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The Competitiveness of the Czech Republic

– Quality of human resources

National Observatory of Employment and Training - National Training Fund

ANALYSIS

Research Centre
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NATIONAL OBSERVATORY
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The Competitiveness of the Czech Republic 2008 – 2009 Analysis

Part – Quality of Human Resources

CONTENT

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Introduction

The Quality of Human Resources represents the fifth part of the publication The Competitiveness of the Czech Republic 2008-2009. This part is divided into three chapters. The first chapter provides a response to the fact that, in the context of robust technological advancement and an increasing focus on production and services at a higher level of technology intensity on the part of most developed economies, the demands placed on the workforce are growing. People are required not only to master advanced technologies, but also to be capable and willing to keep up with and acquire new knowledge and skills on a continuous basis. Due to rapid and frequent changes in occupational requirements initial education falls short of providing individuals with appropriate competencies for the entire length of their careers. Continuing education and training are becoming an increasingly pressing requirement if one wishes to retain appropriate standards of employment. In addition to continuing education, the capacity to work with a PC and to use the Internet is becoming a must as part of efforts to succeed both in professional and civic life. These are topics that are addressed in the second chapter. The third chapter builds on the fact that labour market flexibility is important for competitiveness of the economy. Therefore it provides an analysis of three major elements that affect this flexibility: foreign employment, flexible employment contracts and wage differentiation.

The chapter ***Preparation of Human Resources for Skills-Intensive Occupations*** (Michal Lapáček, Olga Kofroňová) is divided into two subchapters. The first subchapter is entitled Students and Graduates of Science and Technology Fields and it concerns the motivation for and interest in studying sciences and technology programmes on the part of young people. It provides an analysis of admission proceedings for tertiary education programmes and the rate of study success. On the basis of a forecast of the number of tertiary education graduates until 2014 the subchapter assesses the expected development. The second subchapter – Transition of Science and Technology Graduates into the Labour Market – compares the situation of two age groups of graduates in terms of their employment in the CR and in the EU. Moreover, it analyses predominating job-seeking strategies, the nature of employment contracts, satisfaction with employment and the match between the knowledge and skills offered and those required.

In its subchapter concerned with the continuing education of adults the chapter ***Continuing Education and Training and the Information Society*** (Jiří Braňka, Marta Salavová, Věra Havlíčková) assesses the overall position of the CR within the EU in terms of participation of the adult population in continuing education and training. This participation is analysed particularly from the perspectives of labour market position, occupation, the qualification achieved, age and gender. Moreover, reasons for participation and non-participation are examined, and so is the link between participation in CET and the rate of unemployment for specific groups of occupations. The second part of the chapter concerned with the influence of the information society on continuing education and training explores the impact of ICT development on the competencies required by the labour market. Moreover, it assesses the measures adopted at EU level in the form of action plans and initiatives. The situation in the CR is compared to that in various EU countries in terms of the use of computers in employment, acquisition of electronic skills and the level of these skills. Attention is also paid to the use of ICT in education and training – on the part of both enterprises and individuals.

Labour Market Flexibility (Hana Žáčková, Zdenka Šímová, Zdeňka Matoušková, Věra Czesaná) is a chapter consisting of three subchapters. The first one, Foreign Employment, examines the reasons for workforce migration within the global economy and the EU. Foreign employment is placed in the context of demographic changes and the developments at the labour market that are characterised by the number of job vacancies. The number of foreigners in the CR and their employment are addressed, particularly in terms of gender, nationality, sector, and the skills intensity of the jobs concerned. Furthermore, attention is paid to illegal migration and the related problems. The second subchapter, Flexible Working Arrangements, compares the degree to which flexible job contracts are used in the CR and in the EU. Part-time and fixed contracts are analysed in detail according to age, gender and sector. The degree to which these contracts are forced upon the employees and the impact on employment are also examined. In the third subchapter, Earnings Differentiation the decisive factors are identified that affect wage differences. The subchapter provides an analysis of the influence of the level of education, as well as an analysis of the relationship between the wage premium of employees with tertiary qualifications on the one hand and the level of GDP and availability of the workforce with such qualifications on the other hand – both for the CR and the EU. Moreover, the development of wage differentiation within various educational categories is also tracked, as well as the link between wages and the length of work experience – for the CR only.

The fourth chapter of the statistical part of **The Quality of Human Resources** contains a set of indicators mapping the major characteristics of the quality of human resources and factors that affect, either directly or indirectly, this quality. It contains time series of values of 28 indicators and a detailed description of the method used to calculate them. The main sources of the data are EUROSTAT, IMD (Institute for Management Development) and WEF (World Economic Forum). In some cases the indicators are calculated on the basis of primary data from LFS (Labour Force Survey). The indicators are divided into four groups. The first group contains indicators mapping the **qualifications and skills of the population**. These capture, above all, the educational structure of the adult population, the quality of tertiary education, the flexibility and adaptability of people in the economy, the level of computing skills and the use of the Internet. The second group covers **participation in education** and includes the following indicators: dropouts from the education system, participation in tertiary education, participation in continuing education and training, training in enterprises, foreign language teaching in schools, participation in computing courses and the mobility of tertiary education students. The third group concerns **expenditure on education** – i.e. the overall spending, private expenditure and public expenditure. The fourth group consists of indicators concerning the availability of **human resources for the development of technologies.** These are the following: graduates of science and technology fields, professionals and engineers, employment in ICT, the quality of human resources in technology-intensive manufacturing industries and in knowledge and technology-intensive services.

1. Preparation of Human Resources for Skills-Intensive Occupations

As technological advancement is speeding up and most developed economies are heading towards manufacturing and services at a higher level of technology-intensity, the demands placed on human resources are growing. In addition to a perfect mastery of high-tech technologies, individuals must be able and wiling to keep pace with the development and to learn new processes that are involved. There are also increasing requirements for inter-disciplinary knowledge, particularly foreign languages and management skills. The most robust demands in this respect are placed on graduates and young people with qualifications in science and technology (S&T). In this context the European Union has set as one of its objectives to increase the number of graduates in these disciplines by an average of 15% by 2010 as compared with 2000. At the same time the EU called on its member countries to make efforts to encourage women to take more interest in studying these fields. An overview of groups of fields of education in science and technology is presented in Box 1.

Box 1 – Definition of science and technology fields of education according to the SCL classification (Classification of Fields of Education and Training) used by Eurostat

Sciences: EF42-Life science (Biology and Biochemistry, Environmental science), EF44-Physical science (Physics, Chemistry, Earth Science), EF46-Mathematics and statistics (Mathematics, Statistics), EF48-Computing (Computer science, Computer use), EF85-Environmental protection (Environmental protection technology, Natural environments and wildlife, Community sanitation services).

Technology: EF52-Engineering and engineering trades (Mechanics and metal work, Electricity and energy, Electronics and automation, Chemical and process, Motor vehicles, ships and aircraft), EF54-Manufacturing and processing (Food processing, Textiles, clothes, footwear, leather, Materials, Mining and extraction), EF58-Architekture and building (Architecture and town planning, Building and civil engineering), EF84-Transport services.

This chapter presents an analysis of the ways in which the workforce are prepared for employment in the context described above. The analysis may be divided into the supply part – i.e. most importantly students and graduates of science and technology programmes at higher education institutions, and the demand part – i.e. what employers require in terms of the competencies and skills of these students and graduates in relation to filling a particular job.

1.1 Students and graduates of science and technology fields

The development of economies with a high proportion of technology and knowledge-intensive industries depends, to a large extent, on the availability of individuals with tertiary qualifications in the respective fields. The number and the quality of prospective workers with such education are determined much earlier – when they choose the field of study at secondary level and, also, when they enter tertiary education.

The CR still fails to pay appropriate attention to encouraging young people to study science and technology programmes. The framework educational programme for basic (primary and upper secondary) education is very weak in its support for young peoples' focus on science and technology. This is confirmed, apart from other pieces of evidence, by the results of the PISA survey in scientific literacy (see Box 2). Czech pupils were very successful in 2006 in explaining phenomena scientifically – i.e. applied knowledge. On the other hand, they are significantly less successful when it comes to identifying issues which can be answered scientifically and in using scientific evidence. This reflects the fact that instruction in schools continues to focus on knowledge acquisition and application. A different approach may be seen, for example, in Japan and France where much more attention is paid to scientific thinking – i.e. interpretation and using scientific evidence.

Box 2 The PISA international survey (Programme for International Student Assessment) is a project run by the Organisation for Economic Cooperation and Development (OECD). It aims to ascertain the extent to which fifteen-year-old pupils are prepared for life – i.e. what foundations they have established for lifelong learning. PISA focuses on identification of pupils' competencies in reading, mathematics and science. These basic competencies – types of literacy in PISA – are acquired by the young population primarily during initial education. This means that the results of the survey reflect, above all, the quality of the systems of initial education.

Scientific literacy is the capacity to use scientific knowledge, to identify questions and to draw evidence-based conclusions in order to understand and help make decisions about the natural world and the changes made to it through human activity.

A motivation-focused approach to instruction and good learning outcomes in the relevant subjects as early as basic education therefore constitute a major precondition for young people to show interest in science and technology. Countries where pupils achieve good scores in the PISA measuring have a high proportion of students/graduates in science and technology fields at tertiary level, and the share of these fields of study in tertiary education as a whole is also relatively higher (see KADEŘÁBKOVÁ, A. et al., 2008, p. 242).

Students of science and technology fields in tertiary education

As Figure 1 illustrates there has been a growing interest in tertiary studies in the Czech republic over the last 5 years. In the period between the 2003/2004 and 2008/2009 academic years the enrolment rose by over 37%, and the number of applications filed also grew steeply by 38.5 %. This means that there was a slight increase in the number of applications per applicant. While in 2003/2004 one applicant filed on average 2.16 applications, five years later this figure was 2.18.

A constant growth may also be observed in the number of students admitted to studies, which is evidence of the rising number of study places. The large intake in the first year is justified by considerations that there will be a high percentage of drop-out after the first year, and also by a short-term increase in the revenue side of the budget of higher education institutions.

For the net rate of entry into Bachelor and Master programmes at HE institutions (see Box 3), the Czech Republic ranked among the countries at the bottom of the EU scale.

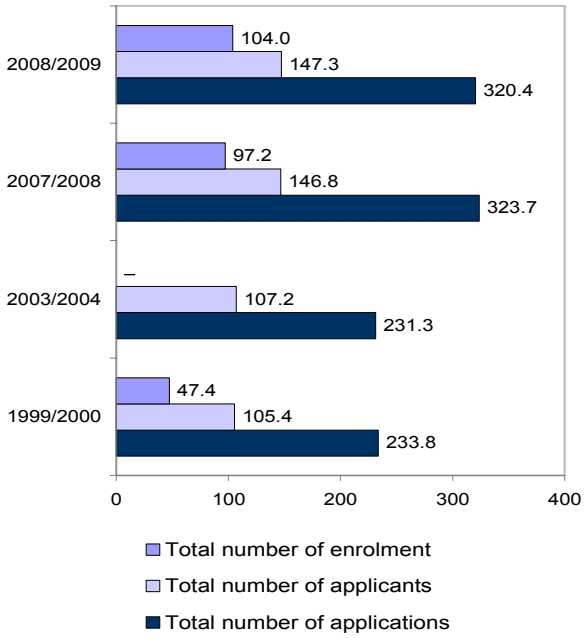
Box 3 The net entry rate into Bachelor and Master programmes at higher education institutions

The net rate of entry into Bachelor and Master programmes at HE institutions is the proportion of people who – while the existing interest in this education is maintained – would enter this type of education during their lives. This rate is not influenced either by differences in the age structure or differences in the typical age of entering tertiary education in the countries compared.

Source: IIE (2007), 6. 11. 2009.

The rate of entry has been increasing constantly. From 25% in 2002 it increased during five years to 54% in 2007 and it nearly achieved the EU19 average. Moreover, in 2004 the net rate of entry into Doctoral programmes at HE institutions began to grow – from 2.6% to 3.4% in 2007. In terms of comparison with the EU–19 average the Czech Republic maintained a slight lead (in 2004 the EU-19 average was 2.2%), but as early as 2006 the EU-19 average and the figure for the CR became the same.

Figure 1: Development of the number of applications, applicants and enrolment at HE institutions in the Czech Republic (in thousand)

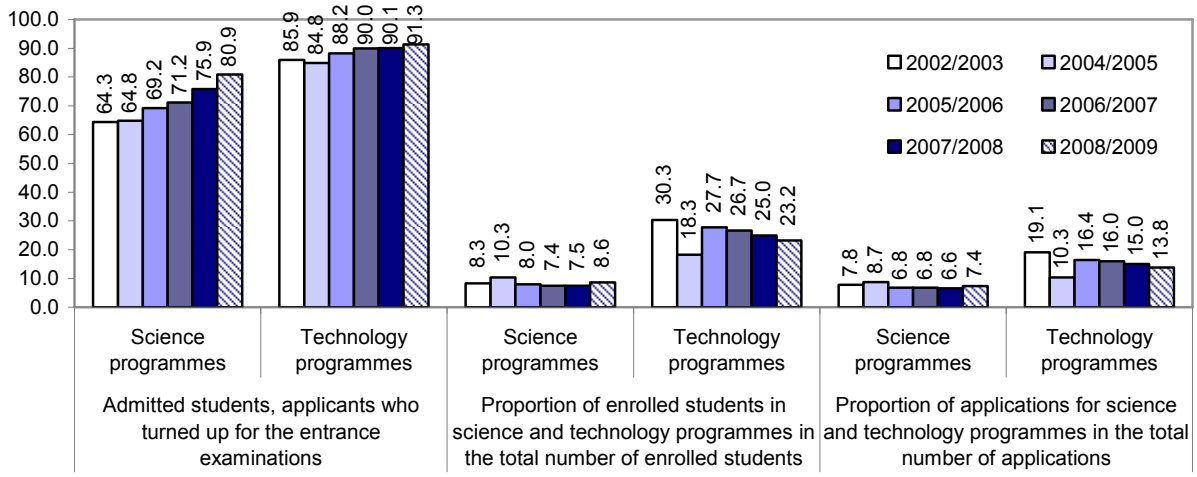


Source: IIE (1995–2005) and IIE (2003–2009), 4. 11. 2009.

For several years the Czech labour market has been afflicted by the problem of inadequate interest in science and technology disciplines on the part of young people. The prospect of demanding studies, associated with stiff requirements for knowledge in mathematics and physics, discourages prospective students so that they prefer humanities and business fields of study. Some of these, such as law, economics or management, are often considered, without the appropriate rationale, to involve better employment prospects and to be more easily attainable. Moreover, graduates of humanities normally have broader knowledge that may be applied in more areas as compared to graduates of technical fields whose knowledge is more specific. Evidence of this is the fact that between the 2003/2004 and 2008/2009 academic years the number of applicants for business programmes rose by nearly 73%, while the increase in the number of those applying for science programmes was much lower – less than 25%.

Figure 2 presents an overview of indicators that characterise the admission proceedings at higher education institutions in science and technology programmes. The ratio of the number of admitted students to the number of applicants who turned up for the entrance examinations can be seen as an indicator of the difficulty of the examinations. This ratio increased in the period under review both in sciences and in technology fields. As concerns sciences, from 2002/2003 there was a relatively steep increase in this ratio from the initial 64.3 % up to 80.9 %. In technology disciplines the increase in the ratio was not so large – only 5.4 p.p. from 2002/2003. However, it must be stated that the ratio is already so high that its further increase would mean that virtually all applicants would be admitted. As the proportion of those enrolled and the proportion of applications for science programmes show minimum changes over time, these data suggest that faculties are more willing to admit students and, at the same time, that the entrance examinations are easier compared to those at other institutions. On the other hand, the enrolment in and the proportion of applications for technology programmes decreased in the given period. This means that the higher ratio of admitted applicants to those who turned up for the entrance examinations may also be influenced by this fact – i.e. institutions try to maintain the same number of students while they are forced to choose from a lower number of applicants. Therefore they make the recruitment easier by lowering the admission thresholds or softening the entrance requirements.

Figure 2: Overview of indicators concerning admission proceedings at HE institutions in science and technology programmes in the CR (in %)



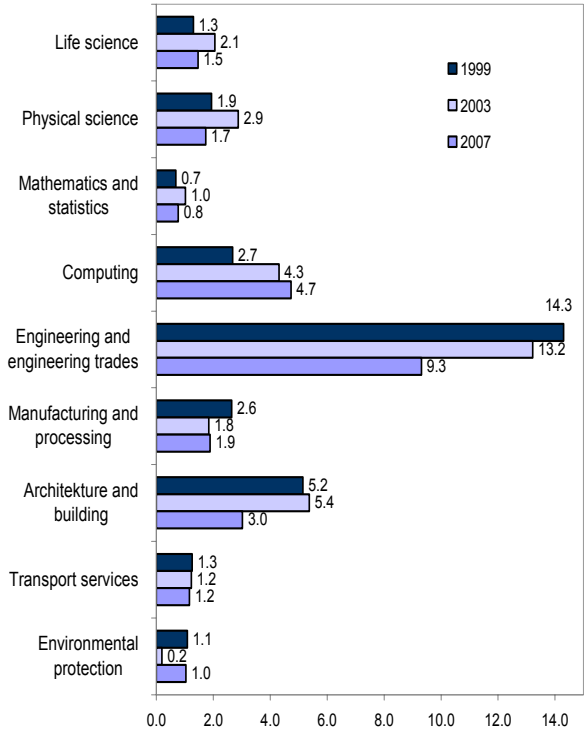
Source: IIE (2003–2009), 4. 11. 2009.

In any case the aforementioned facts point to aggravating problems concerning the motivation for and recruitment in these fields of study.

In the European Union the Czech Republic ranks among the countries with the largest increase in the number of students newly admitted to higher education institutions. This is related to the generally low proportion of the population with tertiary qualifications, which was only 14.5% in 2008 while the EU-27 average was 24.2%. The reason may be seen in an unusually high share of people with secondary qualifications in the population of whom a large portion find employment in the manufacturing industry. They do jobs that, in Western Europe, are often considered to require tertiary qualifications, particularly a Bachelor degree.

Figure 3 shows, in detail, the proportions of students in science and technology programmes in the total number of students.

Figure 3: The proportion of students in various fields within science and technology programmes in the total number of students in tertiary education (CR, in %)



Source: EUROSTAT (1999–2007), table code: educ_enrl5, 1. 11. 2009.

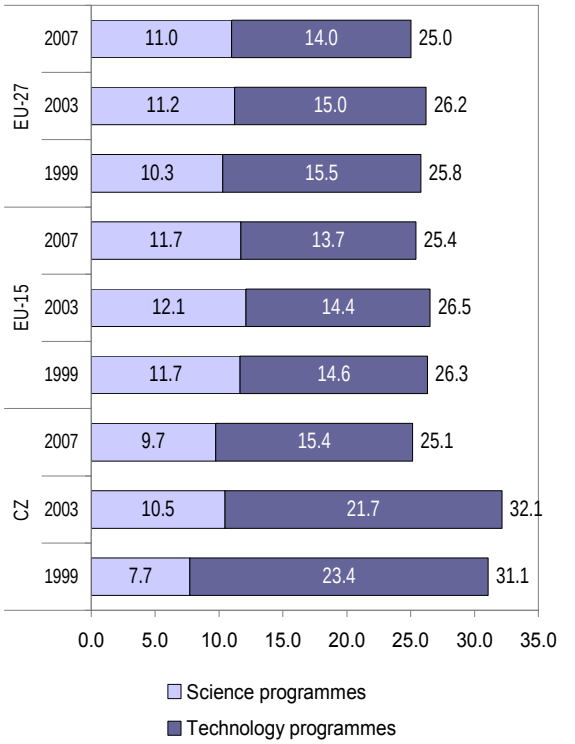
It is clear from the Figure that the proportion of students in all fields within S&T in the overall student population dropped in the 2003–2007 period. The most severe decrease occurred in architecture and building – nearly 28%. A major fall may also be see in physical science where the number of students decreased by almost 25%, while their proportion in the overall student population dropped from the original 2.9% to 1.7%. There was also quite a significant decrease in the number of students in engineering and engineering trades (11%), and in terms of the proportion in the total number of students the decrease was from by 3.5 p.p. from the original 13.2 % down to 9.3 % in 2007.

The only exception was the computing field where the proportion of students increased by 0.4 p.p. from 4.3 % to 4.7 % and the overall number of students rose by 39%. There was also a rise in the number of students in manufacturing and processing (by nearly 30%). However, in terms of the proportion of this field in the total number of students in all fields this only meant a 0.1 p.p. increase.

When we form larger categories of sciences and technology disciplines, there is an evident difference in the trend of their development. While the number of students in sciences increased by over 17% in the CR in 2003–2007, technology programmes are struggling with an opposite development where the number of students is falling both in absolute and relative terms. In this period this number dropped by 10%.

Figure 4 illustrates a comparison of the development in the Czech Republic and in the EU.

Figure 4: Proportions of students in science and technology programmes at HE institution in the total number of students

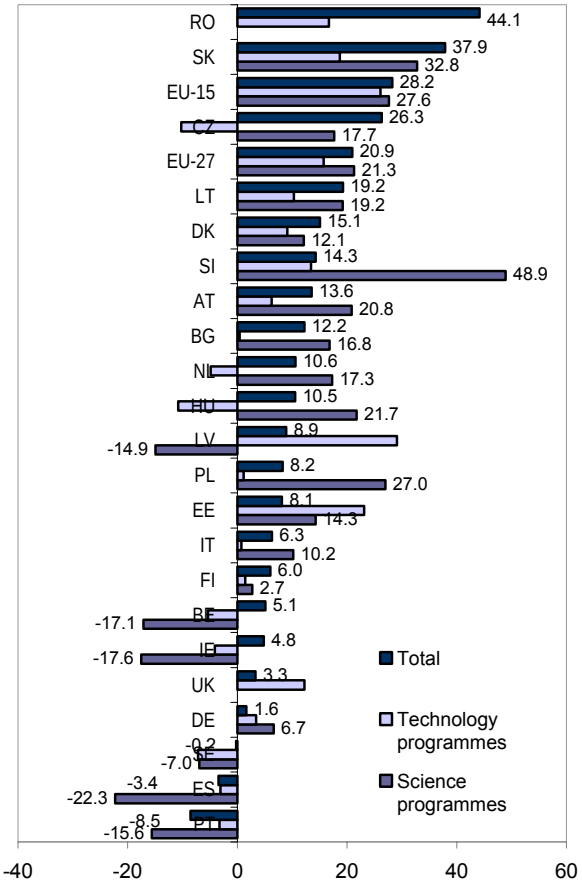


Source: EUROSTAT (1999–2007), table code: educ_enrl5, 1. 11. 2009.

Although in terms of both the EU-27 and EU-15 average the proportion of students in technology programmes is declining, this decline is nowhere near what can be seen in the Czech Republic. Moreover, the absolute number of students in these fields is constantly growing in the EU-27 – the increase was 13% in 2003–2007. Hungary, Sweden, Belgium and Ireland are among EU countries that also tackle a declining number of technology students. Out of these Hungary is the only country that does not face a concurrent fall in the number of science students (their number grew by nearly 22% in 2003–2007). The largest increase in the number of students in technology programmes occurred in Estonia and Latvia. The overall situation is provided by Figure 5.

As concerns sciences, the Czech Republic ranks below the EU average for the increase in the number of students (18% vs. 21.3%). The EU-15 is even higher by 6.3 p.p. The number of students in these fields scored the largest increase in Slovenia, Slovakia or Poland. On the contrary, it decreased in Belgium, Spain, Portugal and Sweden.

Figure 5: Changes in the number of students in science and technology programmes of tertiary education in 2003–2007 (in %)



Source: EUROSTAT (1999–2007), table code: educ_enrl5, 1. 11. 2009.

There are also changes in access to science and technology studies from the perspective of gender. Over the long term the Czech Republic has been experiencing an increase in the number of female students in the overall number of students in tertiary education. This is given by the still low proportion of women in the population with tertiary qualifications (in 2001 it was 41.1% and it gradually rose to 45% in 2007), and also by the growing gender equality both in terms of access to education and employment.

At some higher education institutions such as the University of Veterinary and Pharmaceutical Sciences in Brno, the College of Polytechnics in Jihlava or the Silesian University in Opava, female students predominate with a proportion exceeding 70%.

Along with the general increase in the number of female students in tertiary education we are also witnessing an increase in their proportion in sciences and technology programmes. In sciences there was an increase from 24.3 % in 2001 to 35.1 % in 2007. Technology programmes at first saw a steep decline by 4.4 p.p. between 2001 and 2002, but in the following years the figure gradually rose and achieved the initial value of nearly 25% (see Figure 6).

The most robust increase in the number women students in 2001–2007 occured in architecture and building (10.9 p.p.), physical science (10 p.p.) and life science (7.7 p.p.).

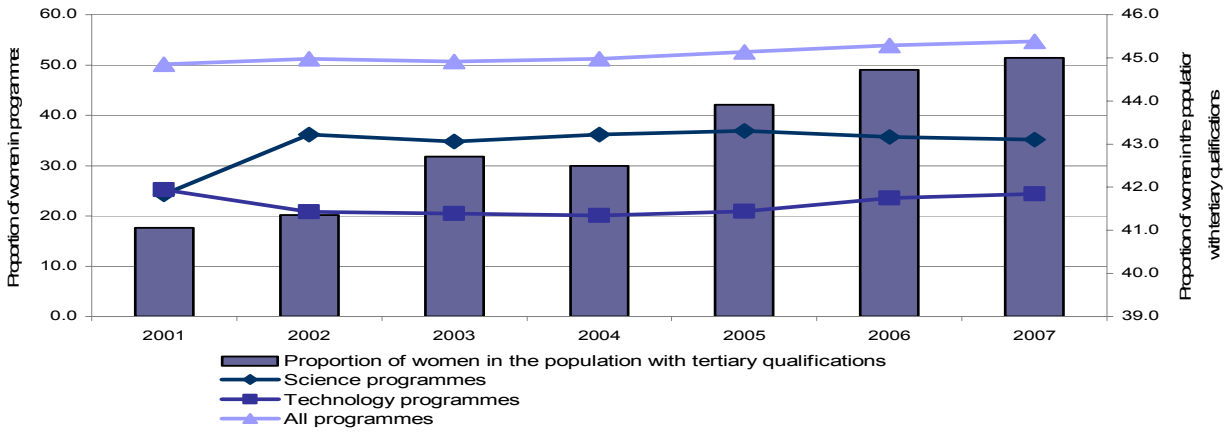
This situation is also illustrated by the proportions of female students in the overall student population at major Czech higher education institutions that provide science and technology programmes.

Table 1: Number of students at major HE institutions providing science and technology programmes in the CR (only faculties focusing on science and technology)

		2003	2007	2008
CU	Number of students	6,838	7,538	8,250
	% women	42.3	44.8	45.1
CTU in Prague	Number of students	20,870	21,947	20,806
	% women	16.5	20.3	21.5
BUT	Number of students	14,873	18,097	18,255
	% women	15.2	17.5	18.2
ICT Prague	Number of students	2,955	3,849	3,817
	% women	52.8	57.1	57.0
VŠB-TU Ostrava	Number of students	11,923	15,887	16,239
	% women	22.5	26.5	27.0

Note: CTU in Prague – all faculties, ICT Prague – all faculties, BUT – all faculties except fine arts and business, VSB-TU Ostrava – all faculties except economics, CU – the Natural Science Faculty and the Faculty of Mathematics and Physics. Source: IIE (2009), 20. 11. 2009.

Figure 6: Development of female student proportions in total number of students in science and technology programmes in the CR; development in terms of the proportion of women in the population with tertiary qualifications

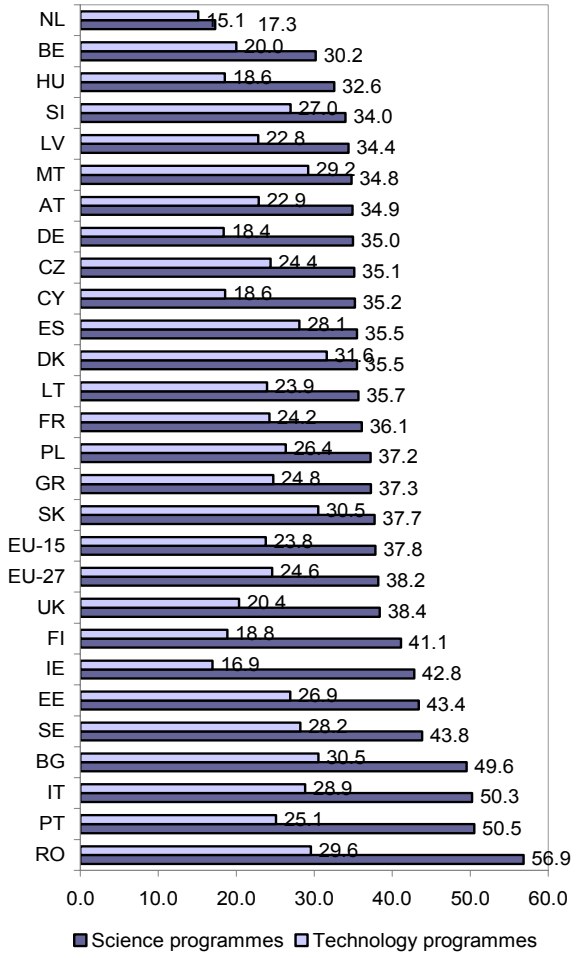


Source: EUROSTAT (2001–2008), table code: lfsa_pgaed, 10. 11. 2009 and EUROSTAT (1999–2007), table code: educ_enrl5, 1. 11. 2009.

In spite of the positive trend in the number of female students in science and technology, in terms of comparison with the European Union the Czech Republic ranks below the average. And this situation is most likely to continue. As regards technology programmes, the situation is the CR is comparable with the EU average. The comparison for 2007 is illustrated in Figure 7.

The EU-27 average only slightly differs from the EU-15 average. Therefore we cannot observe any major difference between more and less advanced EU member countries. In 2007 it was Romania that had the highest proportion of female students in sciences (56.9%). It was followed by Portugal (50.5%), Italy (50.3 %) and Bulgaria (49.5 %). In technology fields Denmark had the lead (31.6 %) followed by Bulgaria (30.5 %), Slovakia (30.5 %) and Romania (29,6 %).

Figure 7: The proportion of female students in total number of students in science and technology programmes in the EU (2007, in %)



Source: EUROSTAT (1999–2007), table code: educ_enrl5, 1. 11. 2009.

In Romania and Bulgaria, in particular, the participation of women in technology education is a matter of tradition that has lasted to this day. A less extensive scope of humanity fields of study on offer, where the number of female students is normally the highest, also plays a certain role in these countries. An extremely low proportion of women studying sciences could be seen in the Netherlands – for this proportion of 17.3% this country is far below Belgium, which is last but one country on the scale (30.2). The same holds true for technology programmes where it was, again, the Netherlands that was at the bottom of the scale (15.1%). It was followed by Ireland (16.9 %) and Germany (18.4 %). However, these differences are not so extreme as compared to sciences.

Graduates of science and technology programmes of tertiary education

The number of tertiary education graduates in the Czech Republic, similarly to the overall number of students, has been growing over the long term. In connection with the aims of the Bologna Declaration (see Box 4), most HE institutions have transformed, or are gradually transforming, their studies into a three-level system with a growing emphasis on the first level – i.e. Bachelor.

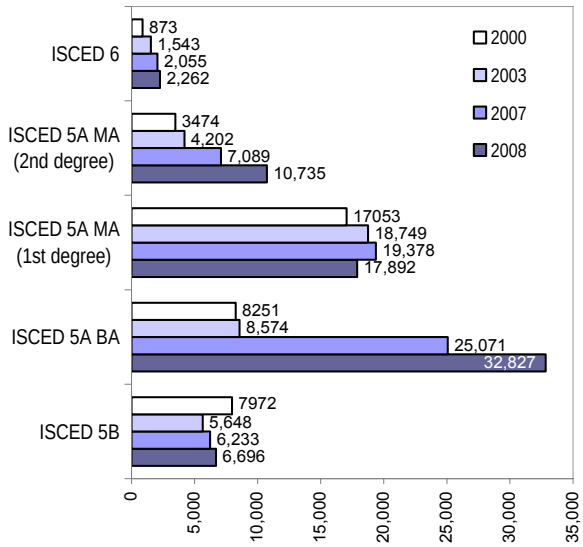
Box 4 The Bologna Declaration

The Bologna Declaration is the principal document of the so-called Bologna process that aims to establish a European Higher Education Area by 2010. There are three main pillars of this process: 1) implementation of three internationally comparable levels of higher education – Bachelor, Master and Doctoral (the Bachelor cycle must not be shorter than three years and must lead to acquisition of a higher education diploma) – along with the development of a European credit system; 2) support for European cooperation in maintaining the quality of higher education; and 3) support for European cooperation in developing the content of education.

Source: MoLSA (2009), 12. 11. 2009

Traditional "long" Master programmes are slowly disappearing and students are mostly admitted to Bachelor programmes upon the completion of which they may continue a follow-up Master programme. This is why the number of graduates of Bachelor programmes is increasing quite rapidly, and the same is true of graduates of follow-up Master studies, while the number of graduates of "long" Master degree programmes is decreasing. An overview of the situation is provided by Figure 8.

Figure 8: Development of the number of tertiary education graduates in the Czech Republic



Note: BA = Bachelor programmes, MA = Master programmes.
Source: IIE (1995–2005) and IIE (2003–2009), 4. 11. 2009.

Between 2003 and 2008 the number of graduates of Bachelor degree programmes in the Czech Republic rose nearly four times (an increase by 290%). The number of graduates

of follow-up Master degree programmes also increased significantly – by 155%. There was also a stable increase in the number of graduates of Doctoral studies - in this period it was by 47%. Only the number of graduates of "long" Master programmes decreased (by 5%). The number of graduates of tertiary professional schools rose by 19%.

However, the situation is more complex as concerns science and technology programmes of tertiary education. The development of the number of graduates is complicated by the fact that there are more students who drop out before completion of studies and the number of graduates is therefore not so high as it could be. One of the reasons is that technical disciplines are normally more demanding, another reason is that HE institutions focusing on technology struggle with insufficient numbers of applicants and therefore also admit less capable students. These students often take advantage of this opportunity, since, upon meeting certain requirements, they may be admitted without entrance examinations. A technical university is something like a life belt for them in a situation where they fail to enter a programme they originally wanted to study, and they leave studies before completion. According to surveys carried out by the National Institute for Technical and Vocational Education[1] in 2007 the highest drop-out rate in technology programmes is among students of mechanical engineering, and the second highest rate is among students of electrical engineering. These are followed by students of natural sciences, particularly mathematics and physics. The lowest drop-out rate is in humanities and healthcare programmes.

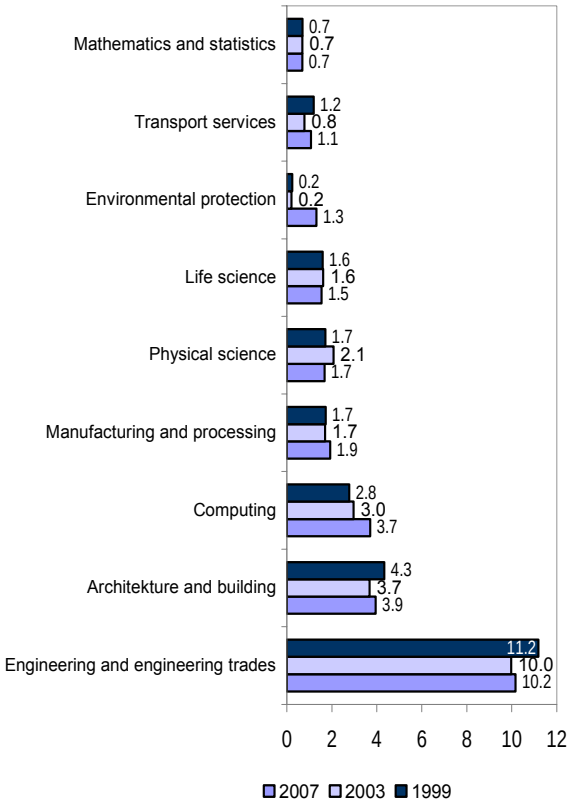
If students return to the education system after some time, they most frequently stay in the field they studied before. This link is the strongest in the case of students in building construction, agriculture, humanities and medicine – the re-entry rate in these fields is over 70%. If science and technology students change a field of study, they most frequently opt for business and humanities – the most frequent reason being that they believe the studies will be easier and the future employment prospects are better. Former students of mathematics and physics and related fields also head towards business programmes, while former chemistry students mostly choose medicine and healthcare-related programmes.

The development of the proportions of graduates of various science and technology degree programmes in the overall number of students at HE in the Czech Republic is illustrated in Figure 9.

The proportion of graduates rose in six out of nine fields of science and technology in 2003–2007. However, these were mostly negligible changes in the order of tenths of percentage points. Worth mentioning is the increase in environmental protection (by 1.1 p.p.) or in computing (0.7 p.p.). There was also a tiny increase in transport services, manufacturing and processing, architecture and building and engineering and engineering trades. In the other three fields the proportion remained the same or dropped in the period under review. The largest decrease occurred in physical science (0.4 p.p.), a minute drop could be seen in life science (0.1 p.p.) and there was no change in mathematics and statistics where the proportion has, for long, been hovering at around 0.7 %.

[1] KLEŇHOVÁ, M., VOJTĚCH J. (2009), p.9-10.

Figure 9: Development of the number of graduates of various fields within science and technology programmes at HE institutions in the overall number of students in HE in the Czech Republic (in %)



Source: EUROSTAT (1999–2007), table code: educ_enrl5, 1. 11. 2009.

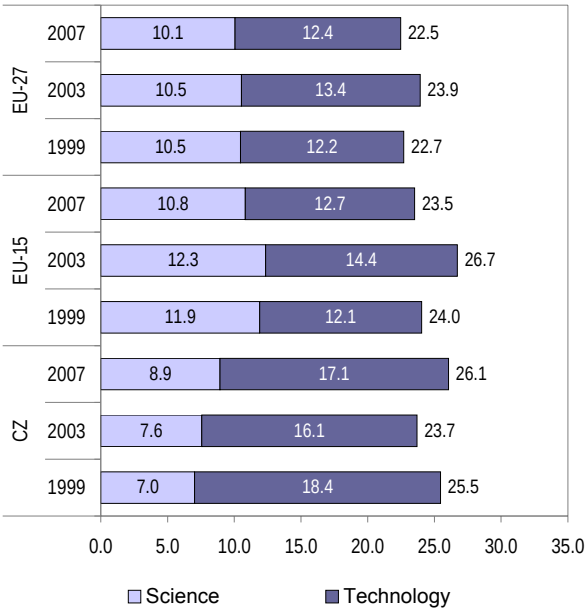
Figure 10 presents the development of the proportions of graduates of science and technology programmes at HE institutions in the total number of HE graduates in the last ten years both for the Czech Republic and the European Union. In the 2003–2007 period the absolute number of graduates in these disciplines in the Czech Republic grew at an above-average pace.

Thanks to this growth there was also an increase in the proportion of graduates of these programmes in terms of all fields of study, although it was not so rapid as compared to absolute figures. In the period under review the proportion of graduates of science programmes in the total number of graduates in all programmes increased from 7.6% in 2003 to 8.9% in 2007. The number of graduates in technology programmes rose by 1. p.p. from the original 16.1% in 2003 to 17.1% in 2007. Taking the average lengths of studies which is five years, this corresponds to a growing proportion of students in these fields that occurred before 2002. Then the proportion began to decline. Therefore we may expect that the proportion of graduates will decrease in the upcoming years, particularly as regards technology programmes where the fall could be rather steep.

In terms of comparison with the EU-27, the proportion of science graduates in the Czech Republic is still low. Nevertheless, there is a trend towards a gradual elimination of the differences, since in the EU-27 this proportion remains virtually unchanged. In 2003 the difference between the CR and the EU-27 was 2.9 p.p., while in 2007 in was only 1.2 p.p. On the other hand, the CR maintains a proportion of

technology graduates that is far above the average level. In 2007 it was 17.1%, which was 4.7 p.p. higher than the EU-27 average and 2.7 p.p. higher than the EU-15 average.

Figure 10: Development of the number of graduates of science and technology programmes at HE institutions in the total number of HE graduates in the CR, EU–15 and EU–27 (in %)



Source: EUROSTAT (1999–2007), table code: educ_enrl5, 20. 11. 2009.

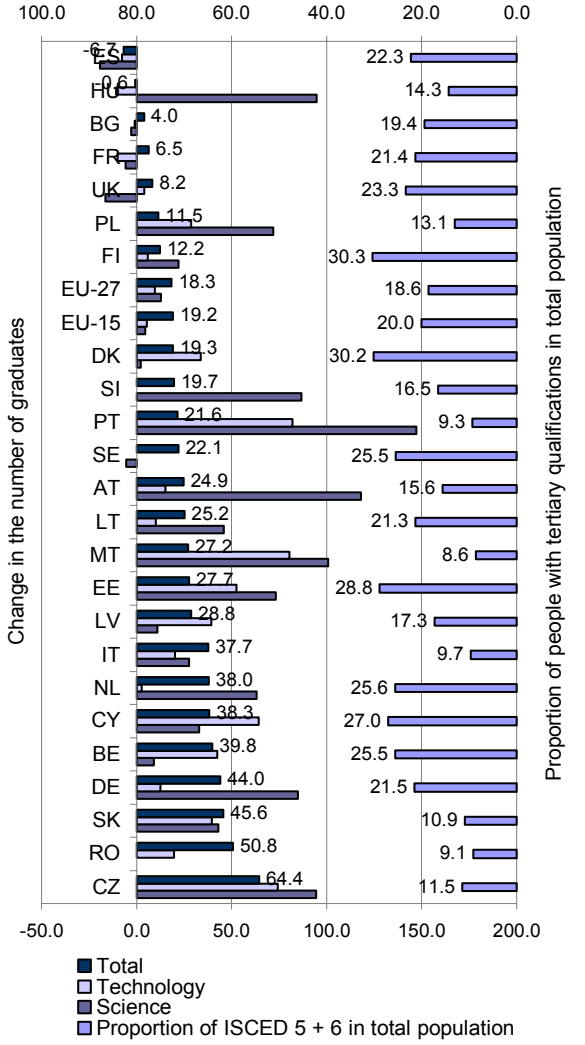
A comparison of the development of the number of science and technology graduates in various EU countries is offered by Figure 11. It is clear at first sight that the Czech Republic tops the EU scale in terms of an increase, in percentage terms, in the total number of tertiary education graduates. The increase for the CR was 64.4% between 2003 and 2007, which the EU-27 average was only 18.3% (the EU-15 average was slightly higher – 19.2%). A robust increase in the number of graduates of these fields also occurred in Romania (50.8 %), Slovakia (45.6 %), Germany (44 %) and Belgium (39.8 %). Negative figures were achieved by Estonia (-6.7 %) or Hungary (-0.6 %).

In terms of the increase in the number of science graduates in the 2003-2007 period the Czech Republic ranks among the top 5 countries (94.5%). The other four countries are Portugal (147.4%), Austria (118.2 %), Malta (101%) and Hungary (94.7%). The EU-27 average was only 12.9%, the EU-15 even as low as 4.6%. A decrease occurred in Estonia, the UK, France, Sweden and Bulgaria.

As for technology programmes, the Czech Republic occupies the 3rd place among all EU countries in terms of the increase in the number of graduates. This number increased by 74.4% in the period under review, while the EU-27 average was only 9.6%. The EU-15 did even worse with just 5.4%. The largest increase occurred in Portugal (82 %), Malta (80.4 %), followed by the Czech Republic as we have mentioned. As distinct from this, some countries faced a decline in the number of technology graduates. These were Hungary (-10.7 %), France (-10.1 %), Spain (-7.5 %) and Bulgaria (-0.9 %).

The large increases displayed by the Czech Republic are, to a large extent, the result of the very low proportion of people with tertiary qualifications in the population, which is nearly twice as low compared to the EU-27 average. In 2003 this proportion was 18.6 % in EU-27 average terms, and in the EU-15 it was even higher – 20%. In the CR it was only 11.5%. Only Italy, Portugal, Romania and Malta did worse (97 %, 9.3 %, 9.1 % and 8.6% respectively).

Figure 11: Change in the number of science and technology graduates in 2003–2007, and the proportion of people with tertiary qualifications in total population (2003, in %)



Source: EUROSTAT (1999–2007), table code: educ_enrl5 and EUROSTAT (2001–2008), table code: lfsa_pgaed, 20. 11. 2009.

At the end of 2008 the National Observatory of Employment and Training commissioned a forecast of the future number of graduates of secondary schools and higher education institutions according to groups of fields of education. The forecast was developed by experts at the Institute for Information on Education. As the employment situation of graduates is only influenced by those who actually enter the labour market and do not continue studying, the analysis we present only includes those graduates who leave the education system upon graduation. In addition to this, the analysis does not include graduates of distance programmes as an overwhelming majority of them work and study on top of their work obligations.

The projection clearly points to certain trends that are typical of the Czech Republic and cannot be avoided. First of all,

there is a clear shift from lower levels of education towards more advanced ones. In 2004 the number of graduates of secondary programmes with "maturita" began to increase, primarily at the expense of secondary programmes without "maturita" (their number began to dwindle). Another stage of changes began in 2007, characterised by a strong move from secondary to tertiary levels of education. The number of tertiary education graduates began to grow rapidly, while the number of graduates of secondary programme without "maturita" continued to decline, and, in addition to this, the number of graduates of secondary schools with "maturita" began to fall. This trend should continue in the future. By 2014 the number of graduates of tertiary education will nearly triple as compared to 2006, from the original 25.6 thousand to 75.5 thousand. In relative terms, the number of graduates of secondary education without "maturita" will decrease from 25% to 11%, the number of graduates of secondary studies with "maturita" will go down from the initial 46.1 % to 28.5 %, and the proportion of graduates of tertiary education will double from 29.1 % up to 60.6 %. A comprehensive picture is provided by Figure 12.

As we have mentioned, the forecast also provides data for graduates that are broken down according to more detailed criteria, particularly the fields of education. The fields are put together to form logical groups that are adjusted to the relevant level of education.

The list of fields of education at tertiary level is presented in Box 5.

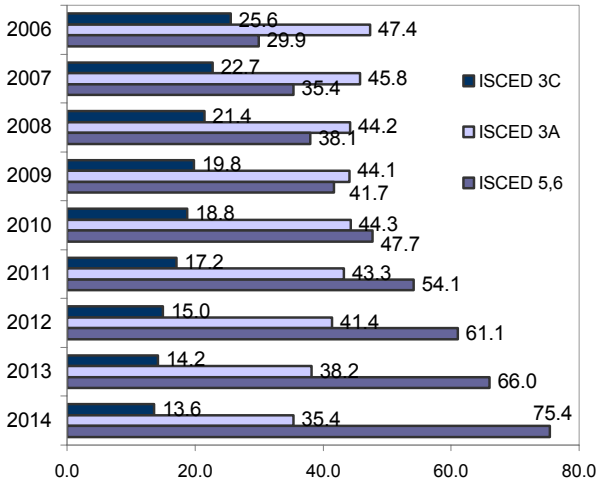
Box 5 Groups of fields of education at higher education institutions and tertiary professional schools, as used in the forecast of the future number of graduates

1. Sciences
2. Mechanics, metal casting and metallurgy
3. Electrical engineering and energy
4. Construction and architecture
5. Other engineering fields
6. Agriculture and veterinary science
7. Health
8. Business, trade and services
9. Law
10. Teacher training
11. Other social sciences
12. Other sciences

Source: KLEŇHOVÁ, M. (2008).

For an analysis of the graduates of science and technology programmes groups 1, 2, 3, 4 and 5 are important

Figure 12: Development and projection of the number of graduates of secondary and tertiary education in the Czech Republic (in %)

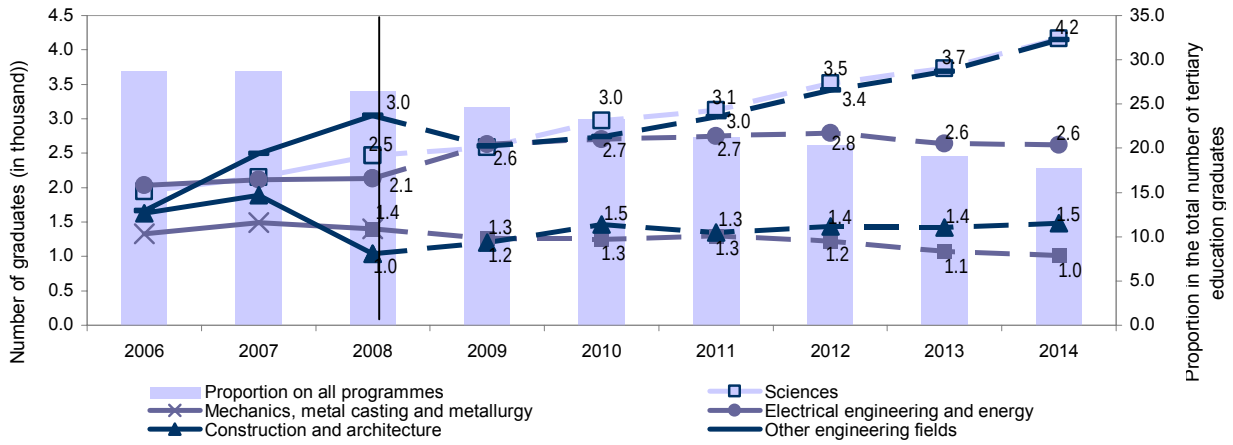


Source: KLEŇHOVÁ, M (2008).

Figure 13 illustrates the development of the numbers of graduates in these groups until 2008, and also the forecast for the 2009-2014 period. With the exception of some minute decreases these numbers are growing over time. The only exception is the group of fields involving mechanics, metal casting and metallurgy where the number of graduates is expected to decline slightly. In the following 5 years the largest increases are forecasted for sciences (an increase by 115%) and other engineering fields. (149%).

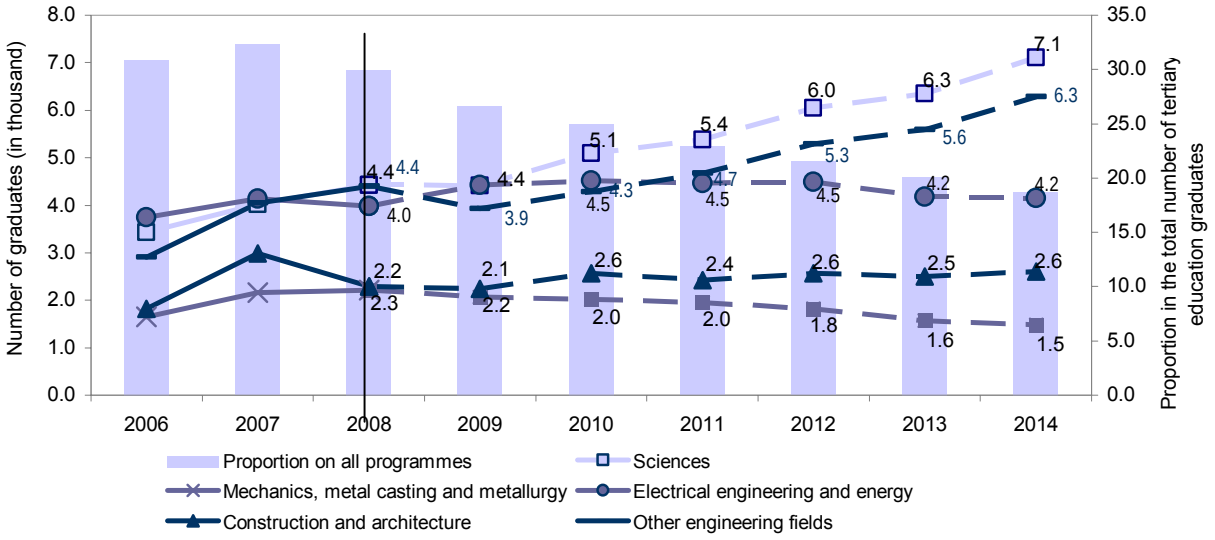
Although according to the projection the number of graduates in sciences and other engineering fields is going to grow, their proportion in the total number of tertiary education graduates is gradually going to decrease – from 26.5 % in 2008 to 17.8 % in 2014. The reason is, above all, the extremely rapid increase in the number of graduates in the business, trade and services group of fields. In this group the number of graduates will grow by 167% from 10 thousand in 2008 to nearly 27 thousand people in 2014.

Figure 13: Forecast of the number of graduates of science and technology programmes of tertiary education and their proportion in the total number of tertiary education graduates (CR, in %, only those entering the labour market)



Source: KLEŇHOVÁ, M (2008).

Figure 14: Forecast of the number of graduates of science and technology programmes of tertiary education and their proportion in the total number of tertiary education graduates (CR, in %, all the graduates)



Source: KLEŇHOVÁ, M.(2008).

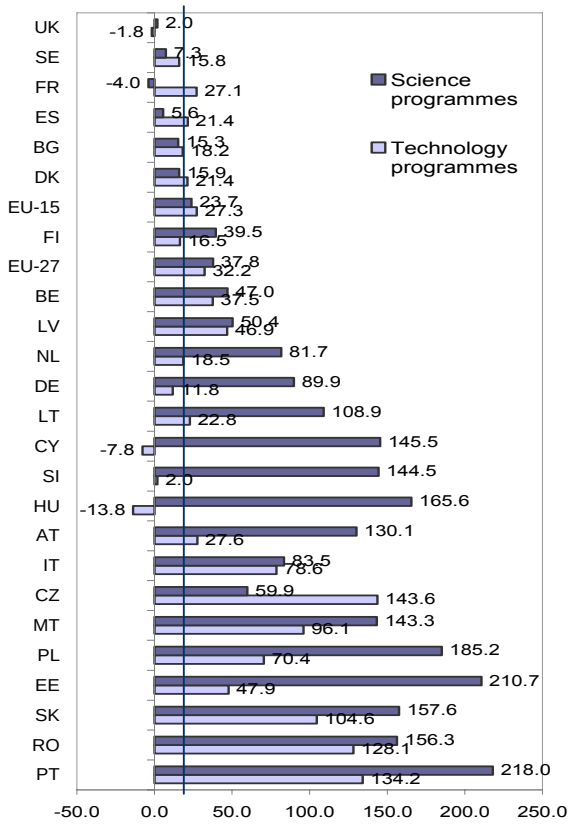
If the implementation of the Lisbon objective is to be evaluated (i.e. increasing the number of science and technology graduates on average by 15% between 2000 and 2010), it is necessary to include all graduates and not only those entering the labour market immediately upon graduation. The development of their numbers is also addressed in the aforementioned projection (Figure 14).

If we consider all graduates, the trends are virtually identical to those where only graduates transferring into employment are taken into account. A more noticeable difference may only be observed when there are disparities between the groups of fields in terms of the proportions of graduates leaving for the labour market upon completion of these programmes. For example, in 2008 there was a much higher proportion of graduates of other engineering fields who entered into employment as compared to graduates of sciences.

The objective of increasing the number of graduates of these fields by 15% between 2000 and 2010 is expressed as an average for all member countries of the European Union. The contribution various countries make towards implementation of this objective varies. It is clear from Figure 15, which illustrates the development of the numbers of these graduates in the 2000-2007 period, that the objective is most likely to be fulfilled without difficulties. As early as the 2000-2007 period, for which data are already available, the number of graduates of sciences grew by an average of 37.8% in EU-27 and by 23.7% in EU-15. The increase in the number of graduates of technology fields also surpassed the objective. For EU-27 the increase was 32.2% and for EU-15 it was 27.3%.

The Czech Republic' contribution towards meeting the objective is at an above-average level. The number of graduates of science disciplines grew in this period by nearly 60% from the original 4, 325 to 5, 451. The increase was even higher for technology graduates – 143.6% from 5, 451 to as many as 13, 280.

Figure 15: Change in the proportions of graduates of science and technology programmes of tertiary education in the European Union countries in 2000–2007 (in %)



Source: EUROSTAT (1999–2007), table code: educ_enrl5, 20. 11. 2009.

The figure shows that the objective of increasing the number of graduates of science and technology programmes by an average of 15% in the EU countries is most likely to be met without difficulties. As early as the 2000–2007 period, for

which the data are available, the number of science graduates in the EU-27 grew by an average of 37.8 %, while within the EU-15 it was by 23.7 %. The increase in the number of graduates of technology programmes will also be higher than what the EU has set to aim for. In the same period it increased by 32.2 % in the EU-27 average terms, and by 27.3% in the EU-15.

As concerns sciences, the countries whose contribution to the growing European average figure was the largest included, above all, Portugal (218 %), Estonia (211 %), Poland (185 %) and Hungary (166 %). On the contrary, negative figures that lower the European average were reached by France (-4 %) or the United Kingdom (-1.8%).

The most robust contribution towards the increase in the number of technology graduates in the EU average terms was made by the Czech Republic (143%), followed by Portugal (134 %), Romania (128 %) and Slovakia (105 %).

Transition of science and technology graduates into the labour market

Another factor that is essential for the competitiveness of the Czech economy, in addition to the overall number of science and technology graduates, is the extent to which young people with these qualifications enter the labour market and how successful they are in terms of employment.

As the following table shows, the rate of employment among science graduates aged 25–29 is over 75% in the Czech Republic. Graduates of technology programmes display a higher rate or employment – over 80%.

Table 3: Employment of science and technology graduates in the 25–29 age group in 2007 (%)

	Science graduates			Technology graduates		
	Empl.	Unempl.	Inact.	Empl.	Unempl.	Inact.
CR	76.4	4.4	19.2	82.7	3.5	13.8
IT	54.5	12.0	33.5	66.1	7.3	26.5
NL	92.2	2.2	5.7	96.6	0.4	3.0
EU-27	**81.1**	**8.5**	**12.6**	**87.2**	**6.0**	**8.1**

Note: Empl. = employment, Unempl. = unemployment, Inact = inactive.Source: EUROSTAT (2007). (microdata), own calculations.

In terms of comparison with the EU average, the rate of employment among Czech graduates is lower. Their unemployment rate in 2007 was also lower. The point is that nearly one fifth of science graduates do not work for reasons other than unemployment. In the CR there is also a relatively high proportion of inactive graduates in technology fields as compared to the EU average. The reasons why these graduates do not work include childcare, internships abroad or further studies. As the rate of employment in this age group displays major differences between men and women, the main reason for this is a long period of maternity and parental leave in the CR. A comparison with EU countries shows that graduates of these fields of education are doing best, in terms of employment, in the Netherlands. On the contrary, in Italy nearly half of science graduates are economically inactive and the same is true of almost one third of technology graduates. The situation of graduates of these fields in various countries does not differ significantly from the situation of graduates in general – i.e. it is influenced by the overall economic development and the rate of unemployment.

A somewhat different picture of the employment of graduates of S&T programmes is provided by the following table that shows the situation of graduates in the 30–34 age group.

