

German regions lead European R&D

In 2005, there were 20 European regions that devoted 3 % or more of GDP to research and development. Germany scored highest, with eight of its regions among the top 20.

However, regional disparities in R&D expenditure exist not only between countries, but also between regions of the same country, ranging from 0.21 percentage points between Irish regions to 5.2 percentage points between German regions.

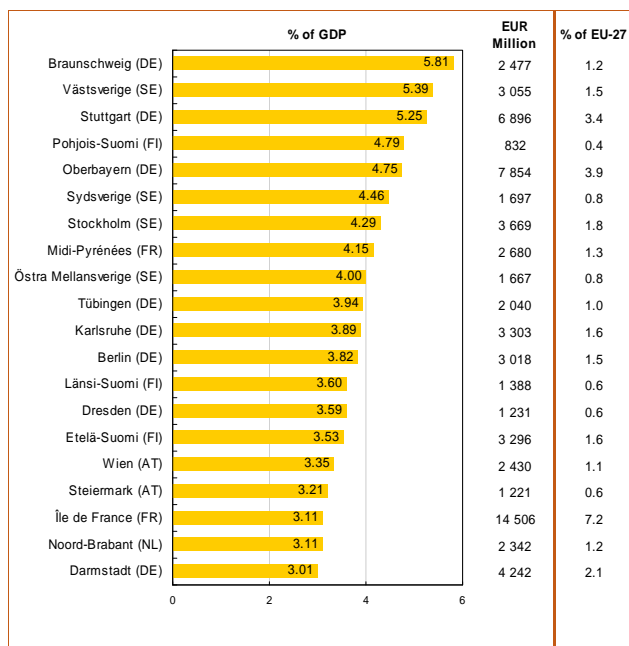
In the business enterprise sector (BES), regions with a high R&D intensity (more than 3 %) were mainly concentrated in Germany and

in northern Europe (Sweden, Finland and the United Kingdom).

Praha (CZ) was the region with the highest percentage of R&D personnel as a share of total employment, with 4.8 %. Germany had five regions in the top 20, making it the leading country in terms of R&D personnel.

Regional disparities also appeared when looking at R&D personnel as a share of total employment. More than 4 percentage points separated the top and bottom regions in the Czech Republic, while the gap between Irish regions was only 0.15 percentage points.

Figure 1: Top 20 EU regions in terms of R&D expenditure as a percentage of GDP, all sectors — 2005



Exceptions to the reference year:

2004: % of GDP regions from AT and FR

2006: EUR Million regions from AT and FI

Noord-Brabant (NL): National estimation and provisional data

Source: Eurostat R&D Statistics

In 2005, the top 20 EU regions in terms of R&D intensity were all above the 3 % target set by the Lisbon strategy.

A first group of three regions registered more than 5 % of GDP devoted to R&D activities. With an R&D intensity of 5.81 %, Braunschweig (DE) led the way in terms of R&D expenditure as a share of GDP, followed by Västsvrige (SE) with 5.39 % and Stuttgart (DE) with 5.25 %. A second group of six regions registered R&D intensities between 4 % and 5 %, including Pohjois-Suomi (FI, 4.79 %), Oberbayern (DE, 4.75 %), Sydsverige (SE, 4.46 %), Stockholm (SE, 4.29 %), Midi-Pyrénées (FR, 4.15 %) and Östra Mellansverige (SE, 4.0 %). The remaining 11 regions registered R&D intensities between 3 % and 4 %.

In absolute terms, R&D expenditure was the highest in Île-de-France, with more than EUR 14 million, accounting for 7.2 % of total R&D expenditure in the EU-27. The French capital region was followed by two German regions, Oberbayern (EUR 7.8 million) and Stuttgart (EUR 6.9 million), accounting for 3.9 % and 3.4 % respectively of total R&D expenditure in the EU-27.

