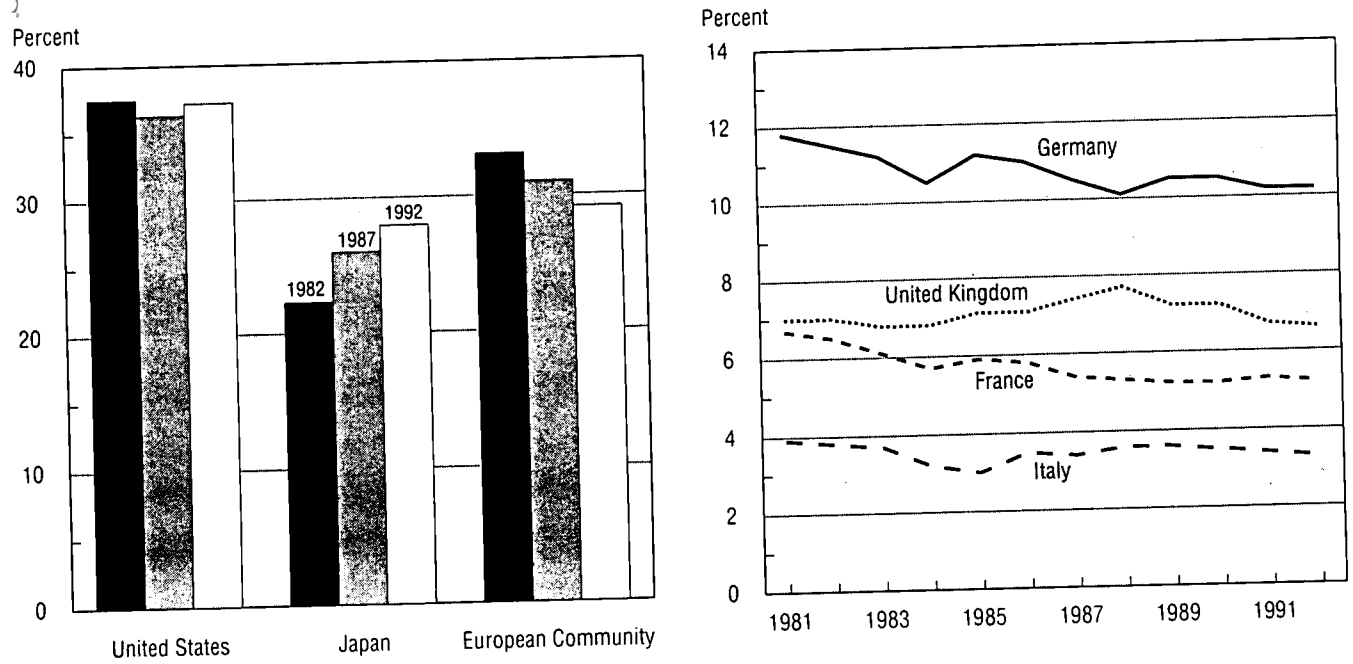
Figure 39. U.S. royalties and license fees generated by exchange of industrial processes between unaffiliated companies: 1991



NOTE: U.S. payments to South and Central America and to South Korea were less than $500,000.

SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business*, vol. 72, No. 9 (Sept. 1992): pp. 95–99.

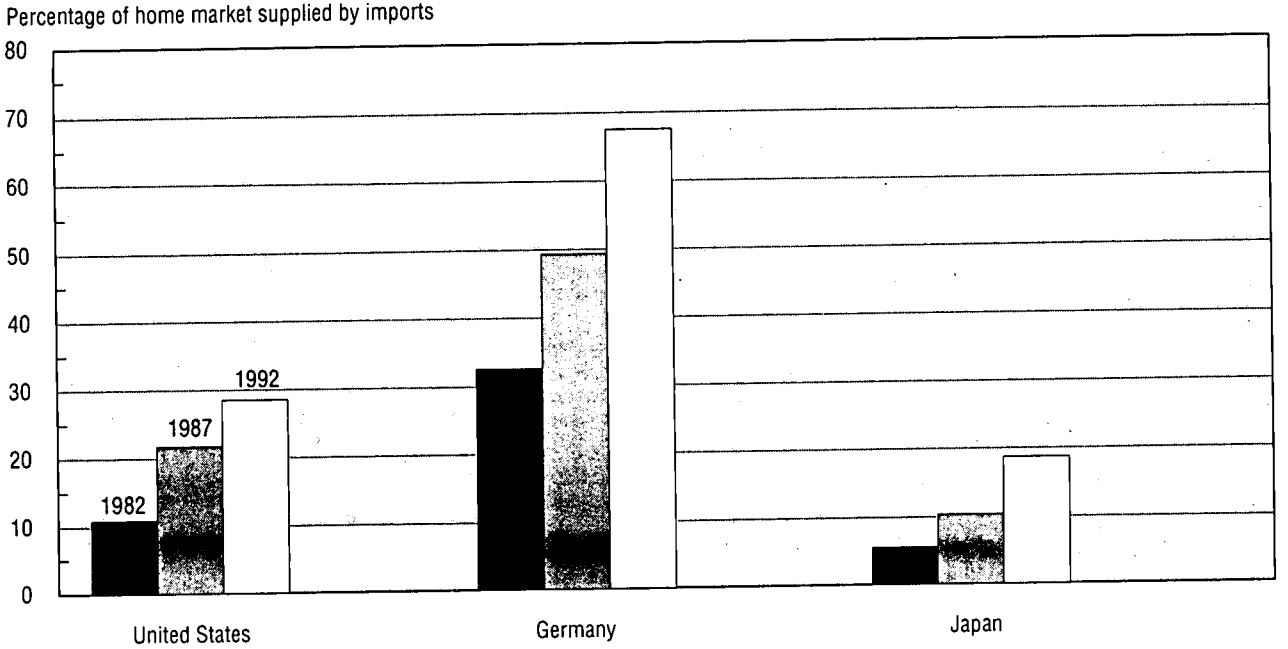
Figure 40. **Country/region share of global high-tech production**



