

R&D in the business enterprise sector of the European Union

Statistics in focus

SCIENCE AND TECHNOLOGY

4/2005

R&D Statistics

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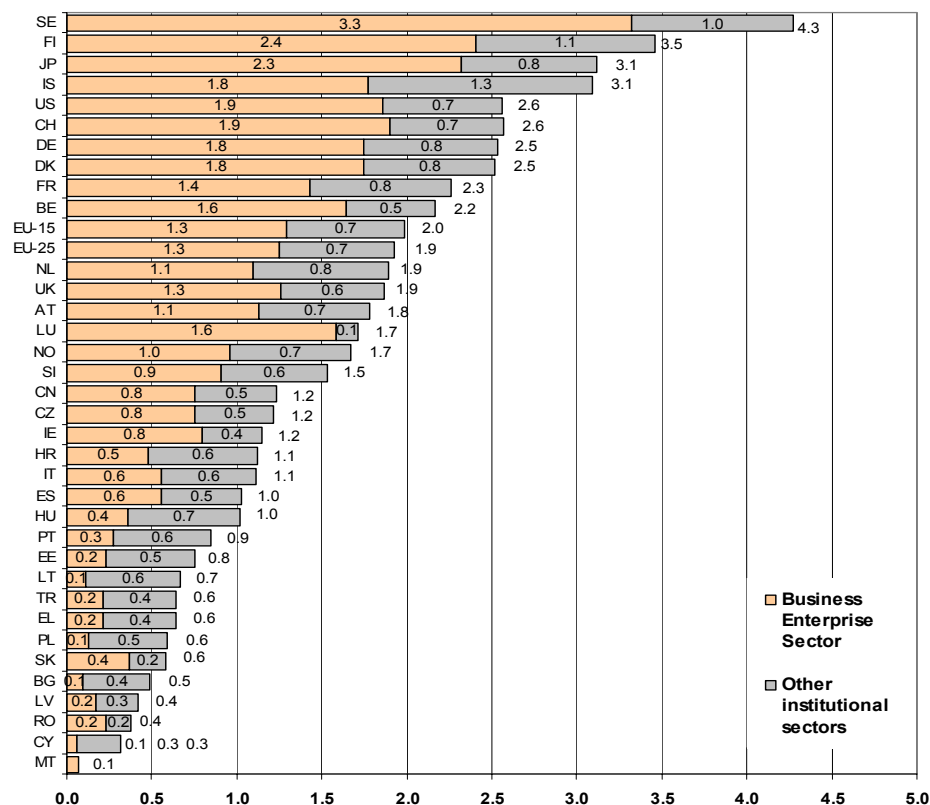
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Figure 1: Research and Development expenditure (Business Enterprise Sector and other institutional sectors) as a percentage of GDP - year 2002* in the EU-25, the Candidate Countries, China, Japan and the US.



* BE, EL, IE, IT, NL, PT, SE: 2001; LU, CH, TR: 2000; AT: 1998

Total for Malta is not available

Main findings

- In 2002, total R&D expenditure represented almost 2 % of GDP for the EU-25, with a Business Enterprise Sector R&D intensity of 1.3 %.
- In the majority of EU Member States, two-thirds or more of Business Enterprise Sector R&D expenditure is financed by the sector itself.
- High-tech manufacturing in Belgium, Germany and Slovenia re-invested 29.4 % (in 2001), 24.8 % and 17.1 % respectively of their value added in R&D expenditure in 2002.
- The share of female researchers is higher in larger companies than in smaller ones.
- In 2002 in France, Romania and Lithuania, 75 %, 70 % and 65 % respectively of BES researchers worked in companies of more than 250 employees, whereas in Estonia, Cyprus and Latvia, BES researchers were mainly employed in small companies.



R&D expenditure statistics measure all R&D expenditure performed within a statistical unit or sector of the economy during a specific period ('intramural' R&D expenditure). In this publication, we focus on the R&D performed by the private sector or the Business Enterprise Sector (BES) as it is called in the realm of R&D statistics.