With eight regions featured in the top 20, Germany was the highest-scoring country, followed by Sweden, with four regions, and Finland, with three. France and Austria each had two regions in the top 20 and the Netherlands one.

Figure 2 shows the regional disparities in R&D expenditure as a share of GDP for the EU-27 and selected countries.

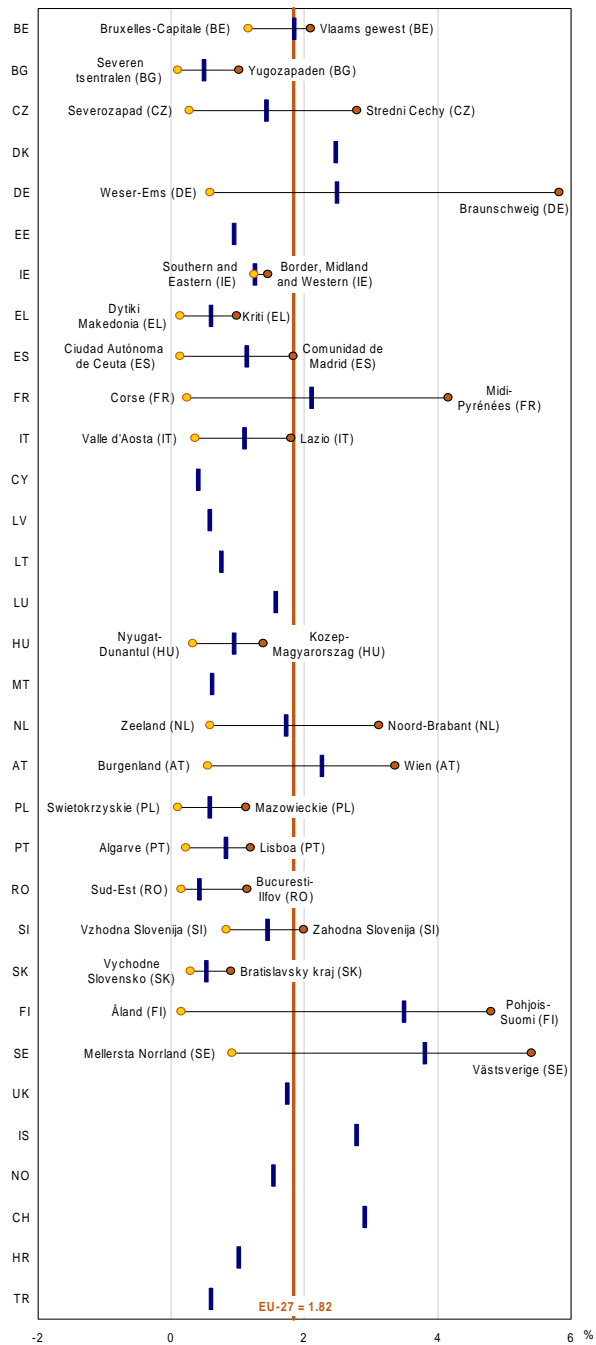
For all sectors considered, three main groups of countries emerge from the ranking. At the top, Germany, France, Finland and Sweden stand out with R&D intensities in their leading region higher than 4%.

The second group includes countries with R&D intensities in the leading region between the EU-27 average (1.82%) and 4%. This group includes Belgium, the Czech Republic, Denmark, the Netherlands, Austria and Slovenia.

The final group comprises countries where R&D intensity in the foremost region is below the EU-27 average; they include Bulgaria, Estonia, Greece, Spain, Italy, Ireland, Cyprus, Latvia, Lithuania, Luxembourg, Malta, Hungary, Poland, Portugal, Slovakia and Romania.

Disparities exist not only between countries but also between regions of the same country. The largest difference between two regions was observed in Germany, and was 5.2 percentage points; conversely, the smallest gap was in Ireland, at 0.21 percentage points. This can partly be explained by the differences in economic weight. Whereas Ireland is divided into two regions at NUTS 2 level, Germany has 39 separate regions.

