



# Science, technology, innovation and entrepreneurship: 2009, the year of creativity and innovation

# 1

Each year a subject is chosen to be the focus of attention for a campaign within the European Union: the year 2009 is the European Year of Creativity and Innovation. The aim for 2009 is to promote creativity and capacity for innovation as key competences for all, to help meet challenges by raising public awareness, disseminate information about good practices, stimulate education and research, creativity and innovation, and promote policy debate and change. By combining actions at Community, national, regional and local levels, it is hoped that this can 'generate synergies and help to focus policy debate on specific issues'.

The European Year of Innovation and Creativity is proposed as a cross-cutting initiative covering not only education and culture, but also other policy domains such as enterprise, media, research, social and regional policy and rural development. As such, the activities of the Year should focus on creating an environment favourable to creativity and innovation and become a strong impetus for long-term policy priorities. All forms of innovation including social and entrepreneurial innovation should be taken into account. Artistic creation and new approaches in culture should also receive due attention, as important means of communication between people in Europe and in the follow-up to the 2008 European Year of Intercultural Dialogue.

Modern economies place increasing emphasis on adding value by means of better use of knowledge and innovation. Most analysts agree that education and training can be a determining factor in enhancing creativity, innovation performance and competitiveness – the 'knowledge triangle' comprising education, research and innovation. However, creativity and innovation are also linked to personal attributes, based on cultural and interpersonal skills and values. Creativity is a human characteristic that manifests itself in many contexts, from works of art, design and craft, to scientific breakthroughs and entrepreneurship. Creativity and innovation have the potential to lead to new products, services, processes, strategies and organisations that arise from new ideas and associations, irrespective of whether the domain is economic, social or artistic. As such, creativity and innovation can be stimulated through a broad, creative, skills base, as well as the development of motivation and a sense of initiative.



In October 2006, the European Parliament and the Council adopted a decision (No 1639/2006/CE) establishing a competitiveness and innovation framework programme (CIP)<sup>(1)</sup>. The CIP runs from 2007 to 2013, and aims to promote the competitiveness of European enterprises. With small and medium-sized enterprises (SMEs) as its main target, the programme aims to support innovation activities (including eco-innovation), provide better access to finance and deliver business support services in the regions. It is hoped that it will encourage a better take-up and use of information and communications technologies (ICT) and help to develop the information society, while also promoting the increased use of renewable energies and energy efficiency.

In December 2006, the seventh framework programme of the European Community for research and technological development for the period 2007 to 2013 (FP7) was established<sup>(2)</sup>. FP7 will be implemented through specific programmes corresponding to the main themes of European research policy, with funding amounting to around EUR 53 billion. In April 2007, the European Commission adopted a Green paper titled 'The European Research Area: New Perspectives'<sup>(3)</sup>. This opens discussions on a number of issues, notably the mobility of researchers, developing research infrastructure and institutions, as well as improvements in the circulation and sharing of knowledge, research programmes, and global research cooperation. It aims to tackle underinvestment,

and fragmentation. The principles of the overall governance of the European Research Area (ERA) are known as the 'Ljubljana Process' stemming from discussions in Ljubljana and Brdo (Slovenia) in April 2008. Five initiatives for the development of ERA have been foreseen, with several already adopted in 2008; these concern researchers, research infrastructure, knowledge sharing, joint programming, and international science and technology cooperation.

In a wider context, by placing competitiveness at the heart of the European political agenda, the reinvigorated Lisbon process aims to make Europe a more attractive place to invest, by boosting entrepreneurial initiative and creating a productive environment where innovation capacity can grow and develop. In October 2005 and September 2006 the European Commission adopted two Communications titled 'More Research and Innovation - Investing for Growth and Employment: A Common Approach' and 'Putting knowledge into practice: A broad-based innovation strategy for the EU'. These point the way forward to accompany industry-led and society-driven innovation with competitiveness and public policies at all levels. The second of these Communications singles out ten priority actions, notably to encourage the emergence of 'lead markets' where public authorities create conditions for a successful market uptake of innovative products and services in a focused way in areas such as e-health, internal security, eco-innovation and eco-construction.

(1) [http://ec.europa.eu/cip/index\\_en.htm](http://ec.europa.eu/cip/index_en.htm).

(2) [http://cordis.europa.eu/fp7/home\\_en.html](http://cordis.europa.eu/fp7/home_en.html).

(3) [http://ec.europa.eu/research/era/index\\_en.html](http://ec.europa.eu/research/era/index_en.html).

In two recent Communications<sup>(4)</sup>, the European Commission has set out its vision for improving the patent system in Europe. A strong industrial property rights system is seen as one driving force for innovation, stimulating R&D investment and facilitating the transfer of knowledge from the laboratory to the marketplace. The latest Communication includes initiatives on enforcement, innovation support for small and medium-sized enterprises, and the quality of industrial property rights. It complements a 2007 Communication on the patent

system, which set out a way forward towards the adoption of a Community patent and an integrated EU-wide jurisdiction for patents.

The overall objective of the European Year of Creativity and Innovation is to promote creativity for all, as a driver for innovation and as a key factor for the development of personal, occupational, entrepreneurial and social competences through lifelong learning. This chapter looks at some of these specific areas through official statistics.

## 1.1 Education

Education is seen as a key to developing an innovation-orientated society, for the development of entrepreneurial skills, as well as literacy, scientific and mathematical competence, languages and digital literacy. Lifelong training and education offer an important opportunity for individuals to maintain or improve their skills situation. Education, vocational training and lifelong learning play a vital role in the economic and social strategy of Europe. More general information on education in Europe is available in Chapter 4.

Within the EU-27 education participation rates of persons aged 15 to 24 slipped back slightly to 59.3 % in 2006. Nevertheless, a sustained period of increase in earlier years meant that this rate was still 6.4 percentage points higher than in 1998. The participation rate for female pupils and students was higher than for their male counterparts within the EU-27 as a whole, and this situation was

repeated in every Member State except the Netherlands and Germany, where the rates for females were slightly lower.

Public expenditure on tertiary level education averaged 1.15 % of GDP in the EU-27 in 2005, up from 1.05 % in 2001. The highest shares were recorded in the Nordic Member States, and the lowest in Romania, Slovakia, Bulgaria and Italy.

Maths, science and technology graduates made up more than one fifth (22.4 %) of all graduates in the EU-27 in 2006, with Austria recording a share closer to one third (32.3 %).

Around one third of employees in the EU-27 participated in continuing vocational training (CVT) courses during 2005. Among the Member States, the proportion ranged from 50 % or more in the Czech Republic and Slovenia to 15 % or less in Greece, Lithuania, Latvia and Bulgaria.

(4) 'Enhancing the patent system in Europe'; 'An Industrial Property Rights Strategy for Europe'; [http://ec.europa.eu/internal\\_market/indprop/rights/index\\_en.htm](http://ec.europa.eu/internal_market/indprop/rights/index_en.htm).


**Table 1.1:** Students studying in secondary and post-secondary non-tertiary education, 2006 (1)

(1 000)

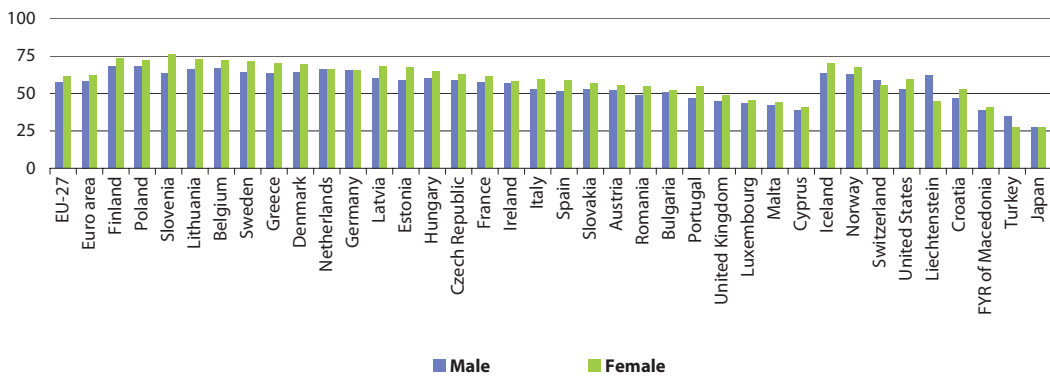
	Total	of which (%):						Services
		Humanities & arts	Social sciences, bus. & law	Science, maths & computing	Engin., manufac. & constr.	Agric. & veterinary	Health & welfare	
<b>EU-27</b>	3 282	3.7	20.1	2.9	29.1	3.4	9.1	12.4
<b>Euro area</b>	2 269	3.4	20.3	2.2	23.6	2.6	10.7	10.4
<b>Belgium</b>	95.7	12.3	16.5	1.3	19.0	1.6	18.4	10.6
<b>Bulgaria</b>	37.4	2.4	18.1	1.3	54.8	7.5	0.7	15.1
<b>Czech Republic</b>	114.9	8.1	26.6	:	38.8	3.3	5.4	16.9
<b>Denmark</b>	64.3	12.4	21.2	25.8	18.4	1.8	14.2	6.2
<b>Germany</b>	709.9	2.4	29.9	3.0	28.9	2.3	10.2	11.0
<b>Estonia</b>	7.2	3.3	14.6	4.8	44.0	5.1	4.2	24.1
<b>Ireland (2)</b>	77.1	2.8	13.2	4.0	30.5	2.4	8.7	13.6
<b>Greece (2)</b>	63.5	5.2	22.9	23.2	17.1	1.3	26.6	3.7
<b>Spain</b>	:	:	:	:	:	:	:	:
<b>France</b>	516.1	2.2	25.8	:	37.4	4.7	13.3	16.6
<b>Italy</b>	437.8	:	:	:	:	:	:	:
<b>Cyprus</b>	:	:	:	:	:	:	:	:
<b>Latvia</b>	9.8	5.4	15.0	5.5	42.9	1.9	4.2	25.1
<b>Lithuania</b>	10.9	3.3	29.1	:	41.0	1.2	2.4	22.5
<b>Luxembourg</b>	2.5	2.7	38.9	2.3	33.1	3.5	7.1	4.9
<b>Hungary</b>	55.5	4.5	21.8	8.8	32.0	3.0	7.9	21.1
<b>Malta</b>	1.7	8.5	12.4	18.1	32.7	1.2	7.0	19.0
<b>Netherlands</b>	132.0	2.2	21.0	5.1	21.0	4.1	26.1	17.4
<b>Austria (2)</b>	97.6	:	:	:	:	:	:	:
<b>Poland</b>	332.7	2.0	24.7	5.2	38.6	2.7	5.6	21.1
<b>Portugal</b>	:	:	:	:	:	:	:	:
<b>Romania</b>	260.9	:	11.2	:	55.4	11.5	:	12.9
<b>Slovenia</b>	20.8	0.4	35.9	1.8	31.7	4.4	9.4	13.2
<b>Slovakia</b>	63.1	3.2	23.2	4.2	36.4	3.6	4.9	23.4
<b>Finland</b>	60.2	5.5	19.8	3.4	29.6	5.0	15.7	21.0
<b>Sweden</b>	56.0	23.4	6.6	0.2	33.9	5.7	11.5	10.7
<b>United Kingdom</b>	:	:	:	:	:	:	:	:
<b>FYR of Macedonia</b>	16.7	2.6	20.4	1.0	44.5	6.6	12.2	12.1
<b>Iceland</b>	2.7	9.0	15.0	1.7	37.1	3.5	11.8	18.5
<b>Liechtenstein</b>	0.4	5.7	:	:	:	:	:	:
<b>Norway</b>	26.9	3.9	8.9	2.9	39.3	3.7	25.6	15.6
<b>Switzerland</b>	72.2	3.1	32.5	9.1	27.8	3.4	11.3	8.8

(1) ISCED levels 3 and 4.

(2) 2005.

Source: Eurostat (educ\_grad5)

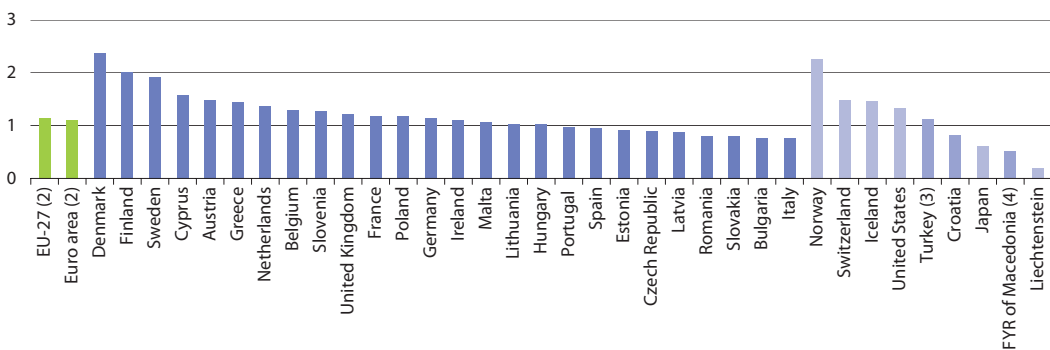
**Figure 1.1:** Participation in education among students aged 15-24 years, 2006 (1)  
(% share of corresponding age population)



(1) This indicator gives the percentage of all 15-24 year olds who are still in education (at any of the ISCED levels). It gives an indication of the number of young people who have not abandoned their efforts to improve their skills through education. The figure ranks countries based on the average of male and female.

Source: Eurostat (educ\_thpar)

**Figure 1.2:** Public expenditure on tertiary level education, 2005 (1)  
(% share of GDP)



(1) Generally, the public sector funds education either by bearing directly the current and capital expenses of educational institutions or by supporting students and their families with scholarships and public loans as well as by transferring public subsidies for educational activities to private firms or non-profit organisations. Both types of transactions together are reported as total public expenditure on education. Luxembourg, not available.

(2) Estimate.

(3) 2004.

(4) 2003.

Source: Eurostat (educ\_figdp)

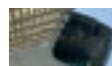

**Table 1.2:** Students studying creative or innovative subjects in tertiary education, 2006 (1)  
 (1 000)

	Total	of which: (%)								
		Arts	Journalism & info.	Life science	Phys. science	Maths & stats.	Computing	Engin. & engin. trades	Manuf. & processing	Architecture & build.
<b>EU-27</b>	18 775	3.9	1.6	2.3	2.4	1.2	4.0	8.7	1.2	3.7
<b>Euro area</b>	11 191	4.3	1.7	2.3	2.6	1.2	3.9	9.4	0.8	4.2
<b>Belgium</b>	394	5.0	2.5	2.2	1.3	0.4	3.0	6.3	0.2	4.0
<b>Bulgaria</b>	243	2.3	1.5	0.7	1.6	0.5	2.2	16.8	1.8	2.4
<b>Czech Republic</b>	337	2.4	1.1	1.4	1.7	0.8	4.6	9.3	1.9	3.3
<b>Denmark</b>	229	3.5	1.2	1.6	1.5	1.1	3.8	5.9	0.7	3.5
<b>Germany</b>	2 289	3.7	1.1	2.6	4.4	2.4	5.9	11.0	0.8	3.9
<b>Estonia</b>	68	4.5	1.7	1.9	1.8	0.6	5.8	5.7	2.1	4.5
<b>Ireland</b>	186	8.5	0.3	3.5	2.3	0.8	5.0	4.8	0.8	4.9
<b>Greece (2)</b>	647	1.7	1.2	5.1	3.6	2.9	4.1	5.2	7.8	3.5
<b>Spain</b>	1 789	4.6	1.6	1.8	2.2	0.7	6.7	11.7	0.8	5.3
<b>France</b>	2 201	4.2	1.4	2.3	3.8	1.6	2.6	6.5	0.8	2.1
<b>Italy</b>	2 029	5.7	3.2	3.8	1.5	0.9	1.7	8.9	0.8	5.9
<b>Cyprus</b>	21	3.3	2.6	0.2	2.1	1.3	9.1	4.4	0.0	1.7
<b>Latvia</b>	131	2.6	1.2	0.4	0.8	0.3	3.6	5.6	1.0	3.5
<b>Lithuania</b>	199	2.8	0.8	0.6	1.1	0.9	3.5	11.2	2.2	4.6
<b>Luxembourg</b>	3	:	:	:	:	:	:	:	:	:
<b>Hungary</b>	439	1.4	2.6	0.7	1.1	0.4	3.1	8.5	1.2	2.7
<b>Malta</b>	9	5.9	2.9	1.1	0.5	2.8	4.0	4.8	0.0	2.8
<b>Netherlands</b>	572	4.4	0.8	0.7	0.7	0.2	5.0	4.4	0.4	3.4
<b>Austria</b>	253	4.2	2.5	3.2	2.6	1.1	5.6	6.5	1.3	4.1
<b>Poland</b>	2 146	1.1	0.9	1.9	1.7	0.8	5.0	6.9	2.7	2.8
<b>Portugal</b>	367	4.5	2.2	2.2	2.1	1.0	2.0	13.1	1.1	7.7
<b>Romania</b>	835	1.6	1.9	2.4	:	2.3	:	13.6	3.8	0.8
<b>Slovenia</b>	115	1.5	0.6	1.1	1.1	0.5	2.8	8.3	3.5	3.9
<b>Slovakia</b>	198	1.7	2.0	2.4	1.9	0.7	4.0	10.6	1.8	4.0
<b>Finland</b>	309	5.4	1.0	1.6	2.6	1.5	5.7	20.9	1.4	3.3
<b>Sweden</b>	423	3.6	2.0	2.4	1.9	1.7	3.7	13.0	0.5	2.8
<b>United Kingdom</b>	2 336	6.7	2.0	3.6	3.5	1.4	5.1	4.3	0.8	3.2
<b>Croatia</b>	137	2.5	6.2	1.0	1.7	1.6	3.1	9.5	2.7	4.1
<b>FYR of Macedonia</b>	48	1.3	1.2	1.3	2.8	0.7	2.4	10.1	4.9	3.3
<b>Turkey</b>	2 343	1.3	4.3	1.0	2.7	1.5	2.4	8.3	2.8	2.2
<b>Iceland</b>	16	2.7	1.3	2.4	2.0	0.5	3.1	4.6	0.2	2.5
<b>Liechtenstein</b>	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.0
<b>Norway</b>	215	3.2	1.9	1.4	1.3	0.9	4.2	4.4	0.3	1.9
<b>Switzerland</b>	205	4.0	1.9	3.1	3.4	0.8	3.4	8.7	0.5	4.2
<b>Japan</b>	4 085	3.8	:	:	:	:	:	:	:	:
<b>United States</b>	17 487	3.3	2.8	2.8	1.0	0.6	4.5	4.7	1.4	0.6

(1) ISCED levels 5 and 6.

