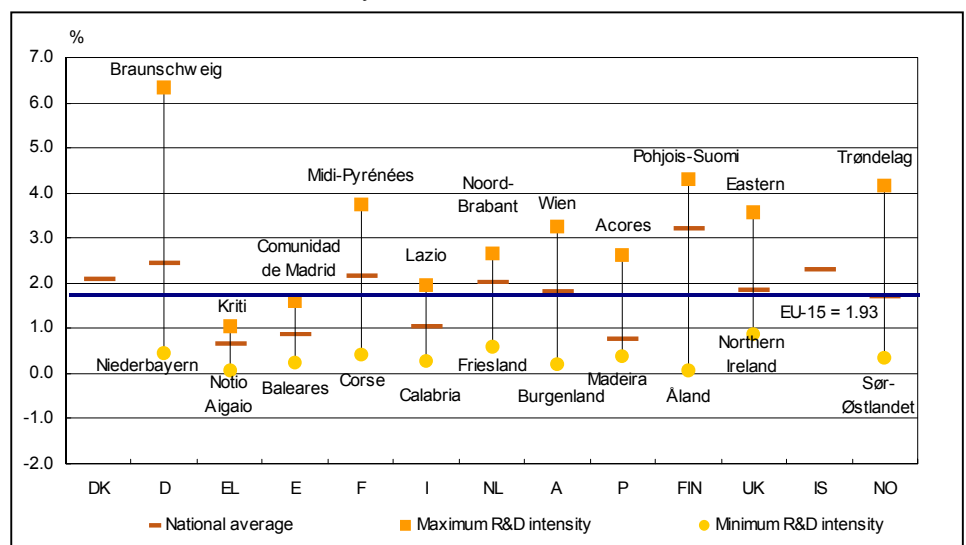


R&D expenditure and personnel in European regions — 1997-99

Simona Frank

German regions lead in R&D intensity, Nordic regions ahead in R&D personnel

Figure 1: Regional R&D expenditure disparities in Europe as a % of GDP for all sectors — 1999



Methodological notes

Exceptions to the 1999 reference year: A — 1998; NO — 1997.

All regional data are at NUTS level 2 except for UK where data are at NUTS level 1.

Source: Eurostat.

- Of the top ten European regions with the highest R&D expenditure as a proportion of GDP, five regions come from Germany, two regions from Finland and one each from France, Norway and the UK. The German regions of Braunschweig, Stuttgart and Oberbayern top this list with an R&D intensity of 6.34 %, 4.84 % and 4.76 % respectively — Table 3.
- The leading regions of most of the European countries have an R&D intensity above the European average of 1.93 %. The top regions of Greece and Spain lie below this level, namely Kriti (1.03 %) and Comunidad de Madrid (1.62 %) respectively — Figure 1.
- Comparing the absolute R&D expenditure across the European regions, Île de France takes the lead with a high of EUR 13.4 billion. This is double the amount spent by the next highest spending regions which are Oberbayern (D): EUR 6.55 billion and Stuttgart (D): EUR 5.64 billion — Table 4.
- The total R&D expenditure at current values for the EEA countries in 1999 was EUR 156.9 billion. This was spent in 219 regions at NUTS 2 level, with half the expenditure concentrated in 31 regions alone — Table 1.
- In 1999, five of the ten leading regions in terms of the proportion of R&D personnel in the labour force were from the Nordic countries. The top two regions were Uusimaa-Suurlue (FIN) and Stockholm (S) with figures of 3.90 % and 3.72 % respectively for the sectors as a whole — Table 6.

Statistics
in focus

SCIENCE AND
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THEME 9 – 2/2003