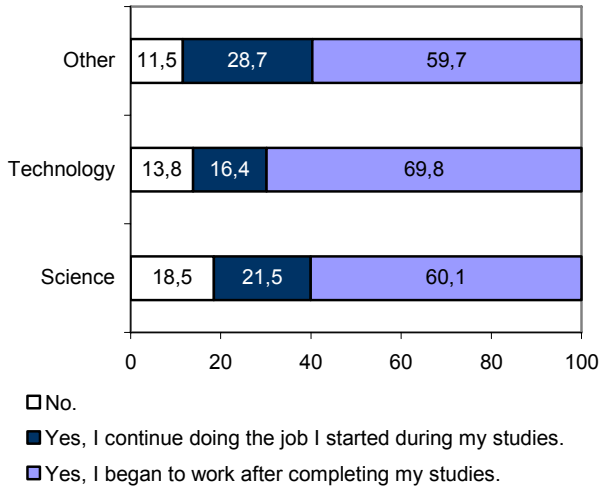
Table 4: Employment of science and technology graduates in the 30–34 age group in 2007 (%)

	Science graduates			Technology graduates		
	Empl.	Unempl.	Inact.	Empl.	Unempl.	Inact.
CR	90.7	2.6	6.7	90.9	0.4	8.7
IT	82.7	4.6	12.7	90.9	3.1	6.0
NL	96.2	0.8	3.0	97.5	0.8	1.7
EU-27	**89.8**	**5.2**	**7.8**	**92.5**	**3.5**	**4.7**

Note: Empl. = employment, Unempl. = unemployment, Inact = inactive. Source: EUROSTAT (2007).

The rate of employment among Czech graduates in this age group increased considerably, and it reaches average levels in EU terms. The rate was unemployment was lower than the average in 2007, and it was virtually negligible for technology disciplines. This means that, in this age group, there are not more inactive graduates in the CR as compared with other EU countries. A similar development in the rate of employment in these age groups as in the CR may be seen, for example, in Italy. However, it is more dramatic there. While in the CR the difference in the rate of employment between the 25–29 and 30–34 age groups is 14.3 percentage points for science and 8.3 p.p. for technology, in Italy this difference is 28.2 p.p., and 24.8 p.p. respectively. As distinct from this, in the Netherlands the difference in the rate of employment in these age groups is only minute. This means that the differences are caused not by the absorption capacity of the labour market, but, primarily, by the social situation in some countries where young people stay in longer in their families or, in the case of women, in households. The period of transition of these graduates into full employment becomes longer, their potential is not made use of and it may disappear over years. In the CR the capacities of these young people, particularly women, can be seen as a resource that may be used to boost the competitiveness of the economy.

Figure 16: Work after graduation (in %)



Source: EPC FE (2006).

Based on the REFLEX survey (EPC FE, 2006.), we also examined the process of transition of S&T graduates into the labour market. As Figure 16 shows 18% and 14% of graduates of science and technology programmes respectively did

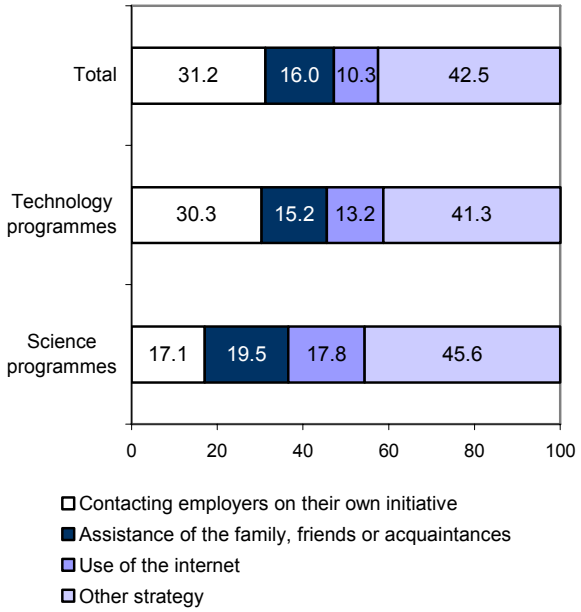
not have any paid work five years after graduation. However, a relatively high proportion of graduates worked during studies and continued in the same job after graduation. Most graduates entered employment after completion of education. Of these a higher number were graduates of technology programmes.

Of those graduates who entered into employment after graduation only a small portion looked for a job before completion of studies (science graduates represented the lowest proportion of these – only 7.5%). Approximately 50% of graduates sought work after graduation, the other half found it either without implementing any job-seeking strategies or at the time when they were still in the education process. The most frequents job-seeking strategies were the following:

- contacting employers on graduates' own initiative;
- assistance of the family, friends or acquaintances;
- use of the internet.

Most graduates of technology programmes found employment by means of contacting employers on their own initiative (30%). Graduates of science studies used the three aforementioned strategies to the same extent and, in addition to these, they were also approached by the employer. While men displayed a higher rate of the internet use, women showed a stronger tendency to approach employers on their own initiative.

Figure 17: Job-seeking strategies (in %)

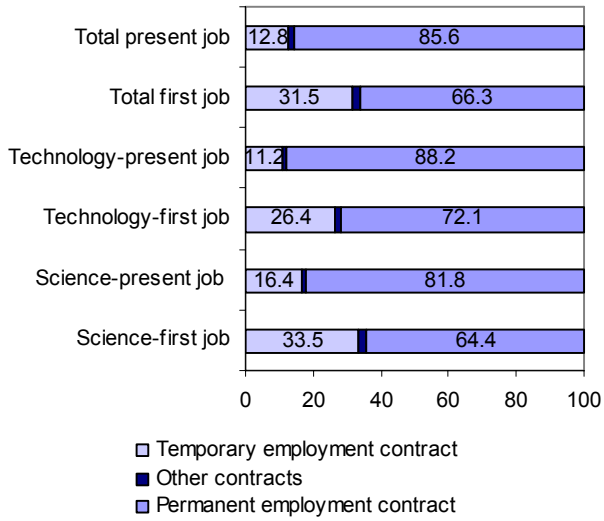


Source: EPC FE (2006).

Some graduates set up their own business (self-employment) – around 12.5%.

Figure 18 illustrates, on the basis of the nature of the employment contract, the extent to which the employment of graduates is stable. A large majority of graduates obtained a contract for an indefinite period of time in their first job (66%) – of these a higher number were technology graduates as compared to science graduates, and there were more men than women. Of those who obtained a temporary employment contract a majority were women – graduates of science programmes. The contract was, in most cases, for 7–12 months (67%), or possibly for an even short period of 1–6 months (18%). Over half of graduates stayed with their first employer in the five years following graduation. Less than 30% had two employers and over 10% worked for three employers. If we compare the situation of graduates in their first employment and that in their present job (i.e. five years after graduation), it is clear that employment stability has improved significantly. As many as 85% of graduates had a permanent employment contract (again male graduates of technology programmes predominated). On the other hand, quarter of women – graduates of science disciplines – still had a contract for a fixed period.

Figure 18: Type of employment contract in the first and present job (in %)



Source: EPC FE (2006).

As the graduates stated, most of them are happy about their employment (71%), while the highest rate of job satisfaction is among male graduates of science programmes (73%). Women in these fields show a lower rate of job satisfaction (62%). An average rate of satisfaction is expressed by 20% of graduates. A total of 7% of graduates are not satisfied with their job. These are mostly women in science disciplines (12.7%). On the contrary, women in technology fields express dissatisfaction less frequently.

It is evident from these data concerning graduates of technology and science programmes, that their transition into the labour market takes place without major difficulties. However, there is a relatively long period during which many of them, particularly women who are economically inactive, face insecurity in terms of job stability, or are even unemployed. This largely concerns women in science disciplines. This means that more attention should be paid to a better utilisation of their potential.

1.2 Requirements for the knowledge and skills of science and technology graduates

The identification of requirements for the knowledge and skills of S&T graduates constitutes an important source of information. This information may be used to inform systemic changes in various areas, particularly in tertiary education, and also to assist the students and graduates themselves. The following is a summary of the results of a secondary analysis of surveys already implemented both among prospective employers and among graduates. The details are presented in Box 6.

Box 6: Research into employers' requirements for science and technology graduates (NTF–NOET 2009b)

The objectives of this project commissioned by the Ministry of Education, Youth and Sports (MoEYS) included the following: 1. to identify the required profile of a prospective employee – graduate of science and technology faculties of HE institutions in terms of the level of qualification and the structure of knowledge and competencies; 2. to ascertain the employers' rate of satisfaction with the graduates' hard and soft skills. The research was carried out using questionnaires employers had to fill in, and in-depth interviews were conducted to complement the information. A total of 102 employers were surveyed, representing small, medium-sized as well as large enterprises.

REFLEX (Education Policy Centre at the Faculty of Education, Charles University, 2006)

This is an international research project entitled "The Flexible Professional in the Knowledge Society: New Demands on Higher Education in Europe". It was implemented in 2004–2007. The objective of this project was to address three theme issues: 1. What competencies do graduates need to meet new labour market requirements? 2. To what extent do individual higher education institutions, faculties and programmes develop these competencies? 3. What tensions arise as graduates, higher education institutions, employers and other key players each strive to meet their own objectives, and how can these tensions be resolved? The REFLEX project applies various research instruments, including a questionnaire-based survey among HE graduates who have been in employment for several years. On the part of the Czech Republic the project was implemented by experts representing the Education Policy Centre at the Faculty of Education of Charles University, the Centre for Higher Education Studies and the UNIVERSITAS agency.

Employers' requirements: the knowledge and skills of graduates doing jobs based on science and technology qualifications

As part of a **survey concerned with employers' requirements for graduates of science and technology programmes (carried out by NOET in 2009)** the employers were asked, above all, about the importance they attribute to the following knowledge and skills in the profile of the graduates (their prospective employees):

- knowledge in one's own discipline,
- knowledge in other disciplines,
- language competencies,
- knowledge in economics and business focus
- soft skills (see Box 7).

Box 7: Soft skills

The definition of soft skills has not yet been clearly established. The term "key competencies", "transferable competencies" or "personal characteristics" are also used to mean the same as "soft skills". Their specific definition depends, to a large extent, on whether the competencies are required in occupations with varying requirements in terms of a qualification and field of education. These skills are characterised, above all, by their transferability – i.e. they may be applied in various work situations regardless of the specificities of the occupations. They form an integral part of the qualification of workers that is required by the existing work organisation, business structure and the development of new technologies. The use of soft skills is similar in various situations and work conditions. Soft skills include, for example, problem solving, critical thinking, learning skills, self-management, self-control, etc.

As concerns soft skills, employers assessed the importance of the following ones in particular:

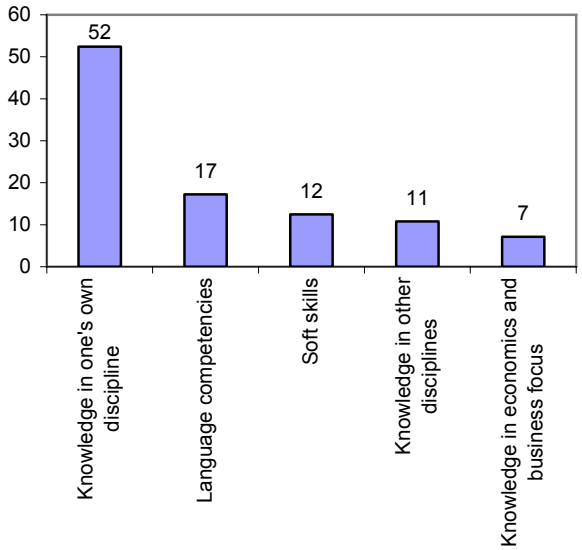
- presentation skills (explanation of one's own ideas and views),
- assertiveness,
- innovativeness (coming up with new ideas and solutions),
- capacity to handle stress situations,
- teamwork.

According to employers, the most important characteristic in all employees doing jobs based on qualifications in science and technology is a **thorough knowledge of one's own discipline**. This knowledge accounts on average for 50% of the qualification profile. The weight of specialist knowledge is larger in graduates of technical disciplines as compared to, for example, graduates of humanities and social sciences. A profound knowledge of one's own discipline is of key importance. However, it is not sufficient – and this even holds true for technical fields.

The second place in terms of importance is occupied by **language competencies** (17 %). The requirements for language skills in workers performing science- and technology-related jobs have recently been increasing rapidly. This is very much the result of foreign investors' entering into Czech companies and of internationalisation of manufacturing processes that requires communication with foreign partners. Language skills are important from two perspectives: communication with customers and partners, and professional development opportunities. Nowadays, professional development is hardly possible without a good command of English, as a large portion of information sources (particularly web-based ones) are only available in this language. Some employers state that the knowledge of one foreign language is a necessity, and the knowledge of another language is an advantage. As Czech producers largely depend on German customers and partners, the second most frequently required language is German.

The importance of the other types of knowledge and skills mentioned above is smaller, according to employers, and it differs significantly depending on the occupation. The importance of **soft skills** took up 12% in the overall qualification profile required. The weight of the **knowledge in other fields** was 11% on average, and the weight of **knowledge in economics and business focus** was 7 % (see Figure 19).

Figure 19 : Employers' requirements concerning the knowledge and skills of graduates (in%)

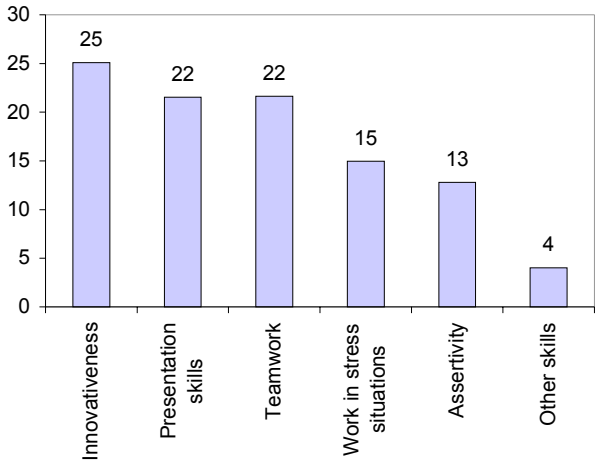


Source: NTF–NOET (2009b).

As it is stated in the publication "Forecasting Labour Market Skills Needs" (NTF-NOET 2009a), tertiary education graduates, and this also applies to S&T graduates, will be increas-

ingly required to display **a certain balance between specialist knowledge, knowledge in related disciplines and soft skills.** One example is the designer/constructer occupations where, according to this publication, the knowledge necessary for doing such jobs will include, in addition to specialised technical knowledge, also knowledge in law, economics and human resources management. A more detailed overview of soft skills is presented in Figure 20.

Figure 20: Employers' requirements concerning soft skills of graduates (in %)



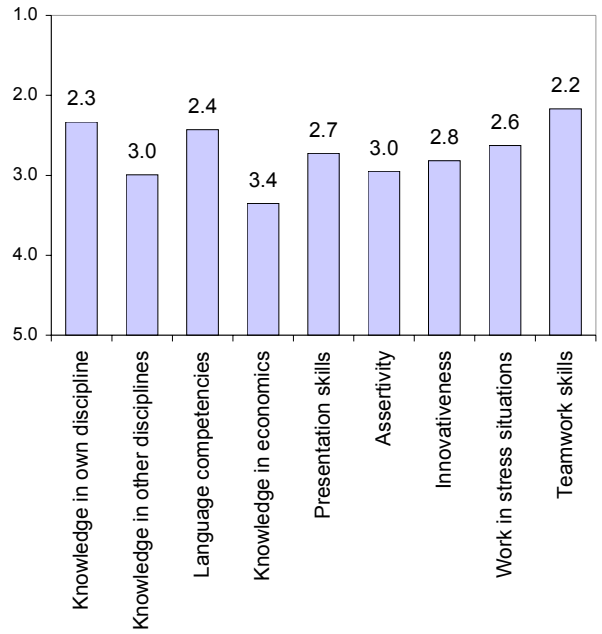
Source: NTF–NOET (2009b).

Among these soft skills the largest weight was attributed to **resourcefulness/innovativeness (**25%), and presentation and teamwork skills (22% each). The importance of the capacity to work in stress situations and in teams was slightly smaller. The employers' emphasis on the innovativeness of employees is the result of the fact that innovation is the driving force behind the development of enterprises and the entire economy. Moreover, generation of new ideas is not separated from the work process. On the contrary, it is becoming an integral part of it.

Assessment on the part of employers: the knowledge and skills of graduates performing occupations based on technology and science qualifications

As part of the **survey concerned with employers' requirements for graduates of science and technology programmes (NOET 2009)** the employers assessed the degree to which the graduates meet the aforementioned requirements (see Figure 21). A five-degree scale was used where 1 was the best score and 5 was the worst score. Knowledge in one's own discipline and teamwork skills received the highest ranking. The worst scores were given to knowledge in economics, knowledge in other disciplines and assertiveness. Employers do not, in general, require a high level of knowledge in economics and assertiveness skills, but graduates do not even meet these relatively soft requirements. The requirements as regards knowledge in other fields are higher, which means that the drawbacks displayed by graduates are more severe. Surprisingly, the employers are happy with the level of language competencies, which they consider to be very important. The ranking of the other soft skills mentioned above is close to the average. It may therefore be stated that employers, on the whole, are not too negative about the level of the graduates' knowledge and skills.

Figure 21: Employers' satisfaction with graduates' knowledge and skills



Source: NTF–NOET (2009b).

Assessment on the part of graduates: the knowledge and skills of graduates of science and technology programmes

As part of the **REFLEX** survey (EPC FE, 2006) graduates expressed their views as regards the level of their knowledge and skills and, also, as regards their employer's requirements in this respect. An overview of the knowledge and skills assessed is presented in Box 8.

Box 8: An overview of knowledge and skills

1. Mastery of one's own field or discipline; 2. Mastery of other disciplines; 3. Analytical thinking; 4. Ability to learn new things quickly; 5. Ability to negotiate effectively; 6. Ability to work well under pressure; 7. Ability to "sense" new opportunities; 8. Ability to coordinate activities; 9. Ability to use time effectively; 10. Ability to work productively in a team; 11. Ability to mobilise the capacities of others; 12. Ability to make your meaning clear to others; 13. Ability to assert your authority; 14. Ability to use a PC and the internet; 15. Ability to come up with new ideas and solutions; 16. Willingness to think again about one's own and other people's ideas; 17. Ability to present products, ideas or news to the public; 18. Ability to develop written materials, reports; 19. Ability to express oneself in a foreign language (also in writing).

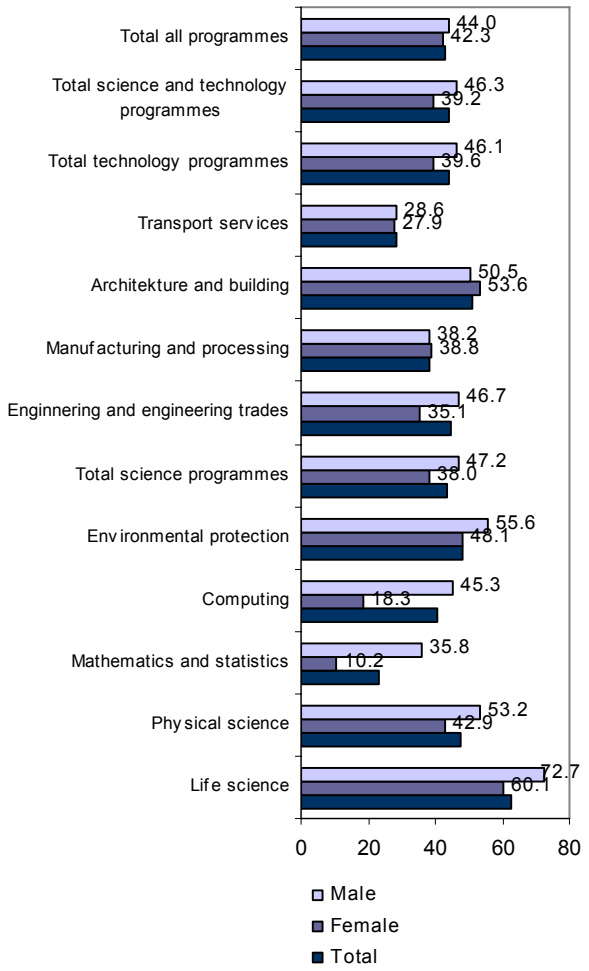
The strengths mentioned by science and technology graduates included, above all, **mastery of one's own field or discipline** (43.8 %) In this respect they do not differ considerably from graduates of other programmes (see Figure 22).

Interestingly, there were rather large differences between the graduates of various programmes (fields of study). Graduates of life sciences and architecture and building were those who most frequently ranked mastery of their own discipline as the most important ability (62.6% and 51.2% respectively). Only 22.9% of graduates mathematics and statistics attributed the largest weight to this ability. Most of them tended to stress their soft skills, particularly analytical thinking and work with a PC and the internet, as their strengths. However, in this case these skills form an integral part of the expertise and are related to mastery of one's own discipline.

If we compare men and women as they assess their strengths it is clear that men assign far more importance to their expert knowledge and skills (46.3%) than women (39.2 %). The most striking differences are to be found in ICT (27 p.p.) and in mathematics (25.6 p.p.). This is probably related to the different employment situation of men and women – graduates of these programmes. Women in this fields thought their largest strength was work with a PC and the internet - not specialist knowledge.

As regards **soft skills,** graduates of science and technology programmes mentioned **work with a PC and the internet** and **analytical thinking** as their strengths (38.7% and 34.8% respectively). In terms of the emphasis they place on these skills they differ considerably from graduates of other programmes. The difference is 12.3 p.p. for work with a PC, and 11.2 p.p. for analytical thinking. 32.2% of S&T graduates think the ability to learn new things quickly is their strength, and 18.4% of them believe the same is true of the ability to develop written materials and reports. The remaining soft skills were mentioned as strengths less often. In this respect S&T graduates do no differ significantly from graduates in other disciplines (see Figure 23).

Figure 22: Mastering of own discipline as a strength of a study programme (% of those who mentioned this feature in the total number of graduates)

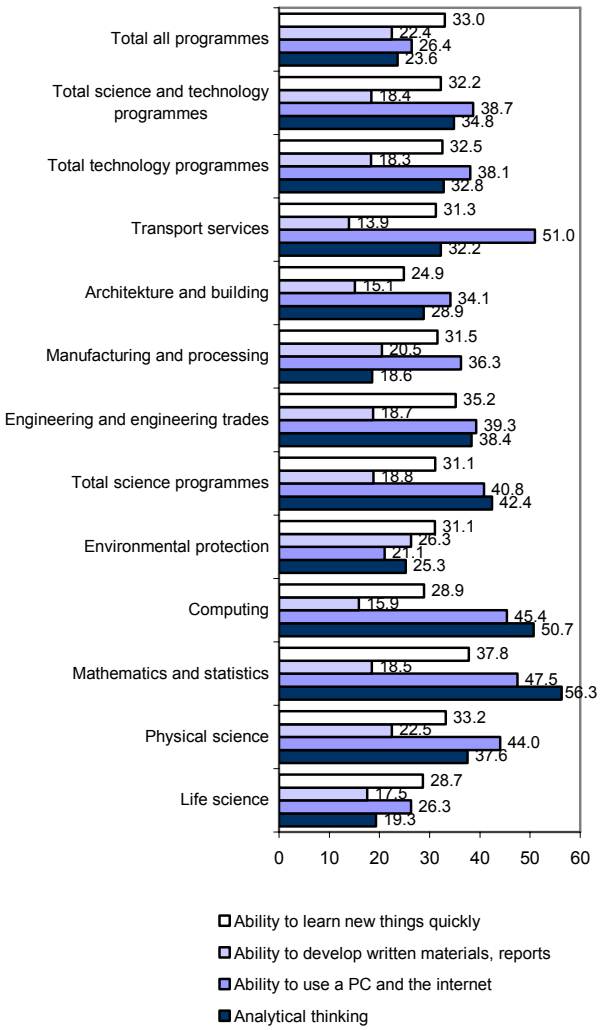


Source: EPC FE (2006).

Graduates of mathematics and ICT programmes differ considerably from other graduates in that they consider, to a much larger extent, analytical thinking to be their most important strength (56.3 %; 50,5 %).

If we compare men and women as they evaluate their strengths, men attach more value to their analytical thinking (29.6% vs. 25.2%). This difference is particularly robust in graduates of science and technology (52.2 % vs. 29.4 %). Female graduates of S&T programmes assign far more importance, as compared to men, to their ability to learn new things quickly (36.4 % vs. 27.4 %). They also differ from male S&T graduates in that they put more weight to other social competencies such as the ability to coordinate activities (12.5% vs. 6.3%). This is particularly true of female graduates of programmes concerned with transport services (48.5%). Moreover, women more often appreciate their ability to use time effectively (14.2% vs. 7.1%), and the ability to work productively in a team (13.9% vs. 7.9%). This is, again, related to the different employment situation of men and women, as women generally **put more emphasis on soft skills** while men focus more on **mastery of their own discipline**.

Figure 23: Soft skills as a strength of a study programme (proportion of individuals who mentioned this feature in the total number of graduates – in %)



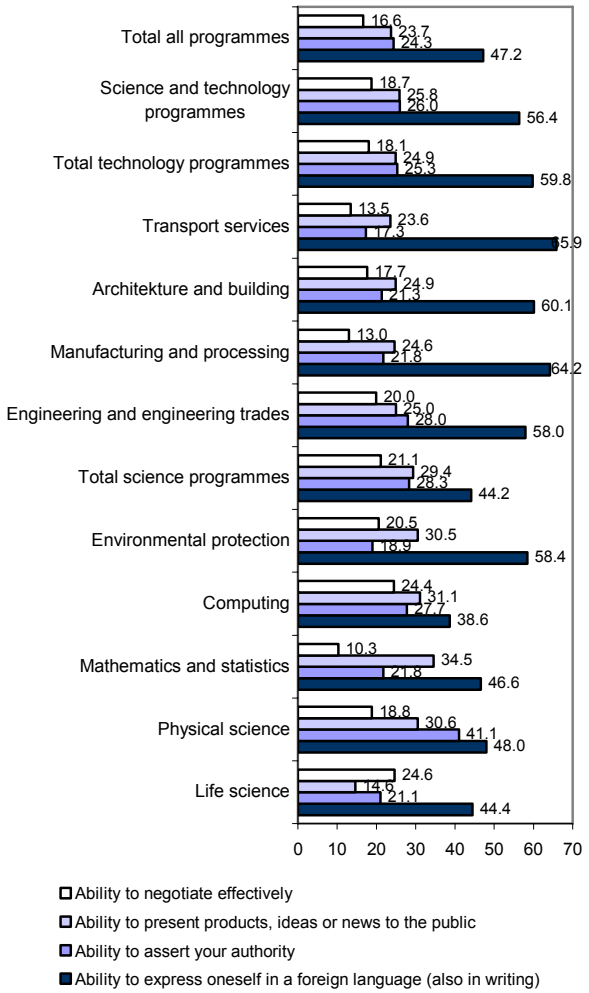
Source: EPC FE (2006).

As part of the REFLEX research project graduates were also asked about the skills they consider to be among their

weaknesses. The **knowledge of a foreign language** came out clearly as the most severe problem, as it was identified as a weakness by 56.4% of S&T graduates. This is more often felt as a problem among technology graduates, particularly in transport services (65.9%) and in manufacturing fields (64.2%) (see Figure 24).

The other soft skills that the graduates thought they were not very good at included the ability to asserts one's authority (26%), presentation skills (25.8%) and negotiation skills (18.7%). It is most frequently male graduates of S&T programmes who complain about their negotiation skills (25.9%). In fewer cases gradates complained about their ability to mobilise the capacities of others and the ability to "sense" new opportunities. Other soft skills, as well as the knowledge in other fields, were considered to be a weakness by a smaller number of graduates. In this respect graduates of science and technology programmes do not differ significantly from graduates in other fields.

Figure 24: Soft skills as a weakness of a study programme (proportion of individuals who mentioned this feature in the total number of graduates – in %)



Source: EPC FE (2006).

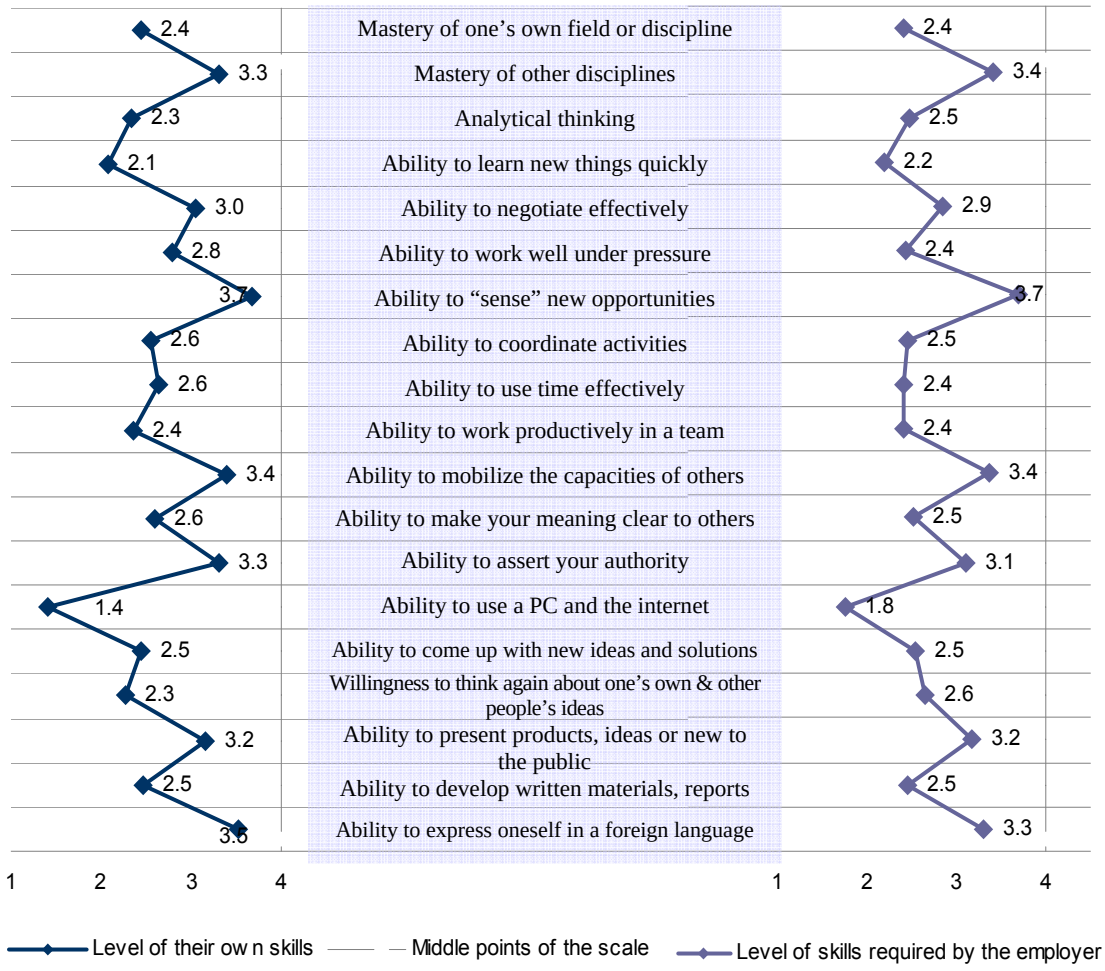
As concerns **innovativeness** – i.e. the capacity to come up with new ideas and solutions, the proportion of graduates who see it as one of their weaknesses is larger (6.3%) than the proportion of those for whom it is a strength (4.4%) However, the low number of answers suggests that the graduates do not consider this ability to be very important and necessary.

As part of the REFLEX study the graduates were also asked how they assess the level of their own skills and the level of skills required by their current job. A scale from 1 to 7 was used where 1 was a very high level and 7 was a very low level. The overall results are presented in Figure 25.

The graduates' ranking of the level of the skills acquired and those required ranges from 1.4 to 3.7 – nearly all skills received above-average scores. The ability to use a PC and the internet scored the best, while the ability to "sense" new opportunities did the worst in terms of ranking. While no other skills apart from work with a PC got an average mark up to 2, a score ranging from 2 to 3 was the most frequent one. A total of 11 skills received a mark within this range, including mastery of one's own discipline and other soft skills. The remaining 7 skills scored, on average, between 4 and 3.7. These included knowledge in other fields and language skills, and also negotiation skills, presentation skills, the ability to mobilise the capacities of others, and to assert one's authority. These types of knowledge and skills can therefore be viewed as less developed. Gradates of science and technology programmes displayed essentially no difference when compared to other graduates. The only aspect where they ranked themselves slightly better were PC skills, and their ranking of negotiation skills was slightly less positive – this was particularly true of male graduates of science programmes. The differences between men and women are not so large either. Men rank lower their ability to coordinate activities and to use time effectively, women think they do worse in innovativeness – i.e. the ability to come up with new ideas and solutions.

As for most of the skills assessed, the graduates to not see any major differences between the level acquired and that required by the employer. The largest differences in the raking (0.4 on the seven-degree scale) concerned the skill to work with a PC, where the gradates think their ability is at a higher level than what the employer requires. A similar difference may be seen in the assessment of innovativeness (0.3). On the contrary, the ability to work under pressure is ranked lower by the graduates as compared to what the employer requires (the difference is 0.4). We may therefore infer that the **level** of the graduates' skills is more or less **in line with what their current job requires** – i.e. they do a job that is more or less in line with their abilities. In this reasoning we do not take account of whether this job corresponds to the level and field of education of these graduates.

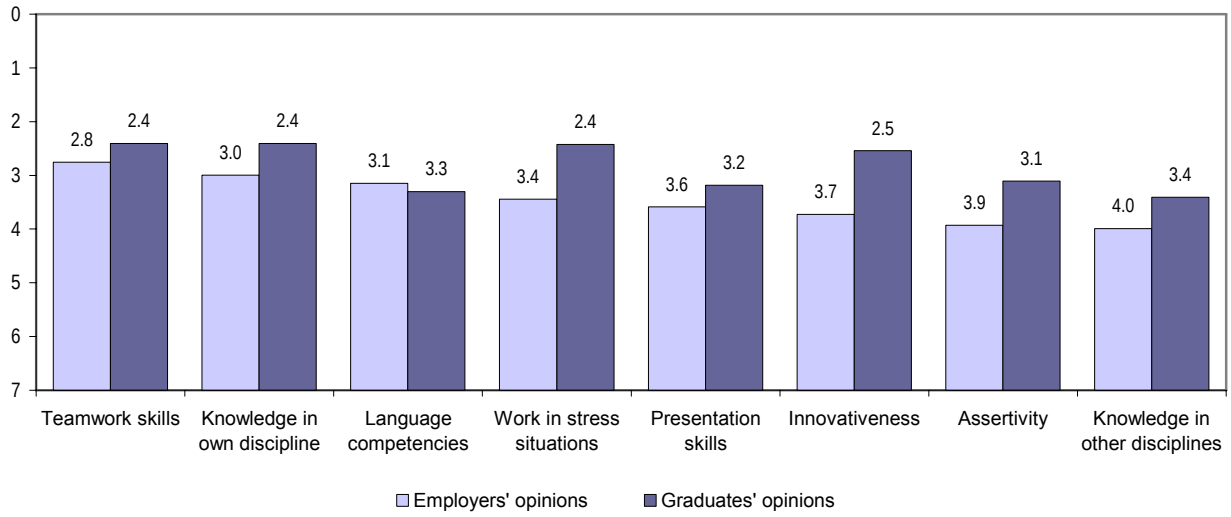
Figure 25: Comparing the level of skills acquired by the graduates and the level of skills required by the employer



Note: The respondents' answers were placed on a seven-degree scale (1 = very high level / corresponds entirely, 7 = very low level / does not correspond at all). As the average for the answers for all the items was above the middle point of the scale (4), for the sake of good illustration there is no need to provide the entire scale. Source: EPC FE (2006).

What is also very interesting is the comparison of the employers' and the graduates' answers as regards the degree to which the graduates have the required skills. It is clear from Figure 26 that the graduates of science and technology programmes largely overrate their skills as compared to what the employers think. This concerns both the specialist knowledge and soft skills. As regards soft skills, the largest differences can be identified in the ranking of innovativeness – 1.2 points on the seven-degree scale. As opposed to the graduates, the employers consider this skill to be the most important soft skill. However, it turns out that they see this skill to be less developed and less in line with what is required as compared to the graduates themselves. The point is that unless the graduates get an opportunity to show their innovativeness, their self-evaluation my be largely inappropriate. This also concerns work in stressful situations and assertiveness, which, however, the employers do not consider to be as important. The graduates' own rating is higher by 1 point than that of the employers as regards work under stress, and by 0.8 point as regards assertiveness. Quite significant differences also occur in the rating of the mastery of own discipline and other disciplines, where the graduates rank themselves 0.6 point higher on the seven-degree scale as compared to the employers. This means that employers are less happy with the graduates even as regards the mastery of own field. The only aspect where the rating of the employers and the graduates is nearly the same (0.2 point difference) is the language competencies – the graduates assess themselves more strictly as compared to the employers. The overall results of the comparison show that, in all aspects examined, the extent to which the graduates meet the employers' requirements is average and higher. This means that their situation in the labour market is good.

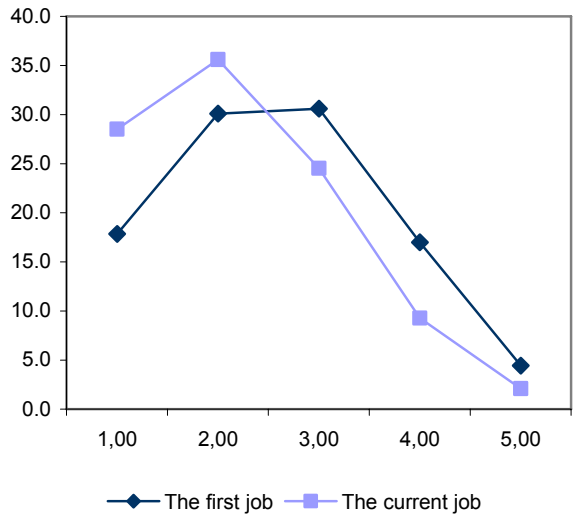
Figure 26: The extent to which graduates meet employers' requirements



Note: 1=fully, 7= not at all. The employers' answers were originally placed on a five-degree scale that was converted into a seven-degree one for the sake of comparison. Source: Employers' opinions: NTF–NOET (2009b), Graduates' opinions: EPC FE (2006).

The graduates also answer the question as to the extent to which their knowledge and skills were made use of in their first employment, and how they are being used in their current job. It is clear from Figure 27 that there is a major shift in the use of the knowledge and skills of the graduates between the first and the current job (after 5 years). While the use of their knowledge and skills in the first job was most frequently rated by the graduates as average (mark 3 on a five-degree scale), in the current job it was most frequently one grade higher. While nearly half of the graduates used their knowledge and skills to a large degree in the first job (mark 1 and 2), this proportion is 64% for the current job. On the other hand, there are about 20% of graduates who state that their knowledge was hardly ever used or not used at all in their first job (grades 4 and 5). As for the current job, this proportion is only 11%.

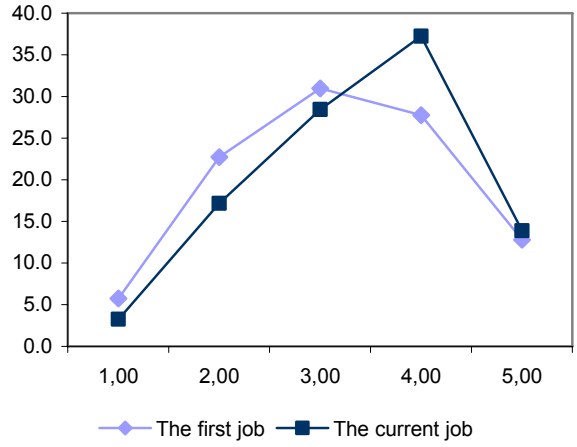
Figure 27: The use of knowledge and skills in employment



Note.: 1 (to a large degree) …..5 (not at all). Source: EPC FE (2006).

Over one quarter of graduates (28 %) also stated that the level of knowledge and skills required by the job content in their first employment was much higher than the level the knowledge and skills they had acquired (grades 1 and 2 on a five-degree scale). The same was mentioned about their current job by as many as one fifth of graduates. On the contrary, 40% of graduates say that the job content in their first employment only required a slightly higher or even the same level of knowledge and skills they had acquired. Half of the graduates said this was true of their current employment. The most frequent mark was 4 (the job content requires slightly more knowledge and skills than what they have) – both for the first and current job. It was only graduates of technology disciplines who most frequently assessed their first job by grade 3 (see Figure 28).

Figure 28: The degree to which job requirements are higher than the knowledge and skills acquired by graduates



Note.: 1(to a large degree) …..5 (not at all). Source: EPC FE (2006).

It is clear from the above that there is a relatively large group of graduates whose knowledge and skills are not properly utilised – particularly in their first job. Understandably, it takes some time of work experience for young people to

reach employment positions where they can make appropriate use of their knowledge and skills. On the other hand, a large group of graduates realise, even in their current job five years after graduation, that their work is more demanding than what their knowledge and skills can offer. This clearly points to the need for the continuing training of graduates so that they gain the knowledge and skills that initial education could not provide. This concerns more graduates of technology programmes who, when entering the labour market, face a rapid technological advancement with which schools often cannot keep up.

Assessment of the knowledge and skills of graduates in European contexts

The overall outcomes of the REFLEX international project[2] also reveal that, in general, the labour market situation of graduates is favourable in most European countries (see Box 9).

Box 9: The Reflex project
There are 13 participating countries – EU/OECD members (the Czech Republic, Finland, France, Italy, Japan, Germany, the Netherlands, Norway, Portugal, Austria, Spain, Switzerland and the United Kingdom). They participate via universities and other research institutions under the guidance of ROA at Maastricht University.

The most important precondition for success at the labour market continues to be the mastery of one's own discipline – both for traditional and new occupations.

Mastery of one's own discipline is a prerequisite for success at the labour market. The importance of specialist knowledge and skills is often underestimated in the light of the fact that, in the current period of fast technological development, they become outdated very quickly. The consequence of this is that an emphasis is placed on soft skills, such as problem solving and the ability to learn. However, the authors of the REFLEX research study point out that these general skills cannot be developed without the context of a specific discipline. Problem solving or learning skills cannot be fostered without a link to a specific content. It is the specific content that forms the basis of each discipline or field of education. Therefore it is by means of studying a specific field and acquiring specific knowledge and skills that soft competencies can be developed. It turns out that mastery of own discipline is important for success in the labour market not only for those who find employment in their own field, but also for those whose job is in a field other than that they studied. Good education in a specific field therefore makes it possible to acquire knowledge and skills that are necessary for employment in the given field, and it also provides a basis for the development of general analytical and other soft skills applicable in other fields as well.
In addition to the traditional requirements concerning the mastery of own discipline, there are growing requirements for the following competencies:

- mobilisation of human resources,
- functional flexibility,
- management of innovation and knowledge,
- international orientation.

[2] ROA (2007).

According to the REFLEX research, **mobilisation of human resources** is the second most important skill in terms of labour market success. This includes both mobilisation of own capacities, and, most importantly, mobilisation of the work capacities of other people. Only a few people are fully independent within the existing work organisation. It is interdependence that is typical of the work process. A large portion of graduates also do management jobs where they motivate and appraise other workers, or adopt strategic decisions in their organisations.

Functional flexibility is understood to mean an ability to cope with changes in the work environment and with new working tasks. This also involves readiness to work in other fields, in addition to one's own, where one can only use part of his/her skills.

Although **innovation and knowledge management** is considered to be a key factor of economic development, the REFLEX study shows that innovativeness as an ability to come up with new ideas and solutions does not always lead to success at the labour market. These skills only make sense when graduates are directly involved in innovation activities. While innovation as such has its place predominantly in large companies, it is graduates in small enterprises who introduce innovation more often. Involvement in innovation activities requires, in addition to resourcefulness, also other skills – for example communication skills. Innovation cannot be perceived as being only related to occupations in research and development. It is important in other occupations and fields as well. For example, teachers must be innovative in applying various methods of instruction, although we do not consider them to be innovators in the first place.

International orientation and experience are already widespread among graduates. Over one quarter of the graduates in the REFLEX research study stated that they had worked or studied abroad for some time. A still larger proportion of graduates work in organisations that operate internationally and where a very good command of a foreign language is necessary. It is therefore alarming that the learning of foreign languages is often seen by graduates as a weakness of study programmes.

The REFLEX study revealed that the requirements for the aforementioned skills are more or less universal. The standards required are relatively high with only small differences between individual skills. Although the level of these skills among graduates is also relatively high, not always is there a match between the graduate's knowledge and the knowledge required by his/her job. Some 10% of graduates state that the level of their skills is lower than what is required by their employment. As distinct from this, around 15% graduates stay that their skills are of a higher standard than what their job requires. Although these proportions are small, a mismatch between the skills acquired and those required has major consequences. An insufficient level of skills means that graduates are unable to do their job appropriately. Conversely, a higher level of skills compared to what is required means that they do not make proper use of their capacities. The REFLEX research shows that employers fail to make use of graduates' capacities particularly in innovation and knowledge management. It is particularly private companies operating at an unstable market that do not make an optimal use of human capital. As opposed to this, organisations that want to be leaders in innovation are more capable of using the graduates' potential.

2. Continuing Education and Training and the Information Society

Both the Czech and the global economy are undergoing increasingly rapid changes that significantly affect the structure of employment, the creation and elimination of jobs and the demands employers place on their employees. Moreover, the economic recession of 2008/2009 is likely to speed up transformation processes within the Czech economy that will diminish the importance of industrial output and further strengthen the significance of services.

Individuals' chances of finding employment in such circumstances increasingly depend on the development of new competencies and acquisition of new knowledge. Due to fast and frequent changes in occupational requirements initial education falls short of equipping individuals with sufficient knowledge and competencies they will need throughout their working lives. In the upcoming years we will increasingly witness situations where individuals change the field of activity several times during their career, and adults will be more and more required to take part the process of lifelong learning.

The continuing education and training (CET) of adults may take the form of formal, non-formal or informal education/learning (see Box 1).

Box 1 – Definition of types of education

Formal education (both initial and continuing) is subject to legal regulations and takes place in educational institutions, mainly in schools (e.g. the secondary or higher/tertiary education of adults). This involves inter-linking levels of education (basic, secondary and tertiary), and the acquisition of the relevant qualification is documented by the relevant certificate (school report, diploma, etc.).

Non-formal education is a more frequent form of CET. It consists in an organised acquisition of knowledge and skills in the presence of a teacher, instructor etc., but it does not lead to a specific qualification (level of education). Non-formal education involves various courses organised in the participants' free time, short-term training courses and lectures, and also retraining and other training activities organised by employers.

Informal education (learning) is not organised at an institutional level and consists, as a rule, in a non-systematic acquisition of knowledge and skills in everyday life situations (in free time, in employment, in the family, etc.). Self-education forms an important part of informal learning. It is characterised, among other things, by the fact that the learners cannot objectively test the knowledge/skills they have acquired.

Source: CZSO (2009a), date of access: 26. 10. 2009.

The objective of this chapter is to analyse the extent to which adults in the Czech Republic are involved in continuing education and training, and the degree to which the CR can compare with other EU countries in this respect. The second part of this chapter analyses the relationship between CET and ICT and seeks to establish links between the rate of participation in CET, the development of information technologies, information literacy and other characteristics of the information society.

2.1 The characteristics of CET in the CR and in the EU

Continuing education and training can be compared at European level thanks to two surveys that were carried out between 2003 and 2008. The first survey is the Ad-hoc Module Life-long Learning (AHM, Lifelong Learning) that was part of the Labour Force Survey (LFS) in the CR in 2003. From 2004 EUROSTAT worked on a new survey, concerned solely with adult education, that was carried out using a uniform methodology. This research, which was entitled Adult Education Survey (AES), was conducted in 2005–2008. In addition to these two surveys CET is regularly monitored as part of LFS. Although the scope of LFS is limited, a uniform methodology has been applied for as many as 12 years, which makes it possible to compare the development of CET in the countries of the European Union over the long term (see Box 2).

Box 2 – Surveys in the area of CET

The Ad-hoc Module Life-long Learning (AHM) was implemented as part of the regular Labour Force Survey (LFS) in the 2nd quarter of 2003. The AHM survey was conducted in thirty European countries. The target group included all individuals aged 25–64. The questions were focused on gathering data about the formal and non-formal education and self-education that the respondents underwent in the four weeks prior to the survey and in the previous 12 months.

Adult Education Survey (AES) covered 29 European countries. Similarly to the AHM it focused on individuals aged 25–64. However, the sample was considerably smaller, which may have an impact on the reliability of the outputs, particularly in smaller countries. The survey was carried out in individual countries between 2005 and 2008.

The AES was a pilot survey. One of its objectives was to propose and test methodological instruments (including a standardised questionnaire) to be used for ascertaining information about continuing education and training. The AES covers formal, non-formal and informal education from the perspectives of participation in these modes of CET, non-participation in CET and the barriers involved. Some additional aspects were explored such as participation in CET according to the level of education, the extent of non-formal education in relation to employment, the number of hour devoted to learning, the costs of CET and employers' contributions, language and ICT skills and participation in cultural activities.

The characteristics of CET are compared for the countries participating in the AES survey. In addition to the EU-27 they include Norway and Croatia. As data concerning some characteristics are missing for some countries, it is not possible to adhere to a uniform structure of the accompanying graphs.

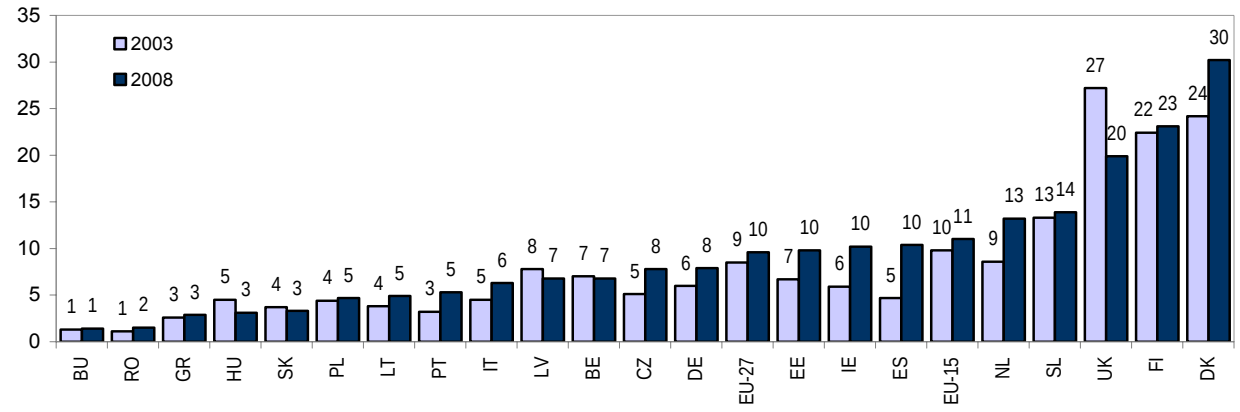
As part of LFS respondents are asked about their participation in CET during the 4 weeks prior to their filling out of the questionnaire. This is the only type of survey that makes it possible to establish a time series for individual countries, since it is carried out annually.

The differences in the methodologies (some indicators) applied to AHM and AES make it impossible to compare the two surveys directly and to assess the results various countries achieve in the area of continuing education and training. This is why the ensuing analyses are based primarily on the most recent AES data, and a comparison of the development in the period between these two surveys is only made where the methodologies are in accord.

In terms of the indicator of adults' participation in continuing education and training the Czech Republic ranks somewhere in the middle of the European scale, but still below the EU-27. However, between 2003 and 2008 the rate of participation in CET in CR increased significantly and reached 7.8%. The most robust year-on-year increase in participation in CET occurred between 2007 and 2008 and amounted to 2.1 percentage points (p.p.).

This development can be linked to a major decrease in unemployment and a high demand for labour. Enterprises were increasingly forced to hire applicants with less appropriate knowledge and skills, which resulted in increased requirements for their retraining and enhancement of qualifications.

Figure 1: The proportion of population aged 25–64 participating in CET in the previous 4 weeks (in %)



Source: EUROSTAT (2001–2008), date of access: 21. 10. 2009

This trend culminated in the middle of 2008 when there were fewer than two registered jobseekers per one vacancy – a considerable improvement compared to the situation two years earlier when this ratio was 7.35:1. This shortage of the workforce was felt in most sectors of the economy. The robust development of Czech industry exceeded the capacity of the education system to supply enough workers with suitable qualifications. Moreover, problems related to the actual preparedness of school leavers grew – i.e. the structure of teaching and the actual knowledge on the part of young people fell increasingly short of the labour market requirements as viewed by employers. This is why the economic situation was a major factor that boosted interest in CET and training in the 2003–2008 period.

However, from the mid-2008 the supply of jobs was negatively affected by the economic recession. In October 2009 labour offices registered 15.5 jobseekers per one vacancy.

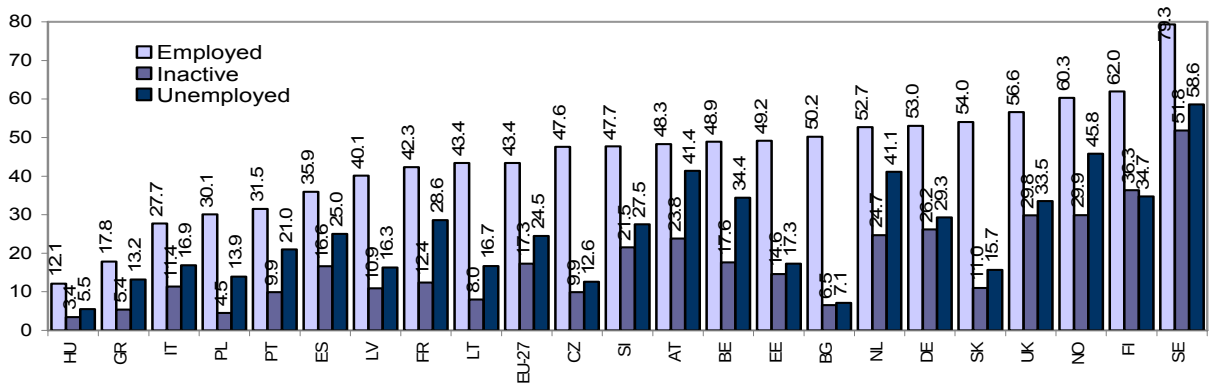
As regards participation in CET, the best situation is in the Nordic countries. Ireland and Spain improved their position significantly in this respect in the period under review, the reverse was true of the UK and Hungary. Among new member countries Slovenia fares very well with nearly twice as many people aged 25–64 involved in CET as compared to the CR (see Figure 1). Most countries of Central and Southern Europe get lower scores than the Czech Republic.

The leading position of the Nordic countries is confirmed by other indicators of CET. In terms of the level of economic activity, all countries under review show that it is employed individuals who most frequently participate in CET. In eight countries more than half of the employed are involved in CET. These countries include all the Nordic countries, but also Slovakia and Bulgaria (see Figure 2).

While the CR shows an above-average rate of participation of the employed in CET (CR: 47.6 %, EU-27: 43.4 %), the results are far worse for unemployed and economically inactive individuals. As regards the participation of inactive people in CET, the CR ranks sixth from bottom of the scale among the countries examined, and reaches about three fifths of the EU-27 level (CR: 9.9 %, EU-27 17.3 %). In the case of the unemployed the CR ranks as low as third from bottom and reaches only a half of the EU-27 level (CR: 12.6 %, EU-27 24.5 %).

This result points to the fact that the Czechs are little interested in investing in their education and, in this way, in enhancing their long-term employability at the labour market. In most cases it is employers who initiate continuing training and who train their employees in specific skills that are necessary for the respective jobs. CET undertaken because the individual feels the need for it is less frequent. This is why the data for the unemployed and inactive part of the population of the Czech Republic are so far below the EU average.

Figure 2: Participation in CET according to economic activity in 2007 (in %)



Source: EUROSTAT (2009), table code: trng_aes_104, date of access: 13. 11. 2009.

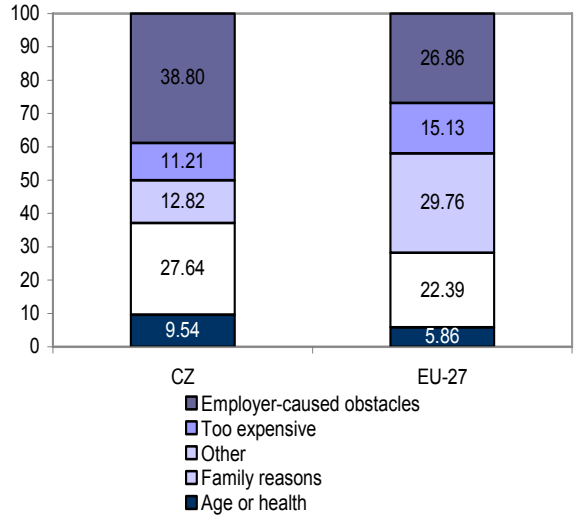
This contributes to long-term and structural unemployment. The part of the population who are temporarily out of the labour market cannot see a clear link between the level of their knowledge and skills and their employability.

As a result of the growing and changing requirements on the part of employers (technology and process development, legislative changes, globalisation trends), there is an increasing mismatch between the knowledge and skills of these people and the labour market demands, and the problem of long-term and structural unemployment further worsens. This applies to a varying degree to most countries of Central and Southern Europe.

The barriers to participation in CET as viewed by individuals in the Czech Republic are mainly related to their workload. Two out of five Czechs stated in the survey that their participation in CET is limited by obstacles generated by the employer, which include the impossibility of bringing the training and work schedules in line with one another. In the EU, on average, this reason is less important and only slightly over one fourth of respondents mention it.

Major barriers to participation in CET in the CR are also related to the family, age or health – these reasons were mentioned by a total of over 37% of respondents, while in the EU average is 9 p.p. lower (see Figure 3).

Figure 3: Reasons for non-participation in CET in 2007 (in %)



Source: EUROSTAT (2009), table code: trng_aes_106, date of access: 13. 11. 2009.

