



Main Science and Technology Indicators

Main Science and Technology Indicators, Volume 2019 Issue 1

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Foreword

This publication contains key data series selected from the OECD Main Science and Technology Indicators Database (MSTI) accessible at <https://oe.cd/msti>. This publication consists of 68 standard tables of data series regarding the resources devoted to research and experimental development (R&D) as well as some indicators of R&D output and the impact of scientific and technological activities. Also presented are the underlying economic series used to calculate these indicators. It is complemented by a description of the general methodology used as well as national specifications available at http://www.oecd.org/sti/inno/MSTI_documentation_e.pdf.

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Conventional signs and abbreviations

Signs and abbreviations

R&D terminology

| | |
|--------|---|
| BERD | Business enterprise Expenditure on R&D (intramural) |
| FTE | Full Time Equivalent (on R&D) |
| GBARD | Government Budget Allocations for R&D |
| GERD | Gross Domestic Expenditure on R&D (intramural) |
| GOVERD | Government Expenditure on R&D (intramural) |
| GUF | General University Funds |
| HERD | Higher Education Expenditure on R&D (intramural) |
| NSE | Natural Sciences and Engineering |
| PNP | Private Non Profit Institutions |
| R&D | Research and Experimental Development |
| SSH | Social Sciences and Humanities |

For further explanations of the above terms, please see the OECD Frascati Manual 2015, <http://oe.cd/frascati>, which includes in particular a glossary of key terms (www.oecd.org/sti/inno/Frascati-2015-Glossary.pdf)

Other

| | |
|------|--|
| GDP | Gross Domestic Product |
| ISIC | International Standard Industrial Classification |
| PCT | Patent Co-operation Treaty |
| PPP | Purchasing Power Parity |

Sources and methods

Detailed methodological information: http://www.oecd.org/sti/inno/MSTI_documentation_e.pdf.

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Standard footnotes

| | |
|---|--|
| b | Time series break. |
| c | Confidential statistical information. |
| d | Definition differs. |
| e | Estimated value. |
| k | Data included in another category. |
| l | Overestimated or based on overestimated data. |
| m | Underestimated or based on underestimated data. |
| p | Provisional value. |
| s | Unrevised breakdown not adding to the revised total. |
| v | The sum of the breakdown does not add to the total. |
| w | Includes data from another category. |

The latest data for European countries, as well as Iceland, Norway, the Russian Federation, Switzerland and Turkey, were collected by Eurostat. From 2017, Eurostat follows slightly different, but generally compatible, conventions with regard to footnotes:

- Countries only use flags 'b', 'c', 'd', 'e' and 'p'.
- Only one flag may be submitted per data item (cell).
- The flags follow a hierarchy: $p > b > d > e$. As an example, an estimated (e) and provisional (p) data will be annotated with a 'p'.
- Estimated (e), overestimated (l) and underestimated (m) data are all annotated with an 'e' flag.
- 'd', 'k', 's', 'v' and 'w' flags are grouped as 'd' (definition differs).

In this publication, flags for these countries are published as they were received by the OECD from Eurostat, except in the following cases:

- The single-flag rule is not applied when this would lead to suppress 'b' flags indicating breaks in series.
- 's' flags are not replaced with 'd'.

Contact details

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International Comparisons

Table 1. Gross domestic expenditure on R&D (GERD) at current prices and PPP

Million USD

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|--------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| Australia | .. | .. | 23 129.7 e | .. | 21 151.5 e | .. | .. |
| Austria | 6 837.0 e | 11 415.1 e | 12 007.9 | 12 863.3 e | 13 147.0 | 14 104.1 e | 14 966.4 p |
| Belgium | 6 225.2 | 10 715.0 | 11 358.6 | 11 935.9 | 12 651.2 | 13 674.4 | 15 189.0 |
| Canada | 23 090.0 | 26 019.5 b | 26 504.1 | 27 793.5 b | 27 005.5 | 27 586.7 | 27 162.8 p |
| Chile | .. | 1 355.5 | 1 532.6 | 1 517.6 b | 1 552.2 | 1 539.0 b | 1 590.8 p |
| Czech Republic | 2 619.5 | 5 441.6 | 6 089.3 | 6 699.4 | 6 854.8 | 6 254.5 | 7 213.2 |
| Denmark | 4 429.5 | 7 468.8 | 7 793.6 | 7 877.7 | 8 518.0 | 9 013.3 | 9 545.1 p |
| Estonia | 206.7 | 730.6 | 624.1 | 544.2 | 563.5 | 506.9 | 567.8 |
| Finland | 5 588.7 | 7 520.0 | 7 382.8 | 7 178.2 | 6 689.7 | 6 590.8 | 7 038.5 |
| France | 39 530.1 | 55 097.7 | 58 353.3 | 60 585.6 b | 61 645.7 | 62 329.5 p | 64 672.1 e |
| Germany | 64 028.3 | 100 490.1 | 102 905.5 | 109 562.7 | 114 128.2 | 119 921.3 | 132 004.4 |
| Greece | 1 627.0 | 1 953.7 | 2 321.7 | 2 436.0 | 2 798.2 | 2 921.2 | 3 476.6 |
| Hungary | 1 586.8 | 2 895.0 | 3 361.4 | 3 408.4 | 3 534.5 | 3 173.4 | 3 801.4 |
| Iceland | 296.8 | .. | 243.3 b | 291.6 | 355.1 | 373.5 | 399.8 |
| Ireland | 2 006.5 | 3 321.6 e | 3 467.8 e | 3 622.8 e | 3 840.1 e | 3 920.0 e | .. |
| Israel ¹ | 6 966.3 d | 10 433.4 d | 11 273.3 d | 11 754.7 d | 12 671.3 d | 14 083.9 d e | 15 391.5 d e |
| Italy | 18 241.2 | 27 419.6 | 28 459.4 | 29 448.3 e | 30 002.9 | 32 460.2 b | 33 542.9 p |
| Japan | 128 694.6 | 152 325.6 | 164 655.8 b | 169 554.1 | 168 546.1 | 164 758.2 | 170 900.7 |
| Korea | 30 618.3 d | 64 862.5 | 68 234.1 | 73 099.8 | 76 932.4 | 80 465.6 | 90 979.6 |
| Latvia | 164.2 | 287.2 | 279.4 | 327.2 | 306.0 | 223.3 | 281.0 |
| Lithuania | 361 | 659 | 750 | 851 | 874 | 733 | 845 |
| Luxembourg | 498.8 | 619.1 b | 676.6 | 712.3 | 751.7 | 792.2 | 806.3 p |
| Mexico | 5 346.2 | 9 799.0 | 10 292.5 | 11 519.2 e p | 11 670.4 e p | 11 259.9 e p | .. |
| Netherlands | 10 892.4 | 15 177.7 b | 15 969.2 | 16 404.4 | 16 913.4 | 17 458.7 | 18 563.6 p |
| New Zealand | 1 189.3 | .. | 1 856.9 | .. | 2 125.4 | .. | 2 647.5 |
| Norway | 3 275.8 | 5 316.3 | 5 620.4 | 5 805.6 | 6 063.5 | 6 180.1 | 6 869.3 |
| Poland | 2 984.9 | 7 990.8 | 8 185.8 | 9 149.3 | 10 234.8 | 10 153.1 | 11 757.8 p |
| Portugal | 1 808.2 | 3 832.4 | 3 869.8 | 3 856.2 | 3 820.8 | 4 105.3 | 4 454.1 |
| Slovak Republic | 441.0 | 1 159.9 | 1 243.8 | 1 379.5 | 1 886.9 | 1 323.8 | 1 554.2 |
| Slovenia | 676.5 | 1 529.9 | 1 583.7 | 1 505.7 | 1 433.4 | 1 378.7 | 1 391.9 p |
| Spain | 13 251.1 | 19 269.2 | 19 282.4 | 19 356.2 | 19 820.6 | 20 228.6 | 21 932.0 |
| Sweden | 10 388.2 b | 13 970.4 e | 14 496.4 e | 14 191.1 e | 15 493.2 v | 15 923.3 e | 17 561.7 v |
| Switzerland | .. | 14 740.0 | .. | .. | 17 854.9 | .. | 18 900.0 |
| Turkey | 4 595.6 | 12 807.9 | 13 834.8 | 15 933.0 | 17 739.0 | 19 718.2 | 21 729.5 |
| United Kingdom | 30 639.7 | 38 490.2 e | 41 532.1 | 43 811.1 e | 45 678.2 | 47 420.7 e | 49 345.3 p |
| United States | 328 128.0 d | 434 349.0 d | 454 821.0 d | 476 452.0 d | 495 098.0 d | 516 254.0 d p | 543 249.0 d e |
| EU28 (OECD estimates) | 226 913.5 e | 340 908.3 e | 355 277.5 e | 371 249.2 e | 385 992.2 e | 399 088.6 e | 430 121.0 e |
| OECD-Total | 778 674.1 e | 1 092 840.6 e | 1 149 710.7 e | 1 202 258.7 e | 1 240 352.1 e | 1 279 917.0 e | 1 360 044.3 e |
| Argentina | 2 277.9 | 5 265.7 p | 5 337.6 p | 5 042.8 p | 5 467.0 | 4 681.8 | 5 024.0 |
| China | 86 836.1 | 292 196.3 | 334 116.6 | 370 605.5 | 407 466.7 | 451 411.9 | 495 980.9 |
| Romania | 844.7 | 1 837.3 | 1 534.5 | 1 569.5 | 2 091.5 | 2 258.8 | 2 625.0 p |
| Russian Federation | 18 120.5 | 37 911.5 | 38 607.0 | 40 330.2 | 38 776.4 | 38 742.6 | 41 868.0 |
| Singapore | 5 077.3 | 8 052.5 | 8 587.5 | 9 842.1 | 10 681.5 | 10 579.0 | 10 479.7 |
| South Africa | 4 045.9 | 4 836.9 | 4 977.1 | 5 489.4 | 5 816.7 | 6 089.8 | .. |
| Chinese Taipei | 15 308.9 | 29 176.4 | 30 910.7 | 32 731.4 | 33 847.7 | 35 928.1 | 39 296.0 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 2. Gross domestic expenditure on R&D (GERD) as a percentage of GDP

Percentage

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Australia | .. | .. | 2.09 e | .. | 1.88 e | .. | .. |
| Austria | 2.37 e | 2.91 e | 2.95 | 3.08 e | 3.05 | 3.13 e | 3.16 p |
| Belgium | 1.78 | 2.27 | 2.33 | 2.39 | 2.46 | 2.56 | 2.70 |
| Canada | 1.97 | 1.77 b | 1.71 | 1.71 b | 1.69 | 1.69 | 1.59 p |
| Chile | .. | 0.36 | 0.39 | 0.38 b | 0.38 | 0.37 b | 0.36 p |
| Czech Republic | 1.17 | 1.78 | 1.90 | 1.97 | 1.93 | 1.68 | 1.79 |
| Denmark | 2.39 | 2.98 | 2.97 | 2.91 | 3.05 | 3.10 | 3.05 p |
| Estonia | 0.92 | 2.12 | 1.72 | 1.43 | 1.47 | 1.25 | 1.29 |
| Finland | 3.33 | 3.42 | 3.29 | 3.17 | 2.89 | 2.74 | 2.76 |
| France | 2.05 | 2.23 | 2.24 | 2.28 b | 2.27 | 2.22 p | 2.19 e |
| Germany | 2.43 | 2.87 | 2.82 | 2.87 | 2.91 | 2.92 | 3.04 |
| Greece | 0.58 | 0.70 | 0.81 | 0.83 | 0.96 | 0.99 | 1.13 |
| Hungary | 0.92 | 1.26 | 1.39 | 1.35 | 1.36 | 1.20 | 1.35 |
| Iceland | 2.69 | .. | 1.70 b | 1.95 | 2.20 | 2.13 | 2.10 |
| Ireland | 1.19 | 1.56 e | 1.56 e | 1.52 e | 1.18 e | 1.16 e | .. |
| Israel ¹ | 4.05 d | 4.16 d | 4.09 d | 4.18 d | 4.26 d | 4.39 d e | 4.54 d e |
| Italy | 1.05 | 1.27 | 1.31 | 1.34 e | 1.34 | 1.37 b | 1.35 p |
| Japan | 3.18 | 3.21 | 3.31 b | 3.40 | 3.28 | 3.16 | 3.21 |
| Korea | 2.63 d | 4.03 | 4.15 | 4.29 | 4.22 | 4.23 | 4.55 |
| Latvia | 0.53 | 0.66 | 0.61 | 0.69 | 0.63 | 0.44 | 0.51 |
| Lithuania | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Luxembourg | 1.57 | 1.27 b | 1.30 | 1.26 | 1.28 | 1.30 | 1.26 p |
| Mexico | 0.40 | 0.49 | 0.50 | 0.53 e p | 0.52 e p | 0.49 e p | .. |
| Netherlands | 1.77 | 1.92 b | 1.93 | 1.98 | 1.98 | 2.00 | 1.99 p |
| New Zealand | 1.12 | .. | 1.15 | .. | 1.23 | .. | 1.37 |
| Norway | 1.48 | 1.62 | 1.65 | 1.71 | 1.93 | 2.03 | 2.09 |
| Poland | 0.56 | 0.88 | 0.87 | 0.94 | 1.00 | 0.96 | 1.03 p |
| Portugal | 0.76 | 1.38 | 1.33 | 1.29 | 1.24 | 1.28 | 1.33 |
| Slovak Republic | 0.49 | 0.80 | 0.82 | 0.88 | 1.17 | 0.79 | 0.88 |
| Slovenia | 1.41 | 2.57 | 2.58 | 2.37 | 2.20 | 2.01 | 1.86 p |
| Spain | 1.10 | 1.29 | 1.27 | 1.24 | 1.22 | 1.19 | 1.21 |
| Sweden | 3.38 b | 3.28 e | 3.30 e | 3.14 e | 3.26 v | 3.27 e | 3.40 v |
| Switzerland | .. | 3.19 | .. | .. | 3.37 | .. | 3.37 |
| Turkey | 0.57 | 0.83 | 0.82 | 0.86 | 0.88 | 0.94 | 0.96 |
| United Kingdom | 1.56 | 1.59 e | 1.64 | 1.66 e | 1.67 | 1.68 e | 1.66 p |
| United States | 2.52 d | 2.68 d | 2.71 d | 2.72 d | 2.72 d | 2.76 d p | 2.79 d e |
| EU28 (OECD estimates) | 1.66 e | 1.91 e | 1.92 e | 1.94 e | 1.96 e | 1.94 e | 1.97 e |
| OECD-Total | 2.14 e | 2.31 e | 2.33 e | 2.35 e | 2.34 e | 2.34 e | 2.37 e |
| Argentina | 0.42 | 0.64 p | 0.62 p | 0.59 p | 0.62 | 0.53 | 0.54 |
| China | 1.31 | 1.91 | 2.00 | 2.03 | 2.07 | 2.12 | 2.15 |
| Romania | 0.41 | 0.48 | 0.39 | 0.38 | 0.49 | 0.48 | 0.50 p |
| Russian Federation | 0.99 | 1.03 | 1.03 | 1.07 | 1.10 | 1.10 | 1.11 e |
| Singapore | 2.15 | 1.94 | 1.94 | 2.10 | 2.19 | 2.09 | 1.95 |
| South Africa | 0.86 | 0.73 | 0.72 | 0.77 | 0.80 | 0.82 | .. |
| Chinese Taipei | 2.32 | 2.96 | 3.02 | 3.01 | 3.06 | 3.16 | 3.30 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 3. Gross domestic expenditure on R&D (GERD) at 2010 prices and PPP

Million 2010 USD

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|--------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| Australia | .. | .. | 21 598.3 e | .. | 20 362.3 e | .. | .. |
| Austria | 7 813.7 e | 10 610.8 e | 10 759.9 | 11 305.2 e | 11 306.5 | 11 822.5 e | 12 249.1 p |
| Belgium | 7 246.6 | 10 122.7 | 10 413.4 | 10 785.1 | 11 312.6 | 11 918.6 | 12 819.7 |
| Canada | 25 388.6 | 25 371.4 b | 24 982.3 | 25 831.1 b | 25 691.7 | 25 981.6 | 25 087.8 p |
| Chile | .. | 1 254.4 | 1 400.6 | 1 375.2 b | 1 428.2 | 1 409.2 b | 1 372.0 p |
| Czech Republic | 3 001.4 | 5 214.9 | 5 531.6 | 5 900.5 | 6 076.4 | 5 421.5 | 6 030.1 |
| Denmark | 5 649.6 | 7 223.1 | 7 264.2 | 7 241.7 | 7 769.6 | 8 083.8 | 8 112.2 p |
| Estonia | 270.8 | 684.6 | 566.2 | 483.5 | 505.4 | 444.7 | 482.0 |
| Finland | 6 642.4 | 7 183.1 | 6 852.9 | 6 565.4 | 6 020.0 | 5 868.2 | 6 056.0 |
| France | 45 975.0 | 53 297.0 | 53 843.9 | 55 303.8 b | 55 700.9 | 55 071.6 p | 55 512.3 e |
| Germany | 73 197.1 | 95 745.5 | 94 634.9 | 98 268.2 | 101 548.3 | 104 008.8 | 110 642.2 |
| Greece | 1 842.5 | 1 844.7 | 2 070.0 | 2 141.8 | 2 459.8 | 2 538.7 | 2 932.5 |
| Hungary | 2 005.7 | 2 721.2 | 3 053.5 | 3 102.0 | 3 232.4 | 2 922.2 | 3 407.9 |
| Iceland | 319.9 | .. | 230.2 b | 269.0 | 317.9 | 328.2 | 339.5 |
| Ireland | 2 300.4 | 3 200.8 e | 3 250.3 e | 3 436.4 e | 3 351.5 e | 3 453.1 e | .. |
| Israel ¹ | 7 196.4 d | 9 820.5 d | 10 081.4 d | 10 688.7 d | 11 179.8 d | 11 998.0 d e | 12 841.1 d e |
| Italy | 22 073.3 | 25 777.3 | 26 065.6 | 26 800.1 e | 27 010.4 | 27 925.4 b | 27 998.5 p |
| Japan | 141 838.5 | 145 773.5 | 153 595.0 b | 158 135.7 | 154 487.8 | 149 440.6 | 155 090.3 |
| Korea | 32 303.2 d | 64 243.2 | 68 123.3 | 72 779.0 | 73 558.6 | 75 900.5 | 84 253.8 |
| Latvia | 199.9 | 270.8 | 255.6 | 293.1 | 274.1 | 197.1 | 238.6 |
| Lithuania | 439 | 613 | 674 | 757 | 780 | 646 | 717 |
| Luxembourg | 604.5 | 564.4 b | 598.8 | 606.0 | 639.7 | 660.9 | 650.8 p |
| Mexico | 6 445.0 | 9 107.1 | 9 452.4 | 10 337.6 e p | 10 544.6 e p | 10 072.1 e p | .. |
| Netherlands | 12 396.0 | 14 413.1 b | 14 496.4 | 15 051.8 | 15 418.1 | 15 851.1 | 16 259.0 p |
| New Zealand | 1 412.8 | .. | 1 685.2 | .. | 1 943.7 | .. | 2 288.2 |
| Norway | 3 885.7 | 4 970.2 | 5 114.1 | 5 286.4 | 5 789.2 | 5 956.2 | 6 400.4 |
| Poland | 3 570.7 | 7 526.3 | 7 541.6 | 8 411.7 | 9 324.5 | 9 235.1 | 10 386.1 p |
| Portugal | 2 120.0 | 3 748.1 | 3 567.6 | 3 499.9 | 3 433.5 | 3 607.2 | 3 845.6 |
| Slovak Republic | 527.2 | 1 132.3 | 1 175.8 | 1 291.0 | 1 790.6 | 1 243.3 | 1 435.4 |
| Slovenia | 736.6 | 1 432.5 | 1 420.0 | 1 341.4 | 1 272.4 | 1 202.1 | 1 167.5 p |
| Spain | 15 455.6 | 18 403.0 | 17 818.0 | 17 590.7 | 17 980.4 | 18 047.5 | 18 907.2 |
| Sweden | 12 209.4 b | 13 101.1 e | 13 363.6 e | 13 047.5 e | 14 156.2 v | 14 558.6 e | 15 444.9 v |
| Switzerland | .. | 13 590.2 | .. | .. | 15 206.0 | .. | 15 705.1 |
| Turkey | 6 117.7 | 12 212.1 | 13 027.0 | 14 412.5 | 15 658.0 | 17 313.7 | 18 925.3 |
| United Kingdom | 34 576.3 | 37 149.0 e | 38 992.7 | 40 626.2 e | 41 806.8 | 42 910.3 e | 43 217.2 p |
| United States | 360 744.4 d | 417 455.3 d | 429 592.1 d | 441 667.4 d | 454 096.3 d | 468 378.3 d p | 483 676.3 d e |
| EU28 (OECD estimates) | 263 565.0 e | 325 283.8 e | 327 303.9 e | 337 148.1 e | 347 230.5 e | 351 678.0 e | 366 870.0 e |
| OECD-Total | 872 817.9 e | 1 049 273.5 e | 1 077 076.5 e | 1 111 799.1 e | 1 133 454.0 e | 1 152 680.4 e | 1 199 576.3 e |
| Argentina | 2 504.3 | 5 065.9 p | 5 053.4 p | 4 690.2 p | 5 030.1 | 4 221.9 | 4 427.2 |
| China | 95 345.5 | 281 426.5 | 316 856.2 | 345 376.2 | 375 751.3 | 411 232.6 | 444 755.1 e |
| Romania | 1 232.8 | 1 730.6 | 1 436.1 | 1 463.6 | 1 940.6 | 2 002.0 | 2 247.1 p |
| Russian Federation | 26 265.9 | 34 984.3 | 35 556.6 | 37 387.1 | 37 308.0 | 37 155.4 | 38 080.3 e |
| Singapore | 5 585.2 | 7 744.0 | 8 112.0 | 9 128.5 | 9 799.7 | 9 598.8 | 9 328.2 |
| South Africa | 4 452.1 | 4 653.3 | 4 712.1 | 5 105.5 | 5 349.4 | 5 507.7 | .. |
| Chinese Taipei | 16 830.8 | 28 040.8 | 29 197.3 | 30 342.2 | 31 044.7 | 32 596.5 | 34 987.6 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 4. Gross domestic expenditure on R&D (GERD) per capita at current prices and PPP

USD

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|----------------|----------------|----------------|----------------|----------------|----------------|------------------|
| Australia | .. | .. | 1 000.1 e | .. | 888.1 e | .. | .. |
| Austria | 831.2 e | 1 354.7 e | 1 416.5 | 1 505.5 e | 1 523.5 | 1 613.8 e | 1 701.7 p |
| Belgium | 594.1 | 968.1 | 1 021.0 | 1 067.6 | 1 125.7 | 1 210.7 | 1 338.4 |
| Canada | 716.1 | 748.7 b | 754.0 | 782.1 b | 756.4 | 764.0 | 743.4 p |
| Chile | .. | 77.7 | 86.9 | 85.1 b | 86.0 | 84.2 b | 85.9 p |
| Czech Republic | 256.0 | 517.8 | 579.3 | 636.5 | 650.2 | 592.0 | 681.2 |
| Denmark | 817.4 | 1 335.9 | 1 388.5 | 1 396.0 | 1 499.1 | 1 573.3 | 1 655.1 p |
| Estonia | 152.1 | 551.3 | 472.7 | 413.6 | 429.0 | 385.2 | 431.6 |
| Finland | 1 065.3 | 1 389.0 | 1 357.4 | 1 314.1 | 1 220.6 | 1 199.4 | 1 277.8 |
| France | 625.8 | 839.3 | 884.3 | 913.6 b | 925.9 | 932.7 p | 964.3 e |
| Germany | 787.2 | 1 249.5 | 1 276.0 | 1 352.9 | 1 397.1 | 1 456.3 | 1 597.0 |
| Greece | 148.1 | 176.9 | 211.7 | 223.6 | 258.6 | 271.1 | 323.3 |
| Hungary | 157.3 | 291.8 | 339.8 | 345.4 | 359.1 | 323.4 | 388.4 |
| Iceland | 1 003.0 | .. | 751.5 b | 890.5 | 1 073.6 | 1 113.6 | 1 164.2 |
| Ireland | 482.3 | 722.5 e | 750.6 e | 778.7 e | 817.8 e | 825.4 e | .. |
| Israel ¹ | 1 000.7 d | 1 319.5 d | 1 399.4 d | 1 431.4 d | 1 512.6 d | 1 648.5 d e | 1 767.3 d e |
| Italy | 313.5 | 454.4 | 469.3 | 484.4 e | 494.0 | 535.4 b | 554.1 p |
| Japan | 1 007.4 | 1 194.2 | 1 293.1 b | 1 332.3 | 1 326.0 | 1 298.0 | 1 348.8 |
| Korea | 635.4 d | 1 292.1 | 1 353.1 | 1 440.5 | 1 508.0 | 1 570.2 | 1 768.4 |
| Latvia | 73.3 | 141.2 | 138.8 | 164.1 | 154.7 | 113.9 | 144.8 |
| Lithuania | 109 | 221 | 254 | 290 | 301 | 256 | 299 |
| Luxembourg | 1 071.0 | 1 164.8 b | 1 240.7 | 1 275.8 | 1 320.2 | 1 356.1 | 1 350.6 p |
| Mexico | 50.0 | 83.8 | 87.1 | 96.4 e p | 96.6 e p | 92.2 e p | .. |
| Netherlands | 667.4 | 905.9 b | 950.3 | 972.7 | 998.4 | 1 025.2 | 1 083.6 p |
| New Zealand | 286.7 | .. | 416.3 | .. | 458.6 | .. | 547.9 |
| Norway | 708.6 | 1 059.2 | 1 106.4 | 1 130.2 | 1 168.1 | 1 180.3 | 1 301.7 |
| Poland | 78.2 | 207.4 | 212.6 | 237.7 | 266.1 | 264.2 | 306.0 p |
| Portugal | 172.2 | 364.5 | 370.1 | 370.8 | 368.9 | 397.6 | 432.4 |
| Slovak Republic | 81.9 | 214.6 | 229.8 | 254.6 | 348.0 | 243.8 | 285.8 |
| Slovenia | 338.1 | 743.8 | 768.9 | 730.3 | 694.7 | 667.8 | 673.8 p |
| Spain | 303.5 | 412.0 | 413.8 | 416.7 | 427.1 | 435.5 | 471.3 |
| Sweden | 1 150.5 b | 1 467.6 e | 1 510.0 e | 1 463.6 e | 1 581.1 v | 1 604.7 e | 1 746.1 v |
| Switzerland | .. | 1 843.2 | .. | .. | 2 155.8 | .. | 2 236.2 |
| Turkey | 67.2 | 170.4 | 181.7 | 206.4 | 226.8 | 248.7 | 270.6 |
| United Kingdom | 507.2 | 604.2 e | 647.9 | 678.2 e | 701.6 | 722.3 e | 747.2 p |
| United States | 1 108.6 d | 1 381.6 d | 1 436.6 d | 1 493.8 d | 1 540.8 d | 1 595.0 d p | 1 666.5 d e |
| EU28 (OECD estimates) | 458.5 e | 673.7 e | 700.6 e | 730.4 e | 757.2 e | 780.5 e | 839.4 e |
| OECD-Total | 657.8 e | 868.8 e | 908.9 e | 944.7 e | 968.9 e | 993.7 e | 1 049.9 e |
| Argentina | 59.0 | 126.2 p | 126.5 p | 118.2 p | 126.8 | 107.4 | 114.1 |
| China | 66.4 | 215.8 | 245.5 | 270.9 | 296.4 | 326.5 | 356.8 |
| Romania | 39.6 | 91.6 | 76.8 | 78.8 | 105.5 | 114.6 | 134.0 p |
| Russian Federation | 126.3 | 264.7 | 269.0 | 276.1 | 264.9 | 264.1 | 285.1 |
| Singapore | 1 190.2 | 1 515.9 | 1 590.6 | 1 799.3 | 1 929.8 | 1 886.7 | 1 867.4 |
| South Africa | 85.0 | 92.4 | 93.7 | 101.8 | 106.2 | 109.5 | .. |
| Chinese Taipei | 672.3 | 1 251.3 | 1 322.4 | 1 396.7 | 1 440.8 | 1 526.3 | 1 667.1 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 5. Estimated civil GERD (Gross domestic expenditure on R&D) as a percentage of GDP

Percentage

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Australia | .. | .. | .. | .. | .. | .. | .. |
| Austria | .. | .. | 2.95 | .. | .. | .. | .. |
| Belgium | 1.78 | .. | .. | .. | .. | .. | .. |
| Canada | .. | .. | .. | .. | .. | .. | .. |
| Chile | .. | 0.36 | 0.39 | 0.37 b | 0.38 | 0.37 b | 0.35 p |
| Czech Republic | 1.16 | 1.78 | 1.89 | 1.97 | .. | .. | .. |
| Denmark | .. | .. | .. | .. | .. | .. | .. |
| Estonia | 0.92 e | 2.12 e | 1.72 e | 1.42 | .. | .. | 1.28 |
| Finland | 3.31 | 3.40 | 3.27 | 3.15 | .. | .. | .. |
| France | 1.88 | 2.16 | 2.16 | 2.21 b | .. | .. | .. |
| Germany | 2.39 e | 2.84 | 2.80 | 2.84 | .. | .. | .. |
| Greece | .. | .. | .. | .. | .. | .. | .. |
| Hungary | 0.91 | 1.26 | 1.38 | 1.35 | 1.36 | 1.19 | 1.34 |
| Iceland | 2.69 | .. | 1.70 b | 1.95 | 2.20 | 2.13 | 2.10 |
| Ireland | 1.19 | 1.56 e | 1.56 e | 1.52 e | 1.18 e | 1.16 e | .. |
| Israel ¹ | 4.05 | 4.16 | 4.09 | 4.18 | 4.26 | 4.39 e | 4.54 e |
| Italy | .. | .. | .. | .. | .. | .. | .. |
| Japan | 3.15 e | 3.19 e | 3.28 b e | 3.37 e | 3.25 e | .. | .. |
| Korea | 2.56 d | 3.87 | 3.97 | 4.13 | 4.07 | 4.09 | 4.36 |
| Latvia | .. | .. | .. | .. | .. | .. | .. |
| Lithuania | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Luxembourg | 1.57 | 1.27 b | 1.30 | 1.26 | 1.28 | 1.30 | 1.26 p |
| Mexico | .. | .. | .. | .. | .. | .. | .. |
| Netherlands | .. | .. | .. | .. | .. | .. | .. |
| New Zealand | .. | .. | 1.14 | .. | 1.22 | .. | 1.35 |
| Norway | .. | .. | .. | .. | .. | .. | .. |
| Poland | .. | .. | .. | .. | .. | .. | .. |
| Portugal | 0.75 | 1.37 | 1.32 | 1.28 | 1.23 | 1.27 | 1.32 |
| Slovak Republic | 0.49 | 0.79 | 0.82 | 0.88 | 1.17 | 0.78 | 0.88 |
| Slovenia | 1.41 | 2.57 | 2.58 | 2.37 | 2.20 | .. | .. |
| Spain | .. | 1.25 | 1.23 | 1.20 | 1.19 | 1.15 | 1.17 |
| Sweden | 3.26 b | .. | 3.18 e | .. | .. | .. | .. |
| Switzerland | .. | 3.15 | .. | .. | .. | .. | .. |
| Turkey | .. | 0.82 | 0.80 | 0.84 | 0.86 | 0.93 | .. |
| United Kingdom | 1.37 | 1.49 e | 1.53 | 1.56 e | .. | .. | .. |
| United States | 2.09 d | .. | .. | .. | .. | .. | .. |
| EU28 (OECD estimates) | 1.60 e | 1.87 e | 1.88 e | 1.91 e | 1.92 e | 1.91 e | 1.94 e |
| OECD-Total | 1.96 e | 2.17 e | 2.21 e | 2.24 e | 2.23 e | 2.22 e | 2.25 e |
| Argentina | 0.42 | 0.63 p | 0.62 p | 0.59 p | .. | .. | .. |
| China | .. | .. | .. | .. | .. | .. | .. |
| Romania | 0.41 | 0.48 | 0.38 | 0.38 | .. | .. | .. |
| Russian Federation | .. | .. | .. | .. | .. | .. | .. |
| Singapore | .. | .. | .. | .. | .. | .. | .. |
| South Africa | 0.81 | 0.69 | 0.69 | 0.72 | 0.75 | .. | .. |
| Chinese Taipei | 2.25 | 2.93 | 2.99 | 2.99 | 3.04 | 3.12 | 3.25 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 6. Basic research expenditure as a percentage of GDP

Percentage

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|----------|----------|----------|----------|----------|----------|----------|
| Australia | .. | .. | .. | .. | .. | .. | .. |
| Austria | .. | .. | 0.56 d | .. | 0.54 d | .. | .. |
| Belgium | .. | .. | 0.46 | .. | 0.38 | .. | 0.30 |
| Canada | .. | .. | .. | .. | .. | .. | .. |
| Chile | .. | 0.09 m | 0.11 m | 0.11 b m | 0.13 m | 0.11 b m | 0.10 m p |
| Czech Republic | 0.36 | 0.53 | 0.62 | 0.61 | 0.61 | 0.48 | 0.49 |
| Denmark | 0.45 e | 0.55 e | 0.57 | 0.59 | 0.58 | .. | 0.56 |
| Estonia | 0.27 | 0.45 | 0.47 | 0.43 | 0.39 | 0.34 | 0.35 |
| Finland | .. | .. | .. | .. | .. | .. | .. |
| France | 0.49 | 0.54 | 0.54 | 0.54 | 0.54 | 0.48 p | .. |
| Germany | .. | .. | .. | .. | .. | .. | .. |
| Greece | .. | .. | 0.28 | .. | 0.34 | .. | 0.35 |
| Hungary | 0.25 | 0.25 e | 0.27 e | 0.25 e | 0.25 e | 0.22 e | 0.26 e |
| Iceland | 0.51 | .. | 0.45 b | 0.45 | 0.45 | 0.45 | 0.45 p s |
| Ireland | 0.28 | .. | 0.30 e | .. | 0.22 e | .. | .. |
| Israel ¹ | 0.65 d e | 0.51 d e | 0.52 d e | 0.51 d e | 0.52 d e | 0.51 d e | 0.52 d e |
| Italy | 0.29 | 0.32 | 0.33 | 0.32 e | 0.33 | 0.32 b | .. |
| Japan | 0.38 | 0.40 | 0.42 b | 0.42 | 0.39 | 0.40 | 0.42 |
| Korea | 0.40 d | 0.74 | 0.75 | 0.76 | 0.73 | 0.68 | 0.66 |
| Latvia | 0.11 | 0.21 | 0.15 | 0.20 | 0.22 | 0.13 | 0.16 |
| Lithuania | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Luxembourg | .. | .. | .. | .. | 0.49 | .. | .. |
| Mexico | .. | 0.14 | 0.14 | 0.15 | 0.15 | 0.14 e p | .. |
| Netherlands | .. | 0.53 b | 0.55 | 0.54 | 0.54 | 0.53 | .. |
| New Zealand | 0.34 | .. | 0.29 | .. | 0.28 | .. | 0.34 |
| Norway | 0.29 | .. | 0.29 m | .. | 0.33 d | .. | 0.35 d |
| Poland | 0.17 | 0.23 | 0.30 b | 0.32 | 0.32 | 0.29 | .. |
| Portugal | 0.19 | 0.29 | 0.30 | 0.30 | 0.29 | 0.29 | 0.29 |
| Slovak Republic | 0.23 | 0.38 | 0.36 | 0.40 | 0.50 | 0.32 | 0.33 |
| Slovenia | 0.20 | 0.34 | 0.35 | 0.43 b | 0.39 | 0.35 | .. |
| Spain | 0.19 m | 0.27 m | 0.29 e | 0.28 e | 0.27 e | 0.26 e | 0.26 |
| Sweden | .. | .. | .. | .. | .. | .. | .. |
| Switzerland | .. | 0.94 | .. | .. | 1.29 | .. | 1.41 |
| Turkey | .. | .. | .. | .. | .. | .. | .. |
| United Kingdom | .. | 0.27 e | 0.28 e | 0.28 e | 0.28 e | 0.30 e | .. |
| United States | 0.47 d | 0.45 d | 0.47 d | 0.47 d | 0.46 d | 0.47 d p | 0.47 d e |
| EU28 (OECD estimates) | .. | .. | .. | .. | .. | .. | .. |
| OECD-Total | .. | .. | .. | .. | .. | .. | .. |
| Argentina | 0.11 | .. | .. | .. | 0.21 b | 0.15 | 0.14 |
| China | 0.07 | 0.09 | 0.09 | 0.10 | 0.10 | 0.11 | 0.12 |
| Romania | 0.09 m | 0.20 | 0.15 | 0.13 | 0.15 | 0.12 | .. |
| Russian Federation | 0.13 m | 0.16 m | 0.16 m | 0.16 m | 0.16 m | 0.15 d | .. |
| Singapore | 0.45 | 0.39 | 0.41 | 0.42 | 0.48 | 0.49 | 0.46 |
| South Africa | 0.16 | 0.19 | 0.17 | 0.19 | 0.20 | 0.22 | .. |
| Chinese Taipei | 0.24 | 0.28 | 0.28 | 0.27 | 0.27 | 0.26 | 0.26 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 7. Total researchers in full-time equivalent

FTE

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|-------------|
| Australia | .. | .. | .. | .. | .. | .. | .. |
| Austria | 28 470 d e | 39 701 d e | 40 426 d | 42 627 d e | 43 562 d | 45 699 d e | 47 519 d p |
| Belgium | 33 146 | 45 597 | 46 355 | 50 820 | 53 178 b | 54 280 e | 54 010 |
| Canada | 136 700 | 161 600 | 163 180 | 161 982 b | 162 952 | 155 128 | .. |
| Chile | .. | 6 798 d | 5 893 d | 7 585 d | 8 175 d | 8 985 d | 9 111 d p |
| Czech Republic | 24 169 b | 33 217 | 34 271 | 36 040 | 38 081 | 37 338 | 39 181 |
| Denmark | 28 179 | 40 080 | 39 868 | 41 409 | 42 826 | 44 815 | 45 278 p |
| Estonia | 3 331 | 4 582 | 4 407 | 4 324 | 4 187 | 4 338 | 4 674 |
| Finland | 39 582 | 40 468 | 39 196 | 38 281 | 37 516 | 35 908 | 37 047 |
| France | 202 507 | 258 913 e | 265 466 e | 271 772 b | 277 631 | .. | 288 579 e |
| Germany | 272 148 | 352 419 | 354 463 | 351 923 | 387 982 | 399 605 | 419 617 |
| Greece | 19 593 d | 24 800 d | 29 228 d | 29 877 d | 34 708 d | 29 403 d | 35 000 d |
| Hungary | 15 878 | 23 837 | 25 038 | 26 213 | 25 316 | 25 804 | 28 426 |
| Iceland | 2 155 | .. | 1 848 b | .. | 1 944 b | 2 206 | 2 050 |
| Ireland | 11 587 | 22 368 e | 23 707 e | 24 543 e | 24 521 e | 24 316 e | .. |
| Israel ¹ | .. | 63 521 d e | .. | .. | .. | .. | .. |
| Italy | 82 489 | 110 695 | 116 163 | 118 183 | 125 875 | 133 706 b | 136 204 p |
| Japan | 680 631 d | 646 347 d | 660 489 b d | 682 935 d | 662 071 d | 665 566 d | 676 292 d |
| Korea | 179 812 d | 315 589 | 321 842 | 345 463 | 356 447 | 361 292 | 383 100 |
| Latvia | 3 282 d | 3 904 d | 3 625 d | 3 748 d | 3 613 d | 3 152 d | 3 482 d |
| Lithuania | 7 637 | 8 023 | 8 557 | 9 075 | 8 167 | 8 525 | 8 741 |
| Luxembourg | 2 227 | 2 310 b | 2 503 | 2 629 | 2 539 | 2 505 p | 2 732 p |
| Mexico | 43 922 | 29 094 | 29 921 | 31 315 | 34 282 | 38 882 | .. |
| Netherlands | 47 854 | 73 235 b | 76 670 | 76 229 | 79 155 | 81 117 | 85 300 p |
| New Zealand | 12 986 | .. | 17 900 | .. | 18 700 | .. | .. |
| Norway | 21 200 | 27 841 | 28 312 | 29 237 | 30 632 | 31 913 | 33 632 |
| Poland | 62 162 | 67 001 | 71 472 | 78 622 | 82 594 | 88 165 | 96 497 p |
| Portugal | 21 126 | 42 498 | 37 813 b | 38 155 | 38 672 | 41 349 | 44 938 |
| Slovak Republic | 10 921 d | 15 271 d | 14 727 d | 14 742 d | 14 406 d | 12 262 | 13 163 |
| Slovenia | 5 253 | 8 884 | 8 707 | 8 574 | 7 900 | 8 119 | 9 293 p |
| Spain | 109 720 | 126 778 d | 123 225 d | 122 235 d | 122 437 d | 126 633 d | 133 213 d |
| Sweden | 55 001 b e | 49 280 e | 64 194 b e | 66 643 e | 66 734 e | 70 372 e | 73 132 |
| Switzerland | .. | 35 785 | .. | .. | 43 740 | .. | 46 088 |
| Turkey | 39 139 | 82 122 | 89 075 | 89 657 | 95 161 | 100 158 | 111 893 |
| United Kingdom | 248 599 b e | 256 156 e | 267 699 | 276 584 e | 284 483 | 288 922 e | 289 674 p |
| United States | 1 104 019 e | 1 253 231 e | 1 294 353 e | 1 339 931 e | 1 369 267 e | 1 371 290 e | .. |
| EU28 (OECD estimates) | 1 374 762 e | 1 687 741 e | 1 736 853 e | 1 772 538 e | 1 845 826 e | 1 892 753 e | 1 964 027 e |
| OECD-Total | 3 707 553 e | 4 404 660 e | 4 529 768 e | 4 666 222 e | 4 773 767 e | 4 838 034 e | .. |
| Argentina | 31 868 | 50 490 | 50 785 | 51 665 | 52 970 | 54 046 | 52 383 |
| China | 1 118 698 d | 1 404 017 | 1 484 040 | 1 524 280 | 1 619 028 | 1 692 176 | 1 740 442 |
| Romania | 22 958 | 18 016 | 18 576 | 18 109 | 17 459 | 18 046 | 17 518 p |
| Russian Federation | 464 577 | 443 269 | 440 581 | 444 865 | 449 180 | 428 884 | 410 617 |
| Singapore | 23 789 | 34 132 | 36 012 | 36 647 | 39 182 | 39 207 | 38 829 |
| South Africa | 17 303 | 21 382 | 23 346 | 23 572 | 26 159 | 27 656 | .. |
| Chinese Taipei | 88 859 | 140 102 | 141 159 | 142 983 | 145 381 | 147 710 | 150 384 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 8. Total researchers in full-time equivalent per thousand total employment

Per thousand

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|--------------|--------------|--------------|--------------|--------------|--------------|------------|
| Australia | .. | .. | .. | .. | .. | .. | .. |
| Austria | 7.4 d e | 9.4 d e | 9.6 d | 10.0 d e | 10.2 d | 10.5 d e | 10.8 d e p |
| Belgium | 7.8 | 10.0 | 10.2 | 11.1 | 11.6 b | 11.7 e | 11.4 e |
| Canada | 8.3 | 9.1 | 9.1 | 9.0 b | 8.9 | 8.4 | .. |
| Chile | .. | 0.9 d | 0.8 d | 1.0 d | 1.0 d | 1.1 d | 1.1 d e p |
| Czech Republic | 4.9 b | 6.6 | 6.7 | 7.1 | 7.3 | 7.1 | 7.4 e |
| Denmark | 10.1 | 14.5 | 14.4 | 14.8 | 15.1 | 15.6 | 15.5 e p |
| Estonia | 5.4 | 7.7 | 7.3 | 7.1 | 6.7 | 6.9 | 7.4 e |
| Finland | 16.4 | 15.9 | 15.6 | 15.3 | 15.0 | 14.3 | 14.5 e |
| France | 7.7 | 9.5 e | 9.7 e | 9.9 b | 10.1 | .. | 10.3 e |
| Germany | 6.9 | 8.4 | 8.4 | 8.2 | 9.0 | 9.2 | 9.5 e |
| Greece | 4.2 d | 6.0 d | 7.3 d | 7.4 d | 8.5 d | 7.2 d | 8.4 d |
| Hungary | 3.8 | 6.0 | 6.2 | 6.2 | 5.9 | 5.8 | 6.3 e |
| Iceland | 13.3 | .. | 10.6 b | .. | 10.6 b | 11.6 | 10.3 e |
| Ireland | 5.9 | 12.0 e | 12.4 e | 12.6 e | 12.3 e | 11.9 e | .. |
| Israel ¹ | .. | 17.4 d e | .. | .. | .. | .. | .. |
| Italy | 3.4 | 4.5 | 4.8 | 4.9 | 5.1 | 5.4 b | 5.4 e p |
| Japan | 10.4 d | 9.9 d | 10.1 b d | 10.4 d | 10.0 d | 10.0 d | 10.0 d e |
| Korea | 7.9 d | 12.8 | 12.8 | 13.5 | 13.7 | 13.8 | 14.4 e |
| Latvia | 3.4 d | 4.5 d | 4.1 d | 4.3 d | 4.1 d | 3.6 d | 3.9 d e |
| Lithuania | 5 | 6 | 7 | 7 | 6 | 6 | 6 e |
| Luxembourg | 7.2 | 6.1 b | 6.5 | 6.6 | 6.3 | 6.0 p | 6.3 e p |
| Mexico | 1.3 | 0.8 | 0.8 | 0.8 | 0.9 | 1.0 | .. |
| Netherlands | 5.7 | 8.3 b | 8.8 | 8.7 | 9.0 | 9.1 | 9.4 e p |
| New Zealand | 6.3 | .. | 8.0 | .. | 7.9 | .. | .. |
| Norway | 9.0 | 10.4 | 10.4 | 10.6 | 11.1 | 11.5 | 12.0 |
| Poland | 4.4 | 4.3 | 4.6 | 5.0 | 5.2 | 5.5 | 5.9 p |
| Portugal | 4.2 | 9.3 | 8.5 b | 8.5 | 8.5 | 8.9 | 9.4 |
| Slovak Republic | 5.2 d | 6.9 d | 6.7 d | 6.6 d | 6.4 d | 5.3 | 5.5 e |
| Slovenia | 5.7 | 9.5 | 9.4 | 9.2 | 8.4 | 8.5 | 9.4 e p |
| Spain | 5.5 | 6.9 d | 6.9 d | 6.8 d | 6.6 d | 6.7 d | 6.8 d |
| Sweden | 12.6 b e | 10.7 e | 13.7 b e | 14.1 e | 13.9 e | 14.4 e | 14.6 e |
| Switzerland | .. | 7.7 | .. | .. | 8.9 | .. | 9.2 |
| Turkey | 2.0 | 3.4 | 3.6 | 3.5 | 3.6 | 3.7 | 4.0 e |
| United Kingdom | 8.6 b e | 8.6 e | 8.9 | 9.0 e | 9.1 | 9.1 e | 9.0 p |
| United States | 7.7 e | 8.7 e | 8.9 e | 9.0 e | 9.1 e | 8.9 e | .. |
| EU28 (OECD estimates) | 6.2 e | 7.5 e | 7.7 e | 7.8 e | 8.0 e | 8.2 e | 8.3 e |
| OECD-Total | 7.0 e | 7.9 e | 8.1 e | 8.2 e | 8.3 e | 8.3 e | .. |
| Argentina | 2.0 | 2.9 | 2.9 | 2.9 | 2.9 | 3.0 | 2.9 |
| China | 1.5 d | 1.8 | 1.9 | 2.0 | 2.1 | 2.2 | 2.2 |
| Romania | 2.5 | 2.1 | 2.2 | 2.1 | 2.0 | 2.1 | 2.0 p |
| Russian Federation | 6.8 | 6.2 | 6.2 | 6.2 | 6.2 | 5.9 | 5.7 |
| Singapore | 10.3 | 10.2 | 10.3 | 10.1 | 10.7 | 10.7 | 10.6 |
| South Africa | 1.4 | 1.5 | 1.6 | 1.6 | 1.7 | 1.8 | .. |
| Chinese Taipei | 8.9 | 12.9 | 12.9 | 12.9 | 13.0 | 13.1 | 13.2 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 9. Total R&D personnel in full-time equivalent

FTE

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Australia | .. | .. | .. | .. | .. | .. | .. |
| Austria | 47 625 d e | 65 088 d e | 66 186 d | 70 138 d e | 71 396 d | 74 897 d e | 77 880 d p |
| Belgium | 53 517 | 67 005 | 67 898 | 72 795 | 77 520 b | 78 668 | 82 686 |
| Canada | 218 590 | 231 230 | 232 910 | 236 470 b | 244 879 | 223 146 | .. |
| Chile | .. | 14 631 d | 13 228 d | 15 887 d | 15 261 d | 16 626 d | 16 620 d p |
| Czech Republic | 43 370 b | 60 329 | 61 976 | 64 444 | 66 433 | 65 783 | 69 736 |
| Denmark | 43 499 | 57 734 | 57 744 | 58 361 | 60 243 | 62 859 | 62 911 p |
| Estonia | 4 362 | 5 855 | 5 858 | 5 790 | 5 636 | 5 772 | 6 048 |
| Finland | 57 471 | 54 047 | 52 972 | 52 130 | 50 367 | 47 429 | 48 999 |
| France | 349 681 | 411 780 m | 416 687 m | 423 903 b | 428 643 | .. | 434 670 e |
| Germany | 475 278 | 591 261 | 588 615 | 605 252 | 640 516 | 657 894 | 686 349 |
| Greece | 33 603 d | 37 361 d | 42 188 d | 43 316 d | 49 658 d | 41 790 d | 47 585 d |
| Hungary | 23 239 | 35 732 | 38 163 | 37 329 | 36 847 | 35 757 | 40 432 |
| Iceland | 3 226 | .. | 2 736 b | .. | 2 941 | 3 247 | 3 172 |
| Ireland | 16 690 | 29 284 e | 31 870 e | 33 494 e | 34 346 e | 34 374 e | .. |
| Israel ¹ | .. | 77 143 d e | .. | .. | .. | .. | .. |
| Italy | 175 248 | 240 179 | 246 764 | 249 467 | 259 167 | 290 040 b | 291 516 p |
| Japan | 896 855 d | 851 132 d | 865 523 b d | 895 285 d | 875 005 d | 872 340 d | 890 749 d |
| Korea | 215 345 d | 395 990 | 401 444 | 430 868 | 442 027 | 447 408 | 471 201 |
| Latvia | 5 483 d | 5 593 d | 5 396 d | 5 739 d | 5 570 d | 5 120 d | 5 378 d |
| Lithuania | 11 002 | 10 416 | 11 080 | 11 791 | 10 607 | 10 924 | 11 577 |
| Luxembourg | 4 392 | 4 743 b | 4 975 | 5 243 | 5 227 | 5 312 | 5 322 p |
| Mexico | 83 685 | 58 849 | 59 073 | 52 150 | 57 013 | 65 824 | .. |
| Netherlands | 93 599 | 122 215 b | 123 214 | 124 066 | 129 060 | 132 867 | 138 292 p |
| New Zealand | 18 929 | .. | 24 900 | .. | 26 400 | .. | .. |
| Norway | 29 966 | 37 707 | 38 536 | 40 297 | 42 409 | 43 918 | 46 234 |
| Poland | 76 761 | 90 716 | 93 751 | 104 359 | 109 249 | 111 789 | 121 428 p |
| Portugal | 25 728 | 47 554 | 46 711 | 46 878 | 47 999 | 50 406 | 54 995 |
| Slovak Republic | 14 404 d | 18 127 d | 17 166 d | 17 594 d | 17 591 d | 15 622 | 16 810 |
| Slovenia | 8 994 | 14 974 | 15 229 | 14 866 | 14 225 | 14 403 | 14 713 p |
| Spain | 174 773 | 208 831 d | 203 302 d | 200 233 d | 200 866 d | 205 873 d | 215 744 d |
| Sweden | 77 557 b e | 81 272 e | 80 957 e | 83 473 e | 83 551 e | 90 690 e | 88 928 v |
| Switzerland | .. | 75 476 | .. | .. | 81 451 | .. | 81 751 |
| Turkey | 49 251 e | 105 122 e | 112 969 e | 115 444 e | 122 288 e | 136 953 | 153 552 |
| United Kingdom | 324 917 b e | 356 484 e | 377 343 e | 396 281 e | 413 860 | 417 390 e | 424 510 p |
| United States | .. | .. | .. | .. | .. | .. | .. |
| EU28 (OECD estimates) | 2 201 520 e | 2 677 518 e | 2 719 150 e | 2 790 416 e | 2 885 718 e | 2 958 970 e | 3 052 999 e |
| OECD-Total | .. | .. | .. | .. | .. | .. | .. |
| Argentina | 45 361 | 72 323 | 74 866 | 76 904 | 78 713 | 79 333 | 78 653 |
| China | 1 364 799 d | 3 246 840 | 3 532 817 | 3 710 580 | 3 758 848 | 3 878 057 | 4 033 597 |
| Romania | 33 222 | 31 135 | 32 507 | 31 391 | 31 331 | 32 232 | 32 586 p |
| Russian Federation | 919 716 | 828 401 | 826 733 | 829 190 | 833 654 | 802 317 | 778 155 |
| Singapore | 28 586 | 39 446 | 41 566 | 42 521 | 45 454 | 45 096 | 44 517 |
| South Africa | 28 798 | 35 050 | 37 956 | 38 465 | 41 055 | 42 533 | .. |
| Chinese Taipei | 149 154 | 229 167 | 234 248 | 240 528 | 245 941 | 251 042 | 255 943 |

 Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

 1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 10. Total R&D personnel in full-time equivalent per thousand total employment

Per thousand

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|----------|----------|----------|----------|--------|----------|------------|
| Australia | .. | .. | .. | .. | .. | .. | .. |
| Austria | 12.3 d e | 15.5 d e | 15.7 d | 16.5 d e | 16.7 d | 17.3 d e | 17.7 d e p |
| Belgium | 12.6 | 14.7 | 15.0 | 16.0 | 16.9 b | 16.9 | 17.5 e |
| Canada | 13.3 | 13.0 | 12.9 | 13.1 b | 13.4 | 12.1 | .. |
| Chile | .. | 1.9 d | 1.7 d | 2.0 d | 1.9 d | 2.0 d | 2.0 d e p |
| Czech Republic | 8.8 b | 11.9 | 12.2 | 12.6 | 12.8 | 12.5 | 13.1 e |
| Denmark | 15.6 | 20.9 | 20.9 | 20.9 | 21.3 | 21.8 | 21.5 e p |
| Estonia | 7.1 | 9.9 | 9.7 | 9.6 | 9.0 | 9.2 | 9.6 e |
| Finland | 23.8 | 21.3 | 21.0 | 20.8 | 20.1 | 18.8 | 19.2 e |
| France | 13.3 | 15.1 m | 15.3 m | 15.5 b | 15.6 | .. | 15.6 e |
| Germany | 12.1 | 14.1 | 13.9 | 14.2 | 14.9 | 15.1 | 15.5 e |
| Greece | 7.2 d | 9.1 d | 10.6 d | 10.7 d | 12.2 d | 10.2 d | 11.4 d |
| Hungary | 5.6 | 9.0 | 9.5 | 8.9 | 8.6 | 8.1 | 9.0 e |
| Iceland | 20.0 | .. | 15.6 b | .. | 16.0 | 17.0 | 16.0 e |
| Ireland | 8.5 | 15.7 e | 16.7 e | 17.3 e | 17.3 e | 16.8 e | .. |
| Israel ¹ | .. | 21.2 d e | .. | .. | .. | .. | .. |
| Italy | 7.2 | 9.7 | 10.1 | 10.2 | 10.6 | 11.7 b | 11.6 e p |
| Japan | 13.7 d | 13.1 d | 13.2 b d | 13.6 d | 13.2 d | 13.0 d | 13.2 d e |
| Korea | 9.4 d | 16.0 | 16.0 | 16.8 | 17.0 | 17.1 | 17.7 e |
| Latvia | 5.7 d | 6.4 d | 6.1 d | 6.5 d | 6.3 d | 5.8 d | 6.1 d e |
| Lithuania | 8 | 8 | 9 | 9 | 8 | 8 | 9 e |
| Luxembourg | 14.3 | 12.5 b | 12.9 | 13.2 | 12.9 | 12.7 | 12.3 e p |
| Mexico | 2.6 | 1.6 | 1.6 | 1.4 | 1.5 | 1.7 | .. |
| Netherlands | 11.2 | 13.8 b | 14.1 | 14.2 | 14.7 | 14.9 | 15.2 e p |
| New Zealand | 9.2 | .. | 11.1 | .. | 11.2 | .. | .. |
| Norway | 12.7 | 14.0 | 14.2 | 14.7 | 15.4 | 15.9 | 16.6 |
| Poland | 5.5 | 5.9 | 6.1 | 6.6 | 6.8 | 7.0 | 7.5 p |
| Portugal | 5.1 | 10.4 | 10.5 | 10.4 | 10.5 | 10.8 | 11.5 |
| Slovak Republic | 6.9 d | 8.2 d | 7.8 d | 7.9 d | 7.8 d | 6.7 | 7.1 e |
| Slovenia | 9.7 | 16.0 | 16.4 | 16.0 | 15.1 | 15.0 | 14.9 e p |
| Spain | 8.8 | 11.4 d | 11.4 d | 11.1 d | 10.8 d | 10.8 d | 11.1 d |
| Sweden | 17.8 b e | 17.6 e | 17.3 e | 17.6 e | 17.4 e | 18.5 e | 17.8 e v |
| Switzerland | .. | 16.1 | .. | .. | 16.6 | .. | 16.3 |
| Turkey | 2.5 e | 4.4 e | 4.6 e | 4.5 e | 4.6 e | 5.1 | 5.5 e |
| United Kingdom | 11.3 b e | 12.0 e | 12.6 e | 12.9 e | 13.2 | 13.2 e | 13.2 p |
| United States | .. | .. | .. | .. | .. | .. | .. |
| EU28 (OECD estimates) | 10.0 e | 11.9 e | 12.1 e | 12.3 e | 12.6 e | 12.7 e | 12.9 e |
| OECD-Total | .. | .. | .. | .. | .. | .. | .. |
| Argentina | 2.9 | 4.1 | 4.2 | 4.3 | 4.4 | 4.4 | 4.3 |
| China | 1.8 d | 4.2 | 4.6 | 4.8 | 4.9 | 5.0 | 5.2 |
| Romania | 3.6 | 3.6 | 3.8 | 3.6 | 3.7 | 3.8 | 3.8 p |
| Russian Federation | 13.5 | 11.6 | 11.6 | 11.6 | 11.5 | 11.1 | 10.8 |
| Singapore | 12.3 | 11.7 | 11.9 | 11.7 | 12.4 | 12.3 | 12.1 |
| South Africa | 2.3 | 2.4 | 2.6 | 2.5 | 2.6 | 2.7 | .. |
| Chinese Taipei | 15.0 | 21.1 | 21.4 | 21.7 | 22.0 | 22.3 | 22.5 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 11. Business-financed GERD (Gross domestic expenditure on R&D) as a percentage of GDP*As a percentage of GDP*

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Australia | .. | .. | .. | .. | .. | .. | .. |
| Austria | 1.08 e | 1.33 e | 1.44 | 1.47 e | 1.52 | 1.66 b e | 1.70 p |
| Belgium | 1.06 | 1.38 | 1.41 | .. | 1.44 | .. | 1.72 |
| Canada | 0.97 | 0.84 b | 0.80 | 0.78 b | 0.74 | 0.71 | 0.65 p |
| Chile | .. | 0.13 | 0.13 | 0.12 b | 0.12 | 0.13 b | 0.11 p |
| Czech Republic | 0.56 | 0.65 | 0.71 | 0.71 | 0.67 | 0.66 | 0.70 |
| Denmark | 1.42 | 1.79 e | 1.75 | .. | 1.81 | .. | 1.78 p |
| Estonia | 0.36 | 1.09 | 0.72 | 0.53 | 0.60 | 0.60 | 0.56 |
| Finland | 2.23 | 2.16 | 2.00 | 1.70 | 1.58 | 1.56 | 1.60 |
| France | 1.07 | 1.23 | 1.23 | 1.24 | 1.23 | 1.23 p | .. |
| Germany | 1.64 d | 1.90 d | 1.85 d | 1.89 d | 1.91 d | 1.90 d | 2.01 d |
| Greece | 0.18 | 0.22 | 0.25 | 0.25 | 0.30 | 0.40 | 0.51 |
| Hungary | 0.36 d | 0.59 | 0.65 | 0.65 | 0.68 | 0.68 | 0.71 |
| Iceland | 1.29 | .. | 0.63 b | 0.70 | 0.79 | 0.80 | 0.77 |
| Ireland | 0.69 | 0.78 e | 0.82 e | 0.79 e | 0.58 e | 0.57 e | .. |
| Israel ¹ | 2.28 d | 1.64 d | 1.47 d | 1.46 d | 1.41 d | 1.61 d e | .. |
| Italy | 0.42 | 0.56 | 0.59 | 0.63 e | 0.67 | 0.71 b | .. |
| Japan | 2.42 | 2.44 | 2.50 b | 2.63 | 2.56 | 2.46 | 2.51 |
| Korea | 1.97 d | 3.01 | 3.14 | 3.23 | 3.14 | 3.19 | 3.47 |
| Latvia | 0.18 | 0.16 | 0.13 | 0.19 | 0.13 | 0.10 | 0.12 |
| Lithuania | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Luxembourg | 1.25 | 0.23 b | 0.22 | .. | 0.60 | .. | .. |
| Mexico | 0.17 | 0.12 | 0.10 | 0.10 e p | 0.10 e p | 0.10 e p | .. |
| Netherlands | 0.82 | 0.99 b | 0.99 | 1.01 | 0.97 | 1.04 | .. |
| New Zealand | 0.46 | .. | 0.46 | .. | 0.54 | .. | 0.63 |
| Norway | 0.69 | .. | 0.71 | .. | 0.85 | 0.88 | 0.90 |
| Poland | 0.19 | 0.28 | 0.32 | 0.37 | 0.39 | 0.51 | .. |
| Portugal | 0.27 | 0.63 | 0.56 | 0.54 | 0.53 | 0.57 | 0.62 |
| Slovak Republic | 0.18 | 0.30 | 0.33 | 0.28 | 0.29 | 0.36 | 0.43 |
| Slovenia | 0.77 | 1.60 | 1.65 | 1.62 | 1.52 | 1.39 | .. |
| Spain | 0.51 | 0.59 | 0.59 | 0.57 | 0.56 | 0.55 | 0.58 |
| Sweden | 2.16 b | .. | 2.01 e | .. | 1.87 | .. | 2.06 |
| Switzerland | .. | 2.03 | .. | .. | 2.14 | .. | 2.26 |
| Turkey | 0.25 d | 0.34 | 0.35 | 0.39 | 0.39 | 0.44 | 0.48 |
| United Kingdom | 0.66 | 0.73 e | 0.76 | 0.80 e | 0.82 | 0.87 e | .. |
| United States | 1.59 d | 1.60 d | 1.66 d | 1.69 d | 1.70 d | 1.74 d | 1.77 d e |
| EU28 (OECD estimates) | 0.89 e | 1.04 e | 1.05 e | 1.06 e | 1.07 e | 1.10 e | .. |
| OECD-Total | 1.33 e | 1.39 e | 1.41 e | 1.44 e | 1.44 e | 1.46 e | 1.49 e |
| Argentina | 0.13 | .. | .. | .. | 0.11 | 0.10 | 0.09 |
| China | 0.88 | 1.42 | 1.49 | 1.53 | 1.54 | 1.61 | 1.64 |
| Romania | 0.15 | 0.17 | 0.12 | 0.13 | 0.18 | 0.24 | .. |
| Russian Federation | 0.30 | 0.28 | 0.29 | 0.29 | 0.29 | 0.31 | 0.33 e |
| Singapore | 1.26 | 1.02 | 1.00 | 1.11 | 1.16 | 1.08 | 1.02 |
| South Africa | 0.38 | 0.28 | 0.30 | 0.31 | 0.31 | 0.32 | .. |
| Chinese Taipei | 1.55 | 2.19 | 2.27 | 2.32 | 2.37 | 2.45 | 2.60 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 12. Government-financed GERD (Gross domestic expenditure on R&D) as a percentage of GDP

Percentage

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Australia | .. | .. | .. | .. | .. | .. | .. |
| Austria | 0.85 e | 1.10 d e | 0.99 | 1.10 d e | 0.99 | 0.95 b d e | 0.93 p |
| Belgium | 0.44 | 0.56 | 0.57 | .. | 0.55 | .. | 0.54 |
| Canada | 0.63 e | 0.60 b e | 0.58 e | 0.55 b e | 0.54 e | 0.53 e | 0.51 p |
| Chile | .. | 0.13 | 0.15 | 0.17 b | 0.16 | 0.17 b | 0.17 p |
| Czech Republic | 0.53 | 0.66 | 0.66 | 0.65 | 0.62 | 0.60 | 0.62 |
| Denmark | 0.66 | 0.87 d e | 0.89 d | .. | 0.92 d | .. | 0.83 d p |
| Estonia | 0.40 | 0.81 | 0.81 | 0.71 | 0.68 | 0.47 | 0.52 |
| Finland | 0.85 | 0.91 | 0.86 | 0.87 | 0.84 | 0.79 | 0.80 |
| France | 0.79 | 0.79 | 0.79 | 0.78 | 0.79 | 0.73 p | .. |
| Germany | 0.69 d | 0.84 d | 0.82 d | 0.82 d | 0.81 d | 0.83 d | 0.84 d |
| Greece | 0.27 | 0.35 | 0.42 | 0.44 | 0.51 | 0.42 | 0.43 |
| Hungary | 0.46 d | 0.47 | 0.50 | 0.45 | 0.47 | 0.32 | 0.43 |
| Iceland | 1.09 | .. | 0.63 b | 0.66 | 0.68 | 0.70 | 0.73 |
| Ireland | 0.38 | 0.43 e | 0.43 e | 0.42 e | 0.31 e | 0.30 e | .. |
| Israel ¹ | 0.59 d | 0.53 d | 0.52 d | 0.56 d | 0.54 d | 0.50 d e | .. |
| Italy | 0.53 | 0.54 | 0.54 | 0.53 e | 0.51 | 0.48 b | .. |
| Japan | 0.53 e | 0.54 e | 0.57 b e | 0.54 e | 0.51 e | 0.47 e | 0.48 e |
| Korea | 0.60 d | 0.96 | 0.95 | 0.98 | 1.00 | 0.96 | 0.98 |
| Latvia | 0.24 | 0.16 | 0.15 | 0.18 | 0.20 | 0.21 | 0.22 |
| Lithuania | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Luxembourg | 0.26 | 0.57 b | 0.63 | .. | 0.61 | .. | .. |
| Mexico | 0.20 | 0.33 | 0.35 | 0.38 e p | 0.37 e p | 0.33 e p | .. |
| Netherlands | 0.69 | 0.62 b | 0.64 | 0.66 | 0.66 | 0.63 | .. |
| New Zealand | 0.48 | .. | 0.46 | .. | 0.46 | .. | 0.49 |
| Norway | 0.65 | .. | 0.76 | .. | 0.87 | 0.93 | 0.98 |
| Poland | 0.32 | 0.45 | 0.41 | 0.42 | 0.42 | 0.37 | .. |
| Portugal | 0.42 | 0.59 | 0.62 | 0.61 | 0.55 | 0.55 | 0.55 |
| Slovak Republic | 0.28 e | 0.33 e | 0.32 e | 0.36 e | 0.37 | 0.32 | 0.31 |
| Slovenia | 0.53 | 0.74 | 0.69 | 0.52 | 0.44 | 0.41 | .. |
| Spain | 0.47 | 0.56 | 0.53 | 0.51 | 0.50 | 0.47 | 0.47 |
| Sweden | 0.83 b | .. | 0.93 e | .. | .. c | .. | 0.85 |
| Switzerland | .. | 0.75 | .. | .. | 0.82 | .. | 0.87 |
| Turkey | 0.29 d | 0.34 | 0.32 | 0.32 | 0.34 | 0.33 | 0.32 |
| United Kingdom | 0.51 | 0.46 e | 0.48 | 0.47 e | 0.46 | 0.44 e | .. |
| United States | 0.78 d | 0.79 d | 0.75 d | 0.71 d | 0.69 d | 0.65 d p | 0.63 d p |
| EU28 (OECD estimates) | 0.59 e | 0.64 e | 0.63 e | 0.63 e | 0.62 e | 0.60 e | .. |
| OECD-Total | 0.63 e | 0.68 e | 0.66 e | 0.64 e | 0.63 e | 0.60 e | 0.60 e |
| Argentina | 0.27 | .. | .. | .. | 0.47 | 0.39 | 0.39 |
| China | 0.34 | 0.41 | 0.42 | 0.41 | 0.44 | 0.42 | 0.42 |
| Romania | 0.22 | 0.24 | 0.20 | 0.19 | 0.20 | 0.19 | .. |
| Russian Federation | 0.61 | 0.70 | 0.69 | 0.74 | 0.76 | 0.75 | 0.73 e |
| Singapore | 0.77 | 0.77 | 0.78 | 0.80 | 0.84 | 0.81 | 0.73 |
| South Africa | 0.33 | 0.33 | 0.31 | 0.34 | 0.36 | 0.38 | .. |
| Chinese Taipei | 0.73 | 0.74 | 0.71 | 0.66 | 0.66 | 0.68 | 0.66 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 13. Percentage of Gross domestic expenditure on R&D (GERD) financed by the business enterprise sector

Percentage

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Australia | .. | .. | .. | .. | .. | .. | .. |
| Austria | 45.6 e | 45.7 e | 48.7 | 47.7 e | 49.7 | 53.1 b e | 54.0 p |
| Belgium | 59.7 | 60.6 | 60.6 | .. | 58.6 | .. | 63.5 |
| Canada | 49.3 | 47.4 b | 46.7 | 45.8 b | 44.0 | 42.2 | 40.9 p |
| Chile | .. | 34.9 | 34.2 | 31.9 b | 32.8 | 35.1 b | 31.4 p |
| Czech Republic | 48.2 | 36.4 | 37.6 | 35.9 | 34.5 | 39.5 | 39.3 |
| Denmark | 59.5 | 59.9 e | 59.0 | .. | 59.1 | .. | 58.5 p |
| Estonia | 38.5 | 51.3 | 42.1 | 37.1 | 41.0 | 48.2 | 43.6 |
| Finland | 66.9 | 63.1 | 60.8 | 53.5 | 54.8 | 57.0 | 58.0 |
| France | 51.9 | 55.3 | 55.1 | 54.5 b | 54.0 | 55.6 p | .. |
| Germany | 67.5 d | 66.1 d | 65.4 d | 66.0 d | 65.6 d | 65.2 d | 66.2 d |
| Greece | 31.1 | 31.0 | 30.3 | 29.8 | 31.4 | 40.2 | 44.8 |
| Hungary | 39.4 d | 46.9 | 46.8 | 48.3 | 49.7 | 56.4 | 52.7 |
| Iceland | 48.0 | .. | 36.9 b | 35.7 | 35.8 | 37.7 | 36.4 |
| Ireland | 57.4 | 50.2 e | 52.6 e | 52.2 e | 48.7 e | 49.0 e | .. |
| Israel ¹ | 56.2 d | 39.4 d | 35.8 d | 35.0 d | 33.2 d | 36.6 d e | .. |
| Italy | 39.7 | 44.3 | 45.2 | 47.3 e | 50.0 | 52.1 b | .. |
| Japan | 76.1 | 76.1 | 75.5 b | 77.3 | 78.0 | 78.1 | 78.3 |
| Korea | 75.0 d | 74.7 | 75.7 | 75.3 | 74.5 | 75.4 | 76.2 |
| Latvia | 34.3 | 23.7 | 21.8 | 27.8 | 20.0 | 21.6 | 24.1 |
| Lithuania | 21 | 26 | 27 | 33 | 29 | 39 | 35 |
| Luxembourg | 79.7 | 18.1 b | 16.5 | .. | 47.1 | .. | .. |
| Mexico | 41.5 | 24.5 | 21.0 | 19.5 e p | 19.7 e p | 20.7 e p | .. |
| Netherlands | 46.3 | 51.6 b | 51.1 | 51.1 | 48.6 | 52.0 | .. |
| New Zealand | 41.1 | .. | 39.8 | .. | 43.8 | .. | 46.4 |
| Norway | 46.8 | .. | 43.1 | .. | 44.2 | 43.2 | 42.8 |
| Poland | 33.4 | 32.3 | 37.3 | 39.0 | 39.0 | 53.1 | .. |
| Portugal | 36.3 | 46.0 | 42.3 | 41.8 | 42.7 | 44.4 | 46.5 |
| Slovak Republic | 36.6 | 37.7 | 40.2 | 32.2 | 25.1 | 46.2 | 49.0 |
| Slovenia | 54.8 | 62.2 | 63.8 | 68.4 | 69.2 | 69.2 | .. |
| Spain | 46.3 | 45.6 | 46.3 | 46.4 | 45.8 | 46.7 | 47.8 |
| Sweden | 63.9 b | .. | 61.0 e | .. | 57.3 v | .. | 60.8 v |
| Switzerland | .. | 63.7 | .. | .. | 63.5 | .. | 67.0 |
| Turkey | 43.3 d | 41.1 | 43.4 | 45.3 | 44.6 | 46.7 | 49.4 |
| United Kingdom | 42.1 | 45.6 e | 46.2 | 48.0 e | 49.0 | 51.8 e | .. |
| United States | 63.3 d | 59.5 d | 61.1 d | 62.0 d | 62.5 d | 63.2 d p | 63.6 d e |
| EU28 (OECD estimates) | 53.7 e | 54.4 e | 54.5 e | 54.6 e | 54.6 e | 56.7 e | .. |
| OECD-Total | 62.2 e | 60.1 e | 60.7 e | 61.3 e | 61.4 e | 62.2 e | 62.8 e |
| Argentina | 31.0 | .. | .. | .. | 17.2 | 18.2 | 16.5 |
| China | 67.0 | 74.0 | 74.6 | 75.4 | 74.7 | 76.1 | 76.5 |
| Romania | 37.2 | 34.4 | 31.0 | 32.9 | 37.3 | 49.4 | .. |
| Russian Federation | 30.0 | 27.2 | 28.2 | 27.1 | 26.5 | 28.1 | 30.2 |
| Singapore | 58.6 | 52.3 | 51.6 | 53.0 | 52.8 | 51.8 | 52.2 |
| South Africa | 43.9 | 38.3 | 41.4 | 40.8 | 38.9 | 39.4 | .. |
| Chinese Taipei | 66.9 | 73.9 | 75.2 | 76.9 | 77.5 | 77.4 | 79.0 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 14. Percentage of Gross domestic expenditure on R&D (GERD) financed by government

Percentage

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Australia | .. | .. | .. | .. | .. | .. | .. |
| Austria | 35.9 e | 37.8 d e | 33.6 | 35.6 d e | 32.6 | 30.4 b d e | 29.5 p |
| Belgium | 24.7 | 24.5 | 24.3 | .. | 22.5 | .. | 20.0 |
| Canada | 31.8 e | 34.1 b e | 33.8 e | 32.1 b e | 31.6 e | 31.3 e | 31.9 p |
| Chile | .. | 36.0 | 38.4 | 44.2 b | 42.6 | 45.5 b | 47.0 p |
| Czech Republic | 45.2 | 36.8 | 34.7 | 32.9 | 32.2 | 35.6 | 34.6 |
| Denmark | 27.6 | 29.2 d e | 29.9 d | .. | 30.2 d | .. | 27.2 d p |
| Estonia | 43.5 | 38.3 | 47.2 | 49.5 | 46.4 | 37.6 | 40.2 |
| Finland | 25.7 | 26.7 | 26.0 | 27.5 | 28.9 | 28.9 | 29.1 |
| France | 38.6 | 35.4 | 35.3 | 34.3 b | 34.8 | 32.8 p | .. |
| Germany | 28.5 d | 29.2 d | 29.1 d | 28.7 d | 27.9 d | 28.5 d | 27.7 d |
| Greece | 46.8 | 50.4 | 52.3 | 53.3 | 53.1 | 42.6 | 37.6 |
| Hungary | 49.4 d | 36.9 | 35.9 | 33.5 | 34.6 | 26.2 | 31.9 |
| Iceland | 40.5 | .. | 37.2 b | 34.1 | 30.8 | 32.9 | 34.5 |
| Ireland | 32.0 | 27.5 e | 27.5 e | 27.4 e | 26.1 e | 25.8 e | .. |
| Israel ¹ | 14.5 d | 12.7 d | 12.7 d | 13.3 d | 12.7 d | 11.4 d e | .. |
| Italy | 50.7 | 42.5 | 41.4 | 39.7 e | 38.0 | 35.2 b | .. |
| Japan | 16.8 e | 16.8 e | 17.3 b e | 16.0 e | 15.4 e | 15.0 e | 15.0 e |
| Korea | 23.0 d | 23.8 | 22.8 | 23.0 | 23.7 | 22.7 | 21.6 |
| Latvia | 46.0 | 23.9 | 23.9 | 25.6 | 32.7 | 47.7 | 43.6 |
| Lithuania | 63 | 40 | 35 | 33 | 35 | 39 | 36 |
| Luxembourg | 16.6 | 45.1 b | 48.4 | .. | 47.7 | .. | .. |
| Mexico | 49.2 | 67.8 | 70.7 | 71.8 e p | 70.3 e p | 67.4 e p | .. |
| Netherlands | 38.8 | 32.4 b | 33.4 | 33.2 | 33.1 | 31.3 | .. |
| New Zealand | 43.2 | .. | 39.8 | .. | 37.1 | .. | 35.8 |
| Norway | 43.6 | .. | 45.8 | .. | 44.9 | 45.7 | 46.7 |
| Poland | 57.7 | 51.3 | 47.2 | 45.2 | 41.8 | 38.9 | .. |
| Portugal | 55.2 | 43.1 | 46.6 | 47.1 | 44.3 | 42.6 | 41.0 |
| Slovak Republic | 57.0 e | 41.6 e | 38.9 e | 41.4 e | 31.9 | 41.0 | 35.5 |
| Slovenia | 37.2 | 28.7 | 26.9 | 21.8 | 19.9 | 20.2 | .. |
| Spain | 43.0 | 43.1 | 41.6 | 41.4 | 40.9 | 40.0 | 38.9 |
| Sweden | 24.4 b | .. | 28.3 e | .. | .. c | .. | 25.0 v |
| Switzerland | .. | 23.6 | .. | .. | 24.4 | .. | 25.9 |
| Turkey | 50.1 d | 40.7 | 39.3 | 37.4 | 38.5 | 35.1 | 33.6 |
| United Kingdom | 32.7 | 28.7 e | 29.1 | 28.4 e | 27.7 | 26.3 e | .. |
| United States | 30.8 d | 29.6 d | 27.5 d | 25.9 d | 25.3 d | 23.6 d p | 22.8 d e p |
| EU28 (OECD estimates) | 35.2 e | 33.4 e | 33.0 e | 32.5 e | 31.8 e | 30.7 e | .. |
| OECD-Total | 29.7 e | 29.3 e | 28.3 e | 27.3 e | 26.8 e | 25.7 e | 25.1 e |
| Argentina | 65.3 | .. | .. | .. | 76.4 | 73.1 | 72.6 |
| China | 26.3 | 21.6 | 21.1 | 20.3 | 21.3 | 20.0 | 19.8 |
| Romania | 53.5 | 49.9 | 52.3 | 48.5 | 41.7 | 39.6 | .. |
| Russian Federation | 61.9 | 67.8 | 67.6 | 69.2 | 69.5 | 68.2 | 66.2 |
| Singapore | 35.7 | 39.4 | 40.2 | 38.0 | 38.2 | 38.9 | 37.4 |
| South Africa | 38.2 | 45.4 | 42.9 | 43.9 | 44.6 | 46.0 | .. |
| Chinese Taipei | 31.5 | 24.8 | 23.6 | 22.0 | 21.4 | 21.6 | 20.0 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 15. Percentage of Gross domestic expenditure on R&D (GERD) financed by other national sources

Percentage

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Australia | .. | .. | .. | .. | .. | .. | .. |
| Austria | 0.4 e | 0.5 d e | 1.1 | 0.5 d e | 1.1 | 0.5 d e | 0.6 d p |
| Belgium | 3.3 | 1.4 | 1.5 | .. | 2.4 | .. | 3.5 |
| Canada | 10.1 e | 12.8 b e | 13.7 e | 13.6 b e m | 14.0 e m | 15.9 e m | 16.3 p |
| Chile | .. | 11.6 | 12.5 | 10.2 b | 11.8 | 15.5 b | 17.1 p |
| Czech Republic | 1.2 | 0.9 | 0.5 | 0.7 | 0.8 | 0.9 | 1.1 |
| Denmark | 2.8 d | 3.8 d e | 4.4 d | .. | 4.4 d | .. | 5.4 d p |
| Estonia | 1.0 | 0.4 | 0.4 | 1.0 | 0.5 | 0.6 | 1.3 |
| Finland | 1.2 | 1.4 | 1.6 | 1.7 | 1.8 | 2.0 | 2.1 |
| France | 1.9 | 1.7 | 1.7 | 3.5 b | 3.5 | 3.9 p | .. |
| Germany | 0.3 d | 0.4 d | 0.3 d | 0.3 d | 0.4 d | 0.3 d | 0.3 d |
| Greece | 3.1 | 2.9 | 3.5 | 3.7 | 2.9 | 2.7 | 2.6 |
| Hungary | 0.3 d | 0.9 | 0.8 | 0.7 | 0.7 | 0.7 | 0.5 |
| Iceland | 0.3 | .. | 5.9 b | 6.9 | 8.1 | 8.1 | 4.6 |
| Ireland | 1.9 | 1.3 e | 1.3 e | 1.7 e | 1.6 e | 1.5 e | .. |
| Israel ¹ | 4.6 d | 2.2 d | 1.7 d | 1.2 d | 1.3 d | 1.9 d e | .. |
| Italy | 1.7 | 3.7 | 3.7 | 3.6 e | 3.7 | 2.9 b | .. |
| Japan | 6.8 e | 6.6 e | 6.7 b e | 6.3 e | 6.1 e | 6.2 e | 6.1 e |
| Korea | 1.3 d | 1.1 | 1.2 | 1.0 | 1.0 | 1.0 | 0.9 |
| Latvia | 1.2 | 2.0 | 2.7 | 2.3 | 2.2 | 2.9 | 2.5 |
| Lithuania | 6 | 1 | 1 | 0 | 2 | 3 | 4 |
| Luxembourg | 0.1 | 2.3 b | 2.8 | .. | 1.9 | .. | .. |
| Mexico | 8.2 | 7.3 | 8.0 | 8.4 e p | 9.6 e p | 11.4 e p | .. |
| Netherlands | 2.8 | 3.5 b | 3.4 | 3.1 | 2.7 | 2.7 | .. |
| New Zealand | 10.6 | .. | 13.2 | .. | 11.4 | .. | 10.1 |
| Norway | 1.6 | .. | 1.6 | .. | 1.6 | 1.7 | 1.7 |
| Poland | 3.2 | 3.0 | 2.3 | 2.4 | 2.4 | 2.6 | .. |
| Portugal | 3.8 | 5.7 | 5.0 | 5.4 | 5.7 | 4.9 | 5.1 |
| Slovak Republic | 0.3 | 2.1 | 2.9 | 2.7 | 3.6 | 2.1 | 1.7 |
| Slovenia | 0.7 | 0.5 | 0.4 | 0.6 | 0.3 | 0.4 | .. |
| Spain | 5.0 | 4.6 | 4.7 | 4.8 | 5.2 | 5.2 | 5.1 |
| Sweden | 3.6 b | .. | 4.1 e | .. | 4.3 v | .. | 4.0 v |
| Switzerland | .. | 1.6 | .. | .. | 1.9 | .. | 1.8 |
| Turkey | 5.8 d | 16.7 | 15.6 | 15.3 | 15.0 | 14.5 | 13.5 |
| United Kingdom | 5.9 | 5.9 e | 6.0 | 6.1 e | 6.3 | 6.4 e | .. |
| United States | 5.9 d | 6.8 d | 6.9 d | 7.0 d | 7.2 d | 7.4 d p | 7.5 d e p |
| EU28 (OECD estimates) | 2.3 e | 2.4 e | 2.4 e | 2.7 e | 2.7 e | 2.8 e | .. |
| OECD-Total | 4.9 e | 5.1 e | 5.2 e | 5.3 e | 5.3 e | 5.5 e | 5.4 e |
| Argentina | 2.9 | .. | .. | .. | 3.1 | 2.4 | 2.3 |
| China | .. | .. | .. | .. | .. | .. | .. |
| Romania | 4.0 | 1.2 | 1.2 | 1.5 | 1.8 | 1.2 | .. |
| Russian Federation | 0.5 | 1.0 | 1.2 | 1.2 | 1.4 | 1.0 | 1.0 |
| Singapore | 1.3 | 2.2 | 2.2 | 2.0 | 2.2 | 3.0 | 3.3 |
| South Africa | 4.4 | 3.2 | 2.8 | 3.1 | 3.5 | 2.9 | .. |
| Chinese Taipei | 1.5 | 1.1 | 1.1 | 1.0 | 1.0 | 0.9 | 0.9 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 16. Percentage of Gross domestic expenditure on R&D (GERD) financed by the rest of the world

Percentage

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|-----------|--------------|--------------|--------------|--------------|--------------|-----------|
| Australia | .. | .. | .. | .. | .. | .. | .. |
| Austria | 18.0 e | 16.1 e | 16.6 | 16.2 e | 16.6 | 16.0 e | 16.0 p |
| Belgium | 12.4 | 13.4 | 13.7 | .. | 16.5 | .. | 13.0 |
| Canada | 8.8 | 5.7 b | 5.8 | 8.1 b | 9.8 | 10.6 | 10.9 p |
| Chile | .. | 17.5 | 15.0 | 13.8 b | 12.9 | 3.9 b | 4.5 p |
| Czech Republic | 5.4 | 25.9 | 27.2 | 30.5 | 32.5 | 24.0 | 25.0 |
| Denmark | 10.1 | 7.2 e | 6.7 | .. | 6.3 | .. | 8.9 p |
| Estonia | 17.1 | 10.0 | 10.3 | 12.5 | 12.2 | 13.6 | 15.0 |
| Finland | 6.3 b | 8.8 | 11.5 | 17.3 | 14.5 | 12.1 | 10.8 |
| France | 7.5 | 7.6 | 7.9 | 7.6 b | 7.6 | 7.7 p | .. |
| Germany | 3.7 d | 4.3 d | 5.2 d | 5.0 d | 6.2 d | 5.9 d | 5.8 d |
| Greece | 19.0 | 15.8 | 14.0 | 13.2 | 12.7 | 14.6 | 15.0 |
| Hungary | 10.7 d | 15.4 | 16.6 | 17.5 | 15.0 | 16.6 | 14.9 |
| Iceland | 11.2 | .. | 20.0 b | 23.3 | 25.4 | 21.4 | 24.5 |
| Ireland | 8.6 | 21.0 e | 18.6 e | 18.7 e | 23.6 e | 23.6 e | .. |
| Israel ¹ | 24.7 d | 45.6 d | 49.8 d | 50.5 d | 52.9 d | 50.2 d e | .. |
| Italy | 8.0 | 9.5 | 9.7 | 9.4 e | 8.3 | 9.8 b | .. |
| Japan | 0.3 | 0.4 | 0.5 b | 0.4 | 0.5 | 0.7 | 0.6 |
| Korea | 0.7 d | 0.3 | 0.3 | 0.7 | 0.8 | 0.9 | 1.3 |
| Latvia | 18.5 | 50.4 | 51.6 | 44.2 | 45.0 | 27.8 | 29.8 |
| Lithuania | 10.5 | 33.2 | 37.1 | 33.8 | 34.3 | 19.2 | 24.4 |
| Luxembourg | 3.6 | 34.4 b | 32.3 | .. | 3.4 | .. | .. |
| Mexico | 1.1 | 0.4 | 0.4 | 0.4 e p | 0.5 e p | 0.6 e p | .. |
| Netherlands | 12.0 | 12.5 b | 12.2 | 12.7 | 15.5 | 13.9 | .. |
| New Zealand | 5.2 | .. | 7.2 | .. | 7.7 | .. | 7.7 |
| Norway | 8.1 | .. | 9.5 | .. | 9.2 | 9.5 | 8.8 |
| Poland | 5.7 | 13.3 | 13.1 | 13.4 | 16.7 | 5.5 | .. |
| Portugal | 4.7 | 5.2 | 6.1 | 5.6 | 7.4 | 8.0 | 7.3 |
| Slovak Republic | 6.0 | 18.7 | 18.0 | 23.7 | 39.4 | 10.7 | 13.7 |
| Slovenia | 7.3 | 8.6 | 8.9 | 9.3 | 10.6 | 10.2 | .. |
| Spain | 5.7 | 6.6 | 7.4 | 7.4 | 8.0 | 8.1 | 8.2 |
| Sweden | 8.1 b | .. | 6.7 e | .. | .. c | .. | 10.1 v |
| Switzerland | .. | 11.2 | .. | .. | 10.2 | .. | 5.2 |
| Turkey | 0.8 | 1.5 | 1.7 | 2.0 | 1.9 | 3.7 | 3.5 |
| United Kingdom | 19.3 | 19.8 e | 18.7 | 17.5 e | 17.1 | 15.6 e | .. |
| United States | .. k | 4.1 d | 4.5 d | 5.0 d | 5.0 d | 5.8 d p | 6.2 d e |
| EU28 (OECD estimates) | 8.7 e | 9.8 e | 10.1 e | 10.2 e | 10.9 e | 9.9 e | .. |
| OECD-Total | .. | 5.6 e | 5.8 e | 6.2 e | 6.5 e | 6.6 e | .. |
| Argentina | 0.8 | .. | .. | .. | 3.3 | 6.3 | 8.5 |
| China | 0.9 | 1.0 | 0.9 | 0.8 | 0.7 | 0.7 | 0.6 |
| Romania | 5.3 | 14.4 | 15.5 | 17.0 | 19.2 | 9.9 | .. |
| Russian Federation | 7.6 | 4.0 | 3.0 | 2.5 | 2.6 | 2.7 | 2.6 |
| Singapore | 4.4 | 6.0 | 6.0 | 7.0 | 6.8 | 6.3 | 7.1 |
| South Africa | 13.6 | 13.1 | 12.9 | 12.2 | 13.0 | 11.7 | .. |
| Chinese Taipei | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 17. Percentage of Gross domestic expenditure on R&D (GERD) performed by the business enterprise sector

Percentage

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Australia | .. | .. | 56.3 e | .. | 53.4 e | .. | .. |
| Austria | 69.8 e | 70.4 e | 70.8 | 71.3 e | 71.4 | 70.2 b e | 70.2 p |
| Belgium | 68.0 | 69.8 | 69.4 | 69.9 | 69.9 | 68.6 | 70.2 |
| Canada | 55.8 d | 51.6 b d | 51.2 d | 53.2 b | 53.3 | 52.6 | 51.8 p |
| Chile | .. | 34.4 | 35.0 | 33.4 b | 34.3 | 37.7 b | 34.2 p |
| Czech Republic | 58.2 b | 52.8 | 53.3 | 55.2 | 54.3 | 61.1 | 62.9 |
| Denmark | 68.3 | 65.6 | 63.3 | 63.8 | 63.5 | 65.1 | 64.7 p |
| Estonia | 45.1 | 57.5 | 47.7 | 43.5 | 46.1 | 51.5 | 47.2 |
| Finland | 70.8 | 68.7 | 68.9 | 67.7 | 66.7 | 65.8 | 65.3 |
| France | 62.1 | 64.6 | 64.6 | 63.6 b | 63.7 | 65.0 p | 65.0 e |
| Germany | 69.2 | 68.0 | 67.2 | 67.7 | 68.7 | 68.2 | 69.1 |
| Greece | 31.0 | 34.3 | 33.3 | 33.9 | 33.0 | 42.2 | 48.8 |
| Hungary | 43.2 d | 65.6 d | 69.4 d | 71.5 d | 73.4 d | 74.1 d | 73.1 d |
| Iceland | 51.5 | .. | 55.8 b d | 61.1 d | 66.0 d | 64.4 d | 64.3 d |
| Ireland | 65.5 | 71.8 e | 71.9 e | 71.0 e | 71.8 e | 72.2 e | .. |
| Israel ¹ | 81.5 d | 84.2 d | 84.2 d | 84.7 d | 85.2 d | 85.6 d e | 86.1 d e |
| Italy | 50.4 | 54.2 | 54.7 | 56.7 e | 58.2 | 60.8 b | 61.4 p |
| Japan | 76.4 | 76.6 | 76.1 b | 77.8 | 78.5 | 78.8 | 78.8 |
| Korea | 76.9 d | 77.9 | 78.5 | 78.2 | 77.5 | 77.7 | 79.4 |
| Latvia | 40.7 | 22.6 | 28.2 | 35.5 | 24.7 | 24.5 | 27.2 |
| Lithuania | 20.4 | 26.9 | 25.5 | 30.9 | 27.4 | 35.0 | 36.8 |
| Luxembourg | 86.4 | 55.3 b | 52.5 | 53.7 | 51.6 | 54.1 | 54.0 p |
| Mexico | 46.9 | 29.7 | 31.2 | 29.9 e p | 30.0 e p | 30.6 e p | .. |
| Netherlands | 52.9 | 56.6 b | 55.7 | 56.0 | 56.0 | 58.3 | 58.8 p |
| New Zealand | 41.6 | .. | 46.4 | .. | 51.1 | .. | 55.2 |
| Norway | 53.5 | 52.3 | 52.5 | 53.7 | 53.9 | 53.3 | 52.6 |
| Poland | 31.8 | 37.2 | 43.6 | 46.6 | 46.6 | 65.7 b | 64.5 p |
| Portugal | 38.5 | 49.7 | 47.5 | 46.4 | 46.4 | 48.4 | 50.4 |
| Slovak Republic | 49.8 | 41.3 | 46.3 | 36.8 | 28.0 | 50.4 | 54.1 |
| Slovenia | 58.8 | 75.7 | 76.5 | 77.3 | 76.3 | 75.7 | 74.7 p |
| Spain | 53.8 | 53.0 | 53.1 | 52.9 | 52.5 | 53.7 | 55.0 |
| Sweden | 72.8 b | 67.8 e | 68.9 e | 67.0 e | 69.7 v | 69.6 e | 71.3 v |
| Switzerland | .. | 71.5 | .. | .. | 71.0 | .. | 69.4 |
| Turkey | 33.8 | 45.1 | 47.5 | 49.8 | 50.0 | 54.2 | 56.9 |
| United Kingdom | 61.4 | 63.3 e | 63.9 | 65.1 e | 66.0 | 67.1 e | 67.6 p |
| United States | 68.9 d | 69.6 d | 70.9 d | 71.5 d | 71.9 d | 72.6 d p | 73.1 d e |
| EU28 (OECD estimates) | 62.1 e | 62.7 e | 62.7 e | 63.1 e | 63.6 e | 65.0 e | 65.8 e |
| OECD-Total | 67.7 e | 67.7 e | 68.2 e | 68.8 e | 69.1 e | 69.9 e | 70.5 e |
| Argentina | 32.2 | 25.3 p | 24.2 p | 20.1 p | 21.2 b | 23.9 | 25.0 |
| China | 68.3 | 76.2 | 76.6 | 77.3 | 76.8 | 77.5 | 77.6 |
| Romania | 49.7 | 39.0 | 30.7 | 41.5 | 44.0 | 55.2 | 56.7 p |
| Russian Federation | 68.0 | 58.3 | 60.6 | 59.6 | 59.2 | 58.7 | 60.1 |
| Singapore | 66.1 | 60.0 | 58.5 | 60.2 | 59.7 | 58.4 | 59.7 |
| South Africa | 58.3 | 44.3 | 45.9 | 45.3 | 42.7 | 41.4 | .. |
| Chinese Taipei | 67.0 | 74.1 | 75.3 | 76.8 | 77.4 | 77.3 | 78.7 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 18. Percentage of Gross domestic expenditure on R&D (GERD) performed by the higher education sector

Percentage

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Australia | .. | .. | 29.6 e | .. | 30.6 e | .. | .. |
| Austria | 24.7 e | 24.6 e | 24.3 | 23.7 e | 23.5 | 22.2 b e | 22.2 p |
| Belgium | 22.3 | 21.3 | 21.7 | 20.6 | 20.3 | 21.2 | 19.8 |
| Canada | 34.0 | 39.4 b | 39.5 | 37.7 b | 39.3 | 40.2 | 41.1 p |
| Chile | .. | 34.3 | 39.3 | 39.0 b | 38.5 | 43.1 b p | 45.8 p |
| Czech Republic | 18.6 | 27.5 | 27.2 | 25.4 | 24.9 | 20.4 | 19.6 |
| Denmark | 24.6 | 31.6 | 33.9 | 33.5 | 33.9 | 32.4 | 32.1 p |
| Estonia | 41.4 | 32.1 | 42.3 | 44.3 | 41.4 | 35.5 | 39.6 |
| Finland | 19.0 | 21.6 | 21.5 | 22.9 | 24.4 | 25.1 | 25.4 |
| France | 18.8 | 20.8 | 20.9 | 22.1 b | 22.0 | 20.7 p | 20.7 e |
| Germany | 16.8 | 17.7 | 17.9 | 17.7 | 17.3 | 18.0 b | 17.4 |
| Greece | 47.5 | 39.9 | 37.4 | 37.2 | 37.8 | 31.9 | 28.3 |
| Hungary | 25.1 d | 18.4 d | 14.4 d | 13.5 d | 12.1 d | 11.1 d | 13.3 d |
| Iceland | 22.0 | .. | 37.4 b | 32.8 | 29.4 | 30.8 | 31.5 |
| Ireland | 27.1 | 23.4 e | 23.5 e | 24.6 e | 23.8 e | 23.6 e | .. |
| Israel ¹ | 14.9 d | 12.8 d | 12.8 d | 12.5 d | 12.2 d | 11.8 d e | 11.4 d e |
| Italy | 30.2 b | 28.0 | 28.3 | 26.7 e | 25.5 e | 24.2 b e | 24.2 p |
| Japan | 13.4 | 13.4 | 13.5 b | 12.6 | 12.3 | 12.3 | 12.0 |
| Korea | 9.9 d | 9.5 | 9.2 | 9.0 | 9.1 | 9.1 | 8.5 |
| Latvia | 40.6 | 50.3 | 42.9 | 40.5 | 49.7 | 43.8 | 46.7 |
| Lithuania | 54.6 | 53.5 | 54.7 | 52.1 | 55.5 | 38.9 | 35.3 |
| Luxembourg | 1.5 | 16.9 b | 18.6 | 16.4 | 18.6 | 19.7 e | 19.7 e p |
| Mexico | 28.7 | 27.5 | 26.1 | 26.6 e p | 26.8 e p | 26.8 e p | .. |
| Netherlands | 34.7 | 31.6 b | 32.1 | 32.1 | 32.1 | 30.4 | 29.8 p |
| New Zealand | 32.5 | .. | 30.4 | .. | 28.0 | .. | 24.7 |
| Norway | 30.8 | 31.3 | 31.5 | 31.0 | 31.1 | 32.6 | 33.7 |
| Poland | 31.6 | 34.4 | 29.3 | 29.2 | 28.9 | 31.4 | 32.9 p |
| Portugal | 35.4 | 36.5 | 44.6 b | 45.6 | 45.5 | 44.7 | 42.5 |
| Slovak Republic | 20.4 | 34.0 | 33.1 | 34.4 | 43.8 | 27.7 | 24.7 |
| Slovenia | 16.7 | 11.1 | 10.4 | 10.5 | 10.2 | 10.8 | 11.2 p |
| Spain | 29.0 | 27.7 | 28.0 | 28.1 | 28.1 | 27.5 | 27.1 |
| Sweden | 22.0 b | 27.1 e | 27.1 e | 29.0 e | 26.7 v | 26.8 e | 24.9 v |
| Switzerland | .. | 26.1 | .. | .. | 26.7 | .. | 27.6 |
| Turkey | 54.6 | 43.9 | 42.1 | 40.5 | 39.7 | 36.3 | 33.5 |
| United Kingdom | 25.7 | 26.7 e | 26.4 | 25.8 e | 25.3 | 24.3 e | 23.7 p |
| United States | 14.3 d | 14.0 d | 13.5 d | 13.1 d | 13.1 d | 13.1 d p | 13.0 d e p |
| EU28 (OECD estimates) | 22.7 e | 23.5 e | 23.6 e | 23.5 e | 23.1 e | 22.6 e | 22.1 e |
| OECD-Total | 17.7 e | 18.3 e | 18.1 e | 17.7 e | 17.5 e | 17.5 e | 17.2 e |
| Argentina | 25.8 | 29.6 p | 29.1 p | 30.5 p | 26.0 | 25.8 | 26.0 |
| China | 9.9 | 7.6 | 7.2 | 6.9 | 7.0 | 6.8 | 7.2 |
| Romania | 13.7 | 19.7 | 19.7 | 15.2 | 17.4 | 11.3 | 10.6 p |
| Russian Federation | 5.8 | 9.3 | 9.0 | 9.8 | 9.6 | 9.1 | 9.0 |
| Singapore | 24.2 | 29.7 | 29.9 | 28.1 | 29.2 | 30.3 | 29.3 |
| South Africa | 19.3 | 30.7 | 28.4 | 28.5 | 30.5 | 32.7 | .. |
| Chinese Taipei | 11.4 | 11.6 | 11.1 | 10.4 | 9.9 | 9.4 | 8.9 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 19. Percentage of Gross domestic expenditure on R&D (GERD) performed by the government sector

