Main Science and Technology Indicators

OECD

Volume 2016/2

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Please cite this publication as:
OECD (2017), *Main Science and Technology Indicators Volume 2016 Issue 2*, OECD Publishing.
http://dx.doi.org/10.1787/msti-v2016-2-en

ISSN 2304-2761 (print)
ISSN 2304-277X (online)

Foreword

This publication is prepared by the Economic Analysis and Statistics (EAS) Division of the OECD Secretariat in collaboration with the Working Party of National Experts on Science and Technology Indicators (NESTI). It contains key data series selected from the OECD Scientific and Technological Indicators Database.

The first part of this publication presents a summary table and charts of key science and technology indicators.

The second part consists of 72 standard tables of data series on the resources devoted to research and experimental development (R&D) as well as some indicators of output and the impact of scientific and technological activities. It is complemented by a description of the general methodology used. National specifications and background economic indicators are shown in annex.

R&D data

The OECD has been collecting R&D data on a regular basis since the early 1960s. During the 1990s, the collection was widened to include selected non-Member economies. This publication presents various indicators of the level and trends in total national R&D efforts. The flagship measure is the Gross Domestic Expenditure on Research and Experimental Development (GERD), which captures all spending on R&D carried out within each economy each year. The pattern of financing and of performance of GERD is also presented.

Further information is given on R&D performed in the Business Enterprise sector – the main R&D performing sector. This includes tables showing the most intensive industries carrying out Business Enterprise R&D (BERD). Data sets are also provided for R&D carried out in the Higher Education and Government sectors. All the above tables are essentially based on retrospective surveys of the units carrying out the R&D though national forecasts have been included when available.

Two tables show data on R&D expenditure of foreign affiliates. These data come from the OECD database on foreign affiliates and in some cases are not directly comparable with standard Business Enterprise R&D. They do, however, provide useful supplementary information.

Measures of the output and impact of science and technology

The publication contains no direct measures of the output of Scientific and Technological activities. However, three types of proxy indicators based on data originally collected for other purposes are presented: patent numbers, the technology balance of payments, and international trade in R&D-intensive industries. While each of these indicators has its shortcomings, together they may throw light on countries' technological performance.

Patent data can be considered as a proxy for the output of R&D in the form of inventions. The data presented show the total number and national percentages of triadic patent families, as well as the number of patent applications to the European Patent Office (EPO) in two specific sectors of interest: the Information and Communications Technology (ICT) and biotechnology sectors.

The Technology Balance of Payments (TBP) series comprise data extracted from national sources (balance of payments or survey results) with the aim of measuring the flow of technological know-

how and services into and out of the economy concerned. The OECD manual "Proposed Standard Method of Compiling and Interpreting Technology Balance of Payments Data" (TBP Manual, 1990), gives the methodology for the international standards for compiling such data. The series quoted comprise money paid or received for the acquisition or use of patents, licences, trademarks, designs, inventions, know-how and closely related technical services.

Indicators of trade performance in R&D intensive industries can be used as proxy measures of the industrial and economic impact of scientific and technological activity. The tables concerned give trade balances and export market shares for three selected groups of R&D intensive industries: "pharmaceuticals", "computer, electronic, and optical industry", and "aerospace".

Abbreviations

R&D terminology

BERD	Business Expenditure on R&D (intramural).
FTE	Full Time Equivalent (on R&D).
GBAORD	Government Budget Appropriations or Outlays 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 (see *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.
TBP	Technology Balance of Payments.

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Standard footnotes

a) Break in series with previous year for which data is available.

b) Secretariat estimate or projection based on national sources.

c) National estimate or projection.

d) Defence excluded (all or mostly).

e) National results adjusted by the Secretariat to meet *Frascati Manual* recommendations.

f) *(Not currently used)*.

g) Excluding R&D in the social sciences and humanities.

h) Federal or central government only.

i) Excludes data for the R&D content of general payment to the higher education sector for combined education and research (public GUF).

j) Excludes most or all capital expenditure.

k) Total intramural R&D expenditure instead of current intramural R&D expenditure.

l) Overestimated or based on overestimated data.

m) Underestimated or based on underestimated data.

n) Included elsewhere.

o) Includes other classes.

p) Provisional.

q) *(Not currently used)*.

r) *(Not currently used)*.

s) Unrevised breakdown not adding to the revised total.

t) Do not correspond exactly to *Frascati Manual* recommendations.

u) University graduates instead of researchers.

v) The sum of the breakdown does not add to the total (see General methodology).

w) Including extramural R&D expenditure.

x) Confidential.

y) Compiled according to the System of National Accounts 1993.

z) *(Not currently used)*.

ISSN 2304-2761
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Key figures

Key Figures

2015 or latest year available

	Gross Domestic Expenditure on R&D						Total researchers
	Million current PPP	% financed by		% performed by			Full time equivalent
		Industry	Government	Industry	Higher Education	Government	
Australia	23 133.6[c]	61.9	34.6	56.3[c]	29.6[c]	11.2[c]	100 414[b]
Austria	13 481.0[b, p]	52.5[c, p]	31.0[c, o, p]	70.8[c, p]	24.3[c, p]	4.4[c, p]	42 339[c, p]
Belgium	12 634.8[p]	61.3	24.1	71.9[p]	19.9[p]	7.8[p]	55 087[p]
Canada	25 740.9[p]	45.4[p]	34.6[c, p]	49.9[g, p]	40.4[p]	9.2[p]	159 190
Chile	1 617.3[p]	32.8[p]	42.6[p]	34.3[p]	38.5[p]	7.8[p]	8 175[p]
Czech Republic	6 933.0[p]	34.5[p]	32.2[p]	54.3[p]	24.9[p]	20.4[p]	38 081[p]
Denmark	8 242.9[p]	59.4[p]	29.4[o, p]	64.0[p]	33.4[p]	2.3[p]	42 425[p]
Estonia	569.7[p]	41.0[p]	46.4[p]	46.0[p]	41.4[p]	10.8[p]	4 187[p]
Finland	6 717.8	54.8	28.9	66.7	24.4	8.2	37 516
France	60 867.9[p]	55.7	34.6	65.1[p]	20.3[p]	13.1[p]	267 308
Germany	112 808.8[c, p]	65.8	28.8	67.7[c, p]	17.4[c, p]	14.9[c, o, p]	357 538[c, p]
Greece	2 735.7[p]	31.8[p]	52.7[p]	33.3[p]	38.2[p]	27.6[p]	35 069[p]
Hungary	3 587.7	49.7	34.6	73.4[v]	12.1[v]	13.3[v]	25 316
Iceland	345.9	33.3	32.0	64.7[o]	30.5	4.8	1 944
Ireland	3 583.2[c]	52.8[c]	27.3[c]	72.1[c]	23.4[c]	4.5[c]	21 451[p]
Israel[1]	13 034.3[d]	37.0[d]	12.5[d]	85.4[d]	11.7[d]	1.7[d]	63 521[c, d]
Italy	30 126.5[p]	46.2[c]	40.8[c]	55.3[p]	28.6[p]	13.3[p]	120 677[p]
Japan	170 081.8	78.0	15.4[b]	78.5	12.3	7.9	662 071
Korea	74 217.7	74.5	23.7	77.5	9.1	11.7	356 447
Latvia	308.0[p]	20.1[p]	32.7[p]	24.8[p]	49.6[p]	25.6[p]	3 613[p]
Luxembourg	761.6[p]	16.5	48.4	51.0[p]	17.8[p]	31.1[o, p]	2 869[p]
Mexico	11 901.4[c, p]	20.6[c, p]	71.2[c, p]	30.9[c, p]	26.2[c, p]	38.2[c, p]	29 921
Netherlands	16 923.4[p]	48.7[p]	33.4[p]	55.6[p]	32.1[p]	12.3[o, p]	76 977[p]
New Zealand	1 857.3	39.8	39.8	46.4	30.4	23.2	17 900
Norway	6 233.9[p]	43.1	45.8	54.3[p]	30.7[p]	15.1[p]	30 826[p]
Poland	10 248.1	39.0	41.8	46.6	28.9	24.4	82 594
Portugal	3 924.7[p]	41.8	47.1	47.1[p]	45.5[p]	5.9[p]	39 580[p]
Slovak Republic	1 913.1	25.1	31.9[m]	28.0	43.8	27.9[d]	14 406
Slovenia	1 460.0[p]	69.2[p]	19.9[p]	76.3[p]	10.2[p]	13.5[p]	7 900[p]
Spain	19 750.5	46.4	41.4	52.5	28.1	19.1	122 437
Sweden	15 299.0[p]	61.0	28.3	69.5[p]	26.9[p]	3.4[p]	68 670[m, p]
Switzerland	13 669.9	60.8	25.4	69.3	28.1	0.8[h]	35 950
Turkey	15 337.7	50.9	26.3	49.8	40.5	9.7	89 657
United Kingdom	46 297.2[c, p]	48.4[c, p]	28.0[c, p]	65.7[c, p]	25.6[c, p]	6.8[c, p]	289 330[c, p]
United States	502 893.0[i, p]	64.2[i, p]	24.0[i, p]	71.5[i, p]	13.2[i, p]	11.2[j, p]	1 351 903[b]
EU28 (OECD estimates)	384 210.2[b]	54.8[b]	32.6[b]	63.3[b]	23.2[b]	12.5[b]	1 805 302[b]
OECD	**1 244 565.0**[b]	**61.3**	**27.4**[b]	**68.8**[b]	**17.7**[b]	**11.1**[b]	**4 651 337**[b]
Non-Member Economies							
Argentina	5 013.9[p]	26.5	70.6	20.1[p]	30.5[p]	47.7[p]	51 665[p]
China	408 829.0	74.7	21.3	76.8	7.0	16.2	1 619 028
Romania	2 025.2[b]	37.3	41.7	44.0	17.4	38.3	17 459
Russian Federation	40 522.1	26.5	69.5	59.2	9.6	31.1	449 180
Singapore	10 066.7	54.1	37.1	61.2	27.4	11.4	36 666
South Africa	4 975.0	41.4	42.9	45.9	28.4	23.4	23 346
Chinese Taipei	33 652.7	77.9	21.1	77.8	9.4	12.5	145 381

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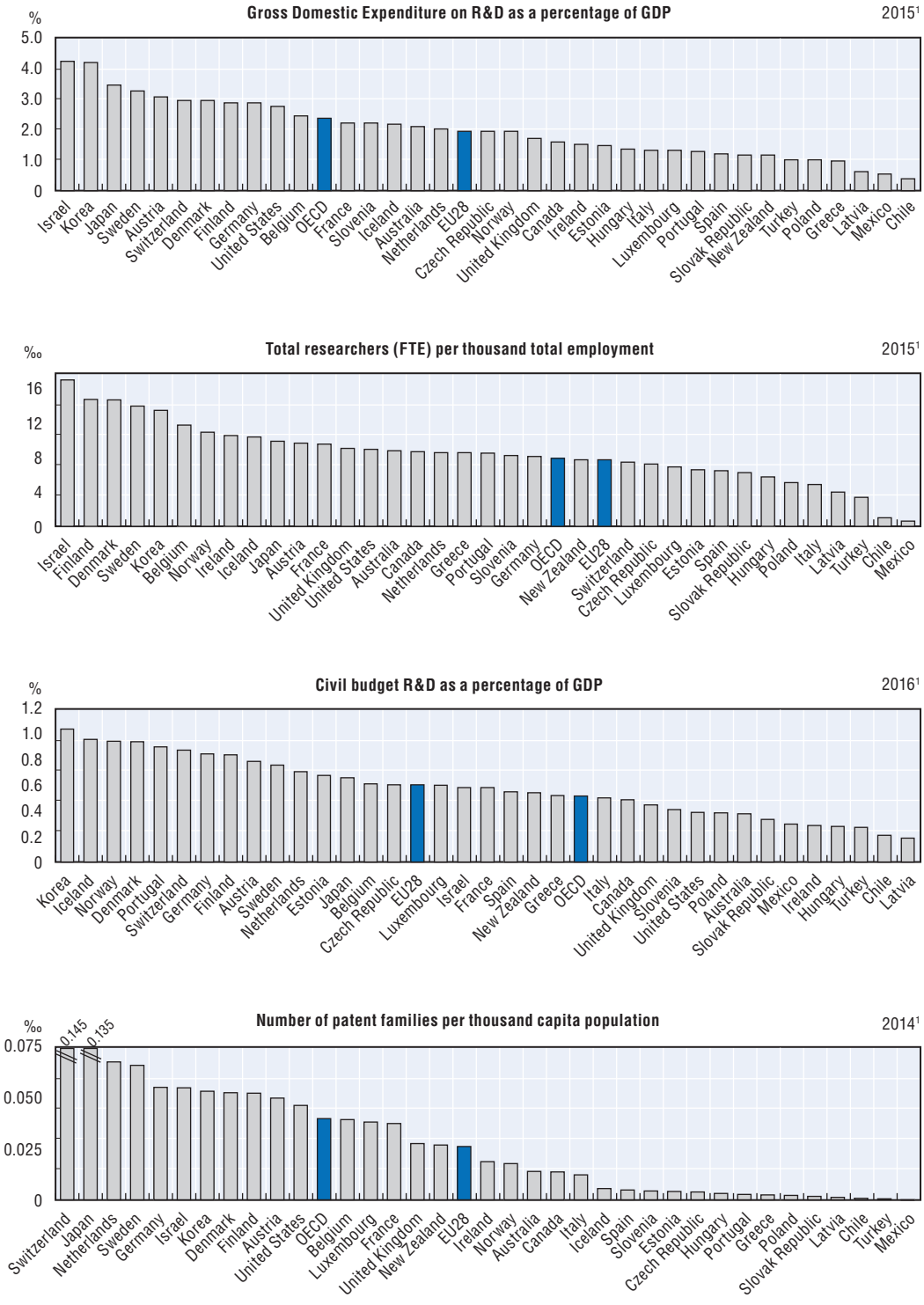
1. Information on data for Israel: *http://dx.doi.org/10.1787/888932315602*.

Note: See tables 1, 7, 13, 14, 17, 18 and 19 for details on reference years.

Source: OECD, Main Science and Technology Indicators database, February 2017.



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1. Or latest year.

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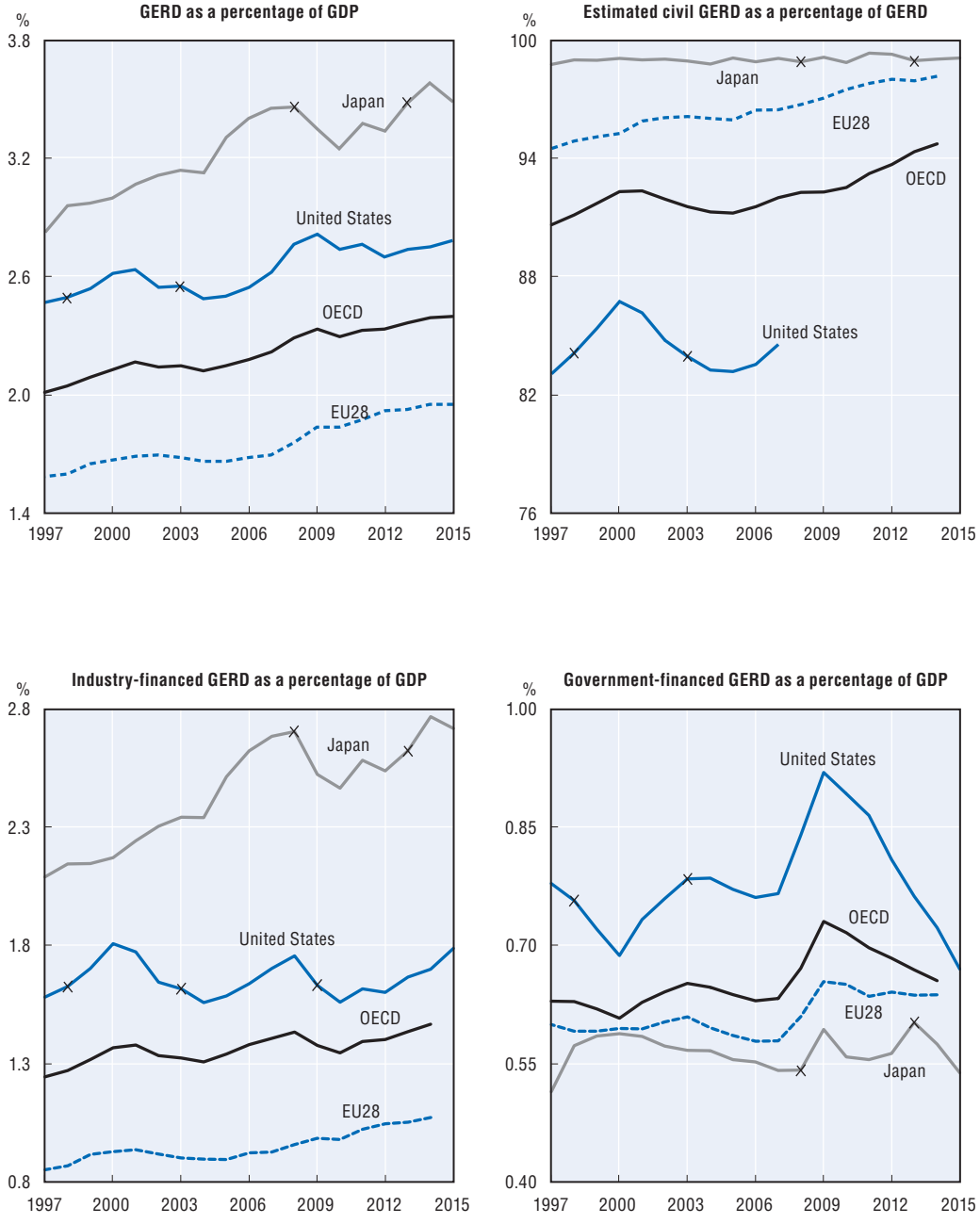
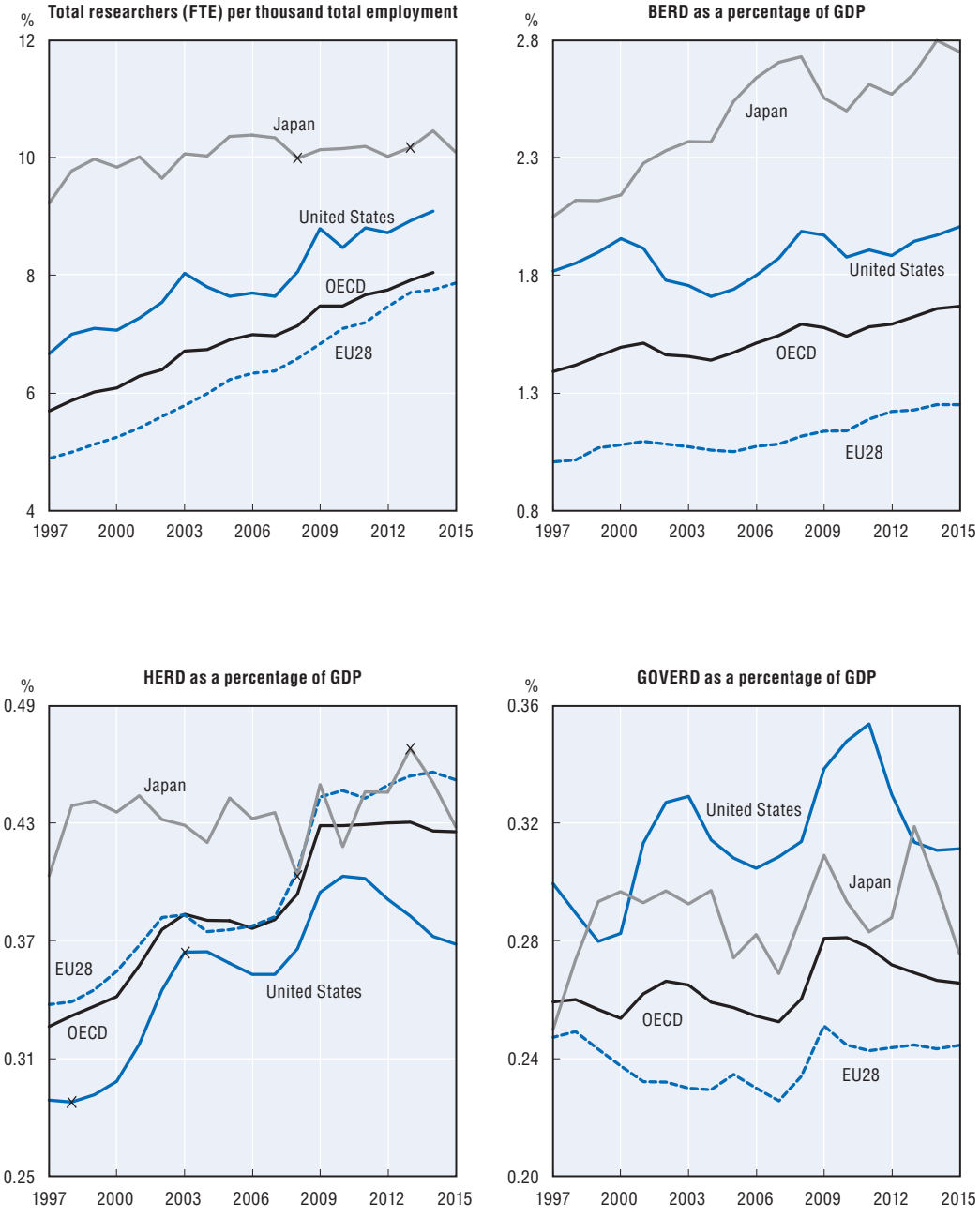


× Break in series.

Source: OECD, Main Science and Technology Indicators database, February 2017.



× Break in series.

Source: OECD, Main Science and Technology Indicators database, February 2017.

ISSN 2304-2761
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International comparisons

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

Million USD

	2005	2010	2011	2012	2013	2014	2015
Australia	..	20 572.9[c]	20 955.6[c]	..	23 133.6[c]	..	..
Austria	6 837.0[c]	9 595.7[c]	9 955.0	11 415.1[c]	12 018.8	12 704.3[c]	13 120.4[c,p]
Belgium	6 225.2	8 966.8	9 822.0	11 133.8	11 851.5	12 381.5[c]	12 634.8[p]
Canada	23 090.0	25 021.8	25 674.6	26 279.0[a]	26 152.2	25 740.9[p]	..
Chile	..	1 027.8	1 232.1	1 355.5	1 547.4	1 536.8[a]	1 617.3[p]
Czech Republic	2 619.5	3 881.8	4 702.3	5 441.6	6 094.8	6 725.0	6 933.0[p]
Denmark	4 429.5	6 972.1	7 283.7	7 468.8	7 800.6	7 884.3	8 242.9[p]
Estonia	206.7	455.4	751.5	730.6	624.7	545.0	569.7[p]
Finland	5 588.7	7 756.1	7 976.8	7 520.0	7 389.5	7 191.7	6 717.8
France	39 530.1	50 956.9[a]	53 617.3	55 097.7	58 406.1	59 581.9	60 867.9[p]
Germany	63 868.1	87 131.0	95 810.0	100 490.1	102 998.5	110 170.1	112 808.8[c,p]
Greece	1 627.0	1 876.8[c]	1 950.7	1 953.7	2 323.8	2 410.8	2 735.7[p]
Hungary	1 586.8	2 458.5	2 708.1	2 895.0	3 364.4	3 427.4	3 587.7
Iceland	296.8	..	313.9[a,l]	..	243.6[a]	292.3	345.9
Ireland	2 006.5	3 148.3[c]	3 206.1[c]	3 321.6[c]	3 470.9[c]	3 583.2[c]	..
Israel[1]	6 966.3[d]	8 666.3[d]	9 523.0[d]	10 450.6[d]	11 444.6[d]	12 263.5[d]	13 034.3[d]
Italy	18 241.2	25 430.8	26 111.7	27 419.6	28 485.1	30 350.9[c]	30 126.5[p]
Japan	128 694.6	140 603.1	148 389.2	152 325.6	164 725.1[a]	170 589.5	170 081.8
Korea	30 618.3[g]	52 172.8	58 379.7	64 862.5	68 368.4	73 216.7	74 217.7
Latvia	164.2	225.4	283.7	287.2	279.7	328.4	308.0[p]
Luxembourg	498.8	653.4	697.6	619.1[a]	677.2	714.6	761.6[p]
Mexico	5 346.2	9 291.1	9 775.3	9 799.0	10 296.7	11 586.6[c,p]	11 901.4[c,p]
Netherlands	10 892.4	12 777.0	14 634.4[a]	15 177.7[a]	15 983.6	16 556.0	16 923.4[p]
New Zealand	1 189.3	..	1 766.6	..	1 857.3	..	..
Norway	3 275.8	4 681.2	5 002.9	5 316.3	5 625.4	5 790.6	6 233.9[p]
Poland	2 984.9	5 782.0	6 487.5	7 990.8	8 193.2	9 195.4	10 248.1
Portugal	1 808.2	4 433.6	4 119.0	3 832.4	3 873.3	3 867.6	3 924.7[p]
Slovak Republic	441.0	830.8	925.0	1 159.9	1 245.0	1 387.7	1 913.1
Slovenia	676.5	1 171.5	1 433.1[a]	1 529.9	1 585.1	1 525.4	1 460.0[p]
Spain	13 251.1	20 105.9	19 862.4	19 269.2	19 299.9	19 358.6	19 750.5
Sweden	10 388.2[a]	12 567.5[c]	13 433.8	13 970.4[c]	14 509.5[m]	14 167.2[c]	15 299.0[p]
Switzerland	..	..	..	13 669.9	..	..	..
Turkey	4 595.6	10 088.7	11 544.6	12 807.9	13 847.3	15 337.7	..
United Kingdom	30 639.7	37 609.3[c]	38 778.6	38 490.2[c]	41 569.6	44 202.9[c]	46 297.2[c,p]
United States	328 128.0[i]	410 093.0[i]	429 792.0[i]	437 081.0[i]	457 612.0[i]	479 358.0[i]	502 893.0[i,p]
EU28 (OECD estimates)	226 764.5[b]	308 253.1[b]	328 425.6[b]	341 234.1[b]	355 983.3[b]	372 573.7[b]	384 210.2[b]
OECD-Total	**778 141.6[b]**	**1 000 696.1[b]**	**1 059 584.9[b]**	**1 094 538.3[b]**	**1 151 377.8[b]**	**1 204 169.9[b]**	**1 244 565.0[b]**
Argentina	2 267.5	4 250.7[p]	4 646.4[p]	5 256.1[p]	5 331.6[p]	5 013.9[p]	..
China	86 827.6	213 460.1	247 808.3	292 197.3	334 135.5	370 115.9	408 829.0
Romania	831.8	1 516.6	1 726.2[a]	1 738.4	1 452.9	1 508.0[b]	2 025.2[b]
Russian Federation	18 120.5	33 093.5	35 192.1	37 911.5	36 614.1	39 863.0	40 522.1
Singapore	5 080.1	7 210.0	8 359.7	8 214.0	8 777.1	10 066.7	..
South Africa	4 051.2	4 433.3	4 652.2	4 826.4	4 975.0	..	..
Chinese Taipei	15 298.9	25 060.8	27 422.7	29 055.1	30 718.3	32 481.8	33 652.7

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

Source: OECD, Main Science and Technology Indicators database, February 2017

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

Percentage

	2005	2010	2011	2012	2013	2014	2015
Australia	..	2.19[c]	2.12[c]	..	2.11[c]	..	..
Austria	2.38[c]	2.74[c]	2.68	2.93[c]	2.97	3.06[c]	3.07[c,p]
Belgium	1.78	2.05	2.16	2.36	2.44	2.46[c]	2.45[p]
Canada	1.98	1.84	1.80	1.79[a]	1.68	1.60[p]	..
Chile	..	0.33[y]	0.35[y]	0.36[y]	0.39[y]	0.38[a,y]	0.39[p,y]
Czech Republic	1.17	1.34	1.56	1.78	1.90	1.97	1.95[p]
Denmark	2.39	2.92	2.94	2.98	2.97	2.92	2.96[p]
Estonia	0.92	1.58	2.31	2.12	1.73	1.45	1.50[p]
Finland	3.33	3.73	3.64	3.42	3.29	3.17	2.90
France	2.04	2.18[a]	2.19	2.23	2.24	2.24	2.23[p]
Germany	2.42	2.71	2.80	2.87	2.82	2.89	2.87[c,p]
Greece	0.58	0.60[c]	0.67	0.70	0.81	0.84	0.96[p]
Hungary	0.92	1.15	1.19	1.27	1.39	1.36	1.38
Iceland	2.71	..	2.49[a,l]	..	1.76[a]	2.01	2.19
Ireland	1.19	1.60[c]	1.54[c]	1.56[c]	1.56[c]	1.51[c]	..
Israel[1]	4.05[d]	3.94[d]	4.02[d]	4.16[d]	4.15[d]	4.27[d]	4.25[d]
Italy	1.05	1.22	1.21	1.27	1.31	1.38[c]	1.33[p]
Japan	3.31[y]	3.25[y]	3.38[y]	3.34[y]	3.48[a,y]	3.59[y]	3.49[y]
Korea	2.63[g]	3.47	3.74	4.03	4.15	4.29	4.23
Latvia	0.53	0.61	0.70	0.67	0.61	0.69	0.63[p]
Luxembourg	1.59	1.51	1.47	1.28[a]	1.31	1.28	1.31[p]
Mexico	0.40	0.54	0.52	0.49	0.50	0.54[c,p]	0.55[c,p]
Netherlands	1.79	1.72	1.90[a]	1.94[a]	1.95	2.00	2.01[p]
New Zealand	1.12	..	1.23	..	1.15	..	..
Norway	1.48	1.65	1.63	1.62	1.65	1.72	1.93[p]
Poland	0.56	0.72	0.75	0.88	0.87	0.94	1.00
Portugal	0.76	1.53	1.46	1.38	1.33	1.29	1.28[p]
Slovak Republic	0.49	0.62	0.66	0.80	0.82	0.88	1.18
Slovenia	1.41	2.06	2.42[a]	2.58	2.60	2.38	2.21[p]
Spain	1.10	1.35	1.33	1.29	1.27	1.24	1.22
Sweden	3.39[a]	3.22[c]	3.25	3.28[c]	3.31[m]	3.15[c]	3.26[p]
Switzerland	..	..	..	2.97	..	..	..
Turkey	0.59[y]	0.84[y]	0.86[y]	0.92[y]	0.94[y]	1.01[y]	..
United Kingdom	1.57	1.68[c]	1.68	1.61[c]	1.66	1.68[c]	1.70[c,p]
United States	2.51[j]	2.74[j]	2.77[j]	2.71[j]	2.74[j]	2.76[j]	2.79[j,p]
EU28 (OECD estimates)	1.66[b]	1.84[b]	1.88[b]	1.92[b]	1.93[b]	1.95[b]	1.95[b]
OECD-Total	**2.15[b]**	**2.30[b]**	**2.33[b]**	**2.34[b]**	**2.37[b]**	**2.39[b]**	**2.40[b]**
Argentina	0.42	0.56[p]	0.57[p]	0.64[p]	0.62[p]	0.59[p]	..
China	1.31[y]	1.71[y]	1.78[y]	1.91[y]	1.99[y]	2.02[y]	2.07[y]
Romania	0.41	0.45	0.49[a]	0.48	0.39	0.38	0.49
Russian Federation	1.00[y]	1.06[y]	1.02[y]	1.05[y]	1.06	1.09	1.13
Singapore	2.16	2.01	2.15	2.00	2.01	2.20	..
South Africa	0.86	0.74	0.73	0.73	0.73	..	..
Chinese Taipei	2.32	2.80	2.90	2.95	3.00	3.00	3.06

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

Source: OECD, Main Science and Technology Indicators database, February 2017

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

Million 2010 USD

	2005	2010	2011	2012	2013	2014	2015
Australia	..	20 572.9[c]	20 647.6[c]	..	21 551.9[c]	..	..
Austria	7 833.0[c]	9 595.7[c]	9 662.6	10 632.0[c]	10 785.7	11 181.5[c]	11 348.6[c,p]
Belgium	7 273.1	8 966.8	9 593.2	10 528.3	10 854.0	11 154.7[c]	11 280.2[p]
Canada	25 434.0	25 021.8	25 250.6	25 630.0[a]	24 663.1	24 092.8[p]	..
Chile	..	1 027.8	1 161.6	1 264.3	1 407.3	1 386.5[a]	1 448.4[p]
Czech Republic	3 008.1	3 881.8	4 597.5	5 225.0	5 542.3	5 911.9	6 098.0[p]
Denmark	5 660.5	6 972.1	7 132.1	7 237.1	7 278.2	7 274.0	7 489.0[p]
Estonia	271.4	455.4	714.5	685.9	565.6	489.0	511.0[p]
Finland	6 655.2	7 756.1	7 769.4	7 197.0	6 866.1	6 576.5	6 032.7
France	46 093.6	50 956.9[a]	52 388.2	53 404.5	53 953.3	54 300.7	54 772.3[p]
Germany	73 155.1	87 131.0	93 047.8	95 930.6	94 817.8	98 629.7	99 855.8[c,p]
Greece	1 846.1	1 876.8[c]	1 915.2	1 848.3	2 074.0	2 146.3	2 453.2[p]
Hungary	2 004.7	2 458.5	2 609.5	2 726.9	3 060.0	3 108.5	3 244.7
Iceland	316.0	..	310.6[a,l]	..	232.1[a]	270.2	306.4
Ireland	2 297.2	3 148.3[c]	3 034.8[c]	3 030.9[c]	3 075.0[c]	3 231.4[c]	..
Israel[1]	7 191.5[d]	8 666.3[d]	9 283.8[d]	9 845.8[d]	10 238.3[d]	10 880.1[d]	11 107.0[d]
Italy	22 116.0	25 430.8	25 299.9	25 827.1	26 116.0	27 498.9[c]	26 838.8[p]
Japan	140 618.9	140 603.1	145 527.0	146 327.1	154 529.6[a]	159 213.4	155 813.0
Korea	32 315.5[g]	52 172.8	58 427.3	64 267.7	68 149.3	72 806.8	73 719.8
Latvia	200.0	225.4	273.5	271.2	256.9	295.3	275.2[p]
Luxembourg	607.0	653.4	649.8	564.0[a]	600.6	615.1	652.8[p]
Mexico	6 353.9	9 291.1	9 283.4	9 234.6	9 573.9	10 442.3[c,p]	10 987.9[c,p]
Netherlands	12 454.5	12 777.0	14 332.5[a]	14 452.2[a]	14 523.0	15 095.0	15 493.6[p]
New Zealand	1 413.6	..	1 719.5	..	1 683.2	..	..
Norway	3 894.0	4 681.2	4 827.9	4 979.2	5 123.4	5 310.6	5 806.2[p]
Poland	3 577.6	5 782.0	6 284.4	7 540.9	7 556.2	8 428.3	9 358.2
Portugal	2 124.1	4 433.6	4 137.5	3 755.3	3 574.5	3 506.7	3 521.9[p]
Slovak Republic	528.3	830.8	919.6	1 134.5	1 178.1	1 293.7	1 795.3
Slovenia	738.0	1 171.5	1 388.9[a]	1 437.9	1 435.9	1 356.2	1 287.0[p]
Spain	15 485.4	20 105.9	19 543.3	18 438.5	17 852.5	17 637.1	18 029.3
Sweden	12 234.3[a]	12 567.5[c]	13 035.0	13 126.3[c]	13 389.3[m]	13 072.4[c]	14 108.6[p]
Switzerland	..	..	..	12 647.9	..	..	..
Turkey	6 042.5	10 088.7	11 183.2	12 250.7	13 080.2	14 349.8	..
United Kingdom	34 616.0	37 609.3[c]	38 291.0	37 195.9[c]	39 027.0	40 688.3[c]	42 115.0[c,p]
United States	361 066.0[j]	410 093.0[j]	421 097.9[j]	420 493.7[j]	433 248.6[j]	445 854.5[j]	462 765.6[j,p]
EU28 (OECD estimates)	263 881.7[b]	308 253.1[b]	320 340.8[b]	326 036.7[b]	328 093.2[b]	337 497.3[b]	344 492.4[b]
OECD-Total	**871 671.8[b]**	**1 000 696.1[b]**	**1 037 430.4[b]**	**1 052 572.4[b]**	**1 080 762.1[b]**	**1 114 848.8[b]**	**1 140 970.0[b]**
Argentina	2 495.1	4 250.7[p]	4 552.8[p]	5 056.7[p]	5 047.0[p]	4 669.8[p]	..
China	95 544.9	213 460.1	242 772.4	281 082.1	316 301.8	344 650.7	376 858.9
Romania	1 184.0	1 516.6	1 672.0[a]	1 646.4	1 365.9	1 392.8	1 850.5
Russian Federation	26 276.0	33 093.5	33 298.4	35 252.0	36 047.2	37 386.1	37 469.7
Singapore	5 588.3	7 210.0	8 185.3	7 903.6	8 312.0	9 363.4	..
South Africa	4 457.1	4 433.3	4 558.1	4 643.2	4 709.4	..	..
Chinese Taipei	16 835.0	25 060.8	26 867.9	27 953.8	29 083.4	30 213.0	30 968.0

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

Source: OECD, Main Science and Technology Indicators database, February 2017

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

USD

	2005	2010	2011	2012	2013	2014	2015
Australia	..	925.8[c]	928.1[c]	..	991.3[c]	..	..
Austria	831.2[c]	1 147.7[c]	1 186.7	1 354.7[c]	1 417.8	1 486.9[c]	1 520.4[c,p]
Belgium	594.3	823.9	894.7	1 007.2	1 067.2	1 109.8[c]	1 126.9[p]
Canada	716.1	735.8	747.6	756.2[a]	743.9	724.2[p]	..
Chile	..	60.1	71.4	77.7	87.7	86.2[a]	89.6[p]
Czech Republic	256.0	369.1	448.0	517.8	579.9	639.0	657.6[p]
Denmark	817.4	1 256.9	1 307.7	1 335.9	1 389.7	1 397.2	1 450.7[p]
Estonia	152.1	341.5	565.1	551.3	473.2	414.2	433.8[p]
Finland	1 065.3	1 446.1	1 480.4	1 389.0	1 358.6	1 316.6	1 225.8
France	626.1	784.3[a]	821.2	839.7	885.9	899.7	915.3[p]
Germany	785.2	1 085.3	1 193.5	1 249.5	1 277.2	1 360.4	1 381.0[c,p]
Greece	148.1	168.8[c]	175.7	176.9	211.9	221.3	251.9[p]
Hungary	157.3	245.9	271.6	291.8	340.1	347.4	364.6
Iceland	1 003.1	..	984.0[a,l]	..	752.3[a]	892.7	1 045.7
Ireland	482.3	690.4[c]	700.5[c]	723.6[c]	754.2[c]	776.4[c]	..
Israel[1]	1 000.7[d]	1 137.2[d]	1 226.7[d]	1 321.7[d]	1 420.6[d]	1 493.3[d]	1 556.0[d]
Italy	313.5	425.1	434.8	454.4	469.7	499.3[c]	496.1[p]
Japan	1 007.4	1 098.1	1 160.8	1 194.2	1 293.7[a]	1 342.0	1 341.5
Korea	636.1[g]	1 055.9	1 172.8	1 297.1	1 361.4	1 452.0	1 466.3
Latvia	73.3	107.5	137.8	141.2	138.9	164.6	155.6[p]
Luxembourg	1 071.0	1 287.5	1 343.1	1 164.8[a]	1 241.9	1 280.0	1 339.3[p]
Mexico	49.9	81.3	84.5	83.7	87.0	96.8[c,p]	98.4[c,p]
Netherlands	667.5	769.1	876.7[a]	906.0[a]	951.4	981.8	999.5[p]
New Zealand	286.7	..	402.1	..	416.4	..	..
Norway	708.6	957.5	1 010.1	1 059.2	1 107.4	1 127.2	1 200.9[p]
Poland	78.2	150.1	168.4	207.4	212.8	238.9	266.5
Portugal	172.2	419.3	390.1	364.5	370.4	371.8	378.9[p]
Slovak Republic	81.9	153.0	171.4	214.6	230.0	256.1	352.8
Slovenia	338.1	571.8	698.1[a]	743.8	769.6	739.8	707.6[p]
Spain	303.5	431.8	425.0	412.0	414.2	416.6	425.4
Sweden	1 150.5[a]	1 340.1[c]	1 421.7	1 467.6[c]	1 511.3[m]	1 461.1[c]	1 561.2[p]
Switzerland	..	..	..	1 709.4	..	..	..
Turkey	67.0	138.2	156.1	171.0	182.7	200.2	..
United Kingdom	507.2	599.3[c]	612.8	604.2[c]	648.5	684.3[c]	711.1[c,p]
United States	1 108.6[j]	1 323.7[j]	1 376.8[j]	1 389.8[j]	1 444.5[j]	1 501.6[j]	1 563.2[j,p]
EU28 (OECD estimates)	458.2[b]	612.1[b]	650.5[b]	674.3[b]	702.1[b]	733.1[b]	753.8[b]
OECD-Total	**659.0[b]**	**806.9[b]**	**849.3[b]**	**872.2[b]**	**912.4[b]**	**948.8[b]**	**974.9[b]**
Argentina	58.7	105.3[p]	114.1[p]	127.9[p]	128.6[p]	119.9[p]	..
China	66.4	159.2	183.9	215.8	245.6	270.6	297.4
Romania	38.9	74.7	85.5[a]	86.5	72.6	75.6[b]	101.9[b]
Russian Federation	126.3	231.7	246.2	265.1	255.5	277.4	277.0
Singapore	1 190.8	1 420.1	1 612.6	1 546.3	1 625.7	1 840.3	..
South Africa	85.7	87.3	90.2	92.2	93.5	..	..
Chinese Taipei	671.9	1 082.0	1 180.7	1 246.1	1 314.2	1 386.1	1 432.5

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

Source: OECD, Main Science and Technology Indicators database, February 2017

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

Percentage

	2005	2010	2011	2012	2013	2014	2015
Australia	..	..	..	..	..	..	..
Austria	..	..	2.67	..	2.96	..	..
Belgium	1.78	..	..	..	..	..	..
Canada	..	..	..	..	..	..	..
Chile	..	0.33[y]	0.35[y]	0.36[y]	0.39[y]	0.38[a,p,y]	0.38[p,y]
Czech Republic	1.16	1.33	1.55	1.78	1.89	1.97	..
Denmark	..	..	..	..	..	..	..
Estonia	0.92	1.58	..[x]	2.12	1.72	..[x]	..[x]
Finland	3.31	3.71	3.62	3.40	3.27	3.16	..
France	1.87	2.08[a]	2.12	2.16	2.16	2.17	..
Germany	2.39[c]	2.68	2.77	2.84	2.80	2.87	..
Greece	0.58[b]	..	0.67[b]	0.70[b]	0.81[b]	0.84[b]	0.96[b,p]
Hungary	..	..	..	..	..	..	..
Iceland	2.71	..	2.49[a,l]	..	1.76[a]	..	..
Ireland	1.19	1.60[c]	1.54[c]	1.56[c]	1.56[c]	1.51[c]	..
Israel[1]	4.05	3.94	4.02	4.16	4.15	4.27	4.25
Italy	1.04[b]	1.22[b]	1.21[b]	1.27[b]	1.31[b]	1.37[b]	1.33[b,p]
Japan	3.28[b,y]	3.22[b,y]	3.36[b,y]	3.32[b,y]	3.45[a,b,y]	3.56[b,y]	3.46[b,y]
Korea	2.52[b,g]	3.32[b]	3.59[b]	3.85[b]	3.97[b]	4.13[b]	4.07[b]
Latvia	..	..	..	..	..	..	..
Luxembourg	1.59	1.51	1.47	1.28[a]	1.31	..	..
Mexico	..	..	..	..	..	..	..
Netherlands	..	..	..	..	..	..	..
New Zealand	..	..	1.22	..	1.14	..	..
Norway	..	..	..	..	..	..	..
Poland	..	..	..	..	..	..	..
Portugal	0.75	1.53	1.45	1.37	1.32	1.28	..
Slovak Republic	0.47	0.61	0.65	0.80	0.82	0.88	..
Slovenia	1.41	2.05	..	..	..	..	..
Spain	..	1.30	1.28	1.25	1.23	1.20	..
Sweden	3.26[a]	..	3.15	..	3.18[m]	..	..
Switzerland	..	..	..	2.93	..	..	..
Turkey	..	..	..	..	..	..	..
United Kingdom	1.38	1.55[c]	1.56	1.51[c]	1.55	1.58[c]	..
United States	2.08[j]	..	..	..	..	..	..
EU28 (OECD estimates)	1.60[b]	1.79[b]	1.84[b]	1.88[b]	1.89[b]	1.92[b]	..
OECD-Total	**1.96[b]**	**2.13[b]**	**2.18[b]**	**2.19[b]**	**2.23[b]**	**2.27[b]**	**..**
Argentina	0.41	0.56[p]	0.56[p]	0.63[p]	0.62[p]	0.58[p]	..
China	..	..	..	..	..	..	..
Romania	0.40	0.45	0.49[a]	0.48	0.38	0.38	..
Russian Federation	..	..	..	..	..	..	..
Singapore	..	..	..	..	..	..	..
South Africa	0.81	0.69	0.70	0.69	0.69	..	..
Chinese Taipei	2.25	2.74	2.84	2.92	2.97	2.98	3.04

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

Source: OECD, Main Science and Technology Indicators database, February 2017

Table 6. Basic research expenditure as a percentage of GDP

Percentage

	2005	2010	2011	2012	2013	2014	2015
Australia	..	..	..	..	..	..	..
Austria	..	..	0.51[k,m]	..	0.56[k,m]	..	..
Belgium	..	..	..	..	0.49[k]	..	..
Canada	..	..	..	..	..	..	..
Chile	..	0.06[m,y]	0.08[y]	0.09[y]	0.11[y]	0.12[y]	0.13[p,y]
Czech Republic	0.32	0.40[k]	0.45[k]	0.53[k]	0.62[k]	0.61[k]	..
Denmark	0.43	0.52[c]	0.52	0.52[c]	0.54[c]	..	..
Estonia	0.25	0.37	0.34	0.34	0.37	0.37	..
Finland	..	..	..	..	..	..	..
France	0.49[k]	0.55[a,k]	0.53[k]	0.54[k]	0.54[k]	0.55[k]	..
Germany	..	..	..	..	..	..	..
Greece	..	..	0.19	..	0.28[k]	..	..
Hungary	0.22	0.22	0.22	0.21	0.23	0.22	..
Iceland	0.51[k]	..	0.62[a,l]	..	0.46[a]	0.45	0.43
Ireland	0.28[k]	0.31[c,k]	0.27[c,k]	..	0.30[c,k]	..	..
Israel[1]	0.59[c,d]	0.40[c,d]	0.40[c,d]	0.41[c,d]	0.40[c,d]	0.39[c,d]	..
Italy	0.29[k]	0.31[k]	0.29[k]	0.32[k]	0.33[k]	0.34[c,k]	..
Japan	0.40[k,y]	0.39[k,y]	0.41[k,y]	0.42[k,y]	0.44[a,k,y]	0.44[k,y]	0.42[k,y]
Korea	0.40[g,k]	0.63[k]	0.68[k]	0.74[k]	0.75[k]	0.76[k]	0.73[k]
Latvia	0.11[k]	0.19[k]	0.20[k]	0.22[k]	0.15[k]	0.20[k]	..
Luxembourg	..	..	..	..	..	..	..
Mexico	..	0.16[k]	0.16[k]	0.14[k]	0.14[k]	0.15[k]	0.16[k]
Netherlands	..	..	0.57[a,k]	0.54[a,k]	0.55[k]	0.55[k]	..
New Zealand	0.34[k]	..	0.32[k]	..	0.29[k]	..	..
Norway	0.27	..	0.29	..	0.29	..	..
Poland	0.17	0.21	0.20	0.23	0.23	0.23	..
Portugal	0.17	0.29	0.27	0.27	0.28	0.28	..
Slovak Republic	0.20	0.23	0.25	0.30	0.31	0.32	..
Slovenia	0.18	0.24	0.28[a]	0.30	0.31	0.39[a]	..
Spain	0.19	0.26	0.27	0.27	0.27	0.26	..
Sweden	..	..	..	..	..	..	..
Switzerland	..	..	..	0.90[k]	..	..	..
Turkey	..	..	..	..	..	..	..
United Kingdom	..	0.20[a,c]	0.18[c]	0.19[c]	0.20[c]	0.20[c]	..
United States	0.47	0.50	0.47	0.45	0.48[p]	..	..
EU28 (OECD estimates)	..	..	..	..	..	..	..
OECD-Total	**..**	**..**	**..**	**..**	**..**	**..**	**..**
Argentina	0.11[k]	..	..	..	..	..	..
China	0.05[y]	0.08[k,y]	0.08[k,y]	0.09[k,y]	0.09[k,y]	0.10[k,y]	0.10[k,y]
Romania	0.09	0.17	0.17[a]	0.16	0.12	0.12	..
Russian Federation	0.13[y]	0.19[y]	0.18[y]	0.16[y]	0.16	0.17	0.16
Singapore	0.45[k]	0.42[k]	0.41[k]	0.39[k]	0.41[k]	0.43[k]	..
South Africa	0.16[k]	0.18[k]	0.18[k]	0.18[k]	0.17[k]	..	..
Chinese Taipei	0.24[k]	0.28[k]	0.28[k]	0.28[k]	0.28[k]	0.27[k]	0.27[k]

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

Source: OECD, Main Science and Technology Indicators database, February 2017

Table 7. Total researchers in full-time equivalent

FTE

	2005	2010	2011	2012	2013	2014	2015
Australia	..	100 414[b]	..	..	..	..	..
Austria	28 470[c]	36 581[c]	37 114	39 701[c]	40 426	41 595[c]	42 339[c,p]
Belgium	33 146	40 832	42 686	45 597	46 355	46 880[c]	55 087[a,p]
Canada	136 700	158 660	165 100	161 590	159 190	..	..
Chile	..	5 440[m]	6 078	6 798	5 893	7 585	8 175[p]
Czech Republic	24 169[a]	29 228	30 682	33 217	34 271	36 040	38 081[p]
Denmark	28 179	37 435	39 181	40 080	39 868	41 409	42 425[p]
Estonia	3 331	4 077	4 511	4 582	4 407	4 324	4 187[p]
Finland	39 582	41 425	40 003[a]	40 468	39 196	38 281	37 516
France	202 507	243 533[a]	249 247	258 913	266 222	267 308	..
Germany	272 148	327 996[c]	338 689	352 419	354 463	351 923	357 538[c,p]
Greece	19 593	..	24 674[a]	24 800	29 228	29 877	35 069[p]
Hungary	15 878	21 342	23 019	23 837	25 038	26 213	25 316
Iceland	2 155	..	2 258[a]	..	1 848[a]	..	1 944[a]
Ireland	11 587	14 176[c]	15 269[c]	16 253[c]	16 844[c]	20 727[a,c]	21 451[p]
Israel[1]	..	..	55 184[d]	63 521[c,d]	..	..	..
Italy	82 489	103 424	106 151	110 695	116 163	118 183	120 677[p]
Japan	680 631	656 032	656 651	646 347	660 489[a]	682 935	662 071
Korea	179 812[g]	264 118	288 901	315 589	321 842	345 463	356 447
Latvia	3 282	3 896	3 947	3 904	3 625	3 748	3 613[p]
Luxembourg	2 227	2 613	2 831	2 310[a]	2 503	2 629	2 869[p]
Mexico	43 922	38 497	39 826	29 094	29 921	..	..
Netherlands	47 854	53 703	61 335[a]	73 235[a]	76 670	76 229	76 977[p]
New Zealand	12 986	..	16 300	..	17 900	..	..
Norway	21 200	26 451	27 228	27 841	28 312	29 237	30 826[p]
Poland	62 162	64 511	64 133	67 001	71 472	78 622	82 594
Portugal	21 126	41 523	44 056	42 498	37 813[a]	38 155	39 580[p]
Slovak Republic	10 921	15 183	15 326	15 271	14 727	14 742	14 406
Slovenia	5 253	7 703	8 774[a]	8 884	8 707	8 574	7 900[p]
Spain	109 720	134 653	130 235	126 778	123 225	122 235	122 437
Sweden	55 001[a,m]	49 312[c,m]	48 702[m]	49 280[c,m]	64 194[a,m]	66 643[c,m]	68 670[m,p]
Switzerland	..	..	..	35 950	..	..	..
Turkey	39 139	64 341	72 109	82 122	89 075	89 657	..
United Kingdom	248 599[a,c]	256 585[c]	251 358	256 156[c]	267 699	276 584[c]	289 330[c,p]
United States	1 101 105[b]	1 198 777[b]	1 253 100[b]	1 264 199[b]	1 305 862[b]	1 351 903[b]	..
EU28 (OECD estimates)	1 374 762[b]	1 601 122[b]	1 626 804[b]	1 681 623[b]	1 730 740[b]	1 759 095[b]	1 805 302[b]
OECD-Total	**3 696 815[b]**	**4 165 737[b]**	**4 305 416[b]**	**4 401 413[b]**	**4 521 867[b]**	**4 651 337[b]**	**..**
Argentina	31 868	46 199[p]	49 029[p]	50 490[p]	50 785[p]	51 665[p]	..
China	1 118 698[t]	1 210 841	1 318 086	1 404 017	1 484 040	1 524 280	1 619 028
Romania	22 958	19 780	16 080[a]	18 016	18 576	18 109	17 459
Russian Federation	464 577	442 071	447 579	443 269	440 581	444 865	449 180
Singapore	23 789	32 031	33 719	34 141	36 025	36 666	..
South Africa	17 303	18 720	20 115	21 383	23 346	..	..
Chinese Taipei	88 859	128 347	134 762	140 102	141 159	142 983	145 381

