InfoBrief
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Universities Report Continuing Decline in Federal R&D Funding in FY 2014

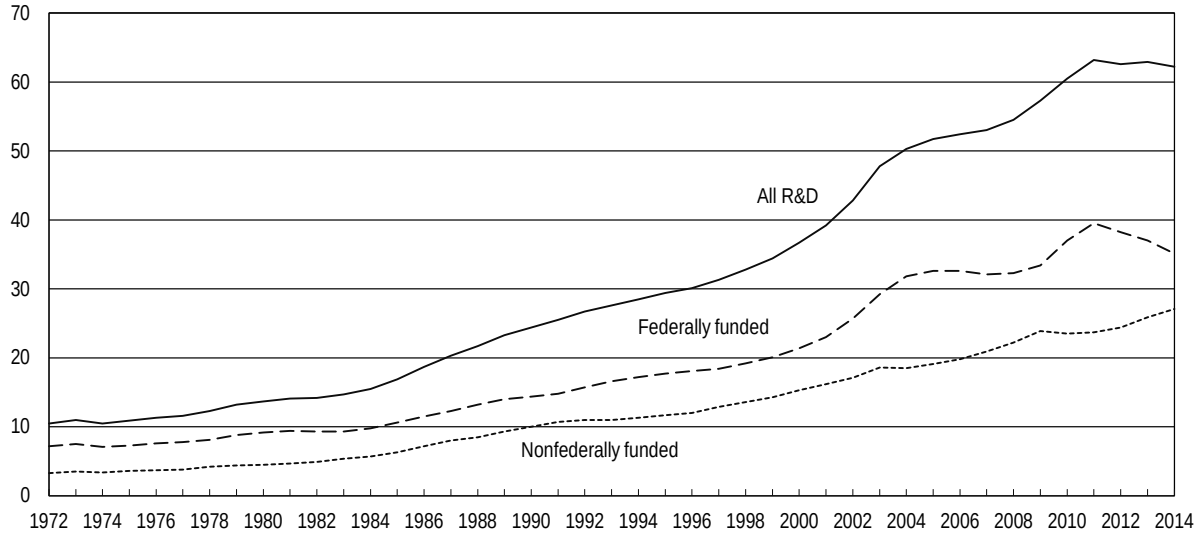
by Ronda Britt[1]

Federal funding of higher education research and development failed to outpace inflation for the third straight year, according to data from the National Science Foundation's (NSF's) Higher Education Research and Development (HERD) Survey. When adjusted for inflation, federal funding for higher education R&D declined by 5.1% between FY 2013 and FY 2014 and has fallen over 11% since its peak in FY 2011 (figure 1). This is the longest multiyear decline in federal funding for academic R&D since the beginning of the annually collected data series in FY 1972.

Overall, universities reported current dollar R&D expenditures of $67.3 billion in FY 2014, a 0.2% increase from the FY 2013 total of $67.1 billion (table 1). This total represents the reported totals of 895 degree-granting institutions that spent at least $150,000 in R&D in the previous fiscal year. The remainder of this InfoBrief will focus on the 634 institutions included in the full version of the HERD Survey (standard form) that reported at least $1 million in R&D during their previous fiscal year and that

FIGURE 1. Higher education R&D expenditures, by source of funds: FYs 1972–2014

Billions of constant 2009 dollars



NOTES: Data include all institutions reporting over $150,000 in R&D expenditures in the fiscal years shown. Prior to FY 2003, totals did not include R&D expenditures in non–science and engineering fields.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, Higher Education Research and Development Survey.

TABLE 1. Higher education R&D expenditures, by source of funds, R&D field, and survey population: FY 2014

(Thousands of current dollars)

Source of funds and R&D field	All institutions	Survey population	
		Short form	Standard form
All R&D expenditures	67,303,797	149,155	67,154,642
Federal government	37,993,216	70,902	37,922,314
State and local government	3,881,683	12,307	3,869,376
Institution funds	15,797,405	43,888	15,753,517
Business	3,731,104	6,133	3,724,971
Nonprofit organizations	3,993,382	13,431	3,979,951
All other sources	1,907,007	2,494	1,904,513
Science	52,874,554	105,805	52,768,749
Computer sciences	1,935,906	8,550	1,927,356
Environmental sciences	3,258,364	9,643	3,248,721
Life sciences	37,967,943	46,699	37,921,244
Mathematical sciences	661,320	3,742	657,578
Physical sciences	4,635,426	18,848	4,616,578
Psychology	1,147,675	6,920	1,140,755
Social sciences	2,216,600	6,347	2,210,253
Sciences nec	1,051,320	5,056	1,046,264
Engineering	10,986,029	12,239	10,973,790
Non–science and engineering	3,443,214	31,111	3,412,103

nec = not elsewhere classified.

