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First estimates of Research & Development expenditure

R&D expenditure in the EU remained stable in 2016 at just over 2% of GDP

Almost two thirds spent in the business sector

In 2016, the Member States of the **European Union** (EU) spent all together over €300 billion on Research & Development (R&D). The R&D intensity, i.e. R&D expenditure as a percentage of GDP, remained stable at 2.03% in 2016. Ten years ago (2006), R&D intensity was 1.76%.

With respect to other major economies, R&D intensity in the **EU** was much lower than in **South Korea** (4.23% in 2015), **Japan** (3.29% in 2015) and the **United States** (2.79% in 2015), while it was about the same level as in **China** (2.07% in 2015) and much higher than in **Russia** (1.10% in 2015) and **Turkey** (0.88% in 2015). In order to provide a stimulus to the EU's competitiveness, an increase by 2020 of the R&D intensity to 3% in the **EU** is one of the five headline targets of the Europe 2020 strategy.

The business enterprise sector continues to be the main sector in which R&D expenditure was spent, accounting for 65% of total R&D conducted in 2016, followed by the higher education sector (23%), the government sector (112%) and the private non-profit sector (1%).

This information on Research and Development in the EU is published by **Eurostat, the statistical office of the European Union**. R&D is a major driver of innovation, and R&D expenditure and intensity are two of the key indicators used to monitor resources devoted to science and technology worldwide.

Research and development intensity in the EU (R&D expenditure as % of GDP)