(2) 2005.

Source: Eurostat (educ\_enr15)


**Table 1.3:** Graduates in creative or innovative subjects, 2006 (1)

(1 000)

	Total	of which: (%)								
		Arts	Journa- lism & info.	Life science	Phys. science	Maths & stats.	Com- puting	Engin. & engin. trades	Manuf. & pro- cessing	Archi- tecture & build.
<b>EU-27</b>	3 846	3.9	1.9	2.4	2.1	1.1	3.9	7.8	1.2	2.9
<b>Euro area</b>	2 113	4.2	2.1	2.3	2.3	1.2	3.9	9.1	1.0	3.3
<b>Belgium</b>	82	4.0	1.8	2.2	1.5	0.5	3.5	6.2	0.3	2.8
<b>Bulgaria</b>	45	2.2	1.2	0.9	1.7	0.4	2.4	12.7	1.5	1.4
<b>Czech Republic</b>	69	2.7	1.0	1.4	1.8	0.8	3.6	10.3	1.8	2.9
<b>Denmark</b>	48	3.3	1.3	1.6	1.3	1.0	3.3	5.7	1.2	4.0
<b>Germany</b>	415	3.8	1.1	2.3	3.2	2.0	3.9	8.9	0.9	3.7
<b>Estonia</b>	12	4.6	1.7	2.1	1.8	0.6	4.9	5.3	2.1	2.5
<b>Ireland (2)</b>	60	4.3	0.3	1.6	1.1	0.5	2.9	2.6	0.5	1.9
<b>Greece (2)</b>	60	2.4	0.9	3.4	4.0	2.4	5.2	7.3	1.0	4.0
<b>Spain</b>	286	5.0	1.8	1.6	1.8	0.6	6.1	11.5	1.0	4.0
<b>France</b>	644	3.7	2.2	2.7	2.8	1.5	4.1	9.4	1.3	2.1
<b>Italy</b>	279	6.5	4.7	3.4	1.3	0.9	1.3	10.1	0.7	5.1
<b>Cyprus</b>	4	4.3	2.0	0.2	2.2	2.0	5.4	3.1	0.0	1.1
<b>Latvia</b>	26	2.2	1.1	0.5	0.7	0.3	3.1	4.3	0.6	1.9
<b>Lithuania</b>	43	2.8	0.8	0.7	1.1	0.9	3.3	9.9	1.9	4.1
<b>Luxembourg</b>	:	:	:	:	:	:	:	:	:	:
<b>Hungary</b>	70	1.3	2.8	0.5	0.8	0.3	4.2	3.9	1.4	1.4
<b>Malta</b>	3	4.2	0.8	0.9	0.8	0.0	4.5	2.3	0.0	2.5
<b>Netherlands</b>	117	4.1	0.6	0.9	0.9	0.3	4.3	4.2	0.4	3.2
<b>Austria</b>	35	4.0	3.3	3.5	2.0	0.6	6.4	13.0	2.0	4.8
<b>Poland</b>	504	0.9	0.9	2.0	1.3	0.8	4.0	4.7	1.9	1.7
<b>Portugal</b>	72	5.3	2.5	2.2	2.9	1.7	5.1	8.0	1.4	5.7
<b>Romania</b>	175	1.7	1.8	2.9	:	1.7	:	12.3	3.1	0.4
<b>Slovenia</b>	17	1.6	0.6	0.9	0.7	0.5	1.4	7.1	2.6	3.0
<b>Slovakia</b>	40	2.2	2.1	2.4	2.2	0.5	3.4	9.5	1.4	4.1
<b>Finland</b>	40	6.1	1.1	1.3	2.1	0.9	4.4	17.0	1.1	2.4
<b>Sweden</b>	61	2.7	1.9	2.4	1.5	0.6	3.6	14.8	0.7	3.0
<b>United Kingdom</b>	640	6.9	2.4	3.4	3.4	1.3	5.3	4.4	0.7	3.1
<b>Croatia</b>	21	2.6	2.2	1.6	1.6	0.8	2.3	6.8	1.7	3.0
<b>FYR of Macedonia</b>	7	2.7	0.9	1.5	3.5	1.0	1.4	7.7	3.6	2.5
<b>Turkey</b>	373	1.3	4.0	1.0	2.4	1.4	3.0	9.0	3.1	2.2
<b>Iceland</b>	3	3.6	1.1	2.8	1.9	0.0	3.2	3.5	0.2	2.9
<b>Liechtenstein</b>	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	34.8
<b>Norway</b>	34	3.4	2.1	1.7	1.0	0.4	5.0	4.7	0.3	2.5
<b>Switzerland</b>	69	3.1	1.3	2.1	2.4	0.5	5.3	8.2	0.7	3.1
<b>Japan</b>	1 068	4.3	:	:	:	:	:	:	:	:
<b>United States</b>	2 639	3.7	3.7	3.2	1.3	0.8	3.7	4.7	1.1	1.4

(1) Graduates from ISCED levels 5 and 6.

(2) 2005.

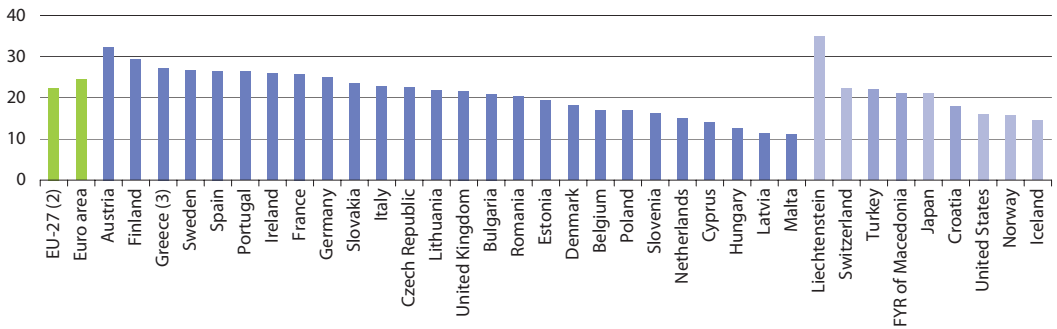
Source: Eurostat (educ\_grad5)





**Figure 1.3:** Maths, science and technology graduates, 2006 (1)

(% share of all graduates)



(1) This indicator shows the proportion of all graduates (ISCED levels 5 and 6) from both public and private institutions completing graduate and post-graduate studies in maths, science and technology fields compared with all graduates. Luxembourg, not available.

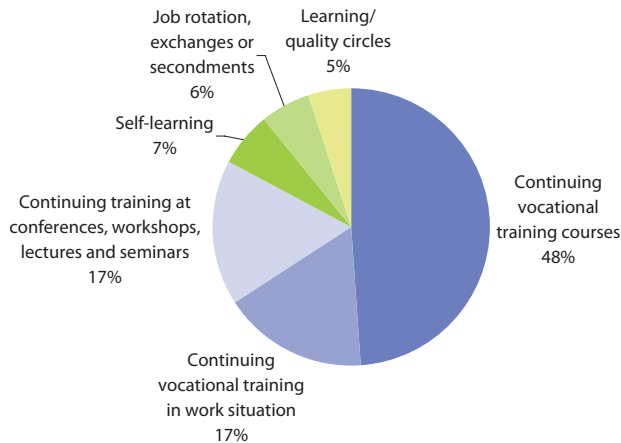
(2) Estimate.

(3) 2005.

Source: Eurostat (educ\_grad5)

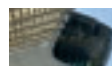
**Figure 1.4:** Continuing vocational training by type of activity received, 2005 (1)

(% of participants in CVT by type of activity)



(1) Figures do not sum to 100 % due to rounding.

Source: Eurostat (trng\_cvts3\_01, trng\_cvts3\_03)



**Table 1.4:** Adult population aged 25 to 64 participating in education and training, 2005

(%)

	Proportion of employees participating in CVT courses	Proportion of enterprises providing CVT courses	Enterprises providing CVT courses by type of course	
			Internal courses	External courses
<b>EU-27</b>	33	49	54	89
<b>Belgium</b>	40	48	98	99
<b>Bulgaria</b>	15	21	58	80
<b>Czech Republic</b>	59	63	66	80
<b>Denmark</b>	35	81	64	96
<b>Germany</b>	30	54	72	90
<b>Estonia</b>	24	56	40	94
<b>Ireland</b>	:	:	:	:
<b>Greece</b>	14	19	38	82
<b>Spain</b>	33	38	44	88
<b>France</b>	46	71	44	92
<b>Italy</b>	29	27	48	86
<b>Cyprus</b>	30	47	31	94
<b>Latvia</b>	15	30	22	97
<b>Lithuania</b>	15	26	34	95
<b>Luxembourg</b>	49	61	63	87
<b>Hungary</b>	16	34	39	94
<b>Malta</b>	32	31	63	82
<b>Netherlands</b>	34	70	36	95
<b>Austria</b>	33	67	43	96
<b>Poland</b>	21	24	43	95
<b>Portugal</b>	28	32	50	82
<b>Romania</b>	17	28	49	74
<b>Slovenia</b>	50	61	49	94
<b>Slovakia</b>	38	38	37	88
<b>Finland</b>	39	70	43	94
<b>Sweden</b>	46	72	62	93
<b>United Kingdom</b>	33	67	67	81
<b>Norway</b>	29	55	66	79

Source: Eurostat (trng\_cvts3\_41, trng\_cvts3\_05)



## 1.2 Research and development

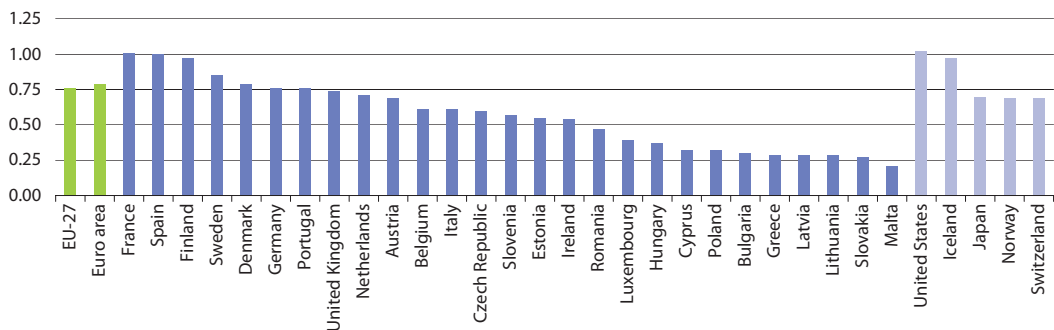
Increased levels of research and development (R & D) expenditure are seen as one means to achieve the goals set out in 2000 by the European Council in Lisbon: in 2002 a target that investment in R & D should reach 3 % of GDP by 2010 was set. Research and development is defined as comprising creative work undertaken on a systematic basis to increase the stock of knowledge (of man, culture and society) and the use of this stock to devise new applications. More information on the sources and methods concerning R & D expenditure data are available in Subchapter 14.2.

Government support for R & D represented 0.8 % of GDP in the EU-27 in 2006, with the highest shares (1.0 %) recorded in France, Spain and Finland: all of the Member States that joined the EU in 2004 or 2007 recorded shares below the EU-27 average, while Greece, Luxembourg and Ireland recorded the lowest shares among the EU-15 Member States. Around 30 % of government support for R & D was

allocated to research financed from general university funds (GUF), an objective which covers R & D related to various fields of science: natural, engineering, medical, agricultural, social sciences and humanities. Defence related appropriations accounted for 13 % of all government appropriations, although this objective had a much higher share in a small number of Member States, notably the United Kingdom, France, Sweden and Spain.

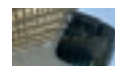
Extending the coverage to include also private funding, total R & D expenditure in the EU-27 was EUR 213 100 million in 2006, equivalent to 1.84 % of GDP. The ratio to GDP is referred to as R & D intensity and this showed high values in the Nordic Member States, Germany and Austria, with only Sweden and Finland above the 3 % target set for 2010; the lowest levels of R & D intensity were recorded in Cyprus, Romania, Slovakia and Bulgaria.

**Figure 1.5:** Government budget appropriations or outlays for research and development, 2007 (1)  
(% share of GDP)



(1) Data on government budget appropriations or outlays on R & D (GBAORD) refer to budget provisions, not to actual expenditure, i.e. GBAORD measures government support for R & D using data collected from budgets. GBAORD are a way of measuring government support; Estonia, Romania and Iceland, 2008; EU-27, euro area, Belgium, Bulgaria, Spain, France, Italy, Cyprus, Latvia, Malta, Poland, Slovenia, Sweden, the United Kingdom, Switzerland and Japan, 2006; Hungary, 2005; EU-27, estimate.