Percentage

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|---------------|---------------|---------------|---------------|---------------|---------------|--------------|
| Australia | .. | .. | 11.2 e | .. | 12.7 e | .. | .. |
| Austria | 5.2 e | 4.6 e | 4.4 | 4.6 e | 4.6 | 7.1 b e | 7.1 p |
| Belgium | 8.4 | 8.5 b | 8.5 | 9.0 | 9.2 | 9.6 | 9.4 |
| Canada | 9.7 | 8.6 b | 8.9 | 8.6 b | 7.0 | 6.8 | 6.8 p |
| Chile | .. | 4.1 | 8.4 b | 8.1 b | 7.8 | 12.9 b | 13.1 p |
| Czech Republic | 22.8 b | 19.2 | 19.1 | 19.0 | 20.4 | 18.2 | 17.2 |
| Denmark | 6.5 | 2.4 | 2.4 | 2.3 | 2.2 | 2.2 | 3.0 p |
| Estonia | 11.3 | 9.3 | 8.9 | 11.0 | 10.8 | 11.4 | 11.8 |
| Finland | 9.6 | 9.0 | 8.9 | 8.6 | 8.2 | 8.2 | 8.5 |
| France | 17.8 | 13.2 | 13.1 | 12.7 b | 12.8 | 12.7 p | 12.7 e |
| Germany | 14.1 d | 14.3 d | 14.9 d | 14.6 d | 14.1 d | 13.8 d | 13.5 d |
| Greece | 20.3 | 24.8 | 28.0 | 27.7 | 28.1 | 25.0 | 22.1 |
| Hungary | 28.0 d | 14.4 d | 14.9 d | 13.7 d | 13.3 d | 13.4 d | 12.6 d |
| Iceland | 23.5 | .. | 6.8 b | 6.1 | 4.7 | 4.7 | 4.2 |
| Ireland | 7.4 | 4.8 e | 4.6 e | 4.4 e | 4.4 e | 4.2 e | .. |
| Israel ¹ | 2.7 d | 1.9 d | 1.9 d | 1.8 d | 1.7 d | 1.6 d e | 1.6 d e |
| Italy | 17.3 | 14.8 | 14.0 | 13.6 e | 13.1 | 12.6 b | 12.7 p |
| Japan | 8.3 | 8.6 | 9.2 b | 8.3 | 7.9 | 7.5 | 7.8 |
| Korea | 11.9 d | 11.3 | 10.9 | 11.2 | 11.7 | 11.5 | 10.7 |
| Latvia | 18.7 | 27.1 | 28.9 | 24.0 | 25.6 | 31.8 | 26.1 |
| Lithuania | 25.0 | 19.6 | 19.8 | 17.0 | 17.1 | 26.1 | 27.9 |
| Luxembourg | 12.1 d | 27.8 b d | 29.0 d | 29.9 d | 29.8 d | 26.3 d e | 26.3 e p |
| Mexico | 23.2 | 38.0 | 38.0 | 38.5 e p | 37.9 e p | 36.5 e p | .. |
| Netherlands | 12.4 d | 11.8 b d | 12.2 d | 11.9 d | 11.9 d | 11.3 d | 11.4 d p |
| New Zealand | 25.9 | .. | 23.2 | .. | 21.0 | .. | 20.1 |
| Norway | 15.7 | 16.4 | 16.0 | 15.2 | 15.0 | 14.2 | 13.7 |
| Poland | 36.4 | 28.0 | 26.8 | 24.0 | 24.4 | 2.5 b | 2.3 p |
| Portugal | 14.6 | 5.4 | 6.5 | 6.3 | 6.5 | 5.3 | 5.5 |
| Slovak Republic | 29.7 d | 24.5 d | 20.5 d | 28.3 d | 27.9 | 21.4 | 20.8 |
| Slovenia | 24.2 | 13.1 | 13.0 | 12.2 | 13.5 | 13.4 | 13.8 p |
| Spain | 17.0 | 19.1 | 18.7 | 18.8 | 19.1 | 18.5 | 17.7 |
| Sweden | 4.9 b | 4.8 e | 3.7 e | 3.7 e | 3.4 v | 3.4 e | 3.6 v |
| Switzerland | .. | 0.7 d | .. | .. | 0.9 d | .. | 0.8 d |
| Turkey | 11.6 | 11.0 | 10.4 | 9.7 | 10.3 | 9.5 d | 9.6 d |
| United Kingdom | 10.6 | 8.0 e | 7.9 | 7.3 e | 6.6 | 6.6 e | 6.5 p |
| United States | 12.3 d | 12.3 d | 11.5 d | 11.4 d | 11.0 d | 10.2 d p | 9.7 d e |
| EU28 (OECD estimates) | 14.1 e | 12.7 e | 12.7 e | 12.4 e | 12.2 e | 11.4 e | 11.3 e |
| OECD-Total | 12.0 e | 11.7 e | 11.4 e | 11.1 e | 10.9 e | 10.2 e | 9.9 e |
| Argentina | 39.7 | 43.4 p | 45.0 p | 47.7 p | 51.2 | 49.5 | 48.2 |
| China | 21.8 | 16.3 | 16.2 | 15.8 | 16.2 | 15.7 | 15.2 |
| Romania | 34.2 | 40.9 | 49.2 | 43.0 | 38.3 | 33.3 | 32.4 p |
| Russian Federation | 26.1 | 32.2 | 30.3 | 30.5 | 31.1 | 32.0 | 30.4 |
| Singapore | 9.7 | 10.2 | 11.6 | 11.7 | 11.1 | 11.2 | 11.0 |
| South Africa | 20.8 | 22.9 | 23.4 | 23.5 | 24.0 | 23.1 | .. |
| Chinese Taipei | 21.0 | 14.1 | 13.3 | 12.5 | 12.4 | 13.1 | 12.1 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 20. Percentage of Gross domestic expenditure on R&D (GERD) performed by the private non-profit sector

Percentage

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Australia | .. | .. | 2.84 e | .. | 3.24 e | .. | .. |
| Austria | 0.30 e | 0.44 e | 0.42 | 0.47 e | 0.49 | 0.49 e | 0.49 p |
| Belgium | 1.31 | 0.40 b | 0.37 | 0.46 | 0.55 | 0.61 | 0.56 |
| Canada | 0.53 | 0.47 b | 0.49 | 0.45 b | 0.47 | 0.45 | 0.40 p |
| Chile | .. | 27.23 | 17.28 b | 19.52 b | 19.35 | 6.36 b | 6.82 p |
| Czech Republic | 0.51 | 0.51 | 0.34 | 0.41 | 0.39 | 0.25 | 0.28 |
| Denmark | 0.67 | 0.41 | 0.42 | 0.41 | 0.35 | 0.35 | 0.30 p |
| Estonia | 2.20 | 1.05 | 1.06 | 1.19 | 1.80 | 1.54 | 1.41 |
| Finland | 0.58 | 0.68 | 0.71 | 0.77 | 0.77 | 0.86 | 0.82 |
| France | 1.29 | 1.44 | 1.47 | 1.51 b | 1.54 | 1.65 p | 1.65 e |
| Germany | .. | .. | .. | .. | .. | .. | .. |
| Greece | 1.26 | 0.96 | 1.25 | 1.24 | 1.12 | 0.89 | 0.80 |
| Hungary | .. | .. | .. | .. | .. | .. | .. |
| Iceland | 2.99 | .. | .. | .. | .. | .. | .. |
| Ireland | .. | .. | .. | .. | .. | .. | .. |
| Israel ¹ | 0.97 d | 1.06 d | 1.13 d | 0.99 d | 1.02 d | 0.99 d e | 0.95 d e |
| Italy | 2.12 | 2.96 | 2.99 | 3.04 e | 3.19 | 2.48 b | 1.69 p |
| Japan | 1.86 | 1.40 | 1.28 b | 1.34 | 1.33 | 1.38 | 1.38 |
| Korea | 1.36 d | 1.28 | 1.33 | 1.52 | 1.64 | 1.59 | 1.41 |
| Latvia | 0.00 | .. | .. | .. | .. | .. | .. |
| Lithuania | .. | .. | .. | .. | .. | .. | .. |
| Luxembourg | .. | .. | .. | .. | .. | .. | .. |
| Mexico | 1.13 | 4.80 | 4.68 | 4.87 e p | 5.41 e p | 6.23 e p | .. |
| Netherlands | .. | .. | .. | .. | .. | .. | .. |
| New Zealand | .. | .. | .. | .. | .. | .. | .. |
| Norway | .. | .. | .. | .. | .. | .. | .. |
| Poland | 0.31 | 0.40 | 0.29 | 0.30 | 0.16 | 0.44 | 0.35 p |
| Portugal | 11.52 | 8.47 | 1.33 b | 1.72 | 1.58 | 1.60 | 1.56 |
| Slovak Republic | 0.08 | 0.10 | 0.15 | 0.41 | 0.40 | 0.49 | 0.41 |
| Slovenia | 0.22 | 0.05 | 0.04 | 0.04 | 0.04 | 0.02 | 0.27 p |
| Spain | 0.14 | 0.19 | 0.17 | 0.17 | 0.20 | 0.24 | 0.21 |
| Sweden | 0.31 b | 0.29 e | 0.22 e | 0.24 e | 0.19 v | 0.19 e | 0.12 v |
| Switzerland | .. | 1.70 | .. | .. | 1.45 | .. | 2.21 |
| Turkey | .. | .. | .. | .. | .. | .. | .. |
| United Kingdom | 2.32 | 1.91 e | 1.79 | 1.81 e | 2.01 | 2.11 e | 2.19 p |
| United States | 4.44 d e | 4.11 d e | 4.04 d e | 4.04 d e | 4.03 d e | 4.12 d e p | 4.14 d e |
| EU28 (OECD estimates) | 1.08 e | 1.04 e | 0.96 e | 0.98 e | 1.00 e | 0.99 e | 0.91 e |
| OECD-Total | 2.65 e | 2.41 e | 2.32 e | 2.36 e | 2.38 e | 2.41 e | 2.37 e |
| Argentina | 2.23 | 1.68 p | 1.67 p | 1.75 p | 1.61 | 0.77 b | 0.92 |
| China | .. | .. | .. | .. | .. | .. | .. |
| Romania | 2.44 | 0.40 | 0.40 | 0.37 | 0.30 | 0.23 | 0.29 p |
| Russian Federation | 0.18 | 0.18 | 0.13 | 0.13 | 0.14 | 0.21 | 0.41 |
| Singapore | .. | .. | .. | .. | .. | .. | .. |
| South Africa | 1.60 | 2.11 | 2.27 | 2.65 | 2.76 | 2.85 | .. |
| Chinese Taipei | 0.48 | 0.30 | 0.32 | 0.33 | 0.31 | 0.30 | 0.24 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 21. Total researchers in headcount

Headcount

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|-----------|-----------|-------------|-----------|-----------|-----------|------------|
| Australia | .. | .. | .. | .. | .. | .. | .. |
| Austria | .. | .. | 71 448 d | .. | 78 051 d | .. | .. |
| Belgium | 48 757 | .. | 66 724 | .. | 73 709 b | .. | 78 867 |
| Canada | .. | .. | .. | .. | .. | .. | .. |
| Chile | .. | 10 447 d | 9 795 d | 12 303 d | 13 015 d | 14 181 d | 14 413 d p |
| Czech Republic | 37 542 | 47 651 | 51 455 | 54 493 | 56 605 | 56 178 | 59 789 |
| Denmark | 43 460 | 57 520 | 57 876 | 58 735 | 60 492 | 60 782 | .. |
| Estonia | 5 734 | 7 634 | 7 515 | 7 721 | 7 181 | 6 845 | 7 344 |
| Finland | 50 773 | 56 704 | 56 720 | 55 515 | 55 728 | 53 752 | 54 139 |
| France | 251 599 | 356 445 | 365 737 | 379 048 b | 383 843 | .. | .. |
| Germany | 406 253 | .. | 549 283 | .. | 586 030 | .. | 623 125 |
| Greece | 33 396 d | .. | 53 744 d | .. | 60 736 d | .. | 61 616 d |
| Hungary | 31 407 | 37 019 | 37 803 | 39 190 | 38 418 | 38 915 | 42 729 |
| Iceland | 3 821 | .. | 3 356 b | .. | 3 722 b | 3 935 | 3 783 |
| Ireland | 17 653 | 17 895 | 32 084 | .. | .. | .. | .. |
| Israel ¹ | .. | .. | .. | .. | .. | .. | .. |
| Italy | 125 534 | 157 960 | 163 925 | 168 074 | 174 327 | 185 916 b | .. |
| Japan | 861 901 d | 887 067 d | 892 406 d | 926 671 d | 907 455 d | 917 725 d | 930 720 d |
| Korea | 234 702 d | 401 724 | 410 333 | 437 447 | 453 262 | 460 769 | 482 796 |
| Latvia | 5 748 d | 7 995 d | 7 448 d | 7 939 d | 7 827 d | 7 400 d | 7 504 d |
| Lithuania | 11 918.00 | 17 677.00 | 18 083.00 | 19 371.00 | 17 293.00 | 17 746.00 | 18 767.00 |
| Luxembourg | 2 443 | .. | 2 713 | .. | 3 134 | .. | .. |
| Mexico | .. | 41 419 | 42 222 | 44 662 | 48 812 | 54 354 | .. |
| Netherlands | 57 782 | 107 184 b | 110 536 | 111 795 | 112 946 | 114 589 | .. |
| New Zealand | 22 186 | .. | 29 300 | .. | 31 000 | .. | .. |
| Norway | 36 555 | 46 747 | 47 795 | 50 025 | 52 181 | 54 601 | 57 934 |
| Poland | 97 875 | 103 627 | 109 611 | 115 375 | 118 494 | 132 547 | .. |
| Portugal | 37 769 | 81 750 | 78 290 b | 78 736 | 81 005 | 85 780 | 89 659 |
| Slovak Republic | 17 526 d | 25 069 d | 24 441 d | 25 080 d | 24 396 d | 21 048 | 20 951 |
| Slovenia | 7 644 | 12 362 | 12 111 | 12 155 | 11 308 | 11 282 | .. |
| Spain | 181 023 | 215 544 d | 208 767 d | 210 104 d | 214 227 d | 218 680 d | 225 995 d |
| Sweden | 82 459 d | .. | 101 820 b e | .. | 108 761 e | .. | 107 042 b |
| Switzerland | .. | 60 279 | .. | .. | 70 834 | .. | 73 502 |
| Turkey | 83 856 | 155 133 | 166 097 | 181 544 | 190 784 | 191 769 | 210 769 |
| United Kingdom | 364 807 e | 442 385 e | 466 689 | 489 181 e | 496 953 e | 510 980 e | .. |
| United States | .. | .. | .. | .. | .. | .. | .. |
| EU28 (OECD estimates) | .. | .. | .. | .. | .. | .. | .. |
| OECD-Total | .. | .. | .. | .. | .. | .. | .. |
| Argentina | 49 050 | 80 245 p | 81 964 p | 83 837 p | 82 407 | 83 947 | 83 190 |
| China | .. | 2 069 650 | .. | .. | .. | .. | .. |
| Romania | 29 608 | 27 838 | 27 600 | 27 535 | 27 253 | 27 801 | .. |
| Russian Federation | 391 121 e | 372 620 e | 369 015 e | 373 905 e | 379 411 e | 370 379 e | 359 793 |
| Singapore | 27 969 | 38 421 | 40 358 | 40 699 | 43 159 | 43 177 | 42 769 |
| South Africa | 39 266 | 42 828 | 45 935 | 48 479 | 51 877 | 56 761 | .. |
| Chinese Taipei | 115 954 | 179 830 | 180 353 | 182 119 | 183 571 | 185 472 | 188 474 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 22. Women researchers as a percentage of total researchers
Based on headcount

Percentage

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|--------|--------|----------|----------|--------|--------|----------|
| Australia | .. | .. | .. | .. | .. | .. | .. |
| Austria | .. | .. | 29.6 d | .. | 29.5 d | .. | .. |
| Belgium | 29.6 | .. | 33.4 | .. | 34.1 b | .. | 34.8 |
| Canada | .. | .. | .. | .. | .. | .. | .. |
| Chile | .. | 31.0 d | 34.3 d | 31.5 d | 33.0 d | 33.1 d | 34.4 d p |
| Czech Republic | 28.8 | 27.5 | 28.3 | 27.2 | 26.9 | 26.7 | 26.8 |
| Denmark | 29.7 | 35.4 e | 35.2 | .. | 33.8 | .. | .. |
| Estonia | 40.8 | 44.0 | 44.4 | 44.0 | 43.9 | 43.6 | 42.2 |
| Finland | 30.2 | 32.2 | 31.5 | 32.1 | 32.3 | 32.5 | 33.2 |
| France | 28.0 | 25.5 e | 25.5 e | 26.7 b e | 27.0 e | .. | .. |
| Germany | 21.3 | .. | 27.9 | .. | 28.0 | .. | 27.9 |
| Greece | 36.4 d | .. | 39.4 d | .. | 38.0 d | .. | 37.8 d |
| Hungary | 34.2 | 30.9 | 30.3 | 30.4 | 30.8 | 30.8 | 30.5 |
| Iceland | 39.3 | .. | 43.8 b | .. | 45.6 b | 47.2 | 46.4 |
| Ireland | 30.3 | .. | 35.3 | .. | .. | .. | .. |
| Israel ¹ | .. | .. | .. | .. | .. | .. | .. |
| Italy | 32.3 | 35.5 | 35.7 | 36.0 | 36.0 | 35.2 b | .. |
| Japan | 11.9 d | 14.4 d | 14.6 d | 14.7 d | 15.3 d | 15.7 d | 16.2 d |
| Korea | 12.9 d | 17.7 | 18.2 | 18.5 | 18.9 | 19.7 | 20.1 |
| Latvia | 51.5 d | 52.8 d | 52.0 d | 52.1 d | 51.0 d | 52.2 d | 52.2 d |
| Lithuania | 48.65 | 52.36 | 51.22 | 50.25 | 50.74 | 51.57 | 49.51 |
| Luxembourg | 18.2 | .. | 27.3 | .. | 28.9 | .. | .. |
| Mexico | .. | 32.8 | 33.0 | .. | .. | .. | .. |
| Netherlands | 21.0 | 24.0 b | 23.6 | 23.4 | 25.4 | 25.8 | .. |
| New Zealand | .. | .. | .. | .. | .. | .. | .. |
| Norway | 31.6 | 36.2 | 36.9 | 37.4 | 37.4 | 37.6 | 38.1 |
| Poland | 39.3 | 38.3 | 37.8 | 37.2 | 37.0 | 36.4 | .. |
| Portugal | 44.4 | 45.0 | 45.4 b | 44.3 | 44.1 | 43.5 | 43.7 |
| Slovak Republic | 41.5 d | 42.3 d | 42.7 d | 42.5 d | 42.2 d | 39.5 | 39.7 |
| Slovenia | 34.8 | 35.8 | 36.0 | 36.1 | 36.5 | 34.5 | .. |
| Spain | 36.7 | 38.8 d | 39.3 d | 39.6 d | 40.0 d | 40.2 d | 40.5 d |
| Sweden | 35.7 d | .. | 33.3 b e | .. | 33.7 e | .. | 32.6 b |
| Switzerland | .. | 32.4 | .. | .. | 33.5 | .. | 34.9 |
| Turkey | 36.1 | 36.2 | 36.2 | 36.9 | 37.3 | 36.7 | 37.0 |
| United Kingdom | 35.7 e | 37.8 e | 38.1 | 37.4 e | 38.6 e | 38.7 e | .. |
| United States | .. | .. | .. | .. | .. | .. | .. |
| EU28 (OECD estimates) | .. | .. | .. | .. | .. | .. | .. |
| OECD-Total | .. | .. | .. | .. | .. | .. | .. |
| Argentina | 50.5 | 52.6 p | 52.4 p | 52.9 p | 52.6 | 53.0 | 54.1 |
| China | .. | .. | .. | .. | .. | .. | .. |
| Romania | 45.3 | 45.1 | 45.7 | 46.0 | 46.2 | 45.8 | .. |
| Russian Federation | 42.4 e | 41.2 e | 40.9 e | 40.5 e | 40.3 e | 40.0 e | 39.5 |
| Singapore | 26.3 | 29.6 | 29.6 | 30.1 | .. | .. | .. |
| South Africa | 39.7 | 43.7 | 44.0 | 44.3 | 45.0 | 45.1 | .. |
| Chinese Taipei | 19.6 | 21.8 | 22.0 | 22.1 | 22.2 | 22.4 | 22.6 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 23. Business enterprise expenditure on R&D (BERD) at current prices and PPP

Million USD

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Australia | 7 515.5 | .. | 13 025.4 | .. | 11 301.5 | .. | .. |
| Austria | 4 770.9 e | 8 038.4 e | 8 504.0 | 9 169.6 e | 9 389.6 | 9 901.9 b e | 10 507.4 p |
| Belgium | 4 233.8 | 7 479.2 | 7 885.3 | 8 342.7 | 8 847.8 | 9 380.4 | 10 665.6 |
| Canada | 12 886.0 d | 13 417.9 d | 13 560.5 d | 14 798.1 b | 14 386.2 | 14 502.5 | 14 059.8 p |
| Chile | .. | 466.7 | 536.4 | 506.5 | 532.4 | 580.0 | 544.6 p |
| Czech Republic | 1 523.5 b | 2 874.8 | 3 246.9 | 3 698.3 | 3 722.4 | 3 824.1 | 4 533.7 |
| Denmark | 3 023.3 | 4 897.4 | 4 936.6 | 5 023.4 | 5 406.7 | 5 864.7 | 6 171.1 p |
| Estonia | 93.2 | 420.3 | 297.8 | 236.9 | 259.5 | 261.0 | 268.0 |
| Finland | 3 958.3 | 5 167.9 | 5 083.5 | 4 860.5 | 4 459.8 | 4 339.3 | 4 592.9 |
| France | 24 554.5 | 35 581.4 | 37 688.6 | 38 551.3 | 39 279.2 | 40 494.9 p | 42 006.3 e |
| Germany | 44 288.0 | 68 327.0 | 69 136.9 | 74 123.8 | 78 353.2 | 81 739.0 | 91 209.4 |
| Greece | 504.0 | 669.8 | 774.1 | 825.3 | 922.3 | 1 233.0 | 1 695.4 |
| Hungary | 685.1 d | 1 899.9 d | 2 333.8 d | 2 437.9 d | 2 595.8 d | 2 352.7 d | 2 779.3 d |
| Iceland | 152.9 | .. | 135.9 b d | 178.1 d | 234.4 d | 240.7 d | 257.2 d |
| Ireland | 1 314.6 | 2 383.4 e | 2 492.4 | 2 572.3 e | 2 758.6 | 2 830.2 e | 3 477.9 |
| Israel ¹ | 5 677.4 d | 8 788.5 d | 9 491.5 d | 9 953.2 d | 10 792.0 d | 12 061.9 d | 13 250.7 d e |
| Italy | 9 186.6 | 14 854.5 | 15 570.9 | 16 688.8 | 17 449.5 | 19 735.6 b | 20 605.3 p |
| Japan | 98 384.0 | 116 716.3 | 125 287.5 | 131 839.8 | 132 293.7 | 129 751.5 | 134 662.3 |
| Korea | 23 531.2 d | 50 559.8 | 53 573.7 | 57 180.5 | 59 643.5 | 62 550.0 | 72 243.4 |
| Latvia | 66.9 | 64.9 | 78.9 | 116.2 | 75.6 | 54.6 | 76.4 |
| Lithuania | 73.54 | 177.49 | 190.88 | 262.83 | 239.47 | 256.27 | 310.90 |
| Luxembourg | 431.1 | 342.3 b | 355.1 | 382.7 | 388.0 | 428.3 | 435.2 p |
| Mexico | 2 510.0 | 2 909.8 | 3 214.3 | 3 449.3 e p | 3 497.1 e p | 3 440.4 e p | .. |
| Netherlands | 5 761.6 | 8 585.1 b | 8 888.9 | 9 190.7 | 9 470.7 | 10 176.0 | 10 911.5 p |
| New Zealand | 495.1 | .. | 861.7 | .. | 1 085.8 | .. | 1 461.8 |
| Norway | 1 752.6 | 2 779.1 | 2 949.9 | 3 118.9 | 3 267.4 | 3 292.1 | 3 613.8 |
| Poland | 947.8 | 2 973.6 | 3 570.4 | 4 262.3 | 4 766.6 | 6 667.1 b | 7 583.1 p |
| Portugal | 695.5 | 1 905.1 | 1 838.4 | 1 789.6 | 1 772.5 | 1 987.7 | 2 245.9 |
| Slovak Republic | 219.8 | 479.6 | 575.4 | 508.2 | 527.4 | 666.6 | 841.1 |
| Slovenia | 398.0 | 1 158.7 | 1 211.9 | 1 164.5 | 1 093.2 | 1 043.7 | 1 039.7 p |
| Spain | 7 128.0 | 10 208.0 | 10 234.7 | 10 242.7 | 10 412.9 | 10 871.0 | 12 053.8 |
| Sweden | 7 564.0 b | 9 470.3 e | 9 995.0 | 9 514.1 e | 10 797.1 | 11 079.7 e | 12 525.9 |
| Switzerland | .. | 10 542.8 | .. | .. | 12 675.6 | .. | 13 116.0 |
| Turkey | 1 554.8 | 5 776.5 | 6 569.7 | 7 931.2 | 8 870.5 | 10 690.0 | 12 359.0 |
| United Kingdom | 18 809.0 | 24 381.2 | 26 534.1 | 28 541.9 | 30 165.0 | 31 811.5 | 33 345.9 p |
| United States | 226 159.0 d | 302 251.0 d | 322 528.0 d | 340 728.0 d | 355 821.0 d | 374 685.0 d | 397 064.0 d e |
| EU28 (OECD estimates) | 141 009.5 e | 213 891.5 e | 222 834.6 e | 234 273.3 e | 245 515.6 e | 259 576.9 e | 282 986.3 e |
| OECD-Total | 526 863.4 e | 739 582.9 e | 784 384.7 e | 827 220.0 e | 857 570.3 e | 894 908.5 e | 959 075.0 e |
| Argentina | 734.3 | 1 333.8 p | 1 292.9 p | 1 011.4 p | 1 161.5 b | 1 118.8 | 1 254.5 |
| China | 59 326.1 | 222 507.6 | 255 971.4 | 286 465.3 | 312 902.2 | 349 685.3 | 384 821.3 |
| Romania | 420.0 | 715.9 | 470.5 | 650.6 | 920.3 | 1 246.6 | 1 488.9 p |
| Russian Federation | 12 317.7 | 22 116.5 | 23 397.5 | 24 040.8 | 22 957.7 | 22 744.9 | 25 181.2 |
| Singapore | 3 354.1 | 4 834.2 | 5 027.2 | 5 925.3 | 6 372.2 | 6 183.4 | 6 255.4 |
| South Africa | 2 357.3 | 2 141.9 | 2 285.4 | 2 486.2 | 2 485.0 | 2 521.9 | .. |
| Chinese Taipei | 10 264.3 | 21 606.6 | 23 286.9 | 25 139.5 | 26 199.8 | 27 760.5 | 30 942.8 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 24. Business enterprise expenditure on R&D (BERD) as a percentage of GDP

Percentage

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Australia | 1.05 | .. | 1.18 | .. | 1.00 | .. | .. |
| Austria | 1.66 e | 2.05 e | 2.09 | 2.20 e | 2.18 | 2.19 b e | 2.22 p |
| Belgium | 1.21 | 1.59 | 1.62 | 1.67 | 1.72 | 1.75 | 1.90 |
| Canada | 1.10 d | 0.91 d | 0.87 d | 0.91 b | 0.90 | 0.89 | 0.82 p |
| Chile | .. | 0.12 | 0.14 | 0.13 | 0.13 | 0.14 | 0.12 p |
| Czech Republic | 0.68 b | 0.94 | 1.01 | 1.09 | 1.05 | 1.03 | 1.13 |
| Denmark | 1.63 | 1.95 | 1.88 | 1.86 | 1.94 | 2.02 | 1.97 p |
| Estonia | 0.42 | 1.22 | 0.82 | 0.62 | 0.68 | 0.64 | 0.61 |
| Finland | 2.36 | 2.35 | 2.26 | 2.15 | 1.93 | 1.81 | 1.80 |
| France | 1.27 | 1.44 | 1.44 | 1.45 | 1.44 | 1.44 p | 1.42 e |
| Germany | 1.68 | 1.95 | 1.90 | 1.94 | 2.00 | 1.99 | 2.10 |
| Greece | 0.18 | 0.24 | 0.27 | 0.28 | 0.32 | 0.42 | 0.55 |
| Hungary | 0.40 d | 0.83 d | 0.96 d | 0.97 d | 1.00 d | 0.89 d | 0.99 d |
| Iceland | 1.38 | .. | 0.95 b d | 1.19 d | 1.45 d | 1.37 d | 1.35 d |
| Ireland | 0.78 | 1.12 e | 1.12 | 1.08 e | 0.85 | 0.84 e | 0.94 |
| Israel ¹ | 3.30 d | 3.50 d | 3.45 d | 3.54 d | 3.63 d | 3.76 d | 3.91 d e |
| Italy | 0.53 | 0.69 | 0.72 | 0.76 | 0.78 | 0.83 b | 0.83 p |
| Japan | 2.43 | 2.46 | 2.52 | 2.64 | 2.58 | 2.48 | 2.53 |
| Korea | 2.02 d | 3.14 | 3.26 | 3.35 | 3.27 | 3.29 | 3.62 |
| Latvia | 0.22 | 0.15 | 0.17 | 0.24 | 0.15 | 0.11 | 0.14 |
| Lithuania | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 | 0.3 | 0.3 |
| Luxembourg | 1.36 | 0.70 b | 0.68 | 0.68 | 0.66 | 0.70 | 0.68 p |
| Mexico | 0.19 | 0.14 | 0.16 | 0.16 e p | 0.16 e p | 0.15 e p | .. |
| Netherlands | 0.94 | 1.08 b | 1.07 | 1.11 | 1.11 | 1.16 | 1.17 p |
| New Zealand | 0.47 | .. | 0.54 | .. | 0.63 | .. | 0.75 |
| Norway | 0.79 | 0.85 | 0.87 | 0.92 | 1.04 | 1.08 | 1.10 |
| Poland | 0.18 | 0.33 | 0.38 | 0.44 | 0.47 | 0.63 b | 0.67 p |
| Portugal | 0.29 | 0.68 | 0.63 | 0.60 | 0.58 | 0.62 | 0.67 |
| Slovak Republic | 0.25 | 0.33 | 0.38 | 0.32 | 0.33 | 0.40 | 0.48 |
| Slovenia | 0.83 | 1.95 | 1.97 | 1.83 | 1.67 | 1.52 | 1.39 p |
| Spain | 0.59 | 0.68 | 0.67 | 0.65 | 0.64 | 0.64 | 0.66 |
| Sweden | 2.46 b | 2.22 e | 2.28 | 2.11 e | 2.27 | 2.27 e | 2.42 |
| Switzerland | .. | 2.28 | .. | .. | 2.39 | .. | 2.34 |
| Turkey | 0.19 | 0.38 | 0.39 | 0.43 | 0.44 | 0.51 | 0.55 |
| United Kingdom | 0.96 | 1.01 | 1.05 | 1.08 | 1.10 | 1.13 | 1.12 p |
| United States | 1.73 d | 1.87 d | 1.92 d | 1.94 d | 1.95 d | 2.00 d | 2.04 d e |
| EU28 (OECD estimates) | 1.03 e | 1.20 e | 1.20 e | 1.23 e | 1.24 e | 1.26 e | 1.30 e |
| OECD-Total | 1.45 e | 1.56 e | 1.59 e | 1.62 e | 1.62 e | 1.64 e | 1.67 e |
| Argentina | 0.14 | 0.16 p | 0.15 p | 0.12 p | 0.13 b | 0.13 | 0.14 |
| China | 0.89 | 1.46 | 1.53 | 1.57 | 1.59 | 1.64 | 1.66 |
| Romania | 0.21 | 0.19 | 0.12 | 0.16 | 0.21 | 0.27 | 0.29 p |
| Russian Federation | 0.67 | 0.60 | 0.62 | 0.64 | 0.65 | 0.64 | 0.67 e |
| Singapore | 1.42 | 1.17 | 1.13 | 1.26 | 1.31 | 1.22 | 1.17 |
| South Africa | 0.50 | 0.32 | 0.33 | 0.35 | 0.34 | 0.34 | .. |
| Chinese Taipei | 1.56 | 2.19 | 2.27 | 2.32 | 2.37 | 2.45 | 2.59 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 25. Business enterprise expenditure on R&D (BERD) at 2010 prices and PPP

Million 2010 USD

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Australia | 8 607.1 | .. | 12 163.0 | .. | 10 879.8 | .. | .. |
| Austria | 5 452.5 e | 7 472.1 e | 7 620.2 | 8 059.0 e | 8 075.1 | 8 300.2 b e | 8 599.6 p |
| Belgium | 4 928.4 | 7 065.8 | 7 229.1 | 7 538.4 | 7 911.7 | 8 175.9 | 9 001.9 |
| Canada | 14 168.8 d | 13 083.7 d | 12 781.8 d | 13 753.3 b | 13 686.3 | 13 658.7 | 12 985.8 p |
| Chile | .. | 431.9 | 490.2 | 459.0 | 489.9 | 531.1 | 469.7 p |
| Czech Republic | 1 745.6 b | 2 755.0 | 2 949.5 | 3 257.3 | 3 299.7 | 3 314.8 | 3 790.1 |
| Denmark | 3 856.0 | 4 736.3 | 4 601.2 | 4 617.9 | 4 931.7 | 5 259.9 | 5 244.7 p |
| Estonia | 122.1 | 393.8 | 270.2 | 210.5 | 232.7 | 229.0 | 227.5 |
| Finland | 4 704.7 | 4 936.4 | 4 718.6 | 4 445.6 | 4 013.4 | 3 863.6 | 3 951.8 |
| France | 28 557.8 | 34 418.5 | 34 776.1 | 35 190.4 | 35 491.4 | 35 779.5 p | 36 056.7 e |
| Germany | 50 629.9 | 65 100.9 | 63 580.4 | 66 482.6 | 69 716.7 | 70 893.0 | 76 449.0 |
| Greece | 570.8 | 632.5 | 690.2 | 725.6 | 810.8 | 1 071.5 | 1 430.0 |
| Hungary | 866.0 d | 1 785.8 d | 2 120.0 d | 2 218.8 d | 2 373.8 d | 2 166.4 d | 2 491.5 d |
| Iceland | 164.8 | .. | 128.6 b d | 164.3 d | 209.8 d | 211.4 d | 218.4 d |
| Ireland | 1 507.1 | 2 296.7 e | 2 336.1 | 2 440.0 e | 2 407.6 | 2 493.1 e | 3 000.5 |
| Israel ¹ | 5 865.0 d | 8 272.3 d | 8 488.0 d | 9 050.6 d | 9 521.7 d | 10 275.4 d | 11 055.1 d e |
| Italy | 11 116.5 | 13 964.8 | 14 261.2 | 15 188.0 | 15 709.1 | 16 978.5 b | 17 199.4 p |
| Japan | 108 432.3 | 111 695.9 | 116 871.3 | 122 961.2 | 121 259.1 | 117 688.5 | 122 204.4 |
| Korea | 24 826.1 d | 50 077.0 | 53 486.8 | 56 929.6 | 57 027.9 | 59 001.4 | 66 902.7 |
| Latvia | 81.4 | 61.2 | 72.2 | 104.1 | 67.7 | 48.2 | 64.9 |
| Lithuania | 89.4 | 165.1 | 171.7 | 233.6 | 213.6 | 226.1 | 263.9 |
| Luxembourg | 522.6 | 312.1 b | 314.3 | 325.6 | 330.1 | 357.3 | 351.2 p |
| Mexico | 3 025.9 | 2 704.3 | 2 951.9 | 3 095.5 e p | 3 159.8 e p | 3 077.5 e p | .. |
| Netherlands | 6 557.0 | 8 152.6 b | 8 069.1 | 8 432.9 | 8 633.4 | 9 239.0 | 9 556.9 p |
| New Zealand | 588.2 | .. | 782.0 | .. | 992.9 | .. | 1 263.4 |
| Norway | 2 078.9 | 2 598.2 | 2 684.2 | 2 840.0 | 3 119.7 | 3 172.8 | 3 367.1 |
| Poland | 1 133.8 | 2 800.8 | 3 289.4 | 3 918.7 | 4 342.7 | 6 064.4 b | 6 698.4 p |
| Portugal | 815.5 | 1 863.2 | 1 694.8 | 1 624.3 | 1 592.8 | 1 746.6 | 1 939.0 |
| Slovak Republic | 262.8 | 468.2 | 544.0 | 475.6 | 500.5 | 626.1 | 776.8 |
| Slovenia | 433.4 | 1 084.9 | 1 086.7 | 1 037.5 | 970.4 | 910.0 | 872.1 p |
| Spain | 8 313.7 | 9 749.1 | 9 457.4 | 9 308.4 | 9 446.1 | 9 698.8 | 10 391.4 |
| Sweden | 8 890.1 b | 8 880.9 e | 9 214.0 | 8 747.4 e | 9 865.3 | 10 130.1 e | 11 016.0 |
| Switzerland | .. | 9 720.4 | .. | .. | 10 795.0 | .. | 10 898.9 |
| Turkey | 2 069.7 | 5 507.8 | 6 186.1 | 7 174.3 | 7 829.8 | 9 386.5 | 10 764.1 |
| United Kingdom | 21 225.6 | 23 531.7 | 24 911.7 | 26 467.0 | 27 608.4 | 28 785.7 | 29 204.7 p |
| United States | 248 639.6 d | 290 495.2 d | 304 637.4 d | 315 852.3 d | 326 353.5 d | 339 938.0 d | 353 522.0 d e |
| EU28 (OECD estimates) | 163 572.8 e | 204 115.6 e | 205 315.5 e | 212 700.3 e | 220 728.9 e | 228 621.3 e | 241 242.2 e |
| OECD-Total | 588 615.3 e | 710 264.8 e | 735 552.8 e | 765 946.8 e | 783 909.1 e | 806 414.5 e | 846 939.0 e |
| Argentina | 807.3 | 1 283.2 p | 1 224.1 p | 940.7 p | 1 068.7 b | 1 008.9 | 1 105.4 |
| China | 65 139.7 | 214 306.4 | 242 748.0 | 266 963.9 | 288 547.2 | 318 560.5 | 345 076.2 e |
| Romania | 613.0 | 674.4 | 440.3 | 606.7 | 853.9 | 1 104.9 | 1 274.5 p |
| Russian Federation | 17 854.7 | 20 408.9 | 21 548.8 | 22 286.4 | 22 088.3 | 21 813.1 | 22 903.1 e |
| Singapore | 3 689.6 | 4 649.0 | 4 748.8 | 5 495.7 | 5 846.2 | 5 610.5 | 5 568.1 |
| South Africa | 2 593.9 | 2 060.6 | 2 163.7 | 2 312.4 | 2 285.4 | 2 280.9 | .. |
| Chinese Taipei | 11 284.6 | 20 765.7 | 21 996.1 | 23 304.5 | 24 030.2 | 25 186.3 | 27 550.2 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 26. Business enterprise expenditure on R&D (BERD) as a percentage of value added in industry

Percentage

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Australia | 1.55 | .. | 1.78 | .. | 1.56 | .. | .. |
| Austria | 2.52 e | 3.15 e | 3.22 | 3.38 e | 3.35 | 3.43 b e | 3.46 e p |
| Belgium | 1.92 | 2.57 | 2.64 | 2.72 | 2.79 | 2.86 | 3.10 e |
| Canada | 1.67 d | 1.43 d | 1.36 d | 1.42 b | 1.44 e | 1.42 e | 1.31 e p |
| Chile | .. | 0.18 | 0.19 | 0.18 | 0.19 e | 0.21 e | 0.18 e p |
| Czech Republic | 0.98 b | 1.38 | 1.49 | 1.58 | 1.52 | 1.49 | 1.64 e |
| Denmark | 2.83 | 3.41 | 3.26 | 3.20 | 3.34 | 3.52 | 3.41 e p |
| Estonia | 0.61 | 1.84 | 1.24 | 0.97 | 1.08 | 1.05 | 1.00 e |
| Finland | 3.85 | 4.12 | 4.00 | 3.80 | 3.42 | 3.20 | 3.13 e |
| France | 2.15 | 2.50 | 2.52 | 2.53 | 2.52 | 2.52 p | 2.49 e |
| Germany | 2.61 | 3.07 | 3.00 | 3.06 | 3.14 | 3.14 | 3.31 e |
| Greece | 0.29 | 0.46 | 0.51 | 0.53 | 0.59 | 0.80 | 1.04 e |
| Hungary | 0.63 d | 1.33 d | 1.54 d | 1.54 d | 1.60 d | 1.43 d | 1.57 d e |
| Iceland | 2.38 | .. | 1.58 b d | 2.02 d | 2.44 d | 2.25 d e | 2.22 d e |
| Ireland | 1.14 | 1.63 e | 1.61 | 1.54 e | 1.12 | 1.09 e | 1.21 e |
| Israel ¹ | 5.46 d e | 5.91 d | 5.79 d | 6.07 d e | 6.20 d e | 6.44 d e | 6.70 d e |
| Italy | 0.83 | 1.13 | 1.18 | 1.25 | 1.28 | 1.37 b | 1.37 e p |
| Japan | 3.21 | 3.43 | 3.51 | 3.68 | 3.56 | 3.42 e | 3.49 e |
| Korea | 2.95 d | 4.56 | 4.73 | 4.89 | 4.77 | 4.83 e | 5.31 e |
| Latvia | 0.32 | 0.23 | 0.27 | 0.39 | 0.25 | 0.17 | 0.22 e |
| Lithuania | 0.2 | 0.3 | 0.3 | 0.4 | 0.4 | 0.4 | 0.5 e |
| Luxembourg | 2.04 | 1.05 b | 1.02 | 1.00 | 0.94 | 1.01 | 0.99 e p |
| Mexico | 0.25 | 0.19 | 0.21 | 0.22 e p | 0.22 e p | 0.20 e p | .. |
| Netherlands | 1.45 | 1.66 b | 1.66 | 1.73 | 1.72 | 1.80 | 1.81 e p |
| New Zealand | 0.69 | .. | 0.83 | .. | 0.97 | .. | 1.17 e |
| Norway | 1.19 | 1.29 | 1.33 | 1.43 | 1.68 | 1.79 e | 1.82 e |
| Poland | 0.26 | 0.46 | 0.54 | 0.62 | 0.66 | 0.89 b | 0.94 p |
| Portugal | 0.49 | 1.16 | 1.08 | 1.03 | 0.98 | 1.06 | 1.16 e |
| Slovak Republic | 0.35 | 0.46 | 0.54 | 0.45 | 0.45 | 0.56 | 0.67 e |
| Slovenia | 1.25 | 3.02 | 3.07 | 2.80 | 2.56 | 2.33 | 2.11 e p |
| Spain | 0.88 | 1.08 | 1.09 | 1.05 | 1.02 | 1.01 | 1.05 e |
| Sweden | 3.98 b | 3.59 e | 3.70 | 3.42 e | 3.65 | 3.67 e | 3.91 e |
| Switzerland | .. | 3.19 | .. | .. | 3.38 | .. | 3.32 e |
| Turkey | 0.28 | 0.55 | 0.57 | 0.62 | 0.63 | 0.74 | 0.78 e |
| United Kingdom | 1.57 | 1.70 | 1.74 | 1.79 | 1.84 | 1.87 | 1.87 e p |
| United States | 2.67 d | 2.97 d | 3.05 d | 3.07 d | 3.08 d | 3.17 d | 3.21 d e |
| EU28 (OECD estimates) | 1.63 e | 1.93 e | 1.94 e | 1.98 e | 1.99 e | 2.03 e | 2.08 e |
| OECD-Total | 2.19 e | 2.42 e | 2.46 e | 2.50 e | 2.50 e | 2.54 e | 2.58 e |
| Argentina | 0.20 | 0.26 p | 0.24 e p | 0.19 e p | 0.21 b e | 0.20 e | 0.22 e |
| China | 1.12 e | 1.86 e | 1.97 e | 2.04 e | 2.09 e | 2.21 e | 2.25 e |
| Romania | 0.29 | 0.27 | 0.17 | 0.23 | 0.31 e | 0.38 e | 0.41 e p |
| Russian Federation | 0.95 e | 0.88 e | 0.93 e | 0.93 e | 0.91 e | 0.91 e | 0.94 e |
| Singapore | 1.69 e | 1.42 e | 1.40 e | 1.55 e | 1.61 e | 1.51 e | 1.44 e |
| South Africa | 0.71 e | 0.47 e | 0.48 e | 0.51 e | 0.50 e | 0.50 e | .. |
| Chinese Taipei | 2.09 e | 3.02 | 3.08 | 3.09 | 3.15 | 3.25 | 3.42 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 27. Business enterprise researchers in full-time equivalent

FTE

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|-------------|
| Australia | 23 794 | .. | 39 065 | .. | 33 016 | .. | .. |
| Austria | 18 155 d e | 25 180 d e | 25 752 d | 27 361 d e | 27 872 d | 28 426 d e | 29 558 d p |
| Belgium | 16 769 | 23 464 | 23 759 | 27 384 | 28 474 b | 29 532 e | 29 358 |
| Canada | 84 410 | 94 010 | 93 150 | 93 647 b | 95 577 | 87 883 | .. |
| Chile | .. | 2 027 d | 1 430 d | 2 248 d | 2 237 d | 2 651 d | 2 640 d p |
| Czech Republic | 9 716 b | 15 057 | 16 367 | 17 892 | 19 161 | 19 185 | 20 206 |
| Denmark | 17 624 | 24 369 | 23 364 | 23 975 | 25 011 | 26 976 | 27 496 p |
| Estonia | 883 | 1 421 | 1 383 | 1 268 | 1 152 | 1 318 | 1 585 |
| Finland | 21 967 | 23 269 | 22 253 | 21 369 | 21 296 | 20 257 | 20 544 |
| France | 106 837 | 156 392 | 161 460 | 161 744 | 165 845 | .. | 173 879 e |
| Germany | 166 874 | 199 623 | 198 585 | 198 076 | 230 823 | 235 758 | 252 759 |
| Greece | 6 033 d | 4 351 d | 4 197 d | 4 938 d | 5 035 d | 5 608 d | 9 660 d |
| Hungary | 5 008 | 13 231 | 14 317 | 15 577 | 15 026 | 15 247 | 17 527 |
| Iceland | 1 012 | .. | 656 b | .. | 813 b | 813 | 876 |
| Ireland | 6 768 | 9 756 e | 10 793 | 11 246 e | 11 296 | 11 185 e | 12 569 |
| Israel ¹ | .. | 53 157 d | 52 067 d | 56 499 d | 59 746 d | 64 559 d | .. |
| Italy | 27 939 | 41 067 | 43 116 | 44 322 | 50 500 | 56 197 b | 57 996 p |
| Japan | 481 496 d | 481 425 d | 485 318 d | 506 134 d | 486 198 d | 488 828 d | 498 732 d |
| Korea | 137 706 d | 247 041 | 253 447 | 274 638 | 284 136 | 287 869 | 311 566 |
| Latvia | 468 d | 594 d | 570 d | 776 d | 604 d | 582 d | 647 d |
| Lithuania | 716.0 | 1 317.0 | 1 763.0 | 2 434.0 | 1 888.0 | 1 956.0 | 2 554.0 |
| Luxembourg | 1 696 | 927 b | 1 001 | 1 015 | 977 | 1 131 | 1 146 p |
| Mexico | 19 888 | 7 194 | 7 323 | 8 925 | 10 107 | 14 500 | .. |
| Netherlands | 22 898 | 43 665 b | 46 838 | 45 684 | 47 860 | 50 160 | 53 515 p |
| New Zealand | 3 700 | .. | 6 000 | .. | 6 900 | .. | .. |
| Norway | 10 239 d | 13 332 d | 13 553 d | 14 314 d | 14 921 d | 15 330 d | 16 342 d |
| Poland | 9 412 | 15 088 | 20 606 | 24 960 | 28 746 | 40 838 b | 50 170 p |
| Portugal | 4 014 | 11 931 | 10 025 b | 11 203 | 11 785 | 13 426 | 15 407 |
| Slovak Republic | 1 947 d | 2 482 d | 2 436 d | 2 645 d | 2 789 d | 2 824 | 3 300 |
| Slovenia | 1 936 | 4 618 | 4 664 | 4 637 | 4 191 | 4 489 | 5 743 p |
| Spain | 35 034 | 44 920 d | 44 714 d | 44 689 d | 45 151 d | 47 222 d | 49 571 d |
| Sweden | 36 697 b d | 30 497 e | 43 141 b | 44 433 e | 45 067 | 47 127 e | 51 843 |
| Switzerland | .. | 16 595 | .. | .. | 21 893 | .. | 22 909 |
| Turkey | 9 456 | 35 034 | 40 207 | 41 847 | 45 313 | 52 463 | 62 305 |
| United Kingdom | 93 717 | 90 422 | 98 469 | 102 221 | 105 774 | 110 149 | 109 856 p |
| United States | .. | 869 000 | 914 000 | 960 000 | 981 000 | 973 000 | .. |
| EU28 (OECD estimates) | 625 655 e | 792 590 e | 829 400 e | 850 197 e | 907 776 e | 952 926 e | 1 010 341 e |
| OECD-Total | 2 197 144 e | 2 644 420 e | 2 743 991 e | 2 861 140 e | 2 938 180 e | 2 989 539 e | .. |
| Argentina | 3 763 | 3 336 | 3 569 | 3 204 | 4 554 b | 4 362 | 4 354 |
| China | 696 413 d | 872 384 | 922 682 | 946 077 | 1 014 614 | 1 048 147 | 1 055 746 |
| Romania | 10 319 | 4 956 | 5 333 | 5 244 | 4 234 | 4 857 | 4 467 p |
| Russian Federation | 237 959 | 204 731 | 205 455 | 207 593 | 208 604 | 198 561 | 193 425 |
| Singapore | 14 238 | 17 285 | 18 326 | 18 518 | 19 761 | 19 396 | 19 372 |
| South Africa | 5 896 | 4 556 | 4 530 | 4 636 | 4 627 | 4 777 | .. |
| Chinese Taipei | 51 202 | 92 279 | 94 236 | 97 019 | 100 106 | 102 721 | 105 558 |

 Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

 1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 28. Business enterprise researchers as a percentage of national total