Figure 2: Regional disparities (at NUTS 2 level) in R&D expenditure as a percentage of GDP, all sectors, EU-27 and selected countries — 2005



Source: Eurostat R&D Statistics

NUTS level 1: BE

EU-27: Eurostat estimation

NL: National estimates and provisional data

FR and SE: Break in series

Exceptions to the reference year:

AT, FR and CH: 2004

JEREMIE (Joint European Resources for Micro-to-Medium Enterprises)

JEREMIE is a process whereby the Member States and Regions will be able to use part of their structural funds through the European Investment Fund (EIF) to obtain a set of financial products specifically engineered for Micro, Small and Medium Enterprises. In other words, instead of using grants as such, it will be possible to transform part of the grants into financial products.

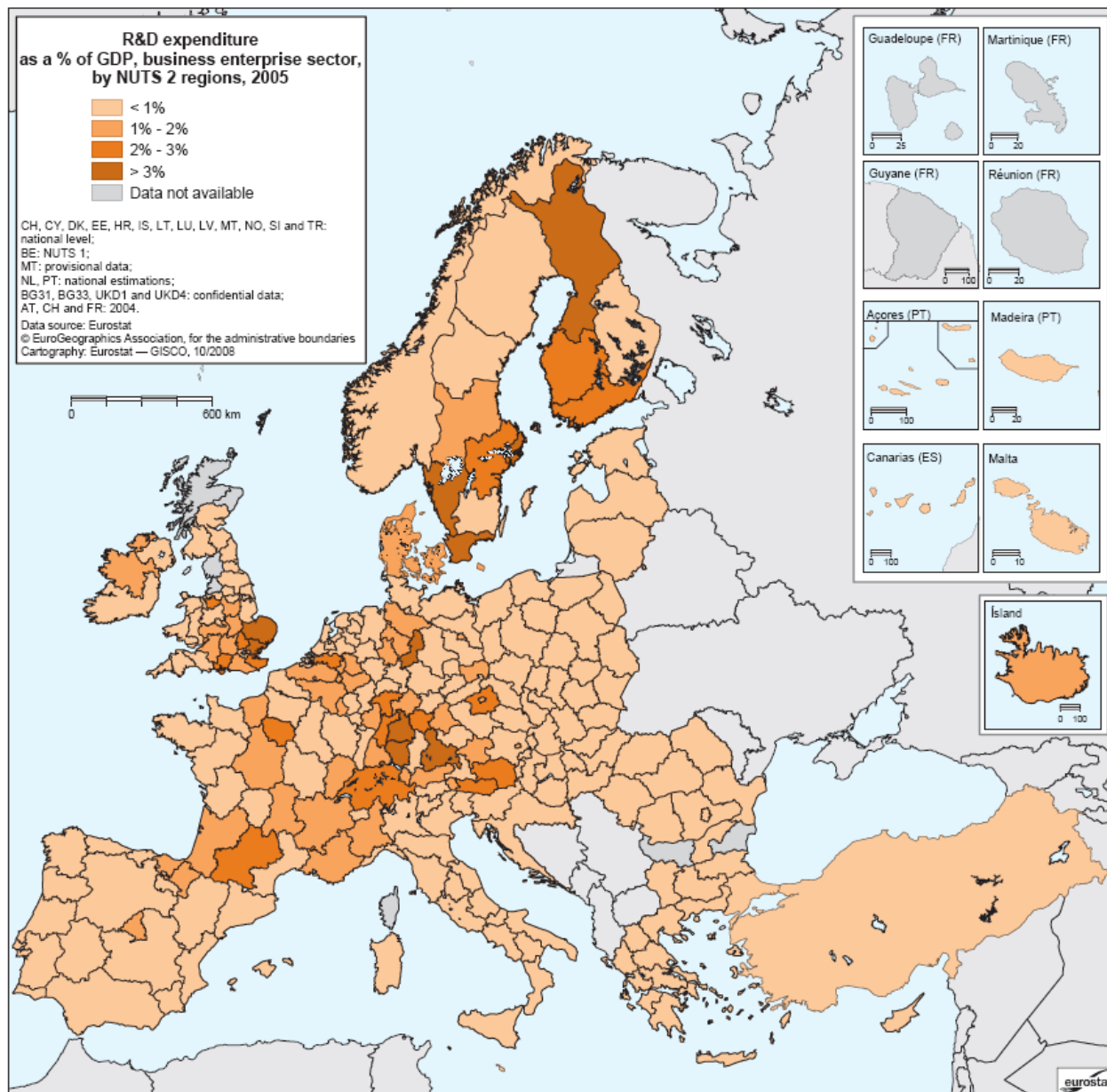
These products include equity, venture capital, guarantees, loans and technical assistance and they will have a multiplier effect on the budget. (For each euro coming from the budget, the sum of the financing products available could range from 2 to 10 euros).

