

Financiamento da Ciência



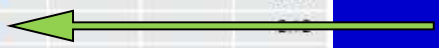
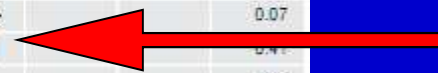
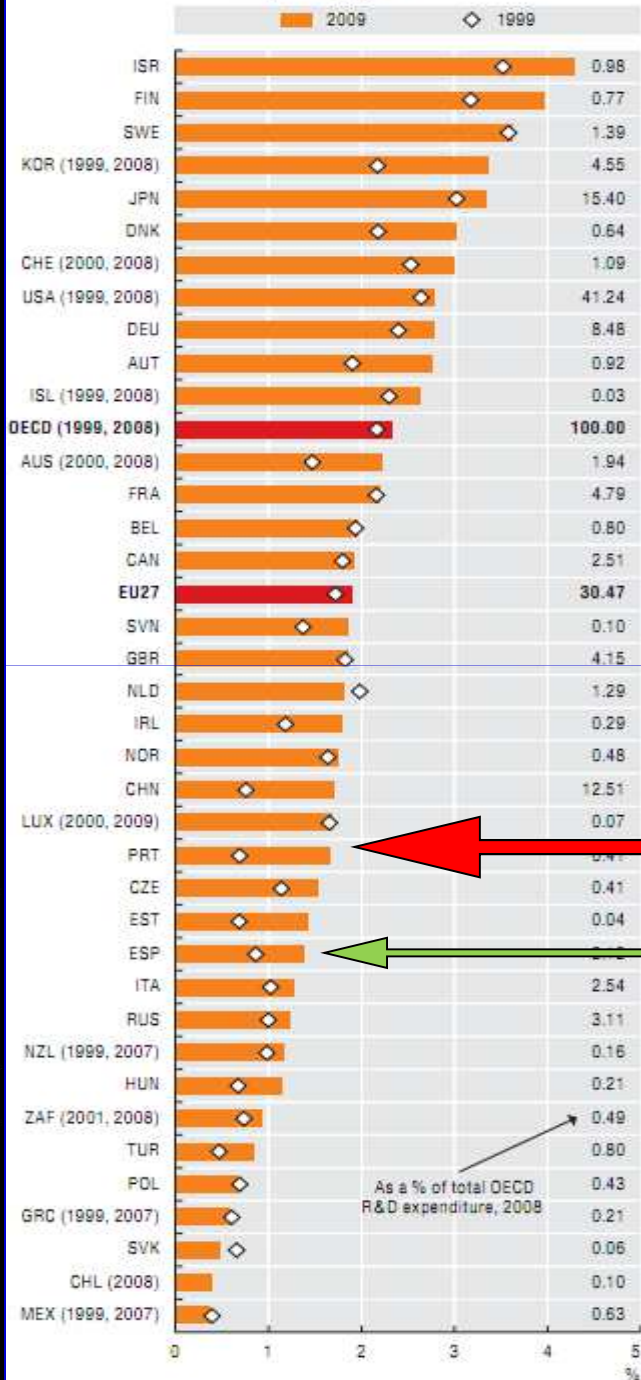
U. PORTO

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Universidade do Porto (Portugal)
<http://www.fc.up.pt/pessoas/jfgomes>

Porto, 29 Setembro 2011

Gross domestic expenditure on R&D, 1999 and 2009

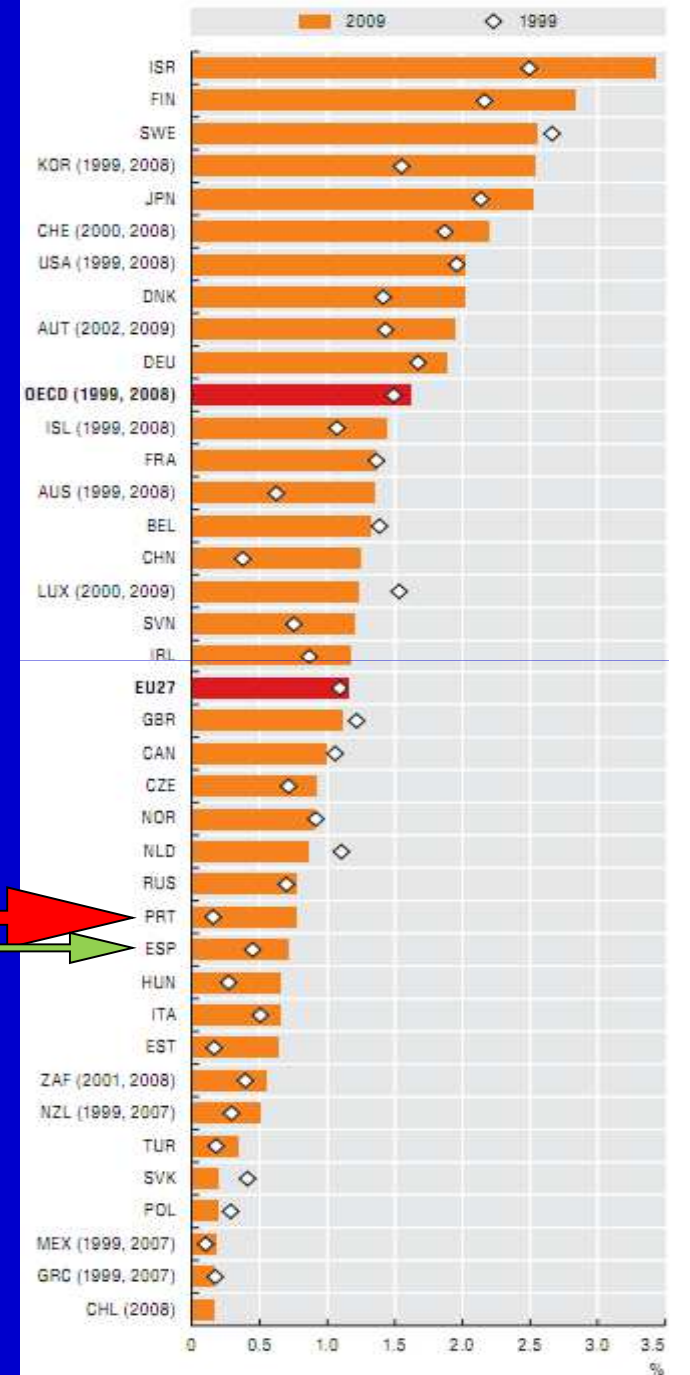
As a percentage of GDP



As a % of total OECD R&D expenditure, 2008

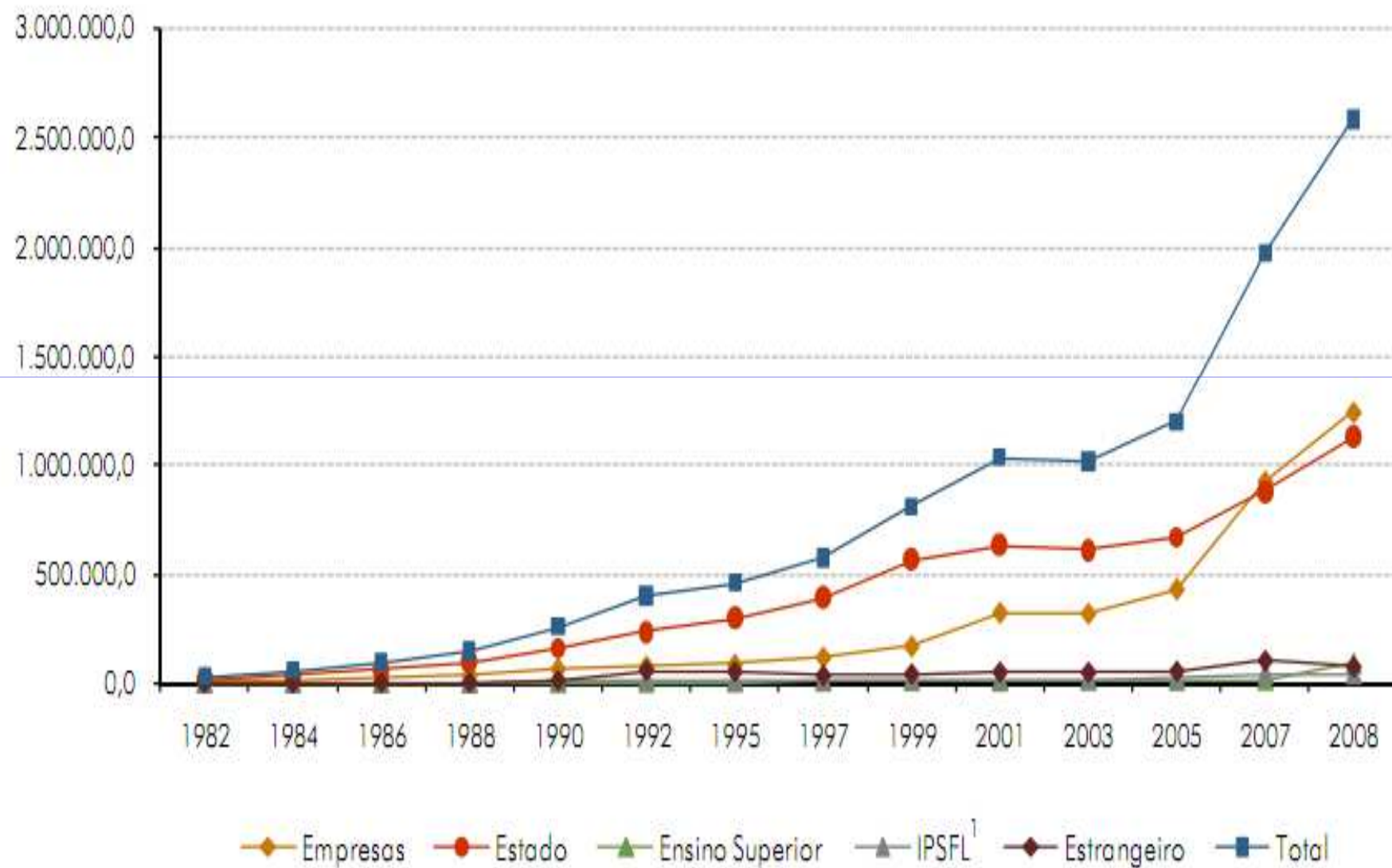
Business enterprise expenditure on R&D, 1999 and 2009

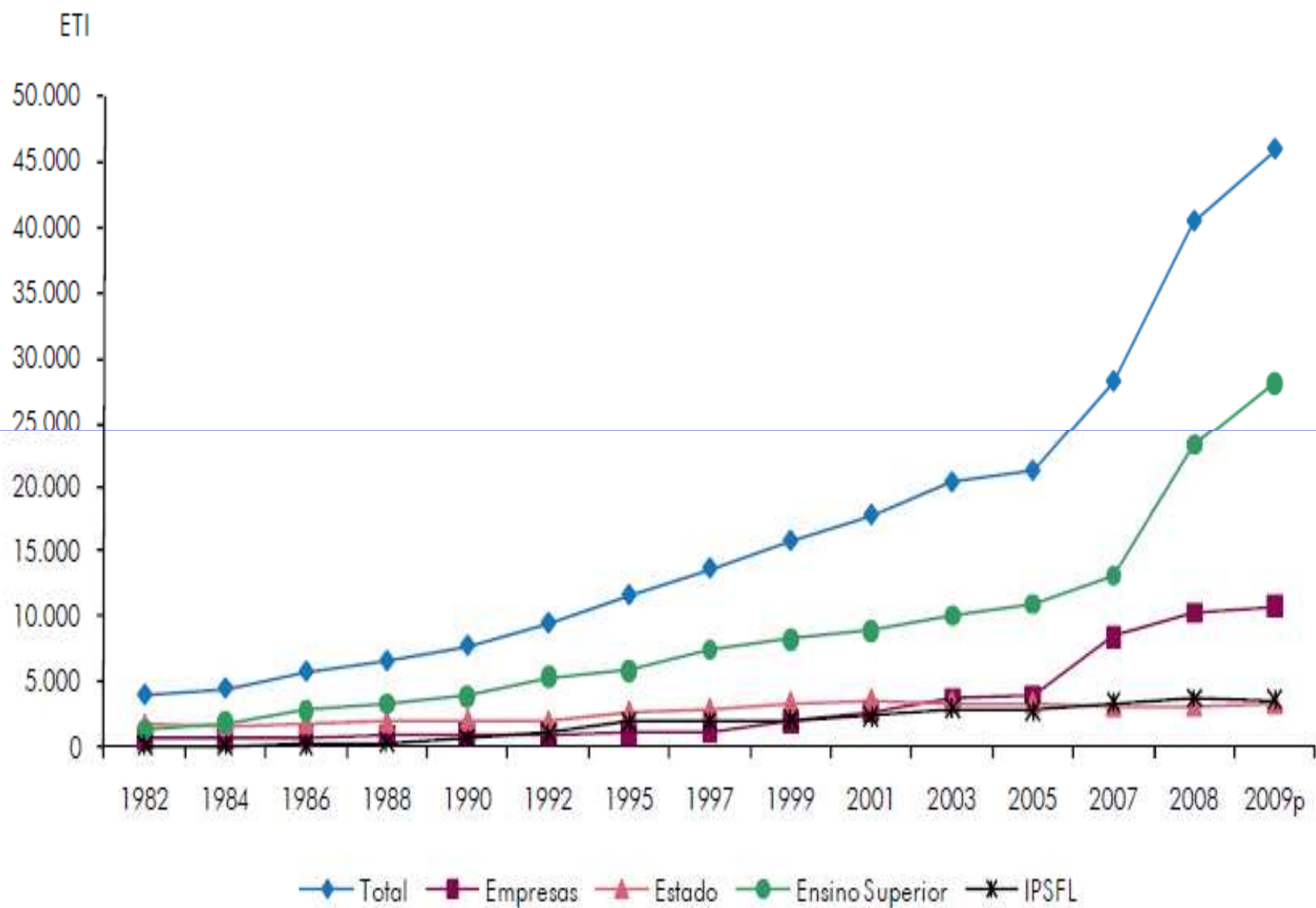
As a percentage of GDP



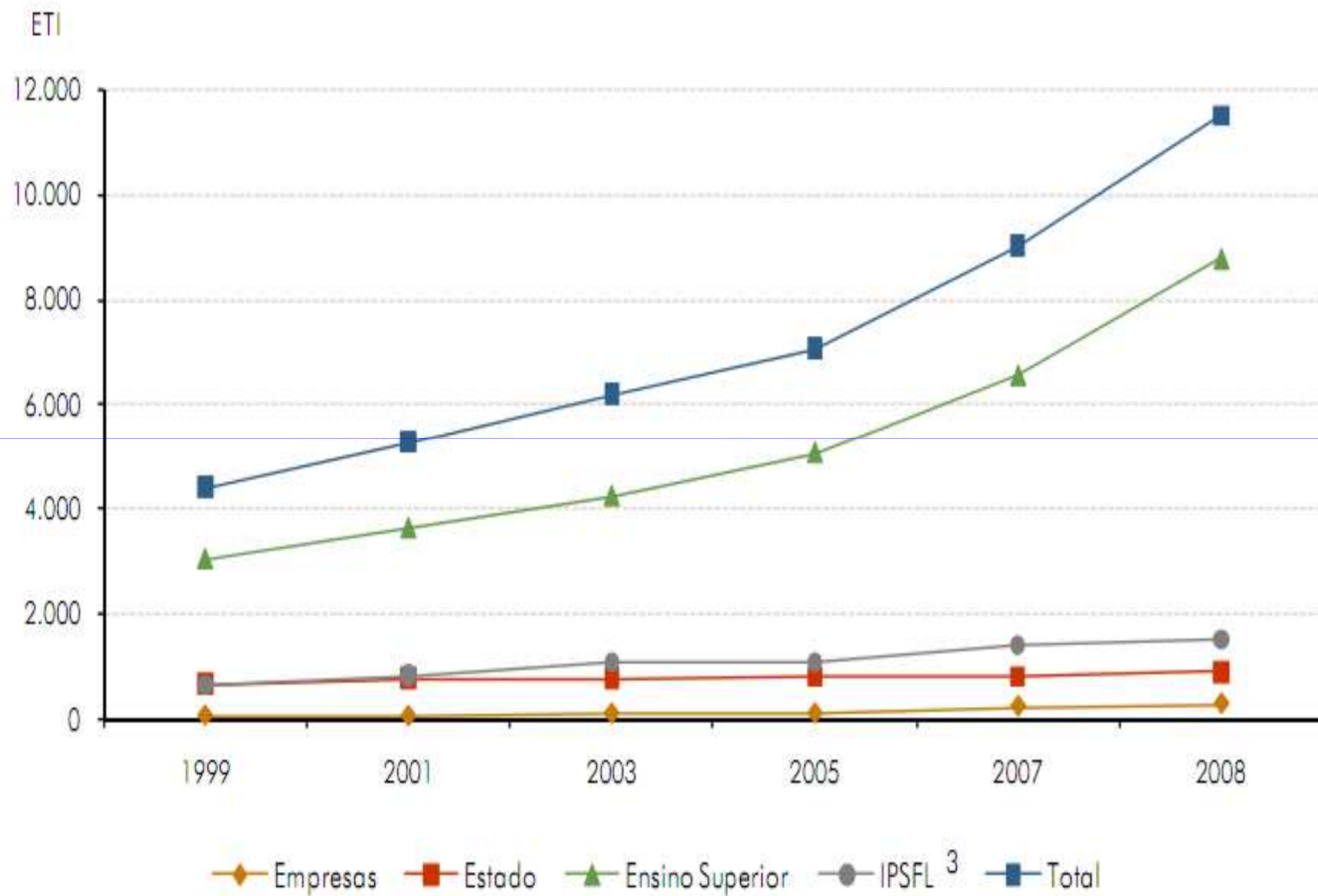
Despesa em I&D, a preços correntes, por sector de financiamento (1982 a 2008)

