Research and Development in Industry: 2002

Funds, 2002
Scientists and Engineers, January 2003

Detailed Statistical Tables

Raymond M. Wolfe, Project Officer

Division of Science Resources Statistics
Directorate for Social, Behavioral, and Economic Sciences

National Science Foundation

July 2006

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INTRODUCTION

This report is the second of two publications containing results from the 2002 Survey of Industrial Research and Development. The first publication, an InfoBrief (NSF 2004) announcing the availability of survey results, contains analytical information and highlights the decline in expenditures for industrial research and development (R&D) funded from companies' own resources. This report contains the full set of statistics produced from the survey including statistics on R&D funding during the calendar year 2002 and on R&D personnel in January 2003. Among the tables are several that include statistics on trends in industrial R&D since 1953, statistics on employment by R&D-performing firms since 1992, and a table classified by state that contains statistics for selected years since 1987. This report also contains (in the technical notes in appendix A) information about the industry-coding classification system, company size classifications (NSF 2001a), survey methodology, comparability of the statistics over time, survey definitions, history of the survey, and other information designed to convey to the data user what the survey statistics represent and, in some cases more importantly, what they do not represent. Survey forms, instructions, and other documents are reproduced in appendix B.

This report provides national estimates of the expenditures on R&D performed within the United States by industrial firms, whether U.S. or foreign owned. Among the statistics are estimates of total R&D, the portion of the total financed by the federal government, and the portion financed by the companies themselves or by other nonfederal sources such as state and local governments or other industrial firms under contract or subcontract. Total R&D is also separated into the types of costs, wages and fringe benefits of R&D staff, materials and supplies, depreciation, and other costs. Other statistics include R&D financed by domestic firms but performed outside the 50 U.S. states and DC, R&D performed by organizations outside the firm, R&D performed in collaboration with other organizations, and the funds spent to perform energy-related R&D. Also, this report provides information on R&D-performing firms including domestic net sales, number of employees, number of R&D-performing scientists and engineers, geographic location where the R&D was performed, and R&D funds spent per R&D-performing scientist and engineer.

The National Science Foundation Act of 1950, as amended, authorizes and directs the National Science Foundation (NSF) "to provide a central clearinghouse for the collection, interpretation, and analysis of data on scientific and engineering resources and to provide a source of information for policy formulation by other agencies of the Federal Government." The Survey of Industrial Research and Development is the vehicle with which NSF carries out the industrial portion of this mandate and NSF's Division of Science Resources Statistics has sponsored and managed a survey of industrial R&D since 1953. The 1953–56 surveys were conducted by the Bureau of Labor Statistics (BLS) in the U.S. Department of Labor (NSF 1956, 1960). Since 1957, the Bureau of the Census in the U.S. Department of Commerce has conducted the survey. Data obtained in the earlier BLS surveys are not directly comparable with Census figures because of methodological and other differences. Census staff conduct the survey under Title 13 of the United States Code, which prohibits publication or release of data or statistics that may reveal information about individual companies. In some tables in this report, the symbol D is used to indicate that estimates are withheld to avoid possible disclosure of information about operations of individual companies.

The Survey of Industrial Research and Development is an annual sample survey that intends to include or represent all for-profit R&D-performing companies, either publicly or privately held. Respondents receive detailed definitions to help them determine which expenses to include or exclude from the R&D data that they provide. Nevertheless, the statistics presented in this report are subject to response and concept errors caused by differences in the way respondents interpret the definitions of R&D activities and by variations in company accounting procedures. The survey's primary focus is on U.S. industry as a performer of, rather than as a source of funds for, R&D. Thus, data on federal support of R&D activities performed by industry are collected, and the resulting statistics appear in several tables while only

limited statistics on industrial funding of R&D undertaken at universities and colleges and other nonprofit organizations are collected.[1]

The result of collecting and publishing performer-reported statistics is that the federally funded R&D performance totals presented in this report differ from the totals reported by the federal agencies that provide the funds and the statistics published in NSF's *Federal Funds for Research and Development* report series. One reason for these differences is that performers of R&D often expend federal funds in a year other than the one in which the federal government provides authorization, obligations, or outlays. (See Comparisons to Other Statistical Series in appendix A for definitions of these terms.) During the past decade, the differences have widened between the federal R&D funding reported by performers and that reported by funding agencies. These differences are documented and analyzed in the latest editions of NSF's *Science & Engineering Indicators* (http://www. nsf.gov/statistics/indicators/) and *National Patterns of R&D Resources* (http://www.nsf.gov/statistics/natlpatterns/) report series.

The content of the Survey of Industrial Research and Development has been expanded and refined over the years in response to an increasing need by policymakers for more detailed information on the nation's R&D effort. For example, questions on energy R&D were added in the early 1970s, following that decade's oil shortage crisis. And, more recently, questions that probe companies' collaborative R&D activities and funding of international performance of R&D have been added to keep up with the fast-changing environment of the conduct and organization of industrial R&D. On the other hand, collection of certain data items has been eliminated in an attempt to alleviate some of the burden on respondents. For large firms known to perform R&D, a detailed survey form (Form RD-1) is used to collect data. To limit the reporting burden on small R&D performers and on firms included in the sample for the first time, an abbreviated survey form (Form RD-1A), which collects only the most crucial data, is used.

Changes have been made to the survey throughout its history and some of the most recent are detailed in appendix A (see Comparability of Statistics). Specific changes are detailed in each of the annual reports resulting from the survey (http://www.nsf.gov/statistics/industry/).

Industry statistics in this report were developed from data collected from individual companies.[2] Since the survey is company based rather than establishment based, all data collected for the various components of each company (plants, divisions, or subdivisions) were tabulated in the company's major industrial classification, which was based on payroll. (See Frame Creation in appendix A for more information about industry classification.) The resulting industry estimates were calculated by summing the data for companies classified within each major industry classification. National totals were then estimated by summing the industry estimates. The North American Industrial Classification System (NAICS) was used to determine a company's major industrial classification and the resulting statistics are published by NAICS code. For years prior to 1999, the Standard Industrial Classification (SIC) system was used. The development and ongoing refinement of NAICS has been a joint effort of statistical agencies in Canada, Mexico, and the United States. The system replaced the Standard Industrial Classification (1980) of Canada, the Mexican Classification of Activities and Products (1994), and Standard Industrial Classification (1987) of the United States. (For a detailed comparison of NAICS to the SIC (1987) of the United States, visit http://www.census.gov/epcd/www/naics.html.) 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 developed with special attention to classifications for new and emerging industries, service industries, and industries that produce advanced technologies. NAICS not only facilitates comparability of information about the economies of the three North American countries but potentially increases comparability with the two-digit level of the United Nations International Standard Industrial Classification (ISIC) system.

The change of industry classification system affects most of the statistical tables produced from the survey.

[1]The survey collects data on the amount of R&D funded by companies but performed by outside entities including universities, colleges, and other nonprofit organizations. Resulting statistics are in table 16. More comprehensive data on R&D performed at universities and colleges are collected in NSF's annual academic R&D expenditure survey, the Survey of Research and Development Expenditures at Universities and Colleges. More information about this survey is available from NSF's Division of Science Resources Statistics website at http://www.nsf.gov/statistics/svryrdexpenditures/.

[2]In the Survey of Industrial Research and Development and in the publications presenting statistics resulting from the survey, the terms *firm, company,* and *enterprise* are used interchangeably. *Industry* refers to the 2-, 3-, or 4-digit North American Industrial Classification System (NAICS) codes or group of NAICS codes used to publish statistics resulting from the survey.

Prior to the 1999 report, tables classified by industry contained the current survey's statistics plus statistics for 10 previous years. Because of the new classification system, these tables now contain only statistics for the current year (2002) and three prior years (1999, 2000, and 2001).[3]

Another enhancement implemented for the 1999 cycle of the survey was an increase in the number of company size 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 and to highlight the growth in the amount of R&D performed by smaller companies compared to 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 historically have been. The more detailed classifications of the U.S. statistics will enable direct comparisons with other countries' statistics. (For more information, visit the Organisation for Economic Co-operation and Development (OECD) website at http://www.oecd.org.)

NSF's objective in conducting the survey has always been to provide estimates for the entire population of firms performing R&D in the United States and to present the estimates in as many meaningful ways as possible. This is especially true for the character of work components of R&D, basic research, applied research, and development. Since the beginning of the survey, NSF has attempted to estimate each component, relying on traditionally poorly reported data. The methods NSF has used to develop these estimates are discussed in appendix A. It is important for the user of this report to know that a review has been made of the underlying data used to prepare recent estimates of basic research, applied research, and development and, as a result of the review, the ongoing effort to strengthen and maintain the quality of character of work estimates has intensified. Identification of anomalous reporting patterns has been completed and publication of character of work distributions of R&D, which had been suspended until the research was complete, has been resumed.

Availability of survey results: Detailed historical statistics for 1953–98 can be obtained from NSF's Industrial Research and Development Information System (IRIS) at http://www.nsf.gov/sbe/srs/iris/start.htm, an online interface to the Survey of Industrial Research and Development Historical Database (SIRDHD) (NSF 2001b). The SIRDHD is a collection of more than 2,500 statistical tables containing all of the statistics produced and published from the 1953–98 cycles of the annual Survey of Industrial Research and Development. Statistics for 1991–2002 are available in separate reports at http://www.nsf.gov/statistics/industry/.

Specific questions regarding the survey may be directed to

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[3]In *Research and Development in Industry: 2000* an effort was made to provide a bridge for users who wanted to make year-to-year comparisons below the aggregate level. In several tables statistics from the 1997 and 1998 cycles of the survey, which were previously classified and published using the Standard Industrial Classification (SIC) system, were reclassified using the new North American Industrial Classification System (NAICS) codes. These reclassified statistics were published using their new NAICS classifications and were shown alongside the 1999 and 2000 statistics, which were estimated using NAICS from the outset.

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Table Notes

These notes pertain to the tables in this section and in appendix A, except as noted in footnotes and other explanatory information at the end of specific tables.

Company Size

Companies were categorized by total number of domestic employees. The following are the size classes used in this report (see Comparability of Statistics in appendix A for information on how this expanded array of company size classes compares to size classes used previously):

- 5–24 employees
- 25–49 employees
- 50–99 employees
- 100–249 employees
- 250–499 employees
- 500–999 employees
- 1,000–4,999 employees
- 5,000–9,999 employees
- 10,000–24,999 employees
- 25,000 or more employees

The survey excludes companies with fewer than five employees to limit burden on small business enterprises in compliance with the Office of Management and Budget's (OMB) guidelines for Federal government data collection activities.

Current and Constant Dollars

Statistics in all tables are reported in current dollars. Constant dollars also are presented in the summary tables (1, 31, 32, and 33). Gross domestic product (GDP) implicit price deflators were used to convert current to constant dollars.

Disclosure and Suppression of Statistics

Title 13 of the United States Code and a pledge of confidentiality to respondents prohibit publication or release of data or statistics that may reveal information about individual companies. Therefore, the data in some table cells have been deleted and replaced with D. This occurs when a small number of companies account for a large percentage of the estimate in a particular data cell. Although publication of certain cells may be withheld, the estimates in the cells are always included in totals. The tables most often affected by cell suppression are those that contain data on federal support for industrial R&D performance.

Geographic Statistics

The statistics in this report cover only those operations located in the 50 U.S. states and the District of Columbia (DC). Statistics on company-sponsored R&D performed outside the 50 U.S. states and DC by foreign subsidiaries of U.S. domestic companies are included in tables 17 and 18 but excluded from all other tables.

Historical Statistics

Prior to the 1999 report, tables classified by industry contained the current survey's statistics plus statistics for 10 previous years. Because of the new classification system (see below), these tables now contain only statistics for the current year and prior years back through 1999. In *Research and Development in Industry: 2000* an effort was made to provide a bridge for users who wanted to make year-to-year comparisons below the aggregate level. In several tables statistics from the 1997 and 1998 cycles of the survey, which were previously classified and published using the standard industrial classification (SIC) system, were reclassified using the new North American Industrial Classification System (NAICS) codes. These reclassified statistics were published using their new NAICS classifications and were shown alongside the 1999 and 2000 statistics, which were estimated using NAICS from the outset.

Industry Classification

One North American Industrial Classification System (NAICS) code was assigned to each company. Multiestablishment companies were assigned single codes based on the most dominant aggregated activity for that firm in terms of total payroll. Statistics for the following industries and industry groupings are published in this report (NAICS codes are given on the right) (see Comparability of Statistics in appendix A for information on NAICS and how it compares with the Standard Industrial Classification (SIC) system used in reports prior to the 1999 edition. The 1997 version of NAICS was used for the 1999–2002 surveys):

Industry	NAICS code
Manufacturing industries	31, 32, 33
Food	311
Beverage and tobacco products	312
Textiles, apparel, and leather	313, 314, 315, 316
Wood products	321
Paper, printing and support activities	322, 323
Petroleum and coal products	324
Chemicals	325
Basic chemicals	3251
Resin, synthetic rubber, fibers, and filament	3252
Pharmaceuticals and medicines	3254
Other chemicals	325 (minus 3251, 3252, 3254)
Plastics and rubber products	326
Nonmetallic mineral products	327
Primary metals	331
Fabricated metal products	332
Machinery	333
Computer and electronic products	334
Computers and peripheral equipment	3341
Communications equipment	3342
Semiconductor and other electronic components	3344
Navigational, measuring, electromedical, and control instruments	3345
Other computer and electronic products	334 (minus 3341, 3342, 3344, 3345)
Electrical equipment, appliances, and components	335
Transportation equipment	336
Motor vehicles, trailers, and parts	3361, 3362, 3363
Aerospace products and parts	3364
Other transportation equipment	336 (minus 3361, 3362, 3363, 3364)
Furniture and related products	337
Miscellaneous manufacturing	339
Medical equipment and supplies	3391
Other miscellaneous manufacturing	339 (minus 3391)
Other manufacturing	31, 32, 33 (minus 311–316, 321–327, 331–337, 339)
Nonmanufacturing industries	21, 22, 23, 42, 44, 45, 48, 49, 51–56, 61, 62, 71, 72, 81
Mining, extraction, and support activities	21
Utilities	22
Construction	23
Trade	42, 44, 45
Transportation and warehousing	48, 49
Information	51
Publishing	511
Newspaper, periodical, book, and database	5111
Software	5112
Broadcasting and telecommunications	513
Radio and television broadcasting	5131
Telecommunications	5133
Other broadcasting and telecommunications	513 (minus 5131, 5133)

Other information	51 (minus 511, 513)
Finance, insurance, and real estate	52, 53
Professional, scientific, and technical services	54
Architectural, engineering, and related services	5413
Computer systems design and related services	5415
Scientific R&D services	5417
Other professional, scientific, and technical services	54 (minus 5413, 5415, 5417)
Management of companies and enterprises	55
Health care services	621, 622, 623
Other nonmanufacturing	56, 61, 624, 71, 72, 81

Since 1999, the frame from which the statistical samples were selected was divided into two partitions based on total company employment. In the manufacturing sector, companies with employment of 50 or more were included in the large-company partition. In the nonmanufacturing sector, companies with employment of 15 or more were included in the large-company partition. Companies in the respective sectors with employment below these values but with at least 5 employees were included in the small-company partition. The purpose of partitioning the sample this way was to reduce the variability in industry estimates largely attributed to the random year-to-year selection of small companies by industry and the high sampling weights that sometimes were assigned to them. Therefore, in the 1999 and 2000 reports detailed industry statistics were published only from the large-company partition; detailed industry statistics from the small-company partition were not. Statistics from the small-company partition were included in the manufacturing, nonmanufacturing, and all industries totals but were aggregated into "small-manufacturing" and "small-nonmanufacturing" classifications instead of being included in their respective industry classifications. Beginning with the 2001 report, this practice was evaluated and discontinued because it was determined that the data for small companies are more useful if they are included in their respective industries even given the sampling concerns described above.

Large Year-to-Year Changes

Large year-to-year changes may occur because of the way industry classifications are assigned during statistical processing. A company's industry classification is a function of its primary activity based on payroll, which is not necessarily the primary source of its R&D activity. If the majority of a company's payroll shifts to an activity other than an R&D-related activity, for example trade, all of its R&D similarly shifts to the new activity. Further, the design of the statistical sample sometimes contributes to large year-to-year changes in industry estimates. Since relatively few companies perform R&D and there is no national register of industrial R&D performers, a large statistical "net" must be cast to capture new R&D performers. When these companies are sampled for the first time, they are often given weights much higher than they would be given if the their size and the amount of R&D they perform were known at the time of sampling. After the size of the company and the amount of R&D performed are discovered via the first survey, the weight assigned for subsequent surveys is adjusted.

Nonresponse and Imputation

For various reasons, some firms did not choose to return the survey form or returned it with one or more blank items. (See Survey Nonresponse in appendix A for more information on the reasons for unit and item nonresponse.) Missing data for major data items were estimated using mathematical algorithms developed from industry comparisons, data from previous cycles of the survey, and other information. Therefore, the statistics in some table cells may be accompanied by the notation S, which indicates that the imputation rate—the percentage of the statistic not reported by respondents and consequently estimated—exceeds 50 percent for that item. In such cases, the estimate may be statistically unreliable. (See table A-5 for imputation rates for specific items.)

Percentages

Percentages were calculated on the basis of thousands of dollars and may differ slightly from those calculated using the rounded figures shown.

Reporting Unit

The basic reporting unit was the company, firm, or enterprise that included all establishments under com-

mon ownership or control. All R&D expenditures and all information about scientists and engineers of each company were classified into a single NAICS code and size category.

ROUNDING

Because of rounding, detail items may not add to totals. Most money amounts are expressed in millions of dollars and are rounded down if less than $500,000 or up if $500,000 or more. Frequency estimates (e.g., number of companies) are accumulated from decimal weights assigned to company records (see Weighting and Maximum Weights in appendix A for information on how company records are weighted) and are rounded down if less than 0.5 and rounded up if 0.5 or greater. Most employment counts (e.g., number of scientists and engineers) are expressed in thousands and are rounded down if less than 500 or up if 500 or greater.

ZEROES

When numerical values are accumulated from the statistical file to estimate money amounts and the accumulated sum rounds to or equals zero, the cell is filled with "-". In the cases where there were no numerical values to accumulate, the cell is filled with "—" indicating that data were not collected. For example, in all tables, cells for "other manufacturing" contain "—" because data were not collected.[4] When numerical values are accumulated from the statistical file to estimate numbers of companies (frequencies) and the accumulated sum rounds to or equals zero, the cell is filled with 0.

[4]With the advent of NAICS, data for the "other manufacturing" classification were not collected because all of the possible NAICS manufacturing industry classifications are represented elsewhere in the industry stub. In future years as NAICS is expanded, it is likely that data will be collected for the "other manufacturing" classification.

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Sales of R&D-Performing Companies and R&D as a Percent of Sales

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Employment of R&D-Performing Companies

TABLE 1. Industrial R&D performance in the United States, by source of funds: 1953–2002

(Millions of dollars)

Year	All R&D [a]		Federal [a]		Company and other [b]	
	Current dollars	Constant 2000 dollars	Current dollars	Constant 2000 dollars	Current dollars	Constant 2000 dollars
1953	3,630	19,899	1,430	7,839	2,200	12,060
1954	4,070	22,098	1,750	9,501	2,320	12,596
1955	4,640	24,756	2,180	11,631	2,460	13,125
1956	6,605	34,060	3,328	17,161	3,277	16,898
1957	7,731	38,583	4,335	21,635	3,396	16,949
1958	8,389	40,925	4,759	23,216	3,630	17,709
1959	9,618	46,351	5,635	27,156	3,983	19,195
1960	10,509	49,948	6,081	28,902	4,428	21,046
1961	10,908	51,266	6,240	29,327	4,668	21,939
1962	11,464	53,152	6,434	29,831	5,029	23,317
1963	12,630	57,941	7,270	33,351	5,360	24,589
1964	13,512	61,054	7,720	34,883	5,792	26,171
1965	14,185	62,945	7,740	34,346	6,445	28,599
1966	15,548	67,084	8,332	35,950	7,216	31,134
1967	16,385	68,577	8,365	35,010	8,020	33,566
1968	17,429	69,963	8,560	34,361	8,869	35,602
1969	18,308	70,015	8,451	32,319	9,857	37,696
1970	18,067	65,618	7,779	28,253	10,288	37,365
1971	18,320	63,369	7,666	26,517	10,654	36,852
1972	19,552	64,814	8,017	26,576	11,535	38,238
1973	21,249	66,716	8,145	25,573	13,104	41,143
1974	22,887	65,908	8,220	23,671	14,667	42,237
1975	24,187	63,648	8,605	22,644	15,582	41,004
1976	26,997	67,163	9,561	23,786	17,436	43,377
1977	29,825	69,764	10,485	24,526	19,340	45,238
1978	33,304	72,785	11,189	24,453	22,115	48,332
1979	38,226	77,151	12,518	25,265	25,708	51,886
1980	44,505	82,351	14,029	25,959	30,476	56,392
1981	51,810	87,636	16,382	27,710	35,428	59,926
1982	58,650	93,501	18,545	29,565	40,105	63,936
1983	65,268	100,093	20,680	31,714	44,588	68,379
1984	74,800	110,561	23,396	34,581	51,404	75,980
1985	84,239	120,837	27,196	39,011	57,043	81,825
1986	87,823	123,261	27,891	39,145	59,932	84,115
1987	92,155	125,902	30,752	42,013	61,403	83,889
1988 [c]	97,015	128,168	30,343	40,087	66,672	88,082
1989 [c]	102,055	129,913	28,554	36,348	73,501	93,564
1990 [c]	109,727	134,487	28,125	34,471	81,602	100,015
1991 [c]	116,952	138,497	26,372	31,230	90,580	107,267
1992 [d]	119,110	137,882	24,722	28,618	94,388	109,263
1993 [d]	117,400	132,835	22,809	25,808	94,591	107,027
1994 [d]	119,595	132,502	22,463	24,887	97,131	107,614
1995 [d]	132,103	143,426	23,451	25,461	108,652	117,965
1996 [d]	144,667	154,144	23,653	25,202	121,015	128,943
1997 [d]	157,539	165,112	23,928	25,078	133,611	140,033
1998 [d]	169,180	175,367	24,164	25,048	145,016	150,320
1999 [d, e]	182,711	186,692	22,535	23,026	160,176	163,666

TABLE 1. Industrial R&D performance in the United States, by source of funds: 1953–2002

(Millions of dollars)

Year	All R&D [a]		Federal [a]		Company and other [b]	
	Current dollars	Constant 2000 dollars	Current dollars	Constant 2000 dollars	Current dollars	Constant 2000 dollars
2000 [d]	199,539	199,539	19,118	19,118	180,421	180,421
2001 [d]	198,505	193,904	16,899	16,507	181,606	177,397
2002 [d]	190,809	183,567	16,401	15,779	174,408	167,789

[a] Beginning with 2001, statistics for total and federally funded industrial R&D exclude data for federally funded research and development centers.

[b] The company-funded R&D in this table is the industrial R&D performed within company facilities funded from all sources except the federal government. The funds predominantly are the company's own, but also include funds from outside organizations such as other companies, research institutions, universities and colleges, nonprofit organizations, and state governments. Excluded from this table are company-funded R&D not performed within the company (e.g., R&D contracted out to other organizations) and company-funded R&D not performed within the 50 U.S. states or DC (e.g., R&D not performed on U.S. soil by foreign subsidiaries or other foreign organizations).

[c] As a result of a new sample design, statistics for 1988 –91 were revised after they were originally published and are not directly comparable with statistics for earlier years.

[d] As a result of annual sampling, implemented to produce statistics that better reflect R&D performance among firms in nonmanufacturing industries and small firms in all industries, statistics for 1992 and later years are not directly comparable with statistics for earlier years.

[e] Statistics for 1999 have been revised since originally published.

NOTES: Gross domestic product (GDP) implicit price deflators were used to convert current dollars to constant (2000) dollars. For information on sampling for 1999–2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

TABLE 2. Summary data for companies performing industrial R&D in the United States, by industry and size of company: 2001–2002

Industry and size of company	NAICS codes	Research and development funds: Total [a] 2001	Total [a] 2002	Federal [a] 2001	Federal [a] 2002	Company and other 2001	Company and other 2002	Domestic net sales 2001	Domestic net sales 2002	R&D scientists and engineers (January) [b] 2002	R&D scientists and engineers (January) [b] 2003	Domestic employment (March) 2001	Domestic employment (March) 2002
Distribution by industry:		Millions of dollars								Thousands			
All industries	21-23, 31-33, 42, 44-81	198,505	190,809	16,899	16,401	181,606	174,408	4,835,140	4,903,345	1060.2	1,066.1	16,749	15,415
Manufacturing	31-33	120,705	108,985	11,484	10,745	109,221	98,240	3,012,938	3,028,003	615.8	585.8	9,913	9,089
Food	311	1,819	(D)	(D)	(D)	1,818	2,034	384,846	314,176	12.2	12.9	1,192	991
Beverage and tobacco products	312	152	170	-	-	152	170	37,026	33,910	0.9	1.0	59	57
Textiles, apparel, and leather	313-16	(D)	(D)	(D)	(D)	255	248	30,929	29,308	2.5	2.5	229	186
Wood products	321	182	(D)	(D)	(D)	181	132	17,041	18,691	2.0 (S)	(D)	92	94
Paper, printing and support activities	322, 323	(D)	(D)	(D)	(D)	2,664	2,620	125,696	204,814	11.1	17.9	611	585
Petroleum and coal products	324	(D)	(D)	(D)	(D)	1,057	1,233	311,244	304,747	2.8 (S)	4.3 (S)	168	179
Chemicals	325	17,892	20,641	180	246	17,713	20,395	368,728	343,723	81.5	86.9	838	837
Basic chemicals	3251	1,876	1,782	42	72	1,835	1,710	83,452	67,183	9.3	8.5	169	154
Resin, synthetic rubber, fibers, and filament	3252	(D)	2,426	(D)	13	2,745	2,413	60,396	61,452	11.1	12.8	118	122
Pharmaceuticals and medicines	3254	10,137	(D)	-	(D)	10,137	14,186	130,287	147,175	39.6	51.8	289	355
Other chemicals	325 minus (3251-52, 3254)	(D)	(D)	(D)	(D)	2,996	2,087	94,593	67,913	21.5 (S)	13.9	262	207
Plastics and rubber products	326	(D)	(D)	(D)	(D)	2,245	1,508	78,730	84,089	11.5	11.0	451	468
Nonmetallic mineral products	327	990	(D)	11	(D)	978	420	41,766	33,945	6.9	(D)	273	145
Primary metals	331	485	473	6	12	479	461	72,413	70,718	4.7	4.0 (S)	311	260
Fabricated metal products	332	1,599	1,355	54	104	1,545	1,251	94,141	89,406	10.1	13.1	517	477
Machinery	333	6,404	6,429	67	62	6,337	6,366	150,306	147,148	55.9	56.5	764	740
Computer and electronic products	334	47,079	35,777	5,848	5,470	41,232	30,307	379,342	401,273	256.7 (S)	209.6	1,420	1,259
Computers and peripheral equipment	3341	(D)	3,040	(D)	25	3,165	3,015	41,383	40,409	15.6	15.1	112	83
Communications equipment	3342	15,507	6,635	298	215	15,209	6,420	91,381	55,294	90.6 (S)	40.9 (S)	284	175
Semiconductor and other electronic components	3344	14,358	11,919	148	48	14,210	11,871	135,597	138,596	83.3	73.3	501	404
Navigational, measuring, electromedical, and control instruments	3345	12,947	13,729	5,382	5,180	7,565	8,549	102,942	158,397	63.5 (S)	75.9	491	574
Other computer and electronic products	334 minus (3341-42, 3344-45)	(D)	453	(D)	1	1,083	452	8,038	8,576	3.7	4.4	32	23
Electrical equipment, appliances, and components	335	4,980	2,039	301 (S)	61	4,680	1,978	162,732 (S)	72,859	33.6	14.0	550	324
Transportation equipment	336	25,965	26,145	4,961	4,692	21,004	21,452	625,167	753,734	99.5	123.1	1,759	1,907
Motor vehicles, trailers, and parts	3361-63	(D)	(D)	(D)	(D)	16,089	15,199	455,455	487,740	73.5	83.2	1,065	987
Aerospace products and parts	3364	7,868	9,654	3,785	4,306	4,083	5,349	137,052	234,840	19.1	32.5	538	785
Other transportation equipment	336 minus (3361-64)	(D)	(D)	(D)	(D)	832 (S)	905	32,659	31,154	6.9 (S)	7.3 (S)	157	135

TABLE 2. Summary data for companies performing industrial R&D in the United States, by industry and size of company: 2001–2002

Industry and size of company	NAICS codes	Research and development funds: Total [a] 2001	Total [a] 2002	Federal [a] 2001	Federal [a] 2002	Company and other 2001	Company and other 2002	Domestic net sales 2001	Domestic net sales 2002	R&D scientists and engineers (January) [b] 2002	R&D scientists and engineers (January) [b] 2003	Domestic employment (March) 2001	Domestic employment (March) 2002
Distribution by industry:		Millions of dollars								Thousands			
Furniture and related products	337	301	258	-	7	301	251	32,825	31,772	2.2	2.0	247	200
Miscellaneous manufacturing	339	6,606	7,457	25	44	6,581	7,414	100,006	93,692	21.9	22.6	431	379
Medical equipment and supplies	3391	(D)	(D)	(D)	(D)	5,903	6,179	65,846	63,537	15.7	14.4	246	227
Other miscellaneous manufacturing	339 minus (3391)	(D)	(D)	(D)	(D)	678	1,235	34,160	30,155	6.2	8.2	185	152
Other manufacturing	31-33 minus (311-16, 321-27, 331-37, 339)	--	--	--	--	--	--	--	--	--	--	--	--
Distribution by industry:													
Nonmanufacturing	21-23, 42, 44-81	77,799	81,824	5,415	5,656	72,384	76,168	1,822,202	1,875,341	444.4	480.3	6,836	6,326
Mining, extraction, and support activities	21	(D)	(D)	(D)	(D)	846	715	64,140	22,181	4.9	(D)	113	85
Utilities	22	133	(D)	19	(D)	114	117	274,151	173,480	0.6	0.5	299	270
Construction	23	320	164	1	-	320	164	22,822	25,426	2.1	1.0	99	91
Wholesale trade	42	(NA)	(D)	(NA)	(D)	(NA)	24,082	(NA)	337,929	(NA)	126.6	(NA)	957
Professional and commercial equipment including computers	4214	(NA)	(D)	(NA)	(D)	(NA)	11,771	(NA)	125,305	(NA)	73.0	(NA)	477
Electrical goods	4216	(NA)	(D)	(NA)	(D)	(NA)	3,980	(NA)	49,960	(NA)	23.6	(NA)	128
Drugs and druggists' sundries	4222	(NA)	(D)	(NA)	(D)	(NA)	6,811	(NA)	72,150	(NA)	20.1	(NA)	115
Other wholesale trade	42 minus (4214, 4216, 4222)	(NA)	1,521	(NA)	1	(NA)	1,520	(NA)	90,515	(NA)	9.8	(NA)	237
Retail trade	44, 45	(NA)	932	(NA)	-	(NA)	932	(NA)	158,289	(NA)	7.9	(NA)	530
Transportation and warehousing	48, 49	1,848	(D)	72	(D)	1,776	339	72,515	71,288	0.7	(D)	650	707
Information	51	(D)	17,870	(D)	106	17,259	17,764	388,770	443,897	119.4	117.0	1,493	1,399
Publishing	511	13,760	13,541	44	53	13,716	13,488	91,172	82,487	86.7	85.1	392	450
Newspaper, periodical, book, and database	5111	649	614	-	-	649	614	23,620	22,307	5.5	4.3	145	140
Software	5112	13,111	12,927	44	53	13,067	12,874	67,552	60,180	81.1	80.8	247	311
Broadcasting and tele-communications	513	(D)	(D)	(D)	(D)	1,270	1,637	249,287	231,311 (S)	13.5	8.6 (S)	(D)	728 (S)
Radio and television broadcasting	5131	(D)	(D)	-	-	(D)	(D)	(D)	(D)	(D)	0.0	(D)	2
Telecommunications	5133	(D)	(D)	(D)	(D)	1,101	1,608	234,848	230,679 (S)	11.7	8.5 (S)	827	725 (S)
Other broadcasting and telecommunications	513 minus (5131, 5133)	(D)	(D)	-	-	(D)	(D)	(D)	(D)	(D)	0.1	(D)	1
Other information	51 minus (511, 513)	(D)	(D)	(D)	(D)	2,273	2,639	48,311	130,099	(D)	23.3	(D)	220

TABLE 2. Summary data for companies performing industrial R&D in the United States, by industry and size of company: 2001–2002

Industry and size of company	NAICS codes	Research and development funds: Total [a] 2001	Total [a] 2002	Federal [a] 2001	Federal [a] 2002	Company and other 2001	Company and other 2002	Domestic net sales 2001	Domestic net sales 2002	R&D scientists and engineers (January) [b] 2002	R&D scientists and engineers (January) [b] 2003	Domestic employment (March) 2001	Domestic employment (March) 2002
Distribution by industry:		Millions of dollars								Thousands			
Finance, insurance, and real estate	52, 53	(D)	1,903	(D)	-	2,424	1,903	323,250	343,709	19.9	18.9	789	711
Professional, scientific, and technical services	54	27,704	30,358	5,065	5,412	22,640	24,946	165,299	223,013	152.9	181.8	900	956
Architectural, engineering, and related services	5413	3,386	4,159	1,021	1,337	2,365	2,822	45,221	53,594	23.7	32.2	225	250
Computer systems design and related services	5415	9,154	11,983	498	1,590	8,656	10,394	52,466	72,495	62.8	90.8	290	333
Scientific R&D services	5417	14,244	13,034	3,352	2,299	10,893	10,735	29,858	61,103	59.9	50.0	164	159
Other professional, scientific, and technical services	54 minus (5413, 5415, 5417)	920	1,182	194	186	726	996	37,753	35,822	6.5	8.9	221	213
Management of companies and enterprises	55	381	148	-	-	381	148	4,862	1,962	1.5	1.5	26	13
Health care services	621-23	1,149	(D)	29	(D)	1,120	4,163	27,200	27,603	8.1	9.1	156	158
Other nonmanufacturing	56, 61, 624, 71, 72, 81	1,259	(D)	38	(D)	1,221	894	85,826	46,563	20.0	10.8	748	450
Distribution by size of company (number of employees):													
Total	(na)	198,505	190,809	16,899	16,401	181,606	174,408	4,835,140	4,903,345	1060.2	1,066.1	16,749	15,415
5 to 24	(na)	4,828	4,261	653	789	4,175	3,471	32,242	48,993	34.4	60.0	159	144
25 to 49	(na)	3,750	3,845	201	259	3,548	3,586	33,507	40,091	26.7	26.6	178	162
50 to 99	(na)	8,202	6,164	548	463	7,654	5,701	73,288	79,880	40.4	38.4	360	280
100 to 249	(na)	12,916	13,227	903	606	12,012	12,622	111,392	140,438	79.9	61.4	639	535
250 to 499	(na)	8,702	8,055	560	686	8,143	7,370	101,466	185,592	47.6	46.4	520	546
500 to 999	(na)	10,564	9,925	627	531	9,936	9,394	175,292	136,776	61.9	61.3	814	690
1,000 to 4,999	(na)	26,748	28,625	608	985	26,140	27,640	627,725	682,463	159.1	165.5	2,333	2,326
5,000 to 9,999	(na)	17,487	17,987	1,651	1,574	15,836	16,414	635,660	489,531	110.6 (S)	104.0	1,772	1,498
10,000 to 24,999	(na)	27,065	26,458	904	1,226	26,161	25,232	753,055	872,414	144.3	158.3	2,397	2,414
25,000 or more	(na)	78,244	72,261	10,243	9,282	68,001	62,979	2,291,513	2,227,168	355.2	344.2	7,577	6,820

(D) = data have been withheld to avoid disclosing operations of individual companies; (S) = indicates imputation of more than 50 percent; (--) = indicates data not collected; (-) = indicates a value of zero or a value rounded to zero; (NA) = not available; (na) = not applicable.

[a] Beginning with 2001, statistics for total and federally funded industrial R&D exclude data for federally funded research and development centers.

[b] Data recorded in January represent employment figures for the previous year.

NOTE: For information on sampling for 1999–2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

TABLE 3. Funds for industrial R&D performance in the United States, by industry and size of company: 1999–2002
(Millions of dollars)

Industry and size of company	NAICS codes	1999 [a]	2000	2001 [b]	2002 [b]	Percent change 2002/2001
Distribution by industry:						
All industries	21-23, 31-33, 42, 44-81	182,711	199,539	198,505	190,809	-4
Manufacturing	31-33	116,921	124,078	120,705	108,985	-10
Food	311	1,132	(D)	1,819	(D)	(na)
Beverage and tobacco products	312	(D)	417	152	170	12
Textiles, apparel, and leather	313-16	334	(D)	(D)	(D)	(na)
Wood products	321	70	105	182	(D)	(na)
Paper, printing and support activities	322, 323	(D)	(D)	(D)	(D)	(na)
Petroleum and coal products	324	615	(D)	(D)	(D)	(na)
Chemicals	325	20,246	20,918	17,892	20,641	15
Basic chemicals	3251	2,746	2,080	1,876	1,782	-5
Resin, synthetic rubber, fibers, and filament	3252	(D)	2,852	(D)	2,426	(na)
Pharmaceuticals and medicines	3254	(D)	(D)	10,137	(D)	(na)
Other chemicals	325 minus (3251-52, 3254)	(D)	(D)	(D)	(D)	(na)
Plastics and rubber products	326	1,785	(D)	(D)	(D)	(na)
Nonmetallic mineral products	327	(D)	846	990	(D)	(na)
Primary metals	331	470	624	485	473	-2
Fabricated metal products	332	1,655	1,672	1,599	1,355	-15
Machinery	333	6,057	6,580	6,404	6,429	0
Computer and electronic products	334	35,932	45,097	47,079	35,777	-24
Computers and peripheral equipment	3341	(D)	5,162	(D)	3,040	(na)
Communications equipment	3342	6,003	11,616	15,507	6,635	-57
Semiconductor and other electronic components	3344	10,701	12,894	14,358	11,919	-17
Navigational, measuring, electromedical, and control instruments	3345	14,337	15,116	12,947	13,729	6
Other computer and electronic products	334 minus (3341-42, 3344-45)	(D)	310	(D)	453	(na)
Electrical equipment, appliances, and components	335	(D)	(D)	4,980	2,039	-59
Transportation equipment	336	33,965	30,085	25,965	26,145	1
Motor vehicles, trailers, and parts	3361-63	(D)	(D)	(D)	(D)	(na)
Aerospace products and parts	3364	14,425	10,319	7,868	9,654	23
Other transportation equipment	336 minus (3361-64)	(D)	(D)	(D)	(D)	(na)
Furniture and related products	337	248	284	301	258	-14
Miscellaneous manufacturing	339	3,851	4,206	6,606	7,457	13
Medical equipment and supplies	3391	(D)	(D)	(D)	(D)	(na)
Other miscellaneous manufacturing	339 minus (3391)	(D)	(D)	(D)	(D)	(na)
Other manufacturing	31-33 minus (311-16, 321-27, 331-37, 339)	--	--	--	--	(na)
Nonmanufacturing	21-23, 42, 44-81	65,790	75,461	77,799	81,824	5
Mining, extraction, and support activities	21	(D)	823	(D)	(D)	(na)
Utilities	22	142	(D)	133	(D)	(na)
Construction	23	691	(D)	320	164	-49
Trade	42, 44, 45	19,616	24,959	24,372	(D)	(na)
Transportation and warehousing	48, 49	460	(D)	1,848	(D)	(na)
Information	51	15,389	16,830	(D)	17,870	(na)

TABLE 3. Funds for industrial R&D performance in the United States, by industry and size of company: 1999–2002

(Millions of dollars)

Industry and size of company	NAICS codes	1999 [a]	2000	2001 [b]	2002 [b]	Percent change 2002/2001
Distribution by industry:						
Publishing	511	11,302	13,004	13,760	13,541	-2
Newspaper, periodical, book, and database	5111	371	365	649	614	-5
Software	5112	10,931	12,639	13,111	12,927	-1
Broadcasting and telecommunications	513	(D)	1,407 (S)	(D)	(D)	(na)
Radio and television broadcasting	5131	(D)	(D)	(D)	(D)	(na)
Telecommunications	5133	(D)	(D)	(D)	(D)	(na)
Other broadcasting and telecommunications	513 minus (5131, 5133)	31	59	(D)	(D)	(na)
Other information	51 minus (511, 513)	(D)	2,420	(D)	(D)	(na)
Finance, insurance, and real estate	52, 53	(D)	4,025	(D)	1,903	(na)
Professional, scientific, and technical services	54	18,994	22,577	27,704	30,358	10
Architectural, engineering, and related services	5413	3,580	3,381	3,386	4,159	23
Computer systems design and related services	5415	(D)	5,169	9,154	11,983	31
Scientific R&D services	5417	10,470	12,892	14,244	13,034	-8
Other professional, scientific, and technical services	54 minus (5413, 5415, 5417)	(D)	1,135	920	1,182	28
Management of companies and enterprises	55	(D)	49	381	148	-61
Health care services	621-23	642	536	1,149	(D)	(na)
Other nonmanufacturing	56, 61, 624, 71, 72, 81	(D)	731	1,259	(D)	(na)
Distribution by size of company (number of employees):						
Total	(na)	182,711	199,539	198,505	190,809	-4
5 to 24	(na)	7,004	6,862	4,828	4,261	-12
25 to 49	(na)	4,750	5,008	3,750	3,845	3
50 to 99	(na)	7,225	7,259	8,202	6,164	-25
100 to 249	(na)	7,213	9,020	12,916	13,227	2
250 to 499	(na)	7,892	7,479	8,702	8,055	-7
500 to 999	(na)	7,032	9,074	10,564	9,925	-6
1,000 to 4,999	(na)	24,840	30,636	26,748	28,625	7
5,000 to 9,999	(na)	16,376	16,768	17,487	17,987	3
10,000 to 24,999	(na)	24,922	28,653	27,065	26,458	-2
25,000 or more	(na)	75,457	78,779	78,244	72,261	-8

(D) = data have been withheld to avoid disclosing operations of individual companies; (S) = indicates imputation of more than 50 percent; (--) = indicates data not collected; (na) = not applicable.

[a] Some statistics for 1999 have been revised since originally published.

[b] Beginning with 2001, statistics for total and federally funded industrial R&D exclude data for federally funded research and development centers.

NOTE: The R&D in this table is the industrial R&D performed within company facilities funded from all sources. The funds are the company's own; funds from outside organizations such as other companies, research institutions, universities and colleges, nonprofit organizations, and state governments; and funds from the federal government. Excluded from this table are R&D not performed within the company (e.g., R&D contracted out to other organizations) and R&D not performed within the 50 U.S. states or DC (e.g., R&D not performed on U.S. soil by foreign subsidiaries or other foreign organizations). For information on sampling for 1999–2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

TABLE 4. Funds for industrial R&D performance in the United States, by industry and by size of company: 2002

(Millions of dollars)

Industry	NAICS codes	Total [a]	Size of company (number of employees)									
			5 to 24	25 to 49	50 to 99	100 to 249	250 to 499	500 to 999	1,000 to 4,999	5,000 to 9,999	10,000 to 24,999	25,000 or more
All industries	21-23, 31-33, 42, 44-81	190,809	4,261	3,845	6,164	13,227	8,055	9,925	28,625	17,987	26,458	72,261
Manufacturing	31-33	108,985	767	937	1,580	2,800	2,831	4,704	15,216	(D)	15,205	(D)
Food	311	(D)	13	-	112	32	38	73	194	98	(D)	(D)
Beverage and tobacco products	312	170	9	(z)	(D)	(D)	1	-	56	(D)	(D)	-
Textiles, apparel, and leather	313-16	(D)	4	(D)	1	(D)	14	(D)	(D)	(D)	(D)	(D)
Wood products	321	(D)	-	4	(z)	5	6	2	27	(D)	(D)	-
Paper, printing and support activities	322, 323	(D)	5	5	2	20	19	90	(D)	96	319	(D)
Petroleum and coal products	324	(D)	6	(z)	(D)	4	5	(D)	(D)	-	(D)	(D)
Chemicals	325	20,641	(D)	82	148	(D)	297	(D)	(D)	(D)	(D)	(D)
Basic chemicals	3251	1,782	11	16	17	(D)	43	246	(D)	267	(D)	-
Resin, synthetic rubber, fibers, and filament	3252	2,426	2	2	2	13	59	50	(D)	(D)	(D)	(D)
Pharmaceuticals and medicines	3254	(D)	(D)	24	(D)	(D)	136	234	(D)	(D)	(D)	(D)
Other chemicals	325 minus (3251-52, 3254)	(D)	36	40	(D)	(D)	59	(D)	(D)	324	(D)	(D)
Plastics and rubber products	326	(D)	17	7	31	91	78	(D)	(D)	(D)	(D)	(D)
Nonmetallic mineral products	327	(D)	(D)	9	1	28	42	7	(D)	(D)	(D)	(D)
Primary metals	331	473	2	(D)	3	(D)	3	(D)	78	(D)	(D)	(D)
Fabricated metal products	332	1,355	22	12	57	77	(D)	(D)	(D)	(D)	(D)	(D)
Machinery	333	6,429	88	168	197	400	285	569	(D)	1,336	(D)	(D)
Computer and electronic products	334	35,777	319	422	568	1,150	1,377	(D)	7,107	(D)	(D)	(D)
Computers and peripheral equipment	3341	3,040	(D)	72	(D)	(D)	178	(D)	600	(D)	(D)	-
Communications equipment	3342	6,635	(D)	41	102	417	414	(D)	1,050	(D)	(D)	(D)
Semiconductor and other electronic components	3344	11,919	75	215	192	(D)	476	(D)	(D)	1,598	(D)	(D)
Navigational, measuring, electromedical, and control instruments	3345	13,729	133	86	(D)	(D)	284	(D)	1,777	(D)	(D)	(D)
Other computer and electronic products	334 minus (3341-42, 3344-45)	453	(D)	9	20	32	26	(D)	(D)	(D)	-	-
Electrical equipment, appliances, and components	335	2,039	27	(D)	109	109	(D)	226	(D)	287	585	-
Transportation equipment	336	26,145	31	18	96	(D)	148	(D)	(D)	(D)	1,857	(D)
Motor vehicles, trailers, and parts	3361-63	(D)	28	4	89	(D)	58	172	(D)	(D)	(D)	(D)
Aerospace products and parts	3364	9,654	-	4	1	(D)	75	(D)	(D)	(D)	(D)	8,437
Other transportation equipment	336 minus (3361-64)	(D)	2	9	6	(D)	16	(D)	(D)	(D)	(D)	-
Furniture and related products	337	258	(D)	(D)	5	(D)	15	(D)	44	76	(D)	(D)
Miscellaneous manufacturing	339	7,457	75	(D)	245	253	(D)	(D)	(D)	1,291	(D)	(D)
Medical equipment and supplies	3391	(D)	44	(D)	209	168	(D)	(D)	(D)	1,175	(D)	(D)
Other miscellaneous manufacturing	339 minus (3391)	(D)	31	(D)	36	85	75	450	(D)	116	(D)	-

TABLE 4. Funds for industrial R&D performance in the United States, by industry and by size of company: 2002

(Millions of dollars)

Industry	NAICS codes	Total [a]	Size of company (number of employees)									
			5 to 24	25 to 49	50 to 99	100 to 249	250 to 499	500 to 999	1,000 to 4,999	5,000 to 9,999	10,000 to 24,999	25,000 or more
Other manufacturing	31-33 minus (311-16, 321-27, 331-37, 339)	--	--	--	--	--	--	--	--	--	--	--
Nonmanufacturing	21-23, 42, 44-81	81,824	3,493	(D)	4,584	10,428	5,224	5,221	13,409	(D)	11,254	(D)
Mining, extraction, and support activities	21	(D)	-	-	-	-	19	(D)	129	(D)	(D)	(D)
Utilities	22	(D)	25	-	-	-	(D)	(D)	(D)	(D)	(D)	(D)
Construction	23	164	(D)	(z)	(D)	(D)	(D)	(D)	17	(D)	(D)	-
Trade	42, 44, 45	(D)	266	(D)	428	1,096	(D)	(D)	(D)	(D)	(D)	(D)
Transportation and warehousing	48, 49	(D)	-	-	-	-	(D)	(D)	(D)	(D)	11	(D)
Information	51	17,870	(D)	(D)	(D)	771	(D)	1,189	3,997	797	1,680	(D)
Publishing	511	13,541	(D)	(D)	(D)	568	(D)	889	(D)	(D)	1,416	(D)
Newspaper, periodical, book, and database	5111	614	-	2	(z)	25	(D)	-	(D)	(D)	(D)	(D)
Software	5112	12,927	(D)	(D)	(D)	543	(D)	889	(D)	(D)	(D)	(D)
Broadcasting and telecommunications	513	(D)	(D)	-	(D)	59	(D)	48	(D)	(D)	-	(D)
Radio and television broadcasting	5131	(D)	-	-	-	(D)	-	-	(D)	-	-	-
Telecommunications	5133	(D)	-	-	-	(D)	(D)	(D)	(D)	(D)	-	(D)
Other broadcasting and telecommunications	513 minus (5131, 5133)	(D)	(D)	-	(D)	(D)	(D)	(D)	-	-	-	-
Other information	51 minus (511, 513)	(D)	31	66	(D)	144	(D)	252	(D)	(D)	264	(D)
Finance, insurance, and real estate	52, 53	1,903	(D)	(D)	(D)	193	76	21	(D)	(D)	463	(D)
Professional, scientific, and technical services	54	30,358	2,182	(D)	3,515	5,338	2,938	2,967	(D)	1,464	(D)	(D)
Architectural, engineering, and related services	5413	4,159	(D)	93	957	500	434	352	(D)	(D)	(D)	38
Computer systems design and related services	5415	11,983	(D)	(D)	927	1,231	(D)	(D)	1,162	(D)	(D)	(D)
Scientific R&D services	5417	13,034	(D)	(D)	1,619	3,489	(D)	(D)	(D)	(D)	-	(D)
Other professional, scientific, and technical services	54 minus (5413, 5415, 5417)	1,182	(D)	(D)	12	119	68 (S)	146	182	61	(D)	(D)
Management of companies and enterprises	55	148	(D)	(D)	(D)	(D)	44	(D)	(D)	-	-	-
Health care services	621-23	(D)	(D)	(D)	(D)	2,977	(D)	(D)	41 (S)	(D)	(D)	(D)
Other nonmanufacturing	56, 61, 624, 71, 72, 81	(D)	(D)	(D)	52	(D)	(D)	(D)	(D)	75	26 (S)	(D)

(D) = data have been withheld to avoid disclosing operations of individual companies; (S) = indicates imputation of more than 50 percent; (z) = indicates data less than half the value shown; (--) = indicates data not collected; (-) = indicates a value of zero.

[a] Beginning with 2001, statistics for total and federally funded industrial R&D exclude data for federally funded research and development centers.

NOTE: For information on sampling for 2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

TABLE 5. Funds for industrial R&D performance in the United States and number of companies that performed R&D in the United States, by industry and size of company and by size of total R&D program: 2002

Industry and size of company	NAICS codes	Number of companies	Amount [a] (millions of dollars)	Size of R&D Program: Less than $200,000 — Number of companies	Less than $200,000 — Amount (millions of dollars)	$200,000 to $999,999 — Number of companies	$200,000 to $999,999 — Amount (millions of dollars)	$1 million to $9.9 million — Number of companies	$1 million to $9.9 million — Amount (millions of dollars)	$10 million to $99.9 million — Number of companies	$10 million to $99.9 million — Amount (millions of dollars)	$100 million or more — Number of companies	$100 million or more — Amount (millions of dollars)
All industries	21–23, 31–33, 42, 44–81	29,001	190,809	13,609	907	8,141	3,941	5,331	16,367	1,681	42,984	238	126,610
Manufacturing	31–33	14,043	108,985	7,538	510	3,578	1,619	2,151	6,472	639	18,926	137	81,457
Food	311	529	(D)	245	(D)	161	72	102	304	17	673	4	(D)
Beverage and tobacco products	312	57	170	14	(D)	36	13	2	(D)	6	152	0	-
Textiles, apparel, and leather	313–16	364	(D)	250	(D)	67	34	40	128	6	89	0	-
Wood products	321	90	(D)	43	(D)	35	15	8	26	3	88	0	-
Paper, printing and support activities	322, 323	396	(D)	259	(D)	81	29	39	121	14	426	3	2,061
Petroleum and coal products	324	79	(D)	50	(D)	17	7	4	10	3	120	4	1,093
Chemicals	325	1,242	20,641	518	48	360	151	225	709	116	3,870	24	15,863
Basic chemicals	3251	182	1,782	47	6	52	23	47	(D)	33	1,192	3	(D)
Resin, synthetic rubber, fibers, and filament	3252	82	2,426	30	1	15	5	22	72	11	374	4	1,974
Pharmaceuticals and medicines	3254	313	(D)	98	9	71	30	83	(D)	46	1,488	15	12,455
Other chemicals	325 minus (3251–52, 3254)	666	(D)	343	32	222	93	73	(D)	25	815	2	(D)
Plastics and rubber products	326	951	(D)	562	(D)	261	108	103	(D)	23	598	2	(D)
Nonmetallic mineral products	327	211	(D)	124	(D)	49	21	27	73	11	321	0	-
Primary metals	331	200	473	130	(D)	33	14	27	93	9	142	1	(D)
Fabricated metal products	332	1,382	1,355	989	(D)	265	131	107	326	21	601	1	(D)
Machinery	333	2,706	6,429	1,669	115	641	311	312	900	72	1,713	12	3,391
Computer and electronic products	334	2,808	35,777	1,012	84	912	402	634	1,869	202	6,053	48	27,368
Computers and peripheral equipment	3341	329	3,040	84	7	146	(D)	67	263	26	625	6	(D)
Communications equipment	3342	501	6,635	193	14	160	73	90	364	49	1,487	8	4,697
Semiconductor and other electronic components	3344	806	11,919	301	34	196	95	232	575	61	2,092	17	9,123
Navigational, measuring, electromedical, and control instruments	3345	1,047	13,729	378	24	368	158	226	610	59	1,595	16	11,342
Other computer and electronic products	334 minus (3341–42, 3344–45)	125	453	55	4	43	(D)	19	57	7	254	1	(D)
Electrical equipment, appliances, and components	335	840	2,039	501	34	171	81	127	406	37	847	5	670
Transportation equipment	336	785	26,145	377	36	197	91	146	444	42	1,418	24	24,156
Motor vehicles, trailers, and parts	3361–63	488	(D)	212	(D)	125	56	116	333	27	1,010	9	13,832
Aerospace products and parts	3364	84	9,654	31	3	17	7	15	62	9	255	11	9,327
Other transportation equipment	336 minus (3361–64)	213	(D)	134	(D)	54	28	14	49	6	153	4	997

TABLE 5. Funds for industrial R&D performance in the United States and number of companies that performed R&D in the United States, by industry and size of company and by size of total R&D program: 2002

Industry and size of company	NAICS codes	Number of companies	Amount [a] (millions of dollars)	Size of R&D Program: Less than $200,000 — Number of companies	Less than $200,000 — Amount (millions of dollars)	$200,000 to $999,999 — Number of companies	$200,000 to $999,999 — Amount (millions of dollars)	$1 million to $9.9 million — Number of companies	$1 million to $9.9 million — Amount (millions of dollars)	$10 million to $99.9 million — Number of companies	$10 million to $99.9 million — Amount (millions of dollars)	$100 million or more — Number of companies	$100 million or more — Amount (millions of dollars)
Distribution by industry:													
Furniture and related products	337	267	258	180	13	46	21	36	79	6	145	0	-
Miscellaneous manufacturing	339	1,136	7,457	616	28	246	118	213	633	51	1,671	9	5,007
Medical equipment and supplies	3391	557	(D)	216	10	145	63	154	(D)	33	822	8	(D)
Other miscellaneous manufacturing	339 minus (3391)	579	(D)	400	19	101	55	59	(D)	18	849	1	(D)
Other manufacturing	31-33 minus (311–16, 321–27, 331–37, 339)												
Nonmanufacturing	21–23, 42, 44–81	14,958	81,824	6,071	398	4,563	2,321	3,180	9,895	1,042	24,058	101	45,153
Mining, extraction, and support activities	21	22	(D)	0	-	4	2	14	(D)	3	118	2	(D)
Utilities	22	285	(D)	254	26	13	7	15	(D)	3	52	0	-
Construction	23	300	164	273	17	14	8	8	25	4	115	0	-
Trade	42, 44, 45	2,837	(D)	1,272	62	1,133	613	280	(D)	118	3,420	35	20,058
Transportation and warehousing	48, 49	120	(D)	10	1	99	56	9	(D)	1	(D)	1	(D)
Information	51	1,726	17,870	398	42	683	368	473	(D)	145	4,320	27	(D)
Publishing	511	1,320	13,541	361	39	477	235	370	1,109	90	2,414	23	9,744
Newspaper, periodical, book, and database	5111	51	614	32	2	4	1	8	47	4	103	3	460
Software	5112	1,269	12,927	329	37	473	234	362	1,062	86	2,311	20	9,284
Broadcasting and telecommunications	513	112	(D)	5	(D)	73	61	8	(D)	24	1,042	2	(D)
Radio and television broadcasting	5131	4	(D)	4	(D)	0	-	0	-	0	-	0	-
Telecommunications	5133	93	(D)	0	-	62	(D)	7	(D)	23	(D)	2	(D)
Other broadcasting and telecommunications	513 minus (5131, 5133)	14	(D)	1	(D)	11	(D)	1	(D)	1	(D)	0	-
Other information	51 minus (511, 513)	294	(D)	31	(D)	134	71	96	(D)	31	864	2	(D)
Finance, insurance, and real estate	52, 53	463	1,903	273	4	22	8	129	426	35	952	3	513
Professional, scientific, and technical services	54	6,973	30,358	2,355	174	2,240	1,090	1,889	5,881	457	11,351	31	11,863
Architectural, engineering, and related services	5413	1,392	4,159	557	40	501	279	273	1,192	57	1,398	5	1,251
Computer systems design and related services	5415	3,304	11,983	1,292	102	1,110	493	746	2,135	146	3,053	10	6,200
Scientific R&D services	5417	1,364	13,034	141	17	370	167	594	(D)	244	6,555	14	(D)

TABLE 5. Funds for industrial R&D performance in the United States and number of companies that performed R&D in the United States, by industry and size of company and by size of total R&D program: 2002

Industry and size of company	NAICS codes	Number of companies	Amount [a] (millions of dollars)	Size of R&D Program: Less than $200,000 Number of companies	Less than $200,000 Amount (millions of dollars)	$200,000 to $999,999 Number of companies	$200,000 to $999,999 Amount (millions of dollars)	$1 million to $9.9 million Number of companies	$1 million to $9.9 million Amount (millions of dollars)	$10 million to $99.9 million Number of companies	$10 million to $99.9 million Amount (millions of dollars)	$100 million or more Number of companies	$100 million or more Amount (millions of dollars)
Distribution by industry:													
Other professional, scientific, and technical services	54 minus (5413, 5415, 5417)	913	1,182	366	14	259	151	276	(D)	11	344	2	(D)
Management of companies and enterprises	55	35	148	8	(z)	1	(D)	23	59	3	(D)	0	-
Health care services	621–23	1,231	(D)	385	17	324	(D)	265	(D)	256	(D)	1	(D)
Other nonmanufacturing	56, 61, 624, 71, 72, 81	966	(D)	842	56	29	16	76	(D)	18	485	1	(D)
Distribution by size of company (number of employees):													
Total	(na)	29,001	190,809	13,609	907	8,141	3,941	5,331	16,367	1,681	42,984	238	126,610
5 to 24	(na)	13,028	4,261	8,477	(D)	3,338	1,556	1,211	2,147	2	(D)	0	-
25 to 49	(na)	4,620	3,845	1,828	131	1,846	937	918	2,375	28	402	0	-
50 to 99	(na)	3,846	6,164	1,851	135	948	467	921	3,580	126	1,982	0	-
100 to 249	(na)	3,441	13,227	879	70	1,145	553	855	2,894	563	9,709	0	-
250 to 499	(na)	1,573	8,055	423	44	407	192	536	1,699	205	5,674	3	446
500 to 999	(na)	962	9,925	85	9	288	150	362	1,334	216	6,692	11	1,740
1,000 to 4,999	(na)	1,054	28,625	46	5	148	74	437	1,902	347	11,202	76	15,442
5,000 to 9,999	(na)	220	17,987	21	2	16	7	54	254	91	3,205	39	14,519
10,000 to 24,999	(na)	152	26,458	1	(D)	5	(D)	26	123	69	2,590	51	23,742
25,000 or more	(na)	105	72,261	0	-	1	(D)	11	59	35	(D)	58	70,720

(D) = data have been withheld to avoid disclosing operations of individual companies; (S) = indicates imputation of more than 50 percent; (z) = indicates data less than half the unit shown; (--) = indicates data not collected; (-) = indicates a value of zero or a value rounded to zero; (na) = not applicable.

