C ICT R&D expenditure and ICT Patents

Research and development (R&D) is a systematic creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of human beings, culture and society, and carried out for the purpose of obtaining or using new knowledge using methods allowing confirmation, widening or refuting of knowledge obtained.

R&D expenditure includes all current (wage and other) and capital expenditure determined for R&D performed in observed institutions on the territory of a given country made during the reference year regardless the source of the funds.

R&D expenditure in the field of ICT is based on the results of the special module about R&D expenditures in specific fields (ICT, software, nanotechnology, biotechnology) that is included in the **Annual R&D survey.** This survey includes questions on human and financial resources determined for R&D activities realized on the territory of the Czech Republic in all sectors of R&D performance. Further information on the Czech Annual R&D Survey can be found at (only at Czech):

http://www.czso.cz/csu/redakce.nsf/i/statistika_vyzkumu_a_vyvoje

Goods and services **in the field of ICT** for R&D expenditures are classified according to the **Classification of Products by Activity (CZ-CPA)** in two categories as follows:

- R&D expenditures into **ICT equipment** (CZ-CPA 26.1-4 and 26.8)
- **Software** R&D expenditures (CZ-CPA 62)

Software-related activities of a routine nature which do not involve scientific and/or technological advances or resolution of technological uncertainties are not to be included in R&D.

Patent statistics brings information about results and success of research, development and innovation activities in selected areas of technology.

A **patent** is a public deed issued by the relevant patent office, which provides legal protection to an invention for the period of up to 20 years (provided that maintenance fees are paid), namely on the territory for which it was issued by the office. Patent protection on the territory of the Czech Republic is ensured by the **Industrial Property Office of the CR** (hereinafter only IPO CR).

Data in this chapter were processed by the Czech Statistical Office (CZSO) based on data sources of the IPO CR. Patent data are broken down according to the **Patent Manual of the OECD (OECD, Paris 2009).** Based on the International Patent Classification (IPC) it is possible to classify ICT related patents into four main categories as follows:

- Telecommunications
- Consumer electronics
- Computers, office machinery
- Other ICT

Category other ICT patents includes, compare to other chapters of this publication, invention in the field of ICT medical and scientific equipment.

The Czech Statistical Office publishes additional information about the **Czech applicants** broken down e.g. by their **institutional sector** (business enterprise sector, government sector, higher education sector, and natural persons) or by region of residence of the patent holder.

The following OECD web site was used as a data source for the international comparison: www.oecd.org/sti/ipr-statistics.

Further information on the Czech patent statistics can be found at: http://www.czso.cz/csu/redakce.nsf/i/patentova_statistika.

C ICT R&D expenditures and Patents

Table C1 Total R&D expenditure into ICT in the Czech Republic

CZK million

	2008	2009	2010
Total	**7 055**	**6 630**	**6 811**
ICT equipment	3 794	3 327	3 147
software	3 261	3 303	3 664
Sector of R&D performance			
Business enterprise	6 216	5 801	5 956
Government	263	209	180
Higher education	561	603	667
Private non-profit	16	17	9

Table C2 R&D expenditure into ICT in the Czech Republic funded by government

CZK million

	2008	2009	2010
Total	**1 315**	**1 384**	**1 282**
ICT equipment	1 018	1 041	947
software	297	343	335
Sector of R&D performance			
Business enterprise	609	716	554
Government	225	184	162
Higher education	475	480	561
Private non-profit	5	4	5

Figure C1 Total R&D expenditure into ICT

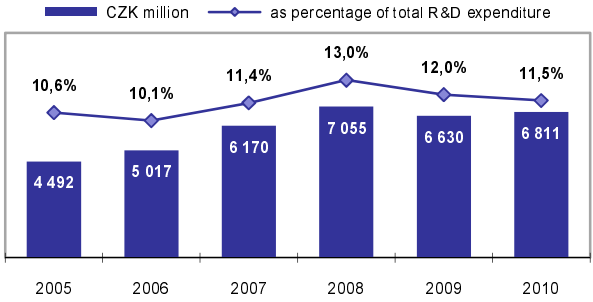
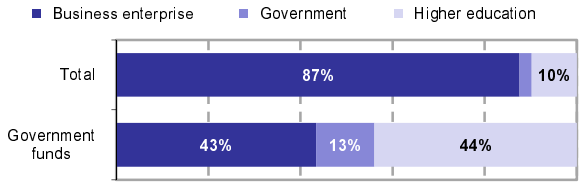