The following section is primarily concerned with R&D intensity and R&D expenditure funding in the BES. Next, expenditure on R&D as a percentage of value added is presented. Finally, the publication highlights a few patterns in the distribution of researchers and female researchers within enterprises in the BES sector.

Sweden and Finland are the leading Member States in terms of BES R&D intensity

Figure 1 shows the R&D intensity (R&D expenditure as a percentage of the GDP) of the BES and that of the rest of the economy in 2002. The leading European countries in terms of BES R&D intensity are Sweden and Finland with 3.3 % (figure for 2001) and 2.4 % respectively. These are the only two EU Member States having a BES R&D intensity in excess of 2 %. They came ahead of Japan (2.3 %) and the United States (1.9 %). Six other European countries – Iceland, Switzerland (in 2000), Germany, Denmark, France and Belgium (2001) – had a ratio of BES R&D expenditure to GDP above the EU average of 1.3 %.

Sweden and Finland's total R&D intensity were also ranked the highest, in line with their Business Enterprise Sectors' (4.3 % in 2001 for Sweden and 3.5 % for Finland in 2002). Noteworthy is that the other institutional sectors of both these Nordic countries, as well as Iceland's, achieve R&D intensities of 1 % or more. Other countries with high total R&D intensities are Japan, Iceland, the US and Switzerland, along with the EU Member States Germany and Denmark.

Similarly, countries displaying less BES R&D expenditure as a percentage of their GDP were the same as those having a small total R&D expenditure as a percentage of their GDP, such as for instance, Cyprus (0.1 %), Malta (0.1 %), Bulgaria (0.1 %), Lithuania (0.1 %) or Poland (0.1 %).

As for the finance resources supporting the R&D expenditure of the Business Enterprise Sector, the breakdown by source of financing in table 1 reveals that in seven Member States out of twenty whose data are available, 90 % or more of the 2002 R&D expenditure financing stemmed from the BES itself.

These Member States were Luxembourg (97.5 %), Finland (95.7 %), Portugal (94.4 % in 2001), Lithuania (92.1 %), Slovenia (93.0 %), Ireland (92.8 % in 2001) and Germany (91.2 %). In three Candidate Countries, Bulgaria (97.8 %), Croatia

(95.6 %) and Turkey (94.3 %), more than 90 % of BES R&D expenditure was also self-financed.

Table 1: R&D expenditure of the Business Enterprise Sector by sector of funding (in percentage) in 2002

	BES ¹	GOV ²	HES+PNP ³	ABROAD
BE	83.8 p	5.9 p	0.0 p	10.3 p
CZ	84.0	12.1	1.6	2.3
DE	91.2	6.2	0.2	2.4
EE	80.5	9.7	0.0	9.7
ES	84.0	9.5	0.5	5.9
FR	78.6	11.1	0.0	10.2
IE	92.8	2.7	0.0	4.5
CY	81.1	4.3	0.3	14.4
LV	35.3	20.2	0.0	44.5
LT	92.1	0.7	0.0	7.2
LU	97.5	1.6	0.0	0.9
HU	69.3	7.2	0.1	22.6
MT	75.0	16.7	0.0	8.4
AT	64.4	5.5	0.1	30.1
PL	86.5	11.8	0.3	1.4
PT	94.4	2.1	0.0	3.6
SI	93.0	5.0	0.1	1.8
SK	77.5	21.1	0.3	1.2
FI	95.7	3.2	0.1	1.0
UK	66.0	6.7	0.0	27.2
CH	91.4	2.3	0.5	5.8
BG	97.8	1.1	0.0	1.1
HR	95.6 p	1.9 p	0.0 p	2.6 p
RO	61.6	33.0	0.4	5.0
TR	94.3	2.9	1.1	1.6

* IE and PT: 2001, LU and CH: 2000, AT: 1998

1 Business Enterprise Sector

2 Government Sector

3 Higher Education Sector + Private Non-Profit Sector

In contrast, in Romania (33.0 %), in Slovakia (21.1 %) and in Latvia (20.2 %), a significant share of R&D expenditure performed by the BES is financed by Government sources. Government also financed between 10 % and 20 % of BES R&D expenditure in the Czech Republic, France, Malta and Poland. In a few countries, the BES R&D performance relied on a wider financial support from abroad than on average in the EU. This is the case for Latvia (44.5 %), Austria (30.1 % in 1998), the United Kingdom (27.2 %) and Hungary (22.6 %).