Milhares de euros

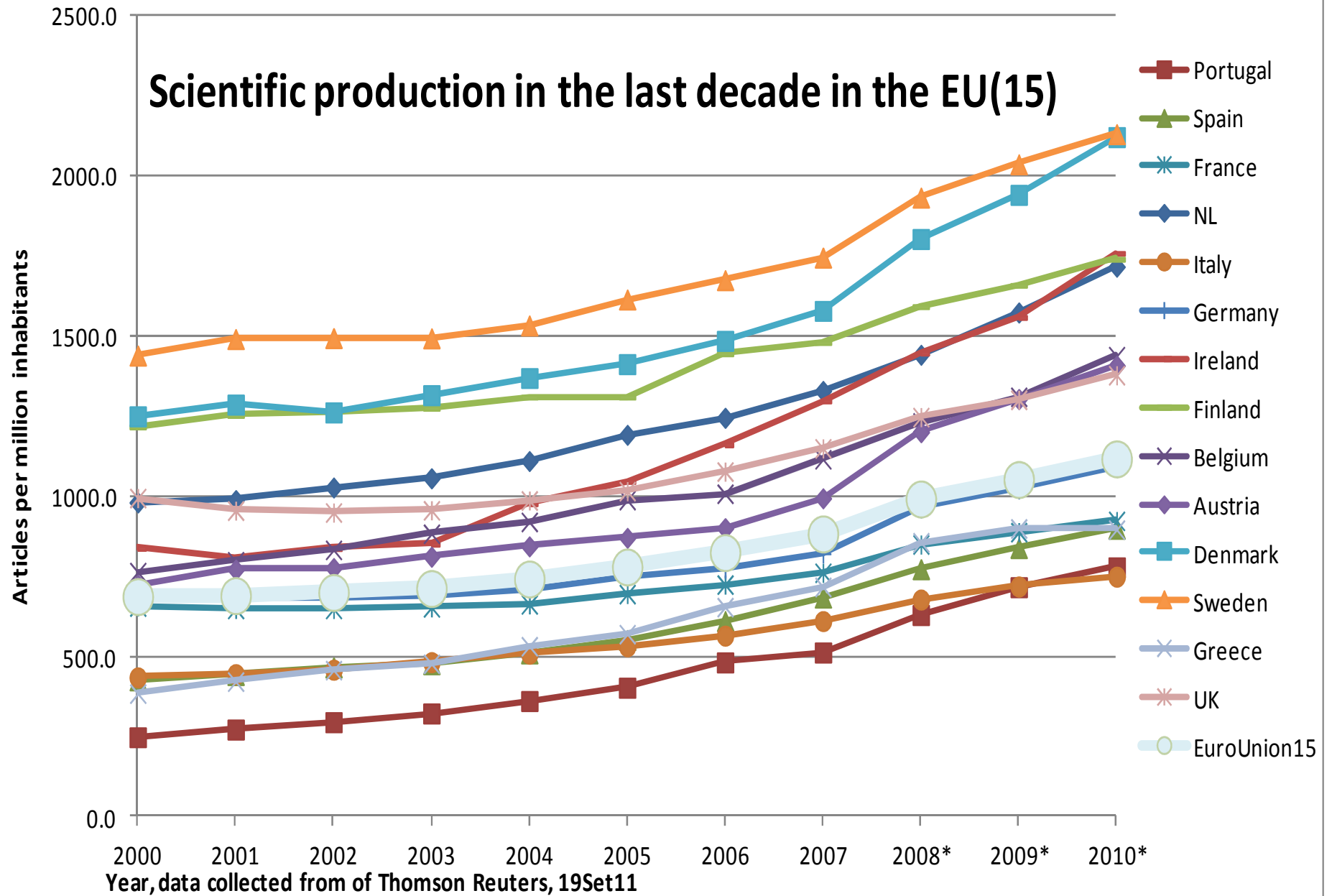


Investigadores¹ em ETI², por sector de execução (1982 a 2009p)

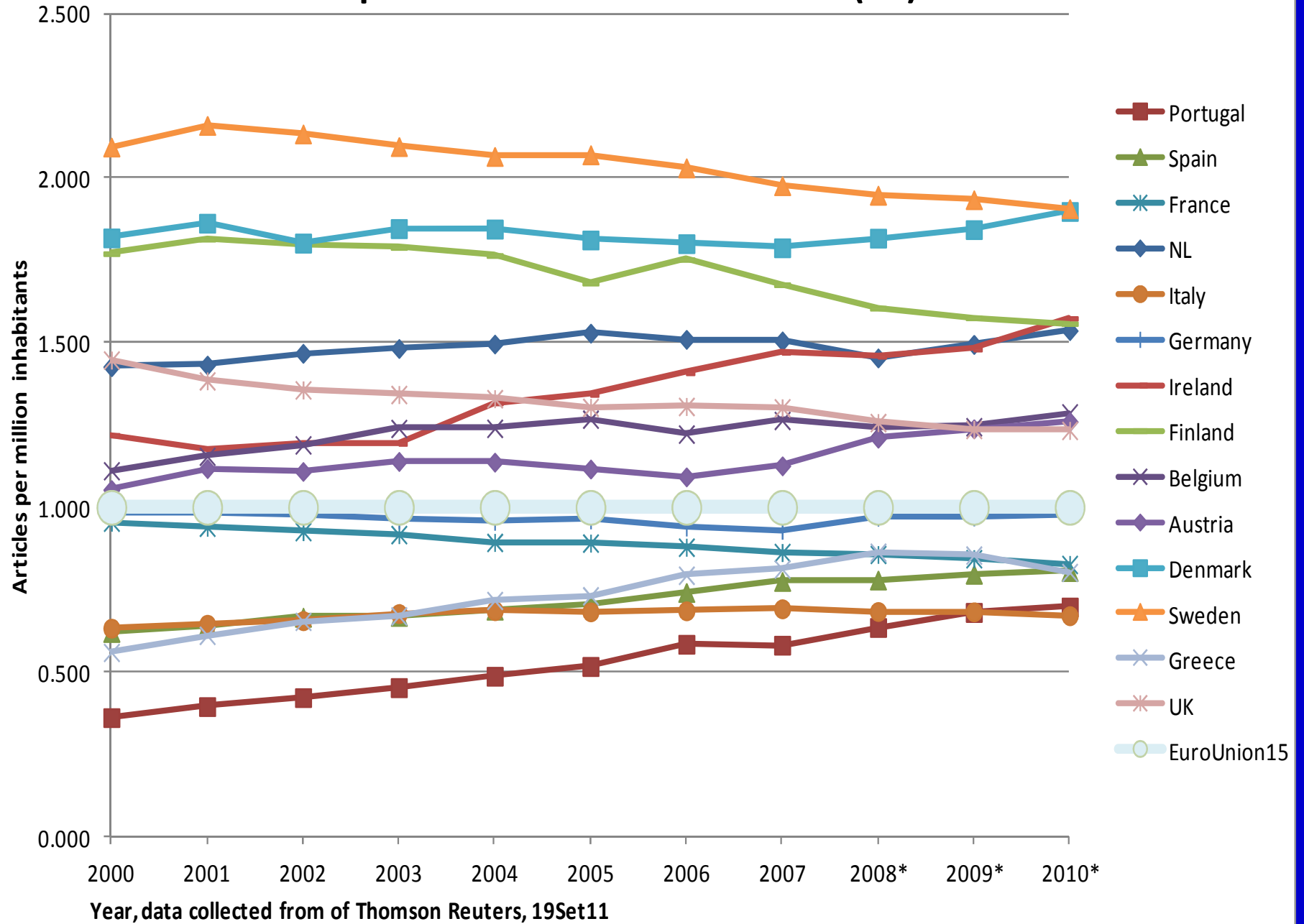
Doutorados em actividades de I&D (ETI)¹, por sector de execução (1999 a 2008)²



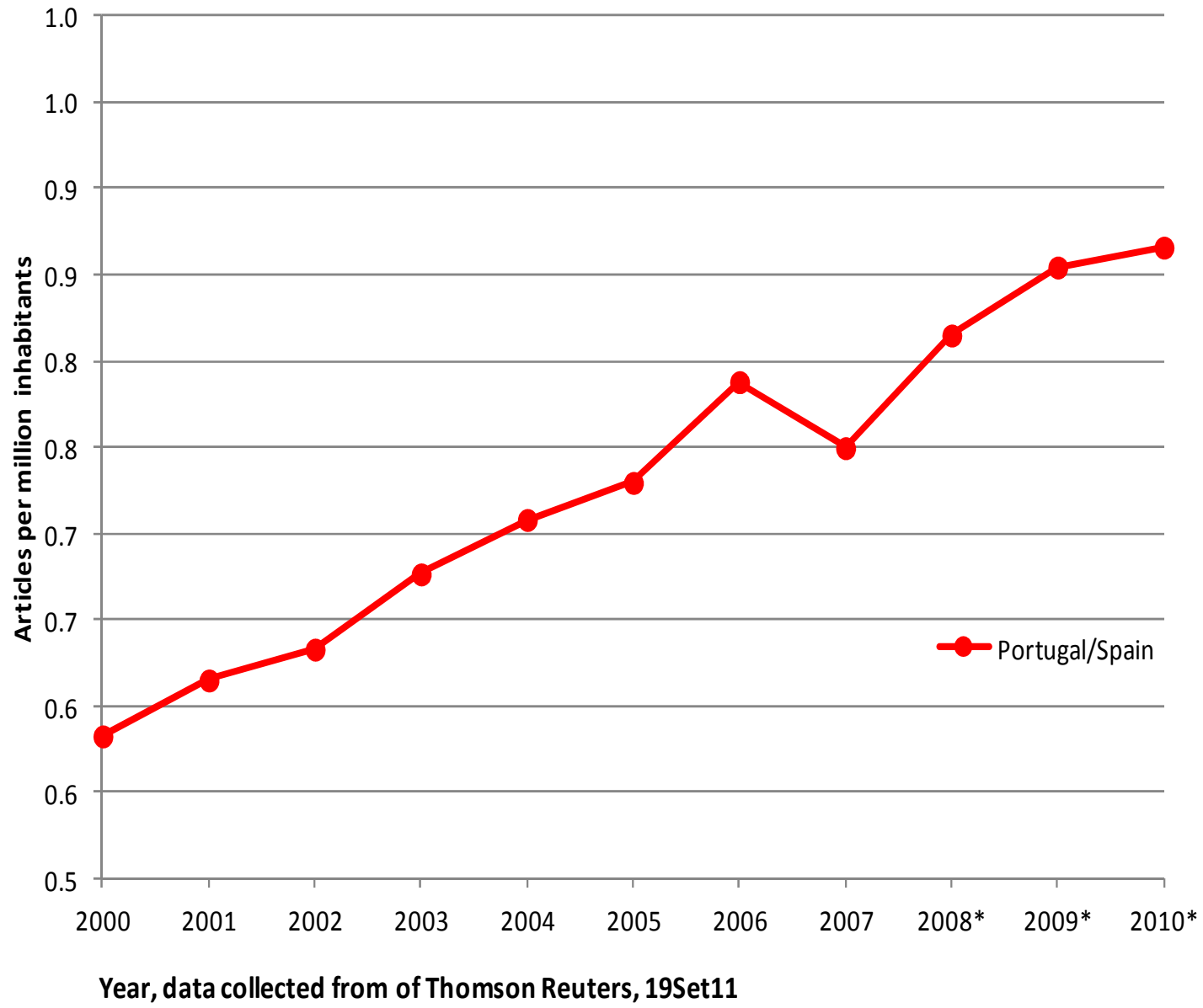
Scientific production in the last decade in the EU(15)



Scientific production relative to the EU(15)

