

TABLE 45. Worldwide, domestic, and foreign R&D paid for by the company and others and performed by the company, R&D employment, and R&D cost per R&D employee, by industry and company size: 2012

| Industry and company size | NAICS code | Company-performed R&D (US\$millions) | | | R&D employment (thousands) | | | Company-performed R&D per R&D employee (US\$thousands per employee) | | |
|---|---------------------|---|----------|---------|----------------------------|----------|---------|---|----------|---------|
| | | Worldwide | Domestic | Foreign | Worldwide | Domestic | Foreign | Worldwide | Domestic | Foreign |
| | | | | | | | | | | |
| All industries | 21-23, 31-33, 42-81 | 374,234 | 302,250 | 71,984 | 2,065 | 1,469 | 597 | 181.2 | 205.8 | 120.7 |
| Manufacturing industries | 31-33 | 261,281 | 208,415 | 52,866 | 1,261 | 886 | 375 | 207.2 | 235.2 | 141.0 |
| Food | 311 | 5,168 | 4,092 | 1,076 | 32 | 24 | 8 | 161.7 | 170.4 | 135.4 |
| Beverage and tobacco products | 312 | D | D | 532 | 6 | 3 | 3 | D | D | 191.1 |
| Textile, apparel, and leather products | 313-16 | 612 | 560 | 52 | 8 | 7 | 1 | 76.9 | 77.8 | 68.4 |
| Wood products | 321 | 463 i | 461 i | 2 | 8 i | 8 i | * | 60.1 | 60.3 | 33.2 |
| Paper | 322 | 858 | 752 | 106 | 8 | 7 | 1 | 107.8 | 108.5 | 103.2 |
| Printing and related support activities | 323 | 291 i | 256 i | 35 | 5 | 4 | * | 63.0 | 61.1 | 81.3 |
| Petroleum and coal products | 324 | D | 894 | D | 6 | 4 | 1 | D | 198.7 | D |
| Chemicals | 325 | 70,593 | 57,225 | 13,367 | 220 | 162 | 58 | 321.6 | 353.4 | 232.1 |
| Basic chemicals | 3251 | 3,641 | 2,916 | 725 | 20 | 15 | 5 | 179.2 | 195.6 | 134.0 |
| Resin, synthetic rubber, and artificial synthetic fibers and filaments | 3252 | D | 946 | D | 8 | 6 | 3 | D | 164.0 | D |
| Pesticide, fertilizer, and other agricultural chemical | 3253 | D | D | D | 8 | 6 | 2 | D | D | D |
| Pharmaceuticals and medicines | 3254 | 59,139 | 48,146 | 10,993 | 151 | 114 | 36 | 392.4 | 421.1 | 302.1 |
| Soap, cleaning compound, and toilet preparation | 3256 | 3,212 | 2,342 | 870 | 18 | 11 | 7 | 183.1 | 213.4 | 132.5 |
| Paint, coating, adhesive, and other chemicals | 3255, 3259 | D | D | 210 | 15 | 10 | 5 | D | D | 43.8 |
| Plastics and rubber products | 326 | 4,337 | 3,509 | 828 | 36 | 30 | 6 | 121.8 | 117.9 | 141.9 |
| Nonmetallic mineral products | 327 | 1,588 i | 1,327 i | 261 | 12 | 8 | 4 | 131.1 | 166.6 | 62.9 |
| Primary metals | 331 | 818 | 741 | 77 | 8 | 7 | * | 107.7 | 103.8 | 167.8 |
| Fabricated metal products | 332 | 1,956 i | 1,833 i | 123 | 33 | 31 | 2 | 59.4 | 59.2 | 63.3 |
| Machinery | 333 | 18,424 | 14,254 | 4,169 | 131 | 89 | 43 | 140.3 | 160.6 | 97.9 |
| Agricultural implement | 33311 | 2,142 | 1,546 | 596 | 13 | 8 | 5 | 169.8 | 194.5 | 127.7 |
| Semiconductor machinery | 333295 | 2,739 | 2,151 | 588 | 9 | 7 | 2 | 309.9 | 306.6 | 322.5 |
| Engine, turbine, and power transmission equipment | 3336 | D | 4,336 | D | 41 | 24 | 18 | D | 181.8 | D |
| Other machinery | other 333 | D | 6,220 | D | 68 | 50 | 18 | D | 124.5 | D |
| Computer and electronic products | 334 | 85,605 | 65,068 | 20,537 | 426 | 267 | 158 | 201.1 | 243.5 | 129.7 |
| Communications equipment | 3342 | 18,514 | 13,989 | 4,525 | 79 | 53 | 26 | 234.7 | 263.6 | 175.2 |
| Semiconductor and other electronic components | 3344 | 36,888 | 27,331 | 9,556 | 175 | 101 | 75 | 210.7 | 271.9 | 128.3 |
| Navigational, measuring, electromedical, and control instruments | 3345 | 18,623 | 15,949 | 2,674 | 98 | 76 | 22 | 189.2 | 209.4 | 120.2 |
| Electromedical, electrotherapeutic, and irradiation apparatus | 334510, 334517 | 4,982 | 4,396 | 586 | 26 | 22 | 4 | 188.9 | 196.3 | 147.3 |
| Search, detection, navigation, guidance, aeronautical, and nautical system and instrument | 334511 | 8,312 | 7,737 | 575 | 33 | 30 | 3 | 252.9 | 255.7 | 220.5 |
| Other measuring and controlling device | other 3345 | 5,328 | 3,816 | 1,512 | 39 | 24 | 16 | 136.0 | 162.2 | 96.5 |
| Other computer and electronic products | other 334 | 11,581 | 7,799 | 3,781 | 73 | 37 | 36 | 158.1 | 208.2 | 105.7 |
| Electrical equipment, appliances, and components | 335 | 4,150 | 3,087 | 1,063 | 42 | 25 | 17 | 98.4 | 121.6 | 63.4 |
| Transportation equipment | 336 | 50,378 | 42,305 | 8,073 | 202 | 147 | 55 | 248.9 | 286.8 | 147.0 |
| Automobiles, bodies, trailers, and parts | 3361-63 | D | D | D | 110 | 64 | 46 | D | D | D |
| Aerospace products and parts | 3364 | D | 24,817 i | D | 82 | 73 | 9 | D | 340.3 | D |
| Aircraft, aircraft engine, and aircraft parts | 336411-13 | D | 23,397 i | D | 76 | 68 i | 9 | D | 345.4 | D |