Table 2 deals with R&D expenditure in a number of specific industries by source of funding, in 2002. In line with the previous conclusions for the BES as a whole, R&D expenditure in the industries considered was mainly financed by BES sources. However, a substantial share of R&D expenditure in the **Manufacturing sector (NACE D)** was sometimes financed by other sources. For instance, in Romania, 28.7 % of R&D expenditure in **Manufacturing industry** was financed by the government. In France, this share reached 12.5 % and in Poland (10.3 %). In France, up to 11.0 % of the **Manufacturing sector's** R&D efforts are financed from abroad as is 16.4 % of

Hungary's.

Between one fifth and one quarter of the **Electricity, gas and water supply sector (NACE E)**, were financed by the government in Germany (data for 2001) and Poland. R&D government financing was even more pervasive in Hungary, where almost one half of the utilities sector's R&D expenditure was financed by the government, in Romania (70 %) and in Malta (100 %).

In the **Services sector (NACE G to K)**, government financed a significant share of R&D expenditure in 2002 in Malta (33.4 %), in the Czech Republic (21.5 %), in Slovenia (19.6 %) and in Spain (12.4 %).

Finally, government also played an important role in the R&D financing of the **Computer and related activities sector (NACE 72)** in a number of countries. Government sources financed 91.1 % of R&D expenditure in Romania, 33.4 % in Malta, 23.0 % in Hungary, 16.0 % in Estonia (2001) and 11.6 % in Spain. A large amount of this sector's R&D expenditure was funded from abroad in Slovakia (26.8 % in 2001), Estonia (18.8 % in 2001) and Cyprus (10.3 %).

Table 2: R&D expenditure in a selected number of industries by source of funding (in percentage) in 2002*

	Manufacturing (NACE D)				Electricity, gas and water supply (NACE E)				Services (NACE G_to_K)				Computer and related activities (NACE K72)			
	BES ^o	GOV ¹	H-P ²	ABR ³	BES ^o	GOV ¹	H-P ²	ABR ³	BES ^o	GOV ¹	H-P ²	ABR ³	BES ^o	GOV ¹	H-P ²	ABR ³
CZ	93.7	5.1	0.0	1.3	98.3	1.7	0.0	0.0	73.3	21.5	0.0	5.1	96.3	3.0	0.0	0.7
DE	93.0	4.2	0.2	2.6	77.6	20.7	:	:	89.9	:	:	:	97.9	1.9	0.1	0.1
EE	98.2	1.8	0.0	0.0	100.0	0.0	0.0	0.0	:	:	:	:	65.1	16.0	0.0	18.8
ES	87.5	7.4	0.3	4.8	87.5	9.2	0.5	2.8	78.8	12.4	0.9	7.8	84.2	11.6	0.1	4.1
FR	76.5	12.5	0.0	11.0	98.1	0.5	0.0	1.4	89.8	4.5	0.1	5.6	87.4	5.4	0.0	7.2
CY	99.1	0.2	0.2	0.5	0.0	0.0	0.0	100.0	:	:	:	:	88.7	1.0	0.1	10.3
HU	79.4	3.7	0.5	16.4	47.3	46.0	0.2	6.5	36.6	:	:	:	71.8	23.0	2.1	3.0
MT	100.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	66.6	33.4	0.0	0.0	66.6	33.4	0.0	0.0
PL	87.8	10.3	0.4	1.5	73.3	23.8	0.0	3.0	:	:	:	:	:	:	:	:
PT	95.1	2.5	0.0	2.4	93.0	3.2	0.0	3.8	94.2	1.5	0.0	4.3	96.5	1.2	0.0	2.4
SI	96.5	2.6	0.1	0.8	:	:	:	:	71.7	19.6	0.3	8.7	90.6	7.1	0.0	1.2
SK	95.5	4.1	0.0	0.4	87.5	12.5	0.0	0.0	:	:	:	:	68.3	4.9	0.0	26.8
FI	96.9	2.5	0.1	0.5	89.6	9.0	0.0	1.4	:	:	:	:	92.8	6.0	0.3	0.9
BG	99.7	0.0	0.0	0.3	:	:	:	:	:	:	:	:	100.0	0.0	0.0	0.0
HR	98.4 p	1.6 p	0.0 p	0.0 p	100.0 p	0.0 p	0.0 p	0.0 p	:	:	:	:	:	:	:	:
RO	65.6	28.7	0.3	5.4	27.5	70.0	0.1	2.5	:	:	:	:	6.8	91.1	0.0	2.1
TR	94.5	3.1	1.1	1.4	98.2	0.5	0.0	1.3	92.8	2.2	1.7	3.3	80.5	2.8	5.8	11.0