Percentage

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|---------------|---------------|---------------|---------------|---------------|---------------|-----------|
| Australia | .. | .. | .. | .. | .. | .. | .. |
| Austria | 63.8 d e | 63.4 d e | 63.7 d | 64.2 d e | 64.0 d | 62.2 d e | 62.2 d p |
| Belgium | 50.6 | 51.5 | 51.3 | 53.9 | 53.5 b | 54.4 e | 54.4 |
| Canada | 61.7 | 58.2 | 57.1 | 57.8 b | 58.7 | 56.7 | .. |
| Chile | .. | 29.8 d | 24.3 d | 29.6 d | 27.4 d | 29.5 d | 29.0 d p |
| Czech Republic | 40.2 b | 45.3 | 47.8 | 49.6 | 50.3 | 51.4 | 51.6 |
| Denmark | 62.5 | 60.8 | 58.6 | 57.9 | 58.4 | 60.2 | 60.7 p |
| Estonia | 26.5 | 31.0 | 31.4 | 29.3 | 27.5 | 30.4 | 33.9 |
| Finland | 55.5 | 57.5 | 56.8 | 55.8 | 56.8 | 56.4 | 55.5 |
| France | 52.8 | 60.4 e | 60.8 e | 59.5 b | 59.7 | .. | 60.3 e |
| Germany | 61.3 | 56.6 | 56.0 | 56.3 | 59.5 | 59.0 | 60.2 |
| Greece | 30.8 d | 17.5 d | 14.4 d | 16.5 d | 14.5 d | 19.1 d | 27.6 d |
| Hungary | 31.5 | 55.5 | 57.2 | 59.4 | 59.4 | 59.1 | 61.7 |
| Iceland | 46.9 | .. | 35.5 b | .. | 41.8 b | 36.9 | 42.7 |
| Ireland | 58.4 | 43.6 e | 45.5 e | 45.8 e | 46.1 e | 46.0 e | .. |
| Israel ¹ | .. | 83.7 d e | .. | .. | .. | .. | .. |
| Italy | 33.9 | 37.1 | 37.1 | 37.5 | 40.1 | 42.0 b | 42.6 p |
| Japan | 70.7 d | 74.5 d | 73.5 b d | 74.1 d | 73.4 d | 73.4 d | 73.7 d |
| Korea | 76.6 d | 78.3 | 78.7 | 79.5 | 79.7 | 79.7 | 81.3 |
| Latvia | 14.3 d | 15.2 d | 15.7 d | 20.7 d | 16.7 d | 18.5 d | 18.6 d |
| Lithuania | 9.4 | 16.4 | 20.6 | 26.8 | 23.1 | 22.9 | 29.2 |
| Luxembourg | 76.1 | 40.1 b | 40.0 | 38.6 | 38.5 | 45.1 p | 41.9 p |
| Mexico | 45.3 | 24.7 | 24.5 | 28.5 | 29.5 | 37.3 | .. |
| Netherlands | 47.8 | 59.6 b | 61.1 | 59.9 | 60.5 | 61.8 | 62.7 p |
| New Zealand | 28.5 | .. | 33.5 | .. | 36.9 | .. | .. |
| Norway | 48.3 d | 47.9 d | 47.9 d | 49.0 d | 48.7 d | 48.0 d | 48.6 d |
| Poland | 15.1 | 22.5 | 28.8 | 31.7 | 34.8 | 46.3 b | 52.0 p |
| Portugal | 19.0 | 28.1 | 26.5 b | 29.4 | 30.5 | 32.5 | 34.3 |
| Slovak Republic | 17.8 d | 16.3 d | 16.5 d | 17.9 d | 19.4 d | 23.0 | 25.1 |
| Slovenia | 36.9 | 52.0 | 53.6 | 54.1 | 53.1 | 55.3 | 61.8 p |
| Spain | 31.9 | 35.4 d | 36.3 d | 36.6 d | 36.9 d | 37.3 d | 37.2 d |
| Sweden | 66.7 b d e | 61.9 e | 67.2 b e | 66.7 e | 67.5 e | 67.0 e | 70.9 |
| Switzerland | .. | 46.4 | .. | .. | 50.1 | .. | 49.7 |
| Turkey | 24.2 | 42.7 | 45.1 | 46.7 | 47.6 | 52.4 | 55.7 |
| United Kingdom | 37.7 b e | 35.3 e | 36.8 | 37.0 e | 37.2 | 38.1 e | 37.9 p |
| United States | .. | 69.3 e | 70.6 e | 71.6 e | 71.6 e | 71.0 e | .. |
| EU28 (OECD estimates) | 45.5 e | 47.0 e | 47.8 e | 48.0 e | 49.2 e | 50.3 e | 51.4 e |
| OECD-Total | 59.3 e | 60.0 e | 60.6 e | 61.3 e | 61.5 e | 61.8 e | .. |
| Argentina | 11.8 | 6.6 | 7.0 | 6.2 | 8.6 b | 8.1 | 8.3 |
| China | 62.3 d | 62.1 | 62.2 | 62.1 | 62.7 | 61.9 | 60.7 |
| Romania | 44.9 | 27.5 | 28.7 | 29.0 | 24.3 | 26.9 | 25.5 p |
| Russian Federation | 51.2 | 46.2 | 46.6 | 46.7 | 46.4 | 46.3 | 47.1 |
| Singapore | 59.8 | 50.6 | 50.9 | 50.5 | 50.4 | 49.5 | 49.9 |
| South Africa | 34.1 | 21.3 | 19.4 | 19.7 | 17.7 | 17.3 | .. |
| Chinese Taipei | 57.6 | 65.9 | 66.8 | 67.9 | 68.9 | 69.5 | 70.2 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 29. Business enterprise researchers in full-time equivalent per thousand employment in industry*Per thousand*

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|--------------|--------------|--------------|--------------|--------------|--------------|-----------|
| Australia | 3.2 | .. | 4.7 | .. | 3.9 | .. | .. |
| Austria | 6.2 d e | 7.9 d e | 8.1 d | 8.5 d e | 8.7 d | 8.8 d e | 8.9 d e p |
| Belgium | 5.7 | 7.5 | 7.7 | 8.8 | 9.1 b | 9.3 e | 9.1 e |
| Canada | 6.8 | 7.2 | 7.0 | 7.0 b | 7.1 | 6.5 | .. |
| Chile | .. | 0.3 d e | 0.2 d | 0.4 d | 0.4 d | 0.4 d | 0.4 d e p |
| Czech Republic | 2.5 b | 3.7 | 4.0 | 4.4 | 4.6 | 4.5 | 4.7 e |
| Denmark | 9.5 | 13.4 | 12.9 | 13.0 | 13.4 | 14.1 | 14.0 e p |
| Estonia | 1.9 | 3.2 | 3.1 | 2.8 | 2.5 | 2.8 e | 3.3 e |
| Finland | 12.9 | 13.0 | 12.6 | 12.2 | 12.2 | 11.5 | 11.5 e |
| France | 5.9 | 8.4 | 8.7 | 8.7 | 8.9 | .. | 9.1 e |
| Germany | 5.8 | 6.5 | 6.4 | 6.4 | 7.4 | 7.5 | 7.9 e |
| Greece | 1.7 d | 1.4 d | 1.4 d | 1.6 d | 1.6 d | 1.8 d | 3.0 d e |
| Hungary | 1.5 | 4.3 | 4.7 | 4.9 | 4.6 | 4.6 e | 5.1 e |
| Iceland | 8.7 | .. | 5.3 b | .. | 6.2 b | 5.9 | 6.1 e |
| Ireland | 4.4 | 7.2 e | 7.7 | 7.9 e | 7.7 | 7.4 e | 8.0 e |
| Israel ¹ | .. | 22.8 d | 21.7 d | 23.1 d | 24.0 d | 25.1 d | .. |
| Italy | 1.5 | 2.2 | 2.4 | 2.5 | 2.8 | 3.1 b | 3.1 e p |
| Japan | 8.9 d e | 9.3 d e | 9.3 d e | 9.7 d e | 9.4 d e | 9.4 d e | 9.4 d e |
| Korea | 7.2 d | 12.4 | 12.6 | 13.4 | 13.7 | 13.8 | 14.8 e |
| Latvia | 0.6 d | 0.9 d | 0.8 d | 1.2 d | 0.9 d | 0.9 d | 1.0 d e |
| Lithuania | 0.7 | 1.4 | 1.8 | 2.4 | 1.9 | 1.9 | 2.5 e |
| Luxembourg | 6.9 | 3.1 b | 3.4 | 3.3 | 3.1 | 3.5 | 3.4 e p |
| Mexico | 0.8 | 0.3 | 0.3 | 0.3 | 0.4 | 0.5 | .. |
| Netherlands | 3.8 | 7.0 b | 7.6 | 7.3 | 7.6 | 7.8 | 8.1 e p |
| New Zealand | 2.4 e | .. | 3.6 e | .. | 4.0 e | .. | .. |
| Norway | 6.7 d | 7.7 d | 7.8 d | 8.1 d | 8.5 d | 8.8 d e | 9.2 d e |
| Poland | 0.8 | 1.2 | 1.7 | 2.0 | 2.3 | 3.2 b | 3.9 e p |
| Portugal | 1.0 | 3.4 | 3.0 b | 3.3 | 3.4 | 3.8 | 4.2 e |
| Slovak Republic | 1.2 d | 1.4 d | 1.4 d | 1.5 d | 1.6 d | 1.5 | 1.8 e |
| Slovenia | 2.5 | 6.1 | 6.3 | 6.2 | 5.5 | 5.8 | 7.2 e p |
| Spain | 2.3 | 3.3 d | 3.4 d | 3.4 d | 3.3 d | 3.4 d | 3.4 d e |
| Sweden | 12.9 b d | 9.9 e | 13.9 b | 14.1 e | 14.2 | 14.7 e | 15.8 e |
| Switzerland | .. | 4.7 | .. | .. | 6.0 | .. | 6.2 |
| Turkey | 0.6 | 1.7 | 1.9 | 1.9 | 2.1 | 2.4 | 2.7 e |
| United Kingdom | 4.4 | 4.2 | 4.5 | 4.6 | 4.6 | 4.7 | 4.7 p |
| United States | .. | 8.7 | 9.0 | 9.3 | 9.4 | 9.1 | .. |
| EU28 (OECD estimates) | 3.8 e | 4.8 e | 5.0 e | 5.1 e | 5.4 e | 5.6 e | 5.8 e |
| OECD-Total | 5.5 e | 6.4 e | 6.6 e | 6.8 e | 7.0 e | 7.0 e | .. |
| Argentina | .. | .. | .. | .. | .. | .. | .. |
| China | .. | .. | .. | .. | .. | .. | .. |
| Romania | 1.2 | 0.7 | 0.7 | 0.7 | 0.6 | 0.7 | 0.6 p |
| Russian Federation | 4.7 | 3.9 | 3.9 | 3.9 | 3.9 | 3.7 | 3.6 |
| Singapore | 7.0 | 5.9 | 6.0 | 5.9 | 6.2 | 6.1 | 6.1 |
| South Africa | 0.6 e | 0.4 e | 0.4 e | 0.4 e | 0.4 | 0.4 | .. |
| Chinese Taipei | 5.9 | 9.8 | 9.9 | 10.1 | 10.3 | 10.5 | 10.7 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 30. Total business enterprise R&D personnel in full-time equivalent

FTE

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|-------------|--------------------|--------------------|--------------------|--------------------|--------------------|-------------|
| Australia | 43 687 | .. | 78 839 | .. | 70 467 | .. | .. |
| Austria | 32 780 d e | 45 468 d e | 46 412 d | 49 539 d e | 50 534 d | 51 953 d e | 54 022 d p |
| Belgium | 31 613 | 38 108 | 38 497 | 42 391 | 44 508 b | 46 564 | 50 106 |
| Canada | 142 030 | 139 460 | 138 620 | 144 462 b | 155 357 | 134 687 | .. |
| Chile | .. | 4 737 d | 3 905 d | 5 087 d | 4 398 d | 4 946 d | 4 537 d p |
| Czech Republic | 21 116 b | 31 705 | 33 188 | 35 256 | 36 365 | 37 263 | 39 968 |
| Denmark | 28 359 | 35 899 | 34 985 | 35 431 | 36 898 | 38 855 | 38 975 p |
| Estonia | 1 398 | 1 988 | 2 069 | 1 798 | 1 694 | 1 855 | 2 086 |
| Finland | 32 109 | 30 995 | 30 381 | 29 634 | 29 770 | 27 634 | 28 148 |
| France | 194 991 | 246 438 | 249 991 | 248 145 | 251 444 | .. | 258 670 e |
| Germany | 304 502 | 367 478 | 360 375 | 371 706 | 404 767 | 413 027 | 436 571 |
| Greece | 11 665 d | 6 532 d | 6 832 d | 7 750 d | 8 131 d | 9 102 d | 13 004 d |
| Hungary | 7 393 | 19 997 | 22 244 | 22 177 | 21 030 | 20 825 | 24 719 |
| Iceland | 1 530 | .. | 1 260 b d | .. | 1 604 d | 1 604 | 1 799 d |
| Ireland | 10 338 | 15 313 e | 17 103 | 17 821 e | 18 383 | 18 203 e | 19 542 |
| Israel ¹ | 43 049 d | 64 596 d | 65 099 d | 69 854 d | 72 914 d | 79 731 d | .. |
| Italy | 70 725 | 120 162 | 124 736 | 129 271 | 136 725 | 164 471 b | 166 116 p |
| Japan | 609 808 d | 581 042 d | 583 855 d | 611 027 d | 592 175 d | 586 593 d | 603 407 d |
| Korea | 153 400 d | 281 523 | 288 758 | 314 019 | 323 652 | 328 948 | 355 601 |
| Latvia | 1 370 d | 885 d | 981 d | 1 382 d | 1 145 d | 896 d | 956 d |
| Lithuania | 1 190.0 | 1 771.0 | 2 401.0 | 3 307.0 | 2 714.0 | 2 630.0 | 3 783.0 |
| Luxembourg | 3 662 | 2 843 b | 2 913 | 3 066 | 3 033 | 3 143 | 3 135 p |
| Mexico | 42 331 | 20 244 | 19 197 | 16 139 | 18 892 | 26 309 | .. |
| Netherlands | 48 588 | 76 767 b | 77 399 | 76 708 | 81 108 | 85 585 | 90 037 p |
| New Zealand | 6 100 | .. | 10 100 | .. | 11 000 | .. | .. |
| Norway | 15 399 | 18 624 | 19 041 | 20 597 | 21 637 | 22 171 | 23 766 |
| Poland | 13 966 | 25 750 | 30 250 | 37 253 | 42 054 | 55 758 b | 67 072 p |
| Portugal | 6 133 | 15 668 | 16 220 | 17 348 | 18 283 | 19 367 | 22 022 |
| Slovak Republic | 3 524 d | 3 790 d | 3 618 d | 4 133 d | 4 405 d | 4 603 | 5 554 |
| Slovenia | 4 347 | 9 451 | 9 811 | 9 696 | 9 222 | 9 569 | 9 946 p |
| Spain | 75 345 | 89 364 d | 88 635 d | 87 642 d | 87 432 d | 90 129 d | 95 667 d |
| Sweden | 56 106 b | 55 839 e | 56 413 | 57 307 e | 57 691 | 64 276 e | 63 729 |
| Switzerland | .. | 47 750 | .. | .. | 50 825 | .. | 49 353 |
| Turkey | 14 992 | 52 233 | 58 391 | 61 945 | 66 667 | 72 579 | 87 918 |
| United Kingdom | 145 401 | 160 116 | 177 948 | 192 221 | 206 153 | 209 584 | 215 713 p |
| United States | .. | 1 251 000 | 1 318 000 | 1 366 000 | 1 399 000 | 1 393 000 | .. |
| EU28 (OECD estimates) | 1 127 705 e | 1 419 949 e | 1 451 412 e | 1 500 557 e | 1 576 984 e | 1 656 882 e | 1 736 526 e |
| OECD-Total | .. | 3 945 866 e | 4 067 220 e | 4 226 388 e | 4 342 077 e | 4 411 805 e | .. |
| Argentina | 7 155 | 9 275 | 9 923 | 9 979 | 12 214 b | 11 860 | 11 520 |
| China | 883 130 d | 2 486 400 | 2 740 563 | 2 896 352 | 2 910 799 | 3 012 081 | 3 119 809 |
| Romania | 16 157 | 10 887 | 10 514 | 10 437 | 10 128 | 10 785 | 11 525 p |
| Russian Federation | 524 049 | 413 796 | 424 063 | 423 134 | 426 372 | 402 097 | 389 191 |
| Singapore | 17 076 | 20 200 | 21 346 | 21 638 | 23 044 | 22 402 | 22 278 |
| South Africa | 12 236 | 11 322 | 11 877 | 12 928 | 12 458 | 12 549 | .. |
| Chinese Taipei | 96 714 | 166 683 | 173 329 | 180 435 | 186 804 | 192 127 | 196 992 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 31. Total business enterprise R&D personnel as a percentage of national total

Percentage

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|----------|----------|----------|----------|--------|----------|----------|
| Australia | .. | .. | .. | .. | .. | .. | .. |
| Austria | 68.8 d e | 69.9 d e | 70.1 d | 70.6 d e | 70.8 d | 69.4 d e | 69.4 d p |
| Belgium | 59.1 | 56.9 | 56.7 | 58.2 | 57.4 b | 59.2 | 60.6 |
| Canada | 65.0 | 60.3 | 59.5 | 61.1 b | 63.4 | 60.4 | .. |
| Chile | .. | 32.4 d | 29.5 d | 32.0 d | 28.8 d | 29.8 d | 27.3 d p |
| Czech Republic | 48.7 b | 52.6 | 53.5 | 54.7 | 54.7 | 56.6 | 57.3 |
| Denmark | 65.2 | 62.2 | 60.6 | 60.7 | 61.2 | 61.8 | 62.0 p |
| Estonia | 32.0 | 34.0 | 35.3 | 31.1 | 30.1 | 32.1 | 34.5 |
| Finland | 55.9 | 57.3 | 57.4 | 56.8 | 59.1 | 58.3 | 57.4 |
| France | 55.8 | 59.8 l | 60.0 l | 58.5 b | 58.7 | .. | 59.5 e |
| Germany | 64.1 | 62.2 | 61.2 | 61.4 | 63.2 | 62.8 | 63.6 |
| Greece | 34.7 d | 17.5 d | 16.2 d | 17.9 d | 16.4 d | 21.8 d | 27.3 d |
| Hungary | 31.8 | 56.0 | 58.3 | 59.4 | 57.1 | 58.2 | 61.1 |
| Iceland | 47.4 | .. | 46.0 b d | .. | 54.5 d | 49.4 | 56.7 d |
| Ireland | 61.9 | 52.3 e | 53.7 e | 53.2 e | 53.5 e | 53.0 e | .. |
| Israel ¹ | .. | 83.7 d e | .. | .. | .. | .. | .. |
| Italy | 40.4 | 50.0 | 50.5 | 51.8 | 52.8 | 56.7 b | 57.0 p |
| Japan | 68.0 d | 68.3 d | 67.5 b d | 68.2 d | 67.7 d | 67.2 d | 67.7 d |
| Korea | 71.2 d | 71.1 | 71.9 | 72.9 | 73.2 | 73.5 | 75.5 |
| Latvia | 25.0 d | 15.8 d | 18.2 d | 24.1 d | 20.6 d | 17.5 d | 17.8 d |
| Lithuania | 10.8 | 17.0 | 21.7 | 28.0 | 25.6 | 24.1 | 32.7 |
| Luxembourg | 83.4 | 59.9 b | 58.6 | 58.5 | 58.0 | 59.2 | 58.9 p |
| Mexico | 50.6 | 34.4 | 32.5 | 30.9 | 33.1 | 40.0 | .. |
| Netherlands | 51.9 | 62.8 b | 62.8 | 61.8 | 62.8 | 64.4 | 65.1 p |
| New Zealand | 32.2 | .. | 40.6 | .. | 41.7 | .. | .. |
| Norway | 51.4 | 49.4 | 49.4 | 51.1 | 51.0 | 50.5 | 51.4 |
| Poland | 18.2 | 28.4 | 32.3 | 35.7 | 38.5 | 49.9 b | 55.2 p |
| Portugal | 23.8 | 32.9 | 34.7 | 37.0 | 38.1 | 38.4 | 40.0 |
| Slovak Republic | 24.5 d | 20.9 d | 21.1 d | 23.5 d | 25.0 d | 29.5 | 33.0 |
| Slovenia | 48.3 | 63.1 | 64.4 | 65.2 | 64.8 | 66.4 | 67.6 p |
| Spain | 43.1 | 42.8 d | 43.6 d | 43.8 d | 43.5 d | 43.8 d | 44.3 d |
| Sweden | 72.3 b e | 68.7 e | 69.7 e | 68.7 e | 69.0 e | 70.9 e | 71.7 v |
| Switzerland | .. | 63.3 | .. | .. | 62.4 | .. | 60.4 |
| Turkey | 30.4 e | 49.7 e | 51.7 e | 53.7 e | 54.5 e | 53.0 | 57.3 |
| United Kingdom | 44.8 b e | 44.9 e | 47.2 e | 48.5 e | 49.8 | 50.2 e | 50.8 p |
| United States | .. | .. | .. | .. | .. | .. | .. |
| EU28 (OECD estimates) | 51.2 e | 53.0 e | 53.4 e | 53.8 e | 54.6 e | 56.0 e | 56.9 e |
| OECD-Total | .. | .. | .. | .. | .. | .. | .. |
| Argentina | 15.8 | 12.8 | 13.3 | 13.0 | 15.5 b | 14.9 | 14.6 |
| China | 64.7 d | 76.6 | 77.6 | 78.1 | 77.4 | 77.7 | 77.3 |
| Romania | 48.6 | 35.0 | 32.3 | 33.2 | 32.3 | 33.5 | 35.4 p |
| Russian Federation | 57.0 | 50.0 | 51.3 | 51.0 | 51.1 | 50.1 | 50.0 |
| Singapore | 59.7 | 51.2 | 51.4 | 50.9 | 50.7 | 49.7 | 50.0 |
| South Africa | 42.5 | 32.3 | 31.3 | 33.6 | 30.3 | 29.5 | .. |
| Chinese Taipei | 64.8 | 72.7 | 74.0 | 75.0 | 76.0 | 76.5 | 77.0 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 32. Total business enterprise R&D personnel in full-time equivalent per thousand employment in industry

Per thousand

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|-----------|--------------|--------------|---------------|---------------|---------------|------------|
| Australia | 5.9 | .. | 9.6 | .. | 8.3 | .. | .. |
| Austria | 11.1 d e | 14.3 d e | 14.6 d | 15.5 d e | 15.7 d | 16.0 d e | 16.3 d e p |
| Belgium | 10.7 | 12.2 | 12.4 | 13.7 | 14.2 b | 14.7 | 15.6 e |
| Canada | 11.5 | 10.6 | 10.4 | 10.8 b | 11.5 | 9.9 | .. |
| Chile | .. | 0.8 d e | 0.7 d | 0.8 d | 0.7 d | 0.8 d | 0.7 d e p |
| Czech Republic | 5.3 b | 7.8 | 8.1 | 8.6 | 8.7 | 8.8 | 9.4 e |
| Denmark | 15.3 | 19.8 | 19.3 | 19.3 | 19.7 | 20.2 | 19.8 e p |
| Estonia | 3.0 | 4.5 | 4.6 | 4.0 | 3.6 | 3.9 e | 4.3 e |
| Finland | 18.8 | 17.3 | 17.2 | 16.9 | 17.0 | 15.7 | 15.8 e |
| France | 10.8 | 13.3 | 13.5 | 13.3 | 13.5 | .. | 13.6 e |
| Germany | 10.6 | 11.9 | 11.6 | 11.9 | 12.9 | 13.1 | 13.6 e |
| Greece | 3.2 d | 2.1 d | 2.2 d | 2.5 d | 2.6 d | 2.9 d | 4.0 d e |
| Hungary | 2.3 | 6.5 | 7.3 | 6.9 | 6.5 | 6.2 e | 7.2 e |
| Iceland | 13.2 | .. | 10.2 b d | .. | 12.3 d | 11.7 | 12.5 d e |
| Ireland | 6.7 | 11.3 e | 12.2 | 12.5 e | 12.5 | 12.0 e | 12.5 e |
| Israel ¹ | 22.9 d | 27.7 d | 27.1 d | 28.5 d | 29.2 d | 31.0 d | .. |
| Italy | 3.9 | 6.5 | 6.9 | 7.2 | 7.6 | 9.0 b | 9.0 e p |
| Japan | 11.3 d e | 11.2 d e | 11.2 d e | 11.7 d e | 11.4 d e | 11.2 d e | 11.4 d e |
| Korea | 8.0 d | 14.1 | 14.3 | 15.3 | 15.6 | 15.7 | 16.9 e |
| Latvia | 1.8 d | 1.3 d | 1.4 d | 2.1 d | 1.7 d | 1.3 d | 1.4 d e |
| Lithuania | 1.1 | 1.8 | 2.4 | 3.3 | 2.7 | 2.5 | 3.7 e |
| Luxembourg | 15.0 | 9.6 b | 9.8 | 10.0 | 9.7 | 9.7 | 9.4 e p |
| Mexico | 1.7 | 0.7 | 0.7 | 0.6 | 0.7 | 0.9 | .. |
| Netherlands | 8.0 | 12.2 b | 12.5 | 12.3 | 12.8 | 13.3 | 13.7 e p |
| New Zealand | 3.9 e | .. | 6.1 e | .. | 6.4 e | .. | .. |
| Norway | 10.1 | 10.8 | 11.0 | 11.7 | 12.3 | 12.7 e | 13.4 e |
| Poland | 1.3 | 2.1 | 2.5 | 3.0 | 3.4 | 4.4 b | 5.2 e p |
| Portugal | 1.6 | 4.5 | 4.8 | 5.1 | 5.3 | 5.5 | 6.0 e |
| Slovak Republic | 2.2 d | 2.2 d | 2.1 d | 2.4 d | 2.5 d | 2.5 | 3.0 e |
| Slovenia | 5.7 | 12.5 | 13.2 | 13.0 | 12.2 | 12.4 | 12.5 e p |
| Spain | 4.9 | 6.6 d | 6.8 d | 6.6 d | 6.4 d | 6.4 d | 6.6 d e |
| Sweden | 19.7 b | 18.1 e | 18.2 | 18.2 e | 18.2 | 20.1 e | 19.5 e |
| Switzerland | .. | 13.6 | .. | .. | 14.0 | .. | 13.4 |
| Turkey | 0.9 | 2.6 | 2.8 | 2.9 | 3.0 | 3.3 | 3.8 e |
| United Kingdom | 6.8 | 7.5 | 8.2 | 8.6 | 9.0 | 9.0 | 9.1 p |
| United States | .. | 12.5 | 13.0 | 13.2 | 13.3 | 13.0 | .. |
| EU28 (OECD estimates) | 6.8 e | 8.5 e | 8.8 e | 9.0 e | 9.3 e | 9.7 e | 10.0 e |
| OECD-Total | .. | 9.6 e | 9.9 e | 10.1 e | 10.3 e | 10.3 e | .. |
| Argentina | .. | .. | .. | .. | .. | .. | .. |
| China | .. | .. | .. | .. | .. | .. | .. |
| Romania | 1.9 | 1.5 | 1.4 | 1.4 | 1.4 | 1.5 | 1.5 p |
| Russian Federation | 10.3 | 7.9 | 8.0 | 8.0 | 8.0 | 7.5 | 7.3 |
| Singapore | 8.4 | 6.9 | 7.0 | 6.8 | 7.2 | 7.0 | 7.0 |
| South Africa | 1.3 e | 1.1 e | 1.1 e | 1.2 e | 1.1 | 1.1 | .. |
| Chinese Taipei | 11.1 | 17.7 | 18.2 | 18.7 | 19.2 | 19.6 | 19.9 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 33. Business-financed BERD (Business enterprise expenditure on R&D) at 2010 prices and PPP

Million 2010 USD

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Australia | 8 092.4 | .. | 11 701.3 | .. | 10 466.3 | .. | .. |
| Austria | .. | .. | 5 085.4 | .. | 5 440.9 | .. | .. |
| Belgium | 4 078.3 | 5 842.8 | 5 981.5 | .. | 6 266.8 | .. | 7 771.9 |
| Canada | 11 686.4 d w | 11 235.5 d w | 10 908.2 d w | 11 007.4 b | 10 478.5 | 10 095.4 | 9 433.0 p |
| Chile | .. | 395.3 | 441.7 | 406.3 | 433.0 | 466.1 | 404.3 p |
| Czech Republic | 1 375.9 b | 1 832.2 | 2 005.4 | 2 033.1 | 1 995.5 | 2 049.8 | 2 270.2 |
| Denmark | 3 316.5 | 4 257.5 e | 4 217.9 | .. | 4 521.6 | .. | 4 668.2 p |
| Estonia | 98.1 | 342.5 | 226.8 | 168.7 | 194.4 | 200.8 | 197.5 |
| Finland | 4 277.7 | 4 384.3 | 4 032.6 | 3 406.0 | 3 197.5 | 3 245.6 | 3 425.2 |
| France | 23 038.1 | 28 531.3 | 28 642.6 | 29 151.9 | 29 096.5 | 29 637.7 p | .. |
| Germany | 46 613.0 e | 59 469.8 e | 58 110.7 | 60 763.4 e | 62 557.7 | 63 626.4 e | 69 143.2 |
| Greece | 489.0 | 488.3 | 563.1 | 572.4 | 667.5 | 938.5 | 1 203.1 |
| Hungary | 674.0 d | 1 189.6 | 1 347.0 | 1 426.6 | 1 537.7 | 1 594.1 | 1 745.7 |
| Iceland | 140.0 | .. | 78.6 b | 90.7 | 109.5 | 119.3 | 122.2 |
| Ireland | 1 297.5 | 1 588.6 e | 1 692.1 | 1 767.2 e | 1 607.6 | 1 664.7 e | 2 038.8 |
| Israel ¹ | 3 942.1 d | 3 761.4 d | 3 496.5 d | 3 591.6 d | 3 562.9 d | 4 216.0 d | .. |
| Italy | 8 535.0 | 11 109.0 | 11 497.5 | 12 393.8 | 13 224.7 | 14 283.4 b | .. |
| Japan | 106 603.6 | 109 718.7 | 114 643.0 | 120 927.9 | 119 177.5 | 115 424.5 | 119 999.9 |
| Korea | 23 446.1 d | 46 911.0 | 50 367.9 | 53 651.0 | 53 636.8 | 55 923.2 | 62 769.2 |
| Latvia | 50.3 | 46.6 | 38.5 | 62.1 | 32.4 | 31.6 | 45.0 |
| Lithuania | 75.0 | 101.7 | 107.8 | 176.9 | 154.7 | 198.3 | 212.9 |
| Luxembourg | 479.0 | 94.5 b | 94.4 | .. | 297.5 | .. | .. |
| Mexico | 2 627.1 | 2 175.8 | 1 922.9 | 1 951.9 e p | 2 012.9 e p | 2 020.8 e p | .. |
| Netherlands | 5 183.2 | 6 739.9 b | 6 762.8 | 7 032.1 | 6 862.6 | 7 581.8 | .. |
| New Zealand | 473.6 | .. | 581.8 | .. | 757.4 | .. | 958.4 |
| Norway | 1 697.0 | 2 055.8 | 2 067.2 | 2 211.6 | 2 440.3 | 2 445.9 | 2 626.3 |
| Poland | 941.3 | 2 270.0 | 2 657.3 | 3 110.0 | 3 464.2 | 4 799.8 | .. |
| Portugal | 745.0 | 1 690.7 | 1 475.8 | 1 432.0 | 1 428.1 | 1 559.3 | 1 745.1 |
| Slovak Republic | 178.4 | 377.3 | 442.4 | 354.8 | 390.2 | 530.9 | 665.3 |
| Slovenia | 369.8 | 857.3 | 875.6 | 886.6 | 851.7 | 807.5 | .. |
| Spain | 6 646.6 | 7 835.1 | 7 712.6 | 7 664.3 | 7 738.4 | 7 977.2 | 8 555.1 |
| Sweden | 7 656.9 b | .. | 7 989.9 | .. | 7 934.6 | .. | 9 206.2 |
| Switzerland | .. | 8 249.0 | .. | .. | 9 220.6 | .. | 10 079.7 |
| Turkey | 1 879.2 | 4 936.6 | 5 580.2 | 6 425.8 | 6 860.3 | 7 972.3 | 9 241.6 |
| United Kingdom | 13 692.6 | 16 047.8 | 17 217.3 | 18 697.0 | 19 920.2 | 21 685.0 | .. |
| United States | 224 552.8 d w | 244 407.3 d | 258 194.8 d | 269 290.4 d | 279 270.8 d | 291 095.4 d | 302 480.6 d e |
| EU28 (OECD estimates) | 134 078.9 e | 168 152.1 e | 169 570.0 e | 175 135.1 e | 180 769.8 e | 190 361.4 e | .. |
| OECD-Total | 525 588.5 e | 613 399.5 e | 637 040.8 e | 664 154.0 e | 677 735.2 e | 699 741.6 e | 735 638.7 e |
| Argentina | 763.1 | .. | .. | .. | 848.0 b | 754.6 | 722.5 |
| China | 59 434.0 | 199 356.9 | 226 303.3 | 250 207.5 | 270 420.4 | 301 604.1 | 327 954.5 e |
| Romania | 352.6 | 447.1 | 318.5 | 359.3 | 593.6 | 853.6 | .. |
| Russian Federation | 6 653.5 | 7 157.2 | 7 639.7 | 7 813.1 | 7 547.4 | 8 393.7 | 9 373.9 e |
| Singapore | 3 239.4 | 3 919.9 | 3 983.9 | 4 600.4 | 4 968.6 | 4 757.4 | 4 671.9 |
| South Africa | 1 771.8 | 1 637.9 | 1 754.2 | 1 880.8 | 1 883.3 | 1 942.1 | .. |
| Chinese Taipei | 11 029.7 | 20 344.2 | 21 586.3 | 22 934.8 | 23 666.9 | 24 812.9 | 27 162.7 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 34. Business-financed BERD (Business enterprise expenditure on R&D) as a percentage of value added in industry

Percentage

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Australia | 1.46 | .. | 1.71 | .. | 1.50 | .. | .. |
| Austria | .. | .. | 2.15 | .. | 2.26 | .. | .. |
| Belgium | 1.59 | 2.13 | 2.18 | .. | 2.21 | .. | 2.67 e |
| Canada | 1.38 d w | 1.23 d w | 1.16 d w | 1.14 b | 1.10 e | 1.05 e | 0.95 e p |
| Chile | .. | 0.16 | 0.18 | 0.16 | 0.17 e | 0.18 e | 0.15 e p |
| Czech Republic | 0.77 b | 0.92 | 1.01 | 0.98 | 0.92 | 0.92 | 0.98 e |
| Denmark | 2.43 | 3.06 e | 2.98 | .. | 3.06 | .. | 3.03 e p |
| Estonia | 0.49 | 1.60 | 1.04 | 0.77 | 0.90 | 0.92 | 0.87 e |
| Finland | 3.50 | 3.66 | 3.42 | 2.91 | 2.73 | 2.69 | 2.71 e |
| France | 1.73 | 2.07 | 2.07 | 2.09 | 2.07 | 2.09 p | .. |
| Germany | 2.40 e | 2.81 e | 2.74 | 2.79 e | 2.82 | 2.82 e | 2.99 e |
| Greece | 0.25 | 0.35 | 0.41 | 0.42 | 0.49 | 0.70 | 0.87 e |
| Hungary | 0.49 d | 0.89 | 0.98 | 0.99 | 1.03 | 1.05 | 1.10 e |
| Iceland | 2.02 | .. | 0.97 b | 1.12 | 1.27 | 1.27 e | 1.24 e |
| Ireland | 0.98 | 1.13 e | 1.17 | 1.12 e | 0.75 | 0.73 e | 0.83 e |
| Israel ¹ | 3.67 d e | 2.69 d | 2.38 d | 2.41 d e | 2.32 d e | 2.64 d e | .. |
| Italy | 0.64 | 0.90 | 0.95 | 1.02 | 1.08 | 1.16 b | .. |
| Japan | 3.16 | 3.37 | 3.45 | 3.62 | 3.49 | 3.36 e | 3.42 e |
| Korea | 2.78 d | 4.27 | 4.45 | 4.61 | 4.49 | 4.57 e | 4.98 e |
| Latvia | 0.20 | 0.18 | 0.15 | 0.23 | 0.12 | 0.11 | 0.15 e |
| Lithuania | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 | 0.4 | 0.4 e |
| Luxembourg | 1.87 | 0.32 b | 0.31 | .. | 0.85 | .. | .. |
| Mexico | 0.22 | 0.15 | 0.14 | 0.14 e p | 0.14 e p | 0.13 e p | .. |
| Netherlands | 1.15 | 1.37 b | 1.39 | 1.44 | 1.36 | 1.48 | .. |
| New Zealand | 0.56 | .. | 0.61 | .. | 0.74 | .. | 0.88 e |
| Norway | 0.97 | 1.02 | 1.02 | 1.12 | 1.31 | 1.38 e | 1.42 e |
| Poland | 0.22 | 0.38 | 0.43 | 0.49 | 0.52 | 0.71 | .. |
| Portugal | 0.45 | 1.05 | 0.94 | 0.90 | 0.88 | 0.95 | 1.04 e |
| Slovak Republic | 0.24 | 0.37 | 0.44 | 0.33 | 0.35 | 0.47 | 0.58 e |
| Slovenia | 1.07 | 2.39 | 2.48 | 2.39 | 2.25 | 2.07 | .. |
| Spain | 0.70 | 0.87 | 0.89 | 0.87 | 0.84 | 0.83 | 0.86 e |
| Sweden | 3.43 b | .. | 3.21 | .. | 2.94 | .. | 3.26 e |
| Switzerland | .. | 2.70 | .. | .. | 2.89 | .. | 3.07 e |
| Turkey | 0.26 | 0.49 | 0.51 | 0.55 | 0.56 | 0.63 | 0.67 e |
| United Kingdom | 1.01 | 1.16 | 1.20 | 1.27 | 1.33 | 1.41 | .. |
| United States | 2.41 d w | 2.50 d | 2.59 d | 2.62 d | 2.64 d | 2.72 d | 2.75 d e |
| EU28 (OECD estimates) | 1.33 e | 1.59 e | 1.60 e | 1.63 e | 1.63 e | 1.69 e | .. |
| OECD-Total | 1.95 e | 2.09 e | 2.13 e | 2.17 e | 2.16 e | 2.20 e | 2.24 e |
| Argentina | 0.19 | .. | .. | .. | 0.17 b e | 0.15 e | 0.14 e |
| China | 1.02 e | 1.73 e | 1.84 e | 1.91 e | 1.96 e | 2.09 e | 2.14 e |
| Romania | 0.17 | 0.18 | 0.12 | 0.14 | 0.21 e | 0.29 e | .. |
| Russian Federation | 0.35 e | 0.31 e | 0.33 e | 0.33 e | 0.31 e | 0.35 e | 0.38 e |
| Singapore | 1.48 e | 1.20 e | 1.17 e | 1.30 e | 1.37 e | 1.28 e | 1.21 e |
| South Africa | 0.49 e | 0.37 e | 0.39 e | 0.41 e | 0.41 e | 0.42 e | .. |
| Chinese Taipei | 2.05 e | 2.96 | 3.02 | 3.04 | 3.10 | 3.20 | 3.37 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 35. Percentage of Business enterprise expenditure on R&D (BERD) financed by the business enterprise sector

Percentage

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Australia | 94.0 | .. | 96.2 | .. | 96.2 | .. | .. |
| Austria | .. | .. | 66.7 | .. | 67.4 | .. | .. |
| Belgium | 82.8 | 82.7 | 82.7 | .. | 79.2 | .. | 86.3 |
| Canada | 82.5 d w | 85.9 d w | 85.3 d w | 80.0 b | 76.6 | 73.9 | 72.6 p |
| Chile | .. | 91.5 | 90.1 | 88.5 | 88.4 | 87.8 | 86.1 p |
| Czech Republic | 78.8 b | 66.5 | 68.0 | 62.4 | 60.5 | 61.8 | 59.9 |
| Denmark | 86.0 | 89.9 e | 91.7 | .. | 91.7 | .. | 89.0 p |
| Estonia | 80.3 | 87.0 | 83.9 | 80.2 | 83.5 | 87.7 | 86.8 |
| Finland | 90.9 | 88.8 | 85.5 | 76.6 | 79.7 | 84.0 | 86.7 |
| France | 80.7 | 82.9 | 82.4 | 82.8 | 82.0 | 82.8 p | .. |
| Germany | 92.1 e | 91.4 e | 91.4 | 91.4 e | 89.7 | 89.7 e | 90.4 |
| Greece | 85.7 | 77.2 | 81.6 | 78.9 | 82.3 | 87.6 | 84.1 |
| Hungary | 77.8 d | 66.6 d | 63.5 d | 64.3 d | 64.8 d | 73.6 d | 70.1 d |
| Iceland | 84.9 | .. | 61.1 b d | 55.2 d | 52.2 d | 56.4 d | 56.0 d |
| Ireland | 86.1 | 69.2 e | 72.4 | 72.4 e | 66.8 | 66.8 e | 68.0 |
| Israel ¹ | 67.2 d | 45.5 d | 41.2 d | 39.7 d | 37.4 d | 41.0 d | .. |
| Italy | 76.8 | 79.6 | 80.6 | 81.6 | 84.2 | 84.1 b | .. |
| Japan | 98.3 | 98.2 | 98.1 | 98.3 | 98.3 | 98.1 | 98.2 |
| Korea | 94.4 d | 93.7 | 94.2 | 94.2 | 94.1 | 94.8 | 93.8 |
| Latvia | 61.7 | 76.3 | 53.3 | 59.7 | 47.9 | 65.6 | 69.3 |
| Lithuania | 83.9 | 61.6 | 62.8 | 75.7 | 72.4 | 87.7 | 80.7 |
| Luxembourg | 91.7 | 30.3 b | 30.0 | .. | 90.1 | .. | .. |
| Mexico | 86.8 | 80.5 | 65.1 | 63.1 e p | 63.7 e p | 65.7 e p | .. |
| Netherlands | 79.0 | 82.7 b | 83.8 | 83.4 | 79.5 | 82.1 | .. |
| New Zealand | 80.5 | .. | 74.4 | .. | 76.3 | .. | 75.9 |
| Norway | 81.6 | 79.1 | 77.0 | 77.9 | 78.2 | 77.1 | 78.0 |
| Poland | 83.0 | 81.0 | 80.8 | 79.4 | 79.8 | 79.1 b | .. |
| Portugal | 91.4 | 90.7 | 87.1 | 88.2 | 89.7 | 89.3 | 90.0 |
| Slovak Republic | 67.9 | 80.6 | 81.3 | 74.6 | 78.0 | 84.8 | 85.6 |
| Slovenia | 85.3 | 79.0 | 80.6 | 85.5 | 87.8 | 88.7 | .. |
| Spain | 79.9 | 80.4 | 81.6 | 82.3 | 81.9 | 82.2 | 82.3 |
| Sweden | 86.1 b | .. | 86.7 | .. | 80.4 | .. | 83.6 |
| Switzerland | .. | 84.9 | .. | .. | 85.4 | .. | 92.5 |
| Turkey | 90.8 | 89.6 | 90.2 | 89.6 | 87.6 | 84.9 | 85.9 |
| United Kingdom | 64.5 | 68.2 | 69.1 | 70.6 | 72.2 | 75.3 | .. |
| United States | 90.3 d w | 84.1 d | 84.8 d | 85.3 d | 85.6 d | 85.6 d | 85.6 d e |
| EU28 (OECD estimates) | 82.0 e | 82.4 e | 82.6 e | 82.4 e | 81.9 e | 83.3 e | .. |
| OECD-Total | 89.3 e | 86.3 e | 86.5 e | 86.6 e | 86.4 e | 86.7 e | 86.8 e |
| Argentina | 94.5 | .. | .. | .. | 79.3 b | 74.8 | 65.4 |
| China | 91.2 | 93.0 | 93.2 | 93.7 | 93.7 | 94.7 | 95.0 |
| Romania | 57.5 | 66.3 | 72.3 | 59.2 | 69.5 | 77.3 | .. |
| Russian Federation | 37.3 | 35.1 | 35.5 | 35.1 | 34.2 | 38.5 | 40.9 |
| Singapore | 87.8 | 84.3 | 83.9 | 83.7 | 85.0 | 84.8 | 83.9 |
| South Africa | 68.3 | 79.5 | 81.1 | 81.3 | 82.4 | 85.1 | .. |
| Chinese Taipei | 97.7 | 98.0 | 98.1 | 98.4 | 98.5 | 98.5 | 98.6 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 36. Percentage of Business enterprise expenditure on R&D (BERD) financed by government

Percentage

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Australia | 4.0 | .. | 2.1 | .. | 2.2 | .. | .. |
| Austria | .. | .. | 12.5 | .. | 12.0 | .. | .. |
| Belgium | 6.2 | 5.4 | 5.2 | .. | 5.5 | .. | 3.4 |
| Canada | 2.6 d | 3.8 d | 4.1 d | 4.5 b | 4.6 | 5.3 | 5.6 p |
| Chile | .. | 6.9 | 8.3 b | 9.3 | 9.7 | 11.7 | 13.0 p |
| Czech Republic | 15.6 b | 13.0 | 10.7 | 9.2 | 7.6 | 6.1 | 7.0 |
| Denmark | 2.4 d | 2.8 d | 1.8 d | .. | 2.7 d | .. | 2.0 d p |
| Estonia | 6.9 | 9.2 | 10.2 | 10.3 | 8.4 | 4.7 | 4.4 |
| Finland | 3.8 | 3.0 | 2.8 | 3.0 | 3.6 | 3.6 | 3.1 |
| France | 10.1 | 7.9 | 8.1 | 7.8 | 8.8 | 8.2 p | .. |
| Germany | 4.5 e | 4.3 e | 3.4 | 3.4 e | 3.3 | 3.4 e | 3.2 |
| Greece | 5.6 | 8.2 | 7.0 | 10.5 | 8.8 | 3.3 | 4.1 |
| Hungary | 3.9 d | 15.7 d | 19.0 d | 16.5 d | 19.4 d | 8.3 d | 13.6 d |
| Iceland | 2.8 | .. | 9.7 b d | 9.0 d | 7.8 d | 8.4 d | 9.2 d |
| Ireland | 4.1 | 5.9 e | 6.0 | 6.0 e | 5.0 | 5.0 e | 4.6 |
| Israel ¹ | 4.8 d | 3.3 d | 2.8 d | 3.7 d | 3.2 d | 2.9 d | .. |
| Italy | 11.0 | 7.1 | 6.4 | 5.7 | 5.5 | 3.5 b | .. |
| Japan | 1.2 | 1.1 | 1.1 | 1.0 | 1.0 | 0.9 | 0.9 |
| Korea | 4.6 d | 6.0 | 5.5 | 5.1 | 5.1 | 4.2 | 4.7 |
| Latvia | 12.7 | 4.6 | 1.5 | 1.4 | 1.6 | 2.6 | 6.1 |
| Lithuania | 1.8 | 4.1 | 2.8 | 1.8 | 2.2 | 1.5 | 1.2 |
| Luxembourg | 5.2 | .. c | .. c | .. | 7.2 | .. | .. |
| Mexico | 11.0 | 19.1 | 34.1 | 36.1 e p | 35.3 e p | 33.2 e p | .. |
| Netherlands | 3.4 | 2.2 b | 2.0 | 1.8 | 1.9 | 1.7 | .. |
| New Zealand | 11.4 | .. | 11.2 | .. | 11.0 | .. | 11.9 |
| Norway | 7.9 | 10.1 | 9.3 | 8.5 | 8.6 | 9.4 | 9.4 |
| Poland | 13.7 | 11.2 | 10.0 | 11.5 | 10.0 | 16.3 b | .. |
| Portugal | 4.2 | 6.9 | 9.1 | 9.1 | 5.5 | 3.8 | 4.2 |
| Slovak Republic | 26.7 | 6.8 | 5.1 | 3.9 | 6.5 | 3.7 | 2.5 |
| Slovenia | 7.0 | 13.8 | 12.6 | 7.7 | 4.3 | 3.1 | .. |
| Spain | 13.6 | 12.6 | 10.7 | 9.7 | 9.4 | 8.9 | 8.7 |
| Sweden | 4.5 b | .. | 6.1 | .. | .. c | .. | 4.7 |
| Switzerland | .. | 0.7 | .. | .. | 1.4 | .. | 1.0 |
| Turkey | 6.9 | 9.4 | 8.6 | 8.9 | 10.6 | 9.9 | 9.0 |
| United Kingdom | 8.3 | 7.9 | 8.9 | 9.3 | 8.7 | 7.8 | .. |
| United States | 9.7 d | 10.2 d | 9.2 d | 7.8 d | 7.6 d | 6.4 d | 6.0 d e |
| EU28 (OECD estimates) | 7.4 e | 6.8 e | 6.4 e | 6.4 e | 6.4 e | 5.6 e | .. |
| OECD-Total | 6.8 e | 7.1 e | 6.5 e | 6.0 e | 6.0 e | 5.2 e | 5.0 e |
| Argentina | 4.5 | .. | .. | .. | 7.1 b | 2.0 | 3.6 |
| China | 4.6 | 4.6 | 4.5 | 4.2 | 4.3 | 3.7 | 3.4 |
| Romania | 36.8 | 19.6 | 14.0 | 19.0 | 13.7 | 12.2 | .. |
| Russian Federation | 53.6 | 60.4 | 61.5 | 62.7 | 63.4 | 59.0 | 56.6 |
| Singapore | 6.3 | 6.5 | 6.9 | 5.5 | 4.8 | 5.1 | 4.9 |
| South Africa | 16.2 | 6.5 | 5.8 | 5.2 | 3.8 | 3.1 | .. |
| Chinese Taipei | 2.2 | 1.9 | 1.7 | 1.5 | 1.4 | 1.4 | 1.3 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 37. Percentage of Business enterprise expenditure on R&D (BERD) financed by other national sources

Percentage

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Australia | 0.33 | .. | 0.07 | .. | 0.05 | .. | .. |
| Austria | .. | .. | 0.06 | .. | 0.06 | .. | .. |
| Belgium | 0.04 | 0.01 | 0.01 | .. | 0.02 | .. | 0.05 |
| Canada | .. k | .. k | .. k | .. c | .. c | 1.32 | 1.43 p |
| Chile | .. | 1.39 | 0.05 | 0.23 | 0.08 | 0.08 | 0.10 p |
| Czech Republic | 0.10 b | 0.04 | 0.08 | 0.04 | 0.05 | 0.07 | 0.08 |
| Denmark | 0.16 d | 0.26 d e | 0.50 d | .. | 0.31 d | .. | 0.75 d p |
| Estonia | 0.01 | 0.03 | 0.11 | 0.06 | 0.03 | 0.07 | 0.04 |
| Finland | 0.01 | 0.06 | 0.06 | 0.06 | 0.02 | 0.02 | 0.03 |
| France | 0.05 | 0.06 | 0.09 | 0.09 | 0.08 | 0.07 p | .. |
| Germany | 0.17 d | 0.26 d | 0.20 d | 0.20 d | 0.27 d | 0.19 d | 0.13 d |
| Greece | 0.37 | 0.15 | 0.06 | 0.04 | 0.01 | 0.02 | 0.05 |
| Hungary | 0.06 d | 0.05 d | 0.06 d | 0.05 d | 0.04 d | 0.05 d | 0.04 d |
| Iceland | 0.00 | .. | 0.62 b d | 3.58 d | 6.18 d | 6.70 d | 2.12 d |
| Ireland | 0.00 | 0.07 e | 0.09 | 0.09 e | 0.00 | 0.03 e | 0.14 |
| Israel ¹ | 0.61 d | 0.60 d | 0.61 d | 0.59 d | 0.57 d | 0.55 d | .. |
| Italy | 0.11 | 0.40 | 0.38 | 0.36 | 0.34 | 0.14 b | .. |
| Japan | 0.10 | 0.14 | 0.24 | 0.17 | 0.12 | 0.09 | 0.10 |
| Korea | 0.06 d | 0.06 | 0.06 | 0.05 | 0.06 | 0.04 | 0.05 |
| Latvia | .. | .. | .. | .. | .. | .. | .. |
| Lithuania | 0.2 | 0.1 | 2.5 | 0.4 | 0.5 | 0.1 | 0.1 |
| Luxembourg | 0.02 | .. | .. | .. | .. | .. | .. |
| Mexico | 0.02 | 0.06 | 0.30 | 0.32 e p | 0.37 e p | 0.43 e p | .. |
| Netherlands | 0.33 | 0.57 b | 0.69 | 0.49 | 0.22 | 0.23 | .. |
| New Zealand | 1.05 | .. | .. c | .. | .. c | .. | .. c |
| Norway | 0.01 | 0.01 | 0.02 | 0.04 | 0.05 | 0.04 | 0.00 |
| Poland | 0.08 | 0.13 | 0.06 | 0.11 | 0.14 | 0.10 b | .. |
| Portugal | 0.00 | 0.01 | 0.01 | 0.02 | 0.02 | 0.03 | 0.03 |
| Slovak Republic | 0.03 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 |
| Slovenia | 0.48 | 0.13 | 0.01 | 0.05 | 0.00 | 0.00 | .. |
| Spain | 0.68 | 0.22 | 0.25 | 0.18 | 0.85 | 0.24 | 0.22 |
| Sweden | 0.20 b | .. | 0.27 | .. | 0.38 | .. | 0.17 |
| Switzerland | .. | 0.57 | .. | .. | 0.52 | .. | 0.45 |
| Turkey | 2.02 d | 0.21 | 0.20 | 0.09 | 0.14 | 0.12 | 0.27 |
| United Kingdom | 0.02 d | 0.22 d | 0.40 d | 0.68 d | 0.62 d | 0.84 d | .. |
| United States | .. k | 0.11 d | 0.08 d | 0.15 d | 0.14 d | 0.26 d | 0.28 d e |
| EU28 (OECD estimates) | 0.14 e | 0.21 e | 0.22 e | 0.25 e | 0.28 e | 0.24 e | .. |
| OECD-Total | 0.10 e | 0.17 e | 0.18 e | 0.20 e | 0.20 e | 0.24 e | 0.24 e |
| Argentina | 0.00 | .. | .. | .. | 0.00 b | 0.03 | 0.04 |
| China | .. | .. | .. | .. | .. | .. | .. |
| Romania | 0.16 | 0.16 | 0.27 | 0.20 | 0.28 | 0.32 | .. |
| Russian Federation | 0.04 | 0.10 | 0.13 | 0.16 | 0.18 | 0.05 | 0.05 |
| Singapore | 0.08 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.05 |
| South Africa | 1.02 | 2.79 | 2.69 | 2.79 | 2.71 | 2.72 | .. |
| Chinese Taipei | 0.04 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 38. Percentage of Business enterprise expenditure on R&D (BERD) financed by the rest of the world