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

Source: OECD, Main Science and Technology Indicators database, February 2017

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

Per thousand

	2005	2010	2011	2012	2013	2014	2015
Australia	..	9.0[b]	..	..	..	..	..
Austria	7.3[c]	8.9[c]	8.9	9.4[c]	9.6	9.8[c]	9.9[c,p]
Belgium	7.8	9.1	9.4	10.0	10.2	10.3[c]	12.0[a,p]
Canada	8.3	9.1	9.3	9.1	8.8	..	..
Chile	..	0.8[m]	0.8	0.9	0.8	1.0	1.0[p]
Czech Republic	4.9[a]	5.8	6.1	6.6	6.7	7.1	7.4[p]
Denmark	10.1	13.4	14.1	14.5	14.4	14.8	15.0[p]
Estonia	5.4	7.4	7.7	7.7	7.3	7.1	6.7[p]
Finland	16.4	16.7	15.9[a]	15.9	15.6	15.3	15.0
France	7.7	9.1[a]	9.2	9.5	9.8	9.8	..
Germany	6.9	8.0[c]	8.1	8.4	8.4	8.2	8.3[c,p]
Greece	4.2	..	5.6[a]	6.0	7.3	7.5	8.7[p]
Hungary	3.8	5.4	5.8	6.0	6.2	6.2	5.9
Iceland	13.4	..	13.5[a]	..	10.6[a]	..	10.6[a,b]
Ireland	5.9	7.5[c]	8.2[c]	8.7[c]	8.8[c]	10.7[a,c]	10.8[p]
Israel[1]	..	..	15.7[d]	17.4[c,d]	..	..	..
Italy	3.4	4.2	4.3	4.5	4.8	4.9	4.9[p]
Japan	10.4	10.2	10.2	10.0	10.2[a]	10.5	10.1[b]
Korea	7.9[g]	11.1	11.9	12.8	12.8	13.5	13.7
Latvia	3.4	4.6	4.6	4.5	4.1	4.3	4.1[p]
Luxembourg	7.2	7.3	7.7	6.1[a]	6.5	6.6	7.1[p]
Mexico	1.1	0.8	0.8	0.6	0.6	..	..
Netherlands	5.7	6.1	6.9[a]	8.3[a]	8.8	8.8	8.8[p]
New Zealand	6.2[b]	..	7.3[b]	..	7.9	..	..
Norway	9.0	10.2	10.4	10.4	10.4	10.6	11.2[b,p]
Poland	4.4	4.2	4.1	4.3	4.6	5.0	5.2
Portugal	4.2	8.5	9.2	9.3	8.5[a]	8.4[b]	8.7[b,p]
Slovak Republic	5.2	7.0	6.9	6.9	6.7	6.6	6.4
Slovenia	5.7	8.0	9.3[a]	9.5	9.4	9.2	8.4[p]
Spain	5.5	6.9	6.8	6.9[b]	6.9[b]	6.8[b]	6.6[b]
Sweden	12.6[a,m]	11.0[c,m]	10.6[m]	10.7[c,m]	13.7[a,m]	14.1[c,m]	14.3[m,p]
Switzerland	..	..	..	7.6	..	..	..
Turkey	2.0	2.8	3.0	3.3	3.5	3.5	..
United Kingdom	8.6[a,c]	8.8[c]	8.6	8.6[c]	8.9	9.0[c]	9.2[c,p]
United States	7.6[b]	8.5[b]	8.8[b]	8.7[b]	8.9[b]	9.1[b]	..
EU28 (OECD estimates)	6.2[b]	7.1[b]	7.2[b]	7.5[b]	7.7[b]	7.8[b]	7.9[b]
OECD-Total	**6.9[b]**	**7.5[b]**	**7.7[b]**	**7.8[b]**	**7.9[b]**	**8.1[b]**	**..**
Argentina	2.0	2.7[p]	2.8[p]	2.9[p]	2.8[p]	2.9[p]	..
China	1.5[t]	1.6	1.7	1.8	1.9	2.0	..
Romania	2.5	2.2	1.8[a]	2.1	2.2	2.1	2.0
Russian Federation	6.8	6.3	6.3	6.2	6.2	6.2	6.2
Singapore	10.3	10.3	10.4	10.2	10.3	10.1	..
South Africa	1.4	1.4	1.4	1.5	1.6	..	..
Chinese Taipei	8.9	12.2	12.6	12.9	12.9	12.9	13.0

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

Source: OECD, Main Science and Technology Indicators database, February 2017

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

FTE

	2005	2010	2011	2012	2013	2014	2015
Australia	..	147 809[b]	..	..	..	..	..
Austria	47 625[c]	59 923[c]	61 171	65 088[c]	66 186	68 101[c]	69 318[c,p]
Belgium	53 517	60 075	62 895	67 005	67 899	68 701[c]	77 864[a,p]
Canada	218 590	233 060	239 920	231 230	226 620	..	..
Chile	..	11 491[m]	13 052	14 631	13 228	15 887	15 261[p]
Czech Republic	43 370[a]	52 290	55 697	60 329	61 976	64 444	66 433[p]
Denmark	43 499	56 623	57 585	57 734	57 744	58 361	59 532[p]
Estonia	4 362	5 277	5 724	5 855	5 858	5 790	5 636[p]
Finland	57 471	55 897	54 526[a]	54 047	52 972	52 130	50 367
France	349 681	397 756[a]	402 492	411 780	418 141	417 129	..
Germany	475 278	548 723	575 099	591 261	588 615	605 252	613 740[c,p]
Greece	33 603	..	36 913[a]	37 361	42 188	43 316	50 512[p]
Hungary	23 239	31 480	33 960	35 732	38 163	37 329	36 847
Iceland	3 226	..	3 244[a]	..	2 736[a]	..	2 941
Ireland	16 690	19 722[c]	21 591[c]	23 169[c]	24 129[c]	28 379[a,c]	29 444[p]
Israel[1]	..	..	70 401[d]	77 143[c,d]	..	..	..
Italy	175 248	225 632	228 094	240 179	246 764	249 467	248 140[p]
Japan	896 855	877 928	869 825	851 132	865 523[a]	895 285	875 005
Korea	215 345[g]	335 228	361 374	395 990	401 444	430 868	442 027
Latvia	5 483	5 563	5 432	5 593	5 396	5 739	5 570[p]
Luxembourg	4 392	4 972	5 191	4 743[a]	4 975	5 243	5 593[p]
Mexico	83 685	70 997	73 436	58 849	59 073	..	..
Netherlands	93 599	100 544	117 436[a]	122 215[a]	123 214	124 066	128 327[p]
New Zealand	18 929	..	23 600	..	24 900	..	..
Norway	29 966	36 121	36 950	37 707	38 536	40 297	42 695[p]
Poland	76 761	81 843	85 219	90 716	93 751	104 359	109 249
Portugal	25 728	47 616	49 599	47 554	46 711	46 878	48 478[p]
Slovak Republic	14 404	18 188	18 112	18 127	17 166	17 594	17 591
Slovenia	8 994	12 940	15 269[a]	14 974	15 229	14 866	14 225[p]
Spain	174 773	222 022	215 079	208 831	203 302	200 233	200 866
Sweden	77 557[a,m]	77 418[c,m]	78 445[m]	81 272[c,m]	80 957[m]	83 473[c,m]	84 523[m,p]
Switzerland	..	..	..	75 476	..	..	..
Turkey	49 251[m]	81 792[m]	92 801[m]	105 122[m]	112 969[m]	115 444[m]	..
United Kingdom	324 917[a,c,m]	350 766[c,m]	356 258[m]	356 484[c,m]	377 343[m]	396 281[c,m]	416 538[c,m,p]
United States	..	..	..	..	..	..	..
EU28 (OECD estimates)	2 201 520[b]	2 539 520[b]	2 612 980[b]	2 671 404[b]	2 712 855[b]	2 772 387[b]	2 836 771[b]
OECD-Total	**..**	**..**	**..**	**..**	**..**	**..**	**..**
Argentina	45 361	65 299[p]	69 568[p]	72 323[p]	74 866[p]	76 904[p]	..
China	1 364 799[t]	2 553 829	2 882 903	3 246 840	3 532 817	3 710 580	3 758 848
Romania	33 222	26 171	29 749[a]	31 135	32 507	31 391	31 331
Russian Federation	919 716	839 992	839 183	828 401	826 733	829 190	833 654
Singapore	28 586	37 013	38 996	39 459	41 582	42 543	..
South Africa	28 798	29 486	30 978	35 050	37 956	..	..
Chinese Taipei	149 154	211 413	222 269	229 167	234 248	240 528	245 941

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

Source: OECD, Main Science and Technology Indicators database, February 2017

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

Per thousand

	2005	2010	2011	2012	2013	2014	2015
Australia	..	13.2[b]	..	..	..	..	..
Austria	12.3[c]	14.6[c]	14.7	15.5[c]	15.7	16.0[c]	16.2[c,p]
Belgium	12.6	13.4	13.9	14.7	15.0	15.1[c]	16.9[a,p]
Canada	13.3	13.4	13.6	13.0	12.6	..	..
Chile	..	1.6[m]	1.7	1.9	1.7	2.0	1.9[p]
Czech Republic	8.8[a]	10.3	11.0	11.9	12.2	12.6	12.8[p]
Denmark	15.6	20.3	20.7	20.9	20.9	20.9	21.0[p]
Estonia	7.1	9.6	9.8	9.9	9.7	9.6	9.0[p]
Finland	23.8	22.5	21.7[a]	21.3	21.0	20.8	20.2
France	13.3	14.8[a]	14.8	15.1	15.3	15.2	..
Germany	12.1	13.4	13.8	14.1	13.9	14.2	14.3[c,p]
Greece	7.2	..	8.4[a]	9.1	10.6	10.8	12.6[p]
Hungary	5.6	7.9	8.6	9.0	9.5	8.9	8.6
Iceland	20.0	..	19.4[a]	..	15.6[a]	..	16.0[b]
Ireland	8.5	10.5[c]	11.5[c]	12.4[c]	12.6[c]	14.6[a,c]	14.8[p]
Israel[1]	..	..	20.0[d]	21.1[c,d]	..	..	..
Italy	7.2	9.1	9.2	9.7	10.1	10.2	10.1[p]
Japan	13.7	13.6	13.5	13.2	13.3[a]	13.7	13.4[b]
Korea	9.4[g]	14.1	14.9	16.0	16.0	16.8	17.0
Latvia	5.7	6.6	6.3	6.4	6.1	6.5	6.3[p]
Luxembourg	14.3	13.8	14.0	12.5[a]	12.9	13.2	13.8[p]
Mexico	2.1	1.5	1.6	1.2	1.2	..	..
Netherlands	11.2	11.5	13.3[a]	13.8[a]	14.1	14.2	14.6[p]
New Zealand	9.1[b]	..	10.6[b]	..	11.0	..	..
Norway	12.7	13.9	14.0	14.0	14.2	14.7	15.5[b,p]
Poland	5.5	5.3	5.5	5.9	6.1	6.6	6.8
Portugal	5.1	9.8	10.4	10.4	10.5	10.4[b]	10.6[b,p]
Slovak Republic	6.9	8.4	8.2	8.2	7.8	7.9	7.8
Slovenia	9.7	13.4	16.1[a]	16.0	16.4	16.0	15.1[p]
Spain	8.8	11.3	11.3	11.4[b]	11.4[b]	11.1[b]	10.8[b]
Sweden	17.8[a,m]	17.2[c,m]	17.1[m]	17.6[c,m]	17.3[m]	17.6[c,m]	17.6[m,p]
Switzerland	..	..	..	15.9	..	..	..
Turkey	2.5[m]	3.6[m]	3.8[m]	4.2[m]	4.4[m]	4.5[m]	..
United Kingdom	11.3[a,c,m]	12.0[c,m]	12.1[m]	12.0[c,m]	12.6[m]	12.9[c,m]	13.3[c,m,p]
United States	..	..	..	..	..	..	..
EU28 (OECD estimates)	10.0[b]	11.3[b]	11.6[b]	11.9[b]	12.1[b]	12.2[b]	12.4[b]
OECD-Total	**..**	**..**	**..**	**..**	**..**	**..**	**..**
Argentina	2.9	3.8[p]	4.0[p]	4.1[p]	4.2[p]	4.3[p]	..
China	1.8[t]	3.4	3.8	4.2	4.6	4.8	..
Romania	3.6	2.9	3.3[a]	3.6	3.8	3.6	3.7
Russian Federation	13.5	12.0	11.8	11.6	11.6	11.6	11.5
Singapore	12.3	11.9	12.1	11.8	11.9	11.7	..
South Africa	2.3	2.1	2.2	2.4	2.6	..	..
Chinese Taipei	15.0	20.1	20.8	21.1	21.4	21.7	22.0

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

Source: OECD, Main Science and Technology Indicators database, February 2017

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

As a percentage of GDP

	2005	2010	2011	2012	2013	2014	2015
Australia	..	..	..	..	..	..	..
Austria	1.09[c]	1.24[c]	1.24	1.34[c]	1.45	1.44[c]	1.45[c,p]
Belgium	1.06	1.18	1.30	1.45	1.49	..	..
Canada	0.98	0.86	0.88	0.85[a]	0.77	0.73[p]	..
Chile	..	0.08[y]	0.12[y]	0.13[y]	0.13[y]	0.12[a,y]	0.13[p,y]
Czech Republic	0.56	0.55	0.59	0.65	0.71	0.71	0.67[p]
Denmark	1.42	1.78[c]	1.80	1.79[c]	1.75	1.72[c]	1.76[p]
Estonia	0.36	0.69	1.27	1.09	0.73	0.54	0.61[p]
Finland	2.23	2.46	2.44	2.16	2.00	1.70	1.59
France	1.06	1.16[a]	1.21	1.23	1.23	1.25	..
Germany	1.64	1.78	1.83	1.90	1.85	1.90	..
Greece	0.18	0.22[c]	0.22	0.22	0.25	0.25	0.30[p]
Hungary	0.36[v]	0.54	0.57	0.59	0.65	0.66	0.68
Iceland	1.30	..	1.24[a,l]	..	0.65[a]	0.72	0.73
Ireland	0.69	0.83[c]	0.75[c]	0.78[c]	0.82[c]	0.80[c]	..
Israel[1]	2.28[d]	1.42[d]	1.50[d]	1.64[d]	1.54[d]	..	..
Italy	0.42	0.55	0.55	0.56	0.59	0.64[c]	..
Japan	2.52[y]	2.47[y]	2.59[y]	2.54[y]	2.63[a,y]	2.77[y]	2.72[y]
Korea	1.97[g]	2.49	2.76	3.01	3.14	3.23	3.15
Latvia	0.18	0.24	0.17	0.16	0.13	0.19	0.13[p]
Luxembourg	1.27	0.66	0.67	0.23[a]	0.22	..	..
Mexico	0.17	0.18	0.17	0.12	0.11	0.11[c,p]	0.11[c,p]
Netherlands	0.83	..	0.97[a]	1.00[a]	1.00	1.02	0.98[p]
New Zealand	0.46	..	0.49	..	0.46	..	..
Norway	0.69	..	0.72	..	0.71	..	..
Poland	0.19	0.18	0.21	0.28	0.32	0.37	0.39
Portugal	0.27	0.67	0.65	0.63	0.56	0.54	..
Slovak Republic	0.18	0.22	0.22	0.30	0.33	0.28	0.30
Slovenia	0.77	1.20	1.48[a]	1.60	1.66	1.63	1.53[p]
Spain	0.51	0.58	0.59	0.59	0.59	0.57	..
Sweden	2.16[a]	..	1.87	..	2.02[m]	..	..
Switzerland	..	..	..	1.80	..	..	..
Turkey	0.26[o,y]	0.38[y]	0.39[y]	0.43[y]	0.46[y]	0.51[y]	..
United Kingdom	0.66	0.74[c]	0.77	0.74[c]	0.77	0.81[c]	0.82[c,p]
United States	1.59[j]	1.56[j]	1.62[j]	1.60[j]	1.67[j]	1.70[j]	1.79[j]
EU28 (OECD estimates)	0.89[b]	0.98[b]	1.02[b]	1.04[b]	1.05[b]	1.07[b]	..
OECD-Total	**1.34[b]**	**1.35[b]**	**1.39[b]**	**1.40[b]**	**1.43[b]**	**1.47[b]**	**..**
Argentina	0.13	..	..	..	..	..	..
China	0.88[y]	1.23[y]	1.31[y]	1.41[y]	1.48[y]	1.52[y]	1.54[y]
Romania	0.15	0.15	0.18[a]	0.17	0.12	0.13	0.18
Russian Federation	0.30[y]	0.27[y]	0.28[y]	0.28[y]	0.30	0.29	0.30
Singapore	1.27	1.07	1.19	1.07	1.06	1.19	..
South Africa	0.38	0.30	0.29	0.28	0.30	..	..
Chinese Taipei	1.55	2.00	2.10	2.19	2.27	2.32	2.38

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

Source: OECD, Main Science and Technology Indicators database, February 2017

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

Percentage

	2005	2010	2011	2012	2013	2014	2015
Australia	..	..	..	..	..	..	..
Austria	0.86[c]	1.05[c,o]	0.96	1.11[c,o]	1.00	1.11[c,o]	1.12[c,o,p]
Belgium	0.44	0.52	0.50	0.57	0.59	..	..
Canada	0.63[c]	0.65[c]	0.61[c]	0.61[a,c]	0.58[c]	0.56[c,p]	..
Chile	..	0.13[y]	0.12[y]	0.13[y]	0.15[y]	0.17[a,y]	0.16[p,y]
Czech Republic	0.53	0.60	0.65	0.66	0.66	0.65	0.63[p]
Denmark	0.66	0.82[c,o]	0.83[o]	0.87[c,o]	0.89[o]	0.87[c,o]	0.87[o,p]
Estonia	0.40	0.70	0.76	0.81	0.82	0.72	0.69[p]
Finland	0.85	0.96	0.91[a]	0.91	0.86	0.87	0.84
France	0.79	0.81[a]	0.77	0.79	0.79	0.77	..
Germany	0.69	0.82	0.84	0.84	0.82	0.83	..
Greece	0.27	0.29[c]	0.33	0.35	0.42	0.45	0.51[p]
Hungary	0.46[v]	0.45	0.46	0.47	0.50	0.46	0.48
Iceland	1.10	..	1.00[a,l]	..	0.66[a]	0.69	0.70
Ireland	0.38	0.47[c]	0.45[c]	0.43[c]	0.43[c]	0.41[c]	..
Israel[1]	0.59[d]	0.56[d]	0.52[d]	0.53[d]	0.52[d]	..	..
Italy	0.53	0.51	0.51	0.54	0.54	0.56[c]	..
Japan	0.55[b,y]	0.56[b,y]	0.55[b,y]	0.56[b,y]	0.60[a,b,y]	0.57[b,y]	0.54[b,y]
Korea	0.60[g]	0.93	0.93	0.96	0.95	0.98	1.00
Latvia	0.24	0.16	0.16	0.16	0.15	0.18	0.20[p]
Luxembourg	0.26	0.53	0.49	0.58[a]	0.63	..	..
Mexico	0.20	0.33	0.33	0.33	0.36	0.39[c,p]	0.39[c,p]
Netherlands	0.70	..	0.65[a]	0.63[a]	0.65	0.66	0.67[p]
New Zealand	0.48	..	0.51	..	0.46	..	..
Norway	0.65	..	0.76	..	0.76	..	..
Poland	0.32	0.44	0.42	0.45	0.41	0.43	0.42
Portugal	0.42	0.69	0.61	0.59	0.62	0.61	..
Slovak Republic	0.28[m]	0.31[m]	0.33[m]	0.33[m]	0.32[m]	0.36[m]	0.38[m]
Slovenia	0.53	0.73	0.76[a]	0.74	0.70	0.52	0.44[p]
Spain	0.47	0.63	0.59	0.56	0.53	0.51	..
Sweden	0.83[a]	..	0.89	..	0.93[m]	..	..
Switzerland	..	..	..	0.75	..	..	..
Turkey	0.30[o,y]	0.26[y]	0.25[y]	0.26[y]	0.25[y]	0.26[y]	..
United Kingdom	0.51	0.54[c]	0.51	0.46[c]	0.48	0.48[c]	0.48[c,p]
United States	0.77[j]	0.89[j]	0.87[j]	0.81[j]	0.76[j]	0.72[j]	0.67[j,p]
EU28 (OECD estimates)	0.59[b]	0.65[b]	0.64[b]	0.64[b]	0.64[b]	0.64[b]	..
OECD-Total	**0.64[b]**	**0.72[b]**	**0.70[b]**	**0.68[b]**	**0.67[b]**	**0.66[b]**	**..**
Argentina	0.27	..	..	..	..	..	..
China	0.34[y]	0.41[y]	0.38[y]	0.41[y]	0.42[y]	0.41[y]	0.44[y]
Romania	0.22	0.25	0.24[a]	0.24	0.20	0.19	0.20
Russian Federation	0.62[y]	0.75[y]	0.69[y]	0.71[y]	0.71	0.75	0.79
Singapore	0.79	0.81	0.82	0.77	0.79	0.81	..
South Africa	0.33	0.33	0.32	0.33	0.31	..	..
Chinese Taipei	0.73	0.77	0.76	0.73	0.70	0.65	0.64

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

Source: OECD, Main Science and Technology Indicators database, February 2017

Table 13. Percentage of Gross domestic expenditure on R&D (GERD) financed by industry

Percentage

	2005	2010	2011	2012	2013	2014	2015
Australia	..	..	..	..	..	..	..
Austria	45.6[c]	45.1[c]	46.2	45.7[c]	48.7	47.2[c]	47.0[c,p]
Belgium	59.7	57.6	60.2	61.3	61.3	..	..
Canada	49.3	47.0	49.0	47.1[a]	45.7	45.4[p]	..
Chile	..	25.4	33.9	34.9	34.2	31.9[a]	32.8[p]
Czech Republic	48.2	40.8	37.7	36.4	37.6	35.9	34.5[p]
Denmark	59.5	61.1[c]	61.2	59.9[c]	59.0	59.0[c]	59.4[p]
Estonia	38.5	43.6	55.0	51.3	42.1	37.1	41.0[p]
Finland	66.9	66.1	67.0	63.1	60.8	53.5	54.8
France	51.9	53.5[a]	55.0	55.3	55.1	55.7	..
Germany	67.6	65.5	65.6	66.1	65.4	65.8	..
Greece	31.1	36.5[c]	32.7	31.0	30.3	29.8	31.8[p]
Hungary	39.4[v]	47.4	47.5	46.9	46.8	48.3	49.7
Iceland	48.0	..	49.8[a]	..	36.9[a]	35.7	33.3
Ireland	57.4	52.2[c]	48.9[c]	50.2[c]	52.6[c]	52.8[c]	..
Israel[1]	56.2[d]	36.2[d]	37.3[d]	39.4[d]	37.0[d]	..	..
Italy	39.7	44.7	45.1	44.3	45.2	46.2[c]	..
Japan	76.1	75.9	76.5	76.1	75.5[a]	77.3	78.0
Korea	75.0[g]	71.8	73.7	74.7	75.7	75.3	74.5
Latvia	34.3	38.8	24.8	23.7	21.8	27.8	20.1[p]
Luxembourg	79.7	43.5	45.3	18.1[a]	16.5	..	..
Mexico	41.5	32.9	32.3	24.5	21.0	20.2[c,p]	20.6[c,p]
Netherlands	46.3	..	51.1[a]	51.6[a]	51.1	51.1	48.7[p]
New Zealand	41.1	..	40.0	..	39.8	..	..
Norway	46.8	..	44.2	..	43.1	..	..
Poland	33.4	24.4	28.1	32.3	37.3	39.0	39.0
Portugal	36.3	43.9	44.7	46.0	42.3	41.8	..
Slovak Republic	36.6	35.1	33.9	37.7	40.2	32.2	25.1
Slovenia	54.8	58.4	61.2[a]	62.2	63.8	68.4	69.2[p]
Spain	46.3	43.0	44.3	45.6	46.3	46.4	..
Sweden	63.9[a]	..	57.6	..	61.0	..	..
Switzerland	..	..	..	60.8	..	..	..
Turkey	43.3[o]	45.1	45.8	46.8	48.9	50.9	..
United Kingdom	42.1	44.0[c]	45.9	45.6[c]	46.2	48.0[c]	48.4[c,p]
United States	63.3[j]	56.9[j]	58.4[j]	59.2[j]	60.8[j]	61.7[j]	64.2[j,p]
EU28 (OECD estimates)	53.7[b]	53.2[b]	54.3[b]	54.4[b]	54.5[b]	54.8[b]	..
OECD-Total	**62.3[b]**	**58.5[b]**	**59.7[b]**	**60.0[b]**	**60.6[b]**	**61.3[b]**	**..**
Argentina	31.0	..	..	..	..	..	..
China	67.0	71.7	73.9	74.0	74.6	75.4	74.7
Romania	37.2	32.3	37.4[a]	34.4	31.0	32.9	37.3
Russian Federation	30.0	25.5	27.7	27.2	28.2	27.1	26.5
Singapore	58.8	53.1	55.3	53.4	52.7	54.1	..
South Africa	43.9	40.1	39.0	38.3	41.4	..	..
Chinese Taipei	66.9	71.3	72.6	74.1	75.5	77.2	77.9

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

Source: OECD, Main Science and Technology Indicators database, February 2017

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

Percentage

	2005	2010	2011	2012	2013	2014	2015
Australia	..	..	..	..	..	..	..
Austria	35.9[c]	38.3[c,o]	35.8	37.8[c,o]	33.6	36.2[c,o]	36.6[c,o,p]
Belgium	24.7	25.4	23.4	24.3	24.1	..	..
Canada	31.8[c]	35.2[c]	34.0[c]	34.3[a,c]	34.6[c]	34.6[c,p]	..
Chile	..	40.4	33.7	36.0	38.4	44.2[a]	42.6[p]
Czech Republic	45.2	44.4	41.7	36.8	34.7	32.9	32.2[p]
Denmark	27.6	28.2[c,o]	28.2[o]	29.2[c,o]	29.9[o]	29.7[c,o]	29.4[o,p]
Estonia	43.5	44.1	32.8	38.3	47.2	49.5	46.4[p]
Finland	25.7	25.7	25.0[a]	26.7	26.0	27.5	28.9
France	38.6	37.1[a]	35.1	35.4	35.3	34.6	..
Germany	28.4	30.4	29.9	29.2	29.1	28.8	..
Greece	46.8	48.3[c]	49.2	50.4	52.3	53.3	52.7[p]
Hungary	49.4[v]	39.3	38.1	36.9	35.9	33.5	34.6
Iceland	40.5	..	40.0[a]	..	37.2[a]	34.1	32.0
Ireland	32.0	29.4[c]	29.4[c]	27.5[c]	27.5[c]	27.3[c]	..
Israel[1]	14.5[d]	14.2[d]	13.0[d]	12.7[d]	12.5[d]	..	..
Italy	50.7	41.6	41.9	42.5	41.4	40.8[c]	..
Japan	16.8[b]	17.2[b]	16.4[b]	16.8[b]	17.3[a,b]	16.0[b]	15.4[b]
Korea	23.0[g]	26.7	24.9	23.8	22.8	23.0	23.7
Latvia	46.0	26.4	22.5	23.9	23.9	25.6	32.7[p]
Luxembourg	16.6	35.1	33.5	45.1[a]	48.4	..	..
Mexico	49.2	62.3	63.0	67.8	70.7	71.8[c,p]	71.2[c,p]
Netherlands	38.8	..	33.9[a]	32.4[a]	33.4	33.2	33.4[p]
New Zealand	43.2	..	41.4	..	39.8	..	..
Norway	43.6	..	46.5	..	45.8	..	..
Poland	57.7	60.9	55.8	51.3	47.2	45.2	41.8
Portugal	55.2	45.1	41.8	43.1	46.4	47.1	..
Slovak Republic	57.0[m]	49.6[m]	49.8[m]	41.6[m]	38.9[m]	41.4[m]	31.9[m]
Slovenia	37.2	35.3	31.5[a]	28.7	26.9	21.8	19.9[p]
Spain	43.0	46.6	44.5	43.1	41.6	41.4	..
Sweden	24.4[a]	..	27.5	..	28.3	..	..
Switzerland	..	..	..	25.4	..	..	..
Turkey	50.1[o]	30.8	29.2	28.2	26.6	26.3	..
United Kingdom	32.7	32.3[c]	30.5	28.7[c]	29.1	28.4[c]	28.0[c,p]
United States	30.8[j]	32.6[j]	31.3[j]	29.9[j]	27.8[j]	26.2[j]	24.0[j,p]
EU28 (OECD estimates)	35.2[b]	35.4[b]	33.8[b]	33.4[b]	33.0[b]	32.6[b]	..
OECD-Total	**29.6[b]**	**31.2[b]**	**29.9[b]**	**29.3[b]**	**28.3[b]**	**27.4[b]**	**..**
Argentina	65.3	..	..	..	..	..	..
China	26.3	24.0	21.7	21.6	21.1	20.3	21.3
Romania	53.5	54.4	49.1[a]	49.9	52.3	48.5	41.7
Russian Federation	61.9	70.3	67.1	67.8	67.6	69.2	69.5
Singapore	36.4	40.2	38.1	38.5	39.3	37.1	..
South Africa	38.2	44.5	43.1	45.4	42.9	..	..
Chinese Taipei	31.5	27.4	26.2	24.6	23.3	21.7	21.1

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

Source: OECD, Main Science and Technology Indicators database, February 2017

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

Percentage

	2005	2010	2011	2012	2013	2014	2015
Australia	..	..	..	..	..	..	..
Austria	0.4[c]	0.5[c]	1.1	0.5[c]	1.1	0.5[c]	0.5[c,p]
Belgium	3.3	3.7	3.5	1.4	1.4	..	..
Canada	10.1[c]	11.3[c]	11.1[c]	13.0[a,c]	13.8[c]	14.0[c,p]	..
Chile	..	14.4	11.2	11.6	12.5	10.2[a]	11.7[p]
Czech Republic	1.2	0.9	0.9	0.9	0.5	0.7	0.8[p]
Denmark	2.8	3.5[c]	3.6	3.8[c]	4.4	4.5[c]	4.7[p]
Estonia	1.0	0.8	0.4	0.4	0.4	1.0	0.4[p]
Finland	1.2	1.3	1.4	1.4	1.6	1.7	1.8
France	1.9	1.8[a]	2.1	1.7	1.7	2.0	..
Germany	0.3	0.2	0.3	0.4	0.3	0.3	..
Greece	3.1	3.4[c]	3.3	2.9	3.5	3.7	2.7[p]
Hungary	0.3[v]	0.9	1.0	0.9	0.8	0.7	0.7
Iceland	0.3	..	1.9[a]	..	5.9[a]	6.9	8.4
Ireland	1.9	1.4[c]	1.3[c]	1.3[c]	1.3[c]	1.3[c]	..
Israel[1]	4.6[d]	2.3[d]	2.0[d]	2.3[d]	1.3[d]	..	..
Italy	1.7	4.0	3.9	3.7	3.7	3.6[c]	..
Japan	6.8[b]	6.4[b]	6.6[b]	6.6[b]	6.7[a,b]	6.3[b]	6.1[b]
Korea	1.3[g]	1.2	1.2	1.1	1.2	1.0	1.0
Latvia	1.2	1.4	1.6	2.0	2.7	2.3	2.2[p]
Luxembourg	0.1	0.8	1.7	2.3[a]	2.8	..	..
Mexico	8.2	4.3	4.1	7.3	8.0	7.7[c,p]	7.8[c,p]
Netherlands	2.8	..	3.6[a]	3.5[a]	3.4	3.1	2.8[p]
New Zealand	10.6	..	12.2	..	13.2	..	..
Norway	1.6	..	1.5	..	1.6	..	..
Poland	3.2	2.8	2.7	3.0	2.3	2.4	2.4
Portugal	3.8	7.8	7.5	5.7	5.2	5.4	..
Slovak Republic	0.3	0.7	2.2	2.1	2.9	2.7	3.6
Slovenia	0.7	0.3	0.2[a]	0.5	0.4	0.6	0.3[p]
Spain	5.0	4.6	4.5	4.6	4.7	4.8	..
Sweden	3.6[a]	..	3.9	..	4.1	..	..
Switzerland	..	..	..	1.7	..	..	..
Turkey	5.8	23.2	24.2	24.4	23.7	21.8	..
United Kingdom	5.9	6.0[c]	5.9	5.9[c]	6.0	6.1[c]	6.0[c,p]
United States	5.9[j]	6.7[j]	6.6[j]	6.8[j]	6.9[j]	7.1[j]	7.1[j,p]
EU28 (OECD estimates)	2.3[b]	2.5[b]	2.5[b]	2.4[b]	2.4[b]	2.4[b]	..
OECD-Total	**4.8[b]**	**5.2[b]**	**5.1[b]**	**5.2[b]**	**5.3[b]**	**5.3[b]**	**5.2[b]**
Argentina	2.9	..	..	..	..	..	..
China	..	..	..	..	..	..	..
Romania	4.0	2.2	1.4[a]	1.2	1.2	1.5	1.8
Russian Federation	0.5	0.6	1.0	1.0	1.2	1.2	1.4
Singapore	0.5	1.8	1.6	2.2	2.2	2.0	..
South Africa	4.4	3.3	2.9	3.2	2.8	..	..
Chinese Taipei	1.5	1.2	1.2	1.1	1.0	1.0	0.9

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

Source: OECD, Main Science and Technology Indicators database, February 2017

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

Percentage

	2005	2010	2011	2012	2013	2014	2015
Australia	..	..	..	..	..	..	..
Austria	18.0[c]	16.1[c]	16.9	16.1[c]	16.6	16.1[c]	15.9[c,p]
Belgium	12.4	13.3	13.0	13.0	13.2	..	..
Canada	8.8	6.5	5.9	5.7[a]	5.9	6.0[p]	..
Chile	..	19.8	21.3	17.5	15.0	13.8[a]	12.9[p]
Czech Republic	5.4	13.9	19.7	25.9	27.2	30.5	32.5[p]
Denmark	10.1	7.2[c]	7.1	7.2[c]	6.7	6.8[c]	6.5[p]
Estonia	17.1	11.4	11.9	10.0	10.3	12.5	12.2[p]
Finland	6.3[a]	6.9	6.5	8.8	11.5	17.3	14.5
France	7.5	7.5[a]	7.7	7.6	7.9	7.8	..
Germany	3.7	3.9	4.2	4.3	5.2	5.0	..
Greece	19.0	11.9[c]	14.8	15.8	14.0	13.2	12.8[p]
Hungary	10.7[v]	12.4	13.5	15.4	16.6	17.5	15.0
Iceland	11.2	..	8.2[a]	..	20.0[a]	23.3	26.4
Ireland	8.6	17.0[c]	20.3[c]	21.0[c]	18.6[c]	18.6[c]	..
Israel[1]	24.7[d]	47.3[d]	47.6[d]	45.6[d]	49.2[d]	..	..
Italy	8.0	9.8	9.1	9.5	9.7	9.3[c]	..
Japan	0.3	0.4	0.5	0.4	0.5[a]	0.4	0.5
Korea	0.7[g]	0.2	0.2	0.3	0.3	0.7	0.8
Latvia	18.5	33.4	51.0	50.4	51.6	44.2	45.0[p]
Luxembourg	3.6	20.6	19.5	34.4[a]	32.3	..	..
Mexico	1.1	0.5	0.6	0.4	0.4	0.4[c,p]	0.4[c,p]
Netherlands	12.0	..	11.3[a]	12.5[a]	12.2	12.7	15.1[p]
New Zealand	5.2	..	6.3	..	7.2	..	..
Norway	8.1	..	7.8	..	9.5	..	..
Poland	5.7	11.8	13.4	13.3	13.1	13.4	16.7
Portugal	4.7	3.2	6.0	5.2	6.1	5.6	..
Slovak Republic	6.0	14.7	14.2	18.7	18.0	23.7	39.4
Slovenia	7.3	6.0	7.0[a]	8.6	8.9	9.3	10.6[p]
Spain	5.7	5.7	6.7	6.6	7.4	7.4	..
Sweden	8.1[a]	..	11.0	..	6.7	..	..
Switzerland	..	..	..	12.1	..	..	..
Turkey	0.8	0.8	0.7	0.6	0.8	1.1	..
United Kingdom	19.3	17.6[c]	17.8	19.8[c]	18.7	17.5[c]	17.6[c,p]
United States	..[n]	3.7[j]	3.8[j]	4.1[j]	4.4[j]	5.0[j]	4.7[j,p]
EU28 (OECD estimates)	8.7[b]	8.9[b]	9.3[b]	9.8[b]	10.1[b]	10.2[b]	..
OECD-Total	**..**	**5.1[b]**	**5.3[b]**	**5.5[b]**	**5.8[b]**	**6.1[b]**	**..**
Argentina	0.8	..	..	..	..	..	..
China	0.9	1.3	1.3	1.0	0.9	0.8	0.7
Romania	5.3	11.1	12.1[a]	14.4	15.5	17.0	19.2
Russian Federation	7.6	3.5	4.3	4.0	3.0	2.5	2.6
Singapore	4.4	4.9	5.0	5.9	5.8	6.8	..
South Africa	13.6	12.1	15.0	13.1	12.9	..	..
Chinese Taipei	0.1	0.0	0.0	0.1	0.1	0.1	0.1

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

Source: OECD, Main Science and Technology Indicators database, February 2017

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

Percentage

	2005	2010	2011	2012	2013	2014	2015
Australia	..	58.2[c]	57.9[c,v]	..	56.3[c]	..	..
Austria	69.8[c]	68.4[c]	68.8	70.4[c]	70.8	70.8[c]	70.8[c,p]
Belgium	68.0	67.1	68.7	70.9	70.7	71.2[c]	71.9[p]
Canada	55.8[g]	51.7[g]	53.1[g]	51.1[a,g]	50.1[g]	49.9[g,p]	..
Chile	..	29.6	34.0	34.4	35.0	33.4[a]	34.3[p]
Czech Republic	59.3	57.7	55.3	53.6	54.1	56.0	54.3[p]
Denmark	68.3	67.0	66.7	65.6	63.3	63.8	64.0[p]
Estonia	45.1	50.2	63.2	57.5	47.7	43.5	46.0[p]
Finland	70.8	69.6	70.5	68.7	68.9	67.7	66.7
France	62.1	63.2[a]	64.0	64.6	64.6	65.0	65.1[p]
Germany	69.3	67.0	67.6	68.0	67.2	67.5	67.7[c,p]
Greece	31.0	39.4[c]	34.9	34.3	33.3	33.9	33.3[p]
Hungary	43.2[v]	59.8[v]	62.4[v]	65.6[v]	69.4[v]	71.5[v]	73.4[v]
Iceland	51.5	..	53.1[a]	..	55.8[a,o]	61.1[o]	64.7[o]
Ireland	65.5	68.7[c]	69.8[c]	71.8[c]	71.9[c]	72.1[c]	..
Israel[1]	81.5[d]	83.0[d]	83.8[d]	84.1[d]	84.3[d]	84.8[d]	85.4[d]
Italy	50.4	53.9	54.6	54.2	54.7	55.4[c]	55.3[p]
Japan	76.4	76.5	77.0	76.6	76.1[a]	77.8	78.5
Korea	76.9[g]	74.8	76.5	77.9	78.5	78.2	77.5
Latvia	40.7	37.0	27.8	22.6	28.2	35.5	24.8[p]
Luxembourg	86.4	66.3	65.9	55.3[a]	52.5	53.7	51.0[p]
Mexico	46.9	35.2	34.9	29.7	31.2	30.6[c,p]	30.9[c,p]
Netherlands	52.9	47.9	56.6[a]	56.6[a]	55.7	56.0	55.6[p]
New Zealand	41.6	..	45.4	..	46.4	..	..
Norway	53.5	51.2	52.2	52.3	52.5	53.7	54.3[p]
Poland	31.8	26.6	30.1	37.2	43.6	46.6	46.6
Portugal	38.5	45.9	47.4	49.7	47.5	46.4	47.1[p]
Slovak Republic	49.8	42.1	37.2	41.3	46.3	36.8	28.0
Slovenia	58.8	67.8	73.9[a]	75.7	76.5	77.3	76.3[p]
Spain	53.8	51.5	52.1	53.0	53.1	52.9	52.5
Sweden	72.8[a]	68.7[c]	69.1	67.8[c]	68.9[l]	67.0[c]	69.5[p]
Switzerland	..	..	..	69.3	..	..	..
Turkey	33.8	42.5	43.2	45.1	47.5	49.8	..
United Kingdom	61.4	60.9[c]	63.6	63.3[c]	63.9	65.1[c]	65.7[c,p]
United States	68.9[j]	68.0[j]	68.4[j]	69.2[j]	70.5[j]	71.1[j]	71.5[j,p]
EU28 (OECD estimates)	62.2[b]	61.1[b]	62.4[b]	62.8[b]	62.8[b]	63.2[b]	63.3[b]
OECD-Total	**67.7[b]**	**66.4[b]**	**67.2[b]**	**67.5[b]**	**68.1[b]**	**68.7[b]**	**68.8[b]**
Argentina	32.2	27.0[p]	27.6[p]	25.3[p]	24.2[p]	20.1[p]	..
China	68.3	73.4	75.7	76.2	76.6	77.3	76.8
Romania	49.7	38.3	36.0[a]	39.0	30.7	41.5	44.0
Russian Federation	68.0	60.5	61.0	58.3	60.6	59.6	59.2
Singapore	66.2	60.8	62.1	60.9	59.4	61.2	..
South Africa	58.3	49.7	47.1	44.3	45.9	..	..
Chinese Taipei	67.0	71.6	72.7	74.3	75.7	77.2	77.8

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

Source: OECD, Main Science and Technology Indicators database, February 2017

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

Percentage

	2005	2010	2011	2012	2013	2014	2015
Australia	..	26.4[c]	28.1[c,v]	..	29.6[c]	..	..
Austria	24.7[c]	25.8[c]	25.6	24.6[c]	24.3	24.3[c]	24.3[c,p]
Belgium	22.3	23.5	22.3	20.5	20.9	20.2[c]	19.9[p]
Canada	34.0	36.8	37.2	39.6[a]	39.8	40.4[p]	..
Chile	..	38.5	32.4	34.3	39.3	39.0[a]	38.5[p]
Czech Republic	18.1	20.0	24.4	27.5	27.2	25.4	24.9[p]
Denmark	24.6	30.3	30.9	31.6	33.9	33.5	33.4[p]
Estonia	41.4	38.0	27.8	32.1	42.3	44.3	41.4[p]
Finland	19.0	20.4	20.0	21.6	21.5	22.9	24.4
France	18.8	21.6[a]	20.9	20.8	20.9	20.6	20.3[p]
Germany	16.5	18.2	17.9	17.7	17.9	17.7	17.4[c,p]
Greece	47.5	35.7[c]	40.2	39.9	37.4	37.2	38.2[p]
Hungary	25.1[v]	19.9[v]	20.2[v]	18.4[v]	14.4[v]	13.5[v]	12.1[v]
Iceland	22.0	..	26.4[a,m]	..	37.4[a]	32.8	30.5
Ireland	27.1	26.5[c]	25.3[c]	23.4[c]	23.5[c]	23.4[c]	..
Israel[1]	14.9[d,g]	13.7[d]	12.9[d]	12.8[d]	12.7[d]	12.3[d]	11.7[d]
Italy	30.2[a]	28.8	28.6	28.0	28.3	28.4[c]	28.6[p]
Japan	13.4	12.9	13.2	13.4	13.5[a]	12.6	12.3
Korea	9.9[g]	10.8	10.1	9.5	9.2	9.0	9.1
Latvia	40.6	40.0	48.9	50.3	42.9	40.5	49.6[p]
Luxembourg	1.5	12.4	10.7	16.9[a]	18.6	16.4	17.8[p]
Mexico	28.7	29.1	30.8	27.5	26.1	26.3[c,p]	26.2[c,p]
Netherlands	34.7	40.4	32.6[a]	31.6[a]	32.1	32.1	32.1[p]
New Zealand	32.5	..	31.8	..	30.4	..	..
Norway	30.8	32.3	31.4	31.3	31.5	31.0	30.7[p]
Poland	31.6	37.2	35.1	34.4	29.3	29.2	28.9
Portugal	35.4	36.9	36.4	36.5	44.6[a]	45.6	45.5[p]
Slovak Republic	20.4	27.6	34.9	34.0	33.1	34.4	43.8
Slovenia	16.7	13.9	11.8[a]	11.1	10.4	10.5	10.2[p]
Spain	29.0	28.3	28.2	27.7	28.0	28.1	28.1
Sweden	22.0[a]	26.3[c]	26.3	27.1[c]	27.1[l]	29.0[c]	26.9[p]
Switzerland	..	..	..	28.1	..	..	..
Turkey	54.6	46.0	45.5	43.9	42.1	40.5	..
United Kingdom	25.7	27.0[c]	26.0	26.7[c]	26.4	25.8[c]	25.6[c,p]
United States	14.3[j]	14.7[j]	14.5[j]	14.5[j]	14.0[j]	13.5[j,p]	13.2[j,p]
EU28 (OECD estimates)	22.6[b]	24.3[b]	23.6[b]	23.5[b]	23.6[b]	23.4[b]	23.2[b]
OECD-Total	**17.7[b]**	**18.7[b]**	**18.4[b]**	**18.4[b]**	**18.2[b]**	**17.8[b]**	**17.7[b]**
Argentina	25.8	29.3[p]	30.2[p]	29.6[p]	29.1[p]	30.5[p]	..
China	9.9	8.5	7.9	7.6	7.2	6.9	7.0
Romania	13.7	24.5	22.9[a]	19.7	19.7	15.2	17.4
Russian Federation	5.8	8.4	9.0	9.3	9.0	9.8	9.6
Singapore	24.2	28.8	27.7	29.0	29.2	27.4	..
South Africa	19.3	26.8	29.8	30.7	28.4	..	..
Chinese Taipei	11.4	12.1	11.8	11.3	10.7	10.0	9.4

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

Source: OECD, Main Science and Technology Indicators database, February 2017

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

Percentage

	2005	2010	2011	2012	2013	2014	2015
Australia	..	12.4[c]	11.2[c,v]	..	11.2[c]	..	..
Austria	5.2[c]	5.2[c]	5.1	4.6[c]	4.4	4.4[c]	4.4[c,p]
Belgium	8.4	8.4	8.1	8.2[a]	8.1	8.2[c]	7.8[p]
Canada	9.7	11.0	9.4	8.9[a]	9.6	9.2[p]	..
Chile	..	3.7	4.0	4.1	8.4[a]	8.1[a]	7.8[p]
Czech Republic	22.1	21.7	19.8	18.4	18.3	18.2	20.4[p]
Denmark	6.5	2.2	2.0	2.4	2.4	2.3	2.3[p]
Estonia	11.3	10.6	8.1	9.3	8.9	11.0	10.8[p]
Finland	9.6	9.2	8.8	9.0	8.9	8.6	8.2
France	17.8	14.0[a]	13.9	13.2	13.1	12.9	13.1[p]
Germany	14.1[o]	14.8[o]	14.5[o]	14.3[o]	14.9[o]	14.8[o]	14.9[c,o,p]
Greece	20.3	23.7[c]	23.8	24.8	28.0	27.7	27.6[p]
Hungary	28.0[v]	18.5[v]	15.8[v]	14.4[v]	14.9[v]	13.7[v]	13.3[v]
Iceland	23.5	..	17.7[a]	..	6.8[a]	6.1	4.8
Ireland	7.4	4.8[c]	4.9[c]	4.8[c]	4.6[c]	4.5[c]	..
Israel[1]	2.7[d]	2.1[d]	2.1[d]	1.9[d]	1.8[d]	1.8[d]	1.7[d]
Italy	17.3	13.7	13.4	14.8	14.0	13.3[c]	13.3[p]
Japan	8.3	9.0	8.4	8.6	9.2[a]	8.3	7.9
Korea	11.9[g]	12.7	11.7	11.3	10.9	11.2	11.7
Latvia	18.7	23.0	23.3	27.1	28.9	24.0	25.6[p]
Luxembourg	12.1[o]	21.3[o]	23.4[o]	27.8[a,o]	29.0[o]	29.9[o]	31.1[o,p]
Mexico	23.2	33.4	32.2	38.0	38.0	38.5[c,p]	38.2[c,p]
Netherlands	12.4[o]	11.7[o]	10.8[a,o]	11.8[a,o]	12.2[o]	11.9[o]	12.3[o,p]
New Zealand	25.9	..	22.7	..	23.2	..	..
Norway	15.7	16.4	16.4	16.4	16.0	15.2	15.1[p]
Poland	36.4	35.9	34.5	28.0	26.8	24.0	24.4
Portugal	14.6	7.1	7.4	5.4	6.5	6.3	5.9[p]
Slovak Republic	29.7[d]	30.0[d]	27.7[d]	24.5[d]	20.5[d]	28.3[d]	27.9[d]
Slovenia	24.2	18.2	14.3[a]	13.1	13.0	12.2	13.5[p]
Spain	17.0	20.1	19.5	19.1	18.7	18.8	19.1
Sweden	4.9[a]	4.9[c]	4.3	4.8[c]	3.7	3.7[c]	3.4[p]
Switzerland	..	..	..	0.8[h]	..	..	..
Turkey	11.6	11.4	11.3	11.0	10.4	9.7	..
United Kingdom	10.6	9.5[c]	8.6	8.0[c]	7.9	7.3[c]	6.8[c,p]
United States	12.3[h,j]	12.7[j]	12.8[j]	12.2[j]	11.4[j]	11.3[j]	11.2[j,p]
EU28 (OECD estimates)	14.1[b]	13.3[b]	12.9[b]	12.7[b]	12.7[b]	12.4[b]	12.5[b]
OECD-Total	**12.0[b]**	**12.2[b]**	**11.9[b]**	**11.6[b]**	**11.4[b]**	**11.1[b]**	**11.1[b]**
Argentina	39.7	42.1[p]	40.6[p]	43.4[p]	45.0[p]	47.7[p]	..
China	21.8	18.1	16.3	16.3	16.2	15.8	16.2
Romania	34.2	36.8	40.7[a]	40.9	49.2	43.0	38.3
Russian Federation	26.1	31.0	29.8	32.2	30.3	30.5	31.1
Singapore	9.7	10.4	10.2	10.0	11.3	11.4	..
South Africa	20.8	22.7	22.4	22.9	23.4	..	..
Chinese Taipei	21.0	15.9	15.1	14.1	13.3	12.6	12.5