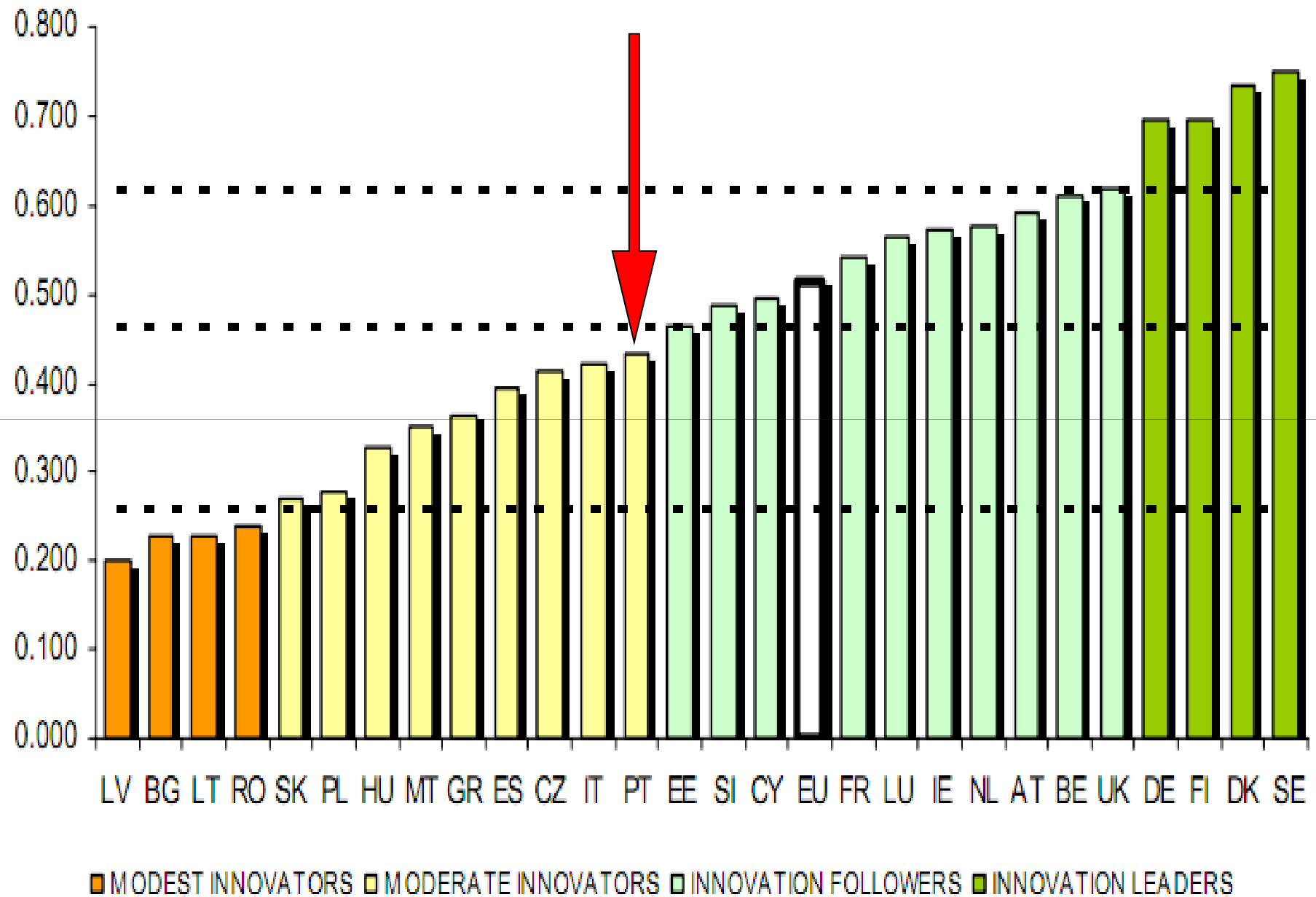


Scientific production, Portugal vs. Spain

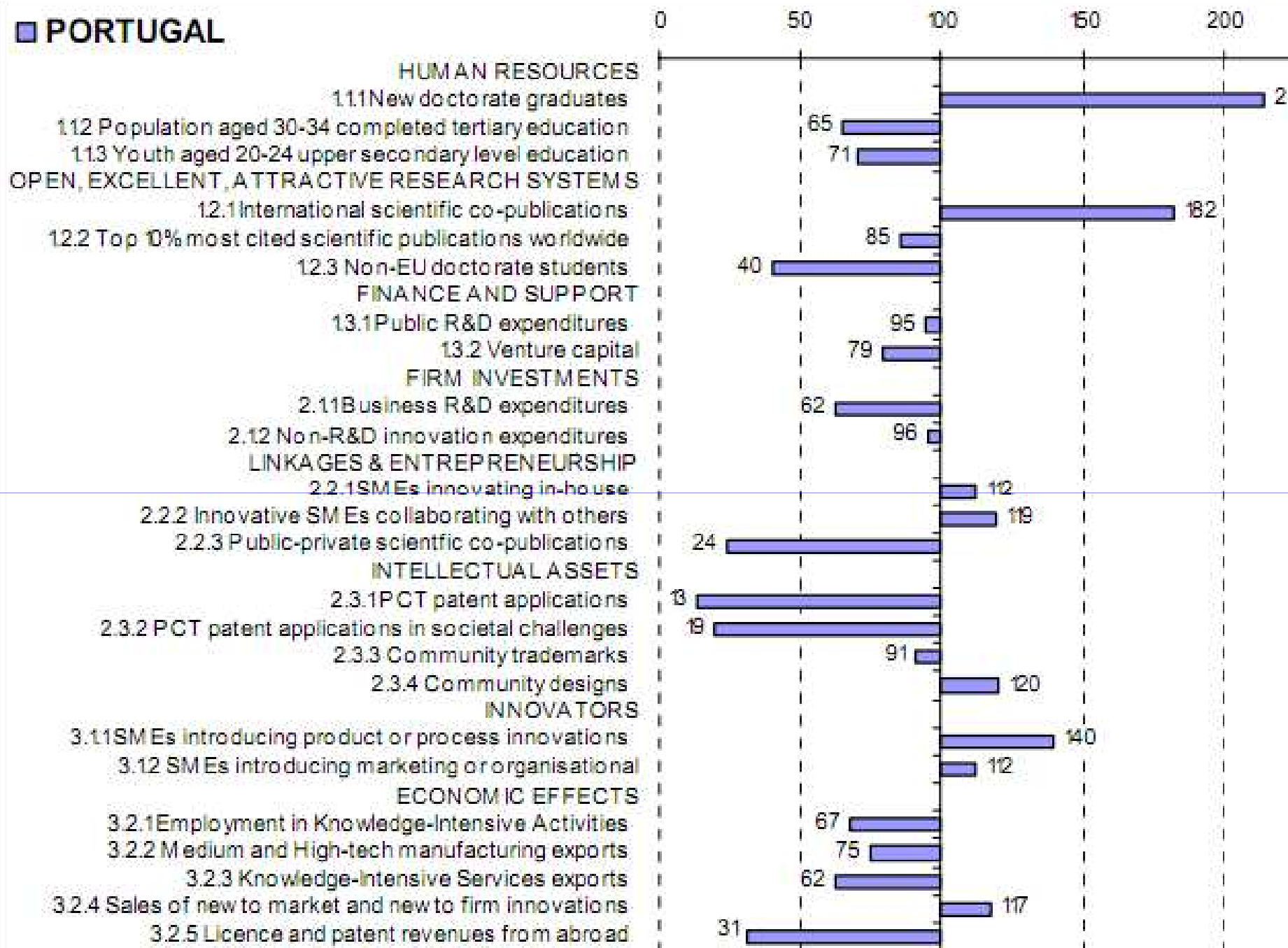


EU MEMBER STATES' INNOVATION PERFORMANCE

U.PORTO

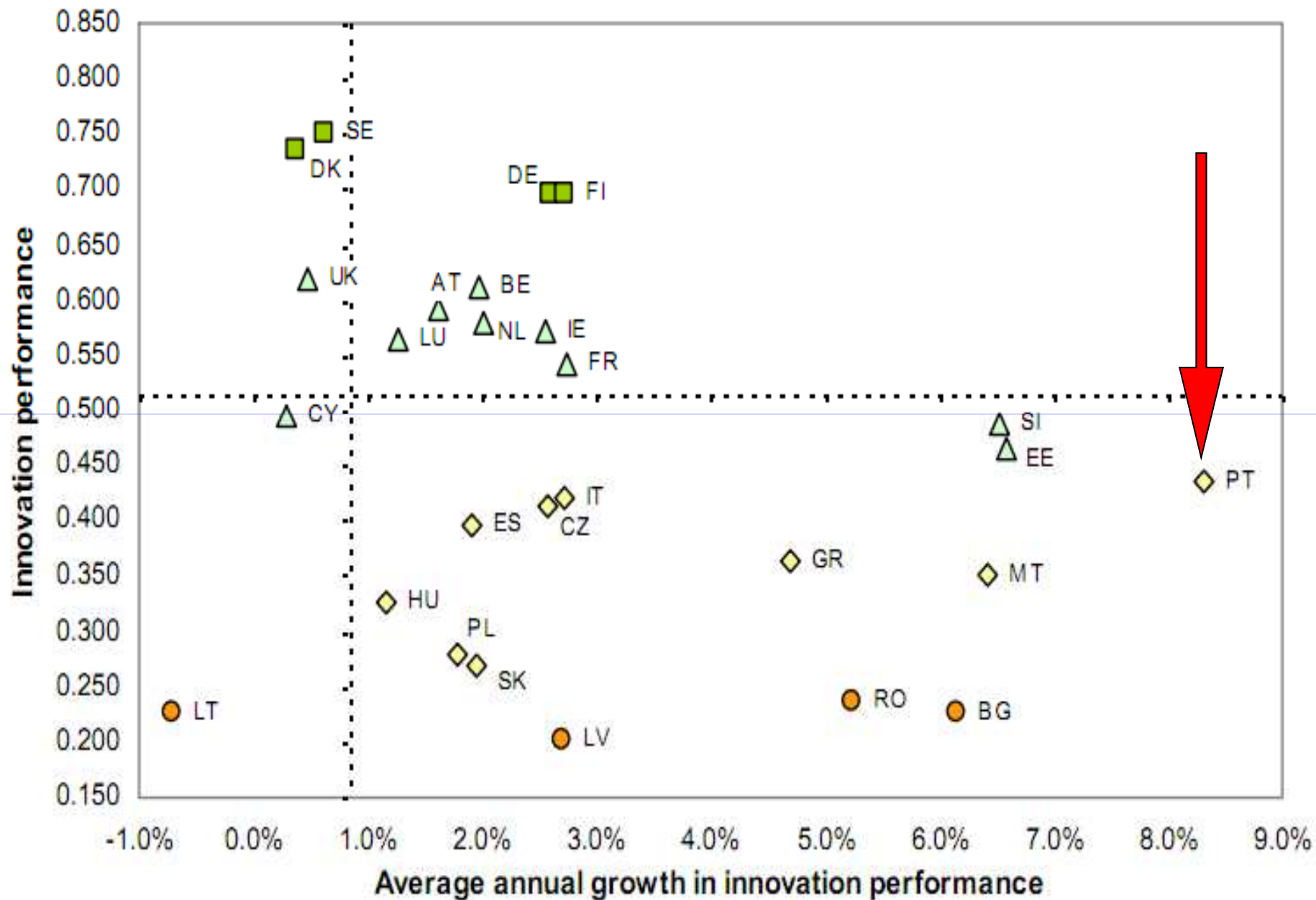


■ PORTUGAL



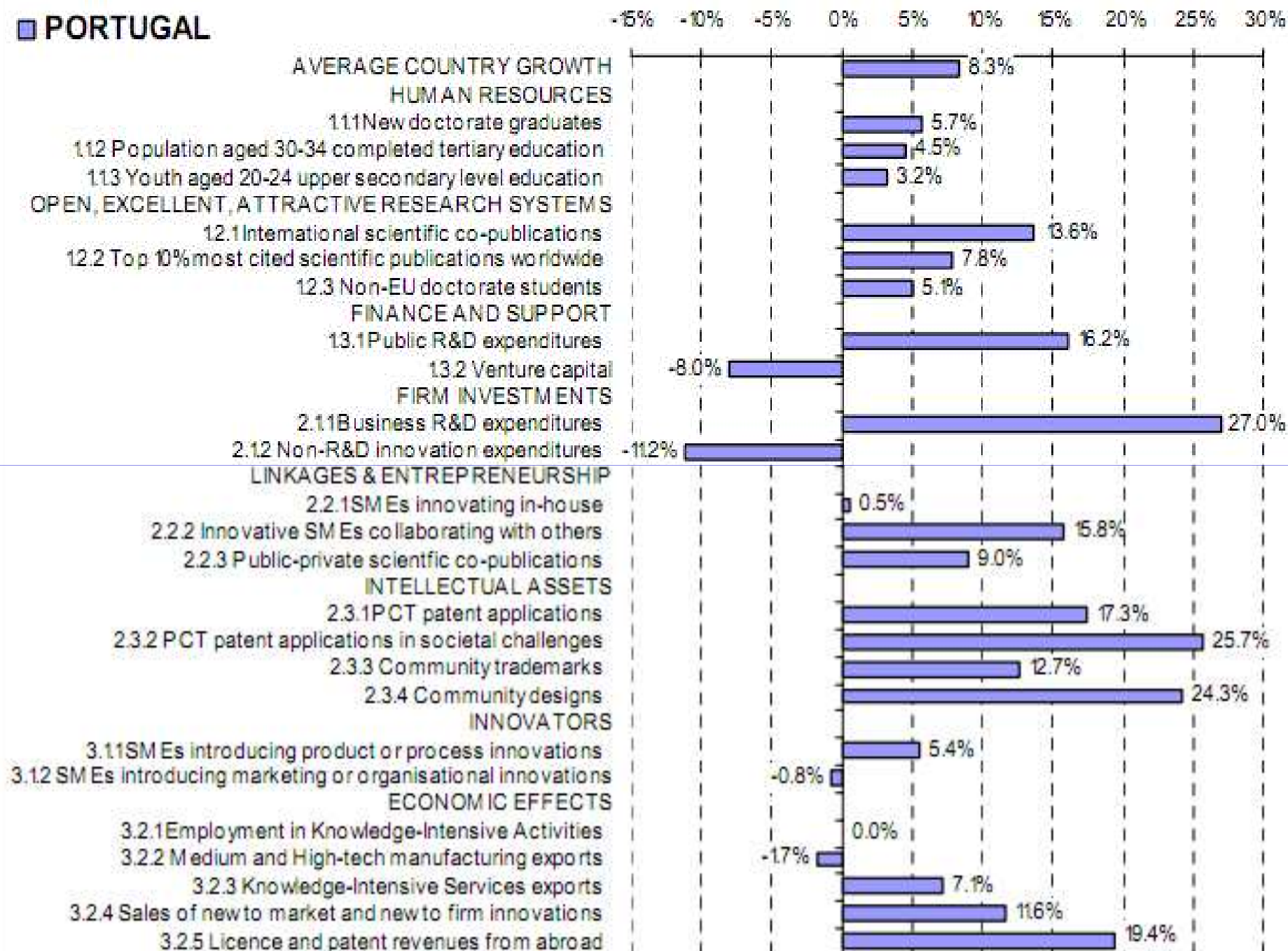
Indicator values relative to the EU27 (EU27=100).

CONVERGENCE IN INNOVATION PERFORMANCE

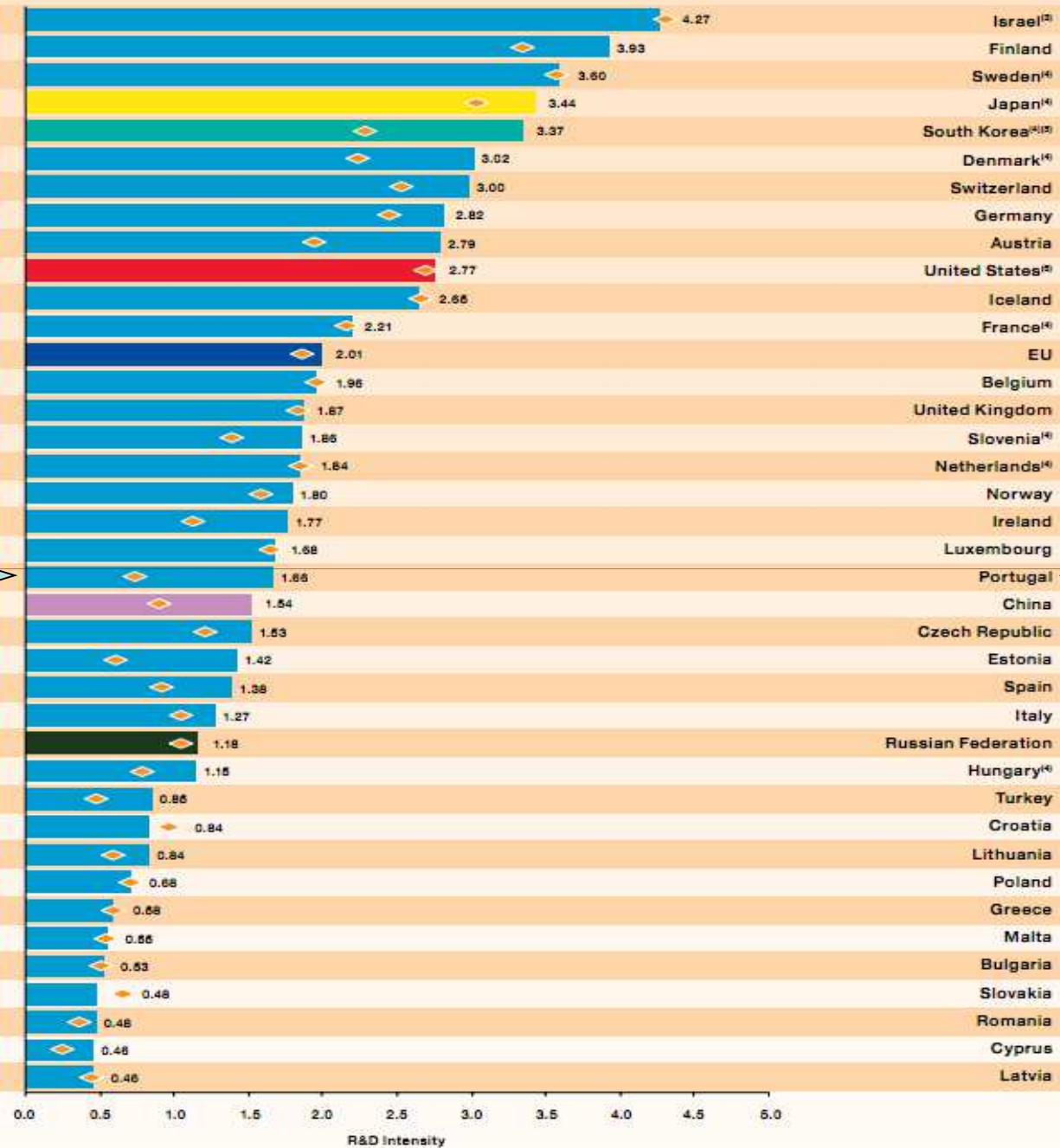


Annual average growth per indicator and average country growth

■ PORTUGAL



R&D Intensity 2000⁽¹⁾ and 2009⁽²⁾

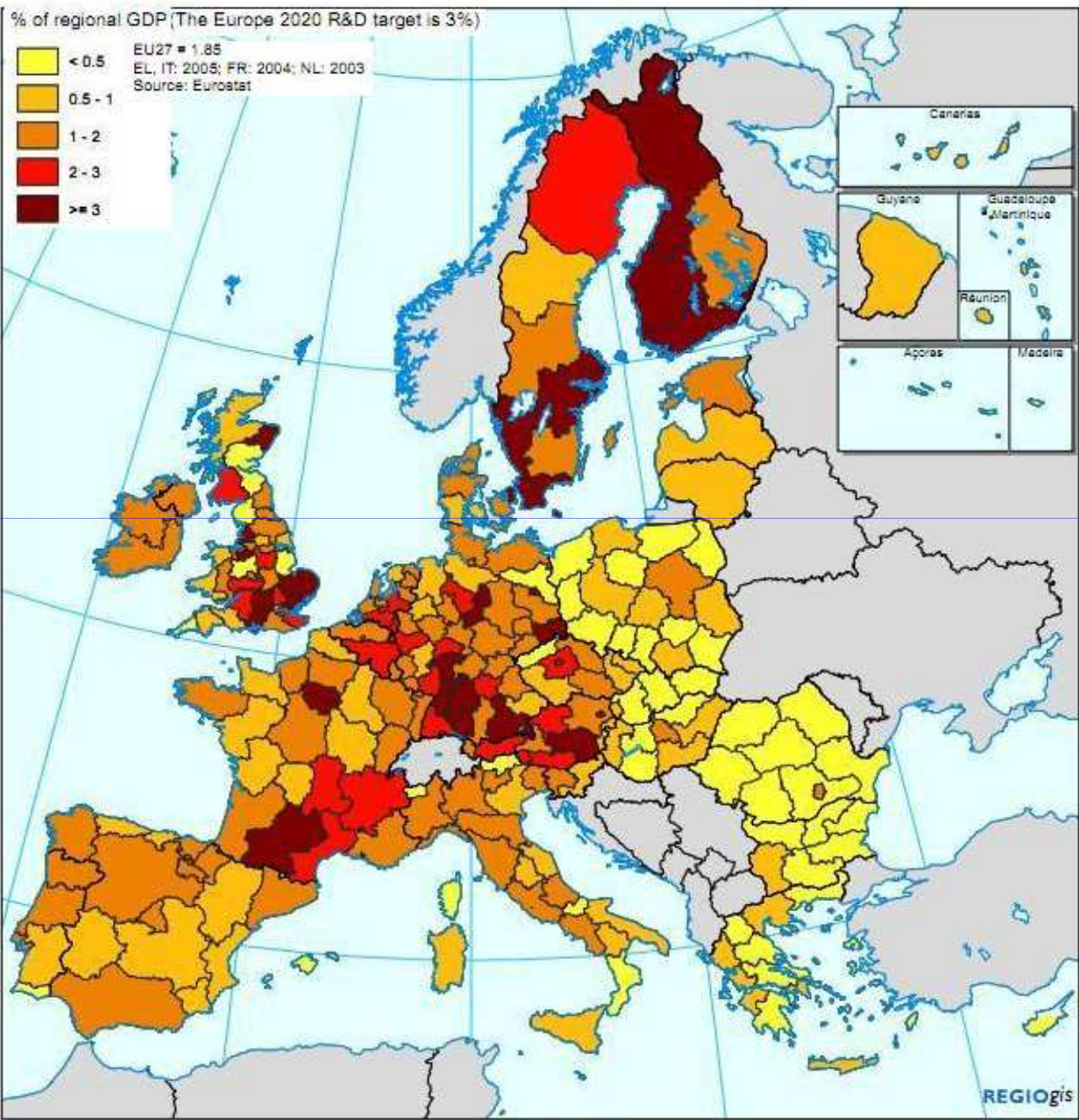


Source: DG Research and Innovation
Data: Eurostat, OECD

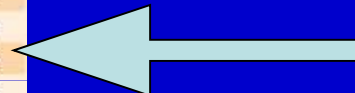
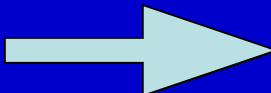
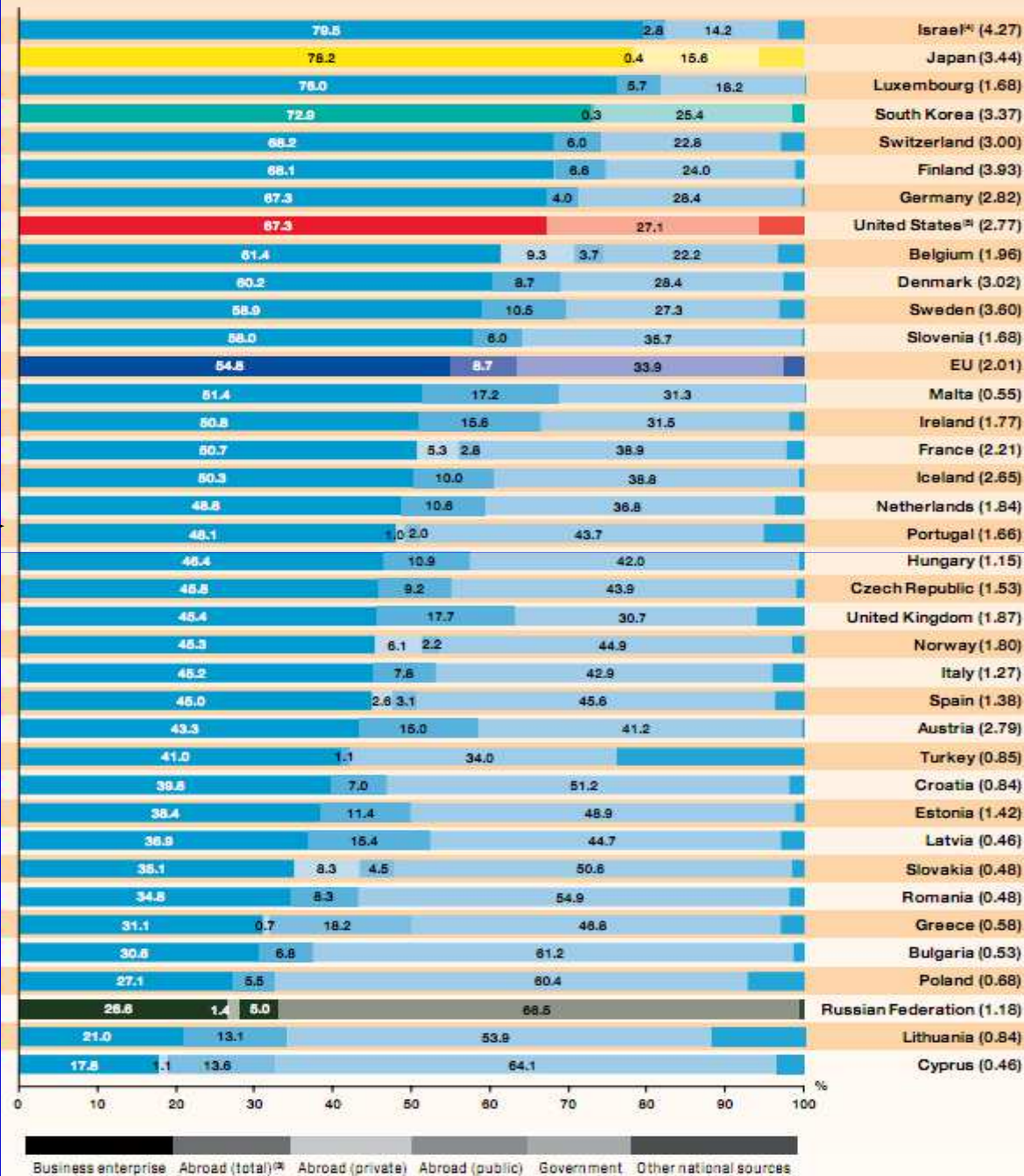
2009 ■ 2000 ◆