Percentage

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|-----------|--------------|--------------|--------------|--------------|--------------|-----------|
| Australia | 1.6 | .. | 1.6 | .. | 1.6 | .. | .. |
| Austria | .. | .. | 20.7 | .. | 20.6 | .. | .. |
| Belgium | 11.0 | 11.9 | 12.0 | .. | 15.3 | .. | 10.2 |
| Canada | 14.9 d | 10.3 d | 10.5 d | 14.7 b | 17.6 | 19.5 | 20.4 p |
| Chile | .. | 0.1 | 1.5 b | 1.9 | 1.9 | 0.5 | 0.8 p |
| Czech Republic | 5.4 b | 20.5 | 21.2 | 28.3 | 31.9 | 32.0 | 33.0 |
| Denmark | 11.4 | 7.1 e | 6.1 | .. | 5.3 | .. | 8.2 p |
| Estonia | 12.7 | 3.8 | 5.7 | 9.4 | 8.1 | 7.5 | 8.7 |
| Finland | 5.3 b | 8.1 | 11.7 | 20.4 | 16.7 | 12.4 | 10.2 |
| France | 9.2 | 9.1 | 9.4 | 9.3 | 9.1 | 8.9 p | .. |
| Germany | 3.3 | 4.0 e | 5.0 | 5.0 e | 6.7 | 6.7 e | 6.3 |
| Greece | 8.3 | 14.4 | 11.4 | 10.6 | 8.9 | 9.1 | 11.7 |
| Hungary | 18.1 d | 17.7 d | 17.4 d | 19.2 d | 15.8 d | 18.0 d | 16.3 d |
| Iceland | 12.2 | .. | 28.5 b d | 32.2 d | 33.8 d | 28.4 d | 32.8 d |
| Ireland | 9.8 | 24.8 e | 21.5 | 21.5 e | 28.3 | 28.2 e | 27.3 |
| Israel ¹ | 27.4 d | 50.6 d | 55.4 d | 56.0 d | 58.8 d | 55.5 d | .. |
| Italy | 12.1 | 13.0 | 12.6 | 12.3 | 10.0 | 12.2 b | .. |
| Japan | 0.4 | 0.5 | 0.6 | 0.5 | 0.6 | 0.9 | 0.8 |
| Korea | 0.9 d | 0.3 | 0.2 | 0.6 | 0.8 | 1.0 | 1.4 |
| Latvia | 25.6 | 19.2 | 45.2 | 38.9 | 50.5 | 31.9 | 24.5 |
| Lithuania | 14.1 | 34.2 | 31.9 | 22.1 | 24.9 | 10.7 | 18.0 |
| Luxembourg | 3.1 | .. c | .. c | .. | 2.7 | .. | .. |
| Mexico | 2.1 | 0.4 | 0.5 | 0.5 e p | 0.6 e p | 0.7 e p | .. |
| Netherlands | 17.2 | 14.5 b | 13.5 | 14.4 | 18.4 | 16.0 | .. |
| New Zealand | 7.0 | .. | 11.6 | .. | 10.5 | .. | 11.0 |
| Norway | 10.5 | 10.7 | 13.7 | 13.6 | 13.1 | 13.5 | 12.6 |
| Poland | 3.2 | 7.6 | 9.2 | 9.0 | 10.1 | 4.4 b | .. |
| Portugal | 4.5 | 2.4 | 3.8 | 2.7 | 4.9 | 6.9 | 5.7 |
| Slovak Republic | 5.3 | 12.7 | 13.6 | 21.5 | 15.5 | 11.5 | 11.9 |
| Slovenia | 7.2 | 7.0 | 6.8 | 6.8 | 8.0 | 8.2 | .. |
| Spain | 5.8 | 6.8 | 7.5 | 7.8 | 7.9 | 8.6 | 8.7 |
| Sweden | 9.1 b | .. | 6.9 | .. | .. c | .. | 11.6 |
| Switzerland | .. | 13.8 | .. | .. | 12.6 | .. | 6.1 |
| Turkey | 0.3 | 0.8 | 1.0 | 1.4 | 1.6 | 5.0 | 4.9 |
| United Kingdom | 27.1 | 23.7 | 21.5 | 19.4 | 18.5 | 16.0 | .. |
| United States | .. k | 5.6 d | 6.0 d | 6.8 d | 6.7 d | 7.7 d | 8.1 d e |
| EU28 (OECD estimates) | 10.5 e | 10.6 e | 10.8 e | 11.0 e | 11.5 e | 10.9 e | .. |
| OECD-Total | .. | 6.4 e | 6.7 e | 7.2 e | 7.4 e | 7.9 e | .. |
| Argentina | 1.0 | .. | .. | .. | 13.6 b | 23.2 | 31.0 |
| China | 1.0 | 1.1 | 1.0 | 0.9 | 0.9 | 0.8 | 0.8 |
| Romania | 5.5 | 14.0 | 13.4 | 21.6 | 16.5 | 10.3 | .. |
| Russian Federation | 9.1 | 4.4 | 2.9 | 2.1 | 2.2 | 2.5 | 2.4 |
| Singapore | 5.9 | 9.2 | 9.2 | 10.8 | 10.2 | 10.1 | 11.2 |
| South Africa | 14.5 | 11.3 | 10.4 | 10.7 | 11.1 | 9.1 | .. |
| Chinese Taipei | 0.0 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 39. Business enterprise expenditure on R&D (BERD) performed in the pharmaceutical industry at current prices and PPP

Million USD

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|------------|------------|------------|------------|------------|------------|----------|
| Australia | 178.0 e | 301.6 e | 366.2 | .. | .. | .. | .. |
| Austria | 269.7 e | 291.6 e | 357.1 | 384.4 e | 368.1 | .. | .. |
| Belgium | 814.5 e | 1 856.0 | 1 929.4 | 1 948.5 | 1 989.8 | 2 575.7 | 2 850.2 |
| Canada | 878.1 d e | 364.0 d | 340.7 d | 375.5 d | 400.6 d | 390.3 d | .. |
| Chile | .. | 18.5 | 33.7 | 28.0 | 28.8 | .. | .. |
| Czech Republic | 55.1 | 83.9 | 76.9 | 84.6 | 86.9 | 88.8 | 88.8 |
| Denmark | .. | 1 065.8 | 1 127.2 | 1 162.6 | 1 239.0 | 1 453.4 | 1 394.3 |
| Estonia | .. | 1.7 | 1.9 | 2.1 | 1.6 | 0.8 | 1.4 |
| Finland | .. | 150.1 | 132.4 | 148.5 | 143.3 | 159.6 | 168.3 |
| France | .. | 956.6 | 988.0 e | 1 055.5 e | 1 100.2 e | 1 067.7 | .. |
| Germany | 3 891.4 e | 5 197.9 | 5 259.4 | 5 247.0 | 5 085.4 | 5 878.0 | .. |
| Greece | .. | 84.5 e | 93.2 | 82.9 e | 69.3 | 72.2 e | 86.4 |
| Hungary | 279.2 e | 436.0 e | 420.3 e | 433.2 | 406.9 | 406.5 | 400.0 |
| Iceland | .. | .. | 0.4 | 0.2 | 1.0 | 1.4 | 0.7 |
| Ireland | .. | 179.2 e | 203.0 | 186.9 e | 179.1 | 275.1 e | 429.0 |
| Israel ¹ | .. | 286.2 d | 383.2 d | 279.0 d | 349.6 d | 338.3 d | .. |
| Italy | 452.2 e | 771.5 | 738.2 | 691.7 | 729.6 | 826.0 | .. |
| Japan | 8 087.5 | 12 526.0 | 14 185.8 | 14 510.5 | 14 091.1 | 13 167.5 | 14 299.7 |
| Korea | 444.0 | 1 221.9 | 1 245.9 | 1 287.1 | 1 576.4 | .. | .. |
| Latvia | .. | 9.7 | 11.2 | 5.4 | 5.4 | 5.6 | 8.4 |
| Lithuania | .. | 6.0 | 5.6 | 17.1 | 5.0 | 1.2 e | 1.5 e |
| Luxembourg | .. | .. | .. | .. | .. | .. | .. |
| Mexico | 216.8 | 167.9 | 246.1 | 264.1 | 267.7 | 263.4 | .. |
| Netherlands | .. | 318.0 | 305.2 | 316.7 | 318.6 | 290.8 | .. |
| New Zealand | .. | .. | .. | .. | .. | .. | .. |
| Norway | 52.1 e | 43.4 | 42.5 | 36.8 | 33.3 | 34.7 | 40.2 |
| Poland | 71.0 | 144.1 | 122.8 | 150.7 | 216.0 | 176.4 | .. |
| Portugal | 63.8 e | 147.8 | 144.9 | 129.7 | 127.5 | 151.3 | 172.2 |
| Slovak Republic | .. | 18.6 | 4.2 | 8.7 | 6.3 | 11.1 | 6.3 |
| Slovenia | 124.1 e | 271.0 | 272.9 | 275.4 | 308.0 | 305.4 | .. |
| Spain | 711.1 e | 844.5 | 841.8 | 873.0 | 892.8 | 963.1 | 1 088.2 |
| Sweden | .. | 829.4 e | 809.6 | 764.4 e | 861.1 e | 811.6 e | 847.4 e |
| Switzerland | 2 295.3 e | 3 692.0 | 3 935.8 e | 4 194.0 e | 4 481.9 | 4 512.9 e | 4 651.6 |
| Turkey | .. | 187.8 | 196.5 | 198.4 | 201.6 | 175.6 | 228.6 |
| United Kingdom | .. | 718.6 | 658.5 | 572.6 | 560.4 | 548.1 | .. |
| United States | 34 839.0 d | 48 146.0 d | 52 426.0 d | 56 612.0 d | 58 675.0 d | 64 628.0 d | .. |
| EU28 (OECD estimates) | .. | .. | .. | .. | .. | .. | .. |
| OECD-Total | .. | .. | .. | .. | .. | .. | .. |
| Argentina | .. | .. | .. | .. | .. | .. | .. |
| China | .. | 8 038.2 | 9 805.1 | 11 113.8 | 12 694.5 | 14 065.5 | .. |
| Romania | 19.2 e | 26.8 | 25.1 | 38.8 | 27.9 | 36.3 | .. |
| Russian Federation | .. | .. | .. | .. | .. | .. | .. |
| Singapore | 72.5 e | 153.4 | 142.5 | .. | .. | .. | .. |
| South Africa | .. | .. | .. | .. | .. | .. | .. |
| Chinese Taipei | 118.3 | 350.2 | 395.1 | 489.7 | 457.1 | 558.2 | .. |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, ANBERD database: Research and Development Expenditure in Industry

Table 40. Business enterprise expenditure on R&D (BERD) performed in the computer, electronic and optical industry at current prices and PPP

Million USD

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|--------------|------------|------------|------------|------------|------------|----------|
| Australia | 182.7 e | .. | .. | .. | .. | .. | .. |
| Austria | 1 234.0 e | 713.6 e | 772.3 | 855.6 e | 909.9 | .. | .. |
| Belgium | 556.1 e | 555.7 | 593.4 | 550.1 | 578.7 | 615.1 | 677.3 |
| Canada | 2 398.6 d e | 2 012.7 d | 1 820.3 d | 838.8 d | 877.4 d | 867.4 d | .. |
| Chile | .. | 0.5 | 1.2 | 1.7 | 1.0 | .. | .. |
| Czech Republic | 105.2 | 92.7 | 119.1 | 147.5 | 152.7 | 182.3 | 205.0 |
| Denmark | .. | 373.3 | 406.2 | 412.4 | 438.4 | 481.7 | 511.4 |
| Estonia | .. | 4.5 | 5.0 | 8.0 | 12.4 | 16.9 | 26.1 |
| Finland | 2 111.4 e | 2 097.5 | 1 966.8 | 1 916.4 | 1 507.0 | 1 291.3 | 1 272.5 |
| France | .. | 4 007.9 | 4 502.6 e | 4 656.1 e | 4 676.9 e | 4 835.9 | .. |
| Germany | 6 607.9 e | 9 389.4 | 9 476.1 | 9 762.4 | 9 693.9 | 9 936.2 | .. |
| Greece | .. | 25.4 e | 23.2 | 20.1 e | 19.6 | 24.8 e | 33.9 |
| Hungary | 57.2 e | 97.0 e | 95.4 e | 35.7 | 37.8 | 44.9 | 44.7 |
| Iceland | .. | .. | 2.7 | 2.8 | 2.4 | 2.8 | 3.6 |
| Ireland | .. | 219.1 e | 251.6 e | 289.2 e | 339.7 | 307.3 e | 337.3 |
| Israel ¹ | 1 486.5 d e | 1 497.9 d | 1 594.5 d | 1 518.8 d | 1 461.3 d | 1 565.7 d | .. |
| Italy | 1 518.7 e | 1 828.9 | 1 757.4 | 1 771.2 | 1 857.0 | 1 366.0 | .. |
| Japan | .. | 28 387.1 | 28 750.8 | 28 017.8 | 27 883.9 | 25 599.2 | 26 050.6 |
| Korea | 11 753.5 | 25 237.8 | 27 676.6 | 30 402.1 | 29 892.6 | .. | .. |
| Latvia | .. | 3.8 | 6.4 | 5.8 | 6.6 | 7.3 | 6.5 |
| Lithuania | .. | 12.3 | 12.8 | 17.8 | 18.2 | 18.6 | 34.7 |
| Luxembourg | .. | .. | .. | .. | .. | .. | .. |
| Mexico | 73.0 e | 80.8 | 94.4 | 101.3 | 102.7 | 101.0 | .. |
| Netherlands | .. | 742.5 | 818.2 | 848.5 | 761.0 | 799.5 | .. |
| New Zealand | .. | .. | .. | .. | .. | .. | .. |
| Norway | 178.9 e | 182.5 | 180.9 | 195.6 | 196.7 | 184.8 | 189.8 |
| Poland | 29.3 | 89.0 | 84.5 | 94.7 | 115.3 | 123.2 | .. |
| Portugal | 121.8 e | 43.0 | 41.0 | 49.8 | 53.1 | 63.0 | 63.2 |
| Slovak Republic | 12.4 | 7.2 | 7.8 | 7.2 | 9.0 | 12.7 | 12.7 |
| Slovenia | 66.7 e | 62.8 | 67.8 | 69.1 | 66.5 | 55.9 | .. |
| Spain | 319.2 e | 258.5 | 260.4 | 257.0 | 246.2 | 258.6 | 300.0 |
| Sweden | .. | 2 059.7 e | 2 039.0 | 1 949.4 e | 2 220.9 | 1 176.1 e | 255.3 |
| Switzerland | 799.1 e | 1 526.1 | 1 632.9 e | 1 718.7 e | 1 777.1 | 1 688.2 e | 1 609.2 |
| Turkey | 279.2 e | 196.5 | 263.9 | 237.1 | 292.8 | 1 398.6 | 1 901.9 |
| United Kingdom | .. | 1 391.9 | 1 468.3 | 1 440.9 | 1 422.7 | 1 560.0 | .. |
| United States | 49 725.0 d e | 65 068.0 d | 67 205.0 d | 73 891.0 d | 72 110.0 d | 77 385.0 d | .. |
| EU28 (OECD estimates) | .. | .. | .. | .. | .. | .. | .. |
| OECD-Total | .. | .. | .. | .. | .. | .. | .. |
| Argentina | .. | .. | .. | .. | .. | .. | .. |
| China | .. | 33 719.0 | 39 535.5 | 44 463.3 | 51 547.8 | 57 494.4 | .. |
| Romania | 8.3 e | 60.8 | 40.2 | 16.2 | 37.8 | 44.1 | .. |
| Russian Federation | .. | .. | .. | .. | .. | .. | .. |
| Singapore | 1 369.0 e | 2 059.1 | 1 801.4 | .. | .. | .. | .. |
| South Africa | .. | .. | .. | .. | .. | .. | .. |
| Chinese Taipei | 7 242.2 | 15 607.0 | 16 855.8 | 18 272.2 | 19 253.5 | 20 268.8 | .. |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, ANBERD database: Research and Development Expenditure in Industry

Table 41. Business enterprise expenditure on R&D (BERD) performed in the aerospace industry at current prices and PPP

Million USD

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|------------|-------------|-------------|------------|-------------|-------------|-------|
| Australia | 39.3 e | .. | .. | .. | .. | .. | .. |
| Austria | 5.7 e | 44.2 e | 45.9 | 57.8 e | 73.2 | .. | .. |
| Belgium | 77.9 e | 138.6 | 156.3 | .. | .. | .. | .. |
| Canada | 708.6 d e | 1 168.2 d e | 1 285.1 d e | 1 317.5 d | 1 320.0 d e | 1 203.6 d e | .. |
| Chile | .. | .. | .. | .. | .. | .. | .. |
| Czech Republic | 37.6 | 45.7 | 54.0 | 69.4 | 47.6 | 60.3 | 92.0 |
| Denmark | .. | .. | .. | .. | .. | 0.7 | 2.8 |
| Estonia | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Finland | .. | 6.4 e | 5.9 e | 5.2 e | 8.4 | 6.7 | 7.9 e |
| France | .. | 3 441.3 | 3 827.4 e | 3 956.4 e | 3 858.5 e | 3 589.6 | .. |
| Germany | 2 285.8 e | 3 019.5 | 2 268.4 | 2 342.5 | 2 194.3 | .. | .. |
| Greece | .. | .. | .. | .. | .. | .. | .. |
| Hungary | .. | .. | .. | .. | .. | .. | .. |
| Iceland | .. | .. | 0.2 | 0.2 | 0.1 | 0.0 | 0.0 |
| Ireland | .. | .. | .. | .. | .. | .. | .. |
| Israel ¹ | .. | .. | .. | .. | .. | .. | .. |
| Italy | 924.0 e | 1 215.7 | 1 121.4 | 1 049.6 | 991.3 | 1 695.0 | .. |
| Japan | 12.4 | 310.3 | 481.4 | 477.7 | 657.3 | 753.9 | 855.7 |
| Korea | 165.5 | 185.7 | 142.6 | 86.6 | 275.1 | .. | .. |
| Latvia | .. | .. | .. | .. | .. | .. | .. |
| Lithuania | .. | .. | .. | 0.0 | .. | .. | .. |
| Luxembourg | .. | .. | .. | .. | .. | .. | .. |
| Mexico | .. | 19.3 | 27.3 | 29.3 | 29.7 | 29.2 | .. |
| Netherlands | .. | 53.9 | 59.1 | .. | .. | .. | .. |
| New Zealand | .. | .. | .. | .. | .. | .. | .. |
| Norway | .. | 1.8 e | 1.2 e | 1.1 e | 1.1 | 1.0 e | 0.9 e |
| Poland | 30.4 | 75.3 | 92.1 | 92.4 | 104.7 | 98.5 | .. |
| Portugal | .. | .. | .. | .. | .. | .. | .. |
| Slovak Republic | .. | .. | .. | .. | .. | .. | .. |
| Slovenia | 0.0 e | 1.0 | 3.9 | 2.0 | 1.8 | 1.6 | .. |
| Spain | 386.8 e | 631.0 | 614.6 | 525.8 | 598.1 | 619.2 | 646.1 |
| Sweden | .. | .. | .. | .. | .. | .. | .. |
| Switzerland | .. | .. | .. | .. | .. | .. | .. |
| Turkey | .. | .. | .. | .. | .. | .. | .. |
| United Kingdom | .. | 1 920.4 | 2 011.5 | 2 137.3 | 2 110.4 | 2 368.5 | .. |
| United States | 15 005.0 d | 24 817.0 d | 27 114.0 d | 26 181.0 d | 27 464.0 d | 26 645.0 d | .. |
| EU28 (OECD estimates) | .. | .. | .. | .. | .. | .. | .. |
| OECD-Total | .. | .. | .. | .. | .. | .. | .. |
| Argentina | .. | .. | .. | .. | .. | .. | .. |
| China | .. | .. | .. | .. | .. | .. | .. |
| Romania | .. | 6.1 | 5.6 | 7.8 | 0.7 | 2.1 | .. |
| Russian Federation | .. | .. | .. | .. | .. | .. | .. |
| Singapore | 20.7 e | .. | .. | .. | .. | .. | .. |
| South Africa | .. | .. | .. | .. | .. | .. | .. |
| Chinese Taipei | .. | .. | .. | .. | .. | .. | .. |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, ANBERD database: Research and Development Expenditure in Industry

Table 42. Business enterprise expenditure on R&D (BERD) performed in service industries at current prices and PPP

Million USD

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|--------------|--------------|--------------|---------------|---------------|-------------|-------------|
| Australia | 3 085.1 e | 5 823.1 e | 6 713.6 | 6 695.7 e | 6 670.3 | .. | .. |
| Austria | 1 306.3 e | 2 917.9 e | 3 146.5 | 3 382.5 e | 3 464.5 | .. | .. |
| Belgium | 1 253.5 e | 2 839.0 | 3 023.3 | 3 572.5 | 3 819.5 | 3 834.7 | 4 512.7 |
| Canada | 5 189.8 d e | 6 005.9 d | 6 167.5 d | 8 135.0 d | 7 869.8 d e | 8 231.5 d e | 8 293.4 d e |
| Chile | .. | 219.1 | 218.1 | 220.9 | 202.4 | 239.7 | 243.2 |
| Czech Republic | 556.0 | 1 352.7 | 1 452.4 | 1 708.1 | 1 685.7 | 1 707.1 | 2 019.1 |
| Denmark | .. | 2 116.1 | 2 033.2 | 2 073.6 | 2 307.6 | 2 728.5 | 2 629.1 |
| Estonia | 50.4 | 198.7 | 181.1 | 155.0 | 173.3 | 173.6 | 169.8 |
| Finland | 737.2 e | 1 307.7 | 1 340.9 | 1 277.3 | 1 302.1 | 1 353.6 | 1 491.1 |
| France | .. | 16 690.9 | 17 431.6 e | 17 741.4 e | 18 153.5 e | 18 897.2 | .. |
| Germany | 4 682.3 e | 8 956.7 | 9 124.9 | 9 219.6 | 11 096.4 | 11 778.7 | .. |
| Greece | .. | 394.7 e | 479.5 | 556.4 e | 649.7 | 821.6 e | 1 053.4 |
| Hungary | 162.6 e | 784.1 e | 1 088.5 e | 1 277.2 | 1 477.7 | 1 177.9 | 1 404.4 |
| Iceland | .. | .. | 95.0 | 132.5 | 174.3 | 175.5 | 189.2 |
| Ireland | .. | 1 399.9 e | 1 431.2 | 1 515.6 e | 1 664.1 | 1 614.3 e | 1 891.0 |
| Israel ¹ | 3 497.4 d e | 6 354.1 d | 6 980.2 d | 7 578.2 d | 8 391.3 d | 9 597.6 d | .. |
| Italy | 2 584.7 e | 3 645.4 | 4 155.2 | 4 533.3 | 4 867.2 | 5 632.0 | .. |
| Japan | 9 828.6 | 12 445.6 | 12 482.7 | 16 299.8 | 16 044.8 | 15 309.9 | 15 891.7 |
| Korea | 1 611.2 | 4 418.3 | 4 531.4 | 4 722.2 | 4 802.3 | .. | .. |
| Latvia | .. | .. | .. | .. | 39.6 | .. | 33.1 |
| Lithuania | .. | 109.2 | 114.6 | 145.8 | 152.9 | 170.0 e | 201.8 |
| Luxembourg | 239.9 | .. | .. | .. | .. | .. | .. |
| Mexico | 457.5 e | 1 564.4 | 1 419.8 | 1 523.6 | 1 544.7 | 1 519.7 | .. |
| Netherlands | .. | 3 232.9 | 3 283.5 | 3 277.1 | 3 627.0 | 3 971.7 | .. |
| New Zealand | 202.2 | 375.0 e | 437.1 | 510.6 e | 565.9 | .. | .. |
| Norway | 886.3 e | 1 637.9 | 1 720.1 | 1 818.2 | 1 943.7 | 1 987.6 | 2 214.9 |
| Poland | 461.3 | 1 332.8 | 1 647.7 | 2 130.2 | 2 473.1 | 4 286.8 e | .. |
| Portugal | 314.5 e | 1 069.1 | 1 062.8 | 1 003.2 | 1 010.7 | 1 097.9 | 1 288.7 |
| Slovak Republic | 117.1 e | 217.6 | 240.2 | 162.7 | 169.8 | 195.3 | 243.0 |
| Slovenia | 71.0 e | 429.0 | 408.1 | 380.9 | 310.5 | 250.2 | .. |
| Spain | 2 975.2 e | 5 006.6 | 5 107.1 | 5 039.8 | 5 180.6 | 5 321.7 | 5 903.4 |
| Sweden | .. | 2 681.6 e | 2 841.5 | 2 755.2 e | 3 178.3 | 4 151.8 e | 5 560.9 |
| Switzerland | 1 237.2 e | 3 164.1 | 3 510.7 e | 3 817.5 e | 4 066.2 | 3 978.5 e | 3 919.5 |
| Turkey | 343.3 e | 2 612.1 | 3 089.0 | 3 717.1 | 4 277.8 | 4 443.1 | 4 923.8 |
| United Kingdom | .. | 14 167.4 | 15 453.3 | 16 810.5 | 17 739.9 | 18 014.6 | .. |
| United States | 65 828.5 d e | 89 912.0 d e | 96 513.0 d e | 102 696.0 d e | 114 677.0 d e | 120 230.0 d | .. |
| EU28 (OECD estimates) | .. | .. | .. | .. | .. | .. | .. |
| OECD-Total | .. | .. | .. | .. | .. | .. | .. |
| Argentina | .. | .. | .. | .. | 321.5 | 322.8 | 381.9 |
| China | .. | 14 114.5 | .. | .. | .. | .. | .. |
| Romania | 47.1 e | 406.0 | 213.7 | 286.0 | 506.8 | 760.3 | .. |
| Russian Federation | .. | .. | .. | .. | .. | .. | .. |
| Singapore | 1 171.2 e | 1 986.0 | 2 195.8 | .. | .. | .. | .. |
| South Africa | 858.3 | .. | .. | .. | .. | .. | .. |
| Chinese Taipei | 734.9 | 1 769.5 | 1 961.5 | 2 081.7 | 2 132.0 | 2 263.9 | .. |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, ANBERD database: Research and Development Expenditure in Industry

Table 43. Higher education expenditure on R&D (HERD) at current prices and PPP

Million USD

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Australia | .. | 6 239.6 | 6 854.0 e | 6 984.6 | 6 477.9 e | 7 495.5 | .. |
| Austria | 1 689.8 e | 2 804.2 e | 2 920.3 | 3 047.5 e | 3 090.7 | 3 133.9 b e | 3 325.5 p |
| Belgium | 1 389.2 | 2 284.2 | 2 469.4 | 2 464.7 | 2 571.8 | 2 893.1 | 3 012.5 |
| Canada | 7 841.7 | 10 249.8 b | 10 460.0 | 10 478.3 | 10 612.9 | 11 090.9 | 11 155.7 p |
| Chile | .. | 464.5 | 602.7 | 591.3 b | 598.1 | 662.7 b p | 729.1 p |
| Czech Republic | 486.2 | 1 494.9 | 1 658.0 | 1 702.5 | 1 707.3 | 1 279.0 | 1 415.8 |
| Denmark | 1 090.8 | 2 363.3 | 2 641.0 | 2 641.4 | 2 891.1 | 2 917.4 | 3 061.9 p |
| Estonia | 85.6 | 234.8 | 264.0 | 241.0 | 233.0 | 180.1 | 225.0 |
| Finland | 1 064.0 | 1 623.2 | 1 588.4 | 1 641.9 | 1 631.4 | 1 656.9 | 1 786.8 |
| France | 7 442.5 | 11 476.0 | 12 184.1 | 13 402.3 b | 13 553.5 | 12 918.2 p | 13 409.4 e |
| Germany | 10 726.2 | 17 757.8 | 18 459.0 | 19 416.8 | 19 724.8 | 21 632.0 b | 22 915.7 |
| Greece | 772.6 | 780.4 | 869.0 | 905.2 | 1 057.3 | 931.5 | 983.8 |
| Hungary | 399.0 d | 533.0 d | 483.8 d | 460.0 d | 428.2 d | 353.7 d | 505.2 d |
| Iceland | 65.2 | .. | 90.9 b | 95.8 | 104.3 | 115.2 | 125.9 |
| Ireland | 543.6 | 777.8 | 816.3 e | 891.4 | 913.5 e | 924.3 | .. |
| Israel ¹ | 1 035.2 d | 1 335.5 d | 1 444.8 d | 1 468.4 d | 1 540.1 d | 1 660.5 d | 1 753.1 d e |
| Italy | 5 509.9 b | 7 687.0 | 8 054.0 | 7 863.1 e | 7 654.8 e | 7 840.5 e | 8 112.3 p |
| Japan | 17 250.4 | 20 344.9 | 22 172.2 b | 21 326.7 | 20 694.2 | 20 294.3 | 20 529.6 |
| Korea | 3 040.0 d | 6 172.7 | 6 305.9 | 6 614.4 | 6 996.8 | 7 350.2 | 7 716.5 |
| Latvia | 66.6 | 144.5 | 119.8 | 132.6 | 152.0 | 97.7 | 131.2 |
| Lithuania | 197.1 | 352.6 | 410.2 | 443.8 | 485.5 | 285.3 | 297.9 |
| Luxembourg | 7.5 | 104.5 | 125.5 | 116.9 | 139.8 | 155.7 e | 158.8 e p |
| Mexico | 1 536.9 | 2 696.2 | 2 689.4 | 3 069.7 e p | 3 124.5 e p | 3 013.0 e p | .. |
| Netherlands | 3 775.3 | 4 795.4 | 5 127.2 | 5 269.8 | 5 425.4 | 5 312.5 | 5 534.1 p |
| New Zealand | 386.3 | .. | 565.0 | .. | 594.4 | .. | 652.7 |
| Norway | 1 010.1 | 1 664.1 | 1 772.1 | 1 802.0 | 1 884.1 | 2 013.3 | 2 315.9 |
| Poland | 942.5 | 2 751.5 | 2 395.1 | 2 668.0 | 2 955.4 | 3 186.0 | 3 865.2 p |
| Portugal | 640.1 | 1 397.4 | 1 727.6 b | 1 758.6 | 1 740.1 | 1 835.9 | 1 894.7 |
| Slovak Republic | 90.1 | 394.7 | 411.7 | 474.8 | 826.3 | 366.9 | 383.4 |
| Slovenia | 113.3 | 170.2 | 165.0 | 157.4 | 146.1 | 149.3 | 156.2 p |
| Spain | 3 846.5 | 5 346.3 | 5 405.2 | 5 444.4 | 5 573.6 | 5 566.7 | 5 940.1 |
| Sweden | 2 284.9 | 3 788.3 e | 3 934.9 | 4 111.2 e | 4 137.9 | 4 270.6 e | 4 378.9 |
| Switzerland | .. | 3 843.2 | .. | 4 415.2 | 4 763.1 | .. | 5 211.0 |
| Turkey | 2 509.8 | 5 622.5 | 5 823.0 | 6 457.8 | 7 035.1 | 7 157.0 | 7 290.0 |
| United Kingdom | 7 885.7 | 10 278.2 | 10 972.1 | 11 294.4 | 11 567.9 | 11 501.3 | 11 698.9 p |
| United States | 47 006.0 d | 60 896.0 d | 61 546.0 d | 62 346.0 d | 64 642.0 d | 67 813.0 d | 70 826.0 d p |
| EU28 (OECD estimates) | 51 464.9 e | 80 058.8 e | 83 874.5 e | 87 178.6 e | 89 349.9 e | 90 095.3 e | 94 977.3 e |
| OECD-Total | 138 070.0 e | 199 521.3 e | 207 673.9 e | 212 800.1 e | 217 666.7 e | 223 610.2 e | 233 743.3 e |
| Argentina | 588.4 | 1 560.8 | 1 555.1 | 1 536.5 | 1 420.2 | 1 208.2 | 1 303.7 |
| China | 8 588.2 | 22 146.7 | 24 162.4 | 25 573.7 | 28 715.2 | 30 875.1 | 35 663.3 |
| Romania | 115.5 | 362.4 | 302.5 | 238.9 | 364.8 | 255.6 | 279.2 p |
| Russian Federation | 1 047.3 | 3 523.7 | 3 476.9 | 3 944.4 | 3 719.2 | 3 527.5 | 3 776.8 |
| Singapore | 1 231.2 | 2 393.5 | 2 565.4 | 2 766.4 | 3 121.0 | 3 210.4 | 3 074.8 |
| South Africa | 781.3 | 1 485.9 | 1 414.5 | 1 567.1 | 1 776.6 | 1 989.3 | .. |
| Chinese Taipei | 1 748.5 | 3 377.9 | 3 423.3 | 3 390.5 | 3 348.6 | 3 364.7 | 3 513.2 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 44. Higher education expenditure on R&D (HERD) as a percentage of GDP

Percentage

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Australia | .. | 0.63 | 0.62 e | 0.62 | 0.57 e | 0.62 | .. |
| Austria | 0.59 e | 0.72 e | 0.72 | 0.73 e | 0.72 | 0.69 b e | 0.70 p |
| Belgium | 0.40 | 0.48 | 0.51 | 0.49 | 0.50 | 0.54 | 0.54 |
| Canada | 0.67 | 0.70 b | 0.67 | 0.65 | 0.67 | 0.68 | 0.65 p |
| Chile | .. | 0.12 | 0.15 | 0.15 b | 0.15 | 0.16 b p | 0.16 p |
| Czech Republic | 0.22 | 0.49 | 0.52 | 0.50 | 0.48 | 0.34 | 0.35 |
| Denmark | 0.59 | 0.94 | 1.01 | 0.98 | 1.04 | 1.00 | 0.98 p |
| Estonia | 0.38 | 0.68 | 0.73 | 0.63 | 0.61 | 0.44 | 0.51 |
| Finland | 0.63 | 0.74 | 0.71 | 0.72 | 0.71 | 0.69 | 0.70 |
| France | 0.39 | 0.46 | 0.47 | 0.50 b | 0.50 | 0.46 p | 0.45 e |
| Germany | 0.41 | 0.51 | 0.51 | 0.51 | 0.50 | 0.53 b | 0.53 |
| Greece | 0.27 | 0.28 | 0.30 | 0.31 | 0.36 | 0.32 | 0.32 |
| Hungary | 0.23 d | 0.23 d | 0.20 d | 0.18 d | 0.17 d | 0.13 d | 0.18 d |
| Iceland | 0.59 | .. | 0.64 b | 0.64 | 0.65 | 0.66 | 0.66 |
| Ireland | 0.32 | 0.37 | 0.37 e | 0.37 | 0.28 e | 0.27 | .. |
| Israel ¹ | 0.60 d | 0.53 d | 0.52 d | 0.52 d | 0.52 d | 0.52 d | 0.52 d e |
| Italy | 0.32 b | 0.36 | 0.37 | 0.36 e | 0.34 e | 0.33 e | 0.33 p |
| Japan | 0.43 | 0.43 | 0.45 b | 0.43 | 0.40 | 0.39 | 0.39 |
| Korea | 0.26 d | 0.38 | 0.38 | 0.39 | 0.38 | 0.39 | 0.39 |
| Latvia | 0.21 | 0.33 | 0.26 | 0.28 | 0.31 | 0.19 | 0.24 |
| Lithuania | 0.4 | 0.5 | 0.5 | 0.5 | 0.6 | 0.3 | 0.3 |
| Luxembourg | 0.02 | 0.21 | 0.24 | 0.21 | 0.24 | 0.25 e | 0.25 e p |
| Mexico | 0.11 | 0.13 | 0.13 | 0.14 e p | 0.14 e p | 0.13 e p | .. |
| Netherlands | 0.61 | 0.61 | 0.62 | 0.63 | 0.64 | 0.61 | 0.59 p |
| New Zealand | 0.36 | .. | 0.35 | .. | 0.35 | .. | 0.34 |
| Norway | 0.46 | 0.51 | 0.52 | 0.53 | 0.60 | 0.66 | 0.71 |
| Poland | 0.18 | 0.30 | 0.25 | 0.27 | 0.29 | 0.30 | 0.34 p |
| Portugal | 0.27 | 0.50 | 0.59 b | 0.59 | 0.57 | 0.57 | 0.57 |
| Slovak Republic | 0.10 | 0.27 | 0.27 | 0.30 | 0.51 | 0.22 | 0.22 |
| Slovenia | 0.24 | 0.29 | 0.27 | 0.25 | 0.22 | 0.22 | 0.21 p |
| Spain | 0.32 | 0.36 | 0.36 | 0.35 | 0.34 | 0.33 | 0.33 |
| Sweden | 0.74 | 0.89 e | 0.90 | 0.91 e | 0.87 | 0.88 e | 0.85 |
| Switzerland | .. | 0.83 | .. | 0.87 | 0.90 | .. | 0.93 |
| Turkey | 0.31 | 0.37 | 0.34 | 0.35 | 0.35 | 0.34 | 0.32 |
| United Kingdom | 0.40 | 0.43 | 0.43 | 0.43 | 0.42 | 0.41 | 0.39 p |
| United States | 0.36 d | 0.38 d | 0.37 d | 0.36 d | 0.35 d | 0.36 d | 0.36 d p |
| EU28 (OECD estimates) | 0.38 e | 0.45 e | 0.45 e | 0.46 e | 0.45 e | 0.44 e | 0.44 e |
| OECD-Total | 0.38 e | 0.42 e | 0.42 e | 0.42 e | 0.41 e | 0.41 e | 0.41 e |
| Argentina | 0.11 | 0.19 | 0.18 | 0.18 | 0.16 | 0.14 | 0.14 |
| China | 0.13 | 0.14 | 0.14 | 0.14 | 0.15 | 0.14 | 0.15 |
| Romania | 0.06 | 0.10 | 0.08 | 0.06 | 0.09 | 0.05 | 0.05 p |
| Russian Federation | 0.06 | 0.10 | 0.09 | 0.10 | 0.11 | 0.10 | 0.10 e |
| Singapore | 0.52 | 0.58 | 0.58 | 0.59 | 0.64 | 0.63 | 0.57 |
| South Africa | 0.17 | 0.23 | 0.21 | 0.22 | 0.24 | 0.27 | .. |
| Chinese Taipei | 0.27 | 0.34 | 0.33 | 0.31 | 0.30 | 0.30 | 0.29 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 45. Higher education expenditure on R&D (HERD) at 2010 prices and PPP

Million 2010 USD

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Australia | .. | 6 290.5 | 6 400.2 e | 6 592.6 | 6 236.2 e | 6 849.3 | .. |
| Austria | 1 931.3 e | 2 606.6 e | 2 616.8 | 2 678.3 e | 2 658.0 | 2 626.9 b e | 2 721.7 p |
| Belgium | 1 617.1 | 2 158.0 | 2 263.9 | 2 227.1 | 2 299.7 | 2 521.6 | 2 542.6 |
| Canada | 8 622.3 | 9 994.5 b | 9 859.4 | 9 738.4 | 10 096.6 | 10 445.6 | 10 303.5 p |
| Chile | .. | 429.8 | 550.8 | 535.8 b | 550.3 | 606.8 b p | 628.8 p |
| Czech Republic | 557.1 | 1 432.6 | 1 506.1 | 1 499.5 | 1 513.4 | 1 108.7 | 1 183.6 |
| Denmark | 1 391.3 | 2 285.6 | 2 461.6 | 2 428.2 | 2 637.1 | 2 616.5 | 2 602.3 p |
| Estonia | 112.2 | 220.0 | 239.5 | 214.1 | 209.0 | 158.0 | 191.0 |
| Finland | 1 264.6 | 1 550.5 | 1 474.4 | 1 501.7 | 1 468.1 | 1 475.3 | 1 537.4 |
| France | 8 655.9 | 11 100.9 | 11 242.5 | 12 233.9 b | 12 246.5 | 11 413.9 p | 11 510.2 e |
| Germany | 12 262.1 | 16 919.4 | 16 975.4 | 17 415.2 | 17 550.7 | 18 761.6 b | 19 207.3 |
| Greece | 874.9 | 736.9 | 774.8 | 795.9 | 929.4 | 809.5 | 829.9 |
| Hungary | 504.4 d | 501.0 d | 439.5 d | 418.7 d | 391.6 d | 325.7 d | 452.9 d |
| Iceland | 70.3 | .. | 86.0 b | 88.4 | 93.3 | 101.2 | 106.9 |
| Ireland | 623.2 | 749.5 | 765.1 e | 845.6 | 797.3 e | 814.2 | .. |
| Israel ¹ | 1 069.4 d | 1 257.1 d | 1 292.1 d | 1 335.3 d | 1 358.8 d | 1 414.5 d | 1 462.6 d e |
| Italy | 6 667.4 b | 7 226.6 | 7 376.5 | 7 156.0 e | 6 891.3 e | 6 745.2 e | 6 771.4 p |
| Japan | 19 012.2 | 19 469.8 | 20 682.8 b | 19 890.5 | 18 968.1 | 18 407.5 | 18 630.4 |
| Korea | 3 207.2 d | 6 113.7 | 6 295.6 | 6 585.4 | 6 690.0 | 6 933.2 | 7 146.0 |
| Latvia | 81.1 | 136.3 | 109.6 | 118.8 | 136.1 | 86.2 | 111.4 |
| Lithuania | 239.7 | 327.9 | 368.9 | 394.4 | 433.0 | 251.7 | 252.9 |
| Luxembourg | 9.1 | 95.3 | 111.1 | 99.5 | 119.0 | 129.9 e | 128.2 e p |
| Mexico | 1 852.8 | 2 505.8 | 2 469.9 | 2 754.8 e p | 2 823.2 e p | 2 695.2 e p | .. |
| Netherlands | 4 296.5 | 4 553.8 | 4 654.3 | 4 835.2 | 4 945.8 | 4 823.4 | 4 847.1 p |
| New Zealand | 458.8 | .. | 512.8 | .. | 543.6 | .. | 564.1 |
| Norway | 1 198.2 | 1 555.8 | 1 612.5 | 1 640.9 | 1 798.9 | 1 940.4 | 2 157.8 |
| Poland | 1 127.5 | 2 591.6 | 2 206.6 | 2 452.9 | 2 692.5 | 2 897.9 | 3 414.3 p |
| Portugal | 750.5 | 1 366.7 | 1 592.7 b | 1 596.1 | 1 563.7 | 1 613.2 | 1 635.8 |
| Slovak Republic | 107.7 | 385.3 | 389.2 | 444.3 | 784.1 | 344.6 | 354.1 |
| Slovenia | 123.4 | 159.4 | 148.0 | 140.2 | 129.7 | 130.2 | 131.0 p |
| Spain | 4 486.4 | 5 106.0 | 4 994.7 | 4 947.8 | 5 056.1 | 4 966.5 | 5 120.8 |
| Sweden | 2 685.5 | 3 552.6 e | 3 627.4 | 3 779.9 e | 3 780.8 | 3 904.6 e | 3 851.1 |
| Switzerland | .. | 3 543.4 | .. | 3 876.6 | 4 056.5 | .. | 4 330.1 |
| Turkey | 3 341.1 | 5 360.9 | 5 483.0 | 5 841.6 | 6 209.8 | 6 284.3 | 6 349.2 |
| United Kingdom | 8 898.9 | 9 920.0 | 10 301.2 | 10 473.3 | 10 587.5 | 10 407.4 | 10 246.1 p |
| United States | 51 678.5 d | 58 527.5 d | 58 132.0 d | 57 794.3 d | 59 288.6 d | 61 524.2 d | 63 059.2 d p |
| EU28 (OECD estimates) | 59 892.9 e | 76 372.7 e | 77 263.1 e | 79 270.4 e | 80 487.2 e | 79 579.5 e | 81 198.1 e |
| OECD-Total | 156 622.3 e | 191 381.3 e | 193 731.8 e | 195 941.4 e | 198 584.0 e | 200 911.0 e | 205 235.9 e |
| Argentina | 646.9 | 1 501.6 | 1 472.3 | 1 429.0 | 1 306.7 | 1 089.5 | 1 148.9 |
| China | 9 429.7 | 21 330.4 | 22 914.2 | 23 832.7 | 26 480.2 | 28 127.0 | 31 979.9 e |
| Romania | 168.5 | 341.4 | 283.2 | 222.8 | 338.5 | 226.6 | 239.0 p |
| Russian Federation | 1 518.0 | 3 251.6 | 3 202.2 | 3 656.6 | 3 578.4 | 3 382.9 | 3 435.1 e |
| Singapore | 1 354.3 | 2 301.8 | 2 423.3 | 2 565.8 | 2 863.3 | 2 912.9 | 2 736.9 |
| South Africa | 859.7 | 1 429.5 | 1 339.2 | 1 457.5 | 1 633.9 | 1 799.1 | .. |
| Chinese Taipei | 1 922.3 | 3 246.5 | 3 233.6 | 3 143.0 | 3 071.3 | 3 052.6 | 3 128.0 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 46. Percentage of Higher education expenditure on R&D (HERD) financed by the business sector

Percentage

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Australia | .. | 4.7 | .. | 5.1 | .. | 5.1 | .. |
| Austria | .. | .. | 5.1 | .. | 5.3 | .. | .. |
| Belgium | 10.9 | 11.3 | 12.1 | 11.7 | 12.9 | 12.1 | 11.7 |
| Canada | 8.4 | 7.5 b | 7.1 | 7.7 | 7.9 | 7.9 | 7.9 p |
| Chile | .. | 5.4 | 4.3 | 3.3 b | 3.0 | 2.8 b p | 2.6 p |
| Czech Republic | 0.8 | 0.8 | 2.0 | 2.4 | 4.0 | 4.7 | 5.1 |
| Denmark | 2.4 | 2.7 | 2.5 | 1.9 | 2.5 | 2.6 | 2.7 p |
| Estonia | 5.2 | 3.5 | 4.4 | 4.4 | 5.4 | 7.4 | 5.8 |
| Finland | 6.5 | 5.1 | 5.0 | 4.0 | 3.7 | 3.7 | 3.2 |
| France | 1.6 | 2.6 | 2.8 | 2.5 b | 2.8 | 2.6 p | .. |
| Germany | 14.6 d | 14.0 d | 14.0 d | 14.1 d | 13.9 d | 13.8 b d | 13.3 d |
| Greece | 8.9 | 7.9 | 5.5 | 6.0 | 7.6 | 7.3 | 8.4 |
| Hungary | 11.8 d | 9.5 d | 8.6 d | 9.1 d | 8.0 d | 9.6 d | 6.1 d |
| Iceland | 11.3 | .. | 4.7 b | 3.4 | 2.0 | 2.3 | 0.8 |
| Ireland | 2.7 | 2.0 | 2.0 e | 2.7 | 2.9 e | 3.2 | .. |
| Israel ¹ | 7.3 d | 6.8 d | 6.8 d | 9.5 d | 8.6 d | 10.3 d | .. |
| Italy | 1.4 b | 1.1 | 1.3 | 1.3 e | 1.3 e | 1.3 e | .. |
| Japan | 2.8 | 2.7 | 2.6 b | 2.6 | 2.6 | 2.8 | 2.9 |
| Korea | 15.2 d | 11.0 | 12.3 | 11.2 | 12.3 | 12.6 | 13.7 |
| Latvia | 15.4 | 5.5 | 6.9 | 7.1 | 7.8 | 5.6 | 5.9 |
| Lithuania | 3.8 | 14.4 | 16.7 | 13.9 | 11.6 | 12.2 | 6.8 |
| Luxembourg | 1.4 | 0.8 | 1.0 | .. | 1.1 | 1.2 e | .. |
| Mexico | 1.2 e | 0.5 | 0.8 | 0.7 e p | 0.7 e p | 0.8 e p | .. |
| Netherlands | 7.8 | 8.3 | 7.6 | 7.7 | 7.8 | 7.8 | .. |
| New Zealand | 8.0 | .. | 4.0 | .. | 3.5 | .. | 4.5 |
| Norway | 4.7 | .. | 4.1 | .. | 3.1 | 3.1 | 2.3 |
| Poland | 5.4 | 2.1 | 3.2 | 2.8 | 2.6 | 3.0 | .. |
| Portugal | 1.2 | 1.3 | 1.7 b | 1.6 | 1.9 | 1.8 | 1.9 |
| Slovak Republic | 0.7 | 3.3 | 2.6 | 2.4 | 1.6 | 1.9 | 2.1 |
| Slovenia | 9.0 | 11.2 | 11.4 | 12.6 | 11.4 | 10.6 | .. |
| Spain | 6.9 | 7.3 | 6.6 | 5.9 | 5.7 | 5.1 | 5.2 |
| Sweden | 5.1 | .. | 3.8 | .. | 4.0 | .. | 3.6 |
| Switzerland | .. | 10.9 | .. | 10.0 | 9.8 | .. | 9.7 |
| Turkey | 22.7 d | 1.0 | 0.8 | 1.1 | 1.2 | 1.2 | 1.3 |
| United Kingdom | 4.6 | 4.1 | 4.1 | 4.3 | 4.4 | 4.4 | .. |
| United States | 5.0 d | 4.5 d | 4.8 d | 5.1 d | 5.2 d | 5.3 d | 5.3 d p |
| EU28 (OECD estimates) | 6.6 e | 6.4 e | 6.4 e | 6.4 e | 6.4 e | 6.5 e | .. |
| OECD-Total | 6.1 e | 5.4 e | 5.5 e | 5.6 e | 5.7 e | 5.8 e | 5.9 e |
| Argentina | 0.6 | 0.2 | 0.3 | 0.2 | 0.1 | 0.3 | 0.3 |
| China | 36.7 | 33.4 | 33.8 | 33.7 | 30.2 | 29.0 | 28.5 |
| Romania | 7.5 | 7.5 | 4.8 | 6.9 | 5.1 | 6.2 | .. |
| Russian Federation | 29.3 | 27.2 | 27.6 | 27.3 | 27.4 | 27.7 | 28.2 |
| Singapore | 1.7 | 4.3 | 6.1 | 7.3 | 5.5 | 5.9 | 6.1 |
| South Africa | 11.6 | 7.9 | 8.1 | 10.6 | 7.8 | 7.8 | .. |
| Chinese Taipei | 5.8 | 7.8 | 7.5 | 8.3 | 9.3 | 9.7 | 10.0 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 47. Higher education researchers in full-time equivalent

