

R&D personnel in European regions

Simona Frank

German and Nordic regions lead in the employment of R&D personnel

- The Finnish region of Uusimaa (Suuralue) had the highest proportion (3.86%) of R&D personnel in its labour force, followed by Stockholm (3.72%).
- The majority of regions with the highest R&D personnel in the labour force in the Business and Government sectors were German. In the Higher education sector, Sweden and Greece were the leaders.

*Table 1: Top 10 regions in terms of R&D personnel as % of the labour force
all sectors, EEA countries — 2001*

All sectors		
Region	Country	R&D personnel as a % of the labour force
EU-15		1.39
Uusimaa (Suuralue)	FI	3.86
Stockholm — 1999	SE	3.72
Oberbayern — 1997	DE	3.44
Braunschweig — 1997	DE	3.33
Pohjois-Suomi	FI	3.24
Wien — 1998	AT	3.14
Iceland — 2002	IS	3.09
Övre Norrland — 1999	SE	2.87
Stuttgart — 1997	DE	2.73
Östra Mellansverige — 1999	SE	2.73

The average percentage of R&D personnel in the EU labour force was 1.39% in 2001 in *All sectors*. As shown in Table 1, in the leading position at the regional level, 3.86% of the labour force in the Finnish region of Uusimaa (Suuralue) were involved in R&D. This was close to three times the EU average.

In second and third position were Stockholm (SE, 3.72%) and Oberbayern (DE, 3.44%). Both Sweden and Germany have three regions each in the top ten regions with high proportions of R&D personnel. Other regions include Pohjois-Suomi (FI) with 3.24%, Wien (AT) with 3.14% and Iceland with 3.09%.

Figure 1 examines the disparities in R&D personnel across the EU regions in 2001 for *All sectors*. For the countries such as Finland, Austria, Sweden and Germany, a big gap (3 to 4%) existed for the regions between the highest and lowest percentage of R&D personnel in the labour force.

For other countries, this difference was slightly lower, the lowest being 0.75% between the top and lowest regions in Portugal. The latter was also the only country whose region had the maximum percentage of R&D personnel per labour force that was below the EU average.

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Looking at the maximum R&D intensity within each country, four regions had above 3% of R&D personnel in the labour force. These are namely Uusimaa Suuralue (FI, 3.86%), Stockholm (SE, 3.72%), Oberbayern (DE, 3.44%) and Wien (AT, 3.14%).

Burgenland (AT) and Valle d'Aosta (IT) had the lowest percentage of R&D personnel in its labour force, with values of 0.13% and 0.15%, respectively.

Table 2 illustrates the top ten EEA regions for each sector of performance in terms of R&D personnel as a percentage of the labour force. The German regions clearly dominated with at least five regions in both the Business enterprise sector — BES — and the Government sector — GOV — (Oberbayern and Braunschweig were presented in both). However in the Higher education sector — HES, Sweden led with four regions having a high proportion of R&D personnel in its labour force, followed by Greece with three regions.

In the BES, the percentage of R&D personnel in the labour force of the top ten EEA regions was between two and four times the corresponding EU average of 0.67%. Oberbayern (DE), Stuttgart (DE) and Uusimaa Suuralue (FI) had the highest percentage of R&D personnel in its labour force, with 2.35, 2.26 and 2.00, respectively.

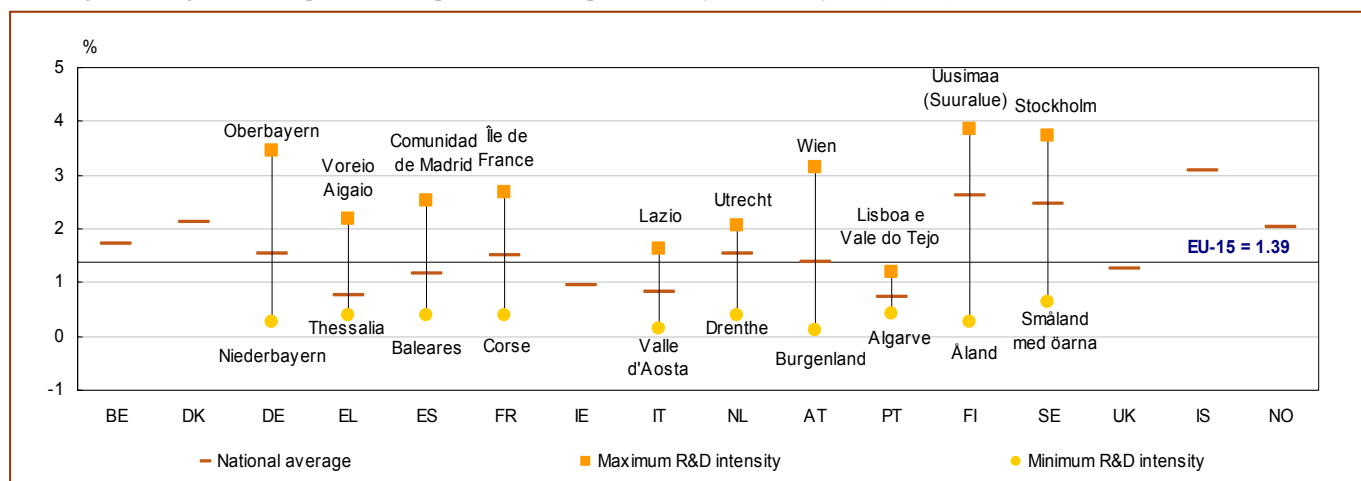
German regions are absent in the top 10 regions in the HES. Sweden is dominant here with four regions, closely followed by three Greek regions. The highest proportion of R&D personnel in the labour force reached 1.99% for Övre Norrland (SE) followed by 1.96% for Kentriki Makedonia (EL). This represented nearly four times the EU average for the HES sector.

