AN ANALYSIS OF THE CURRENT STATE OF RESEARCH, DEVELOPMENT AND INNOVATIONIN THE CZECH REPUBLIC AND COMPARISONWITH THE SITUATION ABROAD IN 2009

Office of the Government

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Prague, December 2009

Contents

Introduction

The present analysis of the state of research, development and innovation in the Czech Republic and comparison with situation abroad in 2009 is organised similarly to last year's. Separate chapters assess inputs into research and development (R&D) (Chapter A), outputs from R&D (Chapter B), Innovation and Competitiveness (Chapter C), the Czech Republic's involvement in international projects (Chapter D) and exceptional results from research, development and innovation in 2008 (Chapter E). The Appendices contain basic indicators for the countries assessed, the assessed results aggregated by research organisations and ranked by group according to the legal form of the institution in 2008 and explanatory notes.

In preparing the 2009 analysis of RDI the authors have worked from their own information sources (the Research, Development and Innovation Information System, hereinafter the RDI IS), from the Evaluations of Research and Development and its results for the period 2003 - 2007, from reports and analyses done by the European Commission and from other domestic and foreign information sources. For a number of indicators values are also included for the EU-15, EU-25 and EU-27 and for other scientifically developed countries. Data, depending on the data sources used, need not cover the same periods.

Chapter A - Inputs into research and development

In this chapter the Analysis of Research, Development and Innovation 2009 contains an evaluation of research and development inputs (R&D). The chapter has two parts: A.1 Investment in R&D and A.2 Human resources in R&D.

Table A.1 Numbers of main indicators in Chapter A

Chapter part	*Title:*	*Number of indicators*
A	R&D inputs	44
A.1	Investments in research and development	27
A.2	Human resources in research and development	17

Part A.1 contains 22 graphs and 5 tables which show international and national comparative data for R&D expenditure, its intensity (share of GDP) and its composition measured by finance sources and use sectors for this expenditure. The main source for this data is the Main Science and Technology Indicators publications (MSTI 2008/1), issued by the OECD. Data for those EU states which are not members of OECD come from Eurostat data.

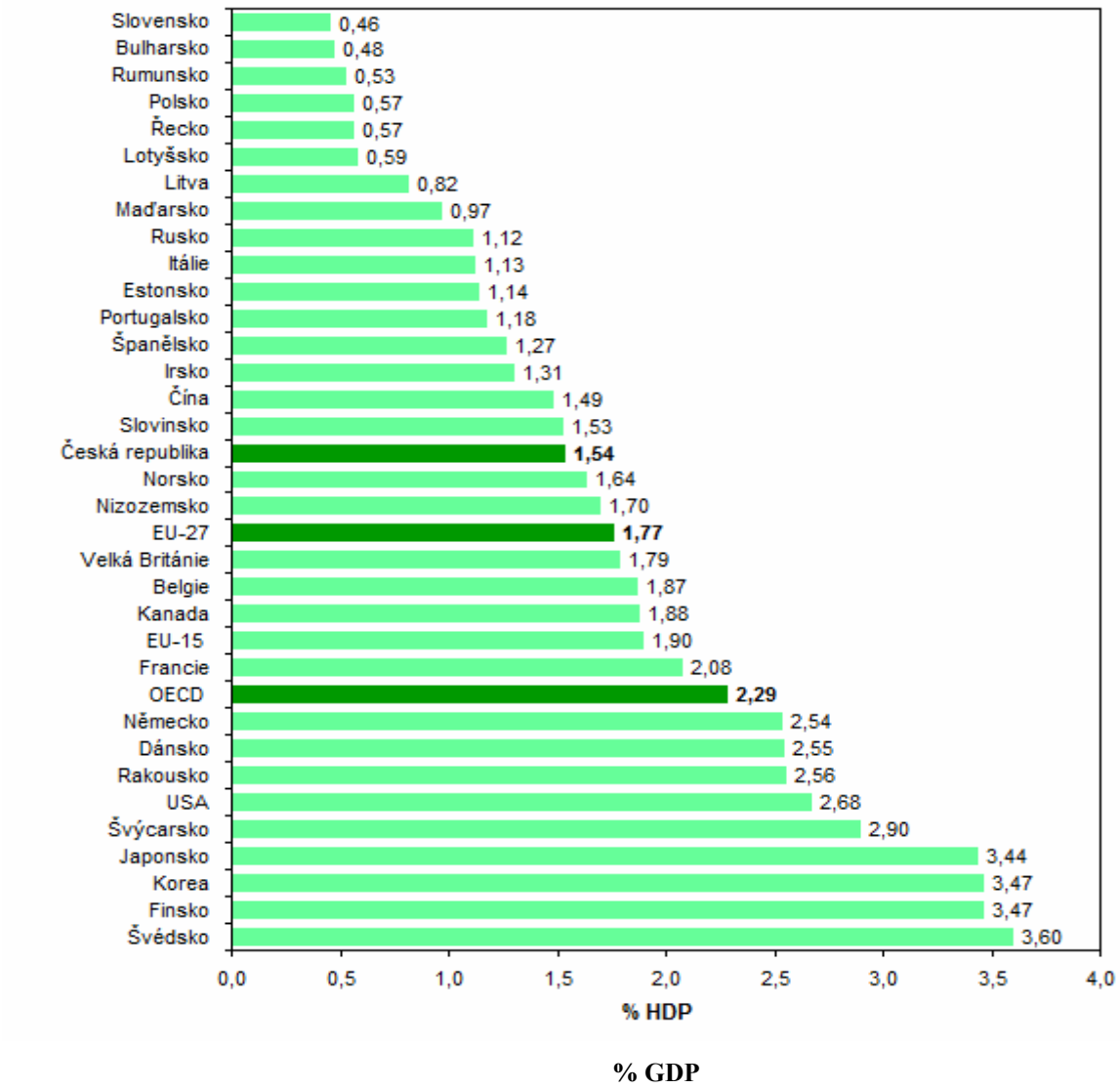
The primary statistical data on R&D inputs for the Czech Republic (on human and financial resources designated for research and development activities in the individual sectors and bodies carrying out R&D in the Czech Republic) are drawn from the regular Czech Statistical Office annual survey.

Data from the R&D Information System (R&D IS), operated by the Research and Development Council, are used to assess how State aid for R&D has evolved in the Czech Republic Developments in general state aid are explored, as are developments in the two basic forms of support – targeted and institutional aid. There is also discussion of R&D support from its largest providers (administrators of the budget chapters which support R&D) and the use of support in the individual regions of the Czech Republic, by individual groups of recipients, by R&D activity type and by main scientific field.

Part A.2 contains 15 graphs and 1 table which give important information on human resources development in R&D, using OECD data from the OECD MSTI publication, data from Eurostat, the Czech Statistical Office and the R&D IS, as well as data from the Institute for Information on Education. The graphs also offer international comparisons of how the numbers of researchers in the public sector, at universities and in the business sector have evolved. In addition, there is an emphasis on students and graduates of science and technology subjects. The final graphs in this part of the chapter shed light on those responsible for carrying out research projects, broken down by gender and age

A.1 Investment in research and development

A.1.1 Total R&D expenditure



Source. OECD, Main Science and Technology Indicators, May 2009 (MSTI 2009/1) Eurostat, July 2009 and own calculations, figures for 2007