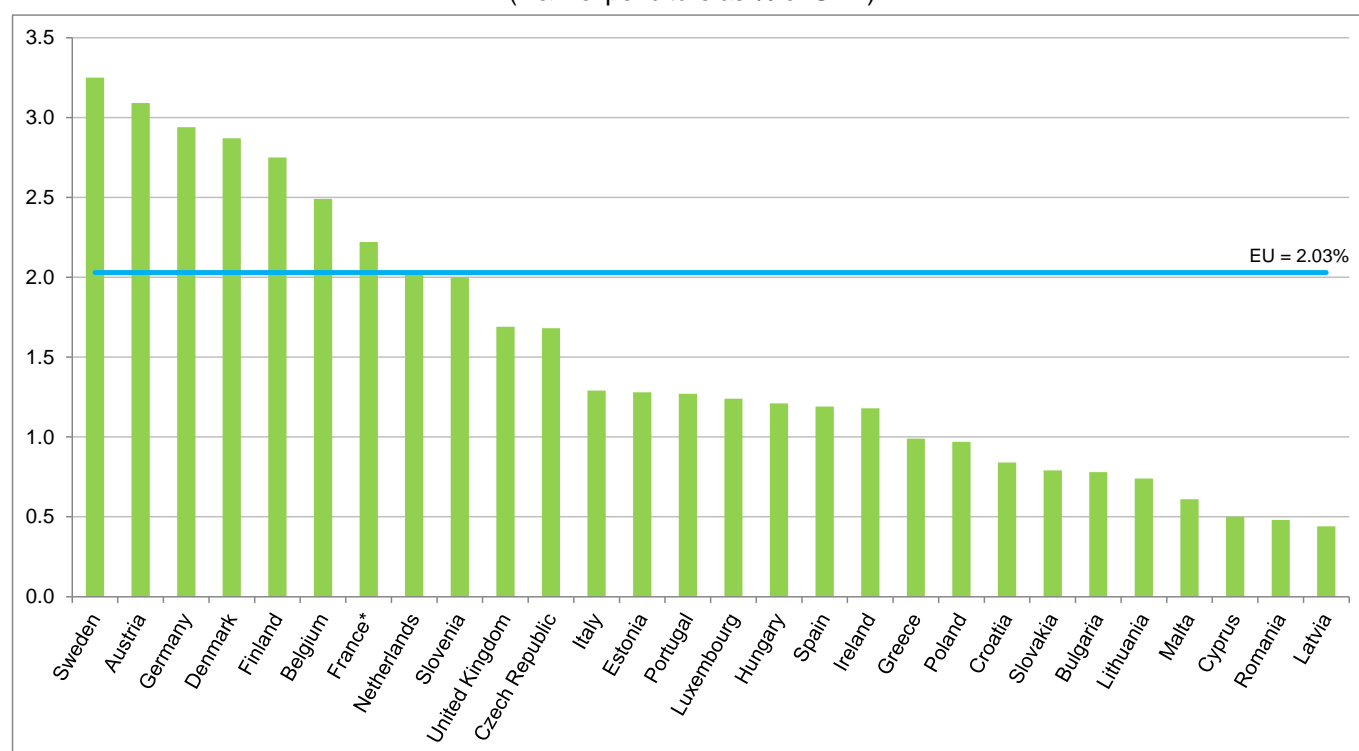


R&D intensity above 3% in Sweden and Austria

In 2016, the highest R&D intensities were recorded in **Sweden** (3.25%) and **Austria** (3.09%), both with R&D expenditure above 3% of GDP. They were closely followed by **Germany** (2.94%), **Denmark** (2.87%) and **Finland** (2.75%). **Belgium** (2.49%), **France** (2.22% in 2015), the **Netherlands** (2.03%) and **Slovenia** (2.00%) registered R&D expenditure between 2.0% and 2.5% of GDP. At the opposite end of the scale, ten Member States recorded a R&D intensity below 1%: **Latvia** (0.44%), **Romania** (0.48%), **Cyprus** (0.50%), **Malta** (0.61%), **Lithuania** (0.74%), **Bulgaria** (0.78%), **Slovakia** (0.79%), **Croatia** (0.84%), **Poland** (0.97%) and **Greece** (0.99%).

Over the last ten years, R&D intensity rose in twenty-two Member States, with the highest increases in **Austria** (from 2.36% in 2006 to 3.09% in 2016, or +0.73 percentage points - pp) and **Belgium** (+0.68 pp). Conversely, R&D intensity decreased in six Member States and most strongly in **Finland** (from 3.34% in 2006 to 2.75% in 2016, or -0.59 pp) and **Luxembourg** (-0.43 pp).

R&D intensity in the EU Member States, 2016
(R&D expenditure as % of GDP)



* 2015 data instead of 2016

Highest share of R&D spending in the business sector in Slovenia, Hungary and Bulgaria...

The main sector in which R&D was performed in 2016 was the business enterprise sector in all Member States, except **Cyprus**, **Latvia** and **Lithuania** (where the higher education sector was the dominant performing sector).

The highest shares of R&D expenditure performed in the business sector were observed in **Slovenia** (76%), **Hungary** (74%), **Bulgaria** (73%), **Ireland** and **Austria** (both 71%), **Belgium** and **Sweden** (both 70%) as well as **Germany** (68%). Over the last ten years, the share of R&D conducted in the business enterprise sector increased in twenty Member States, while it decreased in eight.

... in the government sector in Romania and the higher education sector in Lithuania and Portugal

For the government sector, the highest shares were registered in **Romania** (33%), **Latvia** (32%) and **Luxembourg** (30%). The highest shares of R&D conducted within the higher education sector were recorded in **Lithuania** and **Portugal** (both 45%), **Latvia** (44%) and **Cyprus** (42%).

Research and development expenditure, 2006 and 2016

	R&D intensity (R&D expenditure as % of GDP)		R&D expenditure (in millions of euro)	
	2006	2016	2006	2016
EU	1.76	2.03	216 330	302 220
Belgium	1.81	2.49	5 927	10 518
Bulgaria	0.45	0.78	121	375
Czech Republic	1.23	1.68	1 527	2 963
Denmark	2.40	2.87	5 420	7 967
Germany	2.46	2.94	58 779	92 419
Estonia	1.12	1.28	151	270
Ireland	1.20	1.18	2 217	3 243
Greece	0.56	0.99	1 223	1 733
Spain	1.17	1.19	11 815	13 307
France*	2.05	2.22	37 904	48 643
Croatia	0.74	0.84	298	388
Italy	1.09	1.29	16 831	21 611
Cyprus	0.38	0.50	62	91
Latvia	0.65	0.44	112	110
Lithuania	0.79	0.74	191	286
Luxembourg	1.67	1.24	564	659
Hungary	0.98	1.21	900	1 372
Malta	0.58	0.61	31	61
Netherlands	1.76	2.03	10 175	14 281
Austria	2.36	3.09	6 319	10 906
Poland	0.55	0.97	1 513	4 112
Portugal	0.95	1.27	1 587	2 348
Romania	0.45	0.48	444	818
Slovenia	1.53	2.00	484	809
Slovakia	0.48	0.79	217	641
Finland	3.34	2.75	5 761	5 926
Sweden	3.50	3.25	11 722	15 141
United Kingdom	1.59	1.69	34 037	40 451
Iceland	2.92	2.08	398	381
Norway	1.46	2.04	4 008	6 838
Montenegro*	:	0.38	:	14
FYR of Macedonia*	:	0.44	:	40
Serbia	:	0.89	:	308
Turkey*	0.56	0.88	2 432	6 814
China*	1.37	2.07	30 002	203 202
Japan*	3.28	3.29	118 295	129 819
Russia*	1.01	1.10	8 466	13 437
South Korea*	2.83	4.23	22 815	52 493
United States*	2.55	2.79	281 402	453 261

: Data not available

* 2015 data instead of 2016

2016 data are preliminary for all countries, except Estonia, Latvia, Hungary, Romania, Slovakia, Finland, Iceland and Serbia.