Source: European Investment Fund

With the exception of Bruxelles-Capitale in Belgium and Southern and Eastern Ireland, with an R&D expenditure of 1.14 % and 1.22 %

of GDP respectively, R&D intensity in all the other lowest-ranked regions was below 1 %.

Map 3: R&D expenditure as a percentage of GDP, business enterprise sector, by NUTS 2 regions — 2005



Map 3 displays the distribution of R&D intensity in the business enterprise sector across European regions in 2005.

As is the case for total R&D expenditure, regions with high R&D intensity in the BES (more than 3 %) were mainly concentrated in Germany and in northern Europe (Sweden, Finland and the United Kingdom).

With the exception of the Czech Republic, all new Member States (2004 and 2007 enlargements)

registered R&D intensities in the BES below 1 %.

Figure 4 shows the top 20 European regions in terms of R&D personnel as a share of total employment. In 2007, Praha (CZ) was the leading region, with a share of 4.80 % of R&D personnel in total employment, representing more than 21 000 persons in full-time equivalent (FTE).

The Austrian region of Wien ranked second with 4.58 % in 2006 and the Norwegian region Trøndelag ranked third with 4.36 %.

Germany was again the country with the most regions in this ranking, with five, followed by Sweden with four, Finland with three and Norway with two. Belgium, the Czech Republic, Austria, Iceland, France and Slovakia each had one region in the top 20.

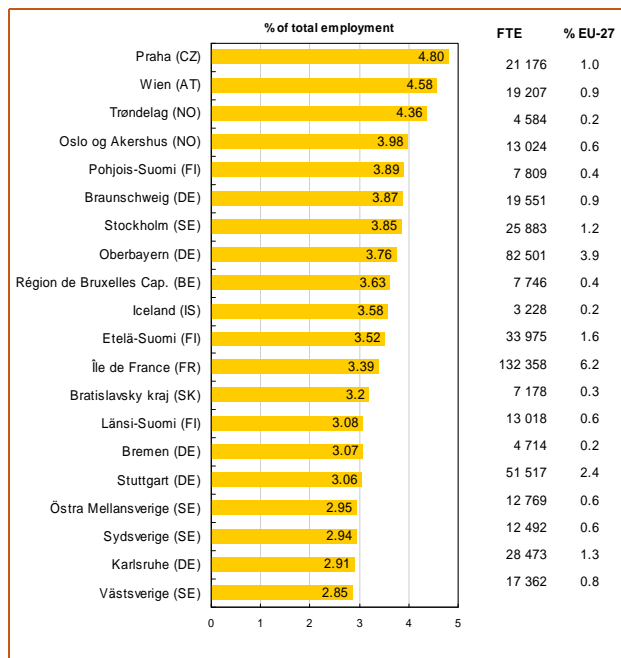
Praha (CZ) together with Bratislavsky kraj (SK) were the only two regions from the new Member States in the ranking.