NOTES: Institutions reporting $1 million or more during the previous fiscal year are included in the standard form population. Institutions are included in the short form population if they reported at least $150,000 but less than $1 million in total R&D expenditures during the previous fiscal year.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, Higher Education Research and Development Survey, FY 2014.

FY 2014 represents the final year that ARRA funds could be spent by universities. Since FY 2011, federally funded expenditures have dropped from 62.5% to 56.5% of total R&D expenditures, which also represents a record low in the history of this data series.

In contrast to the federal funding decline, each of the nonfederal funding sources showed increases from FY 2013 to FY 2014. The universities' own funds used for R&D (institution funds) rose 5.3% to $15.8 billion in FY 2014 and have been the fastest-growing source for the past 5 years. Institution funds now constitute 23.5% of total R&D, rising from 22.4% last year and from 19.5% in FY 2010. Institution funds comprise direct funding for R&D ($9.6 billion in FY 2014), cost sharing on externally sponsored projects ($1.4 billion), and indirect costs on external projects that are not reimbursed by the sponsor ($4.8 billion). Most of the increase since FY 2010 has been within the category of direct funding for R&D, which has increased by $3.4 billion, or 54.8% (figure 2).

accounted for 99.8% of the total R&D expenditures reported in FY 2014. For more information, see "Data Sources, Limitations, and Availability."

R&D Expenditures, by Source of Funding

In current dollars, federally funded R&D at universities declined 3.9% to $37.9 billion in FY 2014. Excluding funding spent in FYs 2013 and 2014 from the one-time American Recovery and Reinvestment Act of 2009 (ARRA), federally funded R&D dropped 1.6% in FY 2014 (table 2).

TABLE 2. Higher education R&D expenditures, by source of funds: FYs 2010–14

(Millions of current dollars)

Fiscal year	All R&D expenditures	Source of funds						
		Federal government (non-ARRA)	Federal government (ARRA)	State and local government	Institution funds	Business	Nonprofit organizations	All other sources
2010	61,254	34,791	2,684	3,852	11,940	3,198	3,740	1,048
2011	65,276	36,594	4,173	3,829	12,610	3,179	3,854	1,037
2012	65,729	37,704	2,436	3,695	13,633	3,271	4,023	968
2013	67,015	37,976	1,469	3,653	14,985	3,506	3,889	1,537
2014	67,155	37,382	541	3,869	15,754	3,725	3,980	1,905

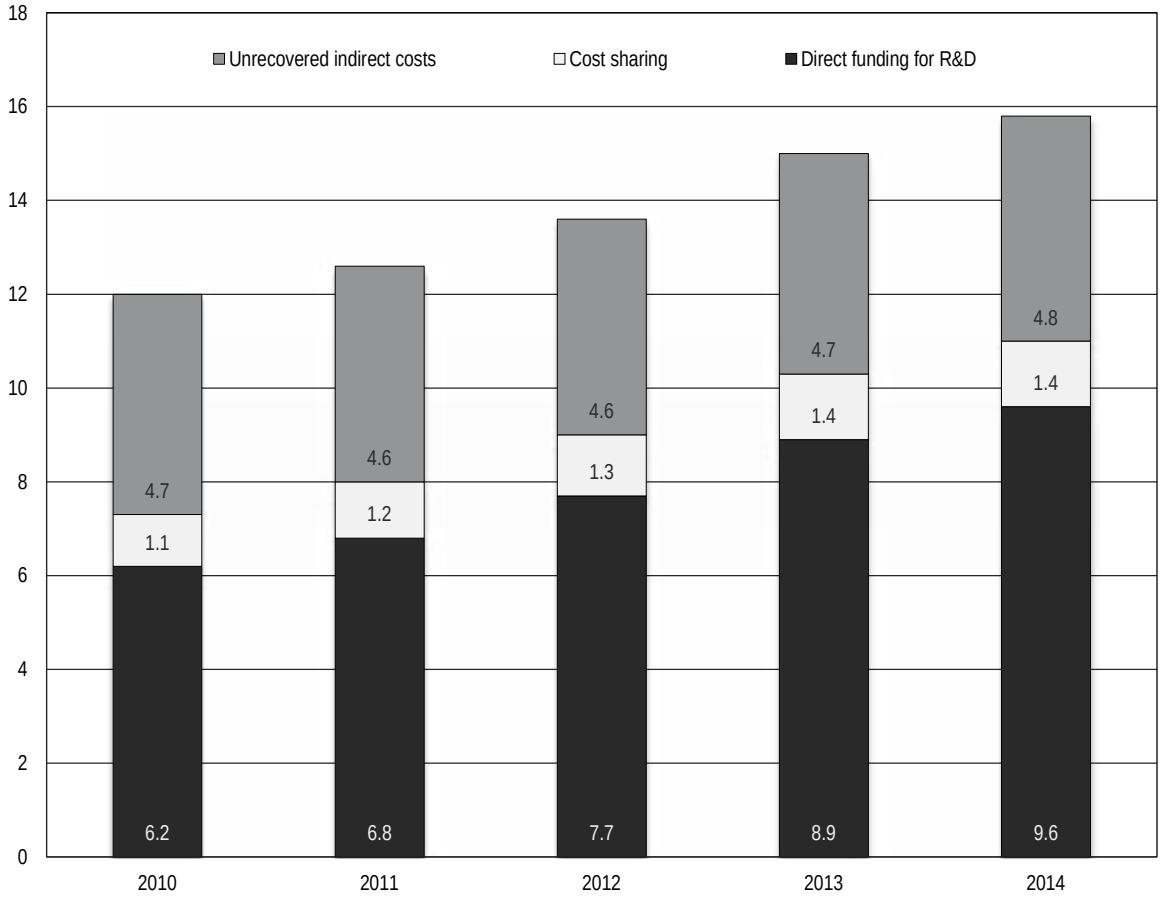
ARRA = American Recovery and Reinvestment Act of 2009.

