

1994 Company Funding of U.S. Industrial R&D Rises as Federal Support Continues to Decline

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Increased company support of R&D offset reduced Federal funding in 1994 and contributed to an overall increase in U.S. industrial R&D, to \$119.6 billion

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The National Science Foundation's Survey of Industrial Research and Development for 1994 shows that firms spent \$119.6 billion on research and development (R&D) in the United States, 2 percent more than during 1993. Company funding continued to increase, from \$94.6 billion to \$97.1 billion, as it has each year since 1953. Federal funding decreased from \$22.8 billion to \$22.5 billion, continuing a trend that began in 1988. After adjusting for inflation, company-funded R&D rose 0.6 percent and Federally funded R&D fell 3.5 percent. Summary statistics from the 1994 survey and revised statistics for 1993 are presented in Table 1.

Although the amount spent for industrial R&D during 1994 increased compared with 1993, total R&D measured in constant dollars decreased 0.2 percent. This downward trend, which began in 1992, is only the second since 1953. The first occurred in the early 1970s when total R&D measured in constant dollars began falling and did not regain its 1969 level until 1978. The remainder of this data brief will focus on the sources of industrial R&D support and will present information on the size and employment of R&D performing firms.

Among manufacturing industry groups, firms in transportation equipment industries, particularly those that build aircraft and missiles, received the largest share of Federal support during 1994. Although down 2 percent from 1993 levels, these firms received \$10 billion or 46 percent of the Government's support of industrial R&D. Makers of professional and scientific instruments and electrical equipment ranked second and third. Firms in those industries performed \$3 billion and \$2 billion of Federal R&D, respectively, and accounted for 23 percent of total Federal R&D. Firms in nonmanufacturing industries as a group received \$5 billion, another 23-percent share of total Federal support. Most of this support went to computer-related service firms and research, development, and testing firms. Manufacturers of machinery including computers, petroleum extractors and refiners, drug and medicine makers, and other manufacturers received the remaining 8 percent, performing \$2 billion of the total Federal R&D.

While the Federal Government's share of support to most industry groups declined during 1994, the amount firms contributed to their own R&D efforts continued to grow. Overall, nonmanufacturing firms as a group comprised approximately 25 percent of the total industrial R&D performance. These firms ranked first among performers of company-funded

R&D, contributing \$24 billion during 1994. In terms of dollars spent, among the largest nonmanufacturing performers were computer-related service firms, which comprised \$6 billion, and research, development, and testing firms, at \$2 billion. Among manufacturing industries, firms in transportation equipment, especially automobile makers, performed the largest amount of R&D during 1994, at \$18 billion, with chemical manufacturers including makers of drugs and medicines ranking a close second, at \$17 billion. Manufacturers of electrical equipment, including electronic and communication components, performed \$14 billion of R&D. Together these four industry groups accounted for two-thirds of total company-funded R&D performed by manufacturers. Makers of professional and scientific instruments, machinery, petroleum extractors and refiners, and other manufacturers performed the remaining third.

Performance of R&D by the smallest firms, those with less than five hundred employees, declined 4 percent during 1994 compared with 1993. For this group, Federally sponsored R&D declined 28 percent. For larger firms, those with 500-5,000 employees, overall R&D increased 22 percent; however, Federal R&D for this group declined 3 percent. For the largest firms, those with more than 5,000 employees, company-funded R&D increased 6 percent, but Federal R&D declined by the same percentage.

In addition to collecting information on the amount of R&D, the Survey of Industrial R&D also gathers information on the number of scientists and engineers who perform R&D. The number of full-time equivalent (FTE) scientists and engineers engaged in R&D activities (those assigned full-time plus a prorated number of employees working part-time on R&D) in 1994 was 758,800 for all industries-561,400 in manufacturing and 197,400 in nonmanufacturing industries. Compared with 1993, the number of FTE scientists and engineers dropped 0.7 percent. It fell 1.2 percent in manufacturing industries and rose 0.5 percent in nonmanufacturing industries.

