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Over Half of U.S. Business R&D Performed in 10 Metropolitan Areas in 2015

by Brandon Shackelford and Ray Wolfe[1]

New estimates from the Business R&D and Innovation Survey (BRDIS) show that 10 metropolitan statistical areas (MSAs) accounted for 55% of the research and development performed by businesses in the United States in 2015 (tables 1 and 2).[2] This is the first year that such estimates represent the entire BRDIS survey population. In prior years, a subset of BRDIS responses were used to produce lower-bound estimates for R&D in metropolitan areas and close to half of the business R&D total was not allocated to a specific location (Shackelford and Wolfe 2016). The National Center for Science and Engineering Statistics within the National Science Foundation and the U.S. Census Bureau developed and cosponsor BRDIS.

Business R&D by Metropolitan Area and State

Companies performed $356 billion of R&D in the United States in 2015, of which $345 billion could be attributed to a specific location within the 50 states or the District of Columbia. The largest MSA in terms of business R&D performance is San Jose-Sunnyvale-Santa Clara, CA ($49 billion), an area commonly referred to as Silicon Valley (table 1). This MSA together with its neighbor, San Francisco-Oakland-Hayward, the second-largest MSA, accounted for over one-fifth of all business R&D in the United States in 2015. Including these two locations, 4 of the 10 largest MSAs in terms of business R&D performance are in California. These four MSAs accounted for 92% of California's estimated $108 billion in business R&D performance. Most of the other states with large amounts of business R&D have only one major metropolitan area with a concentration of business R&D. Texas is an exception with three MSAs (Houston-The Woodlands-Sugar Land, Dallas-Fort Worth-Arlington, and Austin-Round Rock) estimated to each have more than $4 billion of business R&D performance in 2015.

The $345 billion of total U.S. business R&D attributed to a specific location within the 50 states or the District of Columbia includes $288 billion paid for by the performing companies themselves (R&D expense) and $57 billion paid for by others, such as the federal government or other customers or business partners. Although overall 17% of business R&D in the United States is paid for by sources other than the performing companies, these sources of funding represent a relatively larger share in metropolitan areas with large amounts of federally funded R&D, such as St. Louis, MO-IL and Washington-Arlington-Alexandria, DC-VA-MD-WV, or in metropolitan areas with concentrations of contract research organizations, such as Raleigh, NC.

The 100 metropolitan and micropolitan statistical areas—collectively referred to as core-based statistical areas (CBSAs)—listed in tables 1 and 2 account for 93% of the distributed total U.S. business R&D.[3] Companies performed an estimated $21 billion of R&D in the remaining 833 CBSAs in 2015. An additional $3 billion of business R&D is estimated for all other domestic U.S. locations outside of a CBSA. These estimates are modeled using BRDIS data reported by companies on the address of their largest R&D locations and administrative data from the Census Business Register on the payroll for each business establishment in the United States.

Five states—California, Massachusetts, Michigan, Texas, and Washington—accounted for more than half (52%) of all business R&D in the United States in 2015 (Wolfe 2017). The $108 billion of R&D performed by companies in California in 2015 was far more than the $21 billion performed in the second-largest state in terms of business R&D, Massachusetts. R&D paid for by organizations other than the performing

TABLE 1. Domestic R&D performed by companies, by core-based statistical areas with at least $1 billion and source of funds: 2015
(Millions of U.S. dollars)