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

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, Higher Education Research and Development Survey.

FIGURE 2. Institutionally funded R&D expenditures, by type: FYs 2010–14

Billions of current dollars



SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, Higher Education Research and Development Survey.

Expenditures funded by state and local governments increased 5.9% to $3.9 billion in FY 2014, and business-funded R&D rose 6.2% to $3.7 billion. Nonprofit-funded expenditures increased 2.3% to just under $4 billion in FY 2014. Finally, expenditures funded by all other sources—such as foreign governments, other universities, or gifts designated by the donors for research—increased $368 million to $1.9 billion in FY 2014.

R&D Expenditures, by Field

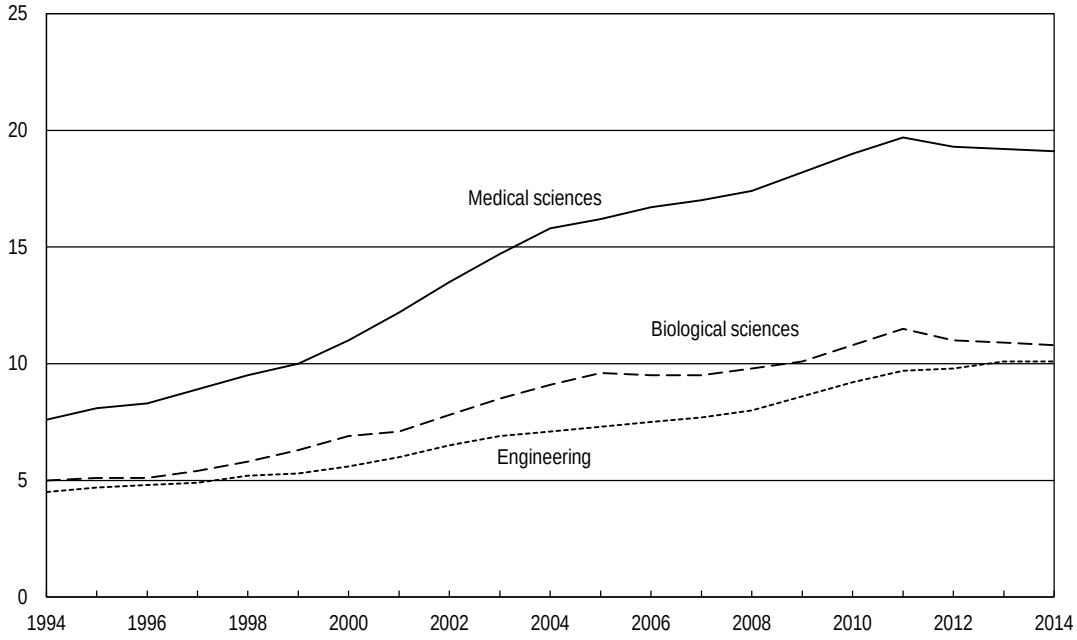
Higher education R&D is heavily concentrated in three fields, which together accounted for 64.5% of the total spent in FY 2014: medical sciences ($20.7 billion), biological sciences ($11.7 billion), and engineering ($11.0 billion). Looking back over the previous 20 years, each field experienced substantial growth between FY 1994 and FY 2011. Biological sciences and engineering each more than doubled in constant dollars, and medical sciences increased by more than 150% (figure 3). However, beginning in FY 2011, R&D spending in the two life science fields has failed to outpace inflation each year, falling back to pre-2010 levels of spending in constant dollar terms. Engineering R&D growth has continued at a slower pace but showed its first year of no inflation-adjusted growth in FY 2014.