One of the salient features of the top 20 leading European regions in relative terms is that 10 of them were capital regions.

In absolute terms, the French region of Île-de-France had the highest number of persons employed in R&D (135 872), representing 6.2% of the EU-27 total. This was followed by Oberbayern (DE) with 62 501 persons, accounting for 2.9% of the EU total. Stuttgart (DE) and Etelä-Suomi (FI) ranked third and fourth, accounting for 2.4% and 1.6% of the EU-27 total respectively.

Two of the top 20 regions, namely Trøndelag (NO), and Bremen (DE) each accounted for only 0.2% of the EU-27 total, and Iceland accounted for 0.1%.

Figure 4: Top 20 European regions in terms of R&D personnel as a percentage of total employment (HC), all sectors — 2005



Exception to the reference year:
 2007: Regions from CZ
 2006: Regions from FI, SE, IS
 2004: Regions from AT
 2001: Regions from FR

Source: Eurostat R&D Statistics

NUTS level 1: BE
 Country level: IS

Seventh Research Framework Programme (2007–2013)

‘People’ Programme

Rationale

‘Abundant and highly-trained qualified researchers are a necessary condition to advance science and to underpin innovation, but also an important factor to attract and sustain investments in research by public and private entities. Against the background of growing competition at world level, the development of an open European labour market for researchers free from all forms of discrimination and the diversification of skills and career paths of researchers are crucial to support a beneficial circulation of researchers and their knowledge, both within Europe and in a global setting. Special measures to encourage young researchers and support early stages of scientific career, as well as measures to reduce the ‘brain drain’, such as reintegration grants, will be introduced.’

Objectives

‘Strengthening, quantitatively and qualitatively, the human potential in research and technology in Europe, by stimulating people to enter into the profession of researcher, encouraging European researchers to stay in Europe, and attracting to Europe researchers from the entire world, making Europe more attractive to the best researchers. Building on the experiences with the ‘Marie Curie’ actions under previous Framework Programmes, this will be done by putting into place a coherent set of ‘Marie Curie’ actions, particularly taking into account the European added value in terms of their structuring effect on the European Research Area. These actions address researchers at all stages of their careers, in the public and private sectors, from initial research training, specifically intended for young people, to life long learning and career development. Efforts will also be made to increase participation by women researchers, by encouraging equal opportunities in all ‘Marie Curie Actions’, by designing the actions to ensure that researchers can achieve an appropriate work/life balance and by facilitating resuming a research career after a break.’

Source: Cordis

Figure 5: Regional disparities (at NUTS 2 level) in R&D personnel as a percentage of total employment, all sectors, EU-27 and selected countries — 2005