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

Source: OECD, Main Science and Technology Indicators database, February 2017

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

Percentage

	2005	2010	2011	2012	2013	2014	2015
Australia	..	2.96[c]	2.98[c,v]	..	2.84[c]	..	..
Austria	0.30[c]	0.49[c]	0.49	0.44[c]	0.42	0.42[c]	0.42[c,p]
Belgium	1.31	0.91	0.90	0.38[a]	0.36	0.35[c]	0.34[p]
Canada	0.53	0.44	0.40	0.46[a]	0.49	0.50[p]	..
Chile	..	28.16	29.57	27.23	17.28[a]	19.52[a]	19.36[p]
Czech Republic	0.51	0.61	0.55	0.51	0.34	0.41	0.39[p]
Denmark	0.67	0.44	0.37	0.41	0.42	0.41	0.37[p]
Estonia	2.20	1.25	0.91	1.05	1.06	1.19	1.80[p]
Finland	0.58	0.68	0.71	0.68	0.71	0.77	0.77
France	1.29	1.25[a]	1.25	1.44	1.47	1.54	1.55[p]
Germany	..[n]	..[n]	..[n]	..[n]	..[n]	..[n]	..[n]
Greece	1.26	1.13[c]	1.01	0.96	1.25	1.24	0.78[p]
Hungary	..	..	..	..	..	..	..
Iceland	2.99	..	2.75[a]	..	..[n]	..[n]	..[n]
Ireland	..	..	..	..	..	..	..
Israel[1]	0.97[d]	1.22[d]	1.20[d]	1.21[d]	1.22[d]	1.21[d]	1.23[d]
Italy	2.12	3.62	3.34	2.96	2.99	2.97[c]	2.88[p]
Japan	1.86	1.59	1.45	1.40	1.28[a]	1.34	1.33
Korea	1.36[g]	1.71	1.65	1.28	1.33	1.52	1.64
Latvia	0.00	..	..	..	..	..	..
Luxembourg	..[n]	..[n]	..[n]	..[n]	..[n]	..[n]	..[n]
Mexico	1.13	2.26	2.13	4.80	4.68	4.55[c,p]	4.62[c,p]
Netherlands	..[n]	..[n]	..[n]	..[n]	..[n]	..[n]	..[n]
New Zealand	..	..	..	..	..	..	..
Norway	..	..	..	..	..	..	..
Poland	0.31	0.28	0.23	0.40	0.29	0.30	0.16
Portugal	11.52	10.09	8.84	8.47	1.33[a]	1.72	1.47[p]
Slovak Republic	0.08	0.31	0.21	0.10	0.15	0.41	0.40
Slovenia	0.22	0.06	0.05[a]	0.05	0.04	0.04	0.04[p]
Spain	0.14	0.19	0.17	0.19	0.17	0.17	0.21
Sweden	0.31[a]	0.03[c,m]	0.32[a]	0.29[c]	0.22[l]	0.24[c]	0.19[p]
Switzerland	..	..	..	1.84	..	..	..
Turkey	..	..	..	..	..	..	..
United Kingdom	2.32	2.48[c]	1.81	1.91[c]	1.79	1.81[c]	1.86[c,p]
United States	4.44[c,j]	4.54[c,j]	4.26[c,j]	4.17[c,j]	4.10[c,j]	4.12[c,j]	4.08[c,j,p]
EU28 (OECD estimates)	1.08[b]	1.21[b]	1.06[b]	1.04[b]	0.95[b]	0.98[b]	0.96[b]
OECD-Total	**2.65[b]**	**2.70[b]**	**2.51[b]**	**2.44[b]**	**2.36[b]**	**2.40[b]**	**2.40[b]**
Argentina	2.23	1.55[p]	1.60[p]	1.68[p]	1.67[p]	1.75[p]	..
China	..	..	..	..	..	..	..
Romania	2.44	0.41	0.38[a]	0.40	0.40	0.37	0.30
Russian Federation	0.18	0.19	0.17	0.18	0.13	0.13	0.14
Singapore	..	..	..	..	..	..	..
South Africa	1.60	0.80	0.77	2.11	2.27	..	..
Chinese Taipei	0.48	0.36	0.34	0.30	0.32	0.33	0.31

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

Source: OECD, Main Science and Technology Indicators database, February 2017

Table 21. Total researchers in headcount

Headcount

	2005	2010	2011	2012	2013	2014	2015
Australia	..	..	..	..	..	..	..
Austria	..	..	65 609	..	71 448	..	..
Belgium	48 757	59 403	63 207	..	66 724	..	..
Canada	..	..	..	..	..	..	..
Chile	..	9 453[m]	9 388	10 447	9 795	12 303	13 015[p]
Czech Republic	37 542	43 418	45 902	47 651	51 455	54 493	..
Denmark	43 460	54 813	56 845	57 520	57 876	59 287	..
Estonia	5 734	7 491	7 646	7 634	7 515	7 721	..
Finland	50 773	57 163	57 549	56 704	56 720	55 515	..
France	251 599	324 551[a]	338 470	356 445	366 299	369 999	..
Germany	406 253	..	522 010	..	549 283	..	..
Greece	33 396	..	45 239[a]	..	53 744	..	..
Hungary	31 407	35 700	36 945	37 019	37 803	39 190	..
Iceland	3 821	..	3 270[a]	..	3 356[a]	..	3 722[a]
Ireland	17 653	20 801[c]	22 358	..	25 393	..	..
Israel[1]	..	..	..	..	..	..	..
Italy	125 534	149 807	151 597	157 960	163 925	168 074	..
Japan	861 901	894 138	892 684	887 067	892 406	926 671	907 455
Korea	234 702[g]	345 912	375 176	401 724	410 333	437 447	453 262
Latvia	5 748	6 517	7 377	7 995	7 448	7 939	..
Luxembourg	2 443	..	3 114	..	2 713	..	..
Mexico	..	54 532	56 481	41 419	42 222	..	..
Netherlands	57 782	64 829	84 072[a]	107 184[a]	110 536	111 795	..
New Zealand	22 186	..	28 100	..	29 300	..	..
Norway	36 555	44 774	45 578	46 747	47 795	50 025	..
Poland	97 875	100 934	100 723	103 627	109 611	115 375	..
Portugal	37 769	80 259	82 354	81 750	78 290[a]	78 736	..
Slovak Republic	17 526	24 049	24 711	25 069	24 441	25 080	..
Slovenia	7 644	11 056	12 514[a]	12 362	12 111	12 155	..
Spain	181 023	224 000	220 254	215 544	208 767	210 104	..
Sweden	82 459[a,u]	..	80 154[m]	..	101 820[a,m]	..	..
Switzerland	..	..	..	60 278	..	..	..
Turkey	83 856	124 796	137 452	155 133	166 097	181 544	..
United Kingdom	364 807[c]	394 755[c]	429 009	442 385[c]	466 689	489 181[c]	..
United States	..	..	..	..	..	..	..
EU28 (OECD estimates)	..	..	..	..	..	..	..
OECD-Total	**..**	**..**	**..**	**..**	**..**	**..**	**..**
Argentina	49 050	72 208[p]	77 354[p]	80 245[p]	81 964[p]	83 837[p]	..
China	..	1 747 589	1 905 899	2 069 650	..	..	..
Romania	29 608	30 707	25 489[a]	27 838	27 600	27 535	..
Russian Federation	391 121[m]	368 915[m]	374 791[m]	372 620[m]	369 015[m]	373 905[m]	379 411[m]
Singapore	27 969	36 561	38 013	38 432	40 385	40 730	..
South Africa	39 266	37 901	40 653	42 828	45 935	..	..
Chinese Taipei	115 954	165 585	174 600	179 830	180 353	182 119	183 571

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

Source: OECD, Main Science and Technology Indicators database, February 2017

Table 22. Women researchers as a percentage of total researchers

Based on headcount

Percentage

	2005	2010	2011	2012	2013	2014	2015
Australia	..	..	..	..	..	..	..
Austria	..	..	29.0	..	29.6	..	..
Belgium	29.6	33.2	33.5	..	33.4	..	..
Canada	..	..	..	..	..	..	..
Chile	..	32.4	30.8	31.0	34.3	31.5	33.0[p]
Czech Republic	28.8	28.1	28.2	27.5	28.3	27.2	..
Denmark	29.7	32.6[c]	33.1	35.4[c]	35.2	..	..
Estonia	40.8	43.4	43.7	44.0	44.4	44.0	..
Finland	30.2	31.9	32.1	32.2	31.5	32.1	..
France	28.0	25.3[a,m]	25.6[m]	25.5[m]	25.5[m]	26.1[a,m]	..
Germany	21.3	..	26.8	..	27.9	..	..
Greece	36.4	..	36.7[a]	..	39.4	..	..
Hungary	34.2	32.0	31.7	30.9	30.3	30.4	..
Iceland	39.3	..	37.3[a]	..	43.8[a]	..	45.6[a]
Ireland	30.3	34.4[c]	32.6	..	32.3	..	..
Israel[1]	..	..	..	..	..	..	..
Italy	32.3	34.5	34.9	35.5	35.7	36.0	..
Japan	11.9	13.8	14.0	14.4	14.6	14.7	15.3
Korea	12.9[g]	16.7	17.3	17.7	18.2	18.5	18.9
Latvia	51.5	50.8	53.3	52.8	52.0	..	..
Luxembourg	18.2	..	22.9	..	27.3	..	..
Mexico	..	..	..	32.8	33.0	..	..
Netherlands	21.0	..	24.2[a]	24.0[a]	23.6	23.4	..
New Zealand	..	..	..	..	..	..	..
Norway	31.6	35.7	36.2	36.2	36.9	37.4	..
Poland	39.3	39.0	38.6	38.3	37.8	37.2	..
Portugal	44.4	43.9	44.0	45.0	45.4[a]	44.3	..
Slovak Republic	41.5	42.4	42.6	42.3	42.7	42.5	..
Slovenia	34.8	36.3	36.4[a]	35.8	36.0	36.1	..
Spain	36.7	38.4	38.7	38.8	39.3	39.6	..
Sweden	35.7[u]	..	37.2	..	33.3[a]	..	..
Switzerland	..	..	..	32.4	..	..	..
Turkey	36.1	35.8	35.6	36.2	36.2	36.9	..
United Kingdom	35.7[c]	38.3[c]	37.7	37.8[c]	38.1	37.4[c]	..
United States	..	..	..	..	..	..	..
EU28 (OECD estimates)	..	..	..	..	..	..	..
OECD-Total	**..**	**..**	**..**	**..**	**..**	**..**	**..**
Argentina	50.5	52.2[p]	52.7[p]	52.6[p]	52.4[p]	52.9[p]	..
China	..	..	..	..	..	..	..
Romania	45.3	44.0	46.1[a]	45.1	45.7	46.0	..
Russian Federation	42.4	41.7	41.4	41.2	40.9	40.5	40.3
Singapore	26.3	29.3	29.2	29.6	29.6	30.1	..
South Africa	39.7	41.7	42.3	43.7	44.0	..	..
Chinese Taipei	19.6	20.9	21.5	21.8	22.0	22.1	22.2

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

Source: OECD, Main Science and Technology Indicators database, February 2017

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

Million USD

	2005	2010	2011	2012	2013	2014	2015
Australia	7 515.5	11 983.0	12 124.9[v]	..	13 027.6	..	..
Austria	4 770.9[c]	6 567.0[c]	6 847.5	8 038.4[c]	8 511.7	8 997.2[c]	9 291.9[c,p]
Belgium	4 233.8	6 021.0	6 747.6	7 898.1	8 375.0	8 817.9[c]	9 090.7[p]
Canada	12 886.0[g]	12 941.2[g]	13 625.3[g]	13 417.9[g]	13 113.7[g]	12 841.8[g,p]	..
Chile	..	304.4	419.5	466.7	541.6	512.9	554.8[p]
Czech Republic	1 552.2	2 239.7	2 601.4	2 917.1	3 298.2	3 763.7	3 764.9[p]
Denmark	3 023.3	4 673.8	4 859.9	4 897.4	4 941.0	5 027.7	5 271.8[p]
Estonia	93.2	228.4	474.7	420.3	298.1	237.3	262.3[p]
Finland	3 958.3	5 401.0	5 620.3	5 167.9	5 088.1	4 869.7	4 478.6
France	24 554.5	32 184.0	34 290.4	35 581.4	37 722.7	38 710.5	39 626.7[p]
Germany	44 288.0	58 402.0	64 758.0	68 327.0	69 199.4	74 351.7	76 412.6[c]
Greece	504.0	740.2[c]	681.3	669.8	774.8	816.7	912.1[p]
Hungary	685.1[v]	1 470.5[v]	1 690.4[v]	1 899.9[v]	2 335.9[v]	2 451.5[v]	2 634.8[v]
Iceland	152.9	161.0[a,c]	166.8[a,l]	..	136.0[a,o]	178.5[o]	223.7[o]
Ireland	1 314.6	2 162.4[c]	2 236.4	2 383.4[c]	2 494.6	2 584.0[c]	..
Israel[1]	5 677.4[d]	7 194.0[d]	7 979.6[d]	8 788.5[d]	9 643.0[d]	10 395.0[d]	11 126.6[d]
Italy	9 186.6	13 709.0	14 268.5	14 854.5	15 585.0	16 807.0	16 659.1[p]
Japan	98 384.0	107 581.3	114 204.6	116 716.3	125 340.2	132 644.8	133 499.1
Korea	23 531.2[g]	39 025.0	44 680.5	50 559.8	53 679.2	57 272.0	57 538.9
Latvia	66.9	83.4	78.8	64.9	79.0	116.6	76.2[p]
Luxembourg	431.1	432.9	459.8	342.3[a]	355.4	384.0	388.6
Mexico	2 510.0	3 274.2	3 410.3	2 909.8	3 215.6	3 549.4[c,p]	3 682.3[c,p]
Netherlands	5 761.6	6 121.1	8 278.9[a]	8 585.1[a]	8 896.9	9 275.6	9 404.1[p]
New Zealand	495.1	..	802.9	..	861.9	..	..
Norway	1 752.6	2 398.7	2 610.4	2 779.1	2 952.5	3 110.9	3 382.1[p]
Poland	947.8	1 539.6	1 954.9	2 973.6	3 573.6	4 283.7	4 772.8
Portugal	695.5	2 035.9	1 952.1	1 905.1	1 840.1	1 794.9	1 849.2[p]
Slovak Republic	219.8	349.7	343.9	479.6	576.0	511.2	534.7
Slovenia	398.0	794.4	1 058.5[a]	1 158.7	1 213.0	1 179.7	1 113.5[p]
Spain	7 128.0	10 345.4	10 357.2	10 208.0	10 244.0	10 243.9	10 376.2
Sweden	7 564.0[a]	8 639.7[c]	9 279.2	9 470.3[c]	10 004.1	9 498.1[c]	10 635.9[p]
Switzerland	..	..	..	9 467.7	..	..	..
Turkey	1 554.8	4 292.3	4 985.9	5 776.5	6 575.6	7 634.8	..
United Kingdom	18 809.0	22 922.5	24 655.7	24 381.2	26 558.1	28 797.1	30 429.3[c,p]
United States	226 159.0[j]	278 977.0[j]	294 092.0[j]	302 251.0[j]	322 528.0[j]	340 728.0[j]	359 652.0[j,p]
EU28 (OECD estimates)	141 043.2[b]	188 463.0[b]	205 010.4[b]	214 320.3[b]	223 533.4[b]	235 510.9[b]	243 268.3[b]
OECD-Total	**526 819.5[b]**	**664 330.8[b]**	**711 564.2[b]**	**738 795.8[b]**	**783 553.1[b]**	**826 740.1[b]**	**856 409.9[b]**
Argentina	730.9	1 148.5[p]	1 282.4[p]	1 331.3[p]	1 291.4[p]	1 005.6[p]	..
China	59 320.3	156 726.1	187 684.1	222 508.3	255 985.9	286 086.9	313 948.3
Romania	413.6	581.1	622.2[a]	677.4	445.5	625.1[b]	891.1[b]
Russian Federation	12 317.7	20 025.3	21 451.5	22 116.5	22 189.7	23 762.3	23 991.2
Singapore	3 360.7	4 386.2	5 194.4	5 005.9	5 215.9	6 157.8	..
South Africa	2 360.3	2 201.8	2 191.9	2 137.2	2 284.4	..	..
Chinese Taipei	10 257.5	17 943.7	19 949.5	21 589.2	23 238.4	25 060.1	26 184.3

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

Source: OECD, Main Science and Technology Indicators database, February 2017

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

Percentage

	2005	2010	2011	2012	2013	2014	2015
Australia	1.05	1.28	1.23[v]	..	1.19	..	..
Austria	1.66[c]	1.87[c]	1.84	2.06[c]	2.10	2.16[c]	2.18[c,p]
Belgium	1.21	1.38	1.48	1.68	1.72	1.75[c]	1.77[p]
Canada	1.10[g]	0.95[g]	0.95[g]	0.92[g]	0.84[g]	0.80[g,p]	..
Chile	..	0.10[y]	0.12[y]	0.13[y]	0.14[y]	0.13[y]	0.13[p,y]
Czech Republic	0.69	0.77	0.86	0.96	1.03	1.10	1.06[p]
Denmark	1.63	1.96	1.96	1.95	1.88	1.86	1.89[p]
Estonia	0.42	0.79	1.46	1.22	0.82	0.63	0.69[p]
Finland	2.36	2.59	2.56	2.35	2.26	2.15	1.94
France	1.27	1.37	1.40	1.44	1.45	1.45	1.45[p]
Germany	1.68	1.82	1.89	1.95	1.90	1.95	1.95[c]
Greece	0.18	0.24[c]	0.23	0.24	0.27	0.28	0.32[p]
Hungary	0.40[v]	0.69[v]	0.75[v]	0.83[v]	0.97[v]	0.97[v]	1.01[v]
Iceland	1.39	1.32[a,c]	1.32[a,l]	..	0.98[a,o]	1.23[o]	1.42[o]
Ireland	0.78	1.10[c]	1.07	1.12[c]	1.12	1.09[c]	..
Israel[1]	3.30[d]	3.27[d]	3.37[d]	3.50[d]	3.49[d]	3.62[d]	3.63[d]
Italy	0.53	0.66	0.66	0.69	0.72	0.76	0.74[p]
Japan	2.53[y]	2.49[y]	2.60[y]	2.56[y]	2.65[y]	2.79[y]	2.74[y]
Korea	2.02[g]	2.59	2.87	3.14	3.26	3.35	3.28
Latvia	0.22	0.23	0.19	0.15	0.17	0.24	0.15[p]
Luxembourg	1.37	1.00	0.97	0.71[a]	0.69	0.69	0.67
Mexico	0.19	0.19	0.18	0.15	0.16	0.16[c,p]	0.17[c,p]
Netherlands	0.95	0.83	1.08[a]	1.10[a]	1.09	1.12	1.12[p]
New Zealand	0.47	..	0.56	..	0.54	..	..
Norway	0.79	0.85	0.85	0.85	0.87	0.92	1.05[p]
Poland	0.18	0.19	0.22	0.33	0.38	0.44	0.47
Portugal	0.29	0.70	0.69	0.68	0.63	0.60	0.60[p]
Slovak Republic	0.25	0.26	0.25	0.33	0.38	0.32	0.33
Slovenia	0.83	1.40	1.79[a]	1.95	1.99	1.84	1.69[p]
Spain	0.59	0.69	0.69	0.68	0.67	0.65	0.64
Sweden	2.47[a]	2.21[c]	2.24	2.22[c]	2.28	2.11[c]	2.27[p]
Switzerland	..	..	..	2.06	..	..	..
Turkey	0.20[y]	0.36[y]	0.37[y]	0.42[y]	0.45[y]	0.50[y]	..
United Kingdom	0.96	1.02	1.07	1.02	1.06	1.09	1.12[c,p]
United States	1.73[j]	1.86[j]	1.90[j]	1.87[j]	1.93[j]	1.96[j]	1.99[j,p]
EU28 (OECD estimates)	1.03[b]	1.12[b]	1.17[b]	1.21[b]	1.21[b]	1.24[b]	1.23[b]
OECD-Total	**1.46[b]**	**1.53[b]**	**1.57[b]**	**1.58[b]**	**1.61[b]**	**1.64[b]**	**1.65[b]**
Argentina	0.14	0.15[p]	0.16[p]	0.16[p]	0.15[p]	0.12[p]	..
China	0.89[y]	1.26[y]	1.34[y]	1.45[y]	1.52[y]	1.56[y]	1.59[y]
Romania	0.20	0.17	0.18[a]	0.19	0.12	0.16	0.22
Russian Federation	0.68[y]	0.64[y]	0.62[y]	0.61[y]	0.64	0.65	0.67
Singapore	1.43	1.22	1.34	1.22	1.20	1.34	..
South Africa	0.50	0.37	0.35	0.32	0.33	..	..
Chinese Taipei	1.56	2.01	2.11	2.19	2.27	2.32	2.38

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

Source: OECD, Main Science and Technology Indicators database, February 2017

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

Million 2010 USD

	2005	2010	2011	2012	2013	2014	2015
Australia	8 575.2	11 983.0	11 946.7[v]	..	12 136.9	..	..
Austria	5 465.9[c]	6 567.0[c]	6 646.4	7 487.0[c]	7 638.5	7 918.8[c]	8 037.1[c,p]
Belgium	4 946.5	6 021.0	6 590.4	7 468.5	7 670.1	7 944.2[c]	8 116.1[p]
Canada	14 194.1[g]	12 941.2[g]	13 400.2[g]	13 086.5[g]	12 367.0[g]	12 019.5[g,p]	..
Chile	..	304.4	395.4	435.3	492.6	462.8	496.9[p]
Czech Republic	1 782.5	2 239.7	2 543.4	2 801.0	2 999.2	3 308.6	3 311.4[p]
Denmark	3 863.5	4 673.8	4 758.8	4 745.5	4 610.1	4 638.5	4 789.6[p]
Estonia	122.3	228.4	451.4	394.6	269.9	212.9	235.3[p]
Finland	4 713.8	5 401.0	5 474.2	4 945.9	4 727.7	4 453.1	4 021.8
France	28 631.5	32 184.0	33 504.3	34 488.0	34 846.8	35 279.3	35 658.3[p]
Germany	50 727.8	58 402.0	62 891.1	65 226.8	63 703.3	66 563.3	67 638.7[c]
Greece	571.9	740.2[c]	668.9	633.7	691.5	727.2	817.9[p]
Hungary	865.5[v]	1 470.5[v]	1 628.9[v]	1 789.6[v]	2 124.6[v]	2 223.4[v]	2 382.9[v]
Iceland	162.8	161.0[a,c]	165.1[a,l]	..	129.6[a,o]	165.0[o]	198.1[o]
Ireland	1 505.1	2 162.4[c]	2 116.9	2 174.8[c]	2 210.1	2 330.3[c]	..
Israel[1]	5 860.9[d]	7 194.0[d]	7 779.1[d]	8 279.9[d]	8 626.5[d]	9 222.4[d]	9 481.3[d]
Italy	11 138.0	13 709.0	13 824.9	13 991.8	14 288.7	15 227.7	14 841.1[p]
Japan	107 499.9	107 581.3	112 001.8	112 120.1	117 582.4	123 799.1	122 299.3
Korea	24 835.6[g]	39 025.0	44 716.9	50 096.2	53 507.2	56 951.4	57 152.9
Latvia	81.4	83.4	75.9	61.3	72.6	104.8	68.1[p]
Luxembourg	524.7	432.9	428.3	311.8[a]	315.2	330.5	333.1
Mexico	2 983.1	3 274.2	3 238.7	2 742.2	2 989.9	3 198.8[c,p]	3 399.7[c,p]
Netherlands	6 588.0	6 121.1	8 108.2[a]	8 174.7[a]	8 083.9	8 457.1	8 609.6[p]
New Zealand	588.5	..	781.5	..	781.1	..	..
Norway	2 083.4	2 398.7	2 519.0	2 602.9	2 689.0	2 853.0	3 150.0[p]
Poland	1 136.0	1 539.6	1 893.7	2 806.2	3 295.8	3 926.4	4 358.4
Portugal	817.1	2 035.9	1 960.9	1 866.8	1 698.1	1 627.4	1 659.4[p]
Slovak Republic	263.3	349.7	341.9	469.1	545.0	476.6	501.8
Slovenia	434.2	794.4	1 025.8[a]	1 089.0	1 098.9	1 048.9	981.5[p]
Spain	8 329.8	10 345.4	10 190.8	9 767.9	9 475.7	9 332.9	9 472.0
Sweden	8 908.3[a]	8 639.7[c]	9 003.8	8 898.1[c]	9 231.7	8 764.1[c]	9 808.4[p]
Switzerland	..	..	..	8 759.9	..	..	..
Turkey	2 044.3	4 292.3	4 829.8	5 525.2	6 211.4	7 143.1	..
United Kingdom	21 250.0	22 922.5	24 345.7	23 561.4	24 933.7	26 507.4	27 680.5[c,p]
United States	248 861.2[j]	278 977.0[j]	288 142.9[j]	290 780.5[j]	305 356.5[j]	316 913.7[j]	330 954.2[j,p]
EU28 (OECD estimates)	163 920.6[b]	188 463.0[b]	199 927.0[b]	204 785.9[b]	206 032.0[b]	213 271.6[b]	217 962.1[b]
OECD-Total	**588 131.5[b]**	**664 330.8[b]**	**696 937.3[b]**	**710 609.9[b]**	**736 232.0[b]**	**766 267.1[b]**	**785 356.1[b]**
Argentina	804.3	1 148.5[p]	1 256.5[p]	1 280.8[p]	1 222.5[p]	936.6[p]	..
China	65 275.9	156 726.1	183 870.0	214 044.1	242 323.3	266 403.2	289 397.8
Romania	588.7	581.1	602.7[a]	641.6	418.8	577.4	814.2
Russian Federation	17 861.5	20 025.3	20 297.2	20 565.0	21 846.1	22 285.8	22 184.1
Singapore	3 696.9	4 386.2	5 086.0	4 816.7	4 939.5	5 727.6	..
South Africa	2 596.8	2 201.8	2 147.6	2 056.1	2 162.5	..	..
Chinese Taipei	11 287.5	17 943.7	19 545.9	20 770.9	22 001.6	23 309.7	24 095.5

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

Source: OECD, Main Science and Technology Indicators database, February 2017

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

Percentage

	2005	2010	2011	2012	2013	2014	2015
Australia	1.56	1.90	1.83[v]	..	1.80	..	..
Austria	2.54[c]	2.89[c]	2.82	3.17[c]	3.24	3.34[c]	3.37[c,p]
Belgium	1.92	2.22	2.38	2.72	2.81	2.86[c]	2.86[p]
Canada	1.67[b,g]	1.49[g]	1.48[g]	1.43[g]	1.32[b,g]	1.25[b,g,p]	..
Chile	..	0.14[y]	0.17[y]	0.18[y]	0.19[y]	0.18[y]	0.19[p,y]
Czech Republic	1.00	1.13	1.25	1.40	1.51	1.60	1.53[p]
Denmark	2.83	3.44	3.45	3.41	3.26	3.20	3.24[p]
Estonia	0.61	1.23	2.20	1.84	1.24	0.97	1.08[p]
Finland	3.85	4.41	4.41	4.12	4.00	3.80	3.43
France	2.15	2.37	2.42	2.50	2.52	2.54	2.53[p]
Germany	2.61	2.87	2.99	3.07	2.99	3.06	3.06[c]
Greece	0.29	0.44[c]	0.44	0.46	0.51	0.53	0.59[p]
Hungary	0.63[v]	1.10[v]	1.18[v]	1.33[v]	1.54[v]	1.54[v]	1.61[v]
Iceland	2.36	2.10[a,c]	2.09[a,l]	..	1.58[a,o]	2.03[o]	2.34[b,o]
Ireland	1.14	1.61[c]	1.55	1.61[c]	1.60	1.56[c]	..
Israel[1]	5.50[b,d]	5.58[b,d]	5.74[b,d]	5.96[b,d]	5.91[b,d]	6.23[b,d]	6.23[b,d]
Italy	0.83	1.08	1.08	1.13	1.18	1.26	1.21[p]
Japan	3.75[b,y]	3.82[b,y]	4.03[b,y]	3.96[b,y]	4.09[b,y]	4.33[b,y]	4.25[b,y]
Korea	2.95[g]	3.77	4.14	4.56	4.73	4.87[b]	4.76[b]
Latvia	0.32	0.34	0.30	0.23	0.27	0.39	0.25[p]
Luxembourg	2.04	1.46	1.43	1.06[a]	1.03	1.02	0.98
Mexico	0.26	0.26	0.24	0.19	0.21	0.23[c,p]	0.23[b,p]
Netherlands	1.45	1.27	1.65[a]	1.66[a]	1.66	1.73	1.72[p]
New Zealand	0.71	..	0.88	..	0.85[b]	..	..
Norway	1.19	1.31	1.30	1.29	1.33	1.44	1.63[b,p]
Poland	0.26	0.28	0.32	0.46	0.54	0.62	0.66
Portugal	0.49	1.19	1.17	1.16	1.08	1.03	1.02[p]
Slovak Republic	0.35	0.36	0.34	0.46	0.54	0.45	0.46
Slovenia	1.25	2.16	2.76[a]	3.02	3.07	2.80	2.55[p]
Spain	0.88	1.08	1.08	1.08	1.08	1.05	1.03[b]
Sweden	3.98[a]	3.55[c]	3.60	3.59[c]	3.70	3.42[c]	3.65[p]
Switzerland	..	..	..	2.89	..	..	..
Turkey	0.29[b,y]	0.52[b,y]	0.54[b,y]	0.60[b,y]	0.65[b,y]	0.72[b,y]	..
United Kingdom	1.56	1.67	1.77	1.70	1.74	1.79	1.84[c,p]
United States	2.66[j]	2.98[j]	3.02[j]	2.96[j]	3.06[j]	3.09[j]	3.15[b,j,p]
EU28 (OECD estimates)	1.63[b]	1.80[b]	1.88[b]	1.93[b]	1.95[b]	1.98[b]	1.98[b]
OECD-Total	**2.23[b]**	**2.39[b]**	**2.45[b]**	**2.46[b]**	**2.52[b]**	**2.57[b]**	**2.59[b]**
Argentina	0.18	0.21[p]	0.23[p]	0.25[p]	0.24[b,p]	0.20[b,p]	..
China	1.12[b,y]	1.59[b,y]	1.70[b,y]	1.85[b,y]	1.97[b,y]	2.03[b,y]	2.09[b,y]
Romania	0.29	0.25	0.25[a]	0.27	0.17	0.23	0.31[b]
Russian Federation	0.95[b,y]	0.92[b,y]	0.90[b,y]	0.88[b,y]	0.93[b]	0.96[b]	0.95[b]
Singapore	1.69[b]	1.49[b]	1.64[b]	1.50[b]	1.48[b]	1.66[b]	..
South Africa	0.73[b]	0.53[b]	0.51[b]	0.48[b]	0.49[b]	..	..
Chinese Taipei	2.10[b]	2.73	2.86	3.02	3.08	3.12	3.18

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

Source: OECD, Main Science and Technology Indicators database, February 2017

Table 27. Business enterprise researchers in full-time equivalent

FTE

	2005	2010	2011	2012	2013	2014	2015
Australia	23 794	27 990	32 439	..	39 065	..	..
Austria	18 155[c]	22 799[c]	23 138	25 180[c]	25 752	26 498[c]	26 971[c,p]
Belgium	16 769	20 008	21 382	23 464	23 759	23 812[c]	26 595[a,p]
Canada	84 410[g]	94 530[g]	99 040[g]	94 000[g]	89 170[g,p]	..	..
Chile	..	1 298	1 752	2 027	1 430	2 248	2 237[p]
Czech Republic	10 143[a]	12 661	13 958	15 444	16 766	18 281	19 161[p]
Denmark	17 624	22 774	23 927	24 369	23 364	23 975	24 613[p]
Estonia	883	1 282	1 504	1 421	1 383	1 268	1 152[p]
Finland	21 967	22 904	22 949	23 269	22 253	21 369	21 296
France	106 837	143 828	148 439	156 392	161 882	161 769	..
Germany	166 874	185 815[c]	190 693	199 623	198 585	198 076	202 038[c]
Greece	6 033	..	4 021[a]	4 351	4 197	4 938	5 028[p]
Hungary	5 008	10 274	11 773	13 231	14 317	15 577	15 026
Iceland	1 012	..	1 060[a]	..	656[a]	..	813[a]
Ireland	6 768	7 884[c]	8 996	9 756[c]	10 793	11 162[c]	11 544[p]
Israel[1]	..	42 088[d]	46 452[d]	53 157[d]	52 067[d]	56 485[d]	..
Italy	27 939	38 297	39 808	41 067	43 116	44 322	46 608[p]
Japan	481 496	490 538	490 920	481 425	485 318	506 134	486 198
Korea	137 706[g]	202 079	223 513	247 041	253 447	274 638	284 136
Latvia	468	632	553	594	570	776	604[p]
Luxembourg	1 696	1 460	1 518	927[a]	1 001	1 015	1 033[p]
Mexico	19 888	10 641	11 652	7 194	7 323	..	..
Netherlands	22 898	26 588	33 609[a]	43 665[a]	46 838	45 684	45 480[p]
New Zealand	3 700	..	5 100	..	6 100	..	..
Norway	10 239[u]	12 504[u]	12 867[u]	13 332[u]	13 553[u]	14 314[u]	15 239[p,u]
Poland	9 412	11 730	10 567	15 088	20 606	24 960	28 746
Portugal	4 014	10 572	12 198	11 931	10 025[a]	11 203	11 461[p]
Slovak Republic	1 947	1 928	2 058	2 482	2 436	2 645	2 789
Slovenia	1 936	3 389	4 510[a]	4 618	4 664	4 637	4 191[p]
Spain	35 034	45 377	44 915	44 920	44 714	44 689	45 151
Sweden	36 697[a,u]	30 440[c]	29 310	30 497[c]	43 141[a]	44 433[c]	47 083[p]
Switzerland	..	..	..	16 595	..	..	..
Turkey	9 456	25 342	30 404	35 034	40 207	41 847	..
United Kingdom	93 717	84 074	89 043	90 422	98 469	102 221	110 420[c,p]
United States	..	804 000	853 000	869 000	914 000	960 000	..
EU28 (OECD estimates)	626 082[b]	719 666[b]	747 214[b]	792 973[b]	830 213[b]	846 077[b]	873 862[b]
OECD-Total	**2 195 145[b]**	**2 439 291[b]**	**2 561 809[b]**	**2 643 527[b]**	**2 737 905[b]**	**2 846 026[b]**	**..**
Argentina	3 763	2 870[p]	3 118[p]	3 336[p]	3 569[p]	3 204[p]	..
China	696 413[t]	739 891	818 811	872 384	922 682	946 077	1 014 614
Romania	10 319	5 853	3 518[a]	4 956	5 333	5 244	4 234
Russian Federation	237 959	211 214	214 744	204 731	205 455	207 593	208 604
Singapore	14 238	16 508	17 432	17 289	18 329	18 521	..
South Africa	5 896	4 804	4 452	4 556	4 530	..	..
Chinese Taipei	51 202	81 111	87 419	92 279	94 236	97 019	100 106

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

Source: OECD, Main Science and Technology Indicators database, February 2017

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

Percentage

	2005	2010	2011	2012	2013	2014	2015
Australia	..	27.9[b]	..	..	..	..	..
Austria	63.8[c]	62.3[c]	62.3	63.4[c]	63.7	63.7[c]	63.7[c,p]
Belgium	50.6	49.0	50.1	51.5	51.3	50.8[c]	48.3[a,p]
Canada	61.7[g]	59.6[g]	60.0[g]	58.2[g]	56.0[g,p]	..	..
Chile	..	23.9[l]	28.8	29.8	24.3	29.6	27.4[p]
Czech Republic	42.0[a]	43.3	45.5	46.5	48.9	50.7	50.3[p]
Denmark	62.5	60.8	61.1	60.8	58.6	57.9	58.0[p]
Estonia	26.5	31.4	33.3	31.0	31.4	29.3	27.5[p]
Finland	55.5	55.3	57.4[a]	57.5	56.8	55.8	56.8
France	52.8	59.1[a]	59.6	60.4	60.8	60.5	..
Germany	61.3	56.7[c]	56.3	56.6	56.0	56.3	56.5[c,p]
Greece	30.8	..	16.3[a]	17.5	14.4	16.5	14.3[p]
Hungary	31.5	48.1	51.1	55.5	57.2	59.4	59.4
Iceland	46.9	..	46.9[a]	..	35.5[a]	..	41.8[a]
Ireland	58.4	55.6[c]	58.9[c]	60.0[c]	64.1[c]	53.9[a,c]	53.8[p]
Israel[1]	..	..	84.2[d]	83.7[c,d]	..	..	..
Italy	33.9	37.0	37.5	37.1	37.1	37.5	38.6[p]
Japan	70.7	74.8	74.8	74.5	73.5[a]	74.1	73.4
Korea	76.6[g]	76.5	77.4	78.3	78.7	79.5	79.7
Latvia	14.3	16.2	14.0	15.2	15.7	20.7	16.7[p]
Luxembourg	76.1	55.9	53.6	40.1[a]	40.0	38.6	36.0[p]
Mexico	45.3	27.6	29.3	24.7	24.5	..	..
Netherlands	47.8	49.5	54.8[a]	59.6[a]	61.1	59.9	59.1[p]
New Zealand	28.5	..	31.3	..	34.1	..	..
Norway	48.3[u]	47.3[u]	47.3[u]	47.9[u]	47.9[u]	49.0[u]	49.4[p,u]
Poland	15.1	18.2	16.5	22.5	28.8	31.7	34.8
Portugal	19.0	25.5	27.7	28.1	26.5[a]	29.4	29.0[p]
Slovak Republic	17.8	12.7	13.4	16.3	16.5	17.9	19.4
Slovenia	36.9	44.0	51.4[a]	52.0	53.6	54.1	53.1[p]
Spain	31.9	33.7	34.5	35.4	36.3	36.6	36.9
Sweden	66.7[a,l,u]	61.7[c,l]	60.2[l]	61.9[c,l]	67.2[a,l]	66.7[c,l]	68.6[l,p]
Switzerland	..	..	..	46.2	..	..	..
Turkey	24.2	39.4	42.2	42.7	45.1	46.7	..
United Kingdom	37.7[a,c]	32.8[c]	35.4	35.3[c]	36.8	37.0[c]	38.2[c,p]
United States	..	67.1[b]	68.1[b]	68.7[b]	70.0[b]	71.0[b]	..
EU28 (OECD estimates)	45.5[b]	44.9[b]	45.9[b]	47.2[b]	48.0[b]	48.1[b]	48.4[b]
OECD-Total	**59.4[b]**	**58.6[b]**	**59.5[b]**	**60.1[b]**	**60.5[b]**	**61.2[b]**	**..**
Argentina	11.8	6.2[p]	6.4[p]	6.6[p]	7.0[p]	6.2[p]	..
China	62.3[t]	61.1	62.1	62.1	62.2	62.1	62.7
Romania	44.9	29.6	21.9[a]	27.5	28.7	29.0	24.3
Russian Federation	51.2	47.8	48.0	46.2	46.6	46.7	46.4
Singapore	59.8	51.5	51.7	50.6	50.9	50.5	..
South Africa	34.1	25.7	22.1	21.3	19.4	..	..
Chinese Taipei	57.6	63.2	64.9	65.9	66.8	67.9	68.9

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

Source: OECD, Main Science and Technology Indicators database, February 2017

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

Per thousand

	2005	2010	2011	2012	2013	2014	2015
Australia	3.2[b]	3.4[b]	3.9	..	4.7	..	..
Austria	6.1[c]	7.3[c]	7.3	7.8[c]	8.0	8.2[c]	8.3[c,p]
Belgium	5.7	6.5	6.9	7.5	7.7	7.7[c]	8.5[a,p]
Canada	6.8[g]	7.4[g]	7.6[g]	7.1[g]	6.7[g,p]	..	..
Chile	..	0.2[b]	0.3[b]	0.4[b]	0.2	0.4	0.4[p]
Czech Republic	2.6[a]	3.1	3.4	3.8	4.1	4.5	4.6[p]
Denmark	9.5	12.6	13.1	13.4	12.9	13.0	13.1[p]
Estonia	1.9	3.2	3.4	3.2	3.1	2.8	2.5[p]
Finland	12.9	13.1	13.0	13.0	12.6	12.2	12.2
France	5.9	7.8	8.0	8.3	8.6	8.6	..
Germany	5.8	6.2[c]	6.3	6.5	6.4	6.4	6.5[c]
Greece	1.7	..	1.2[a]	1.4	1.4	1.6	1.6[p]
Hungary	1.5	3.4	3.9	4.3	4.7	4.9	4.6
Iceland	8.8[b]	..	8.7[a]	..	5.3[a]	..	6.2[a,b]
Ireland	4.4	5.7[c]	6.6	7.2[c]	7.7	7.8[c]	7.9[p]
Israel[1]	..	18.9[d]	20.4[d]	22.8[d]	21.6[d]	23.0[d]	..
Italy	1.5	2.1	2.1	2.2	2.4	2.5	2.6[p]
Japan	8.9[b]	9.3[b]	9.4[b]	9.2[b]	9.2[b]	9.6[b]	9.2[b]
Korea	7.2[g]	10.5	11.4	12.4	12.6	13.4	13.7
Latvia	0.6	1.0	0.8	0.9	0.8	1.2	0.9[p]
Luxembourg	6.9	5.2	5.2	3.1[a]	3.3	3.3	3.3[p]
Mexico	0.6[b]	0.3	0.3	0.2	0.2	..	..
Netherlands	3.8	4.3	5.3[a]	7.0[a]	7.6	7.4	7.2[p]
New Zealand	2.3[b]	..	3.1[b]	..	3.6	..	..
Norway	6.7[u]	7.5[u]	7.6[u]	7.8[u]	7.8[u]	8.1[u]	8.6[b,p,u]
Poland	0.8	1.0	0.9	1.2	1.7	2.0	2.3
Portugal	1.0	2.8	3.3	3.4	3.0[a]	3.3[b]	3.3[b,p]
Slovak Republic	1.2	1.1	1.2	1.4	1.4	1.5	1.6
Slovenia	2.5	4.3	5.9[a]	6.1	6.3	6.2	5.5[p]
Spain	2.3	3.1	3.2	3.3[b]	3.4[b]	3.3[b]	3.3[b]
Sweden	12.9[a,u]	10.2[c]	9.6	9.9[c]	13.9[a]	14.2[c]	14.8[p]
Switzerland	..	..	..	4.7	..	..	..
Turkey	0.5[b]	1.3	1.5	1.7	1.8	1.9	..
United Kingdom	4.4	4.0	4.2	4.2	4.6	4.6	4.9[c,p]
United States	..	8.3	8.7	8.7	9.0	9.3	..
EU28 (OECD estimates)	3.8[b]	4.3[b]	4.5[b]	4.8[b]	5.0[b]	5.1[b]	5.2[b]
OECD-Total	**5.4[b]**	**5.9[b]**	**6.1[b]**	**6.2[b]**	**6.4[b]**	**6.6[b]**	**..**
Argentina	..	..	..	..	..	..	..
China	..	..	..	..	..	..	..
Romania	1.2	0.7	0.4[a]	0.7	0.7	0.7	0.6
Russian Federation	4.5	4.1	4.0	3.8	3.8	3.8	3.8
Singapore	7.0	6.1	6.2	5.9	6.0	5.9	..
South Africa	0.6	0.5	0.5	0.5	0.4	..	..
Chinese Taipei	5.9	8.9	9.4	9.8	9.9	10.1	10.3

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

Source: OECD, Main Science and Technology Indicators database, February 2017

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

FTE

	2005	2010	2011	2012	2013	2014	2015
Australia	43 687	56 511	64 906	..	78 839	..	..
Austria	32 780[c]	40 954[c]	42 098	45 468[c]	46 412	47 755[c]	48 608[c,p]
Belgium	31 613	32 692	35 011	38 108	38 497	38 787[c]	43 406[a,p]
Canada	142 030[g]	144 270[g]	148 930[g]	139 460[g]	132 330[g,p]	..	..
Chile	..	3 465	4 141	4 737	3 905	5 087	4 398[p]
Czech Republic	21 782[a]	26 998	29 509	32 224	33 713	35 777	36 365[p]
Denmark	28 359	36 324	36 886	35 899	34 985	35 431	36 187[p]
Estonia	1 398	1 955	2 121	1 988	2 069	1 798	1 694[p]
Finland	32 109	30 559	31 180	30 995	30 381	29 634	29 770
France	194 991	235 588	239 111	246 438	251 446	248 041	..
Germany	304 502	337 211	357 129	367 478	360 375	371 706	379 140[c]
Greece	11 665	..	6 324[a]	6 532	6 832	7 750	8 128[p]
Hungary	7 393	14 999	17 220	19 997	22 244	22 177	21 030
Iceland	1 530	..	1 491[a,o]	..	1 260[a,o]	..	1 604[o]
Ireland	10 338	12 194[c]	14 120	15 313[c]	17 103	17 688[c]	18 293[p]
Israel[1]	43 049[d]	53 511[d]	59 790[d]	64 596[d]	65 099[d]	69 835[d]	..
Italy	70 725	112 212	112 478	120 162	124 736	129 271	128 563[p]
Japan	609 808	614 772	602 252	581 042	583 855	611 027	592 175
Korea	153 400[g]	230 221	254 280	281 523	288 758	314 019	323 652
Latvia	1 370	1 260	870	885	981	1 382	1 145[p]
Luxembourg	3 662	3 388	3 387	2 843[a]	2 913	3 066	3 129[p]
Mexico	42 331	26 630	28 039	20 244	19 197	..	..
Netherlands	48 588	54 139	74 011[a]	76 767[a]	77 399	76 708	80 063[p]
New Zealand	6 100	..	8 800	..	10 000	..	..
Norway	15 399	17 821	18 111	18 624	19 041	20 597	22 049[p]
Poland	13 966	18 424	19 530	25 750	30 250	37 253	42 054
Portugal	6 133	14 036	16 030	15 668	16 220	17 348	18 126[p]
Slovak Republic	3 524	3 230	3 251	3 790	3 618	4 133	4 405
Slovenia	4 347	7 056	9 622[a]	9 451	9 811	9 696	9 222[p]
Spain	75 345	92 221	89 841	89 364	88 635	87 642	87 432
Sweden	56 106[a]	54 797[c]	54 787	55 839[c]	56 413	57 307[c]	58 748[p]
Switzerland	..	..	..	47 750	..	..	..
Turkey	14 992	37 522	45 408	52 233	58 391	61 945	..
United Kingdom	145 401	154 870	158 385	160 116	177 948	192 221	207 639[c,p]
United States	..	..	1 231 000	1 251 000	1 318 000	1 366 000	..
EU28 (OECD estimates)	1 128 371[b]	1 309 242[b]	1 371 233[b]	1 420 464[b]	1 453 385[b]	1 495 437[b]	1 539 990[b]
OECD-Total	**..**	**..**	**3 865 681[b]**	**3 944 567[b]**	**4 060 389[b]**	**4 208 974[b]**	**..**
Argentina	7 155	7 979[p]	8 669[p]	9 275[p]	9 923[p]	9 979[p]	..
China	883 130[t]	1 873 913	2 169 291	2 486 400	2 740 563	2 896 352	2 910 799
Romania	16 157	8 271	10 002[a]	10 887	10 514	10 437	10 128
Russian Federation	524 049	444 111	439 683	413 796	424 063	423 134	426 372
Singapore	17 076	19 169	20 406	20 204	21 349	21 641	..
South Africa	12 236	10 205	9 895	11 322	11 877	..	..
Chinese Taipei	96 714	148 782	159 730	166 683	173 329	180 435	186 804

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

Source: OECD, Main Science and Technology Indicators database, February 2017

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

Percentage

	2005	2010	2011	2012	2013	2014	2015
Australia	..	38.2[b]	..	..	..	..	..
Austria	68.8[c]	68.3[c]	68.8	69.9[c]	70.1	70.1[c]	70.1[c,p]
Belgium	59.1	54.4	55.7	56.9	56.7	56.5[c]	55.7[a,p]
Canada	65.0[g]	61.9[g]	62.1[g]	60.3[g]	58.4[g,p]	..	..
Chile	..	30.2[l]	31.7	32.4	29.5	32.0	28.8[p]
Czech Republic	50.2[a]	51.6	53.0	53.4	54.4	55.5	54.7[p]
Denmark	65.2	64.1	64.1	62.2	60.6	60.7	60.8[p]
Estonia	32.0	37.0	37.1	34.0	35.3	31.1	30.1[p]
Finland	55.9	54.7	57.2[a]	57.3	57.4	56.8	59.1
France	55.8	59.2[a]	59.4	59.8	60.1	59.5	..
Germany	64.1	61.5	62.1	62.2	61.2	61.4	61.8[c,p]
Greece	34.7	..	17.1[a]	17.5	16.2	17.9	16.1[p]
Hungary	31.8	47.6	50.7	56.0	58.3	59.4	57.1
Iceland	47.4	..	46.0[a,o]	..	46.0[a,o]	..	54.5[o]
Ireland	61.9	61.8[c]	65.4[c]	66.1[c]	70.9[c]	62.3[a,c]	62.1[p]
Israel[1]	..	..	84.9[d]	83.7[c,d]	..	..	..
Italy	40.4	49.7	49.3	50.0	50.5	51.8	51.8[p]
Japan	68.0	70.0	69.2	68.3	67.5[a]	68.2	67.7
Korea	71.2[g]	68.7	70.4	71.1	71.9	72.9	73.2
Latvia	25.0	22.6	16.0	15.8	18.2	24.1	20.6[p]
Luxembourg	83.4	68.1	65.2	59.9[a]	58.6	58.5	55.9[p]
Mexico	50.6	37.5	38.2	34.4	32.5	..	..
Netherlands	51.9	53.8	63.0[a]	62.8[a]	62.8	61.8	62.4[p]
New Zealand	32.2	..	37.3	..	40.2	..	..
Norway	51.4	49.3	49.0	49.4	49.4	51.1	51.6[p]
Poland	18.2	22.5	22.9	28.4	32.3	35.7	38.5
Portugal	23.8	29.5	32.3	32.9	34.7	37.0	37.4[p]
Slovak Republic	24.5	17.8	18.0	20.9	21.1	23.5	25.0
Slovenia	48.3	54.5	63.0[a]	63.1	64.4	65.2	64.8[p]
Spain	43.1	41.5	41.8	42.8	43.6	43.8	43.5
Sweden	72.3[a,l]	70.8[c,l]	69.8[l]	68.7[c,l]	69.7[l]	68.7[c,l]	69.5[l,p]
Switzerland	..	..	..	63.3	..	..	..
Turkey	30.4[l]	45.9[l]	48.9[l]	49.7[l]	51.7[l]	53.7[l]	..
United Kingdom	44.8[a,c,l]	44.2[c,l]	44.5[l]	44.9[c,l]	47.2[l]	48.5[c,l]	49.8[c,l,p]
United States	..	..	..	..	..	..	..
EU28 (OECD estimates)	51.3[b]	51.6[b]	52.5[b]	53.2[b]	53.6[b]	53.9[b]	54.3[b]
OECD-Total	**..**	**..**	**..**	**..**	**..**	**..**	**..**
Argentina	15.8	12.2[p]	12.5[p]	12.8[p]	13.3[p]	13.0[p]	..
China	64.7[t]	73.4	75.2	76.6	77.6	78.1	77.4
Romania	48.6	31.6	33.6[a]	35.0	32.3	33.2	32.3
Russian Federation	57.0	52.9	52.4	50.0	51.3	51.0	51.1
Singapore	59.7	51.8	52.3	51.2	51.3	50.9	..
South Africa	42.5	34.6	31.9	32.3	31.3	..	..
Chinese Taipei	64.8	70.4	71.9	72.7	74.0	75.0	76.0

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

Source: OECD, Main Science and Technology Indicators database, February 2017

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

Per thousand

	2005	2010	2011	2012	2013	2014	2015
Australia	5.8[b]	6.9[b]	7.9	..	9.4	..	..
Austria	11.0[c]	13.1[c]	13.2	14.1[c]	14.4	14.7[c]	14.9[c,p]
Belgium	10.7	10.6	11.2	12.2	12.4	12.5[c]	13.9[a,p]
Canada	11.4[g]	11.2[g]	11.4[g]	10.5[g]	9.9[g,p]	..	..
Chile	..	0.6[b]	0.7[b]	0.8[b]	0.7	0.8	0.7[p]
Czech Republic	5.5[a]	6.7	7.3	7.9	8.2	8.7	8.8[p]
Denmark	15.3	20.0	20.2	19.8	19.3	19.3	19.3[p]
Estonia	3.0	4.8	4.8	4.5	4.6	4.0	3.6[p]
Finland	18.8	17.5	17.6	17.3	17.2	16.9	17.0
France	10.7	12.8	12.8	13.1	13.4	13.2	..
Germany	10.6	11.3	11.7	11.9	11.7	11.9	12.1[c]
Greece	3.2	..	1.9[a]	2.1	2.2	2.5	2.6[p]
Hungary	2.3	4.9	5.6	6.5	7.3	6.9	6.5
Iceland	13.3[b]	..	12.3[a,o]	..	10.1[a,o]	..	12.1[b,o]
Ireland	6.8	8.9[c]	10.3	11.3[c]	12.2	12.4[c]	12.5[p]
Israel[1]	22.9[d]	24.0[d]	26.3[d]	27.7[d]	27.0[d]	28.4[d]	..
Italy	3.9	6.1	6.1	6.5	6.9	7.2	7.1[p]
Japan	11.2[b]	11.7[b]	11.5[b]	11.1[b]	11.1[b]	11.6[b]	11.2[b]
Korea	8.0[g]	12.0	12.9	14.1	14.3	15.3	15.6
Latvia	1.8	2.0	1.3	1.3	1.4	2.1	1.7[p]
Luxembourg	15.0	12.0	11.7	9.6[a]	9.7	10.0	10.0[p]
Mexico	1.2[b]	0.7	0.7	0.5	0.5	..	..
Netherlands	8.0	8.7	11.8[a]	12.2[a]	12.5	12.4	12.7[p]
New Zealand	3.8[b]	..	5.3[b]	..	5.9	..	..
Norway	10.1	10.7	10.8	10.8	11.0	11.7	12.5[b,p]
Poland	1.3	1.5	1.6	2.1	2.5	3.0	3.4
Portugal	1.6	3.8	4.4	4.5	4.8	5.1[b]	5.3[b,p]
Slovak Republic	2.2	1.9	1.9	2.2	2.1	2.4	2.5
Slovenia	5.7	9.0	12.6[a]	12.5	13.2	13.0	12.2[p]
Spain	4.9	6.3	6.3	6.6[b]	6.7[b]	6.5[b]	6.3[b]
Sweden	19.7[a]	18.4[c]	17.9	18.1[c]	18.2	18.3[c]	18.5[p]
Switzerland	..	..	..	13.4	..	..	..
Turkey	0.9[b]	1.9	2.2	2.5	2.7	2.8	..
United Kingdom	6.9	7.4	7.5	7.5	8.3	8.7	9.1[c,p]
United States	..	..	12.6	12.5	13.0	13.2	..
EU28 (OECD estimates)	6.8[b]	7.8[b]	8.2[b]	8.5[b]	8.8[b]	8.9[b]	9.1[b]
OECD-Total	**..**	**..**	**9.2[b]**	**9.3[b]**	**9.5[b]**	**9.7[b]**	**..**
Argentina	..	..	..	..	..	..	..
China	..	..	..	..	..	..	..
Romania	1.9	1.0	1.3[a]	1.5	1.4	1.4	1.4
Russian Federation	10.0	8.5	8.3	7.7	7.9	7.8	7.8
Singapore	8.4	7.0	7.2	6.9	7.0	6.8	..
South Africa	1.3	1.1	1.0	1.1	1.2	..	..
Chinese Taipei	11.1	16.4	17.2	17.7	18.2	18.7	19.2

