

U.S. R&D INCREASED 6.0% IN 2006 ACCORDING TO NSF PROJECTIONS

by Brandon Shackelford

Current-dollar R&D conducted in the United States increased 6.0%, or \$19.3 billion, in 2006 to a level of \$342.9 billion, according to projections released by the National Science Foundation (NSF) (table 1). In 2005, current-dollar R&D had increased 7.8%, or \$23.5 billion, to \$323.5 billion. Estimates for 2005 and 2006 are based on projections and survey data that are incomplete or subject to further revision.¹

Real R&D

Real domestic research and development—expenditures on R&D adjusted to account for inflation—increased 3.5% in 2006 (table 2). In 2005, real R&D had increased by 5.0%. The increase in real R&D in 2006 primarily reflected growth in R&D performed by for-profit companies operating in the United States. R&D performed by federal agencies and in federally funded research and development centers (FFRDCs) declined in 2006.² R&D performed by universities and colleges and by nonprofit institutions both increased.

Funding for R&D

The largest sources of funding for R&D are the business sector and federal government. Together

these two sectors funded 93.2% of the R&D performed in the United States in 2006 (figure 1). Real R&D funding from the business sector increased 4.9% in 2006, whereas real R&D funding from the federal government did not change significantly. The federal government's share of the nation's R&D funding peaked in 1964 at 66.8%. In 2006 it funded 28.2% of U.S. R&D. However, the federal government remains the primary source of funding for R&D performed at U.S. colleges and universities, funding 63.6% of academic R&D in 2006.

Discrepancy in Federal R&D Funding

Data on federal funding for R&D reported here are based on surveys of organizations that conduct R&D, such as companies, universities, and FFRDCs. Federal funding for R&D based on data from these R&D performers differ substantially from the amount of R&D federal agencies report funding. The National Academies' Committee on National Statistics (CNSTAT) has recommended that NSF publish an annual reconciliation of estimates for federal R&D funding as reported by performers of R&D and as reported by federal agencies.

For FY 2006, federal agencies reported obligating \$108.4 billion in total R&D to all R&D performers (\$44.3 billion, or 41%, to industry), compared with \$96.8 billion in federal funding reported by the performers of R&D. Although NSF has not found a definitive explanation for this divergence, CNSTAT notes that comparing federal outlays (as opposed to obligations) for R&D to performer expenditures results in a smaller discrepancy.

¹ The sources of data for sector-specific R&D performance are the following NSF surveys: Survey of Industrial R&D, Survey of R&D Expenditures at Universities and Colleges, Survey of Federal Funds for R&D, and Survey of R&D Funding & Performance by Nonprofit Organizations.

² FFRDCs are R&D-performing organizations that are exclusively or substantially financed by the federal government either to meet particular R&D objectives or, in some instances, to provide major facilities at universities for research and associated training purposes. Each FFRDC is administered either by an industrial firm, a university, or a nonprofit institution.



TABLE 1. U.S. R&D expenditures, by character of work, performing sector, and source of funds: 2006 (projected)