[a] Beginning with 2001, statistics for total and federally funded industrial R&D exclude data for federally funded research and development centers.

NOTE: For information on sampling for 2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

TABLE 6. Funds for industrial R&D performance in the United States and number of companies in manufacturing and nonmanufacturing industries that performed industrial R&D in the United States, by size of company: 2002

Size of company (number of employees)	All industries [a]	Manufacturing	Nonmanufacturing
	Funds for industrial R&D (millions of dollars)		
Total	190,809	108,985	81,824
5 to 24	4,261	767 (S)	3,493
25 to 49	(D)	937	(D)
50 to 99	6,164	1,580	4,584
100 to 249	13,227	2,800	10,428
250 to 499	8,055	2,831	5,224
500 to 999	9,925	4,704	5,221
1,000 to 4,999	28,625	15,216	13,409
5,000 to 9,999	(D)	(D)	(D)
10,000 to 24,999	26,458	15,205	11,254
25,000 or more	(D)	(D)	(D)
	Number of R&D-performing companies		
Total	29,001	14,043	14,958
5 to 24	13,028	4,856	8,172
25 to 49	4,620	2,272	2,348
50 to 99	3,846	2,151	1,695
100 to 249	3,441	2,028	1,414
250 to 499	1,573	1,065	508
500 to 999	962	628	334
1,000 to 4,999	1,054	744	310
5,000 to 9,999	220	146	74
10,000 to 24,999	152	93	59
25,000 or more	105	61	44

(D) = data have been withheld to avoid disclosing operations of individual companies.

(S) = indicates imputation of more than 50 percent.

[a] Beginning with 2001, statistics for total and federally funded industrial R&D exclude data for federally funded research and development centers.

NOTE: For information on sampling for 2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

TABLE 7. Funds for industrial R&D performance in the United States, by industry and size of company and by type of cost: 2002

Industry and size of company	NAICS codes	Total R&D cost	Wages of R&D personnel	Fringe benefits of R&D personnel	Materials and supplies	R&D depreciation	Other costs
		Millions of dollars	Percent				
Distribution by industry:							
All industries	21–23, 31–33, 42, 44–81	190,809	44.5	8.5	11.6	4.3	31.0
Manufacturing	31–33	108,985	43.3	9.0	14.2	4.0	29.6
Food	311	(D)	41.8	11.4	10.2	5.6	31.0
Beverage and tobacco products	312	170	48.2	17.9	6.4	6.1	21.4
Textiles, apparel, and leather	313-16	(D)	46.9	6.2	15.5	2.2 (S)	29.3
Wood products	321	(D)	48.1	4.1	8.8	4.1	34.9
Paper, printing and support activities	322, 323	(D)	47.4	2.8 (S)	13.3	3.6	33.0
Petroleum and coal products	324	(D)	38.7 (S)	18.2 (S)	9.5 (S)	2.7 (S)	30.9 (S)
Chemicals	325	20,641	38.5	8.3	11.5	6.6	35.1
Basic chemicals	3251	1,782	44.5	9.5	11.2	6.2	28.7
Resin, synthetic rubber, fibers, and filament	3252	2,426	47.4	4.6	9.7	9.4	28.8
Pharmaceuticals and medicines	3254	(D)	34.3	8.0	11.6	6.2	39.9
Other chemicals	325 minus (3251–52, 3254)	(D)	51.6	14.4	13.0	5.7	15.3
Plastics and rubber products	326	(D)	52.4	8.7	20.9	4.1	13.9
Nonmetallic mineral products	327	(D)	40.8	10.1	13.3	3.6	32.2
Primary metals	331	473	73.2	4.0	5.8	4.8	12.2
Fabricated metal products	332	1,355	51.2	15.9	9.0	2.7	21.1
Machinery	333	6,429	42.7	5.1	20.7	5.5	26.0
Computer and electronic products	334	35,777	48.9	7.3	14.6 (S)	4.4	24.8
Computers and peripheral equipment	3341	3,040	53.2	6.1 (S)	9.9 (S)	6.4 (S)	24.3
Communications equipment	3342	6,635	48.8 (S)	4.0	20.9 (S)	4.1	22.2 (S)
Semiconductor and other electronic components	3344	11,919	49.7	7.1	10.5	5.4	27.4
Navigational, measuring, electromedical, and control instruments	3345	13,729	47.1 (S)	9.3 (S)	16.1 (S)	3.5 (S)	24.0 (S)
Other computer and electronic products	334 minus (3341–42, 3344–45)	453	60.2	3.9	9.5	3.4	22.9 (S)
Electrical equipment, appliances, and components	335	2,039	48.2	9.6	11.5	3.1	27.6
Transportation equipment	336	26,145	42.5	13.3	16.9	1.9	25.4
Motor vehicles, trailers, and parts	3361-63	(D)	48.4	15.5 (S)	16.6	2.3 (S)	17.4 (S)
Aerospace products and parts	3364	9,654	33.1	10.3	16.5	1.0	39.1
Other transportation equipment	336 minus (3361–64)	(D)	44.1	9.5 (S)	23.9	4.3	18.2
Furniture and related products	337	258	46.4	9.9	13.3	1.4 (S)	28.9
Miscellaneous manufacturing	339	7,457	24.9 (S)	5.0 (S)	7.5 (S)	1.1	61.5
Medical equipment and supplies	3391	(D)	22.2 (S)	4.4 (S)	7.4 (S)	1.0	65.0
Other miscellaneous manufacturing	339 minus (3391)	(D)	51.1	10.8	7.8	1.8	28.5
Other manufacturing	31–33 minus (311–16, 321–27, 331–37, 339)	--	--	--	--	--	--

TABLE 7. Funds for industrial R&D performance in the United States, by industry and size of company and by type of cost: 2002

Industry and size of company	NAICS codes	Total R&D cost	Wages of R&D personnel	Fringe benefits of R&D personnel	Materials and supplies	R&D depreciation	Other costs
		Millions of dollars	Percent				
Distribution by industry:							
Nonmanufacturing	21–23, 42, 44–81	81,824	46.5	7.7	7.5	4.8	33.4
Mining, extraction, and support activities	21	(D)	53.1 (S)	11.3 (S)	11.1 (S)	4.7 (S)	19.8 (S)
Utilities	22	(D)	22.4	(D)	13.0	(D)	58.1
Construction	23	164	47.7	7.4 (S)	29.2	1.1 (S)	14.6
Trade	42, 44, 45	(D)	36.4	5.2	6.5	4.3	47.7
Transportation and warehousing	48, 49	(D)	53.7	16.9	1.4	(D)	(D)
Information	51	17,870	64.7	9.1 (S)	3.0 (S)	4.8 (S)	18.4
Publishing	511	13,541	61.2 (S)	10.3 (S)	3.4 (S)	5.2 (S)	19.9
Newspaper, periodical, book, and database	5111	614	67.4	10.4	(D)	(D)	17.3
Software	5112	12,927	60.9 (S)	10.3 (S)	3.5 (S)	5.3 (S)	20.1
Broadcasting and telecommunications	513	(D)	81.3 (S)	4.9 (S)	1.4 (S)	8.1 (S)	4.4 (S)
Radio and television broadcasting	5131	(D)	(D)	(D)	(D)	(D)	(D)
Telecommunications	5133	(D)	81.4 (S)	4.8 (S)	1.4 (S)	8.0 (S)	4.4 (S)
Other broadcasting and telecommunications	513 minus (5131, 5133)	(D)	(D)	(D)	(D)	(D)	(D)
Other information	51 minus (511, 513)	(D)	81.2	3.2	1.3	0.6 (S)	13.6
Finance, insurance, and real estate	52, 53	1,903	72.5	7.6	6.0 (S)	2.6	11.5
Professional, scientific, and technical services	54	30,358	42.5	9.1	11.6	5.7	31.1
Architectural, engineering, and related services	5413	4,159	42.4	10.9	18.0	6.6 (S)	22.1
Computer systems design and related services	5415	11,983	50.9	9.4	5.4	5.9	28.4
Scientific R&D services	5417	13,034	35.3	8.4	15.7	5.4	35.3
Other professional, scientific, and technical services	54 minus (5413, 5415, 5417)	1,182	41.7	7.9	8.6	2.2	39.6 (S)
Management of companies and enterprises	55	148	56.3	(D)	(D)	2.8	37.9
Health care services	621–23	(D)	43.8	12.3	4.0	1.3	38.6
Other nonmanufacturing	56, 61, 624, 71, 72, 81	(D)	45.9	6.9	4.4 (S)	10.4	32.3

TABLE 7. Funds for industrial R&D performance in the United States, by industry and size of company and by type of cost: 2002

Industry and size of company	NAICS codes	Total R&D cost	Wages of R&D personnel	Fringe benefits of R&D personnel	Materials and supplies	R&D depreciation	Other costs
		Millions of dollars	Percent				
Distribution by size of company (number of employees):							
Total	(na)	190,809	44.5	8.5	11.6	4.3	31.0
5 to 24	(na)	4,261	44.8	8.2	14.4	4.4	28.1
25 to 49	(na)	3,845	38.4	8.1	11.9	5.0	36.6
50 to 99	(na)	6,164	44.9	7.7	12.4	5.4	29.6
100 to 249	(na)	13,227	41.6	7.4	14.0	5.8	31.5
250 to 499	(na)	8,055	47.7	7.4	10.1	5.6	29.7
500 to 999	(na)	9,925	47.6	7.3	10.2	5.2	29.8
1,000 to 4,999	(na)	28,625	47.9	7.8	10.8	6.1	27.3
5,000 to 9,999	(na)	17,987	45.1	8.1	12.4	4.6	29.8
10,000 to 24,999	(na)	26,458	40.3	7.3	10.3	3.3	38.8
25,000 or more	(na)	72,261	44.4	9.7	12.2	3.7	30.0

(D) = data have been withheld to avoid disclosing operations of individual companies; (S) = indicates imputation of more than 50 percent; (--) = indicates data not collected; (na) = not applicable.

NOTE: For information on sampling for 2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

TABLE 8. Funds for industrial R&D performance in the United States, by industry and size of company and by technology area: 2002

Industry and size of company	NAICS codes	Number of companies	Amount (millions of dollars)	Biotechnology R&D: Number of companies	Biotechnology R&D: Amount (millions of dollars)	Software development R&D: Number of companies	Software development R&D: Amount (millions of dollars)	Materials synthesis and processing R&D: Number of companies	Materials synthesis and processing R&D: Amount (millions of dollars)	R&D in other technology areas: Number of companies	R&D in other technology areas: Amount (millions of dollars)	Undistributed R&D: Number of companies	Undistributed R&D: Amount (millions of dollars)
Distribution by industry:													
All industries	21–23, 31–33, 42, 44-81	29,001	190,809	2,694	13,493	10,238	24,014	5,367	14,571	13,711	48,949	2,853	89,782
Manufacturing	31–33	14,043	108,985	752	4,973	2,665	3,390	4,273	11,850	7,826	32,792	1,709	55,979
Food	311	529	(D)	47	97	108	(D)	134	111	234	946	52	875
Beverage and tobacco products	312	57	170	0	-	31	2	2	(D)	43	60	15	(D)
Textiles, apparel, and leather	313–16	364	(D)	0	-	41	1	116	53	94	81	142	(D)
Wood products	321	90	(D)	0	-	13	1	41	83	35	45	18	(D)
Paper, printing and support activities	322, 323	396	(D)	2	(D)	118	52	145	105	114	190	36	2,299
Petroleum and coal products	324	79	(D)	1	(D)	1	(D)	37	(D)	36	207	7	768
Chemicals	325	1,242	20,641	316	4,102	34	205	528	2,612	399	3,596	106	10,125
Basic chemicals	3251	182	1,782	23	109	2	(D)	82	492	66	563	27	(D)
Resin, synthetic rubber, fibers, and filament	3252	82	2,426	3	9	0	-	55	109	29	234	8	2,074
Pharmaceuticals and medicines	3254	313	(D)	229	3,820	14	93	48	1,213	41	2,322	23	(D)
Other chemicals	325 minus (3251–52, 3254)	666	(D)	61	164	18	(D)	343	799	263	478	48	677
Plastics and rubber products	326	951	(D)	10	(D)	6	(z)	497	362	446	377	57	769
Nonmetallic mineral products	327	211	(D)	1	(D)	4	4	82	87	103	96	32	232
Primary metals	331	200	473	2	(D)	6	1	104	292	95	106	12	(D)
Fabricated metal products	332	1,382	1,355	118	14	200	58	545	207	833	699	237	377
Machinery	333	2,706	6,429	41	22	412	216	590	1,313	1,847	2,124	257	2,755
Computer and electronic products	334	2,808	35,777	101	143	1,172	1,815	593	4,635	1,848	11,008	249	18,176
Computers and peripheral equipment	3341	329	3,040	22	(D)	238	361	31	96	144	741	50	(D)
Communications equipment	3342	501	6,635	1	(D)	181	596	78	79	348	1,959	49	(D)
Semiconductor and other electronic components	3344	806	11,919	6	23	259	160	290	3,792	588	4,214	45	3,729
Navigational, measuring, electro-medical, and control instruments	3345	1,047	13,729	73	107	450	645	185	662	687	3,885	93	8,431
Other computer and electronic products	334 minus (3341–42, 3344–45)	125	453	0	-	43	54	9	5	80	208	11	186
Electrical equipment, appliances, and components	335	840	2,039	8	2	226	53	253	269	553	987	76	728
Transportation equipment	336	785	26,145	2	(D)	44	(D)	275	1,195	455	11,495	159	13,118

TABLE 8. Funds for industrial R&D performance in the United States, by industry and size of company and by technology area: 2002

Industry and size of company	NAICS codes	Number of companies	Amount (millions of dollars)	Biotechnology R&D: Number of companies	Biotechnology R&D: Amount (millions of dollars)	Software development R&D: Number of companies	Software development R&D: Amount (millions of dollars)	Materials synthesis and processing R&D: Number of companies	Materials synthesis and processing R&D: Amount (millions of dollars)	R&D in other technology areas: Number of companies	R&D in other technology areas: Amount (millions of dollars)	Undistributed R&D: Number of companies	Undistributed R&D: Amount (millions of dollars)
Distribution by industry:													
Motor vehicles, trailers, and parts	3361–63	488	(D)	1	(D)	17	46	160	1,014	293	6,556	117	7,642
Aerospace products and parts	3364	84	9,654	1	(D)	6	255	25	124	44	4,296	23	(D)
Other transportation equipment	336 minus (3361–64)	213	(D)	0	-	21	36	90	57	118	642	19	(D)
Furniture and related products	337	267	258	1	(D)	30	14	36	29	129	112	104	(D)
Miscellaneous manufacturing	339	1,136	7,457	100	562	220	603	294	261	565	663	150	5,369
Medical equipment and supplies	3391	557	(D)	87	542	164	79	146	131	253	302	45	(D)
Other miscellaneous manufacturing	339 minus (3391)	579	(D)	13	20	57	524	148	130	312	361	106	(D)
Other manufacturing	31–33 minus (311–16, 321–27, 331–37, 339)	--	--	--	--	--	--	--	--	--	--	--	--
Nonmanufacturing	21–23, 42, 44–81	14,958	81,824	1,942	8,519	7,573	20,624	1,095	2,721	5,886	16,157	1,144	33,803
Mining, extraction, and support activities	21	22	(D)	3	(D)	1	(D)	4	16	15	71	6	619
Utilities	22	285	(D)	2	(D)	5	3	3	(z)	26	66	257	64
Construction	23	300	164	0	-	180	12	30	22	85	27	7	103
Trade	42, 44, 45	2,837	(D)	431	2,157	859	4,058	231	1,633	1,585	4,914	117	(D)
Transportation and warehousing	48, 49	120	(D)	0	-	105	108	3	2	5	8	11	(D)
Information	51	1,726	17,870	4	1	1,495	8,174	130	103	111	1,453	108	8,139
Publishing	511	1,320	13,541	4	1	1,147	5,921	129	103	51	206	87	7,310
Newspaper, periodical, book, and database	5111	51	614	0	-	38	232	4	(z)	5	178	4	203
Software	5112	1,269	12,927	4	1	1,109	5,689	125	103	46	28	83	7,107
Broadcasting and telecommunications	513	112	(D)	0	-	88	248	1	(D)	20	(D)	8	677
Radio and television broadcasting	5131	4	(D)	0	-	0	-	0	-	4	(D)	0	-
Telecommunications	5133	93	(D)	0	-	75	230	0	-	15	(D)	7	667
Other broadcasting and telecommunications	513 minus (5131, 5133)	14	(D)	0	-	13	18	1	(D)	0	-	1	(D)
Other information	51 minus (511, 513)	294	(D)	0	-	260	2,005	0	-	41	(D)	13	152
Finance, insurance, and real estate	52, 53	463	1,903	15	4	173	1,284	3	(D)	11	84	265	(D)
Professional, scientific, and technical services	54	6,973	30,358	1,089	5,763	4,361	6,483	635	843	2,618	5,849	296	11,420

TABLE 8. Funds for industrial R&D performance in the United States, by industry and size of company and by technology area: 2002

Industry and size of company	NAICS codes	Number of companies	Amount (millions of dollars)	Biotechnology R&D: Number of companies	Biotechnology R&D: Amount (millions of dollars)	Software development R&D: Number of companies	Software development R&D: Amount (millions of dollars)	Materials synthesis and processing R&D: Number of companies	Materials synthesis and processing R&D: Amount (millions of dollars)	R&D in other technology areas: Number of companies	R&D in other technology areas: Amount (millions of dollars)	Undistributed R&D: Number of companies	Undistributed R&D: Amount (millions of dollars)
Distribution by industry:													
Architectural, engineering, and related services	5413	1,392	4,159	443	357	422	886	39	55	729	1,451	50	1,410
Computer systems design and related services	5415	3,304	11,983	11	(D)	3,155	4,706	378	(D)	473	2,011	111	4,859
Scientific R&D services	5417	1,364	13,034	534	5,157	272	546	216	465	578	1,990	124	4,875
Other professional, scientific, and technical services	54 minus (5413, 5415, 5417)	913	1,182	102	(D)	511	344	2	(D)	837	396	10	276
Management of companies and enterprises	55	35	148	1	(D)	1	(D)	3	(D)	28	52	2	(D)
Health care services	621–23	1,231	(D)	393	558	1	(D)	0	-	805	3,515	35	105
Other nonmanufacturing	56, 61, 624, 71, 72, 81	966	(D)	3	(D)	392	433	53	13	595	117	40	384
Distribution by company size (number of employees):													
Total	(na)	29,001	190,809	2,694	13,493	10,238	24,014	5,367	14,571	13,711	48,949	2,853	89,782
5 to 24	(na)	13,028	4,261	1,540	891	5,265	1,044	2,111	359	6,108	1,850	968	117
25 to 49	(na)	4,620	3,845	421	458	1,960	1,675	710	434	2,183	962	321	318
50 to 99	(na)	3,846	6,164	291	1,333	1,287	1,990	859	358	1,855	1,875	284	608
100 to 249	(na)	3,441	13,227	198	1,537	853	2,932	733	834	1,769	5,432	354	2,493
250 to 499	(na)	1,573	8,055	90	1,156	309	1,694	354	617	830	2,477	231	2,111
500 to 999	(na)	962	9,925	50	1,486	286	2,407	254	658	366	2,668	171	2,706
1,000 to 4,999	(na)	1,054	28,625	59	3,225	191	4,504	243	2,007	428	7,838	300	11,051
5,000 to 9,999	(na)	220	17,987	19	1,189	24	1,003	50	622	77	4,139	98	11,035
10,000 to 24,999	(na)	152	26,458	10	(D)	34	(D)	28	1,199	62	4,442	70	17,840
25,000 or more	(na)	105	72,261	14	(D)	29	(D)	25	7,483	34	17,268	56	41,505

(D) = data have been withheld to avoid disclosing operations of individual companies; (z) = indicates data less than half the unit shown; (--) = indicates data not collected; (-) = indicates a value of zero or a value rounded to zero; (na) = not applicable.

NOTE: For information on sampling for 2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

TABLE 9. Companies reporting nanotechnology activity, by industry and size of company and by technology area and percentage of R&D attributable to nanotechnology: 2002

Industry and size of company	NAICS codes	Biotechnology		Software development	
		Less than 50%	50% or more	Less than 50%	50% or more
Distribution by industry:					
All industries	21–23, 31–33, 42, 44–81	90	400	487	989
Manufacturing	31–33	52	162	375	199
Food	311	4	18	7	3
Beverage and tobacco products	312	0	0	1	0
Textiles, apparel, and leather	313–16	0	0	6	2
Wood products	321	0	0	3	0
Paper, printing and support activities	322, 323	2	0	5	5
Petroleum and coal products	324	1	0	1	0
Chemicals	325	15	88	15	2
Basic chemicals	3251	5	11	2	0
Resin, synthetic rubber, fibers, and filament	3252	2	1	0	0
Pharmaceuticals and medicines	3254	5	64	7	1
Other chemicals	325 minus (3251–52, 3254)	3	12	6	1
Plastics and rubber products	326	2	0	5	0
Nonmetallic mineral products	327	1	0	3	1
Primary metals	331	1	1	5	1
Fabricated metal products	332	2	2	19	3
Machinery	333	2	5	48	13
Computer and electronic products	334	9	22	165	132
Computers and peripheral equipment	3341	1	1	34	42
Communications equipment	3342	0	1	33	32
Semiconductor and other electronic components	3344	4	1	18	9
Navigational, measuring, electromedical, and control instruments	3345	4	19	73	36
Other computer and electronic products	334 minus (3341–42, 3344–45)	0	0	7	13
Electrical equipment, appliances, and components	335	2	1	36	9
Transportation equipment	336	2	0	21	4
Motor vehicles, trailers, and parts	3361-63	1	0	11	0
Aerospace products and parts	3364	1	0	4	2
Other transportation equipment	336 minus (3361–64)	0	0	6	2
Furniture and related products	337	1	0	5	1
Miscellaneous manufacturing	339	8	25	30	23
Medical equipment and supplies	3391	6	24	22	7
Other miscellaneous manufacturing	339 minus (3391)	2	1	8	16
Other manufacturing	31–33 minus (311–16, 321–27, 331–37, 339)	--	--	--	--
Nonmanufacturing	21–23, 42, 44–81	38	238	112	790
Mining, extraction, and support activities	21	2	1	1	0
Utilities	22	1	1	4	1
Construction	23	0	0	2	2
Trade	42, 44, 45	9	22	23	54
Transportation and warehousing	48, 49	0	0	0	7
Information	51	1	0	4	295
Publishing	511	1	0	1	240
Newspaper, periodical, book, and database	5111	0	0	0	10
Software	5112	1	0	1	230

TABLE 9. Companies reporting nanotechnology activity, by industry and size of company and by technology area and percentage of R&D attributable to nanotechnology: 2002

Industry and size of company	NAICS codes	Biotechnology		Software development	
		Less than 50%	50% or more	Less than 50%	50% or more
Distribution by industry:					
Broadcasting and telecommunications	513	0	0	2	12
Radio and television broadcasting	5131	0	0	0	0
Telecommunications	5133	0	0	1	9
Other broadcasting and telecommunications	513 minus (5131, 5133)	0	0	1	3
Other information	51 minus (511, 513)	0	0	1	43
Finance, insurance, and real estate	52, 53	0	2	1	28
Professional, scientific, and technical services	54	24	183	71	382
Architectural, engineering, and related services	5413	8	12	20	38
Computer systems design and related services	5415	2	2	14	282
Scientific R&D services	5417	13	165	33	40
Other professional, scientific, and technical services	54 minus (5413, 5415, 5417)	1	4	4	22
Management of companies and enterprises	55	0	1	0	1
Health care services	621–23	1	25	0	1
Other nonmanufacturing	56, 61, 624, 71, 72, 81	0	3	6	19
Distribution by size of company (number of employees):					
Total	(na)	90	400	487	989
5 to 24	(na)	5	50	42	137
25 to 49	(na)	7	44	45	147
50 to 99	(na)	8	69	61	186
100 to 249	(na)	8	101	99	197
250 to 499	(na)	11	49	57	124
500 to 999	(na)	14	32	72	79
1,000 to 4,999	(na)	15	43	66	78
5,000 to 9,999	(na)	5	5	9	15
10,000 to 24,999	(na)	5	5	19	15
25,000 or more	(na)	12	2	17	11

TABLE 9. Companies reporting nanotechnology activity, by industry and size of company and by technology area and percentage of R&D attributable to nanotechnology: 2002

Industry and size of company	NAICS codes	Materials synthesis and processing		Other technology areas	
		Less than 50%	50% or more	Less than 50%	50% or more
All industries	21–23, 31-33, 42, 44–81	255	1,029	269	2,195
Manufacturing	31–33	202	924	177	1,742
Food	311	9	32	7	91
Beverage and tobacco products	312	2	0	0	13
Textiles, apparel, and leather	313-16	1	41	6	39
Wood products	321	2	19	1	19
Paper, printing and support activities	322, 323	6	22	2	44
Petroleum and coal products	324	1	10	0	8
Chemicals	325	25	181	22	151
Basic chemicals	3251	5	38	6	29
Resin, synthetic rubber, fibers, and filament	3252	3	23	3	14
Pharmaceuticals and medicines	3254	7	14	5	17
Other chemicals	325 minus (3251–52, 3254)	10	106	8	91
Plastics and rubber products	326	12	102	5	113
Nonmetallic mineral products	327	6	29	2	35
Primary metals	331	6	42	5	32
Fabricated metal products	332	10	63	13	116
Machinery	333	19	75	13	210
Computer and electronic products	334	47	116	62	394
Computers and peripheral equipment	3341	8	12	17	48
Communications equipment	3342	11	11	12	81
Semiconductor and other electronic components	3344	13	44	11	97
Navigational, measuring, electromedical, and control instruments	3345	14	44	21	137
Other computer and electronic products	334 minus (3341–42, 3344–45)	1	5	1	31
Electrical equipment, appliances, and components	335	12	42	7	139
Transportation equipment	336	20	63	11	134
Motor vehicles, trailers, and parts	3361–63	9	37	5	67
Aerospace products and parts	3364	6	13	4	24
Other transportation equipment	336 minus (3361–64)	5	13	2	43
Furniture and related products	337	0	18	3	48
Miscellaneous manufacturing	339	24	69	18	156
Medical equipment and supplies	3391	15	37	12	75
Other miscellaneous manufacturing	339 minus (3391)	9	32	6	81
Other manufacturing	31–33 minus (311–16, 321–27, 331–37, 339)	--	--	--	--
Nonmanufacturing	21–23, 42, 44–81	53	105	92	453
Mining, extraction, and support activities	21	2	2	2	11
Utilities	22	3	0	2	24
Construction	23	0	12	0	14
Trade	42, 44, 45	10	29	20	95
Transportation and warehousing	48, 49	1	2	3	2
Information	51	4	6	11	22
Publishing	511	4	5	5	9
Newspaper, periodical, book, and database	5111	0	1	0	5
Software	5112	4	4	5	4

TABLE 9. Companies reporting nanotechnology activity, by industry and size of company and by technology area and percentage of R&D attributable to nanotechnology: 2002

Industry and size of company	NAICS codes	Materials synthesis and processing		Other technology areas	
		Less than 50%	50% or more	Less than 50%	50% or more
Broadcasting and telecommunications	513	0	1	1	4
Radio and television broadcasting	5131	0	0	0	2
Telecommunications	5133	0	0	1	2
Other broadcasting and telecommunications	513 minus (5131, 5133)	0	1	0	0
Other information	51 minus (511, 513)	0	0	5	9
Finance, insurance, and real estate	52, 53	0	3	3	7
Professional, scientific, and technical services	54	33	43	49	229
Architectural, engineering, and related services	5413	9	3	18	59
Computer systems design and related services	5415	6	7	6	28
Scientific R&D services	5417	18	31	23	130
Other professional, scientific, and technical services	54 minus (5413, 5415, 5417)	0	2	2	12
Management of companies and enterprises	55	0	3	0	4
Health care services	621–23	0	0	0	16
Other nonmanufacturing	56, 61, 624, 71, 72, 81	0	5	2	29
Distribution by size of company (number of employees):					
Total	(na)	255	1,029	269	2,195
5 to 24	(na)	18	91	35	192
25 to 49	(na)	24	62	18	191
50 to 99	(na)	16	123	48	248
100 to 249	(na)	46	232	41	473
250 to 499	(na)	38	163	22	323
500 to 999	(na)	24	143	28	280
1,000 to 4,999	(na)	47	163	44	351
5,000 to 9,999	(na)	14	27	9	65
10,000 to 24,999	(na)	15	13	12	50
25,000 or more	(na)	13	12	12	22

(--) = indicates data not collected.

(na) = not applicable.

NOTE: For information on sampling for 2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

TABLE 10. Funds for industrial energy R&D performance in the United States and companies that performed energy R&D in the United States, by selected industry and size of company: 2002 and projected 2003

(Millions of dollars)

Industry and size of company	NAICS codes	Number of companies	2002 [a]			Projected 2003		
			Total	Federal	Company and other [b]	Total	Federal	Company and other [b]
Distribution by industry:								
All industries	21-23, 31-33, 42, 44-81	86	1,725	123	1,603	1,031	90	941
Manufacturing	31-33	52	1,470	70	1,400	907	47	859
Petroleum and coal products	324	3	(D)	(D)	361	(D)	(D)	317
Chemicals	325	9	19	4	16	(D)	(D)	18
Machinery	333	3	(D)	(D)	15	(D)	(D)	17
Computer and electronic products	334	12	(D)	(D)	371	(D)	(D)	280
Electrical equipment, appliances, and components	335	4	(D)	(D)	5	(D)	(D)	(z)
Transportation equipment	336	7	(D)	(D)	575	(D)	(D)	162
All other manufacturing		14	(D)	(D)	58	(D)	(D)	65
Nonmanufacturing	21-23, 42, 44-81	34	255	53	202	124	43	81
Mining, extraction, and support activities	21	4	(D)	(D)	10	(D)	(D)	(z)
All other nonmanufacturing	--	30	(D)	(D)	192	(D)	(D)	81
Distribution by size of company (number of employees):								
Total	(na)	86	1,725	123	1,603	1,031	90	941
5 to 24	(na)	3	(D)	(D)	8	-	-	-
25 to 49	(na)	2	(D)	(D)	6	(D)	(D)	6
50 to 99	(na)	3	11	11	(z)	(D)	(D)	(z)
100 to 249	(na)	9	35	17	18	24	17	7
250 to 499	(na)	5	(D)	(D)	31	(D)	(D)	(z)
500 to 999	(na)	12	(D)	(D)	92	(D)	(D)	65
1,000 to 4,999	(na)	17	(D)	(D)	219	(D)	(D)	90
5,000 to 9,999	(na)	8	(D)	(D)	55	(D)	(D)	56
10,000 to 24,999	(na)	14	400	2	398	433	2	431
25,000 or more	(na)	13	818	43	776	315	29	286

(D) = data have been withheld to avoid disclosing operations of individual companies; (z) = indicates data less than half the unit shown; (--) = all NAICS codes other than those specified; (-) = indicates a value of zero or a value rounded to zero; (na) = not applicable.

[a] Beginning with 2001, statistics for total and federally funded industrial R&D exclude data for federally funded research and development centers.

[b] The company R&D in this table is the industrial R&D performed within company facilities funded from all sources except the federal government. The funds predominantly are the company's own, but also include funds from outside organizations such as other companies, research institutions, universities and colleges, nonprofit organizations, and state governments. Excluded from this table are company-funded R&D not not performed within the company (e.g., R&D contracted out to other organizations) and company-funded R&D not performed within the 50 U.S. states or DC (e.g., R&D not performed on U.S. soil by foreign subsidiaries or other foreign organizations).

NOTES: Energy R&D data are collected only on Form RD-1, the questionnaire sent to larger R&D-performing companies. Consequently, the universe of companies that performs energy R&D may not be represented by the statistics in this table. For information on sampling for 2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

TABLE 11. Funds for industrial energy R&D performance in the United States and companies that performed energy R&D in the United States, by primary energy source: 2002 and projected 2003

(Millions of dollars)

Primary energy source	Number of companies [b]	2002 [a]			Projected 2003		
		All R&D	Federal	Company and other [c]	All R&D	Federal R&D	Company and other [c]
All sources	86	1,725	123	1,603	1,031	90	941
Fossil fuels	27	769	35	735	338	(D)	(D)
Nuclear	6	(D)	(D)	21	1	(D)	(D)
Geothermal, solar, and conservation and utilization	31	333	42	291	282	34	249
All other energy	50	(D)	(D)	377	198	35	163

(D) = data have been withheld to avoid disclosing operations of individual companies.

[a] Beginning with 2001, statistics for total and federally funded industrial R&D exclude data for federally funded research and development centers.

[b] Detail does not add to total because categories are not mutually exclusive.

[c] The company R&D in this table is the industrial R&D performed within company facilities funded from all sources except the federal government. The funds predominantly are the company's own, but also include funds from outside organizations such as other companies, research institutions, universities and colleges, nonprofit organizations, and state governments. Excluded from this table are company-funded R&D not performed within the company (e.g., R&D contracted out to other organizations) and company-funded R&D not performed within the 50 U.S. states or DC (e.g., R&D not performed on U.S. soil by foreign subsidiaries or other foreign organizations).

NOTES: Energy R&D data are collected only on Form RD-1, the survey form sent to larger R&D-performing companies. Consequently, the universe of companies that performs energy R&D may not be represented by the statistics in this table. For information on sampling for 2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

TABLE 12. Company and other nonfederal funds for industrial R&D performance in the United States, by industry and size of company: 1999–2002
(Millions of dollars)

Industry and size of company	NAICS codes	1999 [a]	2000	2001	2002	Percent change 2002/2001
Distribution by industry:						
All industries	21–23, 31–33, 42, 44–81	160,176	180,421	181,606	174,408	-4
Manufacturing	31–33	99,865	110,750	109,221	98,240	-10
Food	311	1,132	1,145	1,818	2,034	12
Beverage and tobacco products	312	(D)	417	152	170	12
Textiles, apparel, and leather	313–16	334	266	255	248	-3
Wood products	321	70	105	181	132	-27
Paper, printing and support activities	322, 323	2,474	2,700	2,664	2,620	-2
Petroleum and coal products	324	(D)	1,172	1,057	1,233	17
Chemicals	325	20,051	20,768	17,713	20,395	15
Basic chemicals	3251	2,648	2,050	1,835	1,710	-7
Resin, synthetic rubber, fibers, and filament	3252	2,216	2,842	2,745	2,413	-12
Pharmaceuticals and medicines	3254	12,236	12,793	10,137	14,186	40
Other chemicals	325 minus (3251–52, 3254)	2,951	3,084	2,996	2,087	-30
Plastics and rubber products	326	1,785	1,675	2,245	1,508	-33
Nonmetallic mineral products	327	595	845	978	420	-57
Primary metals	331	457	598	479	461	-4
Fabricated metal products	332	1,608	1,631	1,545	1,251	-19
Machinery	333	5,658	6,539	6,337	6,366	0
Computer and electronic products	334	29,939	39,553	41,232	30,307	-26
Computers and peripheral equipment	3341	4,126	5,162	3,165	3,015	-5
Communications equipment	3342	5,797	11,183	15,209	6,420	-58
Semiconductor and other electronic components	3344	10,624	12,787	14,210	11,871	-16
Navigational, measuring, electromedical, and control instruments	3345	8,632	10,114	7,565	8,549	13
Other computer and electronic products	334 minus (3341–42, 3344–45)	760	307	1,083	452	-58
Electrical equipment, appliances, and components	335	3,820	3,390	4,680	1,978	-58
Transportation equipment	336	23,928	22,917	21,004	21,452	2
Motor vehicles, trailers, and parts	3361–63	17,987	18,306	16,089	15,199	-6
Aerospace products and parts	3364	5,309	3,895	4,083	5,349	31
Other transportation equipment	336 minus (3361–64)	632	716	832	905	9
Furniture and related products	337	248	284	301	251	-17
Miscellaneous manufacturing	339	3,825	4,195	6,581	7,414	13
Medical equipment and supplies	3391	3,251	3,741	5,903	6,179	5
Other miscellaneous manufacturing	339 minus (3391)	574	453	678	1,235	82
Other manufacturing	31–33 minus (311–16, 321–27, 331–37, 339)	--	--	--	--	(na)
Nonmanufacturing	21–23, 42, 44–81	60,311	69,671	72,384	76,168	5
Mining, extraction, and support activities	21	2,352	822	846	715	-15
Utilities	22	126	136	114	117	3
Construction	23	690	222	320	164	-49
Trade	42, 44, 45	19,521	24,929	24,284	25,014	3
Transportation and warehousing	48, 49	460	277	1,776	339	-81
Information	51	14,892	16,290	17,259	17,764	3
Publishing	511	11,253	12,926	13,716	13,488	-2
Newspaper, periodical, book, and database	5111	371	365	649	614	-5
Software	5112	10,882	12,561	13,067	12,874	-1

TABLE 12. Company and other nonfederal funds for industrial R&D performance in the United States, by industry and size of company: 1999–2002
(Millions of dollars)

Industry and size of company	NAICS codes	1999 [a]	2000	2001	2002	Percent change 2002/2001
Distribution by industry:						
Broadcasting and telecommunications	513	1,393	1,025	1,270	1,637	29
Radio and television broadcasting	5131	(D)	(D)	(D)	(D)	(na)
Telecommunications	5133	(D)	(D)	1,101	1,608	46
Other broadcasting and telecommunications	513 minus (5131, 5133)	18	59	(D)	(D)	(na)
Other information	51 minus (511, 513)	2,246	2,339	2,273	2,639	16
Finance, insurance, and real estate	52, 53	1,570	4,024	2,424	1,903	-21
Professional, scientific, and technical services	54	14,379	17,949	22,640	24,946	10
Architectural, engineering, and related services	5413	2,402	2,232	2,365	2,822	19
Computer systems design and related services	5415	3,989	4,943	8,656	10,394	20
Scientific R&D services	5417	7,413	9,715	10,893	10,735	-1
Other professional, scientific, and technical services	54 minus (5413, 5415, 5417)	575	1,059	726	996	37
Management of companies and enterprises	55	72	49	381	148	-61
Health care services	621–23	631	477	1,120	4,163	272
Other nonmanufacturing	56, 61, 624, 71, 72, 81	640	713	1,221	894	-27
Distribution by size of company (number of employees):						
Total	(na)	160,176	180,421	181,606	174,408	-4
5 to 24	(na)	6,393	5,940	4,175	3,471	-17
25 to 49	(na)	4,382	4,786	3,548	3,586	1
50 to 99	(na)	6,623	6,745	7,654	5,701	-26
100 to 249	(na)	6,540	8,351	12,012	12,622	5
250 to 499	(na)	7,407	6,819	8,143	7,370	-9
500 to 999	(na)	6,441	8,580	9,936	9,394	-5
1,000 to 4,999	(na)	23,944	29,860	26,140	27,640	6
5,000 to 9,999	(na)	14,182	15,143	15,836	16,414	4
10,000 to 24,999	(na)	24,525	27,976	26,161	25,232	-4
25,000 or more	(na)	59,740	66,221	68,001	62,979	-7

(D) = data have been withheld to avoid disclosing operations of individual companies; (--) = indicates data not collected; (na) = not applicable.

[a] Some statistics for 1999 have been revised since originally published.

NOTES: The R&D in this table is the industrial R&D performed within company facilities funded from all sources except the federal government. The funds predominantly are the company's own, but also include funds from outside organizations such as other companies, research institutions, universities and colleges, nonprofit organizations, and state governments. Excluded from this table are company-funded R&D not performed within the company (e.g., R&D contracted out to other organizations) and company-funded R&D not performed within the 50 U.S. states or DC (e.g., R&D not performed on U.S. soil by foreign subsidiaries or other foreign organizations). For information on sampling for 1999–2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

TABLE 13. Company and other nonfederal funds for industrial R&D performance in the United States, by industry and by size of company: 2002

(Millions of dollars)

Industry	NAICS codes	Total	Size of company (number of employees)									
			5 to 24	25 to 49	50 to 99	100 to 249	250 to 499	500 to 999	1,000 to 4,999	5,000 to 9,999	10,000 to 24,999	25,000 or more
All industries	21–23, 31–33, 42, 44–81	174,408	3,471	3,586	5,701	12,622	7,370	9,394	27,640	16,414	25,232	62,979
Manufacturing	31–33	98,240	682	894	1,541	2,748	2,728	4,614	14,856	12,466	13,981	43,730
Food	311	2,034	13	-	112	32	38	73	194	98	(D)	(D)
Beverage and tobacco products	312	170	9	(z)	(D)	(D)	1	-	56	(D)	(D)	-
Textiles, apparel, and leather	313–16	248	4	(D)	1	(D)	14	51	79	(D)	(D)	(D)
Wood products	321	132	-	4	(z)	5	6	2	27	(D)	(D)	-
Paper, printing and support activities	322, 323	2,620	5	5	2	20	19	86	116	96	319	1,951
Petroleum and coal products	324	1,233	6	(z)	(D)	4	5	(D)	(D)	-	(D)	950
Chemicals	325	20,395	110	82	148	455	297	643	2,908	3,745	4,204	7,805
Basic chemicals	3251	1,710	9	16	17	(D)	43	246	798	(D)	(D)	-
Resin, synthetic rubber, fibers, and filament	3252	2,413	2	2	2	13	59	50	(D)	(D)	(D)	(D)
Pharmaceuticals and medicines	3254	14,186	62	24	(D)	294	136	234	(D)	(D)	(D)	(D)
Other chemicals	325 minus (3251–52, 3254)	2,087	36	40	(D)	(D)	59	113	(D)	324	(D)	(D)
Plastics and rubber products	326	1,508	17	7	31	91	78	(D)	(D)	(D)	(D)	(D)
Nonmetallic mineral products	327	420	10	9	1	28	42	7	124	(D)	(D)	(D)
Primary metals	331	461	2	7	3	(D)	3	(D)	78	44	(D)	(D)
Fabricated metal products	332	1,251	9	12	57	77	99	124	230	135	(D)	(D)
Machinery	333	6,366	88	156	197	400	285	559	1,391	1,336	633	1,320
Computer and electronic products	334	30,307	263	391	547	1,141	1,350	1,811	6,994	4,396	4,332	9,081
Computers and peripheral equipment	3341	3,015	49	71	85	130	178	340	600	(D)	(D)	-
Communications equipment	3342	6,420	(D)	40	102	417	414	(D)	1,050	(D)	(D)	(D)
Semiconductor and other electronic components	3344	11,871	75	188	192	290	462	(D)	3,465	1,598	(D)	(D)
Navigational, measuring, electromedical, and control instruments	3345	8,549	93	83	149	272	270	540	1,671	920	1,940	2,611
Other computer and electronic products	334 minus (3341–42, 3344–45)	452	(D)	9	20	32	26	(D)	208	(D)	-	-
Electrical equipment, appliances, and components	335	1,978	27	101	96	95	121	226	441	287	585	-
Transportation equipment	336	21,452	31	18	92	104	141	199	809	604	1,265	18,189
Motor vehicles, trailers, and parts	3361–63	15,199	28	4	89	(D)	58	172	(D)	(D)	(D)	13,416
Aerospace products and parts	3364	5,349	-	4	1	36	67	(D)	158	111	(D)	4,773
Other transportation equipment	336 minus (3361–64)	905	2	9	3	(D)	16	(D)	(D)	(D)	589 (S)	-

TABLE 13. Company and other nonfederal funds for industrial R&D performance in the United States, by industry and by size of company: 2002

(Millions of dollars)

Industry	NAICS codes	Total	Size of company (number of employees) 5 to 24	25 to 49	50 to 99	100 to 249	250 to 499	500 to 999	1,000 to 4,999	5,000 to 9,999	10,000 to 24,999	25,000 or more
Furniture and related products	337	251	15	(D)	5	(D)	15	5	44	76	(D)	(D)
Miscellaneous manufacturing	339	7,414	75	97	245	240	213	548	(D)	1,291	(D)	(D)
Medical equipment and supplies	3391	6,179	44	(D)	209	155	138	98	764	1,175	(D)	(D)
Other miscellaneous manufacturing	339 minus (3391)	1,235	31	(D)	36	85	75	450	(D)	116	(D)	-
Other manufacturing	31–33 minus (311–16, 321–27, 331–37, 339)	--	--	--	--	--	--	--	--	--	--	--
Nonmanufacturing	21–23, 42, 44–81	76,168	2,789	2,692	4,160	9,873	4,642	4,780	12,783	3,947	11,251	19,249
Mining, extraction, and support activities	21	715	-	-	-	-	19	(D)	129	(D)	(D)	(D)
Utilities	22	117	25	-	-	-	(D)	(D)	(D)	29	(D)	(D)
Construction	23	164	(D)	-	(D)	(D)	(D)	(D)	17	(D)	(D)	-
Trade	42, 44, 45	25,014	266	(D)	428	1,094	(D)	(D)	4,907	(D)	(D)	7,981
Transportation and warehousing	48, 49	339	-	-	-	-	(D)	(D)	8	(D)	11	257
Information	51	17,764	306	285	539	754	1,576	1,189	3,997	797	1,680	6,641
Publishing	511	13,488	278	219	(D)	551	659	889	(D)	(D)	1,416	(D)
Newspaper, periodical, book, and database	5111	614	-	2	(z)	25	(D)	-	(D)	(D)	(D)	(D)
Software	5112	12,874	278	217	(D)	526	(D)	889	(D)	(D)	(D)	(D)
Broadcasting and telecommunications	513	1,637	(D)	-	(D)	59	(D)	48	(D)	(D)	-	(D)
Radio and television broadcasting	5131	(D)	-	-	-	(D)	-	-	(D)	-	-	-
Telecommunications	5133	1,608	-	-	-	(D)	(D)	(D)	(D)	(D)	-	(D)
Other broadcasting and telecommunications	513 minus (5131, 5133)	(D)	(D)	-	(D)	(D)	(D)	(D)	-	-	-	-
Other information	51 minus (511, 513)	2,639	(D)	66	(D)	144	(D)	252	(D)	(D)	264	(D)
Finance, insurance, and real estate	52, 53	1,903	(D)	(D)	(D)	193	76	21	(D)	(D)	463	(D)
Professional, scientific, and technical services	54	24,946	1,493	1,766	3,099	4,803	2,409	2,528	2,850	(D)	(D)	3,567
Architectural, engineering, and related services	5413	2,822	178	71	880	402	191	152	819	36 (S)	56 (S)	38
Computer systems design and related services	5415	10,394	446	(D)	774	1,213	700	808	1,162	(D)	(D)	(D)
Scientific R&D services	5417	10,735	(D)	(D)	1,433	3,107	1,449	1,423	687	(D)	-	(D)
Other professional, scientific, and technical services	54 minus (5413, 5415, 5417)	996	(D)	(D)	12	81	68 (S)	146	182	61	(D)	(D)

TABLE 13. Company and other nonfederal funds for industrial R&D performance in the United States, by industry and by size of company: 2002

(Millions of dollars)

Industry	NAICS codes	Total	Size of company (number of employees)									
			5 to 24	25 to 49	50 to 99	100 to 249	250 to 499	500 to 999	1,000 to 4,999	5,000 to 9,999	10,000 to 24,999	25,000 or more
Management of companies and enterprises	55	148	(D)	(D)	(D)	(D)	44	(D)	(D)	-	-	-
Health care services	621–23	4,163	679	(D)	27	2,977	(D)	85	25 (S)	(D)	(D)	(D)
Other nonmanufacturing	56, 61, 624, 71, 72, 81	894	(D)	(D)	51	(D)	53	100	347	75	26 (S)	(D)

(D) = data have been withheld to avoid disclosing operations of individual companies; (S) = indicates imputation of more than 50 percent; (z) = indicates data less than half the unit shown; (--) = indicates data not collected; (-) = indicates a value of zero or a value rounded to zero.

NOTES: The R&D in this table is the industrial R&D performed within company facilities funded from all sources except the federal government. The funds predominantly are the company's own, but also include funds from outside organizations such as other companies, research institutions, universities and colleges, nonprofit organizations, and state governments. Excluded from this table are company-funded R&D not performed within the company (e.g., R&D contracted out to other organizations) and company-funded R&D not performed within the 50 U.S. states or DC (e.g., R&D not performed on U.S. soil by foreign subsidiaries or other foreign organizations). For information on sampling for 1999–2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

TABLE 14. Company and other nonfederal funds for industrial R&D performance in the United States and number of companies that performed company and other nonfederally funded R&D in the United States, by industry and size of company and by size of nonfederally funded R&D program: 2002

Industry and size of company	NAICS codes	Number of companies	Amount (millions of dollars)	Size of nonfederally funded R&D program									
				Less than $200,000		$200,000 to $999,999		$1 million to $9.9 million		$10 million to $99.9 million		$100 million or more	
				Number of companies	Amount (millions of dollars)	Number of companies	Amount (millions of dollars)	Number of companies	Amount (millions of dollars)	Number of companies	Amount (millions of dollars)	Number of companies	Amount (millions of dollars)
Distribution by industry:													
All industries	21–23, 31–33, 42, 44–81	28,200	174,408	14,040	936	7,256	3,469	5,079	15,600	1,595	40,928	229	113,474
Manufacturing	31–33	13,823	98,240	7,458	500	3,481	1,574	2,122	6,327	631	18,737	131	71,102
Food	311	529	2,034	245	15	161	72	102	304	17	673	4	971
Beverage and tobacco products	312	57	170	14	(D)	36	13	2	(D)	6	152	0	-
Textiles, apparel, and leather	313–16	363	248	250	10	67	34	40	126	5	78	0	-
Wood products	321	90	132	43	3	35	15	8	26	3	88	0	-
Paper, printing and support activities	322, 323	391	2,620	259	15	81	29	34	115	14	426	3	2,036
Petroleum and coal products	324	79	1,233	50	5	17	7	4	10	3	120	4	1,092
Chemicals	325	1,241	20,395	527	50	352	148	225	690	115	3,816	24	15,692
Basic chemicals	3251	181	1,710	56	(D)	43	20	47	174	32	1,141	3	(D)
Resin, synthetic rubber, fibers, and filament	3252	82	2,413	30	1	15	5	22	72	11	373	4	1,961
Pharmaceuticals and medicines	3254	313	14,186	98	9	71	30	83	209	46	1,487	15	12,451
Other chemicals	325 minus (3251–52, 3254)	666	2,087	343	(D)	222	93	73	235	25	815	2	(D)
Plastics and rubber products	326	951	1,508	562	(D)	261	108	103	347	23	598	2	(D)
Nonmetallic mineral products	327	211	420	124	5	49	21	27	73	11	321	0	-
Primary metals	331	200	461	130	(D)	33	14	27	90	9	142	1	(D)
Fabricated metal products	332	1,281	1,251	889	(D)	267	134	103	283	21	549	1	(D)
Machinery	333	2,703	6,366	1,665	114	641	299	312	898	72	1,704	12	3,351
Computer and electronic products	334	2,786	30,307	1,103	91	830	372	605	1,769	202	6,023	46	22,051
Computers and peripheral equipment	3341	328	3,015	84	7	149	(D)	63	255	26	609	6	(D)
Communications equipment	3342	501	6,420	218	15	136	63	90	364	50	1,516	7	4,462
Semiconductor and other electronic components	3344	806	11,871	301	33	198	95	230	543	60	2,077	17	9,123
Navigational, measuring, electro-medical, and control instruments	3345	1,031	8,549	449	32	305	139	203	550	59	1,568	15	6,261
Other computer and electronic products	334 minus (3341–42, 3344–45)	121	452	50	4	43	(D)	19	57	7	253	1	(D)
Electrical equipment, appliances, and components	335	840	1,978	502	34	171	80	133	453	30	740	5	670
Transportation equipment	336	775	21,452	377	36	188	87	147	437	44	1,504	20	19,388
Motor vehicles, trailers, and parts	3361–63	488	15,199	212	26	125	56	117	335	26	999	9	13,781

TABLE 14. Company and other nonfederal funds for industrial R&D performance in the United States and number of companies that performed company and other nonfederally funded R&D in the United States, by industry and size of company and by size of nonfederally funded R&D program: 2002

Industry and size of company	NAICS codes	Number of companies	Amount (millions of dollars)	Size of nonfederally funded R&D program: Less than $200,000 Number of companies	Less than $200,000 Amount (millions of dollars)	$200,000 to $999,999 Number of companies	$200,000 to $999,999 Amount (millions of dollars)	$1 million to $9.9 million Number of companies	$1 million to $9.9 million Amount (millions of dollars)	$10 million to $99.9 million Number of companies	$10 million to $99.9 million Amount (millions of dollars)	$100 million or more Number of companies	$100 million or more Amount (millions of dollars)
Distribution by industry:													
Aerospace products and parts	3364	83	5,349	31	3	17	7	15	54	12	352	7	4,933
Other transportation equipment	336 minus (3361–64)	204	905	134	7	46	24	14	48	6	153	4	673
Furniture and related products	337	189	251	102	8	46	21	35	78	6	145	0	-
Miscellaneous manufacturing	339	1,136	7,414	616	28	246	117	214	625	50	1,660	9	4,984
Medical equipment and supplies	3391	557	6,179	216	10	145	63	155	443	32	(D)	8	(D)
Other miscellaneous manufacturing	339 minus (3391)	579	1,235	400	19	101	55	59	181	18	(D)	1	(D)
Other manufacturing	31–33 minus (311–16, 321–27, 331–37, 339)	--	--	--	--	--	--	--	--	--	--	--	--
Nonmanufacturing	21–23, 42, 44–81	14,377	76,168	6,582	435	3,776	1,895	2,957	9,274	964	22,191	98	42,372
Mining, extraction, and support activities	21	22	715	0	-	4	2	14	(D)	3	118	2	(D)
Utilities	22	284	117	253	26	13	7	16	(D)	2	(D)	0	-
Construction	23	295	164	269	16	14	8	8	25	4	115	0	-
Trade	42, 44, 45	2,837	25,014	1,272	62	1,133	613	280	889	118	3,418	35	20,032
Transportation and warehousing	48, 49	120	339	10	1	99	56	9	(D)	1	(D)	1	(D)
Information	51	1,723	17,764	429	46	653	351	472	(D)	142	4,271	27	(D)
Publishing	511	1,317	13,488	361	39	478	236	368	1,092	88	2,377	23	9,744
Newspaper, periodical, book, and database	5111	51	614	32	2	4	1	8	47	4	103	3	460
Software	5112	1,266	12,874	329	37	474	234	360	1,045	84	2,274	20	9,284
Broadcasting and telecommunications	513	112	1,637	5	(D)	73	61	8	(D)	24	1,042	2	(D)
Radio and television broadcasting	5131	4	(D)	4	(D)	0	-	0	-	0	-	0	-
Telecommunications	5133	93	1,608	0	-	62	(D)	7	(D)	23	(D)	2	(D)
Other broadcasting and telecommunications	513 minus (5131, 5133)	14	(D)	1	(D)	11	(D)	1	(D)	1	(D)	0	-
Other information	51 minus (511, 513)	294	2,639	63	(D)	103	54	97	(D)	30	852	2	(D)
Finance, insurance, and real estate	52, 53	463	1,903	273	4	22	8	129	(D)	35	952	3	(D)
Professional, scientific, and technical services	54	6,412	24,946	2,848	208	1,484	683	1,665	5,250	387	9,660	28	9,144
Architectural, engineering, and related services	5413	1,123	2,822	565	41	255	91	259	(D)	41	925	3	(D)

TABLE 14. Company and other nonfederal funds for industrial R&D performance in the United States and number of companies that performed company and other nonfederally funded R&D in the United States, by industry and size of company and by size of nonfederally funded R&D program: 2002

				Size of nonfederally funded R&D program									
				Less than $200,000		$200,000 to $999,999		$1 million to $9.9 million		$10 million to $99.9 million		$100 million or more	
Industry and size of company	NAICS codes	Number of companies	Amount (millions of dollars)	Number of companies	Amount (millions of dollars)	Number of companies	Amount (millions of dollars)	Number of companies	Amount (millions of dollars)	Number of companies	Amount (millions of dollars)	Number of companies	Amount (millions of dollars)
Distribution by industry:													
Computer systems design and related services	5415	3,046	10,394	1,372	112	863	435	671	1,979	129	2,849	10	5,018
Scientific R&D services	5417	1,333	10,735	302	39	350	150	460	1,718	208	5,577	13	3,251
Other professional, scientific, and technical services	54 minus (5413, 5415, 5417	911	996	609	16	17	7	274	(D)	9	309	2	(D)
Management of companies and enterprises	55	35	148	8	(z)	1	(D)	23	(D)	3	89	0	-
Health care services	621–23	1,230	4,163	385	17	324	(D)	265	(D)	255	3,106	1	(D)
Other nonmanufacturing	56, 61, 624, 71, 72, 81	955	894	835	56	28	16	77	(D)	15	(D)	1	(D)
Distribution by size of company (number of employees):													
Total	(na)	28,200	174,408	14,040	936	7,256	3,469	5,079	15,600	1,595	40,928	229	113,474
5 to 24	(na)	12,312	3,471	8,846	(D)	2,452	1,091	1,012	1,803	2	(D)	0	(D)
25 to 49	(na)	4,605	3,586	1,833	132	1,871	930	873	2,135	27	389	0	-
50 to 99	(na)	3,820	5,701	1,852	136	951	470	922	3,527	96	1,569	0	-
100 to 249	(na)	3,426	12,622	890	72	1,154	558	843	2,772	538	9,220	0	-
250 to 499	(na)	1,559	7,370	464	50	370	185	539	1,672	184	5,016	3	446
500 to 999	(na)	951	9,394	87	9	289	150	358	(D)	207	6,302	10	(D)
1,000 to 4,999	(na)	1,050	27,640	46	5	148	74	439	1,898	344	10,991	73	14,671
5,000 to 9,999	(na)	220	16,414	21	2	17	8	55	260	92	3,256	36	12,888
10,000 to 24,999	(na)	152	25,232	1	(D)	5	(D)	26	(D)	71	2,682	49	22,424
25,000 or more	(na)	105	62,979	0	(D)	1	(D)	12	(D)	34	(D)	58	61,456

(D) = data have been withheld to avoid disclosing operations of individual companies; (S) = indicates imputation of more than 50 percent; (z) = indicates less than half the unit shown; (--) = indicates data not collected; (-) = indicates a value of zero or a value rounded to zero; (na) = not applicable.