* DE, EE, PT, SK: 2001

^o Business Enterprise Sector; ¹ Government Sector; ² Higher Education Sector + Private Non-Profit Sector; ³ Abroad

Belgium, Germany and Slovenia's high-tech manufacturing sectors re-invested a high share of their value added in R&D expenditure

R&D expenditure can be measured as a percentage of value added, as shown in table 3. In 2002, the **Manufacturing sector (NACE D)** invested the largest share of value added in Finland (8.8 %), Germany (8.4 %), Belgium (7.6 % in 2001) and Denmark (7.5 %). These high figures could be attributed to **High-tech manufacturing, High and medium high-tech manufacturing and the Manufacture of coke, refined petroleum products and nuclear fuel, chemicals, chemicals products and man-made fibres, rubber and plastic products (NACE DF, DG and DH)**. R&D expenditure amounted to 29.4 % of value added in Belgium's **High-tech manufacturing sector**, 24.8 % in Germany's and 17.1 % in Slovenia's. These same countries' **High-tech and medium high-tech**

manufacturing sector were those that re-invested the highest shares of value added with 14.0 %, 13.8 % and 8.9 % respectively. The Belgian, German and Finnish **Manufacture of coke, refined petroleum products and nuclear fuel, chemicals, chemicals products and man-made fibres, rubber and plastic products sectors (NACE DF, DG and DH)** also spent proportionally more on R&D than the 'Manufacturing' sector as a whole, with 13.1 %, 10.2 % and 10.1 % respectively of this sector's value added.

In **Computer and related activities (NACE 72)**, R&D expenditure represented 16.3 %, 11.5 % and 10.6 % respectively of value added in Denmark, Finland and Ireland.

Table 3: R&D expenditure of the Business Enterprise Sector in a selected number of industries in 2002* as a percentage of the value added