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|--|--|---|----------|---------|----------------------------|----------|---------|---|----------|---------|
| | | Worldwide | Domestic | Foreign | Worldwide | Domestic | Foreign | Worldwide | Domestic | Foreign |
| | | | | | | | | | | |
| Guided missile, space vehicle, and related parts | 336414-15, 336419 | 1,425 | 1,420 | 5 | 5 | 5 | * | 273.2 | 273.5 | 202.5 |
| Military armored vehicle, tank, and tank component | 336992 | D | D | 0 | * | * | 0 | D | D | 0.0 |
| Other transportation | other 336 | D | D | D | 11 | 10 | 1 | D | D | D |
| Furniture and related products | 337 | 372 | 348 | 23 | 5 | 5 | * | 78.9 | 76.2 | 172.9 |
| Miscellaneous manufacturing | 339 | D | D | D | 75 | 57 | 18 | D | D | D |
| Medical equipment and supplies | 3391 | 10,297 | 8,316 | 1,981 | 52 | 40 | 12 | 196.7 | 206.8 | 163.3 |
| Other miscellaneous manufacturing | 3399 | D | D | D | 23 | 17 | 6 | D | D | D |
| Nonmanufacturing industries | 21-23, 42-81 | 112,953 | 93,835 | 19,118 | 804 | 583 | 222 | 140.4 | 161.0 | 86.3 |
| Mining, extraction, and support activities | 21 | D | 2,815 | D | 13 | 9 | 3 | D | 296.7 | D |
| Utilities | 22 | 368 | 348 | 21 | 2 | 2 | * | 170.5 | 195.7 | 53.9 |
| Wholesale trade | 42 | 1,938 i | 1,825 i | 113 i | 26 i | 25 i | 2 i | 73.7 | 74.4 | 64.0 |
| Electronic shopping and electronic auctions | 454111-12 | D | 1,353 | D | 11 | 9 | 2 | D | 150.8 | D |
| Transportation and warehousing | 48-49 | 186 | 178 | 8 i | 4 | 3 | * | 51.5 | 50.9 | 69.7 |
| Information | 51 | 56,711 | 46,805 | 9,906 | 326 | 225 | 100 | 174.2 | 207.8 | 98.6 |
| Publishing | 511 | 36,858 | 28,987 | 7,871 | 233 | 148 | 85 | 158.4 | 195.7 | 93.0 |
| Newspaper, periodical, book, and directory publishers | 5111 | 244 i | 242 i | 2 i | 3 i | 2 i | * i | 96.0 | 97.0 | 46.1 |
| Software publishers | 5112 | 36,614 | 28,745 | 7,868 | 230 | 146 | 85 | 159.0 | 197.4 | 93.0 |
| Telecommunications | 517 | 2,882 i | 2,824 i | 59 | 14 i | 13 i | 1 | 199.8 | 212.2 | 52.4 |
| Data processing, hosting, and related services | 518 | 5,574 | 4,913 | 661 | 41 | 33 | 8 | 134.8 | 148.4 | 80.2 |
| Other information | other 51 | 11,397 | 10,082 | 1,316 | 37 | 31 | 6 | 307.3 | 328.7 | 205.0 |
| Finance and insurance | 52 | 4,147 | 3,519 | 628 | 31 | 26 | 5 | 135.3 | 135.9 | 132.3 |
| Real estate and rental and leasing | 53 | 400 | 363 | 38 | 2 | 1 | * | 214.8 | 246.4 | 95.8 |
| Lessors of nonfinancial intangible assets (except copyrighted works) | 533 | 379 | 342 | 37 | 1 | 1 | * | 285.2 | 363.7 | 95.9 |
| Other real estate and rental and leasing | other 53 | 21 i | 21 i | * i | 1 i | 1 i | * | 39.7 | 39.5 | 88.0 |
| Professional, scientific, and technical services | 54 | 41,149 | 34,309 | 6,840 | 353 | 248 | 105 i | 116.7 | 138.3 | 65.3 |
| Architectural, engineering, and related services | 5413 | 2,571 i | 2,513 i | 57 | 42 | 39 | 3 | 60.6 | 64.1 | 17.7 |
| Computer systems design and related services | 5415 | 13,649 i | 11,251 i | 2,399 i | 162 i | 101 | 61 i | 84.1 | 111.0 | 39.3 |
| Scientific research and development services | 5417 | 20,471 | 16,544 | 3,927 | 107 | 75 | 32 | 191.2 | 221.6 | 121.1 |
| Biotechnology research and development | 541711 | 8,364 | 7,387 | 977 | 32 | 25 | 7 | 265.5 | 299.5 | 143.0 |
| Physical, engineering, and life sciences (except biotechnology) research and development | 541712 | 11,506 | 8,559 | 2,948 | 72 | 46 | 26 | 159.7 | 184.2 | 115.2 |
| Social sciences and humanities research and development | 541720 | 600 | 598 | 2 | 4 | 4 | * | 169.6 | 169.3 | 306.0 |
| Other professional, scientific, and technical services | other 54 | 4,459 | 4,001 | 457 | 41 | 33 | 8 i | 109.0 | 122.0 | 56.5 |
| Health care services | 621-23 | 712 i | 675 i | 36 | 6 | 6 | * i | 116.0 | 112.5 | 272.6 |
| Other nonmanufacturing | 23, 44-45 (excluding 454111-12), 55-56, 624, 71-72, 81 | D | 1,646 | D | 31 | 28 | 3 | D | 59.1 | D |
| All companies (number of domestic employees) | - | 374,234 | 302,250 | 71,984 | 2,065 | 1,469 | 597 | 181.2 | 205.8 | 120.7 |
| Small companies ^a | | | | | | | | | | |
| 5-499 | - | 53,611 | 49,961 | 3,650 | 494 | 437 | 57 | 108.4 | 114.2 | 63.9 |