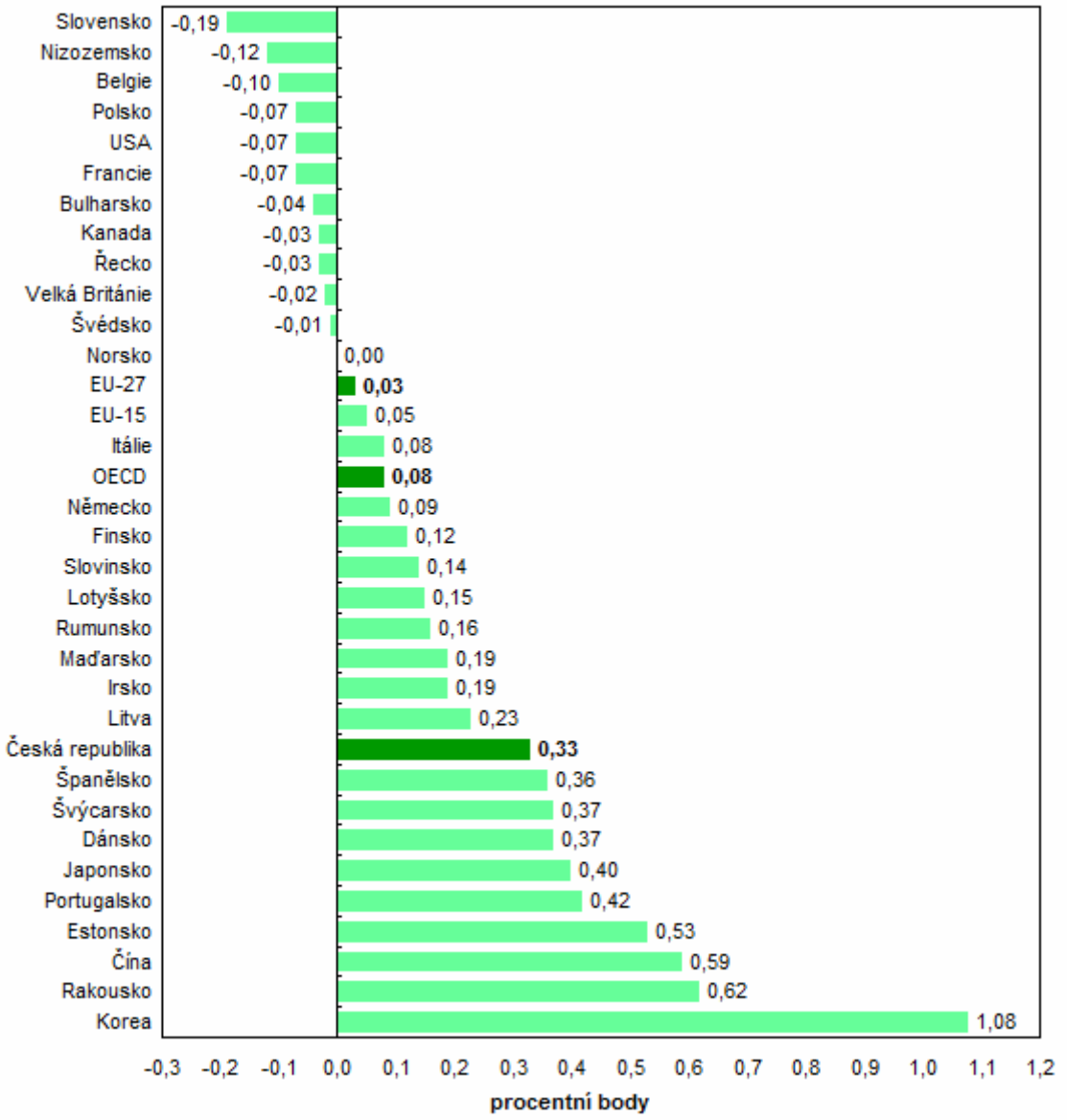
Note: United States without investment expenditure, Italy 2006, Switzerland 2004

Total R&D expenditure (R&D intensity) comprises the sum of all expenditure (both current and capital) intended for internal R&D which is carried out by economic entities in a particular country, no matter how they are financed. In keeping with Eurostat and OECD, the abbreviation GERD (Gross Domestic Expenditure on R&D) is used. GERD is the baseline indicator for R&D statistics and is appropriate for international comparisons

For international comparisons the R&D Intensity indicator is used to express the relative size of GERD as a percentage of gross domestic product (GDP). The values for this indicator shown in the graph in comparison with the preceding year have increased markedly in Portugal by 0.35%, in Korea by 0.24%, in Norway and Denmark by 0.12% and in Austria by 0.11% In Sweden there was a decrease of 0.13% In the other countries the values have changed only slightly, with the EU-27 value growing by 0.01% In the Czech Republic the value showed no

change. It is true that following a slight drop by Slovenia of 0.06%, the Czech Republic has taken up first place among the new member states, but it still does not come close to the EU-27 average.

A.1.2 Changes in R&D expenditure between 2000 and 2007



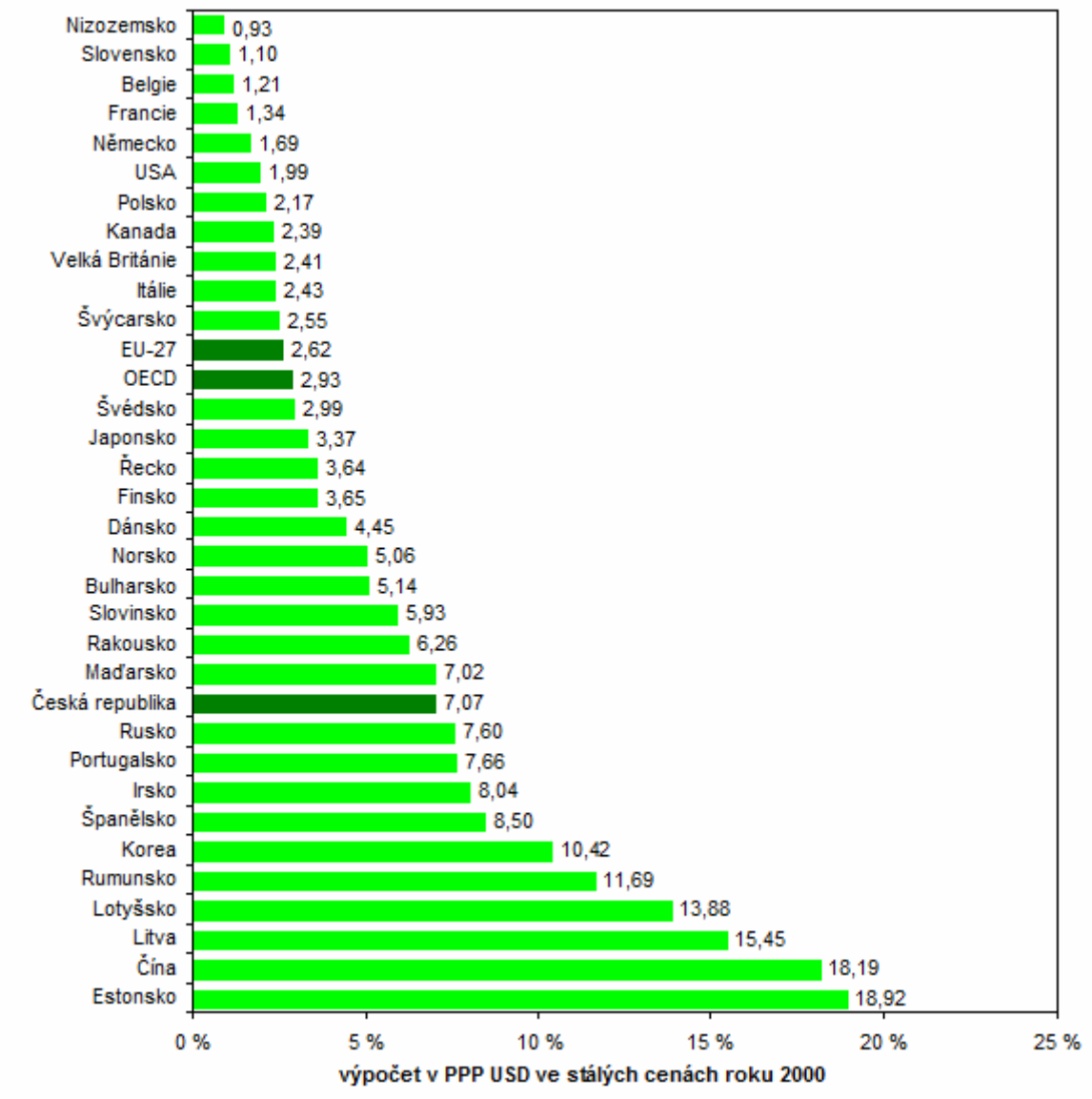
Source: OECD, Main Science and Technology Indicators, May 2009 (MSTI 2009/1) Eurostat, July 2009 and own ČSÚ calculations

Note: Comparison years 1999 and 2007 (Denmark, Greece, Sweden, Norway), 2000 and 2006 (Italy), 2000 and 2004 (Switzerland), United States no investment expenditure, Korea up to 2007 without expenditure on social sciences and humanities.

The graph shows how the size of GERD measured as a % of GDP has changed from 2000 to 2007. The period under scrutiny of eight years is relatively long and from this indicator alone it is not possible to tell whether this is a continuous long-term trend or the result of an exceptional swing in a particular year. Nevertheless the available data show that Austria and

Portugal show stable growth, as do Korea, China and Japan of the non-European countries. The Czech Republic showed growth in 2000, 2003, 2005 and 2006, otherwise showing stagnation.