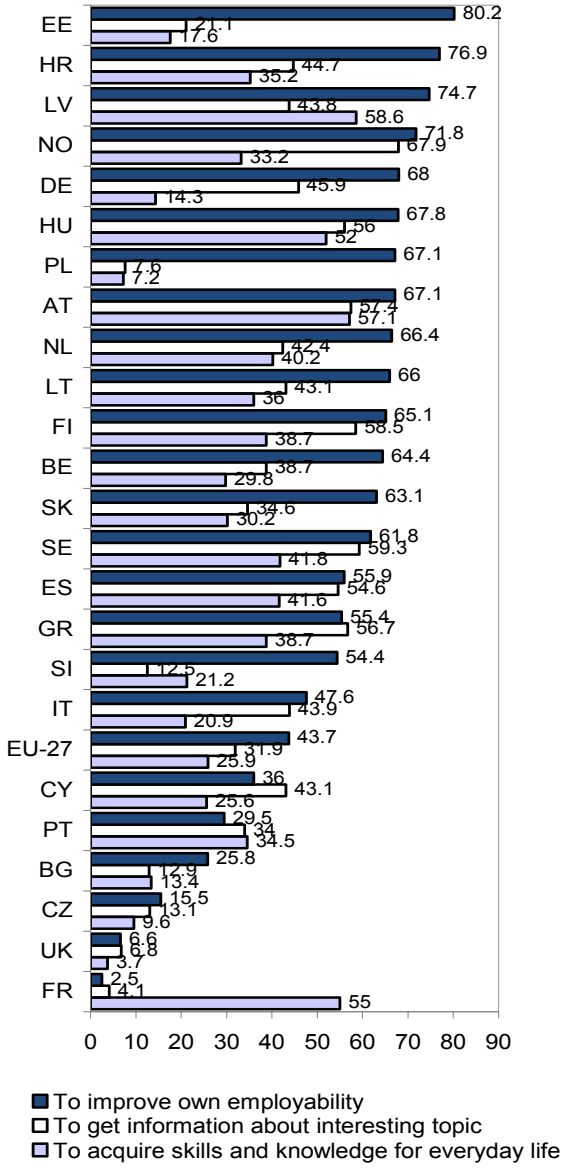
What may be surprising, on the other hand, is that the Czechs do not consider the price of CET to be a major problem – only slightly more than 11% of the respondents thought this was a problem, which is less than the EU-27 average (15.1 %). A similar importance is attributed to the price of education, for example, by respondents in the UK (10.6 %), Norway (10,.6 %), the Netherlands (12.1 %) or Spain (12.1 %).

In the case of new member countries the financial reasons for non-participation in CET are much more frequent – for example in Bulgaria (43.4 %), Poland (35 %), Slovenia (28.5 %) or Slovakia (19.9 %). This indicator places the CR in the group of developed countries and does not confirm the widespread opinion that the Czechs, who are used to free basic education, are not willing to invest in further education when they grow up.

However, it must be pointed out that a large portion of adults in the Czech Republic undergo training at work and the courses are either in full or in part paid by the employer. The provision of educational institutions is often "tailor-made" to corporate customers (i.e. considerable economies of scale are involved), and a high price per one course discourages individual applicants.

On the other hand, an analysis of reasons *for participation* in CET reveals that most respondents see this education as an opportunity for career development and a better practice of their profession. In the EU-27 as a whole this is the reason stated by 43.7% of respondents, while in seventeen countries involved in the survey this view is held by more than 50% of respondents. The Czechs are much more sceptical in this respect and only 15.5% of them share this opinion. Similarly negative views of the benefits of CET were expressed by people in the UK, France or Bulgaria (see Figure 4).

Figure 4: Reasons for participation of individuals in CET in 2007 (in %)



Source: EUROSTAT (2009), table code: trng_aes_142, date of access: 13. 11. 2009.

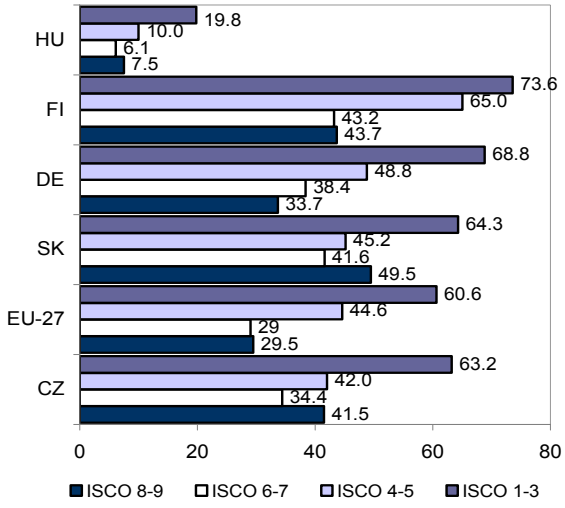
Other reasons for participation in CET are only little related to specific job opportunities. Nearly 32% of respondents in the EU-27 see CET as an opportunity to obtain information about a topic in which they are interested. Another 26% consider CET to be a way of acquiring knowledge and skills applicable in everyday situations in life.

As for this characteristic of the opinions on CET, EU countries cannot be broken down into groups that would differ considerably. It is normally true of new member countries that their citizens more frequently consider CET to be directly linked to employability. It is common in Western, Northern and Southern Europe that "interest-driven" and "practical" reasons for participation in CET are mentioned as frequently as the "career-driven" reasons (e.g. Norway, Austria, Finland, Sweden, Spain, Italy or Greece), or even far more often (France, Portugal).

The attitudes to continuing education and training on the part of individuals in new member countries vary. This can be clearly seen using the examples of Estonia, Poland, Slovenia or Slovakia. The proportion of respondents stating "Interest-driven" and "practical" reasons is also very low, but the same holds true of "career-driven" reasons. Only 13 % of respondents in the CR underwent CET in order to acquire knowledge and skills applicable in everyday life situations. As concerns the search for information about a topic of interest, CET was the choice for only 9% of respondents.

Participation in CET is normally directly linked to a particular occupation. People doing work that is the most skills-intensive (ISCO 1-3) are those most frequently involved in CET, and the proportion of those who participate exceeds 60% in most EU countries.

Figure 5: Participation of individuals in CET by occupational groups in 2007 (in %)



Source: EUROSTAT (2009), table code: trng_aes_104, date of access: 13. 11. 2009.

In terms of comparison with other EU countries, the Czech Republic fares quite well for this indicator. Although individuals within ISCO 1-3 groups are the most frequent participants in CET (the CR's 63.2% is slightly above the EU-27 average), the CR shows an unusually high rate of participation in CET among craftsmen, machinery operators and unskilled occupations (ISCO 9-8, 41.5% is high above the EU average, see Figure 5). These people display relatively intensive efforts aimed at improving their qualifications. On the other hand, the CR ranks far below the EU-27 average for the rate of participation in CET of people in administration and trade (ISCO 4-5).

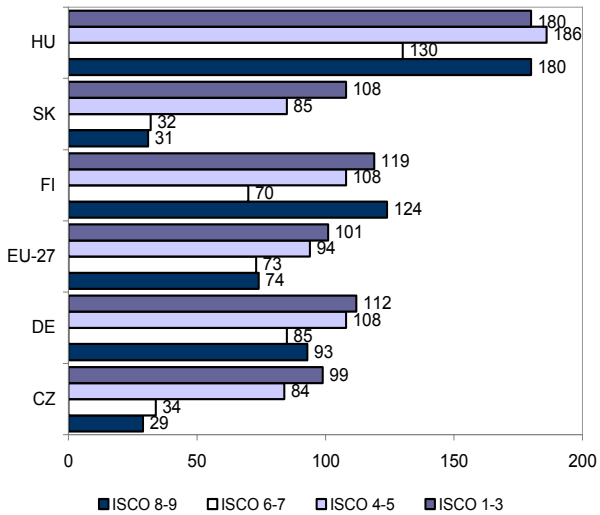
This situation is influenced by the nature of structural changes in the Czech economy after 2000. The dynamic increase in industrial output and the arrival of foreign investors came to a head in 2007 and 2008, and HR managers' main difficulty in the CR was to fill the jobs of manufacturers and craftsmen who were in short supply.

Moreover, a number of industrial companies that were set up in the CR as a result of direct foreign investment (particularly in the automotive, plastics, rubber or electrical engineering industries) brought advanced know-how in the area of processes, training and human resources management. This was connected with the fact that Czech branches that were strongly export-focused often had to meet stringent quality standards required by trans-national concerns. As distinct from this, enterprises in the sector of services and trade operate predominantly at the local market, and their emphasis on human resources development was weaker as compared to what is common in more developed countries.

On the other hand, however, the training of employees in industrial companies usually took the form of introductory on-the-job training or retraining, and only some companies implemented systematic training.

This is confirmed by the assessment of employees according to occupational groups and the average number of hours they devoted to CET. The average time spent in CET per year and per participant in the CR is shorter than the EU average and it is unevenly distributed among occupational groups (see Figure 6).

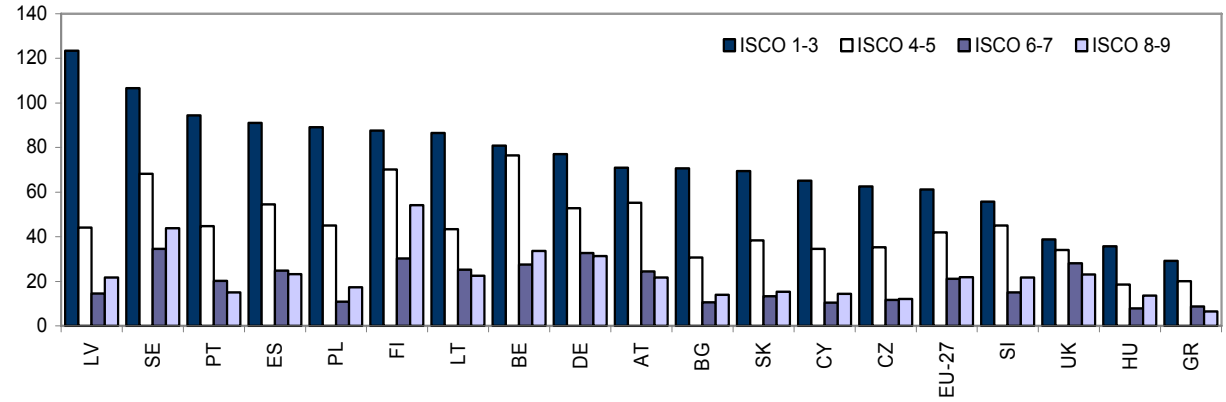
Figure 6: The average number of hours individuals devoted to CET in 2007 - by occupational groups



Source: EUROSTAT (2009), table code: trng_aes_150, date of access: 13. 11. 2009.

While for skills-intensive occupations (ISCO 1-3) the length of CET in the CR is only slightly below the average of EU-27 and the developed West-European countries, and while administrative and trade occupations (ISCO 4-5) also do quite well in this respect, the CR ranks at the very end of the scale as regards the scope of CET in less skills-intensive technical occupations in industry, agriculture and services (ISCO 6-8) and unskilled occupations (ISCO 9).

Figure 7: Coefficient of occupational groups' participation in CET in EU countries in 2007



Source: EUROSTAT (2009), date of access: 13. 11. 2009, own calculations.

With 34 hours per participant in CET in the ISCO 6-7 occupational group the CR ranks third from bottom (followed by Slovakia and Bulgaria). And it even occupies the last position on the scale (together with Bulgaria) for its 21 hours in the ISCO 8-9 occupational groups.

Both pieces of data on participation by occupational groups must be interconnected, since each of them only provides a partial view of the intensity of CET in various countries. By means of *multiplying* the proportion of the participants and the rate of their participation we can assess the overall level of intensity of CET for occupational groups in individual countries.

The resulting indicator – the coefficient of participation of occupational groups in CET – reveals, apart from other things, strong disparities in the rate of participation of various groups in individual countries. A comparison shows that new member countries lag behind as concerns the continuing education and training of the ISCO 6-9 occupational groups, while there is no major difference in skills-intensive occupations and also in trade and administration (see Figure 7).

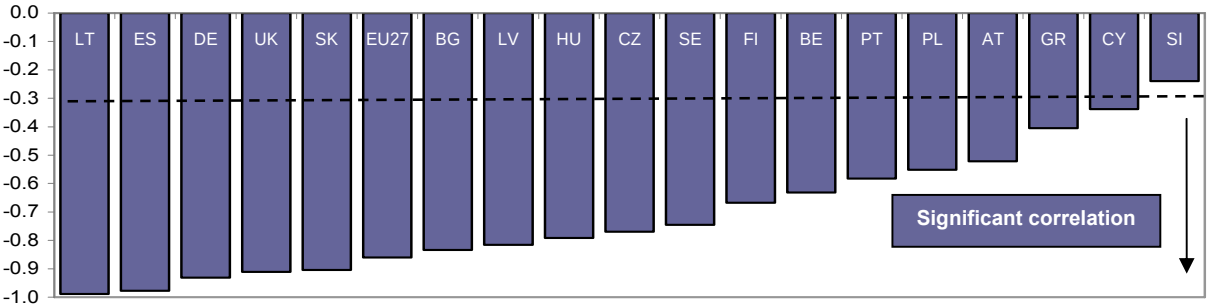
The highest rate of participation in CET in the ISCO 8-9 groups can be seen in the Nordic countries – Finland and Sweden. Lithuania and Latvia are the new member states where the indicator comes closest to those in these countries. The CR ranks last but one on the scale of selected countries, with the intensity of CET in these occupational groups being only slightly higher than 50% of the EU-27 average. As for ISCO 6-7 groups, the CR gets better results and it scores better as compared to a number of countries including Hungary and Poland. However, the EU-27 average is, again, approximately twice as high.

The intensity of CET should positively affect the rate of unemployment. However, partial information about participation in CET in this context must be considered with caution. On the one hand, the ISCO 1-3 occupational groups show the highest level of skills intensity with the most frequently changing job requirements, and there are expectations that the individuals concerned will display the highest level of flexibility and capacity to upgrade their expert knowledge. On the other hand, there are often occupations within these groups that are characterised by a large proportion of general knowledge and a lower degree of specialisation, which makes their situation in the labour market easier and softens the requirements in terms of frequency and scope of CET.

The latter characteristic often applies to ISCO 4-5 as well, while it is common that the remaining occupational groups display a higher level of specialisation and, consequently, there are stiffer requirements for specific knowledge and skills. These requirements can, of course, change with the change of an employer. It should be clear from the above, that CET is important for every occupational group as a factor of long-term employability. The rate of unemployment certainly does not depend merely on the intensity of CET. However, it is useful to ascertain the link between the two indicators.

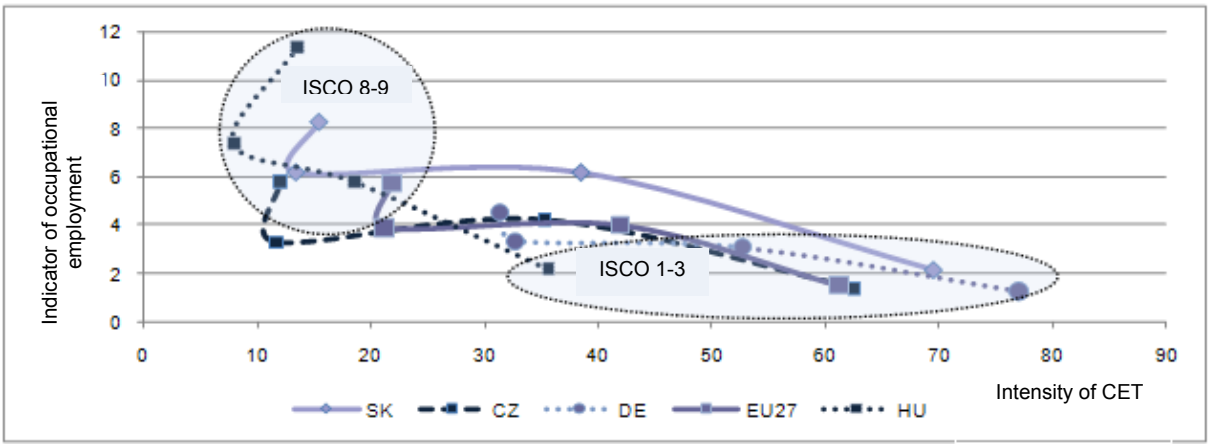
Figure 8 establishes the link between two indicators. The first one is the coefficient of intensity of CET which consists of the overall rate of participation in CET for various occupational groups and the duration of this education for individual participants within these groups.

Figure 8: Correlation between the participation of occupational groups in CET and the coefficient of occupational unemployment in EU countries in 2007



Source: EUROSTAT (2009), date of access: 13. 11. 2009, own calculations.

Figure 9: Correlation between the participation of occupational groups in CET and the rate of unemployment in selected EU countries in 2007



Source: EUROSTAT (2009), date of access: 13. 11. 2009, own calculations.

The second indicator concerns occupational unemployment and compares the proportions of unemployed individuals whose last job, as they stated, fell within the designated occupational groups. This correlation is statistically important for nearly all countries under review.

In all cases there is an indirect link – i.e. growing intensity of continuing education and training contributes to decreasing unemployment in individual occupational groups. Furthermore, in most selected countries the development of this correlation is similar for the occupational groups, as Figure 9 well illustrates.

When illustrated on a scatter graph this correlation for individual countries and occupational groups has the shape of the letter S in a horizontal position. The ISCO 8-9 occupational groups is at the top left corner (low participation rate in CET, high indicator of occupational unemployment). For countries where employees in this group display a higher rate of participation in CET (here it is Germany, but this also applies to the EU-27 average), this group moves in the bottom right direction in the graph (the indicator of unemployment falls along with a growing rate of participation in CET).

The middle section of the curve for individual countries is almost flat – there is not a big difference between ISCO 6-7 and ISCO 4-5, and this is so despite the fact that ISCO 4-5 has a higher rate of participation in CET. It is typical of the ISCO 4-5 occupational categories that their knowledge and skills acquired during studies are of a more general nature. Upgrading this knowledge so that it is in line with what a specific job requires therefore nearly always requires a certain scope of continuing training organised by the employer.

On the other hand, the ISCO 6-7 group (crafts and skilled manual occupations) is normally to be found in the primary and secondary sectors where employers' requirements do not change so quickly, and the occupational mobility is generally lower.

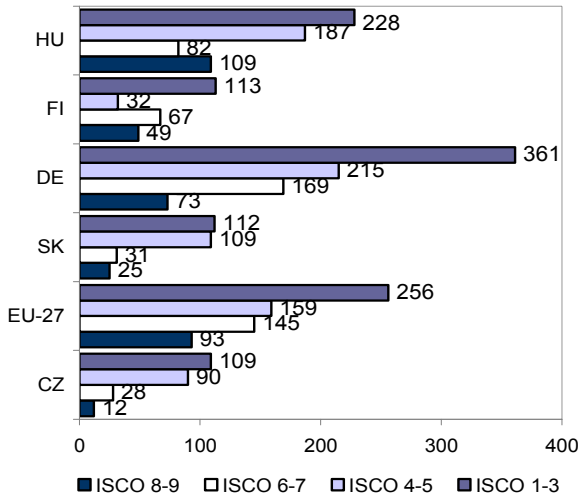
Moreover, in the CR where the quality of technical and vocational education is still high, employees in the ISCO 6-7 group are relatively well prepared for the labour market. In many cases CET is less important as a factor ensuring their long-term employability.

In the bottom right corner there is the ISCO 1-3 occupational group that is characterised by a high rate of participation in CET and a low coefficient of occupational unemployment. In Figure 9 the position of this occupational group for the CR is essentially identical with the data for the EU-27, and the indicator of occupational unemployment is the best among the countries analysed.

The fact is that many countries show a higher intensity of CET in this occupational group as compared to the CR. The low indicator of occupational unemployment for ISCO 1-3 in the CR is the result of several factors. These include a small number of employees with tertiary qualifications (in comparison with the demand) who make up a majority of employment in ISCO 1 and 2 categories, and a high demand for skilled technicians resulting from growing industrial output and employment in the 2003–2008 period.

The picture of CET as seen from the perspective of occupational groups may be complemented by information about financial resources spent on this education per person according to occupational groups. As with the number of hours it is clear that the CR also lags behind in terms of the expenditure on training per participant. In this respect the CR is behind not only developed EU countries and the EU average, but also most new member countries (see Figure 10).

Figure 10: The average amount spent per person in CET according to occupational groups in 2007 (in euros)



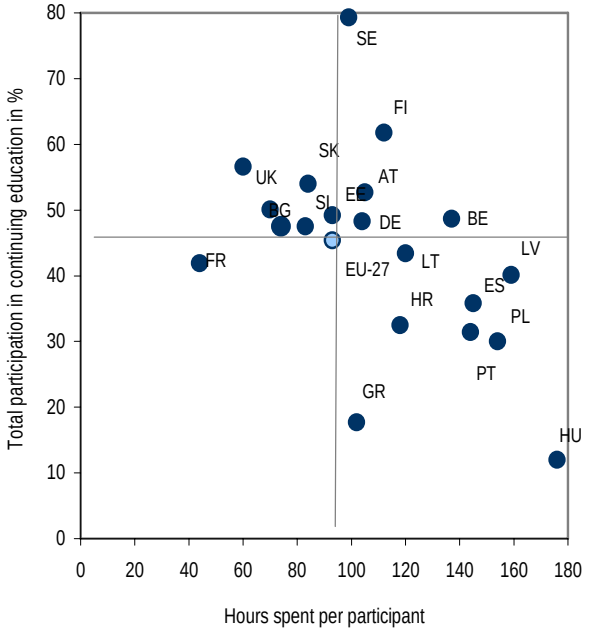
Source: EUROSTAT (2009), table code: trng_aes_160, date of access: 13. 11. 2009.

This time the EU-27 average is far higher. There are also major differences between various occupational groups. While for ISCO 1-3 the CR reaches 43% of the EU-27 average, for ISCO 6-7 it is less than 20% and for ISCO 8-9 even as low as 13%.

The aforementioned comparison of the occupational structure may suggest that the CR scores above-average results in terms of the overall number of individuals participating in CET. However, in terms of the number of hours per participant the CR ranks 20% lower than the EU-27 average, and, as regards the financial resources spent, the difference is a high as nearly 38%. Although the difference in price levels does play a certain role in the expenditure on CET, the CR does not fare well in this respect even when compared to countries that are "cheaper" in other respects (the cost of labour, etc.). Greece, Slovenia and Portugal, where price levels do not differ so much from the CR, rank relatively high on the scale.

In terms of comparison with other countries, the overall position of the CR as regards CET is captured in Figure 11 and Table 1.

Figure 11: Intensity of CET in EU countries in 2007



Source: EUROSTAT (2009), date of access: 13. 11. 2009, own calculations

Figure 11 clearly illustrates the position of the CR in the top left quadrant. The CR is among countries with a higher level of overall participation in CET and with a short duration of this education per participant. The other countries in this quadrant are the UK, France, Slovakia and Slovenia.

The Nordic countries have a lead in terms of the rate of participation in continuing education and training. As for the duration of this education per participant, they only rank slightly above the average. Finland and Sweden occupy the same quadrant as the Baltic countries, Germany and Austria.

Finally, the bottom right quadrant may be described as "South-European". These countries have a small proportion of people involved in CET, but the intensity of this education is very high (Spain, Greece or Hungary).

The position of the CR as compared with other countries can well be illustrated in a table presenting a simple sequence of countries according to the indicators analysed (the overall rate of participation in CET, the average number of hours per one participant and the average cost of this education per participant).

Table 1: The ranking of selected countries in terms of selected characteristics of participation in CET

Total participation of individuals in %	Average number of hours per participant	Average costs per participant
SE	HU	AT
FI	LV	CY
NO	PL	GR
UK	ES	SI
SK	PT	PT
DE	BE	NO
NL	LT	DE
BG	HR	NL
EE	FI	ES
BE	DE	EU-27
AT	AT	HR
CY	NO	HU
CZ	GR	PL
SI	SE	BE
EU-27	EE	LT
LT	EU-27	UK
FR	SK	LV
LV	SI	SE
ES	CY	EE
HR	CZ	SK
PT	BG	FI
PL	UK	CZ
GR	FR	BG

Significantly better than the CR

No major difference

Significantly worse thant the CR

Note: "No major difference" means that the level of the indicator for the given country is not more than 10% higher or lower than the level of the CR. Source: EUROSTAT (2009), date of access: 13. 11. 2009, own calculations.

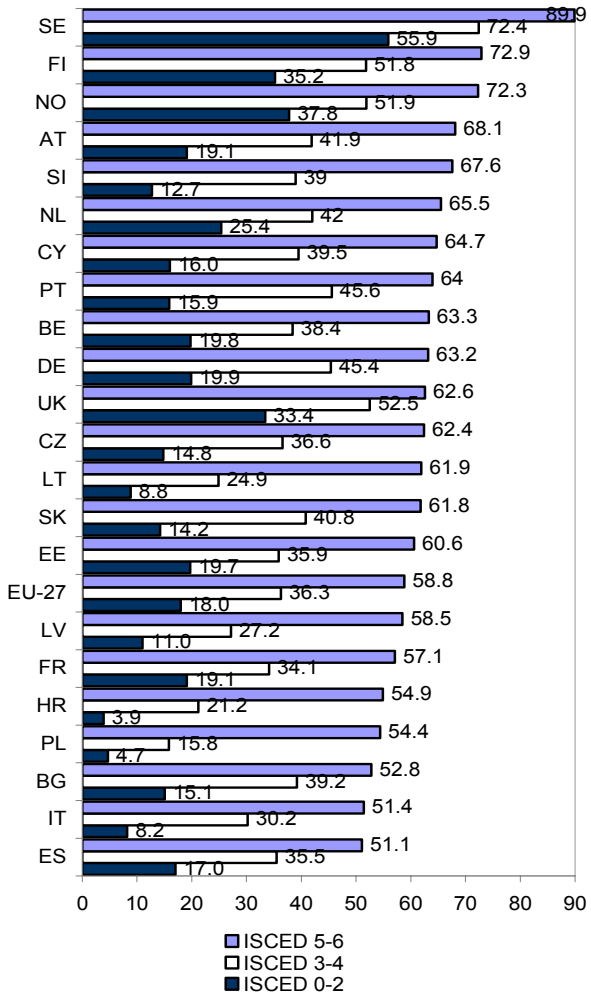
Table 1 documents the gradually sliding position of the Czech Republic from a slightly above-average level as regards overall participation of individuals in CET (CR 47.5 % - EU-27 average of 45.4 %) towards below-average levels in terms of the number of hours per participant (74 hours in the CR compared to 93 hours as the EU-27 average) and the costs per participant (only 76 euros in the CR while the EU-27 average is 202 euros).

If we carry out an analysis of participation in CET according to educational categories, the breakdown of the countries will be similar. As regards participation of employees with tertiary education (ISCED 5-6), the CR ranks above average (62.4 % vs. 58.8 % as the EU-27 average). In terms of comparison with other Central and Eastern European countries only Slovenia scores better (67.6%). With the exception of Hungary and Greece no country rates lower than 50% for participation of this educational category, and the differences between countries are relatively minute (see Figure 12).

When assessing participation in CET for other educational categories, the CR displays a deteriorating trend. The position of the CR in terms of participation in CET of individuals with upper secondary education (ISCED 3-4) is only slightly above the EU-27 average (36.6 % vs. 36.3 %). For this indicator the CR ranks even lower than Slovakia or Bulgaria. The gaps between countries tend to enlarge.

As for employees with basic and lower secondary education (ISCED 0-2), the CR falls by another 2 levels on the scale (14.8% vs. the EU-27 average of 18%). The differences between countries are relatively large. As concerns ISCED 5-6, there are 18 out of the 24 countries under review that achieved similar scores as the CR (+/- 10%) and 15 of them were better than the EU-27 average for this indicator. In the case of ISCED 3-4, only 7 countries displayed similar results as the CR and 14 countries ranked higher than the EU-27 average.

Figure 12: Participation in CET by educational categories in EU countries in 2007



Source: EUROSTAT (2009), table code: trng_aes_102, date of access: 13. 11. 2009.

In the ISCED 0-2 category only 5 countries have a ranking similar to the CR, and only 10 countries score better than the EU-27 average (see Table 2). The Nordic countries rank at the top for all the indicators. They are followed by West-European and Central European economies. The south of Europe gets the worst results in terms of this comparison (including large and relatively developed countries such as Italy or Spain).

The best scores of the Nordic countries can also be observed in the rates of participation in CET for individual age groups. The average participation for the 25–34 age group amounts to two thirds or even more, and in the oldest age group (55–64) it is still over one third.

Table 2: The ranking of selected countries in terms of participation in CET according to educational categories

ISCED 5-6	ISCED 3-4	ISCED 0-2
SE	SE	SE
FI	UK	NO
NO	NO	FI
AT	FI	UK
SI	PT	NL
NL	DE	DE
CY	NL	BE
PT	AT	EE
BE	SK	AT
DE	CY	FR
UK	BG	EU-27
CZ	SI	ES
LT	BE	CY
SK	CZ	PT
EE	EU-27	BG
EU-27	EE	CZ
LV	ES	SK
FR	FR	SI
HR	IT	LV
PL	LV	LT
BG	LT	IT
IT	HR	PL
ES	PL	GR
GR	GR	HR
HU	HU	HU

Significantly better than the CR

No major difference

Significantly worse thant the CR

Note: "No major difference" means that the level of the indicator for the given country is not more than 10% higher or lower than the level of the CR. Source: EUROSTAT (2009), date of access: 13. 11. 2009, own calculations.

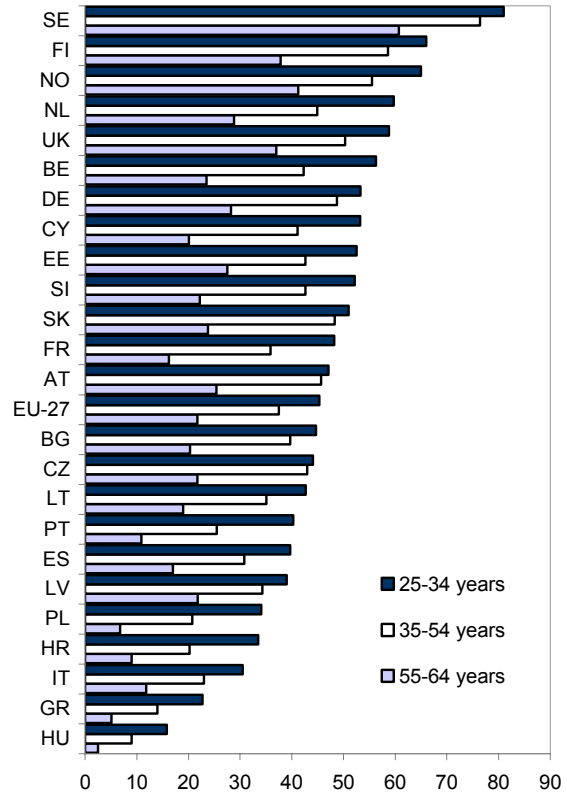
The CR falls within the group of countries hovering at around the EU-27 average. Participation in CET among young people reaches 44.1% (the EU-27 average is 45.3%). As regards the oldest workers aged 55-64, the proportion is the same for the CR and the EU-27 average – i.e. 27.1%. The new member countries that have a good ranking in all age categories also include Slovenia, Slovakia and Estonia (see Figure 13).

As concerns the rate of participation in CET of various age groups, there are major differences between the countries. It is typical of Central and Eastern European countries that there is an above-average level of interest in CET in the 35-54 age group. In terms of this characteristic they can be compared with developed European economies. Participation in CET in this age group exceeds 50 % in the Nordic countries. In other developed European economies and in many new member countries the rates range between 40 and 50%. Only some countries in Southern and Central

Europe rank below the EU-27 average.

This is well illustrated in Table 3 where countries are ranked according to participation in CET in all age groups. As regards the 35–54 age group, the CR ranks 9th with 43%. This is 5.5 p.p. more than the EU-27 average. Slovakia is 2 places higher than the CR with 48.3%.

Figure 13: Participation in CET according to age groups in EU countries in 2007 (in %)



Source: EUROSTAT (2009), table code: trng_aes_101, date of access: 13. 11. 2009.

The developed countries that reach similar results include, for example, neighbouring Germany (48.7 %), Austria (45.7 %) and the Netherlands (44.9 %). The new member states that rank above the EU-27 average include Estonia (10th place, 42.6%), Slovenia (11th place, 42.6 %) and Bulgaria (14th place, 39.7 %).

The higher rate of participation in CET for this age group in economies undergoing transformation may be explained by the inflow of investment that increased the demand for specific occupations (particularly in the automotive, electrical engineering and plastics industry and in services) for which workers in declining industries (agriculture, mining, textiles, clothing and footwear) had to be retrained.

Table 3: The ranking of selected countries in terms of participation in CET according to age groups

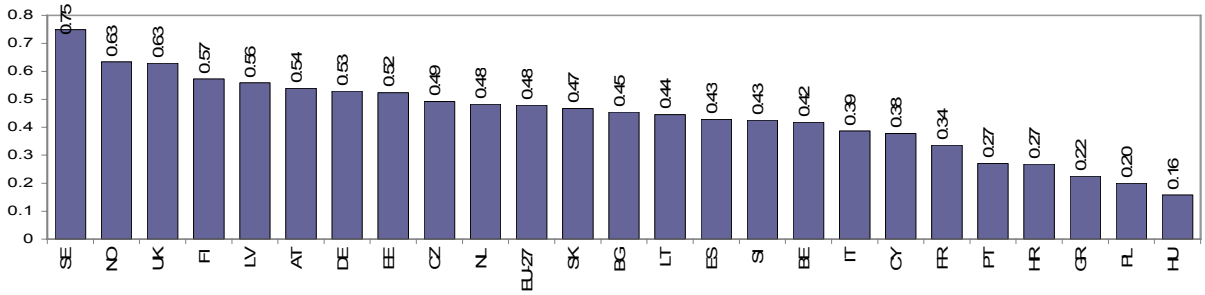
25–34 years	35–54 years	55–64 years
SE	SE	SE
FI	FI	NO
NO	NO	FI
NL	UK	UK
UK	DE	NL
BE	SK	DE
DE	AT	EE
CY	NL	AT
EE	CZ	SK
SI	EE	BE
SK	SI	SI
FR	BE	LV
AT	CY	CZ
EU-27	BG	EU-27
BG	EU-27	BG
CZ	FR	CY
LT	LT	LT
PT	LV	ES
ES	ES	FR
LV	PT	IT
PL	IT	PT
HR	PL	HR
IT	HR	PL
GR	GR	GR
HU	HU	HU

Significantly better than the CR
No major difference
Significantly worse than the CR

Note: "No major difference" means that the level of the indicator for the given country is not more than 10% higher or lower than the level of the CR. Source: EUROSTAT (2009), date of access: 13. 11. 2009, own calculations.

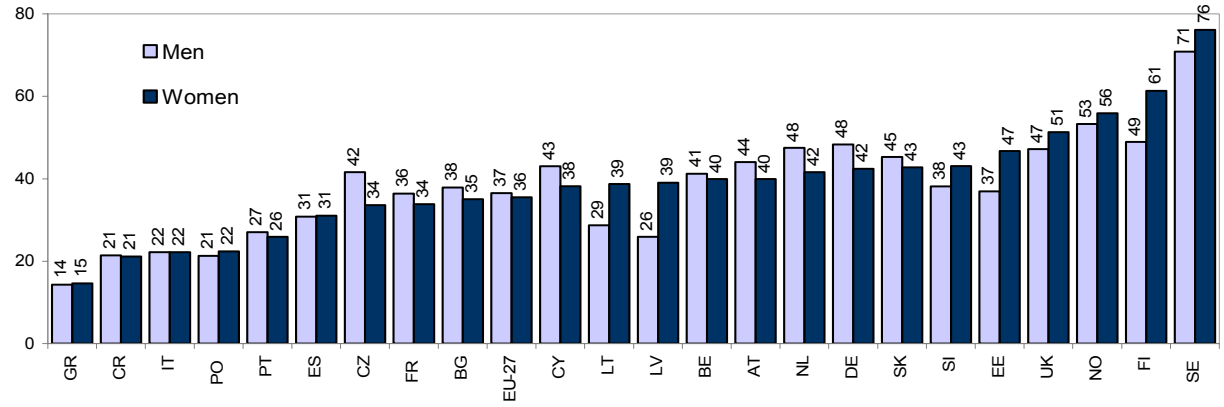
The analysis of participation in CET according to age groups points to a major disadvantage faced by older individuals (aged 55–64). Their participation in EU-27 average terms is more than twice as low compared to the 25–34 age group (the ratio is 0.48). Below-average scores for this indicator are achieved, most importantly, by countries of Eastern, Central and Southern Europe, but also by more advanced economies such as Belgium (0.42) and France (0.34) – see Figure 14).

Figure 14: The ratio of participation in CET of young individuals to that of older individuals in EU countries in 2007



Source: EUROSTAT (2009), date of access: 13. 11. 2009, own calculations.

Figure 15: Participation in CET in EU countries according to gender (2007, in %)



Source: EUROSTAT, table code: trng_aes_100, date of access: 13. 11. 2009.

There are only several countries where the ratio of participation for these two age groups exceeds 60% (the ratio of the participation of older workers to that of young workers). What is satisfying is the position of the CR (0.49 – i.e. above the EU-27 average), which is better than that of most countries of Central, Eastern and Southern Europe. The involvement of older individuals in CET as a share of that of young workers is also very good in the Baltic economics (Latvia – 0.56, Estonia – 0.52). As with other characteristics of continuing education and training, the Nordic countries are at the top of the scale (Sweden– 0,75, Norway – 0,63, Finland – 0,57).

The CR is below the EU-27 average for another major characteristic of CET, and that is the participation of women. Only one third of women in the CR (33.6%) undertook CET in 2007, which is 1.9 p.p. lower than the EU-27 average. In Central and Eastern Europe the Baltic countries, Slovenia and also Slovakia fared better than the CR in this respect (see Figure 15).

The participation of women in CET is normally lower in new member states and also in Southern Europe where it ranges between 10-35 %. The fact is that in new member countries the lower participation of women reflects the overall situation in CET (e.g. in Hungary only 9.6% of women are involved in CET, while for men the rate of participation is even lower – 8.3 %).

However, in some European countries there are major differences between men and women in terms of their participation in CET, and the CR does very badly in this respect. The ratio of men to women in CET is 0.81 in the CR, which is the worst figure among all countries under review. The EU-27 average is much higher – 0.97. Nevertheless, it is typical of countries of Central and Eastern Europe that the ratio is far more often in favour of women. Figure 16 reveals that the transforming economies take up five of the first six places among the countries analysed. The first three positions are occupied by the Baltic countries where the ratio of participation of women to that of men ranges between 1.27-1.51, Hungary ranks 5th (1.16) and Slovenia 6th (1.13). There are 10 countries below the EU-27 average – for example Slovakia (0.93) and Bulgaria (0.91). Still, these countries do much better that the CR.

A low rate of participation in continuing education and training has various negative implications related to a lower level of employability, lower pay, etc. However, it is difficult to document this using the example of women.

Figure 17 illustrates the links between the unemployment of women and their participation in CET. The position of each country in the figure is determined by two characteristics: the vertical axis shows the proportions of unemployed women and men in the economy in 2007, the horizontal axis presents the proportions of women and men participating in CET in 2007.

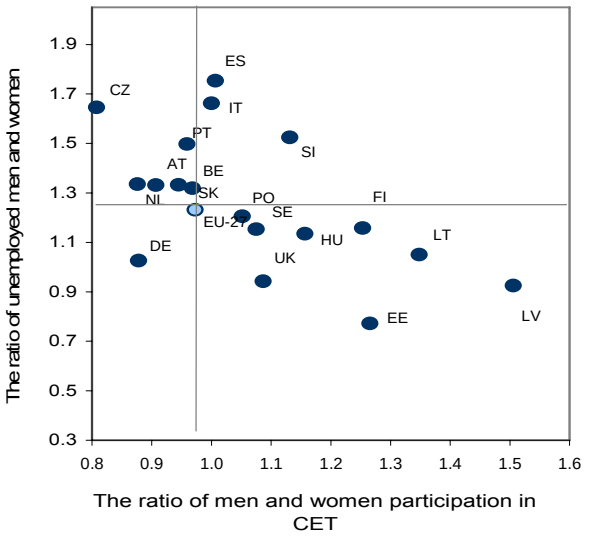
There are no large differences between the countries. Even so we can trace a certain correlation – countries where the proportion of unemployed women is higher than that of men also show a lower rate of participation of women in CET as compared with men. The CR falls within the "worse" part of the picture with a high share of unemployed women coupled with their lower participation in CET. The Baltic and Scandinavian countries represent the reversed picture.

The analysis of the outcomes of a survey focused on the CET of adults and taking account of various perspectives confirmed the leading position of Scandinavian countries.

Figure 16: The ratio of the participation of women in CET to that of men in the EU in 2007

Source: EUROSTAT (2009), date of access: 13. 11. 2009, own calculations.

Figure 17: The ratios of women to men in terms of unemployment and participation in CET in EU countries in 2007



Source: EUROSTAT (2009), date of access: 13. 11. 2009, own calculations

The question is the extent to which CET and its scope (duration) are actually beneficial for the labour market and the country's economy. Two hypotheses may be formulated:

Continuing education and training has a positive impact on the development of the economy and boosts economic growth.

Continuing education and training positively affect the rate of unemployment.

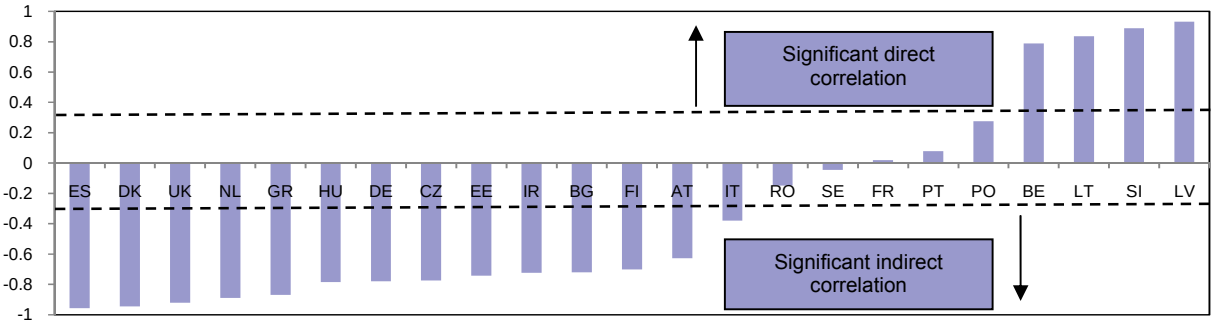
The testing of the first hypothesis is based on the assumption that a high rate of participation in CET over a long term increases the level of knowledge and skills of individuals in the labour market, which enhances the productivity and effectiveness of the economy as a whole. The economies that display a higher rate of participation in CET should, over the long term, be wealthier and reach higher figures for the speed of economic growth and labour productivity.

This hypothesis may be refuted because economic growth depends on many factors of long-term nature, and the influence of CET is not so significant. Continuing education and training may indirectly influence the economic situation of a country by means of improving the knowledge and skills of people. This is tested by the second hypothesis, which is based on the assumption that a high rate of participation in CET over a long term decreases the risks that the knowledge and skills of the workers might not meet the needs of employers. However, the testing of this hypothesis comes up against the problem of how to prove the link between the rate of unemployment and CET. At the times of prosperity and economic growth unemployment decreases and the expenditure on CET rises particularly due to private enterprises as they need to fill job vacancies. Employers have a less extensive range of jobseekers to choose from, the supply of labour is not sufficient. This is why they must invest in the training of those who are available so that they attain the required standards. Conversely, employment services do not have to invest so much in the support for and retraining of jobseekers.

On the other hand, during a period of economic recession the private sector cuts down its spending on the training of adults. Curtailing investment in training courses, which forms one of external cost items, constitutes a "less painful" form of saving compared, for example, with laying off employees. On the contrary, in the period of recession and growing unemployment the public sector seeks to support the redundant workers. It is the very organisation of and financial support for training courses that may help the jobseekers find new employment.

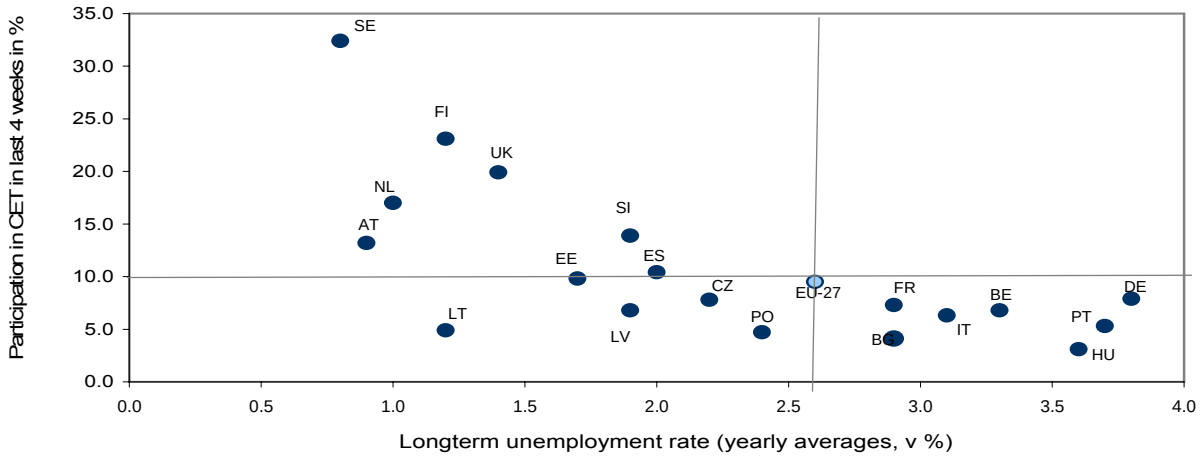
In both cases the two trends go against one another – one supports CET, the other one restricts it. The contradicting nature of these trends makes it impossible to make a clear statement about the link between continuing education and training and the rate of unemployment. However, we may modify this hypothesis and only take account of the link between CET and the rate of *long-term* unemployment. The modified hypothesis is based on the assumption that although it is difficult to prove a direct link between CET and the rate of unemployment, higher levels of participation in CET have a positive impact on the long-term employability of working individuals and, most importantly, diminish the risk that the jobseeker may not find a job for a long time. Long-term unemployment is understood to mean unemployment lasting over 12 months. A systematic involvement of the population in CET should have an effect on the rate of this type of unemployment. In order to test this hypothesis we may choose a correlation analysis that examines the relationship between a time series of the rate of long-term unemployment and participation in CET in EU countries in the 2004–2008 period. The outcome of the correlation analysis is that in most countries under review there is a strong indirect link between participation in CET and the rate of long-term unemployment (see Figure 18).

Figure 18: Correlation between participation in CET and the rate of long-term unemployment in EU countries in 2004–2008



Note: The correlation analysis only concerned those countries where the time series for the period was complete for both values. Source: EUROSTAT (2009), date of access: 13. 11. 2009, own calculations.

Figure 19: Correlation between participation in CET and the rate of long-term unemployment in selected EU countries EU (2008)



Source: EUROSTAT (2009), date of access: 13. 11. 2009, own calculations.

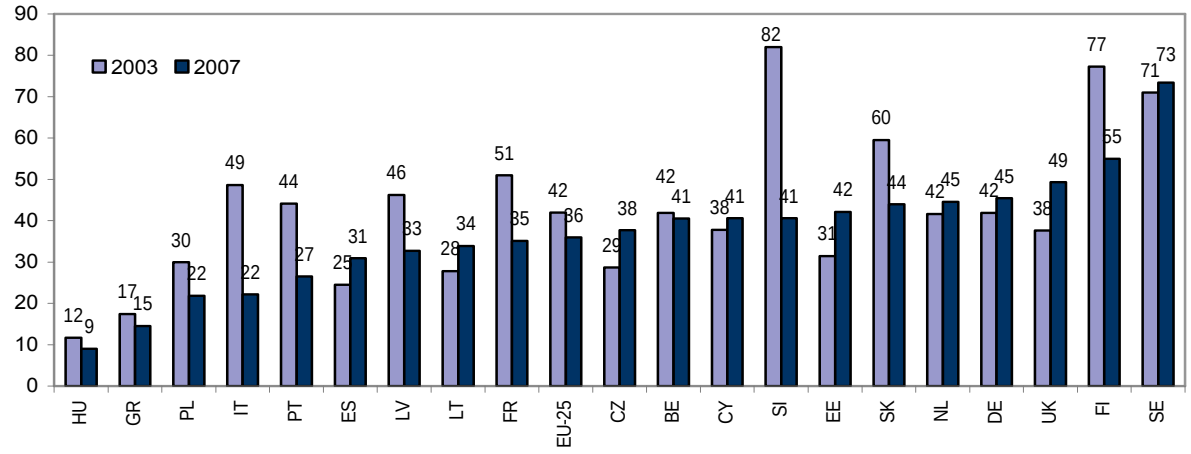
In spite of the this, it is not possible to make a positive statement about the general validity of the hypothesis. Some countries display a major direct correlation, which is difficult to explain, and in other countries (including the EU-27 which is not stated in the Figure) the link is very weak. Based on the most recent data of 2008 it is possible to depict the relationship between participation in CET and the rate of long-term unemployment using a scatter graph which partly supports the theory of a major indirect link. The high rate of participation in CET in the Nordic countries, the UK, Austria or the Netherlands is associated with a very low rate of long-term unemployment (see Figure 19). The more the country moves towards the bottom in the graph (i.e. the participation in CET decreases), the higher the rate of long-term unemployment.

However, this relationship is not a linear one, and some countries (such as Lithuania) have a very low rate of long-term unemployment although they show a low rate of participation in CET. In most countries the rate of participation in CET ranges between 5 and 10% of adults, while the long-term unemployment fluctuates between 1 and 4%. It is therefore evident that the rate of long-term unemployment is affected by a number of factors, and the influence of CET is not so essential. Participation in CET is normally considered as a certain indicator of the level of advancement of the labour market and the education system, and as a factor that positively impacts on the country's competitiveness. However, it is difficult to prove the benefits of CET by means of analysing the available statistics. One of the reasons is that most characteristics of continuing education and training are quantitative (the proportion of individuals, number of hours, resources invested per person, etc.), and they do not provide information about the quality of the courses and their benefits for the participants and, indirectly, for the economy as a whole.

In the conclusion of this chapter we may at least make a basic comparison of the AHM and AES surveys based on the characteristics of overall participation in continuing education and training. In most countries no major change occurred between 2003 and 2007. The overall rate of participation in CET in the EU decreased slightly, but this may the result of the fact that in 2003 it was calculated for the EU-25 and in 2007 the EU-27 was considered (see Figure 20).

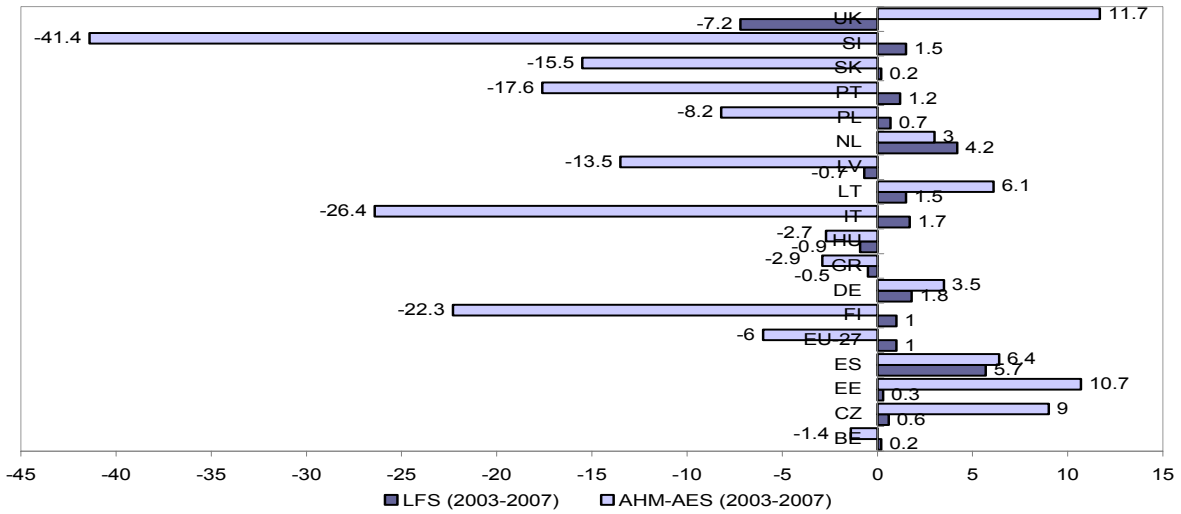
The inclusion of Romania and Bulgaria probably caused the worsening of the resulting EU average. Overall participation in CET decreased in many countries, for example in Slovenia, Finland, Italy, France, Belgium or Greece.

Figure 20: Comparison of participation in CET in selected EU countries based on the AHM (2003) and AES (2007) surveys (in %)



Note: In 2007 the value for EU-27 is used as the EU average. Source: EUROSTAT (2005) and EUROSTAT (2009) date of access: 13. 11. 2009.

Figure 21: Comparison of overall participation in CET according to the LFS methodology and the AHM and AES surveys (2003–2007, change in p.p.)



Note: In 2003 the value for EU-25 is used as the EU average Source: EUROSTAT (2005) a EUROSTAT (2009), date of access: 13. 11. 2009, own calculations.

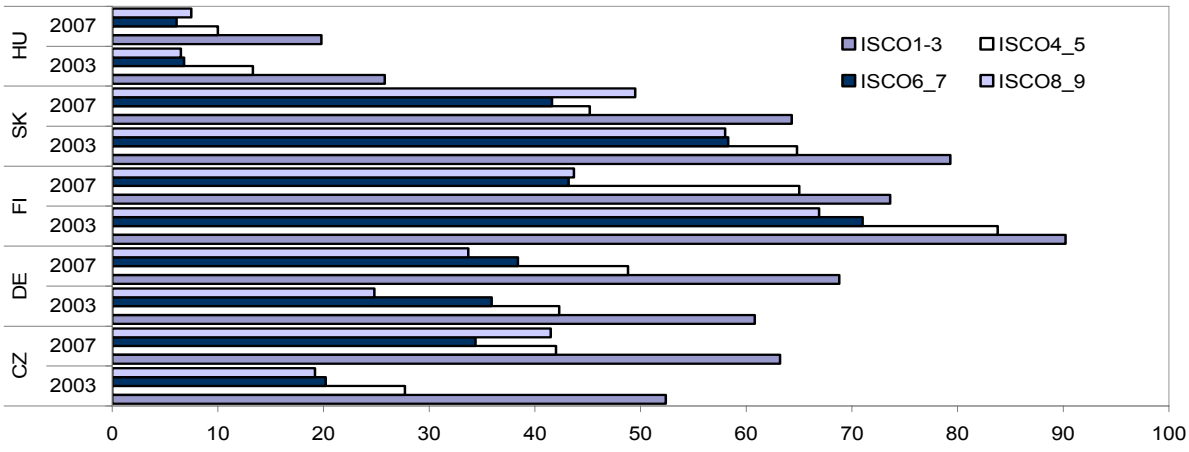
This information only partly confirms the trend in the development of overall participation in CET that is analysed on the basis of regular surveys as part of LFS (see Figure 1). The countries where a decrease in participation in CET occurred in the period between the AHM and the AES surveys included the UK, Hungary, Latvia, Slovakia, Greece and Belgium. It is therefore clear that in some cases the development trend was identical for some countries, while for other countries it was the opposite. The most likely reason for the disparities in the results is the methodology that is not identical – both when LFS is compared with the AHM and the AES, and when the AHM and the AES are compared.

An overview of the most significant differences in the development of participation in CET in various countries in the periods under review is provided by Figure 21. When we compare the two methodologies it is clear that the trends for individual countries display considerable differences, while there is a minority of cases where the results of the surveys are in accord. The largest disparity concerns Slovenia, Finland and Italy. The highest level of agreement between the results of the two surveys was reached in the case of Spain and the Netherlands.

The final comparison of the AHM and the AES surveys concerns the development of participation in CET in terms of occupational groups. The largest increase in the rate of participation in CET in the CR occurred in the ISCO 8-9 category (in 2007 it was nearly twice as high compared to 2003), and a considerable increase also occurred in the ISCO 4-5 and 6-7 groups.

Thanks to this development the CR came much closer to the average of the advanced countries. However, it still lags behind some countries in this respect – e.g. neighbouring Slovakia. Continuing education and training is increasingly considered as being an important issue by all occupational groups, and the differences between the rates of participation for less skilled occupations and those for ISCO 1-3 are becoming smaller (see Figure 22).

Figure 22: Comparison of participation in CET in terms of occupational groups according to AHM and AES surveys (2003–2007, in %)



Source: EUROSTAT (2005) a EUROSTAT (2009), date of access: 13. 11. 2009, own calculations.

2.2 Impact of information society development on continuing education and training

Over the past decade we have seen a massive rise in the information and communication technologies (ICT) sector, which on the one hand has a specific branch structure of economic activities including **manufacturing, trade and services** (see Box 3), but at the same time it has a major impact on all other areas of the economy. ICT development **changes qualifications requirements for the labour force** and hence represents an important factor affecting the labour market. We can see ever stronger **changing requirements of the labour market both inside and outside this sector**.

Box 3 – Definition of the ICT sector

With view to its cross-sectional nature, the actual definition of the ICT sector tends to be difficult. According to the Branch Classification of Economic Activities (BCEA) ICT can be broken down into three basic groups of activities:

a) ICT sectors in the processing industry (BCEA 30, 32, 332, 333);

b) ICT sectors in wholesale (BCEA 5143, 5184, 5186);

c) ICT sectors in services (BCEA 642, 72).

For instance, the Czech Statistical Office (CZSO) does not include data representing ICT sectors in wholesale in its data outputs due to the non-existence of reliable data in the required classification. Analyses of the ICT market usually rely on their own or adjusted branch classification. You can find more about the ICT sector, mainly the scope and dynamics of the ICT market and its development in the Innovation Performance chapter.

Inside the sector we encounter labour force that generates and will continue to generate the product of this sector, i.e. professions such as mechatronic, CAD designer or programmer.

Outside the sector there is labour force demanding the above products. Broadly speaking, it includes e.g. all PC and software product users. More narrowly, it is individuals using ICT to do their job. The latter group includes e.g. the professions of financial and tax advisors who make use of accounting software, most administrative staff or machine operators. In both cases the share of persons who do not use ICT at all is falling.

Information and communication technologies, which per se change the mode of working with information and introduce new forms and qualities of communication, thus become both a **subject** and **tool of education** for us. In relation to ICT as the subject of education we encounter ever more frequently notions such as electronic skills (e-skills) or information and computer literacy. The use of ICT for learning any subject is called e-learning. The latter makes use of various electronic aids, PCs and the Internet. E-learning often takes the form of on-line courses (see Box 4).

With view to the above specific features the development of the information and communication technologies sector has to be seen as a **society-wide process**. The European Commission has had this major item on its agenda since the 1990s. In 1998 it fully liberalised the telecommunications market and in 2003, in the context of digitisation, it broadened this scope to other telecommunications and broadcasting technologies. In 2005 monitoring and support of the development of ICT and the information society became part of the i2010 initiative, which has gained a new dimension against the background of the global economic crisis. ICT development is seen as a great opportunity for the revival and growth of European economies (see the following subchapter).

The first part of this subchapter identifies new opportunities as well as threats of ICT development for human resources, the way how they are tackled at national level in some EU countries (good practice examples) and also how they are implemented in policies and programmes at EU level. It discusses mainly the impact of ICT development on required competencies and a comparison of **human resources flexibility in gaining e-skills** in the CR and other EU countries (EU-15 and EU-27).

Box 4 – Definition of terms covering the relation of ICT to learning

Electronic learning (e-learning): Learning with the help of information and communication technologies. Its subject is not limited to "computer literacy" (i.e. gaining new ICT skills). It may also include various teaching forms and methods: the use of software, the Internet, CD-ROMs, on-line learning and other electronic or interactive media.