	Manufacturing (NACE D)	Manufacture of food products, beverages and tobacco (NACE DA)	Manufacture of textiles and textile products, manufacture of leather and leather products (NACE DB_DC)	Manufacture of wood and wood products, manufacture of pulp, paper and paper products, publishing and printing (NACE DD_DE)	Manufacture of coke, refined petroleum products and nuclear fuel, chemicals, chemicals products and man-made fibres, rubber and plastic products (NACE DF_to_DH)	High-tech manufacturing (°)	High-tech and medium high-tech manufacturing(°)	Land transport, transport via pipelines, water transport, air transport, supporting and auxiliary transport activities, activities of travel agencies, post and telecommunications (NACE I)	High-tech services (°)	Knowledge intensive services (°)	Real estate, renting and business activities (NACE K)	Computer and related activities (NACE K72)	Other business activities (NACE K74)
EU-25	:	:	:	:	:	:	:	:	:	:	:	:	:
BE	7.6	1.8	3.3	1.1	13.1	29.4	14.0	0.6	3.0	1.3	1.7	5.4	1.4
CZ	2.3 p	0.1 p	0.4 p	0.0 p	2.0 p	4.5 p	4.8 p	0.1 p	:	1.7 p	3.1 p	1.8 p	0.4 p
DK	7.5 b	2.9 b	:	0.6 b	:	:	:	0.9 b	:	2.7 b	3.7 b	16.3 b	3.8 b
DE	8.4	0.8	2.7	0.3	10.2	24.8	13.8	0.8	:	0.9	1.0	3.6	0.3
EE	0.8	0.3	0.1	0.3	3.5	:	:	0.1	:	0.5	1.2	6.4	0.8
EL	:	:	:	:	:	:	:	:	:	:	:	:	:
ES	:	:	:	:	:	:	:	:	:	:	:	:	:
FR	:	:	:	:	:	:	:	:	:	:	:	:	:
IE	1.7	0.9	2.1	0.3	:	:	2.2	0.0	:	2.1	3.3	10.6	0.3
IT	:	:	:	:	:	:	:	:	:	:	:	:	:
CY	0.3	0.3	0.0	0.0	1.8	3.8	2.1	0.0	0.3	:	:	1.7	0.3
LV	0.2	0.0	:	0.0	:	:	:	:	:	:	1.8	0.2	1.5
LT	1.8	0.3	:	:	:	:	:	:	:	:	0.3	:	0.0
LU	:	:	:	:	:	:	:	:	:	:	:	:	:
HU	1.5	0.2	0.1	0.1	4.2	7.2	3.0	0.1	0.6	0.3	0.5	1.4	0.4
MT	:	:	:	:	:	:	:	:	:	:	:	:	:
NL	:	:	:	:	:	:	:	:	:	:	:	:	:
AT	:	:	:	:	:	:	:	:	:	:	:	:	:
PL	0.9	:	0.4	0.1	1.2	4.0	2.6	0.3	:	0.2	0.1	0.1 p	0.0
PT	0.9	0.2	0.2	0.5	1.5	:	:	0.4	:	0.8	1.3	4.3	1.2
SI	4.0	0.8	:	0.2	:	17.1	8.9	0.0	5.8	1.3	2.4	0.1	0.6
SK	1.2	0.1	0.1	:	:	:	:	:	:	:	2.7	0.6	0.5
FI	8.8	2.3	1.9	1.4	10.1	:	:	1.4	:	3.4	5.1	11.5	1.9
SE	:	:	:	:	:	:	:	:	:	:	:	:	:
UK	:	:	:	:	:	:	:	:	:	:	:	:	:
NO	:	:	:	:	:	:	:	:	:	:	:	:	:
CH	:	:	:	:	:	:	:	:	:	:	3.3	:	0.6
BG	0.5	0.0	0.0	0.0	:	4.3	1.4	:	:	:	0.7	0.3	1.0
RO	1.2	0.1	0.1	0.1	3.0	:	:	0.0	0.2	0.1	0.3	0.9	0.1

* BE, CZ, IE, LV, LT, PT: 2001; PL, CH: 2000

° DG244+DL30+DL32+DL33+DM353

¹ DG24+DK29+DL30+DL31+DL32+DL33+DM34+DM352+DM353+DM354+DM355

² I642 (instead of I64)+K72+K73

³ I (instead of I61+I62+I64)+K

In France, 70 % of BES researchers worked for a company employing more than 500 people

R&D activities are often considered a catalyst for economic growth as they comprise creative work undertaken on a systematic basis in order to increase the stock of knowledge and the use of this stock of knowledge to devise new applications. Along with R&D expenditure, the number of R&D personnel is one of the most basic R&D input indicators