Contents

R&D expenditure in
the European regions 2

R&D personnel in
the European regions 6



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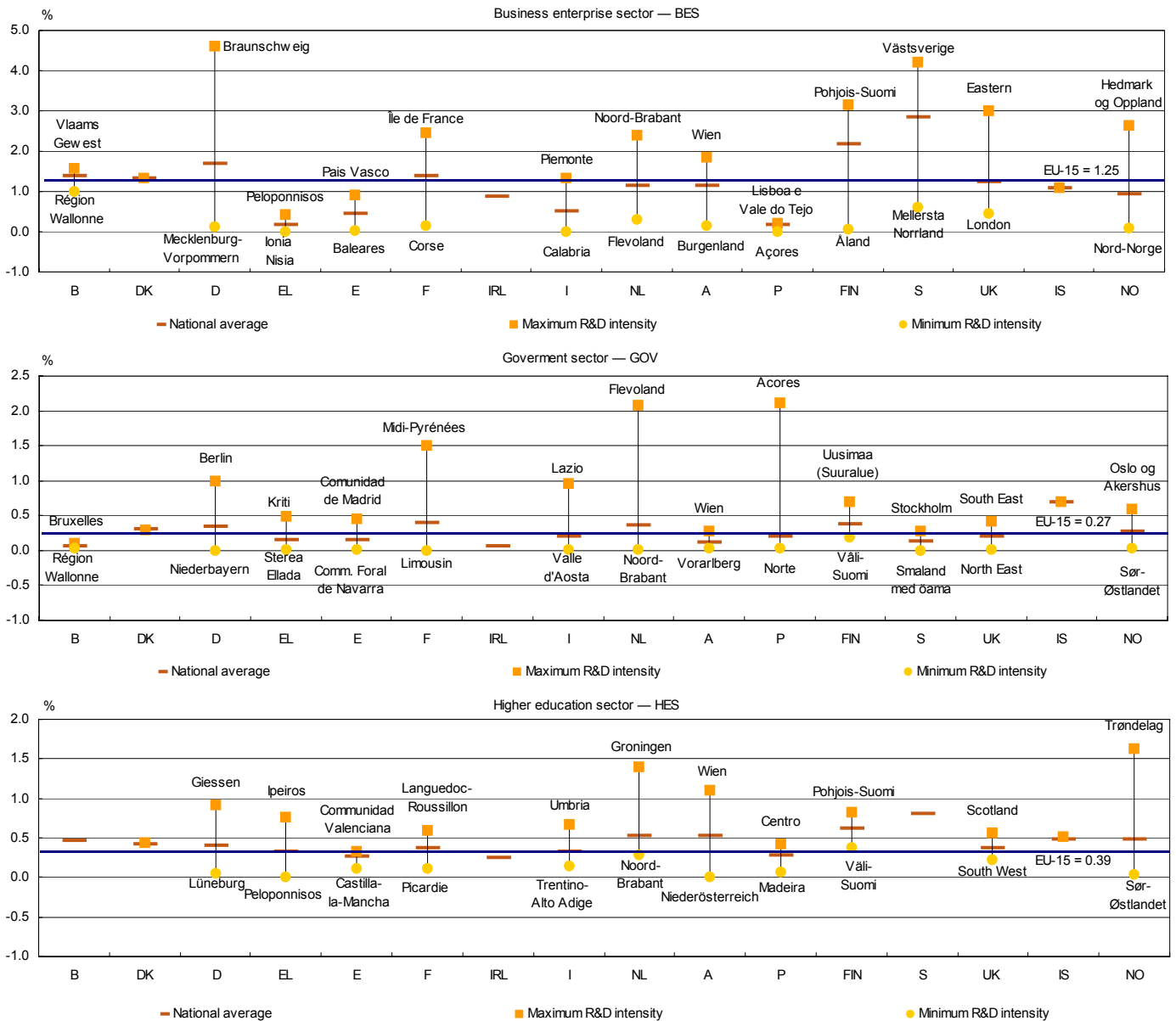
R&D expenditure in the European regions

The proportion of GDP allocated to R&D expenditure varies widely across the European regions. From Figure 1, considering the top regions by country in terms of R&D intensity, Braunschweig (D) leads with 6.84 %, followed by Pohjois-Suomi (FIN) with 4.29 %, Trøndelag (NO) with 4.18 % and Midi-Pyrénées (F) with 3.73 %.

Figure 1 shows the regional R&D expenditure disparities as a proportion of GDP for the total of the sectors across Europe. This shows that with the exception of Greece and Spain, the high expenditure regions in each country lie above the European average of 1.93 %. Among the low expenditure regions, Northern Ireland (UK) — at NUTS 1 level — is the highest with an R&D intensity of 0.88 %.

Figure 2 shows the highest and lowest R&D intensity by country for each institutional sector. For the business enterprise sector (BES), Braunschweig (D) again leads with 4.60 %, closely followed by Västsverige (S) with 4.22 % both over three times the European average of 1.25 % for this sector. Other high intensities occur in Pohjois-Suomi (FIN) and Eastern (UK) with just over 3 % each. The highest intensity regions of Greece, Spain and Portugal fall below the European average. In the government sector (GOV), a maximum R&D intensity of over 2 % is reached by Flevoland (NL) and Açores (P), while in the higher education sector (HES) a lower figure of about 1.6 % is reached by Trøndelag (NO) followed by Groningen (NL) with 1.40 %. Only the German regions remain within the top four R&D intensities in each sector.

