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DATA BRIEF

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U. S. Industrial R&D Performers Report Increased R&D in 1999; New Industry Coding and Size Classifications for NSF Survey

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Company funding of industrial R&D increased to $160.3 billion in 1999; Federal funding fell to $22.5 billion.

The National Science Foundation's (NSF's) 1999 Survey of Industrial Research and Development shows that companies[1] spent $182.8 billion on research and development (R&D) they performed in the United States, up 8 percent[2] over the 1998 figure. Company funding[3] of R&D continued to increase, as it has each year since 1953, rising from $145.0 billion in 1998 to $160.3 billion in 1999—an 11-percent increase. Federal funding of industrial R&D was $22.5 billion in 1999 compared with $24.2 billion in 1998. After adjusting for inflation, total industrial R&D rose 7 percent, company-funded R&D rose 9 percent, and federally funded R&D fell 8 percent.

Domestic net sales of companies that performed R&D in the United States rose from $4.7 trillion in 1998 to $5.9 trillion in 1999.[4] Domestic employment by companies that performed R&D in the United States rose from 18.3 million people in 1998 to 22.9 million in 1999. The number of full-time equivalent (FTE) scientists and engineers who performed industrial R&D remained unchanged, about 1.0 million in both years. Summary statistics from the 1998 and 1999 surveys are compared in table 1.

The North American Industrial Classification System

Beginning with the 1999 cycle, industry[5] statistics resulting from the Survey of Industrial Research and Development will be published using the North American Industrial Classification System (NAICS). The development of NAICS has been a joint effort of statistical agencies in Canada, Mexico, and the United States and the system replaces the Standard Industrial Classification (1980) of Canada, the Mexican Classification of Activities and Products (1994), and Standard Industrial Classification (SIC, 1987) of the United States.[6] NAICS was designed to provide a production-oriented system under which economic units with similar production processes are classified in the same industry. NAICS was

[1] In this Data Brief, and in NSF industrial R&D statistics, "company" is defined as a business organization of one or more establishments under common ownership or control.

[2] The 1998 and 1999 samples were designed to produce coefficients of variation (CVs) of 2 percent for industries in which there is a large amount of R&D expenditures and 5 percent for industries in which there is a moderate amount of R&D expenditures. For industries in which there is little expenditure for R&D, the CVs typically are larger. It is unlikely that year-to-year percentage changes larger than the targets are produced by sampling error, but sampling error can exaggerate them. In addition to sampling error, year-to-year changes may be influenced by companies with large R&D expenditures that change industry classifications because of payroll composition, mergers, or acquisitions, or companies that change size classifications.

[3] "Company funding" refers to funds provided by all sources except the Federal Government for industrial R&D performed within the company's domestic facilities. The funds are predominantly the company's own, but also include funds from such outside organizations as other companies, research institutions, universities and colleges, nonprofit organizations, and state governments.

[4] Domestic net sales, domestic employment, and FTE employment are defined in table 1.

[5] "Industry" refers to the 2-, 3-, or 4-digit North American Industrial Classification System (NAICS) codes or group of NAICS codes used to array statistics resulting from the Survey of Industrial Research and Development.

[6] For a detailed comparison of NAICS to the Standard Industrial Classification (1987) of the United States, visit http://www.census.gov/epcd/www/naics.html.

Electronic Dissemination

SRS data are available through the World Wide Web (http://www.nsf.gov/sbe/srs/). For more information about obtaining reports, contact paperpubs@nsf.gov or call 301-947-2722. For NSF's Telephonic Device for the Deaf, dial 703-292-5090.

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Table 1. Funds for industrial R&D, by source and size of company, and sales and employment of R&D-performing companies: 1998 and 1999

Source of R&D funds, sales, employment, and size of company	1998	1999	Percent change 1998-99	1998	1999	Percent change 1998-99
	In millions of current dollars			In millions of constant (1996) dollars		
Total industrial R&D	169,180	182,823	8.1	164,476	175,168	6.5
Source of R&D funds:						
Company and other non-Federal	145,016	160,288	10.5	140,984	153,577	8.9
Federal	24,164	22,535	-6.7	23,492	21,591	-8.1
Size of company:						
5 to 24 employees	4,943	7,004	41.7	4,806	6,711	39.6
25 to 49 employees	3,323	4,750	42.9	3,231	4,551	40.9
50 to 99 employees	6,415	7,225	12.6	6,237	6,922	11.0
100 to 249 employees	8,681	7,213	-16.9	8,440	6,911	-18.1
250 to 499 employees	6,814	7,892	15.8	6,625	7,562	14.1
500 to 999 employees	5,495	7,032	28.0	5,342	6,738	26.1
1,000 to 4,999 employees	21,525	24,840	15.4	20,927	23,800	13.7
5,000 to 9,999 employees	14,053	16,376	16.5	13,662	15,690	14.8
10,000 to 24,999 employees	24,876	24,922	0.2	24,184	23,879	-1.3
25,000 or more employees	73,055	75,569	3.4	71,024	72,405	1.9
Domestic net sales of U.S. R&D-performing companies [1]	4,683,335	5,856,396	25.0	4,553,116	5,611,187	23.2
	Thousands of employees					
Domestic employment of U.S. R&D-performing companies [2]	18,289	22,935	25.4	NA	NA	NA
Full-time equivalent (FTE) R&D scientists and engineers in R&D-performing companies [3]	998	1,034	3.6	NA	NA	NA

[1] The dollar values for goods sold or services rendered by R&D-performing companies to customers outside the company, including the Federal Government, less such items as returns, allowances, freight charges, and excise taxes. Domestic intracompany transfers and sales by foreign subsidiaries are excluded, but transfers to foreign subsidiaries and export sales to foreign companies are included.