On-line courses, on-line learning: Learning through a network connection in the Internet, Intranet or Extranet environment. A more narrow term than electronic learning.

Some authors define on-line learning not only according to the means of learning (the net), but as learning that takes place in real time in a virtual classroom with the presence of a teacher. Contrary of the E-learning which may include e.g. also self-study with the help of a CD-ROM.

Computer literacy (digital literacy, eLiteracy): The ability to make efficient use of information and communication technologies.

Digital literacy (eLiteracy): The term of digital literacy is usually used in the same sense as computer literacy. The term emphasizes the use of all digital devices (PDAs, iPODs, etc.). In Czech this term is used less frequently.

Information literacy: It is a broader term than computer literacy, comprising work with information, the ability of its efficient search and utilisation.

Electronic skills (e-skills, ICT skills): Skills necessary to efficiently utilise information and communication technologies. Different levels of the above skills are distinguished.

Basic ICT skills: Skills necessary to efficiently utilise the basic functions of information and communication technologies. Some authors limit the scope of basic ICT skills to the individual use of software for text and data processing, the Internet and e-mail. Others also include other software and hardware connection skills (e.g. software installation). In 2001 the European Commission recommended the ECDL certificate (European Computer Driving Licence) as the basic standard for computer literacy.

The second part is aimed at trends in ICT use as a tool of continuing education and training, mainly as concerns **participation in electronic learning** (e-learning and on-line learning) **and ICT use in relation to education and learning**. The trends in ICT use in education and learning are evaluated from the viewpoint of individuals and enterprises mainly based on statistical data from the EUROSTAT, the Czech Statistical Office, the European Commission monitoring reports that evaluate information society development in the Member States over the past

years, and a NVF-NOZV publication Forecasting Skills Needs of the Labour Market.

Opportunities and threats of ICT development for human resources and EU initiatives in this field

As mentioned in introduction, the information and communication technologies sector has a number of specific features. In terms of human resources, mainly the dynamics of its growth, the impact of changes in qualifications requirements and the ICT dimension as a learning subject and tool are of a major importance. The above characteristics of the ICT sector may be on the one hand seen as opportunities and on the other one as threats. In the context of ICT development the biggest threat and opportunity at the same time is its **growth pace**, posing high **demands for the degree of e-skills and human resources flexibility**. This trend can again be seen both inside the ICT sector and across the whole economy. Quality labour force inside the sector has an impact on its innovation performance. The latter was identified by the European Commission as one of the main pillars of future development and a source of ICT investment in EU countries (see the i2010 initiative below). Besides, ICT work demands and develops **different competencies** from those still applied in traditional forms of instruction. We can see both changes in the competencies of school graduates and in competencies required by the labour force demand. The use of information and communication technologies can therefore cause future changes on the labour market, which are nowadays hard to predict. EU countries see a rise in employees using a PC to do their job as a share of total employment. This fact has an impact on e-skills demands. Their need is on the rise both at the user and specialist levels (see Box 5).

Box 5 – E-skills according to the EUROSTAT

The EUROSTAT distinguishes two levels of e-skills: **user ICT skills** and **specialist ICT skills**.

Specialist ICT skills include specification, design, preparation, development, installation, connection, support, maintenance, management, evaluation, testing and development, and research in the field of ICT systems.

User ICT skills comprise mastering widely used software tools, specialised business tools and system applications used for the support of work processes.

ICT or IT specialists are professions demanding specialist ICT skills. They correspond to the following professions in accordance to the ISCO-88 classification:

1236 Computing services department managers;

2131 Computer systems designers and analysts;

2139 Computing professionals not elsewhere classified;

2144 Electronics and telecommunications engineers;

3114 Electronics and telecommunications engineering technicians;

3121 Computer assistants;

3122 Computer equipment operators;

3132 Broadcasting and telecommunications equipment operators.

In the Czech Republic, **40% employees** as a share of total employment (except for the finance sector) **use a PC to do their job** (see Table 4). Compared to the European average (EU-27) the CR is slightly below the average, the leaders being mainly the Nordic countries such as Finland (70%) and Sweden (68%) (see Figure 23). Together with the Netherlands, Denmark and Germany those countries are also in the lead of other indicators of information society development such as households having Internet connection, share of regular Internet users among individuals, share of the ICT sector in total employment or share of employees having specialist ICT skills.

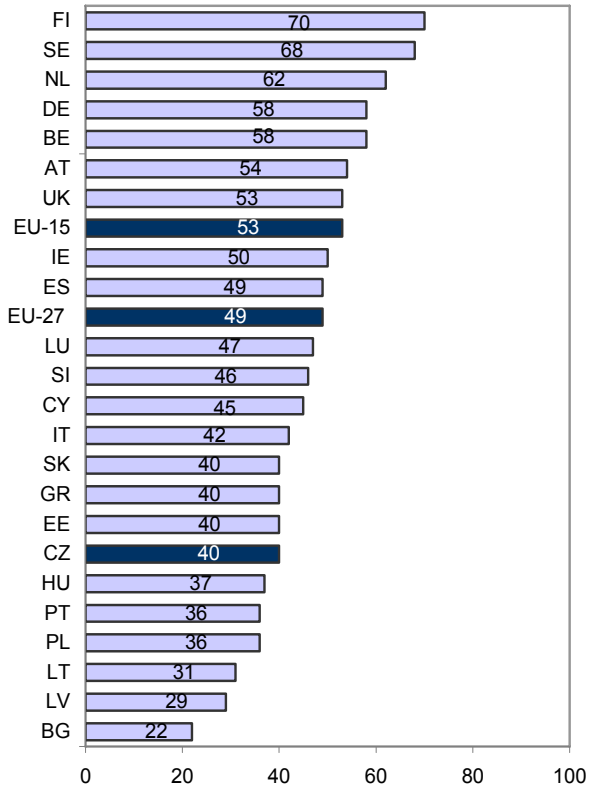
Table 4: Employees using computers in their normal work routine * and enterprises using computers (2005, 2008, in %)

	Employees			Enterprises	
	2005	2008		2005	2008
CZ	36	40	31**	96	97
EU-27	48	49	39**	96	97
EU-15	51	53	42**	95	96

* Percentage of employees using computers in their normal work routine at least once a week as a share of total employment, all enterprises except for the finance sector.
** Percentage of employees using computers connected to the Internet in their normal work routine.
Source: EUROSTAT (2005–2008a), table code: isoc_ci_cm_p, isoc_ci_cm_e, isoc_ci_eu_p, access date: 30. 10. 2009.

The impact of ICT on the transformation of the public sector and the trade sector is manifested as a rising need of individuals to **further develop their e-skills**. Individuals aged 25–54 gained their e-skills mainly by learning by doing (EU-27 average of 57%) and informal education (EU-27 average of 53%) (see Figure 24).

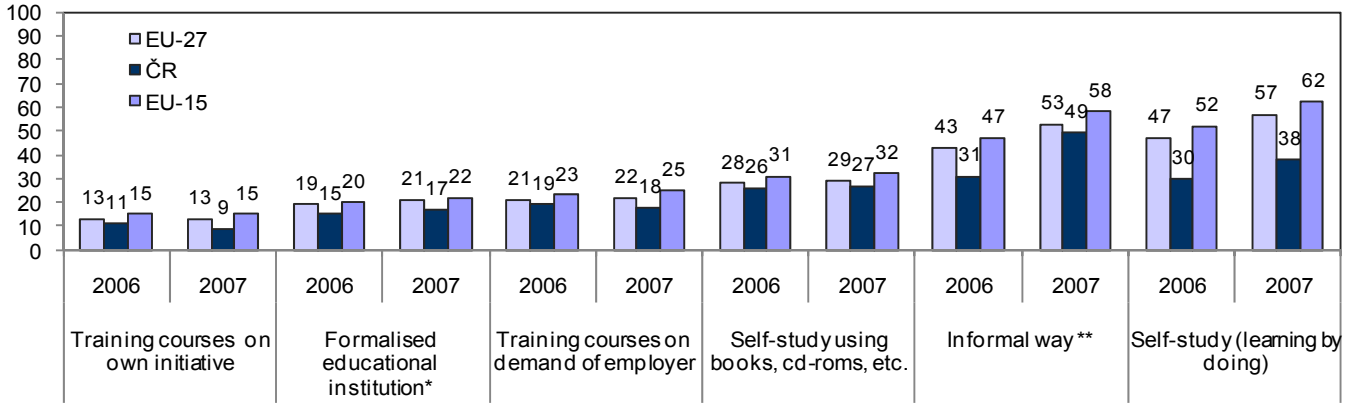
Figure 23: Employees using computers in their normal work routine at least once a week (2008, in %)*



***** Share of total employment except for the finance sector.
Source: EUROSTAT (2005–2008a), table code: isoc_ci_cm_p, isoc_pi_b1, access date: 30. 10. 2009.

Investing money in own skills is unfortunately less frequent. Taking a computer course out of one's own initiative is one of the least frequent ways of gaining e-skills. In spite of that, also this form of gaining ICT skills slightly rose in 2006 and 2007.

Figure 24: Ways of obtaining e-skills by individuals aged 25–54 (2006, 2007, in %)*



Source: EUROSTAT (2006–2007), table code: isoc_sk_how_i, access date: 2. 11. 2009, except for the finance sector.
* School, college, university, etc.
** Through informal assistance from colleagues, relatives in friends and some other ways.

Adults aged 25–54 in the Czech Republic gained e-skills mainly by informal education with the help of colleagues, friends or relatives. Compared with the EU-15 and EU-27 average, learning by doing in the CR was significantly less frequent in 2007. However, in this case the major difference may be caused by a different interpretation of a question contained in a questionnaire survey in the Czech language.[1]

Ever more frequently, user or specialist e-skills are one of the basic requirements posed by employers. This is reflected in the number of individuals acquiring e-skills upon their employer's request and also in the number of employers providing training for their employees for the purposes of ICT skills improvement (see Figures 25 and 27). On average, a quarter of individuals aged 25-54 in EU-15 gained IT skills in a training course **upon their employer's request** (see Figure 3). In the CR in 2007 18% of individuals aged 25–54 acquired IT skills in this way, which is not much below the EU-27 average (22%). On the contrary, individuals in Sweden (50%), Germany (42%) and Austria (30%) underwent training upon their employer's request most often. However, this issue has to be seen also from the viewpoint of the position of the ICT sector in a given country (see Figure 25). With view to the intensity of how individuals gain e-skills (see Box 6), Sweden is again in the lead, followed by Germany, Denmark and Estonia.

Box 6 – E-skills learning intensity

The indicator describes the involvement of individuals in six most common forms of e-skills learning. The rate of 100% represents the use of all available capacities, i.e. participation of individuals in all forms of learning below:

a) in a training course out of one's own initiative;

b) at school as part of formal education;

c) in a training course upon one's employer's request;

d) self-study from textbooks and CD-ROMs;

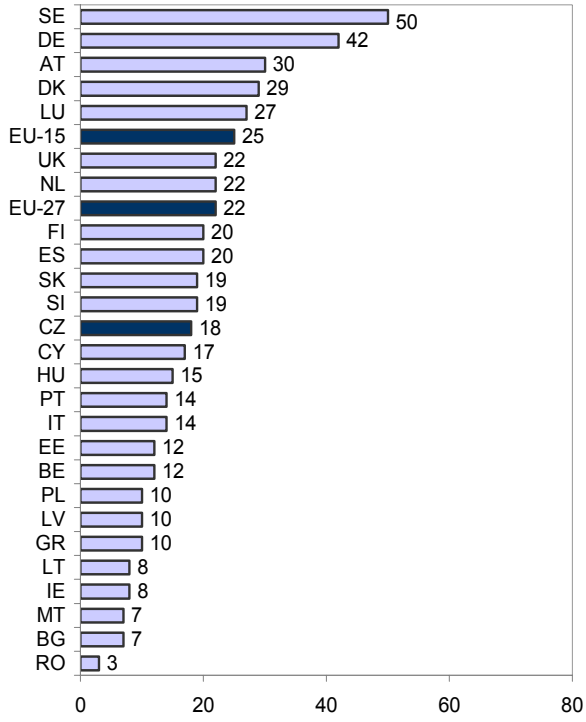
e) informal education (with the help of friends, colleagues or relatives);

f) self-study by means of learning by doing.

[1] The English phrase "*learning by doing*" was interpreted as the *trial and error method*, see a CZSO questionnaire (List of questions for a household survey on the use of information technologies – 2006).

Out of the Eastern European countries, Slovenia and Slovakia exceeded the EU-27 average (33%). However, this indicator does not say anything about the degree of e-skills, but only about the access of individuals to gaining them. Provided the degree of those skills has reached a satisfactory level, the intensity of obtaining e-skills may be lower compared to the EU average, without the country being in a weaker position towards the remaining European countries (see Figure 27).

Figure 25: Individuals (aged 25–54) who have obtained e-skills through training courses and adult education centres, on demand of employer (2007, in %)

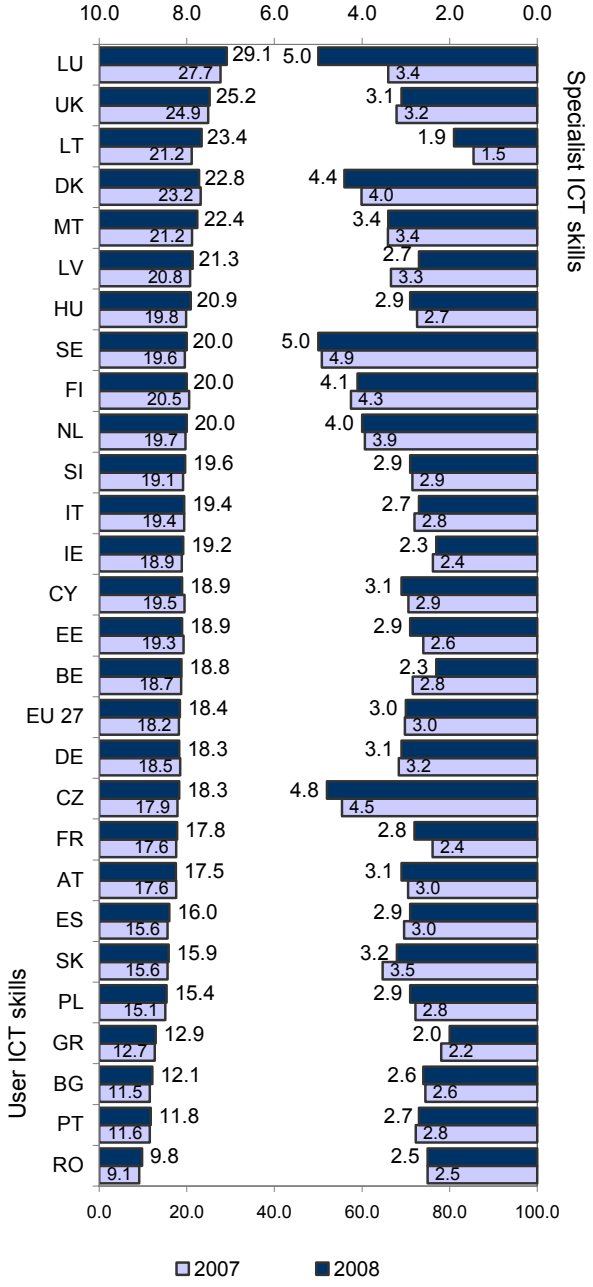


Source: EUROSTAT (2006–2007), table code: isoc_sk_how_i, access date: 2. 11. 2009, except for the finance sector.

Likewise, the level of **e-skills, mainly specialist ones** in the Czech Republic is high when compared to other European countries. In 2008 the share of employees in the CR having specialist ICT skills reached 4.8% and the CR thus ranked third among all EU-27 countries. The first

two positions were taken up by Sweden and Luxembourg, where the share of employees having specialist ICT skills accounted for 5% (see Figure 26). The CR has a weaker position in the share of employees having user ICT skills. Nevertheless, it almost reaches the EU-27 average (it is lower only by 0.1 p.p.).

Figure 26: Persons employed with ICT user skills and ICT specialist skills as a share of total employment (2007, 2008, in %)

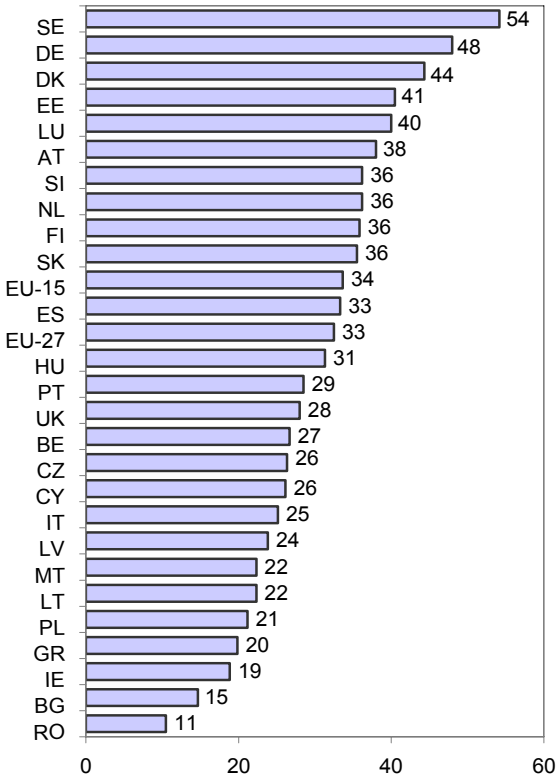


Source: EUROSTAT (2005–2008b): table code: isoc_ic_biski isoc_ic_bispe, access date: 2. 11. 2009. Data for 2008: EC (2009b).

Romania and Bulgaria, the two countries that most recently joined the EU, are the worst off, with a low level of gained user and specialist ICT skills of employees. Besides, those two countries show a very low intensity of acquiring ICT skills. In this they differ e.g. from Portugal, where there is also a low level of employee ICT skills, but the intensity of gaining those skills is close to the EU-27 average and in 2007 in was lower only by 4 p.p. (see Figure 27).

In counties with a high share of employees using a PC to do their job individuals usually take computer courses upon their employer's request more frequently and enterprises also more often invest in enhancing the ICT qualifications of their employees from the user level to the specialist one.

Figure 27: E-skills learning intensity of individuals aged 25–54 (2007, in %)



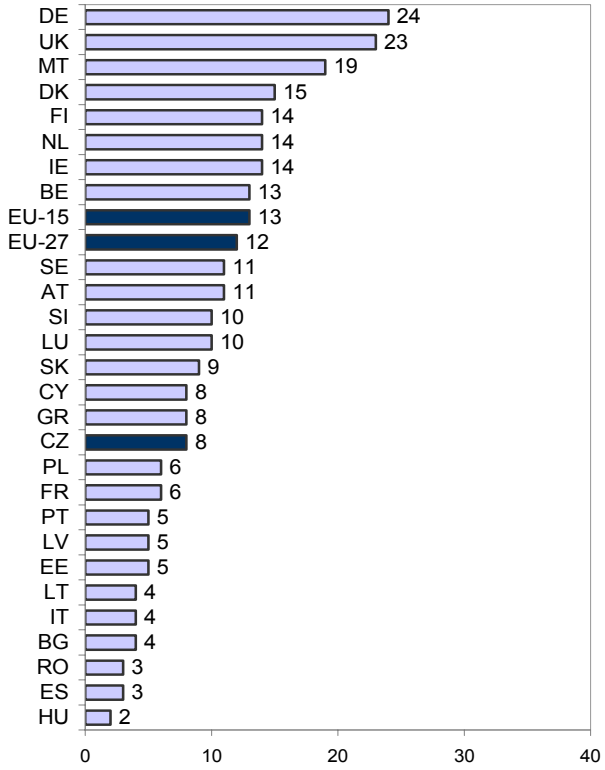
Source: EUROSTAT (2006–2007), table code: isoc_sk_how_i, access date: 2. 11. 2009, except for the finance sector, and own calculation.

In this case the overall **position of the ICT sector in a given country** and the degree of ICT skills already reached by employees (not only those in the ICT sector) also play a role. Since learning by doing and informal education are one of the major forms of gaining e-skills and include implicit on-the-job training, we can see a dependence between the participation of individuals in those forms of learning and the share of employees using a PC to do their job (in 2007 the correlation coefficient between the two above indicators accounted to 0.703 in EU countries[2]).

The intensity of individuals learning e-skills corresponds to data about individuals who completed a computer course in 2007 upon their employer's request. Germany, Sweden, Austria and Denmark are in the lead also here. From the viewpoint of the position of the ICT sector in the above counties it is clear that those countries are the best knowledge economies with a high share of enterprises employing ICT specialists.

[2] Own calculation based on data from 23 EU countries, Figure 1.

Figure 28: Enterprises who provided training to upgrade ICT skills of their personnel for ICT/IT specialists (2007, in %)



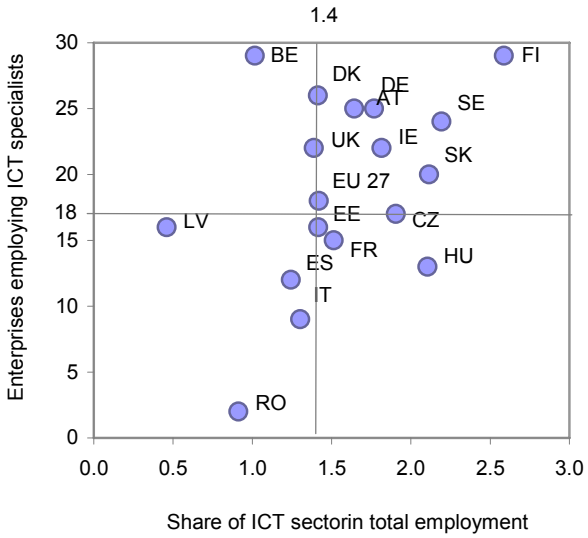
Source: EUROSTAT (2006–2007), table code: isoc_ske_itt, access date: 3. 11. 2009.

In countries with a high share of the ICT sector in employment and a low share of enterprises employing ICT specialists (e.g. Hungary) employers also show a low initiative of providing continuing education and training for their employees, i.e. enhancing their ICT skills and knowledge to the ICT specialist level (see Figure 28). Although the position of the ICT sector in total employment in those countries is comparable to economies such as Sweden or Finland, the difference in the knowledge level of employees is significant. The above Nordic countries have a higher share of enterprises employing ICT specialists and a higher share of employees having specialist ICT skills in total employment. Figure 29 clearly shows that countries ranking in the 1st and 2nd quadrants are more advanced knowledge economies, whereas in countries that rank in the 3rd quadrant the **ICT sector employs rather less qualified labour force**.

A typical example of employers proving this trend includes consumer electronics assembly plants, defined as a part of the ICT sector, yet requiring only very little specialist professions with an advanced ICT skills level. The Czech Republic is one of the countries where this type of enterprises serves as a major contributor to employment in the ICT sector. Among other countries, Ireland also used to have a similar employment structure in the ICT sector in the past, but between 2001 and 2005 a qualitative change took place and the assembly of computer hardware and consumer electronics was replaced by activities with a higher added value, such as service and logistic services for ICT producers, software development, etc. Those countries where such qualitative shift as in Ireland did not occur find themselves in a more risky situation in the economic crisis, which holds true also for the Czech Republic. In 2007 the CR almost reached the EU-27 average (18%) in the share of enterprises that employ ICT specialists. As concerns the share of the ICT sector in total employment in 2007 the CR with its 1.9% even exceeded the EU-27 average (1.4%), which shifted the CR right up to the upper part of the 3rd quadrant (see Figure 29).

However, the above data related to the CR are based on the situation in 2007, which had been far more favourable than the situation during the global financial and economic crisis. Nevertheless, regardless of the crisis conditions between 2000 and 2007 were volatile to a great extent anyway and were affected by a favourable wave of foreign investment. Foreign investors' plants in the CR have a fairly high share of employment in the ICT sector and unpleasant impacts of the crisis may involve their potential move or employee dismissals. Those companies include e.g. Foxconn (Hon Hai Precision Industry) and L.G. Philips Displays Holding/Multidisplay. However, the impact of the crisis on the business activities of the two above enterprises in the CR significantly differs. Foxconn, which was to create 4,500 jobs according to its investment plan, has been hit by the crisis only very little and has dismissed almost no employees. The weaker impact of the crisis is mainly due to the company's focus on Electronic Manufacturing Services (EMS), which find it easier to face the crisis than Original Equipment Manufacturers (OEM). L.G. Philips is far worse off; it was meant to create 3,250 jobs and in 2006 it employed over 1,300 people. Nevertheless, the plant in Hranice ended in liquidation and the last 200 employees have been dismissed. However, we have to take into account the difficulties the plant had been facing from its very establishment.

Figure 29: Relation between the size of the ICT sector (as a share of total employment) and enterprises who employed ICT/IT specialists (2007, in %)



Source: EUROSTAT (2005–2008b), table code: isoc_ic_biemp, access date: 30. 11. 2009. EUROSTAT (2006–2007), table code: isoc_ske_itsp_e, access date: 1. 12. 2009.

The way how foreign investors tackle the crisis differs. However, from the viewpoint of the CR's competitiveness a role is played by the qualifications demand factor of professions into which domestic labour force is recruited.

The Czech Republic has a good position in the share of employees with e-skills, predominantly specialist skills (see Figure 26), which should be further strengthened. Those skills are a necessary precondition for doing the ICT specialist profession (see Box 5). As has been said above, in 2008 the CR ranks third among EU-27 in the share of employees having specialist ICT skills.

Box 7 – LearnDirect (United Kingdom), nation-wide and individual education

LearnDirect is a nationally recognised education system brand in the United Kingdom based on eLearning. The project is funded by the Department of Innovation, Universities and Skills (Dius). The LearnDirect brand indicates a network of education and training centres and is owned by the University for Industry (Ufl), which is an institution (not a higher education institution) established in 1998. Over a ten-year period LearnDirect has become the largest eLearning network of its kind in the world. Its main benefits include personalisation of courses according to individual level of knowledge and skills and easy access to education for all. A series of entrance tests ensures that the courses are personalised. The tests are designed so as to verify basic types of skills (mathematic, language, work with data, etc.) and the subsequent electronic training is then tailored to one's individual needs. Participants can have access to a course from their home or from any other place with Internet access. Another alternative is to go to LearnDirect teaching computer centres.

The franchising method has proven good for a swift introduction of the system into practice. The University for Industry as the franchiser provides e-learning software applications and other know-how under the LearnDirect brand to education and training centres across the whole of the United Kingdom, of which there are currently already 770. The LearnDirect project aims at filling the rising qualifications gaps on the labour market. The following data clearly indicate that unless a change takes place, the low level of qualifications will represent a great threat for the future competitiveness of the United Kingdom and the mobility of its inhabitants:

a) Five million economically active people have no qualification;

b) One in six inhabitants does not have a level of literacy expected at the age of 11 and over a half of the adult population does not master functional numeracy skills;

c) In order for the United Kingdom to be competitive on the global market, the British market will need another 5 million highly qualified employees by 2020.

In the context of the rising qualifications gap on the labour market the British government pursues an active policy. LearnDirect is one of those measures. More than **two and a half million clients** have completed a training in this system since 2000**.** The training has helped them to obtain new knowledge and skills and thus has given them a greater chance to find a job on the labour market. Since autumn 2008 LearnDirect also provides career advice related to the selection of continuing education and training courses, return to work, possibilities of granting support as well as child care.

More advanced knowledge economies (i.e. mainly those in the 1st and 2nd quadrants in Figure 29) again ranked above the EU-15 and EU-27 average as concerns the share of enterprises doing trainings to enhance ICT proficiency of their employees (see Figure 28). In 2007 countries such as Germany or the United Kingdom invested the most into continuing education and training of ICT staff. This attempt to enhance competitiveness also follows from the location of the above countries in the central part of the 2nd quadrant. On the whole it is clear that the competitive struggle, reflected in improving the knowledge of labour force, has affected mainly EU countries in the first and second quadrants, i.e. those where the ICT sector employs more ICT specialists than is the average. Belgium is in the lead as concerns the relationship between the size of the ICT sector and enterprises that employ ICT specialists.

Opportunities of ICT development for human resources comprise its use in education through **eLearning**. In this field information and communication technologies make it possible to have an easier access to education, reduce education costs and combine some benefits of collective and individual learning. A good example from practice is the LearnDirect programme in the United Kingdom whose aim is to fill in a rising qualifications gap on the labour market through a nation-wide introduction of eLearning courses (see Box 7 below).

A European Commission report on the use of ICT to foster innovation and lifelong learning issued in 2008 records the development of eLearning in EU Member States from the Lisbon European Council in 2000 until 2008. Results from the past years have led to conclusions and recommendations for the future period. The Lisbon meeting in 2000 recognised information and communication technologies as a key component of the knowledge economy and its incorporation in the education system at the same time as a key tool of building it. In accordance with the Lisbon Strategy the eEurope action plan was prepared, focusing on information society development, in which eLearning was put among the key priorities together with the introduction of broadband Internet or e-health. This plan preceded the i2010 strategy (see below). ICT support in education also became part of framework programmes. Permanent support was guaranteed by the Seventh Framework Programme, Programme for Competitiveness and Innovations and other accompanying activities of the European Commission (e.g. a programme entitled "e-Skills for the 21st Century: Fostering Competitiveness, Growth and Jobs").

Since 2007 ICT in education has become one of the four crucial lines of lifelong learning and a priority of four programmes (Erasmus, Comenius, Leonardo da Vinci and Grundtvig). The use of ICT in education and vocational training has thus been gradually incorporated in the mainstream of European policies.

Conclusions of the above European Commission report show that in comparison with the impact of ICT on the transformation of public services and trade the impact of ICT on education and vocational training has not yet been as extensive as expected. The changes would have had to become apparent at multiple levels (see above), which has not been achieved yet. However, ICT has a great potential both for lifelong learning and for formal and informal education. Likewise, neither on-the-job training has yet made full use of ICT possibilities. They are mostly utilised by large enterprises and public institutions, whereas SMEs are still lagging behind in ICT use in employee education and training, even though it could greatly benefit its efficiency. Similarly, innovative and electronically better equipped schools obtain better results; however, in spite of that the good practice examples do not serve as role models to the expected extent. Experience in Member States noted by the European Commission has led to the following recommendations.

a) Strengthen the use of information and communication technologies at schools, not only in instruction, but also by transforming instruction procedures, changing management and administrative and organisational conditions. Only then can money invested in infrastructure be efficiently utilised.

b) Promote change and innovativeness as the key features of the education system. If knowledge, competencies and

Table 5: Ranking of policies according to priorities and involvement of EU countries (2009)

	Country/Policy	AT	BE	BG	CY	CZ	DE	DK	EE	ES	FI	FR	GR	HU	IE	LV	LT	LU	MT	NL	PL	RO	SI	SK
1	Infrastructure*	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2	eGovernment	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3	eLearning/ICT in		✓	✓	✓				✓	✓	✓	✓	✓		✓	✓			✓	✓			✓	
4	eSecurity	✓			✓					✓	✓	✓	✓			✓	✓	✓						✓
5	ICT R&D and		✓	✓		✓	✓			✓		✓						✓			✓			
6	eInclusion/digital			✓		✓				✓			✓	✓					✓			✓		✓
7	eHealth				✓	✓			✓	✓			✓								✓		✓	
8	Encouraging use		✓									✓	✓						✓			✓	✓	
9	eBusiness		✓		✓					✓			✓											
10	eJustice					✓				✓											✓		✓	
11	Green ICT							✓							✓			✓						
12	Harmful content										✓													

Source: EC (2009b) and own analysis.
* Broadband diffusion, broadband Internet coverage, mobile networks, households and enterprises equipped with a PC.

skills for the innovative society are to be transmitted, education as such has to be flexible and innovative.

c) Contribute to a wider incorporation of ICT in the lifelong learning system and promote substantial benefits of ICT, meaning mainly easy access to education and personalisation of teaching methods.

d) Limit the social exclusion of some disadvantaged groups of inhabitants from the use information and communication technologies, which may provide an easier solution of their situation.

ICT development brings new tasks for the public sector and government policy. A requirement has been brought up at European level to maintain EU's competitiveness in digital economy and globally flexible labour force. As part of European strategies and own initiatives Member States have adopted measures and national action plans supporting information society development. General strategies include e.g. expansion of Internet access, mainly broadband, and of the mobile services market, development of computer literacy as one of the aspects of the inclusion of citizens in the information society (eInclusion) and public online service (eGovernment). However, besides the above objectives other specific challenges are also being tackled, e.g. strengthening the role of ICT in business (eBusiness, eCommerce), electronic learning (eLearning) or healthcare digitisation (eHealth)**.**

In 2005 the European Commission introduced the i2010 strategy. Its main aim has been to support the leading position of Europe in ICT and make use of the information society for growth and job creation in Europe. The strategy is based on three main pillars:

a. Single European information area offering accessible and safe broadband communication, rich and diverse content and digital services;

b. Performance at global level in research and innovations related to ICT thanks to reducing the differences between Europe and leading competitive participants;

c. Widely accessible information society providing quality public services and supporting the quality of life.

Evaluation of the results of this strategy in EU Member States between 2005 and 2009 shows that tangible results have been reached in all three above areas, most notably in the **use and development of Internet access**, mobile telephones and services. However, in some ways Europe is either lagging behind or the risk is that it may lose its competitive advantage. The second pillar, i.e. that of innovative development, is seen as posing the highest risk with Asia is in the lead, there in particular Japan and South Korea with the high-speed optical fibre technology, together with the USA and its innovative use of Internet services and applications. Hence, greater attention and investment flow into this field. In its framework programme for competitiveness and innovations for the period of 2007–2013 the EU adopted its biggest ever ICT budget. As part of an evaluation covering the years 2005–2009 and in the context of the economic and financial crisis, the need for a new digital agenda was identified. The report says that EU's ICT policies have strengthened Europe's resilience during the crisis. That is why in its further Economic Recovery Plan the European Commission has recognised the key importance of broadband Internet accessibility for "new jobs and skills, new markets and cost reduction". So as to speed up economic recovery, the European Council has upon EC's proposal approved an investment of up to EUR 1.02 billion into rural broadband networks. The impact of broadband Internet accessibility on further education and its development in recent years is one of the issues discussed in the text. Even though ICT initiatives have been adapted in all Member States in a comparable structure, they differ in the mode and degree of incorporation in specific policies. As Table 5 shows, the biggest priority is infrastructure development, in particular broadband coverage and to a smaller extent e-business support. Most notably policies focusing on ICT equipment at schools are crucial for human resources together with eLearning, support of ICT use and inclusion of citizens in the information society (in particular of groups at risk of social exclusion due to insufficient ICT knowledge and skills) and development of computer and information literacy. Numerous projects target multiple levels of the set targets. For instance projects aimed at equipping schools with ICT and eLearning development are usually accompanied by the development of computer and information skills of both pupils and teachers (Bulgaria, Cyprus, Estonia, Finland, France, Greece, Ireland, Lithuania or Malta). The same applies to the inclusion of disadvantaged groups of citizens, e.g. the unemployed, economically inactive persons, low-income households not equipped with the Internet, women and seniors. Projects in the field of eInclusion want to enhance the equipment of the above groups with PCs and the Internet (providing

discounted purchase of PC equipment and Internet connection) and computer literacy; hence touching upon several levels of ICT policy: infrastructure, eLearning/ICT at schools, support of ICT use and eInclusion.

Further development of ICT and the knowledge economy in the EU will be influenced by the new EU 2020 strategy, which will replace the Lisbon Strategy. The first priority of EU 2020 is "creating value by basing growth on knowledge". Besides ICT and the digital economy it also focuses on full utilisation of the potential in education, science and research.

Information and communication technologies as a CET tool

The chapter has so far pointed out the opportunities and threats that follow from ICT development for human resources, with a focus on labour force flexibility in acquiring e-skills. However, as has already been said in the introduction, information and communication technologies do not serve only as a subject of education and training, but also as its useful tool**.**

This part focuses on the **use of ICT as a CET tool**. It is often replaced by terms such as eLearning or on-line learning, referring to direct involvement of ICT in instruction. However, in general the **impact of ICT on education and training is far broader**, involving also innovation in management and technological, organisational and other changes of the education system. From this point of view the impact of ICT on the education system, mainly on formal education at school, is also monitored by European Union institutions. Attention is paid to e-learning, yet only partially. Electronic learning (eLearning) is seen as one of the major tools of human resources development and in a number of countries it is used as a fast and less costly way to fill qualifications gaps on the labour market. Electronic education methods can be applied both in formal and informal education and in a broad range of subjects. However, we first have to take the infrastructure of a given country into consideration, mainly the equipment of individuals and enterprises with PCs and Internet connection. This has an impact on the share of PC and Internet users among the inhabitants. The share of PC and Internet users and their participation in continuing education and training through eLearning is greatly influenced by the **type of connection**, namely **broadband access**. Individuals and households with a slower connection participate in eLearning less often. Broadband, i.e. high-speed Internet network density plays an important role in the development of the whole information society.

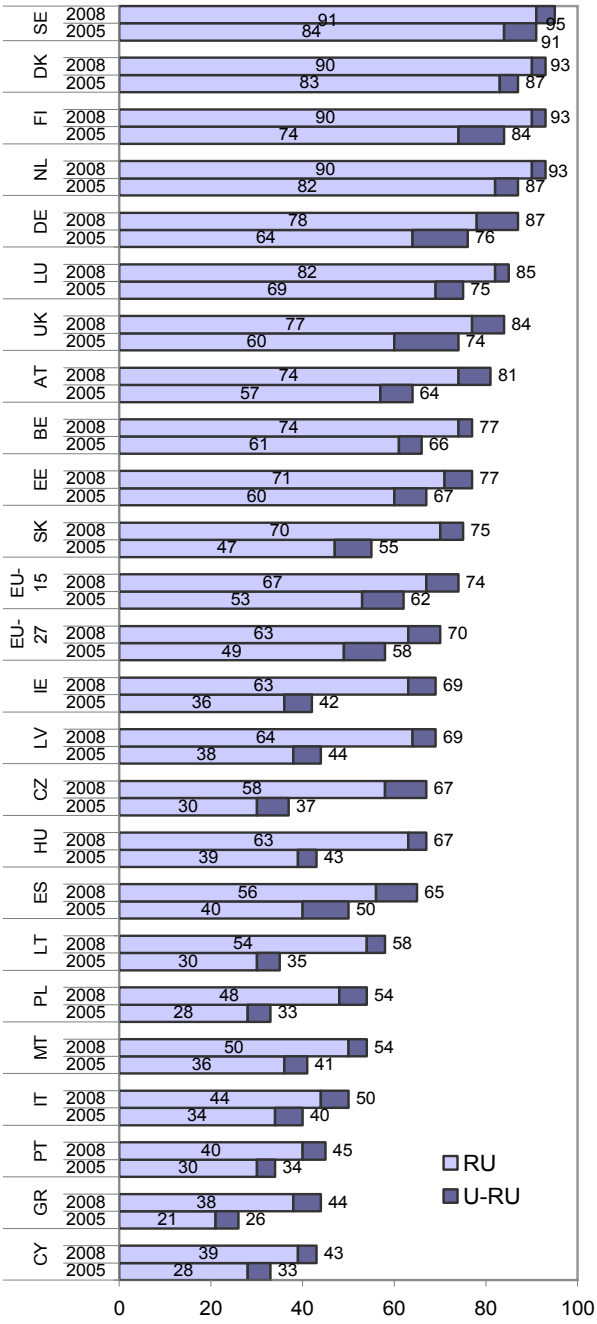
Box 8 – Definition of the types PC and Internet users

A PC user is an individual who has used a PC over the past 3 months. Personal computers include all types of PCs, i.e. desktop computers (traditional non-portable PCs), portable laptops (often referred to as notebooks) and palmtops (Personal Digital Assistants – PDAs).

An Internet user is an individual who **has used the Internet over the past 3 months.**

Regular PC and Internet users use a PC and the Internet respectively **at least once a week.**

Figure 30: Internet users (U) and regular Internet users (RU) aged 25-64 as a share of population (aged 25-64) in selected EU countries (2005, 2008, in %)

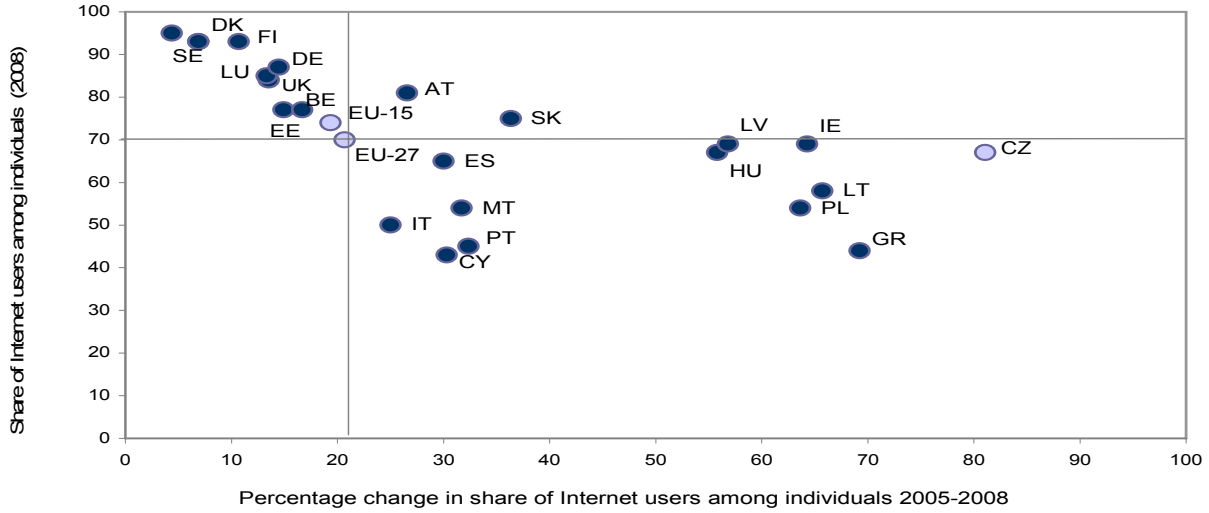


Source: EUROSTAT (2005–2008a), table code: isoc_ci_ifp_iu, 30. 10. 2009, own calculations.

The Czech Republic with its 67% **share of Internet users aged 25–54**[3] is close to the EU-27 average in 2008, which was higher by only 3 p.p. However, in 2005 the CR only reached less than 64% of the EU-27 average share of Internet users among the inhabitants. Between 2005 and 2008 the share of Internet users in the CR nearly doubled. The CR saw the biggest increase from the whole EU-27 (see Figure 30). The countries whose share of Internet users

[3] The age span of 25-54 has been selected for the purposes of comparability with other data related to the participation of this age group in e-learning.

Figure 31: Individuals aged 25–54 using the Internet and their percentage increase in EU countries (2008, 2005–2008, in %)



Source: EUROSTAT (2005–2008a), table code: isoc_ci_ifp_iu, 30. 10. 2009, own calculations.

among the inhabitants was below the EU-27 or EU-15 average in 2005-2008 may be divided into two groups: some Southern European countries such as Spain, Malta, Cyprus, Italy and Portugal saw slow growth; on the contrary, the share of Internet users grew quickly among the inhabitants in Greece, Poland, Lithuania, Latvia, Ireland and Hungary (see Figure 31).

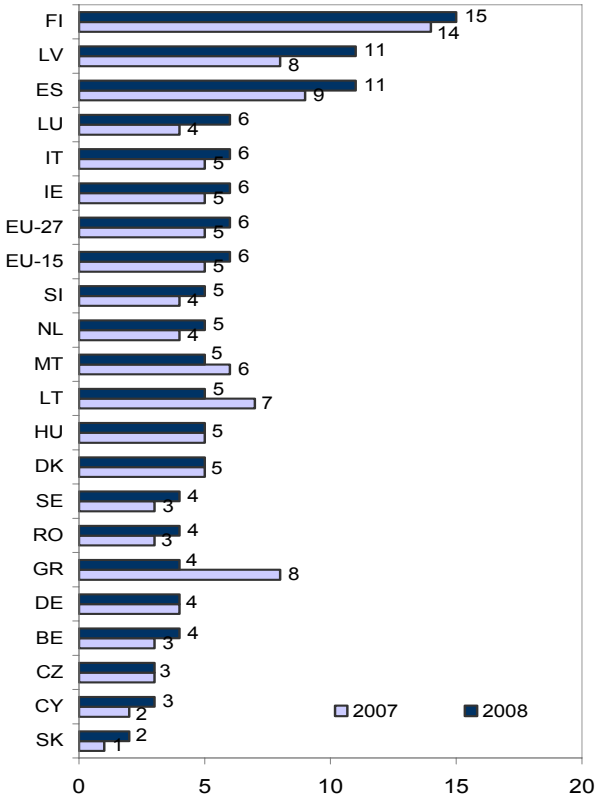
The Nordic countries (Sweden, Denmark and Finland) have the highest ranking among European countries, together with Germany and the Benelux countries. The above countries are among the most advanced ICT knowledge economies of the European Union and usually are also in the lead of other information society indicators. A similar situation can be seen in most countries with the share of regular users: over 90% of Internet users are usually its regular users in most countries.

The participation of individuals aged 25-54 in education through on-line courses did not change significantly in most EU countries between 2007 and 2008 (see Figure 32). Most countries including the CR saw either a slight increase or stagnation. However, some countries experienced a major fall (Greece, Lithuania). High participation in on-line courses requires the information society to be advanced, as well as the infrastructure and at least a basic degree of e-skills for the use of this education tool. This is partly reflected in the ranking of countries where individuals participate in on-line courses most often. Besides, their ranking reflects also other factors related more to the supply rather than demand for this specific type of e-learning, i.e. the network of on-line course providers. Fluctuations in the rise or fall in individual participation in on-line courses may be down to the courses on offer to a great extent, which may be reinforced by support at national or EU level (subsidy programmes, tax relief, etc.).

This is verified by the second indicator, which is more general and copies the ranking of the most advanced information economies far more. It is namely the share of persons in the same age group who use the **Internet for education and vocational training** (see Figure 33). The discrepancy between the trends seen in these two indicators follows from the definition of on-line education and Internet education. An on-line course does not equal obtaining e-skills. In this case ICT is truly applied as an education tool in any subject. On-line education means participation in a formalised on-line course that takes place in real time. In general, Internet use for education can take numerous forms and may also include on-line education, literature search, knowledge testing, search and work with information, etc.

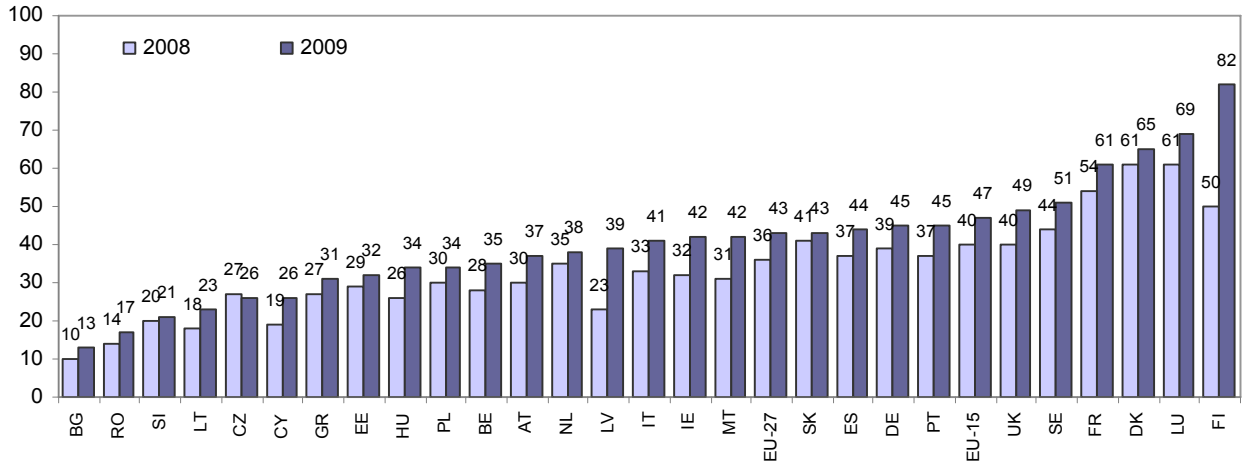
The first indicator may thus be more influenced by the education and training on offer, whereas the second one describes the degree of information society development as well as the trends in demand for education and training.

Figure 32: Participation of individuals aged 25-54 in on-line training courses (2007, 2008, in %)*



* The share of individuals who have completed an on-line Internet course in any subject over the past 3 months.
Source: EUROSTAT (2005–2008b), table code: isoc_pibi_ioa, access date: 2. 11. 2009.

Figure 33: Individuals aged 25–54 who used the Internet over the past 3 months for education and training (2008, 2009, in %)*



Source: EUROSTAT (2005–2008b), table code: isoc_pibi_ioa, access date: 2. 11. 2009.

A positive shift in ICT use in **formal education** took place in 2000–2008, which had an impact mainly on initial education. However, in continuing education and training ICT tends to be applied more in the form of informal education. This follows from the low participation of adults with completed initial education in continuing formal education (see subchapter 2.1). In 2003 1.4% of adults aged 25-64 participated in formal education, i.e. three times less than the EU-25 average. However, in the same year 12.4% of individuals of the same age group underwent computer training as part of informal education. None the less, also in this case it was less than the EU-25 average (19.2%). According to the latest AHM survey[4] from 2006 Internet use in adult formal education in the CR was significantly weaker compared with the EU-15 and EU-27 average (see Table 6). This was in spite of the fact that eLearning can be applied in expanding formal education in the distance mode or in involving those groups of individuals who would not take part in the traditional forms of formal education (mainly unqualified workers).

Table 6: Individuals who have used the Internet over the past 3 months for formalised educational activities (2006, in %)*

Country/age	16-74		16-24	25-34	25-54	55-64
EU-15	9.1	16.2*	30.1	12.1	7.9	2.1
EU-27	8.3	16.0*	27.7	10.5	6.9	1.7
FI	23.9	31.0*	73.3	29.3	20.0	4.7
RO	2.3	11.2*	11.1	1.1	0.5	:
CZ	7.8	17.6*	39.0	5.6	3.1	:

* Individuals/Individuals who have used the Internet over the past 3 months.
Source: EUROSTAT (2005–2008b), table code: isoc_pi_e2, access date: 3. 11. 2009.

Besides PC and Internet use for formal and informal education of individuals, its use for on-the-job continuing education and training is also vital[5]. Large enterprises and public institutions are best equipped to train their employees by means of eLearning applications. On the contrary, SMEs tend to use this form of employee training below the average (see Table 7). The use of eLearning by employers in the Czech Republic has a similar structure like in EU-27. It is most widely used by large enterprises with over 250 employees (56% in 2009) and significantly less by small and medium-sized enterprises (32% in 2009). With view to this indicator the CR is above the EU-27 average, which accounted to 24% for all enterprises (except for the finance sector) in 2009, i.e. was by 8 p.p. lower than in the CR.

Table 7: Enterprises using e-learning applications for training and education of employees (in %, 2008, 2009)*

Enterprise size*	All enterprises		Large enterprises		Small and medium-sized enterprises	
Country/year	2008	2009	2008	2009	2008	2009
EU-27	**24**	**24**	**44**	**46**	**23**	**23**
EU-15	22	21	42	42	22	20
BE	24	:	48	:	23	:
BU	17	18	33	38	16	18
CZ	**29**	**32**	**54**	**56**	**28**	**32**
DK	28	:	53	:	27	:
DE	13	16	25	36	13	16
EE	37	37	64	61	36	36
IE	37	39	78	72	36	38
GR	48	49	69	66	47	48
FR	23	23	33	39	22	22
IT	17	18	41	43	17	17
CY	35	23	74	59	34	23
LV	30	31	54	58	29	31
LT	54	55	75	66	53	55
LU	22	24	43	51	22	23
HU	15	17	37	36	15	16
MT	26	30	54	54	25	29
NL	16	16	48	48	15	16
AT	29	28	57	49	28	27
PL	21	25	.	47	20	25
PT	33	29	58	62	33	28
RO	41	47	73	73	41	46
SI	41	39	67	52	40	38
SK	48	45	60	62	48	45
FI	41	:	61	:	40	:
SE	25	:	56	:	24	:
UK	24	:	53	:	23	:

* All enterprises – enterprises with more than 10 employees, except for the finance sector; large enterprises – enterprises with more than 250 employees, except for the finance sector; small and medium-sized enterprises (10–249 employees).
Source: EUROSTAT (2005–2008b), table code: isoc_pi_e3, isoc_pi_e3n2, access date: 3. 11. 2009.

[4] For information about this survey please see Box 2, subchapter 2.1.
[5] I.e. organised, not informal on-the-job training.

3. Labour Market Flexibility

The following chapter examines three areas that influence labour market flexibility. The first section analyses foreign employment, its structure, its place in the labour market in the Czech Republic and Europe, and its long-run and short-run evolution, which reflects the current effects of the economic crisis. The second section focuses on flexible working arrangements, in particular part-time work and fixed-term contracts. It compares the situation in the Czech Republic and other EU countries and tries to identify the causes of differences. It also looks at the effect of the economic crisis on flexible forms of employment. The third section is devoted to earnings differentiation, which is an important feature of a flexible labour market. Earnings differentiation is analysed mainly with regard to educational attainment, occupation and work experience. Attention is also devoted to pay in high-tech and knowledge-intensive sectors. The situation in the Czech Republic is analysed in the context of the average situation in the EU and individual member states.

3.1 Foreign employment

Foreign labour force usually forms one of the most flexible components of supply in the labour market. It makes up a significant proportion of the labour force in some sectors and occupations in the Czech labour market. Labour migration is often mentioned on the one hand as a potential solution to the demographic situation in developed countries and to labour market imbalances, but on the other hand also as a potential source of new economic and social problems. This subchapter analyses foreign employment in the Czech labour market from several perspectives. First, the causes and background of labour migration will be analysed in the context of the global economy and in the context of the EU. The evolution and structure of foreign employment in the Czech Republic will then be examined. This will include an analysis of the occupations and sectors in which foreigners most frequently work in the Czech Republic and of differences in migration for high-skilled and low-skilled occupations. Finally, the impacts of the current economic crisis on foreign employment are examined. Labour migration and the employment of foreign workers are relatively difficult to monitor owing to illegal migration, legislative factors and the fragmented nature of the sources that statistically monitor foreign nationals in the Czech Republic. This subchapter will therefore also cover the methodological and legislative context of the monitoring of employment of foreign workers in the Czech Republic and will conclude by discussing illegal migration and its economic and social consequences.

Causes of labour migration

Labour migration results from a combination of "push" factors motivating workers to leave their country of origin, and "pull" factors attracting migrants to a specific host country. The main **pull factor** is the labour market situation in the host country. An inflow of foreign workers can be triggered either by a shortage of a particular category of workers in the target country (the addition effect) or by efforts of employers in the target country to reduce their wage costs (the substitution effect).

The **addition effect** – namely the situation where foreign workers hold positions for which suitable workers are not available in the target country – is seen primarily in skill demanding occupations. A typical example is the shortage of workers in ICT professions. The **substitution effect**, by contrast, is motivated by employers' efforts to minimise labour costs. It usually applies to low skilled occupations and to occupations with difficult working conditions. Foreign workers take jobs that the local population is not interested in doing at the wages and under the conditions on offer. In specific cases the substitution effect can also be seen for certain skilled occupations for which pay in the country of origin does not correspond to the cost and effort spent on getting an education. In Europe, this is seen, for example, for health workers. In some cases the substitution effect involves a chain reaction. Workers from countries with lower living costs move to countries with higher wages, thereby freeing up vacancies for immigrants from countries where costs are lower.

Box 1 – Residence of foreign nationals in the Czech Republic

The residence of foreign nationals in the Czech Republic is governed by Act No. 326/1999. It distinguishes the following basic types of residence of foreign nationals in the Czech Republic:

Temporary residence

Citizens of EU states may stay temporarily in the Czech Republic without restrictions. Permission to stay temporarily is a right and can be refused or cancelled only in exceptional cases, such cases usually being linked with the endangerment of public safety.

Third-country nationals may stay temporarily in the Czech Republic:
- in the short term (up to 90 days) without a visa (citizens of states with which the Czech Republic has visa-free relations),
- on the basis of a short-term visa for a stay of up to 90 days,
- on the basis of a long-term visa for a stay of over 90 days, valid for a maximum of one year,
- on the basis of a long-term residence permit, provided that they intend to reside in the Czech Republic for more than one year and previously resided in the Czech Republic on the basis of a long-term visa for a stay of over 90 days. A long-term residence permit can be obtained in special cases for the purpose of employment in the form of a "green card", i.e. a joint residence and work permit for specified jobs.

Permanent residence

Permanent residence can be obtained by a foreign national who:
- has resided in the Czech Republic for an uninterrupted period of at least five years,
- is employed in the Czech Republic and has resided there continuously for at least three years,
- applies for residence on the basis of cohabitation with a family member who is a citizen of the Czech Republic or has permanent residence in the Czech Republic (in the case of citizens of other EU states the family member may also be a citizen of another EU country having permanent residence in the Czech Republic).

Various forms of residence permit may also be granted on humanitarian or similar grounds. Applicants for asylum and foreign nationals having valid asylum status form a special category. The rights of asylum seekers correspond in scope to permanent residence.

In the CZSO's statistics, **the Czech population** includes foreign nationals with permanent residence, EU nationals with temporary residence and third-country nationals with long-term residence. It therefore does not include foreign nationals residing in the Czech Republic in the short term or on the basis of a long-term visa for a stay of over 90 days.

Source: Act No. 326/1999 Coll. and CZSO (2009b), date of access 2. 11. 2009.

For both effects, the supply of labour from abroad affects the supply-demand equilibrium in the target country's labour market. In the case of the addition effect, it helps to eliminate the mismatch between supply and demand. In the ideal case, it can also contribute to reducing unemployment in the country of origin. The substitution effect has ambiguous

impacts as regards labour market equilibrium. The supply of foreign workers from a country with a lower standard of living who are satisfied with a lower wage level reduces the costs of low skilled labour in the target country and can thereby increase the unemployment rate among domestic low skilled workers. Unlike workers from countries with lower costs, they are not willing to work for the wage on offer and prefer to remain dependent on the social security system. International labour migration thus reduces the costs of host-country employers but can generate indirect costs for the host country. The rise in unemployment has impacts on the state budget and leads to problems due to exclusion of social groups in the domestic population in the long term. Problems associated with the integration of foreigners into society also place new demands on the host country.

On the other hand, production in a given country, whether it employs workers from the home population or from abroad, always contributes to GDP of host country and generates tax revenues for the state. In the global market, any restriction on the inflow of foreign workers will not necessarily lead to investors hiring domestic workers at a higher wage. Rather, it might result in the given type of production not taking place in the country at all and the investors moving production to a country where they can get cheaper labour. Restrictive measures in the domestic market therefore entail many risks.

