SIDEBAR

Location of R&D Performance, by State

Distribution of R&D expenditures among the U.S. states

In 2015, the 10 states with the largest R&D expenditure levels accounted for about 65% of U.S. R&D expenditures that can be allocated to the states: California, Massachusetts, Texas, New York, Maryland, Michigan, Washington, Illinois, New Jersey, and Pennsylvania (Table 4-A; Appendix Table 4-10).* California alone accounted for 25% of the U.S. total, about four times as much as Massachusetts, the next highest state. The top 20 states accounted for 85% of the R&D total; the 20 lowest-ranking states accounted for around 4% (Appendix Table 4-11).

The states with the largest R&D expenditures are not necessarily those with the highest intensity of R&D. Among those with the greatest R&D-to-GDP ratios in 2015 were New Mexico, Massachusetts, Maryland, California, and Washington (Table 4-A). New Mexico is the location of several major government research facilities. Massachusetts benefits from both leading research universities and thriving high-technology industries. Maryland is the site of many government research facilities and growing research universities. California has relatively high R&D intensity and benefits from the presence of Silicon Valley, other high-technology industries, federal R&D, and leading research universities, but it is still fourth on this list. Washington State is home to government research facilities, leading research universities, and high-technology industries.

U.S. R&D performance, by sector and state

The proportion of R&D performed by each of the main R&D-performing sectors (business, higher education, federal intramural R&D facilities, and federally funded R&D centers [FFRDCs]) varies across the states. But the states that lead in total R&D also tend to be well represented in each of these sectors (Table 4-A).

In 2015, R&D performed by the business sector accounted for about 73% of the U.S. total R&D that could be allocated to specific states. Of the top 10 states in total R&D performance, 9 states are also in the top 10 in business R&D. Connecticut, 10th in business sector R&D, surpasses Maryland in the business R&D ranking.

Higher education-performed R&D accounts for 15% of the allocable U.S. total. The top 10 states for higher education R&D performance include 7 that are also top 10 in total R&D performance. But Connecticut, New Jersey, and Washington fall out and are replaced by Florida, Maryland, and North Carolina.

Federal R&D performance (including both intramural R&D facilities and FFRDCs)—about 10% of the U.S. total—is more concentrated geographically than other sectors. Only five jurisdictions—Maryland, California, New Mexico, Virginia, and the District of Columbia—account for 63% of all federal R&D performance.† This figure rises to 80% when the other 5 of the top 10 state locations for federal R&D performance—Massachusetts, Alabama, Tennessee, Washington, and Illinois—are included.

Federal R&D accounts for the bulk of total R&D in several states, including New Mexico (85%), which is home to the nation's two largest FFRDCs (Los Alamos and Sandia National Laboratories), and Tennessee (35%), which is home to Oak Ridge National Laboratory. The high figures for Maryland (55%), the District of Columbia (67%), and Virginia (41%) reflect the concentration of federal facilities and federal R&D administrative offices in the national capital area.

TABLE 4-A

Top 10 states in U.S. R&D performance, by sector and intensity: 2015

(Millions of current dollars, ranking, and R&D-to-GDP ratio)

Rank	All R&D[a]		Sector ranking			R&D intensity (R&D-to-GDP ratio)		
	State	Amount (current $millions)	Business	Higher education	Federal intramural and FFRDCs[b]	State	R&D/ GDP (%)	GDP (current $billions)
1	California	125,056	California	California	Maryland	New Mexico	6.52	93.2
2	Massachusetts	28,665	Massachusetts	New York	California	Massachusetts	5.87	488.1
3	Texas	23,668	Michigan	Texas	New Mexico	Maryland	5.57	366.2
4	New York	22,401	Texas	Maryland	Virginia	California	5.02	2,491.6
5	Maryland	20,385	Washington	Massachusetts	District of Columbia	Washington	4.49	446.4
6	Michigan	19,891	New York	Pennsylvania	Massachusetts	Michigan	4.23	470.6
7	Washington	20,038	New Jersey	North Carolina	Alabama	Delaware	4.19	68.9
8	Illinois	16,502	Illinois	Illinois	Tennessee	Connecticut	3.87	256.3
9	New Jersey	15,865	Pennsylvania	Florida	Illinois	Idaho	3.34	72.6
10	Pennsylvania	14,839	Connecticut	Michigan	Washington	Oregon	3.38	215.3

FFRDC = federally funded research and development center; GDP = gross domestic product.

[a] Includes in-state total R&D performance of the business sector, universities and colleges, federal agencies, FFRDCs, and federally financed nonprofit R&D.

[b] Includes costs associated with administration of intramural and extramural programs by federal personnel and actual intramural R&D performance.

Note(s)

Small differences in parameters for state rankings may not be significant. Rankings do not account for the margin of error of the estimates from sample surveys.

Source(s)

National Science Foundation, National Center for Science and Engineering Statistics, National Patterns of R&D Resources (annual series). State GDP data are from the U.S. Bureau of Economic Analysis. See Appendix Table 4-10.

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* The latest data available on the distribution of U.S. R&D performance by state are for 2015 (Appendix Table 4-10). Total U.S. R&D expenditures that year are estimated at $495.1 billion. Of this total, $468.9 billion could be attributed to one of

the 50 states or the District of Columbia. This state-attributed total differs from the U.S. total for several reasons: Some business R&D expenditures cannot be allocated to any of the 50 states or the District of Columbia because respondents did not answer the question related to location, nonfederal sources of nonprofit R&D expenditures (about $11 billion in 2015) could not be allocated by state, state-level university R&D data have not been adjusted for double-counting of R&D passed from one academic institution to other performers, and state-level university and federal R&D performance data are not converted from fiscal to calendar years.

† Federal intramural R&D includes costs associated with the administration of intramural and extramural programs by federal personnel, as well as actual intramural R&D performance. This is a main reason for the large amount of federal intramural R&D in the District of Columbia.