Source: Eurostat (tsc00007)



**Table 1.5:** Government budget appropriations or outlays for research and development, 2007 (1)

	Total research and development		Civil research and development		
	(EUR per inhabitant)	(EUR million)	(EUR per inhabitant)	(EUR million)	(% of total research and development)
<b>EU-27</b>	178.2	87 840	154.7	76 255	86.8
<b>Euro area</b>	:	66 925	:	59 846	89.4
<b>Belgium</b>	185.1	1 946	184.6	1 940	99.7
<b>Bulgaria</b>	9.8	75	:	:	:
<b>Czech Republic</b>	75.3	774	73.4	755	97.5
<b>Denmark</b>	328.6	1 790	326.7	1 780	99.4
<b>Germany</b>	223.6	18 405	209.9	17 274	93.9
<b>Estonia</b>	58.8	79	58.2	78	99.0
<b>Ireland</b>	230.6	995	230.6	995	100.0
<b>Greece</b>	60.3	673	59.9	670	99.5
<b>Spain</b>	223.9	9 799	187.6	8 209	83.8
<b>France</b>	289.3	18 225	224.6	14 147	77.6
<b>Italy</b>	154.9	9 099	152.8	8 975	98.6
<b>Cyprus</b>	61.6	47	61.6	47	100.0
<b>Latvia</b>	20.1	46	20.0	46	99.7
<b>Lithuania</b>	24.2	82	24.0	81	99.2
<b>Luxembourg</b>	298.2	142	298.2	142	100.0
<b>Hungary</b>	32.6	329	32.5	329	99.9
<b>Malta</b>	26.0	11	26.0	11	100.0
<b>Netherlands</b>	243.9	3 990	239.0	3 910	98.0
<b>Austria</b>	225.3	1 870	225.3	1 870	100.0
<b>Poland</b>	22.5	858	22.3	850	99.1
<b>Portugal</b>	116.7	1 237	115.9	1 228	99.3
<b>Romania</b>	19.2	415	18.8	405	97.6
<b>Slovenia</b>	86.5	173	85.2	171	98.4
<b>Slovakia</b>	27.8	150	27.2	146	97.8
<b>Finland</b>	327.8	1 730	320.0	1 689	97.6
<b>Sweden</b>	295.7	2 675	245.9	2 225	83.2
<b>United Kingdom</b>	233.9	14 124	167.7	10 127	71.7
<b>Iceland</b>	401.8	124	401.8	124	100.0
<b>Norway</b>	423.2	1 981	399.6	1 871	94.4
<b>Switzerland</b>	284.7	2 123	283.0	2 111	99.4
<b>Japan</b>	:	24 478	:	23 221	94.9
<b>United States</b>	:	102 917	:	42 932	41.7

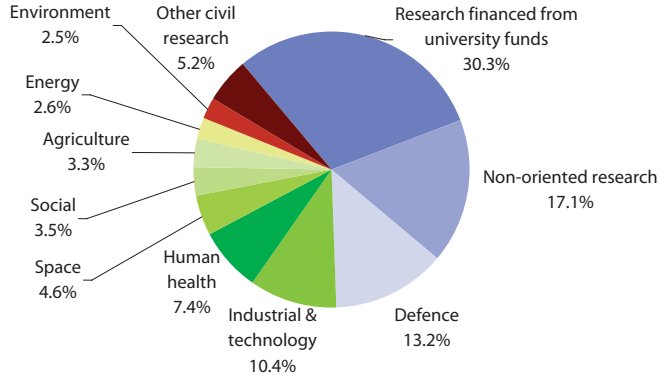
(1) EU-27, euro area, Belgium, Bulgaria, Spain, France, Italy, Cyprus, Latvia, Malta, Poland, Slovenia, Sweden, the United Kingdom, Switzerland and Japan, 2006; Hungary, 2005.

Source: Eurostat (gba\_nabsfin)



**Figure 1.6:** Socio-economic objectives of government budget appropriations or outlays for research and development, EU-27, 2006 (1)

(% share of total)

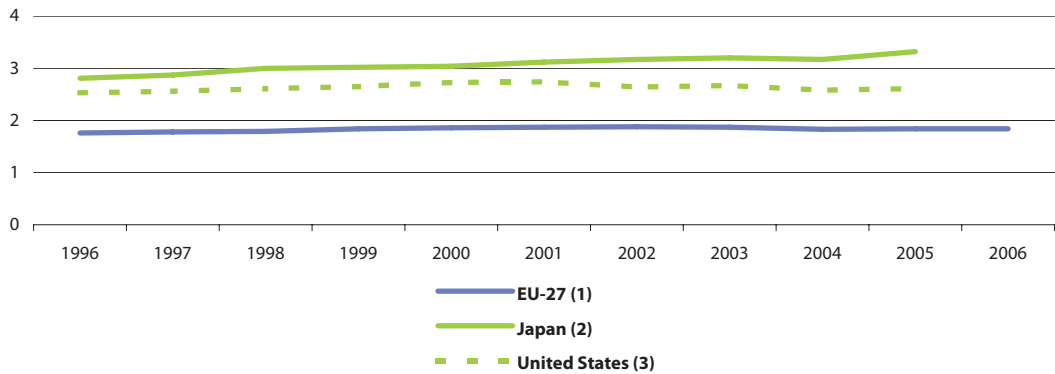


(1) Figures do not sum to 100 % due to rounding.

Source: Eurostat (gba\_nabsfin)

**Figure 1.7:** Gross domestic expenditure on research and development

(% share of GDP)



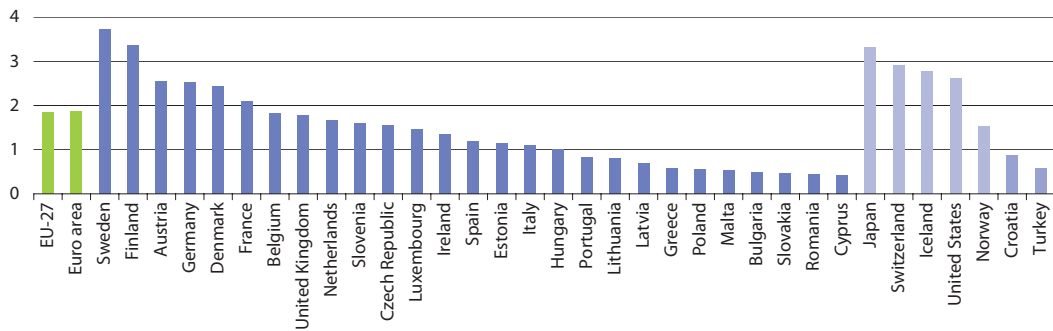
(1) Estimates.

(2) Break in series, 1996; not available, 2006.

(3) Break in series, 1998; excludes most or all capital expenditure.

Source: Eurostat (tsc00001)

**Figure 1.8:** Gross domestic expenditure on research and development, 2006 (1)  
(% share of GDP)

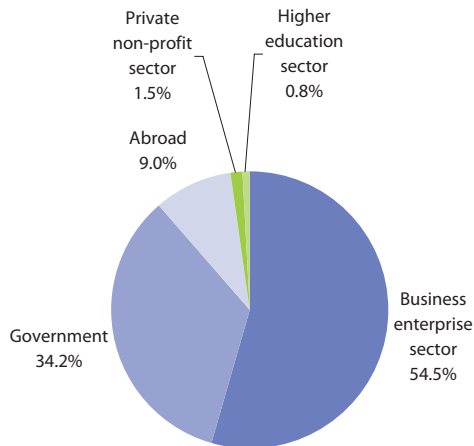


(1) Ireland, Austria, Slovakia and Finland, 2007; Italy, Iceland and Japan, 2005; Switzerland, 2004; EU-27, estimate.

Source: Eurostat (tsiir020)

**Figure 1.9:** Gross domestic expenditure on research and development, by source of funds, EU-27, 2005 (1)

(% share of total)



(1) Estimates.

Source: Eurostat (rd\_e\_gerdfund)


**Table 1.6:** Research and development expenditure, 2006 (1)

	Research and development expenditure		Expenditure by sector of performance (%)			
	(EUR per inhabitant)	(EUR million)	Business enterprise	Government	Higher education	Private non-profit
<b>EU-27</b>	432.3	213 127	63.7	13.5	21.9	0.9
<b>Euro area</b>	:	156 953	63.7	14.6	21.0	0.7
<b>Belgium</b>	551.5	5 798	67.9	8.6	22.3	1.2
<b>Bulgaria</b>	15.7	121	25.5	64.1	9.6	0.9
<b>Czech Republic</b>	171.8	1 761	66.2	17.5	15.9	0.4
<b>Denmark</b>	985.5	5 349	66.6	6.7	26.1	0.6
<b>Germany</b>	713.8	58 848	69.9	13.8	16.3	0.0
<b>Estonia</b>	112.3	151	44.4	13.1	40.6	1.8
<b>Ireland</b>	579.4	2 500	66.8	6.8	26.4	0.0
<b>Greece</b>	109.9	1 223	30.0	20.8	47.8	1.3
<b>Spain</b>	270.0	11 815	55.5	16.7	27.6	0.2
<b>France</b>	600.7	37 844	63.3	17.3	18.2	1.3
<b>Italy (2)</b>	266.8	15 599	50.4	17.3	30.2	2.1
<b>Cyprus</b>	80.7	62	22.3	28.4	41.7	7.6
<b>Latvia</b>	49.0	112	50.4	15.1	34.5	0.0
<b>Lithuania</b>	56.0	191	27.9	22.8	49.2	0.0
<b>Luxembourg</b>	1 059.1	497	84.9	12.6	2.4	0.0
<b>Hungary</b>	89.4	900	48.3	25.4	24.4	:
<b>Malta</b>	68.0	28	61.8	4.8	33.4	0.0
<b>Netherlands</b>	545.5	8 910	57.6	14.1	:	:
<b>Austria</b>	777.1	6 423	66.7	5.1	26.3	0.4
<b>Poland</b>	39.6	1 513	31.5	37.0	31.0	0.4
<b>Portugal</b>	122.4	1 294	41.7	:	:	:
<b>Romania</b>	20.6	444	48.5	32.3	17.7	1.5
<b>Slovenia</b>	241.5	484	60.2	24.5	15.1	0.2
<b>Slovakia</b>	40.2	217	43.1	32.8	24.1	0.1
<b>Finland</b>	1 140.0	6 016	71.5	9.7	18.7	0.0
<b>Sweden</b>	1 292.2	11 691	74.9	4.5	20.4	0.2
<b>United Kingdom</b>	563.6	34 037	61.7	10.0	26.1	2.2
<b>Croatia</b>	67.0	297	36.7	26.5	36.6	0.1
<b>Turkey</b>	33.5	2 432	37.0	11.7	51.3	0.0
<b>Iceland</b>	1 238.5	364	51.5	23.5	22.0	3.0
<b>Norway</b>	877.2	4 071	54.1	15.7	30.2	0.0
<b>Japan</b>	953.6	121 831	76.4	8.3	13.4	1.9
<b>Russian Federation</b>	59.3	8 466	66.6	27.0	6.1	0.3
<b>United States</b>	878.6	260 803	69.6	12.0	14.1	4.3

(1) Ireland and Finland, 2007; Italy, Iceland, Japan and the United States, 2005.

(2) Higher education, break in series.

Source: Eurostat (rd\_e\_gerdot)

### 1.3 Science and technology personnel

The European Commission has placed renewed emphasis on the conversion of Europe's scientific expertise into marketable products and services, while also focusing on improving the mobility of European researchers, encouraging networks between researchers from different Member States. 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. More information on the sources and methods concerning data on human resources in science and technology are available in Subchapter 14.1.

In total there were 3.1 million R & D personnel (head count) in the EU-27 in 2006, representing 1.3 % of the labour force. Generally Member States with a high R & D intensity recorded also a high share of R & D personnel in the labour force, with Finland and Sweden again leading the way.

Restricting the coverage, across the EU-27 there were 1.9 million researchers (head count) in 2006. Approximately half of all researchers were active in the business enterprise sector, with more than one third in higher education, and most of the remainder in the government sector. Within the business enterprise sector, manufacturing enterprises employed just over 70 % of all business enterprise researchers.

Human resources in science and technology (HRST) is a broader concept and includes individuals who have successfully completed tertiary-level education and/or work in a science and technology occupation as professionals or technicians. In total there were around 85 million such persons in the EU-27 in 2006, with

an almost equal split between men and women. Around two fifths of these were considered to be core science and technology personnel, in other words they were classified as human resources in science and technology both in terms of their level of education and their occupation. In total there were around 10 million scientists and engineers in the EU-27 in 2006, of which more than two thirds were male.

Looking at international mobility, around 5 % of the human resources in science and technology in EU-27 Member States were not nationals of the Member State where they were resident: the share of non-nationals exceeded 10 % in Estonia, Cyprus and Ireland, and most notably in Luxembourg where the share was 45 %.

High and medium-high technology manufacturing concerns the manufacture of chemicals (NACE Rev. 1.1 Division 24), machinery and equipment (NACE Rev. 1.1 Subsection DK), electrical and optical equipment (NACE Rev. 1.1 Subsection DL) and transport equipment (NACE Rev. 1.1 Subsection DM), and these sectors combined contributed around 10 % of total employment in Germany, the Czech Republic and Slovakia, but less than 2 % in Cyprus, Luxembourg and Latvia, compared with an EU-27 average of 6.6 %. High-technology knowledge-intensive services include post and telecommunications (NACE Rev. 1.1 Division 64), computer and related activities (NACE Rev. 1.1 Division 72) and research and development (NACE Rev. 1.1 Division 73). These activities contributed 3.3 % of total employment in the EU-27, ranging from 4 % or more in the Nordic Member States and the United Kingdom, to 1.6 % in Romania.




**Table 1.7:** Research and development personnel, 2006

	Research and development personnel (1 000)		of which (% based on fte) (2)			
	(head count) (1)	(full-time equivalent) (2)	Business enterprise	Government	Higher education	Private non-profit
<b>EU-27</b>	3 112.6	2 167.4	53.3	15.2	30.2	1.2
<b>Euro area</b>	2 233.9	1 563.2	54.3	15.3	29.2	1.2
<b>Belgium</b>	78.5	55.2	58.4	7.0	33.6	1.0
<b>Bulgaria</b>	18.6	16.3	15.1	62.8	21.2	0.9
<b>Czech Republic</b>	69.2	47.7	50.5	22.4	26.8	0.3
<b>Denmark</b>	67.3	45.2	64.8	7.3	27.3	0.6
<b>Germany</b>	678.9	489.1	63.8	15.7	20.4	0.0
<b>Estonia</b>	8.7	4.7	34.4	15.1	48.3	2.2
<b>Ireland</b>	30.6	17.6	61.2	7.1	31.7	0.0
<b>Greece</b>	61.5	35.1	32.4	13.0	53.9	0.6
<b>Spain</b>	309.9	189.0	43.9	18.3	37.5	0.3
<b>France</b>	432.6	353.6	56.2	14.0	27.9	1.8
<b>Italy (3)</b>	277.4	175.2	40.4	18.7	38.2	2.8
<b>Cyprus</b>	2.5	1.2	25.4	29.1	38.1	7.4
<b>Latvia</b>	10.7	6.5	28.7	17.9	53.4	0.0
<b>Lithuania</b>	16.3	11.4	11.2	25.6	63.2	0.0
<b>Luxembourg</b>	5.0	4.6	81.7	12.9	5.4	0.0
<b>Hungary</b>	50.4	26.0	35.7	31.5	32.8	0.0
<b>Malta</b>	1.4	0.8	53.5	5.7	40.8	0.0
<b>Netherlands</b>	113.6	94.7	55.8	13.5	:	:
<b>Austria</b>	:	50.3	67.9	4.7	26.8	0.5
<b>Poland</b>	121.3	73.6	19.3	24.0	56.5	0.3
<b>Portugal</b>	44.6	25.7	23.8	17.6	45.4	13.1
<b>Romania</b>	42.2	30.8	44.7	27.2	27.8	0.3
<b>Slovenia</b>	13.4	9.8	49.2	29.1	21.4	0.3
<b>Slovakia</b>	23.1	15.0	20.9	24.8	54.2	0.1
<b>Finland</b>	79.9	58.3	56.6	12.7	29.8	0.8
<b>Sweden</b>	117.7	78.7	73.2	4.6	21.8	0.4
<b>United Kingdom</b>	:	323.4	45.0	6.3	:	2.0
<b>Croatia</b>	:	8.5	26.1	31.9	41.9	0.2
<b>Turkey</b>	105.0	54.4	33.1	17.8	49.1	0.0
<b>Iceland</b>	5.7	3.2	47.4	26.3	23.0	3.3
<b>Norway</b>	54.3	31.7	52.1	16.8	31.1	0.0
<b>China</b>	:	1 502.5	65.7	18.1	16.1	0.0
<b>Japan</b>	:	921.2	66.2	6.8	25.4	1.6
<b>Russian Federation (4)</b>	807.1	916.5	56.2	32.5	11.0	0.3

(1) Belgium, Bulgaria, Denmark, Germany, Greece, Italy, Cyprus, Lithuania, Luxembourg, the Netherlands, Portugal, Sweden, Iceland and Norway, 2005.

(2) France, Italy, Portugal, the United Kingdom, Iceland and Japan, 2005.

(3) Higher education, break in series.