CBSA	CBSA code	Total	Paid for by the company	Paid for by others
All locations	-	355,821	296,677	59,144
CBSAs with at least $1 billion of R&D	-	292,890	244,353	43,536
San Jose-Sunnyvale-Santa Clara, CA	41940	48,861	45,136	3,724 i
San Francisco-Oakland-Hayward, CA	41860	25,196	23,900	1,296 i
New York-Newark-Jersey City, NY-NJ-PA	35620	22,389 i	18,181 i	4,208 i
Boston-Cambridge-Newton, MA-NH	14460	20,282	16,681	3,602
Seattle-Tacoma-Bellevue, WA	42660	16,135	15,650	485 i
Los Angeles-Long Beach-Anaheim, CA	31080	15,067 i	10,844 i	4,224 i
Detroit-Warren-Dearborn, MI	19820	13,449	12,721	728
San Diego-Carlsbad, CA	41740	10,160	8,358	1,802 i
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	37980	9,757	7,902	1,855
Chicago-Naperville-Elgin, IL-IN-WI	16980	9,450	8,427 i	1,023
Minneapolis-St. Paul-Bloomington, MN-WI	33460	6,155	5,658	497
Portland-Vancouver-Hillsboro, OR-WA	38900	6,141 i	5,939 i	202 i
Houston-The Woodlands-Sugar Land, TX	26420	5,865	5,067	798
Dallas-Fort Worth-Arlington, TX	19100	5,520 i	4,316 i	1,205 i
St. Louis, MO-IL	41180	5,007 i	D	D
Washington-Arlington-Alexandria, DC-VA-MD-WV	47900	4,980 i	2,775 i	2,205 i
Norwich-New London, CT	35980	4,271	3,186	1,085
Austin-Round Rock, TX	12420	4,209 i	3,914 i	295 i
Indianapolis-Carmel-Anderson, IN	26900	4,073	3,459	613
Phoenix-Mesa-Scottsdale, AZ	38060	4,004 i	3,321 i	682 i
Atlanta-Sandy Springs-Roswell, GA	12060	3,901	3,166	735 i
Cincinnati, OH-KY-IN	17140	3,595	2,571	1,025
Sacramento--Roseville--Arden-Arcade, CA	40900	3,077 i	2,018 i	1,059 i
Baltimore-Columbia-Towson, MD	12580	2,971	1,506	1,465
Raleigh, NC	39580	2,840	1,574	1,265
Durham-Chapel Hill, NC	20500	2,744 i	2,120 i	625
Oxnard-Thousand Oaks-Ventura, CA	37100	2,274	1,972	302
Kansas City, MO-KS	28140	2,138	1,511	627
Hartford-West Hartford-East Hartford, CT	25540	1,982	1,272	710
Salt Lake City, UT	41620	1,862	1,702	160 i
Denver-Aurora-Lakewood, CO	19740	1,802 i	1,655 i	147 i
Columbus, OH	18140	1,792	743	1,049
Miami-Fort Lauderdale-West Palm Beach, FL	33100	1,716 i	1,486 i	231 i
Bridgeport-Stamford-Norwalk, CT	14860	1,683	1,461	223 i
Charlotte-Concord-Gastonia, NC-SC	16740	1,565 i	1,482 i	84 i
Milwaukee-Waukesha-West Allis, WI	33340	1,528	1,457	71 i
Madison, WI	31540	1,470 i	1,004	467 i
Pittsburgh, PA	38300	1,445 i	1,344 i	102 i
Manchester-Nashua, NH	31700	1,432	383	1,048
Peoria, IL	37900	1,422 i	1,411 i	11 i
Boise City, ID	14260	1,416	1,181	236
Trenton, NJ	45940	1,360	1,087	273
Albany-Schenectady-Troy, NY	10580	1,256 i	923 i	333
Cleveland-Elyria, OH	17460	1,254 i	1,066	188 i
Boulder, CO	14500	1,160	1,061	99 i
Rochester, NY	40380	1,149 i	1,043 i	106 i
Tucson, AZ	46060	1,085	719	366
CBSAs with less than $1 billion of R&D	-	49,872	42,077	12,797
Locations outside a CBSA	-	2,555 i	2,059 i	495 i
Undistributed[a]	-	10,504	8,188	2,316

D = data withheld to avoid disclosing operations of individual companies; i = > 50% of the estimate is a combination of imputation and reweighting to account for nonresponse.

CBSA = core-based statistical area, or metropolitan and micropolitan statistical areas.