Figure 2: Regional R&D expenditure disparities in Europe (as a % of GDP) — 1999



Methodological notes

Exceptions to the 1999 reference year: A — 1998 for all three sectors; NO — 1997; UK — 2000 for HES only. UK data are at NUTS level 1.

Source: Eurostat

Table 1: R&D expenditure concentration in EEA regions
in current ECU/EUR by institutional sectors — 1999

	Number of regions per quartile of R&D expenditure				Total R&D expenditure for EEA In millions — 1999	% of R&D expenditure not broken down by region
	Q 1	Q 2	Q 3	1		
All sectors	8	31	:	:	160 248	28
Business enterprise — BES	6	23	94	:	103 669	22
Government — GOV	6	20	:	:	22 207	26
Higher education — HES	13	45	:	:	33 298	28

Methodological notes
 Exceptions to the 1999 reference year: A — 1998. Total expenditure = EEA 1999 + A 1998.
 No NUTS 2 data are available for B, IRL and UK. In HES, no NUTS 2 level are available for S. Source: Eurostat.

Table 1 shows that during 1999, from a total of 219 European regions and in all the sectors combined, eight regions alone accounted for 25 % of total R&D expenditure and 31 regions accounted for 50 % of this expenditure.

A breakdown of this figure by sector shows that in both the BES and GOV sectors, half of the R&D expenditure is concentrated in some 20 regions, whereas in the HES sector this is spread over 45 regions.

Table 2 shows the two top and bottom regions per country ranked according to current R&D expenditure. With the exception of Germany, it can be observed that the top two regions of each country together contribute to at least 40 % of

the total national R&D expenditure. This proportion exceeds 50 % for France and Spain, and for the top two regions of Portugal and Finland it reaches some 75 % of the national R&D expenditure.

In Germany, its two leading regions of Oberbayern and Stuttgart account for only 14 % and 12 % respectively of the national R&D expenditure. As to the share of R&D expenditure in the EEA total, Île de France (F) has the highest proportion with 8.6 %, followed by Oberbayern (D) and Stuttgart (D) with approximately 4 % each, and the UK NUTS 1 regions of South-East and Eastern with 2.9 % and 3.8 % respectively. In the low R&D intensity regions, Finland stands out with its second lowest region of Itä-Suomi allocated a high of 3.9 % of the national R&D expenditure.

Table 2: Regional R&D expenditure disparities in current ECU/EUR, all sectors — NUTS 2 level — 1999

	Regions with high R&D expenditure				Regions with low R&D expenditure					
	Top regions	Current ECU/EUR			Current PPS Mio	Lowest regions	Current ECU/EUR			Current PPS Mio
		Mio	As a % of the country	As a % of the EEA			Mio	As a % of the country	As a % of the EEA	
EU-15		154 237		98	135 390					
EEA		156 871		100	137 320					
DK	Denmark — 2000	3 604	100	2.2	3 011					
D	Oberbayern	6 548	14	4.2	6 147	Trier	81	0.2	0.1	76
	Stuttgart	5 643	12	3.6	5 298	Dessau	53	0.1	0.0	49
EL	Attiki	419	53	0.3	543	Ionia Nisia	3	0.3	0.0	3
	Kentriki Makedonia	126	16	0.1	163	Notio Aigaio	2	0.3	0.0	3
E	Comunidad de Madrid — 2000	1 752	31	1.0	2 137	Baleares — 2000	35	0.6	0.0	43
	Cataluña — 2000	1 262	22	0.7	1 539	La Rioja — 2000	27	0.5	0.0	33
F	Île de France	13 426	45	8.6	12 665	Limousin	89	0.3	0.1	84
	Rhône-Alpes	2 966	10	1.9	2 798	Corse	19	0.1	0.0	18
IRL	Ireland	1 076	100	0.7	1 074					
I	Lombardia	2 658	23	1.7	3 039	Molise	14	0.1	0.0	16
	Lazio	2 228	19	1.4	2 547	Valle d'Aosta	11	0.1	0.0	12
NL	Zuid-Holland	1 732	23	1.1	1 781	Zeeland	57	0.8	0.0	59
	Noord-Brabant	1 466	19	0.9	1 508	Drenthe	54	0.7	0.0	56
A	Wien — 1998	1 639	49	1.0	1 559	Vorarlberg	75	2.0	0.1	72
	Steiermark — 1998	596	18	0.4	567	Burgenland — 1998	8	0.0	0.0	8
P	Lisboa e Vale do Tejo	437	54	0.3	631	Algarve	16	2.0	0.0	24
	Norte	169	21	0.1	244	Madeira — PT	10	1.0	0.0	14
FIN	Uusimaa -Suuralue — 2000	2 045	46	1.2	1 873	Itä-Suomi — 2000	171	3.9	0.1	157
	Etelä-Suomi — 2000	1 341	30	0.7	1 229	Aland — 2000	2	0.0	0.0	2
UK	South East — NUTS 1	6 021	24	3.8	5 597	North East	424	1.7	0.3	394
	Eastern — NUTS 1	4 595	18	2.9	4 272	Northern Ireland	266	1.1	0.2	247
IS	Iceland	188	100	0.1	164					
NO	Oslo og Akershus	1 151	47	0.7	950	Nord-Norge	115	4.7	0.1	95
	Troendelag	420	17	0.3	347	Sør-Østlandet	42	1.7	0.0	34