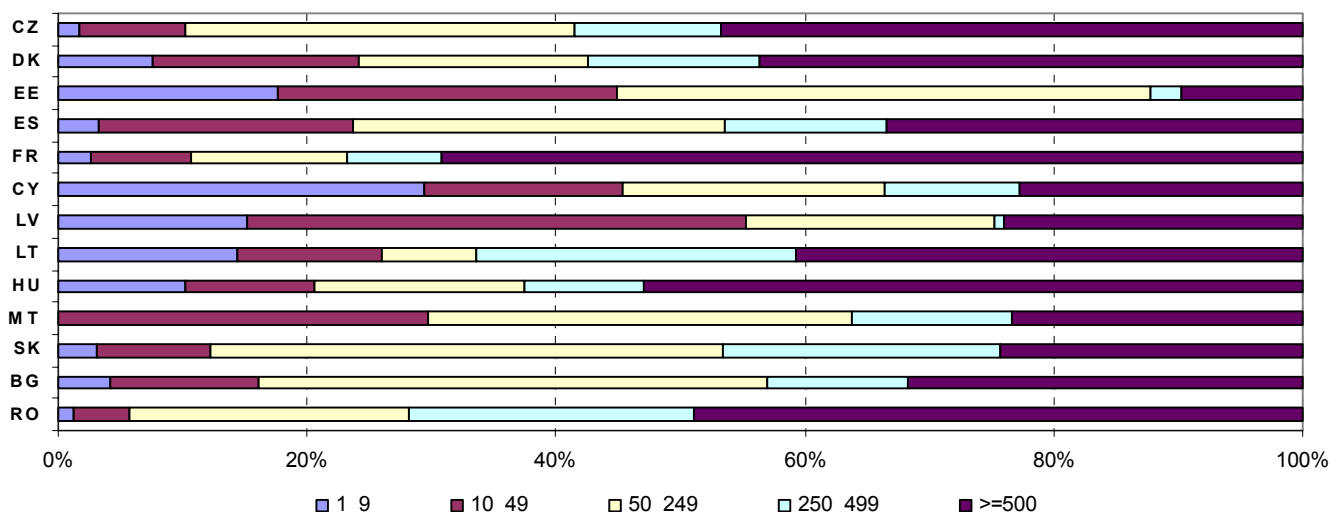
Table 4 shows the distribution of R&D personnel in the Business Enterprise Sector in a selected number of industries and the percentage of female R&D personnel. Among the various industries considered, approximately 20 % to 30 % of personnel in the **Manufacturing sector (NACE D)** were female,

although some countries such as Bulgaria, Lithuania, or Latvia stood out with very much higher percentages (58 %, 50 % and 49 % respectively). In the **Services sector (NACE G_to_K)**, most of the countries whose data are available had a female share of R&D personnel of around 30 %, except for Belgium, with 14 % and Latvia with 58 %. The share of females was more significant in the **Research and development industry (NACE 73)** than in the other sectors considered, especially in countries such as France (50 %), Bulgaria (47 %) or Croatia (46 %).

Table 4: R&D personnel in the Business Enterprise Sector in a selected number of industries in 2002, in head counts, and percentage of females

	Mining and quarrying (NACE C)		Manufacturing (NACE D)		Electricity, gas and water supply (NACE E)		Services (NACE G_to_K)		Wholesale and commission trade (NACE G)		Transport and communication (NACE I)		Financial intermediation (NACE J)		Computer activities (NACE K72)		Research and development (NACE K73)		Architectural, engineering and other technical activities (NACE K742-K743)	
	Total headcount	% of females	Total headcount	% of females	Total headcount	% of females	Total headcount	% of females	Total headcount	% of females	Total headcount	% of females	Total headcount	% of females	Total headcount	% of females	Total headcount	% of females	Total headcount	% of females
BE	64 p	36 p	30 952 p	24 p	299 p	14 p	9 410 p	14 p	678 p	17 p	671 p	11 p	589 p	12 p	2 959 p	16 p	112 p	32 p	:	:
CZ	39	36	11 969	20	33	30	9 910	36	445	23	349	28	17	6	1 109	19	4 990	39	606	20
DK	:	:	19 114 b	34 b	146 b	21 b	18 346 b	30 b	1 867 b	32 b	1 095 b	21 b	2 403 b	:	5 263 b	27 b	:	:	:	:
EE	:	:	465	29	56	50	643	30	27	4	53	66	:	:	240	17	84	43	215	31
ES	156	17	43 030	23	576	22	28 353	32	1 613	30	1 720	23	1 424	27	6 718	25	9 419	39	4 757	27
FR	913	19	140 355	21	3 186	32	52 851	31	2 390	24	7 799	:	261	:	10 391	16	18 521	50	9 484	18
CY	0	0	219	35	4	0	255	33	12	33	35	17	13	38	63	35	0	0	67	28
LV	:	:	354	49	:	:	1 981	58	8	50	:	:	:	:	55	44	562	37	:	:
LT	15	53	385	50	4	25	149	36	:	:	2	:	:	:	5	40	136	37	:	:
HU	3	:	6 386	39	188	46	2 439	29	516	16	331	25	10	:	380	21	101	35	681	33
PL	447	:	9 132	:	156	:	1 287	:	8	:	355	:	:	:	:	:	485	:	:	:
SI	62	19	4 439	35	0	0	822	32	35	17	0	0	0	0	6	17	537	34	151	21
SK	0	0	2 458	:	139	:	2 101	:	:	:	:	:	0	0	66	:	1 593	:	310	:
FI	53	43	28 181	23	238	11	10 014	20	688	32	1 322	19	:	:	4 101	13	1 817	38	:	:
NO	792	:	9 744	:	172	:	10 596	:	673	:	801	:	454	:	3 400	:	3 106	:	:	:
BG	:	:	656	58	:	:	:	:	:	:	:	:	0	:	7	43	460	47	187	35
HR	812	:	:	:	12	25	:	:	:	:	20	30	:	:	:	:	1 669	46	:	:
RO	1 200	49	12 681	45	289	47	:	:	:	:	169	47	:	:	282	42	533	36	:	:
TR	99	27	6 846	20	37	14	1 830	31	3	33	454	24	360	39	881	31	:	:	116	31