[a] Includes data reported on Form BRDI-1 that were not allocated to a specific state, as well as data reported on Form BRDI-1(S) by multi-establishment companies. For single-establishment companies, data reported on Form BRDI-1(S) were allocated to the location of the address used to mail the form.

NOTES: Detail may not add to total because of rounding. Statistics are representative of companies located in the United States that performed R&D.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, and U.S. Census Bureau, Business R&D and Innovation Survey, 2015.

TABLE 2. Domestic R&D performed by companies, by core-based statistical areas with less than $1 billion and source of funds: 2015
(Millions of U.S. dollars)

CBSA	CBSA code	Total	Paid for by the company	Paid for by others
CBSAs with less than $1 billion of R&D	-	49,872	42,077	12,797
Tampa-St. Petersburg-Clearwater, FL	45300	992 i	606 i	386 i
Palm Bay-Melbourne-Titusville, FL	37340	965 i	256 i	709 i
Providence-Warwick, RI-MA	39300	958 i	860 i	98
Huntsville, AL	26620	934	360	574
Worcester, MA-CT	49340	902	823	80 i
Buffalo-Cheektowaga-Niagara Falls, NY	15380	886 i	446 i	440 i
Santa Rosa, CA	42220	797 i	776 i	21 i
Riverside-San Bernardino-Ontario, CA	40140	778 i	702 i	76 i
Cedar Rapids, IA	16300	773	D	D
Grand Rapids-Wyoming, MI	24340	770	579	191
Orlando-Kissimmee-Sanford, FL	36740	734 i	506 i	228 i
Bloomington, IL	14010	713	695	18 i
Lancaster, PA	29540	708 i	658 i	50 i
Ogden-Clearfield, UT	36260	680	313	367
Akron, OH	10420	626 i	500	126 i
Provo-Orem, UT	39340	621	569 i	51
Corning, NY	18500	607	607	* e
Des Moines-West Des Moines, IA	19780	577	563	14 i
Allentown-Bethlehem-Easton, PA-NJ	10900	567 i	540 i	28 e
Kalamazoo-Portage, MI	28020	559	303	256
Wichita, KS	48620	556 i	548 i	8 e
Dayton, OH	19380	531 i	298 i	233 i
San Antonio-New Braunfels, TX	41700	525 i	427 i	98 e
New Haven-Milford, CT	35300	517 i	446	71 i
Fort Collins, CO	22660	516 i	483 i	33 i
Richmond, VA	40060	516	493	23 i
Santa Maria-Santa Barbara, CA	42200	505 i	326 i	179 i
Syracuse, NY	45060	498 i	369 i	129 i
Jacksonville, FL	27260	485 i	377 i	107 i
Greensboro-High Point, NC	24660	477 i	413 i	64
Colorado Springs, CO	17820	447 i	376 i	72 i
Oshkosh-Neenah, WI	36780	438	437	2 e
Ann Arbor, MI	11460	437	269	168
Omaha-Council Bluffs, NE-IA	36540	423 i	405 i	18 i
Nashville-Davidson--Murfreesboro--Franklin, TN	34980	421 i	360 i	62 i
Columbus, IN	18020	419	365	55
Virginia Beach-Norfolk-Newport News, VA-NC	47260	404 i	209 i	195 i
Midland, MI	33220	394	393	* e
Albuquerque, NM	10740	385 i	186 i	199 i
Memphis, TN-MS-AR	32820	380	339	41 i
Rockford, IL	40420	378 i	D	D
Davenport-Moline-Rock Island, IA-IL	19340	374	369	5 i
Flagstaff, AZ	22380	364	358	6 e
Niles-Benton Harbor, MI	35660	360 i	355 i	5
Pueblo, CO	39380	350	12 i	338
Lexington-Fayette, KY	30460	339	306	33 e
Charleston-North Charleston, SC	16700	315 i	242 i	73
Santa Cruz-Watsonville, CA	42100	314 i	303 i	12 e
Harrisburg-Carlisle, PA	25420	314	301	13 e
Waterloo-Cedar Falls, IA	47940	308	306	2 i
Richmond-Berea, KY	40080	298	5 i	293
Dubuque, IA	20220	292	292	1 e
Savannah, GA	42340	291	284	7 i
All other CBSAs	-	21,152 i	D	D

* = amount < $500,000; D = data withheld to avoid disclosing operations of individual companies; e = estimated, more than 50% of the estimate is modeled—see technical notes; i = > 50% of the estimate is a combination of imputation and reweighting to account for nonresponse.