Table 3: Top 10 regions in terms of R&D intensity by institutional sector in the EEA countries — 1999

All sectors					
Region		As a %	Current ECU/EUR		Current
		of GDP	Mio	%	PPS Mio
EU-15		1.93	154 237	98	148 921
EEA		1.92	156 871	100	151 102
Braunschweig	D	6.34	2 484	1.6	2 332
Stuttgart	D	4.84	5 643	3.6	5 298
Oberbayern	D	4.76	6 548	4.2	6 147
Pohjois-Suomi	FIN	4.29	474	0.3	437
Tübingen	D	4.23	1 835	1.2	1 723
Trøndelag — 1997	NO	4.18	346	0.2	281
Uusimaa (Suuralue)	FIN	4.09	1 804	1.1	1 662
Midi-Pyrénées	F	3.73	1 866	1.2	1 760
Berlin	D	3.62	2 765	1.8	2 596
Eastern — NUTS 1	UK	3.56	4 595	2.9	4 272

Business enterprise sector — BES					
Region		As a %	Current ECU/EUR		Current
		of GDP	Mio	%	PPS Mio
EU-15		1.25	100 066	99	95 661
EEA		1.24	101 522	100	96 867
Braunschweig	D	4.60	1 799	1.8	1 689
Stuttgart	D	4.38	5 104	5.0	4 792
Västsvrige	S	4.22	1 685	1.7	1 413
Stockholm	S	4.10	2 483	2.4	2 082
Oberbayern	D	3.75	5 155	5.1	4 839
Tübingen	D	3.48	1 511	1.5	1 419
Pohjois-Suomi	FIN	3.14	347	0.3	319
Sydsverige	S	3.02	864	0.9	741
Eastern — NUTS 1	UK	3.01	3 885	3.8	3 611
Rheinessen-Pfalz	D	2.76	1 283	1.3	1 204

Government — GOV					
Region		As a %	Current ECU/EUR		Current
		of GDP	Mio	%	PPS Mio
EU-15		0.27	21 555	98	21 136
EEA		0.27	21 988	100	21 496
Acores — P	P	2.12	39	0.2	56
Flevoland — 1998	NL	2.08	100	0.5	104
Midi-Pyrénées	F	1.50	748	3.4	706
Berlin	D	1.00	762	3.5	715
Karlsruhe	D	0.98	724	3.3	679
Dresden	D	0.97	271	1.2	254
Braunschweig	D	0.97	379	1.7	356
Lazio	I	0.96	1 087	4.9	1 243
Languedoc-Roussillon	F	0.95	380	1.7	359
Brandenburg	D	0.78	323	1.5	303

Higher education — HES					
Region		As a %	Current ECU/EUR		Current
		of GDP	Mio	%	PPS Mio
EU-15		0.39	31 555	98	31 071
EEA		0.40	32 295	100	31 683
Trøndelag — 1997	NO	1.63	135	0.4	100
Groningen	NL	1.40	204	0.6	188
Wien — 1998	A	1.11	562	1.7	501
Giessen	D	0.91	209	0.6	178
Steiermark — 1998	A	0.91	214	0.7	190
Eastern Scotland — 2000	UK	0.83	410	1.3	362
Pohjois-Suomi	FIN	0.82	91	0.3	80
Halle	D	0.82	115	0.4	98
Inner London — 2000	UK	0.80	1 408	4.4	1 242
Utrecht	NL	0.79	262	0.8	242

Source: Eurostat.