[2] The number of people employed in the United States by R&D-performing companies in all activities during the pay period that includes the 12th of March, the date most employers use when paying first quarter employment taxes to the Internal Revenue Service.

[3] The number of people domestically employed by R&D-performing companies who were engaged in scientific or engineering work at a level that required knowledge, gained either formally or by experience, of engineering or of the physical, biological, mathematical, statistical, or computer sciences equivalent to at least that acquired through completion of a 4-year college program with a major in one of those fields. The survey statistics show full-time-equivalent (FTE) employment of persons employed by the company during the January following the survey year who were assigned full time to R&D, plus a prorated number of employees who worked part time on R&D.

KEY: NA = Not applicable

NOTES: Detail may not add to totals because of rounding. 1996 gross domestic product (GDP) implicit price deflators were used to convert current to constant dollars.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development.

R&D-performing industries reported $5.9 trillion in sales and employed 22.9 million people in 1999.

developed with special attention to classifications for new and emerging industries, service industries, and industries that produce advanced technologies. NAICS not only eases comparability of information about the economies of the three North American countries, but it also increases comparability with the two-digit level of the United Nations' International Standard Industrial Classification (ISIC) system. Important for the Survey of Industrial Research and Development is the creation of several new classifications that cover major performers of R&D in the U.S. Among manufacturers, the new computer and electronic products classification (NAICS 334) includes makers of computers and peripherals, semiconductors, and navigational and electromedical instruments. Among nonmanufacturing industries are information (NAICS 51) and professional, scientific, and technical services (NAICS 54). Information includes publishing, both paper and electronic, broadcasting, and telecommunications. Professional, scientific, and technical services includes a variety of industries. Of specific importance for the survey are engineering and scientific R&D services.

Effects of NAICS on Survey Statistics

The change in industry classification system does not affect the summary statistics given in this Data Brief. However, in more detailed tables produced from the survey, the industry categories differ from those produced from the survey's 1998 and earlier cycles. For 1999, early release tables are available at http://www.nsf.gov/sbe/srs/srs01410/start.htm. Among those tables classified by industry, statistics from the 1997 and 1998 cycles of the survey which were previously classified using the SIC system have been reclassified using the new NAICS codes. This has been done to provide a bridge for users who want to make year-to-year comparisons beyond the aggregate comparisons made here.

Size of Business Classifications

Another survey enhancement beginning with the 1999 cycle is an increase in the number of size of company categories used to classify survey statistics. The original 6 categories have been expanded to 10 to emphasize the role of small companies in R&D performance. During 1998, companies with fewer than 500 employees spent $30.2 billion on industrial R&D performed in the United States. During 1999, they spent $34.1 billion. Of this amount, as shown in table 1, 21 percent ($7.0 billion) was spent by the smallest companies (those with at least 5 but fewer than 25 employees). The statistics further show that there was more growth in the amount of R&D performed by smaller companies than in the amount performed by larger companies. The more detailed business size information also facilitates better international comparisons. Generally, statistics produced by foreign countries that measure their industrial R&D enterprise are reported with more detailed company size classifications at the lower end of the scale than U.S. industrial R&D statistics traditionally have been.[7] The new classifications of the U.S. statistics will enable more direct comparisons with other countries' statistics.

Notes on Survey Methodology

Statistics resulting from the 1999 cycle of the survey benefit from recent efforts to strengthen statistics for industries that perform the greatest amounts of R&D while lessening coverage of industries that perform little or no R&D. Specifically, beginning with the 1998 survey, a new sampling approach was used for companies in industries that do not conduct large amounts of R&D. These companies were sampled at much lower rates than in prior surveys allowing companies that conduct relatively large amounts of R&D to be sampled at higher rates. This has shifted emphasis toward those industries crucial in developing strong, representative estimates of industrial R&D spending. This sampling approach and its effect on the resulting statistics are

[7] For more information, visit the Organisation for Economic Co-operation and Development (OECD) website at http://www.oecd.org.

discussed in detail in the latest annual report, *Research and Development in Industry: 1998* (NSF 01-305) at http://www.nsf.gov/sbe/srs/nsf01305/start.htm and in the forthcoming *Research and Development in Industry: 1999*.

Statistical Reports

This Data Brief provides statistics and information from the 1999 Survey of Industrial Research and Development. Seven early release tables are available at http://www.nsf.gov/sbe/srs/srs01410/start.htm. The annual report, *Research and Development in Industry: 1999*, will be published later this year and will contain the full set of 48 tables available from the survey. The tables will present R&D statistics by industry, size of company, source of funds, character of R&D, R&D as a percentage of net sales, and R&D contracted to outside organizations and performed outside the United States. The report also will provide historical trends in R&D, sales and total employment of R&D-performing companies, employment of R&D scientists and engineers, statistics by state, and technical information on the survey sample, processing, and the new North American Industrial Classification System.

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