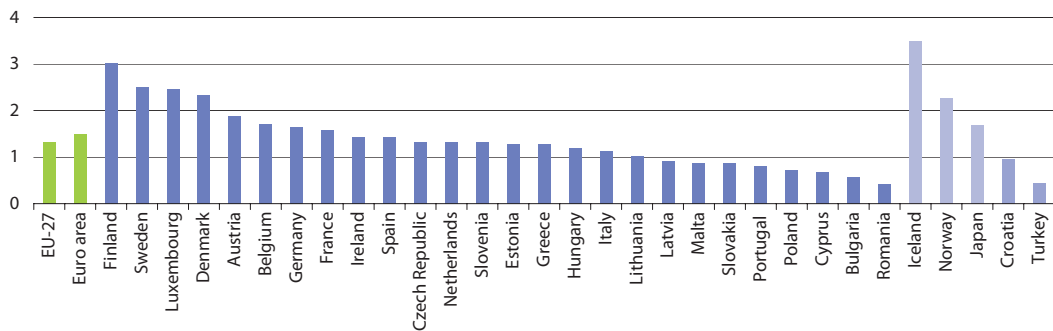
(4) Data in head counts are underestimated.

Source: Eurostat (rd\_p\_perisci)



**Figure 1.10:** Research and development personnel, 2006 (1)

(% share of total labour force)

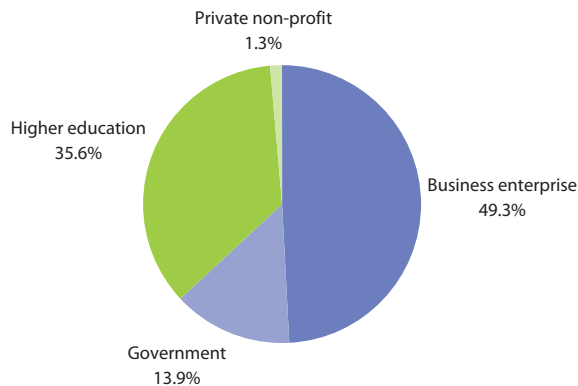


(1) R & D personnel include all persons employed directly on R & D, plus persons supplying direct services to R & D, such as managers, administrative staff and office staff. Head count (HC) data measure the total number of R & D personnel; EU-27, estimate; Belgium, Bulgaria, Denmark, Germany, Greece, France, Italy, Cyprus, Lithuania, Luxembourg, the Netherlands, Portugal, Sweden, Iceland, Norway and Japan, 2005; Austria and Croatia, 2004; the United Kingdom, not available.

Source: Eurostat (tsc00002)

**Figure 1.11:** Researchers, EU-27, 2006 (1)

(% breakdown by sector of performance, based on full-time equivalents)



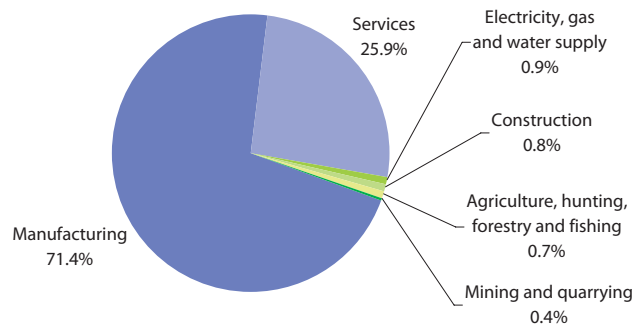
(1) Estimates; figures do not sum to 100 % due to rounding.

Source: Eurostat (rd\_p\_perssci)



**Figure 1.12:** Business enterprise researchers, EU, 2005 (1)

(% breakdown by activity, based on head counts)

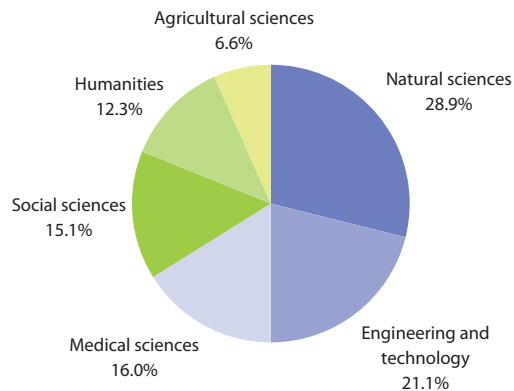


(1) Average composed of those Member States for which data are available; Belgium and the Czech Republic 2006; France and Austria, 2004; Bulgaria, 2003; Denmark, Luxembourg, Malta, Slovakia and the United Kingdom, not available; figures do not sum to 100 % due to rounding.

Source: Eurostat (rd\_p\_bempoc)

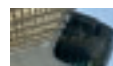
**Figure 1.13:** Government and higher education researchers, EU, 2006 (1)

(% breakdown by field of science, based on full-time equivalents)



(1) Average composed of those Member States for which data are available; the Czech Republic, Estonia, Ireland, Spain, Latvia, Hungary, Malta, Poland, Romania, Slovenia and Slovakia, 2006; Belgium, Bulgaria, Denmark, Germany, Italy, Cyprus, Lithuania, Luxembourg and Portugal, 2005; Greece, France, the Netherlands, Austria, Finland, Sweden and the United Kingdom, not available.

Source: Eurostat (rd\_p\_perssci)



**Table 1.8:** Researchers, 2006

	Researchers (1 000)		of which (% based on fte) (2)			
	(head count) (1)	(full-time equivalent) (2)	Business enterprise	Government	Higher education	Private non-profit
<b>EU-27</b>	1 891.1	1 301.0	49.3	13.9	35.6	1.3
<b>Euro area</b>	1 298.0	895.3	50.3	13.9	34.5	1.3
<b>Belgium</b>	48.8	33.9	50.5	7.4	41.4	0.7
<b>Bulgaria</b>	11.9	10.3	12.6	59.5	26.7	1.2
<b>Czech Republic</b>	39.7	26.3	43.0	25.0	31.8	0.2
<b>Denmark</b>	43.5	28.7	60.6	7.6	31.0	0.7
<b>Germany</b>	411.8	282.1	60.6	14.2	25.2	:
<b>Estonia</b>	6.4	3.5	24.9	14.6	58.1	2.3
<b>Ireland</b>	18.6	12.2	57.5	4.1	38.4	:
<b>Greece</b>	33.4	19.9	27.1	11.3	60.8	0.7
<b>Spain</b>	193.0	115.8	34.5	17.3	47.9	0.3
<b>France</b>	253.0	204.5	53.2	12.7	32.4	1.7
<b>Italy (3)</b>	125.5	82.5	33.9	17.5	44.9	3.7
<b>Cyprus</b>	1.4	0.8	23.2	15.2	57.0	4.6
<b>Latvia</b>	7.2	4.0	19.3	14.9	65.8	0.0
<b>Lithuania</b>	11.9	8.0	10.9	21.2	67.8	:
<b>Luxembourg</b>	2.4	2.3	73.9	16.5	9.6	:
<b>Hungary</b>	32.8	17.5	35.6	29.8	34.6	:
<b>Malta</b>	1.0	0.5	46.3	3.6	50.1	0.0
<b>Netherlands</b>	49.8	45.9	60.6	15.6	:	:
<b>Austria</b>	:	30.5	63.6	4.0	31.9	0.5
<b>Poland</b>	96.4	59.6	15.7	20.9	63.2	0.2
<b>Portugal</b>	37.8	21.1	19.0	15.8	51.9	13.3
<b>Romania</b>	30.1	20.5	37.6	27.2	34.8	0.4
<b>Slovenia</b>	8.2	5.8	38.8	30.9	29.8	0.5
<b>Slovakia</b>	18.8	11.8	16.1	21.2	62.6	0.1
<b>Finland</b>	53.3	40.4	56.2	11.1	31.8	0.9
<b>Sweden</b>	82.5	55.7	67.6	5.5	26.4	0.4
<b>United Kingdom</b>	:	180.5	51.9	5.2	:	2.1
<b>Croatia</b>	:	5.2	13.8	31.2	54.9	0.1
<b>Turkey</b>	90.1	42.7	26.4	11.0	62.6	:
<b>Iceland</b>	3.8	2.2	47.0	23.2	27.1	2.6
<b>Norway</b>	37.0	21.7	49.4	15.9	34.7	:
<b>China</b>	:	1 223.8	63.5	17.2	19.3	:
<b>Japan</b>	861.9	704.9	68.3	4.8	25.6	1.3
<b>Russian Federation (4)</b>	388.9	464.4	51.0	33.1	15.6	0.4
<b>United States</b>	:	1 394.7	79.2	:	:	:

(1) Belgium, Bulgaria, Denmark, Germany, Greece, France, Italy, Cyprus, Lithuania, Luxembourg, the Netherlands, Portugal, Sweden, Iceland, Norway and Japan, 2005.

(2) France, Italy, Portugal, the United Kingdom, Iceland, Norway, Japan and the United States, 2005.

(3) Higher education, break in series.

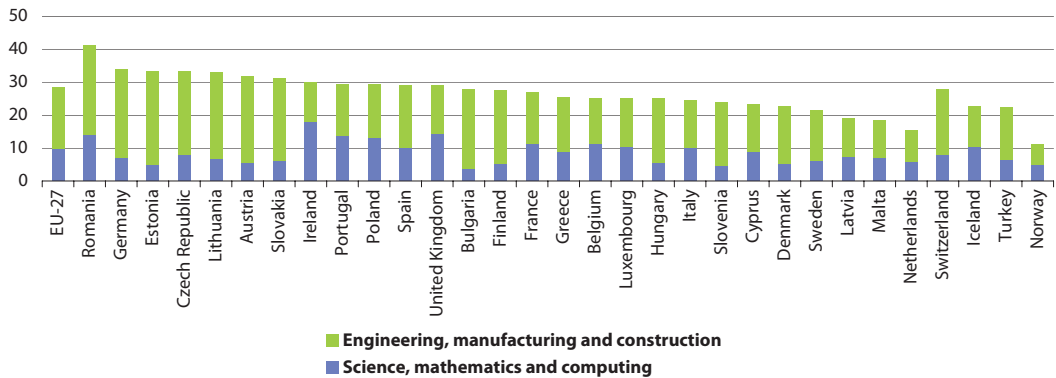
(4) Data in head counts are underestimated.

Source: Eurostat (rd\_p\_perssci)



**Figure 1.14:** Human resources in science and technology with tertiary education, 2006 (1)

(% of human resources in science and technology aged 25-64 years with a tertiary education in the specified field)

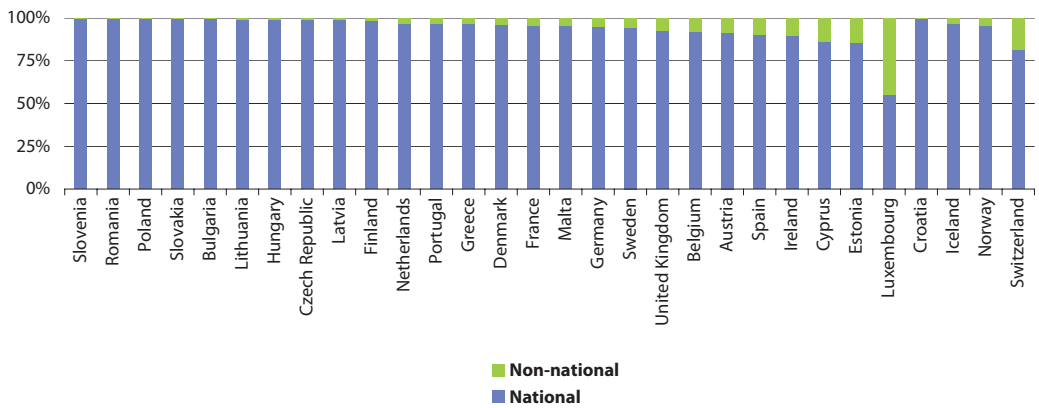


(1) Ireland and Norway, 2005; persons aged 25-64.

Source: Eurostat (hrst\_st\_nfiex)

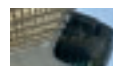
**Figure 1.15:** Human resources in science and technology, 2006 (1)

(% of total)



(1) Ireland, 2005; Italy, not available; persons aged 25-64.

Source: Eurostat (hrst\_st\_nnat)



**Table 1.9:** Human resources in science and technology, 2006 (1)

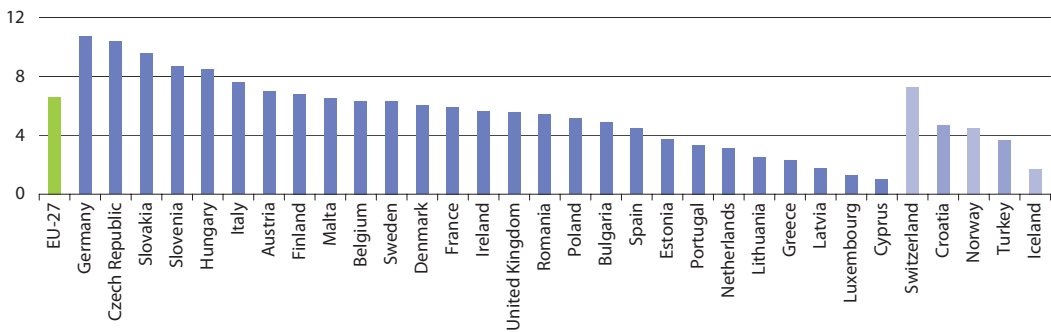
	Human resources in science and technology			Core			Scientists and engineers		
	(1 000)	Male (%)	Female (%)	(1 000)	Male (%)	Female (%)	(1 000)	Male (%)	Female (%)
<b>EU-27</b>	85 422	49.9	50.1	34 455	48.5	51.5	10 338	68.8	31.2
<b>Belgium</b>	2 183	50.5	49.6	919	47.4	52.6	335	51.3	48.7
<b>Bulgaria</b>	1 069	40.8	59.2	488	32.6	67.6	96	52.1	46.9
<b>Czech Republic</b>	1 736	48.4	51.6	537	54.4	45.6	164	70.1	29.9
<b>Denmark</b>	1 333	48.4	51.7	676	44.1	55.9	163	70.6	29.4
<b>Germany</b>	16 708	52.9	47.1	6 416	56.5	43.5	2 156	76.7	23.3
<b>Estonia</b>	281	37.7	61.9	106	29.2	71.7	26	53.8	46.2
<b>Ireland</b>	772	47.4	52.7	324	46.0	54.0	138	50.0	49.3
<b>Greece</b>	1 496	51.7	48.3	754	51.1	48.9	194	69.1	30.9
<b>Spain</b>	8 442	51.3	48.7	3 519	48.8	51.2	911	59.2	40.8
<b>France</b>	11 122	49.6	50.4	4 567	48.1	51.9	1 342	77.0	23.0
<b>Italy</b>	8 359	50.9	49.1	2 633	48.8	51.2	713	69.1	30.9
<b>Cyprus</b>	143	52.4	48.3	65	52.3	49.2	16	56.3	37.5
<b>Latvia</b>	365	37.5	62.7	142	31.7	68.3	37	45.9	54.1
<b>Lithuania</b>	588	37.2	62.8	245	28.6	71.4	65	44.6	55.4
<b>Luxembourg</b>	89	52.8	47.2	45	53.3	46.7	10	80.0	20.0
<b>Hungary</b>	1 402	41.7	58.3	569	43.1	56.9	161	67.7	32.3
<b>Malta</b>	44	59.1	40.9	17	52.9	47.1	5	60.0	40.0
<b>Netherlands</b>	3 716	51.6	48.4	1 640	52.3	47.7	453	68.4	31.6
<b>Austria</b>	1 432	55.0	45.0	443	53.3	46.7	118	76.3	23.7
<b>Poland</b>	5 051	41.6	58.4	2 194	39.6	60.4	782	46.7	53.3
<b>Portugal</b>	1 105	47.1	52.9	524	39.5	60.5	146	55.5	44.5
<b>Romania</b>	2 095	46.1	53.9	935	47.6	52.4	367	62.4	37.6
<b>Slovenia</b>	368	45.9	54.3	162	40.1	60.5	50	64.0	34.0
<b>Slovakia</b>	797	44.2	55.7	274	49.6	50.4	67	65.7	34.3
<b>Finland</b>	1 234	45.4	54.5	550	41.3	58.9	166	72.9	26.5
<b>Sweden</b>	2 098	48.4	51.6	1 005	40.7	59.2	292	62.0	38.0
<b>United Kingdom</b>	11 395	52.1	47.9	4 704	48.2	51.8	1 369	80.3	19.6
<b>Turkey</b>	4 216	66.6	33.4	1 488	62.8	37.2	317	73.2	26.8
<b>Iceland</b>	61	44.3	55.7	22	45.5	54.5	12	50.0	41.7
<b>Norway</b>	1 079	49.1	51.0	565	44.1	55.9	111	58.6	41.4
<b>Switzerland</b>	1 883	57.6	42.4	763	64.1	35.8	286	83.2	16.4

(1) Persons aged 25-64.