Gross Domestic Expenditure on R&D (GERD) as % of regional GDP, 2007

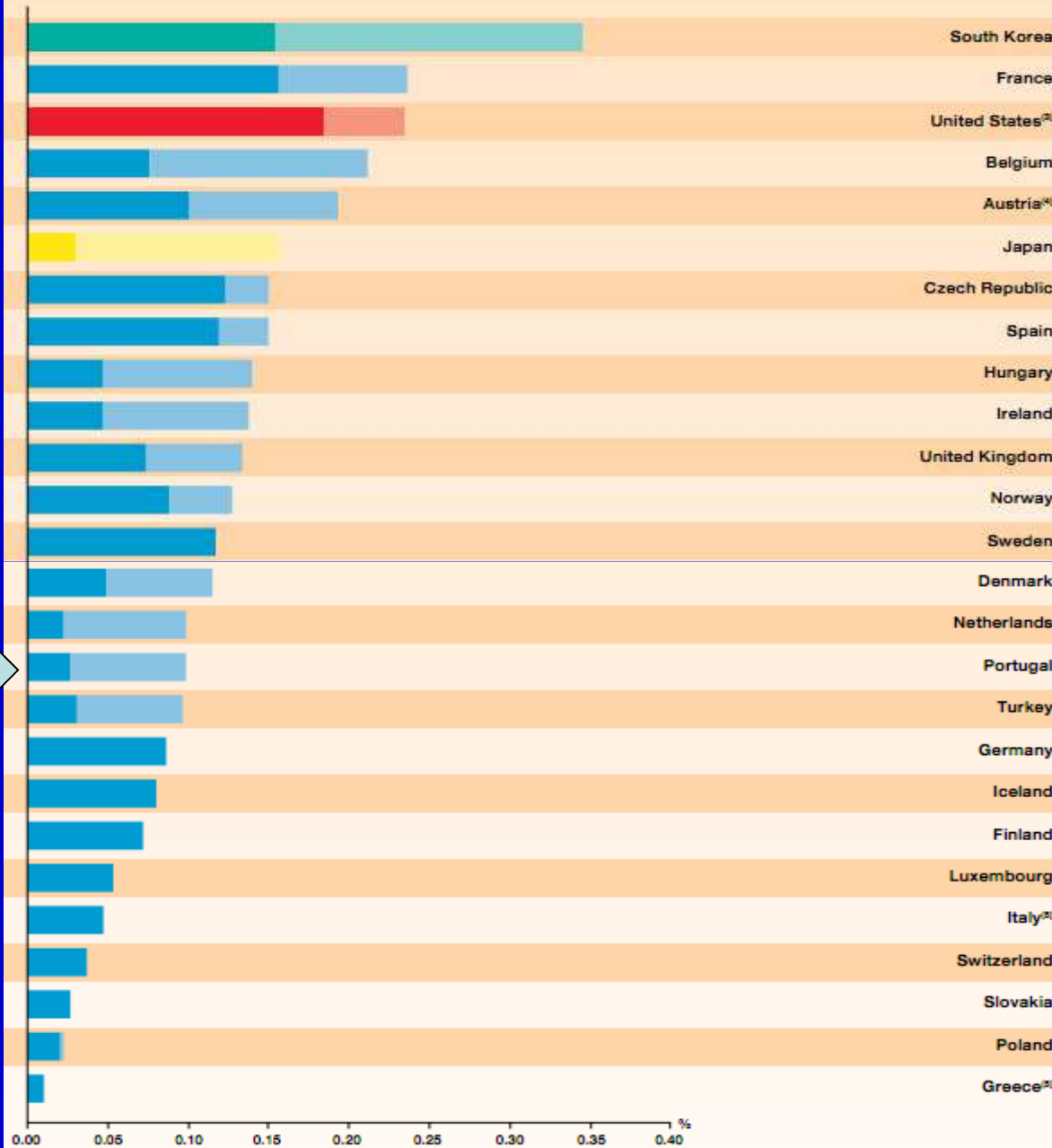
Total intramural R&D expenditure (GERD), 2007



R&D expenditure by main sources of funds, 2009⁽¹⁾;
in brackets R&D Intensity, 2009⁽²⁾

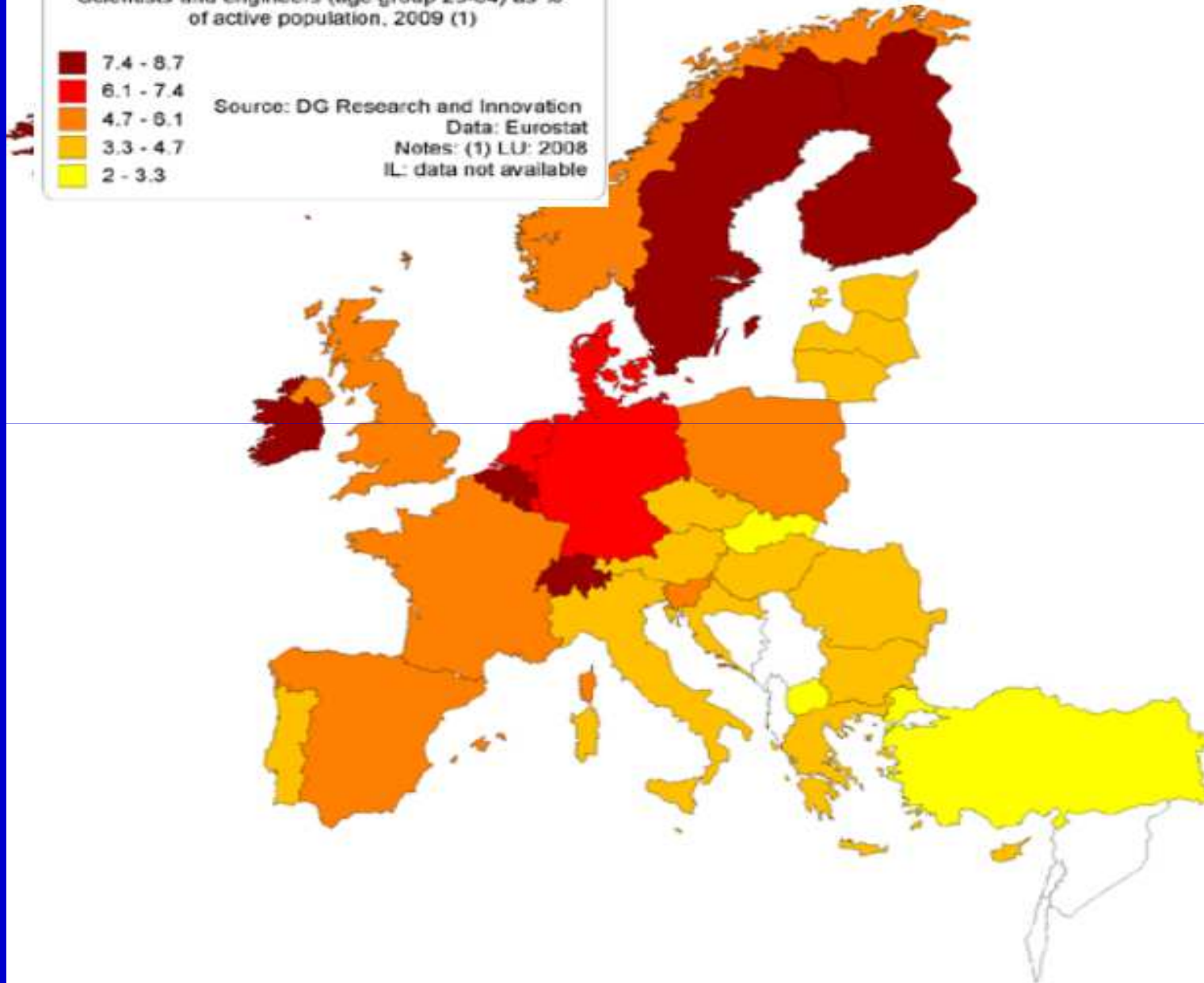
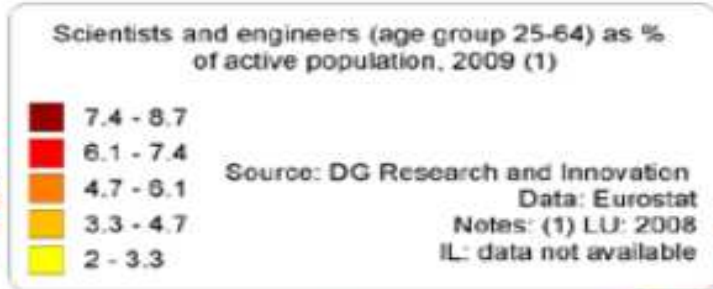


Direct and indirect government funding of business R&D and tax incentives for R&D⁽¹⁾ as % of GDP, 2008⁽²⁾



Direct government funding of BERD Indirect government support through R&D tax incentives

Scientists and engineers (age group 25-64) as % of active population, 2009



New graduates in Science and Engineering per thousand population aged 25-34, 2008

ISCED 5 total science and engineering graduates
per thousand population aged 25-34 2008 (1)

19 - 23.3

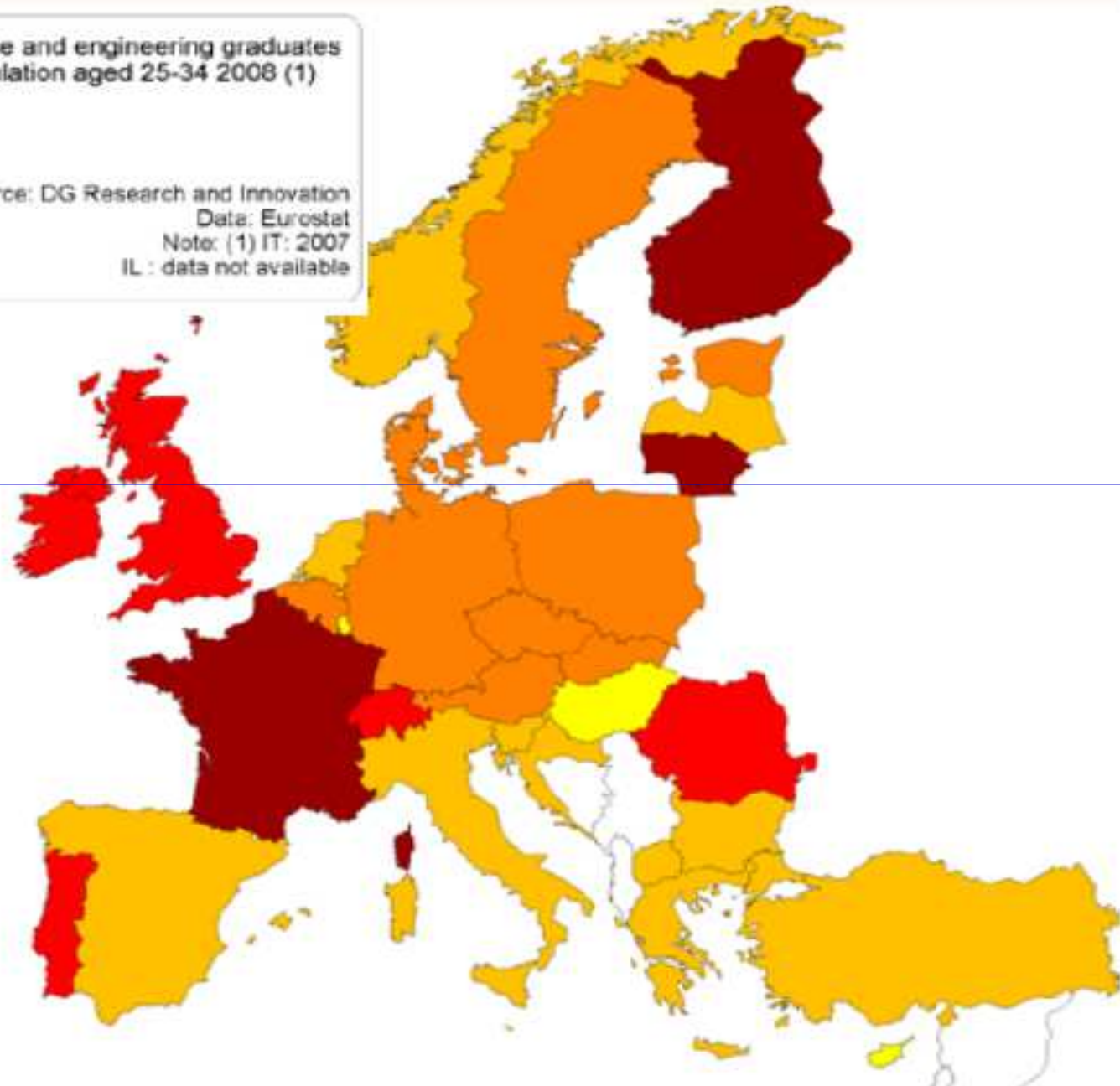
14.6 - 19

10.3 - 14.6

6 - 10.3

1.6 - 6

Source: DG Research and Innovation
Data: Eurostat
Note: (1) IT: 2007
IL: data not available

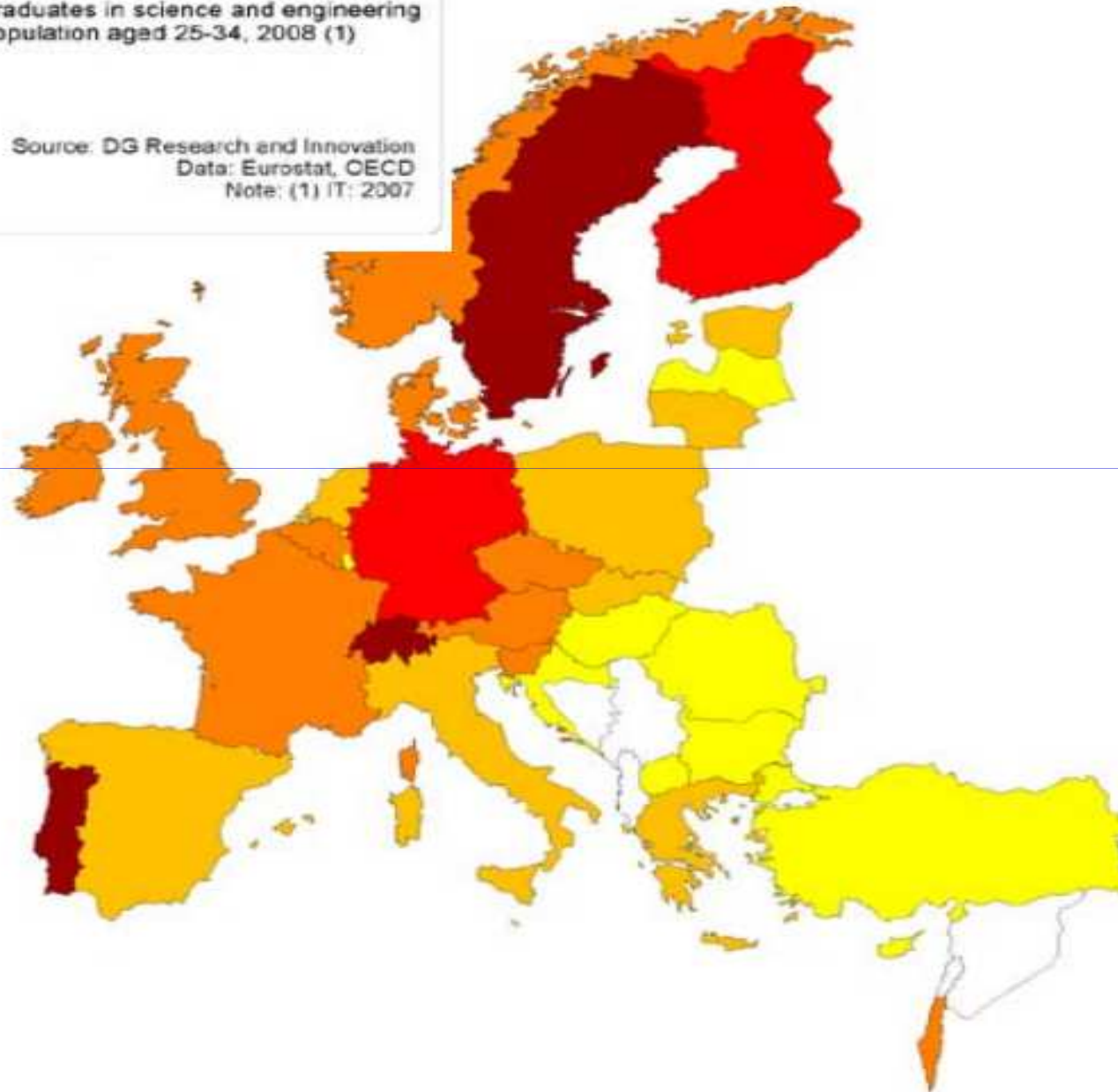


New doctoral graduates in Science and Engineering per thousand population aged 25-34, 2008

ISCED 6 - doctoral graduates in science and engineering per thousand population aged 25-34, 2008 (1)