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Source: OECD, Main Science and Technology Indicators database, February 2017

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

Million 2010 USD

	2005	2010	2011	2012	2013	2014	2015
Australia	8 062.4	11 649.8	11 571.0	..	11 676.1	..	..
Austria	..	..	4 305.3	..	5 097.6	..	..
Belgium	4 093.3	4 897.1	5 494.2	6 165.6	6 330.3	..	..
Canada	11 707.3[g]	10 941.5[g]	11 524.3[g]	11 238.0[g]	10 504.1[g]	10 186.0[g,p]	..
Chile	..	228.6	364.5	398.4	443.8	409.7	439.1[p]
Czech Republic	1 382.3	1 530.2	1 683.0	1 842.3	2 015.1	2 042.1	2 002.6[p]
Denmark	3 322.9	4 187.9[c]	4 277.7	4 265.7[c]	4 226.0	4 241.6[c]	4 375.6[p]
Estonia	98.3	189.7	384.8	343.1	226.6	170.7	196.5[p]
Finland	4 286.0	4 965.7	5 043.8	4 392.8	4 040.4	3 411.8	3 204.2
France	23 097.5	26 389.5	27 897.3	28 588.9	28 700.8	29 234.2	..
Germany	46 703.1[m]	53 740.2[c]	57 451.1	59 584.7[c]	58 223.0	60 837.1[c]	61 820.0[c]
Greece	490.0	..	527.0[a]	489.3	564.2	573.6	673.2[p]
Hungary	673.6[v]	1 040.6	1 131.7	1 192.2	1 349.9	1 429.5	1 543.6
Iceland	138.2	..	143.8[a,l]	..	79.2[a]	91.1	97.7
Ireland	1 295.7	1 622.6[c]	1 464.3	1 504.3[c]	1 600.8	1 687.8[c]	..
Israel[1]	3 939.4[d]	3 031.3[d]	3 361.4[d]	3 764.9[d]	3 644.6[d]	3 874.0[d]	..
Italy	8 551.5	11 068.8	11 096.9	11 130.5	11 519.7	12 426.2	..
Japan	105 687.0	105 651.9	110 069.4	110 135.4	115 340.6	121 752.0	120 199.8
Korea	23 455.1[g]	36 313.9	41 926.2	46 928.9	50 387.1	53 671.5	53 754.3
Latvia	50.3	68.8	55.3	46.7	38.7	62.6	32.7[p]
Luxembourg	481.0	280.3	286.3	94.4[a]	94.7	..	..
Mexico	2 590.0	2 987.8	2 907.4	2 206.2	1 947.6	2 046.0[c,p]	2 195.3[c,p]
Netherlands	5 207.7	..	6 667.1[a]	6 758.2[a]	6 775.2	7 052.2	6 895.4[p]
New Zealand	473.9	..	596.7	..	581.1	..	..
Norway	1 700.7	1 873.1	1 997.4	2 059.6	2 070.9	2 221.8	..
Poland	943.1	1 219.7	1 549.5	2 274.4	2 662.4	3 116.1	3 476.7
Portugal	746.4	1 913.9	1 798.3	1 693.9	1 478.7	1 434.8	..
Slovak Republic	178.8	252.8	268.1	378.0	443.2	355.5	391.3
Slovenia	370.5	636.1	815.6[a]	860.5	885.4	896.3	861.4[p]
Spain	6 659.5	7 893.6	7 944.6	7 850.2	7 727.6	7 684.5	..
Sweden	7 672.5[a]	..	7 342.5	..	8 005.2	..	..
Switzerland	..	..	..	7 284.0	..	..	..
Turkey	1 856.1	3 779.0	4 358.5	4 952.2	5 603.0	6 397.8	..
United Kingdom	13 708.3	15 800.7	16 722.3	16 068.1	17 232.5	18 725.6	19 554.3[c,p]
United States	224 752.9[j,o]	229 200.0[j]	241 562.6[j]	244 647.4[j]	258 804.3[j]	270 195.3[j]	291 869.3[j,p]
EU28 (OECD estimates)	134 348.9[b]	155 311.7[b]	165 124.2[b]	168 665.5[b]	170 126.6[b]	175 908.4[b]	..
OECD-Total	**525 139.4[b]**	**568 214.4[b]**	**601 896.6[b]**	**613 690.6[b]**	**637 614.1[b]**	**665 562.3[b]**	**690 767.5[b]**
Argentina	760.3	..	..	..	..	..	..
China	59 558.3	145 346.7	170 978.7	199 112.9	225 907.3	249 681.9	271 217.6
Romania	338.6	363.5	448.1[a]	425.3	302.9	342.0	566.0
Russian Federation	6 656.0	6 434.4	7 312.0	7 212.0	7 745.1	7 812.9	7 580.1
Singapore	3 247.7	3 752.0	4 419.4	4 089.7	4 172.8	4 831.9	..
South Africa	1 773.8	1 647.9	1 653.5	1 634.4	1 753.2	..	..
Chinese Taipei	11 032.5	17 539.1	19 154.6	20 349.3	21 591.8	22 939.9	23 731.1

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

Source: OECD, Main Science and Technology Indicators database, February 2017

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

Percentage

	2005	2010	2011	2012	2013	2014	2015
Australia	1.47	1.84	1.77	..	1.73	..	..
Austria	..	..	1.83	..	2.16	..	..
Belgium	1.59	1.80	1.99	2.24	2.32	..	..
Canada	1.38[b,g]	1.26[g]	1.28[g]	1.23[g]	1.12[b,g]	1.06[b,g,p]	..
Chile	..	0.10[y]	0.15[y]	0.16[y]	0.18[y]	0.16[y]	0.17[p,y]
Czech Republic	0.77	0.77	0.83	0.92	1.02	0.99	0.93[p]
Denmark	2.43	3.09[c]	3.10	3.06[c]	2.98	2.93[c]	2.96[p]
Estonia	0.49	1.02	1.87	1.60	1.04	0.77	0.90[p]
Finland	3.50	4.05	4.07	3.66	3.42	2.91	2.73
France	1.73	1.94	2.01	2.07	2.07	2.11	..
Germany	2.40[m]	2.64[c]	2.73	2.81[c]	2.74	2.80[c]	2.80[c]
Greece	0.25	..	0.35[a]	0.35	0.41	0.42	0.49[p]
Hungary	0.49[v]	0.78	0.82	0.89	0.98	0.99	1.04
Iceland	2.00	..	1.82[a,l]	..	0.97[a]	1.12	1.15[b]
Ireland	0.98	1.21[c]	1.07	1.12[c]	1.16	1.13[c]	..
Israel[1]	3.70[b,d]	2.35[b,d]	2.48[b,d]	2.71[b,d]	2.50[b,d]	2.62[b,d]	..
Italy	0.64	0.87	0.87	0.90	0.95	1.02	..
Japan	3.68[b,y]	3.75[b,y]	3.96[b,y]	3.89[b,y]	4.01[b,y]	4.25[b,y]	4.18[b,y]
Korea	2.78[g]	3.51	3.88	4.27	4.45	4.59[b]	4.48[b]
Latvia	0.20	0.28	0.22	0.18	0.14	0.23	0.12[p]
Luxembourg	1.87	0.95	0.96	0.32[a]	0.31	..	..
Mexico	0.22	0.23	0.22	0.16	0.14	0.14[c,p]	0.15[b,p]
Netherlands	1.15	..	1.35[a]	1.37[a]	1.39	1.44	1.38[p]
New Zealand	0.57	..	0.68	..	0.63[b]	..	..
Norway	0.97	1.02	1.03	1.02	1.03	1.12	..
Poland	0.22	0.22	0.26	0.38	0.43	0.49	0.53
Portugal	0.45	1.12	1.07	1.05	0.94	0.90	..
Slovak Republic	0.24	0.26	0.27	0.37	0.44	0.33	0.36
Slovenia	1.07	1.73	2.19[a]	2.39	2.48	2.39	2.24[p]
Spain	0.70	0.83	0.84	0.86	0.88	0.86	..
Sweden	3.43[a]	..	2.94	..	3.21	..	..
Switzerland	..	..	..	2.40	..	..	..
Turkey	0.26[b,y]	0.46[b,y]	0.48[b,y]	0.54[b,y]	0.59[b,y]	0.65[b,y]	..
United Kingdom	1.01	1.15	1.22	1.16	1.20	1.26	1.30[c,p]
United States	2.40[i,o]	2.45[i]	2.53[i]	2.49[i]	2.59[i]	2.64[i]	2.78[b,i,p]
EU28 (OECD estimates)	1.33[b]	1.48[b]	1.55[b]	1.59[b]	1.61[b]	1.64[b]	..
OECD-Total	**1.99[b]**	**2.05[b]**	**2.12[b]**	**2.13[b]**	**2.18[b]**	**2.23[b]**	**2.27[b]**
Argentina	0.17	..	..	..	..	..	..
China	1.02[b,y]	1.47[b,y]	1.58[b,y]	1.72[b,y]	1.83[b,y]	1.90[b,y]	1.96[b,y]
Romania	0.17	0.15	0.19[a]	0.18	0.12	0.14	0.22[b]
Russian Federation	0.35[b,y]	0.30[b,y]	0.32[b,y]	0.31[b,y]	0.33[b]	0.34[b]	0.33[b]
Singapore	1.49[b]	1.27[b]	1.42[b]	1.28[b]	1.25[b]	1.40[b]	..
South Africa	0.50[b]	0.40[b]	0.39[b]	0.38[b]	0.40[b]	..	..
Chinese Taipei	2.05[b]	2.66	2.80	2.96	3.02	3.07	3.13

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

Source: OECD, Main Science and Technology Indicators database, February 2017

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

Percentage

	2005	2010	2011	2012	2013	2014	2015
Australia	94.0	97.2	96.9[v]	..	96.2	..	..
Austria	..	..	64.8	..	66.7	..	..
Belgium	82.8	81.3	83.4	82.6	82.5	..	..
Canada	82.5[g]	84.5[g]	86.0[g]	85.9[g]	84.9[g]	84.7[g,p]	..
Chile	..	75.1	92.2	91.5	90.1	88.5	88.4[p]
Czech Republic	77.5	68.3	66.2	65.8	67.2	61.7	60.5[p]
Denmark	86.0	89.6[c]	89.9	89.9[c]	91.7	91.4[c]	91.4[p]
Estonia	80.3	83.0	85.3	87.0	83.9	80.2	83.5[p]
Finland	90.9	91.9	92.1	88.8	85.5	76.6	79.7
France	80.7	82.0	83.3	82.9	82.4	82.9	..
Germany	92.1[m]	92.0[c]	91.4	91.4[c]	91.4	91.4[c]	91.4[c]
Greece	85.7	..	78.8[a]	77.2	81.6	78.9	82.3[p]
Hungary	77.8[v]	70.8[v]	69.5[v]	66.6[v]	63.5[v]	64.3[v]	64.8[v]
Iceland	84.9	..	87.1[a]	..	61.1[a,o]	55.2[o]	49.3[o]
Ireland	86.1	75.0[c]	69.2	69.2[c]	72.4	72.4[c]	..
Israel[1]	67.2[d]	42.1[d]	43.2[d]	45.5[d]	42.2[d]	42.0[d]	..
Italy	76.8	80.7	80.3	79.6	80.6	81.6	..
Japan	98.3	98.2	98.3	98.2	98.1	98.3	98.3
Korea	94.4[g]	93.1	93.8	93.7	94.2	94.2	94.1
Latvia	61.7	82.5	72.8	76.3	53.3	59.7	48.0[p]
Luxembourg	91.7	64.8	66.8	30.3[a]	30.0	..	..
Mexico	86.8	91.3	89.8	80.5	65.1	64.0[c,p]	64.6[c,p]
Netherlands	79.0	..	82.2[a]	82.7[a]	83.8	83.4	80.1[p]
New Zealand	80.5	..	76.4	..	74.4	..	..
Norway	81.6	78.1	79.3	79.1	77.0	77.9	..
Poland	83.0	79.2	81.8	81.0	80.8	79.4	79.8
Portugal	91.4	94.0	91.7	90.7	87.1	88.2	..
Slovak Republic	67.9	72.3	78.4	80.6	81.3	74.6	78.0
Slovenia	85.3	80.1	79.5[a]	79.0	80.6	85.5	87.8[p]
Spain	79.9	76.3	78.0	80.4	81.6	82.3	..
Sweden	86.1[a]	..	81.5	..	86.7	..	..
Switzerland	..	..	..	83.2	..	..	..
Turkey	90.8	88.0	90.2	89.6	90.2	89.6	..
United Kingdom	64.5	68.9	68.7	68.2	69.1	70.6	70.6[c,p]
United States	90.3[j,o]	82.2[j]	83.8[j]	84.1[j]	84.8[j]	85.3[j]	88.2[j,p]
EU28 (OECD estimates)	81.9[b]	82.4[b]	82.6[b]	82.3[b]	82.6[b]	82.5[b]	..
OECD-Total	**89.4[b]**	**85.5[b]**	**86.3[b]**	**86.3[b]**	**86.5[b]**	**86.8[b]**	**87.9[b]**
Argentina	94.5	..	..	..	..	..	..
China	91.2	92.7	93.0	93.0	93.2	93.7	93.7
Romania	57.5	62.5	74.4[a]	66.3	72.3	59.2	69.5
Russian Federation	37.3	32.1	36.0	35.1	35.5	35.1	34.2
Singapore	87.8	85.5	86.9	84.9	84.5	84.4	..
South Africa	68.3	74.8	77.0	79.5	81.1	..	..
Chinese Taipei	97.7	97.7	98.0	98.0	98.1	98.4	98.5

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

Source: OECD, Main Science and Technology Indicators database, February 2017

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

Percentage

	2005	2010	2011	2012	2013	2014	2015
Australia	4.0	1.7	1.9[v]	..	2.1	..	..
Austria	..	..	13.3	..	12.5	..	..
Belgium	6.2	7.8	6.2	6.1	6.1	..	..
Canada	2.6[g]	3.7[g]	3.6[g]	3.8[g]	4.2[g]	4.2[g,p]	..
Chile	..	24.7	6.0	6.9	8.3[a]	9.3	9.7[p]
Czech Republic	17.0	15.4	15.7	13.7	11.6	10.0	7.6[p]
Denmark	2.4[o]	2.8[c,o]	2.8[o]	2.8[c,o]	1.8[o]	2.2[c,o]	2.8[o,p]
Estonia	6.9	11.1	6.8	9.2	10.2	10.3	8.4[p]
Finland	3.8	2.6	2.8	3.0	2.8	3.0	3.6
France	10.1	8.7	7.5	7.9	8.1	7.8	..
Germany	4.5[i]	4.5[c]	4.3	4.3[c]	3.4	3.4[c]	3.4[c]
Greece	5.6	..	8.0[a]	8.2	7.0	10.5	8.8[p]
Hungary	3.9[v]	14.0[v]	14.5[v]	15.7[v]	19.0[v]	16.5[v]	19.4[v]
Iceland	2.8	..	7.5[a]	..	9.7[a,o]	9.0[o]	8.3[o]
Ireland	4.1	4.2[c]	5.9	5.9[c]	6.0	6.0[c]	..
Israel[1]	4.8[d]	4.2[d]	2.9[d]	3.3[d]	2.4[d]	3.1[d]	..
Italy	11.0	5.9	6.9	7.1	6.4	5.7	..
Japan	1.2	1.2	1.0	1.1	1.1	1.0	1.0
Korea	4.6[g]	6.7	6.1	6.0	5.5	5.1	5.1
Latvia	12.7	3.5	4.3	4.6	1.5	1.4	1.6[p]
Luxembourg	5.2	..[x]	..[x]	..[x]	..[x]	..	..
Mexico	11.0	8.4	9.2	19.1	34.1	35.3[c,p]	34.6[c,p]
Netherlands	3.4	7.4	3.8[a]	2.2[a]	2.0	1.8	1.8[p]
New Zealand	11.4	..	12.2	..	11.2	..	..
Norway	7.9	9.9	9.7	10.1	9.3	8.5	..
Poland	13.7	13.8	12.7	11.2	10.0	11.5	10.0
Portugal	4.2	4.3	4.0	6.9	9.1	9.1	..
Slovak Republic	26.7	10.7	10.4	6.8	5.1	3.9	6.5
Slovenia	7.0	15.6	15.1[a]	13.8	12.6	7.7	4.3[p]
Spain	13.6	16.6	14.4	12.6	10.7	9.7	..
Sweden	4.5[a]	..	5.0	..	6.1	..	..
Switzerland	..	..	..	0.8	..	..	..
Turkey	6.9	10.4	8.9	9.4	8.6	8.9	..
United Kingdom	8.3	8.7	9.3	7.9	8.9	9.3	9.3[c,p]
United States	9.7[h,j]	12.3[j]	10.8[j]	10.2[j]	9.2[j]	7.8[j]	5.5[j,p]
EU28 (OECD estimates)	7.5[b]	7.3[b]	6.9[b]	6.9[b]	6.4[b]	6.4[b]	..
OECD-Total	**6.8[b]**	**8.1[b]**	**7.3[b]**	**7.1[b]**	**6.6[b]**	**6.0[b]**	**5.1[b]**
Argentina	4.5	..	..	..	..	..	..
China	4.6	4.6	4.4	4.6	4.5	4.2	4.3
Romania	36.8	30.1	18.1[a]	19.6	14.0	19.0	13.7
Russian Federation	53.6	64.2	58.7	60.4	61.5	62.7	63.4
Singapore	6.2	7.1	5.8	6.2	6.6	5.3	..
South Africa	16.2	8.3	4.8	6.5	5.8	..	..
Chinese Taipei	2.2	2.2	2.0	1.9	1.7	1.5	1.4

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

Source: OECD, Main Science and Technology Indicators database, February 2017

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

Percentage

	2005	2010	2011	2012	2013	2014	2015
Australia	0.33	..x	..x	..	0.07	..	..
Austria	..	..	0.10	..	0.06	..	..
Belgium	0.04	0.01	0.01	0.01	0.01	..	..
Canada	0.00g	0.00g	0.00g	0.00g	0.00g	0.00g,p	..
Chile	..	0.13	1.58	1.39	0.05	0.23	0.08p
Czech Republic	0.09	0.10	0.05	0.04	0.08	0.04	0.05p
Denmark	0.16	0.27c	0.26	0.26c	0.50	0.41c	0.32p
Estonia	0.01	0.11	0.01	0.03	0.11	0.06	0.00p
Finland	0.01	0.02	0.05	0.06	0.06	0.06	0.02
France	0.05	0.10	0.06	0.06	0.09	0.09	..
Germany	0.17	0.09c	0.26	0.26c	0.20	0.20c	0.20c
Greece	0.37	..	0.20a	0.15	0.06	0.04	0.01p
Hungary	0.06v	0.26v	0.12v	0.05v	0.06v	0.05v	0.04v
Iceland	0.00	..	0.01a	..	0.62a,o	3.58o	6.55o
Ireland	0.00	0.04c	0.07	0.07c	0.09	0.09c	..
Israel[1]	0.61d	0.65d	0.65d	0.60d	0.60d	0.58d	..
Italy	0.11	0.21	0.30	0.40	0.38	0.36	..
Japan	0.10	0.08	0.11	0.14	0.24	0.17	0.12
Korea	0.06g	0.07	0.06	0.06	0.06	0.05	0.06
Latvia	..	..	..	..	..	..	..
Luxembourg	0.02	..	..	..	..	..	..
Mexico	0.02	0.18	0.40	0.06	0.30	0.29c,p	0.29c,p
Netherlands	0.33	..	0.76a	0.57a	0.69	0.49	0.26p
New Zealand	1.05	..	..x	..	..x	..	..
Norway	0.01	0.01	0.02	0.01	0.02	0.04	..
Poland	0.08	0.09	0.20	0.13	0.06	0.11	0.14
Portugal	0.00	0.00	0.01	0.01	0.01	0.02	..
Slovak Republic	0.03	0.03	0.15	0.00	0.00	0.00	0.01
Slovenia	0.48	0.06	0.01a	0.13	0.01	0.05	0.00p
Spain	0.68	0.30	0.22	0.22	0.25	0.18	..
Sweden	0.20a	..	0.34	..	0.27	..	..
Switzerland	..	..	..	0.62	..	..	..
Turkey	2.02	0.19	0.08	0.21	0.20	0.09	..
United Kingdom	0.02	0.03	0.60a	0.22	0.40	0.68	0.68c,p
United States	..n	0.28j	0.13j	0.11j	0.08j	0.15j	0.14j,p
EU28 (OECD estimates)	0.14b	..	0.26b	0.21b	0.22b	0.24b	..
OECD-Total	**0.08b**	**0.19b**	**0.17b**	**0.15b**	**0.16b**	**0.19b**	**..**
Argentina	0.00	..	..	..	..	..	..
China	..	..	..	..	..	..	..
Romania	0.16	0.37	0.08a	0.16	0.27	0.20	0.28
Russian Federation	0.04	0.16	0.32	0.10	0.13	0.16	0.18
Singapore	0.08	0.05	0.03	0.01	0.01	0.01	..
South Africa	1.02	2.54	3.31	2.79	2.69	..	..
Chinese Taipei	0.04	0.03	0.02	0.01	0.01	0.01	0.01

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

Source: OECD, Main Science and Technology Indicators database, February 2017

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

Percentage

	2005	2010	2011	2012	2013	2014	2015
Australia	1.6	0.9	1.2[v]	..	1.6	..	..
Austria	..	..	21.9	..	20.7	..	..
Belgium	11.0	10.9	10.4	11.4	11.4	..	..
Canada	14.9[g]	11.7[g]	10.4[g]	10.3[g]	10.9[g]	11.1[g,p]	..
Chile	..	0.1	0.2	0.1	1.5[a]	1.9	1.9[p]
Czech Republic	5.4	16.2	18.1	20.5	21.2	28.2	31.9[p]
Denmark	11.4	7.3[c]	7.1	7.1[c]	6.1	6.0[c]	5.5[p]
Estonia	12.7	5.7	7.9	3.8	5.7	9.5	8.1[p]
Finland	5.3[a]	5.5	5.0	8.1	11.7	20.4	16.7
France	9.2	9.2	9.1	9.1	9.4	9.3	..
Germany	3.3	3.4[c]	4.0	4.0[c]	5.0	5.0[c]	5.0[c]
Greece	8.3	..	13.0[a]	14.4	11.4	10.6	8.9[p]
Hungary	18.1[v]	15.0[v]	15.9[v]	17.7[v]	17.4[v]	19.2[v]	15.8[v]
Iceland	12.2	..	5.4[a]	..	28.5[a,o]	32.2[o]	35.9[o]
Ireland	9.8	20.8[c]	24.8	24.8[c]	21.5	21.5[c]	..
Israel[1]	27.4[d]	53.0[d]	53.2[d]	50.6[d]	54.8[d]	54.3[d]	..
Italy	12.1	13.2	12.5	13.0	12.6	12.3	..
Japan	0.4	0.5	0.6	0.5	0.6	0.5	0.6
Korea	0.9[g]	0.2	0.1	0.3	0.2	0.6	0.8
Latvia	25.6	14.0	22.8	19.2	45.2	38.9	50.4[p]
Luxembourg	3.1	..[x]	..[x]	..[x]	..[x]	..	..
Mexico	2.1	0.2	0.6	0.4	0.5	0.5[c,p]	0.5[c,p]
Netherlands	17.2	..	13.2[a]	14.5[a]	13.5	14.4	17.8[p]
New Zealand	7.0	..	8.9	..	11.6	..	..
Norway	10.5	12.0	10.9	10.7	13.7	13.6	..
Poland	3.2	6.9	5.3	7.6	9.2	9.0	10.1
Portugal	4.5	1.7	4.3	2.4	3.8	2.7	..
Slovak Republic	5.3	17.0	11.1	12.7	13.6	21.5	15.5
Slovenia	7.2	4.2	5.4[a]	7.0	6.8	6.8	8.0[p]
Spain	5.8	6.8	7.4	6.8	7.5	7.8	..
Sweden	9.1[a]	..	13.1	..	6.9	..	..
Switzerland	..	..	..	15.4	..	..	..
Turkey	0.3	1.3	0.8	0.8	1.0	1.4	..
United Kingdom	27.1	22.4	21.4	23.7	21.5	19.4	19.4[c,p]
United States	..[n]	5.2[j]	5.3[j]	5.6[j]	6.0[j]	6.8[j]	6.2[j,p]
EU28 (OECD estimates)	10.5[b]	10.1[b]	10.2[b]	10.6[b]	10.8[b]	10.8[b]	..
OECD-Total	**..**	**6.1[b]**	**6.2[b]**	**6.4[b]**	**6.7[b]**	**7.1[b]**	**..**
Argentina	1.0	..	..	..	..	..	..
China	1.0	1.6	1.6	1.1	1.0	0.9	0.9
Romania	5.5	7.0	7.4[a]	14.0	13.4	21.6	16.5
Russian Federation	9.1	3.5	5.0	4.4	2.9	2.1	2.2
Singapore	5.8	7.3	7.3	8.8	8.9	10.3	..
South Africa	14.5	14.3	14.9	11.3	10.4	..	..
Chinese Taipei	0.0	0.0	0.0	0.1	0.1	0.1	0.1

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

Source: OECD, Main Science and Technology Indicators database, February 2017

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

Million USD

	2005	2010	2011	2012	2013	2014	2015
Australia	178.0[b]	252.0[b]	267.2[b]	..	366.3[b]	..	..
Austria	269.7[b]	202.5[b]	204.8[b]	269.7[b]	357.5[b]	..	..
Belgium	1 042.4[b]	1 739.8[b]	2 068.3[b]	2 679.4[b]	2 846.9[b]	..	..
Canada	877.5[b,g]	547.0[b,g]	417.8[b,g]	364.0[b,g]	329.6[b,g]	348.6[b,g]	..
Chile	..	..	..	..	..	..	..
Czech Republic	55.1[b]	77.2[b]	80.7[b]	83.9[b]	77.0[b]	84.9[b]	..
Denmark	..	932.3[b]	892.2[b]	1 065.8[b]	1 128.2[b]	1 140.6[b]	..
Estonia	..	0.5[b]	6.2[b]	1.7[b]	1.9[b]	2.1[b]	..
Finland	..	117.1[b]	130.1[b]	150.1[b]	132.6[b]	148.8[b]	..
France	3 335.1[b]	3 776.9[b]	3 733.2[b]	3 709.7[b]	3 838.3[b]	..	..
Germany	3 891.4[b]	4 650.4[b]	5 159.8[b]	5 197.9[b]	5 264.2[b]	5 263.1[b]	..
Greece	..	..	84.6[b]	..	93.2[b]	..	..
Hungary	305.6[b]	442.5[b]	434.1[b]	493.4[b]	480.6[b]	506.2[b]	..
Iceland	..	..	..	..	0.4[b]	0.2[b]	1.0[b]
Ireland	..	277.7[b]	153.0[b]	..	203.2[b]	..	..
Israel[1]	..	313.9[b,d]	283.2[b,d]	286.2[b,d]	382.4[b,d]	285.8[b,d]	..
Italy	452.2[b]	722.0[b]	762.4[b]	771.5[b]	738.9[b]	696.6[b]	..
Japan	8 087.5[b]	11 430.0[b]	11 446.1[b]	12 526.0[b]	14 191.7[b]	14 599.1[b]	14 219.5[b]
Korea	444.0[b]	877.9[b]	1 010.1[b]	1 221.9[b]	1 248.3[b]	1 289.2[b]	1 520.8[b]
Latvia	..	7.3[b]	..	9.7[b]	11.2[b]	5.4[b]	..
Luxembourg	..	..	..	..	..	..	..
Mexico	216.8[b]	501.1[b]	584.2[b]	167.9[b]	246.2[b]	271.7[b]	281.9[b]
Netherlands	..	448.1[b]	384.5[b]	318.0[b]	305.5[b]	319.6[b]	..
New Zealand	..	..	..	..	..	..	..
Norway	54.4[b]	55.4[b]	80.9[b]	45.3[b]	44.5[b]	37.0[b]	..
Poland	71.0[b]	86.2[b]	92.9[b]	144.1[b]	122.9[b]	151.5[b]	..
Portugal	63.8[b]	125.3[b]	140.4[b]	147.8[b]	145.0[b]	130.1[b]	..
Slovak Republic	..	22.3[b]	25.3[b]	18.6[b]	4.2[b]	8.7[b]	6.4[b]
Slovenia	125.0[b]	252.1[b]	263.4[b]	271.8[b]	273.3[b]	279.0[b]	..
Spain	808.2[b]	996.2[b]	1 024.2[b]	967.2[b]	1 026.9[b]	1 015.2[b]	..
Sweden	..	757.5[b]	876.5[b]	834.0[b]	810.4[b]	..	..
Switzerland	..	..	..	2 805.6[b]	..	..	..
Turkey	..	100.3[b]	201.0[b]	187.8[b]	196.7[b]	191.0[b]	..
United Kingdom	4 775.7[b]	6 611.2[b]	6 869.0[b]	5 994.4[b]	5 874.7[b]	5 668.7[b]	..
United States	34 839.0[b,j]	49 415.0[b,j]	45 949.0[b,j]	48 146.0[b,j]	52 426.0[b,j]	56 612.0[b,j]	..
EU28 (OECD estimates)	..	..	..	..	..	..	..
OECD-Total	**..**	**..**	**..**	**..**	**..**	**..**	**..**
Argentina	..	..	..	..	..	..	..
China	..	5 034.7[b]	6 026.1[b]	8 038.2[b]	9 805.7[b]	11 099.1[b]	12 736.9[b]
Romania	18.9[b]	7.8[b]	23.9[b]	25.4[b]	23.8[b]	37.3[b]	..
Russian Federation	..	..	..	..	..	..	..
Singapore	72.3[b]	120.8[b]	131.8[b]	152.8[b]	142.5[b]	..	..
South Africa	..	..	..	..	..	..	..
Chinese Taipei	118.2[b]	260.8[b]	327.3[b]	349.9[b]	394.3[b]	488.2[b]	456.8[b]

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

Source: OECD, ANBERD database: Research and Development Expenditure in Industry, February 2017

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

Million USD

	2005	2010	2011	2012	2013	2014	2015
Australia	182.7[b]	248.8[b]	237.9[b]	..	..	..	..
Austria	1 234.0[b]	673.8[b]	630.1[b]	687.6[b]	773.0[b]	..	..
Belgium	733.9[b]	520.6[b]	541.4[b]	643.7[b]	685.7[b]	..	..
Canada	2 398.6[b,g]	1 739.4[b,g]	1 980.8[b,g]	2 012.7[b,g]	1 815.1[b,g]	1 813.4[b,g]	..
Chile	..	..	..	..	..	..	..
Czech Republic	105.2[b]	87.3[b]	86.1[b]	92.7[b]	119.2[b]	148.1[b]	..
Denmark	..	334.9[b]	325.7[b]	373.3[b]	406.6[b]	412.8[b]	..
Estonia	..	5.6[b]	5.7[b]	4.5[b]	5.0[b]	8.0[b]	..
Finland	2 111.4[b]	2 875.7[b]	2 794.6[b]	2 097.5[b]	1 968.6[b]	1 920.0[b]	..
France	4 128.1[b]	4 558.4[b]	4 586.2[b]	4 781.8[b]	5 067.4[b]	..	..
Germany	6 607.9[b]	7 460.4[b]	8 321.4[b]	9 389.4[b]	9 484.6[b]	9 792.5[b]	..
Greece	..	..	32.3[b]	..	23.2[b]	..	..
Hungary	71.2[b]	116.1[b]	149.2[b]	129.4[b]	129.8[b]	51.2[b]	..
Iceland	..	..	..	..	2.7[b]	2.8[b]	2.4[b]
Ireland	..	179.2[b]	183.8[b]	..	..	..	..
Israel[1]	1 486.5[b,d]	1 408.4[b,d]	1 559.4[b,d]	1 497.9[b,d]	1 596.0[b,d]	1 628.2[b,d]	..
Italy	1 518.7[b]	1 787.0[b]	1 902.8[b]	1 828.9[b]	1 758.9[b]	1 783.8[b]	..
Japan	..	26 265.9[b]	29 244.8[b]	28 387.1[b]	28 762.9[b]	28 188.8[b]	28 138.0[b]
Korea	11 753.5[b]	19 631.5[b]	21 873.9[b]	25 237.8[b]	27 731.1[b]	30 450.7[b]	28 837.8[b]
Latvia	..	3.5[b]	2.6[b]	3.8[b]	6.4[b]	5.8[b]	..
Luxembourg	..	..	..	..	..	..	..
Mexico	73.0[b]	26.1[b]	29.9[b]	80.8[b]	94.4[b]	104.2[b]	108.1[b]
Netherlands	..	658.1[b]	697.1[b]	742.5[b]	818.9[b]	856.3[b]	..
New Zealand	..	..	..	..	..	..	..
Norway	179.2[b]	171.4[b]	188.6[b]	188.1[b]	187.2[b]	200.1[b]	..
Poland	29.3[b]	84.4[b]	74.0[b]	89.0[b]	84.6[b]	95.1[b]	..
Portugal	121.8[b]	31.1[b]	42.5[b]	43.0[b]	41.0[b]	49.9[b]	..
Slovak Republic	12.4[b]	4.6[b]	5.5[b]	7.2[b]	7.8[b]	7.2[b]	9.2[b]
Slovenia	82.5[b]	69.3[b]	77.3[b]	80.3[b]	98.0[b]	83.8[b]	..
Spain	338.0[b]	336.7[b]	303.3[b]	266.9[b]	268.8[b]	275.8[b]	..
Sweden	..	2 024.4[b]	2 149.1[b]	2 071.2[b]	2 040.9[b]	..	..
Switzerland	..	..	..	1 525.8[b]	..	..	..
Turkey	279.2[b]	133.3[b]	153.7[b]	196.5[b]	264.2[b]	228.3[b]	..
United Kingdom	1 866.7[b]	1 732.4[b]	1 820.0[b]	2 105.4[b]	2 298.2[b]	2 478.7[b]	..
United States	49 725.0[b,j]	59 875.0[b,j]	62 704.0[b,j]	65 068.0[b,j]	67 205.0[b,j]	73 891.0[b,j]	..
EU28 (OECD estimates)	..	..	..	..	..	..	..
OECD-Total	**..**	**..**	**..**	**..**	**..**	**..**	**..**
Argentina	..	..	..	..	..	..	..
China	..	25 186.3[b]	30 292.6[b]	33 719.1[b]	39 537.7[b]	44 404.6[b]	51 720.1[b]
Romania	8.2[b]	13.4[b]	13.2[b]	57.5[b]	38.0[b]	15.6[b]	..
Russian Federation	..	..	..	..	..	..	..
Singapore	1 366.0[b]	1 804.8[b]	1 644.2[b]	2 052.1[b]	1 801.4[b]	..	..
South Africa	..	..	..	..	..	..	..
Chinese Taipei	7 237.5[b]	12 826.8[b]	14 473.2[b]	15 594.4[b]	16 820.8[b]	18 214.5[b]	19 242.1[b]

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

Source: OECD, ANBERD database: Research and Development Expenditure in Industry, February 2017

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

Million USD

	2005	2010	2011	2012	2013	2014	2015
Australia	39.3[b]	36.8[b]	23.6[b]	..	..	..	..
Austria	5.7[b]	51.0[b]	44.7[b]	44.6[b]	46.0[b]	..	..
Belgium	73.1[b]	115.6[b]	142.9[b]	157.4[b]	182.8[b]	..	..
Canada	708.6[b,g]	1 005.6[b,g]	1 060.6[b,g]	1 168.2[b,g]	1 286.7[b,g]	1 235.1[b,g]	..
Chile	..	..	..	..	..	..	..
Czech Republic	37.6[b]	32.1[b]	37.7[b]	45.7[b]	54.1[b]	69.6[b]	..
Denmark	..	..	..	..	..	..	..
Estonia	0.0[b]	0.0[b]	0.0[b]	0.0[b]	0.0[b]	0.0[b]	..
Finland	..	..	..	..	..	..	..
France	2 898.9[b]	3 076.3[b]	3 410.1[b]	3 806.2[b]	4 326.9[b]	..	..
Germany	2 285.8[b]	2 894.8[b]	2 920.7[b]	3 019.5[b]	2 270.4[b]	2 349.7[b]	..
Greece	..	..	..	..	..	..	..
Hungary	..	..	..	..	..	..	..
Iceland	..	..	..	..	..	..	0.1[b]
Ireland	..	..	..	..	..	..	..
Israel[1]	..	..	..	..	..	..	..
Italy	924.0[b]	1 220.3[b]	1 242.8[b]	1 215.7[b]	1 122.4[b]	1 057.1[b]	..
Japan	12.4[b]	192.1[b]	238.0[b]	310.3[b]	481.6[b]	480.6[b]	663.3[b]
Korea	165.5[b]	83.6[b]	91.2[b]	185.7[b]	142.8[b]	86.7[b]	265.4[b]
Latvia	..	..	..	..	..	..	..
Luxembourg	..	..	..	..	..	..	..
Mexico	..	..	..	..	..	..	..
Netherlands	..	44.6[b]	35.7[b]	53.9[b]	59.2[b]	..	..
New Zealand	..	..	..	..	..	..	..
Norway	..	2.7[b]	..	..	..	..	..
Poland	30.4[b]	51.9[b]	74.5[b]	75.3[b]	92.2[b]	92.9[b]	..
Portugal	..	..	..	..	..	..	..
Slovak Republic	..	..	..	..	..	..	..
Slovenia	0.0[b]	2.3[b]	2.3[b]	1.0[b]	3.9[b]	2.0[b]	..
Spain	441.8[b]	617.5[b]	779.8[b]	712.1[b]	712.7[b]	626.8[b]	..
Sweden	..	..	..	..	..	..	..
Switzerland	..	..	..	..	..	..	..
Turkey	..	..	..	..	..	..	..
United Kingdom	3 048.3[b]	2 006.7[b]	2 007.2[b]	2 163.0[b]	2 383.7[b]	2 450.5[b]	..
United States	15 005.0[b,j]	29 854.0[b,j]	26 054.0[b,j]	24 817.0[b,j]	27 114.0[b,j]	26 181.0[b,j]	..
EU28 (OECD estimates)	..	..	..	..	..	..	..
OECD-Total	**..**	**..**	**..**	**..**	**..**	**..**	**..**
Argentina	..	..	..	..	..	..	..
China	..	..	..	..	..	..	..
Romania	..	1.4[b]	4.1[b]	5.8[b]	5.3[b]	7.5[b]	..
Russian Federation	..	..	..	..	..	..	..
Singapore	20.6[b]	104.9[b]	63.3[b]	..	..	..	..
South Africa	..	..	..	..	..	..	..
Chinese Taipei	..	..	..	..	..	..	..

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

Source: OECD, ANBERD database: Research and Development Expenditure in Industry, February 2017

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

Million USD

	2005	2010	2011	2012	2013	2014	2015
Australia	3 085.1[b]	5 144.5[b]	5 512.0[b]	..	6 714.7[b]	..	..
Austria	1 306.3[b]	2 187.5[b]	2 395.3[b]	2 797.4[b]	3 149.3[b]	..	..
Belgium	722.0[b]	1 312.0[b]	1 420.0[b]	1 457.6[b]	1 558.0[b]	..	..
Canada	5 190.2[b,g]	5 751.2[b,g]	6 128.7[b,g]	6 005.9[b,g]	5 963.0[b,g]	5 866.4[b,g]	..
Chile	..	196.5[b]	181.2[b]	196.5[b]	220.9[a,b]	226.1[b]	..
Czech Republic	584.7[b]	935.7[b]	1 091.0[b]	1 259.9[b]	1 330.8[b]	1 560.0[b]	..
Denmark	..	2 176.5[b]	2 280.4[b]	2 116.1[b]	2 035.1[b]	2 051.5[b]	..
Estonia	50.4[b]	137.7[b]	147.0[b]	198.7[b]	181.2[b]	156.7[b]	..
Finland	737.2[b]	975.4[b]	1 174.5[b]	1 307.7[b]	1 342.1[b]	1 279.7[b]	..
France	2 375.7[b]	6 055.2[b]	6 470.4[b]	7 142.6[b]	8 090.2[b]	..	..
Germany	4 682.3[b]	7 791.4[b]	8 804.6[b]	8 956.7[b]	9 133.1[b]	9 248.0[b]	..
Greece	..	..	395.2[b]	..	480.0[b]	..	..
Hungary	128.2[b]	472.0[b]	593.8[b]	649.2[b]	915.6[b]	1 098.2[b]	..
Iceland	..	..	..	..	95.1[b]	132.8[b]	176.5[b]
Ireland	..	..	..	..	..	..	..
Israel[1]	3 497.4[b,d]	4 985.1[b,d]	5 506.0[b,d]	6 340.3[b,d]	7 049.7[b,d]	7 873.3[b,d]	..
Italy	2 584.7[b]	3 710.5[b]	3 609.7[b]	3 645.4[b]	4 158.9[b]	4 565.4[b]	..
Japan	9 828.6[b]	12 083.8[b]	12 264.2[b]	12 445.6[b]	12 488.0[b]	16 399.4[b]	16 191.0[b]
Korea	1 611.2[b]	3 522.9[b]	3 955.3[b]	4 418.3[b]	4 540.3[b]	4 729.7[b]	4 632.9[b]
Latvia	..	..	..	..	..	..	..
Luxembourg	239.9[b]	..	..	..	..	..	..
Mexico	457.5[b]	1 382.1[b]	1 357.6[b]	1 564.4[b]	1 420.4[b]	1 567.8[b]	1 626.5[b]
Netherlands	..	..	3 152.1[b]	3 232.9[b]	3 286.5[b]	3 307.4[b]	..
New Zealand	202.0[b]	..	358.0[b]	..	437.2[b]	..	..
Norway	699.9[b]	1 097.5[b]	1 219.1[b]	1 267.4[b]	1 369.5[b]	1 522.7[b]	..
Poland	461.3[b]	728.1[b]	925.0[b]	1 332.8[b]	1 649.2[b]	2 140.9[b]	..
Portugal	314.5[b]	1 259.8[b]	1 207.6[b]	1 069.1[b]	1 063.8[b]	1 006.2[b]	..
Slovak Republic	..	..	..	..	..	..	..
Slovenia	33.8[b]	140.6[b]	276.8[b]	325.3[b]	313.2[b]	334.6[b]	..
Spain	2 130.5[b]	3 919.3[b]	3 784.5[b]	3 820.5[b]	3 839.4[b]	3 741.0[b]	..
Sweden	..	2 223.0[b]	2 512.4[b]	2 644.2[b]	2 844.0[b]	..	..
Switzerland	..	..	..	2 974.0[b]	..	..	..
Turkey	343.3[b]	2 018.0[b]	2 245.6[b]	2 612.1[b]	3 091.8[b]	3 578.3[b]	..
United Kingdom	3 857.3[b]	5 898.8[b]	6 287.6[b]	6 196.5[b]	7 296.9[b]	8 517.7[b]	..
United States	65 828.5[b,j]	78 220.0[b,j]	88 838.0[b,j]	89 912.0[b,j]	96 513.0[b,j]	102 696.0[b,j]	..
EU28 (OECD estimates)	..	..	..	..	..	..	..
OECD-Total	**..**	**..**	**..**	**..**	**..**	**..**	**..**
Argentina	..	..	..	..	..	..	..
China	..	9 828.0[b]	12 049.6[b]	14 114.5[b]	..	..	..
Romania	46.4[b]	185.6[b]	288.9[b]	384.1[b]	202.3[b]	274.8[b]	..
Russian Federation	..	..	..	..	..	..	..
Singapore	1 168.6[b]	1 695.2[b]	2 710.4[b]	1 979.2[b]	2 195.8[b]	..	..
South Africa	859.4[b]	..	..	..	..	..	..
Chinese Taipei	734.4[b]	1 364.2[b]	1 455.0[b]	1 768.1[b]	1 957.4[b]	2 075.1[b]	2 130.7[b]

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

Source: OECD, ANBERD database: Research and Development Expenditure in Industry, February 2017

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

Million USD

	2005	2010	2011	2012	2013	2014	2015
Australia	..	5 430.8	5 880.0[v]	6 239.6	6 855.2[c]	6 954.3	..
Austria	1 689.8[c]	2 479.6[c]	2 547.1	2 804.2[c]	2 923.0	3 089.7[c]	3 190.9[c,p]
Belgium	1 389.2	2 108.3	2 194.3	2 284.2	2 471.6	2 502.9[c]	2 519.7[p]
Canada	7 841.7	9 211.9	9 542.7	10 407.3[a]	10 400.5	10 401.5[p]	..
Chile	..	396.0	399.3	464.5	608.5	598.7[a]	623.1[p]
Czech Republic	474.3	777.9	1 145.6	1 494.9	1 659.5	1 709.0	1 726.7[p]
Denmark	1 090.8	2 113.6	2 249.2	2 363.3	2 643.4	2 643.5	2 750.1[p]
Estonia	85.6	173.2	209.2	234.8	264.3	241.4	235.6
Finland	1 064.0	1 585.2	1 594.4	1 623.2	1 589.9	1 644.9	1 638.3
France	7 442.5	10 996.0	11 231.1	11 476.0	12 195.1	12 289.5	12 343.3[p]
Germany	10 565.9	15 844.0	17 138.2	17 757.8	18 475.6	19 476.5	19 576.0[c,p]
Greece	772.6	670.6[c]	784.6	780.4	869.8	895.8	1 045.9[p]
Hungary	399.0[v]	489.9[v]	546.6[v]	533.0[v]	484.2[v]	462.6[v]	434.6[v]
Iceland	65.2	81.7[a]	82.8[a]	..	91.0[a]	96.0	105.5
Ireland	543.6	835.6	811.1[c]	777.8	817.1[c]	839.3	879.8[c]
Israel[1]	1 035.2[d,g]	1 188.1[d]	1 230.0[d]	1 337.7[d]	1 453.1[d]	1 504.2[d]	1 527.2[d]
Italy	5 509.9[a]	7 318.3	7 472.4	7 687.0	8 061.3	8 612.9[c]	8 606.9[p]
Japan	17 250.4	18 098.9	19 603.5	20 344.9	22 181.6[a]	21 457.0	20 882.7
Korea	3 040.0[g]	5 645.5	5 890.4	6 172.7	6 318.3	6 625.0	6 750.0
Latvia	66.6	90.2	138.7	144.5	119.9	133.1	152.9[p]
Luxembourg	7.5	81.3	74.5	104.5	125.6	117.3	135.9[p]
Mexico	1 536.9	2 700.9	3 013.7	2 696.2	2 690.5	3 049.3[c,p]	3 120.7[c,p]
Netherlands	3 775.3	5 155.6	4 777.3	4 795.4	5 131.8	5 318.5	5 432.1[p]
New Zealand	386.3	..	562.6	..	565.1	..	..
Norway	1 010.1	1 514.1	1 569.9	1 664.1	1 773.7	1 797.4	1 912.2[p]
Poland	942.5	2 150.5	2 277.3	2 751.5	2 397.3	2 681.5	2 959.2
Portugal	640.1	1 634.5	1 498.7	1 397.4	1 729.2[a]	1 763.9	1 785.9[p]
Slovak Republic	90.1	229.6	323.3	394.7	412.1	477.6	837.8
Slovenia	113.3	163.0	169.0[a]	170.2	165.2	159.5	148.8[p]
Spain	3 846.5	5 682.6	5 604.1	5 346.3	5 410.1	5 445.1	5 553.8
Sweden	2 284.9	3 311.2[c]	3 533.1	3 788.3[c]	3 938.5	4 104.3[c]	4 108.9
Switzerland	..	3 027.3	..	3 847.7	..	4 411.2	..
Turkey	2 509.8	4 641.8	5 251.0	5 622.5	5 828.3	6 216.5	..
United Kingdom	7 885.7	10 171.5	10 093.6	10 278.2	10 982.0	11 395.4	11 859.2[c,p]
United States	47 006.0[j]	60 374.0[j]	62 435.0[j]	63 263.0[j]	63 949.0[j]	64 796.0[j,p]	66 514.0[j,p]
EU28 (OECD estimates)	51 286.1[b]	75 040.4[b]	77 500.7[b]	80 030.4[b]	83 926.1[b]	87 061.1[b]	89 179.7[b]
OECD-Total	**137 675.8[b]**	**186 927.0[b]**	**195 307.0[b]**	**201 690.0[b]**	**209 724.6[b]**	**214 522.1[b]**	**220 765.1[b]**
Argentina	585.7	1 246.5	1 403.1	1 558.0	1 553.4	1 527.7	..
China	8 587.3	18 052.8	19 650.4	22 146.7	24 163.8	25 539.9	28 811.2
Romania	113.7	371.6	394.7[a]	342.9	286.5	229.5[b]	353.3[b]
Russian Federation	1 047.3	2 764.1	3 178.6	3 523.7	3 297.4	3 898.7	3 886.7
Singapore	1 228.4	2 076.8	2 314.3	2 386.1	2 566.3	2 761.2	..
South Africa	782.3	1 187.4	1 384.4	1 482.6	1 413.9	..	..
Chinese Taipei	1 747.4	3 037.1	3 241.0	3 277.3	3 288.2	3 233.6	3 171.7