FTE

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|-------------|--------------------|-------------|--------------------|-----------|------------|------------|
| Australia | .. | 65 772 | .. | 68 528 | .. | 69 287 | .. |
| Austria | 8 962 d e | 12 704 d e | 12 846 d | 13 462 d e | 13 658 d | 13 464 d e | 14 000 d p |
| Belgium | 13 853 | 18 361 | 18 750 | 19 157 | 20 362 b | 19 601 | 19 705 |
| Canada | 43 400 | 57 510 | 60 270 | 58 550 | 58 850 | 59 260 | .. |
| Chile | .. | 3 561 d | 3 259 d | 3 600 d | 4 004 d | 4 357 d | 4 520 d p |
| Czech Republic | 7 762 b | 11 498 | 10 995 | 10 965 | 11 357 | 10 511 | 10 875 |
| Denmark | 8 242 | 14 305 | 15 057 | 15 854 | 16 193 | 16 233 | 16 180 p |
| Estonia | 1 905 | 2 534 | 2 398 | 2 443 | 2 431 | 2 426 | 2 452 |
| Finland | 12 879 | 12 368 | 12 056 | 12 381 | 12 240 | 11 987 | 12 731 |
| France | 66 290 | 71 890 e | 72 750 m | 78 409 b | 79 622 | .. | 81 560 e |
| Germany | 65 363 | 97 199 | 99 123 | 100 992 | 103 148 | 109 877 b | 112 143 |
| Greece | 11 356 d | 15 723 d | 18 957 d | 18 801 d | 22 149 d | 17 241 d | 17 853 d |
| Hungary | 5 911 | 5 932 | 5 939 | 5 860 | 5 610 | 5 592 | 6 032 |
| Iceland | 585 | .. | 1 011 b | 1 033 | 892 b | 1 151 | 927 |
| Ireland | 4 400 | 12 117 b | 12 477 e | 12 836 | 12 731 e | 12 627 | .. |
| Israel ¹ | .. | 9 433 d e | 9 615 d e | 9 639 d e | 9 590 d e | 9 524 d e | .. |
| Italy | 37 073 b | 45 223 | 47 526 | 48 198 | 48 841 e | 50 816 e | 51 932 p |
| Japan | 156 176 d | 125 890 d | 136 593 b d | 137 586 d | 137 078 d | 138 095 d | 138 697 d |
| Korea | 27 416 d | 43 826 | 41 784 | 41 938 | 40 866 | 40 759 | 38 813 |
| Latvia | 2 224 d | 2 607 d | 2 348 d | 2 291 d | 2 318 d | 1 944 d | 2 264 d |
| Lithuania | 5 116.0 | 5 334.0 | 5 399.0 | 5 241.0 | 4 830.0 | 4 992.7 | 4 574.5 |
| Luxembourg | 157 | 651 | 769 | 906 | 945 | 972 | 980 p |
| Mexico | 16 691 e | 13 850 | 14 422 | 14 921 | 16 677 | 17 008 | .. |
| Netherlands | 17 928 | 20 990 | 21 216 | 21 921 | 22 342 | 22 244 | 22 200 p |
| New Zealand | 7 481 | .. | 9 800 | .. | 9 900 | .. | .. |
| Norway | 7 512 | 9 855 | 10 054 | 10 296 | 10 976 | 11 795 | 12 538 |
| Poland | 40 449 | 38 152 | 37 167 | 39 695 | 40 126 | 44 414 | 43 579 p |
| Portugal | 10 956 | 23 825 | 25 760 b | 24 978 | 25 043 | 26 106 | 27 562 |
| Slovak Republic | 6 458 d | 9 782 d | 9 625 d | 8 959 d | 8 508 d | 6 504 | 6 942 |
| Slovenia | 1 695 | 2 398 | 2 201 | 2 180 | 2 069 | 1 951 | 2 020 p |
| Spain | 54 028 | 59 775 d | 57 641 d | 57 156 d | 57 107 d | 58 413 d | 62 542 d |
| Sweden | 15 125 b | 16 561 e | 18 401 | 19 616 e | 18 215 | 19 726 e | 17 501 |
| Switzerland | .. | 18 760 | .. | .. | 21 375 | .. | 22 724 |
| Turkey | 25 434 | 40 801 | 42 574 | 41 269 | 43 293 | 40 996 | 42 916 |
| United Kingdom | 141 762 b e | 153 755 | 158 445 | 163 838 | 167 463 | 167 519 | 168 655 p |
| United States | .. | .. | .. | .. | .. | .. | .. |
| EU28 (OECD estimates) | 551 645 e | 668 368 e | 682 835 e | 701 232 e | 712 050 e | 722 363 e | 732 539 e |
| OECD-Total | .. | 1 360 556 e | .. | 1 407 173 e | .. | .. | .. |
| Argentina | 14 200 | 23 332 | 23 220 | 23 153 | 21 701 | 22 274 | 20 720 |
| China | 221 908 d | 262 052 | 272 683 | 282 304 | 298 728 | 307 923 | 327 891 |
| Romania | 5 386 | 6 591 | 6 578 | 6 378 | 6 480 | 6 314 | 6 413 p |
| Russian Federation | 70 494 | 87 259 | 89 085 | 91 501 | 92 503 | 83 024 | 75 977 |
| Singapore | 8 187 | 15 091 | 15 843 | 16 180 | 17 275 | 17 418 | 17 140 |
| South Africa | 9 235 | 13 744 | 15 772 | 15 804 | 18 367 | 19 629 | .. |
| Chinese Taipei | 23 180 | 32 588 | 31 712 | 30 621 | 29 828 | 29 099 | 28 810 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 48. Higher education researchers as a percentage of national total

Percentage

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|-----------|---------------|-----------|---------------|-----------|-----------|-----------|
| Australia | .. | .. | .. | .. | .. | .. | .. |
| Austria | 31.5 d e | 32.0 d e | 31.8 d | 31.6 d e | 31.4 d | 29.5 d e | 29.5 d p |
| Belgium | 41.8 | 40.3 | 40.4 | 37.7 | 38.3 b | 36.1 e | 36.5 |
| Canada | 31.7 | 35.6 | 36.9 | 36.1 b | 36.1 | 38.2 | .. |
| Chile | .. | 52.4 d | 55.3 d | 47.5 d | 49.0 d | 48.5 d | 49.6 d p |
| Czech Republic | 32.1 b | 34.6 | 32.1 | 30.4 | 29.8 | 28.2 | 27.8 |
| Denmark | 29.2 | 35.7 | 37.8 | 38.3 | 37.8 | 36.2 | 35.7 p |
| Estonia | 57.2 | 55.3 | 54.4 | 56.5 | 58.1 | 55.9 | 52.5 |
| Finland | 32.5 | 30.6 | 30.8 | 32.3 | 32.6 | 33.4 | 34.4 |
| France | 32.7 | 27.8 e | 27.4 e m | 28.9 b | 28.7 | .. | 28.3 e |
| Germany | 24.0 | 27.6 | 28.0 | 28.7 | 26.6 | 27.5 b | 26.7 |
| Greece | 58.0 d | 63.4 d | 64.9 d | 62.9 d | 63.8 d | 58.6 d | 51.0 d |
| Hungary | 37.2 | 24.9 | 23.7 | 22.4 | 22.2 | 21.7 | 21.2 |
| Iceland | 27.2 | .. | 54.7 b | .. | 45.9 b | 52.2 | 45.2 |
| Ireland | 38.0 | 54.2 b e | 52.6 e | 52.3 e | 51.9 e | 51.9 e | .. |
| Israel ¹ | .. | 14.9 d e | .. | .. | .. | .. | .. |
| Italy | 44.9 b | 40.9 | 40.9 | 40.8 | 38.8 e | 38.0 b e | 38.1 p |
| Japan | 22.9 d | 19.5 d | 20.7 b d | 20.1 d | 20.7 d | 20.7 d | 20.5 d |
| Korea | 15.2 d | 13.9 | 13.0 | 12.1 | 11.5 | 11.3 | 10.1 |
| Latvia | 67.8 d | 66.8 d | 64.8 d | 61.1 d | 64.2 d | 61.7 d | 65.0 d |
| Lithuania | 67.0 | 66.5 | 63.1 | 57.8 | 59.1 | 58.6 | 52.3 |
| Luxembourg | 7.1 | 28.2 b | 30.7 | 34.5 | 37.2 | 38.8 p | 35.9 p |
| Mexico | 38.0 e | 47.6 | 48.2 | 47.6 | 48.6 | 43.7 | .. |
| Netherlands | 37.5 | 28.7 b | 27.7 | 28.8 | 28.2 | 27.4 | 26.0 p |
| New Zealand | 57.6 | .. | 54.7 | .. | 52.9 | .. | .. |
| Norway | 35.4 | 35.4 | 35.5 | 35.2 | 35.8 | 37.0 | 37.3 |
| Poland | 65.1 | 56.9 | 52.0 | 50.5 | 48.6 | 50.4 | 45.2 p |
| Portugal | 51.9 | 56.1 | 68.1 b | 65.5 | 64.8 | 63.1 | 61.3 |
| Slovak Republic | 59.1 d | 64.1 d | 65.4 d | 60.8 d | 59.1 d | 53.0 | 52.7 |
| Slovenia | 32.3 | 27.0 | 25.3 | 25.4 | 26.2 | 24.0 | 21.7 p |
| Spain | 49.2 | 47.1 d | 46.8 d | 46.8 d | 46.6 d | 46.1 d | 46.9 d |
| Sweden | 27.5 b e | 33.6 e | 28.7 b e | 29.4 e | 27.3 e | 28.0 e | 23.9 |
| Switzerland | .. | 52.4 | .. | .. | 48.9 | .. | 49.3 |
| Turkey | 65.0 | 49.7 | 47.8 | 46.0 | 45.5 | 40.9 | 38.4 |
| United Kingdom | 57.0 b e | 60.0 e | 59.2 | 59.2 e | 58.9 | 58.0 e | 58.2 p |
| United States | .. | .. | .. | .. | .. | .. | .. |
| EU28 (OECD estimates) | 40.1 e | 39.6 e | 39.3 e | 39.6 e | 38.6 e | 38.2 e | 37.3 e |
| OECD-Total | .. | 30.9 e | .. | 30.2 e | .. | .. | .. |
| Argentina | 44.6 | 46.2 | 45.7 | 44.8 | 41.0 | 41.2 | 39.6 |
| China | 19.8 d | 18.7 | 18.4 | 18.5 | 18.5 | 18.2 | 18.8 |
| Romania | 23.5 | 36.6 | 35.4 | 35.2 | 37.1 | 35.0 | 36.6 p |
| Russian Federation | 15.2 | 19.7 | 20.2 | 20.6 | 20.6 | 19.4 | 18.5 |
| Singapore | 34.4 | 44.2 | 44.0 | 44.1 | 44.1 | 44.4 | 44.1 |
| South Africa | 53.4 | 64.3 | 67.6 | 67.0 | 70.2 | 71.0 | .. |
| Chinese Taipei | 26.1 | 23.3 | 22.5 | 21.4 | 20.5 | 19.7 | 19.2 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 49. Higher education Total R&D personnel in full-time equivalent

FTE

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|-------------|------------|-------------|------------|------------|------------|------------|
| Australia | .. | 74 669 | .. | 78 038 | .. | 79 008 | .. |
| Austria | 12 353 d e | 16 678 d e | 16 840 d | 17 479 d e | 17 682 d | 17 571 d e | 18 271 d p |
| Belgium | 17 767 | 22 770 | 23 156 | 23 733 | 26 156 b | 24 953 | 25 060 |
| Canada | 56 950 | 71 320 | 74 730 | 72 510 | 72 720 | 73 230 | .. |
| Chile | .. | 6 819 d | 6 672 d | 7 361 d | 7 190 d | 8 058 d | 8 233 d p |
| Czech Republic | 10 972 b | 16 441 | 16 240 | 16 525 | 16 868 | 15 201 | 15 803 |
| Denmark | 11 561 | 19 991 | 20 925 | 20 956 | 21 258 | 21 969 | 21 907 p |
| Estonia | 2 176 | 3 000 | 2 850 | 3 103 | 3 062 | 2 969 | 3 015 |
| Finland | 17 453 | 16 146 | 15 726 | 16 034 | 15 515 | 15 157 | 16 007 |
| France | 98 743 | 108 794 e | 109 883 e | 119 081 b | 120 480 | .. | 119 300 e |
| Germany | 94 522 | 127 900 | 130 079 | 132 542 | 134 032 | 141 661 b | 143 753 |
| Greece | 17 401 d | 20 508 d | 23 390 d | 23 924 d | 27 383 d | 20 404 d | 21 986 d |
| Hungary | 8 194 | 8 130 | 8 154 | 7 937 | 7 706 | 7 476 | 8 442 |
| Iceland | 742 | .. | 1 211 b | 1 232 | 1 062 | 1 360 | 1 096 |
| Ireland | 5 220 | 13 050 b | 13 949 e | 14 847 | 15 012 e | 15 178 | .. |
| Israel ¹ | 9 011 d | 11 098 d e | 11 311 d e | 11 340 d e | 11 283 d e | 11 205 d e | .. |
| Italy | 66 976 b | 76 207 | 76 986 | 75 235 | 76 858 e | 80 226 e | 80 715 p |
| Japan | 209 734 d | 195 043 d | 207 766 b d | 209 101 d | 208 579 d | 210 683 d | 212 212 d |
| Korea | 42 157 d | 77 099 | 73 196 | 74 861 | 72 745 | 72 482 | 70 037 |
| Latvia | 2 856 d | 3 538 d | 3 237 d | 3 177 d | 3 241 d | 3 147 d | 3 448 d |
| Lithuania | 6 699.0 | 6 514.0 | 6 452.0 | 6 260.0 | 5 737.0 | 5 895.3 | 5 386.6 |
| Luxembourg | 169 | 723 | 866 | 989 | 1 057 | 1 097 | 1 106 p |
| Mexico | 25 218 e | 20 211 | 21 106 | 21 721 | 23 998 | 25 130 | .. |
| Netherlands | 32 305 | 31 952 | 32 331 | 33 237 | 33 604 | 33 300 | 33 400 p |
| New Zealand | 9 660 | .. | 11 600 | .. | 11 900 | .. | .. |
| Norway | 9 420 | 12 413 | 12 715 | 13 010 | 13 952 | 14 937 | 15 675 |
| Poland | 44 763 | 42 917 | 41 441 | 44 304 | 44 961 | 51 652 | 50 670 p |
| Portugal | 11 680 | 24 513 | 27 753 b | 26 870 | 27 001 | 28 265 | 30 078 |
| Slovak Republic | 7 146 d | 10 124 d | 9 969 d | 9 297 d | 8 815 d | 6 797 | 7 232 |
| Slovenia | 2 099 | 2 926 | 2 805 | 2 667 | 2 555 | 2 321 | 2 395 p |
| Spain | 66 996 | 77 238 d | 74 923 d | 73 428 d | 73 327 d | 75 191 d | 79 286 d |
| Sweden | 17 686 b | 21 781 e | 21 004 | 22 410 e | 21 435 | 21 918 e | 20 196 |
| Switzerland | .. | 26 945 | .. | .. | 29 717 | .. | 31 523 |
| Turkey | 25 434 e | 40 801 e | 42 574 e | 41 269 e | 43 293 e | 52 576 b | 54 289 |
| United Kingdom | 152 634 b e | 173 499 e | 177 767 e | 183 023 e | 186 724 | 186 770 | 188 036 p |
| United States | .. | .. | .. | .. | .. | .. | .. |
| EU28 (OECD estimates) | 723 258 e | 863 777 e | 876 288 e | 896 324 e | 909 717 e | 919 754 e | 930 091 e |
| OECD-Total | .. | .. | .. | .. | .. | .. | .. |
| Argentina | 15 507 | 27 178 | 27 737 | 27 896 | 26 015 | 26 619 | 28 128 |
| China | 227 163 d | 313 520 | 324 942 | 334 794 | 354 861 | 360 049 | 382 160 |
| Romania | 6 803 | 8 710 | 9 523 | 8 966 | 9 008 | 8 627 | 8 416 p |
| Russian Federation | 97 672 | 119 360 | 118 971 | 121 526 | 121 680 | 110 379 | 101 628 |
| Singapore | 9 337 | 16 243 | 17 086 | 17 386 | 18 532 | 18 634 | 18 278 |
| South Africa | 10 611 | 15 614 | 17 778 | 17 944 | 20 812 | 22 061 | .. |
| Chinese Taipei | 25 752 | 36 115 | 35 088 | 34 135 | 33 177 | 32 349 | 31 866 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 50. Government intramural expenditure on R&D (GOVERD) at current prices and PPP

Million USD

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|-------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Australia | .. | 2 419.0 | 2 592.5 e | 2 292.1 | 2 685.7 e | 2 259.4 | .. |
| Austria | 355.9 e | 522.5 e | 533.1 | 585.3 e | 602.4 | 999.3 b e | 1 060.4 p |
| Belgium | 520.6 | 908.7 b | 961.6 | 1 073.8 | 1 162.0 | 1 317.7 | 1 425.9 |
| Canada | 2 238.7 | 2 230.4 | 2 354.6 | 2 392.8 | 1 879.0 | 1 868.0 | 1 838.6 p |
| Chile | .. | 55.3 | 128.7 b | 123.6 | 121.2 | 198.5 | 208.6 p |
| Czech Republic | 596.5 b | 1 044.1 | 1 163.5 | 1 271.0 | 1 398.6 | 1 135.9 | 1 243.5 |
| Denmark | 285.7 | 177.3 | 183.6 | 180.5 | 190.0 | 199.6 | 283.6 p |
| Estonia | 23.3 | 67.9 | 55.7 | 59.7 | 60.9 | 57.9 | 66.8 |
| Finland | 534.0 | 677.9 | 658.7 | 620.7 | 546.8 | 537.6 | 601.0 |
| France | 7 024.1 | 7 248.2 | 7 620.6 | 7 717.1 | 7 863.1 | 7 889.8 p | 8 186.2 e |
| Germany | 9 014.2 d | 14 405.3 d | 15 309.6 d | 16 022.1 d | 16 050.1 d | 16 550.3 d | 17 879.3 d |
| Greece | 329.9 | 484.8 | 649.7 | 675.3 | 787.2 | 730.8 | 769.4 |
| Hungary | 444.3 d | 418.1 d | 500.7 d | 468.3 d | 469.7 d | 425.6 d | 477.4 d |
| Iceland | 69.8 | .. | 16.5 b | 17.7 | 16.5 | 17.6 | 16.7 |
| Ireland | 148.3 | 160.4 | 159.0 | 159.1 | 168.0 | 164.8 | 178.8 |
| Israel ¹ | 186.4 d | 198.4 d | 209.1 d | 217.0 d | 209.8 d | 221.5 d e | 242.2 d e |
| Italy | 3 158.8 | 4 066.2 | 3 984.0 | 4 001.6 | 3 941.3 | 4 078.4 | 4 257.1 p |
| Japan | 10 669.1 | 13 130.7 | 15 096.3 | 14 116.7 | 13 313.1 | 12 437.1 | 13 353.8 |
| Korea | 3 631.6 d | 7 299.4 | 7 446.8 | 8 196.6 | 9 033.8 | 9 289.4 | 9 734.0 |
| Latvia | 30.7 | 77.9 | 80.7 | 78.4 | 78.4 | 71.0 | 73.4 |
| Lithuania | 90.1 | 129.1 | 148.7 | 144.7 | 149.3 | 191.3 | 235.8 |
| Luxembourg | 60.1 d | 172.3 d | 196.0 d | 212.7 d | 224.1 d | 208.1 d e | 212.3 e p |
| Mexico | 1 238.8 | 3 722.3 | 3 907.1 | 4 439.1 e p | 4 417.3 e p | 4 105.1 e p | .. |
| Netherlands | 1 355.4 d | 1 797.2 b d | 1 953.1 d | 1 943.9 d | 2 017.3 d | 1 970.1 d | 2 118.0 d p |
| New Zealand | 308.1 | .. | 430.2 | .. | 446.0 | .. | 533.0 |
| Norway | 513.1 | 873.0 | 898.4 | 884.7 | 911.9 | 874.7 | 939.6 |
| Poland | 1 085.2 | 2 234.1 | 2 196.2 | 2 191.5 | 2 496.7 | 255.2 b | 268.7 p |
| Portugal | 264.3 | 205.2 | 252.1 | 241.6 | 247.7 | 215.8 | 244.2 |
| Slovak Republic | 130.8 d | 284.4 d | 254.8 d | 390.9 d | 525.7 | 283.8 | 323.4 |
| Slovenia | 163.7 | 200.2 | 206.1 | 183.2 | 193.6 | 185.3 | 192.3 p |
| Spain | 2 258.7 | 3 678.8 | 3 610.6 | 3 636.5 | 3 792.0 | 3 742.1 | 3 891.0 |
| Sweden | 506.9 b | 671.0 e | 533.7 e | 531.7 e | 529.5 | 542.1 e | 636.0 |
| Switzerland | .. | 102.9 d | .. | 148.7 d | 157.0 d | .. | 154.6 d |
| Turkey | 531.0 | 1 408.9 | 1 442.1 | 1 544.0 | 1 833.5 | 1 871.2 d | 2 080.4 d |
| United Kingdom | 3 234.9 | 3 097.1 | 3 280.7 | 3 181.6 | 3 028.9 | 3 107.8 | 3 218.1 p |
| United States | 40 378.0 d | 53 342.0 | 52 372.0 | 54 106.0 | 54 680.0 | 52 482.0 | 52 888.0 |
| EU28 (OECD estimates) | 31 990.1 e | 43 407.1 e | 45 174.9 e | 46 164.8 e | 47 245.7 e | 45 459.5 e | 48 543.7 e |
| OECD-Total | 93 112.3 e | 127 394.3 e | 130 938.0 e | 133 892.8 e | 135 617.3 e | 130 488.4 e | 135 236.6 e |
| Argentina | 904.5 | 2 282.8 | 2 400.4 | 2 406.9 | 2 797.3 | 2 319.0 | 2 419.5 |
| China | 18 921.8 | 47 542.1 | 53 982.8 | 58 566.5 | 65 849.3 | 70 851.5 | 75 496.4 |
| Romania | 288.6 | 751.6 | 755.4 | 674.2 | 800.1 | 751.3 | 849.4 p |
| Russian Federation | 4 723.4 | 12 202.6 | 11 684.3 | 12 293.4 | 12 046.4 | 12 387.6 | 12 736.4 |
| Singapore | 492.0 | 824.8 | 994.9 | 1 150.4 | 1 188.3 | 1 185.2 | 1 149.5 |
| South Africa | 842.6 | 1 107.0 | 1 164.1 | 1 290.3 | 1 394.8 | 1 405.0 | .. |
| Chinese Taipei | 3 222.4 | 4 103.3 | 4 102.6 | 4 093.1 | 4 195.7 | 4 696.4 | 4 744.3 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 51. Government intramural expenditure on R&D (GOVERD) as a percentage of GDP

Percentage

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Australia | .. | 0.24 | 0.23 e | 0.20 | 0.24 e | 0.19 | .. |
| Austria | 0.12 e | 0.13 e | 0.13 | 0.14 e | 0.14 | 0.22 b e | 0.22 p |
| Belgium | 0.15 | 0.19 b | 0.20 | 0.21 | 0.23 | 0.25 | 0.25 |
| Canada | 0.19 | 0.15 | 0.15 | 0.15 | 0.12 | 0.11 | 0.11 p |
| Chile | .. | 0.01 | 0.03 b | 0.03 | 0.03 | 0.05 | 0.05 p |
| Czech Republic | 0.27 b | 0.34 | 0.36 | 0.37 | 0.39 | 0.31 | 0.31 |
| Denmark | 0.15 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 | 0.09 p |
| Estonia | 0.10 | 0.20 | 0.15 | 0.16 | 0.16 | 0.14 | 0.15 |
| Finland | 0.32 | 0.31 | 0.29 | 0.27 | 0.24 | 0.22 | 0.24 |
| France | 0.36 | 0.29 | 0.29 | 0.29 | 0.29 | 0.28 p | 0.28 e |
| Germany | 0.34 d | 0.41 d | 0.42 d | 0.42 d | 0.41 d | 0.40 d | 0.41 d |
| Greece | 0.12 | 0.17 | 0.23 | 0.23 | 0.27 | 0.25 | 0.25 |
| Hungary | 0.26 d | 0.18 d | 0.21 d | 0.19 d | 0.18 d | 0.16 d | 0.17 d |
| Iceland | 0.63 | .. | 0.12 b | 0.12 | 0.10 | 0.10 | 0.09 |
| Ireland | 0.09 | 0.08 | 0.07 | 0.07 | 0.05 | 0.05 | 0.05 |
| Israel ¹ | 0.11 d | 0.08 d | 0.08 d | 0.08 d | 0.07 d | 0.07 d e | 0.07 d e |
| Italy | 0.18 | 0.19 | 0.18 | 0.18 | 0.18 | 0.17 | 0.17 p |
| Japan | 0.26 | 0.28 | 0.30 | 0.28 | 0.26 | 0.24 | 0.25 |
| Korea | 0.31 d | 0.45 | 0.45 | 0.48 | 0.50 | 0.49 | 0.49 |
| Latvia | 0.10 | 0.18 | 0.18 | 0.17 | 0.16 | 0.14 | 0.13 |
| Lithuania | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 |
| Luxembourg | 0.19 d | 0.35 d | 0.38 d | 0.38 d | 0.38 d | 0.34 d e | 0.33 e p |
| Mexico | 0.09 | 0.18 | 0.19 | 0.20 e p | 0.20 e p | 0.18 e p | .. |
| Netherlands | 0.22 d | 0.23 b d | 0.24 d | 0.23 d | 0.24 d | 0.23 d | 0.23 d p |
| New Zealand | 0.29 | .. | 0.27 | .. | 0.26 | .. | 0.27 |
| Norway | 0.23 | 0.27 | 0.26 | 0.26 | 0.29 | 0.29 | 0.29 |
| Poland | 0.20 | 0.25 | 0.23 | 0.23 | 0.24 | 0.02 b | 0.02 p |
| Portugal | 0.11 | 0.07 | 0.09 | 0.08 | 0.08 | 0.07 | 0.07 |
| Slovak Republic | 0.15 d | 0.20 d | 0.17 d | 0.25 d | 0.33 | 0.17 | 0.18 |
| Slovenia | 0.34 | 0.34 | 0.34 | 0.29 | 0.30 | 0.27 | 0.26 p |
| Spain | 0.19 | 0.25 | 0.24 | 0.23 | 0.23 | 0.22 | 0.21 |
| Sweden | 0.17 b | 0.16 e | 0.12 e | 0.12 e | 0.11 | 0.11 e | 0.12 |
| Switzerland | .. | 0.02 d | .. | 0.03 d | 0.03 d | .. | 0.03 d |
| Turkey | 0.07 | 0.09 | 0.09 | 0.08 | 0.09 | 0.09 d | 0.09 d |
| United Kingdom | 0.16 | 0.13 | 0.13 | 0.12 | 0.11 | 0.11 | 0.11 p |
| United States | 0.31 d | 0.33 | 0.31 | 0.31 | 0.30 | 0.28 | 0.27 |
| EU28 (OECD estimates) | 0.23 e | 0.24 e | 0.24 e | 0.24 e | 0.24 e | 0.22 e | 0.22 e |
| OECD-Total | 0.26 e | 0.27 e | 0.27 e | 0.26 e | 0.26 e | 0.24 e | 0.24 e |
| Argentina | 0.17 | 0.28 | 0.28 | 0.28 | 0.32 | 0.26 | 0.26 |
| China | 0.28 | 0.31 | 0.32 | 0.32 | 0.33 | 0.33 | 0.33 |
| Romania | 0.14 | 0.20 | 0.19 | 0.16 | 0.19 | 0.16 | 0.16 p |
| Russian Federation | 0.26 | 0.33 | 0.31 | 0.33 | 0.34 | 0.35 | 0.34 e |
| Singapore | 0.21 | 0.20 | 0.22 | 0.24 | 0.24 | 0.23 | 0.21 |
| South Africa | 0.18 | 0.17 | 0.17 | 0.18 | 0.19 | 0.19 | .. |
| Chinese Taipei | 0.49 | 0.42 | 0.40 | 0.38 | 0.38 | 0.41 | 0.40 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 52. Government intramural expenditure on R&D (GOVERD) at 2010 prices and PPP

Million 2010 USD

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Australia | .. | 2 438.7 | 2 420.8 e | 2 163.5 | 2 585.5 e | 2 064.6 | .. |
| Austria | 406.8 e | 485.7 e | 477.6 | 514.4 e | 518.1 | 837.6 b e | 867.8 p |
| Belgium | 606.0 | 858.5 b | 881.6 | 970.3 | 1 039.1 | 1 148.5 | 1 203.5 |
| Canada | 2 461.6 | 2 174.9 | 2 219.4 | 2 223.8 | 1 787.6 | 1 759.3 | 1 698.2 p |
| Chile | .. | 51.1 | 117.6 b | 112.0 | 111.6 | 181.7 | 179.9 p |
| Czech Republic | 683.4 b | 1 000.6 | 1 056.9 | 1 119.4 | 1 239.8 | 984.7 | 1 039.6 |
| Denmark | 364.4 | 171.5 | 171.1 | 165.9 | 173.4 | 179.0 | 241.0 p |
| Estonia | 30.6 | 63.6 | 50.6 | 53.1 | 54.6 | 50.8 | 56.7 |
| Finland | 634.7 | 647.5 | 611.5 | 567.7 | 492.0 | 478.7 | 517.1 |
| France | 8 169.4 | 7 011.4 | 7 031.7 | 7 044.3 | 7 104.8 | 6 971.0 p | 7 026.7 e |
| Germany | 10 305.0 d | 13 725.2 d | 14 079.2 d | 14 370.4 d | 14 281.0 d | 14 354.2 d | 14 985.9 d |
| Greece | 373.6 | 457.7 | 579.2 | 593.7 | 692.0 | 635.1 | 649.0 |
| Hungary | 561.6 d | 393.0 d | 454.8 d | 426.2 d | 429.5 d | 391.9 d | 428.0 d |
| Iceland | 75.3 | .. | 15.7 b | 16.4 | 14.8 | 15.5 | 14.2 |
| Ireland | 170.0 | 154.5 | 149.0 | 150.9 | 146.6 | 145.2 | 154.2 |
| Israel ¹ | 192.6 d | 186.8 d | 187.0 d | 197.4 d | 185.1 d | 188.7 d e | 202.1 d e |
| Italy | 3 822.4 | 3 822.6 | 3 648.9 | 3 641.8 | 3 548.2 | 3 508.6 | 3 553.5 p |
| Japan | 11 758.7 | 12 565.9 | 14 082.2 | 13 166.1 | 12 202.6 | 11 280.8 | 12 118.4 |
| Korea | 3 831.4 d | 7 229.7 | 7 434.7 | 8 160.6 | 8 637.7 | 8 762.3 | 9 014.4 |
| Latvia | 37.4 | 73.4 | 73.8 | 70.2 | 70.2 | 62.7 | 62.3 |
| Lithuania | 109.6 | 120.0 | 133.7 | 128.6 | 133.1 | 168.7 | 200.2 |
| Luxembourg | 72.9 d | 157.1 d | 173.4 d | 180.9 d | 190.7 d | 173.6 d e | 171.4 e p |
| Mexico | 1 493.5 | 3 459.5 | 3 588.2 | 3 983.8 e p | 3 991.2 e p | 3 672.1 e p | .. |
| Netherlands | 1 542.5 d | 1 706.7 b d | 1 773.0 d | 1 783.6 d | 1 838.9 d | 1 788.7 d | 1 855.1 d p |
| New Zealand | 366.0 | .. | 390.4 | .. | 407.8 | .. | 460.7 |
| Norway | 608.6 | 816.1 | 817.4 | 805.5 | 870.7 | 843.0 | 875.4 |
| Poland | 1 298.2 | 2 104.3 | 2 023.4 | 2 014.8 | 2 274.7 | 232.1 b | 237.3 p |
| Portugal | 309.9 | 200.7 | 232.4 | 219.2 | 222.6 | 189.6 | 210.9 |
| Slovak Republic | 156.4 d | 277.7 d | 240.9 d | 365.9 d | 498.9 | 266.6 | 298.6 |
| Slovenia | 178.2 | 187.5 | 184.8 | 163.2 | 171.9 | 161.6 | 161.3 p |
| Spain | 2 634.4 | 3 513.4 | 3 336.4 | 3 304.8 | 3 439.9 | 3 338.6 | 3 354.4 |
| Sweden | 595.8 b | 629.2 e | 492.0 e | 488.8 e | 483.8 | 495.6 e | 559.4 |
| Switzerland | .. | 94.8 d | .. | 130.6 d | 133.7 d | .. | 128.5 d |
| Turkey | 706.9 | 1 343.4 | 1 357.9 | 1 396.7 | 1 618.4 | 1 643.0 d | 1 811.9 d |
| United Kingdom | 3 650.6 | 2 989.1 | 3 080.1 | 2 950.3 | 2 772.2 | 2 812.2 | 2 818.5 p |
| United States | 44 391.6 d | 51 267.3 | 49 466.9 | 50 155.8 | 50 151.7 | 47 615.0 | 47 088.3 |
| EU28 (OECD estimates) | 37 259.9 e | 41 394.9 e | 41 585.1 e | 41 856.4 e | 42 502.9 e | 39 973.9 e | 41 323.8 e |
| OECD-Total | 104 631.6 e | 122 309.0 e | 122 653.0 e | 123 652.7 e | 123 947.2 e | 117 429.2 e | 119 067.5 e |
| Argentina | 994.3 | 2 196.1 | 2 272.6 | 2 238.6 | 2 573.7 | 2 091.2 | 2 132.0 |
| China | 20 776.1 | 45 789.8 | 51 194.0 | 54 579.5 | 60 723.9 | 64 545.1 | 67 699.0 e |
| Romania | 421.3 | 708.0 | 707.0 | 628.7 | 742.4 | 665.9 | 727.1 p |
| Russian Federation | 6 846.7 | 11 260.4 | 10 761.1 | 11 396.3 | 11 590.2 | 11 880.1 | 11 584.2 e |
| Singapore | 541.2 | 793.2 | 939.8 | 1 067.0 | 1 090.2 | 1 075.4 | 1 023.2 |
| South Africa | 927.2 | 1 065.0 | 1 102.1 | 1 200.1 | 1 282.7 | 1 270.7 | .. |
| Chinese Taipei | 3 542.7 | 3 943.6 | 3 875.2 | 3 794.4 | 3 848.3 | 4 260.9 | 4 224.1 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 53. Percentage of Government intramural expenditure on R&D (GOVERD) financed by the business sector

Percentage

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|--------------|--------------|--------------|--------------|--------------|--------------|---------|
| Australia | .. | 7.7 | .. | 9.9 | .. | 10.3 | .. |
| Austria | .. | .. | 4.2 | .. | 6.0 | .. | .. |
| Belgium | 9.2 | 4.9 b | 5.4 | 3.6 | 6.2 | 5.8 | 5.4 |
| Canada | 3.8 | 2.2 | 2.1 | 2.1 | 0.9 | 0.9 | 0.8 p |
| Chile | .. | 2.4 | 1.5 b | 3.3 | 2.7 | 1.8 | 2.0 p |
| Czech Republic | 9.4 b | 4.5 | 3.7 | 3.8 | 2.8 | 4.0 | 3.6 |
| Denmark | 2.1 | 1.6 | 2.8 | 1.7 | 1.2 | 2.1 | 3.9 p |
| Estonia | 0.0 | 1.2 | 1.3 | 1.3 | 1.6 | 2.9 | 1.8 |
| Finland | 12.4 | 9.9 | 9.9 | 8.3 | 8.7 | 9.1 | 7.4 |
| France | 7.4 | 7.8 | 8.0 | 8.0 | 7.6 | 8.2 p | .. |
| Germany | 9.9 d | 10.3 d | 10.3 d | 11.2 d | 11.3 d | 11.2 d | 10.1 d |
| Greece | 1.3 | 5.5 | 3.6 | 3.1 | 4.5 | 3.2 | 5.6 |
| Hungary | 10.3 d | 9.8 d | 9.7 d | 7.8 d | 8.8 d | 6.0 d | 5.2 d |
| Iceland | 7.4 | .. | 15.0 b | 15.3 | 15.5 | 12.2 | 3.8 |
| Ireland | 4.1 | 1.8 | 1.9 | 1.9 | 0.7 | 0.8 | 3.9 |
| Israel ¹ | 7.7 d | 1.8 d | 2.2 d | 2.5 d | 2.1 d | 2.1 d e | .. |
| Italy | 2.4 | 5.3 | 4.2 | 4.1 | 4.2 | 3.8 | .. |
| Japan | 0.7 | 1.7 | 1.9 | 1.9 | 2.3 | 2.4 | 2.8 |
| Korea | 4.3 d | 3.5 | 2.8 | 2.8 | 2.3 | 3.0 | 3.4 |
| Latvia | 15.6 | 13.9 | 13.2 | 15.6 | 16.9 | 9.7 | 9.7 |
| Lithuania | 6.6 | 11.3 | 11.9 | 12.3 | 13.3 | 13.5 | 11.9 |
| Luxembourg | 3.9 d | 4.6 d | 2.0 d | .. | 1.3 d | 1.1 d e | .. |
| Mexico | 1.2 e | 0.9 | 0.7 | 0.7 e p | 0.7 e p | 0.8 e p | .. |
| Netherlands | 14.6 d | 18.3 b d | 16.6 d | 16.0 d | 13.6 d | 16.1 d | .. |
| New Zealand | 19.0 | .. | 17.2 | .. | 18.2 | .. | 17.0 |
| Norway | 10.6 | 9.1 | 8.9 | 9.6 | 7.4 | 8.0 | 7.5 |
| Poland | 14.3 | 4.9 | 4.3 | .. c | 4.5 | 5.3 b | .. |
| Portugal | 2.0 | 1.5 | 1.7 | 1.2 | 1.9 | 5.9 | 5.0 |
| Slovak Republic | 8.5 d | 13.2 d | 8.2 d | 13.4 d | 8.6 | 12.0 | 8.8 |
| Slovenia | 12.1 | 8.4 | 7.6 | 7.8 | 8.0 | 6.8 | .. |
| Spain | 7.3 | 5.0 | 5.9 | 5.8 | 6.0 | 5.6 | 5.9 |
| Sweden | 1.3 b | .. | 3.7 e | .. | 3.9 | .. | 6.8 |
| Switzerland | .. | .. | .. | 0.0 d | 2.4 d | .. | 3.9 d |
| Turkey | 1.5 | 2.1 | 2.0 | 2.6 | 2.8 | 2.1 d | 1.9 d |
| United Kingdom | 9.9 | 12.5 | 11.6 | 12.0 | 2.2 | 1.8 | .. |
| United States | 0.0 d | 0.3 d | 0.4 d | 0.4 d | 0.4 d | 0.4 d | 0.4 d p |
| EU28 (OECD estimates) | 8.3 e | 8.6 e | 8.4 e | 8.6 e | 7.8 e | 8.2 e | .. |
| OECD-Total | 3.5 e | 3.7 e | 3.7 e | 3.8 e | 3.5 e | 3.7 e | .. |
| Argentina | 0.2 | 1.9 | 0.5 | 0.2 | 0.3 | 0.5 | 0.2 |
| China | 4.9 | 4.1 | 4.6 | 4.1 | 3.9 | 4.7 | 4.6 |
| Romania | 16.1 | 17.3 | 16.0 | 17.0 | 15.2 | 18.0 | .. |
| Russian Federation | 11.4 | 13.1 | 13.8 | 11.5 | 11.6 | 9.1 | 9.7 |
| Singapore | 2.3 | 3.8 | 6.1 | 4.3 | 4.0 | 3.5 | 3.2 |
| South Africa | 7.9 | 2.7 | 7.0 | 3.2 | 4.7 | 5.9 | .. |
| Chinese Taipei | 3.0 | 3.0 | 3.1 | 3.4 | 2.9 | 2.9 | 3.9 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 54. Government researchers in full-time equivalent

FTE

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|------------------|------------------|------------------|------------------|------------------|-----------|------------------|
| Australia | .. | 8 311 | .. | 7 637 | .. | 7 483 | .. |
| Austria | 1 232 d e | 1 555 d e | 1 567 d | 1 654 d e | 1 682 d | 3 442 d e | 3 579 d p |
| Belgium | 2 274 | 3 591 b | 3 657 | 4 062 | 4 041 b | 4 290 | 4 486 |
| Canada | 8 360 | 9 490 | 9 100 | 9 250 | 7 930 | 7 400 | .. |
| Chile | .. | 404 d | 710 b d | 769 d | 863 d | 1 296 d | 1 163 d p |
| Czech Republic | 6 564 b | 6 453 | 6 725 | 6 979 | 7 393 | 7 500 | 7 908 |
| Denmark | 2 105 | 1 208 | 1 254 | 1 384 | 1 426 | 1 392 | 1 388 p |
| Estonia | 474 | 546 | 553 | 533 | 514 | 504 | 549 |
| Finland | 4 374 | 4 432 | 4 482 | 4 089 | 3 550 | 3 209 | 3 318 |
| France | 25 889 d | 27 413 | 27 893 | 28 065 | 28 445 | .. | 28 480 e |
| Germany | 39 911 | 55 597 | 56 755 d | 52 854 b d | 54 011 d | 53 971 d | 54 715 d |
| Greece | 2 076 d | 4 510 d | 5 778 d | 5 844 d | 7 256 d | 6 263 d | 7 184 d |
| Hungary | 4 959 | 4 674 | 4 782 | 4 776 | 4 680 | 4 965 | 4 867 |
| Iceland | 501 | .. | 181 b | .. | 239 b | 242 | 247 |
| Ireland | 419 | 495 | 437 | 461 | 494 | 504 | 580 |
| Israel ¹ | .. | 503 d e | .. | .. | .. | .. | .. |
| Italy | 14 454 | 20 499 | 21 313 | 21 045 | 21 592 | 21 711 | 21 800 p |
| Japan | 34 035 d | 31 567 d | 30 904 d | 30 373 d | 30 242 d | 30 238 d | 30 610 d |
| Korea | 12 791 d | 22 204 | 23 292 | 24 750 | 26 431 | 27 170 | 27 185 |
| Latvia | 589 d | 703 d | 707 d | 681 d | 691 d | 626 d | 571 d |
| Lithuania | 1 805.0 | 1 372.0 | 1 395.0 | 1 400.0 | 1 449.0 | 1 576.6 | 1 612.6 |
| Luxembourg | 374 | 732 | 733 | 708 | 617 | 601 | 606 p |
| Mexico | 6 589 e | 7 205 | 7 273 | 6 772 | 6 798 | 6 670 | .. |
| Netherlands | 7 028 d | 8 581 b d | 8 616 d | 8 624 d | 8 953 d | 8 714 d | 9 586 p |
| New Zealand | 1 800 | .. | 2 000 | .. | 1 900 | .. | .. |
| Norway | 3 449 d | 4 654 | 4 705 | 4 627 | 4 735 | 4 788 | 4 752 |
| Poland | 12 175 | 13 583 | 13 571 | 13 847 | 13 618 | 2 369 b | 2 329 p |
| Portugal | 3 338 | 1 682 | 1 386 b | 1 447 | 1 351 | 1 340 | 1 477 |
| Slovak Republic | 2 503 d | 2 967 d | 2 635 d | 3 123 d | 3 084 d | 2 878 | 2 854 |
| Slovenia | 1 591 | 1 850 | 1 825 | 1 744 | 1 629 | 1 667 | 1 502 p |
| Spain | 20 446 | 21 850 d | 20 673 d | 20 180 d | 19 962 d | 20 663 d | 20 844 d |
| Sweden | 2 929 b d e | 2 002 e | 2 386 b e | 2 304 e | 3 322 b e | 3 362 e | 3 788 |
| Switzerland | .. | 430 d | .. | 466 d | 472 d | .. | 455 d |
| Turkey | 4 249 | 6 288 | 6 294 | 6 541 | 6 555 | 6 700 d | 6 672 d |
| United Kingdom | 9 311 | 7 729 | 7 641 | 7 769 | 7 057 | 7 047 | 6 789 p |
| United States | .. | .. | .. | .. | .. | .. | .. |
| EU28 (OECD estimates) | 179 520 e | 204 449 e | 207 268 e | 203 743 e | 206 770 e | 197 027 e | 200 473 e |
| OECD-Total | 294 963 e | 340 936 e | 341 695 e | 339 955 e | 343 482 e | .. | 333 363 e |
| Argentina | 13 285 | 23 237 | 23 444 | 24 814 | 26 266 | 27 168 | 26 975 |
| China | 200 377 d | 269 581 | 288 675 | 295 899 | 305 686 | 336 106 | 356 805 |
| Romania | 7 082 | 6 372 | 6 583 | 6 409 | 6 659 | 6 755 | 6 526 p |
| Russian Federation | 154 827 | 149 593 | 144 776 | 144 700 | 146 840 | 145 956 | 139 479 |
| Singapore | 1 364 | 1 756 | 1 843 | 1 950 | 2 146 | 2 394 | 2 317 |
| South Africa | 1 974 | 2 789 | 2 705 | 2 735 | 2 781 | 2 910 | .. |
| Chinese Taipei | 13 789 | 14 630 | 14 599 | 14 753 | 14 887 | 15 366 | 15 542 |

 Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

 1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 55. Government researchers as a percentage of national total

Percentage

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|--------------|--------------|--------------|--------------|--------------|---------|----------|
| Australia | .. | .. | .. | .. | .. | .. | .. |
| Austria | 4.3 d e | 3.9 d e | 3.9 d | 3.9 d e | 3.9 d | 7.5 d e | 7.5 d p |
| Belgium | 6.9 | 7.9 b | 7.9 | 8.0 | 7.6 b | 7.9 e | 8.3 |
| Canada | 6.1 | 5.9 | 5.6 | 5.7 b | 4.9 | 4.8 | .. |
| Chile | .. | 5.9 d | 12.1 b d | 10.1 d | 10.6 d | 14.4 d | 12.8 d p |
| Czech Republic | 27.2 b | 19.4 | 19.6 | 19.4 | 19.4 | 20.1 | 20.2 |
| Denmark | 7.5 | 3.0 | 3.1 | 3.3 | 3.3 | 3.1 | 3.1 p |
| Estonia | 14.2 | 11.9 | 12.5 | 12.3 | 12.3 | 11.6 | 11.7 |
| Finland | 11.1 | 11.0 | 11.4 | 10.7 | 9.5 | 8.9 | 9.0 |
| France | 12.8 d | 10.6 e | 10.5 e | 10.3 b | 10.2 | .. | 9.9 e |
| Germany | 14.7 | 15.8 | 16.0 d | 15.0 b d | 13.9 d | 13.5 d | 13.0 d |
| Greece | 10.6 d | 18.2 d | 19.8 d | 19.6 d | 20.9 d | 21.3 d | 20.5 d |
| Hungary | 31.2 | 19.6 | 19.1 | 18.2 | 18.5 | 19.2 | 17.1 |
| Iceland | 23.3 | .. | 9.8 b | .. | 12.3 b | 11.0 | 12.0 |
| Ireland | 3.6 | 2.2 e | 1.8 e | 1.9 e | 2.0 e | 2.1 e | .. |
| Israel ¹ | .. | 0.8 d e | .. | .. | .. | .. | .. |
| Italy | 17.5 | 18.5 | 18.3 | 17.8 | 17.2 | 16.2 b | 16.0 p |
| Japan | 5.0 d | 4.9 d | 4.7 b d | 4.4 d | 4.6 d | 4.5 d | 4.5 d |
| Korea | 7.1 d | 7.0 | 7.2 | 7.2 | 7.4 | 7.5 | 7.1 |
| Latvia | 17.9 d | 18.0 d | 19.5 d | 18.2 d | 19.1 d | 19.9 d | 16.4 d |
| Lithuania | 23.6 | 17.1 | 16.3 | 15.4 | 17.7 | 18.5 | 18.4 |
| Luxembourg | 16.8 | 31.7 b | 29.3 | 26.9 | 24.3 | 24.0 p | 22.2 p |
| Mexico | 15.0 e | 24.8 | 24.3 | 21.6 | 19.8 | 17.2 | .. |
| Netherlands | 14.7 d | 11.7 b d | 11.2 d | 11.3 d | 11.3 d | 10.7 d | 11.2 p |
| New Zealand | 13.9 | .. | 11.2 | .. | 10.2 | .. | .. |
| Norway | 16.3 d | 16.7 | 16.6 | 15.8 | 15.5 | 15.0 | 14.1 |
| Poland | 19.6 | 20.3 | 19.0 | 17.6 | 16.5 | 2.7 b | 2.4 p |
| Portugal | 15.8 | 4.0 | 3.7 b | 3.8 | 3.5 | 3.2 | 3.3 |
| Slovak Republic | 22.9 d | 19.4 d | 17.9 d | 21.2 d | 21.4 d | 23.5 | 21.7 |
| Slovenia | 30.3 | 20.8 | 21.0 | 20.3 | 20.6 | 20.5 | 16.2 p |
| Spain | 18.6 | 17.2 d | 16.8 d | 16.5 d | 16.3 d | 16.3 d | 15.6 d |
| Sweden | 5.3 b d e | 4.1 e | 3.7 b e | 3.5 e | 5.0 b e | 4.8 e | 5.2 |
| Switzerland | .. | 1.2 d | .. | .. | 1.1 d | .. | 1.0 d |
| Turkey | 10.9 | 7.7 | 7.1 | 7.3 | 6.9 | 6.7 d | 6.0 d |
| United Kingdom | 3.7 b e | 3.0 e | 2.9 | 2.8 e | 2.5 | 2.4 e | 2.3 p |
| United States | .. | .. | .. | .. | .. | .. | .. |
| EU28 (OECD estimates) | 13.1 e | 12.1 e | 11.9 e | 11.5 e | 11.2 e | 10.4 e | 10.2 e |
| OECD-Total | 8.0 e | 7.7 e | 7.5 e | 7.3 e | 7.2 e | .. | .. |
| Argentina | 41.7 | 46.0 | 46.2 | 48.0 | 49.6 | 50.3 | 51.5 |
| China | 17.9 d | 19.2 | 19.5 | 19.4 | 18.9 | 19.9 | 20.5 |
| Romania | 30.8 | 35.4 | 35.4 | 35.4 | 38.1 | 37.4 | 37.3 p |
| Russian Federation | 33.3 | 33.7 | 32.9 | 32.5 | 32.7 | 34.0 | 34.0 |
| Singapore | 5.7 | 5.1 | 5.1 | 5.3 | 5.5 | 6.1 | 6.0 |
| South Africa | 11.4 | 13.0 | 11.6 | 11.6 | 10.6 | 10.5 | .. |
| Chinese Taipei | 15.5 | 10.4 | 10.3 | 10.3 | 10.2 | 10.4 | 10.3 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 56. Government Total R&D personnel in full-time equivalent