Source: Eurostat (hrst\_st\_ncat)

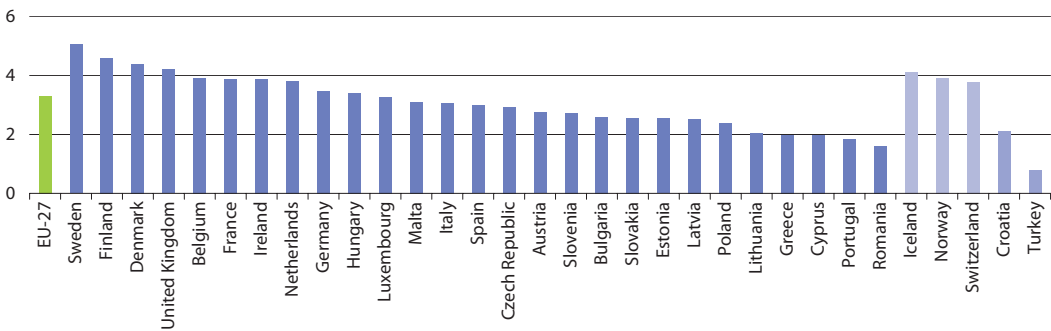


**Figure 1.16:** Persons employed in high- and medium high-technology manufacturing, 2006  
(% of total employment)



Source: Eurostat (htec\_emp\_nat)

**Figure 1.17:** Persons employed in high-technology knowledge intensive services, 2006  
(% of total employment)



Source: Eurostat (htec\_emp\_nat)



## 1.4 Innovation

The fifth Community Innovation Survey (CIS5) collected information about both product and process innovation and organisational and marketing innovation. For the purpose of this survey, 'innovation' is defined as a new or significantly improved product (good or service) introduced to the market, or the introduction within an enterprise of a new or significantly improved process. Innovations are based on the results of new technological developments, new combinations of existing technology, or the utilisation of other knowledge acquired by the enterprise. Innovations may be developed by the innovating enterprise or by another enterprise. However, purely selling innovations wholly produced and developed by other enterprises is not included as an innovation activity, nor is introducing products with purely aesthetic changes. Innovations should be new to the enterprise concerned: for product innovations they do not necessarily have to be new to the market and for process innovations the enterprise does not necessarily have to be the first one to have introduced the process.

Enterprises with innovation activity include all types of innovator, namely product innovators, process innovators, as well as enterprises with only on-going and/or abandoned innovation activities. The proportion of enterprises with innovation activity may also be referred to as the propensity to innovate.

The EU's Summary Innovation Index (SII) provides an overall assessment of innovation performance. Based on performance in 2003 and 2007, four main groupings of Member States can be determined. The first group can be considered as 'innovation leaders': Sweden, Finland, Denmark, Germany and the United Kingdom all reported indices well above the EU-27 average. The second group can be thought of as 'innovation followers', including Luxembourg, Ireland, the Netherlands, Austria, Belgium and France (scores below those of the innovation leaders but equal to or above that of the EU-27). The third group can be termed 'moderate innovators', including Estonia, the Czech Republic, Slovenia, Italy, Cyprus and Spain (with scores below the EU-27 average). The last group represent those countries that are 'catching-up', including Malta, Lithuania, Greece, Hungary, Portugal, Slovakia, Poland, Bulgaria, Latvia and Romania (with scores significantly below the EU-27 average, but moving towards the EU-27 average over time).





In 2006 just under 40 % of the EU-27's enterprises were considered as innovative. Germany had the highest propensity to innovate with almost two thirds (62.6 %) of all enterprises having some form of innovation activity. Generally, the majority of core innovative enterprises operated within the industrial economy (56.9 % among the 21 Member States for which data are available), a share that rose to 72.4 % in Bulgaria. A breakdown by enterprise size class shows that large (250 and more employees) innovative enterprises were more inclined to introduce products new to the market: almost half (47.4 %) of all large innovative enterprises did so in the EU-27 in 2006. In many of the Member States, large innovative enterprises were also more likely to introduce processes innovations that they had developed.

In many of the Member States, a large majority of innovation expenditure was spent on the acquisition of machinery, equipment and software. Otherwise, the breakdown of innovation expenditure in 2006 shows that intramural R & D spending was generally the next most important category, followed by extramural R & D expenditure.

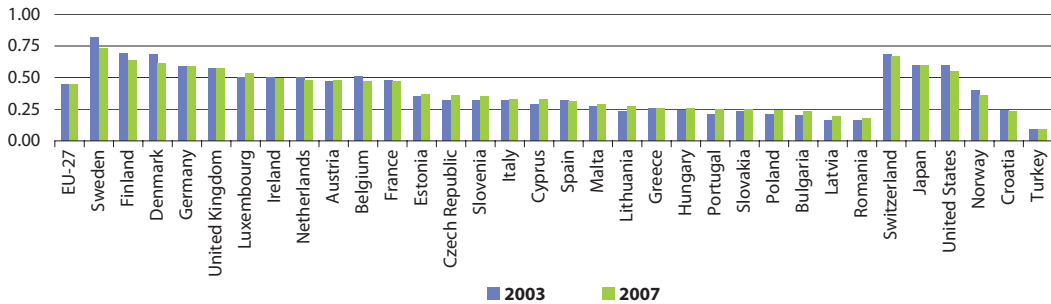
Using information from within the enterprise was the most widespread source of information for innovation among innovative enterprises in 2006 (44.0 % of enterprises among those countries for which data are available). Only a relatively small proportion of innovative enterprises used higher education institutes (4.3 %) or government and public research institutes (3.7 %) as a source of information for innovation.

The most important effect of innovation was the product-oriented effect of improving the quality of goods and services; across the EU (data for 20 Member States), 35.5 % of innovative enterprises noted improved quality, while 31.6 % of innovative enterprises cited a wider range of goods and services as an effect of innovation. In each of the Member States for which data are available (except Bulgaria), a majority of innovative enterprises introduced organisational or marketing innovations, the most common effects of which were reduced customer response time and/or the improved quality of goods and services.

Innovative enterprises across the EU protected their intellectual property by registering trademarks (16.3 % of innovative enterprises), applying for patents (8.0 %) and registering industrial designs (7.6 %). Claiming copyrights (3.6 %) was the least used protection method in 2006.

Among non-innovative enterprises in the EU in 2006 (data for 19 Member States), around one in six (16.7 %) stated that an important factor in not innovating was a perceived lack of demand to do so. A little under one in every ten (9.0 %) non-innovative enterprises across the EU stated that they no longer innovated due to prior innovations.

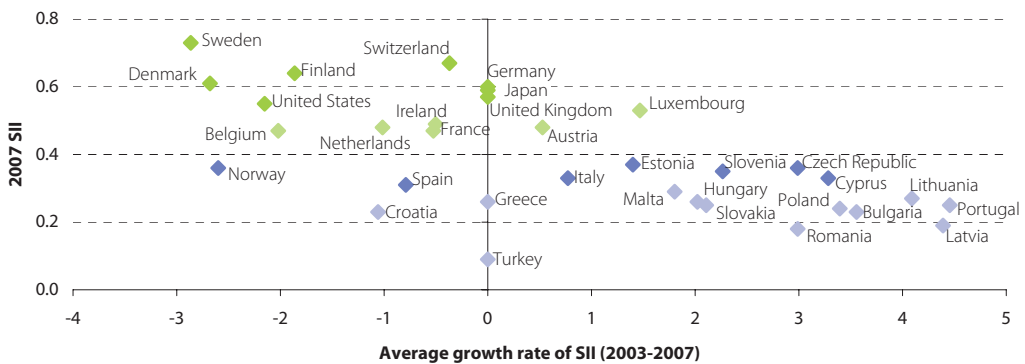
**Figure 1.18:** Summary Innovation Index (SII), 2003 and 2007 (1)



(1) The Summary Innovation Index gives an 'at a glance' overview of aggregate national innovation performance and is a composite indicator of 25 measures. The SII can range from 0 (worst performance) to 1 (best performance). Countries are categorised as either innovation leaders, innovation followers, moderate innovators or catching-up countries.

Source: European Commission, Directorate-General for Enterprise and Industry (European Innovation Scoreboard, 2007 - Comparative analysis of innovation performance)

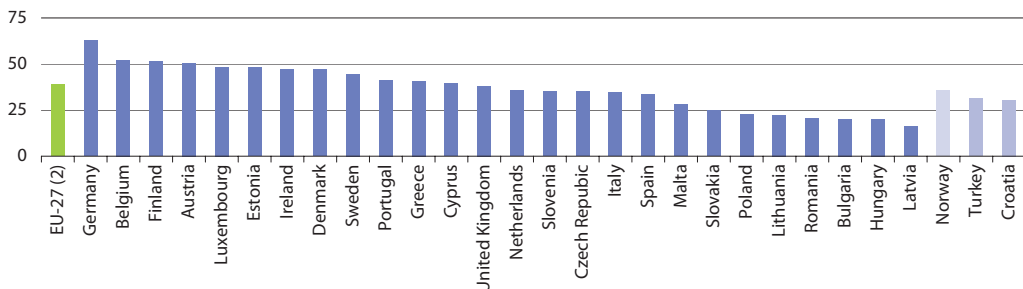
**Figure 1.19:** Evolution of the Summary Innovation Index (SII)



Source: European Commission, Directorate-General for Enterprise and Industry (European Innovation Scoreboard, 2007 - Comparative analysis of innovation performance)

**Figure 1.20:** Innovative enterprises, 2006 (1)

(% of all enterprises)



(1) France, not available.

(2) Excluding France.

Source: Eurostat (inn\_cis5\_prod)



**Table 1.10:** Proportion of innovative enterprises which introduced products new to the market or own-developed process innovations, 2006

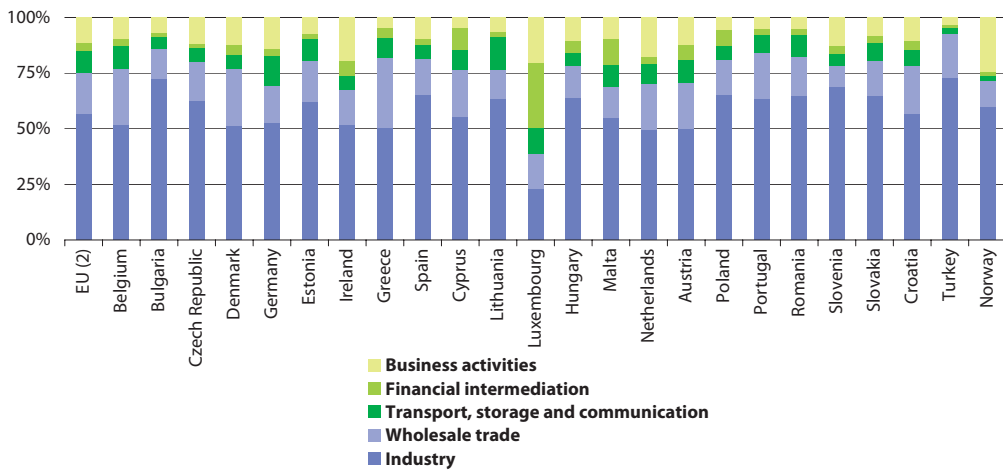
(% of innovative enterprises within size class or total)

	Process innovations: developed by the enterprise or group				Product innovations: new to market			
	Total	With 10 to 49 employees	With 50 to 249 employees	With > 250 employees	Total	With 10 to 49 employees	With 50 to 249 employees	With > 250 employees
<b>EU-27 (1)</b>	:	:	:	:	32.4	29.3	36.9	47.4
<b>Belgium</b>	40.0	38.2	43.3	49.8	41.4	38.6	44.1	65.3
<b>Bulgaria</b>	37.9	37.3	38.1	41.4	41.3	38.6	46.2	45.7
<b>Czech Republic</b>	39.0	37.6	41.8	39.7	38.9	32.5	48.3	51.2
<b>Denmark</b>	35.0	32.5	41.3	41.1	33.8	30.9	37.9	50.7
<b>Germany</b>	30.9	27.7	32.4	50.1	30.4	25.9	35.3	47.7
<b>Estonia</b>	41.3	40.0	41.8	58.5	32.9	32.9	32.1	36.4
<b>Ireland</b>	42.4	41.1	42.1	58.8	40.8	38.0	47.0	51.6
<b>Greece</b>	48.6	46.7	55.8	47.9	35.8	29.5	55.0	58.6
<b>Spain</b>	47.8	46.3	51.8	54.1	18.3	14.8	26.0	39.5
<b>France</b>	:	:	:	:	:	:	:	:
<b>Italy</b>	:	:	:	:	29.5	26.8	37.2	50.1
<b>Cyprus</b>	31.7	33.0	31.5	13.0	34.4	30.7	42.2	52.2
<b>Latvia</b>	:	:	:	:	44.7	49.8	34.0	41.9
<b>Lithuania</b>	35.2	33.2	40.7	36.9	36.0	36.8	32.4	38.5
<b>Luxembourg</b>	45.5	42.1	51.7	52.9	58.9	59.3	52.3	74.2
<b>Hungary</b>	28.5	28.7	25.6	33.8	30.9	30.1	29.6	38.2
<b>Malta</b>	46.7	41.3	52.1	66.7	59.0	57.1	60.4	66.7
<b>Netherlands</b>	23.0	22.1	22.4	35.4	48.1	46.1	50.8	59.5
<b>Austria</b>	37.2	35.7	37.8	48.0	45.4	42.1	48.8	65.0
<b>Poland</b>	47.0	48.1	46.1	46.0	32.7	33.1	30.6	37.5
<b>Portugal</b>	46.2	45.8	47.4	46.9	29.8	26.5	37.1	48.5
<b>Romania</b>	69.2	70.0	68.0	68.1	24.7	22.1	26.6	33.9
<b>Slovenia</b>	39.2	41.2	35.1	40.0	51.1	52.5	44.9	59.4
<b>Slovakia</b>	31.8	26.0	38.8	38.4	37.6	34.7	39.8	43.8
<b>Finland</b>	38.3	38.0	38.1	42.1	44.6	44.3	40.7	58.0
<b>Sweden</b>	36.6	36.8	:	:	51.3	49.3	55.8	58.3
<b>United Kingdom</b>	:	:	:	:	31.6	31.0	31.7	39.8
<b>Croatia</b>	36.0	36.7	34.4	35.8	31.7	28.5	33.1	47.5
<b>Turkey</b>	64.3	64.3	62.8	69.9	59.6	62.3	50.5	52.9
<b>Norway</b>	29.3	28.5	29.8	36.8	39.9	40.6	37.0	42.0

(1) Excluding France.

Source: Eurostat (inn\_cis5\_prod)

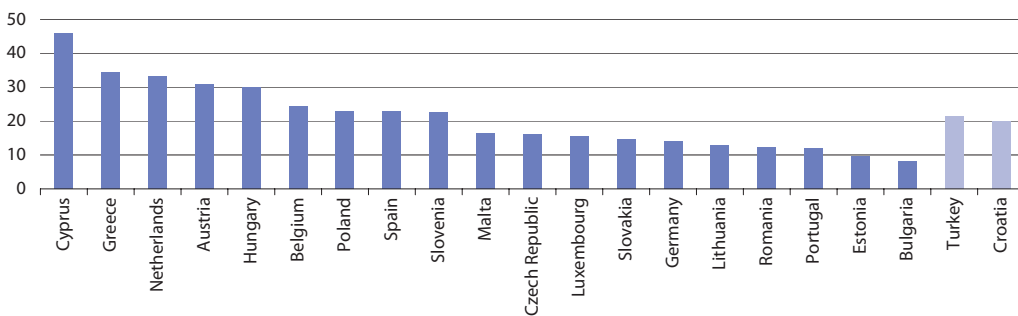
**Figure 1.21: Enterprises engaged in innovation activities, by economic activities, 2006 (1)**  
(% share of innovative enterprises)



(1) Data for France, Italy, Latvia, Finland and the United Kingdom, not available; data for Sweden, incomplete; the core aggregate covers enterprises in industry (NACE Sections C, D and E), wholesale trade (NACE Division 51), transport, storage and communication (NACE Section I), financial intermediation (NACE Section J) and business activities (NACE Division 72 and NACE Groups 74.2 and 74.3).  
(2) Average based upon data for 21 Member States, excluding France, Italy, Latvia, Finland, Sweden and the United Kingdom.