The movement of foreign workers depends not only on the situation in the target country, but also on that in the country of origin and in other countries. The motivation to migrate depends above all on the difference in economic and wage level between the country of origin and the target country. Studies have been conducted to measure the differential between the country of origin and the target country. Based on the size of that differential, they identify four levels of the income motivation to migrate, ranging from a very strong motivation (earnings in the target country at least three times higher than in the country of origin) to "economic maturity", where the motivation to migrate virtually disappears (earnings in the country of origin equal to 70% of earnings in the target country) (see Baštýř, 2009). If the labour market situation in the country of origin improves and the differences between the target country and the country of origin shrink, the push factors that originally motivated workers to migrate vanish and in some cases those workers return to their country of origin. This has happened in recent years, for example, in the case of Polish workers in the UK and Ireland. A change in the labour market situation in surrounding countries can also affect migrants' behaviour. Foreign workers form one of the most flexible components of the labour force in the target country. Moving on to a third country with an even better labour market situation is a relatively minor problem for them compared to the domestic population.

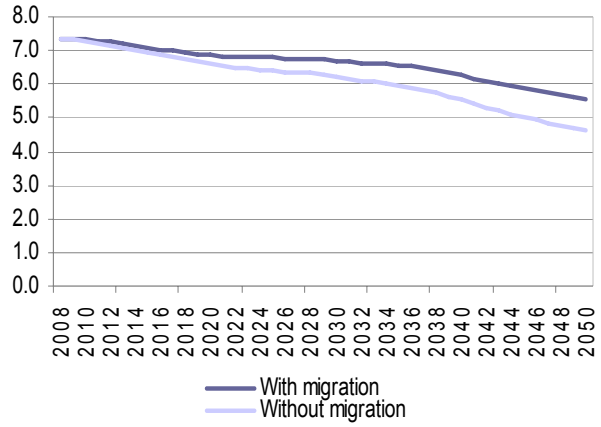
Other, non-economic factors influence the pattern of migration behaviour as well. Established social networks play a major role. Among potential countries with similar labour market situations, migrants tend to opt for those where a community of their compatriots is already established to some extent. Such a community can help them find work, obtain work permits, communicate with officials, overcome language barriers and so on. The nationality structure of immigrants therefore varies greatly from one European country to another. In the Czech Republic the Vietnamese community operates the most on the basis of social support networks, and there is also a large group of immigrants from Ukraine. In South European countries – in particular France, Spain and Italy – there are large groups of immigrants from Morocco. Polish emigrants, which form one of the largest groups of emigrants in Europe, are concentrated mainly in the UK and Germany (see Herm, 2008).

Demographic trends and immigration

A major labour market problem across Europe is the expected decline in labour supply due to population ageing. Generations entering the labour market are smaller than those exiting it. Labour immigration is often mentioned as a potential solution to the problem of population ageing.

The latest Eurostat population projection predicts that net migration (the difference between the number of immigrants and the number of emigrants) will gradually fall in the EU. In the Czech Republic it should continue rising over the next couple of years, but in 2012 it will also start declining slowly and after 2040 the migration inflow will be lower than it is now. The Eurostat population projection in general assumes convergence, with all EU countries gradually copying the demographic behaviour of the "front-runners" and the differences in the demographic behaviour of EU countries gradually disappearing. The convergence year is 2150, when zero net migration (immigration equal to emigration) is also assumed. The decline in immigration may be affected, for example, by the fast economic growth in Asian countries and the transfer of industrial production to countries with lower labour costs, which will also shift demand for low skilled third-country workers outside Europe. In some source countries a rising price level may also play a role by narrowing the differential between source and host countries and thereby reducing the motivation to migrate. International migration, however, is the most difficult to predict population projection variable, as it depends on numerous external (e.g. economic and legislative) conditions. For example, in its projection the Czech Statistical Office does not assume a fall in migration, but keeps net migration constant and positive over the entire projection period up to 2065.[1].

Figure 1: Projection of Czech population aged 15–64 (millions)



Source: Eurostat: (2008), table code: proj_08c2150p, proj_08c2150zmp, date of access: 18. 11. 2009.

In terms of population ageing the Czech Republic is in a worse situation than the EU-27 as a whole. According to the Eurostat projection, by 2050 the population aged 15–64 will decrease by 12% in the EU-27 and 24% in the Czech Republic taking migration into account. In the hypothetical case

[1] Source: CZSO (2009f), date of access: 16.11.2009.

of zero migration, the productive-age population would fall by 37% in the Czech Republic and 27% in the EU-27 (see Figure 1). According to the projection, migration has greater potential to slow the effect of population ageing in the EU-27 than in the Czech Republic, but even in the Czech Republic its slowing effect on the decline in the productive-age population is significant. Population projections reveal that immigration to European countries, not excepting the Czech Republic, can help to slow but not reverse the labour force shrinkage trend. Despite immigration to the EU, therefore, ageing of the European population must be expected and further measures introduced to deal with it.

Labour statistics and stay of foreign nationals

There are no fully integrated statistics of the stay and employment of foreign nationals in the Czech Republic. The data on foreign nationals come from numerous different sources (see Box 2). Although the CZSO tries to publish these data in a single location, they do not form a consistent database that can be linked to the figures on total employment in the Czech Republic.

Box 2 – Sources of data on foreign nationals in the Czech Republic and their employment

The Interior Ministry Directorate of the Alien and Border Police Service monitors the stay of foreign nationals in the Czech Republic and the type (duration) of this stay broken down by regions of the Czech Republic. It provides information on the country of origin of foreign nationals residing in the Czech Republic and on their age and sex structure, but it does not monitor their economic activity. The statistics include data on the number of foreign nationals residing in the Czech Republic on the basis of temporary residence of EU citizens, permanent residency permits, long-term residency permits or visas for stays of over 90 days in the case of third-country nationals (i.e. citizens of non-EU/EEA/EFTA countries). The data are published monthly and in a more detailed breakdown quarterly and annually. Legislative amendments to the types of stay of foreign nationals have caused methodological changes to these statistics and thus breaks in some of the time series in 2000 and 2004.

The Ministry of Labour and Social Affairs (MoLSA) Employment Services Administration monitors information on foreign nationals as employees, partners, members, and members of statutory bodies of companies and cooperatives. It keeps records of valid employment permits issued to foreign nationals and data on the recruitment of foreign nationals who do not need an employment permit (EU/EEA and Swiss citizens and nationals of other countries with permanent residence). The MoLSA data contains information on the occupations and sectors of employment of foreign nationals and are published monthly and in a more detailed breakdown quarterly and annually.

The Ministry of Industry and Trade keeps records on the number of trade licences issued and hence provides certain information on the employment of trade licence holders, among other things source documents relating to the sector breakdown. These data are available annually.

The Labour Force Survey (CZSO) is generally the primary source of information for monitoring the structure of employment and unemployment in the Czech Republic. This survey takes place quarterly on a sample of around 26,000 households living in flats. Collective accommodation establishments are excluded from the survey.

Source: CZSO (2009b), date of access: 2. 11. 2009.

The standard survey providing information on employment and its structure in the Czech Republic is the Labour Force Survey (LFS) conducted quarterly by the Czech Statistical Office. However, because the LFS is conducted in households it systemically omits some groups of the population. For example, it excludes collective accommodation establishments (hostels, dormitories), which are occupied largely by foreign nationals. The numbers of foreign nationals residing and employed in the Czech Republic are thus systematically and significantly underestimated in the LFS. The occupation and sector structures of foreign nationals are of course also misrepresented in the LFS, since hostels are occupied significantly more often by low skilled foreign nationals working in elementary occupations in construction and manufacturing.

The statistics on the employment of foreign nationals obtained from Ministry of Labour and Social Affairs (MoLSA) and Ministry of Industry and Trade administrative sources cannot be simply added to the LFS employment statistics, as they differ methodologically. Moreover, it is impossible to identify exactly what proportion of foreign nationals is covered by the survey. As the employment of foreign nationals accounts for a significant 7% or so of total employment, the issue of integrating the two sets of statistics is highly important. Besides differences stemming from the various examination methods, illegal stays and illegal labour are a major problem. In some sectors, illegal workers can account for a significant proportion of employment. From the statistical perspective, this results, for example, in unrealistic labour productivity results in those sectors. Despite the major limitations of the current statistics on foreign nationals working in the Czech Republic, however, numerous analyses can be conducted. These are presented in the following text.

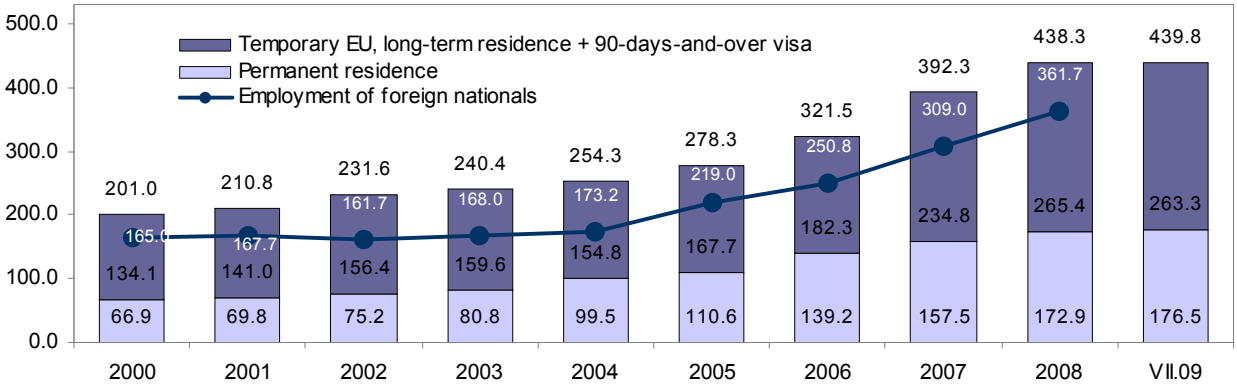
Number of foreign nationals in the Czech Republic and their employment

Immigration to the Czech Republic differs from the immigration behaviour observable in other EU countries. Overall growth in the rate of migration to the EU-27 gradually slowed in 2002–2006. In particular, there was slowing growth in migrants from third countries, who make up the majority of migrants in EU countries. By contrast, migration of citizens between the current EU countries increased faster and faster, being strongly affected by the enlargement of the EU and later the Schengen Area (see Herm, 2008, p. 2)

The Czech Republic recorded a different trend. Growth in immigration to the Czech Republic started accelerating in 2004 in the case of both EU-27 and third-country immigrants. The rate of migration to the Czech Republic expressed in terms of the number of immigrants (i.e. persons who in a given year migrated to the Czech Republic for 12 months or more) per 1,000 citizens was still below the EU-27 average in 2006 but was above it in 2007 (see Figure 3).The Czech Republic has shown positive net migration of foreign nationals since 2002. Every year the number of immigrants exceeds the number of emigrants and so **the number of foreign nationals residing in the Czech Republic** is rising in the long term. The growth trend accelerated sharply after the Czech Republic joined the EU in 2004. Between 2003 and 2008, the number of foreign nationals residing in the Czech Republic rose by almost 80% (see Figure 2).[2]

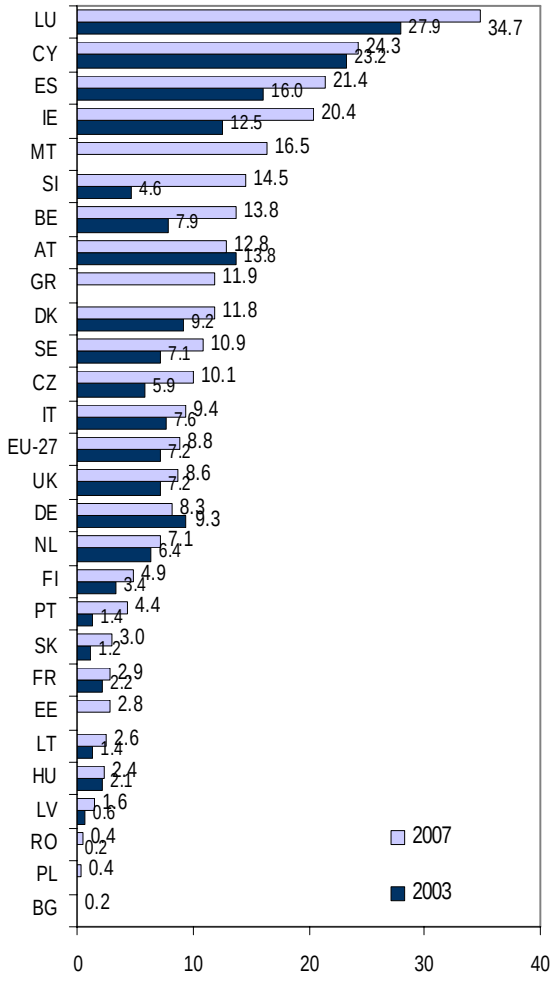
[2] The statistics on the stay of foreign nationals cover foreign nationals residing in the Czech Republic on the basis of visas for stays of over 90 days and longer durations. They do not cover short-term stays of up to 90 days.

Figure 2: Foreign nationals residing in the Czech Republic and their employment (thousands)



Note: Covers foreign nationals with residence for over 90 days and longer durations. The residence data for 2008 and 2009 have been added to the time series from the monthly statistics, which may differ slightly from the statistics published annually. The data do not cover the approximately 2,000 asylum seekers resident in the Czech Republic. Source: CZSO (2009b), date of access: 2. 11. 2009.

Figure 3: Rate of migration to EU countries (‰) – number of immigrants per 1,000 citizens



Note: FR-2007 – data for 2006, for notes to the immigration statistics in individual countries see http://epp.eurostat.ec.europa.eu/cache/ITY_SDDS/Annexes/migr_flow_esms_an1.pdf. Source: EUROSTAT (2003–2007), table migr_immictz, 10. 11. 2009

The share of foreign nationals who have permanent residence in the Czech Republic in the total number of foreign nationals is broadly constant. Until 2003 it was fluctuating around one-third. On the Czech Republic's entry to the EU it jumped to around 40%. This increase was due mainly to a change in conditions entitling EU citizens to apply for permanent residence in some cases after three rather than five years (see Box 1).

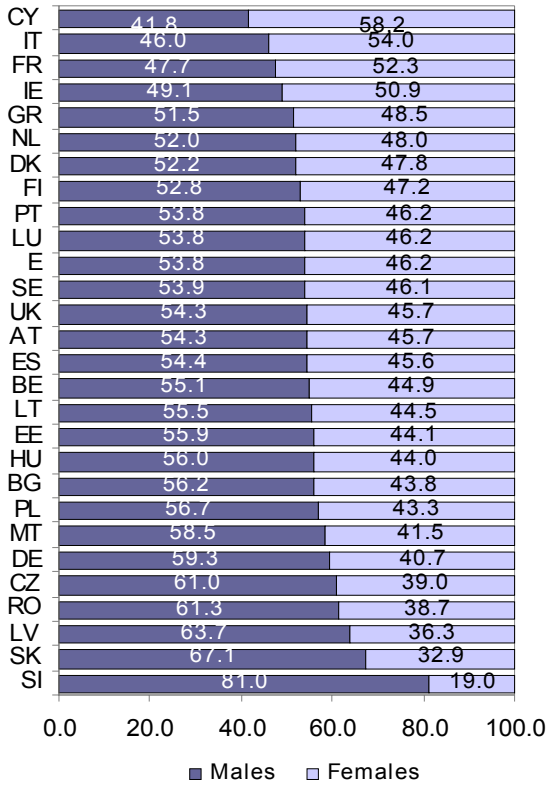
The primary reason for immigration to the Czech Republic is a desire to work in the Czech labour market. The most frequent purpose for which foreign nationals are granted residence permits is employment (33%). In second place is family unification, which also entitles family members of Czech citizens to work in the Czech Republic (28%), and in third place is work on the basis of a trade licence (17%) (see CZSO, 2009b). Studying is not a major factor attracting migration to the Czech Republic. One reason for this may be the language barrier and the still low capacity of courses offered in major world languages.

Approximately 60% of all foreign nationals in the Czech Republic are men. The structure of the Czech labour market offers male foreign nationals better job opportunities than it does female ones (for example in industrial production and construction). Many families, especially from relatively nearby countries such as Ukraine, opt for a strategy of temporary employment of a male family member in the Czech Republic while the rest of the family stays in the country of origin, where living costs are lower. In recent years, a predominance of male over female immigrants has also been recorded by the EU-27 as a whole, and in particular by the states of Central and Eastern Europe. By contrast, women have predominated among immigrants to the countries of Southern Europe (see Figure 4), where they are probably finding work primarily in tourism. The mismatch between male and female migration is higher for migrants from EU countries than for those from third countries.

The rate of employment of foreign nationals in the Czech Republic is around 80% of the number of all resident foreign nationals. This is a significantly higher figure that that for the domestic population and testifies to economic reasons for migration. When one relates the number of foreign nationals employed in the Czech Republic to the total number of foreign nationals aged over 15, the employment

rate comes to almost 100%.[8] 90% of foreign nationals residing in the Czech Republic are of economically active age (15–64 years). For comparison, only 71% of people in the Czech population are of economically active age (2007) (see CZSO, 2009b and CZSO, table 3, date of access 2.11.2009).

Figure 4: Shares of males and females in immigration (2007, %)



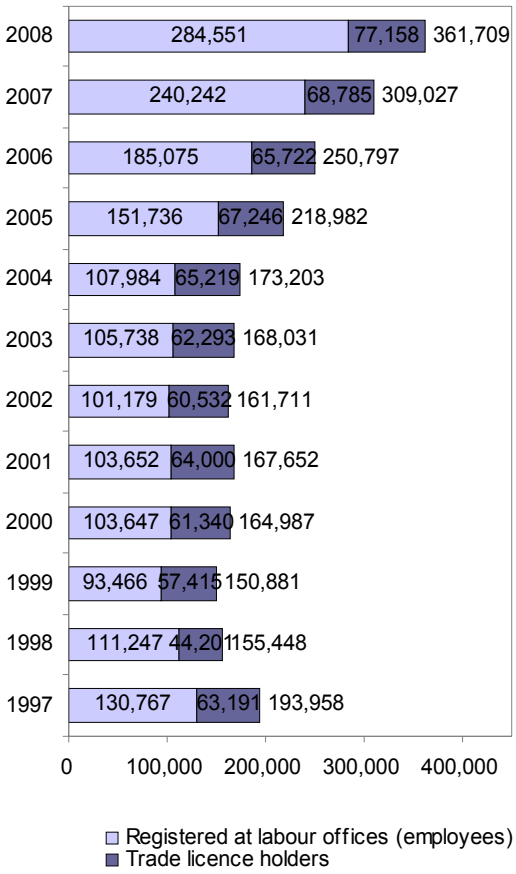
Note: FR – 2006, for notes to the statistics see http://epp.eurostat.ec.europa.eu/cache/ITY_SDDS/Annexes/migr_flow_esms_an1.pdf. Source: Eurostat (2003–2007), table code migr_immictz, date of acsess 10. 11. 2009.

The number of foreign nationals working in the Czech Republic fluctuated in the second half of the 1990s. An unbroken rise in the number of foreign workers started in 2002 and accelerated in 2005 after the Czech Republic joined the EU (see Figure 5). Between 2004 and 2008, the number of foreign nationals working in the Czech Republic more than doubled, rising faster than the total number of foreign nationals residing in the Czech Republic. Work was thus an increasingly frequent reason for immigration following the Czech Republic's entry to the EU (see Box 3).

There was particularly dynamic growth in the number of foreign employees, which rose 2.6 times between 2004 and 2008. The numbers of foreign trade licence holders also rose, but far less significantly and also not constantly; for example, their number fell slightly between 2005 and 2006.

[8] The employment rate calculation is only approximate, as the data on stays and employment come from various sources (see Box 2).

Figure 5: Employment of foreign nationals in the Czech Republic 1997–2008



Source: CZSO (2009b), date of access: 2. 11. 2009.

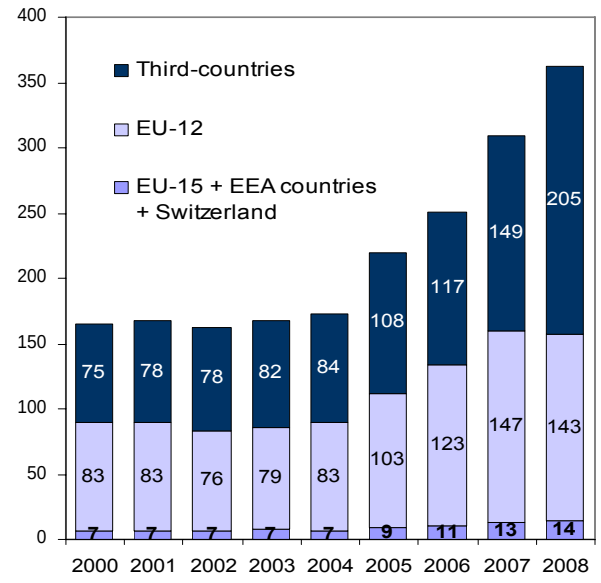
Box 3 – Employment of foreign nationals

Employment of foreign nationals is governed mainly by Act No. 435/2004 Coll., on Employment. Only EU citizens, family members of Czech nationals and foreign nationals having permanent residence are allowed to work in the Czech Republic without a work permit or trade licence. Other foreign nationals may be employed only if they have a valid residence permit for the purpose of employment and a valid employment permit or are green card holders. Employment permits are issued by labour offices for a maximum period of two years and can be extended. Trade licences are issued to foreign nationals by the Ministry of Industry and Trade.

Source: Act No. 435/2004 Coll.

The Czech Republic's entry to the EU and the related opening of the Czech labour market to citizens of the EU, EEA countries and Switzerland was a key factor in the inflow of foreign workers. The number of workers from these countries rose 1.8 times in the case of the new EU member states and 1.9 times in the case of the old EU member states between 2004 and 2008. The growth in the number of third-country workers was even more sizeable (see Figure 6), but this growth was due more to the overall economic situation in the Czech Republic than to EU accession per se. In 2005–2008, the Czech Republic recorded relatively high economic growth and rising employment, which in turn generated higher demand for foreign labour. The rising number of foreign nationals employed in the Czech Republic was influenced by jobs created by foreign investors, which boosted demand mainly for less skilled workers in manufacturing and construction.

Figure 6: Numbers of foreign workers by country of origin (thousands)



Source: CZSO (2009b), date of access 2. 11. 2009.

Structure of foreign employment

Given the above limitations of the statistics, the structure of foreign employment can be investigated to only a limited extent. The following analysis is based on the structure monitored in Ministry of Labour and Social Affairs and Ministry of Industry and Trade administrative sources (see Box 2).

Table 1: Numbers of foreign workers by nationality (top ten countries in 2008)

	2000		2008	
	Score	%	Score	%
Foreigners total	164,987	100.0	361,709	100.0
Slovakia	70,237	42.6	109,478	30.3
Ukraine	37,155	22.5	102,285	28.3
Vietnam	19,382	11.7	48,393	13.4
Poland	8,712	5.3	22,044	6.1
Mongolia	891	0.5	13,157	3.6
Moldova	1,852	1.1	9,748	2.7
Bulgaria	2,697	1.6	6,066	1.7
Russia	2,970	1.8	4,576	1.3
Germany	2,289	1.4	4,135	1.1
Romania	1,090	0.7	3,876	1.1

Source: CZSO (2009b), date of access 2. 11. 2009.

Not surprisingly, Slovaks account for the largest share of foreign nationals working in the Czech Republic (see Table 1). Many are long-term or permanent residents of the Czech Republic. Unlike other foreign nationals, they do not face language or cultural barriers and their labour market conditions are close to those of the domestic population. Although their share in total employment is decreasing, they still make up almost one-third of foreign employment. The number of workers from Ukraine almost drew level with the number of Slovaks in 2008. It recorded the largest growth between 2000 and 2008. Ukrainians accounted for 28.3% of employment of foreign nationals in the Czech Republic in 2008. Workers from Vietnam accounted for a further 13.4% of foreign employment in the Czech Republic in 2008, with Poles, Mongolians and Moldovans following some way behind. Germany is the only EU-15 state in the top ten. More than 1,000 registered workers also came from other EU-15 countries (the UK, France, Italy and Austria).

Employment status

Most foreign nationals work in the Czech Republic as employees. In 2008, employees made up around 79% of all foreign workers in the Czech Republic. However, the proportion of trade licence holders is higher among foreign nationals than among the Czech population (21% as against 16%) (see CZSO, VŠPS, 2008). A trade licence is easier to obtain and more advantageous than a work permit, as the latter is tied to a specific job and if that job is lost the residency permit can also be cancelled. This is confirmed by the fact that the proportion of trade licence holders is just 10% among EU/EEA citizens, who do not require a work permit to work in the Czech Republic, while it is 30% among third-country nationals. Third-country nationals often work in disguised employment (as so-called "Švarc system workers"), i.e. they work mostly for a single employer, but as trade licence holders rather than as employees. The employer is thus not bound by the obligations laid down in the Labour Code and does not have to pay employee-related social and health insurance contributions.

By far the highest proportion of trade licence holders is recorded in the Vietnamese community (66%). Vietnamese people living in the Czech Republic have taken on the role of small traders, and most of them are genuinely doing business. There are also relatively high proportions of trade licence holders among citizens of Russia (28%) and Ukraine (21%), where the share of Švarc system workers is certainly significant (see Figure 7).

Flexibility of foreign employment

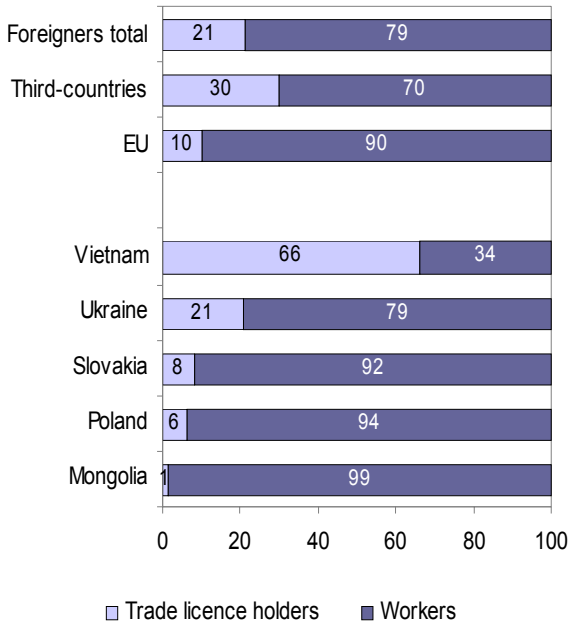
As with the Švarc system, other (legal) forms of flexible employment of foreign nationals tend to be imposed by employers rather than being requested by foreign employees themselves. In particular, third-country nationals working in manual jobs very often have fixed-term employment contracts lasting just a few months. According to a survey of employers conducted in 2006, roughly half of employers preferred fixed-term contracts for foreign nationals working in manual jobs and almost one-third preferred the same for foreign nationals working in qualification demanding occupations (see Rakoczyová, 2007, p. 78). Meanwhile, the proportion of fixed-term contracts or agreements among all those employed in the Czech Republic in the same year was just 10% in manual occupations (ISCO 5–9) and 7% in skilled occupations (ISCO 2–3) (see CZSO, 2006). In many cases, the fixed-term work of foreign nationals is linked with the limited time validity of work permits.

A specific form of employment of foreign nationals is **agency employment**. The agency functions as an employer that provides its employers to various companies for work. These workers are the company's most flexible staff, as the Labour Code does not apply to the company in respect of such workers. The Labour Code must be observed by the employer, i.e. the agency, which can react flexibly to changes in demand by moving its workers from one company to another. There were 1,025 employment agencies with authorisation to employ foreign nationals registered in the Czech Republic in October 2009 (see MoLSA, 2009a). In past years the number of foreign nationals employed by employment agen-

cies was quite high. However, in the first half of 2009, owing to the economic crisis and rising unemployment, administrative restrictions were imposed on the occupations for which foreign nationals can be hired on temporary assignment from employment agencies. The newly specified occupations only covered vacancies that could not be filled despite the rising unemployment – in particular technicians, health workers, construction and other trades workers, machine operators and drivers (see GO 64/2009 Coll.). In October 2009 the number of employment permits for foreign nationals employed by employment agencies was less than 5,000[4].

Foreign nationals form a flexible workforce not only as regards easier termination of employment (either by termination of agreement or by expiration of contract), but also as regards adaptability to difficult working conditions. According to the results of the LFS, around 20% of workers were working nights, while 31% of employers reported foreign nationals working nights. 22% of total employment was weekend work, while 72% of employers reported weekend work for foreign nationals (see CZSO, 2006 and Rakoczyová, 2007, p. 81). Although the data from the LFS and the employer survey are not fully comparable, they do suggest that foreign nationals work non-standard hours more often than the domestic population.

Figure 7: Share of trade licence holders among workers from various countries (2008, %)



Note: EU includes EU/EEA and EFTA countries. Source: CZSO (2009b), date of access 2. 11. 2009.

Sector structure of employment of foreign nationals

The employment of foreign nationals in the Czech Republic is concentrated mostly in two sectors – manufacturing and construction. By comparison with the domestic population the share of foreign nationals employed in construction is particularly high. The majority of foreign nationals entering the Czech Republic work in these sectors, mostly as unskilled workers in low-paid jobs with difficult working conditions. Another (smaller) proportion of foreign nationals is concentrated in highly specialised service sectors such as legal and accounting services, architectural and engineering services, research and development, advertising and market research, and translating. These are sectors where foreign nationals work in highly specialised positions for which the Czech labour market still seems to lack workers with the necessary expertise (see Table 2).

Table 2: Sector structure of employees in the Czech Republic as a whole and of foreign nationals (2008, %)

NACE Rev. 2		Foreigners	CR
A	Agriculture, forestry and fishing	1.9	3.0
C	Manufacturing	36.2	30.6
F	Construction	24.3	7.0
G	Wholesale and retail trade; repair of motor vehicles and motorcycles	8.4	11.2
H	Transportation and storage	2.8	7.0
I	Accommodation and food service activities	2.2	3.4
J	Information and communication	2.6	2.3
L	Real estate activities	3.2	0.6
M	Professional, scientific and technical activities	7.0	2.5
N	Administrative and support service activities	3.1	2.5
P	Education	1.5	6.5
Q	Human health and social work activities	1.9	7.1
	Others	5.1	16.2
	Total	100.0	100.0

Note: Data on foreign nationals with employee status are available for 2008 in the structure of the new CZ-NACE classification of economic activities. By contrast, the latest data on the structure of trades licences issued are available for 2007 still in the structure of the previously used OKEČ classification. The change to the new classification restricts full comparability of the data on trade licence holders and employees but is not a barrier to the main findings. For more on the classification of economic activities see the CZSO website: http://www.czso.cz/csu/klasifik.nsf/i/klasifikace_ekonomickych_cinnosti_(cz_nace). Source: CZSO, 2009c, date of access 2. 11. 2009 and CZSO, 2008a.

For the analysis of the sector structure of foreign-national trade licence holders, data are available on the number of trade licences issued. This does not directly give the sector structure of the main line of business, since some people may have more than one trade licence. The comparison with the LFS trade licence holder structure is thus only indicative. However, it does generate some interesting findings.

Foreign-national trade licence holders operate to a far greater extent than their Czech counterparts in the trade sector (see Table 3). The majority are people from Vietnam who make a living as retailers in the Czech Republic. A large percentage of foreign nationals – most of them Ukrainian citizens – also do business in the construction sector. Some of them may be genuinely independent craft workers, but many are hired by firms on the basis of trade licence certificates rather than being employed (the aforementioned Švarc system).

Skilled and unskilled labour of foreign nationals

As indicated earlier by the sector structure of employment, the employment of foreign nationals in the Czech Republic is highly polarised between a minority of workers in highly qualification demanding jobs and a majority of workers in jobs requiring very low or zero skills. 33% of foreign nationals with employee status work in elementary occupations.

[4] Source: MoLSA (2009c).

Table 3: Sector structure of trade licence holders in the Czech Republic and trade licences issued to foreign nationals (2007, %)

NACE Rev. 1.1		Foreigners	CR
A,B	Agriculture, hunting and forestry; Fishing	1.4	4.2
D	Manufacturing	8.0	13.6
F	Construction	20.4	21.4
G	Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	44.8	17.8
H	Hotels and restaurants	3.9	4.3
I	Transport, storage and communication	0.9	5.9
K	Real estate, renting and business activities	14.6	15.9
M	Education	2.0	1.2
O	Other community, social, personal service activities	3.3	7.8
	Others	0.6	7.9
	Total	100.0	100.0

Source: CZSO (2009b), date of access 2. 11. 2009 and CZSO (2007).

Foreign nationals make up more than 25% of all employees in such jobs. A further large section of foreign nationals works in other low-skilled occupations – as craft workers (24%) and as plant and machine operators and assemblers (17.5%) (see Table 4).

Table 4: Occupation structure of employment of foreign nationals (2008)

	Employees total	Foreigners	Foreigners as a share of all employees
1. Legislators, senior officials and managers	5.3	2.5	3.2
2. Professionals	10.5	6.8	4.4
3.Technicians and associate professionals	23.1	6.9	2.0
4. Clerks	8.2	3.0	2.5
5. Service workers and shop and market sales workers	11.7	4.7	2.8
6. Skilled agricultural and fishery workers	1.0	0.9	6.3
7.Craft and related trades workers	17.0	24.2	9.7
8. Plant and machine operators and assemblers	15.2	17.5	7.8
9. Elementary occupations	8.1	33.4	28.2
Total	100.0	100.0	6.8

Source: CZSO (2009b) and CZSO (2008b), date of access 2. 11. 2009.

The share of foreign nationals in qualification demanding occupations is relatively low, but a higher proportion of foreign nationals work in high demanding occupations – as managers, professionals and technicians – than in medium demanding occupations – as clerks and service workers. Management positions are often held by managers of international companies appointed to such posts when companies start up in the Czech market. Temporary duplication of managerial posts (i.e. a foreign manager working together with a Czech one) also exists.

The smaller share of foreign workers in medium demanding occupations may also be due to the more frequent need for a good knowledge of Czech language in administrative jobs and services, which restricts the employment of foreign nationals in such jobs. Prejudice also plays a large role, as it often stops employers in services from recruiting workers with "Eastern accents" (see Grygar, Čaněk, Čejník, 2006, p. 9).

The occupation structure of foreign employees corresponds fairly well to the structure of vacancies registered by labour offices, which again suggests that foreign nationals work in the Czech Republic mainly in jobs that the Czech population is not interested in doing (see Figure 8). The differences are only small – among foreign nationals the proportion of unskilled occupations is higher, while among vacancies, by contrast, the proportion of skilled craft occupations is higher.

Low skilled and unskilled work in the Czech Republic is the domain of third-country nationals, especially from Eastern and South-Eastern Europe. Foreign nationals from these countries are viewed by the public as being predestined for unskilled work regardless of their true qualifications. Employers fail to use the skills potential of third-country migrants and in most cases recruit them automatically only to low skilled jobs.

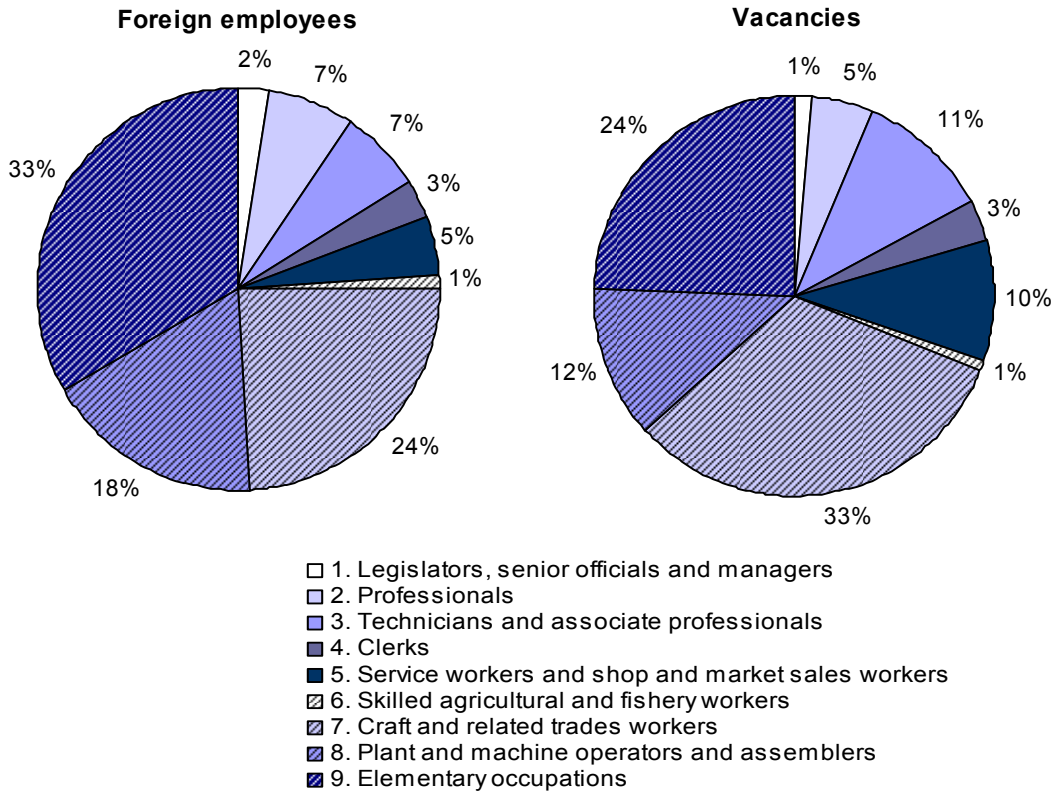
Although the Labour Force Survey is not particularly appropriate for investigating the employment of foreign nationals, it can offer some relevant data. This data reveals that third-country nationals work far more frequently in low-skilled occupations than do the domestic population and EU foreign nationals, regardless of their formal qualifications. According to the LFS, around 28% of all those with tertiary education from third countries were working in lower skilled occupations (ISCO 5–9). Among Czech workers the equivalent figure was just 4% and among workers from EU/EEA countries it was practically zero. That said, one should bear in mind that the LFS systematically underestimates the numbers of third-country workers working in low skilled occupations because they are living in hostels and dormitories (see above). The true share of third-country university graduates working in lower-skilled occupations is therefore probably even higher.

It would seem that the Czech Republic does not know how to fully exploit the potential of third-country workers and offer them employment commensurate with their skills. And yet a large proportion of tertiary-educated foreign nationals have technical and health training that is in high demand in the Czech Republic. Highly qualified third-country workers are still motivated to come to the Czech Republic. The earnings difference and the difference in the supply of job opportunities is so great that university-educated foreign nationals are better off doing unskilled work in the Czech Republic than skilled work in their country of origin. The language barrier may also be preventing foreign nationals from entering skilled occupations in the Czech labour market.

Besides not being employed in highly qualification demanding occupations, third-country nationals are also at an earnings disadvantage compared to Czechs. Although exact data are not available, the predications of employed foreign nationals suggest that their starting salaries and wage progression are significantly lower than those of Czechs employed in the same position with the same employer, even among foreign nationals that already have permanent residence in the Czech Republic (see Grygar, Čaněk, Čejník, 2006, p. 17).

The migration of qualified labour force is usually promoted strongly by target countries. Countries of origin, by contrast, tend to try to prevent this situation, as for them a brain drain means a major loss of development potential. If, however, labour emigration is only temporary, its effect on the country of origin need not be negative. Work experience in an economically more advanced country can develop workers' skills and experience, which can then be applied in country of origin. Host countries try to attract skilled foreign workers

Figure 8: Occupation structure of foreign employees and vacancies (as of 31 December 2008, %)



Source: CZSO (2009b), date of access: 2. 11. 2009 and MoLSA (2009d), date of access: 4. 11. 2009.

with various incentives. At the start of 2009, the Czech Republic introduced a "green card" scheme allowing employment and residence permits to be obtained simultaneously for selected occupations. Just after it was introduced, however, the inflow of foreign nationals into the Czech Republic was hit by the economic crisis. This measure is on the statute book but not used to any great extent. Twenty green cards had been issued by the end of October 2009 (see MoLSA (2009e).

With increasing skills, the intensity of the income incentive to migrate falls and the importance of other motivating factors, such as gaining experience or developing language skills, rises. A special case is the mobility of leading experts and scientists, for whom the income incentive plays a smaller role and the academic prestige of the host institution and creativity are more important (see Vavrečková, 2006, p. 12). The income incentive to migrate for high skilled workers can differ greatly from one occupation to another depending on the demand for them and on salaries in the country of origin and the host country. Doctors have a particular high earnings incentive to migrate from the Czech Republic to the UK, Ireland, Germany and Austria. On the other hand, computer programmers have virtually no incentive to migrate, as their salary level in the Czech Republic is almost comparable with that in Ireland, Germany and Austria (see Baštýř, 2009).

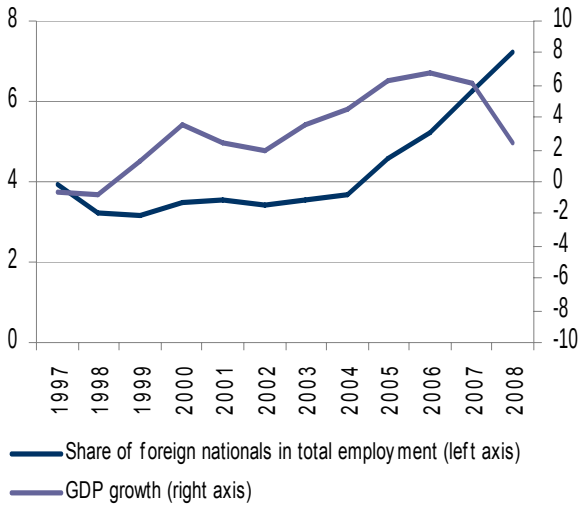
According to a study conducted in 2004/5, there was particularly high demand in the Czech labour market for technical professionals (ISCO 214). They accounted for 31% of professionals in demand among high-skilled occupations (ISCO 1+2). Among them, mechanical engineers were the most highly sought after. There was also high demand for business professionals (finance, personnel, etc.) and health care professionals, in particular doctors and pharmacists. It turned out that the Czech labour market was short of experts capable of combining their specialised knowledge with other skills (e.g. customer relations) (see Vavrečková, 2006, p. 39). These occupations are in many cases very difficult to replace with short-term and temporary foreign labour, as many positions still require a good command of Czech. For technological positions, where the degree of communication with customers is lower and where customers are often foreign nationals owing to links to foreign clients, Czech is less important and the prospects of recruiting experts from abroad are rather better.

Effect of economic situation on foreign employment

Foreign employment shows a stronger dependence on economic growth than total employment in the Czech Republic (correlation coefficients of 0.804 versus 0.452 in the period 1997–2008), confirming the assumption of high flexibility of foreign labour force[5]. GDP and the numbers of foreign nationals have been rising very significantly in recent years, and so, therefore, has their share in employment in the Czech Republic. In 1998, foreign nationals made up around 3% of total employment; by 2008 the figure had reached 7% (see Figure 9). As indicated in the methodology section, however, the share of foreign nationals in total employment may be misleading, as it is not exactly clear which employed foreign nationals are included in total employment and which are not.

[5] Employment generally lags behind the economy – economic growth/decline is reflected in employment growth/decline with a lag of one or more quarters. Economic growth in 1996–2007 and employment in 1997–2008 were thus used for the correlation computation.

Figure 9 – Share of foreign nationals in total employment and GDP growth (%)

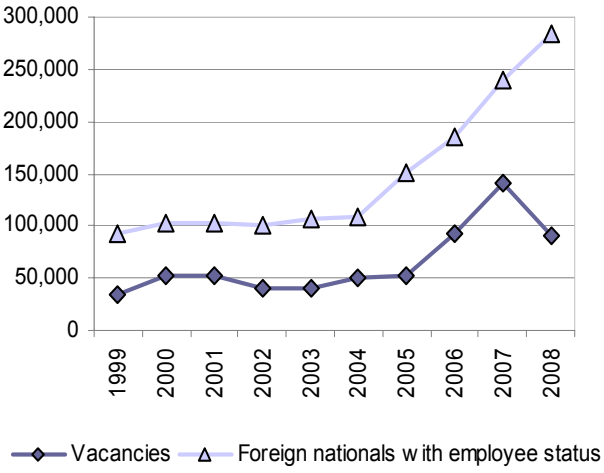


Source: CZSO (2009b), date of access 2. 11. 2009 and CZSO (2009d), date of access 24. 11. 2009.

Until 2007, the number of foreign nationals with employee status was developing in line with the number of vacancies (see Figure 10). This suggests that foreign labour force responds to the labour market situation and can help to resolve labour market imbalances. However, this applies fully only in a situation of rising vacancies. Foreign labour force reacts far less quickly to a fall in the number of vacancies. This is indicated by the discrepancy between a rising number of foreign nationals and a falling number of vacancies resulting from the economic crisis at the end of 2008.

The inflow of foreign employees adjusted strongly to the increased demand for labour at the time of rapid economic growth and rising employment in the Czech Republic in 2005–2008. The economic crisis led to a wave of redundancies which most affected agency employees, fixed-term contract workers and workers in lower-skilled occupations, i.e. the categories of employees in which the largest proportion of foreign employees is concentrated.

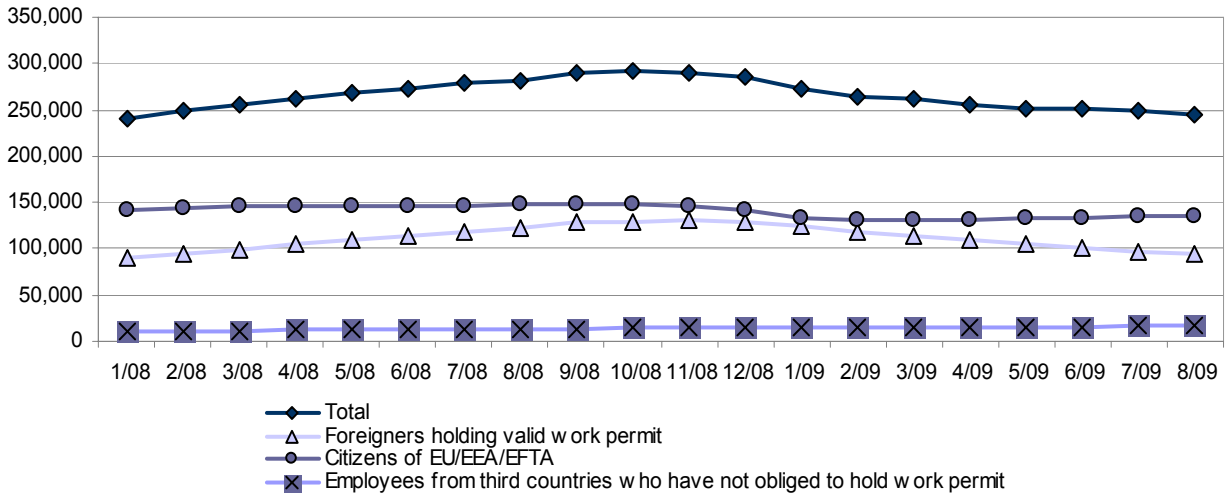
Figure 10: Number of foreign nationals with employee status and number of vacancies.



Note: Data as of 31 December each year. Source: CZSO: CZSO (2009b), date of access 2. 11. 2009 and MoLSA (2009d), date of access 24. 11. 2009.

As Figure 11 shows, the rate of inflow of foreign employees clearly reacted to the onset of the economic crisis. The long-term upward trend in the number of foreign employees in the Czech Republic immediately halted when the crisis broke out in September 2008. Foreign employees were made redundant in the shortest time allowed by the statutory two-month notice period, i.e. in December 2008. The fall in the number of employed foreign nationals was very rapid during the first quarter of 2009 and then slowed slightly. A particularly sharp fall was seen in January, linked primarily with the termination of fixed-term employment at the end of the calendar year. This situation is repeated seasonally every year. In previous years, the January decline had been offset by the signing of new contracts in the subsequent two months and the situation had returned to the long-term upward trend in employed foreign nationals. In 2009, however, as a result of the economic crisis, new contracts were not signed and the total number of employed foreign nationals kept falling until August 2009 (for which the latest data are currently available).

Figure 11: Number of foreign nationals with employee status at the onset of the economic crisis



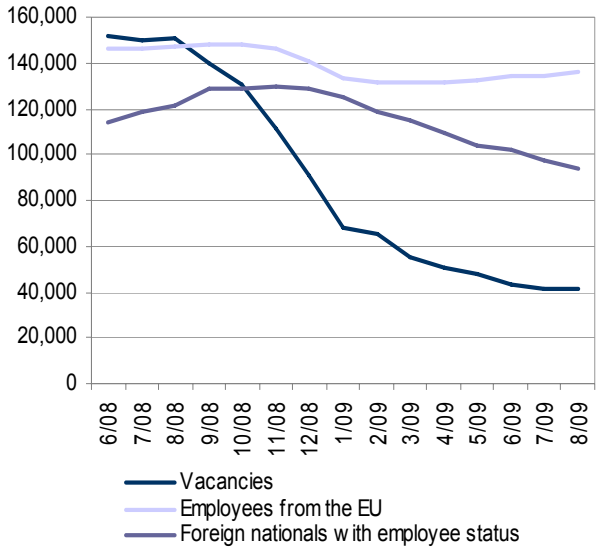
Source: CZSO (2009b), date of access 2. 11. 2009

The consequences of the crisis have been different for third-country nationals working in the Czech Republic on the basis of work permits and for foreign nationals from EU/EEA/EFTA countries, who do not need a work permit to work in the Czech Republic. The rate of growth of the number of third-country nationals kept increasing in the period 2006–2008, mainly because of strong demand for their labour in low skilled occupations, especially in manufacturing and construction. These sectors were hit hardest by the crisis. Employment of third-country nationals started falling at the end of 2008 and declined at a roughly constant rate right up to the end of the period under review. Between August 2008 and August 2009, employment of foreign nationals working in the Czech Republic on the basis of work permits decreased by almost one-quarter, i.e. by around 28,000 workers.

The rate of growth in the number of foreign nationals from EU countries began slowing roughly in mid-2007. The outbreak of the crisis of course led to a decline in employment in this group, too, in late 2008 and the first quarter of 2009. In May 2009, however, the number of foreign nationals from EU countries employed in the Czech Republic began rising again. In August 2009 their employment fell only by around 11,000 persons year on year, i.e. around 8%. The recent trend is one of gradual growth. Foreign nationals from EU countries work in the Czech Republic to a greater extent in service sectors and in higher-skilled occupations, which have not been hit as hard by the economic crisis as industrial sectors and less-skilled occupations.

The preceding analysis of longer-term trends reveals that the number of employed foreign nationals is linked to a large extent with the registered number of vacancies. During the economic crisis this trend has been confirmed for third-country employees, although the decline in employment of foreign nationals is lagging behind that in the number of vacancies, probably because of statutory notice periods. The number of employees from the EU, however, is not following the number of vacancies to any great degree. The former started rising in May 2009, whereas the number of vacancies registered by labour offices is still falling (see Figure 12).

Figure 12: Number of foreign nationals with employee status and vacancies during economic crisis



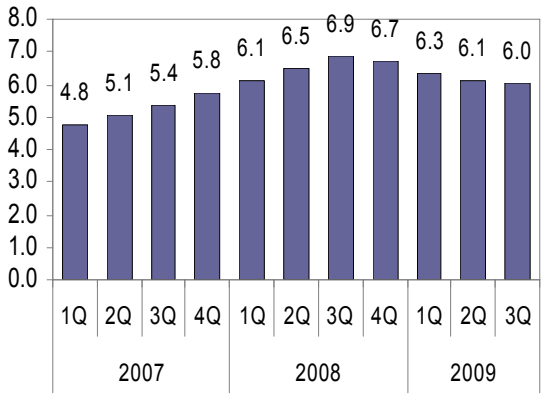
Source: CZSO (2009b), date of access 2. 11. 2009 and MoLSA (2009d), date of access 24. 11. 2009.

This may again be due to the qualification level of the occupations in which EU citizens work. Labour office registers contain lower skilled vacancies to a much greater extent. Qualification demanding vacancies are usually filled by other mechanisms. Now that the initial, most dramatic effects of the economic crisis have subsided, demand for qualification demanding occupations is creeping up again, since firms need skilled employees for innovation and restructuring processes.

The impacts of the crisis have hit foreign employees in the Czech Republic harder than employees as a whole. Up to the third quarter of 2008, when the economic crisis started, the share of foreign nationals in all employees in the Czech Republic was rising regardless of seasonal effects. Since then, it has been falling constantly. Although the total number of employees has also been decreasing as a result of the crisis, the share of foreign nationals reveals that foreign employees have been hit harder (see Figure 13).

This is due both to their sectoral and occupational structure, with manufacturing sectors and low skilled occupations having been hardest hit, and to the fact that foreign nationals in the Czech Republic were working more often than the Czech population on the basis of some form of flexible contract (for instance as agency employees, by agreement or for a fixed period). These flexible arrangements were first in line to be cancelled when the crisis erupted.

Figure 13: Share of foreign nationals in all employees (%)



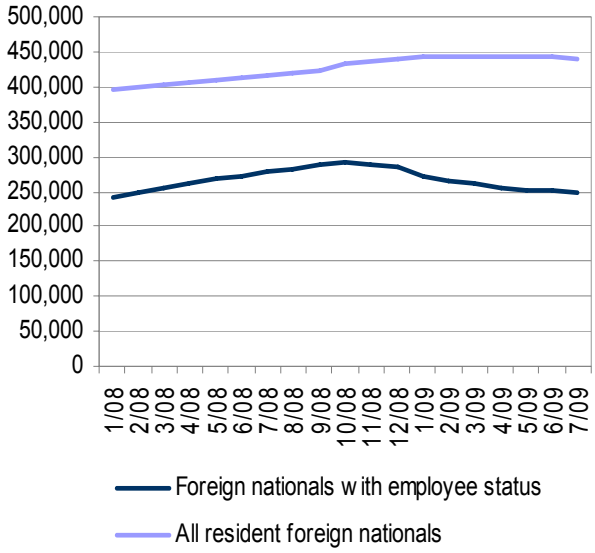
Note: Including members of production cooperatives. Source: CZSO (2009b), date of access 2. 11. 2009 and 2007–2Q/2009 – CZSO (2009h), table 206; 3Q 2009 – CZSO (2009g), date of access 5. 11. 2009.

The economic crisis has led to a decline in both total employment and the absolute number of employees in the Czech Republic. Seemingly paradoxically, however, the absolute number of trade licence holders has started rising. This has been enforced largely by employers, who have started to use the labour of their former employees through the Švarc system.

At present it is impossible to determine whether a similar strategy has been adopted by foreign nationals who previously worked in the Czech Republic as employees and hence to what extent the total employment of foreign nationals in the Czech Republic has really fallen. The data on the number of foreign nationals with a trade licence are published only once a year and the latest data are from the end of 2008, when the economic crisis had yet to impact

fully on employment. This is, however, an important analytical issue as regards future monitoring of the employment of foreign nationals. The hypothesis appears likely also because the numbers of foreign nationals living legally in the Czech Republic has not started falling at all significantly despite the declining number of foreign employees (see Figure 14). If these individuals have not started performing some other type of economic activity, they would not be able to continue residing legally in the Czech Republic.

Figure 14: Number of foreign nationals with employee status and all resident foreign nationals



Source: CZSO (2009b), date of access 2. 11. 2009.

Illegal labour of foreign nationals

The preceding analyses were based on statistics on foreign nationals who are residing and working legally in the Czech Republic and are therefore captured in the official statistics. Besides them, however, an additional large number of foreign nationals are residing and working illegally or unreported in the Czech Republic, like in other European states. This part of the subchapter on the employment of foreign nationals at least briefly examines the issue of illegal labour, which had to be omitted from all the previous analyses owing to a shortage of data sources. Illegal labour of foreign nationals can take a whole range of forms, ranging from basically criminal activity through to mere failure to report the labour of foreign nationals allowed to work legally in the Czech Republic. In the following text, illegal labour refers primarily to work that is not necessarily criminal per se, but whose illegality ensues from the fact that it is performed by a worker who is not legally entitled to work in the Czech Republic. Unregistered work refers primarily to unreported work by EU citizens, who are entitled to work in the Czech Republic without restrictions, but whose employer is required to report that it has entered into an employment relationship.

Illegal labour has adverse economic and social consequences. Taxes and mandatory deductions are not paid from it, so it reduces the revenues of the state budget. In occupations with a higher proportion of illegal employees, legal wages are pushed downwards and worsen the working conditions both for legally employed foreign nationals and for workers from the domestic population. Legal employees are not able to compete with illegal ones in the labour market, since their labour is more expensive on principle. Illegal employment also gives an unfair advantage to employers, as it reduces their labour costs in comparison with employers who employ workers legally and who must therefore abide by the Labour Code and pay mandatory deductions for their employees.

Besides the above economic consequences, illegal labour and residence generates social problems. Putting people in any way outside the law carries the risk of further criminality. The key question is how to deal with illegal migrants and employees whose employment permits have ended as a result, for example, of the economic crisis, and how the responsibility and potential costs associated with repatriation should be split in this situation. Illegal employee status also has numerous negative implications for migrants themselves and in many cases is not voluntary. Many migrants entering the Czech Republic use the services of agencies, be they legal or illegal and whether they operate from the Czech Republic or directly in the migrant's country of origin. Migrants and their families often get heavily into debt in order to be able to work in the host country. In many cases this subsequently implies loss of work/residence permit, thus putting migrants in a very difficult life situation. If they returned to their country of origin, they would be unable – given the wage level there – to repay the debt from their income. Illegal labour in the host country, which guarantees a higher income, is thus basically the migrant's only way out (see Drbohlav, 2008).

Although migrants themselves are primarily responsible for dealing with the situation of loss of employment and residency permit, the large majority of them are not able to do so for the reasons given above. Repatriation costs could in theory be borne by the other entities involved in the entire process – the host country, employer or agent. It has been proposed that the state should organise coverage of such expenses, for example via payments into a fund by employers or agencies employing foreign nationals. It is very hard to avoid excessive debt preventing return. The only possible solution is tighter control of agencies organising employment for foreign nationals in other countries and cooperation with governments of countries of origin. Given the political situation, however, this is possible only in some cases.

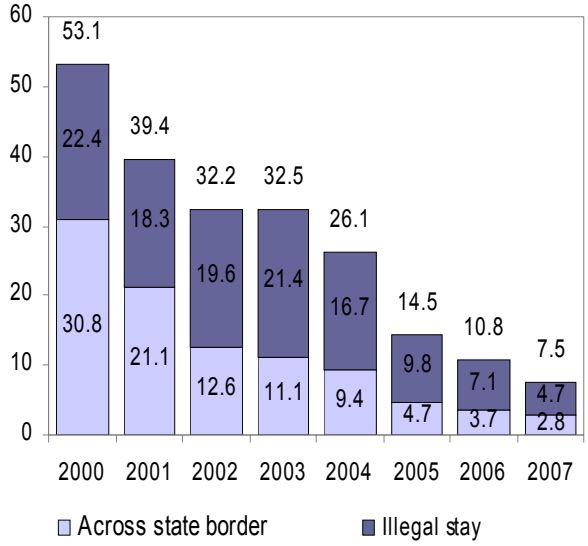
Illegal and unregistered employment is also a problem with regard to monitoring the labour market and the performance of the economy. In the statistics, output produced by illegal workers is regarded as having been produced by legal employment, which distorts the labour productivity picture. As illegal employment is concentrated primarily in just a few sectors, this distortion can be relatively significant despite a generally negligible level of illegal employment.