A.1.3 Average real annual growth in total R&D expenditure, 2000-2007



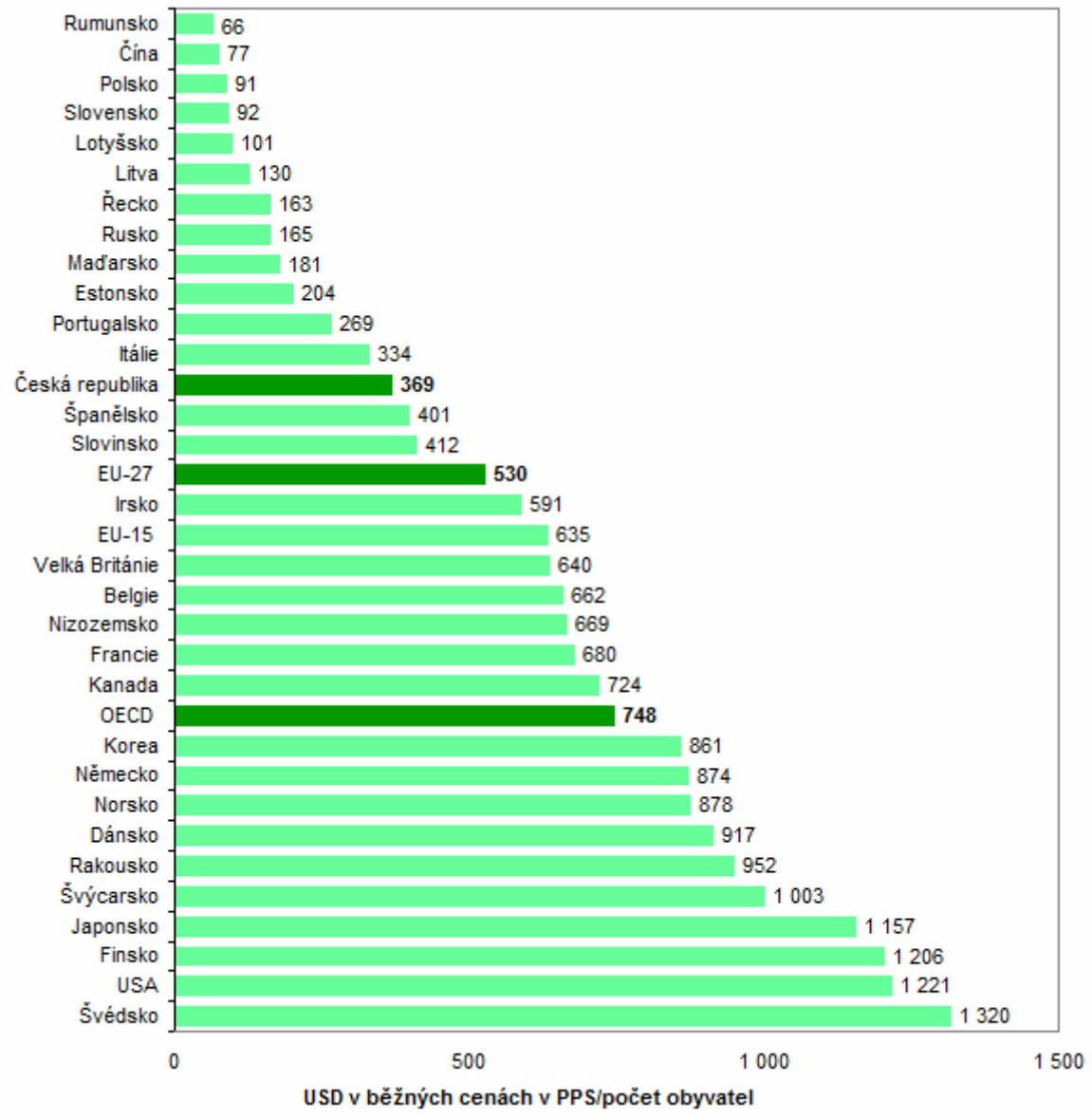
Calculated in PPP USD in constant 2000 prices

Source: OECD, Main Science and Technology Indicators, May 2009 (MSTI 2009/1) Eurostat, July 2009 and own ČSÚ calculations

Note: 2000-2004 (Switzerland), 1999-2006 (Norway, Greece and Sweden)

In all the new member states of the EU with the exception of Slovakia and Poland the average annual growth of GERD calculated by purchasing power parity in national currencies (PPP) in constant 2000 prices was significantly higher than the EU-27 average. This corresponds to the relatively lower starting position of these countries in 2000 and the need and the attempt to catch up with developed countries. In addition to the new member countries, Austria, Portugal, Ireland, Spain and (of the non-EU countries) Russia, Korea and China were all notable for their relatively high (more than twice the EU-27 value) growth rate.

A.1.4 Total R&D expenditure per capita in 2007



USD in current prices in PPP per capita

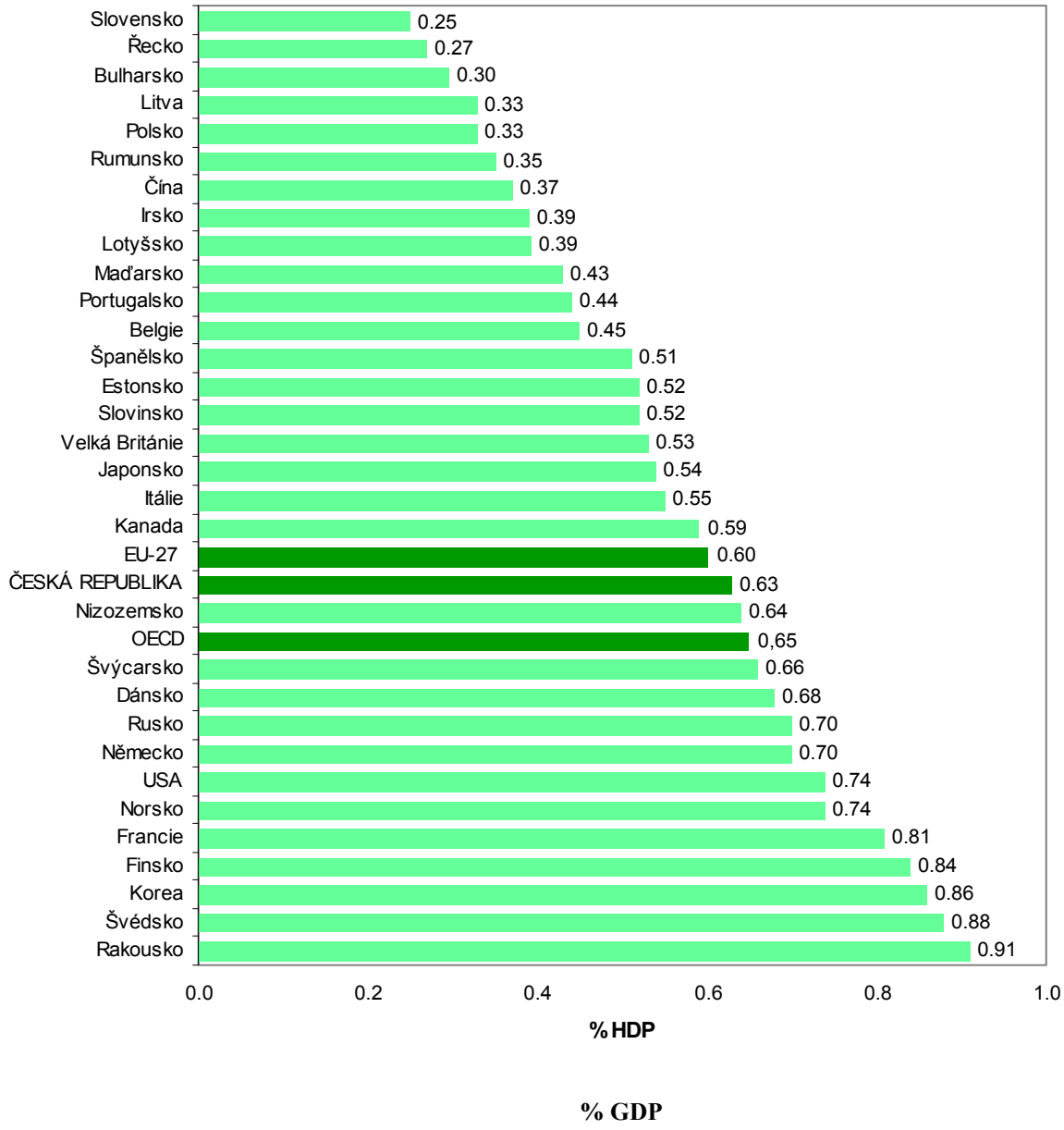
Source: OECD, Main Science and Technology Indicators, May 2009 (MSTI 2009/1) Eurostat, July 2009 and own ČSÚ calculations

Note: United States without investment expenditure, Italy 2006, Switzerland 2004

The values in the graph indicate the relative size of GERD per capita calculated by PPP for 2007. Together with Slovenia the Czech Republic achieved the highest values (412 and 369 USD respectively) of the new member states (next in the ranking was Estonia with 204 USD), but they continue to lag behind the EU-27 average (530 USD) and reach less than half the values for example of Austria or Denmark. Again it can be stated that the lower the value of GERD, the faster the growth. The highest growth in this indicator for the years 2000-2007 is shown by Estonia, (344%), Romania (319%), Latvia (285%) and Lithuania (258%). In those developed countries with a high absolute value for GERD (e.g. Sweden and Finland) the year-on-year growth of the indicator in this period is relatively stable and close to the EU-27 level (i.e. around 6% p.a. in aggregate some 40% since 2007). In the Czech Republic by comparison

(and similarly in Portugal and in Spain) the year-on-year growth in the indicator varies considerably, and has roughly doubled overall since 2000.

A.1.5 Public R&D expenditure as a % of GDP in 2007



Source: OECD, Main Science and Technology Indicators, May 2009 (MSTI 2009/1) Eurostat, July 2009 and own ČSÚ calculations, figures for 2007

Note: United States (without investment expenditure) 2003 the Netherlands, 2004 Switzerland, 2005 (Belgium, Denmark, Portugal, Greece, Sweden), 2006 (France, Ireland, Italy, Germany, Spain, EU-15, EU-27, OECD]

The graph shows the size of that part of R&D intensity in 2007 (the relative size of GERD expressed as a % of GDP) which is made up of public sources, i.e. of financial resources which come from state budgets or local government budgets. By comparison with graph A.1.1 one can follow the connection between higher R&D Intensity from public sources and higher overall R&D intensity. Norway, Russia and Italy represent a particular exception, where there is a relatively higher share of public expenditure. The closest to meeting one of the Lisbon Treaty goals - a ratio of R&D expenditure to GDP of 1% - are Austria (0,91% of GDP),

Sweden (0,88%) and Finland (0,84%). In 2007 the Czech Republic achieved the EU-27 average for this indicator for the first time.