NOTES: The R&D in this table is the industrial R&D performed within company facilities funded from all sources except the federal government. The funds predominantly are the company's own, but also include funds from outside organizations such as other companies, research institutions, universities and colleges, nonprofit organizations, and state governments. Excluded from this table are company-funded R&D not performed within the company (e.g., R&D contracted out to other organizations) and company-funded R&D not performed within the 50 U.S. states or DC (e.g., R&D not performed on U.S. soil by foreign subsidiaries or other foreign organizations). For information on sampling for 2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

TABLE 15. Company and other nonfederal funds for industrial R&D performance in the United States performed by outside organizations and number of R&D-performing companies that funded outside performance of company-funded R&D, by industry and size of company: 2001–2002

Industry and size of company	NAICS codes	2001		2002		Percent change 2002/2001
		Number of companies	Amount (millions of dollars)	Number of companies	Amount (millions of dollars)	
Distribution by industry:						
All industries	21–23, 31–33, 42, 44–81	2,939	8,723	3,097	7,846	-10
Manufacturing	31–33	1,363	3,957	1,676	4,428	12
Food	311	53	59	61	105	78
Beverage and tobacco products	312	2	(D)	2	(D)	(na)
Textiles, apparel, and leather	313–16	6	2	42	9	350
Wood products	321	2	(D)	16	12	(na)
Paper, printing and support activities	322, 323	2	(D)	26	248	(na)
Petroleum and coal products	324	3	107	3	(D)	(na)
Chemicals	325	325	2,065	188	2,485	20
Basic Chemicals	3251	124	(D)	26	30	(na)
Resin, synthetic rubber, fibers, and filament	3252	4	(D)	14	38	(na)
Pharmaceuticals and medicines	3254	162	1,899	79	2,368	25
Other chemicals	325 minus (3251–52, 3254)	35	99	70	49	-51
Plastics and rubber products	326	23	22	142	28	27
Nonmetallic mineral products	327	10	2	16	2	0
Primary metals	331	19	4	44	4	0
Fabricated metal products	332	46	10	145	12	20
Machinery	333	51	115	146	134	17
Computer and electronic products	334	530	565	433	411	-27
Computers and peripheral equipment	3341	119	118	58	83	-30
Communications equipment	3342	87	80	136	19	-76
Semiconductor and other electronic components	3344	108	86	82	41	-52
Navigational, measuring, electromedical, and control instruments	3345	210	278	140	264	-5
Other computer and electronic products	334 minus (3341–42, 3344–45)	5	2	17	5	150
Electrical equipment, appliances, and components	335	81	60 (S)	125	35	-42
Transportation equipment	336	62	708	114	799	13
Motor vehicles, trailers, and parts	3361–63	10	657	68	617	-6
Aerospace products and parts	3364	50	(D)	18	178	(na)
Other transportation equipment	336 minus (3361–64)	2	(D)	29	5	(na)
Furniture and related products	337	4	2	11	3	50
Miscellaneous manufacturing	339	145	54	162	79	46
Medical equipment and supplies	3391	110	50	96	70	40
Other miscellaneous manufacturing	339 minus (3391)	34	4	66	8	100
Other manufacturing	31–33 minus (311–16, 321–27, 331–37, 339)	--	--	--	--	(na)
Nonmanufacturing	21–23, 42, 44–81	1,576	4,766	1,422	3,418	-28
Mining, extraction, and support activities	21	4	11	5	71	545
Utilities	22	26	93	24	110	18
Construction	23	63	(D)	3	(D)	(na)
Trade	42, 44, 45	429	1,887	173	1,301	-31

TABLE 15. Company and other nonfederal funds for industrial R&D performance in the United States performed by outside organizations and number of R&D-performing companies that funded outside performance of company-funded R&D, by industry and size of company: 2001–2002

Industry and size of company	NAICS codes	2001 Number of companies	2001 Amount (millions of dollars)	2002 Number of companies	2002 Amount (millions of dollars)	Percent change 2002/2001
Distribution by industry:						
Transportation and warehousing	48, 49	3	(D)	4	32	(na)
Information	51	237	577	275	363	-37
Publishing	511	153	187	146	113	-40
Newspaper, periodical, book, and database	5111	4	10	37	11	10
Software	5112	149	177	109	102	-42
Broadcasting and telecommunications	513	4	171	64	122 (S)	-29
Radio and television broadcasting	5131	0	-	0	-	(na)
Telecommunications	5133	4	171	63	(D)	(na)
Other broadcasting and telecommunications	513 minus (5131, 5133)	0	-	1	(D)	(na)
Other information	51 minus (511, 513)	81	218	65	129	-41
Finance, insurance, and real estate	52, 53	27	241	15	400	66
Professional, scientific, and technical services	54	655	1,676	611	1,113	-34
Architectural, engineering, and related services	5413	92	86	131	69	-20
Computer systems design and related services	5415	114	233	143	86	-63
Scientific R&D services	5417	441	1,310	328	890	-32
Other professional, scientific, and technical services	54 minus (5413, 5415, 5417)	8	46	10	68	48
Distribution by industry:						
Management of companies and enterprises	55	18	22	2	(D)	(na)
Health care services	621–23	6	8	6	11	38
Other nonmanufacturing	56, 61, 624, 71, 72, 81	107	245	302	17	-93
Distribution by size of company (number of employees):						
Total	(na)	2,939	8,723	3,097	7,846	-10
5 to 24	(na)	735	311	675	133	-57
25 to 49	(na)	562	265	469	130	-51
50 to 99	(na)	551	489	719	326	-33
100 to 249	(na)	532	1,080	540	555	-49
250 to 499	(na)	131	260	234	229	-12
500 to 999	(na)	158	248	139	262	6
1,000 to 4,999	(na)	150	1,104	165	1,212	10
5,000 to 9,999	(na)	47	1,021	59	832	-19
10,000 to 24,999	(na)	34	1,702	50	1,539	-10
25,000 or more	(na)	39	2,242	47	2,626	17

(D) = data have been withheld to avoid disclosing operations of individual companies; (S) = indicates imputation of more than 50 percent; (--) = indicates data not collected; (-) = indicates a value of zero or a value rounded to zero; (na) = not applicable.

NOTE: The R&D in this table is the industrial R&D performed outside company facilities funded from all sources except the federal government. The funds predominantly are the company's own, but also include funds from outside organizations such as other companies, research institutions, universities and colleges, nonprofit organizations, and state governments. Excluded from this table is company-funded R&D not performed within the 50 U.S. states or DC. (e.g., R&D not performed on U.S. soil by foreign subsidiaries or other foreign organizations). For information on sampling for 1999–2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

TABLE 16. Company and other nonfederal funds for industrial R&D performance in the United States by outside organizations and number of R&D-performing companies that funded outside performance of R&D, by type of organization and by industry and size of company: 2002

Industry and size of company	NAICS codes	Number of companies	Company-funded R&D performed by outside organizations (millions of dollars)	For-profit companies		Universities or colleges		Nonprofit organizations (other than universities and colleges)		Undistributed R&D performed by outside organizations	
				Number of companies	Amount (millions of dollars)	Number of companies	Amount (millions of dollars)	Number of companies	Amount (millions of dollars)	Number of companies	Amount (millions of dollars)
Distribution by industry:											
All industries	21–23, 31–33, 42, 44–81	3,097	7,846	319	4,850	134	331	47	109	2,746	2,556
Manufacturing	31–33	1,676	4,428	154	3,122	74	237	22	53	1,500	1,016
Food	311	61	105	9	67	4	31	2	(D)	52	(D)
Beverage and tobacco products	312	2	(D)	2	(D)	2	(D)	1	(D)	0	-
Textiles, apparel, and leather	313–16	42	9	5	2	2	(D)	0	-	37	(D)
Wood products	321	16	12	2	(D)	1	(D)	0	-	14	2
Paper, printing and support activities	322, 323	26	248	4	(D)	4	1	1	(D)	20	123
Petroleum and coal products	324	3	(D)	3	(D)	3	(D)	1	(D)	0	-
Chemicals	325	188	2,485	25	1,693	20	182	6	45	156	566
Basic chemicals	3251	26	30	6	12	5	1	0	-	18	17
Resin, synthetic rubber, fibers, and filament	3252	14	38	2	(D)	2	(D)	0	-	10	26
Pharmaceuticals and medicines	3254	79	2,368	13	1,676	11	171	6	45	65	475
Other chemicals	325 minus (3251–52, 3254)	70	49	4	(D)	2	(D)	0	-	64	47
Plastics and rubber products	326	142	28	5	3	1	(D)	0	-	137	(D)
Nonmetallic mineral products	327	16	2	1	(D)	1	(D)	0	-	14	1
Primary metals	331	44	4	0	-	1	(D)	1	(D)	43	(D)
Fabricated metal products	332	145	12	7	2	2	(D)	1	(D)	137	(D)
Machinery	333	146	134	11	83	6	4	1	(D)	134	(D)
Computer and electronic products	334	433	411	38	268	10	5	4	3	390	136
Computers and peripheral equipment	3341	58	83	5	38	1	(D)	1	(D)	53	(D)
Communications equipment	3342	136	19	7	5	0	-	1	(D)	128	(D)
Semiconductor and other electronic components	3344	82	41	7	(D)	4	2	1	(D)	72	11
Navigational, measuring, electromedical, and control instruments	3345	140	264	17	195	4	(D)	1	(D)	122	66
Other computer and electronic products	334 minus (3341–42, 3344–45)	17	5	2	(D)	1	(D)	0	-	15	1
Electrical equipment, appliances, and components	335	125	35	11	10	1	(D)	0	-	114	(D)
Transportation equipment	336	114	799	20	(D)	9	(D)	2	(D)	91	24
Motor vehicles, trailers, and parts	3361–63	68	617	13	605	7	1	0	-	53	11
Aerospace products and parts	3364	18	178	5	165	2	(D)	2	(D)	12	(D)
Other transportation equipment	336 minus (3361–64)	29	5	2	(D)	0	-	0	-	27	(D)
Furniture and related products	337	11	3	0	-	0	-	0	-	11	3
Miscellaneous manufacturing	339	162	79	11	32	7	(D)	2	(D)	150	40

TABLE 16. Company and other nonfederal funds for industrial R&D performance in the United States by outside organizations and number of R&D-performing companies that funded outside performance of R&D, by type of organization and by industry and size of company: 2002

Industry and size of company	NAICS codes	Number of companies	Company-funded R&D performed by outside organizations (millions of dollars)	For-profit companies		Universities or colleges		Nonprofit organizations (other than universities and colleges)		Undistributed R&D performed by outside organizations	
				Number of companies	Amount (millions of dollars)	Number of companies	Amount (millions of dollars)	Number of companies	Amount (millions of dollars)	Number of companies	Amount (millions of dollars)
Distribution by industry:											
Medical equipment and supplies	3391	96	70	7	29	6	(D)	2	(D)	88	34
Other miscellaneous manufacturing	339 minus (3391)	66	8	4	3	1	(D)	0	(D)	62	6
Other manufacturing	31–33 minus (311–16, 321–27, 331–37, 339)	--	--	--	--	--	--	--	--	--	--
Nonmanufacturing	21–23, 42, 44–81	1,422	3,418	165	1,728	60	94	25	57	1,247	1,540
Mining, extraction, and support activities	21	5	71	3	(D)	0	-	0	-	2	(D)
Utilities	22	24	110	5	6	3	1	6	37	17	67
Construction	23	3	(D)	0	-	0	-	0	-	3	(D)
Trade	42, 44, 45	173	1,301	19	539	7	(D)	3	(D)	151	736
Transportation and warehousing	48, 49	4	(D)	1	(D)	0	-	0	-	3	31
Information	51	275	363	26	146	2	(D)	0	-	249	(D)
Publishing	511	146	113	20	(D)	1	(D)	0	-	126	(D)
Newspaper, periodical, book, and database	5111	37	11	2	(D)	0	-	0	-	35	(D)
Software	5112	109	102	18	36	1	(D)	0	-	91	(D)
Broadcasting and telecommunications	513	64	122 (S)	1	(D)	0	-	0	-	63	(D)
Radio and television broadcasting	5131	0	-	0	-	0	-	0	-	0	-
Telecommunications	5133	63	(D)	1	(D)	0	-	0	-	62	113
Other broadcasting and telecommunications	513 minus (5131, 5133)	1	(D)	0	-	0	-	0	-	1	(D)
Other information	51 minus (511, 513)	65	129	5	98	1	(D)	0	-	60	(D)
Finance, insurance, and real estate	52, 53	15	400	10	294	0	-	0	-	5	106
Professional, scientific, and technical services	54	611	1,113	96	(D)	46	63	15	(D)	510	356
Architectural, engineering, and related services	5413	131	69	8	21	2	(D)	1	(D)	123	44
Computer systems design and related services	5415	143	86	16	35	0	-	0	-	128	50
Scientific R&D services	5417	328	890	67	584	42	47	14	11	255	248
Other professional, scientific, and technical services	54 minus (5413, 5415, 5417)	10	68	5	(D)	2	(D)	0	-	5	15
Management of companies and enterprises	55	2	(D)	0	-	0	-	0	-	2	(D)
Health care services	621–23	6	11	2	(D)	1	(D)	1	(D)	4	3
Other nonmanufacturing	56, 61, 624, 71, 72, 81	302	17	3	(D)	1	(D)	0	-	299	12

TABLE 16. Company and other nonfederal funds for industrial R&D performance in the United States by outside organizations and number of R&D-performing companies that funded outside performance of R&D, by type of organization and by industry and size of company: 2002

Industry and size of company	NAICS codes	Number of companies	Company-funded R&D performed by outside organizations (millions of dollars)	For-profit companies		Universities or colleges		Nonprofit organizations (other than universities and colleges)		Undistributed R&D performed by outside organizations	
				Number of companies	Amount (millions of dollars)	Number of companies	Amount (millions of dollars)	Number of companies	Amount (millions of dollars)	Number of companies	Amount (millions of dollars)
Distribution by size of company (number of employees):											
Total	(na)	3097	7,846	319	4,850	134	331	47	109	2,746	2,556
5 to 24	(na)	675	133	7	12	3	1	0	-	668	121
25 to 49	(na)	469	130	13	34	4	1	1	(D)	455	(D)
50 to 99	(na)	719	326	26	107	14	8	6	1	690	211
100 to 249	(na)	540	555	46	320	23	21	7	6	490	209
250 to 499	(na)	234	229	34	112	12	18	3	(D)	197	(D)
500 to 999	(na)	139	262	41	159	6	4	1	(D)	97	(D)
1,000 to 4,999	(na)	165	1,212	66	774	30	44	7	4	87	391
5,000 to 9,999	(na)	59	832	23	659	12	39	4	8	33	125
10,000 to 24,999	(na)	50	1,539	30	466	14	75	9	44	15	954
25,000 or more	(na)	47	2,626	33	2,207	16	121	9	40	14	258

(D) = data have been withheld to avoid disclosing operations of individual companies; (S) = indicates imputation of more than 50 percent; (--) = indicates data not collected; (-) = indicates a value of zero or a value rounded to zero; (na) = not applicable.

NOTES: The R&D in this table is the industrial R&D performed outside company facilities by outside organizations funded from all sources except the federal government. The funds predominantly are the company's own, but also include funds from outside organizations such as other companies, research institutions, universities and colleges, nonprofit organizations, and state governments. Excluded from this table is company-funded R&D not performed within the 50 U.S. states or DC (e.g., R&D not performed on U.S. soil by foreign subsidiaries or other foreign organizations). For information on sampling for 1999–2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

TABLE 17. Company and other nonfederal funds and number of companies that funded industrial R&D performed outside of the United States by majority-owned foreign affiliates and other organizations, by industry and size of company: 1999–2002

Industry, size of company, and affiliation of performing organizations	NAICS codes	1999 [a] Number of companies	1999 [a] Amount (millions of dollars)	2000 Number of companies	2000 Amount (millions of dollars)	2001 Number of companies	2001 Amount (millions of dollars)	2002 Number of companies	2002 Amount (millions of dollars)	Percent change 2002/2001
All foreign R&D:										
All industries	21–23, 31–33, 42, 44–81	1,261	16,765	1,718	17,463	2,407	17,869	1,404	24,868	39
Manufacturing	31–33	747	12,354	572	12,252	593	10,998	828	17,093	55
Food	311	9	87	16	95 (S)	21	210	53	300	43
Beverage and tobacco products	312	1	(D)	1	(D)	0	-	1	(D)	(na)
Textiles, apparel, and leather	313–16	7	(D)	15	(D)	8	26	6	25	-4
Wood products	321	1	(D)	0	-	2	(D)	4	(D)	(na)
Paper, printing and support activities	322, 323	11	(D)	9	(D)	8	(D)	15	544	(na)
Petroleum and coal products	324	3	(D)	3	9	2	(D)	3	16	(na)
Chemicals	325	105	3,243	94	3,578	60	2,328	116	3,989	71
Basic chemicals	3251	15	(D)	40	256	15	152	24	249	64
Resin, synthetic rubber, fibers, and filament	3252	7	(D)	4	(D)	6	(D)	20	366	(na)
Pharmaceuticals and medicines	3254	64	2,832	20	3,030	19	1,720	39	3,268	90
Other chemicals	325 minus (3251–52, 3254)	18	95	30	(D)	20	(D)	33	107	(na)
Plastics and rubber products	326	42	172	23	168	37	181	28	218	20
Nonmetallic mineral products	327	5	40	14	40	8	15	16	32	113
Primary metals	331	5	7	3	(D)	15	12	19	23	92
Fabricated metal products	332	42	75	32	65	20	61	44	371	508
Machinery	333	70	707	86	736	66	527	111	788	50
Computer and electronic products	334	177	1,902	178	1,705	219	2,562	259	3,763	47
Computers and peripheral equipment	3341	12	289	25	(D)	16	478 (S)	31	383 (S)	-20
Communications equipment	3342	22	(D)	33	377	55	633	41	969	53
Semiconductor and other electronic components	3344	98	302	34	327	86	852	75	1,647	93
Navigational, measuring, electromedical, and control instruments	3345	42	1,112	85	679	59	586	102	756	29
Other computer and electronic products	334 minus (3341–42, 3344–45)	2	(D)	1	(D)	3	12	10	7	-42
Electrical equipment, appliances, and components	335	33	433	20	455	23	418 (S)	33	279	-33
Transportation equipment	336	90	3,933	27	3,640	22	2,832	49	5,160	82

TABLE 17. Company and other nonfederal funds and number of companies that funded industrial R&D performed outside of the United States by majority-owned foreign affiliates and other organizations, by industry and size of company: 1999–2002

Industry, size of company, and affiliation of performing organizations	NAICS codes	1999 [a] Number of companies	1999 [a] Amount (millions of dollars)	2000 Number of companies	2000 Amount (millions of dollars)	2001 Number of companies	2001 Amount (millions of dollars)	2002 Number of companies	2002 Amount (millions of dollars)	Percent change 2002/2001
Motor vehicles, trailers, and parts	3361–63	64	(D)	21	(D)	15	(D)	33	4,598	(na)
Aerospace products and parts	3364	6	(D)	3	(D)	4	138	8	552	300
Other transportation equipment	336 minus (3361–64)	20	17	3	(D)	3	(D)	8	10	(na)
Furniture and related products	337	2	(D)	5	(D)	1	(D)	7	(z)	(na)
Miscellaneous manufacturing	339	47	963	47	942	83	1,226	65	1,578	29
Medical equipment and supplies	3391	38	(D)	26	(D)	67	1,150	48	1,472	28
Other miscellaneous manufacturing	339 minus (3391)	8	(D)	21	(D)	16	76	16	106	39
Other manufacturing	31–33 minus (311–16, 321–27, 331–37, 339)	--	--	--	--	--	--	--	--	(na)
Nonmanufacturing	21–23, 42, 44–81	513	4,411	1,146	5,211	1,814	6,871	575	7,775	13
Mining, extraction, and support activities	21	52	48	6	43	7	37	5	48	30
Utilities	22	0	-	0	-	0	-	2	(D)	(na)
Construction	23	1	(D)	1	(D)	2	(D)	1	(D)	(na)
Trade	42, 44, 45	93	2,356	345	2,244	447	4,192	109	4,753	13
Transportation and warehousing	48, 49	0	-	0	-	0	-	0	-	(na)
Information	51	108	1,379	135	1,564	345	1,672	165	1,806	8
Publishing	511	101	637	118	940	336	983	146	(D)	(na)
Newspaper, periodical, book, and database	5111	0	-	2	(D)	5	8	6	(D)	(na)
Software	5112	101	637	116	(D)	331	975	140	1,058	9
Broadcasting and telecommunications	513	1	(D)	1	(D)	1	(D)	1	(D)	(na)
Radio and television broadcasting	5131	0	-	0	-	0	-	0	-	(na)
Telecommunications	5133	1	(D)	1	(D)	1	(D)	1	(D)	(na)
Other broadcasting and telecommunications	513 minus (5131, 5133)	0	-	0	-	0	-	0	-	(na)
Other information	51 minus (511, 513)	6	(D)	16	(D)	8	(D)	18	(D)	(na)
Finance, insurance, and real estate	52, 53	3	(D)	4	(D)	6	24	13	113	371
Professional, scientific, and technical services	54	196	523	236	904	943	881	270	964	9

TABLE 17. Company and other nonfederal funds and number of companies that funded industrial R&D performed outside of the United States by majority-owned foreign affiliates and other organizations, by industry and size of company: 1999–2002

Industry, size of company, and affiliation of performing organizations	NAICS codes	1999 [a] Number of companies	1999 [a] Amount (millions of dollars)	2000 Number of companies	2000 Amount (millions of dollars)	2001 Number of companies	2001 Amount (millions of dollars)	2002 Number of companies	2002 Amount (millions of dollars)	Percent change 2002/2001
Architectural, engineering, and related services	5413	47	(D)	54	371	193	78	14	(D)	(na)
Computer systems design and related services	5415	67	146	101	(D)	149	302	144	600	99
Scientific R&D services	5417	81	287	80	292	592	488	110	297	-39
Other professional, scientific, and technical services	54 minus (5413, 5415, 5417)	1	(D)	1	(D)	9	12	3	(D)	(na)
Management of companies and enterprises	55	2	(D)	5	(D)	2	(D)	2	(D)	(na)
Health care services	621–23	2	(D)	1	(D)	2	(D)	1	(D)	(na)
Other nonmanufacturing	56, 61, 624, 71, 72, 81	55	14	7	75 (S)	60	43	7	65	51
Distribution by size of company (number of employees):										
Total	(na)	1,261	16,765	1,718	17,463	2,407	17,869	1,404	24,868	39
5 to 24	(na)	46	1	484	352	1,050	96	156	35	-64
25 to 49	(na)	51	14	86	37	269	21	120	60	186
50 to 99	(na)	231	117	188	455	301	228	203	267	17
100 to 249	(na)	264	140	246	421	149	223	152	262	17
250 to 499	(na)	144	243	132	162	93	207	143	289	40
500 to 999	(na)	156	860	188	532	134	647	152	484	-25
1,000 to 4,999	(na)	204	2,099	228	2,238	251	2,104	292	2,955	40
5,000 to 9,999	(na)	81	1,188	74	1,352	74	2,073	71	2,652	28
10,000 to 24,999	(na)	48	2,965	49	3,626	44	3,329	59	4,168	25
25,000 or more	(na)	35	9,138	42	8,288	43	8,940	55	13,696	53
Foreign R&D performed by majority-owned foreign affiliates:										
All industries	21–23, 31–33, 42, 44–81	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	1,076	23,974	(na)
Manufacturing	31–33	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	636	16,399	(na)
Nonmanufacturing	21–23, 42, 44–81	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	439	7,575	

TABLE 17. Company and other nonfederal funds and number of companies that funded industrial R&D performed outside of the United States by majority-owned foreign affiliates and other organizations, by industry and size of company: 1999–2002

Industry, size of company, and affiliation of performing organizations	NAICS codes	1999 [a] Number of companies	1999 [a] Amount (millions of dollars)	2000 Number of companies	2000 Amount (millions of dollars)	2001 Number of companies	2001 Amount (millions of dollars)	2002 Number of companies	2002 Amount (millions of dollars)	Percent change 2002/2001
Distribution by size of company (number of employees):										
Total	(na)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	1,076	23,974	(na)
5 to 24	(na)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	136	34	(na)
25 to 49	(na)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	73	55	(na)
50 to 99	(na)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	133	232	(na)
100 to 249	(na)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	95	212	(na)
250 to 499	(na)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	115	261	(na)
500 to 999	(na)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	122	399	(na)
1,000 to 4,999	(na)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	241	2,654	(na)
5,000 to 9,999	(na)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	63	(D)	(na)
10,000 to 24,999	(na)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	53	(D)	(na)
25,000 or more	(na)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	45	13,592	(na)
Foreign R&D performed by other organizations other than majority-owned affiliates:										
All industries	21–23, 31–33, 42, 44–81	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	275	321	(na)
Manufacturing	31–33	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	132	219	(na)
Nonmanufacturing	21–23, 42, 44–81	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	143	102	
Total		(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	275	321	(na)
5 to 24	(na)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	20	1	(na)
25 to 49	(na)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	47	5	(na)
50 to 99	(na)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	66	23	(na)
100 to 249	(na)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	47	27	(na)
250 to 499	(na)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	21	12	(na)
500 to 999	(na)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	21	20	(na)
1,000 to 4,999	(na)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	33	117	(na)
5,000 to 9,999	(na)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	5	12	(na)
10,000 to 24,999	(na)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	4	1	(na)
25,000 or more	(na)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	10	104	(na)

TABLE 17. Company and other nonfederal funds and number of companies that funded industrial R&D performed outside of the United States by majority-owned foreign affiliates and other organizations, by industry and size of company: 1999–2002

Industry, size of company, and affiliation of performing organizations	NAICS codes	1999 [a] Number of companies	1999 [a] Amount (millions of dollars)	2000 Number of companies	2000 Amount (millions of dollars)	2001 Number of companies	2001 Amount (millions of dollars)	2002 Number of companies	2002 Amount (millions of dollars)	Percent change 2002/2001
Undistributed foreign R&D										
All industries	21–23, 31–33, 42, 44–81	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	53	573 (S)	(na)
Manufacturing	31–33	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	30	475 (S)	(na)
Nonmanufacturing	21–23, 42, 44–81	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	23	98 (S)	(na)
Distribution by size of company (number of employees):										
Total	(na)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	53	573 (S)	(na)
5 to 24	(na)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	0	-	(na)
25 to 49	(na)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	0	-	(na)
50 to 99	(na)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	4	12 (S)	(na)
100 to 249	(na)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	10	22 (S)	(na)
250 to 499	(na)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	7	16 (S)	(na)
500 to 999	(na)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	9	66 (S)	(na)
1,000 to 4,999	(na)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	18	185 (S)	(na)
5,000 to 9,999	(na)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	3	(D)	(na)
10,000 to 24,999	(na)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	2	(D)	(na)
25,000 or more	(na)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	0	-	(na)

(D) = data have been withheld to avoid disclosing operations of individual companies; (S) = indicates imputation of more than 50 percent; (--) = indicates data not collected; (-) = indicates a value of zero or a value rounded to zero; (NA) = not available; (na) = not applicable.

[a] Some statistics for 1999 have been revised since originally published.

NOTES: The R&D in this table is the industrial R&D performed outside the 50 U.S. states and DC by a company's foreign subsidiaries or other organizations funded from all sources except the federal government. The funds predominantly are the company's own, but also include funds from outside organizations such as other companies, research institutions, universities and colleges, nonprofit organizations, and state governments. Excluded from this table is company-funded R&D performed within the 50 U.S. states or DC (e.g., R&D performed on U.S. soil by foreign subsidiaries or other organizations). For information on sampling for 1999–2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

TABLE 18. Company and other nonfederal funds for industrial R&D performance outside of the United States by majority-owned foreign affiliates and other organizations, by location of R&D performance: 2002

(Millions of current US dollars)

Location of R&D performance	Number of companies [a]	Amount	
All locations	1,404	24,868	
Canada	212	2,176	
Germany	193	3,071	
France	161	1,578	
Japan	124	1,058	
United Kingdom	278	2,887	
Puerto Rico	21	178	(S)
Other locations [a]	377	4,943	
Undistributed [b]	900	8,977	

(S) = indicates imputation of more than 50 percent.

[a] Outside of the 50 U.S. states and DC.

[b] Includes R&D reported on Form RD-1 that was not allocated to specific locations outside of the 50 U.S. states and DC. Also includes total R&D performed in locations outside of the 50 U.S. states and DC reported on Form RD-1A, because Form RD-1A does not collect data by location.

NOTES: The R&D in this table is the industrial R&D performed outside the 50 U.S. states and DC by a company's foreign subsidiaries or other organizations funded from all sources except the federal government. The funds predominantly are the company's own, but also include funds from outside organizations such as other companies, research institutions, universities and colleges, nonprofit organizations, and state governments. Excluded from this table is company-funded R&D performed within the 50 U.S. states or DC (e.g., R&D performed on U.S. soil by foreign subsidiaries or other organizations). For information on sampling for 2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

TABLE 19. Company and other nonfederal funds for performance of collaborative industrial R&D in the United States, by industry and size of company and by type of collaborator: 2002

Industry and size of company	NAICS codes	Company-funded R&D		All collaborative R&D		For-profit companies		Federal laboratories		Universities or colleges		Nonprofit organizations (other than universities and colleges)		Undistributed collaborative R&D	
		Number of companies	Amount (millions of dollars)	Number of companies	Amount (millions of dollars)	Number of companies	Amount (millions of dollars)	Number of companies	Amount (millions of dollars)	Number of companies	Amount (millions of dollars)	Number of companies	Amount (millions of dollars)	Number of companies	Amount (millions of dollars)
Distribution by industry:															
All industries	21–23, 31–33, 42, 44–81	28,200	174,408	180	3,961	152	3,852	13	21	53	57	13	22	3	10
Manufacturing	31–33	13,823	98,240	80	2,361	65	2,291	8	18	32	40	8	12	0	-
Food	311	529	2,034	3	(D)	3	(D)	0	-	2	(D)	1	(D)	0	(D)
Beverage and tobacco products	312	57	170	3	(D)	3	(D)	0	-	1	(D)	1	(D)	0	(D)
Textiles, apparel, and leather	313–16	363	248	1	(D)	1	(D)	0	-	0	(D)	0	-	0	-
Wood products	321	90	132	1	(D)	0	-	0	-	1	(D)	0	-	0	(D)
Paper, printing and support activities	322, 323	391	2,620	3	(D)	3	(D)	1	(D)	1	(D)	1	(D)	0	(D)
Petroleum and coal products	324	79	1,233	3	5	2	(D)	1	(D)	2	(D)	0	(D)	0	(D)
Chemicals	325	1,241	20,395	18	212	15	190	2	(D)	11	16	4	(D)	0	-
Basic chemicals	3251	181	1,710	4	10	4	4	1	(D)	4	5	2	(D)	0	-
Resin, synthetic rubber, fibers, and filament	3252	82	2,413	2	(D)	1	(D)	0	-	1	(D)	0	-	0	(D)
Pharmaceuticals and medicines	3254	313	14,186	9	198	8	184	1	(D)	4	9	2	(D)	0	(D)
Other chemicals	325 minus (3251–52, 3254)	666	2,087	3	(D)	2	(D)	0	-	2	(D)	0	-	0	(D)
Plastics and rubber products	326	951	1,508	3	(D)	2	(D)	0	-	1	(D)	0	-	0	(D)
Nonmetallic mineral products	327	211	420	3	(D)	1	(D)	0	-	2	(D)	0	-	0	(D)
Primary metals	331	200	461	1	(D)	1	(D)	0	-	0	(D)	0	-	0	-
Fabricated metal products	332	1,281	1,251	8	68	7	(D)	0	-	1	(D)	0	-	0	(D)
Machinery	333	2,703	6,366	6	195	5	(D)	0	-	1	(D)	0	-	0	(D)
Computer and electronic products	334	2,786	30,307	16	1,627	15	1,606	2	(D)	5	1	1	(D)	0	-
Computers and peripheral equipment	3341	328	3,015	2	(D)	2	(D)	0	-	0	(D)	0	-	0	-
Communications equipment	3342	501	6,420	1	(D)	1	(D)	0	-	0	(D)	0	-	0	-
Semiconductor and other electronic components	3344	806	11,871	5	(D)	4	(D)	0	-	2	(D)	1	6	0	(D)
Navigational, measuring, electromedical, and control instruments	3345	1,031	8,549	7	1,357	7	1,342	2	(D)	2	1	0	(D)	0	(D)
Other computer and electronic products	334 minus (3341–42, 3344–45)	121	452	1	(D)	1	(D)	0	-	1	(D)	0	-	0	(D)

TABLE 19. Company and other nonfederal funds for performance of collaborative industrial R&D in the United States, by industry and size of company and by type of collaborator: 2002

Industry and size of company	NAICS codes	Company-funded R&D		All collaborative R&D		For-profit companies		Federal laboratories		Universities or colleges		Nonprofit organizations (other than universities and colleges)		Undistributed collaborative R&D	
		Number of companies	Amount (millions of dollars)	Number of companies	Amount (millions of dollars)	Number of companies	Amount (millions of dollars)	Number of companies	Amount (millions of dollars)	Number of companies	Amount (millions of dollars)	Number of companies	Amount (millions of dollars)	Number of companies	Amount (millions of dollars)
Distribution by industry:															
Electrical equipment, appliances, and components	335	840	1,978	3	(D)	2	(D)	1	(D)	0	(D)	0	(D)	0	-
Transportation equipment	336	775	21,452	5	17	4	14	1	(D)	2	(D)	0	(D)	0	(D)
Motor vehicles, trailers, and parts	3361–63	488	15,199	3	(D)	2	(D)	0	-	2	(D)	0	-	0	(D)
Aerospace products and parts	3364	83	5,349	2	(D)	2	(D)	1	(D)	0	(D)	0	(D)	0	-
Other transportation equipment	336 minus (3361–64)	204	905	0	-	0	-	0	-	0	-	0	-	0	-
Furniture and related products	337	189	251	0	-	0	-	0	-	0	-	0	-	0	-
Miscellaneous manufacturing	339	1,136	7,414	3	(D)	1	(D)	0	-	2	(D)	0	-	0	(D)
Medical equipment and supplies	3391	557	6,179	3	(D)	1	(D)	0	-	2	(D)	0	-	0	(D)
Other miscellaneous manufacturing	339 minus (3391)	579	1,235	0	-	0	-	0	-	0	-	0	-	0	-
Other manufacturing	31–33 minus (311–16, 321–27, 331–37, 339)	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nonmanufacturing	21–23, 42, 44–81	14,377	76,168	100	1,600	87	1,560	5	3	21	17	5	10	3	10
Mining, extraction, and support activities	21	22	715	2	(D)	1	(D)	0	-	1	(D)	0	-	0	(D)
Utilities	22	284	117	0	-	0	-	0	-	0	-	0	-	0	-
Construction	23	295	164	0	-	0	-	0	-	0	-	0	-	0	-
Trade	42, 44, 45	2,837	25,014	13	742	12	739	1	(D)	3	1	2	(D)	0	(D)
Transportation and warehousing	48, 49	120	339	0	-	0	-	0	-	0	-	0	-	0	-
Information	51	1,723	17,764	8	191	8	191	0	-	0	-	0	-	0	-
Publishing	511	1,317	13,488	7	(D)	7	(D)	0	-	0	(D)	0	-	0	-
Newspaper, periodical, book, and database	5111	51	614	0	-	0	-	0	-	0	-	0	-	0	-
Software	5112	1,266	12,874	7	(D)	7	(D)	0	-	0	(D)	0	-	0	-

TABLE 19. Company and other nonfederal funds for performance of collaborative industrial R&D in the United States, by industry and size of company and by type of collaborator: 2002

Industry and size of company	NAICS codes	Company-funded R&D		All collaborative R&D		For-profit companies		Federal laboratories		Universities or colleges		Nonprofit organizations (other than universities and colleges)		Undistributed collaborative R&D	
		Number of companies	Amount (millions of dollars)	Number of companies	Amount (millions of dollars)	Number of companies	Amount (millions of dollars)	Number of companies	Amount (millions of dollars)	Number of companies	Amount (millions of dollars)	Number of companies	Amount (millions of dollars)	Number of companies	Amount (millions of dollars)
Distribution by industry:															
Broadcasting and telecommunications	513	112	1,637	1	(D)	1	(D)	0	-	0	(D)	0	-	0	-
Radio and television broadcasting	5131	4	(D)	0	-	0	-	0	-	0	-	0	-	0	-
Telecommunications	5133	93	1,608	1	(D)	1	(D)	0	-	0	(D)	0	-	0	-
Other broadcasting and telecommunications	513 minus (5131, 5133)	14	(D)	0	-	0	-	0	-	0	-	0	-	0	-
Other information	51 minus (511, 513)	294	2,639	0	-	0	-	0	-	0	-	0	-	0	-
Finance, insurance, and real estate	52, 53	463	1,903	1	(D)	1	(D)	0	-	0	(D)	0	-	0	-
Professional, scientific, and technical services	54	6,412	24,946	73	645	63	610	4	(D)	16	(D)	3	(D)	3	10
Architectural, engineering, and related services	5413	1,123	2,822	8	(D)	7	(D)	1	(D)	2	2	0	(D)	0	(D)
Computer systems design and related services	5415	3,046	10,394	14	99	11	91	0	-	1	(D)	0	-	2	(D)
Scientific R&D services	5417	1,333	10,735	49	513	43	488	3	(D)	13	13	3	(D)	1	(D)
Other professional, scientific, and technical services	54 minus (5413, 5415, 5417)	911	996	2	(D)	2	(D)	0	-	0	(D)	0	-	0	-
Management of companies and enterprises	55	35	148	0	-	0	-	0	-	0	-	0	-	0	-
Health care services	621–23	1,230	4,163	2	(D)	1	(D)	0	-	1	(D)	0	-	0	(D)
Other nonmanufacturing	56, 61, 624, 71, 72, 81	955	894	1	(D)	1	(D)	0	-	0	(D)	0	-	0	-

TABLE 19. Company and other nonfederal funds for performance of collaborative industrial R&D in the United States, by industry and size of company and by type of collaborator: 2002

Industry and size of company	NAICS codes	Company-funded R&D		All collaborative R&D		For-profit companies		Federal laboratories		Universities or colleges		Nonprofit organizations (other than universities and colleges)		Undistributed collaborative R&D	
		Number of companies	Amount (millions of dollars)	Number of companies	Amount (millions of dollars)	Number of companies	Amount (millions of dollars)	Number of companies	Amount (millions of dollars)	Number of companies	Amount (millions of dollars)	Number of companies	Amount (millions of dollars)	Number of companies	Amount (millions of dollars)
Distribution by size of company (number of employees):															
Total	(na)	28,200	174,408	180	3,961	152	3,852	13	21	53	57	13	22	3	10
5 to 24	(na)	12,312	3,471	7	12	7	12	1	(D)	1	(D)	1	(D)	0	(D)
25 to 49	(na)	4,605	3,586	11	15	8	8	1	(D)	4	1	0	(D)	1	(D)
50 to 99	(na)	3,820	5,701	13	59	13	(D)	0	-	3	1	0	-	0	(D)
100 to 249	(na)	3,426	12,622	43	394	35	369	2	(D)	12	12	3	(D)	2	(D)
250 to 499	(na)	1,559	7,370	13	148	12	(D)	0	-	2	(D)	0	-	0	(D)
500 to 999	(na)	951	9,394	16	80	15	78	1	(D)	3	2	0	(D)	0	(D)
1,000 to 4,999	(na)	1,050	27,640	38	1,000	30	991	3	(z)	11	5	3	3	0	-
5,000 to 9,999	(na)	220	16,414	9	117	6	(D)	0	-	6	23	2	(D)	0	(D)
10,000 to 24,999	(na)	152	25,232	16	480	14	477	1	(D)	5	2	0	(D)	0	-
25,000 or more	(na)	105	62,979	14	1,657	12	1,619	4	17	6	9	4	11	0	-

(D) = data have been withheld to avoid disclosing operations of individual companies; (z) = indicates data less than half the unit shown; (--) = indicates data not collected; (-) = indicates a value of zero or a value rounded to zero; (na) = not applicable.

NOTES: The R&D in this table is the industrial R&D performed within company facilities funded from all sources except the federal government in collaboration with another organization. The funds predominantly are the company's own, but also include funds from outside organizations such as other companies, research institutions, universities and colleges, nonprofit organizations, and state governments. Excluded from this table are company-funded R&D not performed within the company (e.g., R&D contracted out to other organizations) and company-funded R&D not performed within the 50 U.S. states or DC (e.g., R&D not performed on U.S. soil by foreign subsidiaries or other foreign organizations). For information on sampling for 2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

TABLE 20. Federal funds for industrial R&D performance in the United States, by industry and size of company: 1999–2002
(Millions of dollars)

Industry and size of company	NAICS codes	1999 [a]	2000	2001 [b]	2002 [b]	Percent change 2002/2001
Distribution by industry:						
All industries	21–23, 31–33, 42, 44–81	22,535	19,118	16,899	16,401	-3
Manufacturing	31–33	17,055	13,328	11,484	10,745	-6
Food	311	-	(D)	-	(D)	(na)
Beverage and tobacco products	312	-	-	-	-	(na)
Textiles, apparel, and leather	313–16	-	(D)	(D)	(D)	(na)
Wood products	321	-	-	-	(D)	(na)
Paper, printing and support activities	322, 323	(D)	(D)	(D)	(D)	(na)
Petroleum and coal products	324	(D)	(D)	(D)	(D)	(na)
Chemicals	325	194	150	180	246	37
Basic chemicals	3251	98	31	42	72	71
Resin, synthetic rubber, fibers, and filament	3252	(D)	11	(D)	13	(na)
Pharmaceuticals and medicines	3254	(D)	(D)	-	(D)	(na)
Other chemicals	325 minus (3251–52, 3254)	(D)	(D)	(D)	(D)	(na)
Plastics and rubber products	326	-	(D)	(D)	(D)	(na)
Nonmetallic mineral products	327	(D)	1	11	(D)	(na)
Primary metals	331	12	26 (S)	6	12	100
Fabricated metal products	332	46	41	54	104	93
Machinery	333	399 (S)	41	67	62	-7
Computer and electronic products	334	5,993	5,544	5,848	5,470	-6
Computers and peripheral equipment	3341	(D)	-	(D)	25	(na)
Communications equipment	3342	206	432	298	215	-28
Semiconductor and other electronic components	3344	77	107	148	48	-68
Navigational, measuring, electromedical, and control instruments	3345	5,705	5,002	5,382	5,180	-4
Other computer and electronic products	334 minus (3341–42, 3344–45)	(D)	3	(D)	1	(na)
Electrical equipment, appliances, and components	335	(D)	(D)	301 (S)	61	-80
Transportation equipment	336	10,037	7,168	4,961	4,692	-5
Motor vehicles, trailers, and parts	3361–63	(D)	(D)	(D)	(D)	(na)
Aerospace products and parts	3364	9,117	6,424	3,785	4,306	14
Other transportation equipment	336 minus (3361–64)	(D)	(D)	(D)	(D)	(na)
Furniture and related products	337	-	-	-	7	(na)
Miscellaneous manufacturing	339	26	12	25	44	76
Medical equipment and supplies	3391	(D)	(D)	(D)	(D)	(na)
Other miscellaneous manufacturing	339 minus (3391)	(D)	(D)	(D)	(D)	(na)
Other manufacturing	31–33 minus (311–16, 321–27, 331–37, 339)	--	--	--	--	(na)
Nonmanufacturing	21–23, 42, 44–81	5,479	5,790	5,415	5,656	4
Mining, extraction, and support activities	21	(D)	1	(D)	(D)	(na)
Utilities	22	17	(D)	19	(D)	(na)
Construction	23	2	(D)	1	(z)	(na)
Trade	42, 44, 45	95	30	88	(D)	(na)
Transportation and warehousing	48, 49	-	(D)	72	(D)	(na)
Information	51	497	540 (S)	(D)	106	(na)

TABLE 20. Federal funds for industrial R&D performance in the United States, by industry and size of company: 1999–2002

(Millions of dollars)

Industry and size of company	NAICS codes	1999 [a]	2000	2001 [b]	2002 [b]	Percent change 2002/2001
Distribution by industry:						
Publishing	511	49	78	44	53	20
Newspaper, periodical, book, and database	5111	-	-	-	-	(na)
Software	5112	49	78	44	53	20
Broadcasting and telecommunications	513	(D)	382 (S)	(D)	(D)	(na)
Radio and television broadcasting	5131	(D)	(D)	-	-	(na)
Telecommunications	5133	(D)	(D)	(D)	(D)	(na)
Other broadcasting and telecommunications	513 minus (5131, 5133)	13	-	-	-	(na)
Other information	51 minus (511, 513)	(D)	81	(D)	(D)	(na)
Finance, insurance, and real estate	52, 53	(D)	-	(D)	-	(na)
Professional, scientific, and technical services	54	4,615	4,628	5,065	5,412	7
Architectural, engineering, and related services	5413	1,177	1,149	1,021	1,337	31
Computer systems design and related services	5415	(D)	226	498	1,590	219
Scientific R&D services	5417	3,057	3,177	3,352	2,299	-31
Other professional, scientific, and technical services	54 minus (5413, 5415, 5417)	(D)	77	194	186	-4
Management of companies and enterprises	55	(D)	-	-	-	(na)
Health care services	621–23	10	59	29	(D)	(na)
Other nonmanufacturing	56, 61, 624, 71, 72, 81	(D)	18	38	(D)	(na)
Distribution by size of company (number of employees):						
Total	(na)	22,535	19,118	16,899	16,401	-3
5 to 24	(na)	611	922	653	789	21
25 to 49	(na)	368	222	201	259	29
50 to 99	(na)	603	514	548	463	-16
100 to 249	(na)	674	669	903	606	-33
250 to 499	(na)	485	660	560	686	23
500 to 999	(na)	591	495	627	531	-15
1,000 to 4,999	(na)	896	775	608	985	62
5,000 to 9,999	(na)	2,194	1,625	1,651	1,574	-5
10,000 to 24,999	(na)	397	678	904	1,226	36
25,000 or more	(na)	15,717	12,559	10,243	9,282	-9

(D) = data have been withheld to avoid disclosing operations of individual companies; (S) = indicates imputation of more than 50 percent; (z) = indicates data less than half the unit shown; (--) = indicates data not collected; (-) = indicates a value of zero or a value rounded to zero; (na) = not applicable.

[a] Some statistics for 1999 have been revised since originally published.

[b] Beginning with 2001, statistics for total and federally funded industrial R&D exclude data for federally funded research and development centers.

NOTES: The R&D in this table is the industrial R&D performed within company facilities funded by the federal government. Excluded from this table are R&D not performed within the company (e.g., R&D contracted out to other organizations) and R&D not performed within the 50 U.S. states or DC (e.g., R&D not performed on U.S. soil by subsidiaries or other foreign organizations). For information on sampling for 2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

TABLE 21. Federal funds for industrial R&D performance in the United States, by industry and by size of company: 2002

(Millions of dollars)

Industry	NAICS codes	Total [a]	Size of company (number of employees)									
			5 to 24	25 to 49	50 to 99	100 to 249	250 to 499	500 to 999	1,000 to 4,999	5,000 to 9,999	10,000 to 24,999	25,000 or more
All industries	21–23, 31–33, 42, 44–81	16,401	789	259	463	606	686	531	985	1,574	1,226	9,282
Manufacturing	31-33	10,745	85	43	39	51	104	90	360	(D)	1,224	(D)
Food	311	(D)	-	-	-	-	-	-	-	-	(D)	-
Beverage and tobacco products	312	-	-	-	-	-	-	-	-	-	-	-
Textiles, apparel, and leather	313-16	(D)	-	-	-	-	-	(D)	(D)	-	-	-
Wood products	321	(D)	-	-	-	-	-	-	-	(D)	-	-
Paper, printing and support activities	322, 323	(D)	-	-	-	-	-	4	(D)	-	-	(D)
Petroleum and coal products	324	(D)	-	-	-	-	-	-	-	-	-	(D)
Chemicals	325	246	(D)	-	1	(D)	1	(D)	(D)	(D)	(D)	(D)
Basic chemicals	3251	72	1	-	-	(D)	-	-	(D)	(D)	-	-
Resin, synthetic rubber, fibers, and filament	3252	13	-	-	-	-	-	-	(D)	-	(D)	(D)
Pharmaceuticals and medicines	3254	(D)	(D)	-	1	(D)	1	-	(D)	-	-	(D)
Other chemicals	325 minus (3251–52, 3254)	(D)	-	-	-	(D)	-	(D)	-	-	(D)	(D)
Plastics and rubber products	326	(D)	-	-	-	-	-	-	(D)	-	-	-
Nonmetallic mineral products	327	(D)	(D)	-	-	-	-	-	(D)	-	-	-
Primary metals	331	12	-	(D)	-	-	-	-	-	(D)	-	(D)
Fabricated metal products	332	104	13	-	-	(z)	(D)	(D)	(D)	(D)	-	-
Machinery	333	62	(z)	12	(z)	(z)	-	9	(D)	-	(D)	(D)
Computer and electronic products	334	5,470	56	31	21	9	27 (S)	(D)	113	(D)	(D)	(D)
Computers and peripheral equipment	3341	25	(D)	1	(D)	(D)	-	(D)	-	-	-	-
Communications equipment	3342	215	(D)	1	-	-	-	(D)	-	-	(D)	(D)
Semiconductor and other electronic components	3344	48	(z)	26	-	(D)	13 (S)	-	(D)	-	(D)	(D)
Navigational, measuring, electromedical, and control instruments	3345	5,180	39	3	(D)	(D)	14 (S)	(D)	106	(D)	(D)	(D)
Other computer and electronic products	334 minus (3341–42, 3344–45)	1	(D)	-	-	-	-	-	(D)	-	-	-
Electrical equipment, appliances, and components	335	61	(z)	(D)	14	14	(D)	-	(D)	-	-	-
Transportation equipment	336	4,692	-	-	3	(D)	7	(D)	(D)	(D)	592	(D)
Motor vehicles, trailers, and parts	3361–63	(D)	-	-	-	-	-	-	(D)	(D)	-	(D)
Aerospace products and parts	3364	4,306	-	-	-	(D)	7	(D)	(D)	(D)	(D)	3,664
Other transportation equipment	336 minus (3361–64)	(D)	-	-	3	-	-	(D)	-	-	(D)	-

TABLE 21. Federal funds for industrial R&D performance in the United States, by industry and by size of company: 2002

(Millions of dollars)

Industry	NAICS codes	Total [a]	Size of company (number of employees)									
			5 to 24	25 to 49	50 to 99	100 to 249	250 to 499	500 to 999	1,000 to 4,999	5,000 to 9,999	10,000 to 24,999	25,000 or more
Furniture and related products	337	7	(D)	-	-	-	-	(D)	-	-	-	-
Miscellaneous manufacturing	339	44	-	(D)	(z)	13	(D)	(D)	(D)	-	(D)	-
Medical equipment and supplies	3391	(D)	-	(D)	(z)	13	(D)	(D)	(D)	-	(D)	-
Other miscellaneous manufacturing	339 minus (3391)	(D)	-	-	-	-	-	-	(D)	-	(D)	-
Other manufacturing	31-33 minus (311–16, 321–27, 331–37, 339)	--	--	--	--	--	--	--	--	--	--	--
Nonmanufacturing	21–23, 42, 44–81	5,656	704	(D)	424	554	582	441	625	(D)	3	(D)
Mining, extraction, and support activities	21	(D)	-	-	-	-	-	-	-	-	-	(D)
Utilities	22	(D)	-	-	-	-	(D)	-	-	(D)	(D)	(D)
Construction	23	(z)	-	(z)	-	-	-	-	-	-	-	-
Trade	42, 44, 45	(D)	-	-	-	2	(D)	-	(D)	(D)	(D)	(D)
Transportation and warehousing	48, 49	(D)	-	-	-	-	-	-	(D)	-	-	(D)
Information	51	106	(D)	(D)	(D)	17	(D)	-	-	-	-	(D)
Publishing	511	53	(D)	(D)	(D)	17	(D)	-	-	-	-	-
Newspaper, periodical, book, and database	5111	-	-	-	-	-	-	-	-	-	-	-
Software	5112	53	(D)	(D)	(D)	17	(D)	-	-	-	-	-
Broadcasting and telecommunications	513	(D)	-	-	-	-	-	-	-	-	-	(D)
Radio and television broadcasting	5131	-	-	-	-	-	-	-	-	-	-	-
Telecommunications	5133	(D)	-	-	-	-	-	-	-	-	-	(D)
Other broadcasting and telecommunications	513 minus (5131, 5133)	-	-	-	-	-	-	-	-	-	-	-
Other information	51 minus (511, 513)	(D)	(D)	-	-	-	(D)	-	-	-	-	(D)
Finance, insurance, and real estate	52, 53	-	-	-	-	-	-	-	-	-	-	-
Professional, scientific, and technical services	54	5,412	689	(D)	416	535	529	439	(D)	(D)	(D)	(D)
Architectural, engineering, and related services	5413	1,337	(D)	22	76	98	243	200	(D)	(D)	(D)	-
Computer systems design and related services	5415	1,590	(D)	12	153	17	(D)	(D)	-	-	-	(D)
Scientific R&D services	5417	2,299	156	(D)	186	382	(D)	(D)	(D)	(D)	-	-
Other professional, scientific, and technical services	54 minus (5413, 5415, 5417)	186	148	-	-	38	-	-	-	-	-	-

TABLE 21. Federal funds for industrial R&D performance in the United States, by industry and by size of company: 2002

(Millions of dollars)

Industry	NAICS codes	Total [a]	Size of company (number of employees)									
			5 to 24	25 to 49	50 to 99	100 to 249	250 to 499	500 to 999	1,000 to 4,999	5,000 to 9,999	10,000 to 24,999	25,000 or more
Management of companies and enterprises	55	-	-	-	-	-	-	-	-	-	-	-
Health care services	621–23	(D)	(D)	(D)	(D)	-	-	(D)	15	-	-	-
Other nonmanufacturing	56, 61, 624, 71, 72, 81	(D)	-	-	1	(z)	(D)	(D)	(D)	-	-	-

(D) = data have been withheld to avoid disclosing operations of individual companies; (S) = indicates imputation of more than 50 percent; (z) = indicates data less than half the unit shown; (--) = indicates data not collected; (-) = indicates a value of zero or a value rounded to zero.