CBSA = core-based statistical area, or metropolitan and micropolitan statistical areas.

NOTES: Detail may not add to total because of rounding. Statistics are representative of companies located in the United States that performed R&D. For a given estimate in this table, if the conditions are satisfied for both the i and e flags, the e flag is assigned, because the imputation rate may be found in the corresponding table of imputation rates.

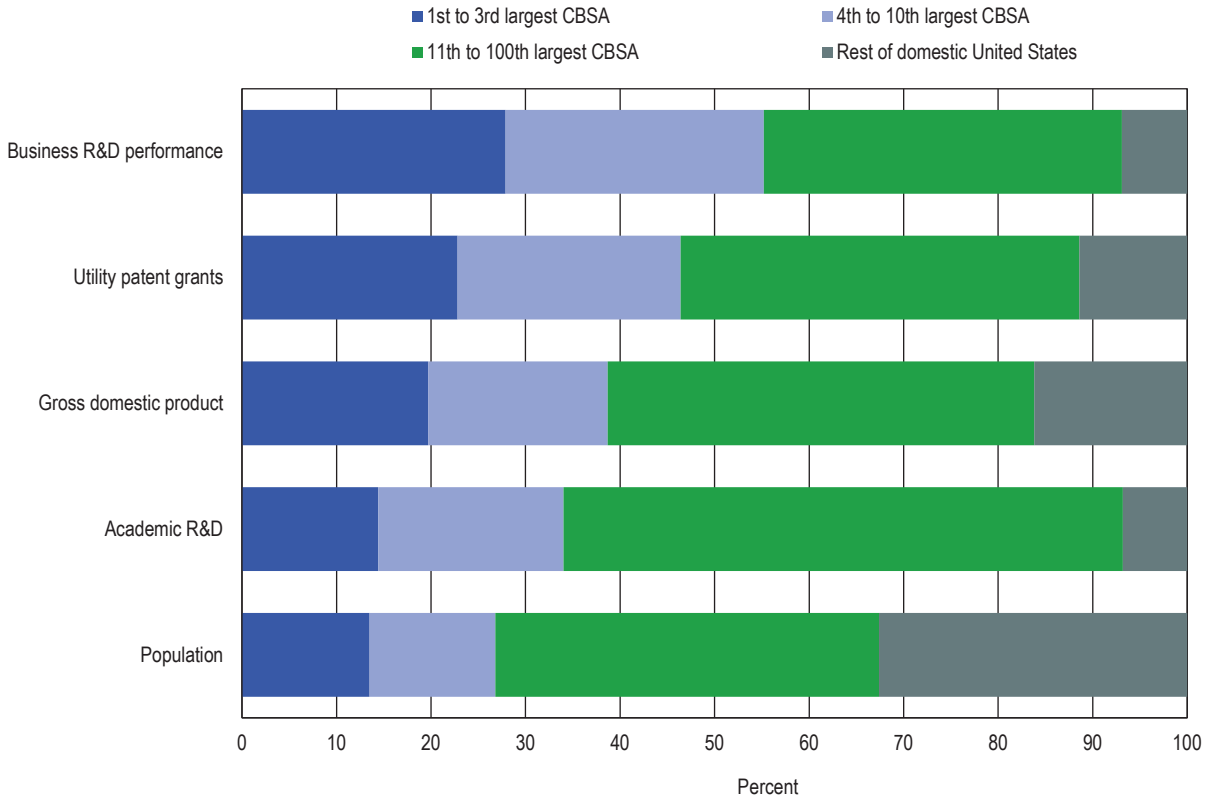
SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, and U.S. Census Bureau, Business R&D and Innovation Survey, 2015.

companies is less concentrated geographically than R&D paid for by the company. The five states with the largest amount of outside funding—California, Massachusetts, New York, Ohio, and Texas—accounted for 45% of the U.S. total.

