INFOBRIEF SRS
Science Resources Statistics

National Science Foundation
Directorate for Social, Behavioral, and Economic Sciences

NSF 07-336
September 2007

UNIVERSITIES REPORT STALLED GROWTH IN FEDERAL R&D FUNDING IN FY 2006

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Federal funding for research and development in academic science and engineering (S&E) fields failed to outpace inflation in FY 2006, according to university-reported data collected by the National Science Foundation (NSF) Survey of Research and Development Expenditures at Universities and Colleges. Federally funded academic R&D expenditures rose 2.9% in FY 2006 to $30.0 billion. When adjusted for inflation, this represents a 0.1% decline from FY 2005 (figure 1).[1] The federal government remains the largest source of academic R&D funding, on average accounting for over 60% of total R&D expenditures since FY 1972. In constant 2000 dollars federal funding for academic R&D has increased an average of 5.5% each year since the last inflation-adjusted decline in federally funded expenditures, in FY 1982.

Overall, universities and colleges reported S&E R&D expenditures of $47.8 billion in FY 2006, 4.3% more than in the previous year ($45.8 billion) (table 1). When adjusted for inflation, academic R&D rose by 1.2% in FY 2006.

Other Sources of R&D Funding

R&D expenditures financed by state and local government funding also failed to outpace inflation and grew by only 2.5% in FY 2006, to $3.0 billion.[2] Industry funding continued to rise for the second year in a row after a 3-year decline between FY 2002 and FY 2004, growing 5.8% to $2.4 billion in FY 2006. The most significant gain occurred in funding originating from institutions, which increased 9.7% in FY 2006 to $9.1 billion. Funding from all other sources combined (nonprofit organizations and other nongovernmental entities) increased 4.2% to $3.2 billion.

Funding by Federal Agency

According to the surveyed institutions, the Department of Health and Human Services (HHS), including its National Institutes of Health, continues to provide the majority of the federal government's funding to universities and colleges. In FY 2006 HHS contributed 57% of the total federal funding ($17.1 billion), primarily in support of the medical and biological sciences (table 2). NSF provided the second largest amount of federal funding ($3.6 billion) and was the largest contributor for R&D in the computer, environmental, mathematical, and physical sciences.

Top Academic Research Performers

Of the 650 institutions surveyed, the top 20 in terms of total R&D expenditures accounted for 30% of total academic R&D spending (table 3). The top 100 research performers accounted for 80% of all R&D dollars in FY 2006. These proportions have varied little during the past two decades.[3]

Columbia University in the City of New York, a newcomer to the top 20 in FY 2005, moved to 22nd in FY 2006. Replacing it was the University of Arizona,

[1] Preliminary NSF estimates of federal R&D funding to universities generated for the annual publication *National Patterns of R&D Resources* did not reflect such a major slowing in support.

[2] Schools report general-purpose funds received from state and local governments as institutional support.

[3] See *Science and Engineering Indicators 2006* figure 5-12 (http://www.nsf.gov/statistics/seind06/c5/fig05-12.htm).