Table 4: Top 10 regions in terms of R&D expenditure, in current ECU/EUR for all sectors and the BES in the EEA countries — 1999

All sectors				
Region		Current ECU/EUR		Constant PPS
		Mio	% of the EEA	Mio
EU-15		154 237	98	135 390
EEA		156 871	100	137 320
Île de France	F	13 426	8.6	11 860
Oberbayern	D	6 548	4.2	5 579
Stuttgart	D	5 643	3.6	4 808
Darmstadt	D	3 868	2.5	3 296
Köln	D	3 699	2.4	3 152
Denmark	DK	3 406	2.2	2 514
Rhône-Alpes	F	2 966	1.9	2 620
Berlin	D	2 765	1.8	2 356
Lombardia	I	2 658	1.7	2 675
Karlsruhe	D	2 517	1.6	2 145

Business enterprise — BES				
Region		Current ECU/EUR		Constant PPS
		Mio	% of the EEA	Mio
EU-15		100 066	99	87 049
EEA		101 522	100	88 114
Île de France	F	9 381	9.2	8 286
Oberbayern	D	5 155	5.1	4 392
Stuttgart	D	5 104	5.0	4 349
Darmstadt	D	3 383	3.3	2 883
Stockholm	S	2 483	2.4	1 947
Köln	D	2 207	2.2	1 881
Denmark	DK	2 159	2.1	1 594
Rhône-Alpes	F	2 014	2.0	1 779
Lombardia	I	1 958	1.9	1 963
Braunschweig	D	1 799	1.8	1 533

Source: Eurostat.

Table 3 ranks the top 10 regions across the EEA countries by sector in terms of the R&D intensity for 1999. One striking observation is the presence of at least four leading German regions (mainly Braunschweig) in the overall, BES and GOV institutional sectors.

Combining all sectors, the leading regions, other than five from Germany, consist of two from Finland and one each from Norway, France and the UK. The three regions with the highest intensity are Braunschweig (6.34 %), Stuttgart (4.84 %) and Oberbayern (4.76 %).

For the BES, Braunschweig and Stuttgart lead in R&D intensity with 4.60 % and 4.38 % respectively. They are closely followed by two Swedish regions of Väsverige and Stockholm with intensities of 4.22 % and 4.10 % respectively. The top ten regions in this sector are at least twice the corresponding EU average of 1.25 %.

In the sectors of GOV and HES, the average R&D intensity for the EU are 0.27 % and 0.39 % respectively. The regions of Acores (P) and Flevoland (NL) lead in the GOV sector with an

intensity of 2.12 % and 2.08 %, although in absolute terms their expenditure values are much less than in other European regions. Other than five German regions in this top ten for GOV, two regions come from Italy and one from France. Norway is first in the HES with an intensity of 1.63 %. The remaining regions in this top ten category are from Netherlands, Austria, Germany, Finland and the UK.

Table 4 ranks the top ten European regions by current R&D expenditure for 1999 for the overall and the business sector. Île de France (F) is by far the highest with about twice the R&D expenditure of the next region Oberbayern (D) which follows. Six German regions are in the top ten for the absolute R&D expenditure; other countries included in this ranking are Denmark (NUTS 2 level) and Italy.

Table 5 below lists for each EEA country the two regions which had the highest annual average growth rate (AAGR) in R&D expenditure between 1997 and 1999. For all sectors, the top region of each country (except DK, IRL and NO) showed AAGRs which varied between 13 % (A) and 63 % (EL).