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

Source: OECD, Main Science and Technology Indicators database, February 2017

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

Percentage

	2005	2010	2011	2012	2013	2014	2015
Australia	..	0.58	0.60[v]	0.63	0.62[c]	0.63	..
Austria	0.59[c]	0.71[c]	0.69	0.72[c]	0.72	0.74[c]	0.75[c,p]
Belgium	0.40	0.48	0.48	0.48	0.51	0.50[c]	0.49[p]
Canada	0.67	0.68	0.67	0.71[a]	0.67	0.65[p]	..
Chile	..	0.13[y]	0.11[y]	0.13[y]	0.15[y]	0.15[a,y]	0.15[p,y]
Czech Republic	0.21	0.27	0.38	0.49	0.52	0.50	0.48[p]
Denmark	0.59	0.88	0.91	0.94	1.01	0.98	0.99[p]
Estonia	0.38	0.60	0.64	0.68	0.73	0.64	0.62
Finland	0.63	0.76	0.73	0.74	0.71	0.73	0.71
France	0.38	0.47	0.46	0.46	0.47	0.46	0.45[p]
Germany	0.40	0.49	0.50	0.51	0.51	0.51	0.50[c,p]
Greece	0.27	0.21[c]	0.27	0.28	0.30	0.31	0.37[p]
Hungary	0.23[v]	0.23[v]	0.24[v]	0.23[v]	0.20[v]	0.18[v]	0.17[v]
Iceland	0.59	0.67[a]	0.66[a]	..	0.66[a]	0.66	0.67
Ireland	0.32	0.42	0.39[c]	0.36	0.37[c]	0.35	0.28[c]
Israel[1]	0.60[d,g]	0.54[d]	0.52[d]	0.53[d]	0.53[d]	0.52[d]	0.50[d]
Italy	0.32[a]	0.35	0.35	0.36	0.37	0.39[c]	0.38[p]
Japan	0.44[y]	0.42[y]	0.45[y]	0.45[y]	0.47[a,y]	0.45[y]	0.43[y]
Korea	0.26[g]	0.38	0.38	0.38	0.38	0.39	0.38
Latvia	0.21	0.24	0.34	0.33	0.26	0.28	0.31[p]
Luxembourg	0.02	0.19	0.16	0.22	0.24	0.21	0.23[p]
Mexico	0.12	0.16	0.16	0.14	0.13	0.14[c,p]	0.15[c,p]
Netherlands	0.62	0.70	0.62	0.61	0.63	0.64	0.65[p]
New Zealand	0.36	..	0.39	..	0.35	..	..
Norway	0.46	0.53	0.51	0.51	0.52	0.53	0.59[p]
Poland	0.18	0.27	0.26	0.30	0.25	0.27	0.29
Portugal	0.27	0.57	0.53	0.50	0.59[a]	0.59	0.58[p]
Slovak Republic	0.10	0.17	0.23	0.27	0.27	0.30	0.52
Slovenia	0.24	0.29	0.29[a]	0.29	0.27	0.25	0.23[p]
Spain	0.32	0.38	0.37	0.36	0.36	0.35	0.34
Sweden	0.74	0.85[c]	0.85	0.89[c]	0.90	0.91[c]	0.88
Switzerland	..	0.73	..	0.84	..	0.88	..
Turkey	0.32[y]	0.39[y]	0.39[y]	0.40[y]	0.40[y]	0.41[y]	..
United Kingdom	0.40	0.45	0.44	0.43	0.44	0.43	0.44[c,p]
United States	0.36[j]	0.40[j]	0.40[j]	0.39[j]	0.38[j]	0.37[j,p]	0.37[j,p]
EU28 (OECD estimates)	0.38[b]	0.45[b]	0.44[b]	0.45[b]	0.45[b]	0.46[b]	0.45[b]
OECD-Total	**0.38[b]**	**0.43[b]**	**0.43[b]**	**0.43[b]**	**0.43[b]**	**0.43[b]**	**0.43[b]**
Argentina	0.11	0.16	0.17	0.19	0.18	0.18	..
China	0.13[y]	0.14[y]	0.14[y]	0.14[y]	0.14[y]	0.14[y]	0.15[y]
Romania	0.06	0.11	0.11[a]	0.10	0.08	0.06	0.09
Russian Federation	0.06[y]	0.09[y]	0.09[y]	0.10[y]	0.10	0.11	0.11
Singapore	0.52	0.58	0.60	0.58	0.59	0.60	..
South Africa	0.17	0.20	0.22	0.22	0.21	..	..
Chinese Taipei	0.27	0.34	0.34	0.33	0.32	0.30	0.29

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

Source: OECD, Main Science and Technology Indicators database, February 2017

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

Million 2010 USD

	2005	2010	2011	2012	2013	2014	2015
Australia	..	5 430.8	5 793.6[v]	6 276.6	6 386.5[c]	6 578.5	..
Austria	1 936.0[c]	2 479.6[c]	2 472.2	2 611.8[c]	2 623.1	2 719.4[c]	2 760.0[c,p]
Belgium	1 623.0	2 108.3	2 143.2	2 159.9	2 263.6	2 254.9[c]	2 249.5[p]
Canada	8 637.7	9 211.9	9 385.1	10 150.3[a]	9 808.3	9 735.5[p]	..
Chile	..	396.0	376.5	433.3	553.4	540.2[a]	558.0[p]
Czech Republic	544.7	777.9	1 120.1	1 435.4	1 509.0	1 502.4	1 518.8[p]
Denmark	1 394.0	2 113.6	2 202.4	2 290.0	2 466.3	2 438.9	2 498.6[p]
Estonia	112.4	173.2	198.9	220.4	239.3	216.6	211.3
Finland	1 267.0	1 585.2	1 552.9	1 553.5	1 477.3	1 504.2	1 471.2
France	8 678.2	10 996.0	10 973.6	11 123.3	11 265.3	11 200.2	11 107.2[p]
Germany	12 102.3	15 844.0	16 644.1	16 952.1	17 008.2	17 436.3	17 328.3[c,p]
Greece	876.6	670.6[c]	770.3	738.3	776.3	797.6	937.9[p]
Hungary	504.1[v]	489.9[v]	526.7[v]	502.1[v]	440.4[v]	419.6[v]	393.1[v]
Iceland	69.4	81.7[a]	81.9[a]	..	86.7[a]	88.8	93.5
Ireland	622.4	835.6	767.7[c]	709.7	723.9[c]	756.9	746.1[c]
Israel[1]	1 068.6[d,g]	1 188.1[d]	1 199.1[d]	1 260.3[d]	1 299.9[d]	1 334.5[d]	1 301.3[d]
Italy	6 680.3[a]	7 318.3	7 240.1	7 240.5	7 390.8	7 803.6[c]	7 667.7[p]
Japan	18 848.7	18 098.9	19 225.4	19 543.7	20 808.7[a]	20 026.0	19 130.8
Korea	3 208.5[g]	5 645.5	5 895.2	6 116.1	6 298.0	6 587.9	6 704.7
Latvia	81.1	90.2	133.7	136.5	110.1	119.7	136.6[p]
Luxembourg	9.1	81.3	69.4	95.2	111.4	101.0	116.4[p]
Mexico	1 826.6	2 700.9	2 862.1	2 540.9	2 501.7	2 748.1[c,p]	2 881.1[c,p]
Netherlands	4 316.8	5 155.6	4 678.8	4 566.2	4 662.9	4 849.1	4 973.2[p]
New Zealand	459.1	..	547.6	..	512.2	..	..
Norway	1 200.8	1 514.1	1 515.0	1 558.6	1 615.4	1 648.4	1 781.0[p]
Poland	1 129.7	2 150.5	2 206.0	2 596.6	2 210.9	2 457.8	2 702.3
Portugal	751.9	1 634.5	1 505.4	1 369.3	1 595.8[a]	1 599.2	1 602.6[p]
Slovak Republic	107.9	229.6	321.4	386.0	390.0	445.2	786.2
Slovenia	123.6	163.0	163.7[a]	160.0	149.6	141.8	131.2[p]
Spain	4 495.1	5 682.6	5 514.0	5 115.9	5 004.3	4 960.9	5 069.8
Sweden	2 691.0	3 311.2[c]	3 428.2	3 559.4[c]	3 634.4	3 787.1[c]	3 789.2
Switzerland	..	3 027.3	..	3 560.0	..	3 888.6	..
Turkey	3 300.0	4 641.8	5 086.6	5 377.9	5 505.4	5 816.1	..
United Kingdom	8 909.1	10 171.5	9 966.7	9 932.5	10 310.3	10 489.3	10 787.9[c,p]
United States	51 724.5[j]	60 374.0[j]	61 172.0[j]	60 862.2[j]	60 544.3[j]	60 267.2[j,p]	61 206.6[j,p]
EU28 (OECD estimates)	59 796.4[b]	75 040.4[b]	75 644.9[b]	76 446.9[b]	77 335.0[b]	78 960.3[b]	80 103.7[b]
OECD-Total	**156 111.3[b]**	**186 927.0[b]**	**191 011.6[b]**	**193 769.4[b]**	**195 999.0[b]**	**197 838.9[b]**	**202 017.7[b]**
Argentina	644.5	1 246.5	1 374.8	1 498.9	1 470.4	1 422.8	..
China	9 449.5	18 052.8	19 251.0	21 304.3	22 874.1	23 782.7	26 558.2
Romania	161.8	371.6	382.3[a]	324.7	269.3	212.0	322.8
Russian Federation	1 518.6	2 764.1	3 007.6	3 276.5	3 246.3	3 656.5	3 593.9
Singapore	1 351.3	2 076.8	2 266.0	2 296.0	2 430.3	2 568.3	..
South Africa	860.7	1 187.4	1 356.4	1 426.4	1 338.4	..	..
Chinese Taipei	1 922.8	3 037.1	3 175.4	3 153.1	3 113.2	3 007.7	2 918.6

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

Source: OECD, Main Science and Technology Indicators database, February 2017

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

Percentage

	2005	2010	2011	2012	2013	2014	2015
Australia	..	4.9	..	4.7	..	5.1	..
Austria	..	..	5.2	..	5.1	..	..
Belgium	10.9	10.1	10.7	11.3	12.1	..	..
Canada	8.4	7.5	8.2	7.7[a]	7.2	7.2[p]	..
Chile	..	6.4	5.5	5.4	4.3	3.3[a]	3.0[p]
Czech Republic	0.8	1.1	1.0	0.8	2.0	2.4	4.0[p]
Denmark	2.4	3.1	3.4	2.7	2.5	1.9	2.6[p]
Estonia	5.2	4.2	3.5	3.5	4.4	4.4	5.4
Finland	6.5	5.7	5.5	5.1	5.0	4.0	3.7
France	1.6	2.0	2.6	2.6	2.8	2.7	..
Germany	14.1	13.8	13.9	14.0	14.0	14.1	..
Greece	8.9	..	9.0[a]	7.9	5.5	6.0	7.6[p]
Hungary	11.8[v]	13.6[v]	11.3[v]	9.5[v]	8.6[v]	9.1[v]	8.0[v]
Iceland	11.3	..	2.0[a]	..	4.7[a]	3.4	2.0
Ireland	2.7	2.3	2.2[c]	2.0	2.0[c]	2.0	2.0[c]
Israel[1]	7.3[d,g]	6.8[d]	6.8[d]	6.8[d]	9.3[d]	..	..
Italy	1.4[a]	1.1	1.3	1.1	1.3	1.3[c]	..
Japan	2.8	2.6	2.7	2.7	2.6[a]	2.6	2.6
Korea	15.2[g]	11.3	11.0	11.0	12.3	11.2	12.3
Latvia	15.4	7.8	4.7	5.5	6.9	7.1	7.8[p]
Luxembourg	1.4	0.4	0.7	0.8	1.0	..	..
Mexico	1.2[c]	0.4	1.4	0.5	0.8	0.8[c,p]	0.8[c,p]
Netherlands	7.8	..	8.2	8.3	7.6	7.7	8.0[p]
New Zealand	8.0	..	4.1	..	4.0	..	..
Norway	4.7	..	4.0	..	4.1	..	..
Poland	5.4	2.9	2.6	2.1	3.2	2.8	2.6
Portugal	1.2	0.6	1.9	1.3	1.7[a]	1.6	..
Slovak Republic	0.7	2.3	3.5	3.3	2.6	2.4	1.6
Slovenia	9.0	12.0	12.5[a]	11.2	11.4	12.6	11.4[p]
Spain	6.9	7.9	8.0	7.3	6.6	5.9	..
Sweden	5.1	..	4.0	..	3.8	..	..
Switzerland	..	9.1	..	10.9	..	10.0	..
Turkey	22.7[o]	16.2	14.6	13.9	13.9	14.9	..
United Kingdom	4.6	4.1	4.0	4.1	4.1	4.3	4.3[c,p]
United States	5.0[j]	4.7[j]	4.5[j]	4.6[j]	5.0[j]	5.2[j,p]	5.4[j,p]
EU28 (OECD estimates)	6.5[b]	6.4[b]	6.5[b]	6.5[b]	6.4[b]	6.4[b]	..
OECD-Total	**6.1[b]**	**5.8[b]**	**5.8[b]**	**5.8[b]**	**5.9[b]**	**6.0[b]**	**..**
Argentina	0.6	0.3	0.2	0.2	0.3	0.2	..
China	36.7	33.2	35.3	33.4	33.8	33.7	30.2
Romania	7.5	4.3	5.7[a]	7.5	4.8	6.9	5.1
Russian Federation	29.3	24.5	24.0	27.2	27.6	27.3	27.4
Singapore	1.7	2.5	3.7	4.3	6.1	7.3	..
South Africa	11.6	6.8	7.6	7.9	8.1	..	..
Chinese Taipei	5.8	6.7	7.5	8.0	7.8	8.7	9.8

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

Source: OECD, Main Science and Technology Indicators database, February 2017

Table 47. Higher education researchers in full-time equivalent

FTE

	2005	2010	2011	2012	2013	2014	2015
Australia	..	60 862	..	65 772	..	68 528	..
Austria	8 962[c]	11 954[c]	12 199	12 704[c]	12 846	13 217[c]	13 454[c,p]
Belgium	13 853	17 878	18 228	18 361	18 750	19 148[c]	23 643[a,p]
Canada	43 400	53 970	56 090	57 510	60 270	..	..
Chile	..	3 274	3 295	3 561	3 259	3 600	4 004[p]
Czech Republic	7 575[a]	10 115	10 289	11 498	10 995	10 965	11 357[p]
Denmark	8 242	13 250	13 881	14 305	15 057	15 854	16 190[p]
Estonia	1 905	2 179	2 398	2 534	2 398	2 443	2 431
Finland	12 879	13 548	11 964[a]	12 368	12 056	12 381	12 240
France	66 290	70 295	71 170	71 890	72 749	73 393	..
Germany	65 363	90 398	93 811	97 199	99 123	100 992	102 200[c,p]
Greece	11 356	..	16 068[a]	15 723	18 957	18 801	22 881[p]
Hungary	5 911	6 041	5 975	5 932	5 939	5 860	5 610
Iceland	585	..	733[a]	..	1 011[a]	1 033	892[a]
Ireland	4 400	5 730	5 726[c]	6 002	5 614[c]	9 104[a]	9 413[c]
Israel[1]	..	..	7 837[d]	9 433[c,d]	9 614[c,d]	9 639[c,d]	..
Italy	37 073[a]	43 470	43 828	45 223	47 526	48 198	48 262[p]
Japan	156 176	125 263	126 133	125 890	136 593[a]	137 586	137 078
Korea	27 416[g]	39 265	40 844	43 826	41 784	41 938	40 866
Latvia	2 224	2 629	2 708	2 607	2 348	2 291	2 318[p]
Luxembourg	157	491	566	651	769	906	1 049[p]
Mexico	16 691[c]	18 668	18 881	13 850	14 422	..	..
Netherlands	17 928	20 156	20 965	20 990	21 216	21 921	22 300[p]
New Zealand	7 481	..	9 300	..	9 800	..	..
Norway	7 512	9 468	9 760	9 855	10 054	10 296	10 807[p]
Poland	40 449	39 170	39 677	38 152	37 167	39 695	40 126
Portugal	10 956	23 858	23 754	23 825	25 760[a]	24 978	26 297[p]
Slovak Republic	6 458	10 203	10 339	9 782	9 625	8 959	8 508
Slovenia	1 695	2 262	2 431[a]	2 398	2 201	2 180	2 069[p]
Spain	54 028	64 590	62 185	59 775	57 641	57 156	57 107
Sweden	15 125[a]	16 959[c]	17 101	16 561[c]	18 401	19 616[c]	18 135[p]
Switzerland	..	16 810	..	18 760	..	..	..
Turkey	25 434	32 913	35 644	40 801	42 574	41 269	..
United Kingdom	141 762[a,c]	159 941	150 650	153 755	158 445	163 838	168 682[c,p]
United States	..	..	..	..	..	..	..
EU28 (OECD estimates)	551 459[b]	662 382[b]	656 966[b]	662 252[b]	675 972[b]	692 231[b]	707 197[b]
OECD-Total	**..**	**..**	**..**	**1 359 908[b]**	**..**	**..**	**..**
Argentina	14 200	21 190	22 766	23 332	23 220	23 153	..
China	221 908[t]	239 251	249 025	262 052	272 683	282 304	298 728
Romania	5 386	8 245	6 563[a]	6 591	6 578	6 378	6 480
Russian Federation	70 494	84 359	89 938	87 259	89 085	91 501	92 503
Singapore	8 187	13 766	14 460	15 096	15 853	16 195	..
South Africa	9 235	11 068	12 828	13 744	15 772	..	..
Chinese Taipei	23 180	31 567	32 045	32 588	31 712	30 621	29 828

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

Source: OECD, Main Science and Technology Indicators database, February 2017

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

Percentage

	2005	2010	2011	2012	2013	2014	2015
Australia	..	60.6[b]	..	..	..	..	..
Austria	31.5[c]	32.7[c]	32.9	32.0[c]	31.8	31.8[c]	31.8[c,p]
Belgium	41.8	43.8	42.7	40.3	40.4	40.8[c]	42.9[a,p]
Canada	31.7	34.0	34.0	35.6	37.9	..	..
Chile	..	60.2[l]	54.2	52.4	55.3	47.5	49.0[p]
Czech Republic	31.3[a]	34.6	33.5	34.6	32.1	30.4	29.8[p]
Denmark	29.2	35.4	35.4	35.7	37.8	38.3	38.2[p]
Estonia	57.2	53.4	53.2	55.3	54.4	56.5	58.1[p]
Finland	32.5	32.7	29.9[a]	30.6	30.8	32.3	32.6
France	32.7	28.9[a]	28.6	27.8	27.3	27.5	..
Germany	24.0	27.6[c]	27.7	27.6	28.0	28.7	28.6[c,p]
Greece	58.0	..	65.1[a]	63.4	64.9	62.9	65.2[p]
Hungary	37.2	28.3	26.0	24.9	23.7	22.4	22.2
Iceland	27.2	..	32.5[a]	..	54.7[a]	..	45.9[a]
Ireland	38.0	40.4[c]	37.5[c]	36.9[c]	33.3[c]	43.9[a,c]	43.9[c,p]
Israel[1]	..	..	14.2[d]	14.9[c,d]	..	..	..
Italy	44.9[a]	42.0	41.3	40.9	40.9	40.8	40.0[p]
Japan	22.9	19.1	19.2	19.5	20.7[a]	20.1	20.7
Korea	15.2[g]	14.9	14.1	13.9	13.0	12.1	11.5
Latvia	67.8	67.5	68.6	66.8	64.8	61.1	64.2[p]
Luxembourg	7.1	18.8	20.0	28.2[a]	30.7	34.5	36.6[p]
Mexico	38.0[c]	48.5	47.4	47.6	48.2	..	..
Netherlands	37.5	37.5	34.2[a]	28.7[a]	27.7	28.8	29.0[p]
New Zealand	57.6	..	57.1	..	54.7	..	..
Norway	35.4	35.8	35.8	35.4	35.5	35.2	35.1[p]
Poland	65.1	60.7	61.9	56.9	52.0	50.5	48.6
Portugal	51.9	57.5	53.9	56.1	68.1[a]	65.5	66.4[p]
Slovak Republic	59.1	67.2	67.5	64.1	65.4	60.8	59.1
Slovenia	32.3	29.4	27.7[a]	27.0	25.3	25.4	26.2[p]
Spain	49.2	48.0	47.7	47.1	46.8	46.8	46.6
Sweden	27.5[a,l]	34.4[c,l]	35.1[l]	33.6[c,l]	28.7[a,l]	29.4[c,l]	26.4[l,p]
Switzerland	..	..	..	52.2	..	..	..
Turkey	65.0	51.2	49.4	49.7	47.8	46.0	..
United Kingdom	57.0[a,c]	62.3[c]	59.9	60.0[c]	59.2	59.2[c]	58.3[c,p]
United States	..	..	..	..	..	..	..
EU28 (OECD estimates)	40.1[b]	41.4[b]	40.4[b]	39.4[b]	39.1[b]	39.4[b]	39.2[b]
OECD-Total	**..**	**..**	**..**	**30.9[b]**	**..**	**..**	**..**
Argentina	44.6	45.9[p]	46.4[p]	46.2[p]	45.7[p]	44.8[p]	..
China	19.8[t]	19.8	18.9	18.7	18.4	18.5	18.5
Romania	23.5	41.7	40.8[a]	36.6	35.4	35.2	37.1
Russian Federation	15.2	19.1	20.1	19.7	20.2	20.6	20.6
Singapore	34.4	43.0	42.9	44.2	44.0	44.2	..
South Africa	53.4	59.1	63.8	64.3	67.6	..	..
Chinese Taipei	26.1	24.6	23.8	23.3	22.5	21.4	20.5

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

Source: OECD, Main Science and Technology Indicators database, February 2017

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

FTE

	2005	2010	2011	2012	2013	2014	2015
Australia	..	69 392	..	74 669	..	78 038	..
Austria	12 353[c]	15 878[c]	16 096	16 678[c]	16 840	17 328[c]	17 637[c,p]
Belgium	17 767	22 371	22 709	22 770	23 156	23 548[c]	27 505[a,p]
Canada	56 950	67 590	70 010	71 320	74 730	..	..
Chile	..	6 133	6 223	6 819	6 672	7 361	7 190[p]
Czech Republic	10 776[a]	14 056	14 724	16 441	16 240	16 525	16 868[p]
Denmark	11 561	18 444	18 916	19 991	20 925	20 955	21 257[p]
Estonia	2 176	2 465	2 735	3 000	2 850	3 103	3 062
Finland	17 453	17 924	15 847[a]	16 146	15 726	16 034	15 515
France	98 743	106 585	107 891	108 794	109 883	111 700	..
Germany	94 522	120 981	124 308	127 900	130 079	132 542	134 400[c,p]
Greece	17 401	..	20 640[a]	20 508	23 390	23 924	28 508[p]
Hungary	8 194	8 256	8 260	8 130	8 154	7 937	7 706
Iceland	742	..	1 057[a]	..	1 211[a]	1 232	1 062
Ireland	5 220	6 501	6 437[c]	6 935	6 208[c]	9 866[a]	10 200[c]
Israel[1]	9 011[d]	9 120[d]	9 220[d]	11 097[c,d]	11 311[c,d]	11 340[c,d]	..
Italy	66 976[a]	72 299	73 723	76 207	76 986	75 235	74 892[p]
Japan	209 734	188 324	192 265	195 043	207 766[a]	209 101	208 579
Korea	42 157[g]	73 511	73 468	77 099	73 196	74 861	72 745
Latvia	2 856	3 285	3 393	3 538	3 237	3 177	3 241[p]
Luxembourg	169	548	631	723	866	989	1 146[p]
Mexico	25 218[c]	25 507	26 377	20 211	21 106	..	..
Netherlands	32 305	34 981	32 197	31 952	32 331	33 237	33 550[p]
New Zealand	9 660	..	11 500	..	11 600	..	..
Norway	9 420	11 968	12 283	12 413	12 715	13 010	13 746[p]
Poland	44 763	43 111	44 154	42 917	41 441	44 304	44 961
Portugal	11 680	25 092	24 491	24 513	27 753[a]	26 870	27 766[p]
Slovak Republic	7 146	10 535	10 712	10 124	9 969	9 297	8 815
Slovenia	2 099	2 727	3 003[a]	2 926	2 805	2 667	2 555[p]
Spain	66 996	83 300	80 900	77 238	74 923	73 428	73 327
Sweden	17 686[a]	19 471[c]	20 010	21 781[c]	21 004	22 410[c]	21 350[p]
Switzerland	..	24 719	..	26 945	..	..	..
Turkey	25 434[m]	32 913[m]	35 644[m]	40 801[m]	42 574[m]	41 269[m]	..
United Kingdom	152 634[a,c,m]	170 446[m]	175 185[m]	173 499[m]	177 767[m]	183 023[m]	188 434[c,m,p]
United States	..	..	..	..	..	..	..
EU28 (OECD estimates)	723 062[b]	846 133[b]	853 329[b]	857 662[b]	868 547[b]	883 624[b]	899 323[b]
OECD-Total	**..**	**..**	**..**	**..**	**..**	**..**	**..**
Argentina	15 507	24 602	26 270	27 178	27 737	27 896	..
China	227 163[t]	289 670	299 296	313 520	324 942	334 794	354 861
Romania	6 803	9 054	8 879[a]	8 710	9 523	8 966	9 008
Russian Federation	97 672	113 353	121 151	119 360	118 971	121 526	121 680
Singapore	9 337	14 877	15 551	16 252	17 099	17 405	..
South Africa	10 611	12 477	14 563	15 614	17 778	..	..
Chinese Taipei	25 752	35 219	35 818	36 115	35 088	34 135	33 177

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

Source: OECD, Main Science and Technology Indicators database, February 2017

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

Million USD

	2005	2010	2011	2012	2013	2014	2015
Australia	..	2 550.7[c]	2 348.7[v]	2 419.0	2 592.9[c]	2 282.2	..
Austria	355.9[c]	502.5[c]	511.5	522.5[c]	533.5	564.0[c]	582.4[c,p]
Belgium	520.6	755.5	791.7	908.7[a]	962.4	1 017.6[c]	981.2[p]
Canada	2 238.7	2 757.3	2 405.0	2 333.3	2 509.5	2 368.2[p]	..
Chile	..	37.9	49.0	55.3	129.9[a]	125.2	126.3[p]
Czech Republic	579.6	840.4	929.4	1 001.8	1 116.2	1 224.5	1 414.6[p]
Denmark	285.7	153.9	147.7	177.3	183.7	180.8	190.8[p]
Estonia	23.3	48.0	60.8	67.9	55.8	59.8	61.6
Finland	534.0	717.2	705.6	677.9	659.3	621.9	549.1
France	7 024.1	7 142.4[a]	7 427.2	7 248.3	7 627.5	7 663.1	7 955.2[p]
Germany	9 014.2[o]	12 885.0[o]	13 913.7[o]	14 405.3[o]	15 323.4[o]	16 341.9[o]	16 820.1[c,o,p]
Greece	329.9	444.8[c]	465.1	484.8	650.3	668.3	756.3[p]
Hungary	444.3[v]	455.3[v]	426.8[v]	418.1[v]	501.1[v]	470.9[v]	476.7[v]
Iceland	69.8	..	55.7[a,l]	..	16.6[a]	17.8	16.7
Ireland	148.3	150.2	158.6	160.4	159.2	159.8	169.4
Israel[1]	186.4[d]	178.3[d]	199.1[d]	198.3[d]	209.2[d]	215.5[d]	220.9[d]
Italy	3 158.8	3 482.7	3 497.6	4 066.2	3 987.6	4 030.0	3 993.0[p]
Japan	10 669.1	12 688.6	12 428.3	13 130.7	15 102.7	14 202.9	13 434.4
Korea	3 631.6[g]	6 612.3	6 847.1	7 299.4	7 461.5	8 209.7	8 715.1
Latvia	30.7	51.8	66.2	77.9	80.8	78.7	78.9[p]
Luxembourg	60.1[o]	139.2[o]	163.3[o]	172.3[o]	196.2[o]	213.4[o]	237.2[o,p]
Mexico	1 238.8	3 106.3	3 143.5	3 722.3	3 908.7	4 460.3[c,p]	4 548.7[c,p]
Netherlands	1 355.4[o]	1 500.4[o]	1 578.1[o]	1 797.2[a,o]	1 954.9[o]	1 961.9[o]	2 087.2[o,p]
New Zealand	308.1	..	401.1	..	430.3	..	..
Norway	513.1	768.4	822.6	873.0	899.2	882.4	939.6[p]
Poland	1 085.2	2 075.5	2 240.3	2 234.1	2 198.2	2 202.5	2 500.0
Portugal	264.3	315.6	303.9	205.2	252.4	242.3	232.0[p]
Slovak Republic	130.8[d]	248.9[d]	255.9[d]	284.4[d]	255.0[d]	393.3[d]	533.0[d]
Slovenia	163.7	213.5	204.9[a]	200.2	206.3	185.5	197.2[p]
Spain	2 258.7	4 038.9	3 868.2	3 678.8	3 613.9	3 637.0	3 779.2
Sweden	506.9[a]	612.2[c]	578.8	671.0[c]	534.2[m]	530.8[c]	525.6
Switzerland	..	85.4[h]	..	103.4[h]	..	148.6[h]	155.6[h]
Turkey	531.0	1 154.7	1 307.7	1 408.9	1 443.4	1 486.3	..
United Kingdom	3 234.9	3 583.0	3 326.7	3 097.1	3 283.7	3 210.1	3 147.4[c,p]
United States	40 378.0[h]	52 121.0	54 974.0	53 342.0	52 370.0	54 103.0	56 206.0
EU28 (OECD estimates)	31 987.5[b]	41 015.3[b]	42 421.7[b]	43 331.8[b]	45 126.6[b]	46 365.9[b]	48 150.2[b]
OECD-Total	**93 018.8[b]**	**122 416.2[b]**	**126 184.9[b]**	**127 331.6[b]**	**130 964.1[b]**	**134 061.5[b]**	**137 622.9[b]**
Argentina	900.3	1 789.9	1 886.7	2 278.6	2 397.8	2 393.1	..
China	18 920.0	38 681.2	40 473.8	47 542.2	53 985.8	58 489.1	66 069.4
Romania	284.2	557.6	702.8[a]	711.2	715.2	647.8[b]	774.8[b]
Russian Federation	4 723.4	10 242.6	10 500.4	12 202.6	11 081.1	12 150.9	12 588.7
Singapore	490.9	747.0	851.1	822.0	994.9	1 147.7	..
South Africa	843.7	1 008.5	1 040.1	1 104.6	1 163.6	..	..
Chinese Taipei	3 220.3	3 989.9	4 138.9	4 100.0	4 094.0	4 080.2	4 193.3

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

Source: OECD, Main Science and Technology Indicators database, February 2017

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

Percentage

	2005	2010	2011	2012	2013	2014	2015
Australia	..	0.27[c]	0.24[v]	0.24	0.24[c]	0.21	..
Austria	0.12[c]	0.14[c]	0.14	0.13[c]	0.13	0.14[c]	0.14[c,p]
Belgium	0.15	0.17	0.17	0.19[a]	0.20	0.20[c]	0.19[p]
Canada	0.19	0.20	0.17	0.16	0.16	0.15[p]	..
Chile	..	0.01[y]	0.01[y]	0.01[y]	0.03[a,y]	0.03[y]	0.03[p,y]
Czech Republic	0.26	0.29	0.31	0.33	0.35	0.36	0.40[p]
Denmark	0.15	0.06	0.06	0.07	0.07	0.07	0.07[p]
Estonia	0.10	0.17	0.19	0.20	0.15	0.16	0.16
Finland	0.32	0.34	0.32	0.31	0.29	0.27	0.24
France	0.36	0.30[a]	0.30	0.29	0.29	0.29	0.29[p]
Germany	0.34[o]	0.40[o]	0.41[o]	0.41[o]	0.42[o]	0.43[o]	0.43[c,o,p]
Greece	0.12	0.14[c]	0.16	0.17	0.23	0.23	0.26[p]
Hungary	0.26[v]	0.21[v]	0.19[v]	0.18[v]	0.21[v]	0.19[v]	0.18[v]
Iceland	0.64	..	0.44[a,l]	..	0.12[a]	0.12	0.11
Ireland	0.09	0.08	0.08	0.08	0.07	0.07	0.05
Israel[1]	0.11[d]	0.08[d]	0.08[d]	0.08[d]	0.08[d]	0.08[d]	0.07[d]
Italy	0.18	0.17	0.16	0.19	0.18	0.18	0.18[p]
Japan	0.27[y]	0.29[y]	0.28[y]	0.29[y]	0.32[y]	0.30[y]	0.28[y]
Korea	0.31[g]	0.44	0.44	0.45	0.45	0.48	0.50
Latvia	0.10	0.14	0.16	0.18	0.18	0.17	0.16[p]
Luxembourg	0.19[o]	0.32[o]	0.34[o]	0.36[o]	0.38[o]	0.38[o]	0.41[o,p]
Mexico	0.09	0.18	0.17	0.19	0.19	0.21[c,p]	0.21[c,p]
Netherlands	0.22[o]	0.20[o]	0.21[o]	0.23[a,o]	0.24[o]	0.24[o]	0.25[o,p]
New Zealand	0.29	..	0.28	..	0.27	..	..
Norway	0.23	0.27	0.27	0.27	0.26	0.26	0.29[p]
Poland	0.20	0.26	0.26	0.25	0.23	0.23	0.24
Portugal	0.11	0.11	0.11	0.07	0.09	0.08	0.08[p]
Slovak Republic	0.15[d]	0.18[d]	0.18[d]	0.20[d]	0.17[d]	0.25[d]	0.33[d]
Slovenia	0.34	0.37	0.35[a]	0.34	0.34	0.29	0.30[p]
Spain	0.19	0.27	0.26	0.25	0.24	0.23	0.23
Sweden	0.17[a]	0.16[c]	0.14	0.16[c]	0.12[m]	0.12[c]	0.11
Switzerland	..	0.02[h]	..	0.02[h]	..	0.03[h]	0.03[h]
Turkey	0.07[y]	0.10[y]	0.10[y]	0.10[y]	0.10[y]	0.10[y]	..
United Kingdom	0.17	0.16	0.14	0.13	0.13	0.12	0.12[c,p]
United States	0.31[h]	0.35	0.35	0.33	0.31	0.31	0.31
EU28 (OECD estimates)	0.23[b]	0.24[b]	0.24[b]	0.24[b]	0.24[b]	0.24[b]	0.24[b]
OECD-Total	**0.26[b]**	**0.28[b]**	**0.28[b]**	**0.27[b]**	**0.27[b]**	**0.27[b]**	**0.27[b]**
Argentina	0.17	0.24	0.23	0.28	0.28	0.28	..
China	0.28[y]	0.31[y]	0.29[y]	0.31[y]	0.32[y]	0.32[y]	0.33[y]
Romania	0.14	0.17	0.20[a]	0.20	0.19	0.16	0.19
Russian Federation	0.26[y]	0.33[y]	0.31[y]	0.34[y]	0.32	0.33	0.35
Singapore	0.21	0.21	0.22	0.20	0.23	0.25	..
South Africa	0.18	0.17	0.16	0.17	0.17	..	..
Chinese Taipei	0.49	0.45	0.44	0.42	0.40	0.38	0.38

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

Source: OECD, Main Science and Technology Indicators database, February 2017

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

Million 2010 USD

	2005	2010	2011	2012	2013	2014	2015
Australia	..	2 550.7[c]	2 314.2[v]	2 433.3	2 415.6[c]	2 158.8	..
Austria	407.8[c]	502.5[c]	496.4	486.7[c]	478.8	496.4[c]	503.8[c,p]
Belgium	608.2	755.5	773.2	859.3[a]	881.4	916.8[c]	876.0[p]
Canada	2 466.0	2 757.3	2 365.3	2 275.6	2 366.6	2 216.6[p]	..
Chile	..	37.9	46.2	51.5	118.2[a]	112.9	113.1[p]
Czech Republic	665.6	840.4	908.7	962.0	1 015.0	1 076.5	1 244.2[p]
Denmark	365.2	153.9	144.7	171.8	171.4	166.8	173.3[p]
Estonia	30.6	48.0	57.8	63.7	50.5	53.7	55.2
Finland	635.9	717.2	687.3	648.8	612.6	568.7	493.1
France	8 190.4	7 142.4[a]	7 257.0	7 025.5	7 046.0	6 983.9	7 158.5[p]
Germany	10 325.0[o]	12 885.0[o]	13 512.6[o]	13 751.7[o]	14 106.4[o]	14 630.0[o]	14 888.8[c,o,p]
Greece	374.3	444.8[c]	456.7	458.6	580.4	595.0	678.2[p]
Hungary	561.3[v]	455.3[v]	411.2[v]	393.9[v]	455.8[v]	427.1[v]	431.2[v]
Iceland	74.4	..	55.1[a,l]	..	15.8[a]	16.4	14.8
Ireland	169.7	150.2	150.1	146.3	141.0	144.1	143.6
Israel[1]	192.5[d]	178.3[d]	194.1[d]	186.8[d]	187.1[d]	191.2[d]	188.2[d]
Italy	3 829.8	3 482.7	3 388.9	3 830.0	3 655.9	3 651.3	3 557.2[p]
Japan	11 657.6	12 688.6	12 188.6	12 613.6	14 167.9	13 255.8	12 307.3
Korea	3 832.9[g]	6 612.3	6 852.6	7 232.5	7 437.6	8 163.8	8 656.6
Latvia	37.4	51.8	63.8	73.5	74.2	70.7	70.5[p]
Luxembourg	73.2[o]	139.2[o]	152.1[o]	156.9[o]	174.0[o]	183.6[o]	203.3[o,p]
Mexico	1 472.4	3 106.3	2 985.3	3 507.9	3 634.3	4 019.8[c,p]	4 199.6[c,p]
Netherlands	1 549.8[o]	1 500.4[o]	1 545.5[o]	1 711.3[a,o]	1 776.2[o]	1 788.8[o]	1 910.8[o,p]
New Zealand	366.3	..	390.4	..	389.9	..	..
Norway	609.9	768.4	793.8	817.6	818.9	809.2	875.1[p]
Poland	1 300.7	2 075.5	2 170.2	2 108.3	2 027.3	2 018.8	2 282.9
Portugal	310.5	315.6	305.2	201.1	232.9	219.7	208.1[p]
Slovak Republic	156.7[d]	248.9[d]	254.4[d]	278.2[d]	241.3[d]	366.6[d]	500.2[d]
Slovenia	178.6	213.5	198.5[a]	188.2	186.8	165.0	173.8[p]
Spain	2 639.5	4 038.9	3 806.0	3 520.2	3 342.9	3 313.6	3 449.9
Sweden	597.0[a]	612.2[c]	561.6	630.4[c]	493.0[m]	489.8[c]	484.7
Switzerland	..	85.4[h]	..	95.7[h]	..	131.0[h]	134.0[h]
Turkey	698.2	1 154.7	1 266.8	1 347.6	1 363.5	1 390.6	..
United Kingdom	3 654.8	3 583.0	3 284.8	2 992.9	3 082.8	2 954.9	2 863.1[c,p]
United States	44 431.2[h]	52 121.0	53 862.0	51 317.7	49 581.8	50 321.6	51 721.1
EU28 (OECD estimates)	37 320.3[b]	41 015.3[b]	41 349.3[b]	41 396.5[b]	41 579.9[b]	41 952.3[b]	43 173.0[b]
OECD-Total	**104 490.1[b]**	**122 416.2[b]**	**123 492.2[b]**	**122 469.8[b]**	**122 934.4[b]**	**123 968.5[b]**	**126 248.2[b]**
Argentina	990.7	1 789.9	1 848.7	2 192.2	2 269.7	2 228.9	..
China	20 819.5	38 681.2	39 651.3	45 733.7	51 104.5	54 464.9	60 902.9
Romania	404.6	557.6	680.7[a]	673.6	672.4	598.3	708.0
Russian Federation	6 849.3	10 242.6	9 935.4	11 346.6	10 909.6	11 395.9	11 640.5
Singapore	540.0	747.0	833.3	790.9	942.2	1 067.5	..
South Africa	928.2	1 008.5	1 019.1	1 062.7	1 101.5	..	..
Chinese Taipei	3 543.6	3 989.9	4 055.1	3 944.6	3 876.1	3 795.2	3 858.7

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

Source: OECD, Main Science and Technology Indicators database, February 2017

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

Percentage

	2005	2010	2011	2012	2013	2014	2015
Australia	..	..	7.1[v]	7.7	..	9.9	..
Austria	..	..	4.2	..	4.2	..	..
Belgium	9.2	6.7	5.7	5.0[a]	5.4	..	..
Canada	3.8	4.0	2.8	2.1	2.0	1.9[p]	..
Chile	..	0.7	2.0	2.4	1.5[a]	3.3	2.7[p]
Czech Republic	9.2	4.7	3.4	4.0	3.3	3.5	2.8[p]
Denmark	2.1	0.9	3.6	1.6	2.8	1.7	1.2[p]
Estonia	0.0	2.4	1.5	1.2	1.3	1.3	1.6
Finland	12.4	9.7	11.0	9.9	9.9	8.3	8.7
France	7.4	8.0[a]	7.8	7.8	8.0	8.1	..
Germany	9.9[o]	9.0[o]	9.3[o]	10.3[o]	10.3[o]	11.2[o]	..
Greece	1.3	..	6.6[a]	5.5	3.6	3.1	4.6[p]
Hungary	10.3[v]	12.7[v]	11.5[v]	9.8[v]	9.7[v]	7.8[v]	8.8[v]
Iceland	7.4	..	16.3[a]	..	15.0[a]	15.3	15.5
Ireland	4.1	1.6	1.7	1.8	1.9	1.9	0.8
Israel[1]	7.7[d]	2.4[d]	2.1[d]	1.8[d]	2.2[d]	..	..
Italy	2.4	4.8	5.3	5.3	4.2	4.1	..
Japan	0.7	0.7	2.0	1.7	1.9	1.9	2.3
Korea	4.3[g]	3.5	3.2	3.5	2.8	2.8	2.3
Latvia	15.6	22.6	9.9	13.9	13.2	15.6	16.9[p]
Luxembourg	3.9[o]	2.4[o]	5.0[o]	4.6[o]	2.0[o]	..	..
Mexico	1.2[c]	1.3	1.3	0.9	0.7	0.7[c,p]	0.7[c,p]
Netherlands	14.6[o]	..	17.9[o]	18.3[a,o]	16.6[o]	16.0[o]	13.2[o,p]
New Zealand	19.0	..	17.6	..	17.2	..	..
Norway	10.6	10.1	9.5	9.1	8.9	9.6	..
Poland	14.3	6.2[o]	7.4	4.9	4.3	..[x]	4.5
Portugal	2.0	3.6	1.0	1.5	1.7	1.2	..
Slovak Republic	8.5[d]	13.0[d]	12.5[d]	13.2[d]	8.2[d]	13.4[d]	8.6[d]
Slovenia	12.1	13.0	7.0[a]	8.4	7.6	7.8	8.0[p]
Spain	7.3	7.2	6.9	5.0	5.9	5.8	..
Sweden	1.3[a]	..	5.2	..	3.7	..	..
Switzerland	..	0.0[h]	..	0.0[h]	..	0.0[h]	0.0[h]
Turkey	1.5	1.8	2.0	2.1	2.0	2.6	..
United Kingdom	9.9	7.4	9.7	12.5	11.6	12.0	12.0[c,p]
United States	0.0[h]	0.3[j]	0.3[j]	0.3[j]	0.4[j]	0.4[j]	0.4[j,p]
EU28 (OECD estimates)	8.3[b]	8.4[b]	8.4[b]	8.6[b]	8.4[b]	8.7[b]	..
OECD-Total	**3.5[b]**	**3.5[b]**	**3.6[b]**	**3.7[b]**	**3.7[b]**	**3.8[b]**	**..**
Argentina	0.2	0.5	1.1	1.9	0.5	0.2	..
China	4.9	4.4	4.2	4.1	4.6	4.1	3.9
Romania	16.1	19.0	22.7[a]	17.3	16.0	17.0	15.2
Russian Federation	11.4	12.9	11.8	13.1	13.8	11.5	11.6
Singapore	2.3	3.5	2.9	3.8	6.1	4.3	..
South Africa	7.9	4.4	1.4	2.7	7.0	..	..
Chinese Taipei	3.0	2.9	2.6	3.0	3.1	3.4	2.9

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

Source: OECD, Main Science and Technology Indicators database, February 2017

Table 54. Government researchers in full-time equivalent

FTE

	2005	2010	2011	2012	2013	2014	2015
Australia	..	..	8 454	8 311	..	7 637	..
Austria	1 232[c]	1 568[c]	1 511	1 555[c]	1 567	1 612[c]	1 641[c,p]
Belgium	2 274	2 650	2 781	3 591[a]	3 657	3 724[c]	4 611[a,p]
Canada	8 360	9 610	9 450	9 490	9 100	..	..
Chile	..	292	337	404	710[a]	769	863[p]
Czech Republic	6 323[a]	6 244	6 235	6 066	6 326	6 590	7 393[p]
Denmark	2 105	1 216	1 181	1 208	1 254	1 384	1 426[p]
Estonia	474	548	536	546	553	533	514
Finland	4 374	4 551	4 630	4 432	4 482	4 089	3 550
France	25 889[d]	26 611[a]	26 808	27 413	28 227	28 276	..
Germany	39 911	51 783	54 185	55 597	56 755	52 854[a]	53 300[c,p]
Greece	2 076	..	4 370[a]	4 510	5 778	5 844	6 945[p]
Hungary	4 959	5 027	5 271	4 674	4 782	4 776	4 680
Iceland	501	..	411[a]	..	181[a]	..	239[a]
Ireland	419	562	547	495	437	461	494
Israel[1]	..	..	477[d]	503[c,d]	..	..	..
Italy	14 454	17 496	18 780	20 499	21 313	21 045	21 229[p]
Japan	34 035	32 422	32 164	31 567	30 904	30 373	30 242
Korea	12 791[g]	19 753	21 203	22 204	23 292	24 750	26 431
Latvia	589	635	686	703	707	681	691[p]
Luxembourg	374	662	747	732	733	708	787[p]
Mexico	6 589[c]	8 160	8 263	7 205	7 273	..	..
Netherlands	7 028[o]	6 959[o]	6 761[o]	8 581[a,o]	8 616[o]	8 624[o]	9 197[o,p]
New Zealand	1 800	..	1 900	..	2 000	..	..
Norway	3 449[u]	4 479	4 601	4 654	4 705	4 627	4 780[p]
Poland	12 175	13 553	13 824	13 583	13 571	13 847	13 618
Portugal	3 338	2 440	2 531	1 682	1 386[a]	1 447	1 336[p]
Slovak Republic	2 503[d]	2 999[d]	2 892[d]	2 967[d]	2 635[d]	3 123[d]	3 084[d]
Slovenia	1 591	2 036	1 817[a]	1 850	1 825	1 744	1 629[p]
Spain	20 446	24 377	22 893	21 850	20 673	20 180	19 962
Sweden	2 929[a,m,u]	1 892[c,m]	2 097[a,m]	2 002[c,m]	2 386[a,m]	2 304[c,m]	3 322[a,m]
Switzerland	..	406[h]	..	430[h]	..	466[h]	472[h]
Turkey	4 249	6 087	6 060	6 288	6 294	6 541	..
United Kingdom	9 311	8 620	7 571	7 729	7 641	7 769	7 609[c,p]
United States	..	..	..	..	..	..	..
EU28 (OECD estimates)	179 279[b]	198 085[b]	200 647[b]	204 063[b]	207 203[b]	203 182[b]	206 890[b]
OECD-Total	**292 773[b]**	**333 356[b]**	**338 908[b]**	**339 015[b]**	**340 154[b]**	**339 025[b]**	**..**
Argentina	13 285	21 452	22 566	23 237	23 444	24 814	..
China	200 377[t]	231 699	250 250	269 581	288 675	295 899	305 686
Romania	7 082	5 590	5 846[a]	6 372	6 583	6 409	6 659
Russian Federation	154 827	145 056	141 572	149 593	144 776	144 700	146 840
Singapore	1 364	1 757	1 827	1 756	1 843	1 950	..
South Africa	1 974	2 651	2 645	2 789	2 705	..	..
Chinese Taipei	13 789	15 131	14 706	14 630	14 599	14 753	14 887

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

Source: OECD, Main Science and Technology Indicators database, February 2017

Table 55. Government researchers as a percentage of national total

Percentage

	2005	2010	2011	2012	2013	2014	2015
Australia	..	..	..	..	..	..	..
Austria	4.3[c]	4.3[c]	4.1	3.9[c]	3.9	3.9[c]	3.9[c,p]
Belgium	6.9	6.5	6.5	7.9[a]	7.9	7.9[c]	8.4[a,p]
Canada	6.1	6.1	5.7	5.9	5.7	..	..
Chile	..	5.4[l]	5.5	5.9	12.1[a]	10.1	10.6[p]
Czech Republic	26.2[a]	21.4	20.3	18.3	18.5	18.3	19.4[p]
Denmark	7.5	3.2	3.0	3.0	3.1	3.3	3.4[p]
Estonia	14.2	13.4	11.9	11.9	12.5	12.3	12.3[p]
Finland	11.1	11.0	11.6[a]	11.0	11.4	10.7	9.5
France	12.8[d]	10.9[a]	10.8	10.6	10.6	10.6	..
Germany	14.7	15.8[c]	16.0	15.8	16.0	15.0[a]	14.9[c,p]
Greece	10.6	..	17.7[a]	18.2	19.8	19.6	19.8[p]
Hungary	31.2	23.6	22.9	19.6	19.1	18.2	18.5
Iceland	23.3	..	18.2[a]	..	9.8[a]	..	12.3[a]
Ireland	3.6	4.0[c]	3.6[c]	3.0[c]	2.6[c]	2.2[a,c]	2.3[p]
Israel[1]	..	..	0.9[d]	0.8[c,d]	..	..	..
Italy	17.5	16.9	17.7	18.5	18.3	17.8	17.6[p]
Japan	5.0	4.9	4.9	4.9	4.7[a]	4.4	4.6
Korea	7.1[g]	7.5	7.3	7.0	7.2	7.2	7.4
Latvia	17.9	16.3	17.4	18.0	19.5	18.2	19.1[p]
Luxembourg	16.8	25.3	26.4	31.7[a]	29.3	26.9	27.4[p]
Mexico	15.0[c]	21.2	20.7	24.8	24.3	..	..
Netherlands	14.7[o]	13.0[o]	11.0[a,o]	11.7[a,o]	11.2[o]	11.3[o]	11.9[o,p]
New Zealand	13.9	..	11.7	..	11.2	..	..
Norway	16.3[u]	16.9	16.9	16.7	16.6	15.8	15.5[p]
Poland	19.6	21.0	21.6	20.3	19.0	17.6	16.5
Portugal	15.8	5.9	5.7	4.0	3.7[a]	3.8	3.4[p]
Slovak Republic	22.9[d]	19.7[d]	18.9[d]	19.4[d]	17.9[d]	21.2[d]	21.4[d]
Slovenia	30.3	26.4	20.7[a]	20.8	21.0	20.3	20.6[p]
Spain	18.6	18.1	17.6	17.2	16.8	16.5	16.3
Sweden	5.3[a,u]	3.8[c]	4.3[a]	4.1[c]	3.7[a]	3.5[c]	4.8[a,p]
Switzerland	..	..	..	1.2[h]	..	..	..
Turkey	10.9	9.5	8.4	7.7	7.1	7.3	..
United Kingdom	3.7[a,c]	3.4[c]	3.0	3.0[c]	2.9	2.8[c]	2.6[c,p]
United States	..	..	..	..	..	..	..
EU28 (OECD estimates)	13.0[b]	12.4[b]	12.3[b]	12.1[b]	12.0[b]	11.6[b]	11.5[b]
OECD-Total	**7.9[b]**	**8.0[b]**	**7.9[b]**	**7.7[b]**	**7.5[b]**	**7.3[b]**	**..**
Argentina	41.7	46.4[p]	46.0[p]	46.0[p]	46.2[p]	48.0[p]	..
China	17.9[t]	19.1	19.0	19.2	19.5	19.4	18.9
Romania	30.8	28.3	36.4[a]	35.4	35.4	35.4	38.1
Russian Federation	33.3	32.8	31.6	33.7	32.9	32.5	32.7
Singapore	5.7	5.5	5.4	5.1	5.1	5.3	..
South Africa	11.4	14.2	13.1	13.0	11.6	..	..
Chinese Taipei	15.5	11.8	10.9	10.4	10.3	10.3	10.2

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

Source: OECD, Main Science and Technology Indicators database, February 2017

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

FTE

	2005	2010	2011	2012	2013	2014	2015
Australia	..	..	16 689	16 381	..	14 715	..
Austria	2 318[c]	2 680[c]	2 567	2 544[c]	2 538	2 611[c]	2 658[c,p]
Belgium	3 589	4 404	4 573	5 818[a]	5 932	6 047[c]	6 605[a,p]
Canada	17 860	19 880	19 740	19 070	18 110	..	..
Chile	..	404	504	607	1 382[a]	1 372	1 495[p]
Czech Republic	10 584[a]	10 926	11 133	11 345	11 749	11 859	12 953[p]
Denmark	3 240	1 563	1 511	1 543	1 544	1 687	1 792[p]
Estonia	696	772	776	774	851	800	782
Finland	7 422	6 836	6 881	6 360	6 319	5 880	4 519
France	49 645[d]	49 925[a]	49 685	49 903	49 980	49 762	..
Germany	76 254[o]	90 531[o]	93 663[o]	95 882[o]	98 161[o]	101 005[o]	100 200[c,p]
Greece	4 345	..	9 620[a]	9 982	11 436	11 125	13 460[p]
Hungary	7 652	8 225	8 480	7 605	7 765	7 215	8 111
Iceland	849	..	594[a]	..	266[a]	..	275
Ireland	1 132	1 027	1 034	921	818	826	951
Israel[1]	..	..	837[d]	883[c,d]	..	..	..
Italy	32 684	34 665	36 153	37 851	39 023	38 506	38 212[p]
Japan	62 975	61 830	62 833	62 752	61 486	61 585	60 299
Korea	16 847[g]	26 939	28 246	32 977	34 367	35 574	38 174
Latvia	1 256	1 018	1 169	1 170	1 178	1 180	1 184[p]
Luxembourg	560[o]	1 036[o]	1 173[o]	1 178[o]	1 195[o]	1 187[o]	1 319[o,p]
Mexico	14 837[c]	16 714	16 817	16 638	16 944	..	..
Netherlands	12 706[o]	11 424[o]	11 228[o]	13 496[a,o]	13 485[o]	14 121[o]	14 714[o,p]
New Zealand	3 100	..	3 300	..	3 300	..	..
Norway	5 147	6 332	6 556	6 670	6 780	6 690	6 900[p]
Poland	17 877	20 180	21 407	21 804	21 884	22 614	22 073
Portugal	4 533	3 328	3 265	2 204	1 983	2 037	1 944[p]
Slovak Republic	3 717[d]	4 359[d]	4 103[d]	4 168[d]	3 545[d]	4 147[d]	4 335[d]
Slovenia	2 517	3 141	2 628[a]	2 579	2 596	2 490	2 437[p]
Spain	32 077	46 008	43 913	41 787	39 349	38 764	39 678
Sweden	3 444[a,m]	3 110[c,m]	3 388[a,m]	3 359[c,m]	3 217[m]	3 404[c,m]	4 234[a,m]
Switzerland	..	719[h]	..	781[h]	..	897[h]	909[h]
Turkey	8 825	11 357	11 749	12 088	12 004	12 230	..
United Kingdom	20 415	18 745	16 919	16 880	16 592	16 250	15 915[c,p]
United States	..	..	..	..	..	..	..
EU28 (OECD estimates)	320 924[b]	351 181[b]	355 889[b]	360 049[b]	362 637[b]	363 951[b]	368 267[b]
OECD-Total	**..**	**..**	**..**	**..**	**..**	**..**	**..**
Argentina	21 688	31 307	33 277	34 472	35 850	37 757	..
China	254 506[t]	390 245	414 316	446 920	467 313	479 435	493 200
Romania	10 055	8 704	10 675[a]	11 381	12 336	11 866	12 080
Russian Federation	296 428	280 506	276 341	292 894	282 051	283 161	283 968
Singapore	2 173	2 967	3 039	3 003	3 134	3 497	..
South Africa	5 586	6 491	6 208	7 346	7 410	..	..
Chinese Taipei	25 673	26 439	25 645	25 246	24 727	24 876	24 948