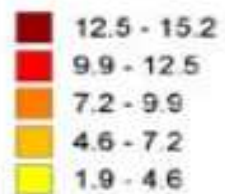


Source: DG Research and Innovation
Data: Eurostat, OECD
Note: (1) IT: 2007

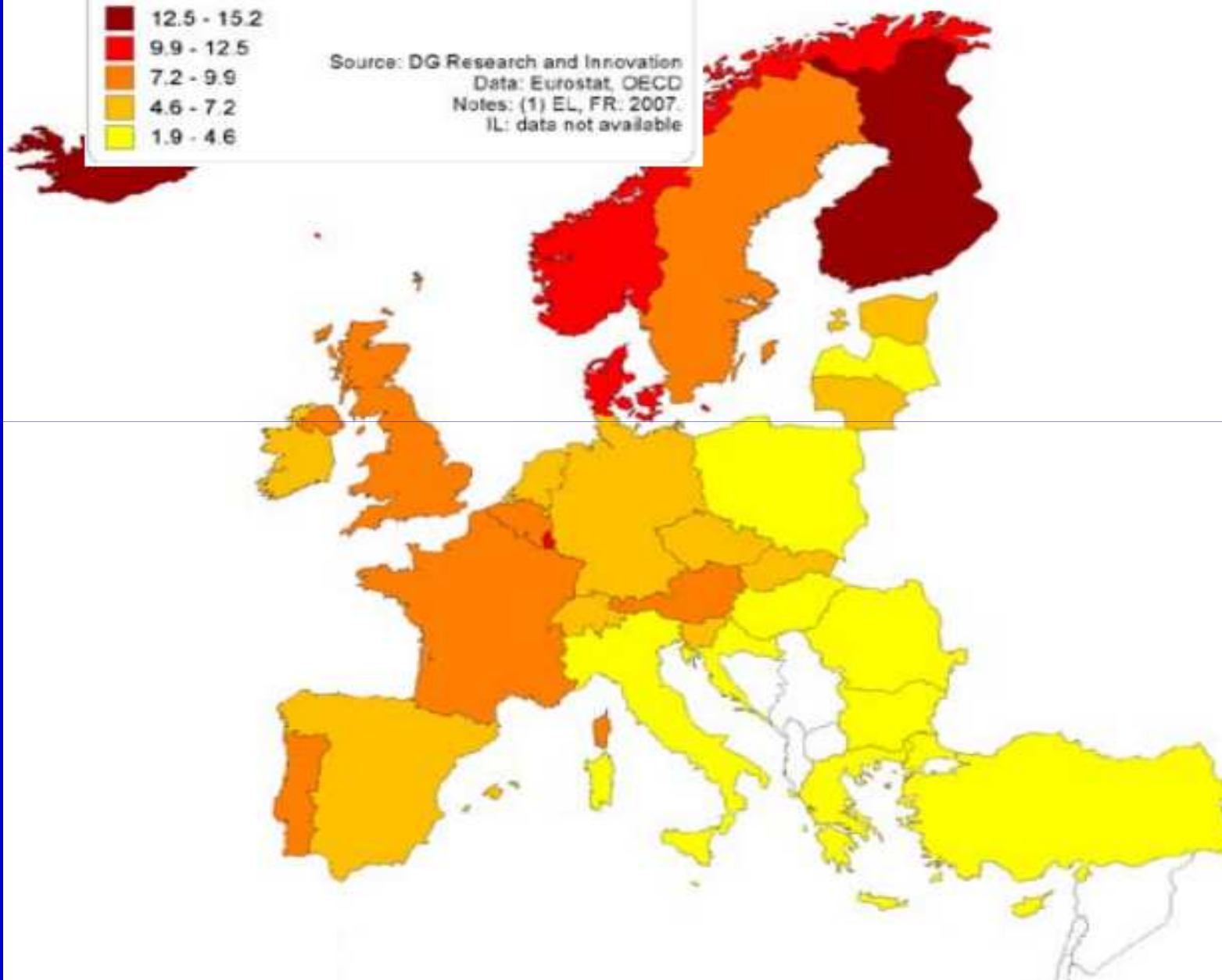


Researchers (FTE) per thousand labour force, 2008

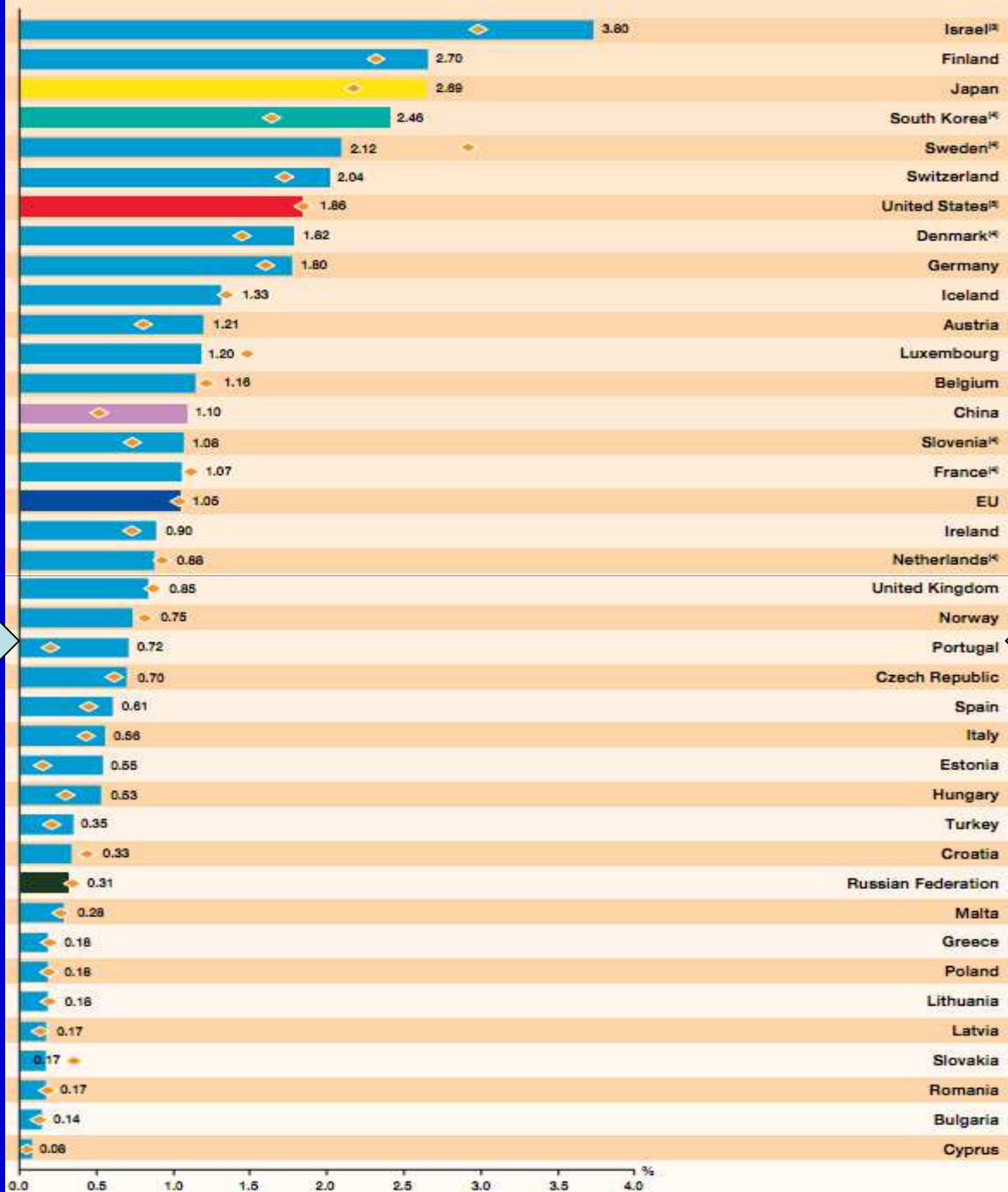
Researchers (FTE) per thousand labour force, 2008 (1)



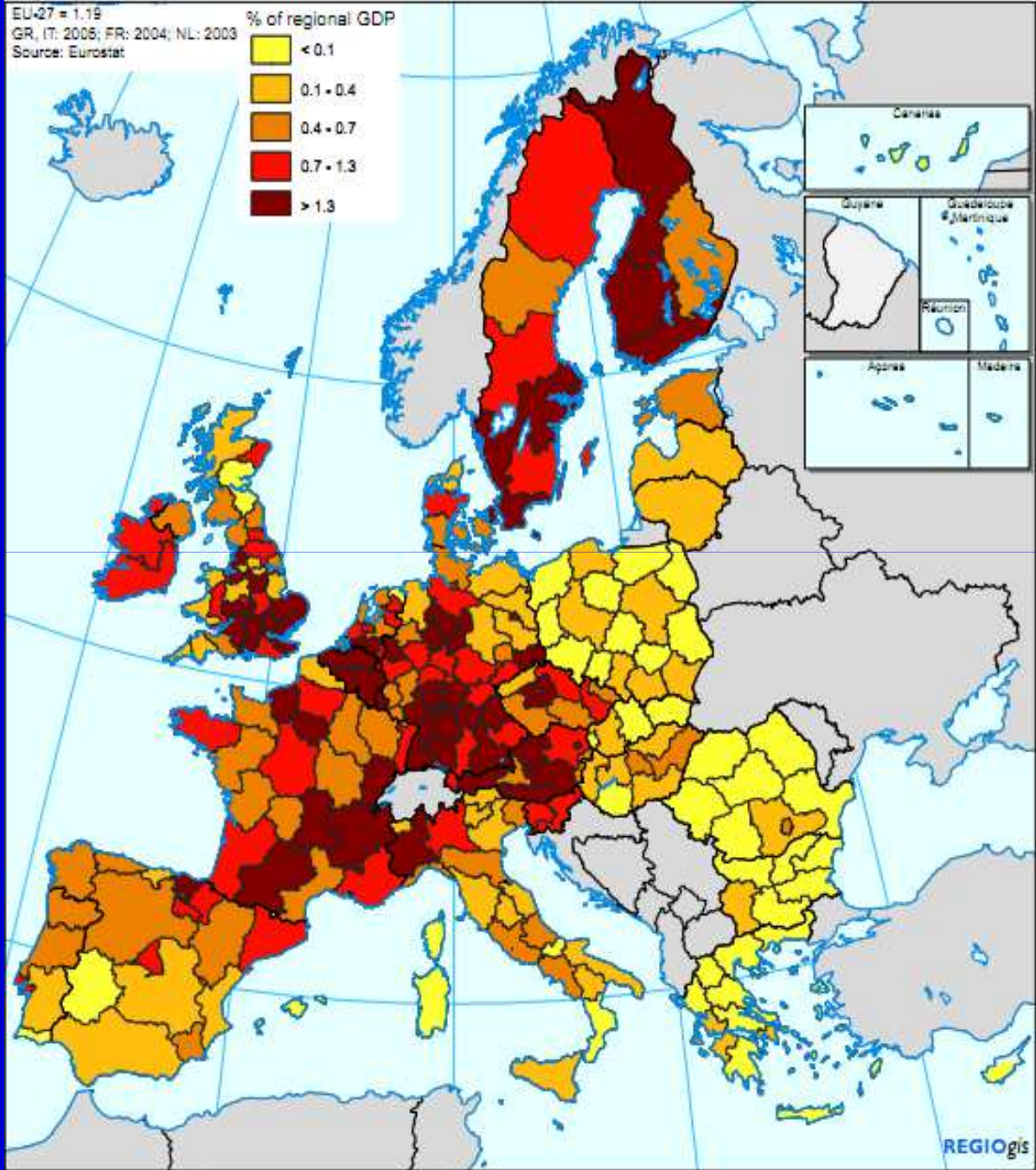
Source: DG Research and Innovation
Data: Eurostat, OECD
Notes: (1) EL, FR: 2007.
IL: data not available



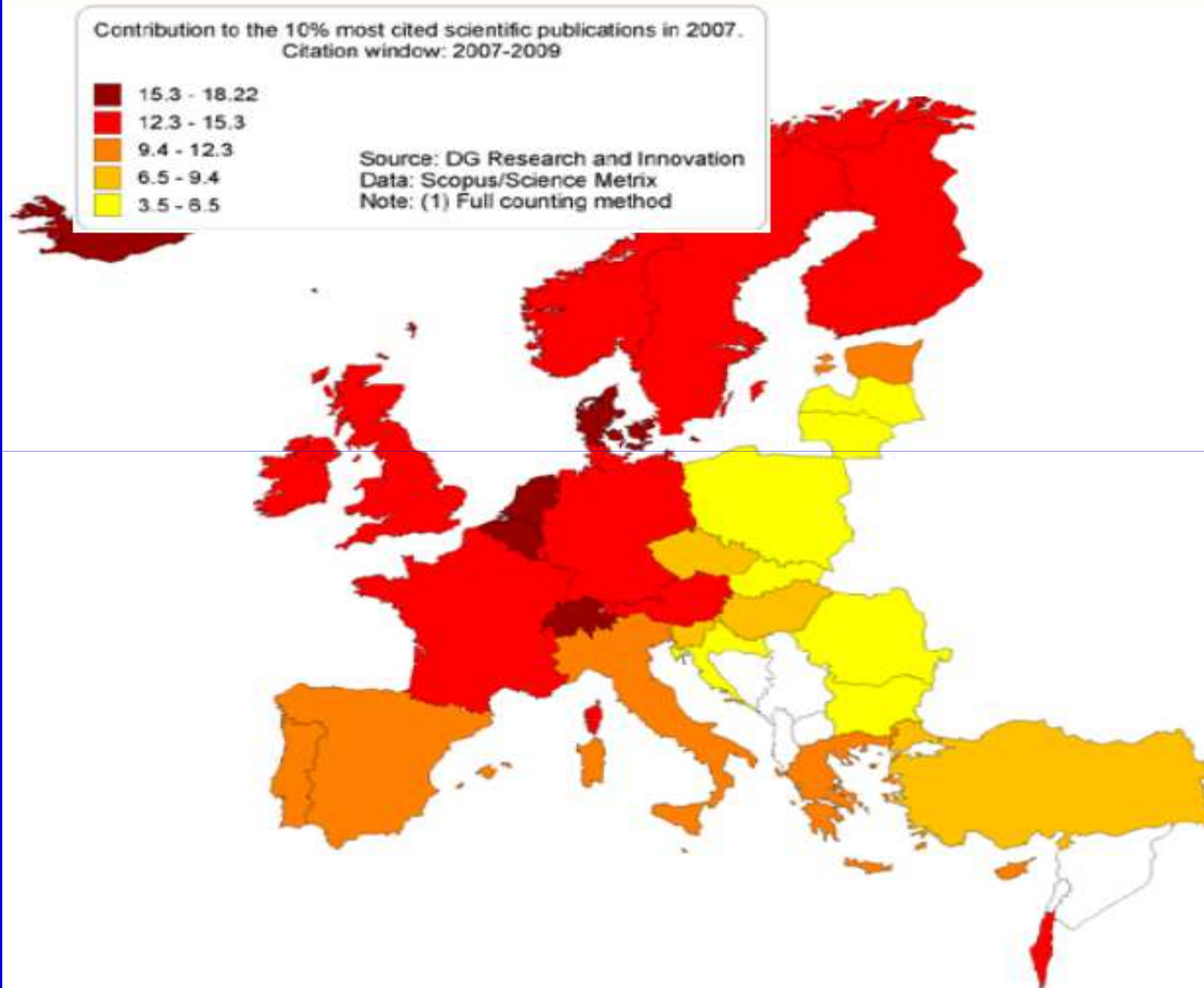
GERD financed by business enterprise as % of GDP, 2000⁽¹⁾ and 2009⁽²⁾



Business R&D expenditure as % of GDP by NUTS 2 regions, 2007

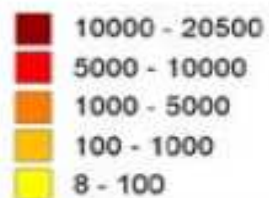


Contribution to the 10% most cited scientific publications as % of total national publications, 2007