Figure 2: Researchers in the Business Enterprise Sector by size class, in full-time equivalent, in 2002

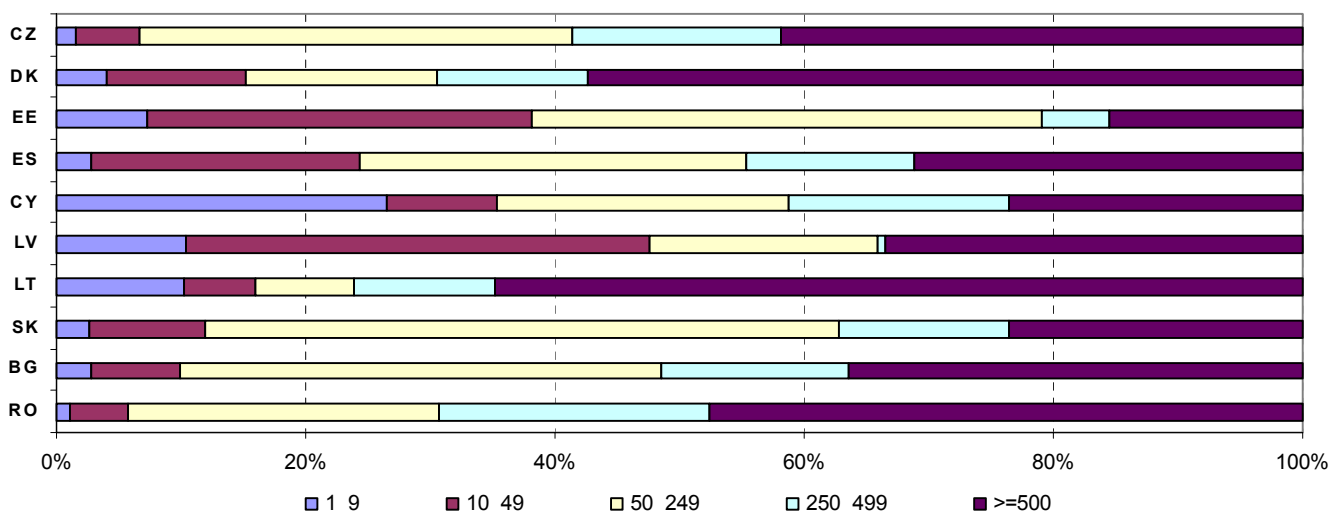


Figures 2 and 3 present the breakdown of researchers and female researchers in the Business Enterprise Sector in 2002. Figure 2 shows that there are some countries where the bulk of BES researchers work in companies of more than 250 employees. On the other hand, in a few countries BES researchers are mainly employed in small companies. In France, Romania, and Lithuania, approximately 75 %, 70 %, and 65 % respectively of BES researchers worked in companies of more than 250 employees. In Estonia, Cyprus and Latvia, 90 %, 80 % and 75 % respectively of researchers were employed in companies with less than 250 employees. In Cyprus, about 30 % of researchers had a job in companies of less than 9 employees.