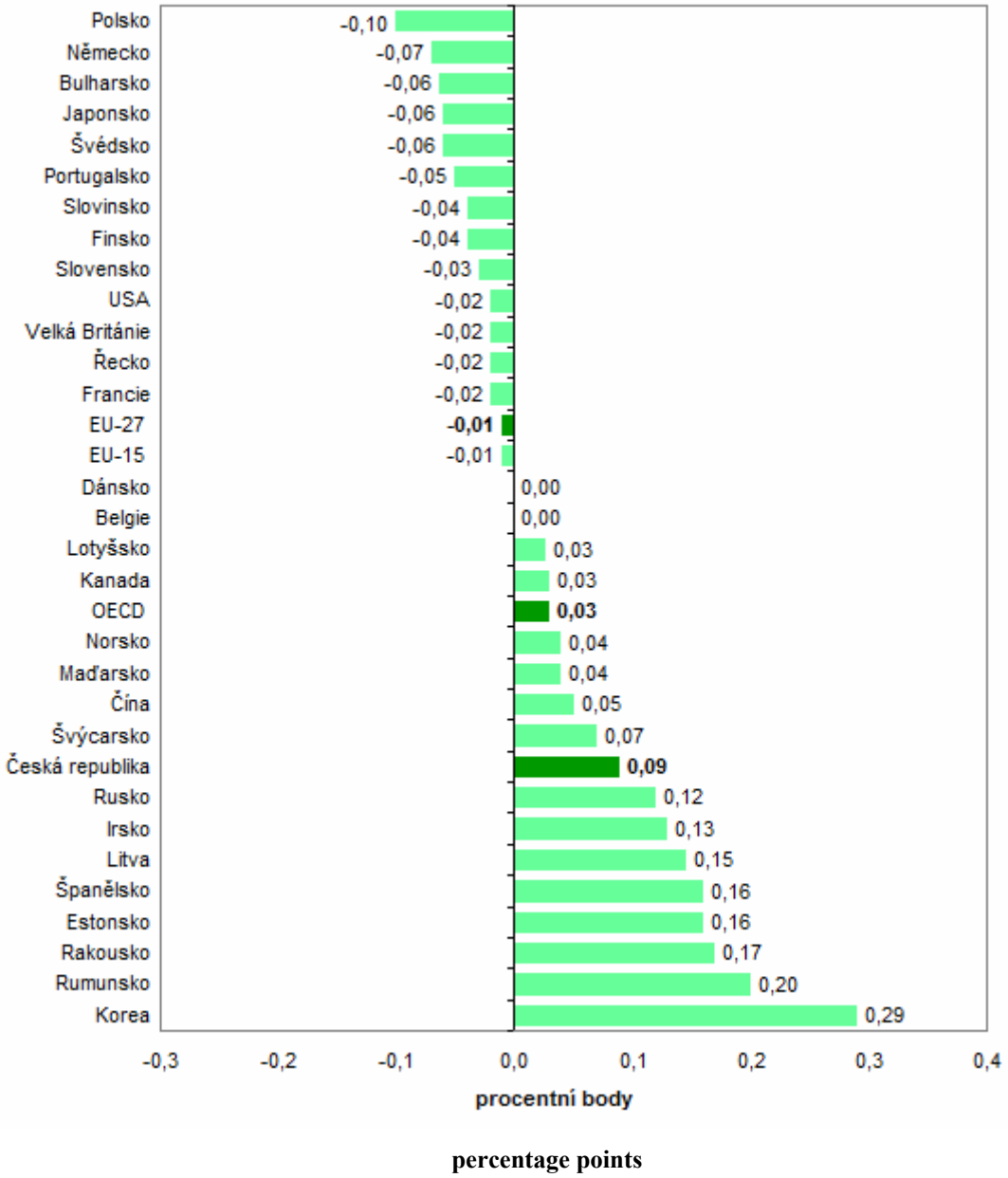
The next table shows the percentage share of R&D expenditure from public funds by individual sectors, for the Czech Republic, selected countries and the EU-27 average.

Table A.2 Share by sector of public expenditure on R&D in 2007

Sector	*Business*	*Government*	*University*
Finland	10,4	26,5	62,1
France	18,3	37,0	44,1
Hungary	10,9	43,8	40,4
Germany	11,3	40,9	47,8
Austria	21,0	14,1	64,9
Romania	26,4	42,8	30,8
Sweden	13,5	19,2	66,8
Slovenia	13,4	53,5	33,1
EU-27	13,5	32,5	53,0
Czech Republic	**21,0**	**40,8**	**37,5**
United States	23,9	38,5	32,0
Japan	4,8	50,4	40,2

It is clear from the table that strategies for public support of R&D vary from country to country and are not dependent on the level of economic development. The Czech Republic, Romania and Romania are the EU countries with the highest proportion of public expenditure on R&D incurred in the business sector. In the Czech Republic in 2007 this was 0.13% of GDP. To this must be added indirect support in the form of the use of corporation tax allowances under §34 para.3 of the Income Tax Act, which according to Czech Statistical Office data represented 0.03% of GDP in 2005.

A.1.6 Changes in the intensity public R&D expenditure between 2000 and 2007

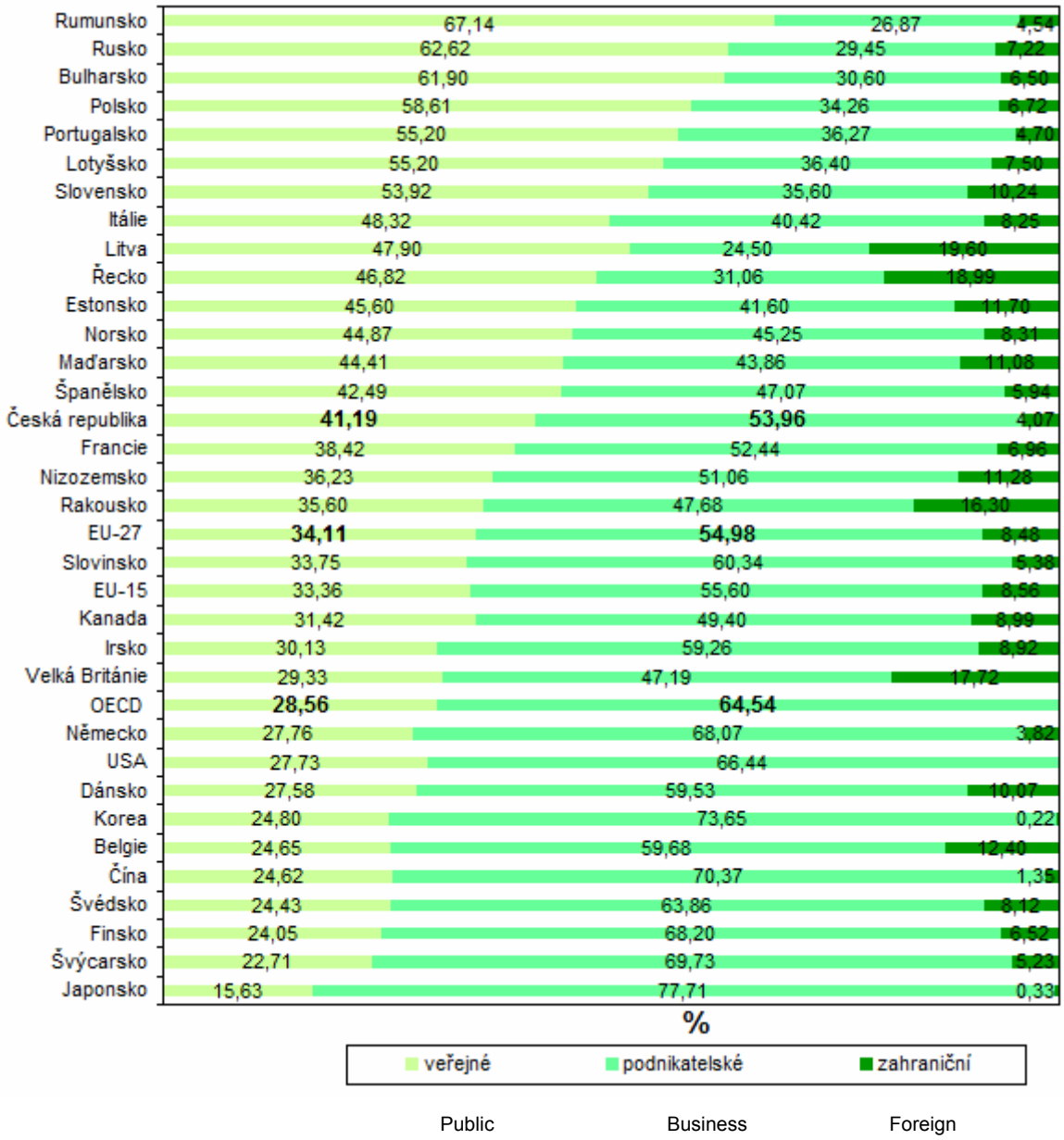


Source. OECD, Main Science and Technology Indicators, May 2009 (MSTI 2009/1) Eurostat, July 2009 and own ČSÚ calculations

Note: Period 1999-2005 (Denmark, Greece, Sweden), 1999-2007 (Norway), 2000-2004 (Switzerland), 2000-2005 (Belgium, Portugal) 2000-2006 (France, Ireland, Germany, Spain, Bulgaria, EU-15, EU-27, OECD, China)

The graph shows how the share of GERD made up of public funds, to GDP changed between 2000 and 2007. Even though the intensity of public expenditure on R&D did not change in most of the countries under scrutiny in 2000 and 2007. An exception in the case of Korea is partly the result of the major growth in public expenditure on R&D in the last two years, but particularly the methodological impact of the fact that the statistics up to 2007 did not include Korean expenditure on social and humanities. There was negative growth in Poland (a reduction of 0.1).