By its very nature, the extent of illegal migration and employment is difficult to measure. According to the statistics on recorded illegal migration, the number of illegal migrants has been falling sharply in recent years (see Figure 15). Provided that the efficiency of police work in this area is not falling drastically, one can thus assume that illegal migration is still declining overall.

Illegal employment is not the same as illegal migration. Some illegal workers may be residing legally in the Czech Republic but their residence permit does not entitle them to be employed or carry on business. The extent of illegal labour is very difficult to quantify. It can be inferred, for example, from the inspections conducted by labour offices. In 2007, labour offices inspected almost 22,000 foreign workers, of which almost 4,000, i.e. around 17%, were not regis-

tered. 7% of cases concerned illegal labour and 10% concerned failure to fulfil the reporting duty. Most frequently involved were citizens of Slovakia and Ukraine, who make up the largest group of foreign nationals working in the Czech Republic (see MoLSA, 2008). If the results of these inspections reflected the true level of illegal labour, it would mean that there are more than 60,000 workers working unregistered or illegally in the Czech Republic. However, this generalisation is very approximate, since the inspections are not conducted in a very systematic or representative way.

Figure 15: Recorded illegal migration (thousands)



Source: CZSO (2009b), date of access 2. 11. 2009.

Expert estimates of the number of illegal migrants in the Czech Republic lie in the wide interval of 17,000–300,000 (see Drbohlav, 2008, p. 178). The median number of illegal workers according to the Delphi expert opinion method ranged between 100,000 and 150,000 in 2005/6, but here too there was no great consensus (see Table 5). Such high illegal employment would account for almost 3% of total employment in the Czech Republic. The high rate of illegal labour by foreign nationals is influenced by the fact that illegal labour is also quite widespread among the domestic population in the Czech Republic, usually in the form of undeclared side-line job or failure to declare some proportion of business work.

Table 5: Likely number of illegally economically active migrants in the Czech Republic

	Informants answers (%)
0–39,999	11
40,000–99,999	33
100,000–149,000	19
150,000–199,999	19
200,000 and more	19

Note: Total exceeds 100% owing to rounding. Source: Drbohlav, 2008.

Agriculture, construction and low-productive manufacturing, retail trade, and hotels and restaurants are regarded as the traditional sectors of illegal labour. That said, illegal labour also reflects changes in the economy and is starting to be seen in personal services as well (child-minding and cleaning). These are all sectors with a high volume of manual work, low productivity and high seasonality. However, illegal labour is also now penetrating higher-skilled sectors. Here it is being supported, for example, by the spread of information technology, which makes it relatively easy for self-employed people to work illegally (see Drbohlav, 2008, pp. 69 and 72). According to experts, by far the largest percentage of illegal workers comes from Ukraine, followed by Russia and Vietnam (see same reference, p. 109). Bear in mind, however, that among third countries these countries also account for the highest shares of legal workers in the Czech Republic.

Illegal and legal employment of foreign nationals is a relatively new and increasingly important phenomenon in the Czech labour market. Owing to the ageing of the Czech population and the shortage of workers in some occupations starting to emerge in the Czech labour market, the importance of workers from abroad for the Czech Republic will remain high. There is thus a need to seek ways of integrating foreign nationals effectively into the Czech labour market, minimising illegal employment and exploiting the skills of foreign nationals who come to work in the Czech Republic.

3.2 Flexible working arrangements

Globalisation of the economy, technological progress (linked with a rising pace of change in demands on the labour force) and the drive to stay competitive in this environment are fostering an emphasis on quick and easy adaptability (flexibility) of human resources. The concept of "flexicurity" has become a focus of interest among analysts and politicians in recent years. This expresses the effort to achieve sufficient labour market flexibility while maintaining adequate social security and employee protection.

In this chapter we examine an important element of labour market flexibility, namely flexible forms of employment. Flexible working arrangements and working hours play a key role in work-life balance. The accelerating population ageing expected in the coming decades and the growing need to increase employment among those who are currently often completely outside the labour market (e.g. parents on parental leave, older persons and the disabled) will lead to a greater prevalence of flexible working arrangements tailored to the needs of individuals and groups.

The term "flexible forms of employment" has blurred boundaries. The legal definition of flexible forms of work in the Czech Republic is described in Box 4. It also mentions other alternative work organisation methods that are applied despite not being expressly defined in the legislation. In different countries, however, the individual alternatives are defined differently and are subject to different rules, or they may even not occur in a given country at all. They also differ in concept and content across different studies and papers.

By comparison with other EU countries, the Czech Republic provides a very high level of legislative protection of standard (permanent) employment. Temporary employment contracts, by contrast, are regulated to a relatively small extent. Changes have been made to the Labour Code in recent years in an effort to gradually redress the balance. On the one hand, greater freedom has been introduced into employment contracts (the "what is not forbidden is allowed" principle) and the process of laying off employees has been made easier. Social partners also have greater freedom to negotiate flexible forms of work and these changes are also appearing more frequently in collective agreements (see Nekolová, 2008). On the other hand, legislative protection is being increased for temporary employees and agency work-

ers, for example through a ban on chaining temporary contracts for more than two years.

Despite these quite rapid changes in the legislation, the active use of flexible forms of employment in the Czech Republic is lower than in the majority of European countries. According to a questionnaire survey conducted in the Czech Republic in 2008 by the Confederation of Industry of the Czech Republic[6], 79% of companies apply flexible forms[7] of work, but those forms account for just 5% of the total volume of employment, which is below the EU average. The most prevalent arrangements are flexitime (86% of companies that use flexible working arrangements, corresponding to around 68% of all the companies surveyed) and part-time work (around 40% of all the companies surveyed). Some companies also offer the option of homeworking (around 30%). The other flexible forms of work covered by the survey are less prevalent in the Czech Republic (e.g. phased retirement – 17%, job sharing – 9%).

Box 4: Flexible forms of employment in Czech labour law

The basic options for flexible employment in the Czech Republic are laid down in the Labour Code. As regards duration of employment it distinguishes **fixed-term (temporary) employment**, for which a duration period is expressly stipulated, and **indefinite-term (permanent) employment**. Temporary employment contracts (including repeating ones) between the same parties are limited to a maximum total period of two years. The exemptions where a longer temporary employment contract is permissible consist mainly of the situation where someone is standing in for an employee who is temporarily absent because of a career break (in practice this refers mainly to maternity and parental leave).

The Labour Code also defines **agreements on work performed outside the scope of employment**, where the employer is not obliged to specify the employee's working hours. Such agreements cover agreements on work performance, limited to 150 hours a year, and agreements on working activity, limited to half the weekly working time on average.

Under an employment contract it is possible to agree **part-time work**, i.e. working hours shorter than the stipulated weekly hours (in most occupations 40 hours), for which the employee receives a commensurately reduced wage. Working hours can also be flexibly scheduled in various ways. So-called **irregular working hours** allow for working time to be scheduled into shifts (of 12 hours at most) according to the needs of the firm or the employee. **Flexible working hours** mean that the employee chooses when to start and finish work within time periods defined by the employer, in between which there is a core period when the employee is required to be at work. The employee must complete the required working hours in a four-week balancing period at most. In the case of a **working time account** the employer is required to keep a working time account and earnings account for the employee and the balancing period may be up to 26 weeks long (the working time account primarily addresses large seasonal fluctuations in work volume).

In addition to these forms of employment defined expressly by the Labour Code, the following options can be applied, for example: **homeworking**, where the employee works off-site and schedules his or her own work time; **teleworking**, where the employee again works off-site and stays in touch by means of telecommunication; **jobshare**, where two or more part-time employees share a job and split their working hours by agreement; and **compressed working week**, where the full weekly working time is concentrated into four longer days and the employee takes the fifth day off.

[6] The survey was conducted as part of the project *Promotion of Flexible Forms of Work through Social Dialogue from Employers' Perspectives*. Responses were obtained from 114 domestic companies and compared with the results from eight other European countries.

[7] The survey did not cover agreements on work performance, agreements on working activity and temporary employment contracts.

The Czech Society for Human Resources Development (ČSRLZ) also conducted a survey of flexible forms of employment among its members in 2008 (ČSRLZ, 2008) and arrived at similar conclusions. Companies were also asked about agreements on work performed outside the scope of employment (agreements on work performance and agreements on working activity). These turned out to be the most prevalent types of flexible working (offered by around 90% of the companies surveyed[8]). The other findings were broadly in line with the results of the Confederation of Industry (SPČR) survey. Part-time work and flexitime are very widely used (both being offered by roughly 80% of the companies surveyed). 36% of the companies surveyed allow some of their employees to work from home part time. The other flexible work options covered by the survey are offered to a lesser extent: full-time homeworking – 12%, jobshare – 11%, compressed working week – 6%.

The comparability of the SPČR and ČSRLZ surveys is limited, since they examined various forms of flexible working which in neither case copy exactly the breakdown of work forms defined by the Czech legislation. The slightly more positive results obtained by the ČSRLZ may be due to the fact that it conducted its survey mostly among its members and it is reasonable to assume that these are employers that put greater emphasis on care for human resources.

The explanation of why flexible forms of work are still less prevalent in the Czech Republic than in most EU countries lies in a combination of factors. State support for them is insufficient, employees show little interest in them as they are not favourable for the majority of them under the existing conditions (see below), and a large proportion of employers see them as risky. For example, the SPČR survey reveals that almost half of the employers surveyed are worried that there could be more limited training opportunities for employees in flexible forms of employment. Almost half of employers are also convinced that flexible work forms require a different style of human resources management. One-third of employers believe that flexible work forms mean less control over employees' work time (almost half of employers not using alternative work forms believe this).

On many issues the survey results revealed a large difference between the opinions of companies that use flexible forms of employment and those that have no experience of them. The survey results took no account of the area of business, which significantly affects how much flexible work forms are feasible and advantageous for the companies and therefore also the probability of whether or not they have experience of them. The difference in opinions does deserve attention, though. Companies with no experience viewed the risks as being more serious and the benefits mostly as being smaller, or saw the potential benefits as lying elsewhere than actually stated by companies using flexible forms of employment based on their experience. Companies not using alternative forms of employment also much more frequently (40%) said that they did not have enough information about them. It can therefore be inferred that distorted ideas and low awareness among employers are a major barrier to the wider use of flexible work forms in the Czech Republic. Take, for example, the responses of employers regarding higher administrative costs associated with flexible forms of employment. Only 16% of the companies that use these

[8] A total of 105 companies took part in the ČSRLZ survey. The overwhelming majority of them were in the 500–3,000 employees category.

forms replied that they cause increased administrative costs, whereas 53% of them disagreed with this assertion. By contrast, 57% of companies that do not use flexible work forms believe that they do cause increased administrative costs. These findings suggest that this frequently cited argument against flexible forms of employment is either prejudice or justified by concerns arising from the hard-to-quantify organisational and capacity costs of switching to a new way of organising work. Nevertheless, firms in which flexible forms of work are already established and functioning do not experience higher administrative costs.

Employers were also asked about the potential benefits of flexible forms of work. Quite a large number of benefits were found. Employers believe most frequently that flexible forms of work allow better retention of valuable employees who otherwise might leave the company (64%), that they can increase the subjective satisfaction and motivation of employees (62%) and that they allow them to extend operating hours without incurring overtime costs (60%). Large proportions of employers also said the advantages included more flexible planning during peak and quiet periods (e.g. seasonal fluctuations) or flexibility in covering sick/annual leave (54%), wider recruitment options (49%) and reduced recruitment/turnover/absenteeism costs (34%).

A large proportion of employers express an interest in increasing the number of flexible workers in the future (for example 54% of those surveyed in the ČSRLZ study). The further development of such work forms will probably also be supported by the economic crisis, which will force companies not only to cut jobs, but also to offer alternative work forms to valuable employees whom they wish to retain (see SPČR, 2008).

The prevalence of flexible forms of work is influenced to a large extent by the size and type of business of the company. For a small firm it can be organisationally difficult and potentially risky to coordinate labour if it has a high percentage of employees enjoying a high level of freedom (ibid.), but the international EWCS[9] survey showed that in most EU countries, including the Czech Republic, part-time work is more prevalent among people working in small enterprises (or in small local units of companies) of up to 49 employees. In many countries (although not the Czech Republic), however, the share of part-time workers rises again in the largest enterprises/units (250+ employees). The prevalence of flexible forms of work also differs markedly across sectors (see below), since the individual forms differ in their suitability for different types of business.

Two forms of flexible working – part-time work and temporary contracts – were chosen for more detailed analysis.

Part-time work

Part-time work is far less prevalent in the Czech Republic than in the EU on average. Indeed, the Czech Republic has one of the lowest levels of part-time work as a percentage of total employment – 5.6% (see Table 6). There is no great interest in part-time work among either employees or employers in the Czech Republic. The lack of interest among employees is due mainly to the lower earnings associated with shorter hours. Consistent with this is the fact that the part-time work is least prevalent in less developed countries. However, Turkey and Romania, for example, have appreciably higher shares than the Czech Republic, indicating that economic level and relative income are not the sole determinants.

Another reason why employees do not favour part-time work is the fact that such workers are often expected to do more than their fair share of work and a widespread culture of unofficial overtime forces them to work harder than they are paid to do. Part-time employees also tend to be excluded from company programmes and benefits provided to full-time employees (e.g. meal vouchers, pension/life insurance contributions, contributions for leisure activities, career plans and training support).

The EWCS findings confirm that the subjective assessment of part-time work is often worse than that of full-time work. For almost all EU countries, including the Czech Republic, part-time workers have far fewer subordinates on average than do full-time workers. Part-time work is therefore associated more frequently with lower positions. This is logical given the obvious fact that managerial positions, associated with the management of subordinates, tend to be more demanding and require control of the entire work process and therefore require a full-time presence in the workplace.

Table 6: Part-time work as a percentage of total employment (2Q 2009, %)

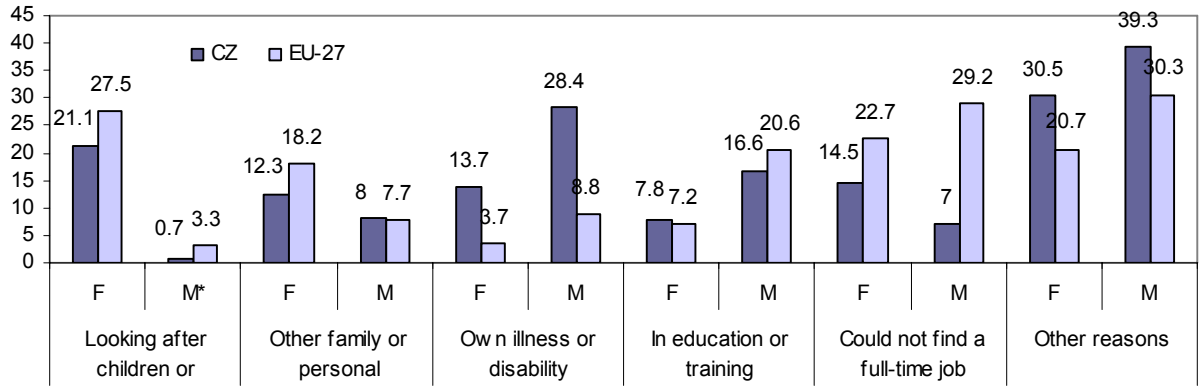
		Age group			
	Total	15–24	25–49	50–64	65 and older
NL	**48.2**	73.6	40.9	46.9	79.7
SE	**27.0**	48.2	22.0	25.5	68.8
DE	**26.3**	22.0	25.3	27.5	69.7
UK	**26.1**	38.1	20.9	28.0	67.6
DK	**25.8**	60.5	16.5	23.3	63.6
AT	**24.9**	18.3	25.1	24.7	70.7
BE	**23.2**	25.8	20.9	28.4	61.6
EU-15	**21.6**	31.3	19.0	22.1	57.7
IE	**20.8**	33.4	17.1	23.9	39.8
EU-27	**18.8**	28.1	16.1	19.7	53.6
FR	**17.1**	21.7	15.4	18.9	53.3
IT	**14.4**	20.2	15.0	10.6	25.5
FI	**13.4**	35.7	8.0	12.9	59.7
ES	**12.9**	25.5	12.1	10.7	30.5
EE	**11.7**	16.3 u	9.5	10.8	57.8 u
PT	**11.7**	12.9	6.3	13.5	58.5
TR	**11.3**	12.0	8.5	19.4	35.2
SI	**10.7**	37.5	5.8	10.7	45.9
RO	**10.0**	14.7	6.7	12.1	35.8
LT	**8.6**	10.0 u	7.0	10.7	28.1 u
PL	**8.6**	14.4	5.5	12.2	56.2
CY	**8.4**	15.4	6.2	7.5	43.8
LV	**8.1**	17.0	5.7	8.3	20.6
GR	**6.0**	14.8	5.3	4.9	19.0
CZ	**5.6**	8.1	3.9	6.1	53.1
HU	**5.6**	7.5	4.3	7.3	50.4
SK	**4.0**	4.8	3.2	5.3	39.2 u
BG	**2.6**	3.4 u	1.9	3.3	19.2 u

Note: u – unreliable data. Source: EUROSTAT (2000–2009), table code: lfsq_eppga, date of access: 30. 10. 2009.

It is also practically the rule among EU countries, including the Czech Republic, that full-time employees significantly more frequently see prospects for career advancement. In most countries full-time workers also state more frequently that they have opportunities to learn and grow. This trend is

[9] European Working Conditions Survey (Eurofound, 2005).

Figure 16: Reasons for part-time work among women and men (2008, %)



Note: * Unreliable data for the Czech Republic. Source: EUROSTAT (2000–2009), table code: lfsa_epgar, date of access: 4. 11. 2009.

also indicated in the Czech Republic, but was not confirmed as statistically significant owing to the small size of the sample. In roughly half of EU countries, part-time workers worry more frequently that they might lose their jobs in the next six months. In the Czech Republic, this result was again not confirmed as statistically significant. Lastly, in the majority of EU countries, full-time employees more frequently have friends at work. This can be regarded as an indicator of feeling good at work and subjectively integrated into the organisation. However, the difference compared to part-time workers is not large and in many countries, including the Czech Republic, not statistically significant.

The EWCS findings also reveal some positive aspects of part-time work. For example, in the majority of European countries part-timers state more frequently that their working hours fit in with their family and social commitments. In the Czech Republic the difference in the responses is small and not statistically significant. It was also not confirmed here that part-time employees are less satisfied than full-time employees with how well paid they are for the work they do.

Employers are deterred from offering part-time work by concerns about increased administrative and organisational costs associated with dividing the same amount of work between employees and by the idea that part-timers (in particular those working significantly shorter hours, e.g. half the full number) are not fully focused on their work, lack work continuity in teams and so on. (The disadvantages employers see in flexible forms of employment were ascertained in the Confederation of Industry survey in 2008 – see above.)

The Czech Republic also lacks a system of state support for part-time workers, including the systematic information support that exists in many Western European countries. Financial incentives, for example, are common: tax relief (UK), reduced social security contributions (France and Belgium) and direct subsidies for employers/employees (see Kotrusová, 2006). In the UK a campaign took place in 2000 to encourage employers to introduce flexible forms of work ("Work Life Balance Campaign") (see ILO, 2005).

Table 6 also shows that the percentage of persons working part time in their main job is very low in the Czech Republic in all age groups. In the 15–24 years age group the figure is 8.1% (the EU average for this age group is 28.1%). Only in the group of persons of retirement age (65+) is the share of part-time work in total employment significantly higher (53.1%). However, even this figure is not high by European standards – it is close to the EU-27 average (53.6%).

Part-time employees in the Czech Republic work an average of 22 hours a week[10], which is around 52% of the average full-time figure. The figures for other European countries are similar at around half the full-time figure. The EU-27 average is 19.9 hours, which represents 48% of the average full-time figure in the EU-27. Germany has relatively the shortest number of hours (18.1 hours, i.e. 43% of the average full-time figure), while Romania has the longest (24.4 hours, i.e. 60% of the average full-time figure).

The share of part-time work in the Czech Republic is fairly stable. Between 2001 and 2008 it fluctuated between 4.8% and 5.1%.[11] Between 2008 and 2009 (data for 2Q) it rose more sharply as a result of the economic crisis (from 5% to 5.6%). The absolute number of part-time employees rose even though total employment fell. However, this result is still among the smallest increases in the EU. Estonia recorded the biggest rise in the share of part-time work, from 6.4% to 11.7%. In Slovakia it rose from 2.2% to 4%. The EU-27 countries on average have been recording steady growth since 2001, although this has increased recently in year on year terms (16.4% in 2000, 18.3% in 2008 and 18.8% in 2009). For all the countries under review the percentage of part-time work is higher among women than among men (data for 2Q 2009). This difference tends to be greater in countries where part-time work is more prevalent. In countries such as Belgium, Germany, Austria and France, part-time work is approximately five times more prevalent among women than among men. Southern European countries – Italy and Spain – are not far behind. In countries where part-time work is more marginal, its prevalence among men and women is also more balanced (in Romania, Lithuania, Bulgaria and Slovakia the percentage of women is approximately 1.2–1.5 times higher than that of men).

It is reasonable to assume on the one hand that these facts show that in countries with higher average incomes women can more frequently afford to work part time, and on the other hand that they reflect traditional patterns of behaviour in some

[10] Source: EUROSTAT (2000–2009), table code: lfsq_ewhun2, data for 2Q 2009, date of access: 11. 11. 2009. Actual hours of work, including paid and unpaid overtime, were monitored.
[11] Source: EUROSTAT (2000–2009), table code: lfsq_eppga, date of access: 10. 11. 2009.

countries where full-time work is more typical of men while the focus of women's activities lies more often outside employment, for example in the home. The Czech Republic is an exception to this tendency. Although the rate of part-time work is very low overall, the difference between men and women is quite large. 9.2% of women work part time, compared to just 2.8% of men.

The overwhelming majority of part-time employees in the Czech Republic chose this status voluntarily for personal or family reasons. The proportion of those who work part time involuntarily (i.e. would prefer full-time work but cannot find it) is just 12.6% of total part-time work and has been falling constantly since 2005. This is a favourable fact, especially by comparison with the average for the EU-27, where the rate of involuntary part-time work in 2008 was almost one-quarter (24.2%) and unlike in the Czech Republic has been showing a rising tendency in recent years.

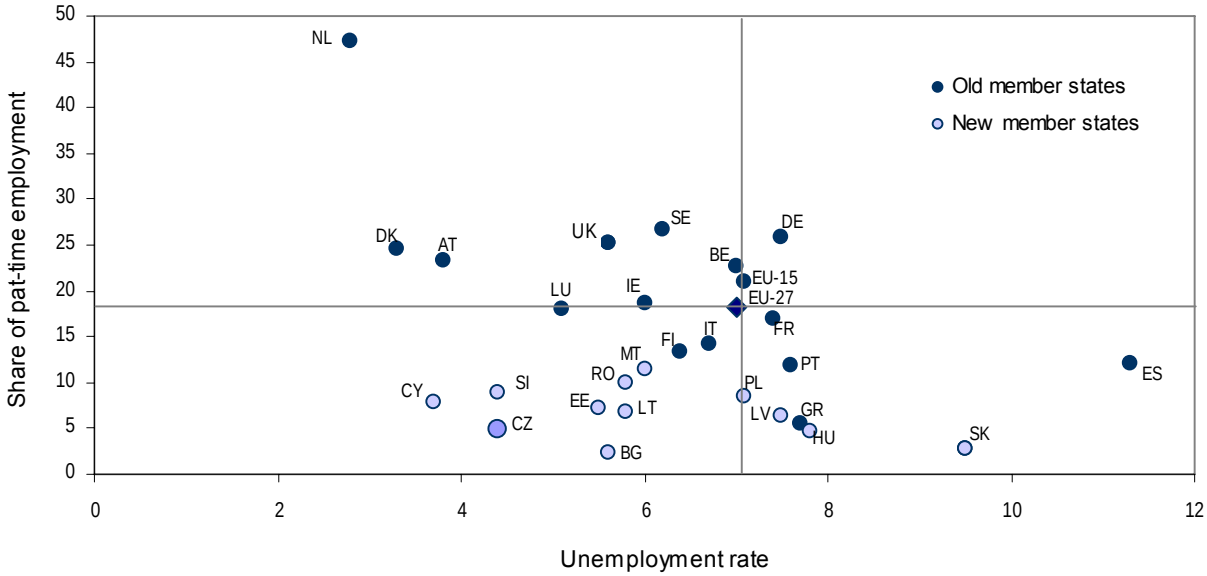
For both men and women, the most prevalent reasons why employees chose part-time work in the Czech Republic are further unspecified "other reasons" – 39.3% of men and 30.5% of women working part-time (see Figure 16). For men, "own illness or handicap" followed in second place (28.2%) and "in education or training" in third place (16.6%). For women, "looking after children or incapacitated adults" was in second place (21.1%) and "could not find a full-time job" was in third. For men, this is the second least common reason (behind looking after children or incapacitated adults). This reveals a rather unfavourable phenomenon as regards equal access to employment, namely that women in the Czech Republic who work part-time are forced much more often than men to choose this form of employment out of necessity. The Czech Republic differs strongly from the European average in the prevalence of this reason. This difference is due largely to different responses by men in the Czech Republic, just 7% of whom gave this reason, as compared to 29.2% in the EU-27. The situation is underscored by the fact that in most European countries the difference between the shares of men and women giving this reason is the exact opposite to that in the Czech Republic. The percentage of men is higher – 29.3%, as compared to 22.7% of women (the EU-27 average). This ratio is unaffected by less-developed countries or by new member states, since the EU-15 has very similar values on average (28.9% of men and 22.8% of women) as the EU-27. Along with the high proportion of men working part time in the Czech Republic for health reasons, this is further evidence that this form of employment is a marginal phenomenon among Czech men and not one of the usual choices considered by employees and employers.

The relatively low prevalence of involuntary part-time work compared to the EU average may be linked with the fact that Czech employers do not favour part-time work and part-time jobs do not feature much in the job supply. If someone is interested in working in the Czech Republic, they are more likely to find full-time work than to be forced into taking a part-time job involuntarily. By contrast, in countries where the share of involuntary part-time jobs in the job supply is higher, such jobs can also far more often become an "emergency exit" for job seekers.

The correlation between the rate of part-time work and the unemployment rate, compared across EU countries, is shown in Figure 17. It is evident that for all 27 EU countries the correlation between these two indicators is not all that strong. The correlation coefficient for all countries is -0,38, but three outlying countries contribute significantly to this outcome (the Netherlands, Spain and Slovakia). Without them, the correlation coefficient is just -0.12. The strongest correlation between the rate of part-time work and the unemployment rate is that for the old EU member states (correlation coefficient -0.66), while that for the new EU member states is much weaker (correlation coefficient -0.37, or -0.11 excluding Slovakia), since for the latter the rate of part-time work is relatively low regardless of the unemployment rate.

The labour market institutional systems in the older EU countries are generally more stable. This, combined with a higher income level of the population, allows for freer (more spontaneous) development of part-time work. By contrast, the lower average income level in the new member states hinders wider use of part-time work.

Figure 17: Correlation between the unemployment rate and the rate of part-time work in the economy (2008, %)



Note: For detailed notes to the data see EUROSTAT, LFS. Source: EUROSTAT (2000–2009), table code: lfsa_urgan, date of access: 29. 12. 2009, table code: lfsa_eppga, date of access: 29. 12. 2009.

A comparison of the rate of part-time work with the percentage of part-time work accepted involuntarily by employees offers an interesting insight into the role played by part-time work in the labour market of a particular country. This comparison is shown in Figure 18. The y-axis shows the prevalence of part-time work in a given country (part-time work as a percentage of total employment). The x-axis shows involuntary part-time work as a percentage of total part-time work. The average for the EU-27 countries notionally divides the field of values into four quadrants. The lower left-hand field contains countries in which the situation is similar to that in the Czech Republic. Part-time work has a relatively low prevalence and the percentage of persons who accept it involuntarily is also very low. These are, broadly speaking, the more developed new member states (the Czech Republic, Slovenia, Poland, Estonia, Slovakia and Lithuania) and small countries (Luxembourg and Malta).

The lower right-hand quadrant contains countries that also have a relatively low rate of part-time work, a high percentage of which, however, is involuntary. These are typically Southern European countries (Spain, Italy and Greece) or economically less developed new member states (Romania and Bulgaria), for which the rate of involuntary part-time work is highest of all (up to almost 45%). It is evident from the outcome for these countries that full-time work is regarded as the norm and part-time work is just an "emergency exit", a solution to unemployment that is regarded as temporary.

An outcome in the upper left-hand quadrant indicates a positive function of part-time work as a factor increasing labour market flexibility in a given country without part-time workers viewing it as a threat to their security. Part-time work has a relatively high prevalence here and a large percentage of such workers choose it voluntarily, i.e. it fits in better with their family and social commitments. This quadrant contains the Netherlands, Austria, Denmark, Belgium and, with a slightly higher rate of involuntary part-time work, but still below the EU-27 average, Germany. The Netherlands has an extraordinary level of both values. Part-time work is entirely normal there (47.3%), with a negligible percentage of persons accepting it involuntarily (4.4%). One can say, then, that people in the Netherlands regard part-time work as a normal alternative to full-time work and choose between the two freely according to their personal and family commitments.

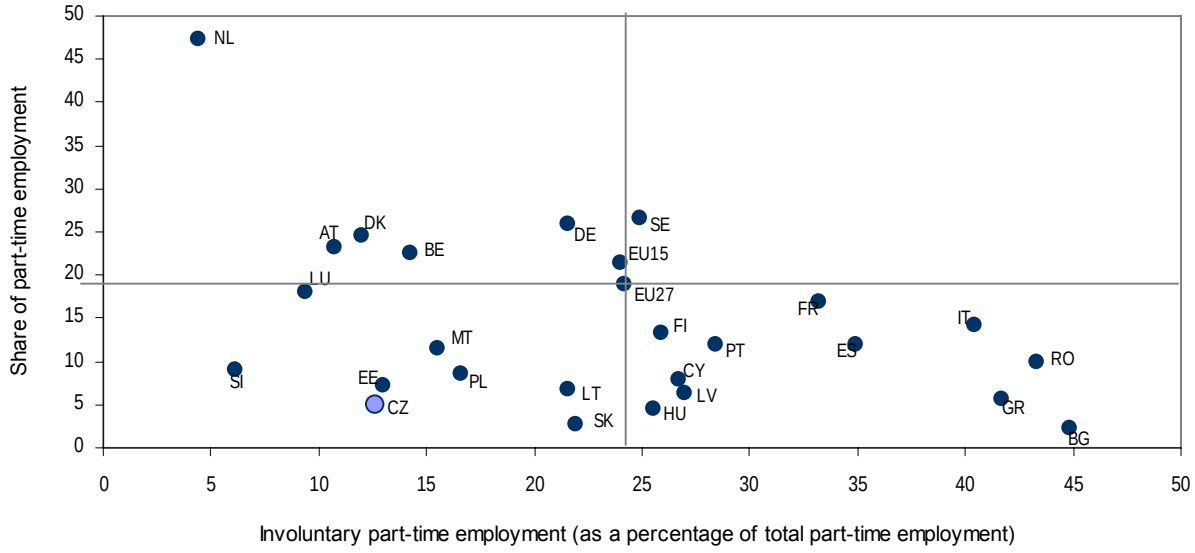
Figure 19 shows the prevalence of part-time work in various sectors according to the NACE (rev. 2) classification. Besides the EU-27 average, data for the Netherlands are included for comparison; its average rate of part-time work is the highest in the EU.

It is clear from the figure that the Czech Republic differs from the EU-27 average not only in terms of a low rate of part-time work, but also to some extent as regards the structural distribution of part-time work within the economy. On average in the EU, part-time work is far more prevalent in the sector "Activities of households as employers" (58%). However, only a very small proportion of the labour force is employed in this sector. The negligible share of this sector in employment also explains why a figure for part-time work is not available for the Czech Republic.

The more significant sectors in which part-time work has a high prevalence in the EU are the following: arts, entertainment and recreation (33%), human health and social work activities (31%), other service activities (29%), administrative and support service activities (28%) and accommodation and food service activities (28%). In the Czech Republic, part-time work has the highest prevalence in education (12%), arts, entertainment and recreation (11%), real estate activities (11%), administrative and support service activities (10%) and other service activities (10%).

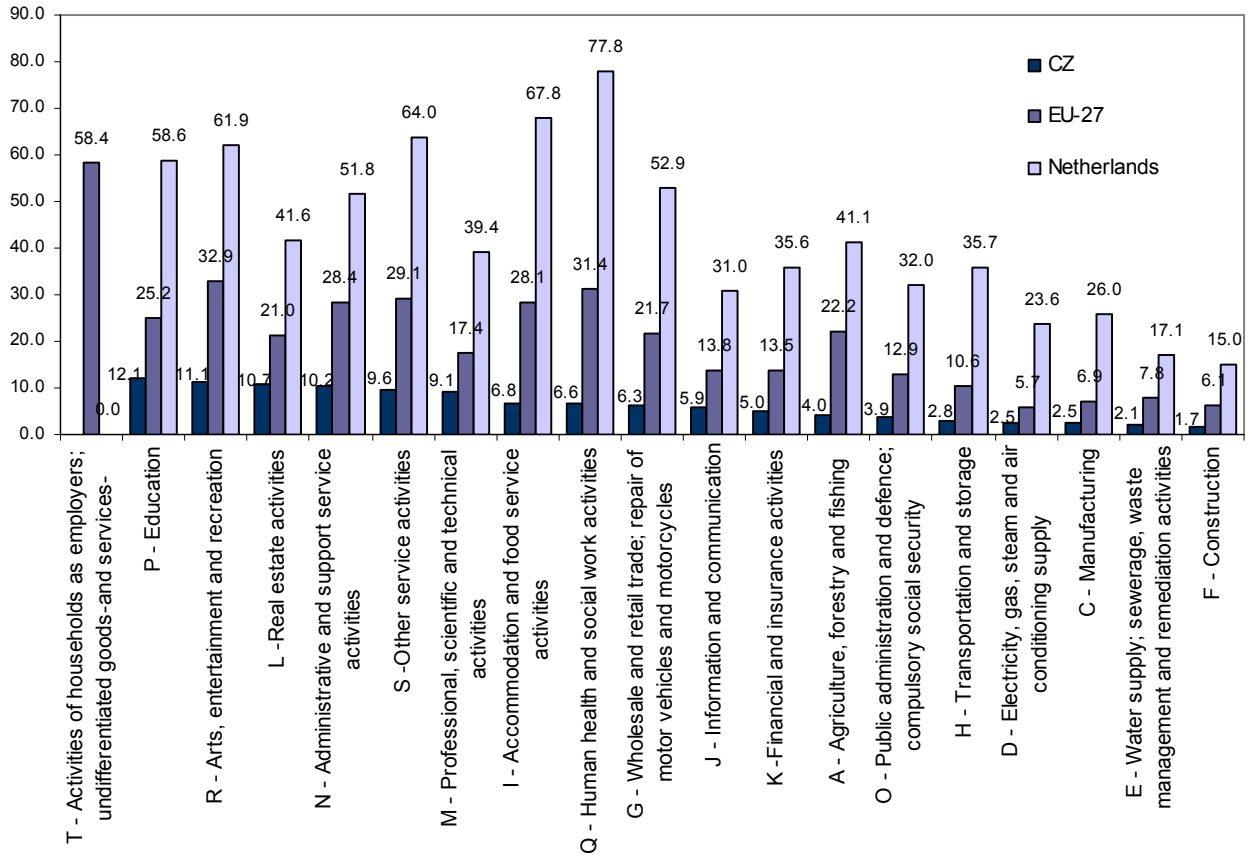
In both the EU and the Czech Republic, typical industrial sectors lie at the notional other end of the spectrum: electricity, gas, steam and air conditioning supply, construction, manufacturing, and water supply, sewerage, waste management and remediation activities. The shares of part-time work in these sectors range between 6% and 8% in the EU and just 1% and 3% in the Czech Republic.

Figure 18: Comparison of the rate of part-time work in the economy with the rate of involuntary part-time work (2008, %)



Note: For detailed notes to the data see EUROSTAT, LFS. Source: EUROSTAT (2000–2009), table code: lfsa_epgn62, date of access: 29. 10. 2009, table code: lfsa_eppgai, date of access: 12. 11. 2009.

Figure 19: Rates of part-time work in individual sectors according to NACE rev. 2 (2008, %)



Note: For detailed notes to the data see EUROSTAT, LFS. Source: EUROSTAT (2000–2009), table code: lfsa_epgan2, date of access: 2. 11. 2009, own calculation.

In terms of the rate of part-time work, the Czech Republic lags furthest behind in agriculture, forestry and fishing and human health and social work activities, where its percentage share is less than one-fifth of the EU average. The low prevalence of part-time work in these sectors is probably linked with their typically low rates of pay, as the reduced earnings associated with part-time work are insufficient to cover the necessities of life. In agriculture a strong tradition of full-time work and a low proportion of seasonal work compared to many other European countries play a role. In health and social care facilities, constant staff shortages are causing an increased need for overtime work rather than fostering the development of part-time work. In the more developed European nations, individualised social services are also much more widespread, allowing greater working time flexibility (e.g. client home visits), whereas in the Czech Republic large facilities providing mass care still predominate.

The Czech Republic is closest to the EU average in professional, scientific and technical activities, real estate activities and education, where the rate of part-time work is "only" around half of the EU-27 average. This is probably due to the high need for flexibility and rapid change in sectors where dynamic commercial services provided to companies and individuals predominate but where a round-the-clock presence in a fixed workplace is not necessary (real estate, education, professional services such as management consultancy and accountancy, etc.). Another factor is that demand for teachers is falling in the Czech Republic owing to declining pupil numbers in schools. This is exerting pressure for shorter working hours. At the same time, the nature of the teaching profession allows teachers to have a second job and thus combine jobs at various schools or other educational establishments. Teachers deal with low earnings levels in this way more frequently than do people in other professions (see Kadeřábková, 2007).

Temporary employment contracts

Part-time work can be assessed with regard to flexicurity in an unequivocally positive way. It is often used on the basis of free choice or because it suits particular life situations. And if it is used conceptually it has the potential to be of benefit to both employees and employers. Temporary employment contracts cannot be assessed quite so unequivocally. The benefits stemming from the flexibility offered by temporary employment tend to lie with employers. From the perspective of employees, this type of employment is viewed as a threat to long-term employment security. This is also reflected in the fact that almost two-thirds of such contracts (see below) in the EU are involuntary on the part of employees. Temporary contracts are also often linked with the secondary labour market[12], and members of socially marginalised or high-risk groups more often work on this basis (see, for example, European Commission, 2007).

[12] The secondary labour market is characterised by low prestige and income levels, greater volatility and low-skilled work.

It is probably for these reasons that temporary employment contracts are not always classed among flexible forms of work (for example, they were not included in the ČSRLZ and SPČR surveys – see above). However, in areas of the economy where the labour market is very vigorous and volatile, where economic activity is characterised by a high prevalence of time-limited projects or assignments that require various levels of expertise for limited periods of time or are linked with seasonal work, temporary employment can be a very important and practical alternative not only for employers, but also for some employees.

The results of the EWCS[13] reveal that employees in the present EU have a subjectively worse experience of temporary employment contracts than of permanent contracts. Employees with temporary contracts are more worried that they might lose their jobs, on average also have positions with a smaller number of subordinates (hence usually lower positions) and less frequently express the view that they are well paid for the work they do. In many countries, including the Czech Republic, temporary employees also identify less strongly with their employer (less frequently reply that they feel at home at their workplace) and less frequently have good friends at work.

In order to increase employee protection, temporary employment contracts tend to be subject to various legislative restrictions. In the Czech Republic their duration is limited by law. They can be agreed between the same employer and employee for a maximum total period of two years (the same applies to repeating contracts). The employment relationship then either ends or converts into permanent employment. An exemption pertains to academic staff, with whom temporary employment lasting 2–5 years must be agreed. This may be repeated no more than twice in a row (any subsequent contract must then be permanent). Until 2009 pensioners were also legally exempt (see below).

As Table 7 shows, the proportion of temporary workers varies considerably across the EU, from a negligible 1.3% in Romania to 29.3% in Spain. This is due both to different legislation with different levels of employment protection and to other characteristics of the labour market in each country (e.g. a higher prevalence of seasonal work, high costs of laying off employees – for example in Spain (EC, 2007a), etc.). A simple comparison with the EU-27 average is therefore relatively problematic in this case from the methodological perspective. However, we can use it to get a basic idea of the differences in the prevalence of this form of employment in individual countries as a starting point for further, more detailed investigation.

With an 8% share of temporary contracts (i.e. around half the EU-27 average), the Czech Republic is in the bottom third of countries. The breakdown of employees by age group reveals that in virtually all countries temporary contracts are used primarily for the youngest category of employees (15–24 years), followed by the oldest group (65+). They are less prevalent in the central age group (25–49) and least prevalent among persons in the 50–64 category, i.e. among those who are at pre-retirement age or recently exceeded it.

The Czech Republic is one of the few exceptions to this ranking, with 83% of employees older than 65 years working on temporary contracts. This was due to legislation which provided that employees drawing an old-age pension might only be employed on temporary contracts (one year at the most). The aforementioned limitation of the total period of temporary employment to two years did not apply to them. As from 2010, however, this limitation has been lifted and pensioners may work and simultaneously draw an old-age pension without restrictions. This is intended to promote employment of the older people and phased retirement. It is therefore likely that the prevalence of temporary contracts in this age group will fall.

Temporary employment contracts are more prevalent among women than among men in almost all EU countries. On average in the EU-27, 13.3% of employed men and 14.9% of women were working on temporary contracts in 2008.[14] The Czech Republic ranks among the countries where the inequality between men and women is relatively high (men 6.5%, women 9.8%).

Table 7: Employees on temporary employment contracts as a percentage of the total number of employees (2008, %)

	Total	Age group			
		15–24	25–49	50–64	65 and older
ES	**29.3**	59.4	29.0	14.2	14.8
PL	**27.0**	62.8	23.8	18.3	41.3
PT	**22.8**	54.2	21.9	10.0	:
NL	**18.2**	45.2	14.2	6.9	50.2
SI	**17.4**	69.8	12.7	5.7	55.7
SE	**16.1**	53.6	12.6	6.4	35.2
FI	**15.0**	39.6	13.7	6.7	26.5
DE	**14.7**	56.6	10.2	4.7	7.2
EU-15	**14.4**	41.4	12.3	6.1	14.4
FR	**14.2**	51.5	11.2	6.3	18.4
EU-27	**14.0**	40.0	12.0	6.6	17.4
CY	**13.9**	20.8	15.1	6.4	:
IT	**13.3**	43.3	12.4	5.9	12.7
GR	**11.5**	29.2	11.0	6.4	:
AT	**9.0**	34.9	4.8	2.7	:
IE	**8.5**	22.0	6.1	4.9	13.0
DK	**8.4**	23.5	6.1	3.4	15.2
BE	**8.3**	29.5	7.0	3.6	:
CZ	**8.0**	15.6	5.3	9.4	83.4
HU	**7.9**	20.0	7.5	5.2	16.7
UK	**5.4**	12.0	4.0	4.2	12.4
BG	**5.0**	9.5	4.4	4.9	16.0
SK	**4.7**	12.6	3.7	3.4	43.4
LV	**3.3**	6.5	3.0	2.3	:
RO	**1.3**	4.3	1.0	0.8	:

Note: - figure not available; for other notes see EUROSTAT, LFS.
Source: EUROSTAT (2000–2009), table code: lfsa_etpga, date of access: 18. 11. 2009.

In the Czech Republic, as in the EU-27, the predominant reason why people work on temporary contracts is unfortunately that they cannot find a permanent job (in the Czech Republic 63.2% of men and 62.5% of women, in the EU-27 61% of women and 57% of men) – see Figure 20. However,

[13] European Working Conditions Survey (Eurofound, 2005).

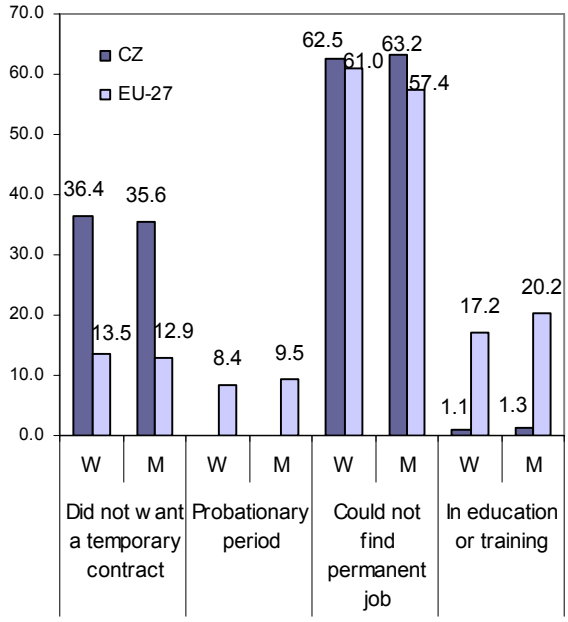
[14] Annual averages. EUROSTAT (2000–2009): table code: lfsa_etpga, date of access: 22. 12. 2009.

the situation in the Czech Republic differs considerably from the EU-27 average as regards the other reasons given. More than one-third of those employed in the Czech Republic on temporary contracts are not interested in working on permanent contracts – 36.4% of women and 35.6% of men. Among the over 65s, more than 77% of the respondents gave this response. However, the aforementioned fact that until 2009 pensioners were only allowed to work on temporary contracts played a role here. A negligible percentage (1.1% of women and 1.3% of men) give training as a reason for this type of contract. This is the most marked difference by comparison with the EU-27 average. The final reason (probation period) is not represented at all in the Czech Republic, because probation periods do not take place here in this way (at least not officially).

On average in the EU-27 countries training is the second most frequent reason (17.2% of women and 20.2% of men). In third place is voluntary choice of temporary work (13.5% of women and 12.9% of men) and in fourth is probation period (8.4% of women and 9.5% of men).

In the breakdown of reasons why people work on temporary contracts there are no major differences between men and women. In the Czech Republic the differences are practically negligible (1 p.p. at most). In the EU-27 on average they are not sizeable either, although they do exist, revealing in particular that men – by comparison with women – less frequently work on temporary contracts involuntarily (i.e. because they cannot find other work) and more frequently do so because of training.

Figure 20: Reasons for working on temporary contracts – comparison of men and women (2008, %)



Note: For detailed notes to the data see EUROSTAT, LFS.
Source: EUROSTAT (2000–2009), table code: lfsa_emptemp, date of access: 19. 11. 2009.

The percentage of temporary contracts has been declining in recent years in most European countries. On average in the EU-27 it fell from 14.2% to 13.5% between 2008 (2Q) and 2009 (2Q), i.e. by 0.7 p.p. The decline in the last year was probably strengthened by the economic crisis and falling employment, as temporary employees are more at risk of losing their jobs if their employer runs into problems. Nonetheless, the use of temporary contracts has been declining since 2007, i.e. since before the global financial crisis started. However, the decline was initially more modest (0.3 p.p. between 2Q 2007 and 2008).

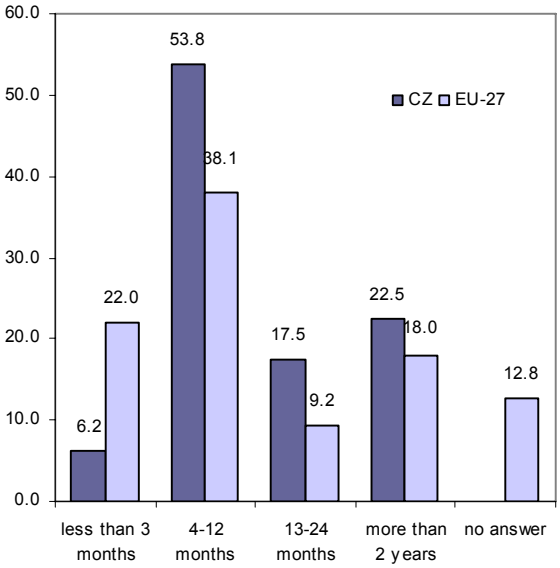
The Czech Republic is among the minority of countries in which the percentage of temporary contracts has increased slightly in the last year (from 8.1% to 8.3%). Since 2004, when the percentage of temporary contracts in the Czech Republic reached 9.5%, it has been recording a downward trend, with some fluctuations. Legislative changes which, with effect from 2004, limited the maximum duration of repeating temporary contracts to two years have been making themselves felt here. The amendment to the Labour Code was also reflected in a relatively sizeable fall in the share of involuntary temporary contracts. In 2004, such contracts accounted for 68% of all temporary contracts. The figure fell to 65.2% the following year and on to 59.6% in 2007. In 2008 it rebounded slightly to 62.8%.

In the Czech Republic the largest percentage of temporary contracts are for a duration of four months to one year (41.2%) – see Figure 21. In second place are contracts for more than two years (22.5%). This may seem inconsistent with the above-mentioned legal limitation. However, given the relatively low absolute number of such employees (around 74,000), we can infer that these are mostly workers standing in for employees on maternity or parental leave, for whom the Labour Code permits an exemption from the two-year limit, and academic workers (see above).

A comparison of the rate of temporary employment contracts with the percentage of those signed “out of necessity” owing to a lack of other opportunities again offers an interesting insight into the issue. This comparison is shown in Figure 22. The EU-27 average was chosen as the reference value. It divides the notional field into four quadrants.

It is reasonable to assume that sufficient employment flexibility, linked with the option of using temporary contracts under relatively advantageous terms and conditions, as well as security of movement of people on the labour market (i.e. a high degree of confidence that they will find a new job and that their existential security will not be put at risk) would be reflected in a higher proportion of temporary contracts and in particular a high share of voluntary temporary contracts. In such a situation, it would be common for people to accept employment for a time-limited assignment without worrying too much about staying unemployed for long after it ended, and it would be convenient for them to use temporary work as part of their career for a time (e.g. when training). In Figure 22 the upper left-hand quadrant would depict such a trend (above-average use of temporary contracts in the economy, most of them voluntary). We can see that there are few countries here, so this situation is far from common in the EU. The Netherlands, Slovenia and Germany are closest to it, but the cause of the outcome is different in each of these countries, as temporary contracts are used to address different situations – in the Netherlands such contracts are frequently used as probation periods, in Germany they are very widespread during training, and in Slovenia a large proportion of those surveyed replied that they were not interested in permanent contracts.

Figure 21: Duration of temporary employment contracts (2008, %)



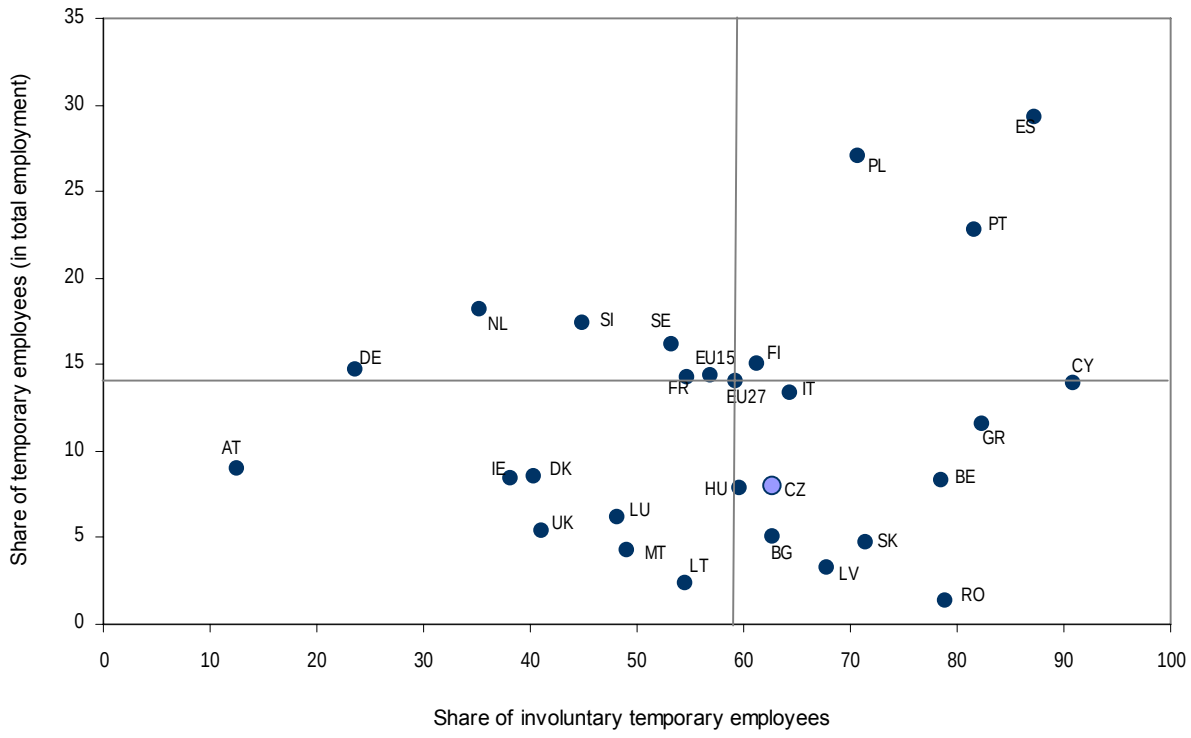
Note: For detailed notes to the data see EUROSTAT, LFS.
Source: EUROSTAT (2000–2009), table code: lfsa_etgadc, date of access: 26. 11. 2009, own calculation.

The lower left-hand quadrant features countries in which the share of involuntary temporary contracts is very low but the total percentage of temporary contracts is also relatively low (below the EU-27 average). Here, then, the emphasis in this sense is on employee protection and temporary contracts do not have any great influence as regards increasing the flexibility of the labour market. A prominent example is Austria, where the total share of temporary contracts is just 9%, of which 12.5% are involuntary. This group of countries also contains Denmark, Ireland, the UK and others. However, these countries have a higher proportion of temporary contracts (around 40–50%).

At the notional opposite end of the spectrum are three countries (Spain, Poland and Portugal) that have high values of both indicators. They have the highest share of temporary contracts in the EU-27 (roughly every third or fourth employment contract) and a large majority of these are concluded due to a lack of other opportunities (70–90%). This high proportion of temporary contracts may therefore contribute more significantly to labour market flexibility, but does so at the cost of lower subjective satisfaction of the individuals who are put in this situation involuntarily. One can say that such a situation is more advantageous for employers.

The lower right-hand quadrant features countries that have a below-average prevalence of temporary contracts, most of which are involuntary. This group of countries contains the Czech Republic along with, for example, Slovakia, Greece, Latvia, Romania, Bulgaria and, from the more developed countries, Belgium. A high rate of involuntary temporary contracts is an unfavourable phenomenon, but given the generally low share of temporary contracts in the economy this situation pertains to a relatively small number of employees. One can say that in these countries temporary work is a marginal choice that is often forced by circumstance.

Figure 22: Comparison of the rate of temporary employment in the economy with the rate of involuntary temporary employment (2008, %)



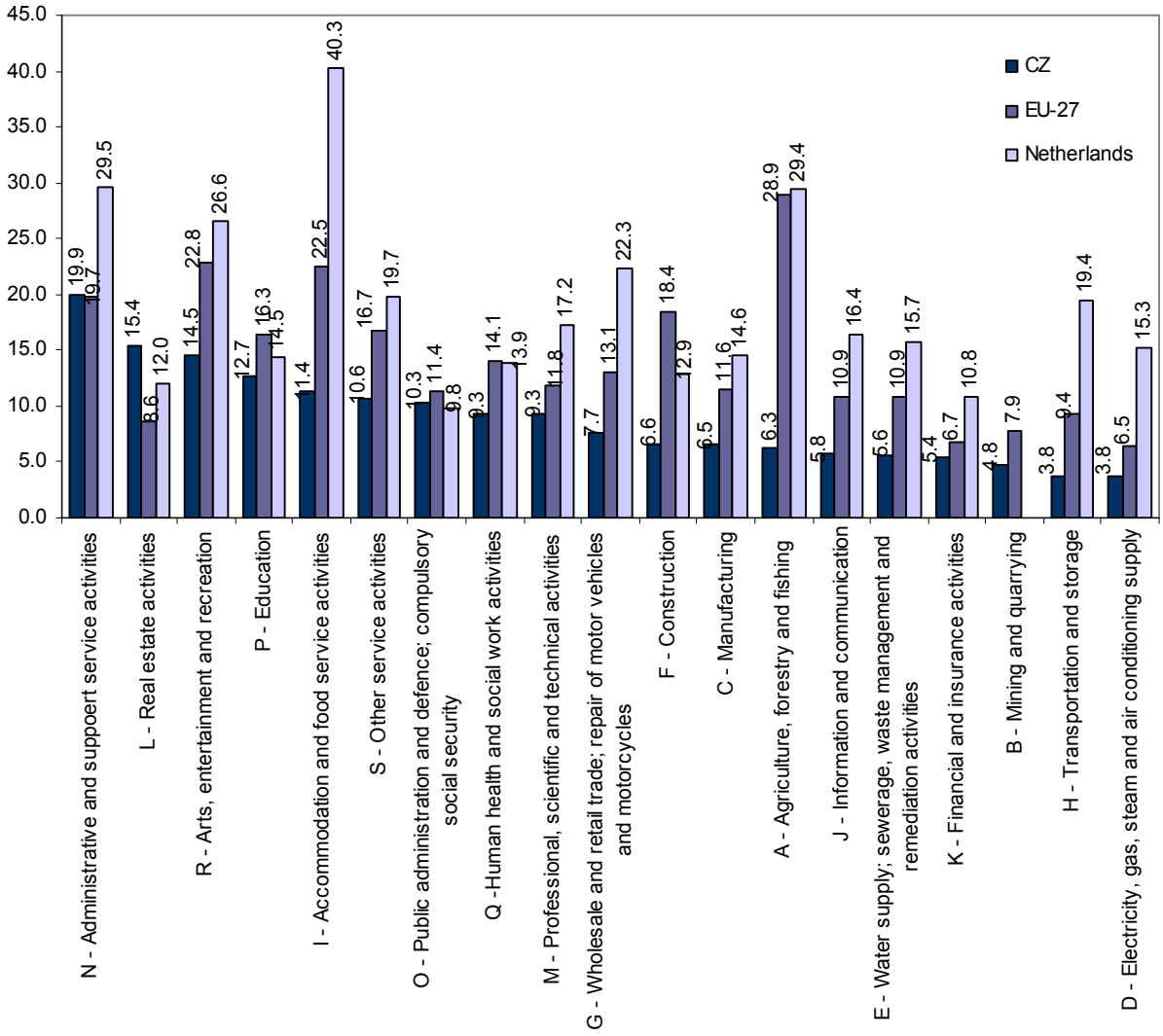
Note: For detailed notes to the data see EUROSTAT, LFS. Source: EUROSTAT (2000–2009), table code: lfsa_etpga, date of access: 18. 11. 2009, table code: lfsa_etgar, date of access: 25. 11. 2009.