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

Source: OECD, Main Science and Technology Indicators database, February 2017

Table 57. Total GBAORD (Government budget appropriations or outlays for R&D) at current prices and PPPs

Million USD

	2005	2011	2012	2013	2014	2015	2016
Australia	3 729.1[h]	4 748.2[h]	4 506.4[h]	4 981.3[h]	4 890.3[h]	4 759.6[h]	4 792.6[b,h,p]
Austria	1 836.6[h]	2 920.6[h]	3 014.8[h]	3 249.3[h]	3 330.2[h]	3 448.2[h]	3 486.6[b,h,p]
Belgium	2 004.6	2 879.6	3 028.1	3 132.0	3 419.3	3 182.8	..
Canada	6 777.1[h]	7 736.9[h]	7 746.2[h]	7 897.5[h]	..	..	..
Chile	..	616.0[v]	726.4[v]	820.1[v]	870.5[v]	874.7[p,v]	..
Czech Republic	1 129.0	1 935.9	1 966.6	2 090.6	2 156.0	2 176.1	2 284.0[b,p]
Denmark	1 329.3	2 483.5	2 511.6	2 675.9	2 709.7	2 805.7	2 720.2[b,p]
Estonia	89.9[c]	246.1[c]	279.9[c]	295.0[c]	269.6[c]	264.3[c]	..
Finland	1 648.0	2 306.8	2 272.1	2 230.9	2 210.5	2 214.9	2 043.5[b,p]
France	18 220.2	19 983.8	17 925.9	18 473.8	18 424.9	17 735.4	17 571.2[b,p]
Germany	19 732.0	30 103.1	30 575.2	32 775.5	33 288.3	34 329.6	35 608.3[b,p,s]
Greece	895.8	909.3	1 069.1	1 361.4	1 265.6	1 499.6	..
Hungary	696.1	665.8	777.0	1 575.6[t]	706.4	736.6	..
Iceland	94.0	122.5	130.7	145.7	140.5[p]	..	..
Ireland	710.7	946.2	914.1	890.3	891.4	915.7	..
Israel[1]	1 044.9[d]	1 479.7[d]	1 568.8[d]	1 677.9[d]	1 781.9[d]	1 806.5[d]	..
Italy	11 199.3	12 075.3	11 798.8	11 463.4	11 505.8	11 520.5	..
Japan	27 617.8[g,h]	34 105.2[h]	35 413.2[h]	35 648.5[h]	35 648.2[h]	33 923.1[h]	34 180.5[b,h]
Korea	9 886.5[a,g]	17 423.9	18 744.5	19 769.0	20 424.5	21 255.1	..
Latvia	57.4	59.7	64.4	65.0	77.1	94.2	..
Luxembourg	81.5	279.3	334.8	389.3	399.2	360.0	369.3[b]
Mexico	2 963.4	5 400.2	5 850.8	6 323.5	7 226.6	7 030.6[c]	6 692.9[b]
Netherlands	4 524.7	5 950.6	5 672.9	6 012.1	6 081.7	6 058.8[p]	6 279.6[b,p]
New Zealand	..	729.2	735.4	756.6	881.0	893.5	988.4[b]
Norway	1 535.9	2 474.1	2 564.1	2 762.2	2 895.9	2 956.6	3 260.7[b,p]
Poland	1 548.8	2 688.0	3 192.1[a]	3 429.6	4 206.9	4 164.2	..
Portugal	1 628.9	2 814.5	2 569.2	2 708.0	2 817.3	3 010.0	2 871.6[b,p]
Slovak Republic	244.6	639.0	584.1	589.5	599.4	682.4	579.8[b,p]
Slovenia	273.3	351.6	313.1	295.8	276.4	273.6	..
Spain	6 440.7	10 155.5	8 899.8	8 428.1	8 722.4	9 060.2	..
Sweden	2 508.0	3 276.2	3 602.1	3 665.8	3 760.2	3 716.5	..
Switzerland	..	..	4 022.5	..	4 447.7	..	..
Turkey	..	4 580.9	4 435.2	5 450.5	4 890.4	4 976.0	..
United Kingdom	12 116.1	12 902.2	12 974.6	14 375.8	14 794.1	14 708.0	..
United States	131 259.0[h]	144 379.0[h]	143 737.0[h]	132 477.0[h]	136 159.0[h]	138 544.0[h]	148 999.0[h,p]
EU28 (OECD estimates)	90 339.9[b]	118 864.1[b]	116 449.2[b]	122 210.8[b]	124 043.9[b]	125 526.6[b]	..
OECD-Total	**276 865.4[b]**	**343 965.6[b]**	**344 521.4[b]**	**343 133.8[b]**	**349 937.6[b]**	**352 400.2[b]**	**..**
Argentina	1 215.4[h]	2 472.4[h]	2 706.3[h]	..	..	..	..
China	..	..	..	..	..	..	..
Romania	441.7	926.4	777.0	774.7[a]	838.5[b]	1 069.5[b]	1 252.6[b]
Russian Federation	6 038.6[a]	18 096.8	19 280.0	20 768.3	20 566.9[p]	19 466.2	..
Singapore	..	..	..	..	..	..	..
South Africa	..	..	..	..	..	..	..
Chinese Taipei	4 886.4	7 362.6	7 350.6	7 303.0	7 368.4	7 585.9	8 027.7

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Source: OECD, Main Science and Technology Indicators database, February 2017

Table 58. Defence Budget R&D

As a percentage of total GBAORD (Government budget appropriations or outlays for R&D)

Percentage

	2005	2011	2012	2013	2014	2015	2016
Australia	6.9[h]	6.8[h]	6.7[h]	6.3[h]	6.4[h]	6.9[h]	6.5[h,p]
Austria	0.0[h]	0.0[h]	0.0[h]	0.0[h]	0.0[h]	0.0[h]	0.1[h,p]
Belgium	0.3	0.2	0.2	0.2	0.2	0.1	..
Canada	4.1[h]	3.0[h]	3.4[h]	3.1[h]	..	..	..
Chile	..	0.0[v]	0.0[v]	0.0[v]	0.0[v]	0.0[p,v]	..
Czech Republic	2.5	1.7	1.6	1.5	1.4	1.3	1.4[p]
Denmark	0.7	0.3	0.3	0.3	0.3	0.3	0.3[p]
Estonia	1.0[c]	0.3[c]	0.3[c]	0.5[c]	1.3[c]	1.5[c]	..
Finland	3.3	2.5	2.6	1.9	2.1	1.9	1.9[p]
France	20.8	6.8[v]	7.1[v]	6.3[v]	6.6[v]	7.2[v]	6.4[p,v]
Germany	5.8[s]	3.9[s]	3.9[s]	3.7[s]	3.8[s]	3.1[s]	2.8[p,s]
Greece	0.5	0.9	0.7	0.4	0.1	0.1	..
Hungary	0.1	0.1	0.3	0.2[t]	0.1	0.6	..
Iceland	0.0	0.0	0.0	0.0	0.0[p]	..	..
Ireland	0.0	0.0	0.0	0.0	0.0	0.0	..
Israel[1]	..	..	..	..	..	..	..
Italy	3.6	0.7	0.7	0.8	0.8	0.8	..
Japan	4.0[g,h,m]	2.6[h,m]	2.9[h,m]	4.6[h,m]	4.4[h,m]	4.4[h,m]	3.1[h,m]
Korea	12.4[a,g]	13.8[c]	14.8	14.8	13.5	13.5	..
Latvia	1.1	0.5	0.4	1.2	1.8	1.9	..
Luxembourg	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mexico	0.0	0.0	0.2	0.2	0.2	0.2[c]	0.2
Netherlands	1.9	1.5	1.7	1.2	1.2	1.3[p]	1.2[p]
New Zealand	..	0.0	0.0	0.0	0.0	0.0	0.0
Norway	6.4	4.3	4.4	4.2	4.0	3.8	3.7[p]
Poland	1.3	..	7.2[a]	5.2	4.8	5.1	..
Portugal	0.7	0.3	0.2	0.2	0.3	0.5	0.3[p]
Slovak Republic	8.3[o]	1.9	2.2	1.4	1.4	1.9	1.4[p]
Slovenia	4.9	0.5	0.7	0.7	0.2	0.2	..
Spain	3.9	1.7	1.7	1.4	1.3	1.4	..
Sweden	17.4	7.8[v]	8.1[v]	4.0[v]	3.8[v]	3.3[v]	..
Switzerland	..	..	0.4	..	0.5	..	..
Turkey	..	20.5	17.5	30.1	13.6	13.9	..
United Kingdom	23.5	14.5	16.2	15.3	16.7	16.4	..
United States	56.9[h]	56.8[h]	54.7[h]	52.7[h]	51.2[h]	51.4[h]	51.4[h,p]
EU28 (OECD estimates)	10.1[b]	4.5[b]	4.8[b]	4.4[b]	4.6[b]	4.4[b]	..
OECD-Total	**31.4[b]**	**26.8[b]**	**26.0[b]**	**23.9[b]**	**23.2[b]**	**23.4[b]**	**..**
Argentina	0.4[h]	1.6[h]	1.4[h]	..	..	..	..
China	..	..	..	..	..	..	..
Romania	1.7	2.0	4.9	1.4[a]	1.8	1.6	1.7
Russian Federation	..	..	..	..	..	..	..
Singapore	..	..	..	..	..	..	..
South Africa	..	..	..	..	..	..	..
Chinese Taipei	10.6	5.8	3.3	2.9	2.6	2.5	5.2

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

Source: OECD, Main Science and Technology Indicators database, February 2017

Table 59. Civil Budget R&D

As a percentage of total GBAORD (Government budget appropriations or outlays for R&D)

Percentage

	2005	2011	2012	2013	2014	2015	2016
Australia	93.1[h]	93.2[h]	93.3[h]	93.7[h]	93.6[h]	93.1[h]	93.5[h,p]
Austria	100.0[h]	100.0[h]	100.0[h]	100.0[h]	100.0[h]	100.0[h]	99.9[h,p]
Belgium	99.7	99.8	99.8	99.8	99.8	99.9	..
Canada	95.9[h]	97.0[h]	96.6[h]	96.9[h]	..	..	..
Chile	..	100.0[v]	100.0[v]	100.0[v]	100.0[v]	100.0[p,v]	..
Czech Republic	97.5	98.3	98.4	98.5	98.6	98.7	98.6[p]
Denmark	99.3	99.7	99.7	99.7	99.7	99.7	99.7[p]
Estonia	99.0[c]	99.7[c]	99.7[c]	99.5[c]	98.7[c]	98.5[c]	..
Finland	96.7	97.5	97.4	98.1	97.9	98.1	98.1[p]
France	79.2	93.2[v]	92.9[v]	93.7[v]	93.4[v]	92.8[v]	93.6[p,v]
Germany	94.2[s]	96.1[s]	96.1[s]	96.3[s]	96.2[s]	96.9[s]	97.2[p,s]
Greece	99.5	99.1	99.3	99.6	99.9	99.9	..
Hungary	99.9	99.9	99.7	99.8[t]	99.9	99.4	..
Iceland	100.0	100.0	100.0	100.0	100.0[p]	..	..
Ireland	100.0	100.0	100.0	100.0	100.0	100.0	..
Israel[1]	..	..	..	..	..	..	..
Italy	96.4	99.3	99.3	99.2	99.2	99.2	..
Japan	96.0[g,h]	97.4[h]	97.1[h]	95.4[h]	95.6[h]	95.6[h]	96.9[h]
Korea	87.6[a,g]	86.2[c]	85.2	85.2	86.5	86.5	..
Latvia	98.9	99.5	99.6	98.8	98.2	98.1	..
Luxembourg	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Mexico	100.0	100.0	99.8	99.8	99.8	99.8[c]	99.8
Netherlands	98.1	98.5	98.3	98.8	98.8	98.7[p]	98.8[p]
New Zealand	..	100.0	100.0	100.0	100.0	100.0	100.0
Norway	93.6	95.7	95.6	95.8	96.0	96.2	96.3[p]
Poland	98.7	..	92.8[a]	94.8	95.2	94.9	..
Portugal	99.3	99.7	99.8	99.8	99.7	99.5	99.7[p]
Slovak Republic	91.7[o]	98.1	97.8	98.6	98.6	98.1	98.6[p]
Slovenia	95.1	99.5	99.3	99.3	99.8	99.8	..
Spain	96.1	98.3	98.3	98.6	98.7	98.6	..
Sweden	82.6	92.2[v]	91.9[v]	96.0[v]	96.2[v]	96.7[v]	..
Switzerland	..	..	99.6	..	99.5	..	..
Turkey	..	79.5	82.5	69.9	86.4	86.1	..
United Kingdom	76.5	85.5	83.8	84.7	83.3	83.6	..
United States	43.1[h]	43.2[h]	45.3[h]	47.3[h]	48.8[h]	48.6[h]	48.6[h,p]
EU28 (OECD estimates)	89.9[b]	95.5[b]	95.2[b]	95.6[b]	95.4[b]	95.6[b]	..
OECD-Total	**68.6[b]**	**73.2[b]**	**74.0[b]**	**76.1[b]**	**76.8[b]**	**76.6[b]**	**..**
Argentina	99.6[h]	98.4[h]	98.6[h]	..	..	..	..
China	..	..	..	..	..	..	..
Romania	98.3	98.0	95.1	98.6[a]	98.2	98.4	98.3
Russian Federation	..	..	..	..	..	..	..
Singapore	..	..	..	..	..	..	..
South Africa	..	..	..	..	..	..	..
Chinese Taipei	89.4	94.2	96.7	97.1	97.4	97.5	94.8

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Source: OECD, Main Science and Technology Indicators database, February 2017

Table 60. Civil GBAORD by socio-economic objectives (million current PPP$)

2016 or latest year available

	Economic development	Health and environment	Education and society	Space programmes	Non-oriented research	General university funds
Australia	1 232.4[BHP]	1 340.6[BHP]	90.9[BHP]	17.8[BHP]	430.9[BHP]	1 366.8[BHP]
Austria	653.7[BHP]	263.3[BHP]	99.5[BHP]	23.4[BHP]	460.5[BHP]	1 983.4[BHP]
Belgium	1 159.9	157.8	162.5	265.1	800.5	633.7
Canada	2 227.3[H]	1 774.2[H]	489.1[H]	293.7[H]	675.6[H]	2 189.7[C]
Chile	206.7	147.4	43.7	14.0	341.2	86.8[P]
Czech Republic	527.9[BP]	247.7[BP]	173.2[BP]	40.2[B]	752.7[BP]	510.7[BP]
Denmark	308.8[BP]	503.4[BP]	222.8[BP]	17.5[BP]	421.9[BP]	1 237.1[BP]
Estonia	53.9[C]	60.5[C]	33.5[C]	3.8[C]	108.5[C]	0.0[C]
Finland	559.6[BP]	97.0[BP]	99.8[BP]	26.2[BP]	571.7[BP]	649.7[BP]
France	2 826.0[BPV]	1 722.2[BPV]	410.6[BPV]	1 041.0[BPV]	3 981.1[BPV]	4 336.7[BPV]
Germany	7 761.0[BPS]	3 499.2[BPS]	1 487.1[BPS]	1 820.6[BPS]	6 055.2[BPS]	14 331.5[BPS]
Greece	200.4	281.9	296.3	27.4	102.6	589.6
Hungary	185.0	133.0	24.9	7.4	265.3	116.5
Iceland	27.3[P]	14.1[P]	18.3[P]	..[N]	27.6[P]	53.2[P]
Ireland	316.9	64.2	34.2	21.5	312.7	166.3
Israel 1	696.0	50.1	56.4	9.6	58.1	936.4
Italy	2 309.0	2 089.3	824.6	1 001.8	246.7	4 962.1
Japan	8 632.9[BH]	2 666.9[BH]	212.3[BH]	2125.8[BH]	7 244.6[BH]	1 2248.4[BH]
Korea	9 248.8	2 694.3	1 439.9	570.9	4 436.3[CO]	..[N]
Latvia	37.4	21.8	5.1	1.6	22.4	4.0
Luxembourg	74.3[BP]	77.4[BP]	24.1[BP]	0.3[BP]	81.6[B]	111.7[BP]
Mexico	2 177.4[B]	747.4[B]	216.0[B]	11.5[B]	1 509.1[B]	2 019.9[BO]
Netherlands	839.0[BP]	327.4[BP]	182.4[BP]	166.5[BP]	1 204.2[BP]	3 484.3[BP]
New Zealand	435.6[B]	202.1[B]	8.0[B]	0.0[B]	100.6[B]	242.0[B]
Norway	690.8[BP]	664.2[BP]	235.1[BP]	69.5[BP]	470.1[BP]	1 009.6[BP]
Poland	1 549.9	801.8	335.0	39.2	1 173.6	54.2
Portugal	451.5[BP]	441.7[BP]	234.2[BP]	11.7[BP]	501.9[BP]	1 222.6[BP]
Slovak Republic	73.3[BP]	59.3[BP]	32.0[BP]	2.3[BP]	94.0[BP]	310.6[BP]
Slovenia	56.8	43.6	13.5	0.2	156.7	2.1
Spain	1 801.5	1 797.3	297.5	413.4	1 994.7	2 626.8
Sweden	519.5[V]	166.9[V]	100.4[V]	30.5[V]	830.1[V]	1 862.3[V]
Switzerland	162.0	25.0	75.6	140.1	1 183.9	2 839.6
Turkey	1 285.6	438.8	283.7	18.9	165.9	2 090.5
United Kingdom	1 943.5	4 314.3	622.5	486.1	1 698.7	3 224.0
United States	8 466.0[HP]	37 922.0[HP]	1 816.0[HP]	12 811.0[HP]	11 422.0[HP]	0.0[H]
EU28 (OECD estimates)	24 568.8[B]	17 754.8[B]	6 618.7[B]	6 241.3[B]	22 470.9[B]	42 438.4[B]
OECD-Total	58 082.8[B]	63 163.1[B]	11 148.4[B]	20 373.5[B]	49 551.2[B]	67 115.1[B]
Argentina	1 187.6[H]	553.2[H]	129.8[H]	210.0[H]	520.0[H]	67.1[H]
China	..	..	..	..	..	..
Romania	284.2[B]	124.6[B]	107.0[B]	34.9[B]	680.1[B]	..
Russian Federation	1 986.6	421.3	516.4	3 340.8	..	..
Singapore	..	..	..	..	..	..
South Africa	..	..	..	..	..	..
Chinese Taipei	2 892.4	1 789.4	358.1	132.9	1 783.4	650.2

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

Source: OECD, Main Science and Technology Indicators database, February 2017.

Table 61. R&D expenditure of foreign affiliates at current prices and PPPs

Million USD

	2005	2009	2010	2011	2012	2013	2014
Australia	..	3 734.2	3 529.1	3 698.1	..	3 547.3[p]	..
Austria	..	3 139.4	..	3 426.9	..	4 311.4[p]	..
Belgium	2 406.2	2 897.8	..	4 453.4[p]	..	..	..
Canada	4 235.2	4 426.1	4 543.3	4 597.1	4 938.9[p]	4 826.0[p]	..
Chile	..	..	..	..	..	..	..
Czech Republic	961.8	1 339.2[p]	..	..	..	1 220.9[a,p]	..
Denmark	..	..	..	..	..	..	..
Estonia	..	..	..	..	..	..	..
Finland	638.2	628.3[a]	..	626.0[p]	..	750.7[p]	..
France	5 767.3[a]	8 608.3	8 946.5	9 413.1	9 776.0[p]	10 724.9[p]	..
Germany	12 159.7	15 149.3	..	16 784.5	..	15 405.7[p]	..
Greece	..	..	..	..	..	..	..
Hungary	299.7	438.3[p]	..	..	..	..	..
Iceland	..	..	..	..	..	..	..
Ireland	924.2	1 450.0	..	1 590.7	..	1 627.1[p]	..
Israel[1]	..	4 619.3	4 406.2	4 794.4[p]	..	..	..
Italy	2 315.4	3 259.4	3 344.6	3 456.0	3 498.6	3 623.2	4 019.4[p]
Japan	5 038.4	6 572.3	5 567.0	..	6 510.4	7 581.8[p]	..
Korea	..	..	..	..	..	..	..
Latvia	..	..	..	..	..	..	..
Luxembourg	..	..	..	..	..	..	..
Mexico	..	..	..	..	..	..	..
Netherlands	..	1 313.7[a]	1 385.4	1 602.1	1 733.4	1 702.9	1 823.1[p]
New Zealand	..	..	..	..	..	..	..
Norway	394.8	491.5	544.9	672.0	679.4	..	..
Poland	288.0	611.1	..	449.2	..	860.7[p]	..
Portugal	236.7	..	..	..	..	..	..
Slovak Republic	52.6	..	..	..	..	..	..
Slovenia	..	177.9[a]	..	214.8[p]	..	..	..
Spain	1 868.8	1 367.0	..	1 863.4	..	1 872.0[p]	..
Sweden	3 529.5	3 000.7	..	3 641.4	..	3 903.1[p]	..
Switzerland	..	..	..	..	1 906.7[p]	..	..
Turkey	..	..	..	..	..	..	..
United Kingdom	7 594.5	10 294.7	9 397.3	12 567.1	12 936.9	14 363.2[p]	14 683.9[p]
United States	31 099.0	40 425.0	42 360.0	45 177.0	50 259.0	54 070.0	56 904.0[p]
EU28 (OECD estimates)	..	..	..	..	..	..	..
OECD-Total	**..**	**..**	**..**	**..**	**..**	**..**	**..**
Argentina	..	..	..	..	..	..	..
China	..	..	..	..	..	..	..
Romania	..	..	..	..	..	..	..
Russian Federation	..	..	..	..	..	..	..
Singapore	..	..	..	..	..	..	..
South Africa	..	..	..	..	..	..	..
Chinese Taipei	..	..	..	..	..	..	..

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

Source: OECD, Activities of Multinational Enterprises database, December 2016

Table 62. R&D expenditure of foreign affiliates as a percentage of R&D expenditures of enterprises

Percentage

	2005	2009	2010	2011	2012	2013	2014
Australia	..	32.1	29.5	30.5	..	27.2[p]	..
Austria	..	52.3	..	50.0	..	50.7[p]	..
Belgium	56.8	53.8	..	66.0[p]	..	..	..
Canada	32.6	33.2	35.1	33.7	36.8[p]	36.8[p]	..
Chile	..	..	..	..	..	..	..
Czech Republic	51.5	58.0[p]	..	..	..	62.8[a,p]	..
Denmark	..	..	..	..	..	..	..
Estonia	..	..	..	..	..	..	..
Finland	16.1	14.5[a]	..	14.8[p]	..	20.4[p]	..
France	23.5[a]	28.1	27.8	27.5	27.5[p]	28.3[p]	..
Germany	27.8	27.3	..	26.1	..	22.4[p]	..
Greece	..	..	..	..	..	..	..
Hungary	59.7	52.6[p]	..	..	..	..	..
Iceland	..	..	..	..	..	..	..
Ireland	70.3	69.9	..	71.1	..	65.2[p]	..
Israel[1]	..	62.0	65.9	64.9[p]	..	..	..
Italy	25.2	24.5	24.4	24.2	23.6	23.3	23.9[p]
Japan	5.1	6.3	5.2	..	5.6	6.0[p]	..
Korea	..	..	..	..	..	..	..
Latvia	..	..	..	..	..	..	..
Luxembourg	..	..	..	..	..	..	..
Mexico	..	..	..	..	..	..	..
Netherlands	..	30.2[a]	32.3	32.5	33.5	31.3	33.5[p]
New Zealand	..	..	..	..	..	..	..
Norway	28.5	26.8	29.3	33.7	31.6	..	..
Poland	30.4	50.5	..	44.8	..	47.0[p]	..
Portugal	34.0	..	..	..	..	..	..
Slovak Republic	23.9	..	..	..	..	..	..
Slovenia	..	33.2[a]	..	29.1[p]	..	..	..
Spain	26.2	26.6	..	35.2	..	37.0[p]	..
Sweden	41.5	31.9	..	38.5	..	39.0[p]	..
Switzerland	..	..	..	..	20.1[p]	..	..
Turkey	..	..	..	..	..	..	..
United Kingdom	39.1	47.0	41.1	50.8	52.1	53.6[p]	51.3[p]
United States	13.8	14.3	15.2	15.4	16.6	16.8	16.7[p]
EU28 (OECD estimates)	..	..	..	..	..	..	..
OECD-Total	..	..	..	..	..	..	..
Argentina	..	..	..	..	..	..	..
China	..	..	..	..	..	..	..
Romania	..	..	..	..	..	..	..
Russian Federation	..	..	..	..	..	..	..
Singapore	..	..	..	..	..	..	..
South Africa	..	..	..	..	..	..	..
Chinese Taipei	..	..	..	..	..	..	..

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Source: OECD, Activities of Multinational Enterprises database, December 2016

Table 63. Number of triadic patent families

By priority year

	2005	2009	2010	2011	2012	2013	2014
Australia	479	348	307	319	332	330[b]	332[b]
Austria	409	369	388	363	372	404[b]	430[b]
Belgium	543	479	461	460	426	438[b]	442[b]
Canada	716	675	548	581	520	505[b]	490[b]
Chile	6	11	15	15	10	14[b]	14[b]
Czech Republic	25	18	15	34	36	40[b]	41[b]
Denmark	389	257	300	256	284	296[b]	299[b]
Estonia	3	3	3	7	4	5[b]	5[b]
Finland	391	224	228	226	286	287[b]	289[b]
France	3 048	2 724	2 458	2 597	2 416	2 441[b]	2 503[b]
Germany	7 138	5 554	5 057	4 802	4 612	4 573[b]	4 509[b]
Greece	24	15	5	11	22	23[b]	26[b]
Hungary	58	51	37	43	31	30[b]	32[b]
Iceland	7	2	4	2	2	2[b]	2[b]
Ireland	97	86	65	69	73	85[b]	87[b]
Israel[1]	502	375	350	364	414	440[b]	457[b]
Italy	964	736	683	720	720	736[b]	756[b]
Japan	17 722	16 515	18 296	18 231	17 858	17 172[b]	17 121[b]
Korea	2 745	2 109	2 462	2 366	2 479	2 667[b]	2 713[b]
Latvia	10	8	1	3	2	4[b]	3[b]
Luxembourg	21	20	19	23	22	24[b]	22[b]
Mexico	19	15	16	18	15	16[b]	18[b]
Netherlands	1 760	1 046	826	969	1 042	1 089[b]	1 153[b]
New Zealand	73	55	42	52	103	111[b]	124[b]
Norway	142	129	115	94	98	98[b]	92[b]
Poland	18	32	62	63	68	78[b]	88[b]
Portugal	16	17	17	26	22	27[b]	27[b]
Slovak Republic	2	2	8	13	8	8[b]	9[b]
Slovenia	22	17	16	10	10	10[b]	9[b]
Spain	292	254	239	218	234	231[b]	232[b]
Sweden	968	792	645	616	660	631[b]	646[b]
Switzerland	1 084	973	1 064	1 051	1 132	1 172[b]	1 184[b]
Turkey	16	28	33	36	31	35[b]	39[b]
United Kingdom	2 160	1 722	1 656	1 725	1 715	1 792[b]	1 808[b]
United States	17 374	13 497	12 742	13 173	13 785	14 688[b]	14 944[b]
EU28 (OECD estimates)	18 390	14 443	13 205	13 271	13 098	13 289[b]	13 457[b]
OECD-Total	**59 242**	**49 158**	**49 182**	**49 555**	**49 843**	**50 502[b]**	**50 948[b]**
Argentina	16	17	8	10	8	7[b]	7[b]
China	519	1 299	1 426	1 499	1 966	2 191[b]	2 582[b]
Romania	7	8	6	9	14	16[b]	17[b]
Russian Federation	91	88	88	85	93	92[b]	91[b]
Singapore	168	102	102	120	109	129[b]	146[b]
South Africa	49	35	31	44	33	32[b]	28[b]
Chinese Taipei	144	384	456	485	381	382[b]	361[b]

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

Source: OECD, Patent database, Autumn 2016

Table 64. Share of countries in triadic patent families

By priority year

Percentage

	2005	2009	2010	2011	2012	2013	2014
Australia	0.79	0.67	0.59	0.61	0.62	0.61[b]	0.60[b]
Austria	0.67	0.71	0.75	0.69	0.70	0.75[b]	0.78[b]
Belgium	0.89	0.93	0.89	0.88	0.80	0.81[b]	0.81[b]
Canada	1.18	1.31	1.05	1.11	0.98	0.93[b]	0.89[b]
Chile	0.01	0.02	0.03	0.03	0.02	0.03[b]	0.03[b]
Czech Republic	0.04	0.03	0.03	0.07	0.07	0.07[b]	0.07[b]
Denmark	0.64	0.50	0.58	0.49	0.53	0.55[b]	0.54[b]
Estonia	0.01	0.01	0.01	0.01	0.01	0.01[b]	0.01[b]
Finland	0.64	0.43	0.44	0.43	0.54	0.53[b]	0.53[b]
France	5.02	5.27	4.73	4.94	4.54	4.51[b]	4.56[b]
Germany	11.75	10.75	9.73	9.14	8.67	8.45[b]	8.21[b]
Greece	0.04	0.03	0.01	0.02	0.04	0.04[b]	0.05[b]
Hungary	0.10	0.10	0.07	0.08	0.06	0.06[b]	0.06[b]
Iceland	0.01	0.00	0.01	0.00	0.00	0.00[b]	0.00[b]
Ireland	0.16	0.17	0.12	0.13	0.14	0.16[b]	0.16[b]
Israel[1]	0.83	0.73	0.67	0.69	0.78	0.81[b]	0.83[b]
Italy	1.59	1.43	1.31	1.37	1.35	1.36[b]	1.38[b]
Japan	29.17	31.96	35.20	34.70	33.58	31.73[b]	31.16[b]
Korea	4.52	4.08	4.74	4.50	4.66	4.93[b]	4.94[b]
Latvia	0.02	0.02	0.00	0.01	0.00	0.01[b]	0.00[b]
Luxembourg	0.03	0.04	0.04	0.04	0.04	0.04[b]	0.04[b]
Mexico	0.03	0.03	0.03	0.03	0.03	0.03[b]	0.03[b]
Netherlands	2.90	2.03	1.59	1.84	1.96	2.01[b]	2.10[b]
New Zealand	0.12	0.11	0.08	0.10	0.19	0.20[b]	0.23[b]
Norway	0.23	0.25	0.22	0.18	0.18	0.18[b]	0.17[b]
Poland	0.03	0.06	0.12	0.12	0.13	0.14[b]	0.16[b]
Portugal	0.03	0.03	0.03	0.05	0.04	0.05[b]	0.05[b]
Slovak Republic	0.00	0.00	0.01	0.02	0.02	0.02[b]	0.02[b]
Slovenia	0.04	0.03	0.03	0.02	0.02	0.02[b]	0.02[b]
Spain	0.48	0.49	0.46	0.41	0.44	0.43[b]	0.42[b]
Sweden	1.59	1.53	1.24	1.17	1.24	1.17[b]	1.18[b]
Switzerland	1.78	1.88	2.05	2.00	2.13	2.17[b]	2.15[b]
Turkey	0.03	0.05	0.06	0.07	0.06	0.06[b]	0.07[b]
United Kingdom	3.55	3.33	3.19	3.28	3.22	3.31[b]	3.29[b]
United States	28.60	26.12	24.52	25.07	25.92	27.14[b]	27.19[b]
EU28 (OECD estimates)	30.27	27.95	25.41	25.26	24.63	24.56[b]	24.49[b]
OECD-Total	**97.52**	**95.14**	**94.63**	**94.32**	**93.72**	**93.33[b]**	**92.71[b]**
Argentina	0.03	0.03	0.02	0.02	0.01	0.01[b]	0.01[b]
China	0.85	2.51	2.74	2.85	3.70	4.05[b]	4.70[b]
Romania	0.01	0.01	0.01	0.02	0.03	0.03[b]	0.03[b]
Russian Federation	0.15	0.17	0.17	0.16	0.18	0.17[b]	0.17[b]
Singapore	0.28	0.20	0.20	0.23	0.20	0.24[b]	0.26[b]
South Africa	0.08	0.07	0.06	0.08	0.06	0.06[b]	0.05[b]
Chinese Taipei	0.24	0.74	0.88	0.92	0.72	0.71[b]	0.66[b]

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

Source: OECD, Patent database, Autumn 2016

Table 65. Number of patents in the ICT sector - applications filed under the PCT

By priority year

	2005	2009	2010	2011	2012	2013	2014
Australia	596	533	501	514	571	557	620
Austria	318	268	264	318	314	316	322
Belgium	234	259	280	332	326	328	314
Canada	1 173	1 123	1 291	1 323	1 369	1 367	1 193
Chile	4	9	14	16	16	16	36
Czech Republic	31	27	30	21	46	48	48
Denmark	253	266	261	267	218	266	262
Estonia	8	24	20	17	6	22	11
Finland	919	784	862	853	891	753	681
France	2 131	2 068	2 096	2 260	2 237	2 276	2 284
Germany	4 085	3 953	4 188	4 364	4 321	4 211	4 291
Greece	22	22	17	25	34	28	34
Hungary	42	70	72	85	86	79	83
Iceland	15	4	7	4	7	4	8
Ireland	127	139	142	179	170	155	163
Israel[1]	875	692	669	832	986	975	969
Italy	533	552	550	555	583	583	590
Japan	11 929	14 343	16 645	18 030	18 625	16 693	16 988
Korea	2 388	4 045	4 530	5 339	5 431	5 554	6 009
Latvia	7	4	3	3	11	3	4
Luxembourg	8	10	13	15	21	11	23
Mexico	24	28	30	31	39	43	54
Netherlands	1 583	1 134	946	1 077	989	1 018	997
New Zealand	72	68	62	66	67	81	64
Norway	177	179	164	142	200	189	174
Poland	20	65	83	72	62	80	95
Portugal	28	33	40	45	31	33	34
Slovak Republic	4	9	13	8	8	16	20
Slovenia	9	19	20	23	26	28	18
Spain	228	407	442	484	473	417	462
Sweden	921	1 252	1 232	1 374	1 555	1 402	1 589
Switzerland	440	509	519	590	665	561	528
Turkey	21	77	64	62	115	144	150
United Kingdom	2 119	1 767	1 849	1 900	1 918	2 164	2 175
United States	20 288	16 303	17 897	20 394	22 033	23 536	22 215
EU28 (OECD estimates)	13 664	13 165	13 461	14 324	14 407	14 314	14 579
OECD-Total	**51 633**	**51 043**	**55 819**	**61 622**	**64 451**	**63 958**	**63 508**
Argentina	11	8	15	20	6	13	15
China	2 159	6 736	8 320	11 006	12 083	14 193	16 022
Romania	10	16	15	19	32	31	32
Russian Federation	215	203	229	334	404	425	379
Singapore	274	288	338	310	309	307	334
South Africa	74	49	71	77	99	93	78
Chinese Taipei	54	73	157	207	227	266	313

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

Source: OECD, Patent database, Autumn 2016

Table 66. Number of patents in the biotechnology sector - applications filed under the PCT

By priority year

	2005	2009	2010	2011	2012	2013	2014
Australia	209	174	170	156	157	135	144
Austria	56	68	78	92	91	62	70
Belgium	114	129	132	136	105	99	102
Canada	303	247	242	286	220	249	231
Chile	2	14	11	17	14	18	23
Czech Republic	5	10	3	7	11	9	13
Denmark	186	124	163	170	180	175	191
Estonia	2	4	3	7	2	3	1
Finland	48	52	64	52	34	58	48
France	320	499	469	545	468	495	506
Germany	661	645	694	669	634	593	624
Greece	5	6	5	6	4	3	5
Hungary	9	13	9	18	12	15	8
Iceland	3	6	9	10	2	1	2
Ireland	22	31	16	33	20	27	33
Israel[1]	161	132	161	160	144	131	154
Italy	160	163	159	122	149	120	132
Japan	1 467	1 162	1 234	1 195	1 168	1 221	1 252
Korea	202	384	463	521	499	505	567
Latvia	1	1	0	0	0	1	1
Luxembourg	1	1	1	2	4	1	2
Mexico	11	15	14	18	10	19	16
Netherlands	223	243	221	209	196	219	210
New Zealand	50	32	40	28	29	25	20
Norway	30	35	43	28	36	38	56
Poland	10	13	21	23	29	32	32
Portugal	10	17	9	12	13	14	10
Slovak Republic	0	1	2	3	0	3	2
Slovenia	4	8	10	7	7	8	6
Spain	121	188	183	183	185	190	160
Sweden	129	121	128	117	110	94	105
Switzerland	139	143	163	157	162	165	173
Turkey	2	2	5	4	4	12	10
United Kingdom	491	374	388	387	407	429	475
United States	4 573	4 083	4 279	4 434	4 360	4 692	4 487
EU28 (OECD estimates)	2 583	2 725	2 764	2 808	2 671	2 662	2 745
OECD-Total	**9 728**	**9 142**	**9 592**	**9 814**	**9 464**	**9 859**	**9 868**
Argentina	9	6	5	8	13	16	12
China	130	293	423	524	465	546	620
Romania	1	1	0	1	1	2	2
Russian Federation	51	41	67	53	67	55	44
Singapore	64	86	71	69	126	106	84
South Africa	16	17	14	11	11	16	20
Chinese Taipei	8	27	37	34	45	34	75

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

Source: OECD, Patent database, Autumn 2016

Table 67. Technology balance of payments: receipts

At current prices and exchange rates

Million USD

	2005	2010	2011	2012	2013	2014	2015
Australia	2 654.5	4 577.3	5 049.2	4 907.8	4 843.4	4 979.4	4 427.9[p]
Austria	4 841.1	8 244.5	10 553.9	10 902.1	11 997.5	13 219.6	11 315.8[p]
Belgium	6 907.3	11 771.5	12 979.7	14 727.1	17 080.1	19 184.6	17 820.5[p]
Canada	2 652.3	3 000.5	2 652.8	2 637.1	2 620.9	..	..
Chile	..	..	..	..	..	..	..
Czech Republic	892.8[a]	2 224.0[a]	3 251.8	3 412.6	3 742.0	3 994.2	3 663.3[p]
Denmark	4 629.4[a]	6 352.2	7 455.0	8 305.9	8 424.9	8 708.6	7 686.3[p]
Estonia	77.2	294.7	361.2	387.2	458.2	491.8	444.8[p]
Finland	3 594.0	9 472.3	10 795.8	10 093.9	11 224.9[a]	11 670.2	10 781.4[p]
France	..	..	..	..	..	..	..
Germany	31 372.2	58 245.5	69 604.0	71 205.8	68 357.4[a]	75 809.6	71 836.5[p]
Greece	353.2	715.2	797.1	674.3	774.6	1 017.1	812.6[p]
Hungary	1 625.9	4 185.5	4 549.9	4 396.0	4 780.0	4 924.1	4 178.6[p]
Iceland	..	283.1	302.2	254.3	323.4[a]	443.6	543.1[p]
Ireland	21 519.2	40 878.4	49 683.4	55 080.8[a]	63 569.6	75 485.8	73 337.0[p]
Israel[1]	6 127.1	10 117.3	12 182.8[a]	13 141.2	14 558.7	14 779.4	15 371.5[p]
Italy	4 265.2	10 277.0	12 177.7	13 841.8	14 383.6	15 144.3	13 239.9[p]
Japan	18 402.5	27 758.5	29 887.2	34 102.4	34 788.2	34 549.4[p]	..
Korea	1 624.9	3 344.9	4 032.1	5 310.8	6 845.6	9 764.5[p]	..
Latvia	84.6	188.1	255.2	240.3	297.4	317.1	316.1[p]
Luxembourg	1 036.8	2 363.3	2 939.4	4 448.6[a]	4 943.4	5 702.6	4 968.8[p]
Mexico	69.5	87.8	96.4	79.7	199.1	..	..
Netherlands	19 353.4	..	39 985.7	40 171.2	44 424.9	52 122.3[a]	56 278.4[p]
New Zealand	416.8	885.6	1 184.2	837.7[a]	830.7	..	..
Norway	2 288.6	4 198.9	4 154.8	4 391.6	4 515.1	..	..
Poland	794.4	3 317.6	3 724.2[a]	4 120.7	4 926.6	6 020.8	4 853.1[p]
Portugal	458.6	1 276.2	1 540.0	1 576.7	1 805.1	2 000.2	1 771.2[p]
Slovak Republic	208.9	504.5	770.0	948.1	..	..	..
Slovenia	..	265.5	301.1	316.7	..	..	..
Spain	4 434.8	15 064.2	17 702.9	16 125.7	16 171.1	19 187.6	17 099.8[p]
Sweden	9 750.4	17 751.8	23 177.6	23 617.1	26 483.3[a]	28 034.4	27 970.4[p]
Switzerland	11 559.5	20 820.4	25 203.8	28 311.3	29 960.0	32 765.3	30 336.4[p]
Turkey	..	..	..	..	..	..	..
United Kingdom	29 001.9	31 119.7	35 653.8	39 559.5	41 547.0	45 790.1	41 060.6[p]
United States	74 826.0	100 569.0	119 936.0	122 658.0	125 519.0	134 325.0	130 834.0[p]
EU28 (OECD estimates)	..	..	..	..	..	..	..
OECD-Total	**..**	**..**	**..**	**..**	**..**	**..**	**..**
Argentina	..	..	..	..	..	..	..
China	..	..	..	..	..	..	..
Romania	21.2[m]	19.9[m]	31.2[m]	92.2[m]	190.2[a]	..	..
Russian Federation	391.6	627.8	592.6	688.8	773.7	1 279.2	1 654.7[p]
Singapore	2 518.6	..	..	..	..	..	..
South Africa	45.3	..	..	..	..	..	..
Chinese Taipei	412.1[m]	822.1[m]	..	903.9[m]	1 013.7[m]	1 114.1[m,p]	..

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

Source: OECD, Technology Balance of Payments database, December 2016

Table 68. Technology balance of payments: payments

At current prices and exchange rates

Million USD

	2005	2010	2011	2012	2013	2014	2015
Australia	3 359.4	7 299.8	8 812.1	8 990.5	9 516.9	9 205.3	7 799.6[p]
Austria	3 006.3	4 656.7	5 967.8	6 728.8	7 902.7	8 472.5	7 133.5[p]
Belgium	5 653.0	9 968.9	11 249.0	12 631.5	14 335.6	18 237.3	17 500.0[p]
Canada	1 207.3	565.9	764.0	892.7	1 227.4	..	..
Chile	..	..	..	..	..	..	..
Czech Republic	1 446.1[a]	2 149.4[a]	2 765.7	3 108.4	3 119.2	3 132.4	2 436.2[p]
Denmark	3 269.5[a]	5 152.3	7 108.0	6 685.2	6 363.1	6 645.4	6 045.6[p]
Estonia	66.1	191.4	341.9	309.3	294.8	365.2	277.9[p]
Finland	4 621.2	7 769.1	8 146.2	8 847.6	7 695.4[a]	6 560.7	5 022.4[p]
France	..	..	..	..	..	..	..
Germany	29 087.7	45 207.9	53 846.8	55 773.3	55 232.7[a]	57 025.7	53 734.3[p]
Greece	871.5	1 383.9	1 267.1	814.1	951.7	1 144.6	950.7[p]
Hungary	2 476.4	3 812.2	4 340.3	4 057.9	5 210.3	4 821.1	3 817.1[p]
Iceland	..	179.1	215.2	239.1	201.0[a]	294.8	243.8[p]
Ireland	24 778.6	44 576.2	48 898.0	54 349.7[a]	57 334.5	76 593.7	98 091.4[p]
Israel[1]	1 869.1	2 494.0	2 634.5[a]	3 660.5	3 231.1	3 792.1	3 512.3[p]
Italy	4 553.2	13 865.5	15 201.5	12 806.8	14 274.5	14 238.3	12 015.7[p]
Japan	6 384.7	6 038.6	5 197.0	5 622.7	5 919.8	4 842.6[p]	..
Korea	4 525.1	10 234.3	9 900.5	11 052.0	12 038.4	15 540.0[p]	..
Latvia	75.9	135.1	182.3	165.8	189.8	169.8	156.4[p]
Luxembourg	876.4	2 180.4	3 193.6	4 997.7[a]	6 738.8	7 211.2	6 004.4[p]
Mexico	1 847.7	656.4	773.0	562.3	523.9	..	..
Netherlands	17 274.4	..	29 427.7	30 877.8	33 375.4	48 838.7[a]	50 215.9[p]
New Zealand	956.9	1 312.1	1 860.5	1 311.7[a]	1 209.6	..	..
Norway	1 828.3	2 269.0	2 531.0	2 974.5	2 903.0	..	..
Poland	2 327.5	5 459.2	3 639.2[a]	3 918.0	5 284.1	5 709.5	3 113.0[p]
Portugal	755.5	1 459.5	1 658.6	1 292.9	1 456.3	1 936.3	1 726.5[p]
Slovak Republic	419.4	763.0	635.6	550.3	..	..	..
Slovenia	..	632.0	690.3	666.6	..	..	..
Spain	6 333.1	10 764.8	11 989.8	10 592.1	9 542.3	10 729.6	10 097.3[p]
Sweden	7 243.2	9 846.3	11 556.1	12 834.0	13 424.7[a]	16 632.5	15 751.6[p]
Switzerland	13 893.8	21 172.1	26 436.0	28 803.0	30 114.9	36 019.4	33 998.8[p]
Turkey	..	..	..	..	..	..	..
United Kingdom	13 949.1	18 435.4	17 826.1	18 598.9	21 788.1	22 995.4	21 280.4[p]
United States	31 851.0	69 577.0	81 826.0	84 168.0	87 920.0	90 459.0	88 891.0[p]
EU28 (OECD estimates)	..	..	..	..	..	..	..
OECD-Total	**..**	**..**	**..**	**..**	**..**	**..**	**..**
Argentina	..	..	..	..	..	..	..
China	..	..	..	..	..	..	..
Romania	33.6[m]	101.0[m]	119.5[m]	121.0[m]	157.8[a]	..	..
Russian Federation	960.9	1 410.1	1 915.4	2 053.1	2 468.7	2 455.8	2 205.4[p]
Singapore	11 688.1	..	..	..	..	..	..
South Africa	1 070.8	..	..	..	..	..	..
Chinese Taipei	1 776.1[m]	4 479.7[m]	..	5 079.1[m]	5 082.4[m]	5 373.9[m,p]	..

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

Source: OECD, Technology Balance of Payments database, December 2016

Table 69. Technology balance of payments: payments as a percentage of GERD (Gross domestic expenditure on R&D)

Percentage

	2005	2010	2011	2012	2013	2014	2015
Australia	..	25.7[c]	27.0[c]	..	29.5[c]	..	..
Austria	40.1[c]	43.6[c]	51.9	56.4[c]	62.2	63.2[c]	61.6[c,p]
Belgium	81.9	100.5	99.0	107.4	113.1	139.2[c]	156.7[p]
Canada	5.2	1.9	2.4	2.7[a]	4.0	..	..
Chile	..	..	..	..	..	..	..
Czech Republic	90.8[a]	77.5[a]	78.0	84.1	78.4	76.4	67.6[p]
Denmark	51.7[a]	54.9	70.2	68.5	62.3	64.6	67.8[p]
Estonia	51.1	62.0	64.0	63.2	68.1	96.0	82.8[p]
Finland	67.9	84.1	81.8	100.8	86.7[a]	75.9	74.6[p]
France	..	..	..	..	..	..	..
Germany	42.0	48.8	51.3	54.9	52.2[a]	50.9	55.6[c,p]
Greece	60.8	77.3[c]	65.5	47.4	48.9	57.9	50.9[p]
Hungary	237.9	255.5	259.3	251.2	277.4	254.2	227.6[p]
Iceland	..	..	58.8[a,m]	..	73.7[a]	85.2	66.3[p]
Ireland	981.5	1 260.8[c]	1 319.4[c]	1 547.2[a,c]	1 535.0[c]	1 976.1[c]	..
Israel[1]	32.4[d]	27.1[d]	25.1[a,d]	34.1[d]	26.6[d]	28.8[d]	27.6[d,p]
Italy	23.5	53.3	55.2	48.6	51.2	48.1[c]	49.5[p]
Japan	4.2	3.4	2.6	2.8	3.5[a]	2.9[p]	..
Korea	19.2[g]	27.0	22.0	22.5	22.2	25.7[p]	..
Latvia	84.7	93.1	91.9	88.7	102.5	78.6	92.6[p]
Luxembourg	149.3	272.7	363.8	692.9[a]	837.9	863.0	806.8[p]
Mexico	52.8	11.6	12.8	9.6	8.2	..	..
Netherlands	142.1	..	173.0[a]	192.1[a]	197.2	277.4[a]	332.2[p]
New Zealand	74.4	..	89.7	..	54.9	..	..
Norway	39.9	32.1	31.2	36.0	33.6	..	..
Poland	135.1	158.0	92.3[a]	88.9	115.8	111.4	65.0[p]
Portugal	50.6	40.0	46.5	43.4	48.6	65.4	68.0[p]
Slovak Republic	173.4	138.4	97.6	73.2	..	..	..
Slovenia	..	64.0	55.5[a]	55.9	..	..	..
Spain	49.9	55.7	60.8	61.6	55.2	63.1	69.1[p]
Sweden	55.0[a]	62.7[c]	63.2	71.9[c]	70.2[a,l]	92.1[c]	97.4[p]
Switzerland	..	..	..	145.9	..	..	..
Turkey	..	..	..	..	..	..	..
United Kingdom	35.4	45.3[c]	40.6	43.6[c]	48.3	45.7[c]	43.7[c,p]
United States	9.7[j]	17.0[j]	19.0[j]	19.3[j]	19.2[j]	18.9[j]	17.7[j,p]
EU28 (OECD estimates)	..	..	..	..	..	..	..
OECD-Total	..	..	..	..	..	..	..
Argentina	..	..	..	..	..	..	..
China	..	..	..	..	..	..	..
Romania	8.3[m]	13.3[m]	13.1[a,m]	14.6[m]	21.3[a]	..	..
Russian Federation	11.8	8.2	9.2	9.0	10.5	11.1	14.7[p]
Singapore	424.5	..	..	..	..	..	..
South Africa	48.1	..	..	..	..	..	..
Chinese Taipei	20.3[m]	35.8[m]	..	34.7[m]	33.1[m]	33.8[m,p]	..