A.1.7 Share of public, business and foreign resources in total R&D expenditure



Source: OECD, Main Science and Technology Indicators, May 2009 (MSTI 2009/1) Eurostat, July 2009 and own ČSÚ calculations, figures for 2007

Note: 2003 the Netherlands, 2004 Switzerland, 2005 (Belgium, Denmark, Portugal, Greece, Sweden), 2006 (France, Ireland, Italy, Germany, Spain, EU-15, EU-27)

In the so-called Lisbon Strategy the European Commission set out the goal of achieving total expenditure on R&D of 3% of GDP by 2010, of which two-thirds should be from private sources. The Scandinavian countries of Finland and Sweden already meet this criterion today. Switzerland, and a little further back, Denmark and Germany, can be considered to be quite successful in this regard. The European Union as a whole has a long way to go to meet this goal.

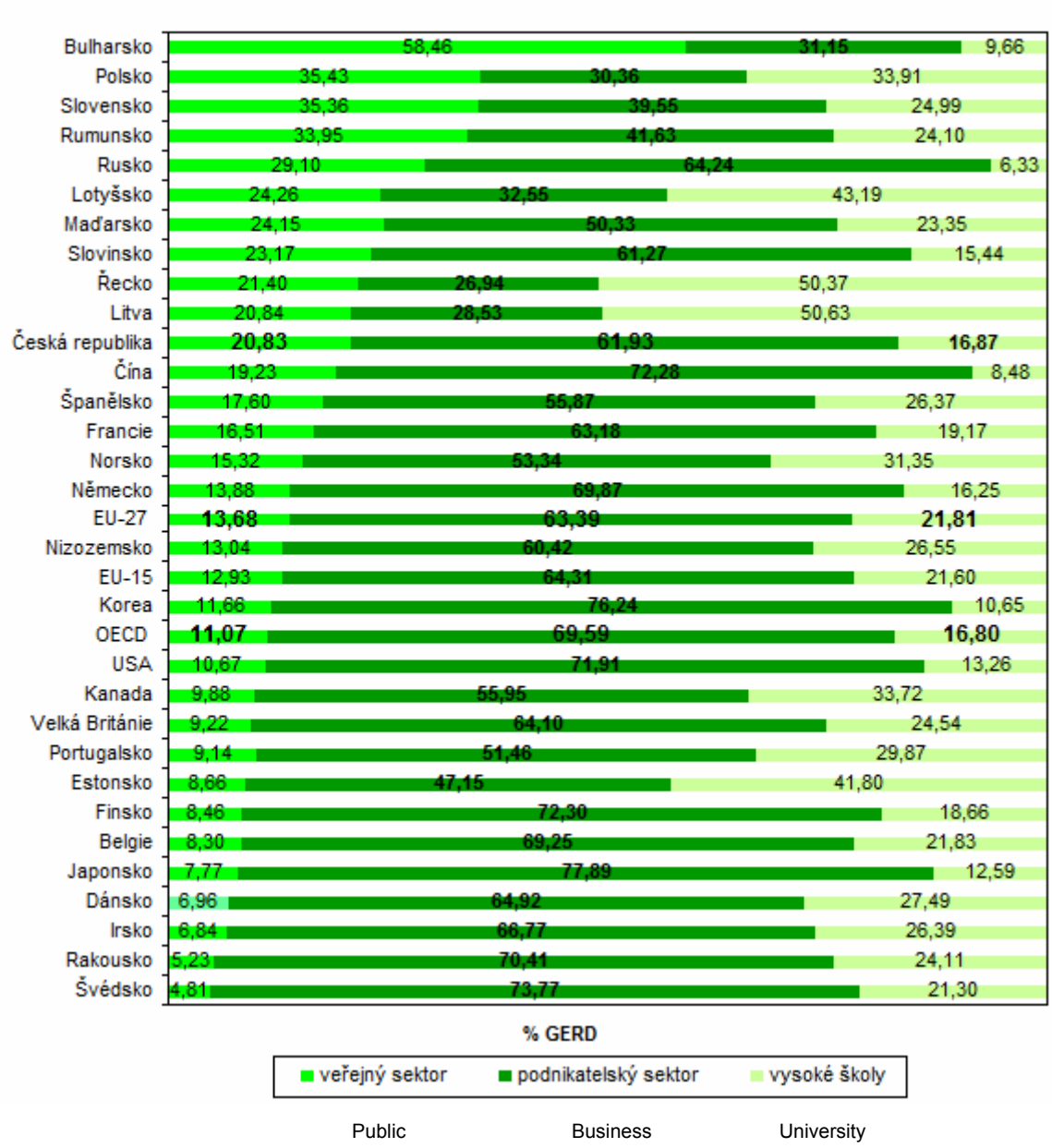
The Czech Republic is in an even worse position, where it does not meet even one of the criteria and has even got worse in the share of R&D expenditure from public sources when compared with 2006 (their share of total expenditure increased by 2%). The share of sources

from the private sector declined by three percentage points in comparison to the preceding year and fell below the EU-15 and EU-27 averages.

The share of foreign sources in R&D expenditure in the Czech Republic exceeded 4%, but still remains one of the lowest in Europe (only Germany has less at 3.8%) The highest values in 2007 were achieved by Lithuania, Great Britain, Greece and Austria.

The Asian countries are characterised by a typical structure with low public and foreign sources and high private sources.

A.1.8 Share of R&D funds used in the public and business sectors and in universities



Source: OECD, Main Science and Technology Indicators, May 2009 (MSTI 2009/1) Eurostat, July 2009 and own ČSÚ calculations, figures for 2007

Note: 2004 Switzerland, 2006 Italy

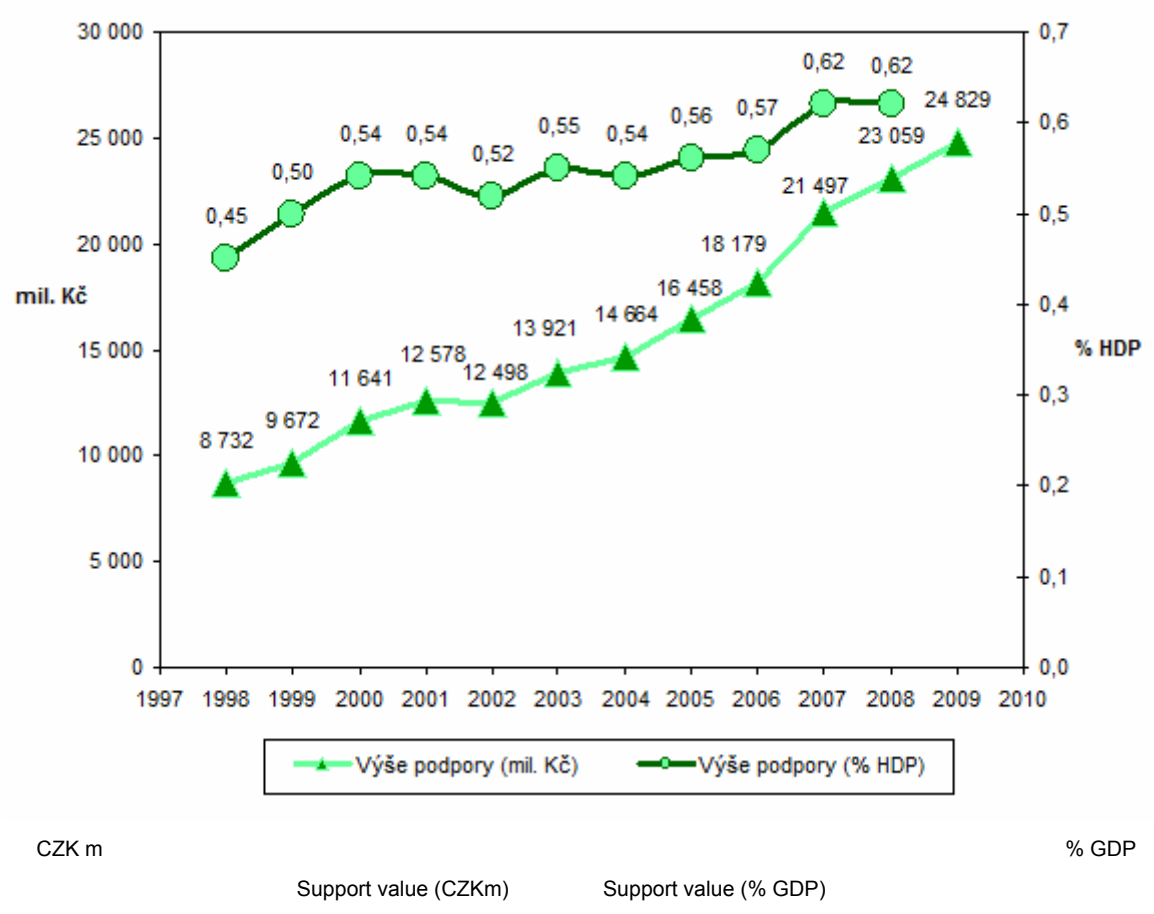
With the exception of Greece, only the new member countries figure among the 11 countries where the share of funds used in the public sector exceeds 20% Of these, Lithuania, Greece, Latvia, and Poland are also characterised by a high share of funds used in universities. Bulgaria is distinguished from other countries by having an exceptionally high share of funds used in the public sector.