Geographic Patterns of R&D and Other Economic Measures

R&D is a rare activity in businesses, and the aggregate amount of business R&D is dominated by a relatively small number of large corporations with R&D budgets exceeding $100 million. These large corporations tend to perform most of their R&D activities in a small number of locations, which contributes to a high degree of geographic concentration of business R&D (Shackelford and Wolfe 2016). Figure 1 shows the concentration of business R&D performance, along with other economic indicators, in the largest CBSAs (largest CBSAs can differ for the various economic indicators). The 3 largest and 10 largest CBSAs in terms of business R&D performance accounted for 28% and 55% of the domestic U.S. total in 2015, respectively. By comparison, the 3 largest and 10 largest CBSAs in terms of population accounted for 14% and 27% of the U.S. total population in 2015, respectively. R&D performed by U.S. universities and colleges, as reported by the Higher Education Research and Development Survey (HERD), is also less concentrated geographically than business R&D, with its 3 largest and

FIGURE 1. Geographic concentration of select U.S. economic statistics, by largest CBSAs for each statistic: 2015



CBSA = core-based statistical area, or metropolitan and micropolitan statistical areas.

NOTES: Domestic United States is defined as the 50 states and the District of Columbia. Regional patent counts are based on the residence locations of the first-named inventors at the time of grant, which may differ from the locations of their inventive activity (e.g., the locations of their employment).

SOURCES: National Science Foundation, National Center for Science and Engineering Statistics, and U.S. Census Bureau, Business R&D and Innovation Survey, 2015. National Science Foundation, National Center for Science and Engineering Statistics, Higher Education Research and Development Survey, FY 2015. U.S. Department of Commerce, Bureau of Economic Analysis, Regional Product Division, Gross Domestic Product by Metropolitan Area, Revised 2015. U.S. Patent and Trademark Office, Patent Technology Monitoring Team, Patenting in Technology Classes, Breakout by Origin, U.S. Metropolitan and Micropolitan Areas, https://www.uspto.gov/web/offices/ac/ido/oeip/taf/cls_cbsa/allcbsa_gd.htm. U.S. Census Bureau, Population Division, Annual Estimates of the Resident Population: April 1, 2010 to July 1, 2016.

10 largest CBSAs accounting for 14% and 34%, respectively, of the U.S. total.[4] Patenting activity—often used as a proxy measure for R&D output—is nearly as concentrated geographically as business R&D. The 3 largest and 10 largest CBSAs accounted for 23% and 46%, respectively, of utility patents (also known as patents for invention) granted in 2015 based on the residence of the first-named inventors.[5]

Comparing levels of geographic concentration between indicators tells nothing about how the indicators are related or correlated. One method of measuring the strength and direction of association between indicators is Spearman's rank-order correlation.[6] Table 3 shows Spearman's rank-order correlation between business R&D performance and a set of other indicators for the largest 10 and largest 100 CBSAs listed in tables 1 and 2. For the 100 largest CBSAs, the Spearman's rank-order correlation is positive and statistically significant between business R&D and each of the analyzed indicators. This means that as the business R&D performance of a CBSA increases, so does each of the other indicators (patent counts, academic R&D, population, and gross domestic product [GDP]). However, these relationships, other than that between business R&D and patent counts, become statistically *insignificant* when this analysis is restricted to the largest 10 CBSAs. This result indicates the unique character of these CBSAs, several of which are statistical outliers along different dimensions. For example, San Jose-Sunnyvale-Santa Clara, CA is by far the largest CBSA in terms of business R&D and patent counts, but it ranks 15th in terms of GDP, 16th in terms of academic R&D performance, and 35th in terms of population. For this CBSA, the ratio of business R&D to GDP—a common indicator of R&D intensity—is almost 10 times that of the United States as a whole (20.7% versus 2.2% in 2015). The relationship between patent counts and business R&D remains strong even for the 10 largest CBSAs—the top 3 CBSAs by business R&D performance share the same ranks for patent counts.