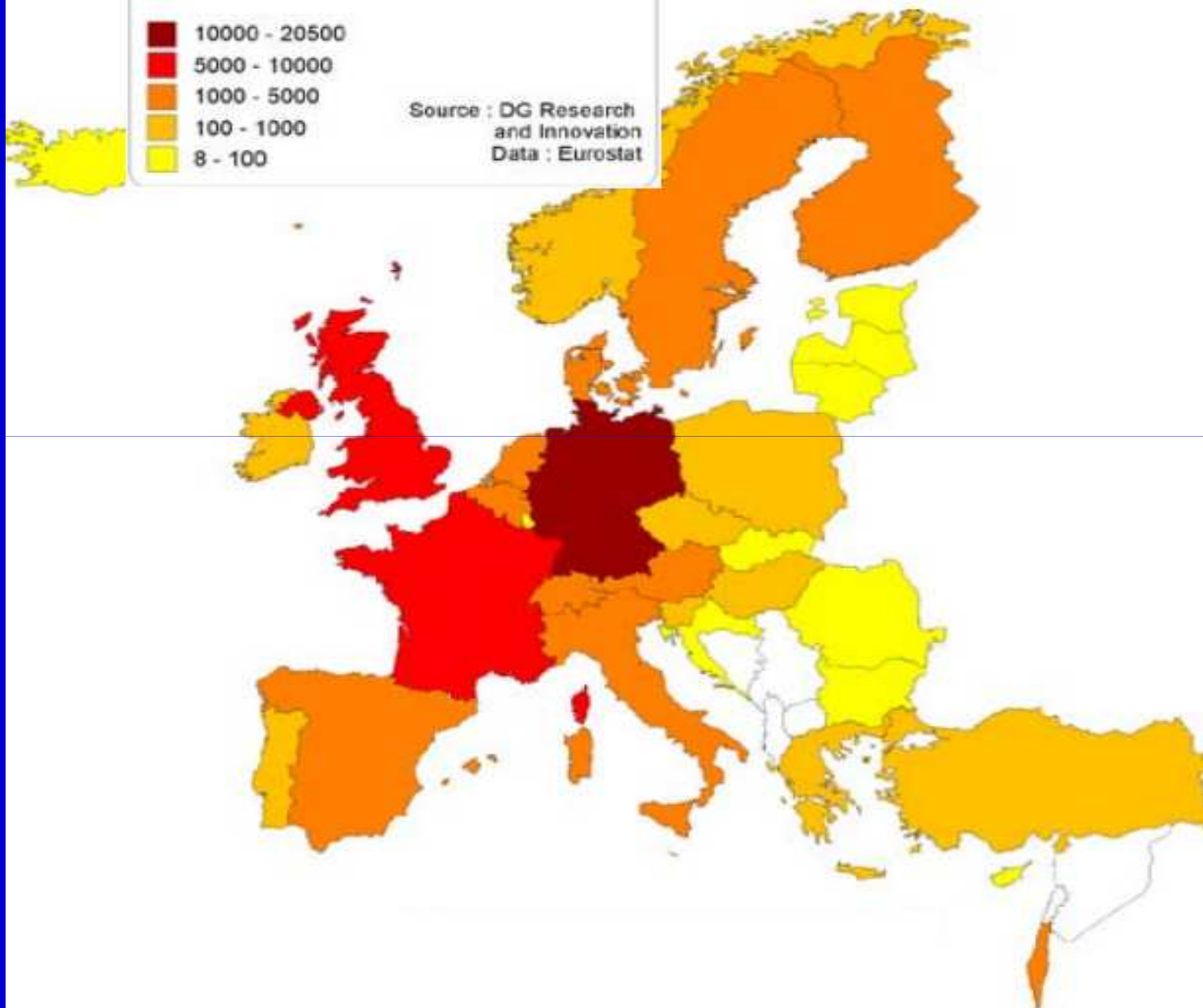


EPO patents applications, 2007

Total number of EPO patent applications, 2007



Source : DG Research
and Innovation
Data : Eurostat



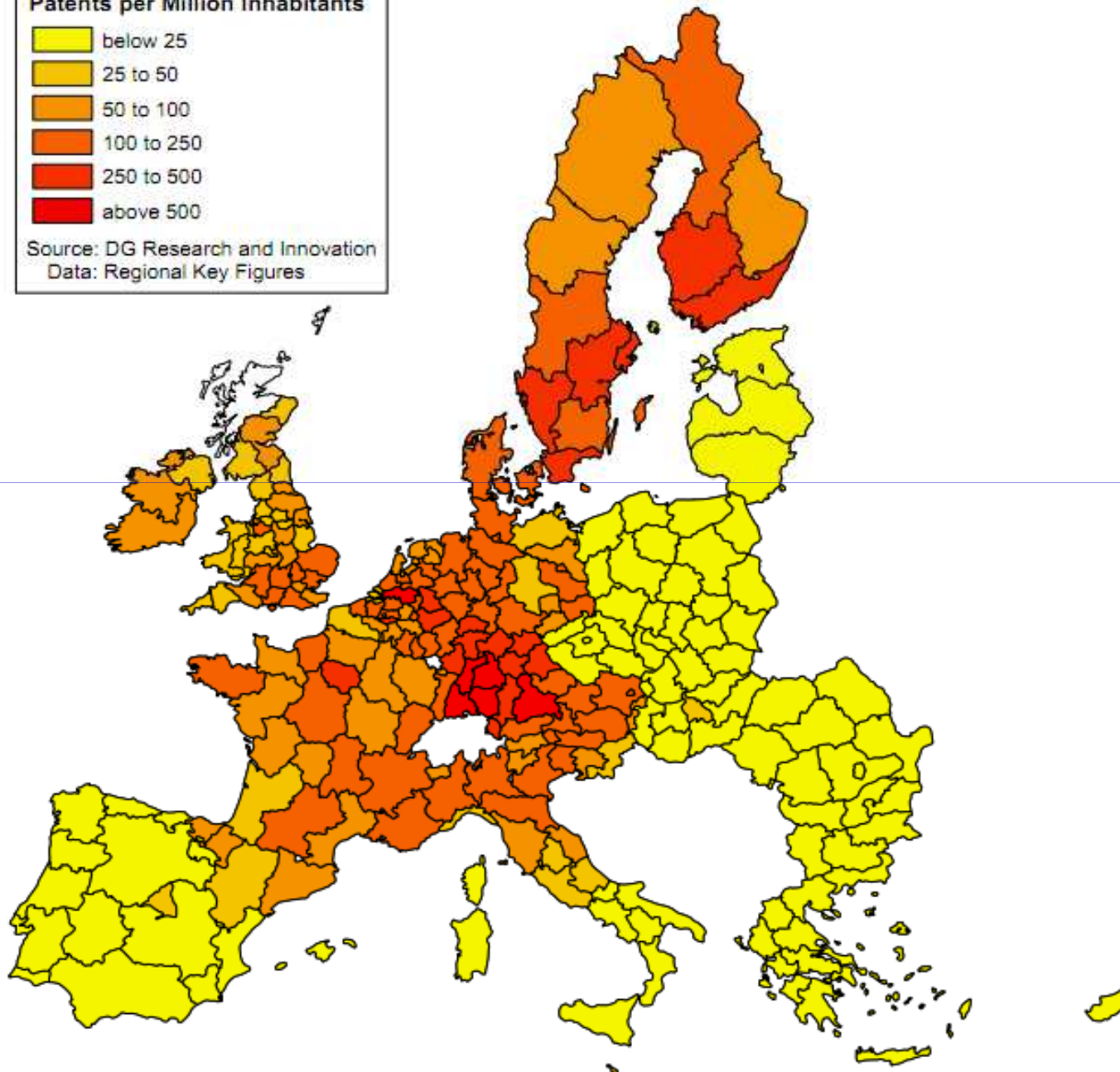
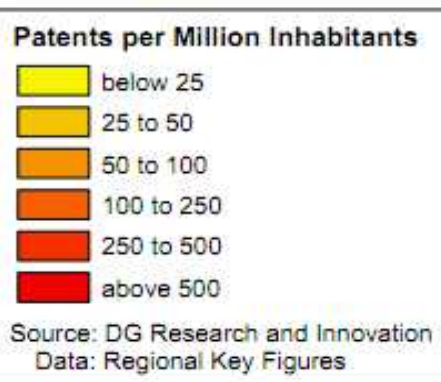
EPO patent applications⁽¹⁾ by inventor's country of residence⁽²⁾ per million population and BERD as % of GDP, 2007⁽³⁾



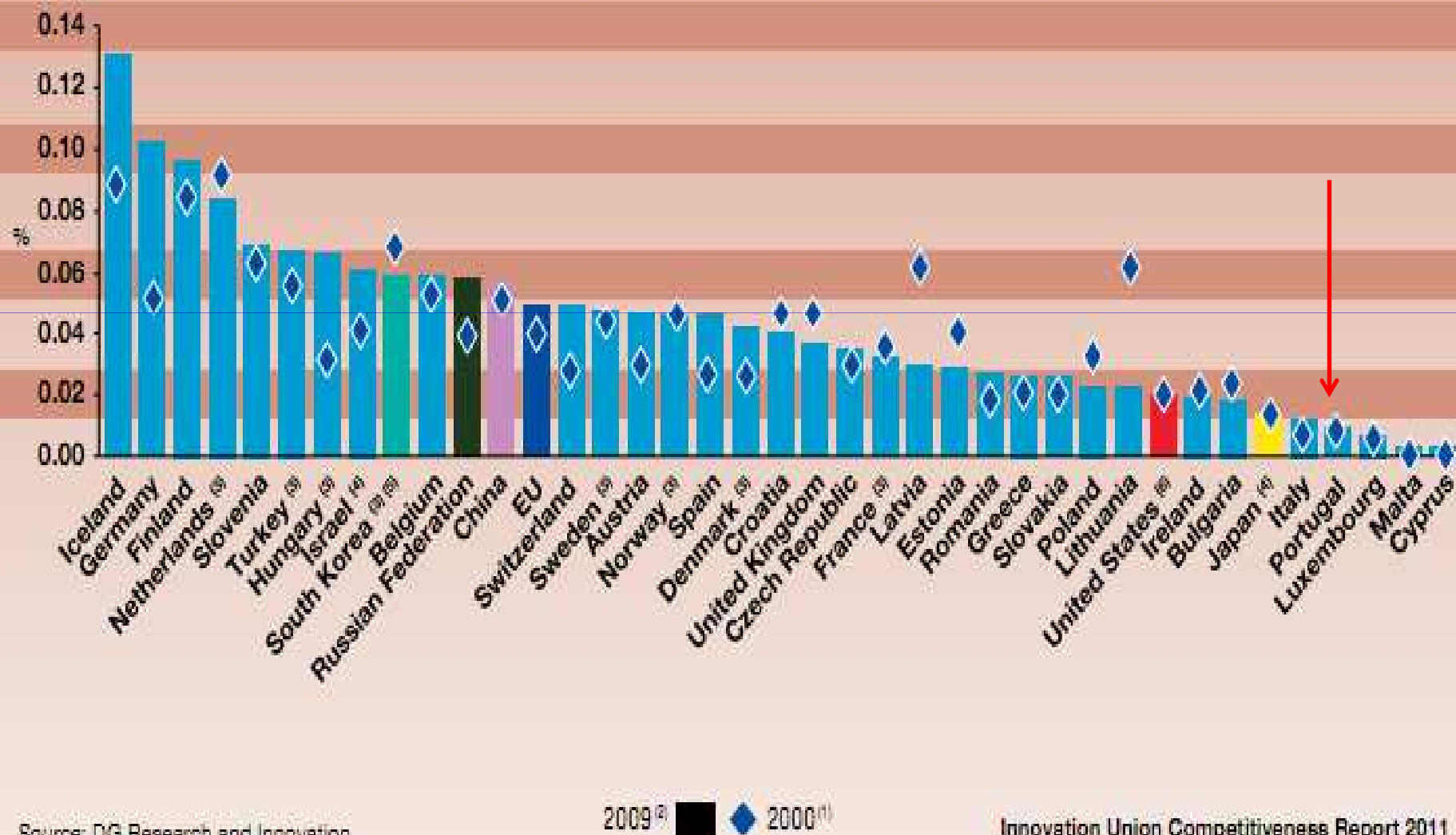
Source: DG Research and Innovation
Data: Eurostat

Innovation Union Competitiveness Report 2011

Patent intensity in the EU NUTS 2 regions 2007



Public sector expenditure on R&D (GOVERD + HERD) financed by business enterprise as% of GDP 2000⁽¹⁾ and 2009⁽²⁾



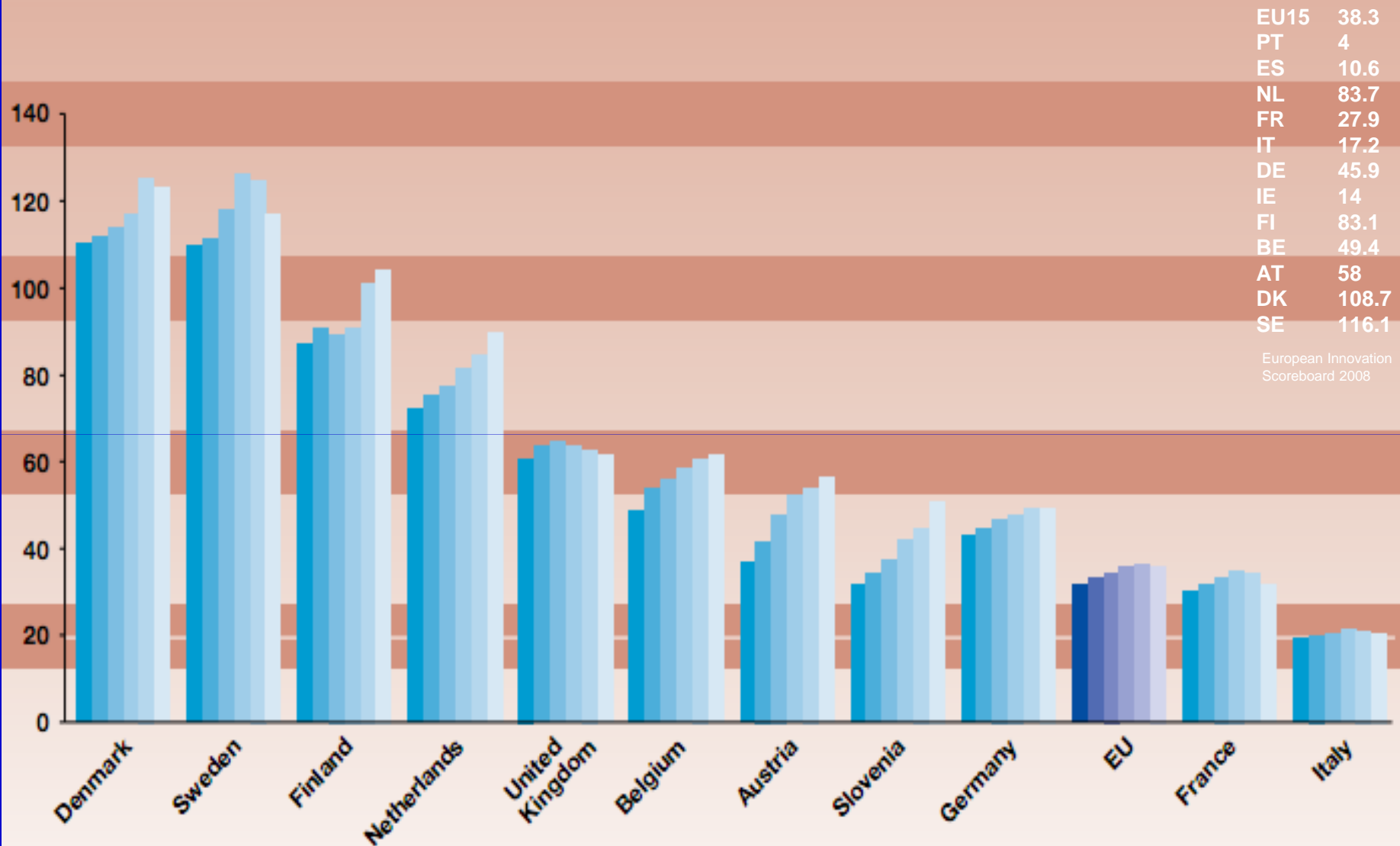
Source: DG Research and Innovation
Data: Eurostat, OECD

Innovation Union Competitiveness Report 2011

Public-private co-publications per million population, EU, United States and Japan, 2003-2008

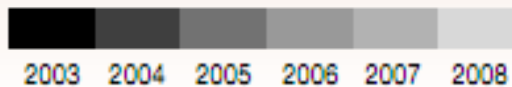


Public-private co-publications per million population, selected Member States, 2000-2008

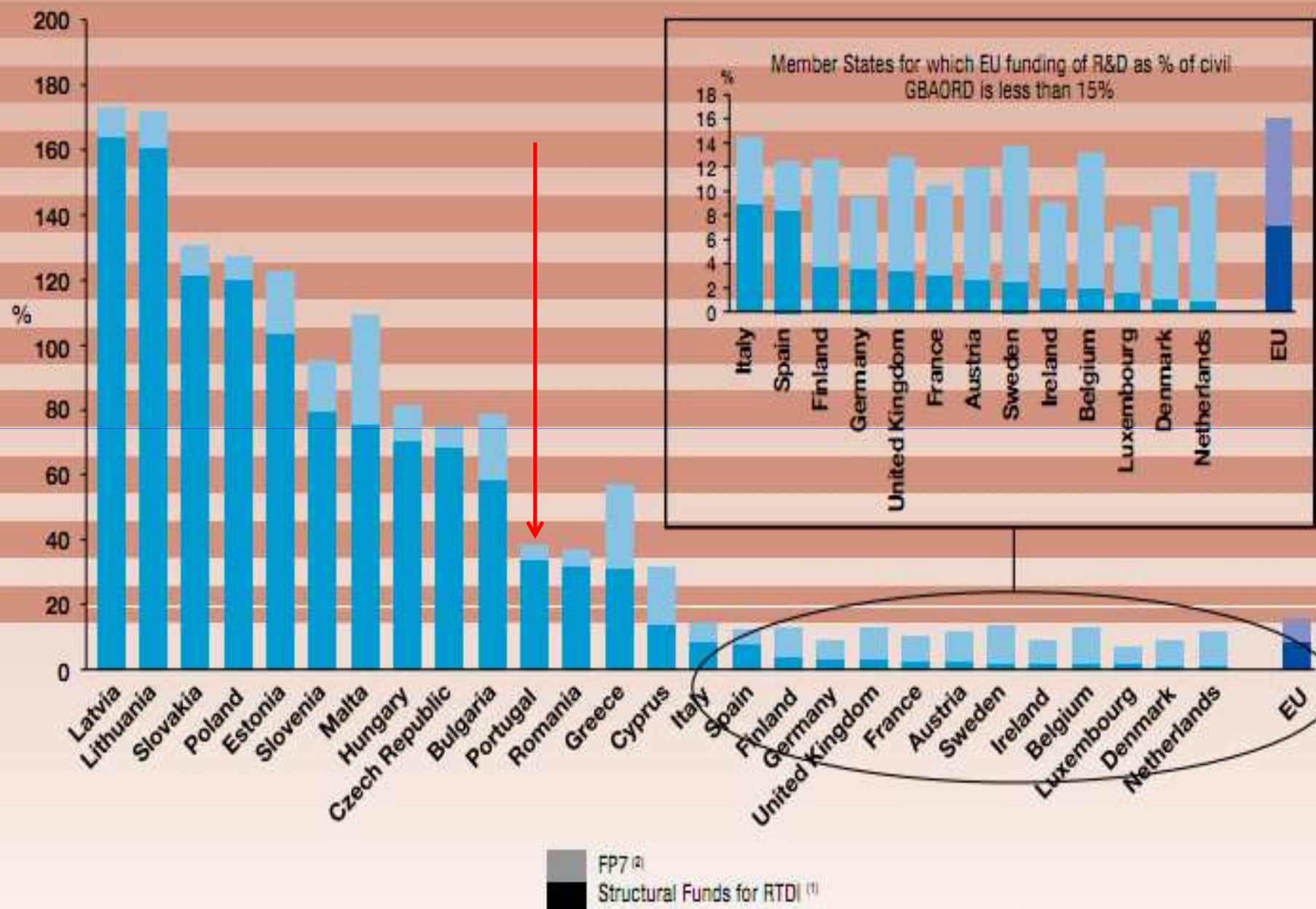


EU15	38.3
PT	4
ES	10.6
NL	83.7
FR	27.9
IT	17.2
DE	45.9
IE	14
FI	83.1
BE	49.4
AT	58
DK	108.7
SE	116.1

European Innovation Scoreboard 2008

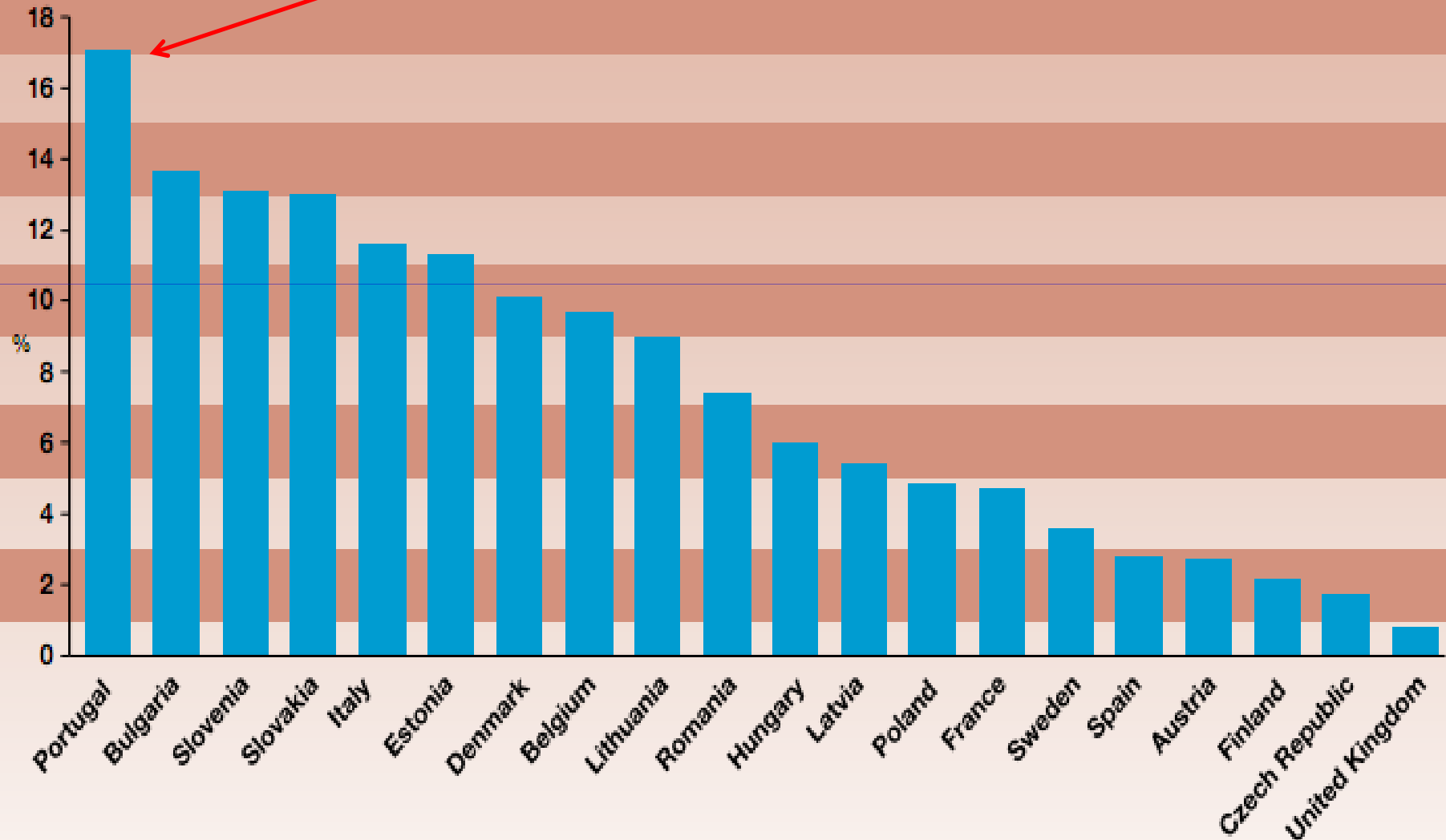


EU funding of R&D as % of civil GBAORD, 2007-2009 (annual average)