This may be due to the fact that enterprises tend to be smaller in less populated countries such as Estonia or Latvia, and larger in more populated countries such as France.

Moreover, female researchers often worked in larger companies, as shown in figure 3. Indeed, in Lithuania, 65 % of female researchers were active in companies with more than 500 employees, although, as shown in figure 2, only 40 % of all researchers were employed in companies with more than 500 employees. The same applies to Denmark, Latvia, Belgium and Cyprus, where the share of female researchers in larger companies was clearly higher than the share of total researchers.

Figure 3: Female Researchers in the Business Enterprise Sector by size class, in full-time equivalent, in 2002



➤ ESSENTIAL INFORMATION – METHODOLOGICAL NOTES

INSTITUTIONAL CLASSIFICATIONS

Intramural R&D expenditure and R&D personnel may be broken down with reference to the four institutional sectors in which the R&D takes place or is funded from.

- **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 and 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.

Selected industries are broken down according to NACE rev. 1.1

- **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 PNP's 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.

- **Abroad-ABR**

All institutions and individuals located outside the political borders of a country, except vehicles, ships, aircraft and space satellites operated by domestic entities and testing grounds acquired by such entities.

All international organisations (except business enterprises), including facilities and operations within the country's borders. *Frascati Manual*, § 229

INDICATORS

- **R&D intensity**

R&D intensity represents the R&D expenditure as a percentage of GDP.

- **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.

- **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 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

HIGH-TECH CLASSIFICATION OF MANUFACTURING INDUSTRIES

Eurostat and OECD use the following breakdown of manufacturing industry according to global technological intensity and based on NACE rev. 1.1 at 3-digit level (Please note that in LFS-based reports, due to restrictions of the data source, Eurostat also uses a different but derived classification based on NACE at 2-digit level):

High-technology	Aerospace (35.3); Pharmaceuticals (24.4); Computers, office machinery (30); Electronics-communications (32); Scientific instruments (33)
Medium-high-technology	Electrical machinery (31); Motor vehicles (34); Chemicals - excl. pharmaceuticals (24 excl. 24.4); Other transport equipment (35.2+35.4+35.5); Non-electrical machinery (29)
Medium-low-technology	Coke, refined petroleum products and nuclear fuel (23); Rubber and plastic products (25); Non metallic mineral products (26); Shipbuilding (35.1); Basic metals (27); fabricated metal products (28)
Low-technology	Other manufacturing and recycling (36+37); Wood, pulp, paper products, printing and publishing (20+21+22); Food, beverages and tobacco (15+16); Textile and clothing (17+18+19)

CLASSIFICATION OF KNOWLEDGE INTENSIVE SERVICES (KIS)

Following a similar logic as for manufacturing, Eurostat defines the following sectors as knowledge-intensive services (KIS):

Knowledge-intensive high-tech services	Post and Telecommunications (64); Computer and related activities (72); Research and development (73)
Knowledge-intensive market services (excl. financial intermediation and high-tech services)	Water transport (61); Air transport (62); Real estate activities (70); Renting of machinery and equipment without operator, and of personal and household goods (71); Other business activities (74)
Knowledge-intensive financial services	Financial intermediation, except insurance and pension funding (65); Insurance and pension funding, except compulsory social security (66); Activities auxiliary to financial intermediation (67)
Other knowledge-intensive services	Education (80); Health and social work (85); Recreational, cultural and sporting activities (92)

SYMBOLS

:	not available	b: break in series
e :	estimated value	r: revised estimate
p :	provisional value	s: Eurostat value

SOURCE

The source of the figures presented in this publication is Eurostat (unless stated otherwise) and reflects the **state of data availability** in Eurostat's reference database NewCronos as at December 2004.

Further information:

➤ **Databases**

[EUROSTAT Web site/Science and technology/Research and development/Statistics on research and development/R&D personnel](#)

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This document has been produced in collaboration with Grégory Czerwinski.

ORIGINAL TEXT: English