An interesting comparison can be made between the Czech Republic and Slovenia based on graphs A.1.8 and A.1.7. Whereas the share of R&D funds used in the public and business sectors and in universities is almost the same in both countries, in Slovenia the share of business sources in overall R&D expenditure is six percentage points higher. In the Czech Republic this share even fell by three percentage points when compared with the previous year, whereas in Slovenia it grew by one percentage point.

The EU-27 average for R&D funds used in the business sector hardly changed during 2000-2007, but lagged significantly behind the USA, Japan and Korea through the whole period. In this respect only Sweden and Finland of the European countries were able to keep pace with them.

From 2000 to 2007 the Czech Republic increased by two percentage points its share of R&D funds used in the business sector, reduced by 4.5 percentage points the share of funds used in the government sector and increased by 2.6 percentage points increased the share of funds used in universities.

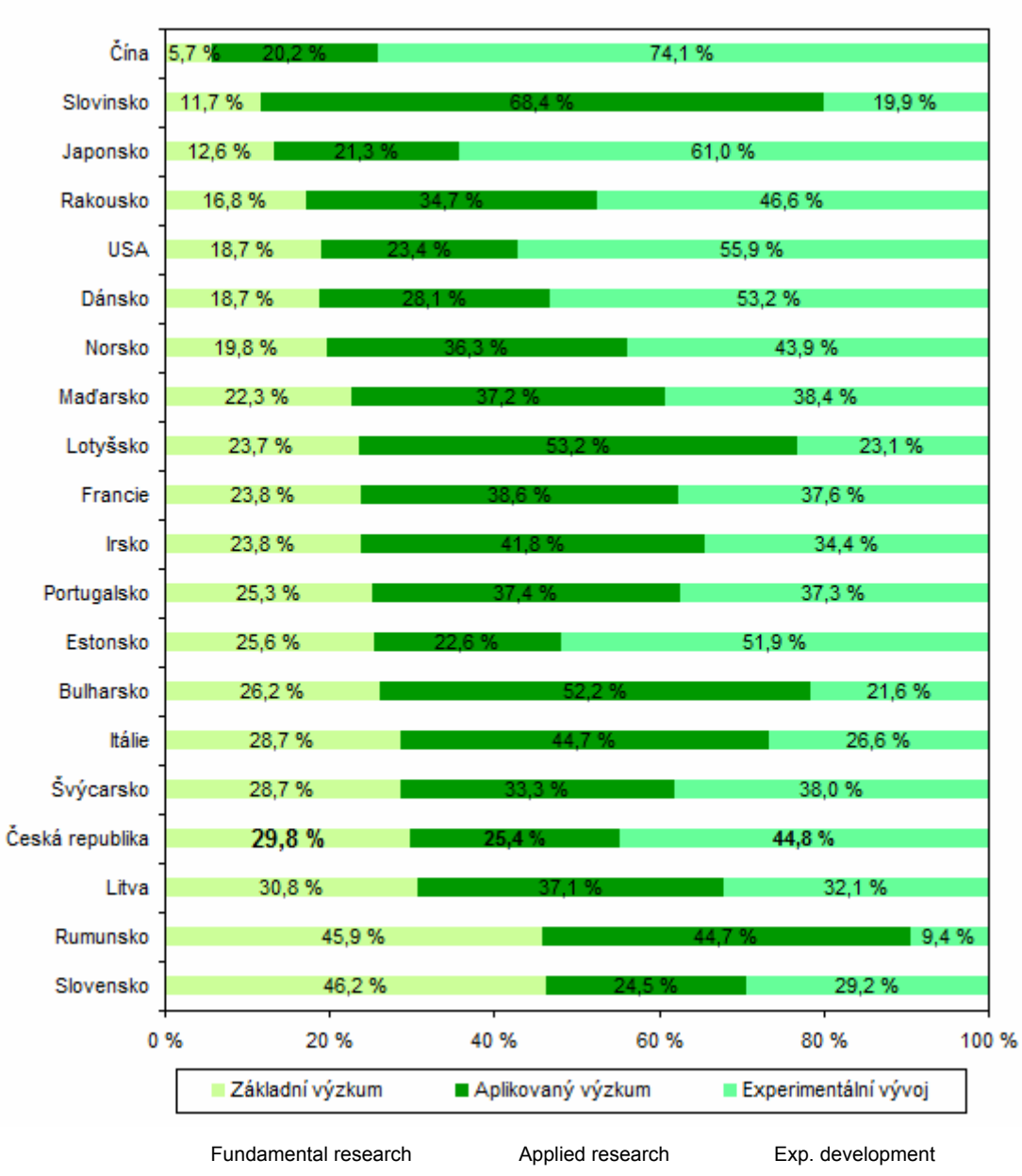
A.1.9 Growth of total R&D support from public funds in the Czech Republic



Source: Czech Republic state budget for 1998 to 2009

The relatively favourable growth of public support for R&D in the Czech Republic expressed in current prices has continued up to and including 2009. Much less satisfactory over the last decade (with the exception of 2007) is the growth of R&D intensity, which from 2000-2006 practically stagnated around a value of 0.54% of GDP. The promising growth of 0.05% in 2007 was not repeated. If we subtract the 1.3bn CZK which is intended for long-term investment in 2009 in R&D in the form of co-financing of structural fund projects, in 2009 there will be almost no growth of comparable overall R&D support from the state budget, when expressed in current prices.

A.1.10 Share of fundamental and applied research and experimental development in overall R&D expenditure



Source: Eurostat, July 2009 and Czech Statistical Office for Czech Republic data, data for 2007

Note: 2003 (USA, Japan, China), 2004 (Switzerland), 2005 (Portugal, Norway, Denmark), 2006 (France, Ireland, Italy, Bulgaria, Austria, Slovenia)

The division into fundamental, applied and experimental R&D is based on the principles set out in the Frascati manual, but may vary in the states under scrutiny, even under the assumption that these principles have been kept to. In particular the boundary between fundamental and applied research is relatively unclear. For international comparison purposes it is therefore better to assess fundamental and applied research together.

From this perspective Romania (9.4%), Slovenia (19.9%), Bulgaria (21.6%) and Latvia (23.1%) are ranked among countries with the lowest share of experimental research in total R&D expenditure. The highest values are shown by China (74.1%) with Japan (61.0%), of the European countries Denmark (53.2%) and Estonia (5.,9%) These are followed at a slight distance by Austria (46.6%), the Czech Republic (44.8%) and Norway (43.9%)