Top University Research Performers

The top 30 institutions in R&D spending in FY 2014 nearly mirrored the list in FY 2013 but with a single change (table 3). Vanderbilt University entered the top 30 at number 28 with a 19.6% increase in reported spending in FY 2014. This increase was primarily due to Vanderbilt's first-time reporting of institution-funded R&D totaling over $130 million. The University of Illinois at Urbana-Champaign dropped to number 32 in FY 2014, primarily due to

FIGURE 3. Higher education R&D expenditures in the three largest fields: FYs 1994–2014

Billions of constant 2009 dollars



SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, Higher Education Research and Development Survey.

a planned decrease in annual spending on the Blue Waters supercomputer project funded by NSF. Twelve of these 30 universities reported declines in their R&D spending between FY 2013 and FY 2014. Combined, the top 30 institutions accounted for 41.3% of the total spent on R&D within the higher education sector in FY 2014.

Data Sources, Limitations, and Availability

The fiscal year referred to throughout this report is the academic fiscal year. For most institutions, FY 2014 represents 1 July 2013 through 30 June 2014. The higher education R&D expenditures data were collected from a census of 895 universities and colleges that grant a bachelor's degree or higher and expended at least $150,000 in R&D in FY 2014. To reduce respondent burden, the HERD Survey was revised beginning in FY 2012 to request abbreviated data from institutions reporting less than $1 million in R&D expenditures during the previous fiscal year. Except for figure 1 and table 1, the totals shown in this InfoBrief do not include expenditures reported by 261 institutions that completed a short-form version of the survey in FY 2014. These institutions accounted for $149 million (0.2% of total) of higher education R&D expenditures in FY 2014.

The amounts reported include all funds expended for activities specifically organized to produce research outcomes and sponsored by an outside organization or separately accounted for using institution funds. R&D expenditures at university-administered federally funded research and development centers (FFRDCs) are collected in a separate survey, the FFRDC R&D Survey, and these data are available at http://www.nsf.gov/statistics/ffrdc/.

The full set of data tables from this survey is available at http://ncsesdata.nsf.gov/herd/2014/.

Note

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TABLE 3. Thirty institutions reporting the largest FY 2014 R&D expenditures in all fields: FYs 2012–14
(Millions of current dollars)

Rank	Institution	FY 2012	FY 2013	FY 2014	Percent change 2013–14
	All institutions	65,729	67,015	67,155	0.2
	Leading 30 institutions	26,422	27,442	27,749	1.1
1	Johns Hopkins U.[a]	2,106	2,169	2,242	3.4
2	U. Michigan, Ann Arbor	1,323	1,375	1,349	-1.9
3	U. Washington, Seattle	1,109	1,193	1,176	-1.4
4	U. Wisconsin, Madison	1,170	1,124	1,109	-1.3
5	U. California, San Francisco	1,033	1,043	1,084	3.9
6	U. California, San Diego	1,074	1,076	1,067	-0.8
7	Duke U.	1,010	993	1,037	4.4
8	U. North Carolina, Chapel Hill	885	973	990	1.7
9	Stanford U.	903	945	959	1.5
10	U. California, Los Angeles	1,003	967	948	-2.0
11	Harvard U.	799	1,013	934	-7.8
12	Massachusetts Institute of Technology	824	901	908	0.8
13	Columbia U. in the City of New York	889	889	891	0.2
14	Cornell U.	802	845	883	4.5
15	U. Minnesota, Twin Cities	826	858	877	2.2
16	U. Pittsburgh, Pittsburgh	867	873	857	-1.8
17	Texas A&M U., College Station and Health Science Center	693	820	854	4.1
18	U. Pennsylvania	847	828	828	0.0
19	Ohio State U.	767	793	815	2.8
20	Pennsylvania State U., University Park and Hershey Medical Center	798	838	801	-4.4
21	U. Texas M. D. Anderson Cancer Center	686	718	795	10.7
22	Yale U.	657	789	773	-2.0
23	U. California, Berkeley	730	727	744	2.3
24	Georgia Institute of Technology	689	730	726	-0.5
25	U. California, Davis	713	726	712	-1.9
26	U. Florida	697	695	709	2.0
27	U. Southern California	624	646	687	6.3
28	Vanderbilt U.	560	572	684	19.6
29	Washington U., Saint Louis	706	685	665	-2.9
30	Northwestern U.	631	640	645	0.8

[a] Johns Hopkins University includes the Applied Physics Laboratory, with $1,254 million in total R&D expenditures in FY 2014.

NOTES: Because of rounding, detail may not add to total. Institutions ranked are geographically separate campuses headed by a campus-level president or chancellor.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, Higher Education Research and Development Survey.

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