[a] Beginning with 2001, statistics for total and federally funded industrial R&D exclude data for federally funded research and development centers.

NOTE: For information on sampling for 2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

TABLE 22. Federal funds for industrial R&D performance in the United States and number of companies that performed federally funded R&D in the United States, by industry and size of company and by size of federally funded R&D program: 2002

Industry and size of company	NAICS codes	Number of companies	Amount [a] (millions of dollars)	Size of federally funded R&D program: Less than $200,000 Number of companies	Less than $200,000 Amount (millions of dollars)	$200,000 to $999,999 Number of companies	$200,000 to $999,999 Amount (millions of dollars)	$1 million to $9.9 million Number of companies	$1 million to $9.9 million Amount (millions of dollars)	$10 million to $99.9 million Number of companies	$10 million to $99.9 million Amount (millions of dollars)	$100 million or more Number of companies	$100 million or more Amount (millions of dollars)
Distribution by industry:													
All industries	21–23, 31–33, 42, 44–81	2,496	16,401	722	61	1,256	575	400	1,099	98	2,400	20	12,266
Manufacturing	31–33	786	10,745	461	41	174	61	116	336	20	681	15	9,626
Food	311	1	(D)	0	-	1	(D)	0	-	0	-	0	-
Beverage and tobacco products	312	0	-	0	-	0	-	0	-	0	-	0	-
Textiles, apparel, and leather	313–16	2	(D)	0	-	0	-	2	(D)	0	-	0	-
Wood products	321	1	(D)	1	(D)	0	-	0	-	0	-	0	-
Paper, printing and support activities	322, 323	5	(D)	0	-	0	-	4	(D)	1	(D)	0	-
Petroleum and coal products	324	2	(D)	0	-	1	(D)	1	(D)	0	-	0	-
Chemicals	325	53	246	15	(D)	24	15	11	(D)	2	(D)	1	(D)
Basic chemicals	3251	17	72	9	1	2	(D)	4	(D)	2	(D)	0	-
Resin, synthetic rubber, fibers, and filament	3252	3	13	0	-	1	(D)	2	(D)	0	-	0	-
Pharmaceuticals and medicines	3254	29	(D)	4	1	21	(D)	4	(D)	0	-	0	-
Other chemicals	325 minus (3251–52, 3254)	4	(D)	2	(D)	0	-	1	(D)	0	-	1	(D)
Plastics and rubber products	326	1	(D)	0	-	0	-	1	(D)	0	-	0	-
Nonmetallic mineral products	327	2	(D)	2	(D)	0	-	0	-	0	-	0	-
Primary metals	331	4	12	0	-	2	(D)	2	(D)	0	-	0	-
Fabricated metal products	332	120	104	103	(D)	7	2	10	(D)	1	(D)	0	-
Machinery	333	85	62	78	(D)	3	1	3	9	2	(D)	0	-
Computer and electronic products	334	355	5,470	174	(D)	116	33	55	127	6	185	5	(D)
Computers and peripheral equipment	3341	29	25	22	(D)	3	(D)	3	5	1	(D)	0	-
Communications equipment	3342	56	215	28	(D)	25	6	0	-	2	(D)	1	(D)
Semiconductor and other electronic components	3344	144	48	116	2	5	2	22	45	0	-	0	-
Navigational, measuring, electromedical, and control instruments	3345	121	5,180	3	(z)	82	22	30	77	3	(D)	4	(D)
Other computer and electronic products	334 minus (3341–42, 3344–45)	5	1	4	(D)	1	(D)	0	-	0	-	0	-
Electrical equipment, appliances, and components	335	23	61	6	(z)	5	(D)	10	(D)	1	(D)	0	-
Transportation equipment	336	33	4,692	0	-	11	(D)	7	(D)	6	275	9	(D)

TABLE 22. Federal funds for industrial R&D performance in the United States and number of companies that performed federally funded R&D in the United States, by industry and size of company and by size of federally funded R&D program: 2002

Industry and size of company	NAICS codes	Number of companies	Amount [a] (millions of dollars)	Size of federally funded R&D program: Less than $200,000 Number of companies	Less than $200,000 Amount (millions of dollars)	$200,000 to $999,999 Number of companies	$200,000 to $999,999 Amount (millions of dollars)	$1 million to $9.9 million Number of companies	$1 million to $9.9 million Amount (millions of dollars)	$10 million to $99.9 million Number of companies	$10 million to $99.9 million Amount (millions of dollars)	$100 million or more Number of companies	$100 million or more Amount (millions of dollars)
Distribution by industry:													
Motor vehicles, trailers, and parts	3361–63	6	(D)	0	-	1	(D)	3	(D)	2	(D)	0	-
Aerospace products and parts	3364	16	4,306	0	-	0	-	4	(D)	4	(D)	8	(D)
Other transportation equipment	336 minus (3361–64)	11	(D)	0	-	10	4	0	-	0	-	1	(D)
Furniture and related products	337	78	7	77	(D)	0	-	1	(D)	0	-	0	-
Miscellaneous manufacturing	339	21	44	5	(z)	5	(D)	9	(D)	1	(D)	0	-
Medical equipment and supplies	3391	19	(D)	5	(z)	4	1	9	(D)	0	-	0	-
Other miscellaneous manufacturing	339 minus (3391)	2	(D)	0	-	1	(D)	0	-	1	(D)	0	-
Other manufacturing	31–33 minus (311–16, 321–27, 331-37, 339)	--	--	--	--	--	--	--	--	--	--	--	--
Nonmanufacturing	21–23, 42, 44–81	1,710	5,656	261	20	1,082	514	284	763	78	1,720	5	2,640
Mining, extraction, and support activities	21	1	(D)	0	-	1	(D)	0	-	0	-	0	-
Utilities	22	4	(D)	3	(D)	0	-	0	-	1	(D)	0	-
Construction	23	4	(z)	4	(z)	0	-	0	-	0	-	0	-
Trade	42, 44, 45	13	(D)	7	(D)	1	(D)	4	(D)	1	(D)	0	-
Transportation and warehousing	48, 49	2	(D)	1	(D)	1	(D)	0	-	0	-	0	-
Information	51	47	106	2	(D)	34	14	8	(D)	3	(D)	0	-
Publishing	511	13	53	2	(D)	3	(D)	7	(D)	1	(D)	0	-
Newspaper, periodical, book, and database	5111	0	-	0	-	0	-	0	-	0	-	0	-
Software	5112	13	53	2	(D)	3	(D)	7	(D)	1	(D)	0	-
Broadcasting and telecommunications	513	1	(D)	0	-	0	-	0	-	1	(D)	0	-
Radio and television broadcasting	5131	0	-	0	-	0	-	0	-	0	-	0	-
Telecommunications	5133	1	(D)	0	-	0	-	0	-	1	(D)	0	-
Other broadcasting and telecommunications	513 minus (5131, 5133)	0	-	0	-	0	-	0	-	0	-	0	-
Other information	51 minus (511, 513)	33	(D)	0	-	31	(D)	1	(D)	1	(D)	0	-
Finance, insurance, and real estate	52, 53	0	-	0	-	0	-	0	-	0	-	0	-
Professional, scientific, and technical services	54	1,606	5,412	228	17	1,035	495	268	710	70	1,549	5	2,640

TABLE 22. Federal funds for industrial R&D performance in the United States and number of companies that performed federally funded R&D in the United States, by industry and size of company and by size of federally funded R&D program: 2002

Industry and size of company	NAICS codes	Number of companies	Amount [a] (millions of dollars)	Size of federally funded R&D program: Less than $200,000 Number of companies	Less than $200,000 Amount (millions of dollars)	$200,000 to $999,999 Number of companies	$200,000 to $999,999 Amount (millions of dollars)	$1 million to $9.9 million Number of companies	$1 million to $9.9 million Amount (millions of dollars)	$10 million to $99.9 million Number of companies	$10 million to $99.9 million Amount (millions of dollars)	$100 million or more Number of companies	$100 million or more Amount (millions of dollars)
Distribution by industry:													
Architectural, engineering, and related services	5413	500	1,337	87	5	371	(D)	24	87	16	475	2	(D)
Computer systems design and related services	5415	369	1,590	2	(D)	256	(D)	94	178	15	171	1	(D)
Scientific R&D services	5417	489	2,299	138	12	164	(D)	147	436	38	869	2	(D)
Other professional, scientific, and technical services	54 minus (5413, 5415, 5417)	249	186	1	(D)	243	(D)	3	9	1	35	0	-
Management of companies and enterprises	55	0	-	0	-	0	-	0	-	0	-	0	-
Health care services	621–23	11	(D)	0	-	8	2	2	(D)	1	(D)	0	-
Other nonmanufacturing	56, 61, 624, 71, 72, 81	22	(D)	16	(z)	2	(D)	2	(D)	2	(D)	0	-
Distribution by size of company (number of employees):													
Total	(na)	2,496	16,401	722	61	1,256	575	400	1,099	98	2,400	20	12,266
5 to 24	(na)	1,678	789	423	30	1,103	509	153	250	0	-	0	-
25 to 49	(na)	219	259	91	14	53	21	75	225	0	-	0	-
50 to 99	(na)	202	463	115	8	23	10	41	147	22	298	0	-
100 to 249	(na)	137	606	29	2	28	16	55	186	24	401	0	-
250 to 499	(na)	111	686	48	5	21	7	25	126	17	548	0	-
500 to 999	(na)	38	531	4	(z)	7	(D)	18	51	8	329	1	(D)
1,000 to 4,999	(na)	46	985	6	(z)	11	6	17	53	9	251	3	675
5,000 to 9,999	(na)	17	1,574	2	(D)	2	(D)	5	13	6	306	2	(D)
10,000 to 24,999	(na)	17	1,226	3	(z)	5	(D)	2	(D)	3	70	4	1,149
25,000 or more	(na)	32	9,282	1	(D)	3	1	9	(D)	9	196	10	9,041

(D) = data have been withheld to avoid disclosing operations of individual companies; (S) = indicates imputation of more than 50 percent; (z) = indicates less than half the unit shown; (--) = indicates data not collected; (-) = indicates a value of zero or a value rounded to zero; (na) = not applicable.

[a] Beginning with 2001, statistics for total and federally funded industrial R&D exclude data for federally funded research and development centers.

NOTE: For information on sampling for 2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

TABLE 23. Federal funds for industrial R&D performance in the United States, by selected federal agency and selected industry: 1999–2002
(Millions of dollars)

Federal agency and industry	NAICS codes	1999 [a]	2000	2001 [b]	2002 [b]	Percent change 2002/2001
All federal agencies	21–23, 31–33, 42, 44–81	22,535	19,118	16,899	16,401	-3
Manufacturing	31–33	NA	NA	NA	10,745	na
Chemicals	325	194	150	180	246	37
Machinery	333	399 (S)	41	67	62	-7
Computer and electronic products	334	5,993	5,544	5,848	5,470	-6
Electrical equipment, appliances, and components	335	(D)	(D)	301 (S)	61	-80
Transportation Equipment	336	NA	NA	NA	4,692	na
Other manufacturing	31–33 minus (325, 333–36)	NA	NA	NA	213	na
Nonmanufacturing	21–23, 42, 44–81	NA	NA	NA	5,656	na
NASA	21–23, 31–33, 42, 44–81	1,469	1,328	1,071	798	na
Manufacturing	31–33	NA	NA	NA	391	na
Chemicals	325	(D)	0	0	(D)	na
Machinery	333	(D)	0 (S)	(D)	-	na
Computer and electronic products	334	267 (S)	(D)	272	149 (S)	-45
Electrical equipment, appliances, and components	335	(D)	(D)	(D)	(D)	na
Transportation Equipment	336	NA	NA	NA	238	na
Other manufacturing	31–33 minus (325, 333–36)	NA	NA	NA	(z) (S)	na
Nonmanufacturing	21–23, 42, 44–81	NA	NA	NA	407	na
DOE	21–23, 31–33, 42, 44–81	2,209	1,435	1,253	969	na
Manufacturing	31–33	NA	NA	NA	381 (S)	na
Chemicals	325	(D)	19 (S)	17 (S)	23	35
Machinery	333	(D)	28 (S)	(D)	(D)	na
Computer and electronic products	334	(D)	0	5	12	140
Electrical equipment, appliances, and components	335	(D)	(D)	34	(D)	-100
Transportation Equipment	336	NA	NA	NA	264 (S)	na
Other manufacturing	31–33 minus (325, 333–36)	NA	NA	NA	27	na
Nonmanufacturing	21–23, 42, 44–81	NA	NA	NA	588	na
DoD and other agencies	21–23, 31–33, 42, 44–81	18,857	16,335	14,575	14,634	na
Manufacturing	31–33	NA	NA	NA	9,973	na
Chemicals	325	NA	NA	NA	(D)	na
Machinery	333	NA	NA	NA	(D)	na
Computer and electronic products	334	NA	NA	NA	5,309	na
Electrical equipment, appliances, and components	335	NA	NA	NA	37	na
Transportation Equipment	336	NA	NA	NA	4,190	na
Other manufacturing	31–33 minus (325, 333–36)	NA	NA	NA	186	na
Nonmanufacturing	21–23, 42, 44–81	NA	NA	NA	4,661	na

(D) = data have been withheld to avoid disclosing operations of individual companies; (S) = indicates imputation of more than 50 percent; (z) = indicates value less than half the unit shown; NA = not available; na = not applicable.

[a] Some statistics for 1999 have been revised since originally published.

[b] Beginning with 2001, statistics for total and federally funded industrial R&D exclude data for federally funded research and development centers.

NOTES: Federal R&D data collected on the Form RD-1A are not allocated by agency type. For information on sampling for 1999–2002, see appendix A, Technical Notes.

During data collection, if exact figures were not available, respondents were asked to estimate or apportion R&D costs according to the number of scientists and engineers working on Federal projects and/or the costs of Federal programs. Consequently, statistics in this table may be based on such estimates.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

TABLE 24. Domestic net sales of companies that performed industrial R&D in the United States, by industry and by size of company: 2002

(Millions of dollars)

Industry	NAICS codes	All net sales	Size of company (number of employees)									
			5 to 24	25 to 49	50 to 99	100 to 249	250 to 499	500 to 999	1,000 to 4,999	5,000 to 9,999	10,000 to 24,999	25,000 or more
All industries	21–23, 31–33, 42, 44–81	4,903,345	48,993	40,091	79,880	140,438	185,592	136,776	682,463	489,531	872,414	2,227,168
Manufacturing	31–33	3,028,003	21,284	13,543	57,137	63,468	70,802	95,807	419,024	312,761	528,009	1,446,168
Food	311	314,176	2,272	-	1,659	4,585	6,504	10,275	31,970	21,789	79,845	155,277
Beverage and tobacco products	312	33,910	31	82	94	(D)	281	-	9,347	(D)	(D)	-
Textiles, apparel, and leather	313–16	29,308	352 (S)	156	427	2,414	(D)	4,238	9,101	(D)	(D)	(D)
Wood products	321	18,691	-	(D)	132	1,109	1,276	(D)	(D)	5,377	6,781	-
Paper, printing and support activities	322, 323	204,814	(D)	(D)	301	1,950	2,324	3,210	17,135	13,040	16,801	143,010
Petroleum and coal products	324	304,747	146	(D)	257	836	466	(D)	(D)	-	122,056	179,670
Chemicals	325	343,723	2,088	2,509	3,071	8,475	10,130	15,079	82,180	57,926	63,382	98,883
Basic chemicals	3251	67,183	394	358	663	(D)	1,136	4,694	29,642	(D)	(D)	-
Resin, synthetic rubber, fibers, and filament	3252	61,452	202	82	291	(D)	3,344	4,003	14,717	(D)	(D)	(D)
Pharmaceuticals and medicines	3254	147,175	(D)	258	374	(D)	2,715	2,083	15,035	21,297	25,799	(D)
Other chemicals	325 minus (3251–52, 3254)	67,913	(D)	1,812	1,743	3,456	2,936	4,299	22,786	16,068 (S)	(D)	(D)
Plastics and rubber products	326	84,089	(D)	(D)	3,579	5,509	5,270	6,820	28,532	9,883	10,189	(D)
Nonmetallic mineral products	327	33,945	311 (S)	449	119	(D)	636	603	11,541	5,969	(D)	(D)
Primary metals	331	70,718	(D)	152	1,819	1,577	(D)	2,791	14,454	13,999	21,183	(D)
Fabricated metal products	332	89,406	(D)	581	1,200	5,518	7,036	6,378	21,296	18,370	15,613	(D)
Machinery	333	147,148	2,903	3,033	4,865	9,176	10,038	10,970	34,184	19,572	18,998	33,409
Computer and electronic products	334	401,273	2,417	2,959	34,604	7,929	9,301	14,867	65,878	29,573	64,434	169,300
Computers and peripheral equipment	3341	40,409	305	539	368	635	1,014	(D)	5,502	(D)	(D)	-
Communications equipment	3342	55,294	417	499	996	(D)	2,193	(D)	12,906	(D)	(D)	(D)
Semiconductor and other electronic components	3344	138,596	495	679	31,210	(D)	2,913	4,238	31,416	6,496	13,617	(D)
Navigational, measuring, electromedical, and control instruments	3345	158,397	1,094	842	1,780	2,736	2,500	3,746	13,332	8,133	18,681	105,553
Other computer and electronic products	334 minus (3341–42, 3344–45)	8,576	106	401	250	(D)	681	1,003	2,721	(D)	-	-
Electrical equipment, appliances, and components	335	72,859	531	1,065	1,194	2,437	2,191	5,472	18,036	16,234	25,698	-
Transportation equipment	336	753,734	582	518	1,919	5,494	7,013	8,731	39,037	68,596	37,364	584,480
Motor vehicles, trailers, and parts	3361–63	487,740	442	52	(D)	4,032	4,459	7,492	28,450	(D)	(D)	369,690
Aerospace products and parts	3364	234,840	-	155	28 (S)	516	1,789 (S)	(D)	4,306	7,263	(D)	214,780
Other transportation equipment	336 minus (3361–64)	31,154	141	312	(D)	946	766	(D)	6,280	(D)	16,587	-

TABLE 24. Domestic net sales of companies that performed industrial R&D in the United States, by industry and by size of company: 2002

(Millions of dollars)

Industry	NAICS codes	All net sales	Size of company (number of employees)									
			5 to 24	25 to 49	50 to 99	100 to 249	250 to 499	500 to 999	1,000 to 4,999	5,000 to 9,999	10,000 to 24,999	25,000 or more
Furniture and related products	337	31,772	104	93	377	888	(D)	629	6,291	7,079	6,991	(D)
Miscellaneous manufacturing	339	93,692	1,390	1,245	1,520	4,484	(D)	5,337	25,334	12,359	14,199	(D)
Medical equipment and supplies	3391	63,537	838	(D)	737	1,936	(D)	2,230	16,237	7,552	(D)	(D)
Other miscellaneous manufacturing	339 minus (3391)	30,155	551	(D)	783	2,548	1,727	3,107	9,096	4,807	(D)	-
Other manufacturing	31–33 minus (311–16, 321–27, 331–37, 339)	--	--	--	--	--	--	--	--	--	--	--
Nonmanufacturing	21–23, 42, 44–81	1,875,341	27,708	26,548	22,743	76,969	114,790	40,969	263,439	176,770	344,405	781,000
Mining, extraction, and support activities	21	22,181	-	-	-	-	680	(D)	4,209	(D)	(D)	(D)
Utilities	22	173,480	(D)	-	-	-	(D)	(D)	22,464 (S)	53,269	85,381	(D)
Construction	23	25,426	472	(D)	416	560	420	2,761	10,535	(D)	(D)	-
Trade	42, 44, 45	496,219	14,649	4,670	4,449	11,251	14,063	9,830	84,940	61,643	132,476	158,248
Transportation and warehousing	48, 49	71,288	-	-	-	-	(D)	395	3,509	(D)	10,350	51,920
Information	51	443,897	1,386	1,210	1,531	8,233	84,923	6,898	29,345	8,972	39,344	262,055 (S)
Publishing	511	82,487	1,154	954	1,373	(D)	4,617	4,337	18,957	(D)	14,071	(D)
Newspaper, periodical, book, and database	5111	22,307	-	145	64	132	(D)	-	3,642	(D)	(D)	(D)
Software	5112	60,180	1,154	808	1,309	(D)	(D)	4,337	15,315	(D)	(D)	(D)
Broadcasting and telecommunications	513	231,311 (S)	9	-	(D)	4,002	591	(D)	3,025	(D)	-	220,780 (S)
Radio and television broadcasting	5131	(D)	-	-	-	(D)	-	-	(D)	-	-	-
Telecommunications	5133	230,679 (S)	-	-	-	3,840	(D)	(D)	(D)	(D)	-	220,780 (S)
Other broadcasting and telecommunications	513 minus (5131, 5133)	(D)	9	-	(D)	(D)	(D)	(D)	-	-	-	-
Other information	51 minus (511, 513)	130,099	223	256	(D)	(D)	79,714	(D)	7,363	(D)	25,273	(D)
Finance, insurance, and real estate	52, 53	343,709	307	(D)	(D)	2,115	3,240	1,424	70,681	11,244	34,271	220,140
Professional, scientific, and technical services	54	223,013	8,622	20,034	12,536	46,425	9,121	11,284	21,023	16,524	18,683	58,760
Architectural, engineering, and related services	5413	53,594	(D)	(D)	7,550	3,161	2,168	1,255	8,385	6,373	(D)	11,240
Computer systems design and related services	5415	72,495	4,468	18,067	3,354	3,498	3,418	6,992	7,342	(D)	(D)	(D)
Scientific R&D services	5417	61,103	2,224	(D)	1,594	39,148	2,914	2,011	2,706	(D)	-	(D)
Other professional, scientific, and technical services	54 minus (5413, 5415, 5417)	35,822	(D)	17	38	618	621	1,026	2,590	3,639	(D)	25,690

TABLE 24. Domestic net sales of companies that performed industrial R&D in the United States, by industry and by size of company: 2002

(Millions of dollars)

Industry	NAICS codes	All net sales	Size of company (number of employees)									
			5 to 24	25 to 49	50 to 99	100 to 249	250 to 499	500 to 999	1,000 to 4,999	5,000 to 9,999	10,000 to 24,999	25,000 or more
Management of companies and enterprises	55	1,962	(D)	(D)	(D)	148	835	(D)	(D)	-	-	-
Health care services	621-23	27,603	1,772	65	1,260	5,821	167	562	(D)	(D)	(D)	(D)
Other nonmanufacturing	56, 61, 624, 71, 72, 81	46,563	471	280	2,464	2,416	(D)	4,874	13,837	8,388	4,103	(D)

(D) = data have been withheld to avoid disclosing operations of individual companies; (S) = indicates imputation of more than 50 percent; (--) = indicates data not collected; (-) = indicates a value of zero or a value rounded to zero.

NOTE: For information on sampling for 2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

TABLE 25. Concentration of all, federal, and company and other industrial R&D funds and net sales of companies that performed industrial R&D in the United States, ranked by size of R&D program: 1992–2002

(Percent distribution)

Companies ranked by size of R&D program	1992	1993	1994	1995	1996	1997	1998	1999 [a]	2000	2001 [b]	2002 [b]
	All (company, Federal, and other) R&D funds										
All companies	100	100	100	100	100	100	100	100	100	100	100
First 4 (1–4)	15	17	15	16	15	14	12	11	10	10	10
Next 4 (5–8)	8	7	8	8	8	8	8	8	7	7	7
Next 12 (9–20)	13	13	14	13	13	13	13	13	13	12	13
Next 20 (21–40)	11	12	13	12	12	11	11	11	11	11	12
Next 60 (41–100)	15	16	15	14	14	14	13	13	14	14	15
Next 100 (101–200)	12	8	9	8	9	9	9	9	9	10	10
Next 200 (201–400)	6	7	7	7	7	8	8	7	10	8	10
All others	20	20	19	22	22	23	26	28	26	28	23
	Federal R&D funds										
All companies	100	100	100	100	100	100	100	100	100	100	100
First 4 (1–4)	11	23	26	35	37	40	46	47	43	41	42
Next 4 (5–8)	18	17	19	19	20	23	17	14	16 (S)	17	15
Next 12 (9–20)	27	32	32	27	23	18	14	15	15	17	19
Next 20 (21–40)	13	16	13	8	7	7	7	8	7	6	9
Next 60 (41–100)	11	5	7	5	5	5	7	7	6	8	9
Next 100 (101–200)	4	5	2	3	4	3	5	4	5	5	5
Next 200 (201–400)	2	2	1	3	4	4	4	5	7	6	2
All others	14	0	0	0	0	0	0	0	1	0	0
	Company and other (except Federal) R&D funds										
All companies	100	100	100	100	100	100	100	100	100	100	100
First 4 (1–4)	17	17	16	16	15	13	12	11	10	11	10
Next 4 (5–8)	8	7	7	7	7	7	7	8	7	8	7
Next 12 (9–20)	12	12	12	11	11	11	12	12	12	11	13
Next 20 (21–40)	11	11	11	11	10	11	10	10	10	10	11
Next 60 (41–100)	17	14	14	14	14	13	13	13	13	14	15
Next 100 (101–200)	14	9	9	9	10	10	10	9	9	10	11
Next 200 (201–400)	7	8	8	8	8	9	8	8	11	8	10
All others	14	22	23	24	25	26	28	29	28	28	23
	Net sales										
All companies	100	100	100	100	100	100	100	100	100	100	100
First 4 (1–4)	8	8	8	8	6	6	5	6 (S)	3	3	8
Next 4 (5–8)	3	3	2	2	3	2	3	2	(D)	4	6
Next 12 (9–20)	4	4	5	6	6	5	5	7	8	8	12
Next 20 (21–40)	4	4	5	4	4	5	5	4	4	5	12
Next 60 (41–100)	12	11	10	9	8	7	8	9	11	9	17
Next 100 (101–200)	9	8	8	8	11	8	8	8	9	11	12
Next 200 (201–400)	11	10	10	10	11	13	11	14	12	10	11
All others	49	52	52	53	51	54	55	50	53	50	22

[a] Some percentages for 1999 have been revised since originally published.

[b] Beginning with 2001, statistics for total and federally funded industrial R&D exclude data for federally funded research and development centers.

(D) = data have been withheld to avoid disclosing operations of individual companies.

(S) = indicates imputation of more than 50 percent.

NOTES: This table shows the percentage of total, company, and Federal R&D and net sales of the top R&D-performing companies. The companies are grouped for analysis. For example, if you would like to know the percentage of total R&D accounted for by the top 20 R&D-performing companies in 1999, you would add the percentages shown for the categories "first 4," "next 4," and "next 12." This result is 32%. Companies were ranked individually for each year; therefore, particular companies comprising the size groups may have changed from year to year. For information on sampling for 1999–2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

TABLE 26. Funds for industrial R&D performance in the United States as a percent of net sales of companies that performed industrial R&D in the United States, by industry and size of company: 1999–2002

(Percent)

Industry and size of company	NAICS codes	1999 [a]	2000	2001 [b]	2002 [b]	Percent change 2002/2001
Distribution by industry:						
All industries	21–23, 31–33, 42, 44–81	3.7	3.8	4.1	3.9	-5
Manufacturing	31–33	3.7	3.6	4.0	3.6	-10
Food	311	0.4	(D)	0.5	(D)	(na)
Beverage and tobacco products	312	(D)	0.7	0.4	0.5	25
Textiles, apparel, and leather	313–16	0.7	(D)	(D)	(D)	(na)
Wood products	321	0.5	0.8	1.1	(D)	(na)
Paper, printing and support activities	322, 323	(D)	(D)	(D)	(D)	(na)
Petroleum and coal products	324	0.4	(D)	(D)	(D)	(na)
Chemicals	325	5.2	5.9	4.9	6	22
Basic chemicals	3251	2.1	2.4	2.2	2.7	23
Resin, synthetic rubber, fibers, and filament	3252	(D)	5.6	(D)	3.9	(na)
Pharmaceuticals and medicines	3254	(D)	(D)	7.8	(D)	(na)
Other chemicals	325 minus (3251–52, 3254)	(D)	(D)	(D)	(D)	(na)
Plastics and rubber products	326	1.9	(D)	(D)	(D)	(na)
Nonmetallic mineral products	327	(D)	1.8	2.4	(D)	(na)
Primary metals	331	0.4	0.5	0.7	0.7	0
Fabricated metal products	332	1.5	1.4	1.7	1.5	-12
Machinery	333	3.5	3.9	4.3	4.4	2
Computer and electronic products	334	10.3	9.0	12.4	8.9	-28
Computers and peripheral equipment	3341	(D)	6.5	(D)	7.5	(na)
Communications equipment	3342	12.0	9.9	17.0	12	-29
Semiconductor and other electronic components	3344	8.3	7.5	10.6	8.6	-19
Navigational, measuring, electromedical, and control instruments	3345	15.2	12.0	12.6	8.7	-31
Other computer and electronic products	334 minus (3341–42, 3344–45)	(D)	4.3	(D)	5.3	(na)
Electrical equipment, appliances, and components	335	(D)	(D)	3.1 (S)	2.8	-10
Transportation equipment	336	4.2	4.0	4.2	3.5	-17
Motor vehicles, trailers, and parts	3361–63	(D)	(D)	(D)	(D)	(na)
Aerospace products and parts	3364	8.8	7.3	5.7	4.1	-28
Other transportation equipment	336 minus (3361–64)	(D)	(D)	(D)	(D)	(na)
Furniture and related products	337	0.7	0.8	0.9	0.8	-11
Miscellaneous manufacturing	339	5.7	8.7	6.6	8.0	21
Medical equipment and supplies	3391	(D)	(D)	(D)	(D)	(na)
Other miscellaneous manufacturing	339 minus (3391)	(D)	(D)	(D)	(D)	(na)
Other manufacturing	31–33 minus (311–16, 321–27, 331–37, 339)	--	--	--	--	(na)
Nonmanufacturing	21–23, 42, 44–81	3.7	4.1	4.3	4.4	2
Mining, extraction, and support activities	21	(D)	1.0	(D)	(D)	(na)
Utilities	22	0.1	(D)	0.0	(D)	(na)
Construction	23	3.1	(D)	1.4	0.6	-57
Trade	42, 44, 45	5.5	5.3	6.2	(D)	(na)
Transportation and warehousing	48, 49	0.5	(D)	2.5	(D)	(na)
Information	51	3.6	4.1	(D)	4.0	(na)

TABLE 26. Funds for industrial R&D performance in the United States as a percent of net sales of companies that performed industrial R&D in the United States, by industry and size of company: 1999–2002

(Percent)

Industry and size of company	NAICS codes	1999 [a]	2000	2001 [b]	2002 [b]	Percent change 2002/2001
Publishing	511	13.4	16.3	15.1	16.4	9
Newspaper, periodical, book, and database	5111	2.0	2.0	2.7	2.8	4
Software	5112	16.8	20.5	19.4	21.5	11
Broadcasting and telecommunications	513	(D)	0.5 (S)	(D)	(D)	(na)
Radio and television broadcasting	5131	(D)	(D)	1.1	(D)	(na)
Telecommunications	5133	(D)	(D)	(D)	(D)	(na)
Other broadcasting and telecommunications	513 minus (5131, 5133)	(D)	(D)	(D)	(D)	(na)
Other information	51 minus (511, 513)	(D)	5.1	(D)	(D)	(na)
Finance, insurance, and real estate	52, 53	(D)	1.2	(D)	0.6	(na)
Professional, scientific, and technical services	54	15.3	18.7	16.8	13.6	-19
Architectural, engineering, and related services	5413	10.1	10.8	7.5	7.8	4
Computer systems design and related services	5415	(D)	12.3	17.4	16.5	-5
Scientific R&D services	5417	45.3	42.9	47.7	21.3	-55
Other professional, scientific, and technical services	54 minus (5413, 5415, 5417)	(D)	6.6	2.4	3.3	38
Management of companies and enterprises	55	(D)	4.4	7.8	7.6	-3
Health care services	621–23	6.5	3.2	4.2	(D)	(na)
Other nonmanufacturing	56, 61, 624, 71, 72, 81	(D)	1.0	1.5	(D)	(na)
Distribution by size of company (number of employees):						
Total	(na)	3.7	3.8	4.1	3.9	-5
5 to 24	(na)	18.2	19.9	15.0	8.7	-42
25 to 49	(na)	11.5	14.0	11.2	9.6	-14
50 to 99	(na)	14.2	12.1	11.2	7.7	-31
100 to 249	(na)	7.6	8.7	11.6	9.4	-19
250 to 499	(na)	6.3	6.7	8.6	4.3	-50
500 to 999	(na)	4.4	5.0	6.0	7.3	22
1,000 to 4,999	(na)	3.2	3.6	4.3	4.2	-2
5,000 to 9,999	(na)	2.6	2.4	2.8	3.7	32
10,000 to 24,999	(na)	2.8	3.2	3.6	3.0	-17
25,000 or more	(na)	3.6	3.4	3.4	3.2	-6

(D) = data have been withheld to avoid disclosing operations of individual companies; (S) = indicates imputation of more than 50 percent; (--) = indicates data not collected; (na) = not applicable.

[a] Some percentages for 1999 have been revised since originally published.

[b] Beginning with 2001, statistics for total and federally funded industrial R&D exclude data for federally funded research and development centers.

NOTE: For information on sampling for 1999–2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

TABLE 27. Company and other nonfederal funds for industrial R&D performance in the United States as a percent of net sales of companies that performed industrial R&D in the United States, by industry and size of company: 1999–2002
(Percent)

Industry and size of company	NAICS codes	1999 [a]	2000	2001	2002	Percent change 2002/2001
Distribution by industry:						
All industries	21–23, 31–33, 42, 44–81	3.3	3.4	3.8	3.6	-5
Manufacturing	31–33	3.2	3.3	3.6	3.2	-11
Food	311	0.4	0.4	0.5	0.6	20
Beverage and tobacco products	312	(D)	0.7	0.4	0.5	25
Textiles, apparel, and leather	313–16	0.7	0.8	0.8	0.8	0
Wood products	321	0.5	0.8	1.1	0.7	-36
Paper, printing and support activities	322, 323	1.4	1.6	2.1	1.3	-38
Petroleum and coal products	324	(D)	0.3	0.3	0.4	33
Chemicals	325	5.1	5.9	4.8	5.9	23
Basic chemicals	3251	2.0	2.3	2.2	2.5	14
Resin, synthetic rubber, fibers, and filament	3252	4.2	5.6	4.5	3.9	-13
Pharmaceuticals and medicines	3254	10.5	9.8	7.8	9.6	23
Other chemicals	325 minus (3251–52, 3254)	3.2	3.6	3.2	3.1	-3
Plastics and rubber products	326	1.9	1.8	2.9	1.8	-38
Nonmetallic mineral products	327	1.5	1.8	2.3	1.2	-48
Primary metals	331	0.4	0.5	0.7	0.7	0
Fabricated metal products	332	1.4	1.4	1.6	1.4	-13
Machinery	333	3.3	3.8	4.2	4.3	2
Computer and electronic products	334	8.5	7.9	10.9	7.6	-30
Computers and peripheral equipment	3341	6.4	6.5	7.6	7.5	-1
Communications equipment	3342	11.6	9.6	16.6	11.6	-30
Semiconductor and other electronic components	3344	8.3	7.4	10.5	8.6	-18
Navigational, measuring, electromedical, and control instruments	3345	9.1	8.0	7.3	5.4	-26
Other computer and electronic products	334 minus (3341–42, 3344–45)	5.8	4.3	13.5	5.3	-61
Electrical equipment, appliances, and components	335	2.3	2.1	2.9 (S)	2.7	-7
Transportation equipment	336	2.9	3.1	3.4	2.8	-18
Motor vehicles, trailers, and parts	3361–63	2.9	3.2	3.5	3.1	-11
Aerospace products and parts	3364	3.2	2.8	3.0	2.3	-23
Other transportation equipment	336 minus (3361–64)	1.6	1.8	2.5 (S)	2.9	16
Furniture and related products	337	0.7	0.8	0.9	0.8	-11
Miscellaneous manufacturing	339	5.7	8.7	6.6	7.9	20
Medical equipment and supplies	3391	7.7	13.1	9.0	9.7	8
Other miscellaneous manufacturing	339 minus (3391)	2.3	2.3	2.0	4.1	105
Other manufacturing	31–33 minus (311–16, 321–27, 331–37, 339)	--	--	--	--	(na)
Nonmanufacturing	21–23, 42, 44–81	3.4	3.8	4.0	4.1	2
Mining, extraction, and support activities	21	1.9	1.0	1.3	3.2	146
Utilities	22	0.1	0.1	0.0	0.1	(na)
Construction	23	3.1	1.9	1.4	0.6	-57
Trade	42, 44, 45	5.5	5.3	6.2	5.0	-19
Transportation and warehousing	48, 49	0.5	0.3	2.4	0.5	-79
Information	51	3.4	4.0	4.4	4.0	-9

TABLE 27. Company and other nonfederal funds for industrial R&D performance in the United States as a percent of net sales of companies that performed industrial R&D in the United States, by industry and size of company: 1999–2002

(Percent)

Industry and size of company	NAICS codes	1999 [a]	2000	2001	2002	Percent change 2002/2001
Distribution by industry:						
Publishing	511	13.4	16.3	15.0	16.4	9
Newspaper, periodical, book, and database	5111	2.0	2.0	2.7	2.8	4
Software	5112	16.7	20.4	19.3	21.4	11
Broadcasting and telecommunications	513	0.4	0.4	0.5	0.7 (S)	40
Radio and television broadcasting	5131	(D)	(D)	1.1	0.2	-82
Telecommunications	5133	(D)	(D)	0.5	0.7 (S)	40
Other broadcasting and telecommunications	513 minus (5131, 5133)	(D)	(D)	(D)	9.2	(na)
Other information	51 minus (511, 513)	8.6	4.9	4.7	2.0	-57
Finance, insurance, and real estate	52, 53	0.5	1.2	0.7	0.6	-14
Professional, scientific, and technical services	54	11.6	14.9	13.7	11.2	-18
Architectural, engineering, and related services	5413	6.8	7.1	5.2	5.3	2
Computer systems design and related services	5415	11.0	11.8	16.5	14.3	-13
Scientific R&D services	5417	32.1	32.3	36.5	17.6	-52
Other professional, scientific, and technical services	54 minus (5413, 5415, 5417)	1.9	6.1	1.9	2.8	47
Management of companies and enterprises	55	5.7	4.4	7.8	7.6	-3
Health care services	621–23	6.4	2.8	4.1	15.1	268
Other nonmanufacturing	56, 61, 624, 71, 72, 81	0.9	1.0	1.4	1.9	36
Distribution by size of company (number of employees):						
Total	(na)	3.3	3.4	3.8	3.6	-5
5 to 24	(na)	16.6	17.2	12.9	7.1	-45
25 to 49	(na)	10.6	13.4	10.6	8.9	-16
50 to 99	(na)	13.0	11.2	10.4	7.1	-32
100 to 249	(na)	6.9	8.0	10.8	9.0	-17
250 to 499	(na)	5.9	6.1	8.0	4.0	-50
500 to 999	(na)	4.0	4.7	5.7	6.9	21
1,000 to 4,999	(na)	3.1	3.5	4.2	4.0	-5
5,000 to 9,999	(na)	2.2	2.2	2.5	3.4	36
10,000 to 24,999	(na)	2.8	3.1	3.5	2.9	-17
25,000 or more	(na)	2.8	2.9	3.0	2.8	-7

(D) = data have been withheld to avoid disclosing operations of individual companies; (S) = indicates imputation of more than 50 percent; (--) = indicates data not collected; (na) = not applicable.

[a] Some percentages for 1999 have been revised since originally published.

NOTES: The R&D in this table is the industrial R&D performed within company facilities funded from all sources except the federal government. The funds predominantly are the company's own, but also include funds from outside organizations such as other companies, research institutions, universities and colleges, nonprofit organizations, and state governments. Excluded from this table are company-funded R&D not performed within the company (e.g., R&D contracted out to other organizations) and company-funded R&D not performed within the 50 U.S. states or DC (e.g., R&D not performed on U.S. soil by foreign subsidiaries or other foreign organizations).

For information on sampling for 1999–2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

TABLE 28. Funds for industrial R&D performance in the United States as a percent of net sales of companies that performed industrial R&D in the United States, by industry and size of company, ranked by size of R&D program: 2002

Industry and size of company	NAICS codes	All R&D funds			R&D funds as a percent of net sales		
		First 4 companies	Next 4 companies	Next 12 companies	First 4 companies	Next 4 companies	Next 12 companies
		Millions of dollars			Percent		
Distribution by industry:							
All industries	21–23, 31–33, 42, 44–81	19,130	12,500	23,697	12.5	6.0	6.1
Manufacturing	31–33	16,860	9,897	17,886	6.5	5.1	6.9
Food	311	971	305	357	1.3	0.8	0.4
Beverage and tobacco products	312	124	33	4	0.5	0.8	0.2
Textiles, apparel, and leather	313–16	67	41 (S)	64	0.9	2.0	1.3
Wood products	321	98	12	11	1.3	0.3	0.2
Paper, printing and support activities	322, 323	2,132	187	176	3.6	0.8	0.2
Petroleum and coal products	324	1,093	124	10	0.5	0.1	0.5
Chemicals	325	6,391	4,278	4,704	8.9	10.8	8.8
Basic chemicals	3251	467	288	501	2.6	5.5	3.9
Resin, synthetic rubber, fibers, and filament	3252	1,974	269	138	5.6	2.9	1.2
Pharmaceuticals and medicines	3254	6,391	3,905	2,566	8.9	12.1	10.0
Other chemicals	325 minus (3251–52, 3254)	1,204	236 (S)	316	6.4	2.7	1.9
Plastics and rubber products	326	553	148	251	3.4	1.8	2.4
Nonmetallic mineral products	327	197	82	84	1.6	1.9	1.2
Primary metals	331	276	57	84	1.2	0.4	0.4
Fabricated metal products	332	430	169	222	2.5	3.0	1.1
Machinery	333	2,077	736	1,046	9.7	4.9	3.7
Computer and electronic products	334	11,787	3,918	6,235	17.5	9.8	8.0
Computers and peripheral equipment	3341	1,783	427	337	5.7	24.4	12.4
Communications equipment	3342	4,081	616	765	16.0	11.6	8.4
Semiconductor and other electronic components	3344	5,789	1,696 (S)	1,927	14.5	6.9	23.2
Navigational, measuring, electromedical, and control instruments	3345	7,334	2,291	2,016	14.2	12.7	12.4
Other computer and electronic products	334 minus (3341–42, 3344–45)	308	68	47	5.4	11.0	5.6
Electrical equipment, appliances, and components	335	560	287	376	2.6	4.0	3.0
Transportation equipment	336	13,806	6,179	3,739	3.7	4.2	4.6
Motor vehicles, trailers, and parts	3361–63	12,894	836	758	3.8	3.1	1.2
Aerospace products and parts	3364	7,091	1,796	689	4.0	4.3	7.2
Other transportation equipment	336 minus (3361–64)	997	127	69	6.3	1.8	1.2
Furniture and related products	337	113	48	35	0.9	0.8	0.9
Miscellaneous manufacturing	339	4,187	717	779	12.9	10.1	5.4
Medical equipment and supplies	3391	4,187	666	470	12.9	12.2	6.6
Other miscellaneous manufacturing	339 minus (3391)	398	197	156	4.4	5.4	3.1
Other manufacturing	31–33 minus (311–16, 321–27, 331–37, 339)	--	--	--	--	--	--
Nonmanufacturing	21–23, 42, 44–81	14,771	6,234	9,231	14.4	25.1	14.8
Mining, extraction, and support activities	21	625	45	40	4.7	0.8	1.2
Utilities	22	61	18 (S)	25	0.2	0.1	-
Construction	23	115	16	13	1.1	0.9	0.1
Trade	42, 44, 45	11,262	3,104	3,625	11.3	12.4	15.6
Transportation and warehousing	48, 49	263	14	4	0.6	0.1	-
Information	51	7,397	1,185	2,164	19.1	1.8	3.2

TABLE 28. Funds for industrial R&D performance in the United States as a percent of net sales of companies that performed industrial R&D in the United States, by industry and size of company, ranked by size of R&D program: 2002

Industry and size of company	NAICS codes	All R&D funds: First 4 companies	All R&D funds: Next 4 companies	All R&D funds: Next 12 companies	R&D funds as a percent of net sales: First 4 companies	R&D funds as a percent of net sales: Next 4 companies	R&D funds as a percent of net sales: Next 12 companies
		Millions of dollars			Percent		
Distribution by industry:							
Publishing	511	6,537	988	1,882	23.9	22.2	12.4
Newspaper, periodical, book, and database	5111	512	60	28	4.1	3.1	0.4
Software	5112	6,537	988	1,758	23.9	22.2	23.4
Broadcasting and telecommunications	513	625 (S)	134 (S)	108	0.4	0.4	0.3
Radio and television broadcasting	5131	(z)	-	-	0.1	-	-
Telecommunications	5133	625 (S)	(D)	90	0.4	0.4	0.3
Other broadcasting and telecommunications	513 minus (5131, 5133)	20 (S)	(D)	-	7.0	0.3	-
Other information	51 minus (511, 513)	1,485	228	258	10.0	0.9	6.6
Finance, insurance, and real estate	52, 53	610	253	334	1.0	0.6	0.5
Professional, scientific, and technical services	54	6,178	2,145	2,252	30.4	87.1	51.4
Architectural, engineering, and related services	5413	1,138	335	542	40.4	38.3	16.3
Computer systems design and related services	5415	5,353	632	971	37.7	27.7	7.9
Scientific R&D services	5417	2,645	749	1,293	28.5	260.1	96.6
Other professional, scientific, and technical services	54 minus (5413, 5415, 5417)	335	125 (S)	94	3.8	13.3	1.0
Management of companies and enterprises	55	96	10	(z)	10.3	7.8	0.3
Health care services	621–23	387	48	47 (S)	4.7	15.5	0.5
Other nonmanufacturing	56, 61, 624, 71, 72, 81	299	124	163	3.1	4.1	2.5
Distribution by size of company (number of employees):							
Total	(na)	19,130	12,500	23,697	12.5	6.0	6.1
5 to 24	(na)	60	22 (S)	50	431.2	117.8	17.6
25 to 49	(na)	90	54	128	102.4	185.5	182.1
50 to 99	(na)	153	102	216	149.2	291.4	139.5
100 to 249	(na)	330	266	607	471.8	121.9	191.6
250 to 499	(na)	540	339	740	167.8	89.0	17.7
500 to 999	(na)	769	596	1,134	115.9	74.5	36.6
1,000 to 4,999	(na)	2,193	1,599	3,361	53.3	22.4	27.6
5,000 to 9,999	(na)	3,988	2,474	4,808	30.8	22.3	13.2
10,000 to 24,999	(na)	7,961	3,918	6,405	18.8	13.3	7.4
25,000 or more	(na)	19,130	12,070	21,583	12.5	5.7	5.5

(D) = data have been withheld to avoid disclosing operations of individual companies; (S) = indicates imputation of more than 50 percent; (z) = indicates data less than half the unit shown; (--) = indicates data not collected; (-) = indicates a value of zero or a value rounded to zero; (na) = not applicable.

NOTES: Excludes data for federally funded research and development centers. Rankings were based on total (company, federal, and other) R&D funds. For information on sampling for 2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002

TABLE 29. Company and other nonfederal funds for industrial R&D performance in the United States as a percent of net sales of companies that performed industrial R&D in the United States, by industry and size of company, ranked by size of nonfederally funded R&D program: 2002

Industry and size of company	NAICS codes	Company and other nonfederal R&D funds			Company and other nonfederal R&D funds as a percent of net sales		
		First 4 companies	Next 4 companies	Next 12 companies	First 4 companies	Next 4 companies	Next 12 companies
		Millions of dollars			Percent		
Distribution by industry:							
All industries	21–23, 31–33, 42, 44–81	18,251	12,009	20,772	11.4	5.7	6.5
Manufacturing	31–33	15,509	8,323	14,903	5.7	3.8	7.1
Food	311	971	305	357	1.3	0.8	0.4
Beverage and tobacco products	312	124	33	4	0.5	0.8	0.2
Textiles, apparel, and leather	313–16	67	37	(S) 59	0.9	1.3	1.4
Wood products	321	98	11	11	1.3	0.3	0.2
Paper, printing and support activities	322, 323	2,106	187	176	3.6	0.8	0.2
Petroleum and coal products	324	1,092	124	10	0.5	0.1	0.5
Chemicals	325	6,387	4,242	4,591	8.9	10.4	8.8
Basic chemicals	3251	449	285	482	2.5	5.4	2.8
Resin, synthetic rubber, fibers, and filament	3252	1,961	268	138	5.6	2.9	1.2
Pharmaceuticals and medicines	3254	6,387	3,905	2,566	8.9	12.1	10.0
Other chemicals	325 minus (3251–52, 3254)	1,067	236	(S) 316	5.6	2.7	1.9
Plastics and rubber products	326	553	148	251	3.4	1.8	2.4
Nonmetallic mineral products	327	197	82	84	1.6	1.9	1.2
Primary metals	331	267	57	81	1.2	0.4	0.4
Fabricated metal products	332	422	145	203	2.3	3.2	1.0
Machinery	333	2,051	734	1,032	9.5	6.4	3.3
Computer and electronic products	334	8,630	3,236	5,481	12.5	9.7	6.9
Computers and peripheral equipment	3341	1,783	414	335	5.7	22.1	12.9
Communications equipment	3342	4,046	515	702	15.9	16.3	6.2
Semiconductor and other electronic components	3344	5,789	1,696	(S) 1,927	14.5	6.9	23.2
Navigational, measuring, electromedical, and control instruments	3345	3,530	1,513	1,601	7.6	7.8	7.9
Other computer and electronic products	334 minus (3341–42, 3344–45)	307	68	47	5.3	11.0	5.6
Electrical equipment, appliances, and components	335	560	287	357	2.6	4.0	2.5
Transportation equipment	336	13,266	3,770	2,352	3.2	3.3	3.1
Motor vehicles, trailers, and parts	3361–63	12,843	836	758	3.8	3.1	1.2
Aerospace products and parts	3364	4,193	813	279	2.2	2.5	2.9
Other transportation equipment	336 minus (3361–64)	673	127	68	4.3	1.8	1.2
Furniture and related products	337	113	48	33	0.9	0.8	0.9
Miscellaneous manufacturing	339	4,187	694	779	12.9	9.8	5.4
Medical equipment and supplies	3391	4,187	666	470	12.9	12.2	6.6
Other miscellaneous manufacturing	339 minus (3391)	375	197	156	4.2	5.4	3.1
Other manufacturing	31–33 minus (311–16, 321–27, 331–37, 339)	--	--	--	--	--	--
Nonmanufacturing	21–23, 42, 44–81	14,751	6,022	7,900	14.4	26.7	12.7
Mining, extraction, and support activities	21	625	45	40	4.7	0.8	1.2
Utilities	22	43	18	(S) 25	0.1	0.1	-
Construction	23	115	16	13	1.1	0.9	0.1
Trade	42, 44, 45	11,240	3,104	3,625	11.3	12.4	15.6
Transportation and warehousing	48, 49	263	14	4	0.6	0.1	-
Information	51	7,372	1,185	2,154	19.1	1.8	3.2

TABLE 29. Company and other nonfederal funds for industrial R&D performance in the United States as a percent of net sales of companies that performed industrial R&D in the United States, by industry and size of company, ranked by size of nonfederally funded R&D program: 2002

Industry and size of company	NAICS codes	Company and other nonfederal R&D funds			Company and other nonfederal R&D funds as a percent of net sales		
		First 4 companies	Next 4 companies	Next 12 companies	First 4 companies	Next 4 companies	Next 12 companies
		Millions of dollars			Percent		
Distribution by industry:							
Publishing	511	6,537	988	1,882	23.9	22.2	12.4
Newspaper, periodical, book, and database	5111	512	60	28	4.1	3.1	0.4
Software	5112	6,537	988	1,758	23.9	22.2	23.4
Broadcasting and telecommunications	513	614 (S)	134 (S)	108	0.4	0.4	0.3
Radio and television broadcasting	5131	(z)	-	-	0.1	-	-
Telecommunications	5133	614 (S)	(D)	90	0.4	0.4	0.3
Other broadcasting and telecommunications	513 minus (5131, 5133)	20 (S)	(D)	-	7.0	0.3	-
Other information	51 minus (511, 513)	1,460	228	258	9.9	0.9	6.6
Finance, insurance, and real estate	52, 53	610	253	334	1.0	0.6	0.5
Professional, scientific, and technical services	54	5,254	1,124	1,871	37.2	37.3	19.3
Architectural, engineering, and related services	5413	696	231	331	25.2	32.0	2.6
Computer systems design and related services	5415	4,278	526	969	49.8	6.6	7.9
Scientific R&D services	5417	1,910 (S)	695	1,244	23.5	49.3	134.9
Other professional, scientific, and technical services	54 minus (5413, 5415, 5417)	335	117 (S)	76	3.8	12.2	0.9
Management of companies and enterprises	55	96	10	(z)	10.3	7.8	0.3
Health care services	621–23	385	43 (S)	37	4.7	0.9	0.8
Other nonmanufacturing	56, 61, 624, 71, 72, 81	284	101	140	2.9	2.3	2.7
Distribution by size of company (number of employees):							
Total	(na)	18,251	12,009	20,772	11.4	5.7	6.5
5 to 24	(na)	60	22 (S)	46	431.2	117.8	10.3
25 to 49	(na)	90	54	122 (S)	102.4	158.1	199.1
50 to 99	(na)	132	96	209	280.4	403.1	123.0
100 to 249	(na)	330	265	603	471.8	122.5	178.0
250 to 499	(na)	536	321	719	211.1	84.6	17.2
500 to 999	(na)	769	584	1,064	115.9	79.3	34.2
1,000 to 4,999	(na)	2,154	1,495	3,255	29.6	39.3	27.3
5,000 to 9,999	(na)	3,725	2,284	4,327	26.1	21.3	11.8
10,000 to 24,999	(na)	7,961	3,916	5,885	18.8	13.3	6.6
25,000 or more	(na)	17,975	11,613	17,770	11.4	5.3	4.8

(D) = data have been withheld to avoid disclosing operations of individual companies; (S) = indicates imputation of more than 50 percent; (z) = indicates data less than half the unit shown; (--) = indicates data not collected; (-) = indicates a value of zero or a vlue rounded to zero; (na) = not applicable.

NOTES: Rankings were based on company and other nonfederal funds for industrial R&D performance.