Source: Eurostat (inn\_cis5\_exp)

**Figure 1.22: Innovative enterprises having received any public funding, 2006 (1)**  
(% share of innovative enterprises)



(1) Denmark, Ireland, France, Italy, Latvia, Finland, Sweden and the United Kingdom, not available.

Source: Eurostat (inn\_cis5\_pub)



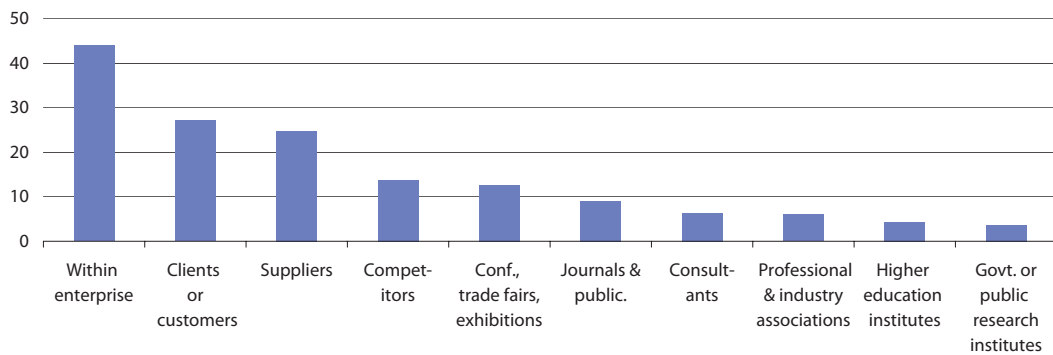
**Table 1.11:** Breakdown of innovation expenditure by category, 2006  
 (% of total innovation expenditure)

	Expenditure in intramural R&D	Expenditure in extramural R&D	Expenditure for acquisition of machinery, equipment & software	Expenditure for acquisition of other external knowledge
<b>Belgium</b>	47.1	22.2	29.4	1.3
<b>Bulgaria</b>	5.8	1.2	91.3	1.7
<b>Czech Republic</b>	24.0	17.8	55.1	3.2
<b>Denmark</b>	59.0	17.2	18.9	5.0
<b>Germany</b>	:	:	:	:
<b>Estonia</b>	8.1	3.4	87.1	1.4
<b>Ireland</b>	37.8	6.1	40.7	15.3
<b>Greece</b>	35.4	8.4	54.9	1.3
<b>Spain</b>	35.6	14.2	33.9	6.3
<b>France</b>	:	:	:	:
<b>Italy</b>	:	:	:	:
<b>Cyprus</b>	2.4	8.1	84.9	4.7
<b>Latvia</b>	:	:	:	:
<b>Lithuania</b>	24.6	7.7	65.2	2.5
<b>Luxembourg</b>	38.9	14.3	36.8	10.0
<b>Hungary</b>	17.4	17.7	61.3	3.6
<b>Malta</b>	22.4	3.5	63.0	11.1
<b>Netherlands</b>	59.3	17.6	20.8	2.3
<b>Austria</b>	:	:	:	:
<b>Poland</b>	8.7	4.4	83.3	3.6
<b>Portugal</b>	27.2	7.1	58.9	6.9
<b>Romania</b>	14.0	1.9	81.6	2.6
<b>Slovenia</b>	32.6	7.4	58.0	2.1
<b>Slovakia</b>	7.6	3.9	86.2	2.4
<b>Finland</b>	:	:	:	:
<b>Sweden</b>	60.2	19.8	:	:
<b>United Kingdom</b>	:	:	:	:
<b>Croatia</b>	19.8	7.5	67.9	4.7
<b>Turkey</b>	30.2	3.0	62.5	3.9

Source: Eurostat (inn\_cis5\_exp)

**Figure 1.23: Sources of information for innovation, average, 2006 (1)**

(% of enterprises with innovation activities)

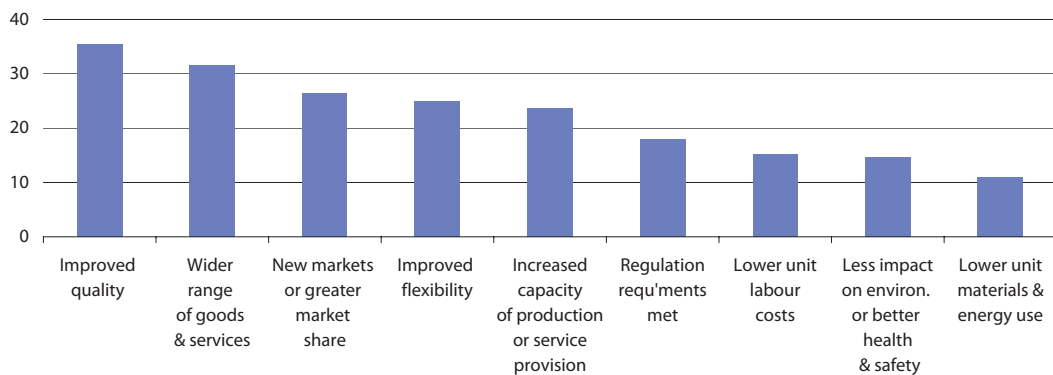


(1) Note that multiple answers could be given; average based upon data for 18 Member States, excluding Denmark, Germany, Ireland, France, Italy, Latvia, Finland, Sweden and the United Kingdom.

Source: Eurostat (inn\_cis5\_sou)

**Figure 1.24: Effects of innovation, average, 2006 (1)**

(% of enterprises with innovation activities)



(1) Note that multiple answers could be given; average based upon data for 20 Member States, excluding Belgium, Germany, Ireland, France, Italy, Slovenia and the United Kingdom.

Source: Eurostat (inn\_cis5\_eff)

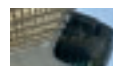

**Table 1.12: Effects of innovation, 2006 (1)**

(% of enterprises with innovation activities)

	Wider range of goods & services	New markets/ greater market share	Impr. quality	Impr. flexib.	Incr. cap. of prod./ service prov.	Lower unit labour costs	Lower unit materials & energy use	Less env. impact or better health & safety	Met regula- tions
Belgium	:	:	:	:	:	:	:	:	:
Bulgaria	38.2	30.1	38.9	21.0	21.7	15.9	13.2	20.9	25.3
Czech Republic	39.3	28.8	38.2	25.4	26.1	18.2	14.2	13.8	7.2
Denmark	18.6	15.8	16.6	15.3	18.8	11.5	7.3	5.3	9.2
Germany	:	:	:	:	:	:	:	:	:
Estonia	29.8	25.7	27.2	20.0	20.5	14.3	7.8	8.4	6.8
Ireland	:	:	:	:	:	:	:	:	:
Greece	9.1	11.6	5.8	8.3	9.2	26.2	20.7	12.9	11.3
Spain	25.2	18.6	33.5	22.6	27.4	12.9	8.5	13.4	19.8
France	:	:	:	:	:	:	:	:	:
Italy	:	:	:	:	:	:	:	:	:
Cyprus	45.3	37.9	57.5	69.8	62.5	29.2	19.9	38.0	56.0
Latvia	27.8	15.8	26.5	16.4	17.3	6.2	5.4	6.3	13.9
Lithuania	32.4	28.0	34.4	25.0	30.5	10.7	8.5	9.9	25.2
Luxembourg	57.7	45.1	62.1	35.2	33.6	13.0	6.8	12.9	28.5
Hungary	32.4	26.2	37.2	21.9	22.3	6.2	7.2	13.6	19.8
Malta	27.7	15.9	31.3	21.0	18.5	11.8	7.7	8.7	20.0
Netherlands	44.8	38.8	44.0	31.8	31.6	16.6	10.5	11.7	14.6
Austria	39.4	33.7	48.7	30.0	27.8	11.9	9.7	13.4	18.5
Poland	36.1	26.9	38.1	20.8	25.7	13.8	11.6	18.5	24.7
Portugal	34.1	25.4	44.3	31.2	36.5	22.4	15.0	24.1	25.6
Romania	37.0	29.4	41.7	28.2	34.1	18.3	14.8	23.7	20.9
Slovenia	:	:	:	:	:	:	:	:	:
Slovakia	38.1	23.1	41.6	28.5	27.2	8.0	10.8	13.8	13.4
Finland	16.5	15.5	16.9	14.4	15.3	10.7	5.2	7.2	9.6
Sweden	33.0	24.3	34.2	18.4	23.1	17.0	10.2	14.0	17.8
United Kingdom	:	:	:	:	:	:	:	:	:
Croatia	39.1	32.8	52.3	34.5	32.2	19.9	15.1	18.0	31.5
Turkey	38.3	32.6	49.5	39.4	39.4	18.0	10.2	21.6	28.8

(1) Note that multiple answers could be given.

Source: Eurostat (inn\_cis5\_eff)



**Table 1.13:** Enterprises that introduced organisational and/or marketing innovations, 2006 (1)  
(% of enterprises with innovation activities)

	Total	Highly important effects of organisational innovation			
		Reduced customer response time	Improved quality of goods & services	Reduced costs per unit output	Improved employee satisfaction and/or reduced rates of employee turnover
Belgium	66.8	25.7	26.9	12.7	9.8
Bulgaria	46.2	12.9	23.1	10.9	9.9
Czech Republic	69.7	21.2	27.8	11.9	13.0
Denmark	76.0	22.1	17.0	12.6	12.1
Germany	84.6	:	:	:	:
Estonia	70.9	26.9	24.8	13.6	12.5
Ireland	65.7	38.6	39.7	29.6	16.6
Greece	86.2	8.3	1.5	23.6	21.3
Spain	:	:	:	:	:
France	:	:	:	:	:
Italy	:	:	:	:	:
Cyprus	80.1	42.1	45.4	22.3	27.7
Latvia	70.5	23.2	30.1	6.7	11.4
Lithuania	73.1	16.2	25.3	15.1	15.5
Luxembourg	83.4	34.4	46.9	14.2	18.8
Hungary	70.9	42.5	39.6	21.0	11.5
Malta	82.1	31.8	33.8	21.0	15.9
Netherlands	53.5	19.4	23.3	10.0	9.5
Austria	77.9	26.2	31.9	10.8	14.0
Poland	72.2	26.9	25.8	9.9	10.2
Portugal	82.4	37.9	43.3	20.9	18.5
Romania	73.9	34.9	39.2	16.2	16.0
Slovenia	76.6	51.4	56.3	37.6	24.7
Slovakia	:	:	:	:	:
Finland	:	:	:	:	:
Sweden	:	:	:	:	:
United Kingdom	:	:	:	:	:
Croatia	76.4	34.9	37.7	13.6	19.2
Turkey	76.6	25.4	37.6	15.6	14.8
Norway	64.0	13.0	17.5	14.5	9.8

(1) Note that multiple answers could be given.

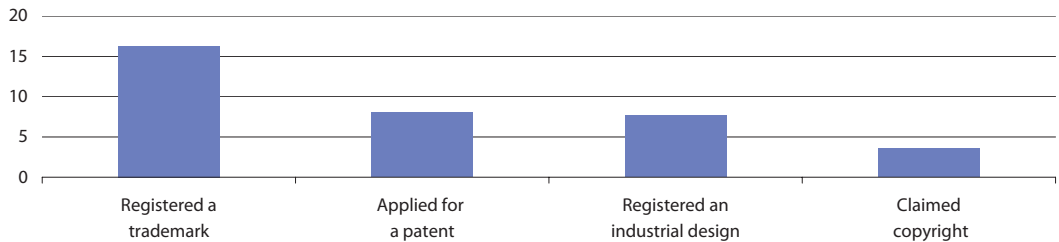
Source: Eurostat (inn\_cis5\_mo and inn\_cis5\_oref)





**Figure 1.25:** Protection methods (copyright, registered designs, trademarks, patents) used by innovative and non-innovative enterprises, average, 2006 (1)

(% of enterprises with innovation activities)

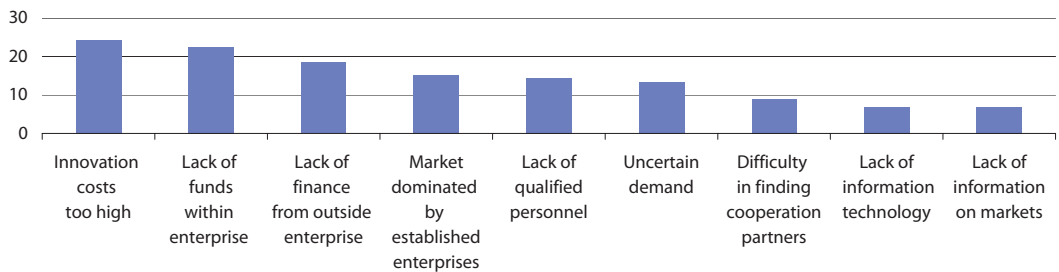


(1) Note that multiple answers could be given; average based upon data for 18 Member States, excluding Denmark, Germany, France, Italy, Latvia, Slovenia, Finland, Sweden and the United Kingdom.

Source: Eurostat (inn\_cis5\_pat)

**Figure 1.26:** Enterprises citing various highly important hampering effects, average, 2006 (1)

(% of enterprises with innovation activities)

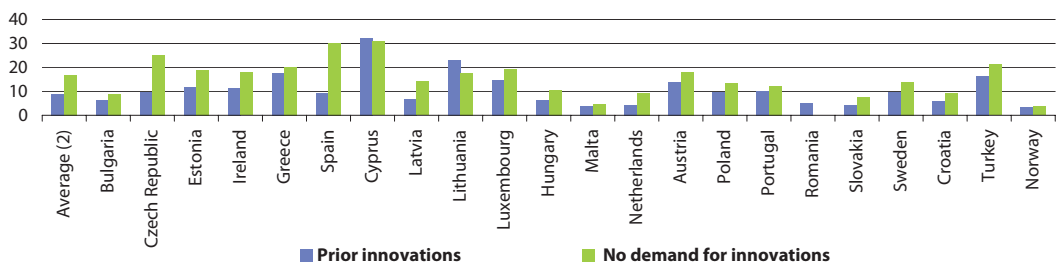


(1) Note that multiple answers could be given; average based upon data for 19 Member States, excluding Belgium, Denmark, Germany, France, Italy, Slovenia, Finland and the United Kingdom.

Source: Eurostat (inn\_cis5\_ham)

**Figure 1.27:** Reasons not to innovate, 2006 (1)

(% of non-innovative enterprises)



(1) Note that multiple answers could be given; Belgium, Denmark, Germany, Italy, Slovenia and Finland, not available.

(2) Average based upon data for 19 Member States, excluding Belgium, Denmark, Germany, France, Italy, Slovenia, Finland and the United Kingdom.

Source: Eurostat (inn\_cis5\_ham)

## 1.5 Patents

Intellectual property rights provide a link between innovation, inventions and the marketplace. Applying for a patent, for example, makes an invention public but at the same time gives it protection. A count of patents is one measure that reflects a country's inventive activity and also shows its capacity to exploit knowledge and translate it into potential economic gains. In this context, indicators based on patent statistics are widely used to assess the inventive and innovative performance. While patents are generally used to protect R & D results, they are also significant as a source of technical information, which may prevent re-inventing and re-developing ideas because of a lack of information. More information on the sources and methods concerning patent data are available in Subchapter 14.3 of this publication.

The falling trend in patent applications between 2000 and 2005 is linked to the length of patenting procedures and should not be understood as a real decline in patenting activity. For this reason the 2005 figures in Eurostat's reference database are flagged as provisional.

Among the Member States, Germany had by far the highest number of patent applications to the European Patent Office (EPO), some 11 500 in 2005 (which was

almost half the total number made by enterprises from within the EU-27). In relative terms, the Member States with the highest number of patent applications per million inhabitants were Luxembourg (143) and Germany (139), followed some way behind by Austria (79).