Performing sector and character of work	Source of funds (\$millions)					Total expenditures (% distribution)
	Total	Industry	Federal government	U&C	Other nonprofit institutions	
R&D	342,886	223,042	96,847	12,073	10,924	100.0
Industry	241,809	219,293	22,516	NA	NA	70.5
Industry-administered FFRDCs	2,426	NA	2,426	NA	NA	0.7
Federal government	24,408	NA	24,408	NA	NA	7.1
U&C	49,090	2,400	31,223	12,073	3,395	14.3
U&C-administered FFRDCs	7,720	NA	7,720	NA	NA	2.3
Other nonprofit institutions	14,599	1,349	5,721	NA	7,530	4.3
Nonprofit-administered FFRDCs	2,834	NA	2,834	NA	NA	0.8
Percent distribution by source	100.0	65.0	28.2	3.5	3.2	NA
Basic research	63,648	10,297	38,467	8,353	6,530	100.0
Industry	9,078	7,887	1,191	NA	NA	14.3
Industry-administered FFRDCs	128	NA	128	NA	NA	0.2
Federal government	4,938	NA	4,938	NA	NA	7.8
U&C	36,887	1,661	24,524	8,353	2,349	58.0
U&C-administered FFRDCs	3,746	NA	3,746	NA	NA	5.9
Other nonprofit institutions	7,697	749	2,768	NA	4,181	12.1
Nonprofit-administered FFRDCs	1,173	NA	1,173	NA	NA	1.8
Percent distribution by source	100.0	16.2	60.4	13.1	10.3	NA
Applied research	79,291	48,364	25,113	3,049	2,766	100.0
Industry	52,721	47,416	5,305	NA	NA	66.5
Industry-administered FFRDCs	1,482	NA	1,482	NA	NA	1.9
Federal government	7,750	NA	7,750	NA	NA	9.8
U&C	10,325	606	5,812	3,049	857	13.0
U&C-administered FFRDCs	1,805	NA	1,805	NA	NA	2.3
Other nonprofit institutions	4,809	342	2,559	NA	1,908	6.1
Nonprofit-administered FFRDCs	399	NA	399	NA	NA	0.5
Percent distribution by source	100.0	61.0	31.7	3.8	3.5	NA
Development	199,947	164,381	33,267	669	1,629	100.0
Industry	180,010	163,990	16,020	NA	NA	90.0
Industry-administered FFRDCs	816	NA	816	NA	NA	0.4
Federal government	11,720	NA	11,720	NA	NA	5.9
U&C	1,877	133	887	669	188	0.9
U&C-administered FFRDCs	2,168	NA	2,168	NA	NA	1.1
Other nonprofit institutions	2,094	258	395	NA	1,441	1.0
Nonprofit-administered FFRDCs	1,262	NA	1,262	NA	NA	0.6
Percent distribution by source	100.0	82.2	16.6	0.3	0.8	NA

NA = not available.

FFRDC = federally funded research and development center; U&C = universities and colleges.

NOTES: State and local government support to industry included in industry support for industry performance. State and local government support to U&C (\$3,164 million in total R&D) included in U&C support for U&C performance.

SOURCE: National Science Foundation, Division of Science Resources Statistics, National Patterns of R&D Resources (annual series).

For FY 2006, federal agencies reported R&D outlays of \$103.7 billion to all R&D performers. The difference in the federal R&D totals appears to be concentrated in the funding of industry R&D by the Department of Defense. See National Science Foundation (2005) for further discussion of these differences.

Data Notes

The U.S. R&D data presented here are derived by adding up the R&D performance for all sectors of the economy for which it can be reasonably estimated. Data from surveys that reference fiscal years (Survey of R&D Expenditures at Universities and Colleges and

TABLE 2. National expenditures for R&D, by performing sector and sources of funding: 1999–2006

(Millions of constant 2000 dollars)

Sector	1999	2000	2001	2002	2003	2004	2005 ^a	2006 ^a
All performing sectors	250,374	267,557	271,229	265,474	271,885	275,036	288,754	298,862
Industry	186,056	199,961	197,284	186,076	188,821	190,929	201,682	210,763
Industry-administered FFRDCs ^b	2,084	2,001	1,973	2,172	2,313	2,278	2,289	2,114
Federal government ^c	18,240	17,917	19,948	20,635	21,403	21,123	22,083	21,274
U&C	28,776	30,688	32,933	35,696	38,058	39,496	40,902	42,787
U&C-administered FFRDCs	5,775	5,742	6,080	6,816	6,868	7,019	6,949	6,728
Other nonprofit institutions	8,429	9,782	10,872	11,852	12,078	11,767	12,336	12,725
Nonprofit-administered FFRDCs ^b	1,014	1,465	2,140	2,226	2,346	2,423	2,513	2,470
All funding sectors	250,374	267,557	271,229	265,474	271,885	275,036	288,754	298,862
Industry	168,247	186,135	184,024	173,448	175,133	175,416	185,237	194,405
Federal government	68,505	66,403	71,114	74,569	78,638	81,493	84,458	84,412
U&C	5,741	6,230	6,664	7,046	7,194	7,271	7,508	7,765
Other nonprofit institutions	5,738	6,542	7,086	7,958	8,342	8,215	8,879	9,522
Nonfederal government	2,143	2,246	2,340	2,453	2,578	2,642	2,671	2,758

FFRDC = federally funded research and development center; U&C = universities and colleges.