The R&D in this table is the industrial R&D performed within company facilities funded from all sources except the federal government. The funds predominantly are the company's own, but also include funds from outside organizations such as other companies, research institutions, universities and colleges, nonprofit organizations, and state governments. Excluded from this table are company-funded R&D not performed within the company (e.g., R&D contracted out to other organizations) and company-funded R&D not performed within the 50 U.S. states or DC (e.g., R&D not performed on U.S. soil by foreign subsidiaries or other foreign organizations). For information on sampling for 2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

TABLE 30. Federal funds for industrial R&D performance in the United States as a percent of net sales of companies that performed industrial R&D in the United States, by industry and size of company, ranked by size of federally funded R&D program: 2002

Industry and size of company	NAICS codes	Federal R&D funds			Federal R&D funds as a percent of net sales		
		First 4 companies	Next 4 companies	Next 12 companies	First 4 companies	Next 4 companies	Next 12 companies
		Millions of dollars			Percent		
Distribution by industry:							
All industries	21–23, 31–33, 42, 44–81	6,883	2,397	2,986	7.6	9.8	1.8
Manufacturing	31–33	6,389	1,654	1,901	6.3	3.9	1.4
Food	311	(D)	-	-	-	-	-
Beverage and tobacco products	312	-	-	-	-	-	-
Textiles, apparel, and leather	313–16	(D)	-	-	3.1	-	-
Wood products	321	(D)	-	-	-	-	-
Paper, printing and support activities	322, 323	(D)	-	-	0.3	-	-
Petroleum and coal products	324	(D)	-	-	-	-	-
Chemicals	325	206	14	11	0.8	0.1	0.1
Basic chemicals	3251	67	4	(z)	1.0	0.1	14.2
Resin, synthetic rubber, fibers, and filament	3252	13	-	-	0.1	-	-
Pharmaceuticals and medicines	3254	(D)	1	-	0.1	0.1	-
Other chemicals	325 minus (3251–52, 3254)	(D)	-	-	1.0	-	-
Plastics and rubber products	326	(D)	-	-	0.1	-	-
Nonmetallic mineral products	327	(D)	-	-	0.1	-	-
Primary metals	331	12	-	-	0.1	-	-
Fabricated metal products	332	58	3	(z)	2.1	0.8	-
Machinery	333	46	2	(z)	0.3	0.3	-
Computer and electronic products	334	4,987	250	114	14.0	1.1	0.5
Computers and peripheral equipment	3341	19	1	-	11.1	0.7	-
Communications equipment	3342	206	(z)	-	0.9	2.7	-
Semiconductor and other electronic components	3344	(D)	5	1	3.6	2.5	-
Navigational, measuring, electromedical, and control instruments	3345	4,987	101	37	14.0	8.0	0.2
Other computer and electronic products	334 minus (3341–42, 3344–45)	(D)	-	-	0.2	-	-
Electrical equipment, appliances, and components	335	43	(D)	(z)	34.5	1.9	0.2
Transportation equipment	336	3,002	(D)	459	3.1	1.0	0.1
Motor vehicles, trailers, and parts	3361–63	(D)	(D)	-	-	-	-
Aerospace products and parts	3364	3,002	1,047	256	3.1	0.9	3.7
Other transportation equipment	336 minus (3361–64)	(D)	-	-	4.9	-	-
Furniture and related products	337	(D)	-	-	2.1	-	-
Miscellaneous manufacturing	339	32	2	1	1.3	0.1	0.6
Medical equipment and supplies	3391	(D)	1	(z)	8.5	-	0.4
Other miscellaneous manufacturing	339 minus (3391)	(D)	-	-	0.7	-	-
Other manufacturing	31-33 minus (311–16, 321–27, 331–37, 339)	--	--	--	--	--	--
Nonmanufacturing	21–23, 42, 44–81	2,539	350	502	30.0	48.6	29.8
Mining, extraction, and support activities	21	1 (S)	-	-	-	-	-
Utilities	22	(D)	-	-	0.1	-	-
Construction	23	(z)	-	-	2.5	-	-
Trade	42, 44, 45	27	2	-	0.1	-	-
Transportation and warehousing	48, 49	(D)	-	-	-	-	-
Information	51	65	14	1	0.1	10.5	1.3

TABLE 30. Federal funds for industrial R&D performance in the United States as a percent of net sales of companies that performed industrial R&D in the United States, by industry and size of company, ranked by size of federally funded R&D program: 2002

Industry and size of company	NAICS codes	Federal R&D funds			Federal R&D funds as a percent of net sales		
		First 4 companies	Next 4 companies	Next 12 companies	First 4 companies	Next 4 companies	Next 12 companies
		Millions of dollars			Percent		
Publishing	511	39	1	(D)	18.8	2.3	0.1
Newspaper, periodical, book, and database	5111	-	-	-	-	-	-
Software	5112	39	1	(D)	18.8	2.3	0.1
Broadcasting and telecommunications	513	(D)	-	-	-	-	-
Radio and television broadcasting	5131	-	-	-	-	-	-
Telecommunications	5133	10	(S) -	-	-	-	-
Other broadcasting and telecommunications	513 minus (5131, 5133)	-	-	-	-	-	-
Other information	51 minus (511, 513)	(D)	-	-	0.2	-	-
Finance, insurance, and real estate	52, 53	-	-	-	-	-	-
Professional, scientific, and technical services	54	2,539	350	482	30.0	48.6	33.3
Architectural, engineering, and related services	5413	709	163	191	82.1	16.6	9.2
Computer systems design and related services	5415	(D)	33	39	17.3	58.6	28.0
Scientific R&D services	5417	1,050	176	278	60.1	67.2	32.6
Other professional, scientific, and technical services	54 minus (5413, 5415, 5417)	(D)	1	-	33.0	81.4	-
Management of companies and enterprises	55	-	-	-	-	-	-
Health care services	621–23	16	1	-	2.5	0.9	-
Other nonmanufacturing	56, 61, 624, 71, 72, 81	69	1	-	16.3	1.6	-
Distribution by size of company (number of employees):							
Total	(na)	6,883	2,397	2,986	7.6	9.8	1.8
5 to 24	(na)	16	9	20	90.4	72.0	74.4
25 to 49	(na)	32	21	44	95.5	91.6	78.1
50 to 99	(na)	92	44	75	72.8	69.8	64.4
100 to 249	(na)	109	79	161	64.3	75.7	70.2
250 to 499	(na)	222	142	207	74.9	57.2	35.6
500 to 999	(na)	354	113	51	82.2	17.3	3.9
1,000 to 4,999	(na)	725	136	105	36.2	7.3	1.8
5,000 to 9,999	(na)	1,439	120	15	24.5	1.6	0.1
10,000 to 24,999	(na)	1,149	73	4	7.2	0.3	-
25,000 or more	(na)	6,883	1,722	641	7.6	1.2	0.2

(D) = data have been withheld to avoid disclosing operations of individual companies; (S) = indicates imputation of more than 50 percent; (z) = indicates data less than half the unit shown; (--) = indicates data not collected; (-) = indicates a value of zero or a value rounded to zero; (na) = not applicable.

NOTES: Excludes data for federally funded research and development centers. Rankings were based on Federal R&D funds. For information on sampling for 2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

TABLE 31. Trends in total (federal plus company and other) funds for performance of industrial basic research, applied research, and development in the United States: 1953–2002

(Millions of dollars)

Year	All R&D		Basic research		Applied research		Development	
	Current dollars	Constant 2000 dollars	Current dollars	Constant 2000 dollars	Current dollars	Constant 2000 dollars	Current dollars	Constant 2000 dollars
1953 [a]	3,630	19,899	151	828	726	3,980	2,753	15,092
1954 [a]	4,070	22,098	166	901	814	4,420	3,090	16,777
1955 [a]	4,640	24,756	189	1,008	928	4,951	3,523	18,796
1956	6,605	34,060	253	1,305	1,268	6,539	5,084	26,216
1957	7,731	38,583	271	1,352	1,670	8,335	5,790	28,896
1958	8,389	40,925	295	1,439	1,911	9,323	6,183	30,163
1959	9,618	46,351	320	1,542	1,991	9,595	7,307	35,214
1960	10,509	49,948	376	1,787	2,029	9,644	8,104	38,517
1961	10,908	51,266	395	1,856	1,977	9,292	8,536	40,118
1962	11,464	53,152	488	2,263	2,449	11,355	8,527	39,535
1963	12,630	57,941	522	2,395	2,457	11,272	9,651	44,274
1964	13,512	61,054	549	2,481	2,600	11,748	10,363	46,825
1965	14,185	62,945	592	2,627	2,658	11,795	10,935	48,523
1966	15,548	67,084	624	2,692	2,843	12,267	12,081	52,125
1967	16,385	68,577	629	2,633	2,915	12,200	12,841	53,744
1968	17,429	69,963	642	2,577	3,124	12,540	13,663	54,846
1969	18,308	70,015	618	2,363	3,287	12,570	14,403	55,081
1970	18,067	65,618	602	2,186	3,427	12,447	14,038	50,985
1971	18,320	63,369	590	2,041	3,415	11,813	14,315	49,516
1972	19,552	64,814	593	1,966	3,514	11,649	15,445	51,199
1973	21,249	66,716	631	1,981	3,825	12,010	16,793	52,726
1974	22,887	65,908	699	2,013	4,288	12,348	17,900	51,547
1975	24,187	63,648	730	1,921	4,570	12,026	18,887	49,701
1976	26,997	67,163	819	2,038	5,112	12,718	21,066	52,408
1977	29,825	69,764	911	2,131	5,636	13,183	23,278	54,450
1978 [a]	33,304	72,785	1,035	2,262	6,300	13,769	25,969	56,755
1979	38,226	77,151	1,158	2,337	7,225	14,582	29,843	60,231
1980 [a]	44,505	82,351	1,325	2,452	8,450	15,636	34,730	64,264
1981	51,810	87,636	1,614	2,730	10,699	18,097	39,497	66,809
1982 [a]	58,650	93,501	1,904	3,035	12,323	19,646	44,423	70,820
1983	65,268	100,093	2,223	3,409	13,927	21,358	49,118	75,326
1984	74,800	110,561	2,608	3,855	15,765	23,302	56,427	83,404
1985	84,239	120,837	2,862	4,105	18,255	26,186	63,122	90,546
1986 [b]	87,823	123,261	4,047	5,680	19,759	27,732	64,017	89,849
1987	92,155	125,902	4,324	5,907	19,813	27,068	68,018	92,926
1988 [c]	97,015	128,168	4,500	5,945	20,748	27,411	71,767	94,813
1989 [c]	102,055	129,913	5,216	6,640	22,691	28,885	74,148	94,388
1990 [c]	109,727	134,487	5,128	6,285	24,785	30,378	79,814	97,824
1991 [c]	116,952	138,497	7,837	9,281	27,446	32,502	81,669	96,714
1992 [d]	119,110	137,882	7,002	8,106	26,168	30,292	85,940	99,484
1993 [d]	117,400	132,835	6,919	7,829	24,686	27,931	85,796	97,076
1994 [d]	119,595	132,502	7,017	7,774	23,490	26,025	89,088	98,703
1995 [d].	132,103	143,426	6,099	6,622	27,454	29,807	98,552	106,999
1996 [d]	144,667	154,144	8,207	8,745	29,241	31,157	107,218	114,242
1997 [d]	157,539	165,112	10,419	10,920	32,642	34,211	114,478	119,981
1998 [d, e]	169,180	175,367	6,421	6,656	32,438	33,624	130,320	135,086
1999 [d, e]	182,711	186,692	7,117	7,272	36,692	37,491	138,902	141,928

TABLE 31. Trends in total (federal plus company and other) funds for performance of industrial basic research, applied research, and development in the United States: 1953–2002

(Millions of dollars)

Year	All R&D		Basic research		Applied research		Development	
	Current dollars	Constant 2000 dollars	Current dollars	Constant 2000 dollars	Current dollars	Constant 2000 dollars	Current dollars	Constant 2000 dollars
2000 [d, e]	199,539	199,539	7,490	7,490	39,082	39,082	152,967	152,967
2001 [d, e, f]	198,505	193,904	7,911	7,728	43,486	42,478	147,108	143,699
2002 [d, e, f]	190,809	183,567	7,424	7,142	28,072	27,007	155,313	149,418

[a] Character-of-work estimates were made by the National Science Foundation. See National Science Foundation, *National Patterns of R&D Resources: 1998* (NSF 99-335).

[b] The character-of-work estimation procedure was revised for 1986 and later years and resulting statistics are not directly comparable with earlier years.

[c] As a result of a new sample design, statistics for 1988–91 were revised after they were originally published and are not directly comparable with earlier years. These statistics now better reflect R&D performance among firms in nonmanufacturing industries and small firms in all industries.

[d] As a result of annual sampling, implemented to produce statistics that better reflect R&D performance among firms in nonmanufacturing industries and small firms in all industries, statistics for 1992 and later years are not directly comparable with statistics for earlier years.

[e] Using data collected during recent cycles of the survey, NSF investigated a potential reporting anomaly for basic research and found that several large companies, known to develop and manufacture products, reported all R&D as basic research. This phenomenon prompted a renewed effort to strengthen character of work estimates produced from the survey. Consequently, improved edit checks were applied during statistical processing to produce the basic research, applied research, and development estimates beginning in 2001. Also, estimates for 1998, 1999, and 2000 were recalculated.

[f] Beginning with 2001, statistics for total and federally funded industrial R&D exclude data for federally funded research and development centers.

NOTES: Gross domestic product (GDP) implicit price deflators were used to convert current dollars to constant (2000) dollars. For information on sampling for 1999–2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

TABLE 32. Trends in company and other nonfederal funds for performance of industrial basic research, applied research, and development in the United States: 1953–2002

(Millions of dollars)

Year	All R&D		Basic research		Applied research		Development	
	Current dollars	Constant 2000 dollars	Current dollars	Constant 2000 dollars	Current dollars	Constant 2000 dollars	Current dollars	Constant 2000 dollars
1953 [a]	2,200	12,060	132	724	438	2,401	1,630	8,936
1954 [a]	2,320	12,596	143	776	492	2,671	1,685	9,149
1955 [a]	2,460	13,125	162	864	560	2,988	1,738	9,273
1956	3,277	16,898	216	1,114	794	4,094	2,267	11,690
1957	3,396	16,949	230	1,148	992	4,951	2,174	10,850
1958	3,630	17,709	252	1,229	1,137	5,547	2,241	10,933
1959	3,983	19,195	248	1,195	1,178	5,677	2,557	12,323
1960	4,428	21,046	297	1,412	1,196	5,684	2,935	13,950
1961	4,668	21,939	314	1,476	1,165	5,475	3,189	14,988
1962	5,029	23,317	345	1,600	1,438	6,667	3,246	15,050
1963	5,360	24,589	375	1,720	1,450	6,652	3,535	16,217
1964	5,792	26,171	384	1,735	1,560	7,049	3,848	17,387
1965	6,445	28,599	406	1,802	1,620	7,189	4,419	19,609
1966	7,216	31,134	451	1,946	1,804	7,784	4,961	21,405
1967	8,020	33,566	427	1,787	1,849	7,739	5,744	24,041
1968	8,869	35,602	462	1,855	2,081	8,354	6,326	25,394
1969	9,857	37,696	458	1,752	2,272	8,689	7,127	27,256
1970	10,288	37,365	444	1,613	2,378	8,637	7,466	27,116
1971	10,654	36,852	456	1,577	2,441	8,443	7,757	26,832
1972	11,535	38,238	463	1,535	2,562	8,493	8,510	28,210
1973	13,104	41,143	499	1,567	2,832	8,892	9,773	30,685
1974	14,667	42,237	536	1,544	3,263	9,397	10,868	31,297
1975	15,582	41,004	573	1,508	3,440	9,052	11,569	30,444
1976	17,436	43,377	634	1,577	3,912	9,732	12,890	32,068
1977	19,340	45,238	701	1,640	4,311	10,084	14,328	33,515
1978 [a]	22,115	48,332	785	1,716	4,870	10,643	16,460	35,973
1979	25,708	51,886	893	1,802	5,670	11,444	19,145	38,640
1980 [a]	30,476	56,392	1,035	1,915	6,550	12,120	22,891	42,357
1981	35,428	59,926	1,313	2,221	8,359	14,139	25,756	43,566
1982 [a]	40,105	63,936	1,523	2,428	9,363	14,927	29,219	46,582
1983	44,588	68,379	1,760	2,699	10,286	15,774	32,542	49,906
1984	51,404	75,980	2,132	3,151	11,541	17,059	37,731	55,770
1985	57,043	81,825	2,373	3,404	12,908	18,516	41,762	59,906
1986 [b]	59,932	84,115	3,496	4,907	15,082	21,168	41,354	58,041
1987	61,403	83,889	3,583	4,895	15,153	20,702	42,667	58,291
1988 [c]	66,672	88,082	3,507	4,633	16,531	21,839	46,634	61,609
1989 [c]	73,501	93,564	3,832	4,878	17,993	22,905	51,676	65,782
1990 [c]	81,602	100,015	3,760	4,608	18,432	22,591	59,410	72,816
1991 [c]	90,580	107,267	6,125	7,253	21,425	25,372	63,030	74,642
1992 [d]	94,388	109,263	5,816	6,733	21,184	24,523	67,385	78,005
1993 [d]	94,591	107,027	5,961	6,745	19,956	22,580	68,678	77,707
1994 [d]	97,131	107,614	6,078	6,734	19,372	21,463	71,683	79,419
1995 [d]	108,652	117,965	5,379	5,840	23,755	25,791	79,516	86,331
1996 [d]	121,015	128,943	6,848	7,297	25,370	27,032	88,798	94,615
1997 [d]	133,611	140,033	8,766	9,187	29,782	31,214	95,064	99,634
1998 [d, e]	145,016	150,320	4,851	5,028	29,576	30,658	110,590	114,635
1999 [d, e]	160,176	163,666	5,362	5,479	33,309	34,035	121,505	124,152

TABLE 32. Trends in company and other nonfederal funds for performance of industrial basic research, applied research, and development in the United States: 1953–2002

(Millions of dollars)

Year	All R&D		Basic research		Applied research		Development	
	Current dollars	Constant 2000 dollars	Current dollars	Constant 2000 dollars	Current dollars	Constant 2000 dollars	Current dollars	Constant 2000 dollars
2000 [d, e]	180,421	180,421	6,017	6,017	36,130	36,130	138,274	138,274
2001 [d, e]	181,606	177,397	7,157	6,991	39,883	38,959	134,566	131,447
2002 [d, e]	174,408	167,789	6,536	6,288	25,620	24,648	142,252	136,853

[a] Character-of-work estimates were made by the National Science Foundation. See National Science Foundation, *National Patterns of R&D Resources 1998* (NSF 99-335).

[b] The character-of-work estimation procedure was revised for 1986 and later years and resulting statistics are not directly comparable with earlier years

[c] As a result of a new sample design, statistics for 1988–91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries.

[d] As a result of annual sampling, implemented to produce statistics that better reflect R&D performance among firms in nonmanufacturing industries and small firms in all industries, statistics for 1992 and later years are not directly comparable with statistics for earlier years.

[e] Using data collected during recent cycles of the survey, NSF investigated a potential reporting anomaly for basic research and found that several large companies, known to develop and manufacture products, reported all R&D as basic research. This phenomenon prompted a renewed effort to strengthen character-of-work estimates produced from the survey. Consequently, improved edit checks were applied during statistical processing to produce the basic research, applied research, and development estimates beginning in 2001. Also, estimates for 1998, 1999, and 2000 were recalculated.

NOTES: The R&D in this table is the industrial R&D performed within company facilities funded from all sources except the federal government. The funds predominantly are the company's own, but also include funds from outside organizations such as other companies, research institutions, universities and colleges, nonprofit organizations, and state governments. Excluded from this table are company-funded R&D not performed within the company (e.g., R&D contracted out to other organizations) and company-funded R&D not performed within the 50 U.S. states or DC (e.g., R&D not performed on U.S. soil by foreign subsidiaries or other foreign organizations). Gross domestic product (GDP) implicit price deflators were used to convert current dollars to constant (2000) dollars. For information on sampling for 1999–2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

TABLE 33. Trends in federal funds for performance of industrial basic research, applied research, and development in the United States: 1953–2002

(Millions of dollars)

Year	All R&D		Basic research		Applied research		Development	
	Current dollars	Constant 2000 dollars	Current dollars	Constant 2000 dollars	Current dollars	Constant 2000 dollars	Current dollars	Constant 2000 dollars
1953 [a]	1,430	7,839	19	104	288	1,579	1,123	6,156
1954 [a]	1,750	9,501	23	125	322	1,748	1,405	7,628
1955 [a]	2,180	11,631	27	144	368	1,963	1,785	9,523
1956	3,328	17,161	37	191	474	2,444	2,817	14,526
1957	4,335	21,635	41	205	678	3,384	3,616	18,046
1958	4,759	23,216	43	210	774	3,776	3,942	19,231
1959	5,635	27,156	72	347	813	3,918	4,750	22,891
1960	6,081	28,902	79	375	833	3,959	5,169	24,567
1961	6,240	29,327	81	381	812	3,816	5,347	25,130
1962	6,434	29,831	143	663	1,011	4,687	5,281	24,485
1963	7,270	33,351	147	674	1,007	4,620	6,116	28,057
1964	7,720	34,883	165	746	1,040	4,699	6,515	29,438
1965	7,740	34,346	186	825	1,038	4,606	6,516	28,914
1966	8,332	35,950	173	746	1,039	4,483	7,120	30,720
1967	8,365	35,010	202	845	1,066	4,462	7,097	29,703
1968	8,560	34,361	180	723	1,043	4,187	7,337	29,452
1969	8,451	32,319	160	612	1,015	3,882	7,276	27,826
1970	7,779	28,253	158	574	1,049	3,810	6,572	23,869
1971	7,666	26,517	134	464	974	3,369	6,558	22,684
1972	8,017	26,576	130	431	952	3,156	6,935	22,989
1973	8,145	25,573	132	414	993	3,118	7,020	22,041
1974	8,220	23,671	163	469	1,025	2,952	7,032	20,250
1975	8,605	22,644	157	413	1,130	2,974	7,318	19,257
1976	9,561	23,786	185	460	1,200	2,985	8,176	20,340
1977	10,485	24,526	210	491	1,325	3,099	8,950	20,935
1978 [a]	11,189	24,453	250	546	1,430	3,125	9,509	20,782
1979	12,518	25,265	265	535	1,555	3,138	10,698	21,592
1980 [a]	14,029	25,959	290	537	1,900	3,516	11,839	21,907
1981	16,382	27,710	301	509	2,340	3,958	13,741	23,243
1982 [a]	18,545	29,565	381	607	2,960	4,719	15,204	24,239
1983	20,680	31,714	463	710	3,641	5,584	16,576	25,421
1984	23,396	34,581	476	704	4,224	6,243	18,696	27,634
1985	27,196	39,011	489	701	5,347	7,670	21,360	30,640
1986 [b]	27,891	39,145	551	773	4,678	6,566	22,662	31,806
1987	30,752	42,013	740	1,011	4,660	6,366	25,352	34,636
1988 [c]	30,343	40,087	993	1,312	4,217	5,571	25,133	33,204
1989 [c]	28,554	36,348	1,384	1,762	4,698	5,980	22,472	28,606
1990 [c]	28,125	34,471	1,368	1,677	6,353	7,787	20,404	25,008
1991 [c]	26,372	31,230	1,712	2,027	6,021	7,130	18,639	22,073
1992 [d]	24,722	28,618	1,186	1,373	4,983	5,768	18,555	21,479
1993 [d]	22,809	25,808	958	1,084	4,730	5,352	17,118	19,369
1994 [d]	22,463	24,887	939	1,040	4,119	4,564	17,405	19,283
1995 [d]	23,451	25,461	720	782	3,699	4,016	19,031	20,662
1996 [d]	23,653	25,202	1,358	1,447	3,871	4,125	18,423 (S)	19,630
1997 [d]	23,928	25,078	1,654	1,734	2,861	2,999	19,412	20,345
1998 [d, e]	24,164	25,048	1,570	1,627	2,862	2,967	19,730	20,452
1999 [d, e]	22,535	23,026	1,755	1,793	3,383	3,457	17,397	17,776

TABLE 33. Trends in federal funds for performance of industrial basic research, applied research, and development in the United States: 1953–2002

(Millions of dollars)

Year	All R&D		Basic research		Applied research		Development		
	Current dollars	Constant 2000 dollars	Current dollars	Constant 2000 dollars	Current dollars	Constant 2000 dollars	Current dollars		Constant 2000 dollars
2000 [d, 5]	19,118	19,118	1,472	1,472	2,951	2,951	14,695		14,695
2001 [d, e, f]	16,899	16,507	754	737	3,603	3,519	12,542		12,251
2002 [d, e, f]	16,401	15,779	888	854	2,452	2,359	13,061	(S)	12,565

(S) = indicates imputation of more than 50 percent.

[a] Character-of-work estimates were made by the National Science Foundation. See National Science Foundation, *National Patterns of R&D Resources: 1998* (NSF 99-335).

[b] The character-of-work estimation procedure was revised for 1986 and later years and resulting statistics are not directly comparable with earlier years.

[c] As a result of a new sample design, statistics for 1988–91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries.

[d] As a result of annual sampling, implemented to produce statistics that better reflect R&D performance among firms in nonmanufacturing industries and small firms in all industries, statistics for 1992 and later years are not directly comparable with statistics for earlier years.

[e] Using data collected during recent cycles of the survey, NSF investigated a potential reporting anomaly for basic research and found that several large companies, known to develop and manufacture products, reported all R&D as basic research. This phenomenon prompted a renewed effort to strengthen character-of-work estimates produced from the survey. Consequently, improved edit checks were applied during statistical processing to produce the basic research, applied research, and development estimates beginning in 2001. Also, estimates for 1998, 1999, and 2000 were recalculated.

[f] Beginning with 2001, statistics for total and federally funded industrial R&D exclude data for federally funded research and development centers.

NOTES: Gross domestic product (GDP) implicit price deflators were used to convert current dollars to constant (2000) dollars. For information on sampling for 2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

TABLE 34. Funds for performance of and number of companies that performed industrial basic research, applied research, and development in the United States, by industry and size of company and by source of funds: 2002

(Millions of dollars)

Industry and size of company	NAICS codes	All industrial R&D				Basic research			
		Number of companies [a]	Total	Federal	Company and other [b]	Number of companies [a]	Total	Federal	Company and other [b]
Distribution by industry:									
All industries	21–23, 31–33, 42, 44–81	29,001	190,809	16,401	174,408	3,596	7,424	888	6,536
Manufacturing	31–33	14,043	108,985	10,745	98,240	2,586	4,716	187	4,529
Food	311	529	(D)	(D)	2,034	111	(D)	(D)	(D)
Beverage and tobacco products	312	57	170	-	170	1	(D)	-	(D)
Textiles, apparel, and leather	313–16	364	(D)	(D)	248	43	(D)	-	(D)
Wood products	321	90	(D)	(D)	132	14	(D)	-	(D)
Paper, printing and support activities	322, 323	396	(D)	(D)	2,620	96	(D)	-	(D)
Petroleum and coal products	324	79	(D)	(D)	1,233	37	(D)	-	(D)
Chemicals	325	1,242	20,641	246	20,395	233	(D)	(D)	2,517
Basic chemicals	3251	182	1,782	72	1,710	56	(D)	(D)	186
Resin, synthetic rubber, fibers, and filament	3252	82	2,426	13	2,413	15	221	-	221
Pharmaceuticals and medicines	3254	313	(D)	(D)	14,186	29	(D)	(D)	1,915
Other chemicals	325 minus (3251–52, 3254)	666	(D)	(D)	2,087	133	(D)	(D)	195 (S)
Plastics and rubber products	326	951	(D)	(D)	1,508	151	(D)	-	(D)
Nonmetallic mineral products	327	211	(D)	(D)	420	27	(D)	(D)	24 (S)
Primary metals	331	200	473	12	461	17	14 (S)	-	14 (S)
Fabricated metal products	332	1,382	1,355	104	1,251	366	45	(z)	45
Machinery	333	2,706	6,429	62	6,366	510	(D)	(D)	(D)
Computer and electronic products	334	2,808	35,777	5,470	30,307	497	937	35 (S)	902
Computers and peripheral equipment	3341	329	3,040	25	3,015	60	59 (S)	16 (S)	42
Communications equipment	3342	501	6,635	215	6,420	109	207 (S)	-	207 (S)
Semiconductor and other electronic components	3344	806	11,919	48	11,871	184	412	1	411
Navigational, measuring, electromedical, and control instruments	3345	1,047	13,729	5,180	8,549	124	257	17 (S)	240
Other computer and electronic products	334 minus (3341–42, 3344–45)	125	453	1	452	20	2	-	2

TABLE 34. Funds for performance of and number of companies that performed industrial basic research, applied research, and development in the United States, by industry and size of company and by source of funds: 2002

(Millions of dollars)

Industry and size of company	NAICS codes	All industrial R&D				Basic research			
		Number of companies [a]	Total	Federal	Company and other [b]	Number of companies [a]	Total	Federal	Company and other [b]
Electrical equipment, appliances, and components	335	840	2,039	61	1,978	151	(D)	(D)	18
Transportation equipment	336	785	26,145	4,692	21,452	119	(D)	(D)	(D)
Motor vehicles, trailers, and parts	3361–63	488	(D)	(D)	15,199	76	(D)	(D)	(D)
Aerospace products and parts	3364	84	9,654	4,306	5,349	11	(D)	(D)	347
Other transportation equipment	336 minus (3361–64)	213	(D)	(D)	905	32	(D)	(D)	(D)
Furniture and related products	337	267	258	7	251	7	(D)	-	(D)
Miscellaneous manufacturing	339	1,136	7,457	44	7,414	206	(D)	(D)	95
Medical equipment and supplies	3391	557	(D)	(D)	6,179	80	(D)	(D)	78
Other miscellaneous manufacturing	339 minus (3391)	579	(D)	(D)	1,235	126	(D)	(D)	17
Other manufacturing	31–33 minus (311–16, 321–27, 339)	--	--	--	--	--	--	--	--
Nonmanufacturing	21–23, 42, 44–81	14,958	81,824	5,656	76,168	1,010	2,708	701	2,007
Mining, extraction, and support activities	21	22	(D)	(D)	715	6	23	-	23
Utilities	22	285	(D)	(D)	117	3	(D)	-	(D)
Construction	23	300	164	(z)	164	11	2	(z)	2
Trade	42, 44, 45	2,837	(D)	(D)	25,014	122	(D)	(D)	837
Transportation and warehousing	48, 49	120	(D)	(D)	339	2	(D)	-	(D)
Information	51	1,726	17,870	106	17,764	128	(D)	(D)	175 (S)
Publishing	511	1,320	13,541	53	13,488	116	(D)	(D)	144 (S)
Newspaper, periodical, book, and database	5111	51	614	-	614	1	(D)	-	(D)
Software	5112	1,269	12,927	53	12,874	115	(D)	(D)	(D)
Broadcasting and telecommunications	513	112	(D)	(D)	1,637	1	(D)	-	(D)
Radio and television broadcasting	5131	4	(D)	-	(D)	0	-	-	-
Telecommunications	5133	93	(D)	(D)	1,608	1	(D)	-	(D)
Other broadcasting and telecommunications	513 minus (5131, 5133)	14	(D)	-	(D)	0	-	-	-
Other information	51 minus (511, 513)	294	(D)	(D)	2,639	10	(D)	-	(D)

TABLE 34. Funds for performance of and number of companies that performed industrial basic research, applied research, and development in the United States, by industry and size of company and by source of funds: 2002

(Millions of dollars)

Industry and size of company	NAICS codes	All industrial R&D				Basic research			
		Number of companies [a]	Total	Federal	Company and other [b]	Number of companies [a]	Total	Federal	Company and other [b]
Finance, insurance, and real estate	52, 53	463	1,903	-	1,903	10	26	-	26
Professional, scientific, and technical services	54	6,973	30,358	5,412	24,946	664	1,456	682	774
Architectural, engineering, and related services	5413	1,392	4,159	1,337	2,822	142	(D)	(D)	21
Computer systems design and related services	5415	3,304	11,983	1,590	10,394	223	(D)	(D)	185
Scientific R&D services	5417	1,364	13,034	2,299	10,735	294	940	383	556
Other professional, scientific, and technical services	54 minus (5413, 5415, 5417)	913	1,182	186	996	5	12 (S)	-	12 (S)
Management of companies and enterprises	55	35	148	-	148	0	-	-	-
Health care services	621–23	1,231	(D)	(D)	4,163	8	(D)	(D)	(D)
Other nonmanufacturing	56, 61, 624, 71, 72, 81	966	(D)	(D)	894	56	(D)	(D)	14
Distribution by size of company (number of employees):									
Total	(na)	29,001	190,809	16,401	174,408	3,596	7,424	888	6,536
5 to 24	(na)	13,028	4,261	789	3,471	1,206	152	55 (S)	97
25 to 49	(na)	4,620	3,845	259	3,586	655	138	27	111
50 to 99	(na)	3,846	6,164	463	5,701	562	274	54	220
100 to 249	(na)	3,441	13,227	606	12,622	482	604	108	496
250 to 499	(na)	1,573	8,055	686	7,370	273	326	84 (S)	242
500 to 999	(na)	962	9,925	531	9,394	140	(D)	(D)	306
1,000 to 4,999	(na)	1,054	28,625	985	27,640	174	1,243	72 (S)	1,170
5,000 to 9,999	(na)	220	17,987	1,574	16,414	43	549 (S)	137 (S)	412
10,000 to 24,999	(na)	152	26,458	1,226	25,232	32	(D)	(D)	1,194
25,000 or more	(na)	105	72,261	9,282	62,979	29	2,539	251	2,288

TABLE 34. Funds for performance of and number of companies that performed industrial basic research, applied research, and development in the United States, by industry and size of company and by source of funds: 2002

(Millions of dollars)

Industry and size of company	NAICS codes	Applied research				Development			
		Number of companies [a]	Total	Federal	Company and other [b]	Number of companies [a]	Total	Federal	Company and other [b]
Distribution by industry:									
All industries	21–23, 31–33, 42, 44–81	6,095	28,072	2,452	25,620	22,983	155,313	13,061 (S)	142,252
Manufacturing	31–33	3,450	18,040	1,095	16,945	11,813	86,229	9,462 (S)	76,767
Food	311	121	(D)	-	(D)	428	1,625	-	1,625
Beverage and tobacco products	312	7	(D)	-	(D)	56	138	-	138
Textiles, apparel, and leather	313–16	48	26	-	26	218	(D)	(D)	(D)
Wood products	321	27	(D)	(D)	(D)	76	59	-	(D)
Paper, printing and support activities	322, 323	102	749 (S)	-	749 (S)	374	1,865 (S)	(D)	(D)
Petroleum and coal products	324	20	479 (S)	-	479 (S)	67	(D)	(D)	(D)
Chemicals	325	428	(D)	(D)	5,409	1,003	12,587	117	12,470
Basic chemicals	3251	80	(D)	(D)	557	123	981	13	968
Resin, synthetic rubber, fibers, and filament	3252	42	(D)	(D)	1,241	58	(D)	(D)	951
Pharmaceuticals and medicines	3254	65	(D)	(D)	2,994	291	(D)	(D)	9,276
Other chemicals	325 minus (3251–52, 3254)	242	(D)	(D)	617	531	(D)	(D)	1,275
Plastics and rubber products	326	244	(D)	-	(D)	883	(D)	(D)	1,200
Nonmetallic mineral products	327	32	131	-	131	133	(D)	(D)	266
Primary metals	331	25	(D)	(D)	85 (S)	172	(D)	(D)	363 (S)
Fabricated metal products	332	399	128	5	123	1,254	1,182	99 (S)	1,083
Machinery	333	782	(D)	(D)	(D)	2,295	(D)	(D)	5,425
Computer and electronic products	334	728	5,452	78 (S)	5,374	2,410	29,388 (S)	5,357 (S)	24,031
Computers and peripheral equipment	3341	76	171	4 (S)	166	294	2,811	5 (S)	2,806
Communications equipment	3342	121	534 (S)	-	534 (S)	429	5,894 (S)	215	5,679 (S)
Semiconductor and other electronic components	3344	314	3,021	33	2,988	702	8,486 (S)	14	8,472 (S)
Navigational, measuring, electromedical, and control instruments	3345	174	1,684	41 (S)	1,644	874	11,788	5,122 (S)	6,666
Other computer and electronic products	334 minus (3341–42, 3344–45)	44	42	-	42	112	409	1 (S)	408
Electrical equipment, appliances, and components	335	110	(D)	(D)	198	714	(D)	(D)	1,762
Transportation equipment	336	118	(D)	854	(D)	599	(D)	(D)	18,486

TABLE 34. Funds for performance of and number of companies that performed industrial basic research, applied research, and development in the United States, by industry and size of company and by source of funds: 2002

(Millions of dollars)

Industry and size of company	NAICS codes	Applied research				Development			
		Number of companies [a]	Total	Federal	Company and other [b]	Number of companies [a]	Total	Federal	Company and other [b]
Distribution by industry:									
Motor vehicles, trailers, and parts	3361–63	72	(D)	(D)	(D)	328	(D)	(D)	13,815
Aerospace products and parts	3364	16	(D)	(D)	1,092	63	7,268	3,358	3,910
Other transportation equipment	336 minus (3361–64)	30	(D)	(D)	(D)	208	(D)	(D)	761
Furniture and related products	337	23	(D)	-	(D)	232	250	7	244
Miscellaneous manufacturing	339	237	(D)	(D)	483	898	6,865	29	6,836
Medical equipment and supplies	3391	136	(D)	(D)	406	436	(D)	(D)	5,695
Other miscellaneous manufacturing	339 minus (3391)	101	(D)	(D)	76	462	(D)	(D)	1,141
Other manufacturing	31–33 minus (311–16, 321–27, 331–37, 339)	--	--	--	--	--	--	--	--
Nonmanufacturing	21–23, 42, 44–81	2,645	10,032	1,357	8,675	11,170	69,084	3,598	65,486
Mining, extraction, and support activities	21	15	(D)	(D)	127	19	(D)	(D)	565 (S)
Utilities	22	8	(D)	-	(D)	273	(D)	(D)	(D)
Construction	23	6	40	-	40	280	122	(z)	122
Trade	42, 44, 45	510	(D)	(D)	2,367	2,223	(D)	(D)	21,810
Transportation and warehousing	48, 49	6	(D)	-	(D)	19	(D)	(D)	(D)
Information	51	265	1,365 (S)	5	1,360 (S)	1,584	(D)	(D)	16,229
Publishing	511	254	1,189 (S)	5	1,184 (S)	1,251	(D)	(D)	12,160
Newspaper, periodical, book, and database	5111	3	(D)	-	(D)	45	580	-	580
Software	5112	251	(D)	5	(D)	1,206	(D)	(D)	11,580 (S)
Broadcasting and telecommunications	513	2	(D)	-	(D)	101	(D)	(D)	(D)
Radio and television broadcasting	5131	0	-	-	-	3	(D)	-	(D)
Telecommunications	5133	2	(D)	-	(D)	84	(D)	(D)	(D)
Other broadcasting and telecommunications	513 minus (5131, 5133)	0	-	-	-	14	(D)	-	(D)
Other information	51 minus (511, 513)	8	(D)	-	(D)	232	(D)	(D)	(D)
Finance, insurance, and real estate	52, 53	40	68	-	68	442	1,809	-	1,809
Professional, scientific, and technical services	54	1,692	5,617	1,312	4,305	5,381	23,286	3,419	19,867

TABLE 34. Funds for performance of and number of companies that performed industrial basic research, applied research, and development in the United States, by industry and size of company and by source of funds: 2002

(Millions of dollars)

Industry and size of company	NAICS codes	Applied research				Development			
		Number of companies [a]	Total	Federal	Company and other [b]	Number of companies [a]	Total	Federal	Company and other [b]
Distribution by industry:									
Architectural, engineering, and related services	5413	180	(D)	(D)	152	771	3,529	880 (S)	2,649
Computer systems design and related services	5415	489	(D)	(D)	431	2,996	11,245	1,467	9,778
Scientific R&D services	5417	672	4,655	997	3,659	956	7,439	919	6,520
Other professional, scientific, and technical services	54 minus (5413, 5415, 5417)	351	97	33	64 (S)	658	1,073	153	920 (S)
Management of companies and enterprises	55	0	-	-	-	34	148	-	148
Health care services	621–23	14	(D)	(D)	313 (S)	325	3,723 (S)	(D)	(D)
Other nonmanufacturing	56, 61, 624, 71, 72, 81	90	(D)	(D)	29	588	(D)	(D)	852
Distribution by size of company (number of employees):									
Total	(na)	6,095	28,072	2,452	25,620	22,983	155,313	13,061 (S)	142,252
5 to 24	(na)	2,285	467	141	326	9,997	3,642	593	3,048
25 to 49	(na)	1,209	681	106	575	4,000	3,027	126	2,900
50 to 99	(na)	672	948	103	845	3,152	4,942	305	4,636
100 to 249	(na)	629	1,980	142	1,838	2,603	10,643	355	10,288
250 to 499	(na)	477	1,097	247	851	1,309	6,632	355	6,277
500 to 999	(na)	288	(D)	(D)	1,364	715	8,054	330	7,724
1,000 to 4,999	(na)	354	4,222	250	3,973	850	23,160	663 (S)	22,497
5,000 to 9,999	(na)	76	3,904	549 (S)	3,355	172	13,535	888 (S)	12,646
10,000 to 24,999	(na)	58	(D)	(D)	4,176	106	20,991	1,129	19,862
25,000 or more	(na)	49	9,033	715	8,318	78	60,689	8,316 (S)	52,373

(D) = data have been withheld to avoid disclosing operations of individual companies; (S) = indicates imputation of more than 50 percent; (--) = indicates data not collected; (-) = indicates a value of zero or a value rounded to zero; (na) = not applicable.

[a] The estimates in the "number of companies" columns are the numbers of companies that actually distributed total R&D among the three character-of-work categories, (basic research, applied research, and development) when responding to the survey. During subsequent statistical processing, when undistributed amounts of R&D were allocated among the three categories for this table, it was not possible to similarly allocate the associated number of companies among the three categories. See table A-7 for the amount of undistributed R&D and the number of companies that reported undistributed R&D.

[b] The company R&D is the industrial R&D in this table is the industrial R&D performed within company facilities funded from all sources except the federal government. The funds predominantly are the company's own, but also include funds from outside organizations such as other companies, research institutions, universities and colleges, nonprofit organizations, and state governments. Excluded from this table are company-funded R&D not performed within the company (e.g., R&D contracted out to other organizations) and company-funded R&D not performed within the 50 U.S. states or DC (e.g., R&D not performed on U.S. soil by foreign subsidiaries or other foreign organizations).

NOTES: Excludes data for federally funded research and development centers. For information on sampling for 2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

TABLE 35. Funds for industrial R&D performance in the United States, by state: Selected years 1987–2002

(Millions of dollars)

State	1987	1989 [a]	1991 [a]	1993 [b]	1995 [b]	1997 [b]	1998 [b,c,d]	1999 [b,c,d]	2000 [b,c,d]	2001 [b,c,d,e]	2002 [b,d,e]	Percent change 2002/2001
United States	92,155	102,055	116,952	117,400	132,103	157,539	169,180	182,711	199,539	198,505	190,809	-4
Alabama	1,523	430	596	557 (S)	686	589 (S)	845	823	821 (S)	905	846	-7
Alaska	10	9	21	14	30	24 (S)	37 (E)	82 (E)	48 (E)	68	51 (E)	-25
Arizona	809	921	1,080	1,039	1,356 (S)	1,854	1,801	2,109 (S)	2,182 (S)	2,707	3,201	18
Arkansas	129	51	(S)	179	181	118	213 (E)	326	400	254 (E)	225 (E)	-12
California	18,636	23,781	(S)	21,975	28,710	34,011	32,856	36,991	43,459	41,745	39,664	-5
Colorado	1,207	1,167	(S)	1,966	1,865	2,248	3,180	3,266	3,143	3,117	2,823	-9
Connecticut	2,121	2,421	1,756	2,228	3,906	3,014	3,346	4,145 (S)	4,132 (S)	4,686	6,077	30
Delaware	(D)	(D)	(D)	913 (S)	1,077 (S)	1,009 (S)	1,356 (S)	1,295 (S)	1,468 (S)	1,232	1,219	-1
District of Columbia	(D)	(D)	46	515 (S)	672 (S)	(D)	598 (S)	268 (E)	196 (E)	242	194	-20
Florida	2,041	2,352	(S)	2,386	4,101	3,442	3,265	3,482	3,773 (S)	3,755	3,707	-1
Georgia	958	722	993	792	1,175	1,273	1,617	1,904	2,159 (S)	1,912	2,107	10
Hawaii	70	9	13	255	14	87	55 (E)	68 (E)	93 (E)	93	103	11
Idaho	467	(D)	(S)	686	827	1,181 (S)	1,103 (S)	1,239	1,363	884	992	12
Illinois	4,099	4,068	5,750	5,023	5,776 (S)	6,248	7,318	8,102	8,393 (S)	8,232	7,616	-7
Indiana	1,860	1,823	2,274	2,141	2,721 (S)	2,677	2,922	2,863 (S)	2,888 (S)	3,583	3,572	0
Iowa	328	365	527	505	998	578	750	730	762	817	753	-8
Kansas	1,128	406	(S)	280 (S)	569	1,136 (S)	1,384 (S)	1,448 (S)	1,327 (S)	1,299 (S)	1,427 (S)	10
Kentucky	238	227	176	282	452	359	606	777	762	636	656	3
Louisiana	128	169	(S)	106	61	172	377 (E)	516 (E)	364 (E)	316 (E)	248 (E)	-22
Maine	39	33	(S)	(D)	286	83	137	208	255	249	250 (S)	0
Maryland	1,292	1,093	1,376	1,296	1,075	1,425	1,905	2,020	2,213	3,682	3,800	3
Massachusetts	5,255	5,851	(S)	5,960	7,416	8,300	10,367	9,626	10,595	11,378	10,279	-10
Michigan	7,095	8,506	9,283	18,845	12,388	13,009	12,554	16,877	17,489 (S)	14,283	13,565	-5
Minnesota	2,145	2,075	2,070	2,341	2,636 (S)	3,116	3,367	3,695	3,971	4,355	4,460	2
Mississippi	42	56	(S)	51	66	73	183 (E)	224 (E)	242 (E)	219 (E)	224	2
Missouri	1,823	2,391	(S)	1,339 (S)	2,028 (S)	1,290 (S)	1,505	1,664	1,978	1,792	1,592	11
Montana	7	(D)	(S)	(D)	17	92	63	92 (E)	78 (E)	70 (E)	66	-5
Nebraska	59	64	67	93	150	71	195 (E)	217 (E)	335 (E)	306	342	12
Nevada	55	29	95	65	322	380	476	490	433	290	339	17
New Hampshire	90	(D)	(D)	247	472	652	1,138	1,157	722	1,339	1,153	-14
New Jersey	5,876	6,410	8,933	8,009	8,200	11,069	11,107	10,145	10,580	10,164	11,566	14
New Mexico	950	1,039	1,217	(D)	1,461	1,310 (S)	1,450 (S)	1,352 (S)	1,203 (S)	231	331	43
New York	6,276	8,107	9,457	8,597	8,651	9,939 (S)	10,283	12,260	11,622	10,884	9,234	-15
North Carolina	1,666	1,311	1,470	1,886	2,226	3,590	3,483	3,632	4,328	4,138	3,443	-17
North Dakota	57	(S)	(S)	(D)	12	33	46 (E)	95 (E)	83 (E)	347	154	-56

TABLE 35. Funds for industrial R&D performance in the United States, by state: Selected years 1987–2002

(Millions of dollars)

State	1987	1989 [a]	1991 [a]	1993 [b]	1995 [b]	1997 [b]	1998 [b,c,d]	1999 [b,c,d]	2000 [b,c,d]	2001 [b,c,d,e]	2002 [b,d,e]	Percent change 2002/2001
Ohio	3,415	3,964	5,406	4,494	4,001	5,608	5,742	6,531	6,245	6,694	6,230	-7
Oklahoma	367	333	448	299	288	428	369	562 (E)	463	543 (E)	412	-24
Oregon	281	357	(S)	455	741	1,102	1,345	1,408	1,533	2,677	2,320	-13
Pennsylvania	4,430	4,653	(S)	4,652	5,331	6,609 (S)	7,393	7,474	8,473	8,967	7,064	-21
Rhode Island	224	140	174	154	520	704 (S)	1,332 (S)	1,317 (S)	1,167 (S)	1,134 (S)	1,121 (S)	-1
South Carolina	500	388	479	461	739	783 (S)	996	922	1,059	921	1,054	14
South Dakota	4	4	6	(D)	19	26	40 (E)	57 (E)	89 (E)	87 (E)	53	-40
Tennessee	621	934	843	788	1,003	1,089	2,440	2,205	1,644	1,503	1,289	-14
Texas	4,077	5,051	5,439	4,562	6,211 (S)	7,265	8,984	8,661	10,048	9,839	10,744	9
Utah	774	389	407	279	803	1,027	1,119	1,028	1,063	1,173	1,116	-5
Vermont	236	(D)	(D)	(D)	248	246	114	346	389	339	286	-15
Virginia	1,284	1,131	1,275	1,046	1,577	1,767	2,540	2,662	2,683	2,957	2,920	-1
Washington	2,939	2,728	3,677	4,575 (S)	4,294 (S)	6,610 (S)	7,072 (S)	7,093 (S)	8,235 (S)	8,933 (S)	8,579 (S)	-4
West Virginia	83	(D)	(D)	100 (S)	243	(D)	335	351	329	211	264	25
Wisconsin	1,165	1,035	1,304	1,296	1,706	1,707	1,929	2,194	2,415	2,469 (S)	2,649	7
Wyoming	4	(D)	2	15	25	28	20 (E)	65 (E)	37 (E)	28 (E)	21 (E)	-26
Undistributed funds [f]	2,281	2,945	772	683	1,773 (S)	7,211 (S)	5,521 (S)	5,647 (S)	9,804 (S)	9,819 (S)	8,406	-14

(D) = data have been withheld to avoid disclosing information about individual companies; (S) = indicates imputation of more than 50 percent. For years prior to 1993, data have been withheld; (T) = data are not separately available but included in total; (E) = indicates imputation of more than 50 percent due to raking of state data.

[a] As a result of a new sample design, statistics for 1989–91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries.

[b] As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for years prior to 1991.

[c] Some statistics for 1998, 1999, 2000, and 2001 have been revised since originally published.

[d] Beginning with 2001, the methodology to produce statistics by state was modified from previous years to address the recurring problem of large year-to-year variation in many state estimates. This variability was caused by many factors including the potential inefficiency of the sample at state levels, the rarity of R&D expenditures, and the large weights often associated with companies that report R&D in the survey for the first time. Under the new methodology, a portion of the amount of R&D reported by some companies not selected for the sample with certainty is allocated among all the states in which there was industrial activity. Note that there was no change to the methodology for estimating the number of R&D performers in each state. This estimate continued to be calculated by summing the weights of the companies that actually reported R&D activity in a given state.

[e] Beginning with 2001, statistics for total and federally funded industrial R&D exclude data for federally funded research and development centers.

[f] Includes data reported on Form RD-1 that were not allocated to a specific state. Data reported on form RD-1A were allocated to the state in the address on the company's survey form which is usually the company's headquarters.

NOTE: For information on sampling for 1999–2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

TABLE 36. Funds for industrial R&D performance in the United States and number of companies that performed R&D in the United States, by state and source of funds: 2002

(Millions of dollars)

State	Number of companies [a]	All funds	Federal	Company and other [b]
United States	29,001	190,809	16,401	174,408
Alabama	242	846	258	588
Alaska	65	51 (E)	3 (S)	48 (E)
Arizona	604	3,201	470	2,731
Arkansas	64	225 (E)	4 (E)	221
California	5,588	39,664	2,975	36,689
Colorado	1,050	2,823	169 (S)	2,654
Connecticut	516	6,077	317	5,761
Delaware	146	1,219	10	1,208
District of Columbia	33	194	92	102 (E)
Florida	1,038	3,707	858	2,848
Georgia	460	2,107	71	2,036
Hawaii	53	103	37	66 (E)
Idaho	366	992	3 (E)	990
Illinois	1,483	7,616	996	6,620
Indiana	566	3,572	123 (S)	3,450
Iowa	228	753	6 (E)	748
Kansas	228	1,427 (S)	(D)	(D)
Kentucky	127	656	6 (E)	650
Louisiana	174	248 (E)	14 (E)	233 (E)
Maine	168	250 (S)	21	229 (S)
Maryland	553	3,800	1,165 (S)	2,635
Massachusetts	1,057	10,279	1,995 (S)	8,284
Michigan	1,159	13,565	133	13,432
Minnesota	1,006	4,460	137	4,323
Mississippi	91	224	14	210
Missouri	923	1,592	151	1,441
Montana	48	66	1 (E)	65
Nebraska	76	342	7 (S)	335
Nevada	151	339	7 (E)	333
New Hampshire	289	1,153	(D)	(D)
New Jersey	1,011	11,566	238	11,328
New Mexico	253	331	92	239
New York	2,198	9,234	539	8,695
North Carolina	738	3,443	50 (E)	3,393
North Dakota	68	154	1 (E)	153
Ohio	1,568	6,230	823	5,407
Oklahoma	276	412	15	397
Oregon	670	2,320	17 (E)	2,302
Pennsylvania	2,020	7,064	114	6,950
Rhode Island	74	1,121 (S)	(D)	(D)
South Carolina	187	1,054	24	1,031
South Dakota	102	53	1 (E)	52
Tennessee	542	1,289	216	1,073
Texas	1,540	10,744	534	10,209
Utah	378	1,116	201 (S)	915

TABLE 36. Funds for industrial R&D performance in the United States and number of companies that performed R&D in the United States, by state and source of funds: 2002

(Millions of dollars)

State	Number of companies [a]	All funds	Federal	Company and other [b]
Vermont	80	286	7 (S)	279
Virginia	815	2,920	719	2,201
Washington	719	8,579 (S)	460	8,120 (S)
West Virginia	99	264	4	260
Wisconsin	914	2,649	19 (E)	2,630
Wyoming	35	21 (E)	1	20 (E)
Undistributed funds [c]	149	8,406	277	8,129

(D) = data have been withheld to avoid disclosing operations of individual companies.

(S) = indicates imputation of more than 50 percent.

(E) = indicates imputation of more than 50 percent due to raking of state data.

[a] Detail does not add to total because multi-establishment companies may perform R&D in more than one state.

[b] The company R&D in this table is the industrial R&D performed within company facilities funded from all sources except the federal government. The funds predominantly are the company's own, but also include funds from outside organizations such as other companies, research institutions, universities and colleges, nonprofit organizations, and state governments. Excluded from this table are company-funded R&D not performed within the company (e.g., R&D contracted out to other organizations) and company-funded R&D not performed within the 50 U.S. states or DC (e.g., R&D not performed on U.S. soil by foreign subsidiaries or other foreign organizations).

[c] Includes data reported on Form RD-1 that were not allocated to a specific state.

NOTES: Beginning with 2001, the methodology to produce estimates of total, federal, and company R&D expenditures by state was modified from previous years to address the recurring problem of large year-to-year variation in many state estimates. This variability was caused by many factors including the potential inefficiency of the sample at state levels, the rarity of R&D expenditures, and the large weights often associated with companies that report R&D in the survey for the first time. Under the new methodology, a portion of the amount of R&D reported by some companies not selected for the sample with certainty is allocated among all the states in which there was industrial activity. Note that there was no change to the methodology for estimating the number of R&D performers in each state. This estimate continued to be calculated by summing the weights of the companies that actually reported R&D activity in a given state.