NOTE: German data are for the former West Germany only.

SOURCE: Organisation for Economic Co-operation and Development; and special tabulations by DR/McGraw-Hill. 1993.

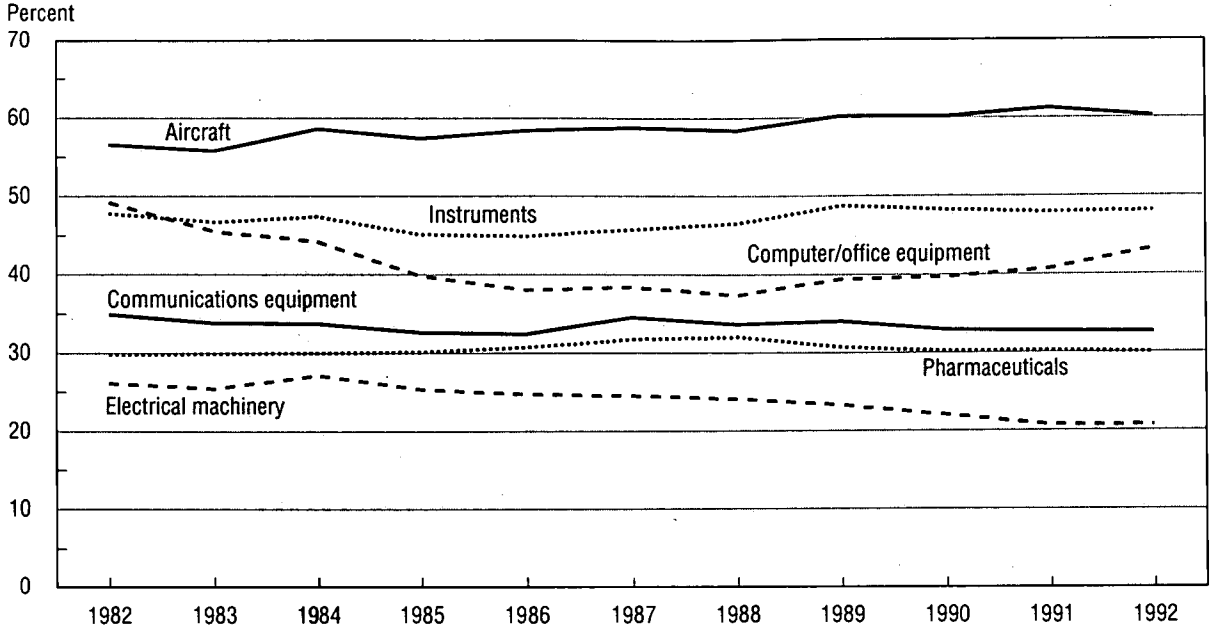
Figure 41. Import penetration of high-tech markets



NOTE: German data are for the former West Germany only.

SOURCE: Organisation for Economic Co-operation and Development, and special tabulations by DR/McGraw-Hill, 1993.

Figure 42. **U.S. global market share, by high-tech industry**



SOURCE: Special tabulations developed by McGraw-Hill from the Organisation for Economic Co-operation and Development's Industrial Structure Statistics and Series C Trade Data.