Table 5: Annual average growth rate in % of R&D expenditure — 1995 ECU/EUR constant prices for the two most R&D dynamic regions per country — by institutional sectors — 1997-99

	All sectors	Business enterprise sector — BES	Government sector — GOV	Higher education sector — HES
EU-15	4.6	5.8	1.7	3.1
EEA	4.6	5.7	1.7	3.1
B		Vlaams Gewest — NUTS 1 2 Région Wallonne — NUTS 1 0	Vlaams Gewest — NUTS 1 2 Région Wallonne — NUTS 1 0	
DK	Denmark 6	Denmark 8	Denmark 5	Denmark 1
D	Oberpfalz 29 Koblenz 28	Oberpfalz 44 Braunschweig 32	Brandenburg 16 Mecklenburg-Vorpommern 16	Koblenz 10 Halle 9
EL	Peloponnisis 63 Dytiki Ellada 25	Anatoliki Makedonia 34 Notio Aigaio 32	Attiki 23 Ionia Nisia 13	Stereia Ellada 75 Thessalia 71
E	Aragon 22 Comunidad Foral de Navarra 18	Aragon 34 Cantabria 32	Aragon 24 Murcia 19	La Rioja 11 Castilla-la Mancha 9
F	Corse 24 Basse-Normandie 11	Basse-Normandie 17 Haute-Normandie 10	Basse-Normandie 63 Languedoc-Roussillon 15	Corse 8 Picardie 6
IRL	Ireland 6	Ireland 8	Ireland -6	Ireland — 1996-98 8
I	Basilicata 30 Trentino-Alto Adige 8	Basilicata 70 Calabria 35	Basilicata 71 Puglia 20	Molise 14 Basilicata 10
NL	Zeeland 53 Noord-Holland 8	Zeeland 70 Noord-Holland 15	Limburg — NL 15 Groningen 10	Limburg — NL 13 Groningen 5
A	Kaernten — 1989-98 13 Steiermark — 1989-98 7	Kaernten — 1989-98 17 Steiermark — 1989-98 7	Salzburg — 1989-98 12 Oberösterreich — 1989-98 5	Niederösterreich — 1989-98 16 Steiermark — 1989-98 7
P	Algarve 29 Norte 17	Acores — PT 37 Norte 30	Centro — P 40 Lisboa e Vale do Tejo 14	Acores — PT 29 Algarve 24
FIN	Pohjois-Suomi 21 Åland 20	Åland 70 Pohjois-Suomi 25	Väli-Suomi 42 Itä-Suomi 13	Uusimaa (Suuralue) 17 Pohjois-Suomi 13
S		Sydsverige 10 Stockholm 8		
UK	Wales — NUTS 1 20 North West — NUTS 1 8	Wales — NUTS 1 30 North West — NUTS 1 10	Wales — NUTS 1 33 South West — NUTS 1 2	Northern Ireland — NUTS 1 8 East Midlands — NUTS 1 7
IS	Iceland 18	Iceland 26	Iceland 19	Iceland 1
NO	Trøndelag 9 Nord-Norge 4	Nord-Norge 23 Trøndelag 12	Agder og Rogaland 10 Hedmark og Oppland 0	Sør-Østlandet 16 Hedmark og Oppland 11

Methodological notes

Regions with very high AAGR — more than 75 % — have not been included in the ranking.

These are — name of the region (country, AAGR):

- All sectors: Valle d'Aosta (I, 120 %); Acores — PT (P, 129 %).
- BES: Peloponnisis (EL, 126 %); Baleares (E, 142 %); Extremadura (E, 113 %); Corse (F, 134 %); Valle d'Aosta (I, 164 %); Algarve (P, 93 %).
- GOV: Dessau (D, 157 %); Dytiki Ellada (EL, 107 %); Acores (P, 234 %).

UK: North West includes Merseyside.

Source: Eurostat.

R&D personnel in the European regions

In 1999, five leading regions in terms of the proportion of R&D personnel in the labour force were from the Nordic countries. At the top were Uusimaa Suuralue (FIN) and Stockholm (S) with 3.90 % and 3.72 % respectively of R&D personnel for all sectors combined.

Five German regions are among those with the highest shares of R&D personnel working in the BES and GOV sectors in Europe. In the HES, seven of the top 10 regions come from Sweden and Greece.

Table 6 below shows that R&D personnel represented 1.37 % of the labour force in EEA countries in 1999. Across all sectors, most of the regions with the highest shares of R&D researchers in Europe were from Finland, Sweden and Germany. As in the case of R&D expenditure, the German regions are a majority among the top 10 with the highest shares of R&D personnel working in the BES and GOV sectors. However in the HES, the lead is taken by Swedish and Greek regions which together make up seven of the top 10 regions. A close look at the individual sectors shows that the number of R&D personnel, in thousand, in the EEA labour force is highest in the BES (1 107) and HES (924) and much less in the GOV sector (330).