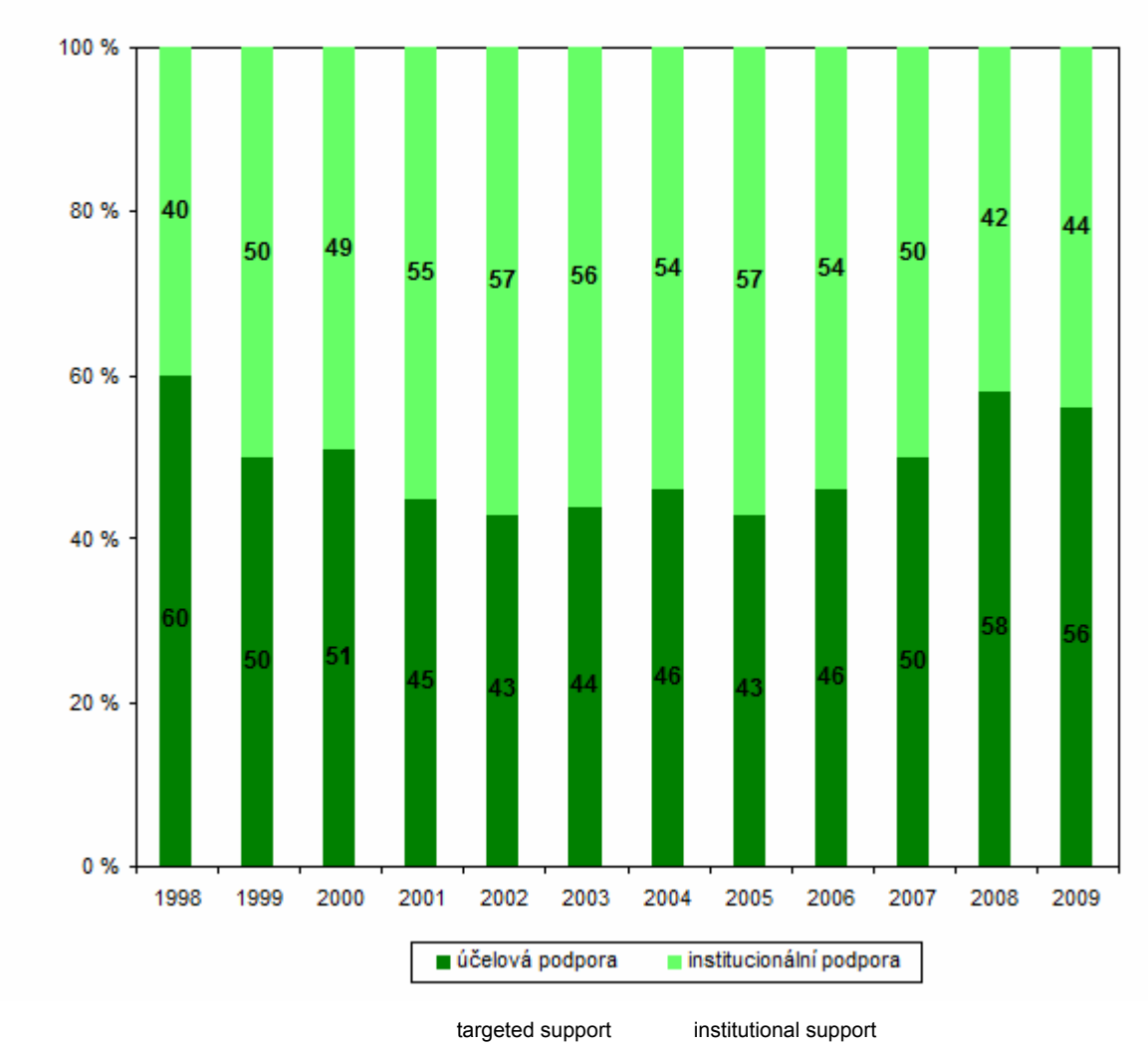
The following table captures the change in structure of overall R&D expenditure in the Czech Republic divided by R&D activity type during 2003-2007. It is somewhat surprising that the share of fundamental research is rising not only in the government and university sectors, but in the business sector as well. A cautionary note may be sounded by the overall tendency for experimental development to grow at the expense of research in the business sector. The relatively large shift over the last year in the private non-profit sector is not significant, because this is overall a small volume of activity.

Table A.3. Share of R&D activity type in overall expenditure by sector of activity

	2003	*2004*	*2005*	*2006*	*2007*
Business (BERD)					
Fundamental research	3 %	4 %	5 %	8 %	5 %
Applied research	29 %	28 %	26 %	23 %	25 %
Experimental development	69 %	68 %	69 %	69 %	70 %
Government (GOVERD)					
Fundamental research	68 %	70 %	76 %	76 %	78 %
Applied research	25 %	24 %	20 %	20 %	20 %
Experimental development	7 %	6 %	4 %	4 %	2 %
University (HERD)					
Fundamental research	50 %	55 %	59 %	62 %	61 %
Applied research	42 %	38 %	35 %	32 %	33 %
Experimental development	7 %	7 %	6 %	6 %	5 %
Private non-profit					
Fundamental research	8 %	17 %	18 %	10 %	12 %
Applied research	58 %	57 %	57 %	57 %	84 %
Experimental development	35 %	26 %	25 %	32 %	4 %
Czech Republic - total (GERD)					
Fundamental research	25 %	26 %	28 %	29 %	30 %
Applied research	30 %	28 %	26 %	24 %	25 %
Experimental development	45 %	45 %	45 %	47 %	45 %

Source: Czech Statistical Office, VTR 5-01 investigation

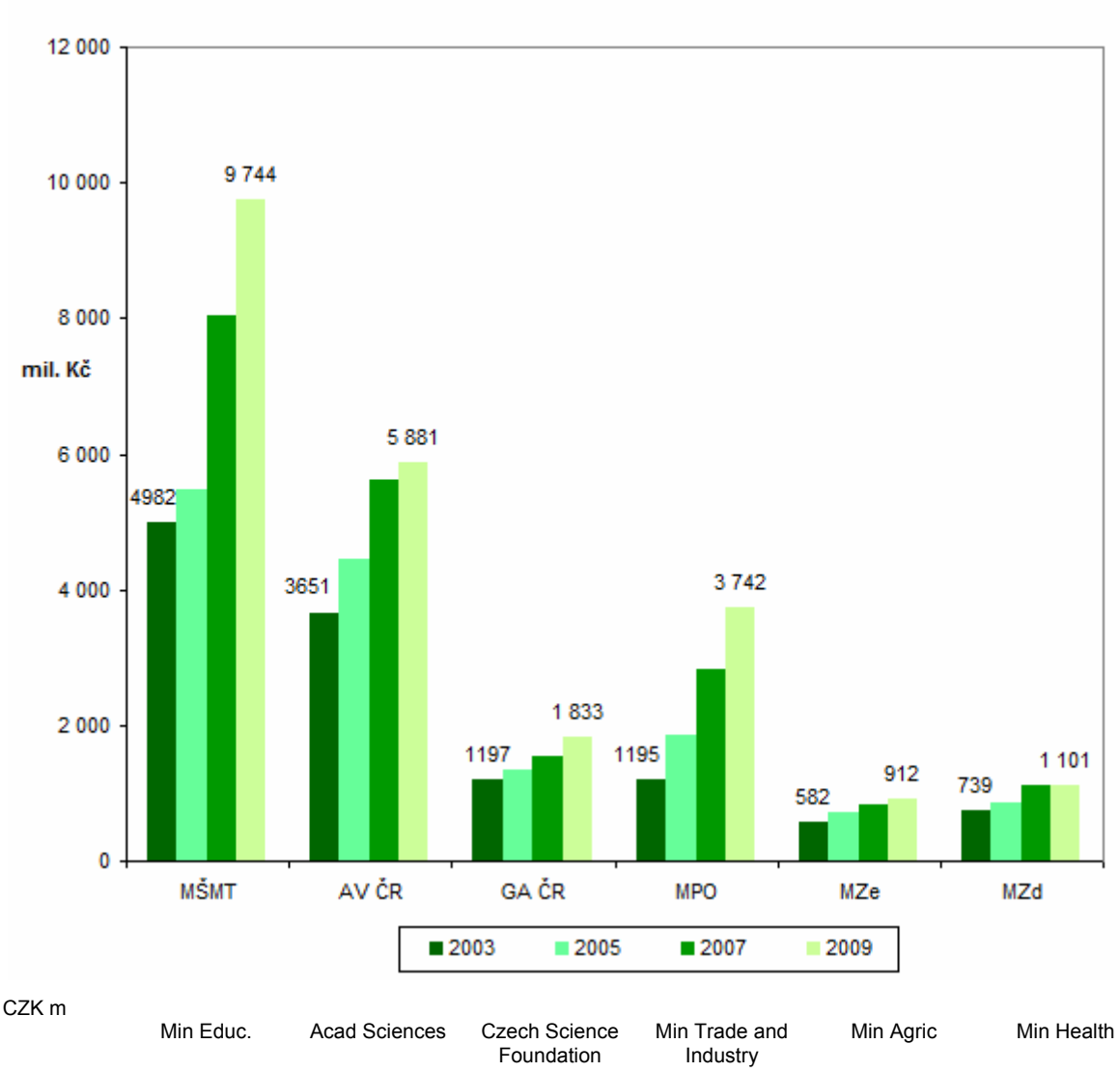
A.1.11 Public R&D expenditure – share of targeted and institutional support in the Czech Republic



Source: Czech Republic state budget for 1998 to 2009

The relatively large change in the share in both expenditure components in 1999 was a result of systemic changes in state support for R&D, in particular the introduction of research plans as a new instrument for institutional financing. The gradual reduction in the share of the institutional component in favour of targeted support after 2005 follows the attainment of the goal set out by the Research Development and Innovation Council in 2002. This ratio in 2009 is however somewhat distorted by the fact that the institutional component contains funds for pre-financing of EU programmes and co-financing of structural funds.