In the Czech Republic, temporary contracts are most prevalent in sectors in which part-time work is also common (see above), with the exception of education. In administrative and support service activities 19.9% of employment contracts are temporary ones. In real estate activities the figure is 15.4%, in arts, entertainment and recreation it is 14.5%, and in accommodation and food service activities it is 11.4%. Temporary contracts are least prevalent in electricity, gas, steam and air conditioning supply, transportation and storage, mining and quarrying, and financial and insurance activities (see Figure 23).

In first place in the EU-27 as regards the share of temporary contracts is agriculture, forestry and fishing with 28.9% (in the Czech Republic the figure is just 6.3%). Seasonal work probably plays a role here, as this is more common in many European countries than in the Czech Republic. Similarly as in the Czech Republic, in the next places are arts, entertainment and recreation (22.8%), accommodation and food service activities (22.5%) and administrative and support service activities (19.7%). As in the Czech Republic, the sectors in which temporary contracts are least prevalent in the EU-27 are electricity, gas, steam and air conditioning supply, financial and insurance activities, and mining and quarrying. The real estate sector differs significantly, having the second-highest share of temporary contracts in the Czech Republic but the fourth-lowest in the EU-27 (8.6%, as against 15.4% in the Czech Republic). We can speculate that this is due to the relatively high staff turnover and labour market volatility in the real estate field in the Czech Republic. However, we do not have data available for a more detailed analysis.

For comparison, Figure 23 also includes data for the Netherlands, which has the most favourable temporary contract labour market in the EU, i.e. a relatively high proportion of temporary contracts, most of which are voluntary.

Figure 23: Rates of temporary employment in individual sectors according to NACE rev. 2 (2008, %)



Note: For detailed notes to the data see EUROSTAT, LFS. Source: EUROSTAT (2000–2009), table code: lfsa_etgan2, date of access: 1. 12. 2009, own calculation.

3.3 Earnings differentiation

Earnings differentiation is an important feature of the labour market. It reflects not only individual characteristics such as education level and subject, work experience, work performance and sex, but also company characteristics such as product market position, labour productivity, ownership nature, management methods and union strength. Earnings differentiation is also influenced by the state, primarily through the setting of minimum wage and social benefit levels, which play an important role in decisions to recruit low-paid workers. Earnings differentiation also reflects balances/imbalances between the supply of and demand for labour and for individual occupations.

Earnings differentiation is analysed on the basis of data on the structure of earnings in relation to selected key factors that influence it, e.g. educational attainment, occupation, work experience as expressed indirectly by employees' age, and sector of employment. Special attention is given to the earnings level in high-tech sectors. The situation in the Czech Republic is compared with that in the EU, and developments in the Czech Republic are studied in more detail. The gender perspective is not subject to analysis, even though the differences in earnings between men and women are still sizeable. A whole range of easily available domestic and foreign studies are devoted to this topic.

Selected factors affecting earnings differences

Educational attainment largely predetermines success in the labour market. People with higher education are less exposed to unemployment, are out of work for shorter periods and tend to have more diverse opportunities and better pay. The term education premium is generally used to express the difference in earnings between employees with different levels of education. It reflects not only the expected higher labour productivity of such employees compared to those with a lower education level, but also the costs they incurred in obtaining a higher education as well as the length of time they were inactive in the labour market because of their studies and thus did not have regular work income.

The earnings differences across individual occupations also reflect labour market imbalances. Excess supply of some occupations leads to a fall in the wages at which firms are willing to recruit, whereas insufficient supply gives people offering skills that are in demand a good bargaining position. For example, the rapid development of IT and its penetration into all fields of human activity has led to an imbalance in this segment of the labour market. This imbalance has, in turn, affected remuneration. In 2008, the mean earnings of computer systems designers, analysts and programmers (ISCO 2131) in the Czech Republic were around 20% higher than those of ISCO 21 employees (physical, mathematical and engineering science professionals).

As a result of globalisation, the earnings differences across occupations are also being increasingly affected by international mobility of both labour and vacancies. The strong labour potential of less developed countries is changing the labour market situation in more advanced countries. It is increasing the supply of labour for less-skilled occupations while simultaneously pushing down wages in such occupations, as the economic situation in the countries of origin of such workers means that they have lower wage demands. This strengthens earnings differentiation in favour of high-skilled occupations.

Recently, however, vacancy mobility has begun to counteract this trend. This no longer pertains solely to less skills- and knowledge-intensive vacancies, but is also starting increasingly to effect vacancies requiring tertiary education. This change in the nature of mobile vacancies has been made possible mainly by a rising educational level of the young population in developing countries and by the wide availability of advanced telecommunication services. Activities such as data processing, programming, design services and accounting are starting to move to countries with lower wage costs, and the range of such activities and thus also occupations can be expected to keep expanding. The occupations concerned are mostly relatively high-skilled yet easily standardised. Not only the migration of such activities itself, but also the mere possibility of migration is exerting pressure on wages in these occupations. Employees and the unions representing their interests vis-à-vis employers are usually willing to make concessions in exchange for a commitment to preserve jobs.

Earnings differentiation versus educational attainment in EU member states

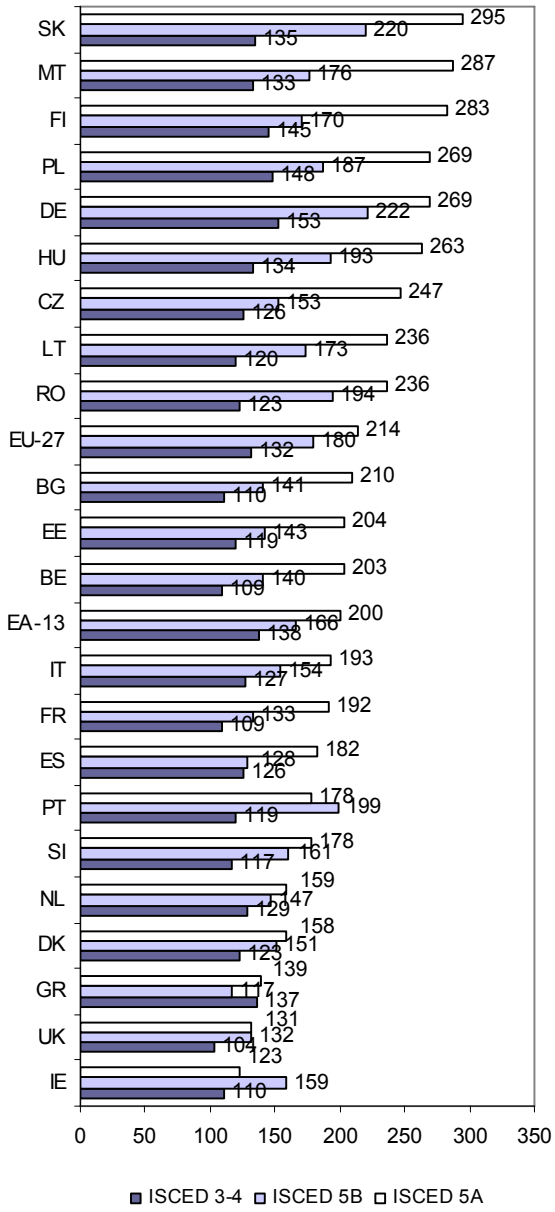
The international comparison of earnings differences is based on the results of surveys conducted under the methodological guidance of Eurostat on the structure of earnings dating from 2006. Data on mean gross annual earnings are used to compare earnings differentiation in the Czech Republic and the EU according to the highest level of education attained. This is because such data are available for a more countries than the data on the mean hourly wage, which would be more suitable for comparison as they eliminate the effect of different paid working hours. As working hours are usually governed by legislation, it is reasonable to assume that the differences within individual countries are not great enough influence the relationship between earnings of employees with different educational levels. The highest level of educational attainment is monitored using the ISCED 97 International Standard Classification of Education, a simplified description of which is given in Box 5.

Box 5 – ISCED 1997 classification of education (simplified description)

ISCED 1	Primary education (first stage of basic education completed).
ISCED 2	Lower secondary education (second stage of basic education completed) – hereinafter basic education.
ISCED 3	Upper secondary education (secondary school completed) – hereinafter secondary education.
ISCED 4	Post-secondary education – hereinafter secondary education.
ISCED 5A	Tertiary education (bachelor's or master's degree completed) – hereinafter referred to as bachelor's and master's education.
ISCED 5B	Lower tertiary education (study at tertiary professional schools or conservatoires) – hereinafter lower tertiary education.
ISCED 6	Tertiary doctoral education – hereinafter doctoral education.

Earnings differentiation is analysed using the relationship between the earnings of employees with basic education and those of employees with a higher level of education, i.e. ISCED 2, ISCED 3–4, ISCED 5B and ISCED 5A. The analysis only covers countries for which data are available for all four levels of education monitored, i.e. 21 EU member states.

Figure 24: Relationship of mean annual gross earnings of selected educational levels to earnings of employees with basic education – ISCED 2 (2006, %)



Note: Excludes enterprises with less than 10 employees and the agriculture, hunting and forestry, fishing, and public administration and defence sectors. Source: EUROSTAT (2001–2008), table code earn_ses06_30, date of access: 22. 9. 2009, own calculation.

As Figure 24 illustrates, earnings increase with increasing level of education. Employees with secondary education (ISCED 3–4) are paid 32% more, employees with lower tertiary education (ISCED 5B) 80% more, and employees with bachelor's and master's education (ISCED 5A) 114% more than employees with basic education (ISCED 2) on average for the EU-27. There are three exceptions from this general tendency, namely Ireland, Portugal and the UK, where ISCED 5B employees earn more than ISCED 5A employees.

Compared to the EU-27 average, the Czech Republic has an above-average earnings premium for ISCED 5A employees, but a below-average earnings premium for ISCED 5B and ISCED 3–4 employees. In the Czech Republic in 2006, the mean gross annual earnings of ISCED 5A employees were almost 2.5 times the earnings of ISCED 2 employees, while the respective figures for ISCED 5B and ISCED 3–4 employees were 1.5 times and 1.3 times. In terms of remuneration, therefore, ISCED 5B employees are closer to ISCED 3–4 employees than to ISCED 5A employees. It is apparent that in the Czech Republic and a whole range of other countries the labour market does not put too much value on this education level.

By comparing the mean data for the entire EU (EU-27) and the euro area countries (EA-13) which make up the economically more advanced core of the EU (Belgium, Germany, Ireland, Finland, France, Italy, Luxembourg, the Netherlands, Austria, Greece, Spain, Portugal and Slovenia) one can infer that the earnings premium of tertiary-educated employees (ISCED 5) is higher in countries with a lower economic level, in which there is simultaneously a lower proportion of tertiary-educated people. This general relationship does not apply absolutely. It does not mean that the country with the highest earnings premium for tertiary-educated people (Slovakia) simultaneously has the lowest GDP (Romania) and the lowest proportion of tertiary-educated people (Romania and Malta).

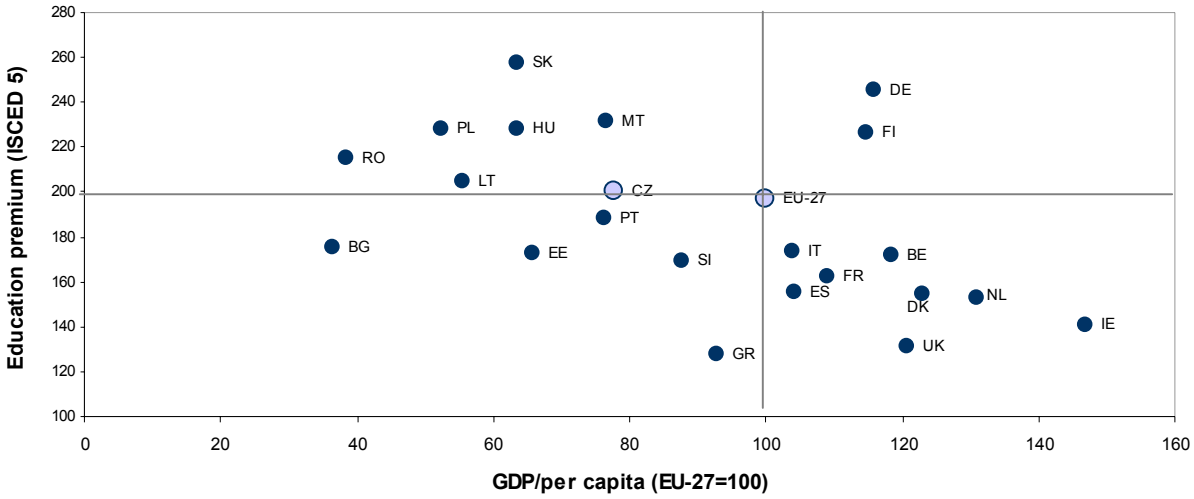
Figure 25 compares EU member states according to GDP and the earnings premium of tertiary-educated employees. Tertiary-educated employees are those with bachelor's and master's education and graduates of tertiary professional schools (ISCED 5A, 5B). The earnings premium of the tertiary educated is expressed as the ratio of their mean gross annual earnings to those of employees with basic education (ISCED 2). The economic level of the individual countries is expressed relatively as the ratio of GDP per capita to the mean value of this indicator for the EU.

Countries with a lower economic level and a higher earnings premium for tertiary-educated employees than the EU-27 average are located in the upper left-hand quadrant of Figure 25. The Czech Republic belongs to this group of seven countries (Slovakia, Poland, Hungary, Malta, Romania, Lithuania). All except Malta are post-communist countries that have undergone transformation from a centrally planned to a market economy and related profound structural changes. These structural changes have gone hand in hand with the introduction of new technology and growth in demand for tertiary-educated workers, whose availability, however, is lower than in economically advanced countries (see Figure 26).

The EU-27 member states also include countries that record both an above-average economic level and an above-average earnings premium. There are only two such countries, namely Germany and Finland (the upper right-hand quadrant of Figure 25).

By contrast, five countries had both a lower economic level and a lower earnings premium for tertiary-educated employees in 2006. These countries are shown in the lower left-hand quadrant. This is the only quadrant in which the new member states (Bulgaria, Estonia and Slovenia) and old member states (Greece and Portugal) are both represented.

Figure 25: Education premium of tertiary-educated employees and GDP (2006, %)



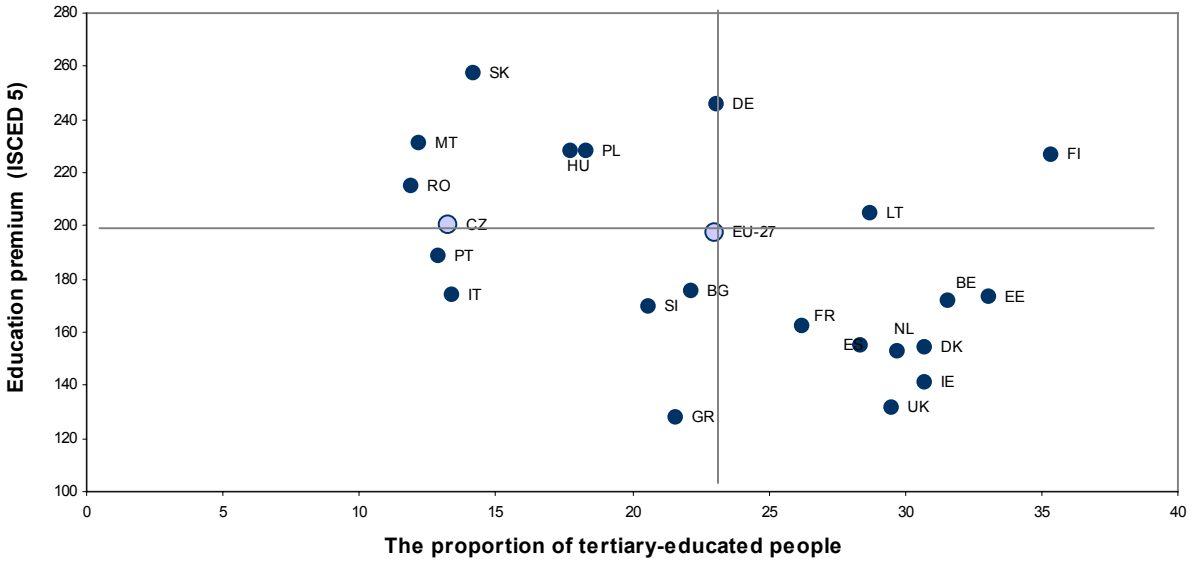
Source: EUROSTAT (2001–2008),: table code: earn_ses06_30, date of access: 22. 9. 2009, EUROSTAT (2009b), table code tsieb010, date of access: 22. 9. 2009.

The largest number of countries (eight) recorded a higher economic level and a lower earnings premium compared to the EU average. All of them are old member states. This quadrant contains Italy, Belgium, France, Denmark, the Netherlands, the UK, Ireland and Spain.

Figure 26 compares EU countries according to the earnings premium of tertiary-educated persons and the availability of tertiary-educated labour force. The availability of tertiary-educated labour force is expressed as the share of tertiary-educated people aged 25–64 in this age category of the population.

The Czech Republic belongs to the group of six countries which have a lower proportion of tertiary-educated labour force and a higher earnings premium. The other countries in this group are Slovakia, Poland, Hungary, Romania and Malta (see the upper left-hand quadrant of Figure 26). This is a similar set of countries as that in the comparison of the earnings premium and economic level. Again, all except Malta are former Soviet Bloc countries. In these countries, access to tertiary education was very limited for both political and capacity reasons. Several generations were denied the opportunity to attain tertiary education, so a lag behind countries with smooth democratic development is still apparent even though educational opportunities have been expanded significantly through both capacity increases at public universities and the creation of private colleges. As demand for tertiary-educated labour force comes into line with supply, the education premium can be expected to decrease and converge to the level usually observed in countries with a higher

Figure 26: Education premium of tertiary-educated employees and availability of tertiary-educated labour force (2006, %)



Note: The proportion of tertiary-educated people relates to 2007. Source: Pramen: EUROSTAT (2001–2008), table code: earn_ses06_30, date of access: 22. 9. 2009, own calculation.

proportion of tertiary-educated people. The largest number of EU member states is located in the lower right-hand quadrant. These countries have an above-average proportion of tertiary-educated people, but employees with this level of education earn a below-average earnings premium. There are eight of them in all (France, Belgium, the Netherlands, Denmark, Ireland, the UK, Spain and Estonia).

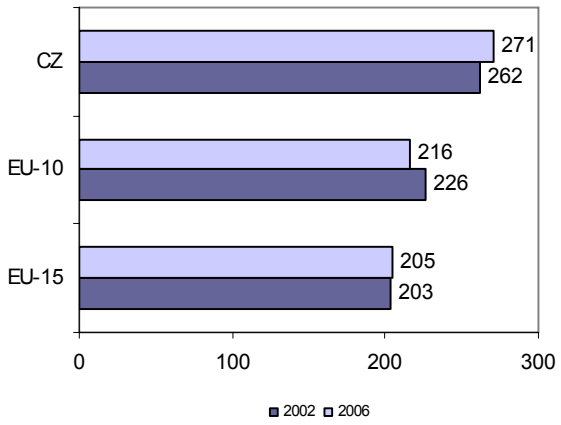
The third-largest group (five countries) consists of countries with a below-average proportion of tertiary-educated people and a below-average earnings premium. It contains three representatives of the old member states (Portugal, Italy and Greece) and two representatives of the new member states (Slovenia and Bulgaria). The least common combination is an above-average proportion of tertiary-educated people and an above-average earnings premium. This combination occurs in just two countries – Finland and Lithuania. Germany has a unique position, with an average proportion of tertiary-educated people aged 25–64 earning an above-average earnings premium.

The correlation coefficient indicates that the relationship of the education premium of tertiary-educated employees to the economic level is roughly as strong as that to the share of tertiary-educated people in the population aged 25–64. The correlation coefficients are -0.50 and -0.46 respectively.

The earnings premium of tertiary-educated employees can be expected to converge gradually within the EU as economic convergence progresses, the availability of tertiary-educated labour force increases in the new member states, and the free movement of labour intensifies.

Given the data available, the tendency in the earnings premium of tertiary-educated people can only be assessed for the period 2002–2006. However, the 2002 data are more aggregated, the only figures available being those on the earnings of employees with at most a basic level of education (ISCED 0–2) and the earnings of employees with tertiary education, which covers employees with lower tertiary education and bachelor's, master's and doctoral education (ISCED 5–6).The 2006 data were therefore recalculated for the same education categories.

Figure 27: Earnings premium of ISCED 5–6 employees (%)

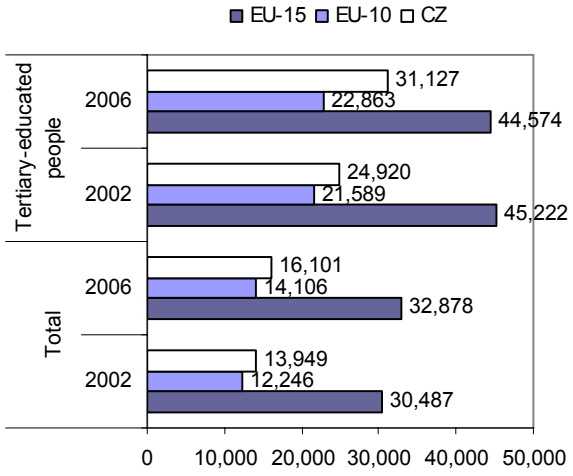


Note: The EU-10 comprises the states that became EU members in 2004 and the EU-15 comprises the old member states. Source: EUROSTAT (2001–2008), table code:earn_ses06_30, date of access:: 22. 9. 2009, own calculation.

As Figure 27 shows, the period 2002–2006 saw **convergence of the earnings premium of ISCED 5–6 employees** between the new (EU-10) and old member states (EU-15). In the new member states the earnings premium of ISCED 5–6 employees decreased by 10 p.p. while in the old member states it increased by 2 p.p. The difference between the new and old member states thus narrowed from 23 p.p. to 11 p.p. In the Czech Republic, however, the trend differed from the average in the new member states. The earnings premium of ISCED 5–6 employees in the Czech Republic further increased, as the earnings of ISCED 5–6 employees rose faster than those of ISCED 0–2 employees.

In the Czech Republic, overall earnings expressed in purchasing power parity (see Figure 28) are lower than the average for the old member states (EU-15) but higher than the average for the countries that joined the EU in the same year as the Czech Republic (EU-10). In terms of earnings level, the Czech Republic is thus less attractive to investors than the other new member states. Mean earnings in the Czech Republic in 2006 were 14% higher than the EU-10 average for all employees and 36% higher for ISCED 5–6 employees. Comparing the earnings level with the earnings of employees in the EU-15, overall mean earnings in the Czech Republic were 49% of earnings in the EU-15. The earnings ratio of the tertiary educated is more favourable thanks to their relatively high earnings premium; in 2006 their mean earnings were 70% of the mean earnings of ISCED 5–6 employees in the EU-15.

Figure 28: Mean annual earnings overall and of ISCED 5–6 employees (PPS)



Note: The EU-10 comprises the states that became EU members in 2004 and the EU-15 comprises the old member states; PPS – purchasing power standard. Source: EUROSTAT (2001–2008), table code:earn_ses06_30, date of access: 22. 9. 2009, own calculation.

The earnings of ISCED 5–6 employees in the Czech Republic in 2006 converged significantly towards the earnings of such employees in the EU-15. In 2002 the earnings of the tertiary educated in the Czech Republic amounted to just 55% of earnings in the EU-15, but by 2006 the figure had reached the aforementioned 70%. This shift was due to the fact that earnings in the EU-15 decreased slightly (by just under 1%) while earnings in the Czech Republic increased by almost one-quarter.

However, the convergence of total mean earnings in the Czech Republic towards mean earnings in the EU-15 was far slower. Their ratio rose from 46% in 2002 to 49% in 2006.

This slower convergence was mainly due to the fact that in the Czech Republic total earnings rose more slowly than earnings of ISCED 5–6 employees (15% vs. 25%), whereas in the EU-15 total earnings rose more quickly than earnings of the tertiary educated (8% vs. -1%). In both cases, though, earnings growth was more dynamic in the Czech Republic than in the EU-15.

Earnings differentiation versus educational attainment in the Czech Republic

The structural statistics on employees' earnings published by the Czech Statistic Office (CSU) give a more detailed insight into the earnings of individual education categories of employees in the Czech Republic (see Box 6).

Aggregated data for the entire Czech Republic are available for employees in the following five education categories: (a) basic and uncompleted basic education (ISCED 0–2), (b) secondary education without "maturita" examination (ISCED 3C), (c) secondary education with "maturita" examination (ISCED 3A), (d) tertiary professional and bachelor's, (e) master's and doctoral. The comparison of earnings differences between the individual levels of educational attainment is based on median monthly earnings. This is the earnings level that divides employees into two halves, one half earning less than the median earnings level and the other half earning more. This indicator reflects earnings differentiation between individual education categories of employees better than mean earnings, which are affected by earnings differentiation within these education categories. Internal earnings differentiation will be assessed later in this subchapter using the following two indicators: (a) the ratio between earnings in the 5th percentile and those in the 95th percentile, and (b) the coefficient of variation.

Box 6 – Structural statistics on employees' earnings

The structural statistics on employees' earnings are published by the Czech Statistical Office in cooperation with the Ministry of Labour and Social Affairs (MoLSA). All components of gross earnings as well as important personal details about employees, in particular sex, age and education, are determined directly. Two data sources are currently used: (a) the MoLSA's Average Earnings Information System (ISPV), which is used to determine data on employees' earnings in the business sector, and (b) the Finance Ministry's Pay Information System, which is used to determine data on employees' pay in budgetary and certain other organisations. The databases of the two information sources are consolidated into a single database used to calculate wages for the whole national economy. Unlike the ISP, the ISPV does not contain data for units with less than ten employees. The data are collected electronically directly from the relevant company databases. Legal and natural persons registered in the Commercial Register are included in the survey. All sectors of the national economy are covered.

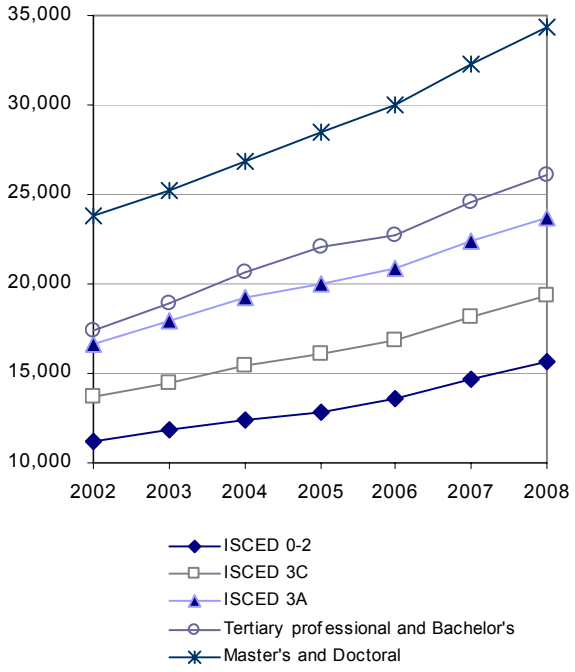
In the structural statistics, gross earnings cover all wages and salaries, including bonuses and other pay, all payments for time not worked (leave, holidays, etc.) and payments for being on call.

Source: CZSO, Structure of employees' earnings 2008 – Introduction.

Monthly earnings depend on the amount of paid work time. The effect of this factor, however, is generally negligible – the differences between the individual education categories are very small. On average for the period 2002–2008, ISCED 3C employees worked the most paid hours per month (174.5 hours) while ISCED 3A employees worked the least (171.9 hours). The maximum monthly difference was less than 2.6 hours. The differences between other employees are in the tens of minutes. University-educated employees worked 172.8 paid hours per month, employees with basic education 172.7 hours per month and employees with lower tertiary education 172.6 hours per month.

Figure 29 shows that ISCED 3A employees and employees with tertiary professional and bachelor's education are very close to each other in terms of **median monthly earnings**. Simplifying somewhat, we can say that in the Czech Republic the differences between the individual consecutive education categories are usually two years, or three years in the case of tertiary professional and bachelor's education. The additional years of study leading from ISCED 3A to tertiary professional and bachelor level are associated with the smallest earnings shift. In 2008 the earnings of the latter employees were only 10% higher than those of ISCED 3A employees. The largest earnings increase is associated with the attainment of master's and doctoral education. In 2008 the earnings of these employees were 32% higher than those of employees with tertiary professional and bachelor's education. Roughly the same earnings shift is associated with the attainment of ISCED 3A and 3C. ISCED 3A employees had earnings 22% higher than ISCED 3C employees in 2008, and the latter had earnings 24% higher than ISCED 0–2 employees.

Figure 29: Median gross monthly earnings of employees by level of educational attainment (CZK)



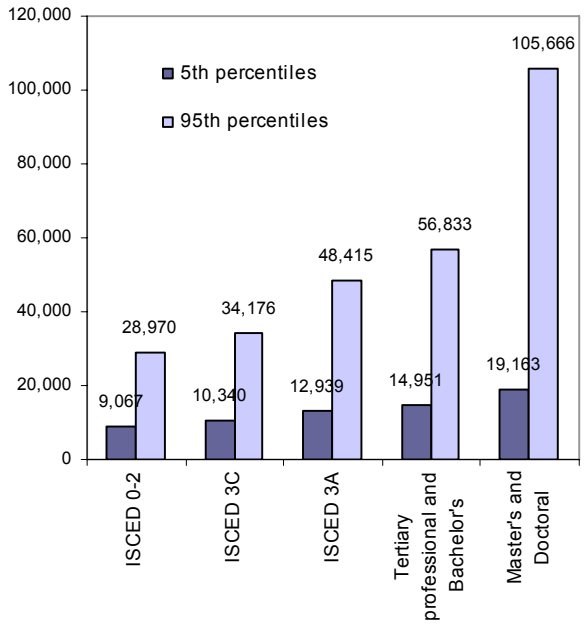
Source: CZSO (2008d), table A4, date of access:12. 11. 2009.

In 2002–2008, only employees with tertiary professional and bachelor's education saw a significant change in the remuneration of additional years of study. In 2002 their earnings were only 6% higher, but in 2008 they were 10% higher as mentioned above. It is apparent that employers are starting to get used to employees in this category, as indicated by the fact that their earnings are starting to get relatively closer to those of employees with master's and doctoral education. In 2002, the earnings of employees with tertiary professional and bachelor's education stood at 73% of those with master's and doctoral education. By 2008 the figure had reached 76%. In absolute terms, however, the difference in their earnings widened (from CZK 6,506 to CZK 8,270). Employees with tertiary professional education (certified specialists) and bachelor's education are evidently gradually starting to

occupy higher-skilled jobs. Another factor here may be the fact that persons with some length of experience also begin to be represented in this segment of the labour force in 2008. As employees with this level of education have only been in the labour market since the turn of the millennium, their length of experience is thus still incomparably shorter than that of people with other types of education. Tertiary professional school graduates could have had no more than 10 years' experience by 2008, and graduates of bachelor's degrees usually raise their level of education to master's level through other forms of study at work. Issues of remuneration of length of experience are examined later in this chapter.

The entry of certified specialists onto the labour market only since the turn of the millennium is due to the fact that study at tertiary professional schools started mainly in the 1996/97 school year, when tertiary professional schools were enacted as a new type of college offering 2–3 and 5-year courses for those wishing to continue their studies after graduating from secondary school but interested in shorter and more practical courses. Owing to experimental testing of this type of study (1992/93–1996/97) its first graduates started appearing on the labour market in the second half of the 1990s. The numbers of graduates with lower tertiary education continued rising steadily thanks to graduates of the bachelor level of study, which started to be offered in particular by private universities, which were allowed to be established starting in 1999/2000, and also to the gradual division of almost all university degrees into bachelor's and master's levels. The fact is, however, that the overwhelming majority of bachelors still continue to master's level.

Figure 30: Earnings differentiation within education categories (2008, CZK)



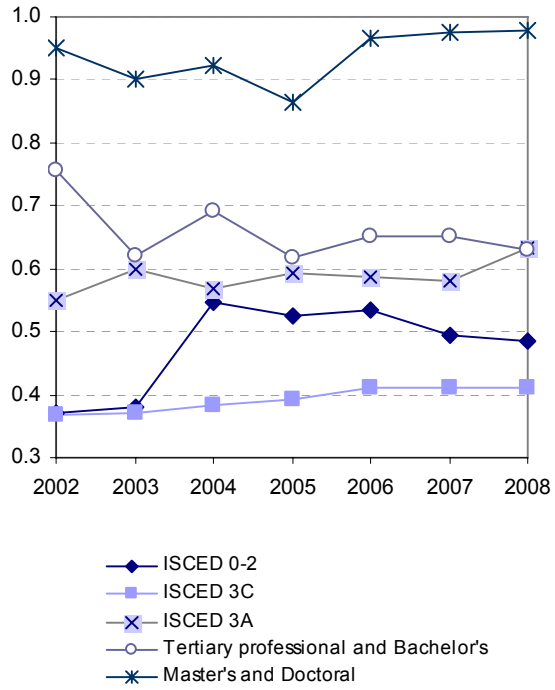
Source: CZSO (2008d), table A18, date of access: 12. 11. 2009.

The distribution of earnings into individual percentiles also provides information on earnings differentiation. The following Figure 30 shows gross monthly earnings in the 5th and 95th percentiles of employees in the individual education categories. It is evident that earnings differentiation between the individual education categories is higher for employees with higher pay, i.e. those in the 95th percentile, than for employees with the lowest earnings, i.e. those in the 5th percentile. For example, the earnings of the worst paid employees with master's and doctoral education are around double those of the worst paid ISCED 0–2 employees, and the earnings of the best paid employees with master's and doctoral education are four times the same.

The ratio of earnings in the lowest and highest percentiles also illustrates **earnings differentiation within education categories**. This increases with increasing education level. ISCED 0–2 and ISCED 3C employees have the least differentiated earnings, with the highest earnings being around three times the lowest (3.2 and 3.3 respectively). There is greater earnings differentiation among ISCED 3A employees and employees with tertiary professional and bachelor's education, where the highest earnings are around four times the lowest (3.7 and 3.8 respectively). The greatest earnings differentiation is recorded for employees with master's and doctoral education, whose earnings in the 95th percentile are almost six times those in the 5th percentile (5.5). The internal earnings differentiation reflects internal differentiation in the skills requirements of individual jobs. People with basic education can hold a relatively narrow range of jobs, whereas jobs associated with university education cover a wide spectrum. Earnings differentiation versus employment is examined later in this chapter.

The coefficient of variation also provides information on internal earnings differentiation (see Figure 31). It confirms that internal earnings differentiation increases with increasing education level. The only exception is the earnings of ISCED 0–2 employees, which are more differentiated than those of ISCED 3C employees. In 2008, internal earnings differentiation was the equal for ISCED 3A employees and employees with tertiary professional and bachelor's education. Earnings differentiation for ISCED 0–2 employees and ISCED 3C employees is relatively close.

Figure 31: Coefficient of variation of mean gross monthly earnings of individual education categories 2002–2008



Source: CZSO (2008d), table A4.

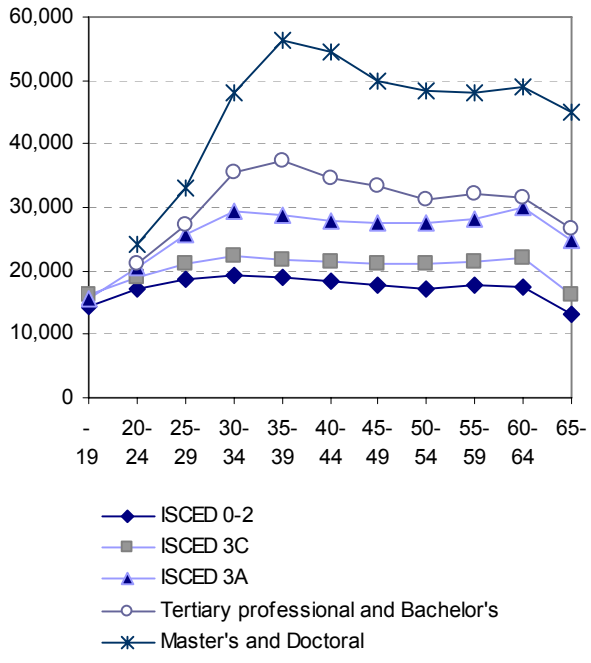
Internal earnings differentiation increased slightly in 2008 compared to 2002 for all education categories. The only exception was the earnings of employees with tertiary professional and bachelor's education, whose earnings level converged.

Earnings differentiation versus educational attainment and age in the Czech Republic

Age to some extent reflects the work experience acquired during a worker's career. However, we cannot assume a directly proportional relationship between an employee's age and professional experience. Career paths can be interrupted for a time by exit from the labour market, i.e. a period of labour inactivity, or a spell of unemployment. In addition, rapid technological progress, the changing structure of job opportunities and the changing demands on traditional occupations are leading to more frequent changes in employment or employer. A lifelong profession or employer will increasingly be characteristic only of people with very high and specialised education.

As Figure 32 illustrates, the earnings level of employees in individual education levels depends on age. The degree of dependence increases with increasing level of education. This is due to differences in career progression opportunities. During their productive life, people with a lower level of education have significantly narrower career (and thus also wage growth) opportunities than employees with a higher level of education. Jobs higher up the hierarchy are usually associated with at least ISCED 3A educational attainment.

Figure 32: Mean gross monthly earnings of employees by education level and age (2008, CZK)



Note: These figures are not recalculated for the whole population, they relate only to the surveyed sample of population. Source: CZSO (2008d), table C2, date of access: 12. 11. 2009.

According to 2008 data, the mean gross monthly earnings of **employees with secondary and lower education** peak at the age of 30–34 years. After that, they decrease slightly and essentially stay constant. A change occurs at the age of 55–64, when mean earnings increase somewhat. This is mainly because males are more strongly represented in this age category than in previous ones, as females have a lower retirement age. In all education categories men still have higher earnings than women. (In 2008 mean gross monthly earnings were CZK 29,628 for men and just CZK 21,939 for women, i.e. 74% of the male wage[15].) Another factor may be that it is mainly those with higher earnings who remain in employment at this age.

Employees with master's and doctoral education aged 35–39 were the best-remunerated category of employees with this level of education. Figure 32 shows that the starting salaries of employees with master's and doctoral education are relatively low but rise sharply over the next 10–15 years as these workers gain experience and make career progression. Their remuneration in subsequent age categories decreases then stabilises. The 50–64 age category has more or less the same mean gross monthly earnings. The lower remuneration of the over-40s compared to the 35–39 category is probably due to the fact that younger age categories of such educated people find work in sectors with high salary levels (e.g. finance and real estate, see below) and hold more senior positions because their education is more up to date, they have been partly educated abroad, and they have better language skills.

Earnings differentiation shows a similar pattern with respect to age for employees with tertiary professional and bachelor's education as for employees with master's and doctoral education. In 2008, the 35–39 age category had the highest earnings. The earnings of older age categories were lower. As tertiary professional school graduates and bachelors starting entering the labour market only at the turn of the millennium, at the age of around 22 years, employees who reached the age of 30 or more in 2008 must be represented mainly by graduates of conservatoires. According to the earnings structure survey, their careers – and thus also their remuneration – peak at the age of 30–39 years.

Earnings fall among the over-65s regardless of educational attainment. Gross monthly earnings of ISCED 0–2 and ISCED 3C employees are below the starting wages of the under-19s with an equivalent education level. For employees in the other education categories the earnings decline is also large, but their earnings level is not below that of the youngest employees. The mean gross monthly earnings of the oldest population category are also affected by the fact that employees in this age category are usually employed only part time. Their wage demands also tend to be much lower, as they are receiving old-age pensions as well as wages.

Earnings differentiation versus employment

Earnings differentiation is analysed in relation to job held using the International Standard Classification of Occupations (ISCO). The Czech version of the ISCO has the KZAM abbreviation and a similar structure. The international ISCO is a four-digit classification, whereas the Czech version is a five-digit one. Given the statistical data available, only the one-digit breakdown is used here. It distributes all occupations into ten classes. However, the tenth class, comprising members of the armed forces, is excluded from the analysis. Box 7 gives an overview of the ISCO.

There is a relatively strong link between educational attainment and job held. Persons with a higher education level mostly hold higher-skilled jobs. They are employed mainly as

[15] Source: CZSO (2008d), table A1, own calculation.

senior officials and managers (ISCO 1), professionals (ISCO 2) and technicians and associate professionals (ISCO 3). Earnings differentiation between individual occupations is compared using the earnings premium, which is expressed as the ratio of their earnings to those of workers in elementary occupations.

Box 7 – International Standard Classification of Occupations (ISCO)

ISCO 1 – Legislators, senior officials and managers

ISCO 2 – Professionals

ISCO 3 – Technicians and associate professionals

ISCO 4 – Clerks

ISCO 5 – Service workers and shop and market sales workers

ISCO 6 – Skilled agricultural and fishery workers

ISCO 7 – Craft and related trades workers

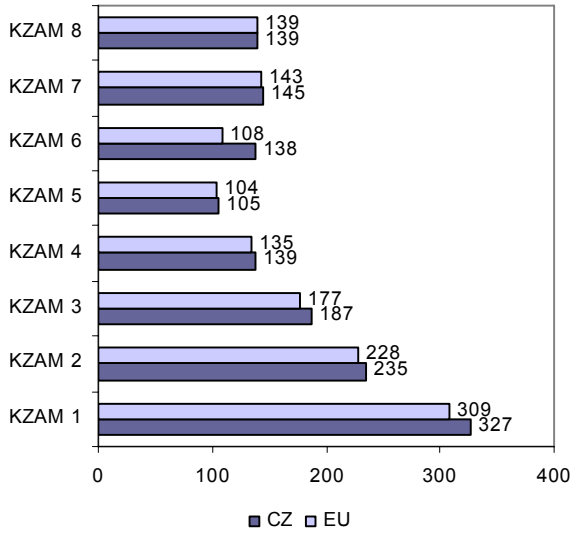
ISCO 8 – Plant and machine operators and assemblers

ISCO 9 – Elementary occupations

ISCO 0 – Armed forces

Source: CZSO – Classification of Occupations http://www.czso.cz/csu/klasifik.nsf/i/kzam_systematicka_cast

Figure 33: Ratio of earnings in individual occupations to earnings of persons working in elementary occupations (2006)



Note: The value for the EU is calculated as the unweighted average of data from 16 countries (BG, CY, CZ, DE, EE, ES, HU, IE, LT, LV, NL, NO, PL, SI, SK, UK). Source: EUROSTAT (2001–2008), table code: earn_ses06_28, date of access: 22. 9. 2009, own calculation.

Figure 33 shows that employees in more senior jobs than elementary occupations are remunerated better in the Czech Republic than the EU average. The sole exception is plant and machine operators, whose earnings premium is equal to the EU average (39%). By contrast, the earnings of agricultural workers, for example, represent 108% of the earnings of employees in elementary occupations on average in the EU and 138% in the Czech Republic. Another example of a major difference is the earnings of senior officials and managers, which was 309% of the earnings of employees in elementary occupations on average in the EU and 327% in the Czech Republic. It is clear that high skills are better remunerated in the Czech Republic than in the EU on average.

Although educational attainment is the key prerequisite for performing a particular occupation, it is not the only one. Table 8 shows that persons at almost all education levels were represented in all occupations in the Czech Republic in 2008 according to earnings structure survey data. A significantly higher-than-necessary education level (tertiary education in ISCO 4–8 jobs) is particularly prevalent among foreign employees, for whom the language barrier is an obstacle to working in jobs with commensurate skills requirements (for details see the foreign employment subchapter).

Table 8: Education premium of employees with different education levels working in same occupations in the Czech Republic (2008, %)

Employment	Education level			
	ISCED 3C	ISCED 3A	Tertiary professional and Bachelor's	Master's and Doctoral
ISCO 1	0.88	1.67	1.21	1.57
ISCO 2	1.01	1.09	1.01	1.25
ISCO 3	1.08	1.02	1.03	1.40
ISCO 4	1.05	1.17	1.14	1.29
ISCO 5	1.12	1.25	1.24	0.92
ISCO 6	1.08	1.04	1.23	0.83
ISCO 7	1.17	1.05	0.98	1.09
ISCO 8	1.13	1.06	1.10	0.89
ISCO 9	1.10	1.06	0.95	1.09

Note: The education premium is calculated as the ratio of mean gross monthly earnings of employees with individual education levels to earnings of employees with basic education in the same occupation. Source: CZSO (2008d), table C6, own calculation.

The education premium can be used as an indicator of the education level that is best remunerated in individual occupations. The earnings structure survey reveals that for ISCO 2, ISCO 3 and ISCO 4 occupations in the Czech Republic university education is the best remunerated relative to other education levels. Compared to other education levels, ISCED 3A pays off the most for senior officials and managers. This finding is generally surprising, since university education might have been expected to be the best remunerated for this occupation category as well. Clearly a factor here is the remuneration of managers of small firms, who are simultaneously the owners of such firms. The ISCED 3A education level is also the best remunerated for service workers and shop and market sales workers (ISCO 5).

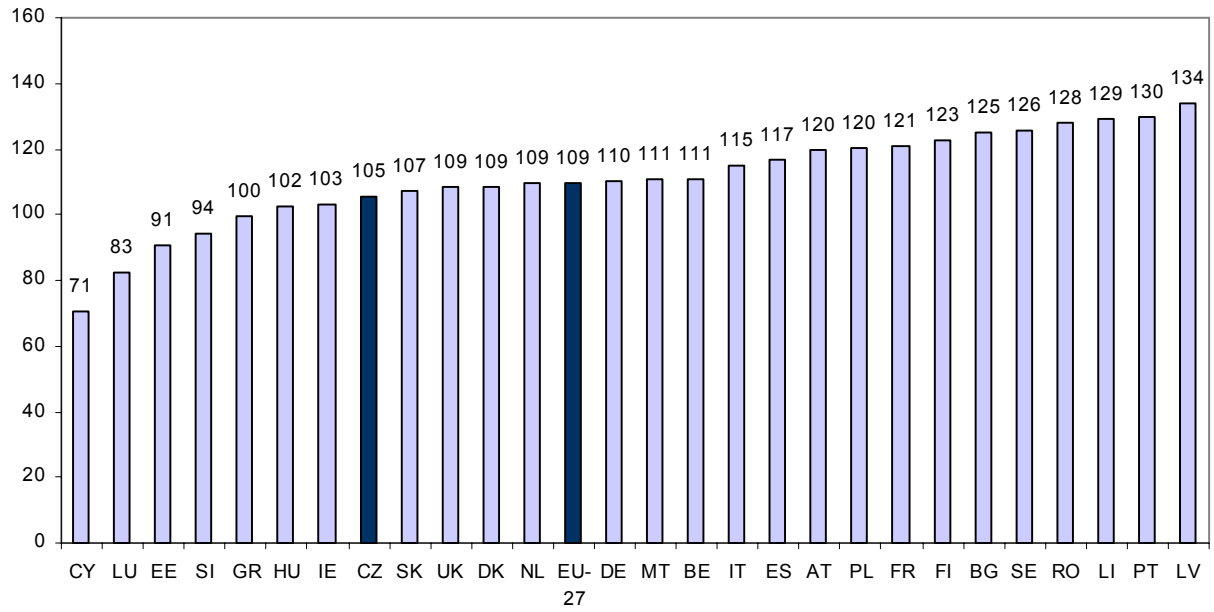
Compared to employees with higher education levels, ISCED 3C employees are the best remunerated as craft and related trades workers (ISCO 7), plant and machine operators and assemblers (ISCO 8) and workers in elementary occupations (ISCO 9). For these less-skilled occupations a higher education level is not an advantage. Skills and techniques learned during training and in practice are most valued.

Given that for individual types of occupation, persons with an education level lower or higher than generally required for the relevant occupation are represented in only a very limited number in the sample analysed, these conclusions – and in particular the indicator values (i.e. education premia) – should be regarded as illustrative.

Earnings in high-tech and knowledge intensive sectors

The fact that higher earnings are associated with higher education levels and higher-skilled jobs should also be reflected in the differences in earnings between individual sectors. Knowledge intensive sectors should offer higher wages than less demanding sectors.

Figure 34: Ratio of mean annual earnings in high-tech manufacturing industries to earnings in manufacturing as a whole (2006, %)



Note: The value for the EU is calculated as an unweighted average. Source: EUROSTAT (2001–2008), table code: earn_ses06_28, date of access: 22. 9. 2009, own calculation.

EUROSTAT divides manufacturing into four categories according to technological intensity and thus also skills intensity. The first two categories represent high-technology industries and the second two categories low-technology industries. Earnings differences will be analysed only for high-technology and medium-high-technology industries. An overview of the industries classed as high-tech and medium-high-tech industries is given in Box 8.

Box 8 – High-technology and high-skilled manufacturing industries (NACE)

High-technology industries

NACE 30 – Manufacture of office machinery and computers
NACE 32 – Manufacture of radio, television and communication equipment and apparatus
NACE 33 – Manufacture of medical, precision and optical instruments, watches and clocks

Medium-high-technology industries

NACE 24 – Manufacture of chemicals and chemical products

NACE 29 – Manufacture of machinery and equipment n.e.c.

NACE 31 – Manufacture of electrical machinery and apparatus n.e.c.

NACE 34 – Manufacture of motor vehicles, trailers and semi-trailers

NACE 35 – Manufacture of other transport equipment

Source: Eurostat, http://epp.eurostat.ec.europa.eu/cache/ITY_SDDS/Annexes/htec_esms_an2.pdf

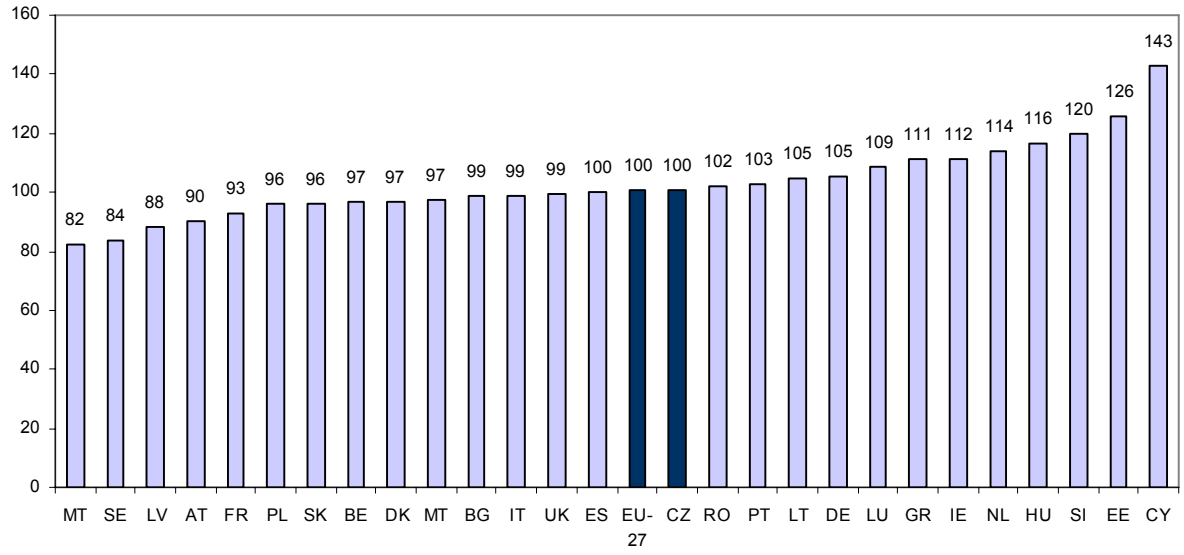
Figure 34 shows that earnings in **high-tech manufacturing industries** were 9% higher than earnings in manufacturing as a whole on average for the EU-27 in 2006. This conclusion does not apply, however, to all the member states. In four countries (Slovenia, Estonia, Luxembourg and Cyprus) earnings in high-tech manufacturing industries were conversely lower, and in one country (Greece) they were the same. Employees in high-tech manufacturing industries had the lowest earnings by comparison with earnings in manufacturing as a whole in Cyprus (71%), while employees in Latvia had the best earnings conditions (134%).

The relative earnings of employees in high-tech manufacturing industries in the Czech Republic are below the EU average. Employees in high-tech manufacturing industries had only 5% higher earnings than employees in manufacturing as a whole. Abstracting from other factors, the earnings gap of employees in high-tech manufacturing industries should reflect the gap in the difficulty of the work they do. It can be expected, therefore, that in countries where earnings in high-tech manufacturing industries differ little from earnings in manufacturing as a whole, the skills requirements for employees differ little as well. In such countries, including the Czech Republic, lower stages of production tend to be represented in high-tech industries and the skills structure of employees is skewed towards a higher proportion of persons with secondary rather than tertiary education.

Medium-high-tech manufacturing industries comprise five industries in all (see Box 8). The earnings of employees in these industries are the same on average for the EU-27 as earnings in high-tech industries. The Czech Republic and Spain are countries in which the situation is the same as the EU average.

There are countries in the EU where earnings in medium-high-tech manufacturing industries are higher than those in higher-tech industries. There were 12 such countries in 2006 – six old member states (e.g. the Netherlands, Ireland and Germany) and six new ones (e.g. Cyprus, Estonia and Slovenia). High-tech companies in these countries employ workers with a lower education level than lower-tech companies. This is linked with a need for machine operators and elementary workers, which is evidently higher in higher-tech industries.

Figure 35: Ratio of mean annual earnings in medium-high-tech manufacturing industries to earnings in high-tech manufacturing industries (2006, %)



Note: The value for the EU is calculated as an unweighted average. Source:EUROSTAT (2001–2008), table code: earn_ses06_28, date of access: 22. 9. 2009, own calculation.

In the remaining 13 EU states, earnings in lower-tech manufacturing industries are lower than earnings in higher-tech industries. This difference is negligible in some states (for example 1% in the UK, Italy and Bulgaria) and much larger in others (for example 18% in Malta).

In more advanced economies, services are playing an increasingly important role. EUROSTAT divides services into four categories according to technological and knowledge intensity: (a) high-tech services, (b) market services, (c) financial services, (d) other knowledge-intensive services. An overview of the services forming the individual categories of high-tech and knowledge-intensive services is given in Box 9.

Box 9 High-tech and knowledge-intensive services

High-tech services
NACE 64 – Post and telecommunications
NACE 72 – Computer and related activities
NACE 73 – Research and development

Market services
NACE 61 – Water transport
NACE 62 – Air transport
NACE 70 – Real estate activities
NACE 71 – Renting of machinery and equipment without operator and of personal and household goods
NACE 74 – Other business activities

Financial services

NACE 65 – Financial intermediation, except insurance and pension funding
NACE 66 – Insurance and pension funding, except compulsory social security
NACE 67 – Activities auxiliary to financial intermediation

Other knowledge-intensive services
NACE 85 – Health and social work
NACE 80 – Education
NACE 92 – Recreational, cultural and sporting activities

Source: Eurostat, http://epp.eurostat.ec.europa.eu/cache/ITY_SDDS/Annexes/htec_esms_an2.pdf

Earnings in **high-tech and knowledge-intensive services** (demanding services) are higher on average in the EU than earnings of employees in high-tech and medium high tech manufacturing industries (demanding industries) (see Figure 36). However, this relationship is not typical of all the member states. On the contrary, in eight countries earnings in demanding industries exceed earnings in demanding services. All eight are old member states belonging to the economically advanced core of the EU. Examples include the Netherlands, Finland and Germany, where earnings in high-tech services are around 10% lower.

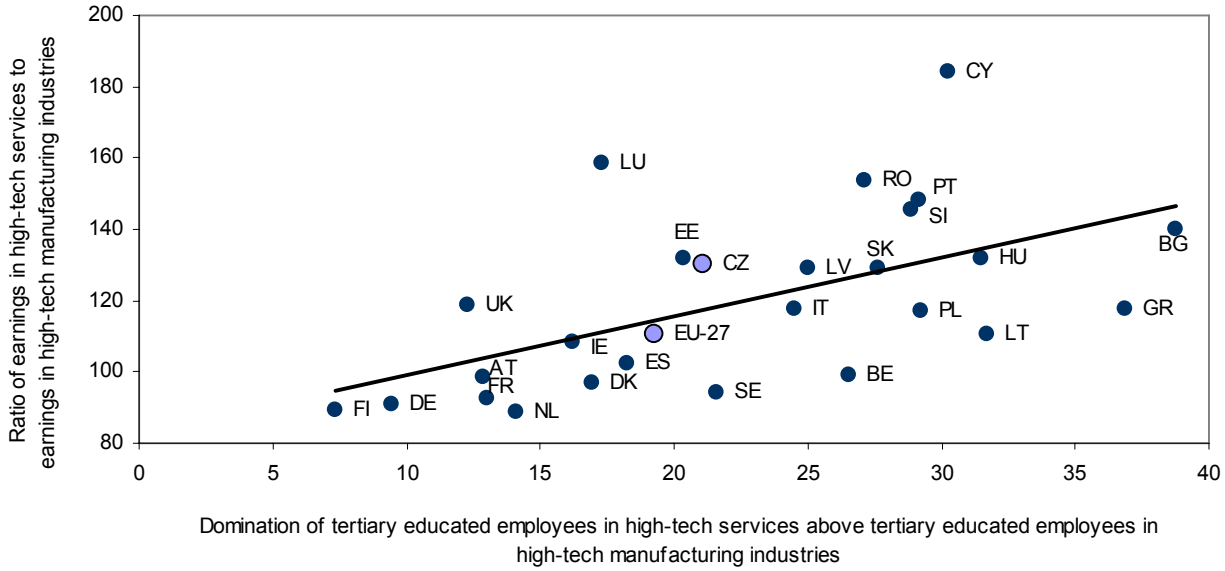
The biggest difference in favour of employees in demanding services was recorded by Cyprus (84%). With the exception of Cyprus, Luxembourg and Portugal, earnings are most skewed in favour of employees in demanding services, i.e. by around 30% or more, in countries that underwent a relatively long period of central planning. These countries include the Czech Republic, where earnings in these services exceed earnings in high-tech manufacturing industries by 30%.

Simplifying somewhat, one can say that this difference is greater in less developed countries than in more developed countries. This is linked with the fact that in less developed countries the availability of tertiary-educated labour force is more limited and its education premium is higher, and with the fact that in these countries the preponderance in the share of tertiary-educated labour force in demanding services over that in high-tech manufacturing industries is greater than in more developed countries.

Two facts are apparent from Figure 36: (a) in all EU countries the share of tertiary-educated labour force in demanding services is greater than that in demanding industries, and (b) the earnings difference in favour of employees in these services increases with increasing difference in the share of tertiary-educated labour force (ISCED 5–6).