Figure 2 illustrates the relationship between R&D intensity and the share of the civilian employed population working in computer, engineering, and science (CES) occupations for the 10 largest CBSAs in terms of business R&D.[7] The R&D intensity of these CBSAs has a high (0.89) and statistically significant Spearman's rank-order correlation with the share of the CBSAs' civilian employed population working in CES occupations. The three most populous CBSAs in the nation—New York-Newark-Jersey City, NY-NJ-PA; Los Angeles-Long Beach-Anaheim, CA; and Chicago-Naperville-Elgin, IL-IN-WI—each had R&D intensities below that of the United States as a whole (2.2%). The share of persons working in CES occupations was close to the U.S. average of 5.5% in these CBSAs. Philadelphia-Camden-Wilmington, PA-NJ-DE-MD had an R&D intensity near that of the U.S. average, but that CBSA had a somewhat higher share of persons employed in CES occupations (6.3%). The remaining CBSAs in figure 2 had R&D intensities at least twice that of the United States as a whole, ranging from 4.8% in San Diego-Carlsbad, CA to 20.7% in San Jose-Sunnyvale-Santa Clara, CA. The share of workers in CES occupations in these CBSAs ranged from 7.1% in Detroit-Warren-Dearborn, MI to 17.7% in San Jose-Sunnyvale-Santa Clara, CA.

TABLE 3. Spearman's rank order correlation between business R&D performance and other statistics for 10 and 100 largest CBSAs: 2015

(Rank order correlation with business R&D performance)

Statistic	10 largest CBSAs	100 largest CBSAs
Utility patent grants	0.87 *	0.85 *
Gross domestic product	-0.01	0.76 *
Academic R&D	0.18	0.64 *
Population	-0.22	0.71 *

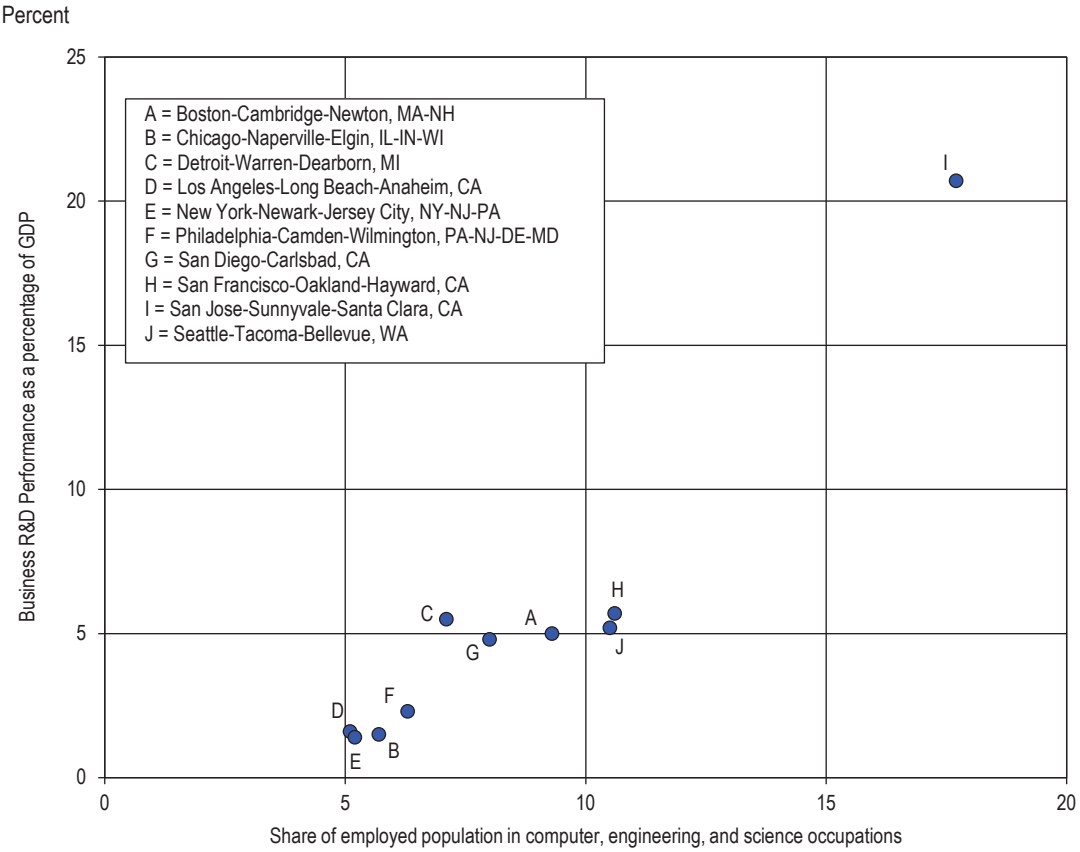
* = significant at 1% level.