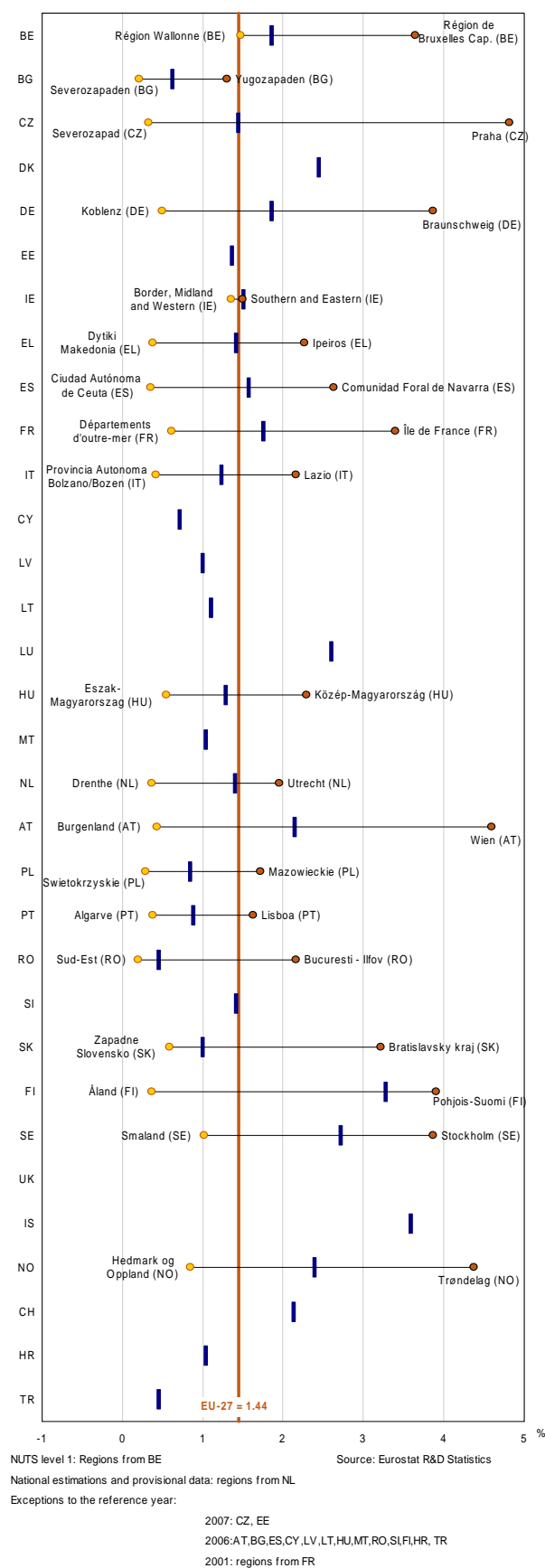


Figure 5 shows regional disparities in R&D personnel as a share of total employment (R&D personnel intensity) in all sectors.

In 2005, 10 Member States registered R&D personnel intensities at national level well above the EU-27 average (1.44%).

However, there were seven Member States where average R&D personnel intensity was below 1%: Bulgaria, Cyprus, Latvia, Poland, Portugal, Romania and Slovakia.

All regions considered, Figure 5 reveals a discrepancy of more than 3 percentage points between the top regions in the Czech Republic (Praha) and Bulgaria (Yugozapaden).

R&D personnel intensity exceeded 4% in Praha (CZ), Wien (AT) and Trøndelag (NO). This share was above 3% in another six leading regions; Bruxelles-Capitale (BE), Braunschweig (DE), Île-de-France (FR), Bratislavsky kraj (SK), Pohjois-Suomi (FI) and Stockholm (SE). Although Yugozapaden (BG), Southern and Eastern (IE), Utrecht (NL), Mazowieckie (PL) and Lisboa (PT) were the leading regions in their respective countries, R&D personnel as a share of total employment was below 2% in these regions.

Looking at the worst-performing regions in each country, we see that R&D personnel intensity was above 1% only in Région Wallonne (BE) and Border, Midland and Western (IE). The remaining regions did not reach the 1% mark, and 12 were below 0.50%.