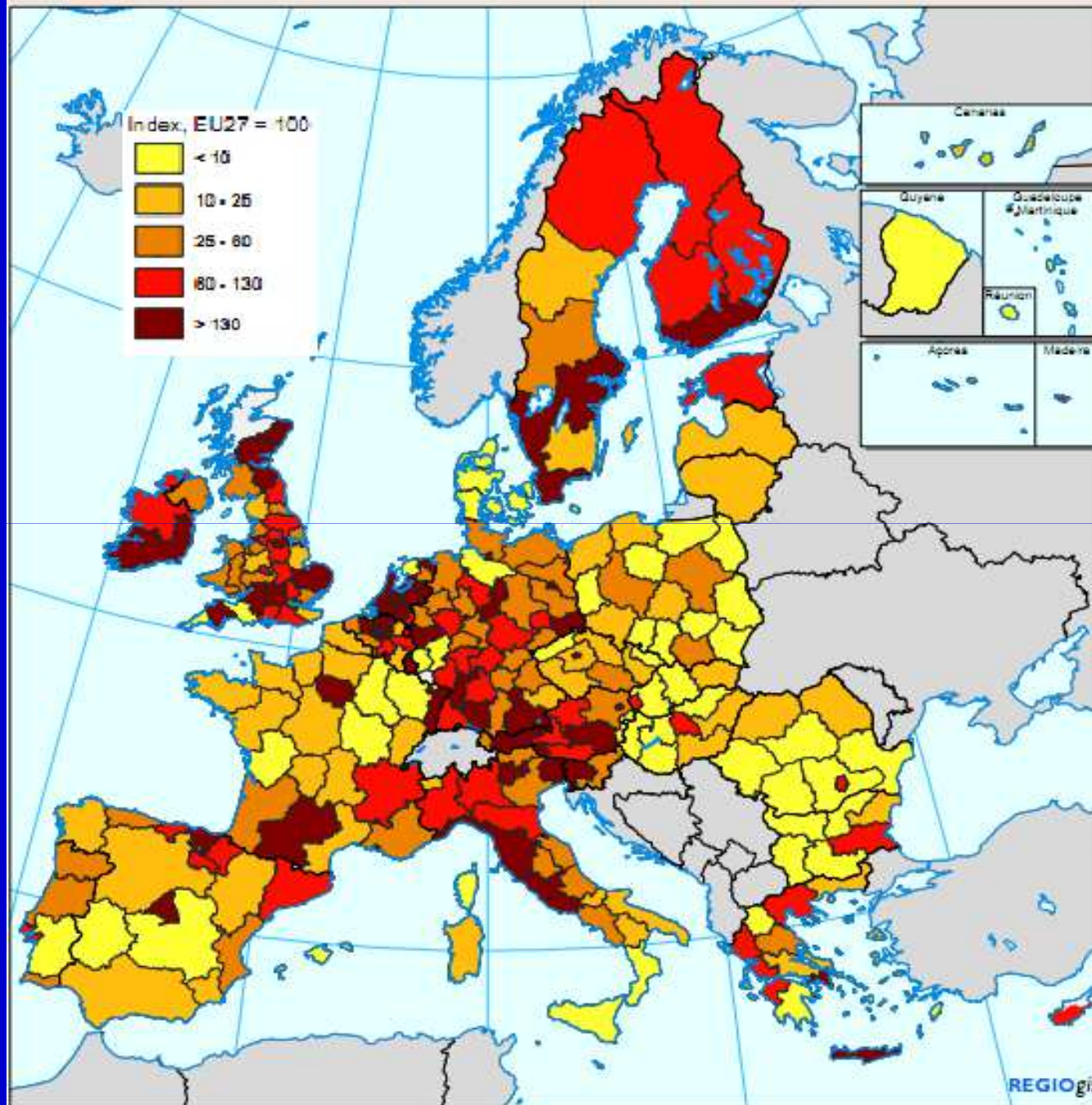


Export PhD

EU doctoral candidates (ISCED 6) in EU Member States of which they are not citizens as % of total doctoral candidates of their citizenship in their home Member State, 2007

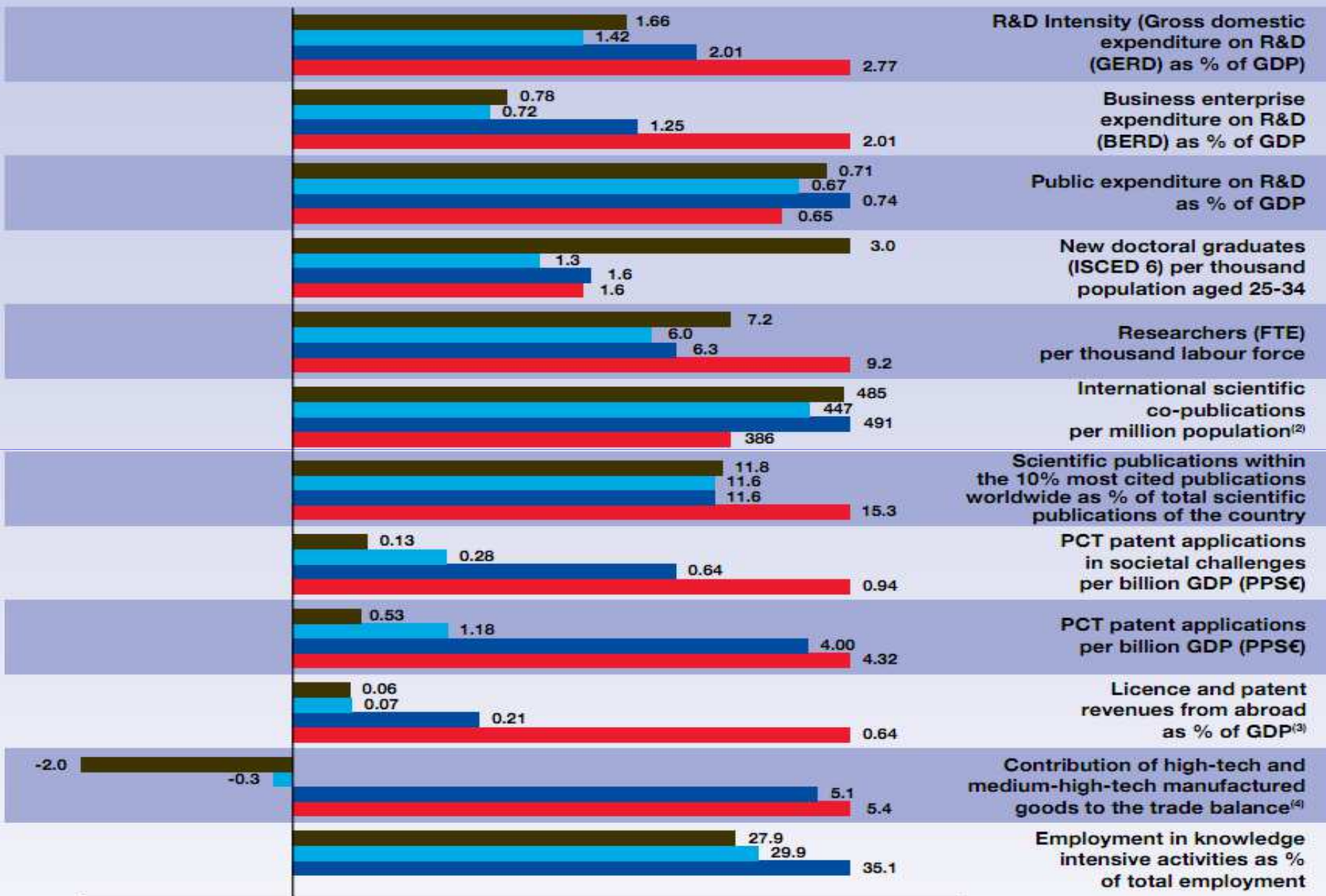


7th Framework Programme, average funding per head, 2007-2009



PORTUGAL

R&D profile, 2009⁽¹⁾



■ Portugal
 ■ Reference Group (EE+ES+PT)
 ■ EU
 ■ United States

World:

Table 2: Top 25 global companies by R&D expenditure

Rank 2010	Company	Sector	Country	R&D (£m)	Growth in R&D over last year (%)	Rank 2009
1	Toyota Motor #	Automobiles & parts	Japan	6,014	-6	1
2	Roche, Switzerland	Pharmaceuticals & biotechnology	Switzerland	5,688	9	4
3	Microsoft#	Software & computer services	USA	5,396	-3	2
4	Volkswagen	Automobiles & parts	Germany	5,144	-2	3
5	Pfizer #	Pharmaceuticals & biotechnology	USA	4,802	-2	6
6	Novartis	Pharmaceuticals & biotechnology	Switzerland	4,581	2	10
7	Nokia	Technology hardware & equipment	Finland	4,440	-6	8
8	Johnson & Johnson #	Pharmaceuticals & biotechnology	USA	4,326	-8	7
9	Sanofi-Aventis	Pharmaceuticals & biotechnology	France	4,060	0	12
10	Samsung Electronics #	Electronic & electrical equipment	South Korea	4,007	8	18
11	Siemens	Electronic & electrical equipment	Germany	3,805	2	20
12	General Motors USA #	Automobiles & parts	USA	3,758	-24	5
13	Honda Motor #	Automobiles & parts	Japan	3,746	-4	11
14	Daimler	Automobiles & parts	Germany	3,700	-6	13
15	GlaxoSmithKline	Pharmaceuticals & biotechnology	UK	3,629	10	21
16	Merck #	Pharmaceuticals & biotechnology	USA	3,619	22	25
17	Intel #	Technology hardware & equipment	USA	3,501	-1	17
18	Panasonic	Leisure goods	Japan	3,445	-7	14
19	Sony #	Leisure goods	Japan	3,308	-4	16
20	Cisco Systems #	Technology hardware & equipment	USA	3,225	1	22
21	Robert Bosch	Automobiles & parts	Germany	3,179	-9	19
22	IBM #	Software & computer services	USA	3,061	-10	15
23	Ford Motor #	Automobiles & parts	USA	3,034	-33	9
24	Nissan Motor #	Automobiles & parts	Japan	3,030	0	23
25	Takeda Pharmaceutical #	Pharmaceuticals & biotechnology	Japan	3,014	64	n/a

Rank	Company	ICB Sector	Country	R&D Investment		R&D/ Net Sales ratio	
				2009 €m	2009 %	2008 %	
European Union:				129,984.00	2.403378387	2.27	
<i>number of companies for calculation</i>				<i>1000</i>	<i>991</i>	<i>980</i>	
1	Volkswagen	Automobiles & parts (335)	Germany	5,790.00	5.7	5.3	
2	Nokia	Telecommunications equipment (9578)	Finland	4,997.00	12.2	10.5	
3	Sanofi-Aventis	Pharmaceuticals (4577)	France	4,569.00	15.3	16.5	
4	Siemens	Electrical components & equipment (2733)	Germany	4,282.00	5.6	5.1	
5	Daimler	Automobiles & parts (335)	Germany	4,164.00	5.3	4.6	
6	GlaxoSmithKline	Pharmaceuticals (4577)	UK	4,084.44	12.8	13.6	
7	Robert Bosch	Automobiles & parts (335)	Germany	3,578.00	9.4	8.7	
8	AstraZeneca	Pharmaceuticals (4577)	UK	3,090.26	13.5	15.9	
9	Bayer	Chemicals (135)	Germany	2,964.00	9.5	8.3	
10	EADS	Aerospace & defence (271)	The Netherlands	2,878.00	6.7	6.4	
11	Alcatel-Lucent	Telecommunications equipment (9578)	France	2,714.00	17.9	18.6	
12	BMW	Automobiles & parts (335)	Germany	2,448.00	5.1	5.4	
13	Ericsson	Telecommunications equipment (9578)	Sweden	2,401.68	11.9	13.4	
14	Peugeot (PSA)	Automobiles & parts (335)	France	2,314.00	4.8	4.4	
15	Boehringer Ingelheim	Pharmaceuticals (4577)	Germany	2,215.00	17.4	18.2	
16	Finmeccanica	Aerospace & defence (271)	Italy	1,926.00	11.7	13.3	
17	Philips Electronics	Leisure goods (374)	The Netherlands	1,714.00	7.4	6.1	
18	Fiat	Automobiles & parts (335)	Italy	1,692.00	3.4	3.3	
19	Renault	Automobiles & parts (335)	France	1,643.00	5.0	6.1	
20	STMicroelectronics	Semiconductors (9576)	The Netherlands	1,547.92	26.1	20.8	
21	SAP	Software (9537)	Germany	1,543.00	14.5	14.1	
22	Volvo	Commercial vehicles & trucks (2753)	Sweden	1,512.03	7.1	5.4	
23	BASF	Chemicals (135)	Germany	1,410.00	2.8	2.2	
24	Continental	Automobiles & parts (335)	Germany	1,405.30	7.0	6.3	
25	Merck	Pharmaceuticals (4577)	Germany	1,344.60	17.4	16.3	
26	BT	Fixed line telecommunications (653)	UK	1,158.14	4.9	5.2	
27	Novo Nordisk	Pharmaceuticals (4577)	Denmark	1,001.06	14.6	16.3	
28	Unilever	Food producers (357)	UK	891.00	2.2	2.3	
29	Vivendi	Media (555)	France	874.00	3.2	2.8	
30	France Telecom	Fixed line telecommunications (653)	France	862.00	1.7	1.7	
31	Banco Santander	Banks (835)	Spain	856.17	2.1	2.3	
32	Telecom Italia	Fixed line telecommunications (653)	Italy	842.00	3.0	2.3	
33	Royal Dutch Shell	Oil & gas producers (53)	UK	784.07	0.4	0.3	
34	Telefonica	Fixed line telecommunications (653)	Spain	777.00	1.4	1.2	

FRANCE				R&D Investment Sales Ratio		
				2009	2009	2008
No	Company	Rank	ICB Sector	€m	%	%
France		<i>number of companies for calculation</i>		116	116	114
1	Sanofi-Aventis	3	Pharmaceuticals (4577)	4,569.00	15.3	16.5
2	Alcatel-Lucent	11	Telecommunications equipment	2,714.00	17.9	18.6
3	Peugeot (PSA)	14	Automobiles & parts (335)	2,314.00	4.8	4.4
4	Renault	19	Automobiles & parts (335)	1,643.00	5.0	6.1
5	Vivendi	29	Media (555)	874.00	3.2	2.8
6	France Telecom	30	Fixed line telecommunications (1	862.00	1.7	1.7
7	Schneider	36	Electrical components & equipm	675.00	4.3	3.9
8	Thales	38	Aerospace & defence (271)	663.70	5.2	4.5
9	TOTAL	39	Oil & gas producers (53)	650.00	0.6	0.4
10	SAFRAN	41	Aerospace & defence (271)	629.00	5.9	5.7
11	Valeo	42	Automobiles & parts (335)	620.00	8.3	9.1
12	ALSTOM	43	Industrial machinery (2757)	613.00	3.1	3.3
13	L'Oreal	44	Personal goods (376)	609.20	3.5	3.3
14	Michelin	51	Automobiles & parts (335)	506.00	3.4	3.0
15	Electricite de France	53	Electricity (753)	438.00	0.7	0.7
16	AREVA	56	Electricity (753)	414.00	3.0	4.2
17	Saint-Gobain	61	Construction & materials (235)	394.00	1.0	0.9
18	UBIsoft Entertainment	65	Softw are (9537)	334.13	38.4	27.9
19	Dassault Systemes	70	Softw are (9537)	302.50	24.2	23.2
20	Societe Generale	77	Banks (835)	251.00	1.2	1.4
21	Dassault Aviation	81	Aerospace & defence (271)	241.84	7.1	7.3
22	GDF SUEZ	87	Gas, w ater & multiutilities (757)	218.00	0.3	0.2
23	Danone	92	Food producers (357)	206.00	1.4	1.3
24	L'Air Liquide	104	Chemicals (135)	173.00	1.4	1.5
25	Legrand	105	Electrical components & equipm	171.60	4.8	4.4
26	Ipsen	110	Pharmaceuticals (4577)	162.10	14.6	13.2
27	Lafarge	114	Construction & materials (235)	152.00	1.0	0.8
28	Essilor International	115	Health care equipment & servic	151.22	4.6	4.7
29	Thomson (now Techn	120	Electronic equipment (2737)	148.00	3.6	5.2
30	Bouygues	123	Construction & materials (235)	147.00	0.5	0.4
31	Veolia Environnemen	127	Gas, w ater & multiutilities (757)	146.20	0.4	0.3
32	BioMerieux	129	Health care equipment & servic	143.00	11.7	11.9
33	Zodiac Aerospace	135	Aerospace & defence (271)	137.23	6.2	6.7