FTE

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|-----------|------------|-----------|-----------|-----------|-----------|------------|
| Australia | .. | 16 381 | .. | 14 715 | .. | 14 773 | .. |
| Austria | 2 318 d e | 2 544 d e | 2 538 d | 2 641 d e | 2 674 d | 4 842 d e | 5 035 d p |
| Belgium | 3 589 | 5 818 b | 5 931 | 6 381 | 6 470 b | 6 653 | 6 946 |
| Canada | 17 860 | 19 070 | 18 110 | 18 050 | 15 410 | 14 300 | .. |
| Chile | .. | 607 d | 1 382 b d | 1 372 d | 1 495 d | 2 223 d | 2 295 d p |
| Czech Republic | 11 054 b | 11 864 | 12 275 | 12 380 | 12 953 | 13 099 | 13 689 |
| Denmark | 3 240 | 1 543 | 1 544 | 1 686 | 1 792 | 1 720 | 1 715 p |
| Estonia | 696 | 774 | 851 | 800 | 782 | 841 | 847 |
| Finland | 7 422 | 6 360 | 6 319 | 5 880 | 4 519 | 4 039 | 4 240 |
| France | 49 645 d | 49 903 | 49 982 | 49 375 | 49 413 | .. | 48 800 e |
| Germany | 76 254 d | 95 882 d | 98 161 d | 101 005 d | 101 717 d | 103 206 d | 106 025 d |
| Greece | 4 345 d | 9 982 d | 11 436 d | 11 125 d | 13 628 d | 11 750 d | 12 074 d |
| Hungary | 7 652 | 7 605 | 7 765 | 7 215 | 8 111 | 7 456 | 7 271 |
| Iceland | 849 | .. | 266 b | .. | 275 | 283 | 277 |
| Ireland | 1 132 | 921 | 818 | 826 | 951 | 993 | 1 051 |
| Israel ¹ | .. | 883 d e | .. | .. | .. | .. | .. |
| Italy | 32 684 | 37 851 | 39 023 | 38 506 | 38 669 | 38 490 | 38 389 p |
| Japan | 62 975 d | 62 752 d | 61 486 d | 61 585 d | 60 299 d | 61 615 d | 62 046 d |
| Korea | 16 847 d | 32 977 | 34 367 | 35 574 | 38 174 | 38 119 | 37 578 |
| Latvia | 1 256 d | 1 170 d | 1 178 d | 1 180 d | 1 184 d | 1 077 d | 974 d |
| Lithuania | 3 113.0 | 2 131.0 | 2 227.0 | 2 224.0 | 2 156.0 | 2 398.5 | 2 407.5 |
| Luxembourg | 560 d | 1 178 d | 1 195 d | 1 187 d | 1 136 d | 1 072 | 1 081 p |
| Mexico | 14 837 e | 16 638 | 16 944 | 13 158 | 12 959 | 13 183 | .. |
| Netherlands | 12 706 d | 13 496 b d | 13 485 d | 14 121 d | 14 348 d | 13 982 d | 14 856 d p |
| New Zealand | 3 100 | .. | 3 300 | .. | 3 500 | .. | .. |
| Norway | 5 147 | 6 670 | 6 780 | 6 690 | 6 820 | 6 810 | 6 793 |
| Poland | 17 877 | 21 804 | 21 884 | 22 614 | 22 073 | 3 733 b | 3 206 p |
| Portugal | 4 533 | 2 204 | 1 983 | 2 037 | 2 066 | 2 098 | 2 212 |
| Slovak Republic | 3 717 d | 4 168 d | 3 545 d | 4 147 d | 4 335 d | 4 144 | 3 941 |
| Slovenia | 2 517 | 2 579 | 2 596 | 2 490 | 2 437 | 2 501 | 2 323 p |
| Spain | 32 077 | 41 787 d | 39 349 d | 38 764 d | 39 678 d | 39 972 d | 40 283 d |
| Sweden | 3 444 b e | 3 359 e m | 3 217 e | 3 404 e | 4 234 b e | 4 269 e | 4 894 |
| Switzerland | .. | 781 d | .. | 897 d | 909 d | .. | 875 d |
| Turkey | 8 825 | 12 088 | 12 004 | 12 230 | 12 328 | 11 799 d | 11 345 d |
| United Kingdom | 20 415 | 16 880 | 16 592 | 16 250 | 14 615 | 14 531 | 13 999 p |
| United States | .. | .. | .. | .. | .. | .. | .. |
| EU28 (OECD estimates) | 321 394 e | 360 563 e | 363 164 e | 364 447 e | 367 855 e | 349 891 e | 353 800 e |
| OECD-Total | .. | .. | .. | .. | .. | .. | .. |
| Argentina | 21 688 | 34 472 | 35 850 | 37 757 | 39 271 | 40 248 | 38 245 |
| China | 254 506 d | 446 920 | 467 313 | 479 435 | 493 200 | 505 927 | 531 629 |
| Romania | 10 055 | 11 381 | 12 336 | 11 866 | 12 080 | 12 663 | 12 500 p |
| Russian Federation | 296 428 | 292 894 | 282 051 | 283 161 | 283 968 | 287 129 | 283 620 |
| Singapore | 2 173 | 3 003 | 3 134 | 3 497 | 3 879 | 4 060 | 3 961 |
| South Africa | 5 586 | 7 346 | 7 410 | 6 362 | 6 417 | 6 453 | .. |
| Chinese Taipei | 25 673 | 25 246 | 24 727 | 24 876 | 24 948 | 25 578 | 26 173 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 57. Total GBARD (Government budget allocations for R&D) at current prices and PPP

Million USD

| | 2005 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|-----------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|-------------|
| Australia | 3 729.1 d | 4 842.9 d | 4 614.5 d | 4 729.7 d | 5 270.5 d p | 5 099.1 d p | .. |
| Austria | 1 836.6 d | 3 314.3 d | 3 437.1 d | 3 643.1 d | 3 703.1 d | 3 705.6 d p | .. |
| Belgium | 2 004.6 | 3 409.3 | 3 172.5 | 3 384.8 | 3 751.1 | 3 731.2 p | .. |
| Canada | 6 777.1 d | 7 937.5 d | 7 947.1 d | 8 189.3 d | .. | .. | .. |
| Chile | .. | 843.3 | 821.7 | 914.7 | 965.2 | .. | .. |
| Czech Republic | 1 129.0 | 2 147.8 | 2 151.6 | 2 184.9 | 2 446.3 | 2 757.7 p | 2 812.4 e |
| Denmark | 1 329.3 | 2 707.4 | 2 795.2 e | 2 637.5 e | 2 796.9 e | 2 872.7 e | 2 935.7 e p |
| Estonia | 89.9 e | 269.2 e | 261.3 e | 272.2 b | 267.1 p | .. | .. |
| Finland | 1 648.0 | 2 206.3 | 2 205.6 | 2 042.4 | 2 150.2 | 2 223.2 | 2 240.6 e p |
| France | 18 220.2 | 18 349.2 | 17 531.1 | 17 677.2 | 19 015.4 | 20 085.2 | .. |
| Germany | 19 732.0 | 33 186.3 | 34 107.7 | 36 883.2 | 39 992.1 | 41 032.0 p | .. |
| Greece | 895.8 | 1 278.9 | 1 515.9 | 1 575.8 | 1 508.8 | 1 962.0 | .. |
| Hungary | 696.1 | 702.5 | 725.6 | 1 040.0 | 1 001.0 | 995.7 p | .. |
| Iceland | 94.0 | 78.8 b | 85.6 | 98.1 | 114.3 | .. | .. |
| Ireland | 710.7 | 887.4 | 909.6 | 887.9 | 928.2 | 936.8 | .. |
| Israel ¹ | 1 044.9 d | 1 749.9 d | 1 837.5 d | 1 978.5 d | 2 040.4 d | .. | .. |
| Italy | 11 199.3 | 11 425.0 | 11 336.0 | 12 235.3 | 12 627.0 | .. | .. |
| Japan | 27 617.8 d | 35 431.8 d | 33 616.8 d | 33 661.4 d | 34 027.7 d | 37 244.3 b d p | .. |
| Korea | 9 886.5 b d | 20 391.9 | 22 032.6 | 22 200.7 | 22 519.2 | .. | .. |
| Latvia | 57.4 | 76.8 | 93.7 | 106.4 | 122.3 | 128.6 p | .. |
| Lithuania | 169.8 | 284.7 | 273.8 | 273.3 | 294.8 | 292.1 | .. |
| Luxembourg | 81.5 | 359.1 | 380.0 | 385.6 | 424.1 | 422.7 p | .. |
| Mexico | 2 963.4 | 7 184.7 | 7 093.7 e | 6 416.5 | 5 589.7 p | 5 445.0 | 5 219.0 e p |
| Netherlands | 4 391.9 | 6 026.0 | 6 027.4 | 6 080.3 | 6 460.5 | 6 979.8 p | 6 870.3 e p |
| New Zealand | .. | 882.1 | 873.8 | 914.8 | 1 025.4 | .. | .. |
| Norway | 1 535.9 | 2 903.4 | 2 917.1 | 3 018.6 | 3 367.2 | 3 450.2 | 3 561.8 e p |
| Poland | 1 548.8 | 4 185.8 | 4 158.7 | 3 458.3 | 4 105.5 | .. | .. |
| Portugal | 1 045.6 | 1 087.4 | 1 174.4 | 1 218.0 | 1 227.7 | 1 195.6 p | .. |
| Slovak Republic | 244.6 | 595.9 | 673.0 | 624.4 | 636.1 | 674.5 p | .. |
| Slovenia | 273.3 | 272.9 | 268.6 | 276.4 | 296.3 | .. | .. |
| Spain | 6 440.7 | 8 721.4 | 9 092.2 | 9 237.5 | 9 351.6 | 9 631.7 p | .. |
| Sweden | 2 508.0 | 3 766.5 | 3 742.9 | 3 819.3 | 4 141.5 | 4 201.7 | 4 129.7 e p |
| Switzerland | .. | 4 451.7 | 4 754.0 | .. | 5 308.9 | .. | .. |
| Turkey | .. | 6 095.5 | 6 915.3 | 7 294.7 | 7 795.1 | .. | .. |
| United Kingdom | 12 116.1 | 14 663.0 | 14 612.7 | 14 786.2 | 15 700.2 p | .. | .. |
| United States | 111 332.0 | 112 502.0 | 115 220.0 | 126 093.0 | 127 306.0 | 130 541.0 p | .. |
| EU28 (OECD estimates) | 89 609.6 e | 121 894.1 e | 122 970.2 e | 127 201.6 e | 135 160.6 e | 139 731.3 e | .. |
| OECD-Total | 256 467.5 e | 325 218.6 e | 329 376.3 e | 345 206.1 e | 356 483.4 e | 369 071.7 e | .. |
| Argentina | 1 221.0 d | .. | .. | .. | .. | .. | .. |
| China | .. | .. | .. | .. | .. | .. | .. |
| Romania | 448.5 | 872.6 | 1 104.5 | 1 313.6 | 979.0 | 952.9 | .. |
| Russian Federation | 6 038.6 b | 20 808.0 | 18 627.6 | 16 531.3 | 15 523.9 | .. | .. |
| Singapore | .. | .. | .. | .. | .. | .. | .. |
| South Africa | .. | .. | .. | .. | .. | .. | .. |
| Chinese Taipei | 4 889.6 | 7 391.7 | 7 590.4 | 7 974.1 | 8 378.4 | 8 217.2 | .. |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 58. Defence Budget R&D

As a percentage of total GBARD (Government budget allocations for R&D)

Percentage

| | 2005 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|-----------------------|---------------|---------------|---------------|---------------|---------------|---------------|-----------|
| Australia | 6.9 d | 6.5 d | 7.7 d | 6.8 d | 6.8 d p | 6.4 d p | .. |
| Austria | 0.0 d | 0.0 d | 0.0 d | 0.1 d | 0.1 d | 0.2 d p | .. |
| Belgium | 0.3 | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 p | .. |
| Canada | 4.1 d | 2.9 d | 2.6 d | 2.2 d | .. | .. | .. |
| Chile | .. | 0.0 | 0.0 | 0.0 | 0.0 | .. | .. |
| Czech Republic | 2.5 | 1.4 | 1.3 | 1.2 | 1.3 | 1.1 p | .. |
| Denmark | 0.7 | 0.3 | 0.3 e | 0.3 e | 0.3 e | 0.3 e | 0.3 e p |
| Estonia | 1.0 e | 1.3 e | 1.5 e | 2.3 b | 1.9 p | .. | .. |
| Finland | 3.3 | 2.1 | 1.9 | 1.9 | 2.2 | 2.4 | 2.5 p |
| France | 20.8 | 6.6 d | 7.2 d | 6.4 d | 7.5 d | 6.2 d | .. |
| Germany | 5.8 s | 3.8 s | 3.1 s | 2.7 | 3.8 | 3.3 p | .. |
| Greece | 0.5 | 0.1 | 0.1 | 0.9 | 1.8 | 1.4 | .. |
| Hungary | 0.1 | 0.1 | 0.6 | 0.1 | 0.4 | 0.1 p | .. |
| Iceland | 0.0 | 0.0 b | 0.0 | 0.0 | 0.0 | .. | .. |
| Ireland | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | .. |
| Israel ¹ | .. | .. | .. | .. | .. | .. | .. |
| Italy | 3.6 | 0.8 | 0.8 | 0.6 | 0.6 | .. | .. |
| Japan | 4.0 d m | 4.4 d m | 4.4 d m | 3.1 d m | 3.5 d m | 2.8 b d p | .. |
| Korea | 12.4 b d | 13.5 | 13.5 | 14.0 | 15.0 | .. | .. |
| Latvia | 1.1 | 1.8 | 1.9 | 2.7 | .. c | .. c | .. |
| Lithuania | 0.2 | 0.0 | 0.1 | 0.3 | 0.1 | 0.2 | .. |
| Luxembourg | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 p | .. |
| Mexico | 0.0 | 0.2 | 0.2 e | 0.1 | 0.2 p | 0.1 | 0.2 p |
| Netherlands | 2.0 | 1.2 | 1.3 | 1.2 | 1.2 | 1.2 p | 1.3 p |
| New Zealand | .. | 0.0 | 0.0 | 0.0 | 0.0 | .. | .. |
| Norway | 6.4 | 4.0 | 3.8 | 3.7 | 3.5 | 3.5 | 3.5 p |
| Poland | 1.3 | 4.8 | 5.1 | 15.5 | 9.2 | .. | .. |
| Portugal | 0.1 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 p | .. |
| Slovak Republic | 8.3 d | 1.4 | 1.9 | 1.5 | 1.7 | 1.8 p | .. |
| Slovenia | 4.9 | 0.2 | 0.2 | 0.2 | 0.3 | .. | .. |
| Spain | 3.9 | 1.3 | 1.4 | 1.0 | 1.1 | 0.9 p | .. |
| Sweden | 17.4 | 3.8 d | 3.3 d | 3.4 e | 3.0 e | 3.7 e | 2.8 e p |
| Switzerland | .. | 0.5 | 0.4 | .. | 0.3 | .. | .. |
| Turkey | .. | 11.4 | 10.7 | 13.1 | 17.3 | .. | .. |
| United Kingdom | 23.5 | 16.7 | 16.4 | 15.8 | 15.2 p | .. | .. |
| United States | 49.1 | 41.0 | 41.6 | 42.7 | 43.5 | 46.3 p | .. |
| EU28 (OECD estimates) | 10.2 e | 4.7 e | 4.5 e | 4.3 e | 4.7 e | .. | .. |
| OECD-Total | 26.1 e | 17.7 e | 18.0 e | 18.8 e | 19.2 e | 19.8 e | .. |
| Argentina | 0.4 d | .. | .. | .. | .. | .. | .. |
| China | .. | .. | .. | .. | .. | .. | .. |
| Romania | 1.7 | 1.8 | 1.6 | 1.7 | 4.5 | 7.7 | .. |
| Russian Federation | .. | .. | .. | .. | .. | .. | .. |
| Singapore | .. | .. | .. | .. | .. | .. | .. |
| South Africa | .. | .. | .. | .. | .. | .. | .. |
| Chinese Taipei | 10.6 | 2.6 | 2.5 | 5.2 | 6.4 | 7.0 | .. |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 59. Civil Budget R&D

As a percentage of total GBARD (Government budget allocations for R&D)

Percentage

| | 2005 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|-----------------------|---------------|---------------|---------------|---------------|---------------|---------------|----------|
| Australia | 93.1 d | 93.5 d | 92.3 d | 93.2 d | 93.2 d p | 93.6 d p | .. |
| Austria | 100.0 d | 100.0 d | 100.0 d | 99.9 d | 99.9 d | 99.8 d p | .. |
| Belgium | 99.7 | 99.8 | 99.9 | 99.9 | 99.9 | 99.9 p | .. |
| Canada | 95.9 d | 97.1 d | 97.4 d | 97.8 d | .. | .. | .. |
| Chile | .. | 100.0 | 100.0 | 100.0 | 100.0 | .. | .. |
| Czech Republic | 97.5 | 98.6 | 98.7 | 98.8 | 98.7 | 98.9 p | .. |
| Denmark | 99.3 | 99.7 | 99.7 e | 99.7 e | 99.7 e | 99.7 e | 99.7 e p |
| Estonia | 99.0 e | 98.7 e | 98.5 e | 97.7 b | 98.1 p | .. | .. |
| Finland | 96.7 | 97.9 | 98.1 | 98.1 | 97.8 | 97.6 | 97.5 p |
| France | 79.2 | 93.4 d | 92.8 d | 93.6 d | 92.5 d | 93.8 d | .. |
| Germany | 94.2 s | 96.2 s | 96.9 s | 97.3 | 96.2 | 96.7 p | .. |
| Greece | 99.5 | 99.9 | 99.9 | 99.1 | 98.2 | 98.6 | .. |
| Hungary | 99.9 | 99.9 | 99.4 | 99.9 | 99.6 | 99.9 p | .. |
| Iceland | 100.0 | 100.0 b | 100.0 | 100.0 | 100.0 | .. | .. |
| Ireland | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | .. |
| Israel ¹ | .. | .. | .. | .. | .. | .. | .. |
| Italy | 96.4 | 99.2 | 99.2 | 99.4 | 99.4 | .. | .. |
| Japan | 96.0 d | 95.6 d | 95.6 d | 96.9 d | 96.5 d | 97.2 b d p | .. |
| Korea | 87.6 b d | 86.5 | 86.5 | 86.0 | 85.0 | .. | .. |
| Latvia | 98.9 | 98.2 | 98.1 | 97.3 | .. c | .. c | .. |
| Lithuania | 99.8 | 100.0 | 99.9 | 99.7 | 99.9 | 99.8 | .. |
| Luxembourg | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 p | .. |
| Mexico | 100.0 | 99.8 | 99.8 e | 99.9 | 99.8 p | 99.9 | 99.8 p |
| Netherlands | 98.0 | 98.8 | 98.7 | 98.8 | 98.8 | 98.8 p | 98.7 p |
| New Zealand | .. | 100.0 | 100.0 | 100.0 | 100.0 | .. | .. |
| Norway | 93.6 | 96.0 | 96.2 | 96.3 | 96.5 | 96.5 | 96.5 p |
| Poland | 98.7 | 95.2 | 94.9 | 84.5 | 90.8 | .. | .. |
| Portugal | 99.9 | 99.7 | 99.7 | 99.7 | 99.7 | 99.7 p | .. |
| Slovak Republic | 91.7 d | 98.6 | 98.1 | 98.5 | 98.3 | 98.2 p | .. |
| Slovenia | 95.1 | 99.8 | 99.8 | 99.8 | 99.7 | .. | .. |
| Spain | 96.1 | 98.7 | 98.6 | 99.0 | 98.9 | 99.1 p | .. |
| Sweden | 82.6 | 96.2 d | 96.7 d | 96.6 e | 97.0 e | 96.3 e | 97.2 e p |
| Switzerland | .. | 99.5 | 99.6 | .. | 99.7 | .. | .. |
| Turkey | .. | 88.6 | 89.3 | 86.9 | 82.7 | .. | .. |
| United Kingdom | 76.5 | 83.3 | 83.6 | 84.2 | 84.8 p | .. | .. |
| United States | 50.9 | 59.0 | 58.4 | 57.3 | 56.5 | 53.7 p | .. |
| EU28 (OECD estimates) | 89.8 e | 95.3 e | 95.5 e | 95.7 e | 95.3 e | .. | .. |
| OECD-Total | 73.9 e | 82.3 e | 82.0 e | 81.2 e | 80.8 e | 80.2 e | .. |
| Argentina | 99.6 d | .. | .. | .. | .. | .. | .. |
| China | .. | .. | .. | .. | .. | .. | .. |
| Romania | 98.3 | 98.2 | 98.4 | 98.3 | 95.5 | 92.3 | .. |
| Russian Federation | .. | .. | .. | .. | .. | .. | .. |
| Singapore | .. | .. | .. | .. | .. | .. | .. |
| South Africa | .. | .. | .. | .. | .. | .. | .. |
| Chinese Taipei | 89.4 | 97.4 | 97.5 | 94.8 | 93.6 | 93.0 | .. |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database

Table 60. R&D expenditure of foreign affiliates at current prices and PPP

Million USD

| | 2005 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|-----------------------|-----------|-----------|-----------|-----------|-----------|-----------|------------|
| Australia | .. | 3 698.1 | .. | 3 546.7 | .. | .. | .. |
| Austria | .. | 3 426.9 | .. | 4 307.5 | .. | 4 637.8 | .. |
| Belgium | 2 406.2 | 4 453.4 p | .. | .. | .. | .. | .. |
| Canada | 4 235.2 | 4 974.6 p | 4 820.8 p | 4 839.1 p | 5 122.9 p | 5 073.7 p | 5 459.5 p |
| Chile | .. | .. | .. | .. | .. | .. | .. |
| Czech Republic | 961.8 | .. | .. | 1 219.8 b | .. | 1 239.3 | .. |
| Denmark | .. | .. | .. | .. | .. | .. | .. |
| Estonia | .. | .. | .. | .. | .. | .. | .. |
| Finland | 638.2 | 626.0 | .. | 750.0 | .. | 1 076.2 | .. |
| France | 5 767.3 b | 9 413.1 | 9 776.0 | 7 967.0 b | 7 636.4 | 8 078.2 p | .. |
| Germany | 12 159.7 | 16 784.5 | .. | 15 391.7 | .. | 16 838.4 | .. |
| Greece | .. | .. | .. | .. | .. | .. | .. |
| Hungary | 299.7 | 589.7 | .. | 753.9 | .. | 721.0 | .. |
| Iceland | .. | .. | .. | .. | .. | .. | .. |
| Ireland | 924.2 | 1 467.6 | .. | 1 625.6 | .. | 1 758.4 | 1 687.2 e |
| Israel ¹ | 3 130.3 | 5 122.3 | 5 745.8 | 6 422.1 | 6 875.8 | 7 409.6 | 8 117.0 |
| Italy | 2 315.4 | 3 456.0 | 3 498.6 | 3 620.0 | 3 991.1 | 4 379.8 | 5 032.6 p |
| Japan | 5 038.4 | .. | 6 510.4 | 7 578.6 | 8 758.0 | 8 927.0 | 6 760.3 p |
| Korea | .. | .. | .. | .. | .. | .. | .. |
| Latvia | .. | .. | .. | .. | .. | .. | .. |
| Lithuania | .. | .. | .. | .. | .. | .. | .. |
| Luxembourg | .. | .. | .. | .. | .. | .. | .. |
| Mexico | .. | .. | .. | .. | .. | .. | .. |
| Netherlands | .. | 1 602.1 | 1 733.4 | 1 701.4 | 1 806.4 | 1 807.9 | 1 836.7 p |
| New Zealand | .. | .. | .. | .. | .. | .. | .. |
| Norway | 394.8 | 672.0 | 679.4 | .. | .. | .. | .. |
| Poland | 288.0 | 449.2 | .. | 860.0 | .. | 988.0 d | .. |
| Portugal | 236.7 | .. | .. | .. | .. | .. | .. |
| Slovak Republic | 52.6 | .. | .. | .. | .. | .. | .. |
| Slovenia | .. | 214.8 | .. | .. c | .. | 329.5 | .. |
| Spain | 1 868.8 | 1 863.4 | .. | 1 870.3 | .. | 1 974.4 | .. |
| Sweden | 3 529.5 | 3 641.4 | .. | 3 899.5 | .. | 4 545.0 p | .. |
| Switzerland | .. | .. | 1 906.7 | .. | .. | 1 639.4 p | .. |
| Turkey | .. | .. | .. | .. | .. | .. | .. |
| United Kingdom | 7 594.5 | 12 567.1 | 12 936.9 | 14 350.3 | 14 668.3 | 15 522.2 | 16 150.1 |
| United States | 31 099.0 | 45 177.0 | 50 259.0 | 54 070.0 | 56 952.0 | 56 731.0 | 60 140.0 p |
| EU28 (OECD estimates) | .. | .. | .. | .. | .. | .. | .. |
| OECD-Total | .. | .. | .. | .. | .. | .. | .. |
| Argentina | .. | .. | .. | .. | .. | .. | .. |
| China | .. | .. | .. | .. | .. | .. | .. |
| Romania | .. | .. | .. | .. | .. | .. | .. |
| Russian Federation | .. | .. | .. | .. | .. | .. | .. |
| Singapore | .. | .. | .. | .. | .. | .. | .. |
| South Africa | .. | .. | .. | .. | .. | .. | .. |
| Chinese Taipei | .. | .. | .. | .. | .. | .. | .. |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Activities of Multinational Enterprises database

Table 61. R&D expenditure of foreign affiliates as a percentage of R&D expenditures of enterprises

Percentage

| | 2005 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|-----------------------|--------|--------|--------|--------|--------|--------|--------|
| Australia | .. | 30.5 | .. | 27.2 | .. | .. | .. |
| Austria | .. | 50.0 | .. | 50.7 | .. | 49.4 | .. |
| Belgium | 56.8 | 66.0 p | .. | .. | .. | .. | .. |
| Canada | 32.6 | 36.5 p | 35.9 p | 35.7 p | 34.6 p | 35.3 p | 37.6 p |
| Chile | .. | .. | .. | .. | .. | .. | .. |
| Czech Republic | 51.5 | .. | .. | 62.8 b | .. | 61.4 p | .. |
| Denmark | .. | .. | .. | .. | .. | .. | .. |
| Estonia | .. | .. | .. | .. | .. | .. | .. |
| Finland | 16.1 | 14.8 | .. | 20.4 | .. | 35.6 | .. |
| France | 23.5 b | 27.5 | 27.5 | 21.1 b | 19.8 | 20.6 p | .. |
| Germany | 27.8 | 26.1 | .. | 22.4 | .. | 21.5 | .. |
| Greece | .. | .. | .. | .. | .. | .. | .. |
| Hungary | 59.7 | 62.6 | .. | 60.9 | .. | 66.1 | .. |
| Iceland | .. | .. | .. | .. | .. | .. | .. |
| Ireland | 70.3 | 65.6 | .. | 65.2 | .. | 63.7 | 59.6 e |
| Israel ¹ | 55.7 | 65.6 | 66.8 | 69.2 | 70.6 | 70.1 | 68.6 |
| Italy | 25.2 | 24.2 | 23.6 | 23.3 | 23.9 | 25.1 | 25.5 p |
| Japan | 5.1 | .. | 5.6 | 6.0 | 6.6 | 6.7 | 5.2 p |
| Korea | .. | .. | .. | .. | .. | .. | .. |
| Latvia | .. | .. | .. | .. | .. | .. | .. |
| Lithuania | .. | .. | .. | .. | .. | .. | .. |
| Luxembourg | .. | .. | .. | .. | .. | .. | .. |
| Mexico | .. | .. | .. | .. | .. | .. | .. |
| Netherlands | .. | 32.5 | 33.5 | 31.3 | 33.5 | 32.4 | 31.1 p |
| New Zealand | .. | .. | .. | .. | .. | .. | .. |
| Norway | 28.5 | 33.7 | 31.6 | .. | .. | .. | .. |
| Poland | 30.4 | 44.8 | .. | 47.0 | .. | 44.7 d | .. |
| Portugal | 34.0 | .. | .. | .. | .. | .. | .. |
| Slovak Republic | 23.9 | .. | .. | .. | .. | .. | .. |
| Slovenia | .. | 29.1 | .. | .. c | .. | 42.1 | .. |
| Spain | 26.2 | 35.2 | .. | 37.0 | .. | 38.4 | .. |
| Sweden | 41.5 | 38.5 | .. | 39.0 | .. | 42.1 p | .. |
| Switzerland | .. | .. | 20.1 | .. | .. | 12.9 p | .. |
| Turkey | .. | .. | .. | .. | .. | .. | .. |
| United Kingdom | 39.1 | 50.8 | 52.1 | 53.6 | 51.3 | 51.1 | 50.0 |
| United States | 13.8 | 15.4 | 16.6 | 16.8 | 16.7 | 15.9 | 16.1 p |
| EU28 (OECD estimates) | .. | .. | .. | .. | .. | .. | .. |
| OECD-Total | .. | .. | .. | .. | .. | .. | .. |
| Argentina | .. | .. | .. | .. | .. | .. | .. |
| China | .. | .. | .. | .. | .. | .. | .. |
| Romania | .. | .. | .. | .. | .. | .. | .. |
| Russian Federation | .. | .. | .. | .. | .. | .. | .. |
| Singapore | .. | .. | .. | .. | .. | .. | .. |
| South Africa | .. | .. | .. | .. | .. | .. | .. |
| Chinese Taipei | .. | .. | .. | .. | .. | .. | .. |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Activities of Multinational Enterprises database

Table 62. Triadic patent families
By priority year

Number

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|---------------|---------------|---------------|---------------|-----------------|-----------------|-----------------|
| Australia | 479 | 337 | 308 | 321 | 296 e | 302 e | 308 e |
| Austria | 410 | 378 | 380 | 398 | 371 e | 374 e | 380 e |
| Belgium | 543 | 429 | 432 | 390 | 369 e | 379 e | 385 e |
| Canada | 720 | 527 | 620 | 590 | 540 e | 536 e | 546 e |
| Chile | 6 | 10 | 12 | 8 | 11 e | 11 e | 11 e |
| Czech Republic | 25 | 36 | 32 | 44 | 42 e | 43 e | 44 e |
| Denmark | 390 | 284 | 263 | 307 | 287 e | 289 e | 293 e |
| Estonia | 3 | 4 | 9 | 6 | 4 e | 4 e | 4 e |
| Finland | 391 | 290 | 271 | 312 | 282 e | 278 e | 274 e |
| France | 3 048 | 2 440 | 2 423 | 2 482 | 2 306 e | 2 314 e | 2 315 e |
| Germany | 7 142 | 4 592 | 4 912 | 4 633 | 4 434 e | 4 489 e | 4 531 e |
| Greece | 24 | 22 | 20 | 23 | 18 e | 18 e | 19 e |
| Hungary | 58 | 31 | 20 | 35 | 35 e | 35 e | 36 e |
| Iceland | 7 | 2 | 2 | 1 | 2 e | 2 e | 2 e |
| Ireland | 98 | 75 | 94 | 105 | 104 e | 106 e | 108 e |
| Israel ¹ | 502 | 401 | 438 | 447 | 461 e | 476 e | 480 e |
| Italy | 966 | 725 | 773 | 815 | 787 e | 815 e | 818 e |
| Japan | 18 932 | 18 651 | 17 646 | 17 594 | 17 340 e | 17 493 e | 17 591 e |
| Korea | 2 746 | 2 495 | 2 549 | 2 400 | 2 314 e | 2 447 e | 2 428 e |
| Latvia | 10 | 2 | 3 | 1 | 4 e | 2 e | 0 e |
| Lithuania | 1.0 | 6.3 | 4.3 | 5.6 | 1.6 e | 0.6 e | 0.3 e |
| Luxembourg | 21 | 21 | 15 | 20 | 17 e | 20 e | 19 e |
| Mexico | 19 | 16 | 19 | 26 | 27 e | 26 e | 26 e |
| Netherlands | 1 762 | 1 039 | 1 139 | 1 283 | 1 218 e | 1 238 e | 1 219 e |
| New Zealand | 73 | 104 | 71 | 100 | 87 e | 84 e | 84 e |
| Norway | 141 | 102 | 103 | 111 | 96 e | 97 e | 98 e |
| Poland | 18 | 69 | 59 | 54 | 74 e | 73 e | 77 e |
| Portugal | 16 | 23 | 21 | 32 | 30 e | 35 e | 35 e |
| Slovak Republic | 2 | 8 | 9 | 7 | 8 e | 9 e | 9 e |
| Slovenia | 22 | 10 | 14 | 13 | 9 e | 10 e | 10 e |
| Spain | 293 | 232 | 230 | 254 | 255 e | 262 e | 263 e |
| Sweden | 969 | 661 | 588 | 674 | 647 e | 648 e | 668 e |
| Switzerland | 1 084 | 1 143 | 1 116 | 1 173 | 1 123 e | 1 153 e | 1 155 e |
| Turkey | 16 | 31 | 42 | 28 | 43 e | 49 e | 52 e |
| United Kingdom | 2 165 | 1 703 | 1 824 | 1 667 | 1 598 e | 1 614 e | 1 612 e |
| United States | 17 372 | 13 737 | 14 798 | 13 587 | 13 280 e | 12 274 e | 12 021 e |
| EU28 (OECD estimates) | 18 408 | 13 106 | 13 558 | 13 586 | 12 931 e | 13 080 e | 13 149 e |
| OECD-Total | 60 472 | 50 633 | 51 258 | 49 945 | 48 521 e | 48 006 e | 47 922 e |
| Argentina | 16 | 8 | 6 | 9 | 10 e | 10 e | 10 e |
| China | 524 | 1 952 | 2 189 | 2 824 | 3 167 e | 3 820 e | 4 215 e |
| Romania | 7 | 14 | 13 | 9 | 12 e | 10 e | 13 e |
| Russian Federation | 91 | 94 | 76 | 111 | 97 e | 96 e | 98 e |
| Singapore | 170 | 107 | 130 | 148 | 111 e | 128 e | 129 e |
| South Africa | 49 | 33 | 29 | 25 | 23 e | 23 e | 23 e |
| Chinese Taipei | 145 | 384 | 336 | 386 | 420 e | 429 e | 432 e |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Patent database

Table 63. Share of countries in triadic patent families
By priority year

Percentage

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|--------------|--------------|--------------|--------------|----------------|----------------|----------------|
| Australia | 0.77 | 0.62 | 0.56 | 0.59 | 0.56 e | 0.57 e | 0.57 e |
| Austria | 0.66 | 0.70 | 0.69 | 0.74 | 0.70 e | 0.70 e | 0.71 e |
| Belgium | 0.88 | 0.80 | 0.79 | 0.72 | 0.69 e | 0.71 e | 0.72 e |
| Canada | 1.16 | 0.98 | 1.13 | 1.09 | 1.02 e | 1.01 e | 1.02 e |
| Chile | 0.01 | 0.02 | 0.02 | 0.02 | 0.02 e | 0.02 e | 0.02 e |
| Czech Republic | 0.04 | 0.07 | 0.06 | 0.08 | 0.08 e | 0.08 e | 0.08 e |
| Denmark | 0.63 | 0.53 | 0.48 | 0.57 | 0.54 e | 0.54 e | 0.55 e |
| Estonia | 0.00 | 0.01 | 0.02 | 0.01 | 0.01 e | 0.01 e | 0.01 e |
| Finland | 0.63 | 0.54 | 0.50 | 0.58 | 0.53 e | 0.52 e | 0.51 e |
| France | 4.92 | 4.52 | 4.43 | 4.58 | 4.34 e | 4.34 e | 4.32 e |
| Germany | 11.52 | 8.51 | 8.97 | 8.56 | 8.35 e | 8.42 e | 8.45 e |
| Greece | 0.04 | 0.04 | 0.04 | 0.04 | 0.03 e | 0.03 e | 0.03 e |
| Hungary | 0.09 | 0.06 | 0.04 | 0.07 | 0.07 e | 0.07 e | 0.07 e |
| Iceland | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 e | 0.00 e | 0.00 e |
| Ireland | 0.16 | 0.14 | 0.17 | 0.19 | 0.20 e | 0.20 e | 0.20 e |
| Israel ¹ | 0.81 | 0.74 | 0.80 | 0.83 | 0.87 e | 0.89 e | 0.90 e |
| Italy | 1.56 | 1.34 | 1.41 | 1.50 | 1.48 e | 1.53 e | 1.52 e |
| Japan | 30.54 | 34.55 | 32.24 | 32.49 | 32.65 e | 32.83 e | 32.80 e |
| Korea | 4.43 | 4.62 | 4.66 | 4.43 | 4.36 e | 4.59 e | 4.53 e |
| Latvia | 0.02 | 0.00 | 0.01 | 0.00 | 0.01 e | 0.00 e | 0.00 e |
| Lithuania | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 e | 0.0 e | 0.0 e |
| Luxembourg | 0.03 | 0.04 | 0.03 | 0.04 | 0.03 e | 0.04 e | 0.04 e |
| Mexico | 0.03 | 0.03 | 0.03 | 0.05 | 0.05 e | 0.05 e | 0.05 e |
| Netherlands | 2.84 | 1.93 | 2.08 | 2.37 | 2.29 e | 2.32 e | 2.27 e |
| New Zealand | 0.12 | 0.19 | 0.13 | 0.19 | 0.16 e | 0.16 e | 0.16 e |
| Norway | 0.23 | 0.19 | 0.19 | 0.21 | 0.18 e | 0.18 e | 0.18 e |
| Poland | 0.03 | 0.13 | 0.11 | 0.10 | 0.14 e | 0.14 e | 0.14 e |
| Portugal | 0.03 | 0.04 | 0.04 | 0.06 | 0.06 e | 0.07 e | 0.07 e |
| Slovak Republic | 0.00 | 0.02 | 0.02 | 0.01 | 0.01 e | 0.02 e | 0.02 e |
| Slovenia | 0.04 | 0.02 | 0.03 | 0.02 | 0.02 e | 0.02 e | 0.02 e |
| Spain | 0.47 | 0.43 | 0.42 | 0.47 | 0.48 e | 0.49 e | 0.49 e |
| Sweden | 1.56 | 1.22 | 1.07 | 1.24 | 1.22 e | 1.22 e | 1.25 e |
| Switzerland | 1.75 | 2.12 | 2.04 | 2.17 | 2.11 e | 2.16 e | 2.15 e |
| Turkey | 0.03 | 0.06 | 0.08 | 0.05 | 0.08 e | 0.09 e | 0.10 e |
| United Kingdom | 3.49 | 3.15 | 3.33 | 3.08 | 3.01 e | 3.03 e | 3.01 e |
| United States | 28.03 | 25.45 | 27.04 | 25.09 | 25.01 e | 23.03 e | 22.41 e |
| EU28 (OECD estimates) | 29.70 | 24.28 | 24.77 | 25.09 | 24.35 e | 24.54 e | 24.52 e |
| OECD-Total | 97.56 | 93.80 | 93.65 | 92.22 | 91.37 e | 90.09 e | 89.36 e |
| Argentina | 0.03 | 0.01 | 0.01 | 0.02 | 0.02 e | 0.02 e | 0.02 e |
| China | 0.84 | 3.62 | 4.00 | 5.21 | 5.96 e | 7.17 e | 7.86 e |
| Romania | 0.01 | 0.03 | 0.02 | 0.02 | 0.02 e | 0.02 e | 0.02 e |
| Russian Federation | 0.15 | 0.17 | 0.14 | 0.21 | 0.18 e | 0.18 e | 0.18 e |
| Singapore | 0.28 | 0.20 | 0.24 | 0.27 | 0.21 e | 0.24 e | 0.24 e |
| South Africa | 0.08 | 0.06 | 0.05 | 0.05 | 0.04 e | 0.04 e | 0.04 e |
| Chinese Taipei | 0.23 | 0.71 | 0.61 | 0.71 | 0.79 e | 0.80 e | 0.81 e |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Patent database

Table 64. Patents in the ICT sector - applications filed under the PCT
By priority year

Number

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|---------------|---------------|---------------|---------------|---------------|---------------|-----------------|
| Australia | 386 | 381 | 398 | 406 | 401 | 401 | 417 e |
| Austria | 212 | 155 | 150 | 163 | 152 | 173 | 175 e |
| Belgium | 145 | 233 | 239 | 233 | 217 | 195 | 200 e |
| Canada | 821 | 1 033 | 935 | 822 | 924 | 920 | 979 e |
| Chile | 2 | 5 | 5 | 16 | 19 | 10 | 8 e |
| Czech Republic | 17 | 27 | 26 | 21 | 23 | 20 | 22 e |
| Denmark | 161 | 110 | 146 | 151 | 154 | 138 | 137 e |
| Estonia | 6 | 3 | 16 | 10 | 5 | 10 | 9 e |
| Finland | 754 | 771 | 626 | 552 | 498 | 491 | 541 e |
| France | 1 504 | 1 381 | 1 362 | 1 435 | 1 348 | 1 301 | 1 335 e |
| Germany | 2 293 | 2 326 | 2 313 | 2 342 | 2 545 | 2 650 | 2 850 e |
| Greece | 14 | 19 | 20 | 25 | 12 | 21 | 20 e |
| Hungary | 27 | 71 | 54 | 67 | 59 | 75 | 74 e |
| Iceland | 5 | 3 | 1 | 2 | 2 | 0 | 0 e |
| Ireland | 84 | 124 | 109 | 124 | 137 | 172 | 190 e |
| Israel ¹ | 672 | 743 | 760 | 748 | 757 | 743 | 768 e |
| Italy | 347 | 334 | 326 | 325 | 307 | 320 | 335 e |
| Japan | 7 818 | 11 650 | 10 298 | 10 184 | 10 428 | 10 938 | 11 840 e |
| Korea | 2 132 | 4 423 | 4 649 | 5 096 | 5 394 | 4 958 | 5 317 e |
| Latvia | 4 | 6 | 1 | 3 | 7 | 1 | 1 e |
| Lithuania | 2.1 | 7.8 | 7.0 | 6.0 | 4.0 | 4.3 | 4.7 e |
| Luxembourg | 5 | 13 | 9 | 15 | 7 | 26 | 30 e |
| Mexico | 14 | 21 | 22 | 33 | 50 | 43 | 44 e |
| Netherlands | 1 266 | 576 | 607 | 592 | 596 | 557 | 562 e |
| New Zealand | 43 | 35 | 39 | 33 | 36 | 31 | 35 e |
| Norway | 100 | 101 | 85 | 71 | 75 | 79 | 90 e |
| Poland | 13 | 37 | 53 | 71 | 103 | 78 | 81 e |
| Portugal | 20 | 18 | 23 | 17 | 36 | 38 | 39 e |
| Slovak Republic | 3 | 8 | 10 | 10 | 13 | 9 | 8 e |
| Slovenia | 5 | 8 | 14 | 7 | 7 | 7 | 6 e |
| Spain | 131 | 285 | 225 | 233 | 182 | 209 | 220 e |
| Sweden | 688 | 1 284 | 1 151 | 1 359 | 1 429 | 1 446 | 1 588 e |
| Switzerland | 219 | 334 | 310 | 277 | 262 | 345 | 356 e |
| Turkey | 11 | 93 | 102 | 105 | 152 | 138 | 133 e |
| United Kingdom | 1 351 | 1 197 | 1 400 | 1 443 | 1 368 | 1 415 | 1 459 e |
| United States | 14 946 | 16 821 | 18 481 | 17 382 | 17 055 | 17 155 | 17 831 e |
| EU28 (OECD estimates) | 9 074 | 9 046 | 8 941 | 9 262 | 9 268 | 9 394 | 9 925 e |
| OECD-Total | 36 223 | 44 639 | 44 971 | 44 377 | 44 765 | 45 119 | 47 708 e |
| Argentina | 7 | 3 | 4 | 5 | 12 | 3 | 3 e |
| China | 1 812 | 10 715 | 12 790 | 14 520 | 18 987 | 22 077 | 23 368 e |
| Romania | 6 | 26 | 29 | 32 | 36 | 21 | 19 e |
| Russian Federation | 153 | 286 | 308 | 282 | 264 | 273 | 277 e |
| Singapore | 192 | 191 | 188 | 216 | 244 | 227 | 240 e |
| South Africa | 54 | 74 | 71 | 65 | 52 | 46 | 46 e |
| Chinese Taipei | 66 | 205 | 242 | 283 | 223 | 249 | 303 e |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Patent database

Table 65. Patents in the biotechnology sector - applications filed under the PCT
By priority year

Number

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|---------------|---------------|---------------|---------------|---------------|---------------|-----------------|
| Australia | 219 | 161 | 148 | 163 | 161 | 155 | 158 e |
| Austria | 61 | 94 | 67 | 76 | 77 | 62 | 64 e |
| Belgium | 118 | 109 | 108 | 113 | 130 | 136 | 137 e |
| Canada | 309 | 225 | 271 | 242 | 253 | 237 | 251 e |
| Chile | 3 | 16 | 18 | 29 | 35 | 21 | 23 e |
| Czech Republic | 5 | 11 | 9 | 14 | 14 | 6 | 8 e |
| Denmark | 192 | 185 | 178 | 195 | 165 | 167 | 175 e |
| Estonia | 2 | 4 | 3 | 1 | 3 | 5 | 6 e |
| Finland | 50 | 37 | 61 | 50 | 48 | 55 | 55 e |
| France | 341 | 498 | 522 | 537 | 542 | 512 | 523 e |
| Germany | 700 | 663 | 627 | 644 | 697 | 619 | 645 e |
| Greece | 6 | 4 | 3 | 5 | 5 | 7 | 8 e |
| Hungary | 10 | 14 | 16 | 9 | 16 | 13 | 15 e |
| Iceland | 5 | 2 | 1 | 2 | 2 | 0 | 0 e |
| Ireland | 27 | 22 | 31 | 36 | 29 | 35 | 33 e |
| Israel ¹ | 170 | 155 | 144 | 174 | 193 | 183 | 201 e |
| Italy | 169 | 165 | 137 | 151 | 146 | 163 | 163 e |
| Japan | 1 527 | 1 237 | 1 282 | 1 344 | 1 448 | 1 611 | 1 684 e |
| Korea | 218 | 528 | 540 | 621 | 733 | 859 | 881 e |
| Latvia | 1 | 0 | 1 | 1 | 1 | 3 | 2 e |
| Lithuania | 1.3 | 7.0 | 6.5 | 5.1 | 4.0 | 2.8 | 2.4 e |
| Luxembourg | 1 | 4 | 1 | 2 | 7 | 3 | 4 e |
| Mexico | 11 | 11 | 21 | 18 | 25 | 22 | 20 e |
| Netherlands | 234 | 225 | 235 | 223 | 255 | 231 | 234 e |
| New Zealand | 53 | 33 | 32 | 26 | 26 | 23 | 21 e |
| Norway | 32 | 43 | 45 | 62 | 35 | 46 | 44 e |
| Poland | 10 | 33 | 35 | 36 | 32 | 25 | 24 e |
| Portugal | 10 | 13 | 14 | 12 | 17 | 16 | 17 e |
| Slovak Republic | 0 | 0 | 3 | 2 | 2 | 5 | 5 e |
| Slovenia | 4 | 7 | 8 | 6 | 6 | 3 | 3 e |
| Spain | 123 | 196 | 202 | 172 | 170 | 130 | 129 e |
| Sweden | 135 | 119 | 108 | 115 | 114 | 137 | 147 e |
| Switzerland | 150 | 181 | 187 | 185 | 214 | 202 | 204 e |
| Turkey | 2 | 9 | 14 | 12 | 16 | 22 | 23 e |
| United Kingdom | 518 | 429 | 455 | 512 | 534 | 493 | 518 e |
| United States | 4 758 | 4 597 | 5 153 | 4 938 | 5 422 | 5 584 | 5 883 e |
| EU28 (OECD estimates) | 2 724 | 2 843 | 2 837 | 2 924 | 3 019 | 2 833 | 2 923 e |
| OECD-Total | 10 174 | 10 035 | 10 684 | 10 732 | 11 575 | 11 791 | 12 307 e |
| Argentina | 10 | 14 | 16 | 13 | 6 | 4 | 4 e |
| China | 123 | 483 | 578 | 654 | 836 | 1 113 | 1 234 e |
| Romania | 1 | 1 | 2 | 3 | 2 | 0 | 0 e |
| Russian Federation | 60 | 72 | 66 | 55 | 49 | 34 | 39 e |
| Singapore | 64 | 130 | 115 | 99 | 89 | 104 | 113 e |
| South Africa | 16 | 11 | 17 | 22 | 16 | 15 | 14 e |
| Chinese Taipei | 11 | 47 | 42 | 86 | 91 | 85 | 87 e |

Note: Detailed metadata:<http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel:<http://dx.doi.org/10.1787/888932315602>

Source: OECD, Patent database

Table 66. Trade balance and export market share: Pharmaceutical industry

| | Trade balance (Million current USD) | | | Export market share (Percentage) | | |
|--------------------|-------------------------------------|-----------------|-----------------|----------------------------------|--------------|--------------|
| | 2011 | 2014 | 2017 | 2011 | 2014 | 2017 |
| Australia | -6 927.5 | -6 205.7 | -5 902.5 | 0.78 | 0.48 | 0.48 |
| Austria | 657.1 | 1 505.1 | 942.2 | 1.83 | 2.04 | 1.99 |
| Belgium | 12 537.5 | 10 509.9 | 9 045.9 | 9.95 | 9.59 | 8.05 |
| Canada | -7 377.4 | -6 066.6 | -6 414.1 | 1.15 | 1.31 | 1.15 |
| Chile | -864.0 | -1 057.5 | -1 252.1 | 0.03 | 0.04 | 0.03 |
| Czech Republic | -2 366.0 | -1 807.4 | -1 993.5 | 0.37 | 0.50 | 0.46 |
| Denmark | 6 692.8 | 8 234.7 | 9 672.8 | 2.15 | 2.39 | 2.52 |
| Estonia | -318.8 | -369.6 | -394.3 | 0.01 | 0.01 | 0.02 |
| Finland | -759.6 | -1 285.2 | -1 263.8 | 0.33 | 0.21 | 0.15 |
| France | 4 090.8 | 3 413.3 | 4 493.7 | 6.88 | 6.59 | 5.81 |
| Germany | 16 418.4 | 28 684.8 | 28 735.7 | 14.09 | 14.81 | 15.23 |
| Greece | -3 254.5 | -2 174.0 | -2 122.2 | 0.26 | 0.25 | 0.24 |
| Hungary | 362.0 | 855.1 | 831.6 | 0.96 | 0.89 | 0.92 |
| Iceland | -10.2 | -55.9 | -131.1 | 0.03 | 0.02 | 0.00 |
| Ireland | 30 470.0 | 23 369.6 | 29 879.7 | 7.46 | 5.41 | 7.21 |
| Israel | 5 356.7 | 4 293.2 | 5 113.9 | 1.44 | 1.15 | 1.33 |
| Italy | -4 598.6 | 1 991.2 | 1 065.7 | 4.15 | 4.90 | 4.89 |
| Japan | -17 192.9 | -17 446.4 | -18 290.3 | 0.90 | 0.60 | 0.88 |
| Korea | -2 978.3 | -3 441.0 | -2 888.9 | 0.26 | 0.33 | 0.57 |
| Latvia | -219.1 | -235.1 | -183.5 | 0.09 | 0.08 | 0.09 |
| Lithuania | -487.0 | -370.6 | -343.6 | 0.08 | 0.12 | 0.14 |
| Luxembourg | -381.4 | -348.2 | -365.7 | 0.02 | 0.02 | 0.02 |
| Mexico | -3 128.2 | -3 477.2 | -3 257.7 | 0.40 | 0.37 | 0.27 |
| Netherlands | 2 501.2 | 6 845.7 | 9 470.6 | 3.32 | 4.88 | 4.33 |
| New Zealand | -637.5 | -642.9 | -622.0 | 0.05 | 0.06 | 0.06 |
| Norway | -1 181.7 | -1 162.0 | -1 544.0 | 0.14 | 0.17 | 0.14 |
| Poland | -3 867.9 | -2 552.5 | -2 206.3 | 0.46 | 0.66 | 0.78 |
| Portugal | -2 202.1 | -1 677.0 | -1 522.4 | 0.17 | 0.21 | 0.22 |
| Slovak Republic | -1 591.7 | -1 425.7 | -1 517.9 | 0.10 | 0.11 | 0.07 |
| Slovenia | 1 561.0 | 1 838.0 | 1 648.3 | 0.54 | 0.58 | 0.55 |
| Spain | -3 314.2 | -2 431.6 | -2 577.0 | 2.49 | 2.44 | 2.16 |
| Sweden | 4 443.8 | 4 174.0 | 4 170.9 | 1.80 | 1.58 | 1.53 |
| Switzerland | 34 822.1 | 41 330.3 | 44 100.5 | 11.66 | 12.27 | 13.43 |
| Turkey | -4 452.1 | -3 860.2 | -3 857.1 | 0.12 | 0.16 | 0.16 |
| United Kingdom | 9 496.7 | -316.3 | -677.7 | 7.31 | 6.30 | 5.98 |
| United States | -27 323.7 | -28 566.5 | -50 986.5 | 8.58 | 8.76 | 8.74 |
| OECD-Total | 34 462.5 | 50 440.3 | 39 200.7 | 90.28 | 90.15 | 90.47 |
| Argentina | -1 087.2 | -1 366.6 | -1 649.0 | 0.18 | 0.17 | 0.16 |
| China | 703.3 | -5 428.8 | -11 370.0 | 2.42 | 2.47 | 2.74 |
| Romania | -2 217.5 | -2 385.3 | -2 517.9 | 0.21 | 0.21 | 0.16 |
| Russian Federation | -13 040.1 | -12 481.0 | -10 382.9 | 0.07 | 0.11 | 0.13 |
| Singapore | 4 251.8 | 5 619.8 | 3 937.4 | 1.43 | 1.50 | 1.22 |
| South Africa | -1 771.7 | -1 696.6 | -1 829.1 | 0.10 | 0.08 | 0.09 |
| Chinese Taipei | -2 105.1 | -2 275.1 | -2 936.2 | 0.07 | 0.09 | 0.11 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, STAN Bilateral Trade in Goods by Industry and End-use Category database