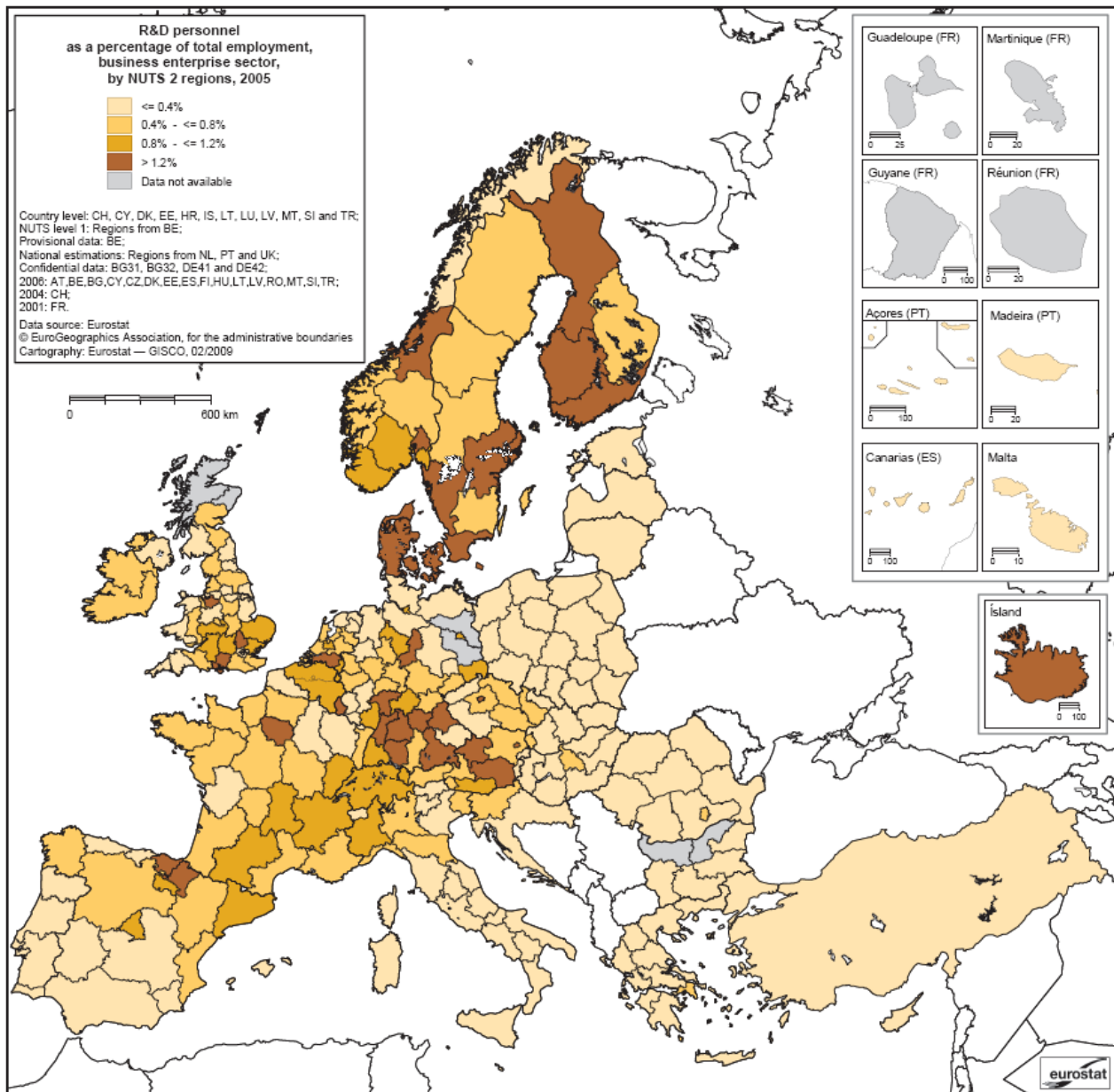
The lowest-ranked region in Belgium (Région Wallonne, with 1.46%) performed better than the leading region in Bulgaria (Yugozapaden, with 1.29%).

Figure 5 also reveals broad disparities between regions of the same country, with the highest contrasts recorded in the Czech Republic (4.49 percentage points) and Austria (4.16 percentage points). Finland, Norway and Germany also presented disparities of more than 3 percentage points.

On the other hand, in Ireland regional disparities in R&D personnel intensity stayed at 0.15 percentage points.

It is also worth noting that, with the exception of Germany, Greece, Spain, the Netherlands and Finland, the best-performing regions were capital regions, which shows the influence of capital cities in attracting R&D companies and personnel.

Map 6: R&D personnel as a percentage of total employment, business enterprise sector, by NUTS 2 regions — 2005



Map 6 shows R&D personnel as a share of total employment in the business enterprise sector.