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

Source: OECD, Technology Balance of Payments database, December 2016

Table 70. Trade balance and export market share: Pharmaceutical industry

	Trade balance (Million current USD)			Export market share (Percentage)		
	2009	2012	2015	2009	2012	2015
Australia	-4 156.9	-6 168.0	-5 842.9	0.71	0.89	0.35
Austria	795.1	1 039.6	369.5	1.70	1.84	1.75
Belgium	8 562.4	8 932.8	7 654.8	11.46	9.24	8.60
Canada	-5 543.8	-7 624.7	-4 697.7	1.44	1.04	1.48
Chile	-574.7	-945.6	-1 111.2	0.02	0.03	0.04
Czech Republic	-2 370.2	-2 112.3	-1 666.1	0.30	0.34	0.45
Denmark	4 658.6	7 434.8	8 722.4	1.77	2.28	2.41
Estonia	-272.5	-320.5	-335.3	0.01	0.01	0.01
Finland	-1 157.8	-919.9	-1 254.7	0.26	0.28	0.18
France	7 015.5	5 838.1	4 665.7	7.65	7.16	5.86
Germany	17 525.8	24 808.1	28 328.3	14.42	14.27	14.49
Greece	-4 166.4	-2 516.9	-1 954.9	0.29	0.25	0.21
Hungary	83.1	894.6	683.3	0.71	0.93	0.90
Iceland	-24.0	-7.9	-47.7	0.02	0.02	0.01
Ireland	25 415.5	25 919.9	26 987.3	6.58	6.29	6.36
Israel	3 129.7	4 874.2	4 608.3	1.02	1.32	1.25
Italy	-5 204.5	-2 603.2	-257.8	3.60	4.26	4.42
Japan	-10 144.1	-20 333.8	-20 167.4	0.91	0.78	0.71
Korea	-2 281.8	-3 089.0	-2 861.8	0.26	0.30	0.43
Latvia	-245.5	-188.0	-215.5	0.07	0.07	0.07
Luxembourg	-372.9	-361.8	-314.2	0.02	0.01	0.02
Mexico	-2 964.4	-3 418.4	-3 202.7	0.32	0.42	0.41
Netherlands	2 011.5	6 276.0	8 889.9	6.19	4.81	5.22
New Zealand	-565.1	-668.4	-533.3	0.04	0.05	0.07
Norway	-1 003.7	-1 149.4	-1 080.0	0.15	0.15	0.14
Poland	-3 468.1	-2 939.4	-2 231.4	0.38	0.47	0.59
Portugal	-2 427.7	-1 860.2	-1 712.1	0.14	0.18	0.19
Slovak Republic	-1 485.6	-1 408.8	-1 284.1	0.09	0.08	0.10
Slovenia	1 148.8	1 624.4	1 474.2	0.47	0.54	0.50
Spain	-5 934.6	-2 128.6	-3 342.5	2.45	2.54	2.27
Sweden	4 827.1	3 957.3	4 496.9	1.98	1.69	1.60
Switzerland	26 783.5	36 446.3	41 237.1	9.89	11.72	12.27
Turkey	-3 951.2	-3 612.8	-3 656.3	0.10	0.14	0.18
United Kingdom	10 617.8	8 266.0	2 059.0	7.04	7.25	6.95
United States	-16 369.1	-25 273.1	-38 010.0	9.74	8.75	9.79
OECD-Total	**37 889.8**	**46 661.5**	**44 396.8**	**92.23**	**90.46**	**90.27**
Argentina	-628.0	-1 293.3	-1 442.5	0.16	0.20	0.22
China	1 997.8	-1 745.1	-6 513.7	1.94	2.41	2.58
Romania	-2 111.3	-2 052.6	-1 963.0	0.12	0.24	0.18
Russian Federation	-8 361.7	-12 882.1	-8 444.6	0.07	0.13	0.10
Singapore	3 727.9	6 595.7	4 841.0	1.29	1.83	1.41
South Africa	-1 472.6	-1 981.0	-1 585.3	0.04	0.09	0.07
Chinese Taipei	-1 698.0	-2 100.2	-2 417.3	0.05	0.08	0.10

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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, December 2016

Table 71. Trade balance and export market share: Computer, electronic and optical industry

	Trade balance (Million current USD)			Export market share (Percentage)		
	2009	2012	2015	2009	2012	2015
Australia	-17 379.2	-23 524.2	-20 526.0	0.17	0.17	0.17
Austria	-2 688.1	-2 143.6	-1 218.9	0.46	0.42	0.40
Belgium	-5 584.5	-5 480.5	-2 684.0	0.69	0.54	0.54
Canada	-19 105.7	-28 209.5	-24 252.5	0.87	0.67	0.59
Chile	-3 202.2	-6 157.5	-5 695.1	0.02	0.01	0.01
Czech Republic	-342.2	2 314.0	-939.5	1.05	1.11	1.00
Denmark	-1 775.6	-2 050.9	-1 624.5	0.37	0.30	0.26
Estonia	-180.8	-154.0	-119.8	0.04	0.10	0.08
Finland	992.3	-1 941.9	-2 141.8	0.47	0.20	0.13
France	-17 939.5	-18 243.7	-16 786.0	1.82	1.59	1.39
Germany	-7 686.6	-6 531.7	-7 660.2	5.33	4.86	4.60
Greece	-3 806.7	-2 823.0	-1 665.7	0.04	0.03	0.05
Hungary	6 331.2	3 686.7	25.9	1.38	0.91	0.56
Iceland	-174.0	-213.4	-318.5	0.00	0.00	0.00
Ireland	7 225.4	4 815.9	3 981.4	0.98	0.51	0.51
Israel	4 484.2	2 867.6	3 726.6	0.59	0.46	0.51
Italy	-18 281.7	-16 501.1	-13 330.7	0.81	0.71	0.62
Japan	20 814.6	6 752.3	-10 704.5	5.55	4.98	3.61
Korea	55 532.8	61 251.9	63 931.9	6.15	5.50	5.96
Latvia	-179.4	-269.9	-214.2	0.03	0.04	0.06
Luxembourg	-493.7	-563.1	-526.6	0.04	0.03	0.02
Mexico	1 195.0	-2 120.6	-5 910.9	3.16	3.01	3.02
Netherlands	2 697.1	-2 519.2	-4 116.2	3.59	2.99	2.59
New Zealand	-2 186.7	-2 916.1	-2 934.2	0.03	0.03	0.02
Norway	-3 371.1	-4 698.8	-4 134.4	0.19	0.14	0.13
Poland	-3 931.9	-4 955.4	-4 175.2	0.79	0.60	0.73
Portugal	-3 149.6	-1 962.7	-2 041.7	0.12	0.11	0.09
Slovak Republic	1 929.5	1 083.2	-533.3	0.69	0.60	0.54
Slovenia	-544.8	-350.9	-372.7	0.05	0.04	0.04
Spain	-15 966.1	-13 373.6	-14 346.4	0.38	0.25	0.26
Sweden	-544.6	-3 356.8	-3 588.7	0.87	0.71	0.53
Switzerland	8 576.6	17 825.5	16 418.7	1.29	1.49	1.40
Turkey	-6 575.0	-9 563.6	-12 251.5	0.13	0.13	0.11
United Kingdom	-22 918.9	-28 529.5	-31 984.3	2.01	1.47	1.42
United States	-111 175.0	-155 663.1	-179 650.7	8.97	8.36	8.05
OECD-Total	**-159 404.7**	**-244 221.3**	**-288 364.1**	**49.09**	**43.08**	**40.02**
Argentina	-4 225.6	-6 696.5	-6 805.0	0.01	0.01	0.01
China	102 713.3	157 063.6	184 491.8	22.58	26.61	28.12
Romania	-1 755.6	-2 290.2	-3 262.7	0.20	0.15	0.13
Russian Federation	-13 463.7	-27 624.8	-15 991.5	0.12	0.14	0.17
Singapore	24 751.2	28 021.2	36 072.2	5.67	5.49	5.36
South Africa	-5 608.6	-7 588.1	-6 775.0	0.06	0.07	0.06
Chinese Taipei	41 198.6	65 693.9	67 726.1	4.84	5.31	5.22

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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, December 2016

Table 72. Trade balance and export market share: Aerospace industry

	Trade balance (Million current USD)			Export market share (Percentage)		
	2009	2012	2015	2009	2012	2015
Australia	-70.8	225.6	225.6	0.31	0.37	0.39
Austria	-524.9	329.3	590.1	0.26	0.45	0.37
Belgium	665.0	567.6	489.1	0.75	0.49	0.54
Canada	3 623.2	4 168.4	2 608.3	4.66	3.74	3.84
Chile	-508.1	-2 638.6	-946.6	0.01	0.01	0.00
Czech Republic	335.8	104.8	348.1	0.32	0.20	0.18
Denmark	-1 186.0	-417.7	-42.3	0.10	0.10	0.14
Estonia	-20.8	-26.6	-16.3	0.00	0.00	0.01
Finland	-826.0	-166.8	-221.1	0.08	0.07	0.16
France	19 378.1	25 771.2	24 609.7	16.02	18.50	15.99
Germany	6 146.2	18 179.7	16 376.4	15.22	14.41	12.35
Greece	-195.6	31.1	-173.0	0.21	0.06	0.03
Hungary	-0.9	48.0	-20.4	0.04	0.04	0.02
Iceland	31.0	-199.8	-202.8	0.07	0.00	0.00
Ireland	-4 277.4	-2 626.4	-6 880.9	0.58	0.36	1.60
Israel	1 040.0	1 045.7	2 071.5	0.72	0.54	0.76
Italy	2 881.2	4 053.9	3 105.5	2.16	1.93	1.59
Japan	-4 413.4	-4 326.2	-2 323.3	1.53	1.82	1.97
Korea	-871.7	-2 053.1	-2 463.1	0.37	0.44	0.53
Latvia	-7.4	-5.5	-17.4	0.01	0.00	0.00
Luxembourg	-108.0	-1 871.7	-1 121.9	0.14	0.07	0.05
Mexico	351.3	425.9	867.4	0.32	0.44	0.51
Netherlands	-815.5	-37.1	-404.8	1.11	0.85	0.88
New Zealand	-882.0	-748.1	-1 685.3	0.08	0.03	0.02
Norway	-820.7	-1 002.4	-682.5	0.26	0.15	0.20
Poland	211.4	-181.9	830.9	0.37	0.51	0.56
Portugal	-819.7	-250.1	-210.2	0.05	0.05	0.06
Slovak Republic	-8.1	-6.1	-58.7	0.02	0.01	0.01
Slovenia	-41.4	-91.9	41.0	0.03	0.01	0.02
Spain	809.9	2 388.4	1 286.5	1.49	1.53	1.36
Sweden	160.3	-167.8	-195.6	0.34	0.24	0.19
Switzerland	-49.5	-184.3	518.6	0.89	0.61	0.67
Turkey	-839.3	-2 559.3	-3 396.4	0.17	0.22	0.24
United Kingdom	-1 003.1	8 415.5	7 081.0	9.32	9.86	9.23
United States	53 996.8	65 586.9	78 466.8	32.07	30.36	33.28
OECD-Total	**71 339.9**	**111 780.6**	**118 454.2**	**90.08**	**88.50**	**87.79**
Argentina	-509.4	-440.9	-426.9	0.24	0.15	0.06
China	-10 509.0	-17 807.8	-25 638.7	0.69	0.87	1.61
Romania	-30.9	-6.8	115.8	0.04	0.06	0.07
Russian Federation	693.0	415.2	95.2	0.37	1.70	0.94
Singapore	-4 912.3	-2 294.3	-2 052.9	2.32	2.58	2.67
South Africa	-1 032.7	-784.1	-506.1	0.10	0.15	0.12
Chinese Taipei	-164.6	-445.4	-1 806.9	0.13	0.17	0.21

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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, December 2016

ISSN 2304-2761
Main Science and Technology Indicators: Volume 2016/2

General methodology

R&D data (Tables 1 to 60)

A. Definitions and coverage

1. OECD standards

The R&D data used in this publication have been collected and presented in line with the standard OECD methodology for R&D statistics as laid out in the OECD "Frascati Manual" (see http//oe.cd/Frascati). The 2002 edition of the manual has now been superseded by the 2015 edition. The revised guidelines and definitions are in the course of being implemented and are not expected to change the main indicators significantly although some terminology changes will occur. This edition of MSTI has been compiled in accordance with the 2002 Frascati Manual; these changes will be made in a coming edition as R&D surveys move to the new standard.

2. The two types of R&D data

Most R&D data are derived from retrospective surveys of the units actually carrying out or "performing" R&D tasks. Thus, the indicators in Tables 1 to 56 are based on the sum of performers' reported R&D expenditures and personnel on national territory (i.e. excluding payments to international organisations and other performers abroad). Personnel data are expressed as full time equivalent (FTE) spent working on R&D (i.e. a person working half time on R&D is counted as 0.5 person-years) and headcount.

Because of the complexity of the surveys, it is difficult to obtain very up to date series; some recent data are provisional figures, national estimates, or projections (these data are annotated).

More up to date information on government support for R&D can be derived from budgetary sources. The indicators in Tables 57 to 60 are based on Government Budget Appropriations or Outlays for R&D (GBAORD) as reported by the funding ministry or agency and include payments to international organisations and other performers abroad.

The specifications of these two sets of R&D data vary significantly and, while they can be used complementary to one-another, they should not be combined.

3. Fields of science

In general, the tables cover R&D in both Natural Sciences and Engineering (NSE, including agricultural and medical sciences) and Social Sciences and Humanities (SSH). A large number of countries collect data on R&D activities in the Business Enterprise sector for NSE only.

4. Sectors of performance and sources of funds

Domestic R&D efforts (expenditure or personnel) are divided into four *sectors of performance* for statistical purposes, Business Enterprise, Higher Education, Government, and Private Non Profit institutions (PNP).

R&D expenditure is subdivided into five *sources of funds*, funds from Business Enterprises, from Government (public), from Higher Education, from PNPs, and from abroad. By convention and for international comparison purposes, public general university funds (GUF) are allocated to the government sector as a source of funds. Since the amounts financed by the Higher

Education and PNP sectors are small, they have been combined as "other national sources" in Tables 15 and 37.

5. *R&D in the business enterprise sector*

The Business Enterprise sector covers private and public enterprises and institutes serving such enterprises. The industry breakdown is made according to the main activity of the enterprises. However, for Belgium, France, and the United-Kingdom, data are distributed by product field as longer time series are available. National statistical regulations prevent publication of results where there are very few firms in the given category, hence there are many gaps in the tables broken down by industry.

The industrial classification used is the International Standard Industrial Classification, Revision 4 (ISIC Rev.4). The indicators on industrial BERD concern R&D-intensive manufacturing industries and services:

	ISIC Rev. 4
• *pharmaceutical industry* (Table 39)	21
• *computer, electronic and optical industry* (Table 40)	26
• *aerospace industry* (Table 41)	303
• *services industry* (Table 42)	45-99

The above mentioned indicators were calculated using mainly the Analytical Business Enterprise R&D database (ANBERD) for OECD Member countries and selected non-member economies covered by this database. For further information on this database see: *www.oecd.org/sti/anberd*.

6. *Government budget appropriations or outlays for R&D (GBAORD)*

These data are assembled by national authorities using statistics collected for budgeting purposes. This essentially consists of identifying all the budget items involving R&D and measuring or estimating their R&D content. The series generally cover federal or central government only. These estimates, based on funders' reports, have a different conceptual basis from the "performer reported" data in Tables 1 to 56 but as they are derived from the budget, they can be linked back to policy issues by means of a classification by "objectives" or "goals". Programmes are allocated between socio economic objectives on the basis of *intentions* at the time the funds are committed and not the actual content of the projects concerned. These breakdowns reflect *policies* at a given moment in time.

The classification used is the European Commission's Nomenclature for the Analysis and Comparison of Scientific Programmes and Budgets – NABS, specially developed for R&D analysis (see "Frascati Manual 2015", section 12.4).

The breakdown is as follows:

Defence (Table 58)

All defence R&D financed by government, including military, nuclear, and space but excluding civilian R&D financed by ministries of defence (e.g. meteorology).

Civil (Table 59)

Total GBAORD less Defence.

Economic development (Table 60)

R&D programmes financed for the purpose of the advancement of agriculture, fishery, forestry; industry; energy; and infrastructure and general planning of land use.

Health and environment (Table 60)

R&D programmes funded for the purpose of the protection and improvement of human health; control and care of the environment; and for the exploration and exploitation of Earth.

Education and society (Table 60)

R&D programmes funded for the purpose of education; culture, recreation, religion and mass media; and political and social systems, structure and processes.

Space (Table 60)

Civil space R&D programmes.

Non-oriented research (Table 60)

Research programmes financed in view of the general advancement of knowledge.

General university funds (Table 60)

The estimated R&D content of "block grants" to the Higher Education sector. This category is generally absent or underestimated for countries where only federal government is included.

Budget data are more timely than those derived from performer reports. Readers are warned that GBAORD data vary in coverage from government-financed GERD series and that these two types of data should not be combined.

7. International comparability

Though all OECD countries generally collect and report R&D in line with the Frascati Manual, some detailed national specifications may vary from OECD standards. These differences are generally too small to affect the general indicators quoted in this publication. The main exceptions are shown in Annex 1.

8. Expenditures in current dollars

National currency data have been converted to USD using purchasing power parity (PPP) series (Table C) from the OECD National Accounts Division (see *www.oecd.org/std/ppp*). Due to lags, the PPP series are estimated in the most recent years by comparing the growth in prices (implicit GDP deflator) in each country with that in the United States. These estimated parities are footnoted "*b*" in the tables as are any data converted to current dollars using them.

For most of the non-OECD economies featured in MSTI, PPP series provided by the World Bank are used to convert data from national currency into USD. Only TBP data have been converted using current exchange rates as these transactions are conducted on international markets.

9. Expenditures in constant dollars

R&D expenditure series have been deflated using the implicit GDP deflator taken from the OECD National Accounts database estimated for the most recent years based upon projections published twice a year in the *OECD Economic Outlook* (except in the case of Norway where a deflator excluding trends in petroleum prices has been used) (Table B). Any expenditures series calculated on the basis of these estimated rates are footnoted "*b*".

10. Comparisons with economic indicators

R&D expenditures are shown as a percentage of selected indicators drawn from the OECD National Accounts database and estimated for the most recent years on the basis of the projections published in the *OECD Economic Outlook*. Any ratios where such estimated economic series are the denominator are footnoted "*b*" in the tables concerned. R&D

personnel are expressed "per thousand" in relation to selected indicators from the OECD National Accounts and Labour Force databases. The main indicators used are shown in Annex 2.

R&D data are typically expressed as a percentage of GDP to allow cross-country comparisons. When compiling such indicators for the business enterprise sector, one may wish to exclude, from GDP measures, economic activities for which the Business R&D (BERD) is null or negligible by definition. By doing so, the adjusted denominator (GDP, or Value Added, excluding non-relevant industries) better correspond to the numerator (BERD) with which it is compared to. The MSTI variable "Value added in industry" is used to this end: it is calculated as the total Gross Value Added (GVA) excluding "real estate activities" (ISIC rev.4 68) where the "imputed rent of owner-occupied dwellings", specific to the framework of the System of National Accounts, represents a significant share of total GVA and has no R&D counterpart. Moreover, the R&D performed by the community, social and personal services is mainly driven by R&D performers other than businesses. Consequently, the following service industries are also excluded: ISIC rev.4 84 to 88 and 97 to 98.

In the same way, some indicators on R&D personnel in the business sector are expressed as a percentage of industrial employment. The latter corresponds to total employment excluding ISIC rev.4 68, 84 to 88 and 97 to 98.

Impact of changes to the measurement of GDP on R&D to GDP ratios: the 2008 update to the System of National Accounts (SNA), recognised the role of R&D as an activity leading to the creation of knowledge assets. One implication of recognising R&D as an asset-creating activity is that the level of GDP was, in many countries, revised upwards by a magnitude close to the value of domestic business investment in R&D. This will then reduce the R&D to GDP ratio, as the numerator stays constant and the denominator increases to incorporate an element that was previously missing from the GDP estimate. Figures and indicators for countries which have not yet implemented a revision to their National Accounts figures to take into account the role of R&D as investment – or for which revised data are not yet available in the *National Accounts of OECD Countries* published by the OECD National Accounts Division – are flagged with the note Y (meaning "compiled according to the System of National Accounts 1993"). Users should be careful when comparing the R&D to GDP ratios of countries that have and have not capitalised R&D in their national accounts. Likewise, they should avoid comparing previously published R&D to GDP ratios and more recent ones.

When possible, economic indicators for the non-member economies are also drawn from OECD databases. Alternatively, other international databases are used, such as the Eurostat National Accounts database (in the case of Romania, Bulgaria, Croatia, Cyprus, Lithuania, and Malta for the EU zone totals), the International Monetary Fund, and World Bank databases, as well as various national data sources.

11. *Zone totals*

Zone totals have been calculated for the OECD and the EU-28 for most tables. The OECD zone includes all Member countries of the OECD i.e Australia, Austria, Belgium, Canada, Chile, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Latvia, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and the United States.

The EU-28 includes Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia,

Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain, Sweden and the United Kingdom. Zone totals for EU-15 (the first 15 countries of the EU-28) are available in the electronic editions of this publication.

In order to obtain a full set of data for the OECD countries the Secretariat has made a number of estimates to fill gaps and to bring series up-to-date. These estimates were computed using simple statistical routines or information from national publications and observations of trends. Data points where such estimates would exceed 25% of the zone total have been suppressed. Israel, Korea, and Mexico are included in the OECD total as of 1991. The Czech Republic, Estonia, Hungary, Latvia, Poland, the Slovak Republic and Slovenia are likewise included as of 1995; Chile from 2007; Luxembourg is included in zone totals beginning 2000. Croatia and Malta are included in the EU-28 total beginning 2002.

Data for non-OECD countries used to calculate EU-28 have been provided by the Statistical Office of the European Commission (Eurostat).

OECD estimates for the EU-15 and the EU-28 zones may slightly differ from those published by Eurostat. In this publication, in line with standard OECD practice, national estimates are aggregated using USD Purchasing Power Parity (PPP) indices instead of EUR exchange rates applied by Eurostat. For example, the EU-28 measure of GERD to GDP ratio will be an average of EU countries' GERD intensities, weighted by the share of countries' GDP to EU GDP expressed in USD by applying PPP conversion as opposed to EUR-based GDP shares.

B. Sources

The data are derived from national R&D surveys and budgets are supplied to the Secretariat via an OECD/Eurostat co-ordinated collection.

R&D expenditures of foreign affiliates (Tables 61 and 62)

A. Definitions and coverage

These data are collected as part of the OECD effort to measure globalisation through the role of multinationals. A "foreign affiliate" is a company located outside the country/economy of interest and in which a controlling stake (over 50% of voting shares) is owned by a company within the country/economy of interest (i.e. that for which the R&D statistics are being compiled). These figures thus present the amounts spent on R&D by foreign affiliates of companies based in the domestic economy. For further information on methodological and conceptual aspects of globalisation statistics, see *Handbook on Economic Globalisation Indicators* (OECD, 2005). Data, in some cases, are not directly comparable with standard Business Enterprise R&D. Details on national sources and definitions are published in *Measuring Globalisation, Activities of Multinationals, 2007*. Data are available on-line at *http://oe.cd/amne*.

B. Sources

OECD database on Activities of Multinational Enterprises (AMNE), December 2016.

Patents (Tables 63 to 66)

A. Definitions and coverage

1. *Patents and patent families*

A patent family is defined as a set of patents protecting a single invention across various jurisdictions. Inventors seeking protection file a first application (priority) often in their country of residence. Following this, there is a period where protection may also be applied

for in other jurisdictions. Patent families, as opposed to patents, are provided with the intention of improving international comparability (the "home advantage" is suppressed; the values of the patents are more homogeneous).

The patent families presented in this publication refer to triadic families: i.e. a patent is a member of the patent families if and only if it is filed at the European Patent Office (EPO), the Japan Patent Office (JPO), and the US Patent & Trademark Office (USPTO).

In addition, the number of patent applications filed under the Patent Co-operation Treaty (PCT) is now provided for two specific sectors of interest: the ICT and biotechnology sectors, as well as the total number of applications filed across all sectors. These sectors are defined according to selected classes of the International Patent Classification – IPC. The PCT procedure offers the possibility to seek patent rights in a large number of countries by filing a single international application with a single patent office, and then enter the national stage in the desired countries at a later date.

2. Presentation and availability

For patent counts, the choice of the country and date of reference among the set of information included in patent documents is important. Patents are presented here according to the country (or countries) of residence of the inventor(s), giving an indication of technological innovativeness of researchers and laboratories located in a country.

The *priority date*, the date of the first international filing of a patent, is chosen as the reference date. It is the earliest *available date* and therefore the closest to the invention date. Although the application date may provide more recent series, counts by *application date* introduce a bias between residents and foreigners for a selected patent office with respect to the *priority date*. Residents usually first file a patent application at their domestic office, the extension of application to other countries takes one year following the traditional procedure, and up to two and a half years for the PCT procedure.

However, counting patent families according to the earliest priority date increases the drawback of traditional patent counts with respect to timeliness. The time lag between the priority date and the availability of information on patent applications could be up to 4 years. From priority years 2012 to 2014, patent families for individual countries are Secretariat estimates, based on the latest trends on patent filings observed at the three offices. Furthermore, because of changes in the rules and regulations at the USPTO, triadic patent families before 2001 are based on USPTO granted patents.

The PCT procedure expanded after 1990 and is increasingly used by applicants from all signatory states: since the early 2000s, most countries are well represented. For the transition period (1990-2000), cross-country comparisons or time trends should be interpreted with care.

A broader set of patent-related indicators is available on-line at *http://oe.cd/ipstats*, along with methodological notes. These present patents by main technology classes and by region, as well as indicators on international co-operation in patenting. For further details on patent data, refer to the *OECD Patent Statistics Manual, 2009*.

B. Sources

The data on patents at intellectual property offices (EPO, JPO, USPTO) are mainly derived from EPO's Worldwide Statistical Patent Database (PATSTAT, Autumn 2016). The series on triadic patent families have been compiled by the Secretariat. The series on PCT applications are based on data published by the EPO.

Technology balance of payments (TBP) (Tables 67 to 69)

A. Definitions and coverage

The TBP registers commercial transactions related to international technology transfers. It consists of money paid or received for the acquisition and use of patents, licences, trademarks, designs, know how and closely related technical services (including technical assistance), and for industrial R&D carried out abroad, etc.

Payments as a percentage of GERD (Table 69) give an indication of the share of imported technology in relation to domestic R&D efforts.

It has not been possible to produce zone totals for the TBP due to a lack of data and because of the challenges of excluding flows within the zones.

B. Sources

OECD database on Technological Balance of Payments (TBP), Decembre 2016.

International trade in highly R&D-intensive industries (Tables 70 to 72)

A. Definitions and coverage

These tables present indicators concerning the international trade in goods of selected R&D intensive industries. Data are presented in accordance with the International Standard Industrial Classification, Revision 4 (ISIC Rev.4). In general, prior to 1988 underlying source data are based on ISIC Revision 2.

These series are taken from the OECD's Bilateral Trade in Goods by Industry and End-use Category database (BTDIxE), derived from the OECD International Trade Statistics and United Nations Statistics Division COMTRADE databases, which have been converted from the Harmonised System (HS) to International Standard Industrial Classification (ISIC).

Industries covered are as follows:

	ISIC Rev. 4
• *pharmaceutical industry* (Table 70)	21
• *computer, electronic and optical industry* (Table 71)	26
• *aerospace industry* (Table 72)	303

A note indicating a break in series is assigned to the first available year of ISIC Revision 4 data. Prior to 1993, the data for Belgium include Luxembourg.

The zone total for EU-15 (presented online) excludes intra-EU trade. The OECD total has not been adjusted to exclude trade between member countries.

From 1996, calculation of the Export market shares is relative to total aggregate exports of the declaring countries available in the OECD BTDIxE database. Reporting economies included in BTDIxE but not presented in this publication notably include Brazil, Hong Kong, India, Indonesia, Malaysia, the Philippines, Saudi Arabia and Thailand. Prior to 1996, Export market shares are based on the share of OECD total exports.

B. Sources

OECD Bilateral Trade in Goods by Industry and End-use Category database (BTDIxE), December 2016 (*www.oecd.org/sti/btd*).

ISSN 2304-2761
Main Science and Technology Indicators: Volume 2016/2

ANNEX 1

National specifications

OECD member countries

- In 2001 in **Australia**, R&D in the Business enterprise sector saw a significant increase due to a change in government policy in regard to the R&D tax concession scheme (Introduction of the 175% Premium (Incremental) Tax Concession for additional investment in R&D; Introduction of an R&D Tax Offset for small companies in tax loss that undertake R&D, enabling them to 'cash out' their R&D tax losses; and a new treatment of R&D plant-asset depreciation that allows a 125% deduction for effective life depreciation of assets used in R&D activities (on a pro-rata basis).

  From 2011, Australia has included submission from agencies that have previously not submitted R&D expenditure data. The agencies have been asked to provide retrospective time series and this results in a break in series in 2002 in GBAORD data. From 1999, Australia has prepared its Federal Budget details according to the principles of accrual accounting, leading to a break in the series for GBAORD data.

  Up to 1998, TBP data come from the Business Enterprise R&D Survey, and only refer to technical know-how. From 1999 TBP data are based on ABS's quarterly Survey of International Trade in Services, and include all TBP components.

  Since 2006, a definition of foreign ownership has not been provided in the national survey and R&D data on foreign affiliates have been accepted (by the Australian Bureau of Statistics) as reported.

- In **Austria**: from 2016, government R&D support through tax incentives is reported as funds from the business sector. Beforehand, it was included in the government funding.

  Since 2009, a large unit previously omitted has been included as an R&D performer in the PNP sector.

  From 2007 onwards, the former "post-secondary colleges for teacher training" ("Paedagogische Akademien") have become "Universities of Education" and are, consequently surveyed as units of the Higher education sector (up to 2006 these units were covered in the Government sector).

  In the BE sector, the "research premium" is included in "funds from government" beginning 2006. This measure was introduced for the first time for the calendar year 2002, and for the 2002 and 2004 data, government funding for R&D via the "research premium" was subsumed under "funds from enterprises".

  In 2004, Statistics Austria's regular annual updating procedure of the R&D expenditure data resulted in revisions showing a significant increase compared to previous estimates, mainly due to the inclusion of results from the 2002 survey of the business enterprise sector.

  As of 1995, TBP data cover royalties and license fees, technology-related services and R&D performed abroad. Until 1991 inclusive, these data cover only royalties and license fees. TBP data are published according to the Balance of Payments and International Investment Position Manual (BPM6) as of 2006.

- In **Belgium**: the personnel data increased markedly in 2015 due to the introduction of a new government incentive scheme for hiring researchers. However, this was not

matched by a counterpart increase in R&D expenditure, which grew only slightly. It is therefore likely that labour costs are being underreported in relation to the number of R&D personnel employed.

Some institutions were reallocated from the PNP sector to the Government sector in 2012.

Beginning with the 1998 data, two large non-profit organisations, formerly included in the higher education sector, were reclassified in the government sector.

As of 1993 (1992 for the Business enterprise sector), data are based on full surveys and no longer on a combination of budget figures and survey findings.

Total national R&D expenditures are underestimated in 1987 and 1988, as is the contribution of government as R&D financed by federative authorities (about 2-4 % of GERD and 7-15 % of government-financed GERD) is excluded. As a breakdown of this sum by sector of performance is not available, the impact on the other R&D expenditure tables cannot be estimated, though it probably affects R&D in the Government and Higher Education sectors.

As of 1995, TBP data are collected according to the OECD, IMF, and Eurostat Manuals. Up to 2001, data refer to the Belgium-Luxembourg Economic Union (BLEU). From 2002 onwards, data refer to Belgium only. TBP data are published according to the BPM6 as of 2008.

- In **Canada**, from 2012 the coefficients used for estimating R&D expenditure in the Higher Education sector have been revised, as well as the distribution of HERD between funds directly from government for R&D, GUF, and from institutions' own funds. From 1988, the estimated values for R&D in hospitals not covered by university reports are included in the R&D expenditure of the higher education sector (not previously included).

  From 1989, non-federal sources are no longer excluded from GUF in GBAORD.

- For **Chile**, prior to 2014, higher education data was obtained from the research departments of each institution (in a centralised way). Thereafter, it is obtained from the units directly (research centres of universities, scientific centres, etc). In 2013, some institutions, previously classified in the PNP sector, were included in the government sector. BERD funded by industry and by abroad has also significantly increased as a result of better reporting in the R&D surveys starting with reference year 2013. From reference year 2009 in the business sector innovation and R&D surveys were separated and the survey sampling modified. Astronomical observatories are surveyed and included in the PNP sector from 2009; this may include some observatories operated by international organisations.

- For the **Czech Republic**, beginning in 2005, there is a change in methodology for the collection of R&D personnel data in FTE. Data are provided in FTE by the reporting units, and based on new, more precise guidelines.

  Between 2004 and 2008, some public research institutions were included in the business enterprise sector because of their classification as non-financial enterprises (ISEKTOR 11) in the European System of Accounts (ESA). These institutions have been re-classified into the government sector and R&D expenditure and personnel data have been recalculated for those years.

  Up to 2004, TBP data come from the balance of payments figures produced by the Czech National Bank. From 2005, TBP data are prepared by the Czech Statistical Office and come from the quarterly trade in services survey, except for the item "Sale/purchase of patents and inventions" which continued to be collected by the central bank up to 2008. TBP data are published according to the BPM6 as of 2010.

- In **Denmark**, from reference year 2007, the surveys are conducted by Statistics Denmark (previously by the Danish Centre for Studies in Research and Research Policy).

Modifications in the questionnaires have increased the response rate; this is particularly noticeable in the Business enterprise sector where survey response is now mandatory. Additionally, due to changes in the administrative structure, a number of institutes, previously classified in the Government sector, were merged with universities.

Until 2002, the HE-sector R&D expenditure was underestimated as R&D carried out in hospital departments at the university-hospitals was included in the Government sector.

As of 2002, the business enterprise survey specifically requests data on researchers, technicians and other personnel. Earlier data for R&D personnel by occupation are based on qualification.

From 2001, GBAORD data include government-financed R&D on renewable energy. In addition, a new principle concerning budgeting of commitments was introduced: from 2001 commitments of grants are carried to the debit side at the time of entering the commitment, where previously commitment of grants was carried to the debit side at maturity.

From 1999, provincial and local government funding is included in the GBAORD data (in particular funding in provincial hospitals), as well as funding from the Danish National Research Foundation and the Danish Investment Fund. In 1983, 1988, and 1993, the method for breaking down GBAORD data by socio-economic objectives changed, leading to breaks in series.

- In **Finland**: a new methodology for calculating the time spent on R&D by personnel in the Higher Education sector was implemented in 2011. As a consequence, R&D personnel (measured in FTE) in the Higher Education sector decreased.

  From 2004, R&D personnel data are available according to occupation. Previous breakdown was by formal qualification.

  From 1998 to 2004, due to a greater number of responses to the BE survey on the group level, the questionnaire category funds from other foreign enterprises of the group was merged with business enterprise funds (own funds) thus reducing the share of funds coming from abroad.

  From 1997, the Higher Education sector includes central university hospitals.

  From 1997 and the implementation of ISCED 97, "Researchers" also includes holders of engineering degrees and graduates of vocational polytechnics, degrees which are now classified in First Stage Tertiary Education (ISCED 5A).

  In 1991, the method for measuring R&D expenditures in the Government and the Higher Education sectors changed. Since 1994, PNP institutions are included in the Government sector in non-survey years.

  Data on GBAORD have been revised back to 1991 because of changes in R&D coefficients for certain research institutes. In 1991, there was an upward adjustment in the total due to the inclusion of pension costs. From 1995, funds received by the State research institutes from external sources are excluded from Government appropriations. As of 1997, the data covers appropriations for central university hospitals.

  Prior to 1999, TBP data refer to royalties and licence fees. Thereafter, data also include Architectural, engineering and other technical services, computer services, and R&D performed abroad. TBP data are published according to the BPM6 from 2013.

- In **France**, from 2014 onwards, university hospitals collect R&D personnel data by gender whereas these figures were previously estimated. The National Centre for Scientific Research (CNRS) is included in the Higher Education sector, whereas in other countries

such as Italy for example, this type of organisation is classified in the Government sector. This affects comparisons of the breakdown of R&D efforts by sector of performance.

The methodology of the public administrations survey was changed in 2010: the method for measuring the resources devoted to R&D in ministries and some public organisations has been modified, leading to a better identification of their financing activities. The impact is notably a 900 million fall in GOVERD and a 3 200 drop in FTE personnel.

From 2004 onwards, a new methodology was introduced to correct for some double-counting of funds for universities. In 2007, the sampling method in the BE sector was modified and the 2004 data revised according to the new methodology.

Beginning with the 2006 survey, in order to better take into account SMEs, there is no longer a cut-off point in the business enterprise sector of one Full-time-equivalent on R&D for an enterprise to be included in the survey population.

From 2001, coverage of the BE sector was expanded. Data communicated by the Ministry of Defence were also extended to cover research that was not considered R&D in earlier years. This also affected GBAORD data.

In 2000, several methodological changes which improved the quality of the public sector data resulted in a break in series for that year: social charges and civil pensions are better captured in universities' research expenses; modification of responses from some institutes to better harmonise with the corresponding multi-annual programme; and implementation of a redesigned questionnaire. National sources estimate that the previous method would have produced a 1.6% increase in GERD, where the current method resulted in 4%.

Due to changes in the methods used to evaluate domestic expenditure on defence, the results of the 1998 surveys revealed significant modifications requiring new estimates for 1997. This break in series relates also to the GBAORD data.

In 1997, the method used to measure R&D personnel in administrations has changed.

Between 1991 and 1992 France Télécom and GIAT Industries were transferred from the Government to the Business Enterprise sector following a change in their legal status.

In 2006 and 2007, following the implementation of the Constitutional Bylaw on Budget Acts (LOLF act: "loi organique relative aux lois de finances"), some departments are no longer recorded in the GBAORD data. Consequently, total GBAORD is underestimated for both years.

- The data in this publication for **Germany** cover unified Germany from 1991 and western Germany only until 1990.

  From reference year 2014, the distribution of R&D personnel by occupation is requested in the government survey whereas it was previously estimated from data by qualification.

  The method for calculating public-financed R&D in the business enterprise sector was reviewed, resulting in the revision of business enterprise R&D and the national total back to 1991.

  In 1992 the methodology of the survey on resources devoted to R&D in the Government sector was changed.

  From 1991, the data for the Private Non-Profit sector have been included in the Government sector.

  For 1997, the methodology for allocating GBAORD by socio-economic objective changed. The 1997 total budget figure of the Federal Ministry of Education, Science, Research and Technology was reduced, but the global reduction was not available by socio-economic

objective. Therefore, total GBAORD reflects the adjusted budget figure, and the sum of the breakdown does not add to the total. This is also the case beginning with the 2001 GBAORD data.

Prior to 1986, the TBP data for Germany cover transactions concerning patents, licences, trademarks, models, and designs. Thereafter, this data also covers technical services, computer services, and industrial R&D. TBP data are published according to the BPM6 as of 2013.

- In **Greece**, in 2011, methodological improvements and a better coverage resulted in breaks in series: in the business enterprise sector, a new population frame was defined to cover all R&D-performing firms; in the government sector, the coverage was extended to also cover public hospitals as well as all institutions administered by the Ministry of Culture; in the higher education sector, all Technological Educational Institutes (TEI) and post-secondary establishments were included. These methodological changes were also applied to estimate the total GERD, BERD, GOVERD, and HERD between 2008 and 2010.

  The methods for estimating R&D in the Higher Education sector changed in 1983, 1989, and 1995.

  From 2008, GBAORD data are exclusively based on R&D funders. Part of the increase in 2008 is also explained by a better identification of GBAORD for cultural and archaeological activities.

- In **Hungary** the breakdown of R&D expenditure data by sector of performance and by source of funds is not complete. Beginning in 2006, government-financed R&D, some of which was not allocated to the appropriate sector, is now allocated, in particular to the Business enterprise sector. Prior to 2004, only defence R&D performed in the civil sector is covered. Up until 1993, Business Enterprise expenditure includes purchases of licenses and know-how. As of 1994, the Central Technology Fund has been reclassified from the Business Enterprise sector to the Government sector.

  2013 GBAORD data include multi-annual R&D projects which are not allocated to the year in which they were budgeted.

  Up to 2003, the source of TBP data was the balance of payments statistics compiled by the Hungarian Central Bank;data covered royalties and licence fees and sale/purchase of patents and inventions only. Since 2004, TBP data have been collected by the Hungarian Central Statistical Office from enterprise surveys on trade in services. TBP data also include computer services, architectural, engineering and other technical services and R&D carried out abroad. TBP data are published according to the BPM6 from 2008 on.

- In **Iceland**, in 2015, the implementation of the 2015 Frascati Manual edition has affected the distribution of personnel data by occupation. From reference year 2013, the R&D data collection methodology has been changed resulting in breaks in series. The main differences concern the redesign of the questionnaire, use of business registers in the sample selection mechanism, the legal obligation for firms to respond, the definition of key R&D concepts in the questionnaire, and changes in the allocation of institutions into the business or government sectors. New sampling methods caused a break in series in 2010 (or in 2011 for sectors with no 2010 data).

  From 2006, GBAORD data make better use of R&D information from the state budget and are based on a better coverage of relevant R&D funding in major recipients organizations. From 1993, new methods for collecting and processing budget data for GBAORD result in a break in series.

  TBP data are published according to the BPM6 from 2013.

- In **Ireland**, from 2014, data on researchers in the higher education sector include PhD students. As of 2000, personnel data in the government sector were surveyed in FTE. Prior to 2000, data were collected for human resources devoted to S&T in FTE, and the R&D expenditure to total S&T expenditure ratio was applied.

  The government data were revised back to 1992, as some government expenditures are no longer classified as R&D.

  Prior to 2004, EU funds were included in GBAORD data.

  TBP data are published according to the BPM6 as of 2012.

- In **Israel**, from 2000 onwards, hospitals were re-classified to the business sector from the government and PNP sectors. Both the business enterprise and higher education surveys were improved in 2009, causing a break in series for the BERD financed by abroad and by the Business Enterprise sector, as well as a break in 2007 for the HERD financed by abroad and by the Higher Education sector. Since 2001, the government sector is covered by a survey; beforehand government R&D was estimated through financial reports and interviews of accountants.

  Data for the higher education sector are partly based on universities'financial reports. Before 2008, humanities and law are only partially covered in the higher education sector.

  The 2009 BERD survey has given more options to businesses to break down the data by sources of funds. Using the results of the 2009 survey, BERD and GERD financed by Business Enterprises and by abroad were revised back to 1993.

  TBP data are published according to the BPM6 as of 2011.

  The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities or third party. 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.

- For **Italy**, in 2005 and 1997, new methods for estimating R&D in universities were introduced, resulting in breaks in series in the higher education sector.

  Up until 1990, the total expenditure on R&D is overestimated by more than 10% as extramural R&D expenditures is included. From 1991, data on extramural R&D expenditure is available separately.

  2010 GBAORD data are calculated with a new set of coefficients especially affecting the data on non-oriented research programmes.

  Up to 2007, the source of TBP data was the balance of payments statistics compiled by the Ufficio Italiano dei Cambi (UIC), based on the ITRS system (settlement data collection system). On 1st January 2008, UIC ceased to exist and its functions were taken over by the Bank of Italy. The data are derived from a new data collection system, mainly based on direct reporting from enterprises. Until 1991, R&D performed abroad is excluded.

- For **Japan** in 2008 and 2013, the FTE coefficients for researchers in the higher education sector were revised, producing an increase (in 2013) and a decrease (in 2008) in both R&D expenditure and personnel for this sector and the national total.

  Beginning with the 2002/2003 survey (OECD data 2002), the coefficients supplied by the Ministry of Education, Culture, Sports, Science and Technology were applied to doctoral level students as well as teachers when calculating FTE for the HE sector, resulting in a break in series in that year.

  Before 1996, Higher Education expenditure and personnel data in FTE are OECD estimates derived from official headcount-based data.

GBAORD data represent the budget for S&T and cover central government only. From 2011 onwards, GBAORD for the "Education and Society" socio-economic objective include a more accurate measure of the budget of the National Institute for Cultural Heritage. Military procurement contracts are excluded from defence GBAORD.Before 2010, GUF excludes SSH.

- In **Korea**, SSH are excluded from the R&D data prior to 2007.

  From 2013, GBAORD data on the education objective are available separately, having previously been included in non-oriented research. Since 2008, GBAORD has been broken down to fit NABS 2007 using estimation techniques.

  TBP data for technology receipts and payments do not come from the same source and are therefore not comparable. Technology receipts data come from the R&D survey and are probably underestimated as all firms are not surveyed. Technology payments data come from the balance of payments statistics compiled by the Bank of Korea.

- In **Luxembourg**, a better identification of R&D in software-related activities resulted in a break in series in 2012 for BERD (and GERD). From 2009, some budgetary items of the Ministry of Research and other ministries are no longer included in the government's own R&D funds. The impact on GOVERD is a drop of less than 7 million.

  The significant increase in R&D performed in the higher education sector in 2004 is due to the re-defined role of higher education in the national system of innovation and research, in particular the newly created University of Luxembourg.

  Government budget appropriations for space programs and GUF are included from 2006.

  The Luxembourg balance of payments was based on an International Transactions Reporting System (ITRS) up until 2011. From 2012 onwards, this has been replaced by direct reporting from companies. Banks are still reporting their own Balance of Payments transactions.

- In **Mexico**, post-graduate students are included in R&D expenditure data from 2007. Beginning with the 2004 data, the Business enterprise survey register was increased to include large firms not previously identified as R&D performers. The first R&D surveys based on the Frascati Manual covered the period 1992-93. Earlier data for R&D performed in the Government sector are based on national estimates and do not exactly correspond to the recommendations of the Frascati Manual.

- In the **Netherlands**, in 2012, the method for sampling enterprises included in ISIC industries 84 to 99 (community, social, and personal services) as well as the breakdown of personnel data by occupation were modified leading to breaks in series in the business and government sectors. In 2011, the method for producing business enterprise data changed: all observed enterprises are included whereas before 2011, only enterprises with substantial R&D activities (*i.e.* with a minimum number of R&D personnel) were incorporated. Subsequent changes affected the higher education sector: before 1999, a large number of PhD candidates were formally employed by research institutes (in the government sector) financing their research. From 1999, universities became the formal employer of PhD candidates and their research activities moved from the Government sector to the Higher Education sector. Besides this, the R&D activities of the Universities of Applied Sciences (HBO) were taken into account for the first time. Finally the R&D activities of the Academic hospitals were increasingly underestimated due to the merging of the Academic hospitals and (parts) of the Faculties of Medicine of the universities into so-called University Medical Centers (UMC's). This started in 1998 and meant for instance that staff of the Faculty of Medicine of the university became employees of the UMC. As a result, data on R&D in the field of medical sciences were also revised. As of 2000, newly-

recruited researchers on the payroll of the Netherlands Organisation for Scientific Research (NOW), previously included in the Government sector, were included with personnel in the higher education sector. In 1982 and 1990, the methodology of the survey on R&D expenditure changed.

In 2003, Statistics Netherlands revised the panel of the R&D survey for the Government and PNP sectors, resulting in breaks in series for both. Also beginning in 2003, R&D personnel in the PNP sector are grouped with Government sector R&D personnel.

In 1994 and 1996 there were major expansions of the scope of the Business Enterprise sector survey; R&D expenditure and personnel data in the latter sector and in the whole economy are thus not comparable with those for the previous years.

In 1990 and 1999, new methods for calculating GUF are introduced for GBAORD series.

TBP data are published according to the BPM6 as of 2014.

- **New Zealand** revised the methods of collection and estimation of R&D data respectively in 1984 (for the Higher Education sector), 1992 (for GUF), and 2001 (BERD and national total and HE personnel).

  In 2016, part of R&D budgets previously reported in the "R&D financed from other sources than GUF" objective was reallocated to "economic development programmes" (more precisely to the "industrial production and technology" objective). GBAORD figures have been revised back to 2007 resulting in a break in series. From 2006 onwards, GBAORD data are collected from all government agencies, together with analysis of selected budgetary information. Prior to that year, data were derived from the budget estimate of the pool for science funding, together with figures on government departments' operational research.

  Up to 1997, TBP data came from the R&D survey conducted by the Ministry of Research, Science, & Technology. From 1999 onwards, the data are based on the quarterly International Trade in Services and Royalties Survey carried out by Statistics New Zealand. All TBP components are covered. TBP data are published according to the BPM6 as of 2012.

- In **Norway**, in 2007, a break in series occurs because of a change in compilation methods for health institutions. This affects both the Higher education sector (university hospitals) and Government sector (other hospitals).

  In 1995, the survey sample was revised to improve coverage of small firms (10 to 50 employees) and non-manufacturing industries.

  As of 1991, personnel in central administration units of higher education are not included, however the cost of such personnel is included in other current R&D expenditure (in line with the Frascati Manual).

  In 1987, own funds from Public enterprises were reclassified from funds from Government to the funds from the Business Enterprise sector. As of 1989, R&D performed by PNP institutes has been included in the government sector.

  The growth in resources devoted to R&D in 1984 is due to the expansion of the scope of the Business Enterprise sector survey.

  The method for compiling GBAORD data changed in 1996. The series have been revised retrospectively to exclude contract research, state enterprises and payments to the European Commission.

  Before 1988, TBP data cover only patent licensing and are consequently underestimated.

- In **Poland**, from 2013, improvements in R&D surveys enable the distribution of all expenditure by type of R&D, leading to a break in basic research series.

GBAORD data exclude European Commission funds since 2012.

Up to 1999, TBP data cover trade in techniques; transactions involving trademarks, patterns and designs; services with a technical content (including prospecting until 1995 and spatial planning, town planning and architectonic work); R&D performed abroad. From 2000, all categories are covered (acquisition/disposal of non-produced, non-financial assets, royalties and licence fees, computer services, architectural, engineering and other technical services and R&D services). TBP data are published according to the BPM6 from 2011.

- In **Portugal**, a significant number of entities previously classified in the PNP sector were re-classified to the higher education sector in 2013. Besides, R&D personnel occupation categories have been reviewed: researchers, technicians and other support staff have been defined according to the main functions performed by each individual as part of R&D activities and according to criteria based on the ISCO classification, rather than being defined only by the level of academic qualification. In 2008, the number of R&D personnel increased because of methodological improvements: the results of the individual survey forms were combined with information from other internal databases resulting notably in the inclusion of all permanent academic staff and all researchers funded by the Ministry of science, technology and higher education in 2008.

  Due to methodological improvements in the 2008 R&D survey as well as complementary information collected from internal databases, there is now a more complete and accurate measure of R&D resources – both expenditure and personnel – in the Higher education sector. In particular, the large increase in higher education funded R&D is due to the inclusion of more accurate data related to private higher education institutions.

  Beginning with the 2007 survey, the following measures resulted in a significant increase in Business enterprise R&D: the reintroduction of the fiscal incentive, SIFIDE; an increase in the number of the firms performing R&D activities; and an updating of the Business Enterprise register.

  New methodological procedures have been adopted for the 1997 survey so that only R&D activities are covered in the survey. The classification of BERD by NACE (Rev 1) was introduced and the data have been revised back to 1995. Some of the PNP units have been re-classified to the Business Enterprise and Higher Education sectors.

  In 1997, due to a new accounting method for structural funds from the European Commission, funds from the Rest of the World and direct Government financing are not comparable with those of earlier years.

  GBAORD data have been revised back to 2008 according to a new methodological exercise.

  TBP data are published according to the BPM6 as of 1996.

- For the **Slovak Republic**, data before 1994 refer to the Research and Development Base (RDB) and cover the whole activity of institutions and not only R&D. Defence R&D was totally excluded until 1997 and only partially included thereafter.

  Since 2002, a new budget classification compatible with COFOG enables the identification of government budget appropriations for defence R&D. The defence category includes R&D appropriations for defence, safety, and security of the country. For earlier years, defence R&D was included in the GBAORD total.

- In **Slovenia**, before 2014, the GERD allocation by type of R&D was estimated from the number of projects recorded in each type of R&D, and not from the actual amount of R&D expenditure (as it is the case from 2014). In 2011, the increase in R&D personnel and expenditure is notably explained by both the improvement of non-response analysis and new administrative sources to better identify R&D performers. Beginning reference year

2008, survey coverage was expanded to include some innovative companies that were not previously recognized as R&D performers.

- For **Spain**, beginning in 2008, the R&D questionnaire includes a specific category for on-site consultants undertaking R&D projects in the enterprise; as well as a specific category within the breakdown of current costs.

  Since 2004, loans for R&D that are returnable are not included in GBAORD, in order to ensure international comparability.

  From 2002, R&D expenditure and personnel data for the business enterprise sector include both occasional and regular R&D.

  Prior to 1989 R&D personnel data for the Higher Education sector only include researchers. In consequence, total R&D personnel may be underestimated in these years by between 10 and 15 %.

  In 1992 there was an upward reestimation of General University Funds causing a break in series in the financing of HERD and GERD. In 1995, the sources of funds for R&D in the Higher Education sector were reviewed; own funds are now separated from the General University Funds, where they were previously included.

  In 1997, the defence objective in GBAORD almost doubled in magnitude due to an exceptional contribution by the Ministry for Industry and Energy. The incorporation in 1997 of the Spanish contribution to CERN has involved substantial changes in the "Energy" category.