Figure 43. **Adult interest in and knowledge about environmental issues and concepts: 1992**

	European Community Percent	United States Percent
Interest in environmental issues		
Very interested	56	59
Moderately interested	38	36
Not very interested	6	5
Informed about environmental issues		
Very well-informed	25	29
Moderately well-informed	60	56
Poorly informed	14	15
Subjective environmental knowledge		
Acid rain	40	32
Air pollution	57	52
Global warming	37	27
The hole in the ozone layer	44	30
The greenhouse effect	40	27
Objective environmental kowledge		
Location of hole in ozone layer	31	17
Hole in ozone layer can cause skin cancer	81	73
Greenhouse effect can reduce deserts	47	32
Greenhouse effect can raise sea level	59	45
Acid rain can cause damage to forests	90	89
Car exhausts have nothing to do with acid	20	16
N=	12,800	2,001

NOTES: There were slight variations in the wording of the questions between the European Community and U.S. samples. The items measuring subjective and objective knowledge were asked of a random half of the U.S. sample (N=1,004). Percentages for the objective items represent percent correct.

SOURCES: J.D. Miller and L.K. Pifer, *Public Attitudes Toward Science and Technology, 1979–1992, Integrated Codebook* (Chicago: International Center for the Advancement of Scientific Literacy, Chicago Academy of Sciences, 1993); and Commission of the European Communities, *Europeans, Science and Technology–Public Understanding and Attitudes* [Eurobarometer 38.1] (Brussels: Commission of the European Communities, 1993).

Other Science Resources Publications

Title	Pub. Type	NSF Pub. No.
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Academic Research Equipment and Equipment Needs in Selected Science and Engineering Fields: 1989–90	Report	91-311
Academic Research Equipment and Equipment Needs in the Physical Sciences: 1989	Report	91-305
Academic Research Equipment in Computer Sciences, Central Computer Facilities and Engineering: 1989	Report	91-304
Characteristics of Science/Engineering Equipment in Academic Settings: 1989–90	Report	91-315
Geographic Patterns: R&D in the United States	Report	89-317
Guide to NSF's Surveys of Academic Science & Engineering December 1991	Report	92-301
International Science and Technology Data Update: 1991	Report	91-309
National Patterns of R&D Resources: 1992	Report	92-330
Profiles—Biological Sciences: Human Resources and Funding	Report	89-318
Science and Engineering Indicators—1993	Report	NSB 93-1
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Science and Technology Pocket Data Book: 1992	Report	92-331
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Superconductivity Research and Development Activities in U.S. Industry: 1987 and 1988	Staff Paper	——
Supplemental Users Guide to NSF's Surveys of Academic Science & Engineering, December 1991	Report	92-302
Survey of Direct U.S. Private Capital Investment in Research and Development Facilities in Japan	Report	91-312

Title	Pub. Type	NSF Pub. No.
Financial Resources		
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Federal Funds for Research and Development: Fiscal Years 1991, 1992 and 1993, Volume XLI	Tables	93-323
Federal R&D Funding by Budget Function: Fiscal Years 1992–94	Report	93-311
Federal Support to Universities, Colleges, and Nonprofit Institutions: Fiscal Year 1991	Tables	92-325
Planned R&D Expenditures of Major U.S. Firms: 1990–91	Report	91-306
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Research and Development in Industry: 1990. Funds, 1990; Scientists & Engineers, January 1991	Tables	94-304
Selected Data on Academic Science/Engineering R&D Expenditures: Fiscal Year 1992	Tables	94-303
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Selected Data on Federal Support to Universities and Colleges: Fiscal Year 1991	Tables	93-320
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Total Federal Academic Obligations Increased 15 Percent in FY 1991	Data Brief	93-304
U.S. Industry R&D Expenditures Declined in 1991	Data Brief	93-310
Human Resources		
Academic Science/Engineering: Graduate Enrollment and Support, Fall 1991	Tables	93-309
Blacks in Undergraduate Science and Engineering Education, April 1992	Special Report	92-305
Characteristics of Doctoral Scientists and Engineers in the United States: 1991	Tables	94-307
Characteristics of Recent Science and Engineering Graduates: 1990	Tables	92-316
Enrollment of S/E Graduate Students Continue to Increase	Data Brief	93-306
Federal Scientists and Engineers: 1988	Tables	89-322
Foreign Citizens Continue to Increase U.S. Ranks of Science and Engineering Doctorate Recipients	Data Brief	92-311
Immigrant Scientists and Engineers: 1990	Tables	93-317

	Pub. Type	NSF Pub. No.
Human Resources *(continued)*		
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Scientists, Engineers, and Technicians in Nonmanufacturing Industries: 1990	Tables	89-321
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Selected Data on Graduate Students and Postdoctorates in Science and Engineering: Fall 1992	Tables	94-301
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Using the Survey of Doctorate Recipients to Measure the Number of Academic Research Personnel in Science and Engineering	Data Brief	92-314
Using the Survey of Doctorate Recipients to Measure the Number of Academic Research Personnel in Science and Engineering	Research Note	92-315
Women and Minorities in Science and Engineering, An Update	Report	92-303
Women Continue to Earn Increasing Percentage of Science and Engineering Baccalaureates	Data Brief	92-313

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Science and Technology Pocket Data Book

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