In 2005, only five European regions (two in Germany, one in Finland, Sweden and Luxembourg) had R&D personnel intensities in the BES above 2%. In 27 regions this share was between 1.2% and 2%.

BES R&D personnel as a percentage of total employment was between 0.8% and 1.2% in northern regions, and in some parts of Austria, Belgium, Germany, Spain, France and the Netherlands.

However, R&D personnel intensity was below 0.4% in the vast majority of European regions, especially in the southern countries.

Innovation clusters in Europe

Clusters are defined by the co-location of producers, services providers, educational and research institutions, financial institutions and other private and government institutions related through linkages of different types. There is huge diversity among clusters: they differ in terms of their stage of development along the cluster life cycle; some are networks of SMEs, some are organised around key anchor firms, and yet others have developed around universities.

Source: http://www.proinno-europe.eu/admin/uploaded_documents/innovation_clusters_in_europe.pdf

METHODOLOGICAL NOTES

Research and experimental development

Research and experimental development activities (R&D) comprise 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 stock of knowledge to devise new applications.

R&D expenditure

Intramural expenditure comprises all expenditure for R&D performed within a statistical unit or sector of the economy during a specific period, whatever the source of funds ([Frascati Manual, paragraph 358](#)).

R&D intensity

R&D intensity is R&D expenditure expressed as a percentage of GDP.

GDP from national accounts is used as reference data for the computation of R&D intensity at the national level.

R&D personnel

Data on R&D personnel measure the resources going directly to R&D activities. The total R&D personnel are defined as follows:

All persons employed directly in R&D activities should be counted, as well as those providing direct services such as R&D managers, administrators and clerical staff. Those providing indirect services, such as canteen and security staff, should be excluded ([Frascati Manual, paragraphs 294-296](#)).

Full-time equivalent

Full time equivalent corresponds to one year's work by one person. Thus someone who normally devotes 40% of his/her time to R&D and the rest to other activities (e.g. teaching, university administration or counselling) should be counted as only 0.4 FTE.

The business enterprise sector (BES)

With regard to R&D, the business enterprise sector includes all firms, organisations and institutions whose primary activity is the market production of goods or services (other than higher education) for sale to the general public at an economically significant price and the private non-profit institutions mainly serving them ([Frascati Manual, paragraph 163](#)).

Nomenclature of territorial units for statistics (NUTS)

The Nomenclature of Territorial Units for Statistics (NUTS) was established to provide a single, uniform

breakdown of territorial units for the production of regional statistics for the European Union.

The NUTS is a five-level hierarchical classification comprising three regional and two local levels. In this way, Member States are divided into NUTS 1 regions, each of which is in turn subdivided into a whole number of NUTS 2 regions, and so on.

The NUTS revision of 2006 entered into force on 1 January 2008 and should be applied to all regional data.

In the present Statistics in Focus data are presented at NUTS 2 level.

Denmark, Cyprus, Estonia, Latvia, Lithuania, Luxembourg, Malta, Iceland, Switzerland, Croatia and Turkey are classified as regions at NUTS 2 level.

Belgium is classified as a region at NUTS 1 level.

European aggregates

For R&D expenditure and personnel, EU totals are calculated as the sum of the national data by sector. If data are missing, estimates are first made for the country in question, reference period, institutional sector or relevant R&D variable, as appropriate.

Sources

Eurostat — R&D statistics.

General abbreviations

e	estimated value
p	provisional value
s	Eurostat estimate
b	break in series
i	more information in metadata
:	not available

Reference manual

Standard method proposed for research and experimental development surveys — [Frascati Manual, OECD, 2002](#).

Data presented in this Statistics in Focus reflects the data availability in Eurostat's reference database.

Further information

Data: [Eurostat Website: http://ec.europa.eu/eurostat](http://ec.europa.eu/eurostat)

Select your theme on the left side of the homepage and then 'Data' from the menu.

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European Statistical Data Support:

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Their mission is to provide help and guidance to Internet users of European statistical data.

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