  Up to 1992, TBP data come from the annual survey into technological transfer in companies conducted by the Ministry of Science and Technology (former Ministry of Industry and Energy). From 1996 onwards, TBP data come from the balance of payments statistics compiled by the Spanish Central Bank. All TBP items are covered. TBP data are published according to the BPM6 as of 2008.

- In **Sweden**, the organisation of the police force was changed in 2015 and this has altered the coverage of the R&D personnel figures (in the government sector) received through survey responses. Part of personnel data were reallocated from the category "technicians" to the category "researchers" in 2013. In 2011 and 2009, the PNP sector decreased due to a new sampling method. In 2011, for personnel data, the institutional coverage of the Government sector was improved.

  Beginning 2007, researchers in the Business enterprise, Government and PNP sectors are now surveyed by occupation; prior to that year, data correspond to university graduates instead of researchers.

  Until 2005, R&D data for Sweden were underestimated: R&D in the Government sector covered central government units only and companies between 10-49 employees were excluded from the coverage. Moreover, prior to 1993 the surveys in the Business Enterprise, Government and Private Non-Profit sectors excluded R&D in the SSH. Also beginning 2005, FTE on R&D in the Higher education sector reflects a change in survey method. Concerning the Government sector, beginning 2005, the data exclude R&D personnel from the County councils, resulting in the personnel data being underestimated.

  From 1997, funding from the Public Research Foundations, previously classified in the PNP sector, is considered as funding from the government sector, due to their re-classification.

  In 1995, some institutions from the PNP sector were reclassified to the Business Enterprise or Government sectors; in the Higher Education sector, capital expenditures are excluded.

From 1998, GBAORD series refer to the calendar year (January-December) instead of the period July-June which had been used until 1994. Budget appropriations for 1995 and 1996 are estimates based on the period July 1995-December 1996. Also from 1998, funding by Public Research Foundations is excluded from the GBAORD data.

Up to 1993, TBP data came from the R&D survey and referred to transactions linked to patents, licences, royalties and know-how. From 1998, the data are based on the quarterly trade in services survey. All TBP components are covered. TBP data are published according to the BPM6 from 2013.

- In **Switzerland**, the Business Enterprise sector comprises private enterprises only. Public enterprises are included in the Government sector.

  From 2000, the Government sector no longer includes the telecommunications companies that have been privatised (Swisscom).

  The Swiss contribution to the European Space Agency is allocated to the space objective in GBAORD as of 2006, while it was before included in non-oriented research programmes. From 1998, the Federal Office of Agriculture and its research institutes no longer break down their R&D by socio-economic objective but group all under "Agriculture". For GBAORD this results in a break in series for both Agriculture and Health objectives, where half of the funds previously declared under Health are now declared under Agriculture. Also in 1998, the telecommunications field of the Federal Post office has become the private enterprise Swisscom which is no longer included under the Infrastructure objective in GBAORD. Before 1994, GBAORD did not include the public sector financed R&D mandates.

  TBP statistics are drawn from the Swiss balance of payments. Up to 2001, they include sales and purchases of intangible assets, technological services (construction services, commercial and technical consulting), license and patent fees, including management fees, computer and information services. From 2002 onwards, TBP data include the following BPM6 items: Charges for the use of intellectual property; Computer services; Architectural, engineering and planning, scientific and other technical services; and Research and development services.

- Total R&D personnel data for **Turkey** are underestimated because personnel data for the Higher Education sector only include researchers.

- In the **United Kingdom**, the methodology for distributing GOVERD by type of R&D was improved in 2010, resulting in a break in series. Beginning in 2005, numbers of researchers in FTEincorporate a more accurate measure of post-graduate students. Estimates are based on the sum of student time allocated to different research activities (some students may be involved in several research projects). Students who spend 50% or more of their time on research activities are counted as one FTE; those for whom it is less than 50% are not counted.

  In 2001, the government research agency, the Defence Evaluation and Research Agency (DERA) was disbanded and two new organisations were created. Around one quarter of DERA remained within the Ministry of Defence as a government agency, whilst the remaining three quarters became a private limited company, resulting in a break in series in both the Government and business enterprise sectors as well as GBAORD.

  In 1996, following work to enhance the estimates of R&D by PNPs, estimates of PNP R&D were substantially revised downwards. The data for previous years were revised accordingly.

  Until 1994 BERD funding by business includes funds that may have been from other national sources such as higher education or PNPs.

A new method for estimating government-financed R&D in the Higher Education sector was applied from 1993.

Reclassification of institutes explains most of the growth of the R&D personnel in the Government sector between 1991 and 1992 and the decline in the following year.

From 1991 the data for the Government sector include an estimate for R&D expenditures in the public health services.

Between 1985 and 1986 the "United Kingdom Atomic Energy Authority" was transferred from the Government sector to the Business Enterprise sector. Expenditure revisions have been made back to 1985.

Due to lack of official data for the higher education sector, the OECD Secretariat has made estimates for total researchers beginning 1999 and total R&D personnel beginning 1994.

As of 1995, the Health objective in GBAORD has been broadened to include the total net costs to National Health Service trusts of their involvement in R&D.

Oil company operations have been included in the United Kingdom TBP data from 1984. From 1996 onwards, the TBP data cover sales of patents and inventions, patent licensing, trademark patterns and designs, technology-related services, and R&D. TBP data are published according to the BPM6 as of 2003.

- For the **United States**, in the business sector, the funds from abroad previously included in the business-financed BERD, are available separately from 2009. In the higher education sector all fields of SSH are included from 2003 onwards.

  Following a survey of federally-funded research and development centers (FFRDCs) in 2005, it was concluded that FFRDC R&D belongs in the government sector – rather than the sector of the FFRDC administrator, as had been reported in the past. R&D expenditures by FFRDCs were reclassified from the other three R&D performing sectors to the Government sector; previously published data were revised accordingly. Between 2003 and 2004, the method used to classify data by industry has been revised. This particularly affects the ISIC category "wholesale trade" and consequently the BERD for total services.

  U.S. R&D data are generally comparable, but there are some areas of underestimation:

  i) Up to 2008, Government sector R&D performance covers only federal government activities. That by State and local government establishments is excluded;

  ii) Except for the Government sector, the R&D data exclude capital expenditures. For the Business Enterprise sector, depreciation is reported in place of gross capital expenditures.

  Higher education (and national total) data were revised back to 1998 due to an improved methodology that corrects for double-counting of R&D funds passed between institutions.

  Breakdown by type of R&D (basic research, applied research, etc.) was also revised back to 1998 in the business enterprise and higher education sectors due to improved estimation procedures.

  No data is available for total R&D personnel; only data for R&D scientists and engineers are collected. The methodology for estimating researchers was changed as of 1985. In the Government, Higher Education and PNP sectors the data since then refer to employed doctoral scientists and engineers who report their primary work activity as research, development or the management of R&D, plus, for the Higher Education sector, the number of full-time equivalent graduate students with research assistantships averaging an estimated 50 % of their time engaged in R&D activities. As of 1985 researchers in the Government sector exclude military personnel. As of 1987, Higher education R&D personnel also include those who report their primary work activity as design.

Due to lack of official data for the different employment sectors, the total researchers figure is an OECD estimate.

2009 GBAORD data also includes the one time incremental R&D funding legislated in the American Recovery and Reinvestment Act of 2009. Beginning with the 2000 GBAORD data, budgets for capital expenditure – "R&D plant" in national terminology – are included. GBAORD data for earlier years relate to budgets for current costs only.

Up to 2000, the United States TBP data cover only royalties and licence fees. From 2001, data also include "Research, development and testing services". Beginning 2006, new statistics on total trade for several types of services are available for the first time. As of 2006, TBP data include royalties and license fees related to industrial processes, business format franchising fees, trademarks and other intangibles; research, development and testing services; computer and data processing services; architectural, engineering and other technical services; industrial engineering services.

Non-member economies

- For **Argentina**, from 2009, business R&D data are derived from a new survey covering an expanded sample of enterprises. The following national report gives further information about the impact of the new methodology on BERD estimates: *http://indicadorescti.mincyt.gob.ar/documentos/Informe_Encuesta%20I+D.pdf* (in Spanish).

  Since 1997, data for human resources relate to R&D. Before that, human resources data were expressed in terms of Science and Technology Activities (STA), involving R&D and diffusion activities of S&T (library services, training services, conferences, etc.). These have not been transferred to the OECD database. Since 2002, the source of funds data for private non-profit organisations, universities and S&T public organisations are requested for R&D. Before 2002, these sources of funds data were requested in terms of STA. These data were converted into R&D by means of a coefficient for each sector of performance. The main source of funds for science and technology activities in Argentina is the National Budget.

- In **China**, the national breakdown by source of funds does not fully match with the classification defined in the Frascati Manual. The R&D financed by the government, business enterprises, and by abroad can be retrieved but part of the expenditure has no specific source of financing, i.e. self-raised funding (in particular for independent research institutions), the funds from the higher education sector and left-over government grants from previous years.

  The government and higher education sectors cover all fields of NSE and SSH while the business enterprise sector only covers the fields of NSE. There are only few organisations in the private non-profit sector, hence no R&D survey has been carried out in this sector and the data are not available.

  From 2009, researcher data are collected according to the Frascati Manual definition of researcher. Beforehand, this was only the case for independent research institutions, while for the other sectors data were collected according to the UNESCO concept of "scientist and engineer".

  In 2009, the survey coverage in the business and the government sectors has been expanded.

  Before 2000, all of the personnel data and 95% of the expenditure data in the business enterprise sector are for large and medium-sized enterprises only. Since 2000 however, the survey covers almost all industries and all enterprises above a certain threshold. In 2000 and 2004, a census of all enterprises was held, while in the intermediate years data for small enterprises are estimated.

Due to the reform of the S&T system some government institutions have become enterprises, and their R&D data have been reflected in the Business Enterprise sector since 2000.

- In **Romania**, in 2011, R&D questionnaires have been redesigned for all sectors (and merged with the Community Innovation Survey in the case of the business enterprise sector). This has had an impact on the number of researchers in both the higher education and business enterprise sectors. A substantial proportion of R&D expenditure and R&D personnel reported in the data for the business enterprise sector are performed/employed in public enterprises (57.4% and 62% respectively for the year 2003).

  The higher education sector includes faculty hospitals. For some of these hospitals, as well as for other types of medical centres, there are problems of delimitation between R&D activities and health activities and in these cases no data is available on R&D expenditures and personnel. The higher education sector does not include experimental stations: given the specific nature of their activity, these are directly co-ordinated by the Ministry of Agriculture, and therefore included in the business enterprise sector.

  In 2013, a change in methodology for the allocation of GBAORD data by socio-economic objectives has resulted in a break in series.

  TBP data are published according to the BPM6 as of 2013.

- In the **Russian Federation**, the business enterprise sector includes all organisations and enterprises whose main activity is connected with the production of goods and services for sale, including those owned by the state, and private non-profit institutions serving the above-mentioned organisations. In practice however, R&D performed in this sector is carried out mostly by industrial research institutes other than enterprises. This particularity reflects the traditional organisation of Russian R&D.

  Headcount data include full-time personnel only, and hence are underestimated, while data in full-time equivalents (FTE) are calculated on the basis of both full-time and part-time personnel. This explains why the FTE data are greater than the headcount data.

  New budgetary procedures introduced in 2005 have resulted in items previously classified as GBAORD being attributed to other headings and have affected the coverage and breakdown by socio-economic objective.

- In **Singapore**, the Public Research Centres are located within the universities and draw upon university expertise. They are closely linked with the universities and several have "spun off" from university research groups. However they are administratively separate from the universities and funded by the Agency for Science, Technology and Research (A*STAR) and industry. The centres have been included in the "Public Research Institutes and Centres" category in the R&D survey since 1995. Until 1995 they were subsumed in the Higher Education sector. This leads to a discontinuity in the statistics for the Government/Public and Higher Education sectors between 1994 and 1995.

  Data for TBP receipts do not include services with a technical content, unless covered under "licensing of new technologies".

- For the 2001/02 R&D survey in **South Africa**, no comprehensive business register was available, nor was there any official register of the specific subset of those entities that actually conduct R&D. However, lists of firms surveyed in previous R&D surveys, those covered in previous technology audits, public listings of the top 200 companies in the economy, as well as lists of firms that participate in public innovation and R&D support programmes were available to the survey agency. These lists provided the basis for a purposive sample of all firms known to have R&D activities. There may however be an underestimation of R&D expenditure by 10% to 15%.

- In **Chinese Taipei**, since 2003, the business sector includes R&D data of private enterprises in the sectors of electricity, gas and water supply; construction; and services, which were not surveyed before.

  Postgraduate students engaged in R&D were not included in the higher education sector until 2002.

  Researchers must have a university degree or above.

  TBP data do not include R&D performed abroad, services with a technical content, or transactions involving trademarks, design, patterns (sale, licensing, franchising).

ISSN 2304-2761
Main Science and Technology Indicators: Volume 2016/2

ANNEX 2

Background economic indicators

Table A. Gross domestic product at current prices and PPPs

Million USD

	2005	2010	2011	2012	2013	2014	2015
Australia	719 166	938 601	987 220	991 828	1 098 874	1 108 435	1 131 787
Austria	286 878	350 483	371 229	389 747	405 016	415 624	426 991
Belgium	349 277	437 234	455 705	471 332	486 334	502 561	514 745
Canada	1 167 581	1 361 136	1 427 467	1 464 565	1 552 127	1 604 000	1 586 726
Chile	206 427[y]	310 517[y]	348 602[y]	371 593[y]	396 229[y]	406 939[y]	419 387[y]
Czech Republic	223 724	289 714	302 260	305 309	320 825	340 876	356 145
Denmark	185 074	239 009	247 352	250 525	262 605	270 028	278 607
Estonia	22 376	28 791	32 579	34 420	36 191	37 555	38 108
Finland	167 840	208 164	219 214	219 916	224 797	226 796	231 435
France	1 933 507	2 342 745	2 447 562	2 471 785	2 608 497	2 660 818	2 729 183
Germany	2 636 420	3 210 822	3 427 141	3 503 684	3 651 075	3 814 255	3 924 034
Greece	281 028	313 653	290 297	279 267	286 427	288 147	285 447
Hungary	171 625	214 666	226 649	228 146	241 276	251 761	260 423
Iceland	10 969	12 216	12 590	12 985	13 815	14 513	15 786
Ireland	168 246	197 097	208 139	213 532	222 345	236 914	318 161
Israel[1]	172 004	219 987	237 080	251 163	276 086	287 195	306 510
Italy	1 742 086	2 079 199	2 158 285	2 157 547	2 178 287	2 206 268	2 260 234
Japan	3 889 582[y]	4 323 635[y]	4 388 645[y]	4 558 488[y]	4 731 223[y]	4 754 026[y]	4 870 962[y]
Korea	1 165 894	1 505 299	1 559 447	1 611 273	1 648 017	1 707 183	1 753 733
Latvia	31 002	36 902	40 660	43 162	45 656	47 620	49 239
Luxembourg	31 419	43 236	47 350	48 418	51 823	55 909	58 129
Mexico	1 322 406	1 730 209	1 893 303	1 984 966	2 039 934	2 151 544	2 152 023
Netherlands	608 165	740 806	768 994	782 578	818 549	827 319	840 000
New Zealand	106 147	136 022	143 508	145 755	160 849	167 256	172 547
Norway	220 866	283 556	307 393	328 116	340 435	337 586	322 230
Poland	530 344	802 285	869 764	907 149	941 145	978 050	1 020 401
Portugal	238 842	289 290	282 734	278 161	292 017	299 881	307 818
Slovak Republic	89 275	134 843	139 467	144 098	151 157	157 389	162 341
Slovenia	47 902	56 936	59 131	59 332	60 889	63 967	66 013
Spain	1 209 299	1 489 723	1 498 907	1 496 106	1 521 282	1 565 844	1 612 868
Sweden	306 709	390 766	413 451	425 754	438 876	450 343	469 008
Switzerland	300 889	414 218	442 451	460 545	484 085	501 818	518 065
Turkey	777 546[y]	1 196 158[y]	1 343 144[y]	1 389 214[y]	1 465 678[y]	1 523 623[y]	1 574 761[y]
United Kingdom	1 949 435	2 243 316	2 306 167	2 387 348	2 504 337	2 632 676	2 722 455
United States	13 093 726	14 964 372	15 517 926	16 155 255	16 691 517	17 393 103	18 036 648
EU28 (OECD estimates)	13 639 194	16 774 661	17 483 674	17 781 974	18 456 760	19 066 491	19 699 507
OECD-Total	**36 157 249**	**43 535 608**	**45 421 815**	**46 823 063**	**48 648 275**	**50 287 822**	**51 792 949**
Argentina	540 979	757 669	820 789	827 159	860 024	851 725	881 316
China	6 638 626[y]	12 483 473[y]	13 957 939[y]	15 331 873[y]	16 788 977[y]	18 312 218[y]	19 778 186[y]
Romania	204 137	335 495	350 031	360 277	375 764	394 257	414 193
Russian Federation	1 809 837[y]	3 123 316[y]	3 441 692[y]	3 625 385[y]	3 467 891	3 666 104	3 579 826
Singapore	235 115	358 179	388 522	409 863	435 906	458 287	472 369
South Africa	469 349	601 498	633 638	659 636	685 219	707 148	732 093[b]
Chinese Taipei	658 404	893 904	947 075	984 378	1 022 334	1 081 451	1 100 201

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

Source: OECD, Statistics Directorate, January 2017

Table B. Implicit GDP price indices

Year 2010 = 1.000

	2005	2010	2011	2012	2013	2014	2015
Australia	0.810	1.000	1.021	1.019	1.034	1.026	1.022
Austria	0.916	1.000	1.019	1.039	1.056	1.074	1.095
Belgium	0.914	1.000	1.020	1.041	1.053	1.060	1.069
Canada	0.902	1.000	1.032	1.045	1.062	1.082	1.073
Chile	0.746[y]	1.000[y]	1.033[y]	1.041[y]	1.065[y]	1.124[y]	1.173[y]
Czech Republic	0.929	1.000	1.000	1.015	1.029	1.055	1.065
Denmark	0.885	1.000	1.006	1.030	1.039	1.048	1.057
Estonia	0.750	1.000	1.053	1.086	1.128	1.147	1.159
Finland	0.915	1.000	1.026	1.056	1.083	1.102	1.120
France	0.921	1.000	1.009	1.021	1.029	1.034	1.041
Germany	0.948	1.000	1.011	1.026	1.046	1.066	1.087
Greece	0.867	1.000	1.008	1.004	0.981	0.963	0.952
Hungary	0.821	1.000	1.022	1.057	1.088	1.125	1.144
Iceland	0.679	1.000	1.030	1.063	1.083	1.127	1.194
Ireland	1.042	1.000	1.036	1.064	1.079	1.066	1.118
Israel[1]	0.906	1.000	1.018	1.057	1.079	1.091	1.121
Italy	0.914	1.000	1.015	1.029	1.041	1.050	1.057
Japan	1.062[y]	1.000[y]	0.981[y]	0.972[y]	0.967[y]	0.983[y]	1.002[y]
Korea	0.889	1.000	1.016	1.026	1.035	1.041	1.064
Latvia	0.741	1.000	1.064	1.103	1.117	1.134	1.139
Luxembourg	0.842	1.000	1.052	1.077	1.092	1.108	1.113
Mexico	0.782	1.000	1.054	1.088	1.105	1.157	1.187
Netherlands	0.920	1.000	1.001	1.016	1.030	1.031	1.032
New Zealand	0.864	1.000	1.021	1.016	1.067	1.073	1.075
Norway	0.829	1.000	1.030	1.056	1.084	1.110	1.137
Poland	0.865	1.000	1.032	1.057	1.060	1.065	1.071
Portugal	0.909	1.000	0.997	0.993	1.016	1.023	1.045
Slovak Republic	0.941	1.000	1.016	1.029	1.035	1.033	1.031
Slovenia	0.878	1.000	1.011	1.014	1.023	1.031	1.041
Spain	0.908	1.000	1.000	1.001	1.005	1.002	1.007
Sweden	0.894	1.000	1.012	1.023	1.033	1.052	1.073
Switzerland	0.935	1.000	1.002	1.000	1.000	0.995	0.989
Turkey	0.691[y]	1.000[y]	1.086[y]	1.161[y]	1.232[y]	1.335[y]	1.435[y]
United Kingdom	0.894	1.000	1.020	1.036	1.056	1.073	1.079
United States	0.909	1.000	1.021	1.039	1.056	1.075	1.087
EU28 (OECD estimates)	..	..	..	..	..	..	..
OECD-Total	**..**	**..**	**..**	**..**	**..**	**..**	**..**
Argentina	0.445	1.000	1.236	1.511	1.872	2.635	3.260
China	0.775[y]	1.000[y]	1.081[y]	1.107[y]	1.132[y]	1.141[y]	1.136[y]
Romania	0.628	1.000	1.047	1.096	1.134	1.153	1.181
Russian Federation	0.555[y]	1.000[y]	1.159[y]	1.255[y]	1.315	1.433	1.544
Singapore	0.911	1.000	1.011	1.018	1.011	1.012	1.028
South Africa	0.695	1.000	1.067	1.125	1.193	1.262	1.325[b]
Chinese Taipei	1.057	1.000	0.977	0.982	0.996	1.013	1.044

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

Source: OECD, Statistics Directorate, January 2017

Table C. Purchasing power parities

National currency per USD

	2005	2010	2011	2012	2013	2014	2015
Australia	1.39	1.50	1.51	1.54	1.45	1.46	1.46
Austria	0.88	0.84	0.83	0.81	0.80	0.79	0.80
Belgium	0.89	0.84	0.83	0.82	0.81	0.80	0.80
Canada	1.21	1.22	1.24	1.24	1.22	1.24	1.25
Chile	333.69	357.46	348.02	347.23	346.34	362.63	375.57
Czech Republic	14.56	13.65	13.35	13.30	12.77	12.65	12.79
Denmark	8.57	7.58	7.47	7.56	7.35	7.32	7.28
Estonia	0.50	0.51	0.51	0.52	0.52	0.53	0.53
Finland	0.98	0.90	0.90	0.91	0.90	0.91	0.90
France	0.92	0.85	0.84	0.84	0.81	0.80	0.80
Germany	0.87	0.80	0.79	0.79	0.77	0.77	0.77
Greece	0.71	0.72	0.71	0.68	0.63	0.62	0.62
Hungary	130.93	126.18	124.27	125.62	124.87	128.69	130.55
Iceland	95.84	132.64	135.15	136.97	136.90	138.22	140.23
Ireland	1.01	0.85	0.83	0.82	0.81	0.82	0.80
Israel[1]	3.72	3.97	3.94	3.96	3.84	3.85	3.80
Italy	0.86	0.77	0.76	0.75	0.74	0.73	0.73
Japan	129.55	111.64	107.45	104.27	101.26	102.43	102.52
Korea	788.92	840.57	854.59	854.89	867.37	870.49	888.73
Latvia	0.44	0.49	0.50	0.51	0.50	0.50	0.49
Luxembourg	0.95	0.92	0.91	0.91	0.89	0.88	0.88
Mexico	7.13	7.67	7.67	7.86	7.88	8.00	8.40
Netherlands	0.90	0.85	0.84	0.82	0.80	0.80	0.81
New Zealand	1.54	1.50	1.49	1.50	1.45	1.44	1.44
Norway	9.01	9.13	9.08	9.04	9.02	9.30	9.67
Poland	1.87	1.80	1.80	1.80	1.76	1.76	1.76
Portugal	0.66	0.62	0.62	0.61	0.58	0.58	0.58
Slovak Republic	0.56	0.50	0.51	0.50	0.49	0.48	0.48
Slovenia	0.61	0.64	0.62	0.61	0.59	0.58	0.58
Spain	0.77	0.73	0.71	0.69	0.67	0.66	0.67
Sweden	9.48	9.01	8.84	8.65	8.59	8.74	8.91
Switzerland	1.69	1.46	1.40	1.35	1.31	1.28	1.25
Turkey	0.83	0.92	0.97	1.02	1.07	1.15	1.24
United Kingdom	0.71	0.70	0.71	0.70	0.69	0.69	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	2.21	2.67	3.21	3.91	5.41	6.62
China	2.82	3.31	3.51	3.52	3.55	3.52	3.47
Romania	1.42	1.59	1.61	1.65	1.70	1.69[b]	1.72[b]
Russian Federation	12.74	15.82	17.35	18.46	20.48	21.26	22.57
Singapore	0.90	0.90	0.89	0.88	0.86	0.85	0.85
South Africa	3.49	4.57	4.77	4.95	5.16	5.37	5.52
Chinese Taipei	18.37	15.80	15.11	14.92	14.90	14.89	15.17

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Source: OECD, Statistics Directorate, January 2017

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

Million USD

	2005	2010	2011	2012	2013	2014	2015
Australia	480 604	631 546	663 942	658 511	723 239	717 914	727 280
Austria	188 046	227 531	242 539	253 598	262 780	269 435	275 413
Belgium	220 030	271 377	283 316	290 627	298 436	308 845	317 627
Canada	770 961[b]	867 989	918 851	938 173	994 263[b]	1 027 492[b]	1 016 426[b]
Chile	150 409[b,y]	224 133[y]	250 431[y]	263 876[y]	278 250[y]	283 578[y]	288 560[y]
Czech Republic	155 851	198 956	207 870	208 734	217 978	235 289	245 388
Denmark	107 004	135 680	141 033	143 797	151 751	157 083	162 690
Estonia	15 236	18 642	21 595	22 790	23 973	24 561	24 363
Finland	102 863	122 565	127 320	125 505	127 139	128 014	130 569
France	1 141 873	1 360 771	1 417 809	1 424 293	1 498 954	1 522 409	1 563 577
Germany	1 697 866	2 032 849	2 168 882	2 223 338	2 311 736	2 428 132	2 493 961
Greece	172 166	168 750	153 105	145 801	152 795	153 516	153 707
Hungary	109 184	133 642	143 695	142 489	151 577	159 083	163 653
Iceland	6 478	7 676	7 993	8 132	8 595	8 794	9 565[b]
Ireland	114 905	134 299	144 347	147 599	155 805	165 920	238 308
Israel[1]	103 235[b]	128 987[b]	138 915[b]	147 540[b]	163 066[b]	166 883[b]	178 567[b]
Italy	1 104 943	1 274 624	1 323 741	1 311 271	1 323 015	1 339 188	1 376 236
Japan	2 625 084[b,y]	2 816 091[b,y]	2 834 521[b,y]	2 947 201[b,y]	3 063 606[b,y]	3 066 635[b,y]	3 142 066[b,y]
Korea	798 471	1 035 214	1 078 532	1 109 265	1 135 541	1 176 309[b]	1 208 383[b]
Latvia	20 748	24 341	26 674	27 993	29 211	30 047	30 901
Luxembourg	21 185	29 555	32 182	32 217	34 465	37 505	39 822
Mexico	977 417	1 273 238	1 416 417	1 493 661	1 510 056	1 574 170	1 574 520[b]
Netherlands	396 829	483 288	502 413	516 385	534 755	537 515	545 553
New Zealand	69 988	86 824	90 828	91 817	101 326[b]	105 361[b]	108 694[b]
Norway	146 981	183 227	200 614	214 986	221 599	216 752	206 893[b]
Poland	365 586	557 751	608 061	642 513	665 366	690 839	723 165
Portugal	141 458	170 499	166 967	163 956	170 057	174 903	180 990
Slovak Republic	63 032	96 054	100 165	104 508	105 884	113 883	117 398
Slovenia	31 859	36 764	38 374	38 337	39 460	42 164	43 611
Spain	812 033	956 525	955 858	948 427	949 400	976 529	1 005 855[b]
Sweden	189 919	243 267	257 471	263 803	270 142	277 452	291 657
Switzerland	215 404	297 379	316 028	327 812	343 906	355 197	366 698[b]
Turkey	544 954[b,y]	817 659[b,y]	931 742[b,y]	965 720[b,y]	1 013 320[b,y]	1 058 654[b,y]	1 094 186[b,y]
United Kingdom	1 203 091	1 369 958	1 393 600	1 437 080	1 530 246	1 608 677	1 653 268
United States	8 495 951	9 349 887	9 731 152	10 203 554	10 552 652	11 018 540	11 426 226[b]
EU28 (OECD estimates)	8 665 509	10 477 554	10 912 917	11 078 412	11 485 236	11 876 387	12 297 029
OECD-Total	**23 611 236**	**27 767 537**	**29 036 983**	**29 985 308**	**31 114 343**	**32 157 269**	**33 125 776**
Argentina	412 070	534 632	557 623	541 768	534 895[b]	495 521[b]	512 737[b]
China	5 319 245[b,y]	9 866 627[b,y]	11 019 065[b,y]	12 001 841[b,y]	13 010 006[b,y]	14 100 150[b,y]	15 014 249[b,y]
Romania	142 623	235 629	244 492	250 446	263 345	271 115	287 690[b]
Russian Federation	1 302 121[b,y]	2 174 865[b,y]	2 395 621[b,y]	2 505 698[b,y]	2 387 141[b]	2 485 893[b]	2 515 930[b]
Singapore	198 302[b]	295 007[b]	316 818[b]	333 167[b]	352 002[b]	371 209[b]	381 012[b]
South Africa	325 024[b]	413 269[b]	430 981[b]	449 555[b]	463 846[b]	476 160[b]	481 376[b]
Chinese Taipei	488 622[b]	658 235	697 544	715 349	754 022	803 458	823 821

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

Source: OECD, Statistics Directorate, January 2017

Table E. Total population

Thousands

	2005	2010	2011	2012	2013	2014	2015
Australia	20 351	22 221	22 579	22 975	23 338	23 663	24 066
Austria	8 225	8 361	8 389	8 426	8 477	8 544	8 630
Belgium	10 474	10 883	10 978	11 054	11 105	11 157	11 212
Canada	32 242	34 005	34 343	34 751	35 155	35 544	35 852
Chile	16 283	17 093	17 267	17 450	17 640	17 836	18 045
Czech Republic	10 234	10 517	10 497	10 509	10 511	10 525	10 543
Denmark	5 419	5 547	5 570	5 591	5 613	5 643	5 682
Estonia	1 359	1 333	1 330	1 325	1 320	1 316	1 313
Finland	5 246	5 363	5 388	5 414	5 439	5 463	5 481
France	63 133	64 974	65 294	65 615	65 927	66 227	66 504
Germany	81 337	80 284	80 275	80 426	80 646	80 983	81 687
Greece	10 987	11 121	11 105	11 045	10 965	10 892	10 858
Hungary	10 087	10 000	9 972	9 920	9 893	9 866	9 839
Iceland	296	318	319	321	324	327	331
Ireland	4 160	4 560	4 577	4 590	4 602	4 615	4 642
Israel[1]	6 961	7 621	7 763	7 907	8 056	8 212	8 377
Italy	58 191	59 830	60 060	60 339	60 646	60 789	60 731
Japan	127 755	128 043	127 831	127 552	127 333	127 120	126 786
Korea	48 138	49 410	49 779	50 004	50 220	50 424	50 617
Latvia	2 239	2 097	2 059	2 034	2 013	1 995	1 979
Luxembourg	466	508	519	532	545	558	569
Mexico	107 151	114 256	115 683	117 054	118 395	119 713	121 005
Netherlands	16 317	16 612	16 693	16 752	16 800	16 863	16 932
New Zealand	4 148	4 363	4 393	4 418	4 460	4 534	4 621
Norway	4 623	4 889	4 953	5 019	5 080	5 137	5 191
Poland	38 161	38 517	38 526	38 534	38 502	38 484	38 455
Portugal	10 503	10 573	10 558	10 515	10 457	10 401	10 358
Slovak Republic	5 387	5 430	5 398	5 406	5 413	5 419	5 422
Slovenia	2 001	2 049	2 053	2 057	2 060	2 062	2 063
Spain	43 663	46 563	46 736	46 766	46 593	46 464	46 426
Sweden	9 030	9 378	9 449	9 519	9 600	9 696	9 799
Switzerland	7 482	7 856	7 912	7 997	8 089	8 189	8 282
Turkey	68 566	73 003	73 950	74 899	75 774	76 619	77 451
United Kingdom	60 413	62 759	63 285	63 705	64 106	64 597	65 110
United States	295 993	309 807	312 169	314 490	316 796	319 233	321 704
EU28 (OECD estimates)	494 871	503 609	504 852	506 042	507 046	508 214	509 715
OECD-Total	**1 180 738**	**1 240 145**	**1 247 652**	**1 254 912**	**1 261 895**	**1 269 110**	**1 276 563**
Argentina	38 648	40 374	40 729	41 087	41 446	41 803	42 247
China	1 307 560	1 340 910	1 347 350	1 354 040	1 360 720	1 367 820	1 374 620
Romania	21 382	20 295	20 199	20 096	20 020	19 947	19 871
Russian Federation	143 519	142 850	142 961	143 000	143 300	143 700	146 300
Singapore	4 266	5 077	5 184	5 312	5 399	5 470	5 535
South Africa	47 270	50 772	51 550	52 356	53 192	54 059	..
Chinese Taipei	22 770	23 162	23 225	23 316	23 374	23 434	23 492

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Source: OECD, Statistics Directorate, January 2017

Table F. Total employment

Thousands

	2005	2010	2011	2012	2013	2014	2015
Australia	10 023[b]	11 180[b]	11 315	11 433	11 565	11 647[b]	11 869[b]
Austria	3 874	4 102	4 166	4 210	4 224	4 263	4 291
Belgium	4 255	4 474	4 535	4 555	4 540	4 559	4 601
Canada	16 431	17 372	17 661	17 829	18 045	18 157[b]	18 313[b]
Chile	6 257[b]	7 131	7 487	7 626	7 786	7 903	8 028
Czech Republic	4 923	5 057	5 043	5 065	5 081	5 109	5 180
Denmark	2 783	2 788	2 787	2 767	2 766	2 794	2 829
Estonia	612	548	584	594	601	606	623
Finland	2 411	2 484	2 516	2 538	2 520	2 507	2 497
France	26 378	26 896	27 107	27 196	27 267	27 394	27 523
Germany	39 326	41 020	41 577	42 061	42 328	42 662	43 057
Greece	4 647	4 705	4 382	4 105	3 998	3 999	4 020
Hungary	4 174	3 970	3 971	3 979	4 022	4 216	4 308
Iceland	161	167	167	169	175	178	184[b]
Ireland	1 962	1 883	1 872	1 862	1 908	1 940	1 989
Israel[1]	2 924	3 412	3 514	3 655	3 753	3 859	3 947
Italy	24 501	24 766	24 843	24 765	24 323	24 339	24 476
Japan	65 594	64 504	64 338	64 414	64 852	65 225	65 486[b]
Korea	22 856	23 829	24 244	24 681	25 066	25 599	25 936
Latvia	969	844	856	869	889	877	888
Luxembourg	308	359	370	379	386	396	406
Mexico	40 470	46 598	46 892	49 003	49 296	49 485[b]	50 682[b]
Netherlands	8 339	8 778	8 854	8 836	8 732	8 711	8 792
New Zealand	2 090[b]	2 192[b]	2 221[b]	2 210[b]	2 273	2 324	2 376[b]
Norway	2 354	2 591	2 630	2 684	2 713	2 746	2 761[b]
Poland	14 057	15 370	15 457	15 475	15 464	15 731	15 970
Portugal	5 041	4 871	4 777	4 581	4 450	4 521[b]	4 570[b]
Slovak Republic	2 089	2 170	2 208	2 209	2 192	2 223	2 267
Slovenia	929	962	946	937	927	931	941
Spain	19 784	19 640	19 113	18 294[b]	17 782[b]	17 995[b]	18 536[b]
Sweden	4 349	4 498	4 594	4 627	4 672	4 737	4 809
Switzerland	4 207	4 555	4 663	4 732	4 803	4 890	4 966
Turkey	20 067	22 594	24 110	24 821	25 524	25 932	26 620
United Kingdom	28 853	29 227	29 375	29 694	30 042	30 754	31 293
United States	143 980	141 386	142 173	144 754	146 185	148 513	151 000
EU28 (OECD estimates)	220 921	225 688	226 000	225 095	224 477	226 777	229 366
OECD-Total	**535 723**	**556 922**	**561 347**	**567 609**	**571 149**	**577 723**	**586 035**
Argentina	15 882	17 064	17 406	17 649	17 908	17 938	..
China	746 470	761 050	764 200	767 040	769 770	772 530	..
Romania	9 267	9 156	9 082	8 645	8 569	8 635	8 558
Russian Federation	68 339	69 934	70 857	71 545	71 391	71 539	72 324
Singapore	2 320	3 106	3 229	3 358	3 494	3 624	..
South Africa	12 769	13 788	14 070	14 425	14 866	15 146	15 741
Chinese Taipei	9 942	10 493	10 709	10 860	10 967	11 079	11 198

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Source: OECD, Statistics Directorate, January 2017

Table G. Industrial employment

Thousands

	2005	2010	2011	2012	2013	2014	2015
Australia	7 487[b]	8 188[b]	8 229	8 268	8 344	8 404[b]	8 563[b]
Austria	2 987	3 119	3 178	3 214	3 217	3 249	3 266
Belgium	2 948	3 082	3 121	3 124	3 103	3 106	3 132
Canada	12 405	12 828	13 083	13 233	13 396	13 479[b]	13 595[b]
Chile	4 323[b]	5 408[b]	5 675[b]	5 702[b]	5 928	6 005	6 066
Czech Republic	3 963	4 048	4 057	4 083	4 087	4 100	4 155
Denmark	1 858	1 814	1 825	1 816	1 813	1 839	1 874
Estonia	471	406	441	444	452	453	469
Finland	1 707	1 746	1 770	1 787	1 766	1 757	1 749
France	18 209	18 456	18 670	18 748	18 740	18 788	18 876[b]
Germany	28 729	29 851	30 394	30 803	30 931	31 110	31 277
Greece	3 648	3 623	3 354	3 151	3 068	3 075	3 088
Hungary	3 242	3 033	3 052	3 062	3 057	3 207	3 250
Iceland	115[b]	117	121	121	125	128	132[b]
Ireland	1 531	1 372	1 369	1 357	1 404	1 431	1 468
Israel[1]	1 881	2 227	2 272	2 334	2 407	2 459	2 506
Italy	18 355	18 483	18 521	18 417	17 999	17 929	18 032
Japan	54 255[b]	52 704[b]	52 418[b]	52 311[b]	52 539[b]	52 735[b]	52 946[b]
Korea	19 172	19 238	19 644	19 925	20 135	20 505	20 778
Latvia	747	644	653	663	683	673	689
Luxembourg	245	283	290	296	299	306	314
Mexico	34 058[b]	38 915	39 157	41 309	41 697	41 856[b]	42 869[b]
Netherlands	6 065	6 234	6 296	6 273	6 188	6 198	6 303
New Zealand	1 600[b]	1 632[b]	1 648[b]	1 646[b]	1 694	1 729	1 768[b]
Norway	1 526	1 665	1 682	1 720	1 738	1 759	1 769[b]
Poland	11 097	12 068	12 185	12 181	12 091	12 302	12 516
Portugal	3 922	3 719	3 642	3 460	3 346	3 399[b]	3 436[b]
Slovak Republic	1 629	1 694	1 731	1 736	1 721	1 743	1 781
Slovenia	765	782	764	753	744	747	757
Spain	15 365	14 732	14 226	13 617[b]	13 236[b]	13 394[b]	13 797[b]
Sweden	2 841	2 983	3 055	3 082	3 108	3 140	3 177
Switzerland	3 226[b]	3 463	3 530	3 561	3 593	3 649	3 682
Turkey	17 337[b]	19 632	20 820	21 147	21 772	22 051	22 505
United Kingdom	21 144	20 863	21 038	21 358	21 561	22 194	22 743
United States	102 536	97 016	98 032	100 257	101 477	103 356	104 808
EU28 (OECD estimates)	165 517	166 804	167 228	166 463	165 533	167 200	169 066
OECD-Total	**407 063**	**416 066**	**419 941**	**424 959**	**427 458**	**432 257**	**438 136**
Argentina	..	..	..	..	..	..	..
China	..	..	..	..	..	..	..
Romania	8 321	8 000	7 930	7 508	7 466	7 556	7 362
Russian Federation	52 372	52 134	53 282	53 781	53 947	54 110	54 582
Singapore	2 040	2 728	2 833	2 938	3 059	3 165	..
South Africa	9 196	9 676	9 829	9 991	10 279	10 423	10 901
Chinese Taipei	8 727	9 099	9 284	9 426	9 523	9 624	9 735

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

Source: OECD, Statistics Directorate, January 2017

Table H. Exchange rates

National currency per USD

	2005	2010	2011	2012	2013	2014	2015
Australia	1.309	1.090	0.969	0.966	1.036	1.109	1.331
Austria	0.804	0.755	0.719	0.778	0.753	0.754	0.902
Belgium	0.804	0.755	0.719	0.778	0.753	0.754	0.902
Canada	1.212	1.030	0.990	0.999	1.030	1.106	1.279
Chile	559.768	510.249	483.668	486.471	495.273	570.348	654.124
Czech Republic	23.957	19.098	17.696	19.578	19.571	20.758	24.599
Denmark	5.997	5.624	5.369	5.792	5.616	5.612	6.728
Estonia	0.804	0.755	0.719	0.778	0.753	0.754	0.902
Finland	0.804	0.755	0.719	0.778	0.753	0.754	0.902
France	0.804	0.755	0.719	0.778	0.753	0.754	0.902
Germany	0.804	0.755	0.719	0.778	0.753	0.754	0.902
Greece	0.804	0.755	0.719	0.778	0.753	0.754	0.902
Hungary	199.583	207.944	201.055	225.104	223.695	232.602	279.333
Iceland	62.982	122.242	115.954	125.083	122.179	116.767	131.919
Ireland	0.804	0.755	0.719	0.778	0.753	0.754	0.902
Israel[1]	4.488	3.739	3.578	3.856	3.611	3.578	3.887
Italy	0.804	0.755	0.719	0.778	0.753	0.754	0.902
Japan	110.218	87.780	79.807	79.790	97.596	105.945	121.044
Korea	1 024.117	1 156.061	1 108.292	1 126.471	1 094.853	1 052.961	1 131.158
Latvia	0.804	0.755	0.713	0.778	0.753	0.754	0.902
Luxembourg	0.804	0.755	0.719	0.778	0.753	0.754	0.902
Mexico	10.898	12.636	12.423	13.169	12.772	13.292	15.848
Netherlands	0.804	0.755	0.719	0.778	0.753	0.754	0.902
New Zealand	1.420	1.388	1.266	1.234	1.219	1.205	1.434
Norway	6.443	6.044	5.605	5.818	5.875	6.302	8.064
Poland	3.235	3.015	2.963	3.257	3.161	3.155	3.770
Portugal	0.804	0.755	0.719	0.778	0.753	0.754	0.902
Slovak Republic	1.030	0.755	0.719	0.778	0.753	0.754	0.902
Slovenia	0.804	0.755	0.719	0.778	0.753	0.754	0.902
Spain	0.804	0.755	0.719	0.778	0.753	0.754	0.902
Sweden	7.473	7.208	6.494	6.775	6.514	6.861	8.435
Switzerland	1.245	1.043	0.888	0.938	0.927	0.916	0.962
Turkey	1.344	1.503	1.675	1.796	1.904	2.189	2.720
United Kingdom	0.550	0.647	0.624	0.633	0.640	0.608	0.655
United States	1.000	1.000	1.000	1.000	1.000	1.000	1.000
EU28 (OECD estimates)	..	..	..	..	..	..	..
OECD-Total	**..**	**..**	**..**	**..**	**..**	**..**	**..**
Argentina	2.904	3.896	4.110	4.537	5.459	8.075	9.233
China	8.194	6.770	6.461	6.312	6.196	6.143	6.227
Romania	2.910	3.177	3.045	3.471	3.327	3.345	4.007
Russian Federation	28.284	30.368	29.382	30.840	31.837	38.378	60.938
Singapore	1.664	1.364	1.258	1.250	1.251	1.267	1.375
South Africa	6.359	7.321	7.261	8.210	9.655	10.853	12.759
Chinese Taipei	32.167	31.642	29.464	29.614	29.770	30.368	31.898

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

Source: OECD, Statistics Directorate, January 2017

ISSN 2304-2761
Main Science and Technology Indicators: Volume 2016/2

ANNEX 3

List of indicators for the electronic publication

The electronic version of the MSTI publication contains, in addition to the indicators published in this volume, most of those which were published in the previous version of the publication before its revision. These are presented as of 1981.

1. Gross Domestic Expenditure on R&D – GERD (million national currency)
2. GERD (million current PPP $)
3. GERD as a percentage of GDP
4. GERD – (million 2010 dollars – constant prices and PPP)
5. GERD – Compound annual growth rate (constant prices)
6. GERD per capita population (current PPP $)
7. Estimated Civil GERD as a percentage of GDP
8. Basic research expenditure as a percentage of GDP
9. Total researchers (FTE)
10. Total researchers – Compound annual growth rate
11. Total researchers per thousand total employment
12. Total researchers per thousand labour force
13. Total R&D personnel (FTE)
14. Total R&D personnel – Compound annual growth rate
15. Total R&D personnel per thousand employment
16. Total R&D personnel per thousand labour force
17. Industry-financed GERD as a percentage of GDP
18. Government-financed GERD as a percentage of GDP
19. Percentage of GERD financed by industry
20. Percentage of GERD financed by government
21. Percentage of GERD financed by other national sources
22. Percentage of GERD financed by abroad
23. Percentage of GERD performed by the Business Enterprise sector
24. Percentage of GERD performed by the Higher Education sector
25. Percentage of GERD performed by the Government sector
26. Percentage of GERD performed by the Private Non Profit sector
27. Total researchers (headcount)
28. Women researchers (headcount)
29. Women researchers as a percentage of total researchers (headcount)
30. Business Enterprise Sector: Total researchers (headcount)
31. Business Enterprise Sector: Women researchers (headcount)

32. Business Enterprise Sector: Women researchers as a percentage of total researchers (headcount)
33. Government Sector: Total researchers (headcount)
34. Government Sector: Women researchers (headcount)
35. Government Sector: Women researchers as a percentage of total researchers (headcount)
36. Higher Education sector: Total researchers (headcount)
37. Higher Education sector: Women researchers (headcount)
38. Higher Education sector: Women researchers as a percentage of total researchers (headcount)
39. Business Enterprise Expenditure on R&D – BERD (million national currency)
40. BERD (million current PPP $)
41. BERD as a percentage of GDP
42. BERD – (million 2010 dollars – constant prices and PPP)
43. BERD – Compound annual growth rate (constant prices)
44. BERD as a percentage of value added in industry
45. Business Enterprise researchers (FTE)
46. Business Enterprise researchers – Compound annual growth rate
47. Business Enterprise researchers as a percentage of national total
48. Business Enterprise researchers per thousand employment in industry
49. Total Business Enterprise R&D personnel (FTE)
50. Total Business Enterprise R&D personnel – Compound annual growth rate
51. Total Business Enterprise R&D personnel as a percentage of national total
52. Total Business Enterprise R&D personnel per thousand employment in industry
53. Industry financed BERD – (million 2010 dollars – constant prices and PPP)
54. Industry financed BERD – Compound annual growth rate (constant prices)
55. Industry financed BERD as a percentage of value added in industry
56. Percentage of BERD financed by industry
57. Percentage of BERD financed by government
58. Percentage of BERD financed by other national sources
59. Percentage of BERD financed by abroad
60. BERD performed in the pharmaceutical industry (million current PPP $)
61. BERD performed in the computer, electronic and optical industry (million current PPP $)
62. BERD performed in the aerospace industry (million current PPP $)
63. BERD performed in service industries (million current PPP $)
64. Percentage of BERD performed in the pharmaceutical industry
65. Percentage of BERD performed in the computer, electronic and optical industry
66. Percentage of BERD performed in the aerospace industry
67. Percentage of BERD performed in service industries
68. Higher Education Expenditure on R&D – HERD (million national currency)
69. HERD (million current PPP $)
70. HERD as a percentage of GDP

71. HERD – (million 2010 dollars – constant prices and PPP)
72. HERD – Compound annual growth rate (constant prices)
73. Percentage of HERD financed by industry
74. Higher Education researchers (FTE)
75. Higher Education researchers – Compound annual growth rate
76. Higher Education researchers as a percentage of national total
77. Higher Education Total R&D personnel (FTE)
78. Higher Education Total R&D personnel – Compound annual growth rate
79. Government Intramural Expenditure on R&D – GOVERD (million national currency)
80. GOVERD (million current PPP $)
81. GOVERD as a percentage of GDP
82. GOVERD – (million 2010 dollars – constant prices and PPP)
83. GOVERD – Compound annual growth rate (constant prices)
84. Percentage of GOVERD financed by industry
85. Government researchers (FTE)
86. Government researchers – Compound annual growth rate
87. Government researchers as a percentage of national total
88. Government Total R&D personnel (FTE)
89. Government Total R&D personnel – Compound annual growth rate
90. Total Government Budget Appropriations or Outlays for R&D – GBAORD (million national currency)
91. Total GBAORD (million current PPP $)
92. Defence Budget R&D as a percentage of Total GBAORD
93. Civil Budget R&D as a percentage of Total GBAORD
94. Civil GBAORD for Economic Development programmes (million current PPP $)
95. Civil GBAORD for Health and Environment programmes (million current PPP $)
96. Civil GBAORD for Education and Society (million current PPP $)
97. Civil GBAORD for Space programmes (million current PPP $)
98. Civil GBAORD for Non oriented Research programmes (million current PPP $)
99. Civil GBAORD for General University Funds (GUF) (million current PPP $)
100. Economic Development programmes as a percentage of Civil GBAORD
101. Health and Environment programmes as a percentage of Civil GBAORD
102. Education and Society as a percentage of Civil GBAORD
103. Space programmes as a percentage of Civil GBAORD
104. Non oriented Research programmes as a percentage of Civil GBAORD
105. General University Funds (GUF) as a percentage of Civil GBAORD
106. R&D expenditure of foreign affiliates (million national currency)
107. R&D expenditure of foreign affiliates (million current PPP $)
108. R&D expenditure of foreign affiliates as a percentage of R&D expenditures of enterprises
109. Number of “triadic” patent families (priority year)
110. Number of patent applications filed under the PCT(priority year)

111. Share of countries in “triadic” patent families (priority year)
112. Number of patents in the ICT sector – applications filed under the PCT (priority year)
113. Number of patents in the biotechnology sector – applications filed under the PCT (priority year)
114. Technology balance of payments: Receipts (million national currency)
115. Technology balance of payments: Payments (million national currency)
116. Technology balance of payments: Receipts (million current dollars)
117. Technology balance of payments: Payments (million current dollars)
118. Technology balance of payments: Payments as a percentage of GERD
119. Total exports: Pharmaceutical industry (million current dollars)
120. Total exports: Computer, electronic and optical industry (million current dollars)
121. Total exports: Aerospace industry (million current dollars)
122. Total imports: Pharmaceutical industry (million current dollars)
123. Total imports: Computer, electronic and optical industry (million current dollars)
124. Total imports: Aerospace industry (million current dollars)
125. Trade Balance: Pharmaceutical industry (million current dollars)
126. Trade Balance: Computer, electronic and optical industry (million current dollars)
127. Trade Balance: Aerospace industry (million current dollars)
128. Export market share: Pharmaceutical industry
129. Export market share: Computer, electronic and optical industry
130. Export market share: Aerospace industry
131. Implicit GDP Price Indices (2010 = 1.00)
132. Exchange Rates (national currency per dollar)
133. Purchasing Power Parity (national currency per dollar)
134. Gross Domestic Product (million national currency)
135. Gross Domestic Product (million current PPP$)
136. Value Added of Industry (million national currency)
137. Value Added of Industry (million current PPP$)
138. Population (thousands)
139. Labour Force (thousands)
140. Total Employment (thousands)
141. Industrial Employment (thousands)

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OECD PUBLISHING, 2, rue André-Pascal, 75775 PARIS CEDEX 16
(94 2016 02 1 P) ISSN 2304-2761 – 2017

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Main Science and Technology Indicators

This biannual publication provides a set of indicators that reflect the level and structure of the efforts undertaken by OECD member countries and seven non-member economies (Argentina, China, Romania, Russian Federation, Singapore, South Africa, Chinese Taipei) in the field of science and technology. These data include final or provisional results as well as forecasts established by government authorities. The indicators cover the resources devoted to research and development, patent families, technology balance of payments and international trade in R&D-intensive industries. Also presented are the underlying economic series used to calculate these indicators. Series are presented for a reference year and for the last six years for which data are available.

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Volume 2016/2

OECD publishing
www.oecd.org/publishing

ISSN 2304-2761
2016 SUBSCRIPTION
(2 ISSUES)
94 2016 02 1 P

9 772304 276009