^a Estimates for 2005 and 2006 are based on projections and source data that are incomplete or subject to further revision.

^b Beginning in 2001, data for industry and nonprofit FFRDCs are reported by FFRDCs. In prior years, these data were collected from FFRDC administrators and federal agencies supporting FFRDCs.

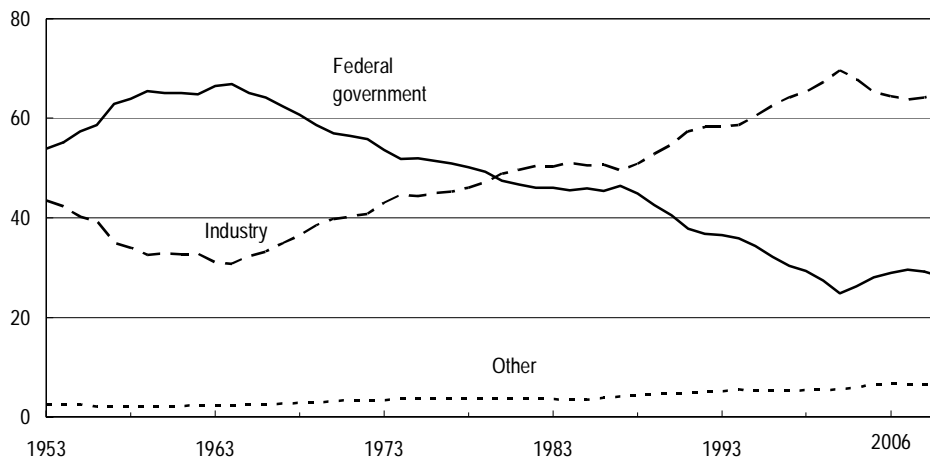
^c Includes expenditures of federal intramural R&D as well as costs associated with administering extramural R&D.

NOTES: Expenditure levels for academic and federal government performers are calendar-year approximations based on fiscal year data. For federal government expenditures, approximation is equal to 75% of amount reported in same fiscal year plus 25% of amount reported in subsequent fiscal year. For academic expenditures, respective percentages are 50 and 50, because those fiscal years generally begin on July 1 instead of October 1. Data are based on annual reports by performers except for nonprofit sector.

SOURCE: National Science Foundation, Division of Science Resources Statistics, National Patterns of R&D Resources (annual series).

FIGURE 1. U.S. R&D expenditures, by source of funds: 1953–2006

Percent



NOTE: Data for 2005 and 2006 are projections.

SOURCE: National Science Foundation, Division of Science Resources Statistics, National Patterns of R&D Resources (annual series).

Survey of Federal Funds for R&D) are converted to a calendar year basis for the purpose of producing national R&D estimates. Preliminary estimates for 2005 and 2006 were derived for each data series using the following information or techniques:

- Federal intramural R&D, R&D performed by FFRDCs, and federally funded R&D performed by industry and nonprofit institutions were estimated using preliminary data reported by federal agencies on the FY 2004 Survey of Federal Funds for R&D, data from the federal R&D budget, and forecast economic growth rates.
- Industrial R&D funded by nonfederal sources was estimated using preliminary data reported by companies on the 2005 Survey of Industrial R&D.
- University and college R&D was estimated using time-series forecasting techniques (log damped trend exponential smoothing models).
- Nonprofit R&D funded by nonfederal sources was estimated using models based on the R&D trends of other sectors of the economy and historical data from the Survey of R&D Funding & Performance by Nonprofit Organizations.

References

National Research Council. 2005. *Measuring Research and Development Expenditures in the U.S. Economy*. Panel on Research and Development Statistics at the National Science Foundation, Committee on National Statistics, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.

National Science Foundation, Division of Science Resources Statistics. 2005. *National Patterns of R&D Resources: 2003*. NSF 05-308. Brandon Shackelford, project officer. Arlington, VA.

The full set of detailed statistical tables from this survey will be available in the report, *National Patterns of Research and Development Resources: 2006*, at <http://www.nsf.gov/statistics/natlpatterns/>. For further information contact

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