For information on sampling for 2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002

TABLE 37. Funds for industrial R&D performance in the United States and number of R&D-performing companies in the United States, by industry and size of company, for the United States and top 10 R&D-performing states: 2002

(Millions of dollars)

Industry and size of comppany	NAICS codes	Number of companies	United States	California	Michigan	New Jersey	Texas	Massa-chusetts	New York	Wash-ington	Illinois	Penn-sylvania	Ohio	All other states and undis-tributed
Distribution by industry:														
All industries	21–23, 31–33, 42, 44–81	29,001	190,809	39,664	13,565	11,566	10,744	10,279	9,234	8,579 (S)	7,616	7,064	6,230	66,267
Manufacturing	31–33	14,043	108,985	17,975	12,319	6,408	6,264	5,754 (S)	4,438	1,983	5,894	4,199	4,085	39,667
Food	311	529	(D)	101	107	186	76	(D)	405 (S)	17	272	73	19	774
Beverage and tobacco products	312	57	170	15	2 (S)	(z) (E)	2 (S)	(D)	1 (E)	(D)	1 (E)	(z) (E)	(z) (E)	145
Textiles, apparel, and leather	313–16	364	(D)	20	2	(D)	4	31	16	1 (S)	1 (E)	6	2	166
Wood products	321	90	(D)	10	4	1 (S)	1	(z) (E)	(z) (E)	2 (S)	(z) (E)	(D)	(D)	62
Paper, printing and support activities	322, 323	396	(D)	(D)	14	5 (E)	61	20	137	40	(D)	18	(D)	1,354
Petroleum and coal products	324	79	(D)	(D)	(z) (E)	(D)	585	(z) (E)	19	(z) (E)	(D)	(D)	34	125
Chemicals	325	1,242	20,641	1,721	532	5,023	533	723	1,750	173	1,439	2,092	407	6,250
Basic chemicals	3251	182	1,782	72	30	235	111	42	72	2 (S)	180	247	155	638
Resin, synthetic rubber, fibers, and filament	3252	82	2,426	29	387	104	284	(D)	(D)	1	20	257 (S)	32	1,218
Pharmaceuticals and medicines	3254	313	(D)	1,494	45	4,371	98	(D)	761	168	1,184	1,432	133	3,992
Other chemicals	325 minus (3251–52, 3254)	666	(D)	126 (S)	69	313	40	76 (S)	(D)	2 (E)	54	155	86 (S)	403
Plastics and rubber products	326	951	(D)	69	126	53	26 (S)	(D)	25 (S)	5 (S)	53	75	432 (S)	640
Nonmetallic mineral products	327	211	(D)	35	72	10	14	(D)	14	(z) (E)	56 (S)	25	67	91 (S)
Primary metals	331	200	473	2 (E)	27 (S)	16	7 (S)	10 (S)	9 (S)	12	12 (S)	259 (S)	26	92
Fabricated metal products	332	1,382	1,355	252	64	9 (E)	22 (E)	39	36	20 (S)	76	84	163	592
Machinery	333	2,706	6,429	1,774	209	163 (S)	216 (S)	120 (S)	249	88	777	133	241	2,460
Computer and electronic products	334	2,808	35,777	9,573	314	372	3,786	3,814 (S)	695	605	1,445 (S)	854 (S)	195	14,125
Computers and peripheral equipment	3341	329	3,040	1,315	3 (S)	10	(D)	181 (S)	33 (S)	90 (S)	129 (S)	(D)	20	790
Communications equipment	3342	501	6,635	1,139	109	58	1,034 (S)	457 (S)	48	26	(D)	(D)	10	2,260 (S)
Semiconductor and other electronic components	3344	806	11,919	4,202	103	90	2,100	505	325	221	61	136	28	4,147
Navigational, measuring, electromedical, and control instruments	3345	1,047	13,729	2,851	99	212	194	2,533 (S)	287	250	220	207	133	6,742

TABLE 37. Funds for industrial R&D performance in the United States and number of R&D-performing companies in the United States, by industry and size of company, for the United States and top 10 R&D-performing states: 2002

(Millions of dollars)

Industry and size of comppany	NAICS codes	Number of companies	United States	California	Michigan	New Jersey	Texas	Massa-chusetts	New York	Wash-ington	Illinois	Penn-sylvania	Ohio	All other states and undis-tributed
Distribution by industry:														
Other computer and electronic products	334 minus (3341–42, 3344–45)	125	453	65	(z) (E)	2 (S)	(D)	137	1 (S)	18 (S)	(D)	20	4	186
Electrical equipment, appliances, and components	335	840	2,039	239	173	49	51	146	123 (S)	3 (E)	184	84	148	839
Transportation equipment	336	785	26,145	3,206 (S)	10,444	106	582	(D)	765	(D)	1,272	263	1,342	6,843
Motor vehicles, trailers, and parts	3361–63	488	(D)	2,197 (S)	10,297	12	33	14 (S)	194	17	244	87	(D)	1,757
Aerospace products and parts	3364	84	9,654	969	102	86	545	(D)	566	(D)	(D)	122	915	4,131
Other transportation equipment	336 minus (3361–64)	213	(D)	40	45	8	4	(D)	5	14 (S)	(D)	54	(D)	955
Furniture and related products	337	267	258	11	81	1 (E)	2 (E)	2 (S)	4	2	19 (S)	4 (E)	6 (S)	127
Miscellaneous manufacturing	339	1,136	7,457	716	148	167	297	442	191	47	193 (S)	170	105	4,981 (S)
Medical equipment and supplies	3391	557	(D)	503	39	138	270	393	144	(D)	24 (E)	132 (S)	54	4,487 (S)
Other miscellaneous manufacturing	339 minus (3391)	579	(D)	212 (S)	109	30 (E)	27 (E)	49	47 (E)	(D)	169 (S)	37	51 (S)	494
Other manufacturing	31–33 minus (311–16, 321–27, 331–37, 339)	--	--	--	--	--	--	--	--	--	--	--	--	--
Nonmanufacturing	21–23, 42, 44–81	14,958	81,824	21,689	1,246	5,159	4,480	4,526	4,797	6,597 (S)	1,722	2,865	2,145	26,600
Mining, extraction, and support activities	21	22	(D)	(D)	(z) (E)	(z) (E)	195 (S)	(z) (E)	(D)	(D)	9 (S)	(D)	(D)	361
Utilities	22	285	(D)	(D)	2 (E)	5	9 (S)	(z) (E)	32	1 (E)	1 (E)	1	11	67
Construction	23	300	164	(D)	3 (S)	12	7	(z) (E)	1 (E)	(z) (E)	9	2	(D)	87 (S)
Trade	42, 44, 45	2,837	(D)	6,921	114 (E)	1,358	1,932	982	2,065	(D)	225	1,460	285	9,128
Transportation and warehousing	48, 49	120	(D)	10 (E)	2 (E)	10	11 (E)	1 (E)	(D)	1 (E)	4 (E)	(D)	11	281 (S)
Information	51	1,726	17,870	4,421	411	374 (S)	907	940	1,293 (S)	4,848 (S)	191	216	172	4,096
Publishing	511	1,320	13,541	3,604	54 (S)	189	487 (S)	698	994 (S)	4,764 (S)	126	97	102	2,427
Newspaper, periodical, book, and database	5111	51	614	82	(D)	(D)	(D)	58	244	2	28	9	(D)	94
Software	5112	1,269	12,927	3,522	(D)	(D)	(D)	640	750 (S)	4,762 (S)	98	87 (S)	(D)	2,334

TABLE 37. Funds for industrial R&D performance in the United States and number of R&D-performing companies in the United States, by industry and size of company, for the United States and top 10 R&D-performing states: 2002

(Millions of dollars)

Industry and size of comppany	NAICS codes	Number of companies	United States	California	Michigan	New Jersey	Texas	Massa-chusetts	New York	Wash-ington	Illinois	Penn-sylvania	Ohio	All other states and undis-tributed
Distribution by industry:														
Broadcasting and telecommunications	513	112	(D)	223	(D)	155 (S)	114 (E)	106 (S)	171 (S)	57 (S)	31 (E)	38 (E)	25 (E)	708 (E)
Radio and television broadcasting	5131	4	(D)	(z) (S)	(D)	(z) (E)	(z) (E)	(z) (E)	(z) (E)	(z) (E)	(z) (E)	(z) (S)	(z) (E)	(z) (E)
Telecommunications	5133	93	(D)	222	(D)	154 (S)	114 (E)	106 (S)	168 (S)	57 (S)	31 (E)	30 (E)	24 (E)	692 (E)
Other broadcasting and telecommunications	513 minus (5131, 5133)	14	(D)	1 (E)	(D)	(z) (E)	(z) (E)	(z) (E)	3 (E)	(z) (E)	(z) (E)	8 (S)	(z) (E)	15 (S)
Other information	51 minus (511, 513)	294	(D)	595	(D)	31	307	136	128	28	34	81	45	961
Finance, insurance, and real estate	52, 53	463	1,903	265	17 (E)	150	94	71	191	8 (E)	43 (E)	103	22 (E)	940
Professional, scientific, and technical services	54	6,973	30,358	9,367	560	3,049 (S)	975 (E)	2,306	925	1,073	1,063	729	1,394	8,916
Architectural, engineering, and related services	5413	1,392	4,159	1,178	122 (E)	92 (E)	166 (E)	130	99 (E)	50 (E)	64 (E)	76 (E)	102 (E)	2,080
Computer systems design and related services	5415	3,304	11,983	3,017	180	2,566 (S)	297 (E)	627	269 (E)	163	865	172 (E)	287	3,540
Scientific R&D services	5417	1,364	13,034	5,042	239	333	473	1,502	434	839	89 (E)	430	987	2,665
Other professional, scientific, and technical services	54 minus (5413, 5415, 5417)	913	1,182	129 (E)	19 (E)	58	40 (E)	47	123 (E)	20	46 (E)	51	18 (E)	630
Management of companies and enterprises	55	35	148	81 (S)	1 (E)	9 (S)	5 (E)	7	5 (E)	1 (E)	2 (E)	2 (E)	4 (S)	32 (E)
Health care services	621–23	1,231	(D)	437 (E)	122 (E)	141 (E)	304 (E)	126 (E)	249 (E)	(D)	155 (E)	288 (E)	158 (E)	2,136 (E)
Other nonmanufacturing	56, 61, 624, 71, 72, 81	966	(D)	76 (E)	14 (E)	51 (S)	40 (E)	92 (S)	28 (E)	(D)	18 (E)	20 (E)	45	557

TABLE 37. Funds for industrial R&D performance in the United States and number of R&D-performing companies in the United States, by industry and size of company, for the United States and top 10 R&D-performing states: 2002

(Millions of dollars)

Industry and size of comppany	NAICS codes	Number of companies	United States	California	Michigan	New Jersey	Texas	Massa-chusetts	New York	Wash-ington	Illinois	Penn-sylvania	Ohio	All other states and undis-tributed
Distribution by size of company (number of employees):														
Total	(na)	29,001	190,809	39,664	13,565	11,566	10,744	10,279	9,234	8,579 (S)	7,616	7,064	6,230	66,267
5 to 24	(na)	13,028	4,261	798 (E)	132 (E)	181 (E)	300 (E)	242 (E)	283 (E)	82 (E)	206 (E)	182 (E)	144 (E)	1,710 (E)
25 to 49	(na)	4,620	3,845	981 (E)	95 (E)	184 (E)	239 (E)	252 (E)	264 (E)	81 (E)	153 (E)	149 (E)	120 (E)	1,326 (E)
50 to 99	(na)	3,846	6,164	1,536	169 (E)	262 (E)	419 (E)	450	286 (E)	138 (E)	215 (E)	267 (E)	201 (E)	2,221 (E)
100 to 249	(na)	3,441	13,227	3,623	334 (E)	512 (E)	698 (E)	907	685 (E)	388	374 (E)	563 (E)	339 (E)	4,804 (E)
250 to 499	(na)	1,573	8,055	2,612	278	172	332	755	379	240	182	183	168	2,754
500 to 999	(na)	962	9,925	2,731	175	355	505	1,036	464	382	390	220	182	3,485
1,000 to 4,999	(na)	1,054	28,625	9,500	725	1,505	838	1,603	890	636 (S)	954	1,090	924	9,958
5,000 to 9,999	(na)	220	17,987	5,478	362	2,236	1,167	731 (S)	770 (S)	502	329 (S)	525	847	5,041
10,000 to 24,999	(na)	152	26,458	2,117	1,069	2,761 (S)	2,689	810	1,162	117	641 (S)	1,459	653	12,981
25,000 or more	(na)	105	72,261	10,289	10,228	3,398	3,556	3,493 (S)	4,050	6,013 (S)	4,171	2,426	2,652	21,985

(D) = data have been withheld to avoid disclosing operations of individual companies; (S) = indicates imputation of more than 50 percent; (E) = indicates imputation of more than 50 percent due to raking of state data; (z) = indicates data less than half the unit shown; (--) = indicates data not collected; (na) = not applicable.

NOTES: Beginning with 2001, the methodology to produce estimates of total, federal, and company R&D expenditures by state was modified from previous years to address the recurring problem of large year-to-year variation in many state estimates. This variability was caused by many factors including the potential inefficiency of the sample at state levels, the rarity of R&D expenditures, and the large weights often associated with companies that report R&D in the survey for the first time. Under the new methodology, a portion of the amount of R&D reported by some companies not selected for the sample with certainty is allocated among all the states in which there was industrial activity. Note that there was no change to the methodology for estimating the number of R&D performers in each state. This estimate continued to be calculated by summing the weights of the companies that actually reported R&D activity in a given state.

For information on sampling for 2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

TABLE 38. Domestic employment of companies that performed industrial R&D in the United States, by industry and by size of company: 2002
(Thousands)

Industry	NAICS codes	Total	Size of company (number of employees)									
			5 to 24	25 to 49	50 to 99	100 to 249	250 to 499	500 to 999	1,000 to 4,999	5,000 to 9,999	10,000 to 24,999	25,000 or more
All industries	21–23, 31–33, 42, 44–81	15,415	144	162	280	535	546	690	2,326	1,498	2,414	682
Manufacturing	31–33	9,089	55	80	157	320	368	435	1,594	969	1,496	361
Food	311	991	2	-	6	18	25	37	102	90	207	50
Beverage and tobacco products	312	57	(z)	(D)	(z)	(D)	1	-	19	(D)	(D)	-
Textiles, apparel, and leather	313–16	186	2	1	(D)	15	12	19	56	35	(D)	(D)
Wood products	321	94	-	(D)	1	6	6	(D)	(D)	21	40	-
Paper, printing and support activities	322, 323	585	1	2	3	10	13	12	63	66	66	34
Petroleum and coal products	324	179	(z)	(D)	1	(D)	2	(D)	(D)	-	56	11
Chemicals	325	837	5	7	14	26	29	33	192	135	151	24
Basic chemicals	3251	154	1	1	(D)	5	4	8	66	40	(D)	-
Resin, synthetic rubber, fibers, and filament	3252	122	(z)	(z)	1	1	6	5	22	(D)	(D)	(D)
Pharmaceuticals and medicines	3254	355	(D)	1	(D)	7	8	7	48	46	72	(D)
Other chemicals	325 minus (3251–52, 3254)	207	(D)	5	8	13	11	13	55	(D)	(D)	(D)
Plastics and rubber products	326	468	(D)	3	25	25	35	38	162	47	65	(D)
Nonmetallic mineral products	327	145	1	2	1	6	(D)	4	52	(D)	(D)	(D)
Primary metals	331	260	(z)	2	2	9	(D)	10	47	54	78	(D)
Fabricated metal products	332	477	(D)	6	11	36	45	34	114	70	83	(D)
Machinery	333	740	11	19	32	50	72	86	157	83	80	15
Computer and electronic products	334	1,259	14	18	28	44	45	65	218	93	193	54
Computers and peripheral equipment	3341	83	(D)	2	2	3	3	12	18	(D)	(D)	-
Communications equipment	3342	175	3	3	5	9	11	14	31	(D)	(D)	(D)
Semiconductor and other electronic components	3344	404	2	7	7	14	15	16	102	(D)	53	(D)
Navigational, measuring, electromedical, and control instruments	3345	574	6	6	12	15	14	20	57	37	81	32
Other computer and electronic products	334 minus (3341–42, 3344–45)	23	(D)	1	1	2	2	3	9	(D)	-	-
Electrical equipment, appliances, and components	335	324	2	8	9	16	14	25	87	37	125	-
Transportation equipment	336	1,907	2	3	8	26	27	38	151	104	175	137
Motor vehicles, trailers, and parts	3361–63	987	1	(z)	(D)	20	20	32	110	(D)	(D)	68
Aerospace products and parts	3364	785	-	1	(z)	3	(D)	3	23	31	(D)	68
Other transportation equipment	336 minus (3361–64)	135	1	2	(D)	4	(D)	4	18	(D)	86	(S) -
Furniture and related products	337	200	1	1	(D)	7	11	6	43	39	46	(D)
Miscellaneous manufacturing	339	379	(D)	7	10	24	21	26	113	58	68	(D)
Medical equipment and supplies	3391	227	3	4	5	12	10	11	69	34	(D)	(D)
Other miscellaneous manufacturing	339 minus (3391)	152	(D)	3	5	13	11	15	44	24	(D)	-

TABLE 38. Domestic employment of companies that performed industrial R&D in the United States, by industry and by size of company: 2002

(Thousands)

Industry	NAICS codes	Total	Size of company (number of employees)									
			5 to 24	25 to 49	50 to 99	100 to 249	250 to 499	500 to 999	1,000 to 4,999	5,000 to 9,999	10,000 to 24,999	25,000 or more
Other manufacturing	31–33 minus (311–16, 321–27, 331–37, 339)	--	--	--	--	--	--	--	--	--	--	--
Nonmanufacturing	21–23, 42, 44–81	6,326	89	82	123	215	178	255	732	529	918	320
Mining, extraction, and support activities	21	85	-	-	-	-	2	5	14	(D)	(D)	(D)
Utilities	22	270	(z)	-	-	-	(D)	(D)	26	88	126	(D)
Construction	23	91	4	(D)	1	4	2	18	15	(D)	(D)	-
Trade	42, 44, 45	1,487	17	25	19	35	44	27	198	146	279	69
Transportation and warehousing	48, 49	707	-	-	-	-	(D)	89 (S)	(D)	(D)	46	55
Information	51	1,399	9	11	14	33	31	39	160	38	123	94
Publishing	511	450	8	8	12	(D)	18	29	90	(D)	74	(D)
Newspaper, periodical, book, and database	5111	140	-	1	(z)	1	(D)	-	19	(D)	(D)	(D)
Software	5112	311	8	7	11	(D)	(D)	29	71	(D)	(D)	(D)
Broadcasting and telecommunications	513	728 (S)	(D)	-	(D)	(D)	7	2	7	(D)	-	69 (S)
Radio and television broadcasting	5131	2	-	-	-	(D)	-	-	(D)	-	-	-
Telecommunications	5133	725 (S)	-	-	-	8	(D)	(D)	(D)	(D)	-	69 (S)
Other broadcasting and telecommunications	513 minus (5131, 5133)	1	(D)	-	(D)	(D)	(D)	(D)	-	-	-	-
Other information	51 minus (511, 513)	220	(D)	3	2	(D)	6	9	62	(D)	50	(D)
Finance, insurance, and real estate	52, 53	711	(D)	4	(D)	3	12	(D)	52	38	120	47
Professional, scientific, and technical services	54	956	43	39	42	81	71	56	116	99	86	32
Architectural, engineering, and related services	5413	250	10	(D)	10	16	16	8	45	36	37	(D)
Computer systems design and related services	5415	333	20	21	19	29	22	30	37	(D)	(D)	10
Scientific R&D services	5417	159	(D)	(D)	13	27	30	12	16	(D)	-	(D)
Other professional, scientific, and technical services	54 minus (5413, 5415, 5417)	213	(D)	(z)	(z)	8	4	6	18	30	(D)	12
Management of companies and enterprises	55	13	(D)	(D)	(D)	(z)	7	(D)	(D)	-	-	-
Health care services	621–23	158	12	(z)	5	43	1	(D)	19	(D)	(D)	(D)
Other nonmanufacturing	56, 61, 624, 71, 72, 81	450	1	3	41	15	3	(D)	118	80	48	(D)

(D) = data have been withheld to avoid disclosing operations of individual companies; (S) = indicates imputation of more than 50 percent; (z) = indicates data less than half the unit shown; (--) = indicates data not collected; (-) = indicates a value of zero or a value rounded to zero.

NOTE: For information on sampling for 2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002

TABLE 39. R&D funds per employee spent by companies that performed industrial R&D in the United States, by size of company 1999–2002

(Dollars)

Size of company (number of employees)	1999 [a]	2000	2001 [b]	2002 [b]	Percent change 2002/2001
Total	10,028	11,297	11,852	12,378	4
5 to 24	34,057	37,703	30,366	29,559	-3
25 to 49	19,590	27,786	21,040	23,695	13
50 to 99	20,460	22,381	22,801	22,019	-3
100 to 249	11,892	15,190	20,206	24,721	22
250 to 499	11,861	12,915	16,736	14,755	-12
500 to 999	9,031	12,550	12,981	14,384	11
1,000 to 4,999	9,276	9,819	11,465	12,307	7
5,000 to 9,999	7,881	9,160	9,866	12,009	22
10,000 to 24,999	8,031	10,497	11,292	10,961	-3
25,000 or more	10,047	10,646	10,327	10,595	3
Company and other [c]	8,791	10,215	10,843	11,314	4
5 to 24	31,087	32,637	26,260	24,083	-8
25 to 49	18,072	26,552	19,911	22,096	11
50 to 99	18,754	20,797	21,277	20,366	-4
100 to 249	10,781	14,063	18,792	23,589	26
250 to 499	11,132	11,775	15,660	13,499	-14
500 to 999	8,272	11,866	12,211	13,614	11
1,000 to 4,999	8,942	9,570	11,204	11,883	6
5,000 to 9,999	6,825	8,273	8,935	10,958	23
10,000 to 24,999	7,903	10,249	10,915	10,453	-4
25,000 or more	7,955	8,949	8,975	9,234	3

[a] Some statistics for 1999 have been revised since originally published.

[b] Beginning with 2001, statistics for total and federally funded industrial R&D exclude data for federally funded research and development centers.

[c] The company-funded R&D in this table is the industrial R&D performed within company facilities funded from all sources except the federal government. The funds predominantly are the company's own, but also include funds from outside organizations such as other companies, research institutions, universities and colleges, nonprofit organizations, and state governments. Excluded from this table are company-funded R&D not performed within the company (e.g., R&D contracted out to other organizations) and company-funded R&D not performed within the 50 U.S. states or DC (e.g., R&D not performed on U.S. soil by foreign subsidiaries or other foreign organizations).

NOTES: Averages were derived by dividing total and company R&D funds spent during a calendar year by total employment in March of that year. For information on sampling for 1999–2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

TABLE 40. Distribution of total employment in companies that performed industrial R&D in the United States, ranked by size of R&D program: 1992–2002

(Percent distribution)

Companies ranked by size of R&D program	1992 [a]	1993	1994	1995	1996	1997 [a]	1998	1999 [a]	2000	2001 [b]	2002 [b]
Total	100	100	100	100	100	100	100	100	100	100	100
First 4 (1–4)	6	6	6	6	6	5	5	4	2	2	3
Next 4 (5–8)	3	2	2	2	2	2	3	2	2	4	2
Next 12 (9–20)	5	5	4	4	4	3	4	5	6	3	5
Next 20 (21–40)	4	4	4	4	4	4	4	4	4	4	5
Next 60 (41–100)	8	8	7	7	7	6	7	6	8	4	8
Next 100 (101–200)	10	9	8	7	8	6	8	7	7	8	10
Next 200 (201–400)	10	10	9	9	9	11	11	14	13	12	10
All others	54	55	59	61	59	63	60	58	57	63	56

[a] Some percentages for 1992, 1997 and 1999 have been revised since originally published.

[b] Beginning with 2001, statistics for total and federally funded industrial R&D exclude data for federally funded research and development centers.

NOTES: This table shows the percentage of total employment in the top R&D-performing companies. The companies are grouped for analysis. For example, if you like to know the percentage of total employment accounted for by the top 20 R&D-performing companies in 1999, you would add the percentages shown for the the categories "first 4," "next 4," and "next 12." The result is 11%. For information on sampling for 1999–2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

TABLE 41. Full-time equivalent R&D scientists and engineers in companies that performed industrial R&D in the United States, by industry and size of company and by source of R&D funds: January 2003

(Thousands)

Industry and size of company	NAICS codes	All sources	Federal	Company and other [a]
Distribution by industry:				
All industries	21–23, 31–33, 42, 44–81	1,066.1	67.2	998.8
Manufacturing	31–33	585.8	41.0 (S)	544.8
Food	311	12.9	(D)	(D)
Beverage and tobacco products	312	1.0	-	1.0
Textiles, apparel, and leather	313–16	2.5	(D)	(D)
Wood products	321	(D)	(D)	0.8
Paper, printing and support activities	322, 323	17.9	(z)	17.6
Petroleum and coal products	324	4.3 (S)	-	4.3 (S)
Chemicals	325	86.9	2.5	84.5
Basic chemicals	3251	8.5	(D)	(D)
Resin, synthetic rubber, fibers, and filament	3252	12.8	(z)	12.7
Pharmaceuticals and medicines	3254	51.8	(z)	51.7
Other chemicals	325 minus (3251–52, 3254)	13.9	(D)	(D)
Plastics and rubber products	326	11.0	(D)	(D)
Nonmetallic mineral products	327	(D)	(D)	3.6
Primary metals	331	4.0 (S)	(z) (S)	4.0 (S)
Fabricated metal products	332	13.1	0.5	12.6
Machinery	333	56.5	0.5 (S)	56.0
Computer and electronic products	334	209.6	25.6 (S)	184.1
Computers and peripheral equipment	3341	15.1	(z)	15.0
Communications equipment	3342	40.9 (S)	1.7	39.2 (S)
Semiconductor and other electronic components	3344	73.3	(z)	73.1
Navigational, measuring, electromedical, and control instruments	3345	75.9	23.4 (S)	52.5
Other computer and electronic products	334 minus (3341–42, 3344–45)	4.4	(z)	4.3
Electrical equipment, appliances, and components	335	14.0	(z)	13.8
Transportation equipment	336	123.1	10.9	112.2
Motor vehicles, trailers, and parts	3361–63	83.2	1.1	82.2
Aerospace products and parts	3364	32.5	9.5	23.0
Other transportation equipment	336 minus (3361–64)	7.3 (S)	(z)	7.0 (S)
Furniture and related products	337	2.0	(z)	1.8
Miscellaneous manufacturing	339	22.6	(z)	22.3
Medical equipment and supplies	3391	14.4	(D)	(D)
Other miscellaneous manufacturing	339 minus (3391)	8.2	(D)	(D)
Other manufacturing	31–33 minus (311–16, 321–27, 331–37, 339)	--	--	--
Nonmanufacturing	21–23, 42, 44–81	480.3	26.2	454.1
Mining, extraction, and support activities	21	(D)	(D)	4.2
Utilities	22	(z)	(D)	(D)
Construction	23	1.0	(z)	1.0
Trade	42, 44, 45	134.5	(z)	134.2
Transportation and warehousing	48, 49	(D)	(D)	1.0
Information	51	117.0	1.0	116.1
Publishing	511	85.1	(z)	84.7
Newspaper, periodical, book, and database	5111	4.3	-	4.3
Software	5112	80.8	(z)	80.4

TABLE 41. Full-time equivalent R&D scientists and engineers in companies that performed industrial R&D in the United States, by industry and size of company and by source of R&D funds: January 2003

(Thousands)

Industry and size of company	NAICS codes	All sources	Federal	Company and other [a]
Broadcasting and telecommunications	513	8.6 (S)	(D)	(D)
Radio and television broadcasting	5131	(z)	-	(z)
Telecommunications	5133	8.5 (S)	(D)	(D)
Other broadcasting and telecommunications	513 minus (5131, 5133)	(z)	-	(z)
Other information	51 minus (511, 513)	23.3	(D)	(D)
Finance, insurance, and real estate	52, 53	18.9	(D)	(D)
Professional, scientific, and technical services	54	181.8	24.4	157.5
Architectural, engineering, and related services	5413	32.2	7.5	24.7
Computer systems design and related services	5415	90.8	4.5	86.3
Scientific R&D services	5417	50.0	11.2	38.7
Other professional, scientific, and technical services	54 minus (5413, 5415, 5417)	8.9	1.1	7.7
Management of companies and enterprises	55	1.5	-	1.5
Health care services	621–23	9.1	(z) (S)	9.0
Other nonmanufacturing	56, 61, 624, 71, 72, 81	10.8	(z)	10.5
Distribution by size of company (number of employees):				
Total	(na)	1,066.1	67.2	998.8
5 to 24	(na)	60.0	6.6	53.4
25 to 49	(na)	26.6	1.4	25.2
50 to 99	(na)	38.4	2.0	36.5
100 to 249	(na)	61.4	3.3	58.1
250 to 499	(na)	46.4	3.8	42.5
500 to 999	(na)	61.3	4.7	56.6
1,000 to 4,999	(na)	165.5	2.3	163.2
5,000 to 9,999	(na)	104.0	13.4 (S)	90.6
10,000 to 24,999	(na)	158.3	5.3 (S)	153.0
25,000 or more	(na)	344.2	24.5 (S)	319.8

(D) = data have been withheld to avoid disclosing operations of individual companies; (S) = indicates imputation of more than 50 percent; (z) = indicates data less than half the unit shown; (--) = indicates data not collected; (-) = indicates a value of zero or a value rounded to zero; (na) = not applicable.

[a] The company R&D referred to in this table is the industrial R&D performed within company facilities funded from all sources except the federal government. The funds predominantly are the company's own, but also include funds from outside company facilities funded from all sources except the federal government. company facilities funded from all sources except the federal government, universities and colleges, nonprofit organizations, and state governments. Excluded from this table are company-funded R&D not performed within the company (e.g., R&D contracted out to other organizations) and company-funded R&D not performed within the 50 U.S. states or DC (e.g., R&D not performed on U.S. soil by foreign subsidiaries or other foreign organizations).

NOTES: Excludes data for federally funded research and development centers. For information on sampling for 2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

TABLE 42. R&D funds per full-time equivalent (FTE) R&D scientist or engineer spent by companies that performed industrial R&D in the United States, by industry and by size of company: 2002
(Dollars)

Industry	NAICS codes	Total	Size of company (number of employees)									
			5 to 24	25 to 49	50 to 99	100 to 249	250 to 499	500 to 999	1,000 to 4,999	5,000 to 9,999	10,000 to 24,999	25,000 or more
All industries	21–23, 31–33, 42, 44–81	189,060	122,065	168,466	174,496	243,910	193,257	178,741	180,665	172,502	174,666	206,129
Manufacturing	31–33	193,166	124,394	133,341	131,539	164,593	169,389	180,452	177,794	178,917 (S)	159,405	230,515
Food	311	(D)	59,877	-	-	194,146	143,062	107,204	180,091	240,981	146,046	212,912
Beverage and tobacco products	312	183,002	200,000	-	-	(D)	(D)	-	213,388	(D)	(D)	-
Textiles, apparel, and leather	313–16	(D)	(D)	-	40,009 (S)	79,638	146,257	151,983	120,959	122,148	(D)	(D)
Wood products	321	(D)	-	-	61,318	119,487	(D)	(D)	145,514	(D)	(D)	-
Paper, printing and support activities	322, 323	(D)	88,712	-	-	193,207	28,667	-	195,929	260,389 (S)	183,537	164,443
Petroleum and coal products	324	(D)	246,828	-	-	-	45,542	(D)	(D)	-	274,543 (S)	(D)
Chemicals	325	249,272	114,221	42,859	115,355	277,102	214,037	258,174	211,938	273,914	246,027	282,101
Basic chemicals	3251	213,209	225,656	-	42,377	177,149	217,816	339,931	217,514	197,025 (S)	(D)	-
Resin, synthetic rubber, fibers, and filament	3252	205,166	(D)	-	-	-	(D)	99,378	166,795 (S)	(D)	(D)	(D)
Pharmaceuticals and medicines	3254	(D)	567,463	15,201	166,080	451,399	-	346,007	289,895	345,130	262,319	303,912
Other chemicals	325 minus (3251–52, 3254)	(D)	50,310	(D)	126,786	188,324	95,872	191,179	137,904	117,044 (S)	(D)	(D)
Plastics and rubber products	326	(D)	142,581	-	128,148	141,564	123,125	157,268	126,334	148,907	114,395 (S)	(D)
Nonmetallic mineral products	327	(D)	126,605	46,614	8,614	31,899	289,111	103,079	128,889	192,431	(D)	(D)
Primary metals	331	120,493 (S)	68,656	(D)	55,822	184,571	39,537	101,421	115,002 (S)	29,376 (S)	280,683	(D)
Fabricated metal products	332	110,940	54,812	86,614	120,475	90,784	178,936	162,406	86,762	116,017	160,357 (S)	(D)
Machinery	333	120,204	117,978	131,648	119,588	188,357	149,530	137,506	128,290	84,535 (S)	96,755	162,277
Computer and electronic products	334	170,650	143,134	266,707	92,867	162,617	180,275	177,656	200,127	172,109 (S)	140,151 (S)	174,329 (S)
Computers and peripheral equipment	3341	215,115	183,027	338,425	124,291	151,323	173,973	185,039	167,648	(D)	(D)	-
Communications equipment	3342	142,987 (S)	91,073 (S)	(D)	29,730	187,774	185,334	155,317	200,745	(D)	(D)	(D)
Semiconductor and other electronic components	3344	164,262	177,768	290,255	239,029	185,945	259,679	203,693	206,382 (S)	237,372	(D)	(D)
Navigational, measuring, electromedical, components	3345	189,255 (S)	141,189	-	170,098	122,544	143,107	180,615	212,428	95,551 (S)	172,868	254,072 (S)
Other computer and electronic products	334 minus (3341–42, 3344–45)	113,042	151,805	188,937	92,953	225,882	45,079	168,636	137,554	(D)	-	-
Electrical equipment, appliances, and components	335	156,049	144,796	162,413	303,849	96,655	246,793	208,241	141,672	182,421 (S)	133,790	-
Transportation equipment	336	226,078	186,249	-	-	223,776	115,227	146,087	167,972	185,206	115,411	255,304
Motor vehicles, trailers, and parts	3361–63	(D)	198,097	-	-	-	55,432	140,872	146,533	213,716	44,711	240,550
Aerospace products and parts	3364	(D)	-	-	-	337,350	-	(D)	287,520	154,998 (S)	(D)	283,010 (S)
Other transportation equipment	336 minus (3361–64)	(D)	107,430	-	-	-	103,941	272,576	113,141	(D)	198,406 (S)	-

TABLE 42. R&D funds per full-time equivalent (FTE) R&D scientist or engineer spent by companies that performed industrial R&D in the United States, by industry and by size of company: 2002
(Dollars)

Industry	NAICS codes	Total	Size of company (number of employees)									
			5 to 24	25 to 49	50 to 99	100 to 249	250 to 499	500 to 999	1,000 to 4,999	5,000 to 9,999	10,000 to 24,999	25,000 or more
Furniture and related products	337	144,168	198,188	-	610,098	76,444	105,429	74,202	130,738	133,535	304,067 (S)	(D)
Miscellaneous manufacturing	339	362,370	114,216	310,584	259,586	202,762	221,736	256,018	172,446	398,070	336,100	(D)
Medical equipment and supplies	3391	(D)	107,018	-	(D)	195,672	234,094	123,156	187,564 (S)	474,839	(D)	(D)
Other miscellaneous manufacturing	339 minus (3391)	(D)	126,435	179,495	59,672	218,342	202,186	341,206	136,104	151,092	(D)	-
Other manufacturing	31–33 minus (311–16, 321–27, 331–37, 339)	--	--	--	--	--	--	--	--	--	--	--
Nonmanufacturing	21–23, 42, 44–81	183,855	121,565	184,091	196,633	280,156	209,238	177,227	184,037	157,027	200,613	162,688
Mining, extraction, and support activities	21	(D)	-	-	-	-	(D)	194,035	233,376 (S)	(D)	(D)	(D)
Utilities	22	(D)	-	-	-	-	(D)	(D)	79,787 (S)	375,171	238,294	(D)
Construction	23	182,183	82,298	-	-	-	(D)	87,425	210,923	(D)	(D)	-
Trade	42, 44, 45	(D)	164,696	130,230	108,724	226,432	164,261	205,464	264,548	147,720 (S)	229,983	184,429
Transportation and warehousing	48, 49	(D)	-	-	-	-	- (S)	(D)	(D)	(D)	(D)	1,293,663
Information	51	157,908	236,140	279,273	183,075	181,675	228,539	148,048	136,861	127,501	157,816	157,477
Publishing	511	167,944	246,547	264,385	147,178	160,992	123,837	143,768	143,353	(D)	(D)	(D)
Newspaper, periodical, book, and database	5111	135,512	-	-	-	-	(D)	-	110,233	(D)	1,048,671 (S)	(D)
Software	5112	169,873	246,547	261,703	147,140	157,171	124,144	143,768	147,598	(D)	(D)	(D)
Broadcasting and telecommunications	513	(D)	631,333	-	(D)	(D)	(D)	79,063 (S)	(D)	(D)	-	81,312 (S)
Radio and television broadcasting	5131	(D)	-	-	-	-	-	-	(D)	-	-	-
Telecommunications	5133	(D)	-	-	-	(D)	-	80,875 (S)	(D)	(D)	-	81,312 (S)
Other broadcasting and telecommunications	513 minus (5131, 5133)	(D)	631,333	-	(D)	(D)	(D)	(D)	-	-	-	-
Other information	51 minus (511, 513)	(D)	(D)	-	247,982	263,973	121,181	203,091	121,607	(D)	89,294	(D)
Finance, insurance, and real estate	52, 53	112,124	346,222	-	(D)	(D)	95,471	(D)	140,152 (S)	123,965 (S)	162,177 (S)	44,637
Professional, scientific, and technical services	54	182,295	89,147	200,160	251,660	217,444	214,716	187,656	201,626	166,833 (S)	(D)	165,211 (S)
Architectural, engineering, and related services	5413	159,104	181,175	211,113	310,532	164,270	178,486	129,487	213,132	85,233	(D)	221,723 (S)
Computer systems design and related services	5415	138,805 (S)	37,094	164,845	183,277	159,379	155,370	123,170	146,883	(D)	(D)	(D)
Scientific R&D services	5417	271,133	209,251	250,449	286,858	264,242	268,339	302,679	391,466	(D)	-	(D)
Other professional, scientific, and technical services	54 minus (5413, 5415, 5417)	197,390	229,758	(D)	67,407	204,057 (S)	(D)	(D)	176,145	98,804	(D)	(D)

TABLE 42. R&D funds per full-time equivalent (FTE) R&D scientist or engineer spent by companies that performed industrial R&D in the United States, by industry and by size of company: 2002

(Dollars)

Industry	NAICS codes	Total	Size of company (number of employees)									
			5 to 24	25 to 49	50 to 99	100 to 249	250 to 499	500 to 999	1,000 to 4,999	5,000 to 9,999	10,000 to 24,999	25,000 or more
Management of companies and enterprises	55	174,633	(D)	(D)	(D)	(D)	-	(D)	(D)	-	-	-
Health care services	621–23	(D)	646,779 (S)	11,322 (S)	(D)	1,134,157	-	204,495	187,251 (S)	(D)	(D)	(D)
Other nonmanufacturing	56, 61, 624, 71, 72, 81	(D)	80,731	-	23,841	225,840	265,416	109,677	102,573	177,469	(D)	(D)

(D) = data have been withheld to avoid disclosing operations of individual companies; (S) = indicates imputation of more than 50 percent; (--) = indicates data not collected; (-) = indicates a value of zero or a value rounded to zero.

NOTES: The number of full-time-equivalent R&D scientists and engineers used to estimate the cost per R&D scientist or engineer in 2002 is the arithmetic mean of the numbers of R&D scientists and engineers reported for January 2002 and 2003. This number is then divided into the total R&D expenditures of 2002, and the ratio is attributed to 2002. For information on sampling for 2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

TABLE 43. R&D funds per full-time equivalent R&D scientist or engineer spent by companies that performed industrial R&D in the United States, ranked by size of R&D program: 1992–2002

(Dollars)

Companies ranked by size of R&D program	1992 [a]	1993 [a]	1994 [a]	1995 [a]	1996 [a]	1997 [a]	1998 [a]	1999 [b]	2000	2001 [c]	2002 [c]	Percent change 2002/2001
First 4 (1–4)	202,492	252,629	218,906	234,791	231,784	229,602 (S)	242,408	289,072 (S)	283,219 (S)	229,610 (S)	270,753	18
Next 4 (5–8)	238,950	199,559	245,626 (S)	188,928 (S)	185,032 (S)	180,389	193,597	192,657	199,586	221,857	198,522	-11
Next 12 (9–20)	170,276	199,118	188,437	190,548	202,670	238,022 (S)	239,162	266,117 (S)	265,044 (S)	245,756 (S)	223,358	-9
Next 20 (21–40)	(S)	(S)	182,699	204,159	210,552	213,496	196,276	208,682 (S)	251,340 (S)	250,910	225,623	-10
Next 60 (41–100)	181,760	193,925	181,163	196,023	202,405	206,350	208,144	203,559	224,965	223,650	212,780	-5
Next 100 (101–200)	173,101	138,227	174,524	162,707	160,560	155,255	162,965	162,654	176,239	182,360	158,657	-13
Next 200 (201–400)	126,545	140,292	156,025	152,977	151,812	157,347	154,395	161,664	238,522	180,908	207,624	15
All others	158,098	154,814	174,536	167,339	168,362	171,495	173,585	179,880	232,405	219,058 (S)	211,253	-4

(S) = indicates imputation of more than 50 percent. Prior to 1994, data have been withheld.

[a] As a result of annual sampling, implemented to produce statistics that better reflect R&D performance among firms in nonmanufacturing industries and small firms in all industries, statistics for 1992 and later years are not directly comparable with statistics for earlier years. For more information, see the technical notes in Survey of Industrial Research and Development Methodology: 2002 at http://www.nsf.gov/sbe/srs/sird/start.htm.

[b] Some statistics for 1999 have been revised since originally published.

[c] Beginning with 2001, statistics for total and federally funded industrial R&D exclude data for federally funded research and development centers.

NOTES: This table shows the average R&D funds spent per each full-time equivalent R&D scientist and engineer by the top R&D-performing companies. The companies are grouped for analysis. For example, if you would like to know the average amount spent on R&D by the top 4 R&D-performing companies in 1999, you would look at the category "first 4." The result is $289,072. The number of full-time-equivalent R&D scientists and engineers used to estimate the cost per R&D scientist or engineer is the arithmetic mean of the numbers of R&D scientists and engineers reported for January in two consecutive years. This number is then divided into the total R&D expenditures of the earlier year, and the ratio is attributed to the earlier year. For information on sampling for 1999–2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

TABLE 44. Full-time equivalent R&D scientists and engineers per 1,000 employees in companies that performed industrial R&D in the United States, by industry and size of company: 1999–2002

Industry and size of company	NAICS codes	1999 [a]	2000	2001 [b]	2002 [b]	Percent change 2002/2001
Distribution by industry:						
All industries	21–23, 31–33, 42, 44–81	57	59	63	65	4
Manufacturing	31–33	55	55	62	62	0
Food	311	8	6	8	12	44
Beverage and tobacco products	312	25	23	25	16	-36
Textiles, apparel, and leather	313–16	31	9	10	11	11
Wood products	321	10	18 (S)	20 (S)	(D)	(na)
Paper, printing and support activities	322, 323	20 (S)	19 (S)	19 (S)	29	50
Petroleum and coal products	324	26	15 (S)	17 (S)	20 (S)	20
Chemicals	325	84	98	98	99	1
Basic chemicals	3251	60	71	64	54	-16
Resin, synthetic rubber, fibers, and filament	3252	65	77	89	97	9
Pharmaceuticals and medicines	3254	133	136	143	137	-4
Other chemicals	325 minus (3251–52, 3254)	61 (S)	77 (S)	75 (S)	68 (S)	-9
Plastics and rubber products	326	24	24	27	22	-18
Nonmetallic mineral products	327	15	30	27	(D)	(na)
Primary metals	331	13 (S)	13 (S)	15 (S)	15 (S)	1
Fabricated metal products	332	13	15	20	26	28
Machinery	333	60	69	72	72	0
Computer and electronic products	334	147 (S)	152 (S)	180 (S)	167	-7
Computers and peripheral equipment	3341	127	135	175	170	-3
Communications equipment	3342	217 (S)	195 (S)	309 (S)	264 (S)	-15
Semiconductor and other electronic components	3344	141 (S)	132 (S)	148 (S)	180	21
Navigational, measuring, electromedical, and control instruments	3345	133	146	144 (S)	126 (S)	-13
Other computer and electronic products	334 minus (3341–42, 3344–45)	112	86	92	171	85
Electrical equipment, appliances, and components	335	37	44	53	40	-24
Transportation equipment	336	65	53	59	61	3
Motor vehicles, trailers, and parts	3361–63	64	60	70	76	8
Aerospace products and parts	3364	72 (S)	43	41 (S)	43 (S)	5
Other transportation equipment	336 minus (3361–64)	40	38 (S)	49 (S)	50 (S)	3
Furniture and related products	337	10	9 (S)	11	9	-14
Miscellaneous manufacturing	339	43	50	45	54	21
Medical equipment and supplies	3391	53	58	57	61	7
Other miscellaneous manufacturing	339 minus (3391)	29	35	28	45	59
Other manufacturing	31–33 minus (311–16, 321–27, 331–37, 339)	--	--	--		(na)
Nonmanufacturing	21–23, 42, 44–81	60	65	64	70	9
Mining, extraction, and support activities	21	16	29	46	(D)	(na)
Utilities	22	2	1	2	2	-3
Construction	23	52	8	15	10	-33
Trade	42, 44, 45	92	76	69	84	22
Transportation and warehousing	48, 49	1	3	2	(D)	(na)
Information	51	68	75	80	81	2
Publishing	511	230	248	222	179	-19
Newspaper, periodical, book, and database	5111	26	31	32	32	1
Software	5112	344	358	334	245	-27

TABLE 44. Full-time equivalent R&D scientists and engineers per 1,000 employees in companies that performed industrial R&D in the United States, by industry and size of company: 1999–2002

Industry and size of company	NAICS codes	1999 [a]	2000	2001 [b]	2002 [b]	Percent change 2002/2001
Distribution by industry:						
Broadcasting and telecommunications	513	14 (S)	12 (S)	(D)	15 (S)	(na)
Radio and television broadcasting	5131	(D)	(D)	(D)	318	(na)
Telecommunications	5133	(D)	(D)	11 (S)	(D)	(na)
Other broadcasting and telecommunications	513 minus (5131, 5133)	(D)	356	(D)	(D)	(na)
Other information	51 minus (511, 513)	114	95	(D)	98	(na)
Finance, insurance, and real estate	52, 53	20	25	26	24	-6
Professional, scientific, and technical services	54	173	201	181	174	-4
Architectural, engineering, and related services	5413	180	207 (S)	135	104	-23
Computer systems design and related services	5415	162	174	216	259 (S)	20
Scientific R&D services	5417	348	366	378	302	-20
Other professional, scientific, and technical services	54 minus (5413, 5415, 5417)	40	61	35	28	-21
Management of companies and enterprises	55	65	110	34	66	93
Health care services	621–23	84	20	40	43	6
Other nonmanufacturing	56, 61, 624, 71, 72, 81	7	8	18	22	23
Distribution by size of company (number of employees):						
Total	(na)	57	59	63	65	4
5 to 24	(na)	249	295	277	242	-13
25 to 49	(na)	144	179	166	141	-15
50 to 99	(na)	163	111	106	126	19
100 to 249	(na)	81	94	106	101	-5
250 to 499	(na)	68	79	90	76	-15
500 to 999	(na)	82	92	79	80	1
1,000 to 4,999	(na)	58	49	67	68	1
5,000 to 9,999	(na)	58	59 (S)	61 (S)	70	14
10,000 to 24,999	(na)	37	56	62	63	2
25,000 or more	(na)	45	46 (S)	46 (S)	51	11

(D) = data have been withheld to avoid disclosing operations of individual companies; (S) = indicates imputation of more than 50 percent;
(--) = indicates data not collected; (na) = not applicable.

[a] Some statistics for 1999 have been revised since originally published.

[b] Beginning with 2001, statistics for total and federally funded industrial R&D exclude data for federally funded research and development centers.

NOTE: For information on sampling for 1999–2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

APPENDIX A. TECHNICAL NOTES

Section *Page*

Survey Methodology

Much of the information for this appendix was provided by the Manufacturing and Construction Division of the U.S. Bureau of the Census, which collected and compiled the survey data. Copies of the technical papers cited can be obtained from NSF's Research and Development Statistics Program in the Division of Science Resources Statistics. The first part of this appendix focuses on recent changes to the survey methodology; major historical changes are discussed later in Comparability of Statistics. More detailed historical information is available from individual annual reports (http://www.nsf.gov/statistics/industry/).

Reporting Unit

The reporting unit for the Survey of Industrial Research and Development is the company,[5] defined as a business organization of one or more establishments under common ownership or control. The survey includes two groups of enterprises: (1) companies known to conduct R&D, and (2) a sample representation of companies for which information on the extent of R&D activity is uncertain.

Frame Creation

The Standard Statistical Establishment List (SSEL), a Bureau of the Census compilation that contains information on more than 3 million establishments with paid employees, was the target population from which the frame used to select the 2002 survey sample was created (see table A-1 for population and sample sizes). For companies with more than one establishment, data were summed to the company level and the resulting company record was used to select the sample and process and tabulate the survey data.

After data were summed to the company level, each company then was assigned a single North American Industry Classification System (NAICS)[6] code based on payroll. The method used followed the hierarchical structure of the NAICS. The company was first assigned to the economic sector, defined by a 2-digit NAICS code representing manufacturing, mining, trade, etc., that accounted for the highest percentage of its aggregated payroll. Then the company was assigned to a subsector, defined by a 3-digit NAICS code, that accounted for the highest percentage of its payroll within the economic sector. Finally, the company was assigned a 4-digit NAICS code within the subsector, again based on the highest percentage of its aggregated payroll within the subsector. Assignment below the 4-digit level was not done because of the concentration of R&D in relatively few industries and disclosure concerns. Both issues are discussed later in this appendix.

Defining Sampling Strata

A fundamental change initiated in 1995 and repeated for subsequent samples was the redefinition of the sampling strata. For the survey years 1992–94, 165 sampling strata were established, each stratum corresponding to one or more 3-digit-level SIC codes. The objective was to select sufficient representation of industries to determine whether alternative or expanded publication levels were warranted. For the 1995-98 surveys, the sampling strata corresponded to publication-level industry aggregations. For each year, 40 publication levels were defined. These correspond to the original 25 groupings of manufacturing industries used as sampling strata before 1992 and an additional 15 groupings of nonmanufacturing industries. Beginning with the 1999 survey, with the conversion to NAICS, 29 manufacturing and 20 nonmanufacturing strata were defined corresponding to the 4-digit industries and groups of industries for which statistics were developed and published.

Identifying Arbitrary Certainty Companies

To limit the growth occurring each year in the number of companies selected for the survey with certainty, the certainty criterion was raised for the 1996 survey from $1 million to $5 million in total R&D expenditures based on data gathered from the 1995 survey. With a fixed total sample size, there was concern that the representation of the very large noncertainty universe by a smaller sample each year would be inadequate. Because the sample size was increased for 2002, the certainty criterion was lowered from $5 million to $3 million in total R&D expenditures.

[5] In the Survey of Industrial Research and Development and in the publications presenting statistics resulting from the survey, the terms *company*, *firm*, and *enterprise* are used interchangeably. *Industry* refers to the 2-, 3-, or 4-digit North American Industry Classification System (NAICS) codes or group of NAICS codes used to publish statistics resulting from the survey.

[6] The 1999 survey was the first year that companies were classified using NAICS. Prior to 1999, the Standard Industrial Classification (SIC) system was used. The two systems are discussed later under Comparability of Statistics.

Beginning in 2001, the methodology to produce statistics by state was modified from previous years to address the recurring problem of large year-to-year variation in many state estimates. Under the new methodology, selected with certainty are the largest 50 companies in each state based on payroll thus providing more coverage of R&D performers (see State Estimates below).

Frame Partitioning

Beginning in 1996, total company employment became the basis for partitioning the frame. The total company employment levels defining the partitions were based on the relative contribution to total R&D expenditures of companies in different employment size groups in both the manufacturing and nonmanufacturing sectors. In the manufacturing sector, all companies with total employment of 50 or more were included in the large company partition. In the nonmanufacturing sector, all companies with total employment of 15 or more were included in the large company partition. Companies in the respective sectors with employment below these values were included in the small company partition.

For the 2002 survey, the frame was partitioned into three groups: (1) companies known to conduct R&D, (2) companies that previously only reported zero R&D, and (3) companies for which information about the extent of R&D activity is uncertain. There were 5,817 companies in the first group, 55,374 companies in the second group, and 1,770,658 companies in the third group.

Sample Selection and Processing

Beginning with the 1996 cycle of the survey, a significant revision in the procedure for selecting samples from the partitions led to a change in the development and presentation of estimates. The revised procedure was repeated for subsequent surveys. For the 1995 survey, the sample of companies from the large-company partition was selected using probability proportionate to size sampling (see below) in each of the 40 strata (discussed previously under Defining Sampling Strata). Likewise, the simple random sampling of the small-company partition was done for each of the 40 strata. However, beginning in 1996, the number of strata established for the small-company partition was reduced to two. One stratum consisted of small companies classified in manufacturing industries and the second stratum consisted of small companies classified in nonmanufacturing industries. Simple random sampling continued as the selection method for these two strata.

The purpose of selecting the small company panel from these two strata was to reduce the variability in industry estimates largely attributed to the random year-to-year selection of small companies by industry and the high sampling weights that sometimes occurred. As a consequence of this change, estimates for industry groups within manufacturing and nonmanufacturing were not possible from these two strata as noted on affected tables. The statistics for the detailed industry groups were based only on the sample from the large-company partition. Prior to 1999, estimates from the small-company partition were included in statistics for total manufacturing, total nonmanufacturing, and all industries. For the reports for 1999 and 2000, the estimates were published separately in the “small manufacturing companies” and “small nonmanufacturing companies” categories. For 2001, the frame still had the small-company partition, but the tabulation of the small companies was incorporated with the large companies. For 2002, the small-company partitions were eliminated from the survey frame. In this report, small-company data were incorporated with that from large companies for 1999-2002.

Probability Proportionate to Size

Imputing R&D. It would be ideal if company size could be determined by its R&D expenditures. Unfortunately, except for the companies that were in a previous survey or for which there is information from external sources, it is impossible to know the R&D expenditures for every firm in the universe (i.e., R&D information is not available from the Standard Statistical Establishment List (SSEL)). Consequently, the probability of selection for most companies is based on estimated R&D expenditures. Since total payroll is known for each company in the universe (i.e., payroll information is available from the SSEL), it is possible to estimate R&D from payroll using relationships derived from previous survey data. Imputation factors relating these two variables are derived for each industry grouping. To impute R&D for a given company, the imputation factors are applied to the company payroll in each industry grouping. A final measure is obtained by adding the industry grouping components. The effect, in general, is to give firms with large payrolls higher probabilities of selection in agreement with the assumption that larger companies are more likely to perform R&D. Estimated R&D values are computed for companies in the small-company partition as well. The aggregate of reported and estimated R&D from each company in both the large- and small-company partitions represent a total universe measure of the previous year’s R&D expenditures. However, assigning R&D to every

company results in an overstatement of this measure. To adjust for the overstatement, the universe measure is scaled down using factors developed from the relationship between the frame measure of the prior year's R&D and the final prior-year survey estimates. These factors, computed at levels corresponding to published industry levels, are used to adjust the originally imputed R&D values so that the new frame total for R&D at these levels approximate the prior year's published values. This adjustment provides for better allocation of the sample among these levels.

For 2001, the distribution of companies by payroll and estimated R&D in the large-company partition was skewed as in earlier frames (i.e., the correlation of payroll and estimated R&D was high because estimated R&D had been calculated based on payroll). Because of this skewness, probability proportionate to size (pps) sampling remained the appropriate selection technique for this group. That is, large companies had higher probabilities of selection than did small companies. However, a different approach to pps sampling was introduced beginning with the 1998 survey. Historically, pps sampling had been accomplished using an independent sampling methodology, i.e., the selection (or nonselection) of a given company was independent of the sampling result (select or nonselect) of any other company. This implied that over repeated samplings in a given stratum, different size samples would result. This added more variability to the sample estimates. For 1998, a fixed sample size pps method was introduced. This method ensured that the sample size desired for a given stratum was achieved, thus eliminating error because of sample size variation from the sample estimates. For a given sample size, the fixed sample size method will produce more precise estimates on average than the independent method. The fixed sample size methodology has been replicated for every survey year since the 1998 survey.

There was a significant change in assigning probabilities for the 2002 survey year. If a company in the frame reported any positive R&D data in the previous four years, then that company received a measure of size equal to the most recent reported positive R&D expenditures and was placed in the first frame partition. If a company reported zero R&D expenditures in the previous four years, then that company was placed in the second frame partition. The remaining companies received a measure of size equal to their company payroll, and then were placed in the third frame partition. Relative standard error (RSE) constraints by industry and by state were imposed separately in the first partition and the company received a probability of selection for each industry in which it had activity, as well as each state. The company's final probability was the maximum of these industry and state probabilities. The same was done for companies in the third partition.

Simple Random Sampling

For 1996-2000, only two major strata were defined for samples in the small-company partition, manufacturing and nonmanufacturing. The use of simple random sampling (srs) implied that each company within a stratum had an equal probability of selection with the exception of the preassigned certainties. The total sample allocated to the small-company partition was dependent upon the total sample specified for the survey and upon the total sample necessary to satisfy criteria established for the large partition. Once determined, the allocation of this total by stratum was made proportionate to the stratum's payroll contribution to the entire partition.

The small manufacturing, small nonmanufacturing, and an unknown NAICS strata, which was added in 2001 to account for companies with an incomplete or missing NAICS code, were eliminated for the srs portion of the 2002 survey frame. The srs portion of the frame consisted of only those companies in the second partition, i.e., those companies that reported only zero for R&D expenditures within the previous four years. These companies were split into two simple random sampling strata. Companies in the first stratum were classified in manufacturing and received a probability of selection of roughly 0.01. Companies in the second stratum were classified in nonmanufacturing and assigned a probability of selection around 0.004.

Sample Stratification and Relative Standard Error Constraints

The particular sample selected was one of a large number of samples of the same type and size that by chance might have been selected. Statistics resulting from the different samples would differ somewhat from each other. These differences are represented by estimates of sampling error or variance. The smaller the sampling error, the more precise the statistic, that is, the closer it is to the result that would have occurred had a complete canvass been done under the same definitions and procedures. The accuracy of the estimate, how close it is to the true value, is a function not only of sampling error but also of nonsampling error.

Controlling Sampling Error. Historically, it has been difficult to achieve control over the sampling error of survey estimates. Efforts were confined to controlling the amount of error due to sample size variation, but this was only one component of the overall sampling error. The other component depended on the correlation between the data from the sampling frame used to assign probabilities (namely R&D values either imputed or reported in the previous survey) and the actual current year reported data. The nature of R&D is such that these correlations could not be predicted with any reliability. Consequently, precise controls on overall sampling error were difficult to achieve.

For recent surveys, primary concern was placed on controlling error for the large-company partition because nearly all of the R&D activity was identified from that portion of the sample. Since 1998, with the introduction of the fixed sample size sampling procedure, the component of sampling error due to sample size variation was eliminated. However, the amount of error attributable to the remaining component of the sample remained. Since there was still no way to predict how well the data from the sampling frame would correlate with actual survey data, the approach taken to allocate the sample across the various strata was to assign probabilities in the same manner as in the past when independent sampling was used. The probabilities resulting from this allocation technique determined the sample sizes to be selected from each stratum subject to the overall sample size constraint dictated by the survey budget. Although the actual survey sampling errors could not be predicted, the parameters used to assign probabilities, and the use of the minimum probability rule resulted in a desirable number of companies being sampled from the large-company partition (see Sample Size below).

Sampling Strata and Standard Error Estimates. A limitation of the sample allocation process for the large-company partition should be noted. The constraints used to control the sample size in each stratum were based on a universe total that, in large part, was improvised. That is, as previously noted, an R&D value was assigned to every company in the frame, even though most of these companies actually may not have had R&D expenditures. The value assigned was imputed for the majority of companies in the frame and, as a consequence, the estimated universe total and the distribution of individual company values, even after scaling, did not necessarily reflect the true distribution. Assignment of sampling probability was nevertheless based on this distribution. The presumption was that actual variation in the sample design would be less than that estimated, because many of the sampled companies have true R&D values of zero, not the widely varying values that were imputed using total payroll as a predictor of R&D. Previous sample selections indicate that in general this presumption held, but exceptions have occurred when companies with large sampling weights have reported large amounts of R&D spending. See table A-2 for a list by industry of the standard error estimates for selected items and table A-3 for a list of the standard error estimates of total R&D by state.

Nonsampling Error. In addition to sampling error, estimates are subject to nonsampling error. Errors are grouped in five categories: specification, coverage, response, nonresponse, and processing. For detailed discussions on the sources, control, and measurement of each of these types of error, see U.S. Bureau of the Census (1994b and 1994f).

Sample Size

For 2002, the parameters set to control sampling error discussed above resulted in sample sizes of 4,395 companies from the first partition of the pps portion of the frame, 262 companies from the second frame partition, and 26,525 companies from the third frame partition. The overall final sample consisted of 31,182 companies. This total included an adjustment to the sample size based on a minimum probability rule and changes in the operational status of some companies.

Changes in Operational Status. Between the time that the frame was created and the survey was prepared for mailing, the operational status of some companies changed. That is, they were merged with or acquired by another company, or they were no longer in business. Before preparing the survey for mailing, the operational status was updated to identify these changes. As a result, the number of companies mailed a survey form was somewhat smaller than the number of companies initially selected for the survey.

Weighting, Maximum Weights, and Probabilities of Selection

The 2002 sample design for the survey was complex and oversampled known research and development performers. Thus, sample weights were required to produce nationally representative estimates. The sample weights used were the inverse of the probability of selection. The 2002 sample design, as was the case since 1997, included

a restriction on the maximum weight (or minimum probability of selection) of any company in the sample. The maximum weight for companies classified in manufacturing was restricted to 100 while the maximum weight for companies classified in non-manufacturing was restricted to 250.