Information and data from the Division of Science Resources Statistics are available on the web at http://www.nsf.gov/statistics/.
To request a printed copy of this report go to http://www.nsf.gov/publications/orderpub.jsp or call (703) 292-PUBS (7827).
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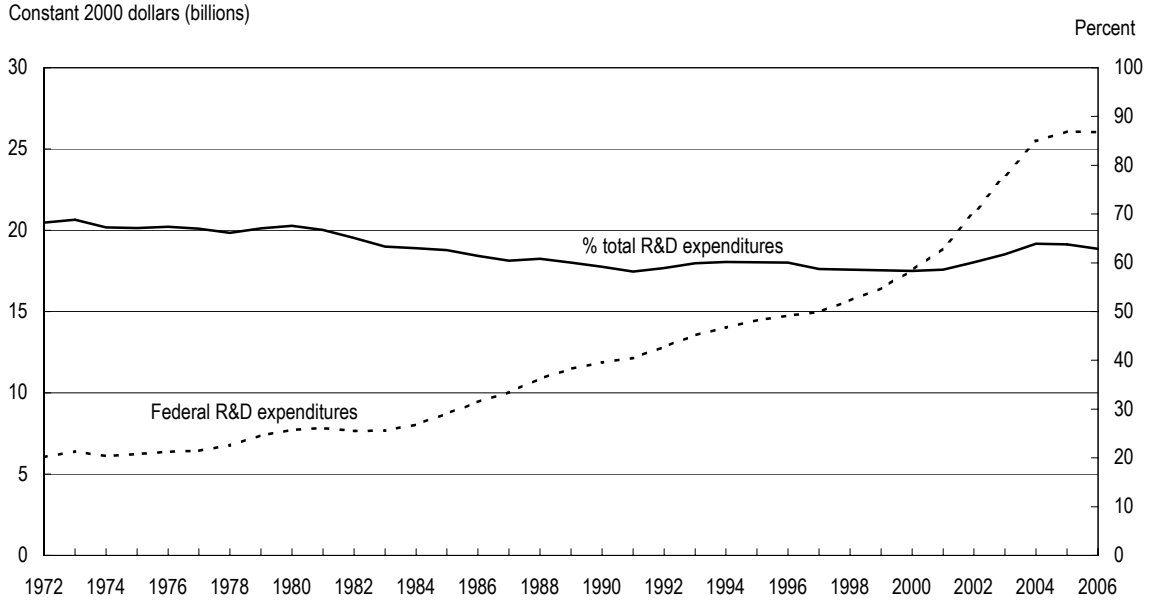
FIGURE 1. Federally funded science and engineering R&D expenditures at universities and colleges: FY 1972–2006



NOTE: Survey began annual data collection in FY 1972.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Survey of Research and Development Expenditures at Universities and Colleges, FY 2006.

TABLE 1. Science and engineering R&D expenditures at universities and colleges: FY 2001–06

(Millions of current dollars)

Source of funds and character of work	2001	2002	2003	2004	2005	2006
All R&D expenditures	32,811	36,394	40,087	43,242	45,777	47,760
Source of funds						
Federal government	19,233	21,864	24,759	27,631	29,191	30,033
State and local government	2,321	2,506	2,646	2,879	2,942	3,016
Industry	2,219	2,191	2,162	2,129	2,294	2,428
Institutional funds	6,614	7,133	7,663	7,752	8,258	9,062
All other sources	2,425	2,700	2,857	2,852	3,093	3,221
Character of work						
Basic research	24,387	27,312	29,997	31,947	34,348	36,044
Applied research and development	8,424	9,082	10,090	11,295	11,429	11,717

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

SOURCE: National Science Foundation, Division of Science Resources Statistics, Survey of Research and Development Expenditures at Universities and Colleges, FY 2006.

which climbed from 27th to 20th in FY 2006 with an increase of $6 million. The University of Florida has risen 10 spots over the past 2 years, from 27th in FY 2004 ($447 million) to 17th in FY 2006 ($565 million). Three institutions remained in the top 20 despite reporting lower total R&D expenditures in FY 2006: the University of Michigan, Stanford University, and the University of California, Berkeley.

Funding by field

Medical sciences ($15.8 billion) and biological sciences ($9.0 billion) once again accounted for more than one-half of all R&D at universities and colleges in FY 2006 (table 4). These two fields consistently have held the largest field shares of academia's R&D performance total throughout the survey's history. The following fields showed the largest percentage increases for FY 2006: sciences not elsewhere classified, a category reserved for difficult-to-classify multidisciplinary

TABLE 2. Federally financed R&D expenditures at universities and colleges, by science and engineering field and agency: FY 2006
(Millions of current dollars)