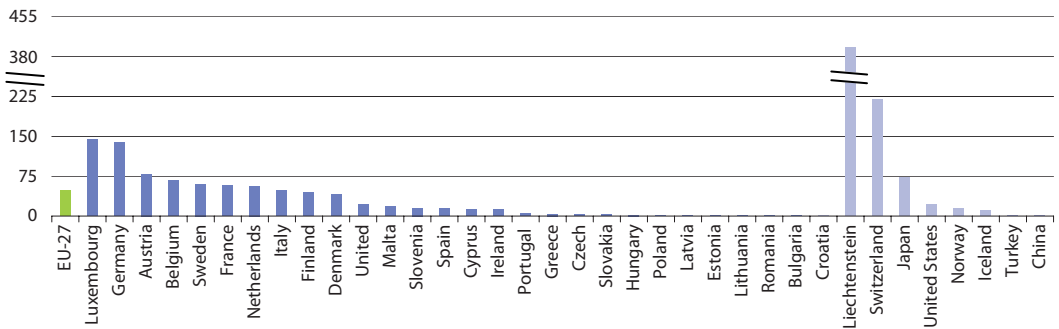
About one third (32.5 %) of the high-technology patent applications made to the EPO in 2005 came from EU-27 Member States, a further one quarter (25.6 %) coming from Japan. A little over one half (52.4 %) of these high-technology applications concerned communications technology, and a further one third (32.1 %) related to computer and automated business equipment.

A little over one fifth (21.7 %) of the patent applications by EU-27 Member States to the EPO in 2005 concerned performing operations (such as printing and shaping) and transport (such as forms of transport or hoisting, lifting and hauling). Patents concerning electricity (such as basic elements, circuitry and power distribution) were the next most common (14.7 %), followed closely by patents in physics (such as optics, checking devices and information storage) and then human necessities (such as foodstuffs, personal or domestic articles and health articles).



**Figure 1.28:** Patent applications to the European Patent Office (EPO), 2005 (1)

(applications per million inhabitants)

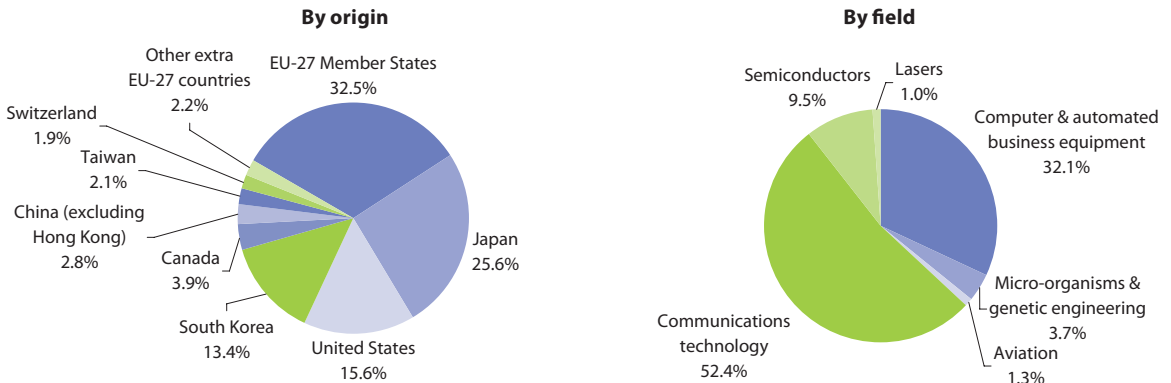


(1) Data refer to applications filed directly under the European Patent Convention or to applications filed under the Patent Co-operation Treaty and designated to the EPO (Euro-PCT). For patent applications to the EPO all direct applications (EPO-direct) are taken into account, but among the PCT applications (applications following the procedure laid down by the PCT) made to the EPO only those that have entered into the regional phase are counted. Patent applications are counted according to the year in which they were filed. Estimates.

Source: Eurostat (pat\_ep\_nipc)

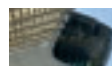
**Figure 1.29:** High-technology patent applications made to the European Patent Office (EPO), 2005 (1)

(% of total)



(1) Provisional.

Source: Eurostat (pat\_ep\_ntec)


**Table 1.14:** Patent applications to the European Patent Office (EPO), 2005 (1)

	Total		of which (%):							
	(1 000)	(per million inhab.)	Human necessities	Performing oper.; transp.	Chem.; metall.	Textiles; paper	Fixed constr.	Mech. eng.; lighting; heating; weapons	Physics	Electricity
<b>EU-27</b>	23.4	47.7	12.4	21.7	6.4	1.9	5.8	11.7	13.0	14.8
<b>Belgium</b>	0.7	66.6	13.8	17.9	11.5	1.9	3.8	5.4	14.9	19.6
<b>Bulgaria</b>	0.0	0.3	:	37.5	:	:	:	:	25.1	37.5
<b>Czech Republic</b>	0.0	3.5	8.9	32.5	14.6	5.6	3.7	:	11.5	13.3
<b>Denmark</b>	0.2	40.0	23.5	13.7	4.5	0.5	10.2	6.8	8.7	20.6
<b>Germany</b>	11.5	138.9	10.9	24.0	6.2	1.8	5.4	12.8	13.0	13.9
<b>Estonia</b>	0.0	1.5	25.0	:	:	:	:	:	50.0	25.0
<b>Ireland</b>	0.0	11.8	8.7	17.3	2.1	0.7	4.1	16.5	18.4	15.8
<b>Greece</b>	0.0	3.9	14.9	11.4	7.6	:	9.9	11.4	10.3	16.0
<b>Spain</b>	0.6	13.6	16.9	22.3	8.7	1.6	9.7	10.0	7.8	9.0
<b>France</b>	3.6	57.7	13.2	18.5	4.8	0.9	5.4	11.5	14.6	19.0
<b>Italy</b>	2.8	48.0	16.4	23.4	4.9	3.8	6.6	12.3	9.0	10.0
<b>Cyprus</b>	0.0	12.5	14.3	:	:	21.4	42.9	10.7	10.7	:
<b>Latvia</b>	0.0	1.6	:	53.3	:	:	:	:	26.7	20.0
<b>Lithuania</b>	0.0	0.6	:	:	25.0	:	:	:	50.0	:
<b>Luxembourg</b>	0.1	143.3	4.6	28.8	11.5	:	2.1	17.9	8.3	9.2
<b>Hungary</b>	0.0	2.1	17.9	10.4	15.8	:	2.4	:	12.6	17.3
<b>Malta</b>	0.0	17.6	84.7	:	:	:	:	:	3.5	11.7
<b>Netherlands</b>	0.9	56.5	14.2	22.0	12.7	1.2	7.1	4.7	16.6	10.0
<b>Austria</b>	0.6	79.1	11.0	19.7	8.1	3.9	9.9	12.0	11.4	10.3
<b>Poland</b>	0.1	1.7	2.1	11.6	7.3	1.5	5.4	18.8	12.5	26.0
<b>Portugal</b>	0.1	5.6	6.7	4.4	3.3	:	5.9	17.3	8.4	36.7
<b>Romania</b>	0.0	0.4	26.0	39.0	:	:	:	:	20.8	13.0
<b>Slovenia</b>	0.0	15.1	16.6	16.6	4.7	6.6	8.3	5.3	6.6	1.9
<b>Slovakia</b>	0.0	2.2	:	4.2	20.1	:	8.4	50.5	:	16.8
<b>Finland</b>	0.2	44.7	13.4	13.1	8.0	4.3	3.4	7.9	12.5	25.2
<b>Sweden</b>	0.5	60.2	7.3	19.0	7.1	0.6	5.2	10.8	17.1	20.7
<b>United Kingdom</b>	1.3	21.1	12.1	14.8	6.9	1.5	5.0	11.1	16.3	20.6
<b>Croatia</b>	0.0	1.0	31.4	:	:	:	:	11.8	:	33.1
<b>Turkey</b>	0.0	0.6	11.3	20.1	8.8	2.5	12.6	17.6	4.4	7.5
<b>Iceland</b>	0.0	10.2	66.7	:	:	:	:	33.3	:	:
<b>Liechtenstein</b>	0.0	391.6	35.2	27.1	11.1	:	3.7	10.5	8.9	:
<b>Norway</b>	0.1	14.5	8.0	23.6	6.8	2.0	1.9	9.9	7.0	14.4
<b>Switzerland</b>	1.6	219.0	14.2	18.7	6.9	2.2	4.7	5.7	21.5	12.3
<b>China</b>	0.5	0.4	8.3	10.5	2.3	0.2	0.9	2.0	11.9	56.4
<b>Japan</b>	9.2	71.8	5.0	19.5	6.5	0.8	0.5	7.8	26.9	24.5
<b>Russian Federation</b>	0.0	0.3	7.9	16.0	14.7	4.1	2.4	:	17.6	20.6
<b>United States</b>	6.4	21.7	14.2	13.6	7.3	0.7	1.1	9.7	21.0	21.3

(1) Provisional.

Source: Eurostat (pat\_ep\_nipc)



## 1.6 Business start-ups and entrepreneurship

The Entrepreneurship Action Plan adopted in 2004 established a mechanism to foster entrepreneurship. A 2006 final report on its implementation concluded that its underlying goals had been achieved, and that it had built the path to further actions to be carried out under the competitiveness and innovation framework programme (CIP). Furthermore, it provided the platform for stronger recognition of SME issues leading to the June 2008 proposal by the European Commission for a 'Small Business Act'<sup>(5)</sup>. This proposal aims to address the needs of Europe's small and medium-sized enterprises, to make Europe more entrepreneurial, and to help its enterprises thrive, by improving the conditions for SMEs while taking account of their diversity. The proposal focuses on promoting entrepreneurship, anchoring the 'Think Small First' principle in policy-making and supporting SMEs' growth.

A majority (57.7 %) of individuals in the EU-25 that launched or were launching their own businesses did so because they saw an opportunity to do so, rather than solely out of necessity (27.0 %). Among the Member States, Greece stood out as the only country where the single largest factor for business start-ups was out of necessity (42.4 % of individuals), which was in stark contrast to the four fifths (82.9 %) of entrepreneurs in Denmark who did so because they saw an opportunity.

A little over one half of the EU-25's entrepreneurs stated that having an appropriate business idea and receiving necessary financial support were very important in making their decision to set up their businesses. For a little over one quarter of entrepreneurs, dissatisfaction with their previous situation and/or changes in family circumstances were also very important reasons to start-up their businesses, with one third (35.5 %) also citing contact with an appropriate business partner as very important.

Among individuals who had never started a business and were not taking steps to start one, a little under two thirds (61.7 %) had never thought about it, this share rising to about three quarters in Belgium and Lithuania. A relatively high proportion of individuals (20.5 %) across the EU-25, who had not yet started a business, had at one time thought about doing so, and in cases taken steps to do so before giving up. In Germany, the United Kingdom and Austria, the proportion of those who did not follow through their interest was relatively high (about 25 %).

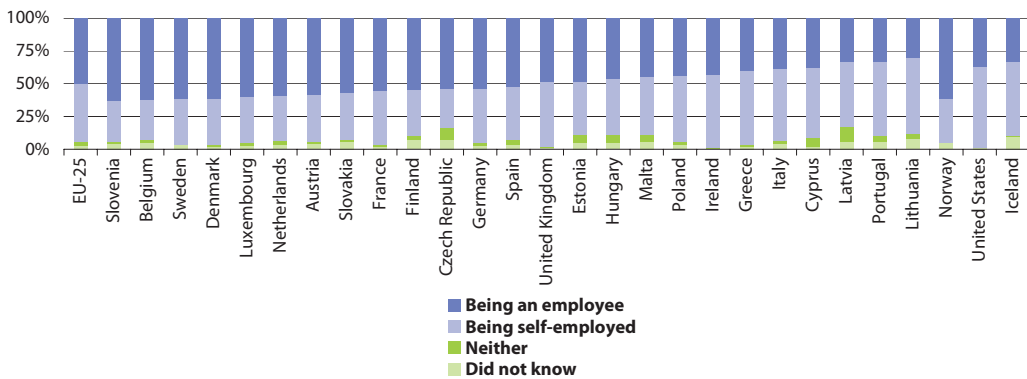
The employer enterprise birth rate for the business economy (NACE Rev. 1.1 Sections C to K, excluding holding companies) was 11.3 % among the 13 Member States for which data are available for 2005. This compared with a birth rate of 9.3 % for the same countries when considering all enterprises, not just those with employees. Employer enterprise birth rates were generally higher than birth rates for all enterprises in 2005, exceptions being in Bulgaria, Latvia and Romania.

(5) [http://ec.europa.eu/enterprise/entrepreneurship/sba\\_en.htm](http://ec.europa.eu/enterprise/entrepreneurship/sba_en.htm).

There is considerable policy interest in the way in which enterprises grow and create employment. Across the 12 Member States for which data are available, the number of persons employed in newly born enterprises in 2005 was the equivalent of 3.5 % of the total number of persons employed in all employer enterprises; the corresponding share for employer enterprise deaths in 2004 was 2.9 % of the workforce. Newly born enterprises accounted for a particularly high share of the workforce in Slovakia (5.9 %), other high shares being in Spain (4.4 %) and Romania (4.1 %).

There is also interest in enterprises (new or established) that display particularly rapid rates of growth. This sub-group are likely to have behaved in an atypical fashion, in that they are likely to have done something different or new in terms of product or process development, in order to achieve such rapid growth. Across the 14 Member States for which data are available for 2005, high-growth enterprises accounted for an average 3.8 % of employment across active enterprises and 5.9 % of turnover. In many of the Member States that joined the EU in either 2004 or 2007, these rates were considerably higher.

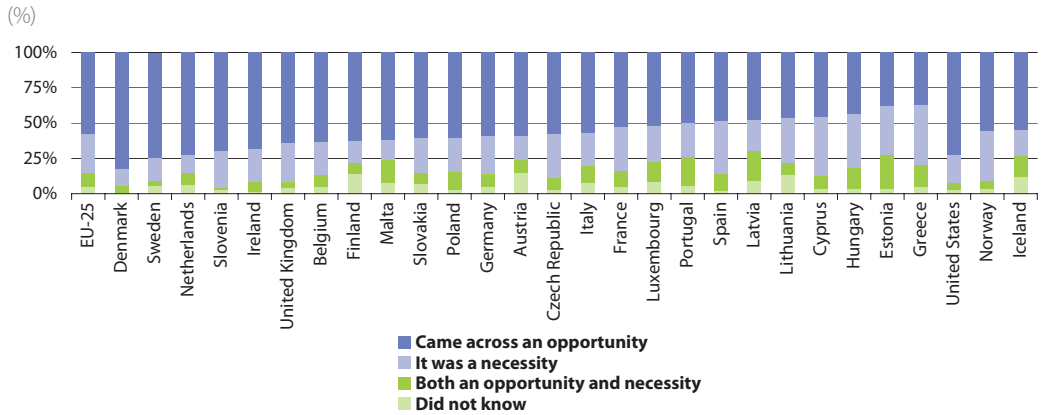
**Figure 1.30:** Preference for being an employee or self-employed, 2007  
(%)



Source: European Commission, Flash Eurobarometer 192 (Entrepreneurship Survey of the EU (25 Member States), United States, Iceland and Norway)

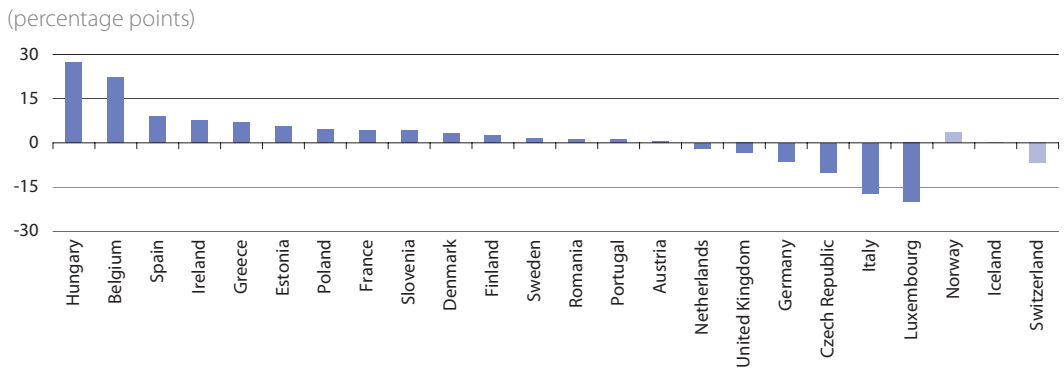


**Figure 1.31:** Business start-up decision by entrepreneurs, 2007



Source: European Commission, Flash Eurobarometer 192 (Entrepreneurship Survey of the EU (25 Member States), United States, Iceland and Norway)

**Figure 1.32:** Change in 'real' employer businesses, total economy (NACE Rev. 1.1 Sections A to Q), 1997-2007 (1)

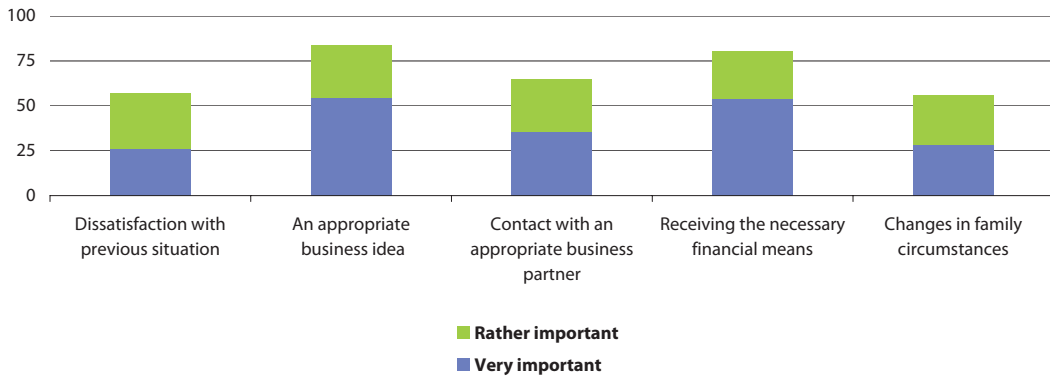


(1) Overall growth of the number of self-employed persons (aged 15 or more), who are not working alone and who are not family workers (in other words, who employ at least one other person); Bulgaria, Cyprus, Latvia, Lithuania, Malta and Slovakia, not available.