Mean earnings in demanding services are the outcome of different earnings levels in the individual categories of sectors that qualify as such services. The starting point for comparing earnings differences between the four segments of high-tech

Figure 36: Difference in share of tertiary-educated labour force in high-tech and knowledge intensive services versus its share in high-tech manufacturing industries (p.p.) and ratio of mean annual earnings of employees in high-tech and knowledge intensive services to earnings of employees in high-tech manufacturing industries (2006, %)



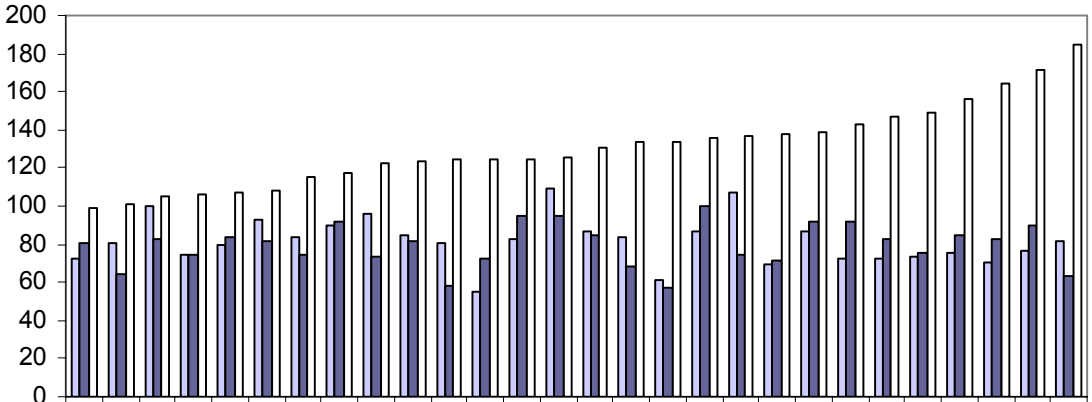
Note: The value for the EU is calculated as an unweighted average. Source: EUROSTAT (2001–2008), tabule code: earn_ses06_28, date of access: 22. 9. 2009, own calculation.

and knowledge-intensive services is earnings in high-tech services. Earnings in the remaining three segments, i.e. market services, financial services and other knowledge-intensive services, are related to their level (see Figure 37).

If earnings in high-tech services represent 100%, then in the EU as a whole earnings in financial services stand at 123%, earnings in other knowledge-intensive services at 85%, and earnings in market services at 81%. If the earnings ratios reflected the ratios in the shares of tertiary-educated labour force, the ranking would have to be different. On average for the EU, tertiary-educated employees are most represented among employees in other knowledge-intensive services (48.3%), followed by high-tech services (41.8%), financial services (38.8%) and market services (38.4%).

In the Czech Republic, as with the EU average, the best remunerated employees worked in financial services (147%). In second place were employees in high-tech services (100%) and in third place were market services employees (83%). Employees in other knowledge-intensive services had relatively the lowest earnings (72%).

Figure 37: Earnings differentiation in high-tech and knowledge-intensive services (2006, %)



	FI	SI	GR	DK	SE	IE	DE	BE	LU	EU-27	PT	SK	NL	CY	AT	ES	BG	FR	IT	PL	MT	UK	CZ	HU	EE	LV	LT	RO
Other services	73	80	100	74	79	93	84	90	96	85	80	55	83	109	87	83	61	87	107	69	86	73	72	74	75	70	77	82
Market services	81	65	83	74	84	82	75	91	73	81	58	73	95	95	85	69	58	100	74	72	92	92	83	75	85	83	90	63
Financial services	99	101	105	106	107	108	115	118	123	123	124	125	125	126	131	133	134	135	137	137	139	143	147	149	156	164	172	185

Note: The value for the EU is calculated as an unweighted average. Source: EUROSTAT(2001–2008), table code: earn_ses06_28, date of access: 22. 9. 2009, own calculation.

As with the EU average, the ranking by shares of tertiary-educated labour force in total employment in the individual segments of high-tech and knowledge intensive services in the Czech Republic is also different. The highest share of the tertiary educated in the Czech Republic is recorded by other knowledge-intensive services (33.5%), where, however, earnings are relatively the lowest. In second place are high-tech services (31.6%), in third place are market services (30.3%) and in last place are financial services (27.4%), despite being first in terms of remuneration.[16] The substantially lower representation of the tertiary educated in the individual segments of high-tech services compared to the EU is due to the generally low representation of the tertiary educated in the population. In 2006, the tertiary educated (ISCED 5–6) accounted for just 13.5% of the total population aged 25–64 in the Czech Republic, while the EU-27 average was 22%.

Financial services are best remunerated in Romania (185%). Other post-communist countries occupy the subsequent places in the notional ranking. With a share of 147%, the Czech Republic has the sixth-highest remuneration in these services. Financial services started evolving in post-communist countries as their market economies developed. To recruit employees with high skills levels, these services offer a high earnings premium derived from the profitability of this sector. In the Czech Republic, market services employees also enjoy an above-average earnings premium (83% vs. 81%).

However, employees in other knowledge-intensive services – especially education and health and social care – are significantly under-remunerated in the Czech Republic compared to the EU average (72% vs. 85%). These are activities whose quality and availability are exceptionally important for the future direction of individual countries and for the present situation/contentment of the population. The earnings situation of employees in this segment of knowledge-intensive services is typically adverse in post-communist countries (Slovakia: 55%, Bulgaria: 61%, Poland: 69%), where the earnings gap compared to earnings in high-tech services is greatest. Only in three EU countries are the earnings of employees in other knowledge-intensive services equal to or higher than those of employees in high-tech services (Greece, Italy and Cyprus).

The standard deviations reveal that earnings in the high-tech and knowledge-intensive services sector are least differentiated in Greece, Finland, Ireland, Sweden and Cyprus (standard deviations: 10–12). By contrast, the biggest differences are recorded by Romania, Lithuania, Latvia, Estonia and Hungary (standard deviations: 35–53). The Czech Republic ranks among the countries with the highest earnings differentiation (standard deviation: 33). It is evident that the countries that underwent a relatively long period of earnings equalisation under central planning are now going through a period of relatively higher earnings differentiation than is the norm in countries in which the market economy has evolved continuously.

[16] Source: Eurostat, LFS, annual means for 2006, own calculation.

4. Conclusion

The quality of human resources as a factor of the Czech Republic's competitiveness was examined in three chapters. The first chapter deals with the preparation of human resources for occupations that require tertiary qualifications in science and technology disciplines, and with the employment situation of graduates of these programmes. The second chapter analyses the decisive aspects of participation of the adult population in continuing education and training (CET) and the penetration of ICT into CET. The third chapter is concerned with foreign employment, flexible employment contracts and wage differentiation as important elements of a flexible labour market. The position of the CR within the EU is identified in all three chapters.

Preparation of human resources for skills-intensive occupations

Technological advancement and structural changes that take place in economies and lead towards more technology-intensive production and services intensify the demand for skilled labour. Moreover, there are growing requirements and demand for **graduates of science and technology disciplines.** The PISA international study has provided evidence that the Czech Republic continues to pay inappropriate attention to encouraging young people to study these fields. When the so-called scientific literacy was examined, Czech pupils did relatively badly in answering questions scientifically and, on the other hand, they were very successful in practical application of knowledge. In countries where as young as basic school pupils have good results in these areas, there is a higher proportion of students and graduates of science and technology programmes at tertiary level.

Interest in studying at higher education institutions in the Czech Republic is constantly growing. In the 2003-2008 period there was an increase both in the number of applications filed (by 38.5%) and in the number of applicants (by 37%). However, there are considerable differences between various fields of study. Humanities and business disciplines are traditionally most sought-after – the number of applicants for these programmes increased by 73% in the 2003-2008 period, while for science and technology fields the increase was only 25%. As regards S&T programmes, there is a constant increase in the ratio of persons admitted to those who turned up for entrance examinations. The level of this indicator (for technology fields it is 90%) points to a growing willingness on the part of institutions to admit also less capable applicants in order to maintain a certain number of students that is important for their operation.

The proportion of **students in science and technology programmes of tertiary education** in the CR decreased in the 2003-2007 period, similarly to the EU-27. However, in terms of comparison the decline in the CR was many times larger. As for sciences, the drop was 0.8 percentage points (p.p.) for the CR as compared to 0.2 p.p. for the EU-27, and for technology fields it was 6.3 p.p. for the CR and 1 p.p. for the EU-27. The largest decrease occurred in architecture and building (2.4 p.p.), while the only sub-category where an increase occurred was computing (04 p.p.)

The proportion of female students in the total student population in tertiary education in the CR is constantly growing. This means that this proportion in the total number of students in science and technology programmes is also increasing. In the 2001-2007 period this proportion in sciences grew from 24.3 % to 35.1 %, and in technology programmes it remained roughly at the initial level – i.e. some 25%. In terms of comparison with the European Union the CR ranks at a below-average level for the proportion of female students in sciences (the EU-27 average was 38.2% in 2007), and for this proportion in technology programmes it hovers at around the average level (the EU-27 average was 24.6%).

In connection with the Bologna Declaration most higher education institutions switch to a three-cycle structure of studies where the largest emphasis is placed on Bachelor level. Evidence of this is, among other things, the gradual development of the number of tertiary education graduates as broken down according to study programmes. The number of the graduates of Bachelor studies in the Czech Republic grew by 290% in the 2003-2008 period, and the number of the follow-up Master degree graduates and Doctoral graduates also increased (by 155% and 47% respectively).

The development in the **number of graduates of science and technology programmes** faces the problem of frequent dropouts, particularly in technology fields. Due to a limited number of applicants technology-focused HE institutions admit a larger body of students where there is a higher percentage of those less talented and also those who perceive the technical institution as a safeguard in the event of not getting admitted to a programme in which they are interested more. Therefore it is not an exception that these students leave the institution as early as the first year of studies either because they cannot cope with the requirements or because they have got admitted to the programme they prefer.

The proportions of students in most fields within **science and technology programmes** in the total number of students grew in 2003-2007. The largest increase occurred in environmental protection (1.1 p.p.) and computing (0.7 p.p.). On the contrary, this proportion decreased for physical science (0.4 p.p.). The proportion of graduates of both sciences and technology disciplines increased in the CR in this period (1.3 and 1 p.p. respectively), while the EU-27 saw a decrease (0.4 and 1 p.p. respectively). The CR occupies one of the top places as for the absolute increase in the number of graduates of these fields. With five years being the average length of studies, this corresponds to an increasing proportion of students in these fields until 2002. Then the proportion began to diminish. We may therefore expect that the proportion of graduates of science and technology programmes will decrease in the upcoming years.

The forecast of the number of graduates in the Czech Republic until 2014 confirms the trend towards more advanced levels of education. From 2006 until 2014 the proportion of graduates of secondary programmes without "maturita" in the total number of graduates? is expected to decrease from 25% to 11%. As concerns graduates of secondary programmes with "maturita" there will be a decrease from 46% to 29%. As distinct from this, the proportion of graduates of tertiary education will double from 29% up to 61%. In the 2008-2013 period there will be a slight increase in the number of graduates of so-called other engineering fields at tertiary level (i.e. engineering fields excluding mechanical engineering, metal casting, metallurgy, electrical engineering, energy, building and architecture) – from 4.4 thousand to 6.3 thousand. The number of graduates of sciences will also increase from 4.4 thousand to 7.1 thousand.
Another aspect that is important for the competitiveness of the economy is the situation of these graduates at the **labour**

market. The employment of graduates of science programmes in the 25-29 age group was 75% in 2007, for technology graduates it was slightly higher – 80%. The CR ranks below the EU-27 average for these indicators. The figures for the EU-27 were 81.1 % and 87.2 % respectively. In the CR there also was a relatively high percentage of graduates who were economically inactive for various reasons such as childcare, foreign internships or further studies. In the 30-34 age group the employment of graduates in the CR was considerably higher (90.7% for science graduates and 90.9% for technology graduates.

Graduates of technology disciplines often found employment as late as after completion of studies (69.8%), and only a small share of them worked still during studies (16,4 %). A slightly higher percentage of graduates of science programmes had a job during studies pracoval již při zaměstnání-V ČJ JE MYSLÍM CHYBA (21.5 %). However, the average for other fields was 28.7 %. Most technology graduates found a job by contacting employers on their own initiative (30.3 %), whereas graduates of sciences more often combined several strategies – apart from their own initiative they also sought assistance of their family or friends, and used the Internet. A clearly predominating proportion of graduates got a permanent employment contract in their first job – this percentage was higher for technology graduates (72.1%) compared to science graduates (64.4%). This proportion further grew in the second and third job.

The identification of **requirements for the knowledge and skills** of graduates of science and technology programmes constitutes an important source of information. This information may be used to inform systemic changes in various areas, particularly in tertiary education, and also to assist the students and graduates themselves. According to **employers,** the most important feature in all employees doing jobs based on science and technology qualifications is mastery of one's own discipline. This feature accounts for an average of 50% of their qualification profile. The weight of the graduates' specialist knowledge is larger in technical disciplines as compared to, for example, humanities and social sciences. A thorough knowledge of ones' own field is of key importance. However, it does not suffice.

The second place in terms of importance is occupied by **language competencies** (17 %). The requirements for foreign language skills in individuals working in technology and science fields have recently been growing rapidly. This is, to a large degree, the result of foreign investors' stakes in Czech enterprises and internationalisation of manufacturing processes that require communication with foreign partners. The command of one foreign language is a must, the knowledge of another language is an advantage. In view of the considerable degree of dependence of Czech producers on German consumers and partners, the second most frequently required language is German.

The importance of **soft skills** was rated, on average, to amount to 12% of the overall qualification profile. The most important soft skills included, according to the rating, **innovativeness** and presentation and teamwork skills. The employers' emphasis on the innovativeness of employees is the result of the fact that innovation is the driving force behind the development of enterprises and the entire economy. Moreover, generation of new ideas is not separated from the work process and it is becoming an integral part of it.

It is clear from the above that graduates will be increasingly required to display a certain balance of specialist knowledge, knowledge of other disciplines and soft skills. As regards the rating by employers, mastery of one's own filed and teamwork received the highest scores, while business knowledge, knowledge of other disciplines and assertiveness were at the bottom of the scale. Employers are surprisingly satisfied with the level of graduates' language skills, which they consider to be very important. The rating of other soft skills is around the average. Therefore we may say that employers are not particularly negative about the overall knowledge and skills of graduates.

The strengths mentioned by **graduates** of science and technology fields included, above all, mastery of one's own discipline (43.8%). As concerns soft skills, work with a PC and the Internet was most frequently seen as a strength (38.7%) as well as analytical thinking (34,8%). If we compare men and women as they assess their strengths, it is clear that women, in general, rank their soft skills more highly whereas men concentrate more on mastery of own discipline.

According to graduates, their most severe problem is proficiency in a foreign language. 56.4% graduates of science and technology programmes mentioned this as a weakness. It is more often technology graduates who see this as a problem. As for innovativeness – i.e. the ability to come up with new ideas and solutions - a higher proportion of graduates think this is a weakness (6.3%) as compared to those for whom this is a strength (4.4%). However, the low number of answers suggests that, in general, graduates do not consider this ability to be overly important and necessary.

Graduates believed that, for nearly all skills, the level they had acquired was above the average as compared to what was required in their current job. Work with a PC and the Internet received the highest scores in this respect, the ability to "sense" new opportunities was rated the lowest. As concerns most of the skills assessed graduates do not see major differences in the level acquired and that required by the employer. This means that the graduates' level of skills is more or less in line with what their current employment demands.

However, when we compare the answers of **employers and graduates** it is revealed that graduates largely overestimate their skills. As regards soft skills, the largest differences can be seen in the assessment of innovativeness. As opposed to graduates employers believe this is the most important of soft skills, and it is evident that employers think this skill is less developed in the graduates as compared to what the graduates think. The problem is that unless graduates get an opportunity to show their innovativeness, their self-evaluation in this respect may be inappropriate to a large degree.

As for the **use of the graduates' knowledge and skills** at work, nearly one fifth of them declare that their knowledge and skills very little used in their first job after graduation or not used at all. On the other hand a large group of graduates (also one fifth) realise – and this also applies to their current job - that the job requirements are higher than the level of their knowledge and skills. This applies more to technology graduates who enter the market and immediately face rapid technological development with which educational institutions often cannot cope.

Overall, graduates fare well at the **labour market** in most European countries. Mastery of one's own discipline continues to be the most important precondition for success at the labour market – both in traditional and new occupations. In addition to the traditional requirements for expertise in one's own field there are increasing requirements for the following

competencies: mobilisation of human resources, functional flexibility, management of innovation and knowledge, and international orientation.

The requirements for the aforementioned skills are more or less universal. The level required is relatively high with small differences between the competencies. Although the level of these competencies among graduates is, on the whole, relatively high, not always does it match the level required from a particular graduate in a particular job. Employers do not make use of graduates' capacities particularly in management of innovation and knowledge. It is mainly private companies that operate at an unstable market and do not make an optimal use of human capital. As distinct from this, organisations wishing to be top innovators display a better ability to use the graduates' potential in this respect.

Continuing education and the information society

Continuing education and training in the context of the rapidly changing labour market and employers' requirements are becoming more and more important. In virtually all European countries, and the Czech Republic is no exception, we can see growing investment in CET.

In terms of the overall rate of **participation in continuing education and training** the CR's ranking is average among EU countries. However, as compared to 2003 there has been a major increase in this rate in the CR. Due to this the gap between the rate of participation in CET in the CR and the average for the EU-27 and other developed countries has been diminishing in recent years. As for this participation, Nordic countries are traditionally the leaders with some West European countries at their heels (e.g. the United Kingdom). As regards new member countries, Slovenia and the Baltic countries (e.g. Estonia) are also getting closer. The CR falls within a large group of countries of Central and Southern Europe where the overall rate of participation fluctuates below the EU-27 average. However, within this group the CR ranks among the better performers in this respect.

The major increase in the overall rate of participation in CET in the CR was the result of two main factors. The first factor was a robust economic growth in the CR in 2003-2008. Due to this development the rate of unemployment fell significantly and the labour market could more easily meet the growing requirements on the part of employers. Companies were forced to invest in staff development as the mismatch between the knowledge and competencies required and those offered increased. At the same time a new trend appeared which made the situation concerning demand for labour more complicated: companies were stiffening their requirements, the selection criteria were tougher, and they would not do with job applicants who did not meet the job requirements in full. The second important factor was the inflow of resources from EU structural funds. In the budgetary period of 2004-2006 there was the Operational Programme Human Resources Development, the follow-up to which is the Operational Programme Education for Competitiveness for 2007-2013, and also partly the Operational Programme Human Resources and Employment. As a result of unfavourable economic forecasts public support for continuing education and training is likely to play a more important role in the upcoming years than has so far been the case.

In terms of comparison with other European countries, continuing education and training in the CR has certain specific features. First of all, the CR displays an above-average rate of **participation in CET on the part of employed individuals**, while the rates are far worse for the unemployed and economically inactive people. The explanation of this is related to one factor that affects the overall participation: CET is, in most cases, an initiative of employers who train their staff in the skills needed for specific jobs. CET undertaken because an individual feels the need for it is less frequent, and the respective data for the unemployed and economically inactive part of the population of the Czech Republic fall deep below the EU average. Unfortunately, this may work as a factor of long-term and structural unemployment as people who are temporarily out of the work process do not see a clear link between enhancement of their knowledge and skills on the one hand and the chances of finding good employment on the other hand.

The extensive involvement of employers in the coverage of the costs of CET contributes to the fact that the Czechs do not see the **price of courses** to be a major problem. On the other hand, there is a significant portion of employers who do not recognise the benefits of continuing education, and it is the workload of Czech employees (i.e. obstacles erected by the employer) that is mentioned as the most frequent reason for non-participation in CET. This reason is less frequent in other EU countries. The differences in the occurrence of reasons related to the family, age and health between the CR and the EU-27 are similar.

An analysis of **reasons for participation** reveals that the prospects of a further career growth and a pay increase predominate. While in most EU countries this reason is mentioned by every second respondent, in the CR it was only by every seventh respondent. As for the other reasons why continuing education and training are pursued (interest in a particular area, efforts to learn a particular skills applicable in everyday life), the Czechs are also very passive in terms of comparison with the EU average. It might appear from their answers that, in many cases, they do not ascribe major importance to CET.

When considering participation in CET according to **occupational groups** it is evident that the situation in the CR improved in the 2003-2007 period. In 2003 the CR compared with developed countries in the most skills-intensive occupations (ISCO 1-3). However, in terms of rate of participation in CET on the part of the other occupational groups the CR lagged behind. During the four-year period there was a major improvement. In 2007 the rate of participation of ISCO 8-9 in the CR was above the EU-27 average, and for ISCO 4-5 it was slightly below the EU-27 average.

Although the CR ranks above the average for the overall rate of participation of adults in CET, the **duration** of this education (number of hours per participant) is much shorter. In terms of the average number of hours devoted to CET per participant and year, the CR ranks among the countries at the bottom of the EU-27 scale. This is particularly true of less skills-intensive engineering occupations in industry, agriculture and services (ISCO 6-8), and unskilled occupations (ISCO 9).

It is therefore not surprising that the CR also lags behind for the indicator of **investment** in continuing education and training. Even in terms of the occupational groups that show the highest rate of participation in CET (ISCO 1-3), the CR scores lower than 50% of the EU-27 average (in euros per one participant in CET). The results of the comparison are even less favourable for the ISCO 6-7 and ISCO 8-9 groups. The difference in the price level does play a role in this comparison, but the CR does not do well even in comparison with countries that do not differ too much in this respect, such as Greece, Slovenia or Portugal.

In terms of participation in continuing education and training according to **educational categories,** the analysis or the position of the CR does not provide any surprise. The rate of participation among people with tertiary qualifications is above the average, whereas for other educational categories the CR's scores gradually worsen in terms of comparison with other countries. Slovenia and Bulgaria are examples of new member countries that fare better than the CR for this indicator.

On the other hand, the CR ranks relatively well as compared to other countries for the rate of participation according to **age groups**. In the 35-54 category, in particular, the CR outruns a number of more developed countries. The seamy side is the lower participation of young people aged 25-34. However, most new countries face a problem in this area.

Furthermore, it is important to mention **participation of women** in continuing education and training, which is some 20% lower than that of men in the CR, while in the EU-27 this difference is only 3%. For this indicator the CR ranks at the very bottom of the scale among the countries under review.

This means that, in the 2003-2007 period, the CR slightly improved its position among European countries as regards CET. The most striking weaknesses still include the involvement of people doing lower skilled jobs, young people and also women. From these perspectives the CR does not do well in terms of comparison with other EU countries. Although the overall benefits of CET for the participants and, consequently, for labour productivity, the pace of innovation and other characteristics of competitiveness of the economy are difficult to measure, there is no doubt that initial education cannot guarantee long-term employability due to rapidly changing requirements for knowledge and skills, and that a low rate of participation in CET is one of the indicators of long-term and structural unemployment.

The ICT sector development is constantly increasing requirements for the knowledge and skills of employees in relation to the use of modern technologies. This places higher demands on the development of the systems of both formal education and the continuing education of the adult population. It is also true that information and communication technologies may contribute to elimination of skills shortages at the labour market. However, participation in electronic learning is strongly dependent on the accessibility of broadband connection to the Internet and on the level of ICT knowledge and skills of the population of the given country.

EU countries witness a growing proportion of people who **use a PC to do their job** in total employment. This proportion in the CR is 40% (all sectors excluding finance), which is below the EU-27 average (49%). This fact has an impact on the electronic skills both at user and specialist level. The influence of ICT on transformation of the public and business sectors takes the form of a growing need on the part of individuals to undergo further training in electronic skills. In the EU-27 individuals aged 25-54 acquire their electronic skills, above all, by means of practical and informal learning – mostly at work or on the initiative of their employer. In the CR adults aged 25-54 gained e-skills most often through informal learning with the help of colleagues, friends or relatives.

Electronic skills at user or specialist level are more and more frequently presented as one of the principal requirements on the part of employers. This is reflected in the number of individuals who were trained in e-skills at the request of the employer, and also in the number of employers who provided **training for their employees in order to improve their ICT skills**. This is the way in which 18% of individuals aged 25-54 gained ICT skills in the CR in 2007, which is not much less as compared to the EU-27 average (22%). On the other hand, training on the initiative of employers was the case of most individuals in Sweden (50%), Germany (42%) and Austria (30%).

In terms of the CR's competitiveness, the skills intensity of occupations for which Czech workers are hired is going to play an increasingly important role. The CR has a good position as regards the proportion of employees with electronic, mainly specialist, skills. This position should be further strengthened. These skills constitute a prerequisite for the jobs of ICT specialists. In 2008 the proportion of employees with **specialist ICT skills** was 4.8% in the CR (the third highest figure in the EU-27). The first two places on the scale were occupied by Sweden and Luxembourg where the proportion of employees with expert ICT skills reached 5%. The CR has a weaker position as concerns the proportion of employees who have **user ICT skills**, but this figure roughly equals the EU-27 average. The worst situation in this respect is in Romania and Bulgaria. These new member countries display a low level of both user and specialist ICT skills among employees. Moreover, these countries are characterised by a very low drive for ICT skills acquisition.

In countries with a large proportion of people using a PC in their employment it is generally more frequent that these individuals undergo PC courses at the requrest of their employer. Moreover, enterprises tend to invest more often in upgrading their employees' ICT skills from user to specialist level. The overall position of the ICT sector also plays a certain role in this case, and so does the level of ICT skills employees already have (not only in the ICT sector). As learning by doing and informal learning constitute the key approaches to e-skills acquisition (this implicitly includes learning at the workplace), we may also observe a link between participation of individuals in these modes of learning and the proportion of employees using a PC to do their job.

The **ICT sector** also involves some less skills-intensive activities and processes, such as installation of computer hardware and consumer electronics. In countries of Central and Eastern Europe (including the CR), workers in these areas account for a considerable proportion of employment in the ICT sector. Targeted staff development in assembly plants in the ICT sector is far less common in these countries, and they rank deep below the EU-27 average in this respect. However, these countries are to undergo transformation of this sector in the upcoming years. Assembling and other less demanding activities will be gradually moved to cheaper locations, and the pressure for enhancing the knowledge and skills of employees in the ICT sector will grow.

With its 67% of **Internet users** aged 25-54 the Czech Republic approached the EU-27 average in 2008 (the EU-27 average was only 3 p.p. higher). In 2005 the proportion of Internet users in the population was only 37% - i.e. less than 64% of the EU-27 average at that time.

The rate of participation of individuals aged 25-54 in **on-line courses** did not show any major changes in the 2007-2008 period. A large majority of countries (including the CR) experienced either a slight increase or stagnation. A high rate of participation in on-line courses is conditional upon a certain level of advancement of the information society, the relevant infrastructure and at least basic level of e-skills making it possible use this learning instrument. This is reflected, to

a degree, in the ranking of countries according to the rate of participation in on-line courses. Moreover, the ranking reflects other factors that concern the supply of rather than demand for this specific type of electronic learning. One of these factors is the network of on-line learning providers.

A positive change in the **use of ICT in formal education** occurred between 2000 and 2008. This particularly concerned initial education. In continuing education and training ICT is used more as part of informal learning. In 2003 there were 1.4% of adults aged 25-64 who took part in formal education – i.e. three times less than the EU-25 average. However, in the same year there were 12.4% of individuals in the same age group who learned to use a PC as part of informal learning. Even in this case the figure was lower than the EU-25 average (19.2%). According to the most recent survey of 2006, the use of the Internet in the formal education of adults was considerably lower as compared of the EU-15 and EU-27 average figures. The point is that eLearning may contribute to enlarging the scope of distance formal education, and to involving those groups of individuals who will not take part in traditional formal education approaches.

Apart from the formal and informal education of individuals, the use of a PC and the Internet is of key importance for the continuing training at the workplace. Large companies and public institutions are best equipped for the training of their staff with the use of **eLearning applications**. On the contrary, small and medium-sized companies usually rank below the average as regards the use of these forms of training for their employees.

The use of eLearning by employers in the CR is similar to that in the EU-27 in terms of structure. Large companies with over 250 employees implement eLearning techniques most frequently (56% in 2009). Small and medium-sized companies show a much lower use (32% in 2009). In terms of the level of this indicator the CR is above the EU-27 average, which was 24% for all companies in 2009 (i.e. 8 p.p. less than in the Czech Republic).

Labour market flexibility

The inflow of foreign nationals into the Czech Republic has grown dramatically in recent years. This growth began to speed up considerably after the CR's joining the European Union in 2004. For this development the Czech Republic differs from the immigration patterns in the EU-27 where the inflow of immigrants from third countries has been gradually slowing down. The most important reason for foreigners coming to the CR is their pursuit of employment or self-employment (a trade licence). Other reasons, such as studies, are not too important.

The inflow of immigrants into the labour market is important as it may, to a degree, close the gap between the supply of and demand for workforce. Foreign labour force may, to an extent, offset the negative implications of the Czech population ageing and to generate a pool of labour for occupations for which there are not enough skilled individuals among the Czechs or which are not attractive for Czech workers due to pay and work conditions. On the other hand, the supply of foreign labour pushes wages down and this may contribute to growing unemployment rates among low-skilled groups of the Czech population.

In 2008 there were some 350 thousand foreigners working in the CR on a legal basis – i.e. approximately 7% of total employment. The **occupations** performed by foreigners in the Czech Republic are strongly polarized. Most foreign nationals do jobs at a very low level of skills intensity regardless of their formal education – mainly in manufacturing and construction. There are even people with tertiary qualifications doing unskilled jobs. A smaller portion of foreigners hold positions with a very high level of skills intensity for which there are no suitable candidates in the Czech Republic – particularly in professional services and in the management of foreign companies.

Foreign workers form the most flexible component of employment. As compared with the Czech population they show a higher level of geographic **mobility** as well as mobility across sectors and occupations. Flexible employment contracts in the case of foreigners tend to be forced by employers. Foreign workers are very often employed on the basis of contracts for a fixed period of time. They more often work in difficult working conditions (e.g. shifts, evening hours, at night and at weekends) as compared to Czech employees.

The inflow of foreigner labour force into the CR was sparked by the rapid economic growth in the Czech Republic in 2005-2008. However, the employment of foreigners was relatively quickly and severely affected by the **economic crisis**. The beginning of the crisis nearly coincided with a halt in the increase of foreign employment. At the beginning of 2009 the number of foreign employees started to fall. The employment of foreigners declined faster compared to overall employment in the CR. There was a particularly robust decrease in the number of workers from third countries most of whom did unskilled jobs in manufacturing. However, this decline could be partly offset by an increasing number of trade licence holders and a more extensive use of the so-called "švarc-systém" (people working for an employer on self-employment basis – i.e. not on the basis of an employment contract). This is indicated by the fact that the total number of foreigners legally residing in the CR has not decreased dramatically.

The tracking of foreign employment is constrained by a lack of coherent sources of statistical data. In addition to this there is a relatively extensive scope of **illegal working** that is not covered by the statistics. The number of illegal workers is estimated by experts to range from 17 thousand to as many as 300 thousand. Illegal work brings about negative economic as well as social implications. It does not generate revenues to the state budget, pushes the cost of labour down, and creates an unfair competitive advantage for employers. Furthermore, statistically uncovered illegal work distorts views of labour productivity.

Flexibility in the forms of employment is increasingly at the centre of analysts' and policy makers' attention, as it is one of the main pillars of labour market flexibility. This is one of the areas where many changes have taken places in recent years. These changes were largely aimed at increasing the flexibility of employment contracts and expanding the use of alternative forms of employment. The Czech Republic is no exception in this respect. Even so, flexible forms of employment in the CR are little used as compared to most European countries. Moreover, state support in this area is insufficient. Although the legislative framework does provide a relative freedom in this respect, in practice alternative employment contracts are still viewed only as complementary forms of employment.

For the use of **part-time employment contracts** the CR ranks far below the EU-27 average. In the second quarter of 2009 these contracts only accounted for 5.6% of total employment, while in many European countries this figure is over 20% (the EU-27 average was 18.8%). The main reason

behind the scarce occurrence of part-time jobs is the relatively lower income level, as compared to more developed countries, which is coupled with non-existence of state incentives and preference for traditional full-time employment on the part of both employees and employers. The proportion of part-time employment in the CR has shown slight fluctuations since 2001 with no major changes in general. As distinct from this, this proportion is slowly but constantly growing in EU-27 countries. A larger year-on-year increase was observed both in the CR and EU-27 in the most recent comparison, which is a consequence of the economic crisis.

A more extensive use of part-time jobs is normally associated with a lower rate of unemployment. An analysis of EUROSTAT data confirmed this link in EU-15 countries. However, in new member states the outcome was not so clear. The use of part-time employment contracts is relatively low in these countries while the rates of unemployment vary. A good condition of the economy and a relative level of income therefore appear to be an important condition for a major increase in the occurrence of part-time jobs.

Fixed employment contracts provide more flexibility to employers in particular. Employees see this type of contract as a certain threat to their job security and there are rather negative sentiments attached to it as compared to permanent employment. This is why in many countries the use of temporary employment contracts is regulated by legislation.

The CR ranks among countries with more extensive **legislative restrictions**, which results in a lower proportion of fixed employment contracts in the economy – 8% of total employment as compared to the average 14% in the EU-27 (2008 data). From 2004 this proportion tended to decrease due to more legislative restrictions being enacted, but the most recent year-on-year evaluation revealed a slight increase. The average figure for the EU-27 has been slowly decreasing over the long term. The most recent year-on-year evaluation showed the decrease was even larger. This is likely to be an impact of the economic crisis as employees are more threatened for a certain period of time during economic recession.

Wage differentiation is the result of the workings of many factors. The most important ones include the characteristics of individual employees (the level and field of education, work experience, commitment, gender), company characteristics (position in the product market, the power of trade unions), state interference (minimum wage) and the relationship between the supply of and demand for labour.

The wage level increases along with the **level of educational attainment**. In 2006 the wage of employees with secondary qualifications (ISCED 3-4) amounted to 132% of the wage of employees with basic qualifications (ISCED 2). The wage of individuals with Bachelor degree education and Master degree education (ISCED 5A) amounted to 214% of the wage of people with basic qualifications. In the CR the wage premium of Bachelor and Master degree holders was significantly higher than the EU average. Their wages reached 247% of the wage of employees with basic education.

The data for the EU reveal that the wage premium of employees with tertiary qualifications (ISCED 5) is lower in countries with higher economic standards and higher availability of people with tertiary education as compared to countries where the reverse is true. According to correlation coefficients the relationship between the wage premium and the economic standards is about as strong as the link between the wage premium and the availability of the relevant workforce (the correlation coefficients were –0.50 and 0.46 respectively).

The wage level in various countries is one of the main decision-making factors for investors as concerns the placement of their activities. In 2006 the average wage expressed in purchasing power parity terms was 14% higher in the CR as compared to new member states (EU-10). However, in terms of comparison with the old member states (EU-15) it accounted for less than half (49%). The wages of employees with tertiary qualifications (ISCED 5) in the CR are 36% higher as compared other new member countries, and in terms of comparison with old member states (EU-15) they reach as high as 70%. These differences in the development of average wages and the wages of people with tertiary qualifications are influenced by two factors. On the one hand, in the CR the wages of people with tertiary education grew more quickly as compared to the wages of people with lower levels of education. On the other hand the wages of people tertiary qualifications in EU-15 average terms decreased slightly.

With a certain degree of simplification we may say that, in the CR, people must study additional two to three years to achieve the following more advanced level of education (qualification). These **additional years of study** are best appreciated by means of wages in the case of Master degrees. In 2008 the median wages of graduates of Master programmes were 32% higher than the wages of graduates of tertiary professional schools and Bachelor programmes (ISCED 5A, 5B). It was the graduates of these levels of education (i.e. Bachelors and "Specialists with a Diploma" – graduates of tertiary professional schools) who had the lowest wage premium. In 2008 employees with these qualifications got wages that were only 10% higher compared to those of employees with secondary education with "maturita".

Evidence of the improving labour market situation of Bachelor degree holders and specialists with a diploma is the fact that their wages have began to come closer to those of the graduates of Master and Doctoral programmes. In 2002 they only accounted for 73%, in 2008 it was 76%. It is clear that employers are gradually beginning to appreciate this type of tertiary education which is relatively new in the CR. This appreciation also results from the fact that there are people with these qualifications at the labour market who have already gained some work experience. However, this experience is still very short as compared to that of graduates at other levels of education. For example, the first graduates of tertiary professional schools entered the labour market as late as the 2nd half of the 1990s.

There are wage differences not only between educational categories but also within them. **Internal wage differentiation** reflects, apart from other influences, differentiation in qualification requirements within individual educational categories. This differentiation increases along with the growing level of educational attainment. People with more advanced education can do a larger spectrum of jobs compared to people with lower qualifications. The highest wages (95th percentile) of employees with basic education are three times higher than the lowest wages (5th percentile), whereas in the category of people with tertiary qualifications the difference is six-fold.

Wage differentiation also depends on experience gained during a career. The age of an employee is an indirect indicator of the scope of **practical experience**, although there is no direct proportionality due to possible career changes or

interruptions. Data about average gross monthly wages show that employees in the CR reach the highest wage levels after some 10-15 years of work experience. Then there is a slight but more or less stable decline or stagnation. As for employees with upper secondary qualifications, the highest wages were to be found in the 30-34 age group. Among people with tertiary qualifications it was the following five-year age cohort (35-39) that received the highest pay. It is clear that, in addition to the length of work experience, employers also appreciate the relevance of formal education, which is higher in younger employees as compared to older ones.

Moreover, remuneration changes depending on the **occupation.** Since there are different qualification requirements for individual occupations it is clear that jobs with higher skills-intensity level offer higher wages than jobs where lower skills suffice. In the CR wage differentiation based on occupation is larger than the EU average. The biggest gap can be see between the wage of managers and that of auxiliary workers, which is 327% in the CR and 309% in the EU. The gap between the wage of technicians, healthcare personnel and teachers and that of auxiliary workers is also quite significant. It is 187% in the CR and 177% in the EU.

The fact that wages increase along with the employees' level of education should also be reflected in the wage level of employees in **technology and skills-intensive sectors** of the national economy. In 2009 wages in technology-intensive manufacturing industries in the EU exceeded the wage level in manufacturing in general by 9%. The Czech Republic ranks among countries where this difference is smaller – only 5%. Neither in the CR nor in EU average terms do wages in manufacturing industries with a high level of technology intensity differ from wages in industries with a medium level of this intensity. It seems that the skills intensity of those two sectors is relatively the same.

Services play an increasingly important role in the economy of developed countries. **Technology and knowledge-intensive services** in all EU countries have a higher proportion of workforce with tertiary qualifications as compared to technology-intensive manufacturing industries. However, their wages are lower in many member countries. The Czech Republic is not one of these countries. Lower wages in technology-intensive services as compared to wages in technology-intensive manufacturing are more typical of advanced economies such as Finland, Germany and the Netherlands.

In the CR, as in EU average terms, employees in **financial services** had the highest wages, although the largest proportion of people with tertiary education was to be found in other knowledge-intensive services (healthcare, education, recreational and cultural services). It is clear that people with tertiary qualifications who do jobs in these sectors are underpaid.

The level of wage differentiation varies in individual EU member countries. In broader terms, there are certain similarities in old member countries, and new member countries also share certain features in this respect. At present wage differentiation is larger in new member countries that had undergone periods of central planning and the related wage equalisation, and periods of a very limited access to tertiary education.

References

Act No. 262/2006 Coll., Labour Code.

Act No. 326/1999 Coll., on the Residence of Aliens in the Territory of the Czech Republic.

Act No. 435/2004 Coll., on Employment.

AVAYA (2009): *Flexible Working 2009: Independent Market Research Commissioned by AVAYA. Dynamic Markets 2009*, (online). Internet:http://www.avaya.com/uk/emea/en-us/resource/assets/premiumcontent/flexibleworking.pdf.

BAŠTÝŘ, I. (2009): *Výdělková motivace k migraci z ČR za prací do zahraničí se zaměřením na kvalifikované, terciárně vzdělané odborníky. (Income motivation to work migration from CR to abroad with focus on qualified professionals with tertiary education)* Fórum sociální politiky 6/2009, str. 2-9., Praha, VÚPSV, 2009. ISSN 1802-5854. P. 32.

BIČÁKOVÁ, O. (2009): *Jaké jsou flexibilní formy zaměstnávání? (What flexible forms of employment there are?),* (online), MPSV, 2009. Internet: http://www.mpsv.cz/cs/5793.

CEDEFOP (2004): *Terminology of vocational training policy, A multiligual glossary for an enlarged Europe*, Luxembourg: Office for Official Publications of the European communities, 2004, ISBN 92-896-0272-4. P.: 199.

CI CR (2008): Výsledky dotazníkového šetření: Jak se v ČR (a osmi dalších zemích) využívají flexibilní formy práce. (Results of survey: How are flexible forms of work used in CR (and other eight countries)) Confederation of Industry of the Czech Republic, 2008, (online). Internet http://www.spcr.cz/cz/ankety/flexi.doc.

ČSRLZ (2008): *Zaměstnavatelé a alternativní úvazky (Employers and alternative contracts)*. ČSRLZ 2008, interní dokument.

CZSO (2005): *Dlouhodobý vývoj (ne)zaměstnanosti a HDP se zaměřením na částečné úvazky (Long-term development of (un)employment with focus on part-time work)*, (online), 2005. Internet: http://www.czso.cz/csu/csu.nsf/6b5c18eccf5e21d7c1256c4d0034d22b/8bd1ae73fe3b5346c12570b4003a16bb/$FILE/kra051110.pdf.

CZSO (2006): LFS, 2006, 2nd quarter (individual data).

CZSO (2007): LFS, 2007, 2na quarter (individual data).

CZSO (2008a): LFS, 2008, annual averages (individual data).

CZSO (2008b): *Zaměstnanost a nezaměstnanost v ČR podle výsledků výběrového šetření pracovních sil - roční průměry 2008 (Employment and Unemployment in the Czech Republic as Measured by the Labour Force Sample Survey – annual averages 2008)*, (online), 2008. Internet: http://www.czso.cz/csu/2009edicniplan.nsf/p/3115-09.

CZSO (2008c): *Věkové složení obyvatelstva v roce 2007 (Age distribution of the population 2007),* (online), 2008. Internet: http://www.czso.cz/csu/2008edicniplan.nsf/publ/4003-08-v_roce_2007.

CZSO (2008d): *Struktura mezd zaměstnanců v roce 2008 (Structure of Earnings Survey 2008)*, (online). Internet: http://www.czso.cz/csu/2009edicniplan.nsf/p/3109-09.

CZSO (2009a): *Další vzdělávání dospělých 2007 (Adult education survey 2007)*, Code: e-331309,(online). Published: 10. 7. 2009. Internet: http://www.czso.cz/csu/2009edicniplan.nsf/t/EE0048ED4D/$File/331309k01.pdf.

CZSO (2009b): *Cizinci v ČR (Foreigners in the CR)*, (online). 2009. Internet: http://www.czso.cz/csu/cizinci.nsf/kapitola/uvod.

CZSO (2009c): *Klasifikace ekonomických činností (CZ-NACE) (Classification of Economic Activities)*, (online), 2009. Internet: http://www.czso.cz/csu/klasifik.nsf/i/klasifikace_ekonomickych_cinnosti_(cz_nace).

CZSO (2009d): *Makroekonomické údaje (Macroeconomic indicators)*, (online), 2009. Internet: http://www.czso.cz/csu/redakce.nsf/i/cr:_makroekonomicke_udaje/$File/HLMAKRO.xls.

CZSO (2009e): *Odvětvová klasifikace ekonomických činností (OKEČ) (Classification of economic activities)*, (online), 2009. Internet. http://www.czso.cz/csu/klasifik.nsf/i/odvetvova_klasifikace_ekonomickych_cinnosti_(okec).

CZSO (2009f): *Projekce obyvatelstva České republiky do roku 2065 (Population projection of the CR until 2065)*, (online), 2009. Internet:: http://www.czso.cz/csu/2009edicniplan.nsf/p/4020-09.

CZSO (2009g): *Rychlá informace, Historicky nejvyšší meziroční vzestup nezaměstnanosti (The highest year-to-year increase of unemployment in history)*, (online), 2009. Internet: http://www.czso.cz/csu/csu.nsf/informace/czam110409.doc.

CZSO (2009h): Zaměstnanost *a nezaměstnanost v ČR podle výsledků výběrového šetření pracovních sil za 1. čtvrtletí 2007 – 2. čtvrtletí 2009 (Employment and Unemployment in the Czech Republic as Measured by the Labour Force Sample Survey – 1st quarter 2007-2nd quarter 2009)*, (online), 2009. Internet: http://www.czso.cz/csu/2009edicniplan.nsf/p/3101-09.

CZSO (2009i): *Analýza trhu práce 2000–2007(Labour market analysis 2000–2007)* , (online), 2009. Internet: http://www.czso.cz/csu/2008edicniplan.nsf/p/3111-08.

CZSO (2009j): *Klasifikace zaměstnání (Classification of occupations)*, systematic part, (online), 2009. Internet: http://www.czso.cz/csu/klasifik.nsf/i/kzam_systematicka_cast.

DRBOHLAV, D. (ed.) (2008): *Nelegální ekonomické aktivity migrantů - Česko v evropském kontextu (Illegal economic activities of migrants – CR in European context)*. Praha, Karolinum, 2008. ISBN 978-80-246-1552-3. P.: 311.

EC (2007a): *European Employment Observatory Review: Autumn 2006*. European Commission 2007.

EC (2007b): *Employment in Europe 2007*, (online), Luxembourg, October 2007, ISBN 978-92-79-06669-6. Internet: http://ec.europa.eu/social/main.jsp?catId=113&langId=en&newsId=542&furtherNews=yes.

EC (2008a): *Employment in Europe 2008*, Luxembourg: Office for Official Publications of the European Communities, 2008, ISBN : 978-92-79-09809-3. P.: 292.

EC (2008b): *The use of ICT to support innovation and lifelong learning for all - A report on progress*, SEC(2008) 2629, Brussels, 2008, Commission Staff Working Document, (online). Internet: http://ec.europa.eu/education/lifelong-learning-programme/doc/sec2629.pdf.

EC (2009a): Accompanying document to the Communication From The Commission To The European Parliament, The Council, The European Economic And Social Committee And The Committee Of The Regions: *Europe's Digital Competitiveness Report*, Volume 1: i2010 — Annual Information

Society Report 2009, Benchmarking i2010: Trends and main achievements, Brussels 2009.

EC (2009b): *Europe's Digital Competitiveness Report: Main achievements of the i2010 strategy 2005–2009*, Luxembourg, Publication Office of the European Union, 2009, ISBN 978-92-79-12823-3, (online). Internet: http://ec.europa.eu/information_society/eeurope/i2010/docs/annual_report/2009/digital_competitiveness.pdf.

EPC FE (2006): Reflex 2006 data file, NOET calculations from individual data.

EUROFOUND (2005): European Working Conditions Survey 2005 (mikrodata).

EUROFOUND (2007): *Part-time work in Europe*. Eurofound, (online), 2007. Internet: http://www.eurofound.europa.eu/ewco/reports/TN0403TR01/TN0403TR01.pdf.

EUROSTAT (1999–2007): Population and Social Conditions, Education and Training, 1999–2007, (online), Internet: http://epp.eurostat.ec.europa.eu/portal/page/portal/education/data/database.

EUROSTAT (2000–2009): Employment and unemployment, Labour Force Survey, 2000–2009, (online). Internet: http://epp.eurostat.ec.europa.eu/portal/page/portal/employment_unemployment_lfs/data/database.

EUROSTAT (2001–2008): Population and Social Conditions, Labour Market, 2001–2008, (online), Internet: http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tsiem080&plugin=0.

EUROSTAT (2003): Population and Social Conditions, Labour Force Survey, 2003, (online). Internet: http://epp.eurostat.ec.europa.eu/portal/page/portal/employment_unemployment_lfs/data/database.

EUROSTAT (2003–2007): Population and Social Conditions, International Migration and Asylum, 2003–2007 (online databáze).

EUROSTAT (2005–2008a): Industry, trade and services. Information society statistics, Computers and the Internet in households and enterprises, (online), 2005–2008. Internet: http://epp.eurostat.ec.europa.eu/portal/page/portal/information_society/data/database.

EUROSTAT (2005–2008b): Industry, trade and services. Information society statistics, Policy indicators, 2005–2008, (online), Internet: http://epp.eurostat.ec.europa.eu/portal/page/portal/information_society/data/database.

EUROSTAT (2006): Labour Force Survey, roční průměry 2006 (mikrodata), vlastní výpočty.

EUROSTAT (2006–2007): Industry, trade and services. Information society statistics, E-skills of individuals and ICT competence in enterprises, (online), 2006–2007, Internet: http://epp.eurostat.ec.europa.eu/portal/page/portal/information_society/data/database.

EUROSTAT (2007): Labour Force Survey, roční průměry 2007 (mikrodata), vlastní výpočty.

EUROSTAT (2008): Population and social conditions, EUROPOP 2008, (online databáze).

EUROSTAT (2009a): *Aggregations of manufacturing based on NACE Rev 1.1*, (online), 2009. Internet: http://epp.eurostat.ec.europa.eu/cache/ITY_SDDS/Annexes/htec_esms_an2.pdf.

EUROSTAT (2009b): *Structural Indicators*, (online), 2009. Internet: http://epp.eurostat.ec.europa.eu/portal/page/portal/structural_indicators/indicators/economical_context.

FLEXIBLE WORK (2008): *Flexible work forms survey – countries and total results*. Reaserch report from project Promotion of Flexible Form of Work through Social Dialogue from Employers´ Perspectives, (online), 2008. Internet: http://www.flexiblework.info/cms/index.php?option=com_content&view=category&layout=blog&id=44&Itemid=115.

Governent order 64/2009 Coll. (GO 2009), o stanovení druhu prací, které agentura práce nemůže formou dočasného přidělení k výkonu práce u uživatele zprostředkovávat (on jobs which cannot be arranged by employment agencies by temporary allocation to user).

GRYGAR, J., ČANĚK, M., ČERNÍK, J (2006).: *Vliv kvalifikace na uplatnění a mobilitu na českém trhu práce u migrantů z třetích zemí (Influence of qualification of third-country migrants on employability and mobility in the Czech labour market)* . Praha, Multikulturní centrum Praha 2006. ISBN 80-239-7824-1. P.: 55.

HERM, A (2008).: *Recent Migration Trends. Statistics in Focus 98/2008*. EUROSTAT, Luxembourg 2008. ISSN 1977-0316. P. 12.

IIE (1995–2005): Vývojová ročenka školství 1995/96–2004/05 (Educational Yearbook) Internet: http://www.uiv.cz/clanek/512/1857.

IIE (2003–2009): Statistická ročenka školství (Statstical educational yearbook) 2003/04, 2007/08 a 2008/09, (on-line). Internet: http://www.uiv.cz/clanek/512/1857.

IIE (2007): Ukazatele hodnotící přístup, účast a výstupy z terciárního vzdělávání aneb Kolik vlastně máme studentů – hodně nebo málo? (Indicators assessing access, participation and outcomes of tertiary education – How many students we have? , (online), říjen 2007, ISBN 978-80-211-0547-8. Internet: http://www.uiv.cz/soubor/3040.

IIE (2009): Zavedení nové metodiky výstupů o studentech vysokých škol (Implementation of new methodology of information on university students), 2009. Příloha 1, (on-line). Internet: http://www.uiv.cz/clanek/612/1467.

ILO (2005): *Hours of Work: From fixed to flexible?*, International Labour Organisation, Geneva 2005.

KADEŘÁBKOVÁ, A. et al. (2007): *The Competitiveness Yearbook Czech Republic 2006–2007* . Linde, 2007, ISBN 978-80-86131-78-8.

KADEŘÁBKOVÁ, A. et al. (2008): *The Competitiveness Yearbook Czech Republic 2007–2008*. Linde, 2008, ISBN 978-80-86131-81-5.

KLEŇHOVÁ, M. (2008): *Vývoj a projekce počtu absolventů podle skupin oborů (Projection of graduates by fields of study) (2006–2014)*, Praha, NOZV-NVF, 2008.

KLEŇHOVÁ, M., VOJTĚCH J. (2009): *Úspěšnost absolventů středních škol ve vysokoškolském studiu, předčasné odchody ze vzdělávání (Success of secondary school graduates in university studies, drop outs)*, NÚOV, Praha, 2009.

KOTRUSOVÁ, M. (2006): *Flexibilitou v zaměstnání k větší harmonizaci rodinných a profesních rolí (Towards better family and work balance by means of employment flexibility),* (online), 2006. Internet: http://www.mpsv.cz/cs/4013.

MEYS (2009): *Bologna proces*, (online), 2009, Internet: http://www.bologna.msmt.cz/?id=BolognaProcess.

MoLSA (2005–2009): *Analýza neobsazenosti volných pracovních míst podle KZAM (Analysis of free vacancies by ISCO)*, (online), 2005–2009, datum přístupu: 9. 11. 2009. Internet: http://portal.mpsv.cz/sz/stat/trh

MoLSA (2008): *Souhrnná informace za rok 2007 o aktivitách realizovaných příslušnými resorty, resp. jejich výkonnými složkami, v oblasti potírání nelegálního zaměstnávání cizinců, předkládaná prostřednictvím Meziresortního orgánu pro potírání nelegálního zaměstnávání cizinců v České republice (Information on activities in the area of prevention of illegal employment 2007)*, (online), 2008. Internet: http://www.mpsv.cz/files/clanky/5516/nelegalni_zamestnavani.pdf.

MoLSA (2009a): *Agentury práce (Employment agencies)*, Integrovaný portál MPSV, (online), 2009. Internet: http://portal.mpsv.cz/sz/obcane/zpr_prace/.

MoLSA (2009b): *Legální migrace – otevřená šance (Legal migration – open chance)*, (online), 2009. Internet: http://www.imigracecz.org/?lang=cz.

MoLSA (2009c): *Postoj MPSV k zaměstnávání cizinců (Attitude of MoLSA to employment of foreigners)*. Press repase of 13.11.2009, (online). Internet: http://www.mpsv.cz/files/clanky/7854/tz_131109a.pdf.

MoLSA (2009d): *Statistiky nezaměstnanosti*, Integrovaný portál MPSV (*Unemployment statistics*, MoLSA integrated portal), (online), 2009. Internet: http://portal.mpsv.cz/sz/stat/nz/qrt .

MoLSA (2009e): *Zaměstnávání cizích státních příslušníků*, Integrovaný portál MPSV (*Employment of foreigners*, MoLSA integrated portal), (online), 2009. Internet: http://portal.mpsv.cz/sz/stat/zam_ciz_stat_prisl.

NEKOLOVÁ, M. (2008): *Flexicurity – hledání rovnováhy mezi flexibilitou a ochranou trhu práce v České republice (Flexicurity – searching balance between labour market flexibility and protection in the CR)*. VÚPSV, v.v.i., Praha 2008.

NTF-NOET (2009a): *Předvídání kvalifikačních potřeb trhu práce (Forecasting of labour market skill needs)*, Praha, Linde, 2009, ISBN 978-80-86131-84-9.

NTF-NOET (2009b): *Průzkum požadavků zaměstnavatelů na absolventy technických a přírodovědných oborů (Survey of employers`demands on science and technologz graduates]*, Praha, 2009.

OECD (2009): OECD Employment Outlook: Tackling the Jobs Crisis. OECD 2009.

POLANSKÁ, J., KADLECOVÁ M. (ed.) (2008): *Neregulérní pobyt cizinců v ČR: Problémy a jejich řešení (Irregular stay of foreigners in the CR. Problems and their solving.)*. Praha, Člověk v tísni, o.p.s., Multikulturní centrum Praha, Organizace pro pomoc uprchlíkům, Poradna pro uprchlíky 2008. P. 120.

POŘÍZKOVÁ, H. (2008): *Analýza zahraniční zaměstnanosti v České republice; postavení cizinců na trhu práce a podmínky jejich ekonomické integrace (Analysis of foreign employment in the CR, stuatus of foreigners in the labour market and conditions of their economic integration)*. Praha, VÚPSV, 2008. ISBN 978-80-87007-83-9. P.: 76.

RÁKOCZYOVÁ, M. et al. (2007): *Zaměstnavatelé zahraničních pracovníků v České republice a jejich role v procesu sociální integrace (Employers of foreign workers in the CR and their role in the social integration process)*. Praha, VÚPSV, 2007. ISBN 978-80-87007-92-1. P.: 156.

ROA (2007): *The Flexible Professional in the Knowledge Society: General Results of the REFLEX Project*. Ed.: Allen, J. - Van der Velden,R., Research Centre for Education and the Labour Market, Maastricht University, 2007.

URBAN, J. (2007): *Mzdy v podmínkách globalizace (Wages in the conditions of globalisation)*, (online), server Ihned.cz, datum vydání: 9. 11. 2007. Internet: http://mam.ihned.cz/c4-10000515-22378250-103000_d-mzdy-v-podminkach-globalizace.

VAVREČKOVÁ, J. et al. (2006): *Migrace odborníků do zahraničí a potřeba kvalifikovaných pracovních sil (Emigration of proffessionals and the need of qualified labour force)*. Praha, VÚPSV, 2006. ISBN 80-87007-00-X. P. 89.

List of Abbreviations

CI CR - Confederation of Industry of the Czech Republic
CZSO – Czech Statistical Office
EC – European Comission
EU – European Union
IIE – Institute for Information on Education
MoLSA – Ministry of Labour and Social Affairs
MEYS – Ministry of Education, Youth and Sports
CET – continuing education and training
AES – Adult Education Survey
AHM – Ad-hoc modul (on Lifelong Learning)
LFS – Labour Force Survey
ISCO - International Standard Classification of Occupations
ISCED - International Standard Classification of Education
AT – Austria
BE – Belgium
BG – Burgaria
CH – Switzerland
CY – Cyprus
CZ – Czech Republic
DK – Denmark
DE – Germany
EE – Estonia
ES – Spain
FI – Finland
FR – France
GR – Greece
HU – Hungary
IE – Ireland
IS - Iceland
IT – Italy
JP – Japan
LV – Latvia
LT – Lithuania
LU – Luxembourg
MT – Malta
NL - Netherlands
NO – Norway
PL – Poland
PT – Portugal
RO - Roamnia
SI – Slovenia
SK – Slovakia
SE – Sweden
UK – United Kingdom
US – United States

OECD - Organization for Economic Cooperation and Development
S&T – science and technology
PISA - Programme for International Student Assessment
HE – higher education
CU – Charles University in Prague
CTU – Czech Technical University in Prague
BUT – Brno University of Technology
ICT Prague – Institute of Chemical Technology Prague
VŠB-TU Ostrava – Technical University of Ostrava
EPC FE – Education Policy Centre, Faculty of Education, Charles University
NTF – National Training Fund
NOET – National Observatory of Employment and Training
ICT - Information and Communication Technologies
ROA - The Research Centre for Education and the Labour Market
ČSRLZ – The Czech Society for Human Resources Development (Czech acronym)
SPČR – Confederation of Industry of the Czech Republic (Czech acronym)
EWCS – European Working Conditions Survey
NACE – Statistical Classification of Economic Activities
p.p. – percentage points