Science and engineering field	Federal R&D expenditures	DOD	DOE	HHS	NASA	NSF	USDA	Other[a]
All science and engineering	30,033	2,718	1,118	17,052	1,047	3,567	869	2,922
Computer sciences	1,015	295	36	47	25	427	2	115
Environmental sciences	1,763	158	91	64	247	566	59	552
Life sciences	18,268	446	153	15,204	103	587	718	1,008
Agricultural sciences	881	16	20	66	13	100	483	181
Biological sciences	6,240	153	66	5,033	44	426	179	306
Medical sciences	10,434	255	48	9,546	41	46	38	449
Life sciences, nec	713	22	19	559	5	16	18	73
Mathematical sciences	373	37	11	79	4	183	3	28
Physical sciences	2,705	324	393	490	326	805	8	241
Psychology	629	33	4	468	12	49	1	58
Social sciences	711	38	13	288	11	100	37	222
Sciences, nec	334	61	12	54	12	79	5	83
Engineering	4,236	1,325	406	357	306	771	37	615

DOD = Department of Defense; DOE = Department of Energy; HHS = Department of Health and Human Services; NASA = National Aeronautics and Space Administration; nec = not elsewhere classified; NSF = National Science Foundation; USDA = U.S. Department of Agriculture.

[a] Includes all other agencies reported.

NOTES: Not all fields are reported in this table. Agency detail may not add to total because some institutions were unable to provide complete agency data.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Research and Development Expenditures at Universities and Colleges, FY 2006.

projects (14.6%); physical sciences not elsewhere classified (14.6%); bioengineering/biomedical engineering (13.5%); mechanical engineering (12.0%); and atmospheric sciences (11.0%). The only field experiencing a significant decrease was aeronautical/astronautical engineering. Spending in this field declined 13.5% in FY 2006. Bioengineering/biomedical engineering R&D has been the fastest growing field over the past 5 years, more than doubling since FY 2001 ($213 million) to $476 million in FY 2006.

Passed-Through Funds

A total of $3.1 billion in R&D expenditures was passed through to subrecipients in FY 2006 for collaboration on R&D projects, and institutions reported receiving a total of $3.6 billion as subrecipients on joint projects (table 5). Academic R&D expenditures passed through to higher education subrecipients increased by $73 million from FY 2005 to FY 2006, whereas expenditures passed through to non-higher education subrecipients increased by $113 million. Almost 90% ($1.5 billion) of the funds passed through to higher education subrecipients and 83% ($0.9 billion) of the funds passed through to non-higher education subrecipients were from federal sources.

Universities also reported an increase of $100 million in R&D expenditures received as a subrecipient from higher education pass-through entities from FY 2005 to FY 2006, whereas R&D expenditures received as a subrecipient from non-higher education entities increased $212 million.[4] Nearly 92% ($1.5 billion) of the funds received from higher education pass-through entities and 87% ($1.5 billion) of the funds received from non-higher education entities originated from federal sources.

Non-S&E R&D Expenditures

Academic institutions spent a total of $1.9 billion on R&D in non-S&E fields in FY 2006 (table 6). (Only institutions reporting S&E R&D expenditures are surveyed for non-S&E R&D spending; see "Data Notes.") The largest amounts reported for individual non-S&E

[4] Amounts reported as passed through to higher education subrecipients do not equal amounts reported as received by those subrecipients due to differences in the item response rates for these two survey questions each year.

TABLE 3. Twenty institutions reporting the largest FY 2006 academic R&D expenditures in science and engineering fields: FY 2005–06

(Millions of current dollars)

Rank	Institution	2005	2006
	All R&D expenditures[a]	45,777	47,760
	Leading 20 institutions	13,685	14,194
1	Johns Hopkins U., The[b]	1,444	1,500
2	U. WI Madison	798	832
3	U. CA, Los Angeles	786	811
4	U. MI all campuses	809	800
5	U. CA, San Francisco	754	796
6	U. WA	708	778
7	U. CA, San Diego	721	755
8	Stanford U.	715	679
9	U. PA	655	676
10	Duke U.	631	657
11	OH State U. all campuses	609	652
12	Cornell U. all campuses	607	649
13	PA State U. all campuses	626	644
14	MA Institute of Technology	581	601
15	U. MN all campuses	549	595
16	U. CA, Davis	547	573
17	U. FL	531	565
18	Washington U. St. Louis	532	548
19	U. CA, Berkeley	555	546
20	U. AZ	530	536
	All other surveyed institutions	32,092	33,566

[a] Excludes R&D performed by university-administered federally funded research and development centers.