Source: Eurostat (lfsa\_egaps)

**Figure 1.33:** Preference for self-employment status - main elements, EU-25, 2007

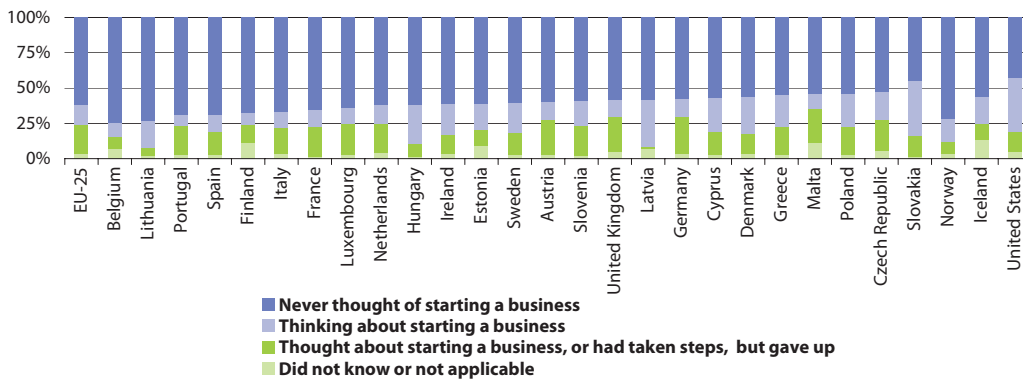
(% of those who have started a business or are taking steps to start one or who thought of it or had already taken steps to start a business but gave up)



Source: European Commission, Flash Eurobarometer 192 (Entrepreneurship Survey of the EU (25 Member States), United States, Iceland and Norway)

**Figure 1.34:** Experience in setting up a business: among those who have not yet done this, EU-25, 2007

(%)

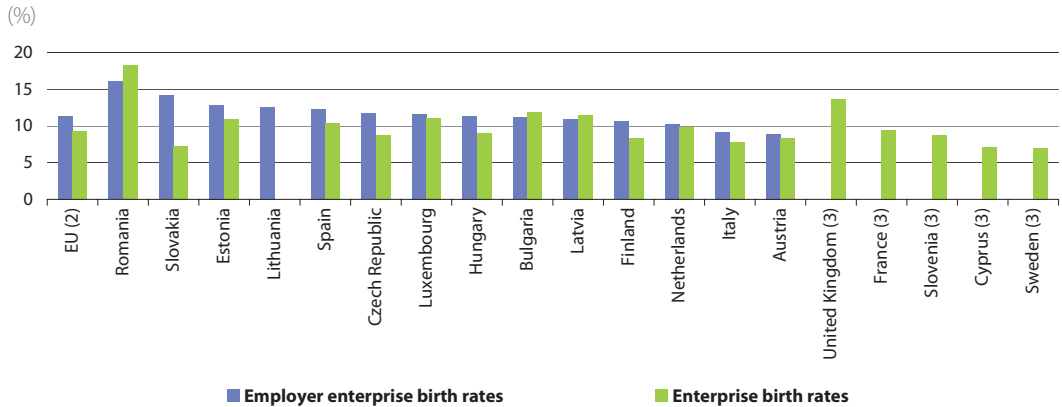


Source: European Commission, Flash Eurobarometer 192 (Entrepreneurship Survey of the EU (25 Member States), United States, Iceland and Norway)





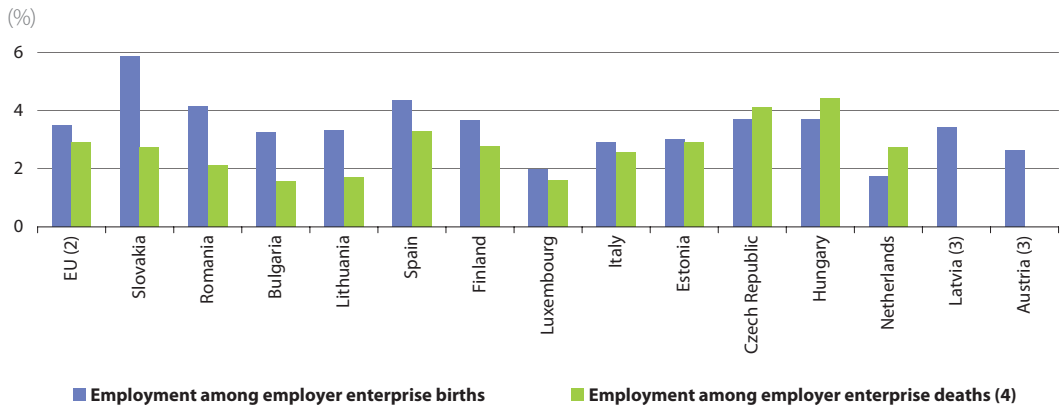
**Figure 1.35:** Comparison of enterprise birth rates and employer enterprise birth rates, 2005 (1)



- (1) Enterprise birth rates are defined as the number of enterprise births in the reference period (t), divided by the number of enterprises active in t; data for Belgium, Denmark, Germany, Ireland, Greece, Malta, Poland and Portugal, not available.  
 (2) EU average based on data available for Bulgaria, the Czech Republic, Estonia, Spain, Italy, Latvia, Luxembourg, Hungary, the Netherlands, Austria, Romania, Slovakia and Finland.  
 (3) Data for employer enterprise birth rates, not available.

Source: Eurostat (bd\_9f\_size\_cl)

**Figure 1.36:** Proportion of employment among employer enterprise births and employer enterprise deaths, 2005 (1)

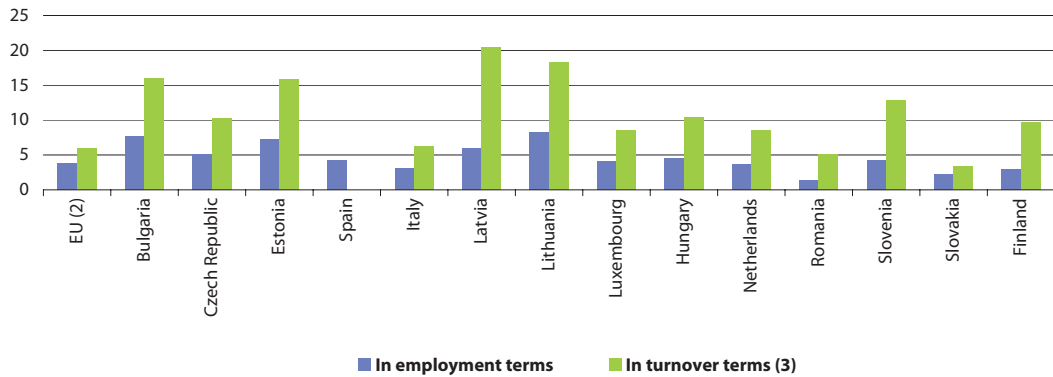


- (1) Data for Belgium, Denmark, Germany, Ireland, Greece, France, Cyprus, Malta, Poland, Portugal, Slovenia, Sweden and the United Kingdom, not available.  
 (2) EU average based on data available for Bulgaria, the Czech Republic, Estonia, Spain, Italy, Lithuania, Luxembourg, Hungary, the Netherlands, Romania, Slovakia and Finland.  
 (3) Data for employment among employer enterprise deaths, not available.  
 (4) Numbers of persons employed in employer enterprise deaths, 2004.

Source: Eurostat (bd\_9f\_size\_cl)

**Figure 1.37:** High-growth firm rate by employment/turnover, business economy (Sections C to K), 2005 (1)

(% of active enterprises)



(1) Share of high growth enterprises in the population of active enterprises, measured in employment/turnover; all enterprises with average annualised growth greater than 20 % per annum, over a three year period should be considered as high-growth enterprises; enterprises with ten or more employees; data for Belgium, Denmark, Germany, Ireland, Greece, France, Cyprus, Malta, Austria, Poland, Portugal, Sweden and the United Kingdom, not available.

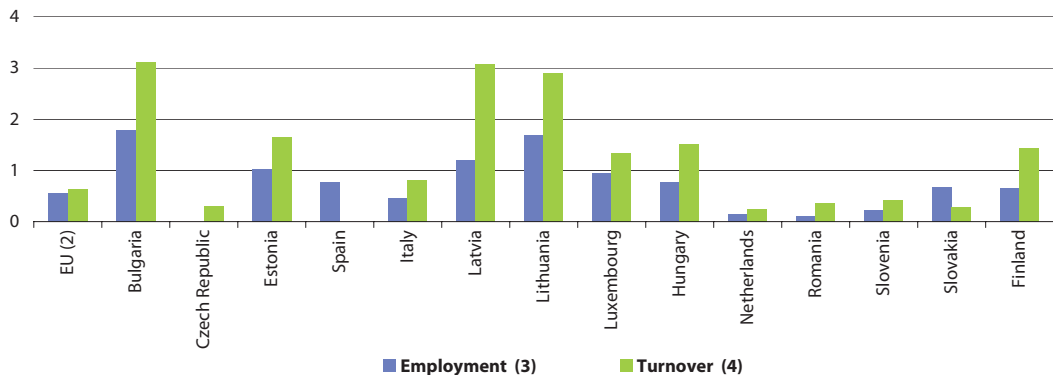
(2) EU average composed of available countries shown in graph.

(3) Spain, not available.

Source: Eurostat (bd\_9n)

**Figure 1.38:** Employment/turnover growth rate of 'gazelles', business economy (Sections C to K), 2005 (1)

(% of active enterprises)



(1) Share of young high growth enterprises in the population of active enterprises, measured in employment/turnover; all enterprises up to 5 years old with average annualised growth greater than 20 % per annum, over a three year period, should be considered as gazelles; enterprises with ten or more employees; data for Belgium, Denmark, Germany, Ireland, Greece, France, Cyprus, Malta, Austria, Poland, Portugal, Sweden and the United Kingdom, not available.

(2) EU average composed of available countries shown in graph.

(3) Czech Republic, not available.

(4) Spain, not available.

Source: Eurostat (bd\_9n)

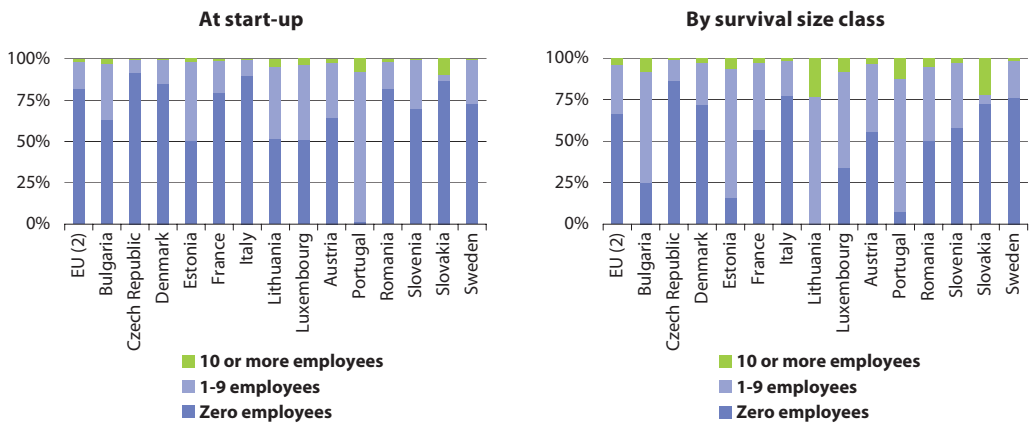


## 1.7 Factors of business success

Averaging across the Member States for which data are available, the overwhelming majority (81.2 %) of enterprises born in 2002 had no employees when starting-up. At start-up in 2002, very few (1.5 %) enterprises had more than 10 employees, the rest (16.8 %) employing between 1 and 9 persons. Of those enterprises born in 2002 that had survived to 2005, however, many had grown in terms of employee numbers: on average, 29.4 % of enterprises had between 1 and 9 employees

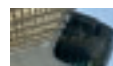
and 4.1 % had more than 10 or more employees. There was particularly strong employment growth among surviving enterprises in Lithuania, where the number of enterprises without employees fell to almost none (0.3 %), whilst those employing over ten employees grew from 4.4 % at start-up in 2002 to 23.5 % of surviving enterprises in 2005. Strong employment growth in surviving start-ups was also noted in Bulgaria, Estonia and Romania.

**Figure 1.39:** Business units having been born in 2002 and surviving to 2005 (1)  
(% share of total number of units having been born in 2002 and surviving to 2005)



(1) Units within industry and services excluding public administration and management activities of holding companies (NACE Rev. 1.1 Sections C to K excluding Class 74.15); Slovenia, not available for  
(2) Average of those Member States for which data are available.

Source: Eurostat (fobs\_isc and fobs\_ssc)



**Table 1.15:** Business units having survived from 2002 to 2005, according to status of the founder (1)

(% share of total number of units having survived)

	By gender		By age			By education			
	Male	Female	Less than 30	30-39 years	40+ years	Primary & lower secondary	Upper secondary	Post-secondary non-tertiary	Tertiary
<b>EU (2)</b>	72.9	27.1	25.0	35.6	39.3	27.6	41.2	10.1	21.1
<b>Bulgaria</b>	59.2	40.8	15.3	28.7	55.9	5.0	45.1	18.7	31.2
<b>Czech Republic</b>	72.7	27.3	33.2	32.7	34.1	13.1	61.7	6.7	18.5
<b>Denmark</b>	79.6	20.4	15.9	35.9	48.2	20.5	24.2	15.7	39.6
<b>Estonia</b>	76.0	24.0	25.3	39.5	35.2	2.8	19.8	20.5	56.9
<b>France</b>	79.4	20.6	8.8	34.0	57.1	23.6	42.5	:	33.9
<b>Italy</b>	74.8	25.2	29.9	40.0	30.1	32.3	46.3	2.3	19.2
<b>Latvia</b>	64.7	35.3	18.1	34.6	47.3	2.3	37.4	10.1	50.2
<b>Lithuania</b>	74.1	25.9	6.6	33.8	59.5	1.2	13.3	17.1	68.4
<b>Luxembourg</b>	81.6	18.4	10.1	36.5	53.3	19.4	23.7	18.2	38.7
<b>Austria</b>	72.3	27.7	10.8	39.7	49.5	5.7	36.6	22.0	35.6
<b>Portugal</b>	85.8	14.2	13.0	31.3	55.7	51.2	26.4	6.7	15.7
<b>Romania</b>	64.4	35.6	23.2	32.3	44.6	52.1	10.0	32.5	5.4
<b>Slovenia</b>	73.4	26.6	24.7	33.2	42.0	4.0	41.3	25.4	29.3
<b>Slovakia</b>	70.0	30.0	31.1	31.4	37.5	28.5	45.3	4.6	21.6
<b>Sweden</b>	79.2	20.8	14.1	34.9	51.1	15.7	35.2	20.9	28.2

(1) Units within industry and services excluding public administration and management activities of holding companies (NACE Rev. 1.1 Sections C to K excluding Class 74.15).

(2) Average of those Member States for which data are available.

Source: Eurostat (fobs\_gen, fobs\_age and fobs\_edu)