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First estimates of Research & Development expenditure

R&D expenditure in the EU increased slightly to 2.07% of GDP in 2017

Two thirds spent in the business enterprise sector

In 2017, the Member States of the **European Union** (EU) spent all together almost €320 billion on Research & Development (R&D). The R&D intensity, i.e. R&D expenditure as a percentage of GDP, stood at 2.07% in 2017, compared with 2.04% in 2016. Ten years earlier (2007), R&D intensity was 1.77%.

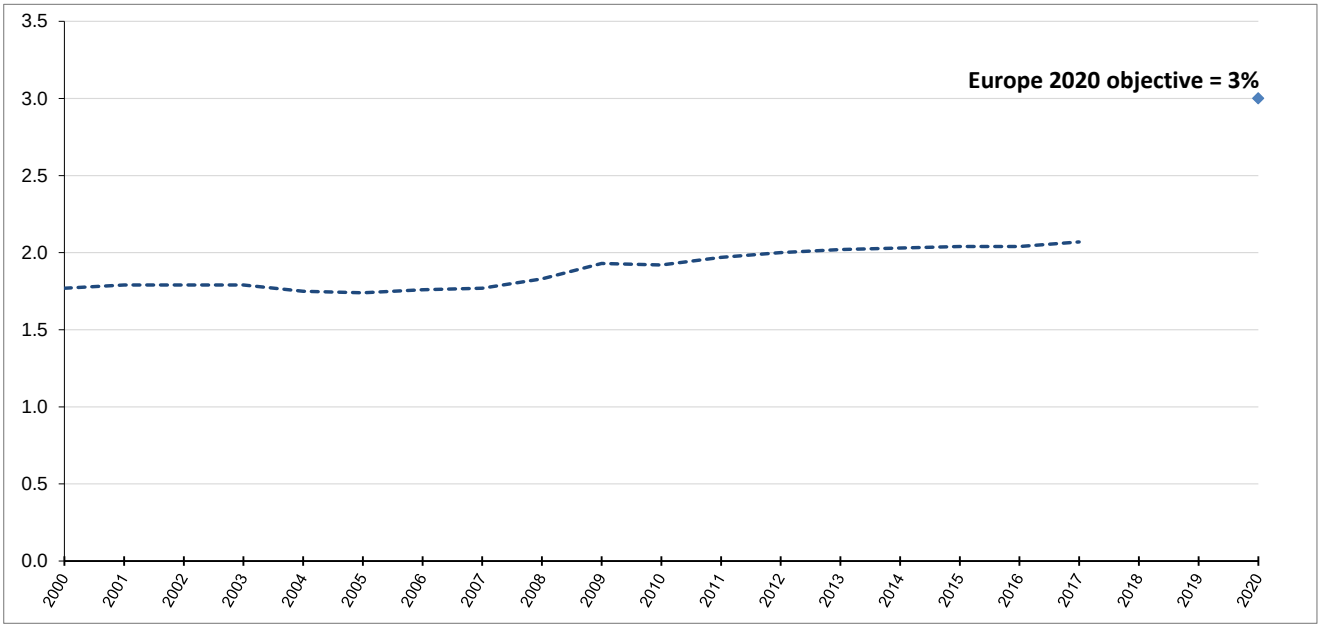
With respect to other major economies, R&D intensity in the **EU** was much lower than in **South Korea** (4.22% in 2015), **Japan** (3.28% in 2015) and the **United States** (2.76% in 2015), while it was at about the same level as in **China** (2.06% in 2015) and much higher than in **Russia** (1.1% in 2015) and **Turkey** (0.96%). 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 66% of total R&D disbursed in 2017, followed by the higher education sector (22%), the government sector (11%) 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 Member States

(R&D expenditure as % of GDP)