Survey Forms

Two forms are used each year to collect data for the survey. Known large R&D performers are sent a detailed survey form, Form RD-1.[7] The Form RD-1 requests data on sales or receipts, total employment, employment of scientists and engineers, expenditures for R&D performed within the company with federal funds and with company and other funds, character of work (basic research, applied research, and development), company-sponsored R&D expenditures in foreign countries, R&D performed by others, R&D performed in collaboration with others, federally funded R&D by contracting agency, R&D costs by type of expense, R&D costs by technology area, domestic R&D expenditures by state, energy-related R&D, R&D done in collaboration with others, and foreign R&D by country. Because companies receiving the Form RD-1 have participated in previous surveys, computer-imprinted data reported by the company for the previous year are supplied for reference. Companies are encouraged to revise or update the prior-year data if they have more current information; however, prior-year statistics that had been previously published were revised only if large disparities were reported.

Small R&D performers and firms included in the sample for the first time were sent Form RD-1A. This form collects the same information as Form RD-1 except for five items: Federal R&D support to the firm by contracting agency, R&D costs by type of expense, domestic R&D expenditures by state, energy-related R&D, and foreign R&D by country. It also includes a screening item that allows respondents to indicate that they do not perform R&D. No prior-year information is made available since the majority of the companies that receive the Form RD-1A have not been surveyed in the previous year.

[7]Form RD-1 is a revised version of the Form RD-1L, formerly used to collect data from large R&D performers for odd-numbered years. For even-numbered years, an abbreviated questionnaire, Form RD-1S was used. Beginning in 1998 the Form RD-1L was streamlined, renamed Form RD-1, and the odd/even-numbered year cycle abandoned.

Recent Survey Form Content Changes

For 2001, a new item asking for R&D costs by technology area was added to both survey forms. In 2002, a new item asking for R&D done in collaboration with others was added to the Form RD-1.

Number of Survey Forms Sent

For the 2002 survey, Form RD-1 was mailed to companies that reported R&D expenditures of $3 million or more in the 2001 survey. Approximately 2,376 companies received Form RD-1 and approximately 28,828 received Form RD-1A. Both survey forms and the instructions provided to respondents are reproduced in appendix B, Survey Documents.

Followup for Survey Nonresponse

The 2002 survey forms were mailed in March 2003. Recipients of Form RD-1A were asked to respond within 30 days, while Form RD-1 recipients were given 60 days. A follow-up form and letter were mailed to RD-1A recipients every 30 days if their completed survey form had not been received; a total of five follow-up mailings were conducted for delinquent RD-1A recipients.

A letter was mailed to Form RD-1 recipients 30 days after the initial mailing, reminding them that their completed survey forms were due within the next 30 days. A second form and reminder letter were mailed to Form RD-1 respondents after 60 days. Two additional follow-up mailings were conducted for delinquent Form RD-1 recipients.

In addition to the mailings, telephone followup was used to encourage response from those firms ranked among the 300 largest R&D performers, based on total R&D expenditures reported in the previous survey. Table A-4 shows the number of companies in each industry or industry group that received a survey form and the percentage that responded to the survey.

Imputation for Item Nonresponse

For various reasons, many firms chose to return the survey form with one or more blank items. (For detailed discussions on the sources, control, and measurement of error resulting from item nonresponse, see U.S. Bureau of the Census 1994b.) For some firms, internal accounting systems and procedures may not have allowed quantification of specific expenditures. Others may have

refused to answer any voluntary questions as a matter of company policy. (All but five items are voluntary. See further discussion under Response Rates and Mandatory/ Voluntary Reporting.)

When respondents did not provide the requested information, estimates for the missing data were made using imputation algorithms. In general, the imputation algorithms computed values for missing items by applying the average percentage change for the target item in the nonresponding firm's industry to the item's prior-year value for that firm, reported or imputed. This approach, with minor variation, was used for most items. (For detailed descriptions and analyses of the imputation methods and algorithms used, see U.S. Bureau of the Census 1994c.) Table A-5 contains imputation rates for the principal survey items.

Response Rates and Mandatory/ Voluntary Reporting

Survey reporting requirements divided survey items into two groups: mandatory and voluntary. Responses to five data items were mandatory; responses to the remaining items were voluntary. The mandatory items were total R&D expenditures, federal R&D funds, net sales, total employment (which are included in the Census Bureau's annual mandatory statistical program) and the distribution of R&D by state. During the 1990 survey cycle, NSF conducted a test of the effect of reporting on a completely voluntary basis to determine whether combining both mandatory and voluntary items on one survey form influences response rates. For this test, the 1990 sample was divided into two panels of approximately equal size. One panel, the mandatory panel, was asked to report as usual on four mandatory items with the remainder voluntary, and the other panel was asked to report all items on a completely voluntary basis. The result of the test was a decrease in the overall survey response rate to 80 percent from levels of 88 percent in 1989 and 89 percent in 1988. The response rates for the mandatory and voluntary panels were 89 percent and 69 percent, respectively. Detailed results of the test were published in *Research and Development in Industry: 1990*. For firms that reported R&D expenditures in 2002, table A-6 shows the percentage that also reported data for other selected items.

Character of Work Estimates

Response to questions about character of work (basic research, applied research, and development) declined in the mid-1980s, and, as a result, imputation rates increased. The general imputation procedure described above became increasingly dependent upon information imputed in prior years, thereby distancing current-year estimates from any reported information. Because of the increasing dependence on imputed data, NSF chose not to publish character of work estimates in 1986. The imputation procedure used to develop these estimates was revised in 1987 for use with later data and differs from the general imputation approach. The new method calculated the character of work distribution for a nonresponding firm only if that firm reported a distribution within a five-year period, extending from two years before to two years after the year requiring imputation. Imputation for a given year was initially performed in the year the data were collected and was based on a character of work distribution reported in either of the two previous years, if any. It was again performed using new data collected in the next two years. If reported data followed no previously imputed or reported data, previous period estimates were inserted based on the currently reported information. Similarly, if reported data did not follow two years of imputed data, the two years of previously imputed data were removed. Thus, character of work estimates were revised as newly reported information became available and were not final for two years following their initial publication.

Beginning with 1995, previously estimated values were not removed for firms that did not report in the third year, nor were estimates made for the two previous years for firms reporting after two years of nonresponse. This process was changed because in the prior period revisions were minimal. Estimates continued to be made for two consecutive years of nonresponse and discontinued if the firm did not report character of work in the third year. If no reported data were available for a firm, character of work estimates were not imputed. As a consequence, only a portion of the total estimated R&D expenditures were distributed at the firm level. Those expenditures not meeting the requirements of the new imputation methodology were placed in a "not distributed" category.

NSF's objective in conducting the survey has always been to provide estimates for the entire population of firms performing R&D in the United States. However, the revised imputation procedure would no longer produce such estimates because of the not distributed component. A baseline estimation method thus was developed to allocate the not distributed amounts among the char-

acter of work components. In the baseline estimation method, the not distributed expenditures were allocated by industry group to basic research, applied research, and development categories using the percentage splits in the distributed category for that industry. The allocation was done at the lowest level of published industry detail only; higher levels were derived by aggregation, just as national totals were derived by aggregation of individual industry estimates, and result in higher performance shares for basic and applied research and lower estimates for development's share than would have been calculated using the previous method.

Using data collected during the 1999 and 2000 cycles of the survey, reporting anomalies for the character of work survey items, especially for basic research, were investigated. It was discovered that a number of large companies known to develop and manufacture products reported all of their R&D as basic research. This phenomenon is not logical and prompted a renewed effort to strengthen character of work estimates produced from the survey. Identification of the anomalous reporting patterns was completed and edit checks were improved for processing of the 2001 and 2002 data. Consequently, publication of character of work distributions of R&D has been resumed, and the tables containing historical basic research, applied research, and development estimates have been revised and footnoted accordingly.

State Estimates

Form RD-1 requests a distribution of the total cost of R&D among the states where R&D was performed. Prior to the 1999 survey, an independent source, the *Directory of American Research and Development*, published by the Data Base Publishing Group of the R. R. Bowker Company was used in conjunction with previous survey results to estimate R&D expenditures by state for companies that did not provide this information. The information on scientists and engineers published in the directory was used as a proxy indicator of the proportion of R&D expenditures within each state. R&D expenditures by state were estimated by applying the distribution of scientists and engineers by state from the directory to total R&D expenditures for these companies. These estimates were included with reported survey data to arrive at published estimates of R&D expenditures for each state. However, the practice of using outside information to formulate or adjust estimates of R&D expenditures for each state has been discontinued because a suitable source for supporting information is no longer available. State estimates resulting from the 1999 and 2000 surveys were based solely on respondent reports and information internal to the survey.

Beginning with the 2001 survey, because of the lack of a reliable, comprehensive outside source of information, in an effort to improve the quality of reported data, NSF sought and was granted authorization to require reporting of the distribution of R&D by state from the Office of Management and Budget (OMB), the federal agency that oversees and controls burden on respondents.

Also beginning in 2001, the sampling and estimation methodologies used to produce state estimates were modified from previous years to yield better accuracy and precision and to reduce erroneous fluctuations in year-to-year estimates due to small sample sizes of R&D performers by state. The new sampling methodology selects known R&D performers with a higher probability than nonperformers and selects with certainty the largest 50 companies in each state based on payroll thus providing more coverage of R&D performers. The new estimation methodology for state estimates takes the form of a hybrid estimator combining the unweighted reported amount by state with a weighted amount apportioned across states with industrial activity. The hybrid estimator smoothes the estimate over states with R&D activity by industry and accounts for real change within a state. The Horvitz-Thompson estimator continues to be used to estimate the number of R&D performers by state.

Comparability of Statistics

This section summarizes major survey improvements, enhancements, and changes in procedures and practices that may have affected the comparability of statistics produced from the Survey of Industrial Research and Development over time and with other statistical series (see also NSF 2002a and U.S. Bureau of the Census 1995). This section focuses on major historical changes. More detailed historical information is available from individual annual reports (http://www.nsf.gov/statistics/industry/).

Industry Classification System

Beginning with the 1999 cycle of the survey, industry statistics are published using the North American Industrial Classification System (NAICS). The ongoing development of NAICS has been a joint effort of statistical agencies in Canada, Mexico, and the United States. The system replaced 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. (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.) 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 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 United States. Among manufacturers, the 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 include a variety of industries. Of specific importance for the survey are engineering and scientific R&D service industries.

Effects of NAICS on Survey Statistics. The change of industry classification system affects most of the detailed statistical tables produced from the survey. Prior to the 1999 report, tables classified by industry contained the current survey's statistics plus statistics for 10 previous years. Because of the new classification system, the tables classified in this report contain only statistics for the current year (2002) and previous years back to 1999. However, to provide a bridge for users who want to make year-to-year comparisons below the aggregate level, in several tables in *Research and Development in Industry: 2000* statistics from the 1997 and 1998 cycles of the survey, which were previously classified and published using the SIC system, were reclassified using the new NAICS codes. These reclassified statistics were slotted using their new NAICS classifications alongside the 1999 and 2000 statistics, which were estimated using NAICS from the outset.

Company Size Classifications

Beginning with the 1999 cycle of the survey, the number of company size categories used to classify survey statistics was increased. The original 6 categories were expanded to 10 to emphasize the role of small companies in R&D performance. 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. (For more information, visit the Organisation for Economic Co-operation and Development (OECD) website at http://www.oecd.org.) The new classifications of the U.S. statistics enable more direct comparisons with other countries' statistics.

Revisions to Historical and Immediate Prior-Year Statistics

Revisions to historical statistics usually have been made because of changes in the industry classification of companies caused by changes in payroll composition detected when a new sample was drawn. Various methodologies have been adopted over the years to revise, or backcast, the data when revisions to historical statistics have become necessary. Documented revisions to the historical statistics from post-1967 surveys through 1992 are summarized by NSF (1994) and in annual reports for

subsequent surveys. Detailed descriptions of the specific revisions made to the statistics from pre-1967 surveys are scarce, but U.S. Bureau of the Census (1995) summarizes some of the major revisions.

Changes to reported data can come from three sources: respondents, analysts involved in survey and statistical processing, and the industry reclassification process. Prior to 1995, routine revisions were made to prior-year statistics based on information from all three sources. Consequently, results from the current-year survey were used not only to develop current-year statistics but also to revise immediate prior-year statistics. Beginning with the 1995 survey, this practice was discontinued. The reasons for discontinuation of this practice were annual sampling; continual strengthening of sampling methodology; and improvements in data verification, processing, and nonresponse followup. Moreover, it was not clear that respondents or those who processed the survey results had any better information a year after the data were first reported. Thus, it was determined that routinely revising published survey statistics increased the potential for error and often confused users of the statistics. Revisions are now made to historical and immediate prior-year statistics only if substantive errors are discovered.

For 1999, an error in the sample frame caused one very large company (based on payroll) to be selected for the sample and its statistical record to be assigned a large weight (see Frame Creation and Weighting and Maximum Weights above). Because the company's record had received a large weight during 1999 sampling, the company was selected with certainty for the 2000 sample and assigned a weight of one (see Identifying Certainty Companies above). This sampling artifact caused an abnormally large decrease in the company's data, especially for sales and employment, when comparing the 2000 statistics with the statistics originally published for 1999. The weight in the company's record in the 1999 statistical file was corrected, and revised 1999 statistics are included in the tables in this report. R&D estimates for the company also were affected; however, the amount of R&D reported was relatively small, even after weighting.

As summarized above under Character of Work Estimates, reporting anomalies for the character of work survey items, especially for basic research, were discovered and investigated using data collected during the 1999 and 2000 cycles of the survey. Companies known to develop and manufacture products but that reported all of their R&D as basic research were contacted and queried regarding their R&D activities. After reviewing the definitions of basic research, applied research, and development, all but several changed their distribution of R&D. Census, the collection and tabulation agent for the survey, was able to go back as far as 1998 and correct the statistical files. Consequently, the tables containing historical basic research, applied research, and development estimates have been revised and footnoted accordingly.

Year-to-Year Changes

Comparability from year to year may be affected by new sample design, annual sample selection, and industry shifts.

Sample Design

By far the most profound influence on statistics from recent surveys occurred when the new sample design for the 1992 survey was introduced. Revisions to the 1991 statistics were dramatic (see *Research and Development in Industry: 1992* for a detailed discussion). While the allocation of the sample was changed somewhat, the sample designs used for subsequent surveys were comparable to the 1992 sample design in terms of size and coverage.

Annual Sample Selection

With the introduction of annual sampling in 1992, more year-to-year change has resulted than when survey panels were used for two reasons. First, changes in classification of companies not surveyed are not reflected in the year-to-year movement. Prior to annual sampling, a wedging operation, which was performed when a new sample was selected, was a means of adjusting the data series to account for the changes in classification that occurred in the frame (see the discussion on wedging later under Time Series Analyses). Second, yearly correlation of R&D data is lost when independent samples are drawn each year.

Industry Shifts

The industry classification of companies is redefined each year with the creation of the sampling frame. By redefining the frame, the sample reflects current distributions of companies by size and industry. A company may move from one industry to another because of either changes in its payroll composition, which is used to determine the industry classification code (see previous discussion under Frame Creation); changes in the industry classification system itself; or changes in the way the

industry classification code was assigned or revised during survey processing.

A company's payroll composition can change because of the growth or decline of product or service lines, the merger of two or more companies, the acquisition of one company by another, divestitures, or the formation of conglomerates. Although an unlikely occurrence, a company's industry designation could be reclassified yearly with the introduction of annual sampling. When companies shift industry classifications, the result is a downward movement in R&D expenditures in one industry that is balanced by an upward movement in another industry from one year to the next.

From time to time, the industry coding system used by federal agencies that publish industry statistics is changed or revised to reflect the changing composition of U.S. and North American industry. The Standard Industrial Classification (SIC) system, as revised in 1987, was used for statistics developed from the 1988–91 panel surveys and the 1992-98 annual surveys. As discussed above, the industrial classification system has been completely changed, and beginning with the 1999 cycle of the survey, the North American Industrial Classification System (NAICS) is now used.

The method used to classify firms during survey processing was revised slightly in 1992. Research has shown that the impact on individual industry estimates was minor. (The effects of changes in the way companies were classified during survey processing are discussed in detail in U.S. Bureau of the Census 1994a and 1994e). The current method used to classify firms was discussed previously under Frame Creation. Methods used for past surveys are discussed in U.S. Bureau of the Census (1995). Large year-to-year changes may occur because of the way industry classifications are assigned during statistical processing. As discussed above, a company's industry classification is a function of its primary activity based on payroll, which is not necessarily the primary source of its R&D activity. If the majority of a company's payroll shifts to an activity other than an R&D-related activity, for example trade, all of its R&D similarly shifts to the new activity. Further, the design of the statistical sample sometimes contributes to large year-to-year changes in industry estimates. Since relatively few companies perform R&D and there is no national register of industrial R&D performers, a large statistical "net" must be cast to capture new R&D performers. When these companies are sampled for the first time, they are often given weights much higher than they would be given if the their size and the amount of R&D they perform were known at the time of sampling. After the size of the company and the amount of R&D performed are discovered via the first survey, the weight assigned for subsequent surveys is adjusted.

Capturing Small and Nonmanufacturing R&D Performers

Before the 1992 survey, the sample of firms surveyed was selected at irregular intervals; until 1967, samples were selected every 5 years. Subsequent samples were selected for 1971, 1976, 1981, and 1987. In intervening years, a panel of the largest firms known to perform R&D was surveyed. For example, a sample of about 14,000 firms was selected for the 1987 survey. For the 1988–91 studies, about 1,700 of these firms were resurveyed annually; the other firms did not receive survey forms, and their R&D data were estimated. This sample design was adequate during the survey's early years because R&D performance was concentrated in relatively few manufacturing industries. However, as more and more firms began entering the R&D arena, the old sample design proved increasingly deficient because it did not capture births of new R&D-performing firms. The entry of fledgling R&D performers into the marketplace was completely missed during panel years. Additionally, beginning in the early 1970s, the need for more detailed R&D information for nonmanufacturing industries was recognized. At that time, the broad industry classifications "miscellaneous business services" and "miscellaneous services" were added to the list of industry groups for which statistics were published. By 1975, about 3 percent of total R&D was performed by firms in nonmanufacturing industries. (See also NSF 1994, 1995, and 1996a.)

During the mid-1980s, there was evidence that a significant amount of R&D was being conducted by an increasing number of companies classified among the nonmanufacturing industries. Again the number of industries used to develop the statistics for nonmanufacturers was increased. Consequently, the annual reports in this series for 1987-91 included separate R&D estimates for firms in the communication, utility, engineering, architectural, research, development, testing, computer programming, and data processing service industries; hospitals; and medical labs. Approximately 9 percent of the estimated industrial R&D performance during 1987 was undertaken by nonmanufacturing firms.

the estimated industrial R&D performance during 1987 was undertaken by nonmanufacturing firms.

After the list of industries for which statistics were published was expanded, it became clear that the sample design itself should be changed to reflect the widening population of R&D performers among firms in the nonmanufacturing industries (NSF 1995a) and small firms in all industries so as to account better for births of R&D-performing firms and to produce more reliable statistics. Beginning with the 1992 survey, NSF decided (1) to draw new samples with broader coverage annually and (2) to increase the sample size to approximately 25,000 firms.[8] As a result of the sample redesign, for 1992 the reported nonmanufacturing share was (and has continued to be) 25-30 percent of total R&D. (See also NSF 1997, 1998, 1999, 2000, 2001, and 2002b.)

Time-Series Analyses

The statistics resulting from this survey on R&D spending and personnel are often used as if they were prepared using the same collection, processing, and tabulation methods over time. Such uniformity has not been the case. Since the survey was first fielded, improvements have been made to increase the reliability of the statistics and to make the survey results more useful. To that end, past practices have been changed and new procedures instituted. Preservation of the comparability of the statistics has, however, been an important consideration in making these improvements. Nonetheless, changes to survey definitions, the industry classification system, and the procedure used to assign industry codes to multiestablishment companies have had some, though not substantial, effects on the comparability of statistics. (For discussions of each of these changes, see U.S. Bureau of the Census 1994g; for considerations of comparability, see U.S. Bureau of the Census 1993 and 1994e.)

The aspect of the survey that had the greatest effect on comparability was the selection of samples at irregular intervals and the use of a subset or panel of the last sample drawn to develop statistics for intervening years. As discussed earlier, this practice introduced cyclical deterioration of the statistics. As compensation for this deterioration, periodic revisions were made to the statistics produced from the panels surveyed between sample years. Early in the survey's history, various methods were used to make these revisions (U.S. Bureau of the Census 1995). After 1976 and until the 1992 advent of annual sampling, a linking procedure called wedging was used. In wedging, the 2 sample years on each end of a series of estimates served as benchmarks in the algorithms used to adjust the estimates for the intervening years. (The process was dubbed wedging because of the wedgelike area produced on a graph that compares originally reported statistics with the revised statistics that resulted after linking. For a full discussion of the mathematical algorithm used for the wedging process that linked statistics from the 1992 survey with those from the 1987 survey, see U.S. Bureau of the Census 1994g and NSF 1995.)

Comparisons to Other Statistical Series

NSF collects data on federally financed R&D from both federal funding agencies, using the Survey of Federal Funds for Research and Development, and from performers of the R&D—industry, federal labs, universities, and other nonprofit organizations—using the Survey of Industrial Research and Development and other surveys (http://www.nsf.gov/statistics/survey.cfm). As reported by federal agencies, NSF publishes data on federal R&D budget authority and outlays, in addition to federal obligations. These terms are defined below (NSF 2002b):

- *Budget authority* is the primary source of legal authorization to enter into obligations that will result in outlays. Budget authority is most commonly granted in the form of appropriations by the congressional committees assigned to determine the budget for each function.

- *Obligations* represent the amounts for orders placed, contracts awarded, services received, and similar transactions during a given period, regardless of when the funds were appropriated or when future payment of money is required.

- *Outlays* represent the amounts for checks issued and cash payments made during a given period, regardless of when the funds were appropriated or obligated.

National R&D expenditure totals in NSF's *National Patterns of R&D Resources* report series are primarily constructed with data reported by performers and include estimates of federal R&D funding to these sectors. But until performer-reported survey data on federal R&D

[8]Annual sampling also remedies the cyclical deterioration of the statistics that results from changes in a company's payroll composition because of product line and corporate structural changes.

data collected from the federal agency funders of R&D were used to project R&D performance. When survey data from the performers subsequently are tabulated, as they were for this report, these statistics replace the projections based on funder expectations. Historically, the two survey systems have tracked fairly closely. For example, in 1980, performers reported using $29.5 billion in federal R&D funding, and federal agencies reported total R&D funding between $29.2 billion in outlays and $29.8 billion in obligations (NSF 1996b). In recent years, however, the two series have diverged considerably. The difference in the federal R&D totals appears to be concentrated in funding of industry, primarily aircraft and missile firms, by the Department of Defense. Overall, industrial firms have reported significant declines in federal R&D support since 1990 (table A-1), while federal agencies have reported level or slightly increased funding of industrial R&D (NSF 2005). NSF continues to identify and examine the factors behind these divergent trends.

TABLE A-1. Companies in the target population and selected for the sample, by industry and size of company: 2002

Industry and size of company	NAICS codes	Companies in target population	Companies selected for the sample			Companies with reported or imputed R&D expenditures [c]		Companies that reported no R&D expenditures [d]	Other companies [e]
			Total	Noncertainties [a]	Certainties [b]	Greater than or equal to $3 million	Less than $3 million		
Distribution by industry:									
All industries	21–23, 31–33, 42, 44–81	1,831,849	31,182	24,016	7,166	2,558	3,250	20,059	5,315
Manufacturing	31–33	168,385	10,935	7,777	3,158	1,330	2,403	5,062	2,141
Food	311	11,250	550	395	155	47	130	277	96
Beverage and tobacco products	312	1,226	155	106	49	7	11	118	19
Textiles, apparel, and leather	313–16	12,263	560	427	133	23	87	303	147
Wood products	321	8,852	469	397	72	6	40	352	71
Paper, printing and support activities	322, 323	20,636	602	485	117	32	57	387	126
Petroleum and coal products	324	562	91	63	28	8	15	48	20
Chemicals	325	5,376	976	593	383	200	304	289	184
Basic chemicals	3251	618	170	67	103	59	45	32	34
Resin, synthetic rubber, fibers, and filament	3252	281	74	26	48	24	22	20	8
Pharmaceuticals and medicines	3254	862	179	97	82	63	50	32	34
Other chemicals	325 minus (3251–52, 3254)	3,615	553	403	150	54	187	205	108
Plastics and rubber products	326	8,371	688	473	215	62	195	293	137
Nonmetallic mineral products	327	6,604	501	416	85	17	62	325	97
Primary metals	331	3,009	321	216	105	23	61	170	67
Fabricated metal products	332	33,863	975	764	211	54	187	580	154
Machinery	333	16,043	811	546	265	148	237	289	137
Computer and electronic products	334	8,290	1,512	912	600	397	415	348	353
Computers and peripheral equipment	3341	847	257	150	107	57	66	64	70
Communications equipment	3342	1,085	249	127	122	94	62	37	57
Semiconductor and other electronic components	3344	3,221	413	261	152	107	84	123	99
Navigational, measuring, electromedical, and control instruments	3345	2,528	446	276	170	124	161	74	87
Other computer and electronic products	334 minus (3341–42, 3344–45)	609	147	98	49	15	42	50	40
Electrical equipment, appliances, and components	335	3,387	473	308	165	81	151	145	96
Transportation equipment	336	6,167	677	432	245	108	149	287	133
Motor vehicles, trailers, and parts	3361–63	3,909	317	198	119	64	73	122	58
Aerospace products and parts	3364	872	151	88	63	29	23	69	30
Other transportation equipment	336 minus (3361–64)	1,386	209	146	63	15	53	96	45
Furniture and related products	337	9,805	569	485	84	12	76	372	110
Miscellaneous manufacturing	339	12,638	977	749	228	105	226	458	188

TABLE A-1. Companies in the target population and selected for the sample, by industry and size of company: 2002

Industry and size of company	NAICS codes	Companies in target population	Companies selected for the sample			Companies with reported or imputed R&D expenditures [c]		Companies that reported no R&D expenditures [d]	Other companies [e]
			Total	Noncertainties [a]	Certainties [b]	Greater than or equal to $3 million	Less than $3 million		
Distribution by industry:									
Medical equipment and supplies	3391	4,529	406	302	104	70	106	160	70
Other miscellaneous manufacturing	339 minus (3391)	8,109	571	447	124	35	120	298	118
Unclassified [f]	31–33 minus (311–16, 321–27, 331–37, 339)	43	28	10	18	0	0	21	6
Nonmanufacturing	21–23, 42, 44–81	1,659,776	20,120	16,140	3,980	1,228	847	14,926	3,121
Mining, extraction, and support activities	21	6,621	276	204	72	14	6	215	41
Utilities	22	1,421	127	52	75	11	28	70	18
Construction	23	229,395	2,294	2,128	166	7	25	1,924	338
Trade	42, 44, 45	407,106	4,358	3,611	747	153	124	3,460	622
Transportation and warehousing	48, 49	50,386	708	565	143	6	9	593	100
Information	51	26,023	1,401	929	472	260	152	680	310
Publishing	511	10,403	799	498	301	202	122	310	166
Newspaper, periodical, book, and database	5111	6,946	274	215	59	12	8	216	39
Software	5112	3,457	525	283	242	190	114	94	127
Broadcasting and telecommunications	513	6,704	293	182	111	17	8	203	65
Radio and television broadcasting	5131	2,759	100	72	28	0	2	73	25
Telecommunications	5133	3,387	137	75	62	15	3	91	28
Other broadcasting and telecommunications	513 minus (5131, 5133)	558	56	35	21	2	3	39	12
Other information	51 minus (511, 513)	8,916	309	249	60	41	22	167	79
Finance, insurance, and real estate	52, 53	112,322	1,492	1,135	357	41	15	1,272	164
Professional, scientific, and technical services	54	172,186	3,590	2,464	1,126	690	397	1,924	579
Architectural, engineering, and related services	5413	32,860	828	654	174	84	75	545	124
Computer systems design and related services	5415	19,088	936	578	358	225	177	313	221
Scientific R&D services	5417	3,064	632	203	429	356	120	75	81
Other professional, scientific, and technical services	54 minus (5413, 5415, 5417)	117,174	1,194	1,029	165	25	25	991	153
Management of companies and enterprises	55	1,309	110	83	27	5	6	80	19
Health care services	621–23	171,964	1,759	1,556	203	14	38	1,506	201
Other nonmanufacturing	56, 61, 624, 71, 72, 81	481,043	4,005	3,413	592	27	47	3,202	729
Unclassified [f]	(na)	3,688	127	99	28	0	0	71	53

TABLE A-1. Companies in the target population and selected for the sample, by industry and size of company: 2002

Industry and size of company	NAICS codes	Companies in target population	Companies selected for the sample			Companies with reported or imputed R&D expenditures [c]		Companies that reported no R&D expenditures [d]	Other companies [e]
			Total	Noncertainties [a]	Certainties [b]	Greater than or equal to $3 million	Less than $3 million		
Distribution by size of company (number of employees):									
Total	(na)	1,831,849	31,182	24,016	7,166	2,558	3,250	20,059	5,315
5 to 24	(na)	1,439,004	10,030	9,852	178	27	475	7,687	1,894
25 to 49	(na)	213,634	4,046	3,798	248	114	381	2,857	688
50 to 99	(na)	100,321	4,005	3,579	426	208	502	2,622	657
100 to 249	(na)	51,658	4,726	3,797	929	449	749	2,827	780
250 to 499	(na)	14,185	2,837	1,728	1,109	333	479	1,532	467
500 to 999	(na)	6,435	2,084	823	1,261	382	310	1,037	357
1,000 to 4,999	(na)	5,071	2,523	416	2,107	644	295	1,190	366
5,000 to 9,999	(na)	736	474	18	456	167	37	182	61
10,000 to 24,999	(na)	516	309	4	305	135	17	98	30
25,000 or more	(na)	289	148	1	147	99	5	27	15

(na) = not applicable.

[a] Noncertainties are companies whose probability of selection is less than one. For more information, see the technical notes.

[b] Certainties are companies whose probability of selection is one. This includes companies whose 2001 R&D expenditures were equal to or greater than $3 million as well as others included in the sample for analytical purposes ("analytical certainties"). For more information, see the technical notes.

[c] For information about imputed R&D, see the technical notes.

[d] This column also includes companies that responded to the survey but did not indicate any information about R&D performance.

[e] This column includes companies that did not respond to the survey or reported that they were out-of-scope, out-of-business, or had merged with another company (which may or may not have been selected for the survey, and/or may not be in the same industry).

[f] Companies that were missing or had an incomplete North American Industry Classification System (NAICS) code at the time of sampling were assigned to an "unclassified" industry category temporarily. If an "unclassified" company reported R&D expenditures, its primary industrial activity was investigated and a NAICS code was assigned during statistical processing.

NOTES: The last four columns in this table account for all of the categories of companies selected for the sample. Companies that responded to the survey are distributed among three categories, those that reported or had imputed R&D greater than or equal to $3 million, those that reported or had imputed R&D less than $3 million, and those that had no reported or imputed R&D. Companies that did not respond to the survey, were found to be out-of-scope, out-of-business, or had merged with another company, are included in the last column. Consequently, the sum of the counts in the last four columns equals the counts for total number of "companies selected for the sample."

The total number of "companies selected for the sample" is larger than the "number of companies that received a questionnaire" in table A-4 because some companies selected for the survey went out of business or were merged with other companies during the time between sample selection and survey mail-out, that is, the sample frame was updated before actual mail-out took place.

For information on sampling for 2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

TABLE A-2. Relative standard error for survey estimates, by industry and size of company: 2002

(Relative standard error in percent)

Industry and size of company	NAICS codes	Number of R&D-performing companies [a]	Domestic net sales of R&D performers	Domestic employment of R&D performers	Number of FTE scientists and engineers	All R&D	Company and other funds for R&D	Company-financed R&D performed outside of U.S.	Company-financed R&D contracted to outside organizations	Federal funds for R&D	Funds for basic research	Funds for applied research	Funds for development
Distribution by industry:													
All industries	21–23, 31–33, 42, 44–81	5,808	1.3	1.0	2.6	1.8	1.9	0.3	1.1	1.7	1.3	1.2	1.3
Manufacturing	31–33	3,733	1.0	0.8	0.5	0.4	0.4	0.4	1.0	0.5	1.4	0.5	0.7
Food	311	177	2.9	4.4	5.9	(D)	3.4	0.8	1.2	(D)	(D)	(D)	3.9
Beverage and tobacco products	312	18	0.3	0.8	9.5	5.4	5.4	(D)	(D)	0.0	(D)	(D)	7.1
Textiles, apparel, and leather	313–16	110	3.7	3.3	16.3	(D)	4.0	0.1	62.2	(D)	(D)	3.4	(D)
Wood products	321	46	1.8	1.9	(D)	(D)	2.9	(D)	6.4	(D)	(D)	(D)	7.0
Paper, printing and support activities	322, 323	89	1.6	3.2	8.1	(D)	1.4	0.0	1.2	(D)	(D)	2.4 (S)	2.7 (S)
Petroleum and coal products	324	23	0.1	0.7	0.8 (S)	(D)	0.3	0.0	(D)	(D)	(D)	0.5 (S)	(D)
Chemicals	325	504	0.4	0.5	0.5	0.4	0.4	0.2	0.7	4.4	(D)	(D)	0.6
Basic chemicals	3251	104	0.4	0.6	0.8	0.5	0.5	1.0	1.5	1.6	(D)	(D)	0.7
Resin, synthetic rubber, fibers, and filament	3252	46	1.2	0.9	0.5	0.3	0.3	0.2	3.1	0.0	0.0	(D)	(D)
Pharmaceuticals and medicines	3254	113	0.6	0.9	0.8	(D)	0.6	0.1	0.7	(D)	(D)	(D)	(D)
Other chemicals	325 minus (3251–52, 3254)	241	1.2	1.4	1.0	(D)	0.8	4.5	3.5	(D)	(D)	(D)	(D)
Plastics and rubber products	326	257	3.2	4.6	2.3	(D)	1.5	0.5	9.8	(D)	(D)	(D)	(D)
Nonmetallic mineral products	327	79	7.6	4.9	(D)	(D)	1.7	47.4	11.9	(D)	(D)	0.5	(D)
Primary metals	331	84	1.6	1.0	2.6 (S)	1.3	1.4	24.4	15.1	0.0	4.8 (S)	(D)	(D)
Fabricated metal products	332	241	2.1	2.6	3.6	4.3	3.1	0.4	15.0	33.2	29.5	10.1	6.7
Machinery	333	385	2.5	5.8	2.2	2.0	2.0	7.7	17.5	19.6	(D)	(D)	(D)
Computer and electronic products	334	812	7.2	0.4	0.4	0.5	0.5	0.4	6.3	0.7	5.5	1.4	0.8 (S)
Computers and peripheral equipment	3341	123	0.5	1.4	1.5	0.8	0.8	2.7 (S)	4.7	18.6	16.9 (S)	4.9	1.4
Communications equipment	3342	156	0.6	1.0	1.0 (S)	1.0	1.0	0.2	25.7	3.0	3.4 (S)	1.4 (S)	2.6 (S)
Semiconductor and other electronic components	3344	191	20.9	1.1	0.9	1.2	1.1	0.4	8.1	49.2	12.9	2.8	2.0 (S)

TABLE A-2. Relative standard error for survey estimates, by industry and size of company: 2002

(Relative standard error in percent)

Industry and size of company	NAICS codes	Number of R&D-performing companies [a]	Domestic net sales of R&D performers	Domestic employment of R&D performers	Number of FTE scientists and engineers	All R&D	Company and other funds for R&D	Company-financed R&D performed outside of U.S.	Company-financed R&D contracted to outside organizations	Federal funds for R&D	Funds for basic research	Funds for applied research	Funds for development
Distribution by industry:													
Navigational, measuring, electromedical and control instruments	3345	285	0.2	0.4	0.5	0.4	0.5	1.4	9.4	0.5	3.5	0.6	0.6
Other computer and electronic products	334 minus (3341–42, 3344–45)	57	2.2	1.6	1.4	1.1	1.1	0.3	7.1	14.7	42.3	2.0	1.4
Electrical equipment, appliances, and components	335	232	0.7	1.1	2.7	4.1	3.8	4.0	55.2	20.6	(D)	(D)	(D)
Transportation equipment	336	257	0.4	0.6	0.3	0.3	0.3	0.1	0.7	0.1	(D)	(D)	(D)
Motor vehicles, trailers, and parts	3361–63	137	0.6	1.2	0.5	(D)	0.5	0.1	0.6	(D)	(D)	(D)	(D)
Aerospace products and parts	3364	52	0.1	0.1	0.2	0.2	0.3	0.0	2.0	0.1	(D)	(D)	0.3
Other transportation equipment	336 minus (3361–64)	68	0.9	0.8	1.2 (S)	(D)	0.6	0.0	6.3	(D)	(D)	(D)	(D)
Furniture and related products	337	88	1.0	1.3	8.3	6.0	5.9	0.0	14.6	75.8	(D)	(D)	8.0
Miscellaneous manufacturing	339	331	1.1	1.6	7.1	4.5	4.6	0.3	7.8	18.3	(D)	(D)	5.5
Medical equipment and supplies	3391	176	0.9	2.2	2.6	(D)	1.8	0.4	8.4	(D)	(D)	(D)	(D)
Other miscellaneous manufacturing	339 minus (3391)	155	2.7	2.4	19.0	(D)	25.8	0.2	21.3	(D)	(D)	(D)	(D)
Other manufacturing	31–33 minus (311–16, 321–27, 331–37, 339)	--	--	--	--	--	--	--	--	--	--	--	--
Nonmanufacturing	21–23, 42, 44–81	2,075	2.9	2.2	5.7	4.1	4.4	0.7	2.1	5.0	2.7	3.3	2.7
Mining, extraction, and support activities	21	20	1.1	1.2	(D)	(D)	1.0	0.0	0.0	(D)	9.7	(D)	(D)
Utilities	22	39	1.3	1.9	1.2	(D)	22.0	(D)	3.1	(D)	(D)	(D)	(D)
Construction	23	32	4.9	9.8	17.9	6.2	6.2	(D)	(D)	87.6	61.1	0.0	14.9
Trade	42, 44, 45	277	1.9	1.6	3.6	(D)	3.6	0.7	1.3	(D)	(D)	(D)	(D)
Transportation and warehousing	48, 49	15	0.9	12.5	(D)	(D)	16.2	0.0	0.0	(D)	(D)	(D)	(D)
Information	51	412	11.2	3.2	1.9	4.0	4.0	1.2	4.6	16.9	(D)	1.4 (S)	(D)

TABLE A-2. Relative standard error for survey estimates, by industry and size of company: 2002

(Relative standard error in percent)

Industry and size of company	NAICS codes	Number of R&D-performing companies [a]	Domestic net sales of R&D performers	Domestic employment of R&D performers	Number of FTE scientists and engineers	All R&D	Company and other funds for R&D	Company-financed R&D performed outside of U.S.	Company-financed R&D contracted to outside organizations	Federal funds for R&D	Funds for basic research	Funds for applied research	Funds for development
Distribution by industry:													
Publishing	511	324	0.4	1.3	1.0	0.7	0.7	(D)	11.6	24.2	(D)	1.7 (S)	(D)
Newspaper, periodical, book, and database	5111	20	0.8	0.9	1.6	2.5	2.5	(D)	36.0	0.0	(D)	(D)	0.6
Software	5112	304	0.5	1.8	1.0	0.8	0.8	2.1	12.2	24.2	(D)	(D)	(D)
Broadcasting and telecommunications	513	25	1.6 (S)	1.2 (S)	11.2 (S)	(D)	40.9	(D)	4.0 (S)	(D)	(D)	(D)	(D)
Radio and television broadcasting	5131	2	(D)	18.9	29.4	(D)	(D)	0.0	0.0	0.0	0.0	0.0	(D)
Telecommunications	5133	18	1.7 (S)	1.2 (S)	11.4 (S)	(D)	41.7	(D)	(D)	(D)	(D)	(D)	(D)
Other broadcasting and telecommunications	513 minus (5131, 5133)	5	(D)	7.6	20.0	(D)	(D)	0.0	(D)	0.0	0.0	0.0	(D)
Other information	51 minus (511, 513)	63	38.1	19.6	7.9	(D)	7.9	(D)	7.0	(D)	(D)	(D)	(D)
Finance, insurance, and real estate	52, 53	56	1.5	2.4	8.1	16.1	16.1	27.1	12.2	0.0	0.7	11.8	17.6
Professional, scientific, and technical services	54	1,087	7.0	4.6	14.5	2.8	3.2	2.3	4.3	5.2	5.2	5.9	4.2
Architectural, engineering, and related services	5413	159	13.5	16.1	12.7	13.9	19.5	(D)	40.1	12.1	(D)	(D)	21.8
Computer systems design and related services	5415	402	18.9	2.5	28.4	3.6	3.7	3.3	16.1	11.0	(D)	(D)	4.4
Scientific R&D services	5417	476	2.3	8.0	3.2	2.6	3.0	2.6	4.1	4.4	7.3	6.9	4.0
Other professional, scientific, and technical services	54 minus (5413, 5415, 5417)	50	2.6	3.1	27.9	27.7	31.0	(D)	0.0	57.7	0.0 (S)	38.8	21.1
Management of companies and enterprises	55	11	41.5	51.1	57.2	50.4	50.4	(D)	0.0	0.0	0.0	0.0	55.1
Health care services	621–23	52	17.2	23.0	56.2	(D)	72.2	(D)	0.3	(D)	(D)	(D)	2.6 (S)
Other nonmanufacturing	56, 61, 624, 71, 72, 81	74	16.1	15.9	21.9	(D)	20.4	0.0	59.8	(D)	(D)	(D)	(D)

TABLE A-2. Relative standard error for survey estimates, by industry and size of company: 2002

(Relative standard error in percent)

Industry and size of company	NAICS codes	Number of R&D-performing companies [a]	Domestic net sales of R&D performers	Domestic employment of R&D performers	Number of FTE scientists and engineers	All R&D	Company and other funds for R&D	Company-financed R&D performed outside of U.S.	Company-financed R&D contracted to outside organizations	Federal funds for R&D	Funds for basic research	Funds for applied research	Funds for development
Distribution by size of company (number of employees):													
Total	(na)	5,808	1.3	1.0	2.6	1.8	1.9	0.3 (S)	1.1	1.7	1.3	1.2	1.3
5 to 24	(na)	502	15.1	9.4	43.3	17.0	19.5	41.5	28.2	30.8	18.3	23.6	11.7
25 to 49	(na)	495	34.4	9.4	12.8	12.4	13.1	36.0	17.4	21.4	27.1	21.4	15.3
50 to 99	(na)	710	36.6	11.7	12.4	12.1	12.8	25.5 (S)	13.5	28.3	18.7	21.9	15.8
100 to 249	(na)	1,198	5.4	7.8	10.3	23.3	24.4	8.7 (S)	5.2	8.4	8.9	4.2	12.3
250 to 499	(na)	812	26.9	7.2	3.7	8.5	9.2	4.3 (S)	5.3	4.8	4.7	1.6	12.4
500 to 999	(na)	692	2.4	13.6	3.8	3.7	3.9	7.9 (S)	4.8	1.0	(D)	(D)	5.3
1,000 to 4,999	(na)	939	1.4	3.3	1.8	0.8	0.9	0.4 (S)	0.2	0.0	0.9	0.2	1.2
5,000 to 9,999	(na)	204	2.0	3.8	0.1	0.0	0.0	(D)	0.4	0.0	0.2 (S)	0.0	0.0
10,000 to 24,999	(na)	152	0.4	0.6	0.3	0.1	0.1	(D)	3.2	0.0	(D)	(D)	0.2
25,000 or more	(na)	104	0.3	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0

(D) = RSE is not calculated for a cell from which data have been withheld to avoid disclosing operations of individual companies; (S) = RSE shown is calculated for a cell with imputation of more than 50 percent; (--) = indicates relative standard error not calculated for data not collected; (na) = not applicable.

[a] The counts of R&D-performing companies in this table are equal to the sum of the counts of companies with reported or imputed R&D expenditures of "greater than or equal to $3 million" plus companies with reported or imputed R&D expenditures of "less than $3 million" in table A-1. The relative standard error (RSE) estimates are based on reported and imputed data.

NOTES: The percentage (or relative) standard errors (RSE) in this table may be converted to standard errors of estimate by multiplying the percentages shown by the associated estimates. For example, the relative standard error of estimate for company-funded R&D performance by the wood products industry (NAICS 321) is shown as 2.9 percent, and the associated company-funded R&D estimate for this industry is shown as $132 million in table A-7. The standard error of estimate is 0.029 times $132 million or $3.8 million. A relative standard error of "0.0" either relates to an estimate of 0 or indicates that the RSE itself has been rounded to zero. For information on sampling for 2002, see appendix A, Technical Notes.

Starting in 1999, the frame from which the statistical samples were selected was divided into two partitions based on total company employment. In the manufacturing sector, companies with employment of 50 or more were included in the large-company partition. In the nonmanufacturing sector, companies with employment of 15 or more were included in the large-company partition. Companies in the respective sectors with employment below these values but with at least 5 employees were included in the small-company partition. The purpose of partitioning the sample this way was to reduce the variability in industry estimates largely attributed to the random year-to-year selection of small companies by industry and the high sampling weights that sometimes were assigned to them. Because of this, in prior reports detailed industry statistics were published only from the large-company partition; detailed industry statistics from the small-company partition were not. Statistics from the small-company partition were included in the manufacturing, nonmanufacturing, and all industries totals, but were aggregated into "small manufacturing" and "small nonmanufacturing" classifications instead of being included in their respective industry classifications. For the 2001 and subsequent reports, this practice was evaluated and discontinued because it was determined that the data for small companies are more useful if they are included in their respective industries even given the sampling concerns described above. Consequently, the "small manufacturing" and "small nonmanufacturing" stublines are no longer present. Statistics for the firms in the small-company classifications are not shown separately in this table but are included in the manufacturing, nonmanufacturing, and all industries totals.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

TABLE A-3. Relative standard error for estimates of total R&D and percentage of estimates attributed to certainty companies, by state: 2002

State	All R&D (millions of dollars) [a]		Relative standard error	Percent of estimate from certainty companies	
United States	190,809		1.8	87.6	
Alabama	846		5.6	72.9	
Alaska	51	(E)	12.6	47.2	
Arizona	3,201		1.7	89.1	
Arkansas	225	(E)	12.4	49.6	
California	39,664		1.1	88.4	
Colorado	2,823		2.2	83.0	
Connecticut	6,077		1.0	92.8	
Delaware	1,219		0.8	95.9	
District of Columbia	194		6.4	57.5	
Florida	3,707		5.9	75.6	
Georgia	2,107		4.8	72.3	
Hawaii	103		8.9	65.8	
Idaho	992		1.1	94.8	
Illinois	7,616		2.3	85.1	
Indiana	3,572		1.9	90.3	
Iowa	753		3.2	81.2	
Kansas	1,427	(S)	2.0	88.9	(S)
Kentucky	656		6.2	74.6	
Louisiana	248	(E)	19.7	30.2	
Maine	250	(S)	5.0	75.9	(S)
Maryland	3,800		1.7	86.7	(S)
Massachusetts	10,279		1.1	88.5	
Michigan	13,565		0.8	94.2	
Minnesota	4,460		1.3	89.7	
Mississippi	224		10.1	63.0	
Missouri	1,592		4.7	78.5	
Montana	66		8.8	54.0	
Nebraska	342		5.3	71.8	
Nevada	339		8.0	67.2	
New Hampshire	1,153		1.3	88.7	
New Jersey	11,566		1.1	91.5	
New Mexico	331		4.3	77.1	
New York	9,234		2.6	82.5	
North Carolina	3,443		3.2	81.9	
North Dakota	154		4.0	84.1	
Ohio	6,230		2.2	86.7	
Oklahoma	412		9.5	60.3	
Oregon	2,320		1.5	90.2	
Pennsylvania	7,064		2.4	85.7	
Rhode Island	1,121	(S)	1.7	92.5	(S)
South Carolina	1,054		4.5	79.5	
South Dakota	53		9.7	49.2	
Tennessee	1,289		6.1	73.5	
Texas	10,744		2.6	84.9	
Utah	1,116		3.0	81.8	

TABLE A-3. Relative standard error for estimates of total R&D and percentage of estimates attributed to certainty companies, by state: 2002

State	All R&D (millions of dollars) [a]		Relative standard error	Percent of estimate from certainty companies	
Vermont	286		1.9	87.8	
Virginia	2,920		3.7	73.3	
Washington	8,579	(S)	0.8	94.5	(S)
West Virginia	264		6.1	80.3	
Wisconsin	2,649		2.2	85.5	
Wyoming	21	(E)	14.2	40.4	
Undistributed funds	8,406		-	100.0	

(S) = indicates imputation of more than 50 percent.

(E) = indicates imputation of more than 50 percent due to raking of state data.

(-) = indicates a value of zero or a value rounded to zero.

[a] Beginning with 2001, statistics for total and federally funded industrial R&D exclude data for federally funded research and development centers.

NOTES: A description of the standard error of estimate is given appendix A, Technical Notes. The percentage (or relative) standard errors in this table may be converted to standard errors of estimate by multiplying the percentages shown by the associated estimates. For example, the relative standard error of estimate for United States, total is shown as 2.0 percent, and the associated R&D estimate is shown as $190.8 billion. The standard error of estimate is 0.02 times $190.8 billion or $3.8 billion.

Beginning with 2001, the methodology to produce statistics by state was modified from previous years to address the recurring problem of large year-to-year variation in many state estimates. This variability was caused by many inefficiency factors including the potential of the sample at state levels, the rarity of R&D expenditures, and the large weights often associated with companies that report R&D in the survey for the first time. Under the new methodology, a portion of the amount of R&D reported by some companies not selected for the sample with certainty is allocated among all the states in which there was industrial activity. Note that there was no change to the methodology for estimating the number of R&D performers in each state. This estimate continued to be calculated by summing the weights of the companies that actually reported R&D activity in a given state.

For information on sampling for 2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

TABLE A-4. Unit response rates, companies that responded to the survey, and percentage of companies that performed R&D, by industry and type of survey form: 2002

Industry and form received	NAICS codes	Number of companies that received a questionnaire [a]	Number of companies that responded to the survey	Percentage of companies that responded to the survey	Percentage of responding companies that reported R&D
All industries	21–23, 31–33, 42, 44–81	30,999	25,074	80.9	21.6
Manufacturing	31–33	10,920	8,534	78.2	41.8
Food	311	549	446	81.2	38.8
Beverage and tobacco products	312	155	134	86.5	13.4
Textiles, apparel, and leather	313–16	560	397	70.9	26.7
Wood products	321	469	395	84.2	11.6
Paper, printing and support activities	322, 323	601	468	77.9	18.8
Petroleum and coal products	324	91	70	76.9	31.4
Chemicals	325	976	759	77.8	62.5
Basic chemicals	3251	169	123	72.8	74.8
Resin, synthetic rubber, fibers, and filament	3252	74	65	87.8	69.2
Pharmaceuticals and medicines	3254	179	137	76.5	77.4
Other chemicals	325 minus (3251–52, 3254)	554	434	78.3	53.2
Plastics and rubber products	326	685	542	79.1	46.7
Nonmetallic mineral products	327	501	395	78.8	19.2
Primary metals	331	320	248	77.5	33.5
Fabricated metal products	332	974	810	83.2	28.9
Machinery	333	810	648	80.0	56.6
Computer and electronic products	334	1,511	1,086	71.9	69.9
Computers and peripheral equipment	3341	257	179	69.6	66.5
Communications equipment	3342	248	176	71.0	80.7
Semiconductor and other electronic components	3344	413	297	71.9	61.3
Navigational, measuring, electromedical, and control instruments	3345	446	332	74.4	78.9
Other computer and electronic products	334 minus (3341–42, 3344–45)	147	102	69.4	52.9
Electrical equipment, appliances, and components	335	472	365	77.3	61.1
Transportation equipment	336	674	529	78.5	46.9
Motor vehicles, trailers, and parts	3361–63	316	252	79.7	53.2
Aerospace products and parts	3364	151	116	76.8	42.2
Other transportation equipment	336 minus (3361–64)	207	161	77.8	40.4
Furniture and related products	337	570	455	79.8	19.1
Miscellaneous manufacturing	339	975	766	78.6	40.9
Medical equipment and supplies	3391	404	320	79.2	51.3
Other miscellaneous manufacturing	339 minus (3391)	571	446	78.1	33.4
Other manufacturing [b]	31–33 minus (311–16, 321–27, 331–37, 339)	27	21	77.8	0.0
Nonmanufacturing	21–23, 42, 44–81	20,079	16,540	82.4	11.2
Mining, extraction, and support activities	21	276	230	83.3	7.8
Utilities	22	127	100	78.7	35.0
Construction	23	2,293	1,943	84.7	1.6
Trade	42, 44, 45	4,356	3,662	84.1	7.0
Transportation and warehousing	48, 49	707	595	84.2	2.5
Information	51	1,394	1,029	73.8	35.2
Publishing	511	792	593	74.9	49.1
Newspaper, periodical, book, and database	5111	275	233	84.7	7.7
Software	5112	517	360	69.6	75.8

TABLE A-4. Unit response rates, companies that responded to the survey, and percentage of companies that performed R&D, by industry and type of survey form: 2002

Industry and form received	NAICS codes	Number of companies that received a questionnaire [a]	Number of companies that responded to the survey	Percentage of companies that responded to the survey	Percentage of responding companies that reported R&D
Broadcasting and telecommunications	513	293	221	75.4	8.6
Radio and television broadcasting	5131	100	75	75.0	2.7
Telecommunications	5133	137	103	75.2	12.6
Other broadcasting and telecommunications	513 minus (5131, 5133)	56	43	76.8	9.3
Other information	51 minus (511, 513)	309	215	69.6	24.2
Finance, insurance, and real estate	52, 53	1,486	1,301	87.6	3.8
Professional, scientific, and technical services	54	3,568	2,824	79.1	33.7
Architectural, engineering, and related services	5413	827	670	81.0	20.7
Computer systems design and related services	5415	923	653	70.7	54.2
Scientific R&D services	5417	624	476	76.3	87.2
Other professional, scientific, and technical services	54 minus (5413, 5415, 5417)	1,194	1,025	85.8	4.4
Management of companies and enterprises	55	110	86	78.2	12.8
Health care services	621–23	1,759	1,535	87.3	3.0
Other nonmanufacturing	56, 61, 624, 71, 72, 81	4,003	3,235	80.8	2.1
FORM RD-1 COMPANIES					
All Industries	21–23, 31–33, 42, 44–81	2,313	1,774	76.7	97.0
Manufacturing	31–33	1,141	918	80.5	98.5
Food	311	41	36	87.8	100.0
Beverage and tobacco products	312	7	7	100.0	100.0
Textiles, apparel, and leather	313–16	26	19	73.1	100.0
Wood products	321	6	5	83.3	100.0
Paper, printing and support activities	322, 323	34	29	85.3	96.6
Petroleum and coal products	324	9	8	88.9	87.5
Chemicals	325	153	115	75.2	100.0
Basic chemicals	3251	54	38	70.4	100.0
Resin, synthetic rubber, fibers, and filament	3252	15	14	93.3	100.0
Pharmaceuticals and medicines	3254	37	30	81.1	100.0
Other chemicals	325 minus (3251–52, 3254)	47	33	70.2	100.0
Plastics and rubber products	326	65	56	86.2	100.0
Nonmetallic mineral products	327	20	16	80.0	100.0
Primary metals	331	23	21	91.3	90.5
Fabricated metal products	332	61	53	86.9	96.2
Machinery	333	132	109	82.6	98.2
Computer and electronic products	334	316	244	77.2	99.2
Computers and peripheral equipment	3341	44	38	86.4	100.0
Communications equipment	3342	68	51	75.0	96.1
Semiconductor and other electronic components	3344	79	64	81.0	100.0
Navigational, measuring, electromedical, and control instruments	3345	111	81	73.0	100.0
Other computer and electronic products	334 minus (3341–42, 3344–45)	14	10	71.4	100.0
Electrical equipment, appliances, and components	335	60	50	83.3	96.0
Transportation equipment	336	88	76	86.4	98.7
Motor vehicles, trailers, and parts	3361–63	54	48	88.9	97.9
Aerospace products and parts	3364	20	17	85.0	100.0
Other transportation equipment	336 minus (3361–64)	14	11	78.6	100.0

TABLE A-4. Unit response rates, companies that responded to the survey, and percentage of companies that performed R&D, by industry and type of survey form: 2002

Industry and form received	NAICS codes	Number of companies that received a questionnaire [a]	Number of companies that responded to the survey	Percentage of companies that responded to the survey	Percentage of responding companies that reported R&D
Furniture and related products	337	12	10	83.3	100.0
Miscellaneous manufacturing	339	88	64	72.7	98.4
Medical equipment and supplies	3391	60	44	73.3	97.7
Other miscellaneous manufacturing	339 minus (3391)	28	20	71.4	100.0
Other manufacturing [b]	31–33 minus (311–16, 321–27, 331–37, 339)	0	0	0.0	0.0
Nonmanufacturing	21–23, 42, 44–81	1,172	856	73.0	95.3
Mining, extraction, and support activities	21	13	10	76.9	100.0
Utilities	22	14	8	57.1	100.0
Construction	23	8	7	87.5	100.0
Trade	42, 44, 45	142	113	79.6	97.3
Transportation and warehousing	48, 49	11	8	72.7	75.0
Information	51	223	157	70.4	95.5
Publishing	511	180	131	72.8	96.9
Newspaper, periodical, book, and database	5111	13	9	69.2	88.9
Software	5112	167	122	73.1	97.5
Broadcasting and telecommunications	513	13	7	53.8	85.7
Radio and television broadcasting	5131	0	0	0.0	0.0
Telecommunications	5133	12	7	58.3	85.7
Other broadcasting and telecommunications	513 minus (5131, 5133)	1	0	0.0	0.0
Other information	51 minus (511, 513)	30	19	63.3	89.5
Finance, insurance, and real estate	52, 53	46	35	76.1	74.3
Professional, scientific, and technical services	54	672	490	72.9	96.5
Architectural, engineering, and related services	5413	85	57	67.1	93.0
Computer systems design and related services	5415	221	156	70.6	96.2
Scientific R&D services	5417	343	261	76.1	97.7
Other professional, scientific, and technical services	54 minus (5413, 5415, 5417)	23	16	69.6	93.8
Management of companies and enterprises	55	4	4	100.0	75.0
Health care services	621–23	12	5	41.7	100.0
Other nonmanufacturing	56, 61, 624, 71, 72, 81	27	19	70.4	94.7
FORM RD-1A COMPANIES					
All Industries	21–23, 31–33, 42, 44–81	28,686	23,300	81.2	15.9
Manufacturing	31–33	9,779	7,616	77.9	35.0
Food	311	508	410	80.7	33.4
Beverage and tobacco products	312	148	127	85.8	8.7
Textiles, apparel, and leather	313–16	534	378	70.8	23.0
Wood products	321	463	390	84.2	10.5
Paper, printing and support activities	322, 323	567	439	77.4	13.7
Petroleum and coal products	324	82	62	75.6	24.2
Chemicals	325	823	644	78.3	55.7
Basic chemicals	3251	115	85	73.9	63.5
Resin, synthetic rubber, fibers, and filament	3252	59	51	86.4	60.8
Pharmaceuticals and medicines	3254	142	107	75.4	71.0
Other chemicals	325 minus (3251–52, 3254)	507	401	79.1	49.4

TABLE A-4. Unit response rates, companies that responded to the survey, and percentage of companies that performed R&D, by industry and type of survey form: 2002

Industry and form received	NAICS codes	Number of companies that received a questionnaire [a]	Number of companies that responded to the survey	Percentage of companies that responded to the survey	Percentage of responding companies that reported R&D
Plastics and rubber products	326	620	486	78.4	40.5
Nonmetallic mineral products	327	481	379	78.8	15.8
Primary metals	331	297	227	76.4	28.2
Fabricated metal products	332	913	757	82.9	24.2
Machinery	333	678	539	79.5	48.2
Computer and electronic products	334	1,195	842	70.5	61.4
Computers and peripheral equipment	3341	213	141	66.2	57.4
Communications equipment	3342	180	125	69.4	74.4
Semiconductor and other electronic components	3344	334	233	69.8	50.6
Navigational, measuring, electromedical, and control instruments	3345	335	251	74.9	72.1
Other computer and electronic products	334 minus (3341–42, 3344–45)	133	92	69.2	47.8
Electrical equipment, appliances, and components	335	412	315	76.5	55.6
Transportation equipment	336	586	453	77.3	38.2
Motor vehicles, trailers, and parts	3361–63	262	204	77.9	42.6
Aerospace products and parts	3364	131	99	75.6	32.3
Other transportation equipment	336 minus (3361–64)	193	150	77.7	36.0
Furniture and related products	337	558	445	79.7	17.3
Miscellaneous manufacturing	339	887	702	79.1	35.6
Medical equipment and supplies	3391	344	276	80.2	43.8
Other miscellaneous manufacturing	339 minus (3391)	543	426	78.5	30.3
Other manufacturing [b]	31–33 minus (311–16, 321–27, 331–37, 339)	27	21	77.8	0.0
Nonmanufacturing	21–23, 42, 44–81	18,907	15,684	83.0	6.6
Mining, extraction, and support activities	21	263	220	83.7	3.6
Utilities	22	113	92	81.4	29.3
Construction	23	2,285	1,936	84.7	1.2
Trade	42, 44, 45	4,214	3,549	84.2	4.2
Transportation and warehousing	48, 49	696	587	84.3	1.5
Information	51	1,171	872	74.5	24.3
Publishing	511	612	462	75.5	35.5
Newspaper, periodical, book, and database	5111	262	224	85.5	4.5
Software	5112	350	238	68.0	64.7
Broadcasting and telecommunications	513	280	214	76.4	6.1
Radio and television broadcasting	5131	100	75	75.0	2.7
Telecommunications	5133	125	96	76.8	7.3
Other broadcasting and telecommunications	513 minus (5131, 5133)	55	43	78.2	9.3
Other information	51 minus (511, 513)	279	196	70.3	17.9
Finance, insurance, and real estate	52, 53	1,440	1,266	87.9	1.8
Professional, scientific, and technical services	54	2,896	2,334	80.6	20.6
Architectural, engineering, and related services	5413	742	613	82.6	14.0
Computer systems design and related services	5415	702	497	70.8	41.0
Scientific R&D services	5417	281	215	76.5	74.4
Other professional, scientific, and technical services	54 minus (5413, 5415, 5417)	1,171	1,009	86.2	3.0

TABLE A-4. Unit response rates, companies that responded to the survey, and percentage of companies that performed R&D, by industry and type of survey form: 2002

Industry and form received	NAICS codes	Number of companies that received a questionnaire [a]	Number of companies that responded to the survey	Percentage of companies that responded to the survey	Percentage of responding companies that reported R&D
Management of companies and enterprises	55	106	82	77.4	9.8
Health care services	621–23	1,747	1,530	87.6	2.7
Other nonmanufacturing	56, 61, 624, 71, 72, 81	3,976	3,216	80.9	1.6

[a] The "number of companies that received a questionnaire" is less than the number of "companies selected for the sample" in table A-1 because some companies selected for the survey went out of business or were merged with other companies during the time between sample selection and survey mail out, that is, the sample frame was updated before actual mail-out took place.