In all sectors combined, the Finnish region of Uusimaa (Suuralue) has the highest percentage (3.90 %) of R&D personnel in the labour force. This is nearly three times the

average proportion for that sector. Stockholm (S) and Oberbayern (D) follow closely behind each with a relative proportion of 3.72 %. Wien (A) and Île de France (F) are also among the top ten regions with 3.14 % and 2.94 % respectively of R&D personnel in the labour force.

In the BES sector, the regions of Germany, Finland and Sweden make up nine of the top ten regions. Oberbayern (D) and Stuttgart (D) lead with 2.35 % and 2.26 % respectively of the total labour force working in R&D in this sector. This is nearly four times the average proportion for that sector. Île de France (F) has the tenth highest percentage (1.55 %) of R&D personnel in the labour force in the BES sector.

Germany dominates again in the GOV sector, being represented by five of the ten leading regions. However Uusimaa (Suuralue) in Finland has the highest proportion of 0.88 % of R&D personnel in its labour force, followed by Braunschweig (D) and Iceland each with 0.81 %.

In the HES sector, Sweden and Greece stand out with four and three regions respectively among the topmost ten. The highest are Övre Norrland (S) and Kentriki Makedonia (EL) with 2.25 % and 1.96 % respectively. Groningen (NL — 1.49 %), Wien (A — 1.46 %) and Comunidad de Madrid (E — 1.17 %) are the three other regions in this top ten ranking.

Table 6: Top 10 regions in terms of R&D personnel as a % of labour force by institutional sectors in the EEA countries — 1999

All sectors					Business enterprises sector — BES				
Region		In % of the labour force	In head count		Region		In % of the labour force	In head count	
			Thousand	% of EEA				Thousand	% of EEA
EU-15		1.36	2 339	98	EU-15		0.63	1 088	98
EEA		1.37	2 387	100	EEA		0.64	1 107	100
Uusimaa (Suuralue)	FIN	3.90	29.8	1.2	Oberbayern— 1997	D	2.35	48.3	4.4
Stockholm	S	3.72	32.4	1.4	Stuttgart — 1997	D	2.26	43.5	3.9
Oberbayern — 1997	D	3.72	76.4	3.2	Uusimaa (Suuralue)	FIN	2.00	15.3	1.4
Braunschweig — 1997	D	3.42	25.7	1.1	Stockholm	S	1.91	16.6	1.5
Wien — 1998	A	3.14	25.3	1.1	Tübingen — 1997	D	1.66	13.9	1.3
Stuttgart — 1997	D	3.04	58.5	2.5	Braunschweig — 1997	D	1.64	12.3	1.1
Île de France — 1998	F	2.94	157.2	6.6	Västssverige	S	1.64	14.2	1.3
Övre Norrland	S	2.83	7.8	0.3	Darmstadt — 1997	D	1.60	28.8	2.6
Pohjois-Suomi	FIN	2.73	20.7	0.9	Pohjois-Suomi	FIN	1.56	4.3	0.4
Östra Mellansverige	S	2.70	4.2	0.2	Île de France — 1998	F	1.55	83.0	7.5

Government sector — GOV					Higher education sector — HES				
Region		In % of the labour force	In head count		Region		In % of the labour force	In head count	
			Thousand	% of EEA				Thousand	% of EEA
EU-15		0.19	322	98	EU-15		0.53	902	98
EEA		0.19	330	100	EEA		0.53	924	100
Uusimaa (Suuralue)	FIN	0.88	6.7	2.0	Övre Norrland	S	2.25	5.4	0.6
Braunschweig — 1998	D	0.81	6.3	1.9	Kentriki Makedonia	EL	1.96	15.0	1.6
Iceland	IS	0.81	1.2	0.4	Ipeiros	EL	1.86	2.2	0.2
Karlsruhe — 1998	D	0.73	9.3	2.8	Östra Mellansverige	S	1.62	12.2	1.3
Lazio — 1998	I	0.73	15.4	4.7	Stockholm	S	1.49	13.0	1.4
Köln — 1998	D	0.66	12.6	3.8	Groningen — 1998	NL	1.49	3.9	0.4
Berlin — 1998	D	0.64	11.2	3.4	Wien — 1998	A	1.46	11.8	1.3
Comunidad de Madrid	E	0.59	13.1	4.0	Dytiki Ellada	EL	1.42	3.6	0.4
Oberbayern — 1998	D	0.56	11.5	3.5	Sydsverige	S	1.39	8.6	0.9
Wien — 1998	A	0.47	3.8	1.2	Comunidad de Madrid	E	1.17	25.9	2.8

Source: Eurostat

➤ ESSENTIAL INFORMATION – METHODOLOGICAL NOTES

Research and development input indicators:

R&D expenditure and R&D personnel

The definitions of R&D personnel and R&D expenditure are taken from *the Frascati Manual* and the *Regional Manual*.