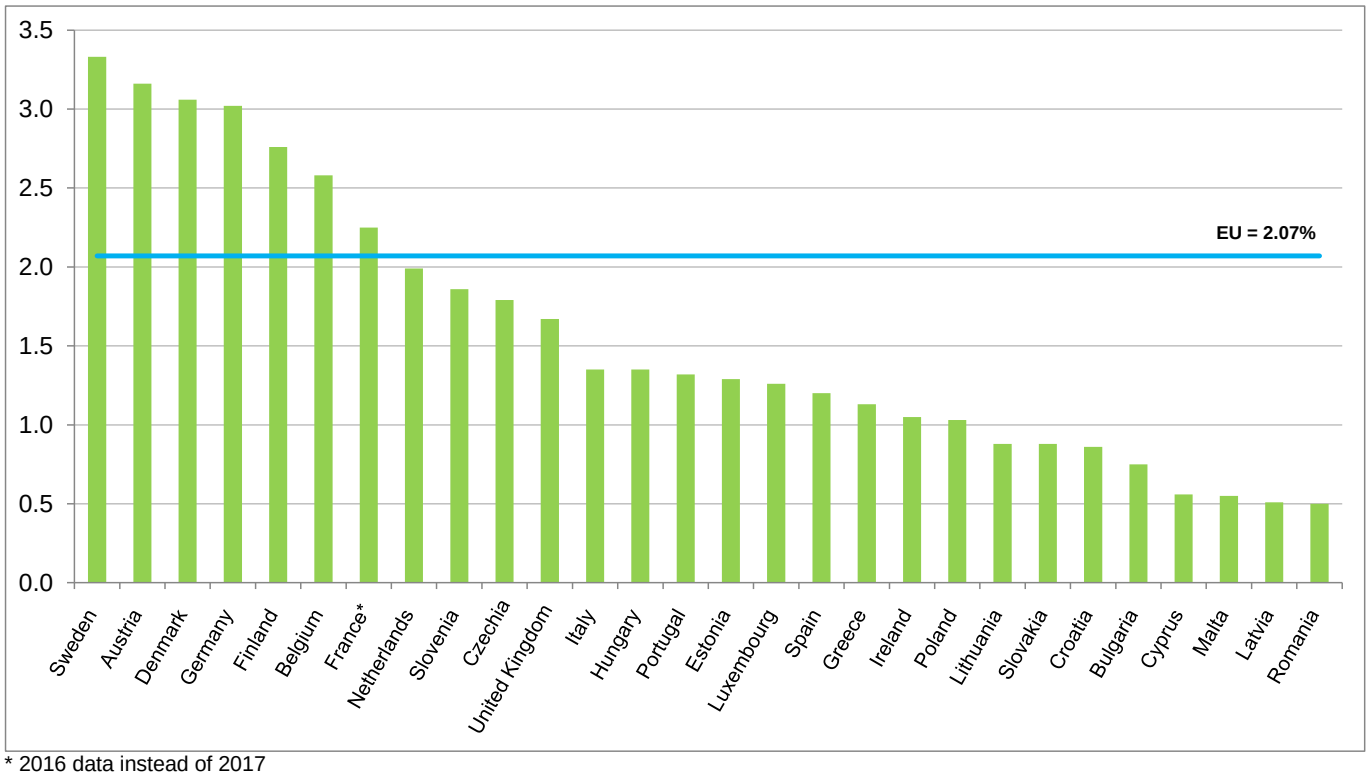


R&D intensity above 3% in Sweden, Austria, Denmark and Germany

In 2017, the highest R&D intensities were recorded in **Sweden** (3.33%) and **Austria** (3.16%), followed by **Denmark** (3.06%) and **Germany** (3.02%), all with R&D expenditure above 3% of GDP, whilst **Finland** (2.76%), **Belgium** (2.58%) and **France** (2.25% in 2016) registered R&D expenditure between 2.0% and 3.0% of GDP. At the opposite end of the scale, eight Member States recorded a R&D intensity below 1%: **Romania** (0.5%), **Latvia** (0.51%), **Malta** (0.55%), **Cyprus** (0.56%), **Bulgaria** (0.75%), **Croatia** (0.86%), **Lithuania** and **Slovakia** (both 0.88%).

Over the last ten years, R&D intensity rose in twenty-one Member States, with the highest increases in **Austria** (from 2.42% in 2007 to 3.16% in 2017, or +0.74 percentage points - pp) and **Belgium** (from 1.84% in 2007 to 2.58% in 2017, or +0.74 pp). Conversely, R&D intensity decreased in six Member States and most strongly in **Finland** (-0.59 pp) and **Luxembourg** (-0.33 pp). In **Malta,** R&D intensity remained at the level of 0.55%.

R&D intensity in the EU Member States, 2017
(R&D expenditure as % of GDP)



* 2016 data instead of 2017

Highest share of R&D spending in the business enterprise sector in Slovenia and Hungary

The main sector in which R&D was performed in 2017 was the business enterprise sector in all Member States, except **Cyprus** and **Latvia** (where the higher education sector was the dominant performing sector) and **Lithuania** (where the share of higher education sector was the same as of business enterprise sector).

The highest shares of R&D expenditure performed in the business enterprise sector were observed in **Slovenia** (75%), **Hungary** (73%), **Ireland** and **Sweden** (both 71%), **Bulgaria** and **Austria** (both 70%), **Germany** (69%), **Belgium** and the **United Kingdom** (both 68%).

Highest share of R&D spending in the government sector in Romania and the higher education sector in Latvia

For the government sector, the highest shares were registered in **Romania** (32%), **Lithuania** (28%), **Luxembourg** and **Latvia** (both 26%). The highest shares of R&D conducted within the higher education sector were recorded in **Latvia** (47%), **Portugal** (43%), **Cyprus** (42%) and **Estonia** (40%).