Figure C2 Composition of R&D expenditures into ICT by sector of performance, 2010



Source: CZSO, Annual R&D survey

C ICT R&D expenditures and Patents

Table C3 Total software R&D expenditure in the CR

CZK million

	2008	2009	2010
Total	**3 261**	**3 303**	**3 664**
Sector of R&D performance			
Business enterprise	3 083	3 105	3 415
Government	9	12	13
Higher education	169	174	235
Private non-profit	0	11	1

Table C4 Software R&D expenditure in the Czech Republic funded by government

CZK million

	2008	2009	2010
Total	**297**	**343**	**335**
Sector of R&D performance			
Business enterprise	142	205	137
Government	8	9	11
Higher education	146	125	187
Private non-profit	0	3	1

Figure C3 Total software R&D expenditure

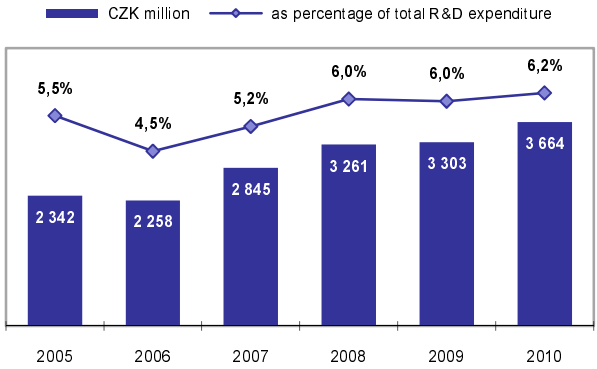
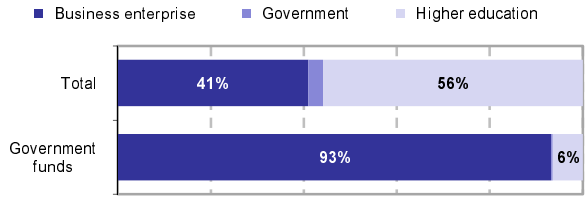


Figure C4 Composition of software R&D expenditure by sector of performance, 2010



Source: CZSO, Annual R&D survey

C ICT R&D expenditures and Patents

Table C5 ICT patents granted or validated in the CR

number

	2008	2009	2010
Total	**317**	**304**	**304**
Telecommunications	81	83	79
Consumer electronics	30	25	33
Computers, office machinery	74	70	41
Other ICT	132	126	151
Country of the patent applicant			
Czech applicants	**24**	**42**	**37**
Business enterprise	12	21	7
Government	3	2	3
Higher education	5	17	26
Private persons	5	2	1
Foreign applicants	**293**	**262**	**267**
Germany	95	88	72
United States	41	44	53
Switzerland	21	20	25
Japan	18	17	17

Figure C5 ICT patents granted or validated in the Czech Republic by main ICT categories

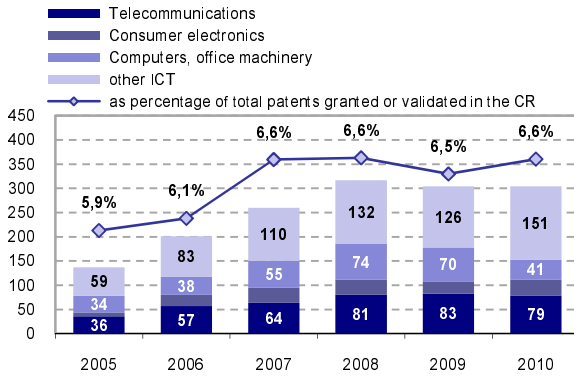
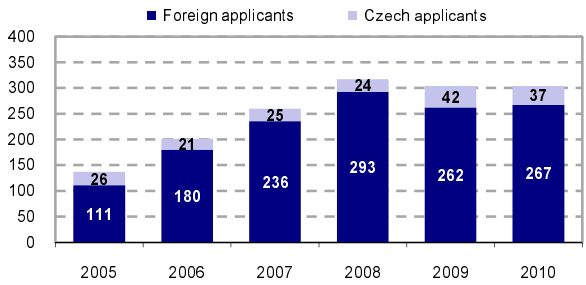


Figure C6 ICT patents of domestic and foreign aplicants granted or validated in the Czech Republic