[b] The Johns Hopkins University includes the Applied Physics Laboratory, total R&D expenditures for which were $678 in FY 2005 and $709 million in FY 2006.

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

SOURCE: National Science Foundation, Division of Science Resources Statistics, Survey of Research and Development Expenditures at Universities and Colleges, FY 2006.

TABLE 4. R&D expenditures at universities and colleges, by science and engineering field: FY 2005–06

(Millions of current dollars)

Field	2005	2006	% change 2005–06
All R&D expenditures	45,777	47,760	4.3
Computer sciences	1,406	1,438	2.3
Environmental sciences	2,551	2,602	2.0
Atmospheric sciences	457	507	11.0
Earth sciences	919	897	-2.4
Oceanography	812	840	3.4
Environmental sciences, nec	363	358	-1.4
Life sciences	27,604	28,831	4.4
Agricultural sciences	2,657	2,794	5.2
Biological sciences	8,843	9,044	2.3
Medical sciences	14,877	15,808	6.3
Life sciences, nec	1,227	1,186	-3.3
Mathematical sciences	495	530	7.2
Physical sciences	3,704	3,823	3.2
Astronomy	454	470	3.4
Chemistry	1,365	1,424	4.3
Physics	1,604	1,608	0.2
Physical sciences, nec	280	321	14.6
Psychology	826	875	5.9
Social sciences	1,685	1,703	1.1
Economics	324	339	4.3
Political sciences	324	317	-2.2
Sociology	370	400	7.9
Social sciences, nec	667	649	-2.7
Sciences, nec	769	882	14.6
Engineering	6,738	7,076	5.0
Aeronautical/astronautical engineering	441	381	-13.5
Bioengineering/biomedical engineering	420	476	13.5
Chemical engineering	506	547	8.2
Civil engineering	788	858	8.9
Electrical engineering	1,581	1,614	2.1
Mechanical engineering	936	1,048	12.0
Metallurgical/materials engineering	612	644	5.2
Engineering, nec	1,455	1,508	3.6

nec = not elsewhere classified.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Survey of Research and Development Expenditures at Universities and Colleges, FY 2006.

fields were in education ($817 million), business and management ($248 million), and humanities ($214 million). Similar to the top institutions in S&E R&D spending, the top 20 performers of non-S&E R&D accounted for 35% of the total non-S&E R&D expenditures in FY 2006. The University of Wisconsin, Madison, ranked 2nd in S&E R&D expenditures, holds the number one spot for non-S&E R&D in FY 2006 at $73 million. Six other institutions within the top 20 are also in the top 20 for S&E R&D expenditures: the University of Michigan (7th), the University of Florida (8th), the University of Washington (10th), the University of California, Los Angeles (11th), the Massachusetts Institute of Technology (16th), and the University of Pennsylvania (19th).

Data Notes

The academic R&D expenditures data presented in this *InfoBrief* were obtained from 650 universities and colleges that granted degrees in the sciences or engineering and expended at least $150,000 in S&E R&D in the survey period. The survey collects the separately budgeted R&D expenditures within S&E fields report-

TABLE 5. Science and engineering R&D expenditures passed through to subrecipients and received as a subrecipient: FY 2005–06

(Millions of current dollars)

Pass-through and	All R&D expenditures		Federal R&D expenditures	
received as entities	2005	2006	2005	2006
Passed through to subrecipients	3,055	3,148	2,660	2,742
Higher education subrecipients	1,547	1,620	1,372	1,455
Other subrecipients	1,027	1,140	877	944
Received from as subrecipient	3,281	3,602	2,913	3,218
Higher education pass-through entities	1,485	1,585	1,350	1,452
Other pass-through entities	1,530	1,742	1,318	1,517

NOTE: Detail may not add to total because of rounding and because some institutions did not specify type of pass-through or subrecipient.