Research and development expenditure, 2007 and 2017

	R&D intensity (R&D expenditure as % of GDP)		R&D expenditure (in millions of euro)	
	2007	2017	2007	2017
EU	**1.77**	**2.07**	**229 601**	**318 108**
Belgium	1.84	2.58	6 357	11 336
Bulgaria	0.43	0.75	140	389
Czechia	1.31	1.79	1 801	3 433
Denmark	2.52	3.06	5 871	8 948
Germany	2.45	3.02	61 501	99 052
Estonia	1.07	1.29	174	304
Ireland	1.23	1.05	2 432	3 091
Greece	0.58	1.13	1 342	2 033
Spain	1.23	1.2	13 342	14 052
France*	2.02	2.25	39 303	50 099
Croatia	0.79	0.86	348	420
Italy	1.13	1.35	18 231	23 355
Cyprus	0.4	0.56	70	109
Latvia	0.55	0.51	126	138
Lithuania	0.8	0.88	233	372
Luxembourg	1.59	1.26	592	695
Hungary	0.96	1.35	977	1 673
Malta	0.55	0.55	32	61
Netherlands	1.67	1.99	10 342	14 676
Austria	2.42	3.16	6 868	11 679
Poland	0.56	1.03	1 764	4 834
Portugal	1.12	1.32	1 973	2 563
Romania	0.51	0.5	653	945
Slovenia	1.42	1.86	501	801
Slovakia	0.45	0.88	252	749
Finland	3.35	2.76	6 243	6 173
Sweden	3.25	3.33	11 608	15 811
United Kingdom	1.62	1.67	36 529	38 898
Iceland	2.55	2.13	401	462
Norway	1.56	2.11	4 587	7 474
Switzerland**	:	3.37	:	20 656
Montenegro*	:	0.32	:	13
FYR of Macedonia	:	0.35	:	36
Serbia	:	0.93	:	342
Turkey	0.69	0.96	3 410	7 245
China**	1.37	2.06	35 614	203 202
Japan**	3.34	3.28	110 116	129 819
Russia**	1.04	1.1	10 597	13 437
South Korea**	3.00	4.22	24 589	52 493
United States**	2.63	2.76	277 502	453 261

: Data not available
* 2016 data instead of 2017
** 2015 data instead of 2017
The source dataset can be found here.

Research and development expenditure in the EU Member States by sector of performance

(% of total)

	Business enterprise		Government		Higher education		Private non-profit	
	2007	2017	2007	2017	2007	2017	2007	2017
EU	**64**	**66**	**13**	**11**	**23**	**22**	**1**	**1**
Belgium	70	68	8	11	21	21	1	0
Bulgaria	31	70	58	23	10	6	1	1
Czechia	58	63	23	17	19	20	0	0
Denmark	70	64	3	2	26	33	0	0
Germany	70	69	14	13	16	17	0	0
Estonia	47	47	9	12	42	40	2	1
Ireland	66	71	7	5	27	25	-	-
Greece	29	49	21	22	49	28	1	1
Spain	56	55	18	18	26	27	0	0
France*	63	64	16	13	19	22	1	2
Croatia	41	50	25	22	34	28	0	0
Italy	52	61	15	13	30	24	3	2
Cyprus	23	37	24	10	45	42	8	12
Latvia	33	27	24	26	43	47	-	-
Lithuania	29	36	21	28	51	36	-	-
Luxembourg	84	54	13	26	3	20	-	-
Hungary	50	73	24	13	23	13	-	-
Malta	66	62	2	1	32	36	-	-
Netherlands	53	59	12	11	35	30	-	-
Austria	71	70	5	7	24	22	0	0
Poland	30	64	35	2	34	33	0	0
Portugal	51	51	9	5	30	43	10	2
Romania	42	57	34	32	24	11	0	0
Slovenia	60	75	24	14	16	11	0	0
Slovakia	40	54	35	21	25	25	0	0
Finland	72	65	8	9	19	25	1	1
Sweden	73	71	5	4	22	26	0	0
United Kingdom	63	68	9	7	26	24	2	2

* 2016 data instead of 2017
- not applicable
0 means less than 0.5%
Shares might not add up to 100% due to rounding
The source dataset can be found here.

Geographical information

The **European Union** (EU) includes Belgium, Bulgaria, Czechia, 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 (2015 edition) published by the OECD. Statistics on R&D cover intramural expenditure, in other words, all expenditures for R&D performed within 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. R&D expenditure data considers the research performed on the national territory, regardless of the source of funds.

Revisions and timetable

2017 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 2019.

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" (2018 edition).

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