Source: Patent Office of the Czech Republic and CZSO calculations

C ICT R&D expenditures and Patents

Table C6 Valid ICT patents in the CR as of 31.12.2010

number

	Total	Country of the patent applicant	
		Czech	Foreign
Total	**1 406**	**153**	**1 253**
Telecommunications	380	17	363
Consumer electronics	166	23	143
Computers, office machinery	270	2	268
Other ICT	590	111	479

Figure C7 Composition of valid ICT patents in the Czech Republic as of 31.12.2010 by main ICT categories

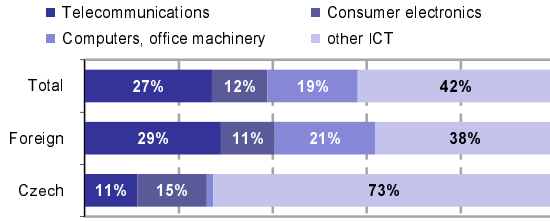
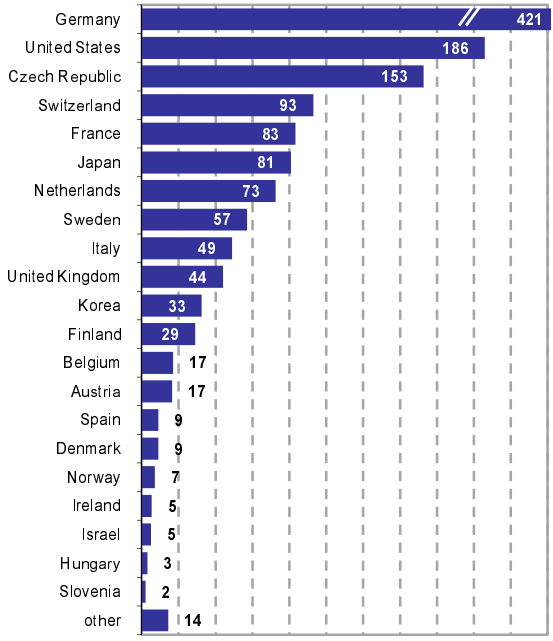
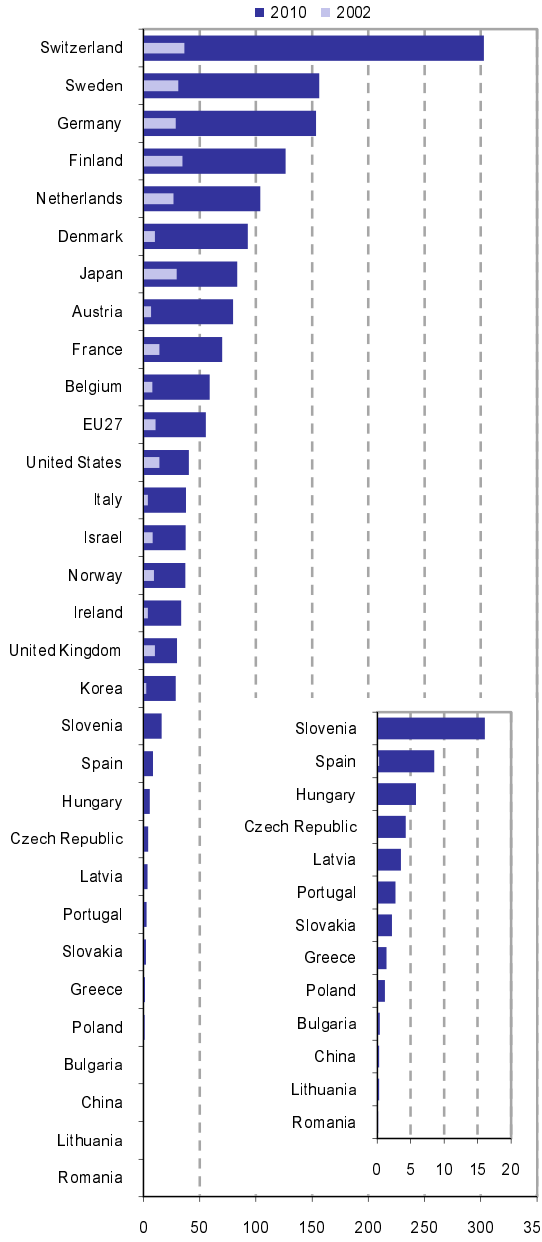


Figure C8 Valid ICT patents in the Czech Republic as of 31.12.2010 by aplicant's country of origin



Source: Patent Office of the Czech Republic and CZSO calculations

Figure C9 ICT patents granted by the European Patent Office (per million inhabitants)



Source: OECD