• R&D expenditure

Intramural expenditure are all expenditure for R&D performed within a statistical unit or sector of the economy, whatever the source of funds. Expenditure made outside the statistical unit or sector but in support of intramural R&D (e.g. purchase of supplies for R&D) are included. Both current and capital expenditure are included.

Regional intramural expenditure are all expenditure for R&D performed within a statistical unit or a sector in a region, whatever the source of funds is.

• 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 an indirect service, such as canteen and security staff, should be excluded, even though their wages and salaries are included as an overhead cost in the measurement of expenditure.

Adjusted to regional purpose, the definition of R&D personnel gives: all persons employed directly on R&D in a region should be counted.

⇒ Full-time equivalent — FTE: 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.

⇒ Personnel in head count — HC: The number of individuals who are employed mainly or partly on R&D. For purposes of comparison between different regions and periods, this indicator is often used in conjunction with employment or population variables.

R&D personnel as a percentage of the labour force is calculated in head count.

Institutional classifications

Internal expenditure and R&D personnel are broken down by institutional sector, i.e. the sector in which the R&D is performed. There are four main sectors: business enterprise, government, higher education and private non-profit institutions.

The business enterprise sector — BES

With regard to R&D, the business enterprise sector includes — *Frascati Manual*, § 145: 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 institutes mainly serving them.

The government sector — GOV

In the field of R&D, the government sector includes — *Frascati Manual*, § 168: 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); and PNP controlled and mainly financed by government.

The higher education sector — HES

This sector is composed of — *Frascati Manual*, § 190: all universities, colleges of technology and other institutes of post-secondary education, whatever their source of finance or legal status is.

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.

The private non-profit sector — PNP

The field covered by this sector includes — *Frascati Manual*, § 178: Non-market, private non-profit institutions serving households (i.e. the general public); and private individuals or households.

Nomenclature of territorial units for statistics — NUTS

The Nomenclature of Territorial Units for Statistics — NUTS — was established by the Statistical Office of the European Communities, in co-operation with the Commission's other departments, 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.

Time series

Measurements in current ECU / EUR are obtained by applying the average exchange rate for the year in question. Data measured in constant 1995 ECU/EUR are first corrected for inflation using the GDP deflator — a Paasche index with 1995 = 100 as a base — of the country in question before applying the 1995 ECU/EUR exchange rate. The GDP deflator in general conforms to the 1995 European System of Accounts (ESA 95), available on NewCronos, Theme 2. Where the series was incomplete, the adjusted GDP deflator from ESA 79 was used. Appropriate caution should be employed when interpreting the results in such cases.

As with the GDP deflator, time series on GDP are built up using the two systems of European accounts.

Purchasing Power Standards — PPS

Purchasing power parities are based on comparisons of the prices of representative and comparable goods or services in different countries or in different currencies on a specific date. As a result, financial aggregates are expressed in purchasing power standards — PPS — rather than ECU/EUR based on exchange rates. The calculations are based on current purchasing power standards.

R&D intensity

R&D intensity corresponds to R&D expenditure as a percentage of GDP. The unit is current EUR. Some methodological changes occurred this year for the calculation of R&D intensity. Previously the GDP from Theme 1 and including both regional and national level data was used as a priority. Now, the GDP from national account data serves for the computation of the R&D intensity at the national level and the GDP from the regional account data is used at the regional level. As it is mentioned for the GDP deflator, GDP ESA 1995 data, were supplemented with ESA 79 data where necessary. More information is available on NewCronos Theme 9.

EU totals

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

Bibliography

- *The Regional Dimension of R&D and Innovation Statistics and Experimental Development — Regional Manual*, European Commission, 1996.
- *Proposed Standard Practice for Surveys of Research and Development — Frascati Manual*, OECD, 1994.

Further information:

➤ Reference publications

Title Statistics on Science and Technology – 2002 edition (fortcoming)
Catalogue No. KS-CT-02-001-EN-C Price EUR 29.50

➤ Databases

New Cronos, Domain RD_Ex_P

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