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|----------------------------|------------|---|----------|---------|----------------------------|----------|---------|---|----------|---------|
| | | Worldwide | Domestic | Foreign | Worldwide | Domestic | Foreign | Worldwide | Domestic | Foreign |
| 5-99 | - | 27,355 i | 26,217 i | 1,138 | 286 | 258 | 28 | 95.6 | 101.6 | 40.6 |
| 5-49 | - | 17,507 i | 17,035 i | 472 i | 201 | 181 | 19 | 87.2 | 94.0 | 24.2 |
| 5-9 | - | 3,025 i | 2,926 i | 99 i | 42 | 38 | 4 | 72.2 | 76.8 | 26.2 |
| 10-24 | - | 7,026 i | 6,915 i | 111 | 76 | 73 | 3 | 92.7 | 94.5 | 43.2 |
| 25-49 | - | 7,456 i | 7,195 i | 261 i | 83 | 70 | 13 | 89.8 | 102.9 | 20.0 |
| 50-99 | - | 9,848 | 9,182 i | 666 | 86 | 77 | 9 | 115.2 | 119.4 | 77.5 |
| 100-249 | - | 13,696 | 12,480 | 1,215 | 116 | 101 | 15 | 118.3 | 124.0 | 80.5 |
| 250-499 | - | 12,561 | 11,264 | 1,297 | 93 | 79 | 14 | 135.7 | 143.3 | 93.1 |
| Medium and large companies | | | | | | | | | | |
| 500-999 | - | 12,921 | 11,484 | 1,438 | 83 | 67 | 16 | 155.2 | 170.5 | 90.3 |
| 1,000-4,999 | - | 63,154 | 50,691 | 12,463 | 335 | 226 | 108 | 188.8 | 224.0 | 115.1 |
| 5,000-9,999 | - | 40,640 | 30,483 | 10,157 | 247 | 138 | 109 | 164.7 | 221.0 | 93.4 |
| 10,000-24,999 | - | 59,713 | 49,493 | 10,220 | 263 | 198 | 65 | 226.9 | 249.5 | 157.8 |
| 25,000 or more | - | 144,194 | 110,138 | 34,056 | 643 | 401 | 242 | 224.2 | 274.4 | 140.9 |

* = amount < \$500,000 or 500 employees; 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.

NAICS = 2007 North American Industry Classification System.

^a The upper bound is based on the U.S. Small Business Administration's definition of a small business; the Business R&D and Innovation Survey does not include companies with fewer than five domestic employees.

NOTES: Detail may not add to total because of rounding. Ratios were calculated using unrounded data. The industry classification is based on the dominant business code for domestic R&D performance, where available. For companies that did not report business codes, the classification used for sampling was assigned. Statistics are representative of companies located in the United States that performed or funded R&D.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, and U.S. Census Bureau, Business R&D and Innovation Survey, 2012.