[b] A number of companies were identified in the manufacturing sector without a detailed industry code. For the companies who returned a questionnaire, none reported R&D.

NOTES: The calculation of the "percentage of companies that responded to the survey" was based on all companies that responded to the survey including those that reported they were out-of-scope, out-of-business, or had merged with another company. It excludes companies for which total R&D expenditure data were imputed. Mathematically, into the number of companies that returned a response or questionnaire regardless of the data or information supplied in the response or on the questionnaire. For information on sampling for 2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

TABLE A-5. Imputation rates for survey items, by industry and size of company: 2002

(Percent)

Industry and size of company	NAICS codes	Net sales	Employment	R&D scientists/ engineers	All R&D			R&D costs by agency			
					Total	Company	Federal	DOD	NASA	DOE	Other agencies
Distribution by industry:											
All Industries	21–23, 31–33, 42, 44–81	10.1	10.3	20.7	6.4	6.7	5.0	19.0	36.1	34.5	32.8
Manufacturing	31–33	5.4	4.8	24.9	5.0	5.5	0.3	19.7	45.6	53.6	35.3
Food	311	1.4	2.0	6.0	(D)	1.4	(D)	0.0	0.0	0.0	0.0
Beverage and tobacco products	312	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Textiles, apparel, and leather	313–16	7.2	6.5	7.3	(D)	12.3	(D)	0.0	0.0	0.0	0.0
Wood products	321	0.0	0.0	(D)	(D)	0.0	(D)	0.0	0.0	0.0	0.0
Paper, printing and support activities	322, 323	0.9	1.0	1.6	(D)	0.3	(D)	0.0	0.0	0.0	0.0
Petroleum and coal products	324	9.9	7.2	50.2	(D)	11.5	(D)	0.0	0.0	0.0	0.0
Chemicals	325	10.1	9.4	13.2	4.7	4.7	1.5	5.0	(D)	26.1	5.0
Basic chemicals	3251	22.4	19.0	20.7	15.9	16.4	5.2	8.6	0.0	12.1	39.7
Resin, synthetic rubber, fibers, and filament	3252	2.1	4.7	7.6	0.7	0.7	0.0	39.3	0.0	81.8	62.3
Pharmaceuticals and medicines	3254	2.7	4.0	10.3	(D)	2.4	(D)	0.0	0.0	0.0	0.0
Other chemicals	325 minus (3251–52, 3254)	21.0	14.2	24.1	(D)	15.3	(D)	0.0	0.0	0.0	0.0
Plastics and rubber products	326	3.3	2.2	30.4	(D)	2.9	(D)	0.0	0.0	0.0	0.0
Nonmetallic mineral products	327	11.3	11.3	(D)	(D)	6.3	(D)	0.0	0.0	0.0	100.0
Primary metals	331	2.4	5.7	66.2	2.5	2.5	0.0	0.0	0.0	0.0	0.0
Fabricated metal products	332	2.8	2.4	9.8	4.3	4.4	3.1	6.0	69.6	6.0	0.0
Machinery	333	9.2	8.9	37.7	9.7	9.7	0.0	34.4	0.0	34.9	34.1
Computer and electronic products	334	8.9	4.4	32.0	5.9	7.0	0.3	16.0	69.5	(D)	77.6
Computers and peripheral equipment	3341	9.2	10.2	15.7	16.5	16.6	0.0	0.0	0.0	0.0	0.0
Communications equipment	3342	2.3	3.0	58.2	3.2	3.3	0.0	0.0	55.5	0.0	0.0
Semiconductor and other electronic components	3344	19.7	6.1	10.4	8.8	8.7	14.8	48.3	96.0	33.3	17.2
Navigational, measuring, electromedical, and control instruments	3345	1.6	2.6	41.3	2.3	3.6	0.2	16.3	79.4	49.5	80.6
Other computer and electronic products	334 minus (3341–42, 3344–45)	9.6	11.0	43.6	12.2	12.3	0.0	0.0	0.0	0.0	0.0
Electrical equipment, appliances, and components	335	5.4	5.3	13.1	5.1	5.3	0.0	0.0	(D)	(D)	0.0
Transportation equipment	336	1.8	3.4	21.2	1.8	2.2	0.1	26.7	31.6	68.3	37.1
Motor vehicles, trailers, and parts	3361–63	0.7	1.1	24.7	(D)	0.6	(D)	13.6	62.1	4.6	18.8
Aerospace products and parts	3364	1.5	1.1	4.2	0.3	0.5	0.1	30.1	31.5	71.6	37.5
Other transportation equipment	336 minus (3361–64)	22.8	34.3	56.7	(D)	39.8	(D)	0.0	0.0	0.0	0.0
Furniture and related products	337	1.5	1.5	31.7	3.5	3.6	0.0	0.0	0.0	0.0	0.0
Miscellaneous manufacturing	339	12.7	12.5	23.2	11.0	11.0	0.0	2.4	0.0	0.0	13.9

TABLE A-5. Imputation rates for survey items, by industry and size of company: 2002

(Percent)

Industry and size of company	NAICS codes	Net sales	Employment	R&D scientists/ engineers	All R&D			R&D costs by agency			
					Total	Company	Federal	DOD	NASA	DOE	Other agencies
Distribution by industry:											
Medical equipment and supplies	3391	10.4	8.6	31.8	(D)	11.5	(D)	6.0	0.0	0.0	13.9
Other miscellaneous manufacturing	339 minus (3391)	17.6	18.5	8.1	(D)	8.9	(D)	1.1	0.0	0.0	0.0
Other manufacturing	31–33 minus (311–16, 321–27, 331–37, 339)	--	--	--	--	--	--	--	--	--	--
Nonmanufacturing	21–23, 42, 44–81	17.7	18.1	15.6	8.3	8.2	14.1	16.5	26.9	22.2	30.0
Mining, extraction, and support activities	21	33.6	40.9	(D)	(D)	32.8	(D)	0.0	0.0	100.0	0.0
Utilities	22	15.0	8.9	28.1	(D)	15.7	(D)	0.0	0.0	0.0	0.0
Construction	23	0.6	1.9	0.5	20.8	20.8	0.0	0.0	0.0	0.0	0.0
Trade	42, 44, 45	4.0	4.4	18.4	(D)	2.9	(D)	0.9	2.7	30.1	7.4
Transportation and warehousing	48, 49	0.0	12.5	(D)	(D)	0.0	(D)	0.0	0.0	0.0	0.0
Information	51	36.9	35.4	14.2	10.1	10.8	14.3	55.2	0.0	0.0	15.1
Publishing	511	12.9	8.8	10.8	8.4	9.3	0.0	75.5	0.0	0.0	0.0
Newspaper, periodical, book, and database	5111	15.1	1.6	5.7	3.8	3.8	0.0	0.0	0.0	0.0	0.0
Software	5112	12.1	12.0	11.0	8.6	9.6	0.0	75.5	0.0	0.0	0.0
Broadcasting and telecommunications	513	65.3	61.7	69.9	(D)	35.9	(D)	0.0	0.0	0.0	0.0
Radio and television broadcasting	5131	(D)	0.0	0.0	(D)	(D)	0.0	0.0	0.0	0.0	0.0
Telecommunications	5133	65.5	62.0	70.6	(D)	35.9	(D)	0.0	0.0	0.0	0.0
Other broadcasting and telecommunications	513 minus (5131, 5133)	(D)	17.7	30.3	(D)	(D)	0.0	0.0	0.0	0.0	0.0
Other information	51 minus (511, 513)	1.4	2.9	6.2	(D)	2.5	(D)	15.7	0.0	0.0	15.7
Finance, insurance, and real estate	52, 53	22.2	34.7	18.7	5.8	5.8	0.0	0.0	0.0	0.0	0.0
Professional, scientific, and technical services	54	12.5	14.5	13.3	12.6	12.2	14.4	15.7	26.9	23.2	30.5
Architectural, engineering, and related services	5413	8.5	12.5	7.2	7.1	8.1	4.9	4.3	7.8	72.9	15.3
Computer systems design and related services	5415	6.9	8.8	10.6	9.2	5.4	33.9	39.4	45.8	95.6	41.0
Scientific R&D services	5417	16.6	24.8	22.9	17.0	19.0	7.4	12.8	48.4	15.5	13.2
Other professional, scientific, and technical services	54 minus (5413, 5415, 5417)	23.0	18.3	8.4	18.6	21.7	1.8	0.0	0.0	100.0	0.0
Management of companies and enterprises	55	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Health care services	621–23	19.2	15.8	13.1	(D)	1.2	(D)	0.0	0.0	0.0	13.2
Other nonmanufacturing	56, 61, 624, 71, 72, 81	9.9	5.3	24.9	(D)	8.6	(D)	0.0	0.0	0.0	0.0

TABLE A-5. Imputation rates for survey items, by industry and size of company: 2002

(Percent)

Industry and size of company	NAICS codes	Net sales	Employment	R&D scientists/ engineers	All R&D			R&D costs by agency			
					Total	Company	Federal	DOD	NASA	DOE	Other agencies
Distribution by size of company (number of employees):											
Total	(na)	10.1	10.3	20.7	6.4	6.7	5.0	19.0	36.1	34.5	32.8
5 to 24	(na)	4.8	1.2	2.6	0.6	0.7	0.0	0.0	0.0	0.0	0.0
25 to 49	(na)	1.7	1.6	2.3	4.6	4.9	0.9	11.7	49.9	16.1	16.4
50 to 99	(na)	0.9	1.1	6.8	5.5	5.6	4.0	12.4	4.0	54.7	11.2
100 to 249	(na)	3.9	3.0	11.8	9.7	9.5	12.4	11.5	42.2	87.2	20.1
250 to 499	(na)	3.7	4.0	17.6	10.7	9.7	21.6	24.7	67.0	31.8	14.8
500 to 999	(na)	7.2	18.1	12.6	9.1	9.5	1.8	2.2	0.5	1.1	0.7
1,000 to 4,999	(na)	11.7	10.2	20.3	10.3	11.5	0.5	10.4	8.5	96.9	50.9
5,000 to 9,999	(na)	12.4	11.4	42.2	10.4	11.3	1.0	54.0	63.4	8.6	24.6
10,000 to 24,999	(na)	6.9	8.3	21.6	3.3	3.4	0.0	38.5	57.3	94.2	50.1
25,000 or more	(na)	12.1	11.7	23.6	4.1	3.9	5.9	13.5	40.0	55.7	36.4

TABLE A-5. Imputation rates for survey items, by industry and size of company: 2002

(Percent)

Industry and size of company	NAICS codes	R&D by type of cost					Company R&D		Energy R&D
		Wages	Fringe benefits	Materials	Depreciation	Other costs	Contracted out R&D	Foreign R&D	
Distribution by industry:									
All Industries	21–23, 31–33, 42, 44–81	38.1	41.1	39.3	36.8	28.6	5.6	0.0	0.0
Manufacturing	31–33	37.1	40.6	38.8	30.0	31.9	2.1	0.0	0.0
Food	311	33.8	29.4	29.5	32.7	25.9	0.0	0.0	0.0
Beverage and tobacco products	312	11.8	8.1	3.3	0.0	25.6	(D)	0.0	0.0
Textiles, apparel, and leather	313–16	27.3	17.0	30.6	57.0	34.3	11.5	0.0	0.0
Wood products	321	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Paper, printing and support activities	322, 323	15.5	59.8	17.7	29.1	6.3	0.0	0.0	0.0
Petroleum and coal products	324	83.7	82.3	82.5	90.0	84.0	(D)	0.0	0.0
Chemicals	325	22.4	23.8	22.8	20.1	22.0	3.3	0.0	0.0
Basic chemicals	3251	29.8	29.0	26.8	23.5	20.3	42.1	0.0	0.0
Resin, synthetic rubber, fibers, and filament	3252	19.0	26.7	21.2	13.7	15.0	0.0	0.0	0.0
Pharmaceuticals and medicines	3254	23.2	24.4	23.8	21.7	23.2	2.9	0.0	0.0
Other chemicals	325 minus (3251–52, 3254)	17.2	17.8	15.3	18.2	18.6	0.1	0.0	0.0
Plastics and rubber products	326	33.5	42.5	20.4	43.5	25.1	0.8	0.0	0.0
Nonmetallic mineral products	327	17.8	24.7	22.8	21.4	21.4	12.1	0.0	0.0
Primary metals	331	7.8	14.5	21.0	2.8	19.0	0.0	0.0	0.0
Fabricated metal products	332	25.2	12.4	35.3	31.6	24.8	4.7	0.0	0.0
Machinery	333	35.6	38.3	37.4	30.6	29.6	0.2	0.0	0.0
Computer and electronic products	334	43.2	42.2	51.7	33.3	43.9	1.8	0.0	0.0
Computers and peripheral equipment	3341	49.7	61.5	50.6	50.1	46.7	0.6	0.0	0.0
Communications equipment	3342	64.5	24.7	77.4	23.0	63.5	0.0	0.0	0.0
Semiconductor and other electronic components	3344	14.7	10.6	14.4	12.5	19.1	1.1	0.0	0.0
Navigational, measuring, electromedical, and control instruments	3345	56.2	62.2	56.6	58.6	57.4	2.5	0.0	0.0
Other computer and electronic products	334 minus (3341–42, 3344–45)	36.1	37.0	38.4	21.1	64.4	0.0	0.0	0.0
Electrical equipment, appliances, and components	335	15.8	8.2	16.8	12.3	17.0	1.2	0.0	0.0
Transportation equipment	336	39.7	47.3	33.2	41.0	37.7	0.3	0.0	0.0
Motor vehicles, trailers, and parts	3361–63	47.2	55.6	41.2	51.0	51.9	0.4	0.0	0.0
Aerospace products and parts	3364	22.7	26.8	21.8	18.9	28.8	0.0	0.0	0.0
Other transportation equipment	336 minus (3361–64)	39.3	52.5	26.3	16.4	20.0	0.0	0.0	0.0
Furniture and related products	337	30.9	36.4	38.1	52.1	37.8	0.0	0.0	0.0
Miscellaneous manufacturing	339	57.7	53.5	68.6	41.7	19.0	0.2	0.0	0.0

TABLE A-5. Imputation rates for survey items, by industry and size of company: 2002

(Percent)

Industry and size of company	NAICS codes	R&D by type of cost					Company R&D		
		Wages	Fringe benefits	Materials	Depreciation	Other costs	Contracted out R&D	Foreign R&D	Energy R&D
Distribution by industry:									
Medical equipment and supplies	3391	65.6	63.4	73.0	46.0	18.0	0.0	0.0	0.0
Other miscellaneous manufacturing	339 minus (3391)	24.9	14.6	28.7	19.3	40.0	2.2	0.0	0.0
Other manufacturing	31–33 minus (311–16, 321–27, 331–37, 339)	--	--	--	--	--	--	--	--
Nonmanufacturing	21–23, 42, 44–81	39.6	42.1	40.7	45.8	23.9	10.1	0.0	0.0
Mining, extraction, and support activities	21	86.6	91.8	94.4	93.1	95.1	27.7	0.0	0.0
Utilities	22	15.7	(D)	21.0	(D)	24.3	1.8	0.0	0.0
Construction	23	33.2	54.3	8.7	57.3	20.4	(D)	0.0	0.0
Trade	42, 44, 45	32.2	39.4	46.0	30.6	13.6	5.6	0.0	0.0
Transportation and warehousing	48, 49	0.0	0.0	0.0	(D)	(D)	0.0	0.0	0.0
Information	51	49.4	56.9	60.7	72.1	42.0	36.9	0.0	0.0
Publishing	511	55.5	58.4	63.3	71.9	45.8	21.8	0.0	0.0
Newspaper, periodical, book, and database	5111	5.8	3.1	(D)	(D)	4.1	6.9	0.0	0.0
Software	5112	58.2	61.2	64.7	73.8	47.6	23.5	0.0	0.0
Broadcasting and telecommunications	513	84.0	66.8	74.3	78.2	65.9	87.2	0.0	0.0
Radio and television broadcasting	5131	(D)	(D)	(D)	(D)	(D)	0.0	0.0	0.0
Telecommunications	5133	83.8	65.8	73.7	77.7	65.5	(D)	0.0	0.0
Other broadcasting and telecommunications	513 minus (5131, 5133)	(D)	(D)	(D)	(D)	(D)	(D)	0.0	0.0
Other information	51 minus (511, 513)	5.5	20.1	12.9	49.9	2.1	2.7	0.0	0.0
Finance, insurance, and real estate	52, 53	29.8	40.9	55.5	45.3	35.8	0.9	0.0	0.0
Professional, scientific, and technical services	54	36.4	33.3	32.7	42.1	31.7	10.0	0.0	0.0
Architectural, engineering, and related services	5413	32.1	26.1	38.1	67.4	21.5	0.0	0.0	0.0
Computer systems design and related services	5415	43.3	40.0	39.1	45.0	36.8	6.4	0.0	0.0
Scientific R&D services	5417	28.8	29.0	29.2	31.6	28.6	11.3	0.0	0.0
Other professional, scientific, and technical services	54 minus (5413, 5415, 5417)	40.2	33.8	39.0	46.1	53.2	8.1	0.0	0.0
Management of companies and enterprises	55	0.0	(D)	(D)	0.0	0.0	(D)	0.0	0.0
Health care services	621–23	12.7	12.5	14.4	35.6	10.4	28.3	0.0	0.0
Other nonmanufacturing	56, 61, 624, 71, 72, 81	23.2	36.8	59.1	18.0	4.2	0.6	0.0	0.0

TABLE A-5. Imputation rates for survey items, by industry and size of company: 2002

(Percent)

Industry and size of company	NAICS codes	R&D by type of cost					Company R&D		
		Wages	Fringe benefits	Materials	Depreciation	Other costs	Contracted out R&D	Foreign R&D	Energy R&D
Distribution by size of company (number of employees):									
Total	(na)	38.1	41.1	39.3	36.8	28.6	5.6	0.0	0.0
5 to 24	(na)	16.9	24.3	14.1	18.6	9.8	0.1	0.0	0.0
25 to 49	(na)	42.7	47.6	49.3	49.5	39.3	12.3	0.0	0.0
50 to 99	(na)	32.8	41.6	33.2	33.0	31.1	14.0	0.0	0.0
100 to 249	(na)	33.0	39.5	33.9	33.8	33.6	6.5	0.0	0.0
250 to 499	(na)	29.3	31.7	31.2	28.5	23.4	5.6	0.0	0.0
500 to 999	(na)	24.4	27.3	19.2	26.4	15.7	18.6	0.0	0.0
1,000 to 4,999	(na)	34.0	34.5	34.2	34.3	30.0	10.1	0.0	0.0
5,000 to 9,999	(na)	32.8	31.4	34.6	30.3	38.0	4.8	0.0	0.0
10,000 to 24,999	(na)	38.9	41.8	35.8	47.4	22.9	0.0	0.0	0.0
25,000 or more	(na)	43.2	46.3	45.7	39.5	29.6	4.5	0.0	0.0

(D) = imputation rate is not calculated for a cell from which data have been withheld to avoid disclosing opeations of individual companies.

(--) = indicates data not collected.

(na) = not applicable.

NOTES: The figures in this table represent the percentage of the value in a given table cell in the section A tables that has been imputed. In those tables, cells for which more than 50 percent of the value is imputed are flagged with an "(S)". For information on sampling for 2002, see appendix A, Technical Notes.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

TABLE A-6. R&D-performing companies that reported nonzero data for major survey items: 2002

(Percent)

Survey item	Form RD-1	Form RD-1A
Sales	97.8	98.1
Employment	98.4	99.1
Scientist and engineers	91.5	93.5
Federal R&D	14.2	5.4
Department of Defense	9.3	NA
NASA	2.8	NA
Department of Energy	2.8	NA
Other Federal agencies	7.0	NA
Company R&D	98.4	98.8
Contracted out R&D	22.8	14.9
Foreign R&D	31.0	5.4
All R&D	100.0	100.0
Wages and salaries	85.1	NA
Fringe benefits	66.4	NA
Materials and supplies	75.4	NA
R&D depreciation	60.8	NA
Other costs by type of expense	77.5	NA
Costs by technology area:		
Biotechnology	13.0	7.2
Software development	27.3	27.2
Materials synthesis and processing	15.5	27.5
Other technology costs	35.5	50.1
Outsourced R&D by organization:		
For-profit company	20.6	NA
University or college	8.3	NA
Nonprofit organization	2.7	NA
Energy R&D	5.0	NA
Basic research:		
Total	18.0	15.7
Company-funded	16.6	15.0
Federally funded	16.6	15.0
Applied research:		
Total	38.8	25.3
Company-funded	37.0	24.5
Federally funded	6.0	2.2
Development:		
Total	79.1	83.6
Company-funded	77.5	82.7
Federally funded	7.5	3.2

NA = not available.

NOTES: Percentages are based on reported data for companies that reported any R&D expenditures. Imputed data are not included. Companies that reported they were out-of-scope, out-of-business, merged with another company, or had no R&D expenditures for 2002 were excluded from the calculations.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

TABLE A-7. Funds for and number of companies that reported amounts for industrial basic research, applied research, and development performed in the United States, and funds and percent of funds not distributed, by industry and size of company and by source of funds: 2002

(Millions of dollars)

Industry and size of company	NAICS codes	All funds				Basic research			
		Number of companies	Total [a]	Federal [a]	Company and other [b]	Number of companies	Total [a]	Federal [a]	Company and other [b]
Distribution by industry:									
All Industries	21–23, 31–33, 42, 44–81	29,001	190,809	16,401	174,408	3,596	5,633	542	5,091
Manufacturing	31–33	14,043	108,985	10,745	98,240	2,586	3,690	120	3,571
Food	311	529	(D)	(D)	2,034	111	(D)	(D)	(D)
Beverage and tobacco products	312	57	170	-	170	1	(D)	-	(D)
Textiles, apparel, and leather	313–16	364	(D)	(D)	248	43	(D)	-	(D)
Wood products	321	90	(D)	(D)	132	14	(D)	-	(D)
Paper, printing and support activities	322, 323	396	(D)	(D)	2,620	96	(D)	-	(D)
Petroleum and coal products	324	79	(D)	(D)	1,233	37	(D)	-	(D)
Chemicals	325	1,242	20,641	246	20,395	233	(D)	(D)	2,190
Basic chemicals	3251	182	1,782	72	1,710	56	(D)	(D)	152
Resin, synthetic rubber, fibers, and filament	3252	82	2,426	13	2,413	15	209	-	209
Pharmaceuticals and medicines	3254	313	(D)	(D)	14,186	29	(D)	(D)	1,663
Other chemicals	325 minus (3251–52, 3254)	666	(D)	(D)	2,087	133	(D)	(D)	165
Plastics and rubber products	326	951	(D)	(D)	1,508	151	(D)	-	(D)
Nonmetallic mineral products	327	211	(D)	(D)	420	27	(D)	(D)	13
Primary metals	331	200	473	12	461	17	6	-	6
Fabricated metal products	332	1,382	1,355	104	1,251	366	26	(z)	26
Machinery	333	2,706	6,429	62	6,366	510	(D)	(D)	(D)
Computer and electronic products	334	2,808	35,777	5,470	30,307	497	530	8	521
Computers and peripheral equipment	3341	329	3,040	25	3,015	60	28	6	22
Communications equipment	3342	501	6,635	215	6,420	109	83	-	83
Semiconductor and other electronic components	3344	806	11,919	48	11,871	184	213	1	212
Navigational, measuring, electromedical, and control instruments	3345	1,047	13,729	5,180	8,549	124	203	1	202
Other computer and electronic products	334 minus (3341–42, 3344–45)	125	453	1	452	20	2	-	2
Electrical equipment, appliances, and components	335	840	2,039	61	1,978	151	(D)	(D)	13
Transportation equipment	336	785	26,145	4,692	21,452	119	(D)	(D)	(D)
Motor vehicles, trailers, and parts	3361–63	488	(D)	(D)	15,199	76	(D)	(D)	(D)
Aerospace products and parts	3364	84	9,654	4,306	5,349	11	(D)	(D)	295
Other transportation equipment	336 minus (3361–64)	213	(D)	(D)	905	32	(D)	(D)	(D)
Furniture and related products	337	267	258	7	251	7	(D)	-	(D)
Miscellaneous manufacturing	339	1,136	7,457	44	7,414	206	(D)	(D)	85

TABLE A-7. Funds for and number of companies that reported amounts for industrial basic research, applied research, and development performed in the United States, and funds and percent of funds not distributed, by industry and size of company and by source of funds: 2002

(Millions of dollars)

Industry and size of company	NAICS codes	All funds				Basic research			
		Number of companies	Total [a]	Federal [a]	Company and other [b]	Number of companies	Total [a]	Federal [a]	Company and other [b]
Distribution by industry:									
Medical equipment and supplies	3391	557	(D)	(D)	6,179	80	(D)	(D)	70
Other miscellaneous manufacturing	339 minus (3391)	579	(D)	(D)	1,235	126	(D)	(D)	15
Other manufacturing	31–33 minus (311–16, 321–27, 331–37, 339)	--	--	--	--	--	--	--	--
Nonmanufacturing	21–23, 42, 44–81	14,958	81,824	5,656	76,168	1,010	1,943	422	1,520
Mining, extraction, and support activities	21	22	(D)	(D)	715	6	23	-	23
Utilities	22	285	(D)	(D)	117	3	(D)	-	(D)
Construction	23	300	164	(z)	164	11	1	(z)	1
Trade	42, 44, 45	2,837	(D)	(D)	25,014	122	(D)	(D)	754
Transportation and warehousing	48, 49	120	(D)	(D)	339	2	(D)	-	(D)
Information	51	1,726	17,870	106	17,764	128	(D)	(D)	106
Publishing	511	1,320	13,541	53	13,488	116	(D)	(D)	82
Newspaper, periodical, book, and database	5111	51	614	-	614	1	(D)	-	(D)
Software	5112	1,269	12,927	53	12,874	115	(D)	(D)	(D)
Broadcasting and telecommunications	513	112	(D)	(D)	1,637	1	(D)	-	(D)
Radio and television broadcasting	5131	4	(D)	-	(D)	0	-	-	-
Telecommunications	5133	93	(D)	(D)	1,608	1	(D)	-	(D)
Other broadcasting and telecommunications	513 minus (5131, 5133)	14	(D)	-	(D)	0	-	-	-
Other information	51 minus (511, 513)	294	(D)	(D)	2,639	10	(D)	-	(D)
Finance, insurance, and real estate	52, 53	463	1,903	-	1,903	10	24	-	24
Professional, scientific, and technical services	54	6,973	30,358	5,412	24,946	664	987	406	582
Architectural, engineering, and related services	5413	1,392	4,159	1,337	2,822	142	(D)	(D)	18
Computer systems design and related services	5415	3,304	11,983	1,590	10,394	223	(D)	(D)	135
Scientific R&D services	5417	1,364	13,034	2,299	10,735	294	655	233	422
Other professional, scientific, and technical services	54 minus (5413, 5415, 5417)	913	1,182	186	996	5	7 (S)	-	7 (S)
Management of companies and enterprises	55	35	148	-	148	0	-	-	-
Health care services	621–23	1,231	(D)	(D)	4,163	8	(D)	(D)	(D)
Other nonmanufacturing	56, 61, 624, 71, 72, 81	966	(D)	(D)	894	56	(D)	(D)	12

TABLE A-7. Funds for and number of companies that reported amounts for industrial basic research, applied research, and development performed in the United States, and funds and percent of funds not distributed, by industry and size of company and by source of funds: 2002

(Millions of dollars)

Industry and size of company	NAICS codes	All funds				Basic research			
		Number of companies	Total [a]	Federal [a]	Company and other [b]	Number of companies	Total [a]	Federal [a]	Company and other [b]
Distribution by size of company (number of employees):									
Total	(na)	29,001	190,809	16,401	174,408	3,596	5,633	542	5,091
5 to 24	(na)	13,028	4,261	789	3,471	1,206	83	27	56
25 to 49	(na)	4,620	3,845	259	3,586	655	126	25	101
50 to 99	(na)	3,846	6,164	463	5,701	562	251	53	197
100 to 249	(na)	3,441	13,227	606	12,622	482	445	98	347
250 to 499	(na)	1,573	8,055	686	7,370	273	262	61	202
500 to 999	(na)	962	9,925	531	9,394	140	(D)	(D)	261
1,000 to 4,999	(na)	1,054	28,625	985	27,640	174	1,009	9	1,000
5,000 to 9,999	(na)	220	17,987	1,574	16,414	43	283	2	281
10,000 to 24,999	(na)	152	26,458	1,226	25,232	32	(D)	(D)	842
25,000 or more	(na)	105	72,261	9,282	62,979	29	2,007	203	1,805

TABLE A-7. Funds for and number of companies that reported amounts for industrial basic research, applied research, and development performed in the United States, and funds and percent of funds not distributed, by industry and size of company and by source of funds: 2002

(Millions of dollars)

Industry and size of company	NAICS codes	Applied research				Development			
		Number of companies	Total [a]	Federal [a]	Company and other [b]	Number of companies	Total [a]	Federal [a]	Company and other [b]
Distribution by industry:									
All industries	21–23, 31–33, 42, 44–81	6,095	20,317	1,574	18,743	22,983	108,006	6,236	101,769
Manufacturing	31–33	3,450	13,034	781	12,253	11,813	56,764	3,603	53,161
Food	311	121	(D)	-	(D)	428	1,499	-	1,499
Beverage and tobacco products	312	7	(D)	-	(D)	56	128	-	128
Textiles, apparel, and leather	313–16	48	23	-	23	218	(D)	(D)	(D)
Wood products	321	27	(D)	(D)	(D)	76	53	-	53
Paper, printing and support activities	322, 323	102	420 (S)	-	420 (S)	374	1,034 (S)	(D)	(D)
Petroleum and coal products	324	20	165	-	165	67	(D)	(D)	(D)
Chemicals	325	428	(D)	(D)	4,753	1,003	10,943	116	10,828
Basic chemicals	3251	80	(D)	(D)	454	123	801	12	789
Resin, synthetic rubber, fibers, and filament	3252	42	(D)	(D)	1,176	58	(D)	(D)	901
Pharmaceuticals and medicines	3254	65	(D)	(D)	2,600	291	(D)	(D)	8,056
Other chemicals	325 minus (3251–52, 3254)	242	(D)	(D)	524	531	(D)	(D)	1,082
Plastics and rubber products	326	244	(D)	-	(D)	883	(D)	(D)	998
Nonmetallic mineral products	327	32	74	-	74	133	(D)	(D)	150
Primary metals	331	25	(D)	(D)	36	172	(D)	(D)	153
Fabricated metal products	332	399	77	5	73	1,254	736	96 (S)	639
Machinery	333	782	(D)	(D)	(D)	2,295	(D)	(D)	4,310
Computer and electronic products	334	728	3,293	33	3,260	2,410	14,678	615	14,063
Computers and peripheral equipment	3341	76	89	2	88	294	1,480	2	1,478
Communications equipment	3342	121	215	-	215	429	2,461	178	2,284
Semiconductor and other electronic components	3344	314	1,571	28	1,543	702	4,387	12	4,375
Navigational, measuring, electromedical, and control instruments	3345	174	1,385	3	1,382	874	6,026	423	5,603
Other computer and electronic products	334 minus (3341–42, 3344–45)	44	33	-	33	112	323	(z)	323
Electrical equipment, appliances, and components	335	110	(D)	(D)	138	714	(D)	(D)	1,229
Transportation equipment	336	118	(D)	592	(D)	599	(D)	(D)	11,388
Motor vehicles, trailers, and parts	3361–63	72	(D)	(D)	(D)	328	(D)	(D)	7,589
Aerospace products and parts	3364	16	(D)	(D)	930	63	5,637	2,306	3,332
Other transportation equipment	336 minus (3361–64)	30	(D)	(D)	(D)	208	(D)	(D)	467
Furniture and related products	337	23	(D)	-	(D)	232	194	7	187
Miscellaneous manufacturing	339	237	(D)	(D)	429	898	6,100	29	6,072

TABLE A-7. Funds for and number of companies that reported amounts for industrial basic research, applied research, and development performed in the United States, and funds and percent of funds not distributed, by industry and size of company and by source of funds: 2002

(Millions of dollars)

Industry and size of company	NAICS codes	Applied research				Development			
		Number of companies	Total [a]	Federal [a]	Company and other [b]	Number of companies	Total [a]	Federal [a]	Company and other [b]
Distribution by industry:									
Medical equipment and supplies	3391	136	(D)	(D)	364	436	(D)	(D)	5,103
Other miscellaneous manufacturing	339 minus (3391)	101	(D)	(D)	65	462	(D)	(D)	969
Other manufacturing	31–33 minus (311–16, 321–27, 331–37, 339)								
Nonmanufacturing	21–23, 42, 44–81	2,645	7,284	793	6,490	11,170	51,241	2,633	48,609
Mining, extraction, and support activities	21	15	(D)	(D)	124	19	(D)	(D)	554 (S)
Utilities	22	8	(D)	-	(D)	273	(D)	(D)	(D)
Construction	23	6	22	-	22	280	67	(z)	67
Trade	42, 44, 45	510	(D)	(D)	2,133	2,223	(D)	(D)	19,654
Transportation and warehousing	48, 49	6	(D)	-	(D)	19	(D)	(D)	(D)
Information	51	265	820	5	815	1,584	(D)	(D)	10,353
Publishing	511	254	677	5	672	1,251	(D)	(D)	6,925
Newspaper, periodical, book, and database	5111	3	(D)	-	(D)	45	371	-	371
Software	5112	251	(D)	5	(D)	1,206	(D)	(D)	6,554
Broadcasting and telecommunications	513	2	(D)	-	(D)	101	(D)	(D)	(D)
Radio and television broadcasting	5131	0	-	-	-	3	(D)	-	(D)
Telecommunications	5133	2	(D)	-	(D)	84	(D)	(D)	(D)
Other broadcasting and telecommunications	513 minus (5131, 5133)	0	-	-	-	14	(D)	-	(D)
Other information	51 minus (511, 513)	8	(D)	-	(D)	232	(D)	(D)	(D)
Finance, insurance, and real estate	52, 53	40	63	-	63	442	1,688	-	1,688
Professional, scientific, and technical services	54	1,692	4,010	752	3,258	5,381	17,354	2,483	14,871
Architectural, engineering, and related services	5413	180	(D)	(D)	128	771	2,557	315	2,243
Computer systems design and related services	5415	489	(D)	(D)	314	2,996	8,581	1,460	7,121
Scientific R&D services	5417	672	3,382	606	2,776	956	5,506	559	4,948
Other professional, scientific, and technical services	54 minus (5413, 5415, 5417)	351	71	32	39	658	709	150	559
Management of companies and enterprises	55	0	-	-	-	34	136	-	136
Health care services	621–23	14	(D)	(D)	31	325	366	(D)	(D)
Other nonmanufacturing	56, 61, 624, 71, 72, 81	90	(D)	(D)	26	588	(D)	(D)	777

TABLE A-7. Funds for and number of companies that reported amounts for industrial basic research, applied research, and development performed in the United States, and funds and percent of funds not distributed, by industry and size of company and by source of funds: 2002

(Millions of dollars)

Industry and size of company	NAICS codes	Applied research				Development			
		Number of companies	Total [a]	Federal [a]	Company and other [b]	Number of companies	Total [a]	Federal [a]	Company and other [b]
Distribution by size of company (number of employees):									
Total	(na)	6,095	20,317	1,574	18,743	22,983	108,006	6,236	101,769
5 to 24	(na)	2,285	295	98	197	9,997	2,256	460	1,796
25 to 49	(na)	1,209	637	104	533	4,000	2,593	119	2,475
50 to 99	(na)	672	860	101	759	3,152	4,439	284	4,155
100 to 249	(na)	629	1,471	120	1,350	2,603	6,958	323	6,635
250 to 499	(na)	477	876	206	670	1,309	5,489	251	5,238
500 to 999	(na)	288	(D)	(D)	1,136	715	6,629	220	6,409
1,000 to 4,999	(na)	354	3,357	158	3,199	850	18,751	311	18,440
5,000 to 9,999	(na)	76	3,111	201	2,910	172	9,572	106	9,466
10,000 to 24,999	(na)	58	(D)	(D)	2,912	106	14,049	649	13,401
25,000 or more	(na)	49	5,509	433	5,076	78	37,269	3,514	33,755

TABLE A-7. Funds for and number of companies that reported amounts for industrial basic research, applied research, and development performed in the United States, and funds and percent of funds not distributed, by industry and size of company and by source of funds: 2002

(Millions of dollars)

Industry and size of company	NAICS codes	Expenditures not distributed [c]				Percent of expenditures not distributed [c]			
		Number of companies	Total [a]	Federal [a]	Company and other [b]	Number of companies	Total [a]	Federal [a]	Company and other [b]
Distribution by industry:									
All industries	21–23, 31–33, 42, 44–81	5,641	56,853	8,049	48,804	19	30.0	49.0	28.0
Manufacturing	31–33	2,160	35,497	6,241	29,256	15	33.0	58.0	30.0
Food	311	100	157	-	157	19	(D)	(D)	8.0
Beverage and tobacco products	312	1	12	-	12	2	7.0	0.0	7.0
Textiles, apparel, and leather	313–16	146	27	-	27	40	(D)	(D)	11.0
Wood products	321	14	13	-	13	15	(D)	(D)	10.0
Paper, printing and support activities	322, 323	16	1,177	26	1,152	4	(D)	(D)	44.0
Petroleum and coal products	324	12	809	1	808	15	(D)	(D)	65.0
Chemicals	325	201	2,629	4	2,625	16	13.0	2.0	13.0
Basic chemicals	3251	49	319	3	316	27	18.0	4.0	18.0
Resin, synthetic rubber, fibers, and filament	3252	23	127	-	127	28	5.0	0.0	5.0
Pharmaceuticals and medicines	3254	22	1,868	1	1,866	7	(D)	(D)	13.0
Other chemicals	325 minus (3251–52, 3254)	107	315	(z)	315	16	(D)	(D)	15.0
Plastics and rubber products	326	67	254	-	254	7	(D)	(D)	17.0
Nonmetallic mineral products	327	77	182	-	182	36	(D)	(D)	43.0
Primary metals	331	28	275	9	266	14	58.0	74.0	58.0
Fabricated metal products	332	128	516	3	512	9	38.0	3.0	41.0
Machinery	333	410	1,309	(z)	1,308	15	20.0	0.0	21.0
Computer and electronic products	334	378	17,276	4,813	12,463	13	48.0	88.0	41.0
Computers and peripheral equipment	3341	35	1,442	16	1,427	11	47.0	63.0	47.0
Communications equipment	3342	71	3,875	37	3,838	14	58.0	17.0	60.0
Semiconductor and other electronic components	3344	94	5,748	7	5,741	12	48.0	15.0	48.0
Navigational, measuring, electromedical, and control instruments	3345	166	6,116	4,752	1,364	16	45.0	92.0	16.0
Other computer and electronic products	334 minus (3341–42, 3344–45)	13	95	1	94	10	21.0	83.0	21.0
Electrical equipment, appliances, and components	335	126	625	27	598	15	31.0	44.0	30.0
Transportation equipment	336	187	9,347	1,357	7,990	24	36.0	29.0	37.0
Motor vehicles, trailers, and parts	3361–63	160	6,857	8	6,850	33	(D)	(D)	45.0
Aerospace products and parts	3364	21	2,141	1,349	792	26	22.0	31.0	15.0
Other transportation equipment	336 minus (3361–64)	5	349	-	349	2	(D)	(D)	39.0
Furniture and related products	337	36	58	-	58	13	23.0	0.0	23.0
Miscellaneous manufacturing	339	235	829	(z)	829	21	11.0	1.0	11.0

TABLE A-7. Funds for and number of companies that reported amounts for industrial basic research, applied research, and development performed in the United States, and funds and percent of funds not distributed, by industry and size of company and by source of funds: 2002

(Millions of dollars)

Industry and size of company	NAICS codes	Expenditures not distributed [c]				Percent of expenditures not distributed [c]			
		Number of companies	Total [a]	Federal [a]	Company and other [b]	Number of companies	Total [a]	Federal [a]	Company and other [b]
Distribution by industry:									
Medical equipment and supplies	3391	119	642	(z)	642	21	(D)	(D)	10.0
Other miscellaneous manufacturing	339 minus (3391)	115	187	(z)	187	20	(D)	(D)	15.0
Other manufacturing	31–33 minus (311–16, 321–27, 331–37, 339)								
Nonmanufacturing	21–23, 42, 44–81	3,481	21,357	1,808	19,549	23	26.0	32.0	26.0
Mining, extraction, and support activities	21	3	14	-	14	13	(D)	(D)	2.0
Utilities	22	11	18	(z)	18	4	(D)	(D)	16.0
Construction	23	20	75	-	75	7	45.0	0.0	45.0
Trade	42, 44, 45	612	2,476	3	2,473	22	(D)	(D)	10.0
Transportation and warehousing	48, 49	101	269	1	268	84	(D)	(D)	79.0
Information	51	141	6,507	18	6,490	8	36.0	17.0	37.0
Publishing	511	69	5,809	-	5,809	5	43.0	0.0	43.0
Newspaper, periodical, book, and database	5111	6	221	-	221	12	36.0	0.0	36.0
Software	5112	63	5,588	-	5,588	5	43.0	0.0	43.0
Broadcasting and telecommunications	513	11	440	-	440	9	(D)	(D)	27.0
Radio and television broadcasting	5131	1	(z)	-	(z)	23	(D)	0.0	(D)
Telecommunications	5133	10	440	-	440	10	(D)	(D)	27.0
Other broadcasting and telecommunications	513 minus (5131, 5133)	0	-	-	-	0	(D)	0.0	(D)
Other information	51 minus (511, 513)	62	258	18	241	21	(D)	(D)	9.0
Finance, insurance, and real estate	52, 53	18	127	-	127	4	7.0	0.0	7.0
Professional, scientific, and technical services	54	1,292	8,007	1,771	6,236	19	26.0	33.0	25.0
Architectural, engineering, and related services	5413	618	1,292	859	433	44	31.0	64.0	15.0
Computer systems design and related services	5415	305	2,831	7	2,824	9	24.0	0.0	27.0
Scientific R&D services	5417	114	3,490	901	2,588	8	27.0	39.0	24.0
Other professional, scientific, and technical services	54 minus (5413, 5415, 5417)	254	395	4	391	28	33.0	2.0	39.0
Management of companies and enterprises	55	1	13	-	13	3	9.0	0.0	9.0
Health care services	621–23	905	3,770	14	3,756	73	(D)	(D)	90.0
Other nonmanufacturing	56, 61, 624, 71, 72, 81	376	80	1	79	39	(D)	(D)	9.0

TABLE A-7. Funds for and number of companies that reported amounts for industrial basic research, applied research, and development performed in the United States, and funds and percent of funds not distributed, by industry and size of company and by source of funds: 2002

(Millions of dollars)

Industry and size of company	NAICS codes	Expenditures not distributed [c]				Percent of expenditures not distributed [c]			
		Number of companies	Total [a]	Federal [a]	Company and other [b]	Number of companies	Total [a]	Federal [a]	Company and other [b]
Distribution by size of company (number of employees):									
Total	(na)	5,641	56,853	8,049	48,804	19	30.0	49.0	28.0
5 to 24	(na)	2,881	1,627	205	1,422	22	38.0	26.0	41.0
25 to 49	(na)	528	489	12	477	11	13.0	5.0	13.0
50 to 99	(na)	626	614	24	590	16	10.0	5.0	10.0
100 to 249	(na)	800	4,354	65	4,289	23	33.0	11.0	34.0
250 to 499	(na)	249	1,427	167	1,260	16	18.0	24.0	17.0
500 to 999	(na)	240	1,765	176	1,589	25	18.0	33.0	17.0
1,000 to 4,999	(na)	197	5,507	507	5,000	19	19.0	51.0	18.0
5,000 to 9,999	(na)	46	5,022	1,266	3,756	21	28.0	80.0	23.0
10,000 to 24,999	(na)	46	8,572	494	8,078	30	32.0	40.0	32.0
25,000 or more	(na)	28	27,476	5,133	22,343	27	38.0	55.0	35.0

(D) = data have been withheld to avoid disclosing operations of individual companies; (S) = indicates imputation of more than 50 percent; (z) = indicates data less than half the unit shown; (--) = indicates data not collected; (-) = indicates a value of zero or a value rounded to zero; (na) = not applicable.

[a] Beginning with 2001, statistics for total and federally funded industrial R&D exclude data for federally funded research and development centers.

[b] The company R&D referred to in this table is the industrial R&D performed within company facilities funded from all sources except the Federal Government. The funds predominantly are the company's own, but also include funds from outside organizations such as other companies, research institutions, universities and colleges, nonprofit organizations, and state governments. Excluded from this table are company-funded R&D not performed within the company (e.g., R&D contracted out to other organizations) and company-funded R&D not performed within the 50 U.S. states or DC (e.g., R&D not performed on U.S. soil by foreign subsidiaries or other foreign organizations).

[c] The amounts of undistributed R&D are distributed among basic research, applied research, and development in tables 31 –34.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Industrial Research and Development: 2002.

identify and examine the factors behind these divergent trends.

Employment, FTE R&D scientists and engineers. Number of people employed in the 50 U.S. states and DC 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 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 on R&D only part of the time.

Employment, total. Number of people employed in the 50 U.S. states and DC by R&D-performing companies in all activities during the pay period that included the 12th of March of the study year (March 12 is the date most employers use when paying first quarter employment taxes to the Internal Revenue Service).

Federally funded R&D centers (FFRDCs). R&D-performing organizations administered by industrial, academic, or other institutions on a nonprofit basis and exclusively or substantially financed by the federal government. To avoid the possibility of disclosing company-specific information and therefore violating the confidentiality provisions of Title 13 of the United States Code, beginning in 2001 data for industry-administered FFRDCs are now collected through NSF's annual academic R&D expenditure survey, the Survey of Research and Development Expenditures at Universities and Colleges, as are data from FFRDCs administered by academic institutions and nonprofit organizations. More information about this survey is available from NSF's Division of Science Resources Statistics website at http://www.nsf.gov/statistics/srvyrdexpenditures/. For current lists of FFRDCs, visit http://www.nsf.gov/statistics/ffrdc/.

Funds for R&D, company and other nonfederal. The cost of R&D performed within the company and funded by the company itself or by other nonfederal sources in the 50 U.S. states and DC; does not include the cost of R&D funded by the company but contracted to outside organizations such as research institutions, universities and colleges, nonprofit organizations, or—to avoid double counting—other companies.

Funds for R&D, federal. The cost of R&D performed within the company in the 50 U.S. states and DC funded by federal R&D contracts, subcontracts, R&D portions of federal procurement contracts and subcontracts, grants, or other arrangements; does not include the cost of R&D supported by the federal government but contracted to outside organizations such as research institutions, universities and colleges, nonprofit organizations, or other companies.

Funds for R&D, total. The cost of R&D performed within the company in its own laboratories or in other company-owned or company-operated facilities in the 50 U.S. states and DC, including expenses for wages and salaries, fringe benefits for R&D personnel, materials and supplies, property and other taxes, maintenance and repairs, depreciation, and an appropriate share of overhead; does not include capital expenditures or the cost of R&D contracted to outside organizations such as research institutions, universities and colleges, nonprofit organizations, or—to avoid double-counting—other companies.

Funds per R&D scientist or engineer. All costs associated with the performance of industrial R&D (salaries, wages, and fringe benefits paid to R&D personnel; materials and supplies used for R&D; depreciation on capital equipment and facilities used for R&D; and any other R&D costs) divided by the number of R&D scientists and engineers employed in the 50 U.S. states and DC. To obtain a per person cost of R&D for a given year, the total R&D expenditures of that year were divided by an approximation of the number of full-time-equivalent (FTE) scientists and engineers engaged in the performance of R&D for that year. For accuracy, this approximation was the mean of the numbers of such FTE R&D-performing scientists and engineers as reported in January for the year in question and the subsequent year. For example, the mean of the numbers of FTE R&D scientists and engineers in January 2002 and January 2003 was divided into total 2002 R&D expenditures for a total cost per R&D scientist or engineer in 2002.

Net sales and receipts. Dollar values for goods sold or services rendered by R&D-performing compa-

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 were excluded, but transfers to foreign subsidiaries and export sales to foreign companies were included.

R&D and industrial R&D. R&D is the planned, systematic pursuit of new knowledge or understanding toward general application (basic research); the acquisition of knowledge or understanding to meet a specific, recognized need (applied research); or the application of knowledge or understanding toward the production or improvement of a product, service, process, or method (development). *Basic research* analyzes properties, structures, and relationships toward formulating and testing hypotheses, theories, or laws; *applied research* is undertaken either to determine possible uses for the findings of basic research or to determine new ways of achieving specific, predetermined objectives; and *development* draws on research findings or other scientific knowledge for the purpose of producing new or significantly improving products, services, processes, or methods. As used in this survey, industrial *basic research* is the pursuit of new scientific knowledge or understanding that does not have specific immediate commercial objectives, although it may be in fields of present or potential commercial interest; industrial *applied research* is investigation that may use findings of basic research toward discovering new scientific knowledge that has specific commercial objectives with respect to new products, services, processes, or methods; and industrial *development* is the systematic use of the knowledge or understanding gained from research or practical experience directed toward the production or significant improvement of useful products, services, processes, or methods, including the design and development of prototypes, materials, devices, and systems. The survey covers industrial R&D performed by people trained, either formally or by experience, in engineering or in the physical, biological, mathematical, statistical, or computer sciences and employed by a publicly or privately owned firm engaged in for-profit activity in the United States. Specifically excluded from the survey are quality control, routine product testing, market research, sales promotion, sales service, and other nontechnological activities; routine technical services; and research in the social sciences or psychology.

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NATIONAL SCIENCE FOUNDATION
4201 WILSON BOULEVARD
ARLINGTON, VIRGINIA 22230

OFFICE OF THE
DIRECTOR

FROM THE DIRECTOR
NATIONAL SCIENCE FOUNDATION

The National Science Foundation (NSF) requests your company's participation in the 2002 Survey of Industrial Research and Development that the U.S. Census Bureau is conducting for us. This annual survey is the only source of detailed information on U.S. industry's research and development (R&D) performance.

Your company's participation is vital to the accuracy of the resulting information. Because R&D expenditures are concentrated in relatively few companies, a completed response is needed from each surveyed firm — *there is no substitute for the information that you can provide.* Your company can be assured of complete confidentiality. Survey data will be released only in aggregate form so that responses of individual companies cannot be identified.

If you have questions concerning the operation of this survey, please direct them to the Census Bureau on (301) 763–5162. Survey results are made available in an annual report entitled *Research and Development in Industry.* The most recent report, historical reports, and descriptive information about the survey are available on the NSF website at http://www.nsf.gov/sbe/srs/sird/start.htm.

Thank you for your assistance in this important effort.

Sincerely,

Rita R. Colwell

Rita R. Colwell
Director

Enclosures

RD-1-CL
(1-2003)

UNITED STATES DEPARTMENT OF COMMERCE
Economics and Statistics Administration
U.S. Census Bureau
Washington, DC 20233-0001
OFFICE OF THE DIRECTOR

FROM THE DIRECTOR
U.S. CENSUS BUREAU

We have enclosed your company's report form and instructions for the 2002 Survey of Industrial Research and Development (R&D). In addition to the traditional report form, we have included a Computerized Self-Administered Questionnaire diskette that you may use as an alternative format for reporting. Please refer to the instructions for installation. If you have any questions about installing or using the diskette, please contact the Electronic Reporting Staff on 1–800–838–2640.

The diskette and Form RD-1 contain information from the previous report for your company. **Please review the instructions, complete the diskette or the form, and return it within 60 days.** Information you report should cover the domestic operations of your consolidated enterprise for calendar year 2002. **For this survey year, federal law requires your response to *ALL* items on the form.**

Data from this survey have many business and policy uses. They provide information for examining R&D tax credits. Some businesses are able to use R&D tax credits to reduce their federal tax burden. The data also assist public officials in allocating research funding by state, which may benefit companies like yours. In addition, analysts use the results to compare spending in this country with other countries to ensure that U.S. businesses are not at a competitive disadvantage.

We recognize that providing this information is a burden, and we have worked hard to minimize it. For example, if you do not have book figures for any item, **you may provide carefully prepared estimates.** The law that authorizes this survey (Title 13, United States Code) requires that we keep your report in full confidence. Only persons sworn to protect Title 13 data will see your information, and they will use it only for statistical purposes.

We conduct this survey with National Science Foundation (NSF) support. We have enclosed a letter from the Director of NSF encouraging your response to the survey. If you have any questions, please call my staff on 301–763–5162. Thank you in advance for your cooperation.

Sincerely,

Charles Louis Kincannon
Director

Enclosures