CBSA = core-based statistical area, or metropolitan and micropolitan statistical areas.

NOTES: Domestic United States is defined as the 50 states and the District of Columbia. Regional patent counts are based on the residence locations of the first-named inventors at the time of grant, which may differ from the locations of their inventive activity (e.g., the locations of their employment).

SOURCES: National Science Foundation, National Center for Science and Engineering Statistics, and U.S. Census Bureau, Business R&D and Innovation Survey, 2015. National Science Foundation, National Center for Science and Engineering Statistics, Higher Education Research and Development Survey, FY 2015. U.S. Department of Commerce, Bureau of Economic Analysis, Regional Product Division, Gross Domestic Product by Metropolitan Area, Revised 2015. U.S. Patent and Trademark Office, Patent Technology Monitoring Team, Patenting in Technology Classes, Breakout by Origin, U.S. Metropolitan and Micropolitan Areas, https://www.uspto.gov/web/offices/ac/ido/oeip/taf/cls_cbsa/allcbsa_gd.htm. U.S. Census Bureau, Population Division, Annual Estimates of the Resident Population: April 1, 2010 to July 1, 2016.

FIGURE 2. Business R&D performance as a percentage of GDP and share of population employed in computer, engineering, and science occupations for the 10 largest CBSAs: 2015



CBSA = core-based statistical area, or metropolitan and micropolitan statistical areas; GDP = gross domestic product.

NOTES: Overall business R&D/GDP ratio for the United States is 2.2%. Overall U.S. share of the CBSA's civilian employed population 16 years and over in computer, engineering, and science occupations is 5.5%.

SOURCES: National Science Foundation, National Center for Science and Engineering Statistics, and U.S. Census Bureau, Business R&D and Innovation Survey, 2015. U.S. Department of Commerce, Bureau of Economic Analysis, Regional Product Division, Gross Domestic Product by Metropolitan Area, Revised 2015. U.S. Census Bureau, 2015 American Community Survey 1-Year Estimates.

Data Sources and Limitations

The sample for BRDIS was selected to represent all for-profit, nonfarm companies that are publicly or privately held and have five or more employees in the United States. Estimates produced from the survey and presented in this InfoBrief are restricted to companies that perform R&D, either domestically or abroad. Because the statistics from the survey are based on a sample, they are subject to both sampling and nonsampling errors (see the technical notes to the 2015 BRDIS data tables at https://ncses.nsf.gov/pubs/nsf18313).

In this InfoBrief, money amounts are expressed in current U.S. dollars and are not adjusted for inflation. A company is defined as a business organization located in the United States, either U.S. owned or a U.S. affiliate of a foreign parent, of one or more establishments under common ownership or control that performs or funds R&D.