The source dataset can be found [here](#).

Research and development expenditure in the EU Member States by performing sector (% of total)

	Business enterprise		Government		Higher education		Private non-profit	
	2006	2016	2006	2016	2006	2016	2006	2016
EU	63	65	13	11	22	23	1	1
Belgium	69	70	8	10	21	20	1	1
Bulgaria	25	73	64	21	10	5	1	0
Czech Republic	59	61	22	18	19	20	0	0
Denmark	67	66	7	2	26	32	1	0
Germany	70	68	14	14	16	18	-	-
Estonia	44	51	13	11	41	36	2	2
Ireland	66	71	7	4	27	25	-	-
Greece	30	42	21	25	48	33	1	1
Spain	56	54	17	18	28	27	0	0
France*	63	65	16	13	19	20	1	2
Croatia	37	45	27	22	37	33	0	-
Italy	49	58	17	13	30	26	4	3
Cyprus	23	33	29	11	41	42	7	13
Latvia	50	24	15	32	35	44	0	-
Lithuania	28	36	23	19	49	45	-	-
Luxembourg	86	51	12	30	2	19	-	-
Hungary	48	74	25	13	24	11	-	-
Malta	66	63	4	1	29	35	0	-
Netherlands	54	57	12	12	34	32	-	-
Austria	70	71	5	5	24	24	0	0
Poland	32	66	37	3	31	31	0	0
Portugal	46	48	11	5	32	45	10	2
Romania	48	55	32	33	18	11	1	0
Slovenia	60	76	25	13	15	11	0	0
Slovakia	43	50	33	21	24	28	0	0
Finland	71	66	9	8	19	25	1	1
Sweden	75	70	4	3	21	27	0	0
United Kingdom	62	67	10	6	26	25	2	2

* 2015 data instead of 2016

- not applicable

0 means less than 0.5%

Shares might not add up to 100% due to rounding

2016 data are preliminary for all countries, except Estonia, Latvia, Hungary, Romania, Slovakia, Finland, Iceland and Serbia.

The source dataset can be found [here](#).

Geographical information

The **European Union (EU)** includes Belgium, Bulgaria, the Czech Republic, Denmark, Germany, Estonia, Ireland, Greece, Spain, France, Croatia, Italy, Cyprus, Latvia, Lithuania, Luxembourg, Hungary, Malta, the Netherlands, Austria, Poland, Portugal, Romania, Slovenia, Slovakia, Finland, Sweden and the United Kingdom.

Methods and definitions

Research and development, abbreviated as R&D, refers to creative work undertaken on a systematic basis in order to increase the stock of knowledge (including knowledge of man, culture and society), and the use of this knowledge to devise new applications.

Eurostat's statistics on R&D expenditure are compiled using guidelines laid out in the [Frascati Manual](#) (2002 edition) published by the [OECD](#). The transition to the 2015 edition has started in some countries. Statistics on R&D cover intramural expenditure, in other words, all expenditures for R&D performed by enterprises or institutions in every sector of the economy in the EU Member States.

R&D intensity for a country is defined as the total R&D expenditure as a percentage of gross domestic product (GDP).

The main analysis of R&D statistics is based on **four institutional sectors of performance**. These four sectors are the business enterprise sector, the government sector, the higher education sector, and the private non-profit sector. Expenditure data considers the research performed on the national territory, regardless of the source of funds.

Revisions and timetable

2016 data on R&D expenditure presented in this News Release are preliminary and might therefore be revised. Following national calendar for the transmission of data, updated figures will be published in March and November 2018.

For more information

Eurostat website section dedicated to science, technology and innovation statistics.

Eurostat database on science and technology.


Eurostat website section dedicated to Europe 2020 indicators. See also Eurostat publication "Smarter, greener, more inclusive? - Indicators to support the Europe 2020 strategy" (2017 edition).


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