SOURCE: National Science Foundation, Division of Science Resources Statistics, Survey of Research and Development Expenditures at Universities and Colleges, FY 2006.

TABLE 6. Twenty institutions reporting the largest academic R&D expenditures in non-science and engineering fields: FY 2006

(Millions of current dollars)

Rank	Institution	All non-S&E fields	Education	Business and management	Humanities	Other
	All non-S&E R&D expenditures	1,880	817	248	214	601
	Leading 20 institutions	667	248	103	63	254
1	U. WI Madison	73	30	18	19	6
2	Harvard U.	54	9	0	1	44
3	Purdue U. all campuses	47	8	16	2	21
4	U. TX Austin	46	23	4	0	18
5	OR State U.	38	1	0	0	37
6	Brown U.	38	14	0	12	12
7	U. MI all campuses	37	18	8	2	9
8	U. FL	34	4	2	2	26
9	MI State U.	31	19	3	2	7
10	U. WA	31	10	0	4	16
11	U. CA, Los Angeles	30	16	7	5	2
12	Northwestern U.	30	4	20	1	5
13	U. Southern CA	26	5	1	5	15
14	FL State U.	24	19	1	1	3
15	IN U. all campuses	23	7	6	0	11
16	MA Institute of Technology	23	5	15	1	1
17	George Washington U.	22	19	0	1	1
18	FL International U.	21	8	1	3	9
19	U. PA	20	11	3	0	6
20	U. CA, Santa Cruz	20	18	0	2	1
	All other surveyed institutions	1,212	569	145	151	347

S&E = science and engineering.

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

SOURCE: National Science Foundation, Division of Science Resources Statistics, Survey of Research and Development Expenditures at Universities and Colleges, FY 2006.

ed by universities and colleges. This includes all funds expended for S&E activities specifically organized to produce research outcomes and commissioned by an agency either external to the institution or separately budgeted by an organizational unit within the institution. Non-S&E expenditures are reported separately in the survey and are not included in the overall expenditure totals. For a complete listing of the fields included under the S&E and non-S&E categories, refer to the FY 2006 survey questionnaire located at http://www.nsf.gov/statistics/question.cfm#12.

Universities have been asked to identify specific agency sources of federal funding since FY 2003. In FY 2006 virtually all (99.9%) of the $30.0 billion federal total was identified by agency source. However, the data for this item still represent slightly lower-bound estimates of agencies' actual support totals for FY 2006 because NSF did not attempt to allocate the undistributed amounts to individual agencies.

Data reported on non-S&E R&D expenditures are also lower-bound estimates for the national totals because NSF did not attempt to estimate for nonresponse on this item. Also, only institutions that conducted at least $150,000 of S&E R&D were surveyed. The activities of institutions that do not perform S&E R&D (but may conduct substantial amounts of non-S&E R&D) are not reflected here.

NSF makes available computer-generated institutional profiles for institutions of higher education with S&E departments that grant master's degrees or higher (http://www.nsf.gov/statistics/profiles/). The profiles contain data from this survey as well as from two other NSF academic S&E surveys: the Survey of Federal Science and Engineering Support to Universities, Colleges, and Nonprofit Institutions and the Survey of Graduate Students and Postdoctorates in Science and Engineering. Data from the three surveys are available on the Web at http://www.nsf.gov/statistics/ and through the NSF WebCASPAR database system, a Web tool for retrieval and analysis of institutional data on academic S&E resources (http://webcaspar.nsf.gov/).

The full set of detailed tables from this survey will be available in the report *Academic Research and Development Expenditures: Fiscal Year 2006* at http://www.nsf.gov/statistics/rdexpenditures/. Individual detailed tables from the 2006 survey may be available in advance of publication of the full report. For further information, contact

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NSF 07-336