For 2015, a total of 44,824 companies were sampled, representing 2,029,436 companies. The actual number of reporting units in the sample that remained within the scope of the survey between sample selection and tabulation was 40,806 for 2015. This lower count represents the number of reporting units that was determined to be within the scope of the survey after all data collected were processed. Reasons for the reduced count include mergers, acquisitions, and instances

where companies had fewer than five paid employees in the United States or had gone out of business in the interim. Of these in-scope reporting units, 79.6% were considered to have met the criteria for a complete response to the 2015 survey.

CBSA-level estimates of business R&D are modeled using BRDIS data reported by companies on the address of their largest R&D locations and administrative data from the Census Business Register on the payroll for each business establishment in the United States.

In 2015, the following could not be assigned to a specific state or CBSA location: 3% of U.S. business R&D paid for and performed by the same companies and 4% of U.S. business R&D paid for by sources other than the performing company. Therefore, CBSA R&D data provided here are lower-bound estimates. Rankings are based on point estimates and do not consider the variance of the survey sample.

The full set of data tables from this survey are available in the report *Business R&D and Innovation: 2015.* Individual data tables and tables with relative standard errors and imputation rates from the 2015 survey also are available. For further information, contact Raymond M. Wolfe.

Notes

1. Brandon Shackelford is the owner of Twin Ravens Consulting, Austin, TX. For more information on this report, contact Raymond Wolfe, Research and Development Statistics Program, National Center for Science and Engineering Statistics, National Science Foundation, 2415 Eisenhower Avenue, Suite W14200, Alexandria, VA 22314 (rwolfe@nsf.gov; 703-292-7789).

2. Some BRDIS R&D could not be attributed to a specific location, such as R&D reported on Form BRDI-1 that is not allocated to a specific state and R&D reported on Form BRDI-1(S) by multiestablishment companies. This R&D is performed in 1 of the 50 states or the District of Columbia, but the specific location is not estimated and is reported as "undistributed" in BRDIS data tables. This InfoBrief does not include this undistributed amount when calculating location shares of total U.S. R&D.

3. CBSAs consist of the county or counties or equivalent entities associated with at least one core (urbanized area or urban cluster) of at least 10,000 population, plus adjacent counties having a high degree of social and economic integration with the core as measured through commuting ties with the counties associated with the core. Metropolitan statistical areas are CBSAs with at least one urbanized area with a population of at least 50,000. Micropolitan statistical areas are CBSAs with at least one urbanized area with a population of at least 10,000 but less than 50,000 (https://www.census.gov/programs-surveys/metro-micro/about.html).

4. NCSES estimates the higher education sector performed $65 billion of R&D in the United States in FY 2015. CBSA-level estimates for this sector are based on the city and state of each campus reporting R&D to the HERD Survey. Other R&D-performing sectors for which CBSA-level estimates are currently not available include the federal government ($54 billion) and other nonprofit organizations ($20 billion) (https://nsf.gov/statistics/2018/nsf18306/).

5. Location data available on patent filings (residence of inventors) may not represent the location where inventive activity took place, as in cases where the inventors commute long distances to their places of work. BRDIS collects aggregate patent data from companies but does so with no location detail.

6. Spearman's rank correlation coefficient measures the monotonic, not linear, relationship between two variables. If the rankings of a set of CBSAs by one variable were identical to the rankings by another variable, then the Spearman rank correlation between the two variables would be 1. Were the ranking reversed for the two variables, their Spearman rank correlation would be -1.

7. Occupation shares from the U.S. Census Bureau 2015 American Community Survey 1-Year Estimates.

References

Shackelford B, Wolfe R. 2016. *Five States Account for Half of U.S. Business R&D in 2013; New Data for Metropolitan Areas Available*. InfoBrief NSF 16-317. Arlington, VA: National Science Foundation, National Center for Science and Engineering Statistics. Available at https://www.nsf.gov/statistics/2016/nsf16317/.

Wolfe R. 2017. *Business R&D Performed in the United States Reached $356 Billion in 2015.* InfoBrief NSF 17-320. Arlington, VA: National Science Foundation, National Center for Science and Engineering Statistics. Available at https://nsf.gov/statistics/2017/nsf17320/.