The corresponding proportion of R&D personnel in the labour force is about three times lower in the GOV sector for the EU average as compared to that in the BES and the HES. Although six German regions featured among the leading ones, Iceland ranked first with 0.81% of its labour force working in R&D. Lazio (IT), Comunidad de Madrid (ES) and Wien (AT) were the other three regions with 0.67%, 0.60% and 0.47%, respectively of R&D personnel in their labour force.

Table 2: Top 10 regions in terms of R&D personnel as % of the labour force, BES, GOV and HES, EEA countries — 2001

Business enterprise sector		
Region	Country	R&D personnel as a % of the labour force
EU-15		0.67
Oberbayern — 1997	DE	2.35
Stuttgart — 1997	DE	2.26
Uusimaa (Suuralue)	FI	2.00
Stockholm — 1999	SE	1.91
Pohjois-Suomi	FI	1.72
Tübingen — 1997	DE	1.66
Braunschweig — 1997	DE	1.64
Västsverige — 1999	SE	1.64
Darmstadt — 1997	DE	1.60
Île de France — 1998	FR	1.55
Government sector		
Region	Country	R&D personnel as a % of the labour force
EU-15		0.17
Iceland — 2002	IS	0.81
Braunschweig — 2000	DE	0.76
Karlsruhe — 2000	DE	0.74
Lazio — 2000	IT	0.67
Köln — 2000	DE	0.65
Berlin — 2000	DE	0.61
Comunidad de Madrid	ES	0.60
Oberbayern — 2000	DE	0.48
Bremen — 2000	DE	0.48
Wien — 1998	AT	0.47
Higher education sector		
Region	Country	R&D personnel as a % of the labour force
EU-15		0.53
Övre Norrland	SE	1.99
Kentriki Makedonia — 1999	EL	1.96
Ipeiros — 1999	EL	1.87
Groningen — 2000	NL	1.61
Östra Mellansverige	SE	1.49
Wien — 1998	AT	1.46
Dytiki Ellada — 1999	EL	1.42
Sydsverige	SE	1.28
Stockholm	SE	1.27
Comunidad de Madrid	ES	1.25

Figure 1: Regional R&D personnel disparities in Europe, as a % of the labour force (in HC), EEA countries — all sectors — 2001



➤ ESSENTIAL INFORMATION – METHODOLOGICAL NOTES

Research and experimental development — R&D

Research and experimental development (R&D) activities 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.

Institutional classifications

Internal expenditure and R&D personnel are broken down with reference to the four institutional sectors in which the R&D takes place.

- **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*, § 163.

- **The government sector — GOV**

In the field of R&D, the government sector includes: all departments, offices and other bodies which furnish but normally do not sell to the community those common services, other than higher education, which cannot otherwise be conveniently and economically provided, and administer the state and the economic and social policy of the community (public enterprises are included in the business enterprise sector) as well as PNPs controlled and mainly financed by government — *Frascati Manual*, § 184.

- **The higher education sector — HES**

This sector comprises: all universities, colleges of technology and other institutes of post-secondary education, whatever their source of finance or legal status. It also includes all research institutes, experimental stations and clinics operating under the direct control of or administered by or associated with higher education establishments — *Frascati Manual*, § 206.

- **The private non-profit sector — PNP**

This sector covers: non-market, private non-profit institutions serving households (i.e. the general public) and private individuals or households— *Frascati Manual*, § 194.

R&D indicators: R&D personnel

All persons employed directly on R&D 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*, § 294 - 296.

- **Researchers**

Researchers are professionals engaged in the conception or creation of new knowledge, products, processes, methods and systems, and in the management of the projects concerned— *Frascati Manual*, § 301.

- **Full-time equivalent — FTE**

One FTE may be thought of as one person-year. For instance, a person who normally spends 40% of his time on R&D and the rest of it on other work (e.g. lecturing, university administration, guidance) should be counted as only 0.4 FTE — *Frascati Manual*, section 5.3.3.

- **Personnel by number of individuals — HC**

The number of individuals who are employed mainly or partly on R&D— *Frascati Manual*, section 5.3.2.

- **Labour force**

The labour force is the active population. It is defined as the sum of employed and unemployed persons. The R&D personnel as a percentage of labour force is calculated from total personnel in head count.

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, NUTS subdivides each Member State into a whole number of NUTS 1 regions, each of which is in turn subdivided into a whole number of NUTS 2 regions, and so on.

In the present Statistics in Focus all data are presented at NUTS 2 level on the basis of the NUTS 1998 version. The exceptions have been indicated in the tables or figures. Denmark is classified at NUTS 2 level, which explain its presence amongst the regions. Data available for UK are at NUTS 1 level.

Iceland and Norway are not included in the NUTS classification but do have similar statistical regions. Iceland is classified at the statistical region level 2.

European aggregates

EU totals are calculated as the sum of the country data by sector. If data are missing, estimations are first made for each country, sector and relevant R&D variable.

EU-15 and EEA totals are estimated values.

EEA: does not include Liechtenstein.

EEA: European economic area.

Reference manual

- *Standard method proposed for research and experimental development surveys — Frascati Manual, OECD, 2002.*
- *The Regional Dimension of R&D and Innovation Statistics and Experimental Development — Regional Manual, European Commission, 1996.*

Further information:

➤ Reference publications

Title Statistics on Science and Technology in Europe
 Catalogue No KS-32-00-904-EN-C Price EUR 35.00

➤ Databases

NewCronos, Theme 9, Domain: rd_ex_p

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