NSF's Survey of Industrial R&D has been conducted annually since 1954. During the early years, the survey focused on manufacturing industries in which R&D performance was heavily concentrated. Beginning in the early 1970s, NSF recognized the need for more detailed information on the R&D performed by firms in the nonmanufacturing sector and gradually changed the survey to collect more detailed statistics for this sector. Previous Data Briefs in this series (NSF 94-317 and NSF 95-325) and the report *Research and Development*

in *Industry: 1992* (NSF 95-324) discussed these survey changes and their impact on the statistics. Beginning with the 1995 survey, more detailed statistics for the non-manufacturing industries will be available. Instead of grouping all nonmanufacturing industries together, as has been done in this and previous analyses, plans call for the addition of about a dozen subgroups to the 1995 tabulations.

This Data Brief is the first publication of statistics and information from the 1994 Survey of Industrial R&D. The annual re-

port, *Research and Development in Industry: 1994* (forthcoming), will contain the full data set (approximately 30 tables) available from the survey. An advanced release data set (18 tables) is available from the address below. Both the advanced release tables and the annual report present R&D statistics by industry, size of company, the sources of funds, and character of R&D. They also provide historical trends in R&D; R&D as a percent of sales; R&D contracted out and performed outside the United States; sales and total employment of R&D-performing companies; and employment and cost of R&D scientists and engineers. The

annual report presents technical information on the survey sample and processing, and additional analysis of the statistics.

For free printed copies of SRS Data Briefs or to be placed on the mailing list for a free copy of the annual report, write to the National Science Foundation, Division of Science Resources Studies, Publications Management Group, 4201 Wilson Boulevard, Suite 965, Arlington, VA 22230; call (703) 306-1773; or send an e-mail request to srspubs@nsf.gov.

Table 1. Funds for industrial R&D, by source, selected industries, and size of company: 1993-94

Source of funds, industry, and size of company	1993	1994	Percent change	1993	1994	Percent change
	Millions of current dollars			Millions of 1987 dollars		
	1993-94			1993-94		
Total.....	117,400	119,595	1.9	95,061	94,841	-0.2
By source and performing industry:						
Company and other nonfederal, total.....	94,591	97,131	2.7	76,592	77,027	0.6
Drugs and medicines.....	9,132	9,625	5.4	7,394	7,633	3.2
Petroleum refining and extraction.....	2,138	1,939	-9.3	1,731	1,538	-11.2
Machinery (including computers).....	8,295	8,011	-3.4	6,717	6,353	-5.4
Electrical equipment.....	11,682	13,537	15.9	9,459	10,735	13.5
Transportation equipment.....	16,640	17,695	6.3	13,474	14,033	4.1
Professional/scientific instruments.....	7,542	8,058	6.8	6,107	6,390	4.6
Nonmanufacturing industries.....	24,690	23,756	-3.8	19,992	18,839	-5.8
Federal, total.....	22,809	22,463	-1.5	18,469	17,814	-3.5
Drugs and medicines.....	15	8	-46.7	12	6	-47.8
Petroleum refining and extraction.....	14	10	-28.6	11	8	-30.0
Machinery (including computers).....	86	99	15.1	70	79	12.7
Electrical equipment.....	1,667	1,801	8.0	1,350	1,428	5.8
Transportation equipment.....	10,617	10,392	-2.1	8,597	8,241	-4.1
Professional/scientific instruments.....	2,577	3,384	31.3	2,087	2,684	28.6
Nonmanufacturing industries.....	6,140	5,090	-17.1	4,972	4,036	-18.8
By size of company [based on number of employees]:						
Fewer than 500.....	14,620	13,966	-4.5	11,838	11,075	-6.4
500 to 999.....	3,230	3,608	11.7	2,615	2,861	9.4
1,000 to 4,999.....	13,334	14,617	9.6	10,797	11,592	7.4
5,000 to 9,999.....	9,135	8,912	-2.4	7,397	7,067	-4.5
10,000 to 24,999.....	15,421	15,972	3.6	12,487	12,666	1.4
25,000 or more.....	61,659	62,519	1.4	49,926	49,579	-0.7

SOURCE: National Science Foundation/SRS, Survey of Industrial Research and Development

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