Table 67. Trade balance and export market share: Computer, electronic and optical industry

| | Trade balance (Million current USD) | | | Export market share (Percentage) | | |
|--------------------|-------------------------------------|-------------------|-------------------|----------------------------------|--------------|--------------|
| | 2011 | 2014 | 2017 | 2011 | 2014 | 2017 |
| Australia | -23 883.6 | -21 658.1 | -22 128.5 | 0.18 | 0.17 | 0.17 |
| Austria | -2 384.1 | -640.7 | -2 300.7 | 0.44 | 0.47 | 0.39 |
| Belgium | -6 458.2 | -4 996.5 | -3 612.3 | 0.63 | 0.54 | 0.54 |
| Canada | -29 074.2 | -26 639.6 | -25 897.1 | 0.73 | 0.58 | 0.57 |
| Chile | -5 696.8 | -5 421.2 | -6 002.0 | 0.01 | 0.02 | 0.01 |
| Czech Republic | 1 095.2 | 1 530.4 | -432.3 | 1.23 | 1.05 | 1.12 |
| Denmark | -1 818.9 | -1 589.5 | -1 735.9 | 0.34 | 0.29 | 0.28 |
| Estonia | -77.1 | -110.9 | -184.7 | 0.10 | 0.10 | 0.07 |
| Finland | -1 837.4 | -2 265.1 | -2 668.6 | 0.24 | 0.16 | 0.15 |
| France | -20 367.0 | -18 054.0 | -18 666.9 | 1.75 | 1.48 | 1.39 |
| Germany | -11 215.6 | -4 320.3 | -5 122.0 | 5.32 | 4.85 | 5.23 |
| Greece | -2 891.4 | -2 091.4 | -1 738.4 | 0.04 | 0.05 | 0.05 |
| Hungary | 7 737.9 | 2 040.1 | 678.6 | 1.20 | 0.67 | 0.64 |
| Iceland | -240.5 | -310.1 | -403.3 | 0.00 | 0.00 | 0.00 |
| Ireland | 4 514.8 | 3 999.4 | 8 143.8 | 0.53 | 0.49 | 0.65 |
| Israel | 2 876.1 | 3 164.2 | 2 116.3 | 0.48 | 0.45 | 0.40 |
| Italy | -25 355.2 | -14 921.8 | -14 422.0 | 0.81 | 0.66 | 0.67 |
| Japan | 15 952.5 | -14 218.6 | -9 560.2 | 5.30 | 3.84 | 3.88 |
| Korea | 63 805.8 | 70 503.0 | 76 232.9 | 5.85 | 5.82 | 6.69 |
| Latvia | -268.7 | -280.3 | -355.3 | 0.03 | 0.06 | 0.05 |
| Lithuania | -485.4 | -483.8 | -533.5 | 0.04 | 0.05 | 0.07 |
| Luxembourg | -489.0 | -651.9 | -599.0 | 0.04 | 0.02 | 0.02 |
| Mexico | -4 940.8 | -3 148.5 | 143.0 | 2.91 | 2.98 | 3.10 |
| Netherlands | 3 271.4 | -1 964.5 | -5 132.0 | 3.40 | 3.00 | 2.76 |
| New Zealand | -2 902.9 | -3 107.8 | -3 142.8 | 0.03 | 0.02 | 0.02 |
| Norway | -4 790.4 | -4 799.0 | -5 201.8 | 0.15 | 0.14 | 0.10 |
| Poland | -5 668.9 | -4 344.9 | -4 883.9 | 0.64 | 0.73 | 0.75 |
| Portugal | -2 175.6 | -2 291.9 | -2 087.1 | 0.12 | 0.10 | 0.14 |
| Slovak Republic | 2 179.6 | 1 081.8 | 127.1 | 0.58 | 0.63 | 0.59 |
| Slovenia | -598.6 | -381.3 | -447.6 | 0.05 | 0.04 | 0.05 |
| Spain | -17 066.9 | -15 037.5 | -15 002.9 | 0.30 | 0.25 | 0.31 |
| Sweden | -1 491.7 | -3 935.6 | -4 539.4 | 0.94 | 0.59 | 0.51 |
| Switzerland | 16 621.6 | 17 897.4 | 14 413.0 | 1.52 | 1.44 | 1.26 |
| Turkey | -9 626.0 | -12 850.7 | -15 664.6 | 0.11 | 0.12 | 0.10 |
| United Kingdom | -27 627.5 | -31 955.5 | -30 208.7 | 1.68 | 1.48 | 1.34 |
| United States | -146 928.5 | -167 521.5 | -203 068.7 | 8.52 | 7.99 | 8.00 |
| OECD-Total | -237 820.5 | -269 292.3 | -303 354.0 | 46.23 | 41.28 | 42.00 |
| Argentina | -7 380.5 | -5 888.6 | -6 990.3 | 0.01 | 0.01 | 0.01 |
| China | 150 852.1 | 186 830.1 | 163 911.1 | 24.87 | 27.08 | 27.05 |
| Romania | -1 654.3 | -3 276.6 | -3 477.2 | 0.25 | 0.15 | 0.18 |
| Russian Federation | -24 572.1 | -22 633.2 | -21 269.1 | 0.12 | 0.21 | 0.15 |
| Singapore | 32 419.0 | 36 203.7 | 32 394.4 | 5.69 | 5.45 | 5.41 |
| South Africa | -8 491.7 | -7 345.8 | -6 742.2 | 0.07 | 0.08 | 0.06 |
| Chinese Taipei | 67 319.4 | 73 294.1 | 80 256.5 | 5.67 | 5.42 | 6.17 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, STAN Bilateral Trade in Goods by Industry and End-use Category database

Table 68. Trade balance and export market share: Aerospace industry

| | Trade balance (Million current USD) | | | Export market share (Percentage) | | |
|--------------------|-------------------------------------|------------------|------------------|----------------------------------|--------------|--------------|
| | 2011 | 2014 | 2017 | 2011 | 2014 | 2017 |
| Australia | -121.9 | 774.7 | -988.7 | 0.40 | 0.41 | 0.38 |
| Austria | 120.4 | 385.5 | 498.7 | 0.36 | 0.38 | 0.46 |
| Belgium | 257.1 | 553.6 | 747.0 | 0.50 | 0.65 | 0.66 |
| Canada | 3 530.1 | 4 071.9 | 2 285.6 | 4.04 | 3.92 | 3.23 |
| Chile | -1 061.3 | -1 504.0 | -118.5 | 0.00 | 0.01 | 0.00 |
| Czech Republic | 110.1 | 164.5 | 384.9 | 0.22 | 0.21 | 0.26 |
| Denmark | -397.1 | -462.2 | -232.3 | 0.12 | 0.11 | 0.12 |
| Estonia | -83.7 | -8.0 | -11.3 | 0.00 | 0.00 | 0.01 |
| Finland | -167.4 | -261.9 | -565.2 | 0.05 | 0.10 | 0.10 |
| France | 24 342.5 | 31 018.3 | 19 700.5 | 19.13 | 17.39 | 15.02 |
| Germany | 10 759.0 | 11 803.6 | 22 054.3 | 14.33 | 12.52 | 11.81 |
| Greece | 22.9 | -141.4 | -207.7 | 0.11 | 0.02 | 0.02 |
| Hungary | -13.9 | -19.7 | -810.2 | 0.03 | 0.03 | 0.04 |
| Iceland | -45.8 | -74.3 | -85.6 | 0.02 | 0.00 | 0.00 |
| Ireland | -2 265.5 | -9 980.3 | -10 208.1 | 0.47 | 0.94 | 1.75 |
| Israel | 1 268.8 | 651.8 | 2 030.7 | 0.67 | 0.50 | 0.77 |
| Italy | 3 030.4 | 4 152.8 | 2 995.1 | 2.01 | 1.87 | 1.45 |
| Japan | -1 459.3 | -2 870.8 | -2 993.1 | 1.77 | 2.01 | 1.81 |
| Korea | -3 168.9 | -1 607.7 | -81.4 | 0.41 | 0.53 | 0.73 |
| Latvia | -35.8 | -30.9 | -365.9 | 0.01 | 0.00 | 0.05 |
| Lithuania | -21.6 | -46.8 | -15.6 | 0.01 | 0.01 | 0.02 |
| Luxembourg | -1 033.2 | -1 546.0 | -761.8 | 0.11 | 0.03 | 0.04 |
| Mexico | 570.7 | 1 015.9 | 1 045.2 | 0.47 | 0.57 | 0.68 |
| Netherlands | 422.5 | 1 103.6 | -168.8 | 1.00 | 0.93 | 1.26 |
| New Zealand | -1 090.3 | -1 869.5 | -1 328.0 | 0.07 | 0.02 | 0.03 |
| Norway | -870.3 | -896.9 | -1 122.1 | 0.22 | 0.19 | 0.21 |
| Poland | 229.0 | 691.4 | 820.9 | 0.49 | 0.60 | 0.80 |
| Portugal | -74.1 | -433.4 | -653.1 | 0.08 | 0.07 | 0.11 |
| Slovak Republic | -17.5 | -93.8 | -169.8 | 0.01 | 0.01 | 0.00 |
| Slovenia | -37.7 | -83.0 | -31.9 | 0.01 | 0.01 | 0.03 |
| Spain | 2 427.9 | 2 369.0 | 401.0 | 1.73 | 1.51 | 1.96 |
| Sweden | -18.1 | -45.4 | 43.4 | 0.28 | 0.21 | 0.19 |
| Switzerland | -26.8 | 763.9 | -1 363.8 | 0.62 | 0.67 | 0.55 |
| Turkey | -3 640.0 | -2 504.2 | -1 831.9 | 0.17 | 0.22 | 0.45 |
| United Kingdom | 10 930.2 | 4 591.0 | 11 269.5 | 10.59 | 9.13 | 10.69 |
| United States | 53 775.5 | 74 344.9 | 81 626.6 | 29.09 | 32.10 | 31.91 |
| OECD-Total | 96 168.8 | 114 022.9 | 121 804.0 | 89.58 | 87.87 | 87.59 |
| Argentina | -148.7 | -587.6 | -631.2 | 0.25 | 0.07 | 0.12 |
| China | -13 343.7 | -27 444.1 | -23 523.3 | 0.98 | 1.30 | 1.74 |
| Romania | -166.1 | 168.5 | -229.6 | 0.04 | 0.08 | 0.09 |
| Russian Federation | 566.9 | -5 005.4 | -2 945.5 | 0.37 | 0.74 | 0.91 |
| Singapore | -3 278.4 | -2 741.5 | -3 081.1 | 2.46 | 2.46 | 2.89 |
| South Africa | -1 776.1 | -372.9 | -703.7 | 0.14 | 0.17 | 0.11 |
| Chinese Taipei | -94.8 | -1 228.1 | -3 861.3 | 0.17 | 0.23 | 0.65 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, STAN Bilateral Trade in Goods by Industry and End-use Category database

Annex. Background Economic Indicators

Table A. Gross domestic product at current prices and PPP

Million USD

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Australia | 717 705 | 997 527 | 1 104 626 | 1 118 350 | 1 127 713 | 1 215 898 | 1 279 147 |
| Austria | 288 087 | 391 635 | 406 370 | 417 060 | 431 078 | 451 297 | 474 006 |
| Belgium | 349 277 | 471 332 | 486 674 | 499 975 | 514 017 | 535 003 | 562 068 |
| Canada | 1 171 325 | 1 468 096 | 1 554 123 | 1 621 392 | 1 594 898 | 1 628 880 | 1 710 462 |
| Chile | 206 274 | 374 242 | 394 292 | 404 667 | 407 689 | 416 517 | 447 887 |
| Czech Republic | 224 201 | 305 309 | 320 535 | 339 583 | 355 312 | 372 257 | 402 796 |
| Denmark | 185 074 | 250 525 | 262 368 | 270 331 | 278 823 | 290 377 | 313 364 |
| Estonia | 22 376 | 34 420 | 36 239 | 38 075 | 38 427 | 40 655 | 44 064 |
| Finland | 167 840 | 219 916 | 224 594 | 226 490 | 231 351 | 240 309 | 255 270 |
| France | 1 926 880 | 2 474 005 | 2 608 524 | 2 662 033 | 2 719 225 | 2 811 271 | 2 959 181 |
| Germany | 2 636 420 | 3 503 684 | 3 647 778 | 3 821 628 | 3 919 280 | 4 110 953 | 4 345 631 |
| Greece | 281 028 | 279 267 | 286 169 | 292 336 | 291 109 | 293 903 | 307 366 |
| Hungary | 172 305 | 229 106 | 242 026 | 251 775 | 259 426 | 263 522 | 281 880 |
| Iceland | 11 048 | 13 446 | 14 297 | 14 966 | 16 162 | 17 555 | 19 000 |
| Ireland | 168 218 | 212 881 | 221 790 | 238 441 | 324 245 | 337 276 | 369 244 |
| Israel ¹ | 171 942 | 250 963 | 275 461 | 281 491 | 297 615 | 320 589 | 338 666 |
| Italy | 1 742 086 | 2 157 547 | 2 176 320 | 2 192 714 | 2 237 096 | 2 367 211 | 2 480 873 |
| Japan | 4 045 734 | 4 746 699 | 4 967 052 | 4 986 566 | 5 136 019 | 5 221 770 | 5 319 800 |
| Korea | 1 165 894 | 1 611 273 | 1 644 777 | 1 704 458 | 1 824 332 | 1 903 411 | 1 998 130 |
| Latvia | 31 002 | 43 235 | 45 640 | 47 468 | 48 891 | 50 634 | 55 086 |
| Lithuania | 48 263 | 73 673 | 78 854 | 82 617 | 83 982 | 86 907 | 94 052 |
| Luxembourg | 31 733 | 48 646 | 51 940 | 56 354 | 58 544 | 61 159 | 64 190 |
| Mexico | 1 341 775 | 2 012 768 | 2 064 491 | 2 171 927 | 2 228 164 | 2 316 428 | 2 424 700 |
| Netherlands | 614 044 | 792 042 | 827 476 | 830 318 | 852 113 | 874 312 | 932 319 |
| New Zealand | 106 147 | 145 406 | 160 890 | 168 034 | 172 225 | 183 610 | 193 858 |
| Norway | 220 866 | 328 453 | 340 620 | 339 137 | 314 014 | 304 327 | 328 137 |
| Poland | 530 344 | 907 168 | 940 325 | 973 566 | 1 020 166 | 1 053 114 | 1 136 624 |
| Portugal | 238 842 | 278 161 | 291 753 | 298 995 | 307 476 | 320 523 | 335 319 |
| Slovak Republic | 89 275 | 144 098 | 151 021 | 156 749 | 161 041 | 167 790 | 176 075 |
| Slovenia | 47 902 | 59 454 | 61 380 | 63 601 | 65 301 | 68 526 | 74 707 |
| Spain | 1 209 299 | 1 496 188 | 1 519 995 | 1 566 855 | 1 626 884 | 1 706 685 | 1 818 879 |
| Sweden | 307 061 | 426 224 | 438 949 | 451 572 | 474 643 | 487 065 | 517 014 |
| Switzerland | 301 741 | 462 615 | 486 239 | 506 895 | 529 568 | 537 701 | 560 354 |
| Turkey | 807 227 | 1 539 111 | 1 690 856 | 1 851 026 | 2 012 362 | 2 087 370 | 2 261 007 |
| United Kingdom | 1 962 572 | 2 414 959 | 2 533 408 | 2 640 579 | 2 738 206 | 2 819 116 | 2 965 796 |
| United States | 13 036 637 | 16 197 007 | 16 784 851 | 17 521 747 | 18 219 297 | 18 707 189 | 19 485 394 |
| EU28 (OECD estimates) | 13 652 450 | 17 841 845 | 18 508 573 | 19 090 356 | 19 735 416 | 20 567 631 | 21 793 938 |
| OECD-Total | 36 372 171 | 47 361 082 | 49 342 701 | 51 109 770 | 52 916 694 | 54 671 113 | 57 332 347 |
| Argentina | 541 392 | 824 212 | 857 669 | 851 124 | 883 852 | 883 043 | 927 768 |
| China | 6 639 272 | 15 281 108 | 16 723 690 | 18 259 747 | 19 726 290 | 21 310 048 | 23 121 407 |
| Romania | 204 714 | 379 730 | 395 622 | 410 588 | 428 644 | 470 258 | 520 941 |
| Russian Federation | 1 827 554 | 3 692 393 | 3 765 661 | 3 768 772 | 3 528 553 | 3 531 999 | 3 784 930 e |
| Singapore | 235 638 | 414 582 | 442 973 | 469 724 | 486 758 | 506 179 | 536 249 |
| South Africa | 468 740 | 659 312 | 686 609 | 711 841 | 728 491 | 743 730 | 765 863 |
| Chinese Taipei | 658 835 | 985 170 | 1 024 466 | 1 085 852 | 1 106 318 | 1 135 323 | 1 192 503 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>Source: OECD, Main Science and Technology Indicators database (underlying sources described in section 10 of the documentation, http://www.oecd.org/sti/inn/MSTI_documentation_e.pdf.)

Table B. Implicit GDP price indices

Year 2010 = 1.000

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|-------|-------|-------|-------|-------|-------|---------|
| Australia | 0.807 | 1.017 | 1.032 | 1.025 | 1.020 | 1.057 | 1.077 |
| Austria | 0.916 | 1.039 | 1.056 | 1.079 | 1.103 | 1.118 | 1.132 |
| Belgium | 0.916 | 1.040 | 1.051 | 1.059 | 1.069 | 1.088 | 1.107 |
| Canada | 0.904 | 1.045 | 1.063 | 1.084 | 1.074 | 1.082 | 1.110 |
| Chile | 0.743 | 1.043 | 1.063 | 1.126 | 1.182 | 1.235 | 1.297 |
| Czech Republic | 0.930 | 1.015 | 1.029 | 1.055 | 1.067 | 1.081 | 1.096 |
| Denmark | 0.885 | 1.030 | 1.039 | 1.050 | 1.055 | 1.062 | 1.077 |
| Estonia | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Finland | 0.915 | 1.056 | 1.083 | 1.101 | 1.120 | 1.121 | 1.132 |
| France | 0.922 | 1.021 | 1.029 | 1.035 | 1.047 | 1.052 | 1.057 |
| Germany | 0.948 | 1.026 | 1.046 | 1.065 | 1.086 | 1.101 | 1.118 |
| Greece | 0.867 | 1.004 | 0.981 | 0.963 | 0.959 | 0.957 | 0.963 |
| Hungary | 0.819 | 1.057 | 1.088 | 1.125 | 1.146 | 1.156 | 1.201 |
| Iceland | 0.669 | 1.067 | 1.090 | 1.130 | 1.193 | 1.215 | 1.221 |
| Ireland | 1.039 | 1.005 | 1.019 | 1.016 | 1.092 | 1.083 | 1.087 |
| Israel ¹ | 0.905 | 1.057 | 1.080 | 1.090 | 1.119 | 1.130 | 1.132 |
| Italy | 0.914 | 1.029 | 1.041 | 1.051 | 1.061 | 1.073 | 1.079 |
| Japan | 1.053 | 0.976 | 0.973 | 0.989 | 1.011 | 1.013 | 1.011 |
| Korea | 0.889 | 1.026 | 1.035 | 1.041 | 1.066 | 1.087 | 1.112 |
| Latvia | 0.7 | 1.1 | 1.1 | 1.1 | 1.1 | 1.2 | 1.2 |
| Lithuania | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Luxembourg | 0.843 | 1.075 | 1.093 | 1.123 | 1.118 | 1.129 | 1.153 |
| Mexico | 0.770 | 1.101 | 1.118 | 1.168 | 1.200 | 1.265 | 1.350 |
| Netherlands | 0.923 | 1.016 | 1.029 | 1.032 | 1.040 | 1.045 | 1.057 |
| New Zealand | 0.864 | 1.016 | 1.065 | 1.071 | 1.078 | 1.104 | 1.137 |
| Norway | 0.830 | 1.056 | 1.084 | 1.113 | 1.136 | 1.162 | 1.181 |
| Poland | 0.865 | 1.057 | 1.060 | 1.065 | 1.073 | 1.076 | 1.098 |
| Portugal | 0.909 | 0.993 | 1.016 | 1.023 | 1.044 | 1.063 | 1.079 |
| Slovak Republic | 0.941 | 1.029 | 1.035 | 1.033 | 1.031 | 1.026 | 1.039 |
| Slovenia | 0.878 | 1.016 | 1.032 | 1.040 | 1.051 | 1.059 | 1.076 |
| Spain | 0.908 | 1.001 | 1.005 | 1.003 | 1.008 | 1.011 | 1.023 |
| Sweden | 0.894 | 1.023 | 1.033 | 1.052 | 1.073 | 1.091 | 1.116 |
| Switzerland | 0.931 | 1.002 | 1.002 | 0.996 | 0.989 | 0.983 | 0.979 |
| Turkey | 0.681 | 1.162 | 1.235 | 1.327 | 1.430 | 1.546 | 1.714 |
| United Kingdom | 0.893 | 1.035 | 1.054 | 1.072 | 1.077 | 1.099 | 1.124 |
| United States | 0.910 | 1.040 | 1.059 | 1.079 | 1.090 | 1.102 | 1.123 |
| EU28 (OECD estimates) | .. | .. | .. | .. | .. | .. | .. |
| OECD-Total | .. | .. | .. | .. | .. | .. | .. |
| Argentina | 0.445 | 1.513 | 1.875 | 2.631 | 3.330 | 4.700 | 5.922 |
| China | 0.777 | 1.106 | 1.130 | 1.139 | 1.140 | 1.152 | 1.197 e |
| Romania | 0.624 | 1.079 | 1.116 | 1.136 | 1.165 | 1.194 | 1.249 |
| Russian Federation | 0.555 | 1.264 | 1.333 | 1.433 | 1.550 | 1.606 | 1.692 e |
| Singapore | 0.911 | 1.018 | 1.016 | 1.015 | 1.050 | 1.060 | 1.085 |
| South Africa | 0.695 | 1.122 | 1.191 | 1.257 | 1.322 | 1.417 | 1.492 |
| Chinese Taipei | 1.057 | 0.982 | 0.996 | 1.013 | 1.046 | 1.055 | 1.043 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>Source: OECD, Main Science and Technology Indicators database (underlying sources described in section 10 of the documentation, http://www.oecd.org/sti/inn/MSTI_documentation_e.pdf.)

Table C. Purchasing power parities

National currency per USD

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|--------|--------|--------|--------|--------|--------|--------|
| Australia | 1.39 | 1.54 | 1.45 | 1.45 | 1.47 | 1.45 | 1.44 |
| Austria | 0.88 | 0.81 | 0.80 | 0.80 | 0.80 | 0.79 | 0.78 |
| Belgium | 0.89 | 0.82 | 0.81 | 0.80 | 0.80 | 0.79 | 0.78 |
| Canada | 1.21 | 1.24 | 1.22 | 1.23 | 1.25 | 1.25 | 1.25 |
| Chile | 333.69 | 347.23 | 349.68 | 367.21 | 391.36 | 406.87 | 402.36 |
| Czech Republic | 14.56 | 13.30 | 12.79 | 12.70 | 12.93 | 12.81 | 12.53 |
| Denmark | 8.57 | 7.56 | 7.35 | 7.33 | 7.30 | 7.23 | 6.95 |
| Estonia | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Finland | 0.98 | 0.91 | 0.91 | 0.91 | 0.91 | 0.90 | 0.88 |
| France | 0.92 | 0.84 | 0.81 | 0.81 | 0.81 | 0.79 | 0.78 |
| Germany | 0.87 | 0.79 | 0.77 | 0.77 | 0.78 | 0.77 | 0.75 |
| Greece | 0.71 | 0.68 | 0.63 | 0.61 | 0.61 | 0.60 | 0.59 |
| Hungary | 130.93 | 125.62 | 124.98 | 129.41 | 132.52 | 134.62 | 136.07 |
| Iceland | 95.84 | 136.97 | 137.02 | 138.55 | 141.94 | 141.89 | 137.73 |
| Ireland | 1.01 | 0.82 | 0.81 | 0.82 | 0.81 | 0.81 | 0.80 |
| Israel ¹ | 3.72 | 3.96 | 3.84 | 3.94 | 3.92 | 3.83 | 3.75 |
| Italy | 0.86 | 0.75 | 0.74 | 0.74 | 0.74 | 0.71 | 0.70 |
| Japan | 129.55 | 104.27 | 101.30 | 103.05 | 103.45 | 102.64 | 102.47 |
| Korea | 788.92 | 854.89 | 869.08 | 871.88 | 857.37 | 862.55 | 866.01 |
| Latvia | 0.4 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| Lithuania | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Luxembourg | 0.95 | 0.91 | 0.90 | 0.88 | 0.88 | 0.87 | 0.86 |
| Mexico | 7.13 | 7.86 | 7.88 | 8.05 | 8.33 | 8.68 | 9.04 |
| Netherlands | 0.90 | 0.82 | 0.80 | 0.81 | 0.81 | 0.81 | 0.79 |
| New Zealand | 1.54 | 1.50 | 1.45 | 1.44 | 1.48 | 1.47 | 1.47 |
| Norway | 9.01 | 9.04 | 9.03 | 9.28 | 9.93 | 10.25 | 10.07 |
| Poland | 1.87 | 1.80 | 1.76 | 1.77 | 1.76 | 1.77 | 1.75 |
| Portugal | 0.66 | 0.61 | 0.58 | 0.58 | 0.58 | 0.58 | 0.58 |
| Slovak Republic | 0.56 | 0.50 | 0.49 | 0.49 | 0.49 | 0.48 | 0.48 |
| Slovenia | 0.61 | 0.61 | 0.59 | 0.59 | 0.60 | 0.59 | 0.58 |
| Spain | 0.77 | 0.69 | 0.67 | 0.66 | 0.66 | 0.66 | 0.64 |
| Sweden | 9.48 | 8.65 | 8.60 | 8.73 | 8.85 | 9.00 | 8.86 |
| Switzerland | 1.69 | 1.35 | 1.31 | 1.28 | 1.24 | 1.23 | 1.19 |
| Turkey | 0.83 | 1.02 | 1.07 | 1.10 | 1.16 | 1.25 | 1.37 |
| United Kingdom | 0.71 | 0.70 | 0.70 | 0.70 | 0.69 | 0.70 | 0.69 |
| United States | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| EU28 (OECD estimates) | .. | .. | .. | .. | .. | .. | .. |
| OECD-Total | .. | .. | .. | .. | .. | .. | .. |
| Argentina | 1.08 | 3.20 | 3.90 | 5.38 | 6.74 | 9.32 | 11.47 |
| China | 2.82 | 3.52 | 3.55 | 3.51 | 3.48 | 3.47 | 3.55 |
| Romania | 1.40 | 1.56 | 1.61 | 1.63 | 1.66 | 1.63 | 1.64 |
| Russian Federation | 12.74 | 18.46 | 19.42 | 21.01 | 23.59 | 24.36 | 24.34 |
| Singapore | 0.90 | 0.88 | 0.86 | 0.85 | 0.87 | 0.86 | 0.87 |
| South Africa | 3.50 | 4.94 | 5.16 | 5.35 | 5.56 | 5.86 | 6.08 |
| Chinese Taipei | 18.35 | 14.91 | 14.87 | 14.84 | 15.16 | 15.13 | 14.68 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>Source: OECD, Main Science and Technology Indicators database (underlying sources described in section 10 of the documentation, http://www.oecd.org/sti/inno/MSTI_documentation_e.pdf.)

Table D. Value added in industry at current prices and PPP

Million USD

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Australia | 484 209 | 668 031 | 733 784 | 732 448 | 726 178 | 783 247 | 823 991 e |
| Austria | 189 163 | 255 176 | 264 027 | 271 260 | 280 105 | 288 771 | 303 736 e |
| Belgium | 220 030 | 290 627 | 298 685 | 306 360 | 316 841 | 328 411 | 344 497 e |
| Canada | 772 894 | 938 173 | 993 773 | 1 042 316 | 1 001 160 e | 1 022 492 e | 1 073 703 e |
| Chile | 151 417 e | 263 582 | 275 490 | 281 272 | 277 537 e | 281 858 e | 303 086 e |
| Czech Republic | 155 817 | 208 734 | 217 781 | 234 396 | 245 668 | 257 352 | 277 069 e |
| Denmark | 107 005 | 143 797 | 151 614 | 156 949 | 162 082 | 166 484 | 181 156 e |
| Estonia | 15 236 | 22 790 | 23 951 | 24 525 | 24 091 | 24 796 | 26 875 e |
| Finland | 102 863 | 125 505 | 127 024 | 127 894 | 130 332 | 135 495 | 146 707 e |
| France | 1 141 873 | 1 424 293 | 1 497 601 | 1 526 212 | 1 558 652 | 1 607 942 | 1 689 609 e |
| Germany | 1 697 866 | 2 223 338 | 2 306 650 | 2 426 217 | 2 493 521 | 2 602 883 | 2 757 635 e |
| Greece | 172 166 | 145 801 | 152 657 | 156 353 | 155 762 | 153 463 | 163 098 e |
| Hungary | 109 308 | 142 630 | 151 586 | 158 647 | 162 673 | 164 409 | 176 891 e |
| Iceland | 6 436 | 8 138 | 8 587 | 8 806 | 9 611 | 10 706 e | 11 588 e |
| Ireland | 114 952 | 145 930 | 154 546 | 167 050 | 246 658 | 258 807 | 286 414 e |
| Israel ¹ | 103 938 e | 148 603 | 164 061 | 164 081 e | 174 033 e | 187 241 e | 197 799 e |
| Italy | 1 104 944 | 1 311 271 | 1 321 820 | 1 331 405 | 1 363 936 | 1 435 938 | 1 503 305 e |
| Japan | 3 061 437 | 3 398 139 | 3 566 122 | 3 586 371 | 3 720 709 | 3 792 423 e | 3 863 620 e |
| Korea | 798 471 | 1 109 265 | 1 133 309 | 1 169 340 | 1 250 492 | 1 296 023 e | 1 360 517 e |
| Latvia | 20 748 | 27 826 | 28 884 | 29 707 | 30 725 | 31 349 | 34 461 e |
| Lithuania | 34 584 | 53 102 | 56 897 | 59 362 | 59 606 | 61 008 | 66 467 e |
| Luxembourg | 21 125 | 32 655 | 34 791 | 38 218 | 41 225 | 42 203 | 43 899 e |
| Mexico | 995 958 | 1 516 019 | 1 531 083 | 1 591 007 | 1 621 086 | 1 690 724 | 1 804 549 e |
| Netherlands | 396 829 | 516 385 | 534 272 | 532 594 | 552 032 | 565 013 | 601 958 e |
| New Zealand | 71 276 | 93 046 | 104 319 | 108 916 | 111 557 | 118 838 e | 125 471 e |
| Norway | 146 981 | 215 324 | 221 757 | 217 684 | 194 726 | 183 930 e | 198 390 e |
| Poland | 365 586 | 642 529 | 664 790 | 687 412 | 725 235 | 745 766 | 805 691 |
| Portugal | 141 458 | 163 956 | 169 903 | 174 386 | 180 593 | 186 763 | 194 019 e |
| Slovak Republic | 63 032 | 104 508 | 105 788 | 114 061 | 116 449 | 119 439 | 125 141 e |
| Slovenia | 31 859 | 38 353 | 39 422 | 41 599 | 42 725 | 44 813 | 49 375 e |
| Spain | 812 033 | 945 577 | 942 236 | 974 561 | 1 016 760 | 1 072 853 | 1 151 115 e |
| Sweden | 189 919 | 263 803 | 269 898 | 277 921 | 295 574 | 302 092 | 320 754 e |
| Switzerland | 216 809 | 330 774 | 346 846 | 360 651 | 374 592 | 378 573 e | 394 522 e |
| Turkey | 552 853 | 1 050 945 | 1 154 990 | 1 280 546 | 1 397 562 | 1 435 952 | 1 593 952 e |
| United Kingdom | 1 198 108 | 1 434 659 | 1 524 350 | 1 590 867 | 1 642 418 | 1 698 826 | 1 787 217 e |
| United States | 8 485 524 | 10 190 334 | 10 567 747 | 11 101 619 | 11 550 115 | 11 807 310 | 12 357 011 e |
| EU28 (OECD estimates) | 8 661 565 | 11 082 729 | 11 474 271 | 11 855 772 | 12 314 472 | 12 810 405 | 13 600 639 |
| OECD-Total | 24 103 288 | 30 593 614 | 31 841 043 | 33 053 010 | 34 253 021 | 35 284 195 | 37 145 289 |
| Argentina | 368 281 | 518 745 | 539 339 e | 536 804 e | 547 633 e | 548 241 e | 573 067 e |
| China | 5 308 893 e | 11 969 389 e | 12 964 240 e | 14 068 908 e | 14 951 746 e | 15 852 626 e | 17 084 529 e |
| Romania | 144 832 | 261 859 | 275 626 | 282 839 | 298 435 e | 330 220 e | 366 037 e |
| Russian Federation | 1 302 121 e | 2 505 698 e | 2 517 073 e | 2 576 961 e | 2 511 867 e | 2 512 687 e | 2 692 624 e |
| Singapore | 198 645 e | 340 188 e | 359 879 e | 381 247 e | 395 268 e | 409 347 e | 434 911 e |
| South Africa | 330 950 e | 458 602 e | 475 668 e | 491 105 e | 499 774 e | 507 922 e | 525 756 e |
| Chinese Taipei | 489 962 e | 715 925 | 755 594 | 813 566 | 831 431 | 854 968 | 905 558 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>Source: OECD, Main Science and Technology Indicators database (underlying sources described in section 10 of the documentation, http://www.oecd.org/sti/inn/MSTI_documentation_e.pdf.)

Table E. Total population

Thousands

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Australia | 20 177 | 22 734 | 23 128 | 23 476 | 23 816 | 24 191 | 24 602 |
| Austria | 8 225 | 8 426 | 8 477 | 8 544 | 8 630 | 8 740 | 8 795 |
| Belgium | 10 479 | 11 068 | 11 125 | 11 180 | 11 238 | 11 295 | 11 349 |
| Canada | 32 242 | 34 751 | 35 152 | 35 535 | 35 703 | 36 109 | 36 540 |
| Chile | 16 283 | 17 450 | 17 640 | 17 836 | 18 045 | 18 278 | 18 522 |
| Czech Republic | 10 234 | 10 509 | 10 511 | 10 525 | 10 543 | 10 565 | 10 590 |
| Denmark | 5 419 | 5 591 | 5 613 | 5 643 | 5 682 | 5 729 | 5 767 |
| Estonia | 1 359 | 1 325 | 1 320 | 1 316 | 1 313 | 1 316 | 1 316 |
| Finland | 5 246 | 5 414 | 5 439 | 5 463 | 5 481 | 5 495 | 5 508 |
| France | 63 168 | 65 651 | 65 991 | 66 312 | 66 581 | 66 828 | 67 063 |
| Germany | 81 337 | 80 426 | 80 646 | 80 983 | 81 687 | 82 349 | 82 657 |
| Greece | 10 987 | 11 045 | 10 965 | 10 892 | 10 821 | 10 776 | 10 755 |
| Hungary | 10 087 | 9 920 | 9 893 | 9 866 | 9 843 | 9 814 | 9 788 |
| Iceland | 296 | 321 | 324 | 327 | 331 | 335 | 343 |
| Ireland | 4 160 | 4 597 | 4 620 | 4 652 | 4 696 | 4 749 | 4 802 |
| Israel ¹ | 6 961 | 7 907 | 8 056 | 8 212 | 8 377 | 8 543 | 8 709 |
| Italy | 58 191 | 60 339 | 60 646 | 60 789 | 60 731 | 60 628 | 60 537 |
| Japan | 127 755 | 127 552 | 127 333 | 127 262 | 127 110 | 126 933 | 126 706 |
| Korea | 48 185 | 50 200 | 50 429 | 50 747 | 51 015 | 51 246 | 51 446 |
| Latvia | 2 239 | 2 034 | 2 013 | 1 994 | 1 977 | 1 959 | 1 941 |
| Lithuania | 3 323 | 2 988 | 2 958 | 2 932 | 2 905 | 2 868 | 2 822 |
| Luxembourg | 466 | 532 | 545 | 558 | 569 | 584 | 597 |
| Mexico | 107 000 | 116 885 | 118 229 | 119 550 | 120 846 | 122 117 | 123 364 |
| Netherlands | 16 320 | 16 755 | 16 804 | 16 865 | 16 940 | 17 030 | 17 131 |
| New Zealand | 4 148 | 4 418 | 4 460 | 4 534 | 4 635 | 4 734 | 4 832 |
| Norway | 4 623 | 5 019 | 5 080 | 5 137 | 5 191 | 5 236 | 5 277 |
| Poland | 38 161 | 38 534 | 38 502 | 38 484 | 38 455 | 38 427 | 38 422 |
| Portugal | 10 503 | 10 515 | 10 457 | 10 401 | 10 358 | 10 326 | 10 300 |
| Slovak Republic | 5 387 | 5 406 | 5 413 | 5 419 | 5 422 | 5 431 | 5 438 |
| Slovenia | 2 001 | 2 057 | 2 060 | 2 062 | 2 063 | 2 065 | 2 066 |
| Spain | 43 663 | 46 766 | 46 593 | 46 455 | 46 410 | 46 450 | 46 534 |
| Sweden | 9 030 | 9 519 | 9 600 | 9 696 | 9 799 | 9 923 | 10 058 |
| Switzerland | 7 482 | 7 997 | 8 089 | 8 189 | 8 282 | 8 373 | 8 452 |
| Turkey | 68 435 | 75 176 | 76 148 | 77 182 | 78 218 | 79 278 | 80 313 |
| United Kingdom | 60 413 | 63 705 | 64 106 | 64 597 | 65 110 | 65 648 | 66 040 |
| United States | 295 993 | 314 374 | 316 598 | 318 953 | 321 323 | 323 668 | 325 983 |
| EU28 (OECD estimates) | 494 910 | 506 042 | 507 095 | 508 293 | 509 753 | 511 308 | 512 396 |
| OECD-Total | 1 183 694 | 1 257 906 | 1 264 965 | 1 272 569 | 1 280 146 | 1 288 037 | 1 295 366 |
| Argentina | 38 592 | 41 733 | 42 203 | 42 670 | 43 132 | 43 590 | 44 045 |
| China | 1 307 560 | 1 354 040 | 1 360 720 | 1 367 820 | 1 374 620 | 1 382 710 | 1 390 080 |
| Romania | 21 320 | 20 060 | 19 989 | 19 916 | 19 820 | 19 707 | 19 592 |
| Russian Federation | 143 519 | 143 202 | 143 507 | 146 091 | 146 406 | 146 675 | 146 842 |
| Singapore | 4 266 | 5 312 | 5 399 | 5 470 | 5 535 | 5 607 | 5 612 |
| South Africa | 47 602 | 52 325 | 53 104 | 53 912 | 54 750 | 55 620 | 56 522 |
| Chinese Taipei | 22 770 | 23 316 | 23 374 | 23 434 | 23 492 | 23 540 | 23 571 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database (underlying sources described in section 10 of the documentation, http://www.oecd.org/sti/inn/MSTI_documentation_e.pdf.)

Table F. Total employment

Thousands

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Australia | 9 965 | 11 385 | 11 450 | 11 654 | 11 883 | 12 041 | 12 350 e |
| Austria | 3 873 | 4 205 | 4 220 | 4 260 | 4 285 | 4 337 | 4 411 e |
| Belgium | 4 255 | 4 555 | 4 540 | 4 560 | 4 601 | 4 658 | 4 723 e |
| Canada | 16 407 | 17 749 | 17 988 | 18 091 | 18 262 | 18 454 | 18 797 e |
| Chile | 6 176 | 7 614 | 7 771 | 7 897 | 8 009 | 8 117 | 8 278 e |
| Czech Republic | 4 923 | 5 065 | 5 081 | 5 109 | 5 182 | 5 249 | 5 330 e |
| Denmark | 2 783 | 2 767 | 2 766 | 2 794 | 2 829 | 2 877 | 2 925 e |
| Estonia | 612 | 594 | 601 | 606 | 623 | 625 | 632 e |
| Finland | 2 411 | 2 538 | 2 520 | 2 508 | 2 504 | 2 517 | 2 546 e |
| France | 26 374 | 27 185 | 27 252 | 27 373 | 27 434 | 27 612 | 27 887 e |
| Germany | 39 326 | 42 061 | 42 319 | 42 672 | 43 069 | 43 638 | 44 265 e |
| Greece | 4 647 | 4 105 | 3 998 | 4 035 | 4 064 | 4 083 | 4 170 |
| Hungary | 4 174 | 3 979 | 4 022 | 4 216 | 4 308 | 4 422 | 4 511 e |
| Iceland | 162 | 169 | 175 | 178 | 184 | 191 | 198 e |
| Ireland | 1 962 | 1 862 | 1 908 | 1 940 | 1 989 | 2 045 | 2 107 e |
| Israel ¹ | 2 924 | 3 645 | 3 742 | 3 847 | 3 934 | 4 026 | 4 126 e |
| Italy | 24 501 | 24 765 | 24 323 | 24 339 | 24 498 | 24 809 | 25 096 e |
| Japan | 65 531 | 65 177 | 65 549 | 65 934 | 66 220 | 66 852 | 67 530 e |
| Korea | 22 856 | 24 681 | 25 066 | 25 599 | 25 936 | 26 235 | 26 549 e |
| Latvia | 969 | 869 | 889 | 877 | 889 | 886 | 886 e |
| Lithuania | 1 421 | 1 275 | 1 292 | 1 318 | 1 335 | 1 361 | 1 354 e |
| Luxembourg | 308 | 379 | 386 | 396 | 406 | 418 | 433 e |
| Mexico | 32 801 | 36 396 | 36 615 | 36 976 | 37 554 | 38 181 | 38 594 e |
| Netherlands | 8 339 | 8 836 | 8 732 | 8 724 | 8 806 | 8 901 | 9 094 e |
| New Zealand | 2 059 | 2 177 | 2 238 | 2 312 | 2 355 | 2 485 | 2 588 e |
| Norway | 2 354 | 2 685 | 2 713 | 2 746 | 2 757 | 2 764 | 2 793 |
| Poland | 14 057 | 15 475 | 15 464 | 15 731 | 15 970 | 16 061 | 16 281 |
| Portugal | 5 041 | 4 581 | 4 450 | 4 513 | 4 576 | 4 651 | 4 802 |
| Slovak Republic | 2 089 | 2 209 | 2 192 | 2 223 | 2 267 | 2 321 | 2 372 e |
| Slovenia | 930 | 937 | 927 | 930 | 942 | 960 | 988 e |
| Spain | 19 784 | 18 343 | 17 862 | 18 039 | 18 521 | 18 987 | 19 479 |
| Sweden | 4 349 | 4 627 | 4 672 | 4 737 | 4 807 | 4 889 | 5 002 e |
| Switzerland | 4 145 | 4 674 | 4 733 | 4 822 | 4 895 | 4 965 | 5 007 |
| Turkey | 19 489 | 24 108 | 24 778 | 25 633 | 26 330 | 26 907 | 27 870 e |
| United Kingdom | 28 853 | 29 695 | 30 042 | 30 752 | 31 281 | 31 725 | 32 058 |
| United States | 143 979 | 144 754 | 146 185 | 148 513 | 151 000 | 153 586 | 153 586 |
| EU28 (OECD estimates) | 220 916 | 225 128 | 224 531 | 226 848 | 229 318 | 232 115 | 235 783 |
| OECD-Total | 528 652 | 556 118 | 559 461 | 566 854 | 574 504 | 582 835 | 589 620 |
| Argentina | 15 708 | 17 643 | 17 792 | 17 811 | 18 093 | 17 991 | 18 207 |
| China | 746 470 | 767 040 | 769 770 | 772 530 | 774 510 | 776 030 | 776 400 |
| Romania | 9 267 | 8 645 | 8 569 | 8 635 | 8 526 | 8 430 | 8 648 |
| Russian Federation | 68 339 | 71 545 | 71 391 | 71 539 | 72 324 | 72 393 | 72 142 |
| Singapore | 2 320 | 3 358 | 3 494 | 3 624 | 3 656 | 3 673 | 3 669 |
| South Africa | 12 769 | 14 425 | 14 866 | 15 146 | 15 741 | 15 780 | 16 169 |
| Chinese Taipei | 9 942 | 10 860 | 10 967 | 11 079 | 11 198 | 11 267 | 11 352 |

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20190731/1d92>

1. Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>

Source: OECD, Main Science and Technology Indicators database (underlying sources described in section 10 of the documentation, http://www.oecd.org/sti/inn/MSTI_documentation_e.pdf.)

Table G. Industrial employment

Thousands

| | 2005 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Australia | 7 453 | 8 267 | 8 255 | 8 399 | 8 493 | 8 566 | 8 808 e |
| Austria | 2 951 | 3 169 | 3 176 | 3 206 | 3 211 | 3 247 | 3 305 e |
| Belgium | 2 948 | 3 124 | 3 103 | 3 105 | 3 131 | 3 170 | 3 218 e |
| Canada | 12 392 | 13 137 | 13 327 | 13 424 | 13 510 | 13 621 | 13 874 e |
| Chile | 4 774 e | 5 810 e | 5 967 | 6 003 | 6 053 | 6 175 | 6 245 e |
| Czech Republic | 3 960 | 4 083 | 4 087 | 4 100 | 4 164 | 4 220 | 4 266 e |
| Denmark | 1 858 | 1 816 | 1 814 | 1 839 | 1 872 | 1 919 | 1 965 e |
| Estonia | 471 | 444 | 452 | 453 | 469 | 470 e | 480 e |
| Finland | 1 707 | 1 787 | 1 766 | 1 757 | 1 749 | 1 762 | 1 786 e |
| France | 18 048 | 18 556 | 18 550 | 18 604 | 18 628 | 18 788 e | 19 055 e |
| Germany | 28 729 | 30 803 | 30 940 | 31 123 | 31 279 | 31 594 | 32 006 e |
| Greece | 3 648 | 3 151 | 3 068 | 3 111 | 3 132 | 3 144 | 3 213 e |
| Hungary | 3 242 | 3 062 | 3 057 | 3 207 | 3 250 | 3 344 e | 3 440 e |
| Iceland | 116 | 121 | 124 | 127 | 131 | 137 | 143 e |
| Ireland | 1 538 | 1 357 | 1 404 | 1 431 | 1 468 | 1 520 | 1 562 e |
| Israel ¹ | 1 882 | 2 330 | 2 403 | 2 447 | 2 494 | 2 569 | 2 634 e |
| Italy | 18 355 | 18 417 | 17 999 | 17 929 | 18 058 | 18 320 | 18 533 e |
| Japan | 53 833 e | 51 774 e | 51 950 e | 52 016 e | 51 957 e | 52 280 e | 52 810 e |
| Korea | 19 172 | 19 925 | 20 135 | 20 505 | 20 778 | 20 890 | 21 010 e |
| Latvia | 747 | 663 | 683 | 673 | 685 | 679 | 678 e |
| Lithuania | 1 084 | 966 | 983 | 1 008 | 1 015 | 1 033 | 1 028 e |
| Luxembourg | 245 | 295 | 299 | 306 | 313 | 323 | 334 e |
| Mexico | 25 303 | 27 674 | 27 817 | 28 077 | 28 449 | 29 070 | 29 449 e |
| Netherlands | 6 066 | 6 273 | 6 188 | 6 220 | 6 323 | 6 421 | 6 577 e |
| New Zealand | 1 557 e | 1 601 e | 1 647 e | 1 698 e | 1 730 e | 1 826 e | 1 902 e |
| Norway | 1 527 | 1 721 | 1 738 | 1 758 | 1 756 | 1 749 e | 1 768 e |
| Poland | 11 097 | 12 181 | 12 091 | 12 302 | 12 516 | 12 634 | 12 819 e |
| Portugal | 3 922 | 3 460 | 3 346 | 3 410 | 3 469 | 3 533 | 3 648 e |
| Slovak Republic | 1 629 | 1 736 | 1 721 | 1 743 | 1 781 | 1 827 | 1 870 e |
| Slovenia | 765 | 753 | 744 | 747 | 757 | 771 | 794 e |
| Spain | 15 365 | 13 548 | 13 090 | 13 212 | 13 669 | 14 064 | 14 475 e |
| Sweden | 2 842 | 3 082 | 3 108 | 3 141 | 3 169 | 3 199 | 3 274 e |
| Switzerland | 3 202 | 3 514 | 3 537 | 3 595 | 3 629 | 3 658 | 3 680 |
| Turkey | 16 854 | 20 406 | 20 992 | 21 577 | 22 040 | 22 299 | 23 098 e |
| United Kingdom | 21 261 | 21 481 | 21 680 | 22 331 | 22 822 | 23 247 | 23 599 |
| United States | 102 533 | 100 257 | 101 477 | 103 356 | 104 808 | 106 826 | 106 826 |
| EU28 (OECD estimates) | 165 443 | 166 281 | 165 289 | 167 011 | 168 807 | 171 075 | 174 082 |
| OECD-Total | 398 299 | 410 744 | 412 718 | 417 940 | 422 757 | 428 895 | 434 172 |
| Argentina | .. | .. | .. | .. | .. | .. | .. |
| China | .. | .. | .. | .. | .. | .. | .. |
| Romania | 8 321 | 7 508 | 7 466 | 7 556 | 7 334 | 7 257 | 7 456 |
| Russian Federation | 50 969 | 52 574 | 52 759 | 52 929 | 53 353 | 53 267 | 53 132 |
| Singapore | 2 040 | 2 935 | 3 057 | 3 161 | 3 182 | 3 192 | 3 179 |
| South Africa | 9 714 e | 10 705 e | 11 026 e | 11 202 e | 11 694 | 11 749 | 12 091 |
| Chinese Taipei | 8 727 | 9 426 | 9 523 | 9 624 | 9 735 | 9 797 | 9 876 |

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