				R&D Investment		R&D/ Net Sales Ratio
				2009	2009	2008
No	Company	Rank	ICB Sector	€m	%	%
				89.16	2.7	1.8
Greece <i>number of companies for calculation</i>				5	5	5
1	Pharmathen	369	Pharmaceuticals (4577)	32.16	36.0	40.4
2	Intralot	391	Travel & leisure (575)	29.23	3.2	1.3
3	Elaktor	516	Construction & materials (	17.96	0.8	0.2
4	Epsilon Net	949	Software (9537)	4.95	52.6	56.0
5	MLS Multimedia	957	Software (9537)	4.87	32.9	31.2
				126.38	8.9	8.1
Hungary <i>number of companies for calculation</i>				2	2	2
1	Gedeon Richter	196	Pharmaceuticals (4577)	87.21	8.8	7.8
2	Egis Pharmaceuticals	329	Pharmaceuticals (4577)	39.17	9.2	8.7
				1,402.72	2.6	2.3
Ireland <i>number of companies for calculation</i>				16	16	16
1	Covidien	68	Health care equipment & s	305.26	4.1	3.2
2	Accenture	69	Support services (279)	303.13	1.9	1.5
3	Elan	98	Pharmaceuticals (4577)	180.51	31.6	37.9
4	Ingersoll-Rand	100	Industrial machinery (2757	179.39	2.0	1.0
5	Kerry	122	Food producers (357)	147.76	3.3	3.1
6	Cooper Industries	179	Electrical components & e	98.34	2.8	2.2
7	Warner Chilcott	275	Pharmaceuticals (4577)	53.48	5.3	5.3
8	Bank of Ireland	316	Banks (835)	41.33	0.6	1.6
9	SkillSoft	380	Software (9537)	30.57	13.9	15.2
10	James Hardie Industri	499	Construction & materials (	18.89	2.4	2.0
11	Trinity Biotech	681	Health care equipment & s	10.58	12.1	11.4
12	Glanbia	692	Food producers (357)	10.33	0.6	0.5
13	Norkom	794	Software (9537)	7.69	15.6	16.2
14	AGI Therapeutics	894	Pharmaceuticals (4577)	5.76	2,584.8	2,762.9
15	Greencore	928	Food producers (357)	5.28	0.5	0.5
16	Merrion Pharmaceutic	996	Pharmaceuticals (4577)	4.41	69.6	200.9

No	Company	Rank	ICB Sector	R&D Investment		R&D/Net Sales Ratio	
				2009	2009	2008	
				€m	%	%	
Portugal				<i>number of companies for calculation</i>	8	8	8
1	Portugal Telecom	89	Fixed line telecommunications (	213.00	3.2	2.2
2	BIAL	257	Pharmaceuticals (4577)	59.75	40.8	23.7	
3	Caixa Geral de Depositos	262	Banks (835)	58.02	2.0	1.6	
4	Energia de Portugal	377	Electricity (753)	31.00	0.3	0.2	
5	Credito Agricola Financial	658	Banks (835)	11.49	1.9	0.1	
6	Novabase	734	Computer services (9533)	9.10	3.8	3.7	
7	Martifer	770	Construction & materials (235)	8.19	1.0	1.3	
8	Brisa	872	Industrial transportation (277)	6.00	0.9	0.8	
				93.43	8.3	7.5	
Spain				<i>number of companies for calculation</i>	27	27	27
1	Banco Santander	31	Banks (835)	856.17	2.1	2.3	
2	Telefonica	34	Fixed line telecommunications (	777.00	1.4	1.2
3	WAM Acquisition	78	Computer services (9533)	250.59	10.2	9.1	
4	Indra Sistemas	103	Computer services (9533)	175.02	7.0	7.0	
5	Almirall	141	Pharmaceuticals (4577)	133.33	14.4	10.9	
6	Acciona	184	Construction & materials (235)	92.20	1.2	0.6	
7	Iberdrola	187	Electricity (753)	90.53	0.4	0.3	
8	Abengoa	189	General industrials (272)	89.72	2.2	0.9	
9	Repsol YPF	222	Oil & gas producers (53)	75.00	0.2	0.1	
10	Fagor Electrodomesticos	233	Household goods & home cons	69.53	4.9	3.5	
11	Zeltia	273	Pharmaceuticals (4577)	54.14	43.9	55.2	
12	Industria de Turbo Propulso	284	Aerospace & defence (271)	50.00	10.3	16.2	
13	Gamesa	314	Industrial machinery (2757)	41.86	1.3	0.8	
14	ACS	324	Construction & materials (235)	40.04	0.2	0.2	
15	Obrascon Huarte Lain	462	Construction & materials (235)	21.39	0.5	0.3	
16	Amper	629	Telecommunications equipment	12.59	4.4	3.1	
17	CAF	636	Commercial vehicles & trucks (	12.37	1.0	0.6
18	Ebro Puleva	715	Food producers (357)	9.68	0.4	0.4	
19	Laboratorios Farmaceuticos	717	Pharmaceuticals (4577)	9.60	6.8	6.1	
20	Corporacion IBV Participaci	754	General industrials (272)	8.69	0.8	0.8	
21	Quil	770	Pharmaceuticals (4577)	8.15	0.8	0.8	

Portugal:

2 bancos em 8 empresas

Spain:

1 banco em 27 empresas

Figure 2
Distribution of R&D expenditure across G1000 by country (2009)

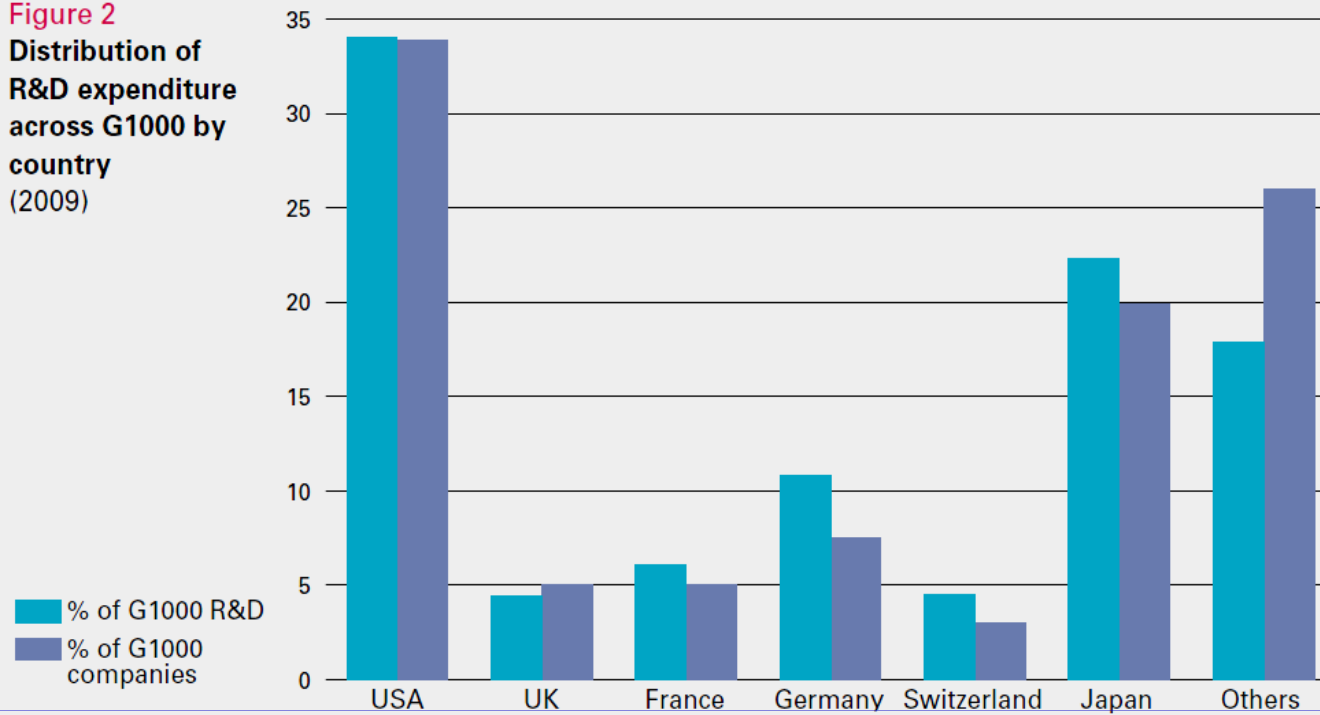


Figure 3
Distribution of UK1000 R&D expenditure, by sector (2009, %)

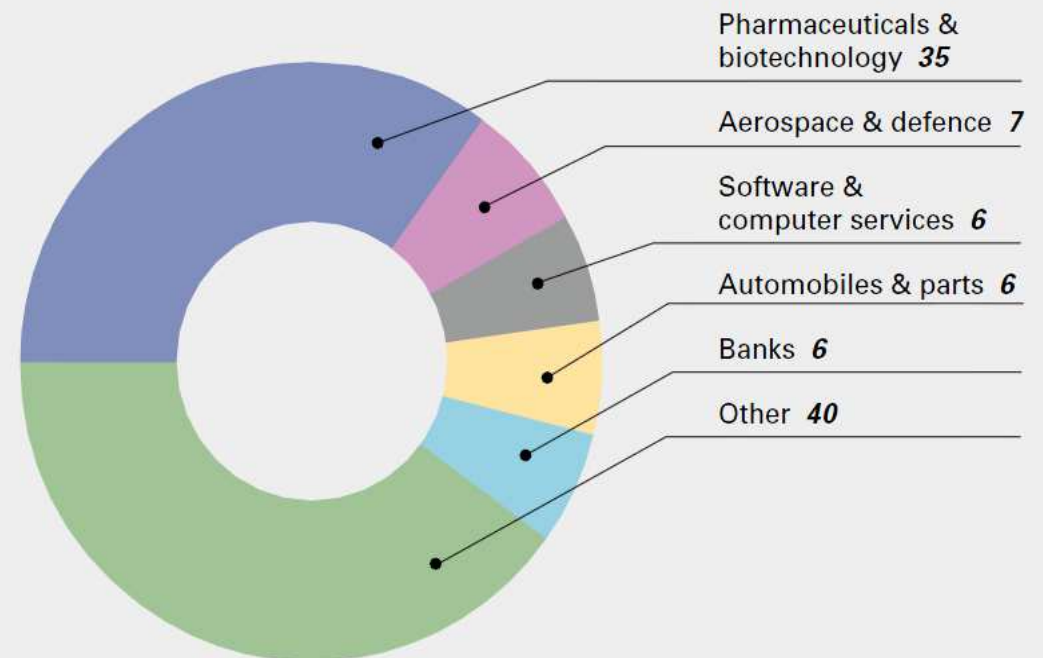


Figure 5
R&D expenditure
by sector and
country in the
G1000
(as % of country
total)

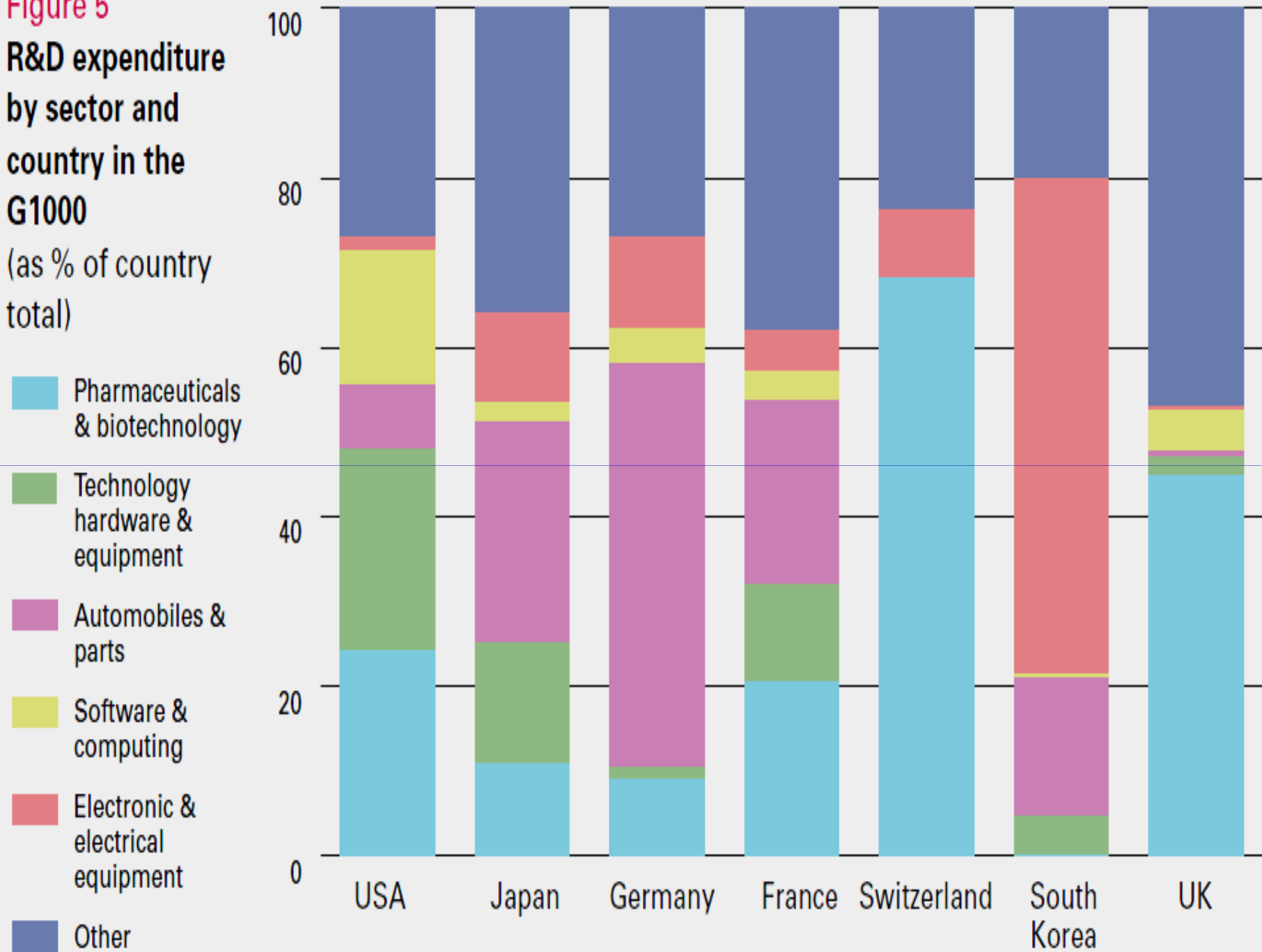
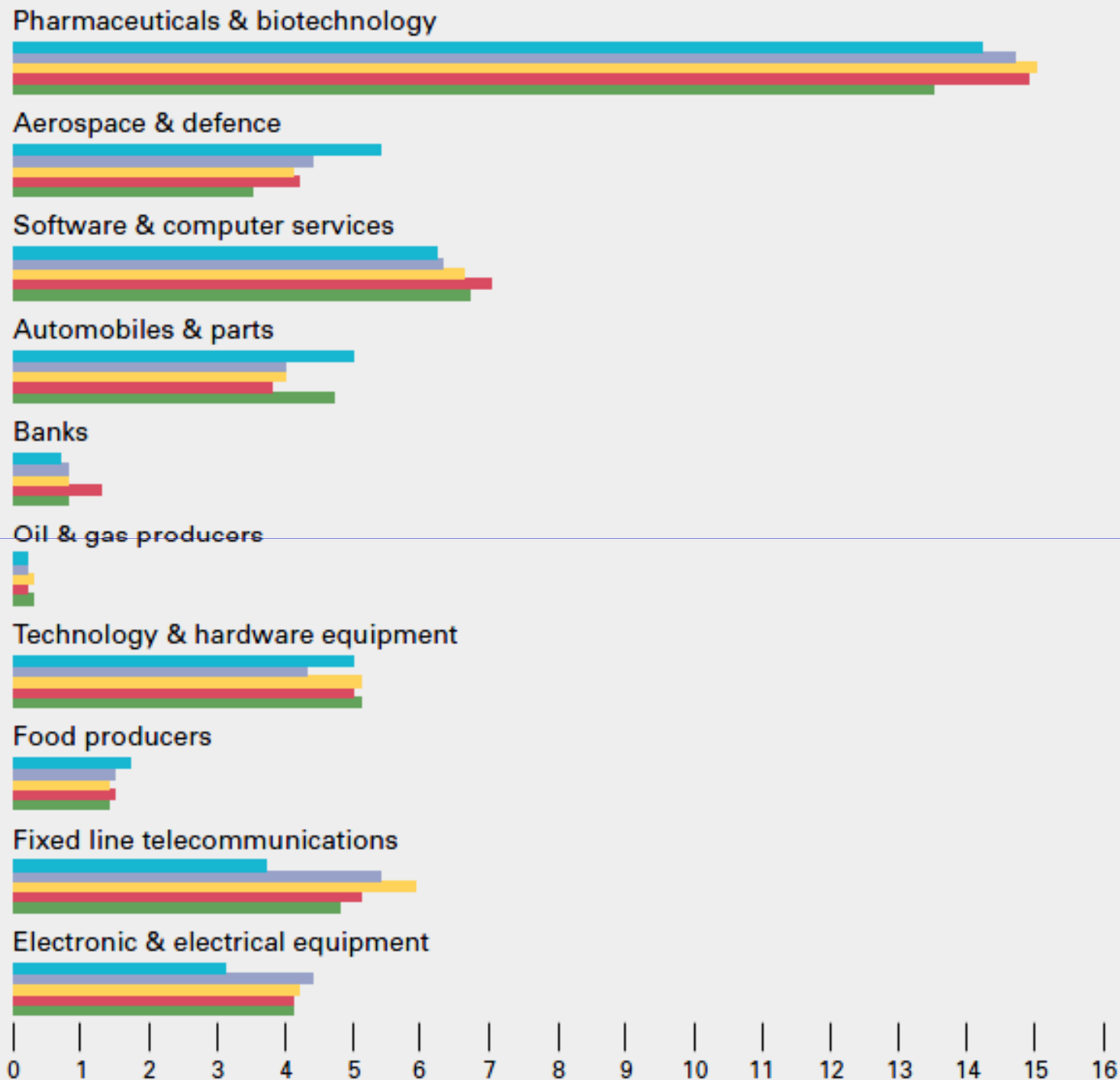


Figure 8
R&D expenditure
as a proportion of
sales by sector in
the UK1000
 (% of sector sales)



BIS | Department for Business
Innovation & Skills

THE 2010 R&D SCOREBOARD

THE TOP 1,000 UK AND
1,000 GLOBAL COMPANIES
BY R&D INVESTMENT

COMMENTARY AND ANALYSIS

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Financiamento da Ciência

Obrigado!

U. PORTO

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Porto, 29 Setembro 2011