A.1.12 Developments in overall R&D support from public funds among selected providers



Source: Czech Republic state budget for 2003 to 2009

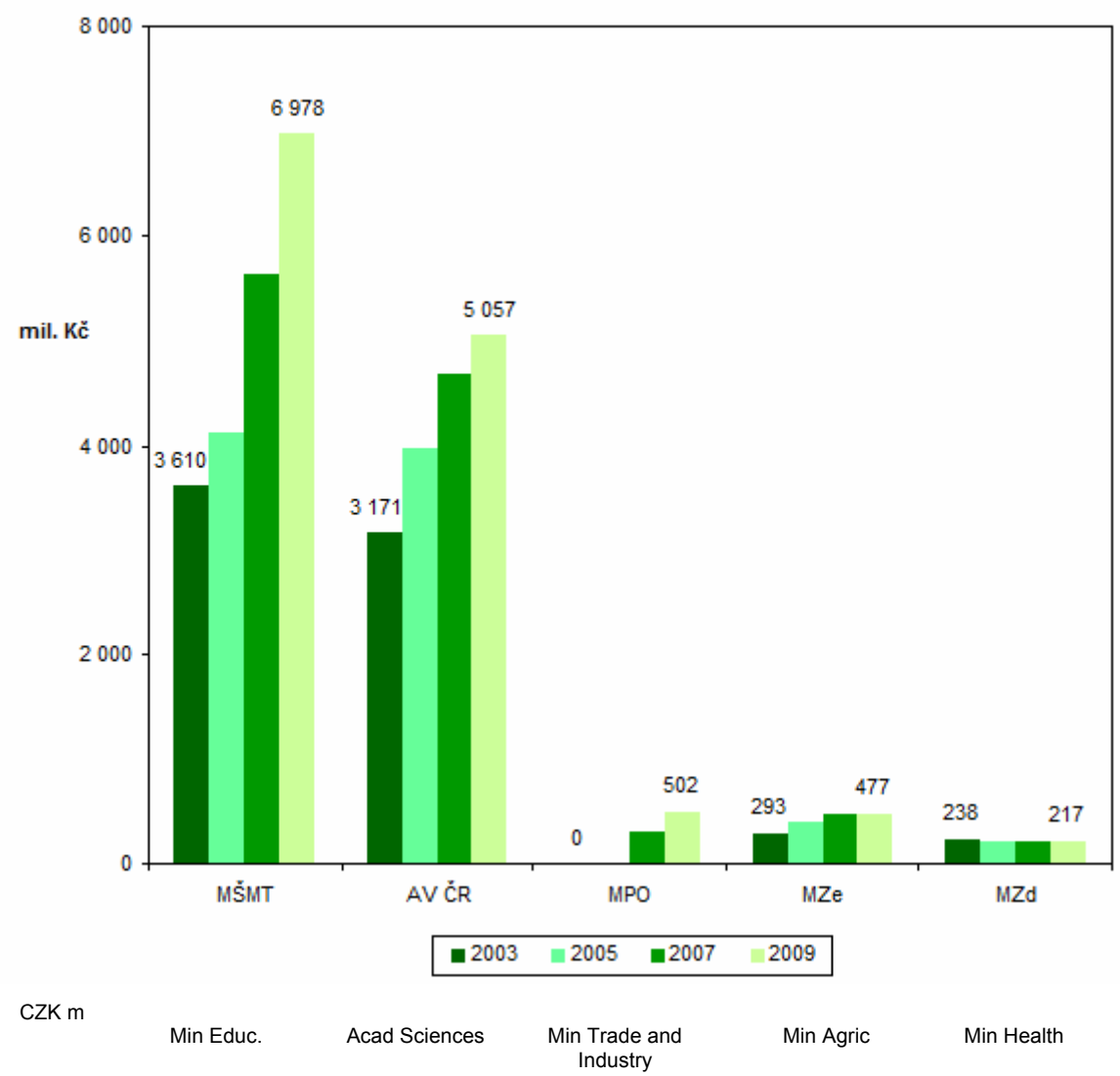
Public support for R&D in the Czech Republic is provided from the budgets of 21 providers - Ministries, central offices of state and public administration, the Academy of Sciences of the Czech Republic (AS CR) and the Czech Science Foundation (GA CR). The largest providers are the Ministry of Education, Youth and Sport (MEYS), Academy of Sciences of the Czech Republic, the Ministry of Industry and Trade (MIT), the GA CR, the Ministry of Health (MH) and the Ministry of Agriculture (MA). The share of these six largest providers in the total public support of R&D in the years under review exceeded 90% of R&D expenditure in the Czech Republic.

Both institutional and targeted components of expenditure (see graphs A.1.13 and A.1.17) shared in the growth of overall support from the Ministry of Education, Youth and Sport and the Academy of Sciences of the Czech Republic, while in the case of the Ministry of Industry and Trade this was primarily the targeted component of expenditure.

Total expenditure in the period in question rose by 78%, while R&D support offered by the Ministry of Industry and Trade increased more than threefold, and support offered by the Ministry of Education, Youth and Sport almost doubled. The support offered by other

providers rose much less markedly: the Academy of Sciences of the Czech Republic by 61%, the Ministry of Agriculture by 57%, the Czech Science Foundation by 53% and the Ministry of Health by 49%

A.1.13 Institutional support for R&D from selected providers



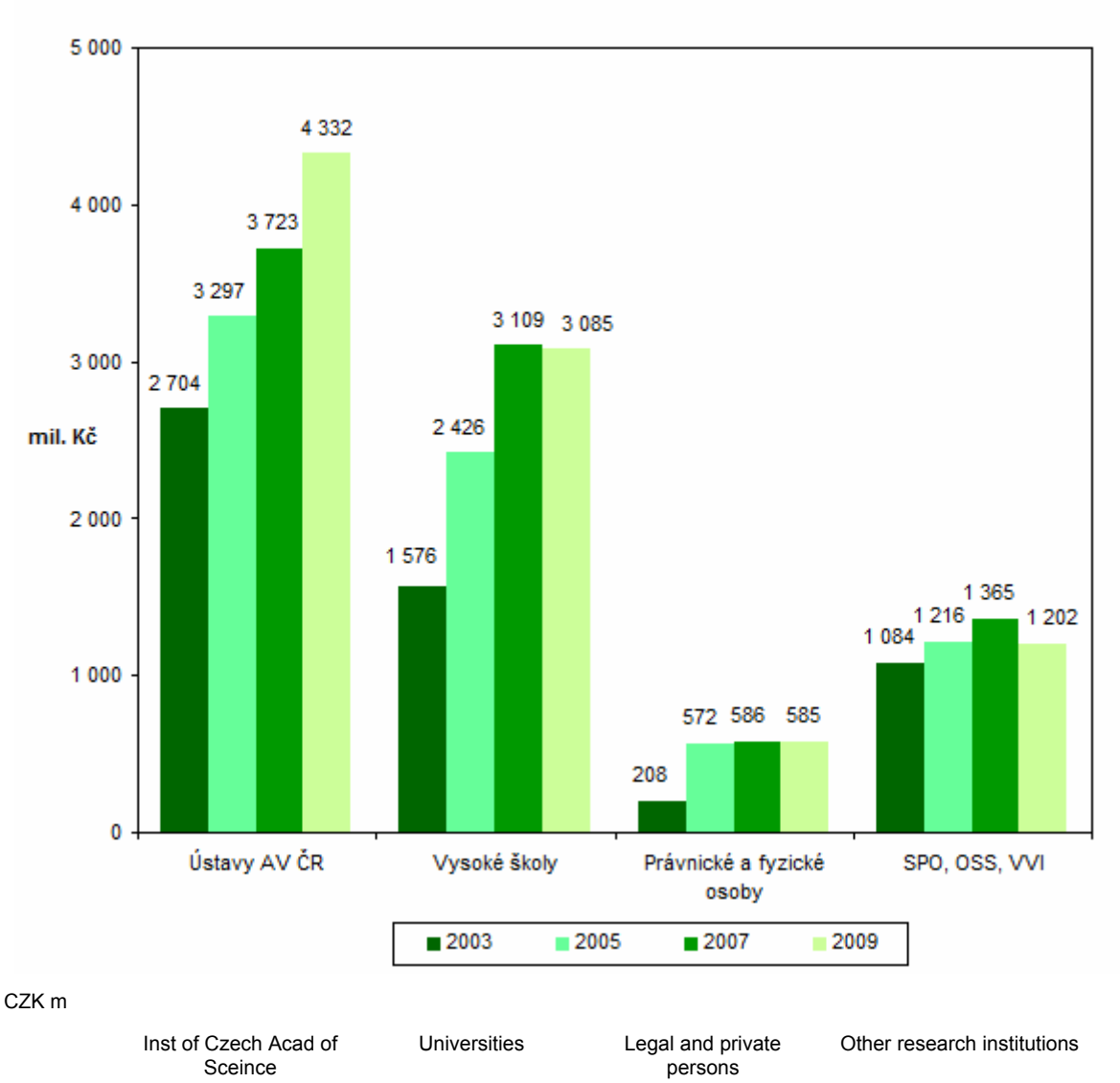
Source: Czech Republic state budget for 2003 to 2009

In the Czech Republic the largest providers of institutional support are naturally the Ministry of Education, Youth and Sport and the Academy of Sciences of the Czech Republic. In the years under review they divided between them more than 85% of the total institutional support for R&D in the Czech Republic. The remainder is provided by the Ministry of Health, the Ministry of Agriculture and certain other ministries and central offices of state and public administration.

Inter alia the Ministry of Education, Youth and Sport finances the research programmes of universities and selected legal entities, which meet the condition set out in Act No. 130/2002 Coll., on support for research and development, specific research at universities and research programmes and from 2007 has also arranged for co-financing of EU framework programmes and EU structural funds.

The Academy of Sciences of the Czech Republic finances research programmes of existing centres which have as of 2007 been turned into public research institutions.

A.1.14 Institutional support for R&D research programmes among group of recipients



Source: RD&I IS, Central Programmes Register (CEZ)

In the R&D IS, **groups of** State aid **beneficiaries** are registered and classified by legal form and founder.

The **Institutes of the Academy of Sciences of the Czech Republic** include public research institutions set up by the AV CR in accordance with Act No 341/2005 Coll.

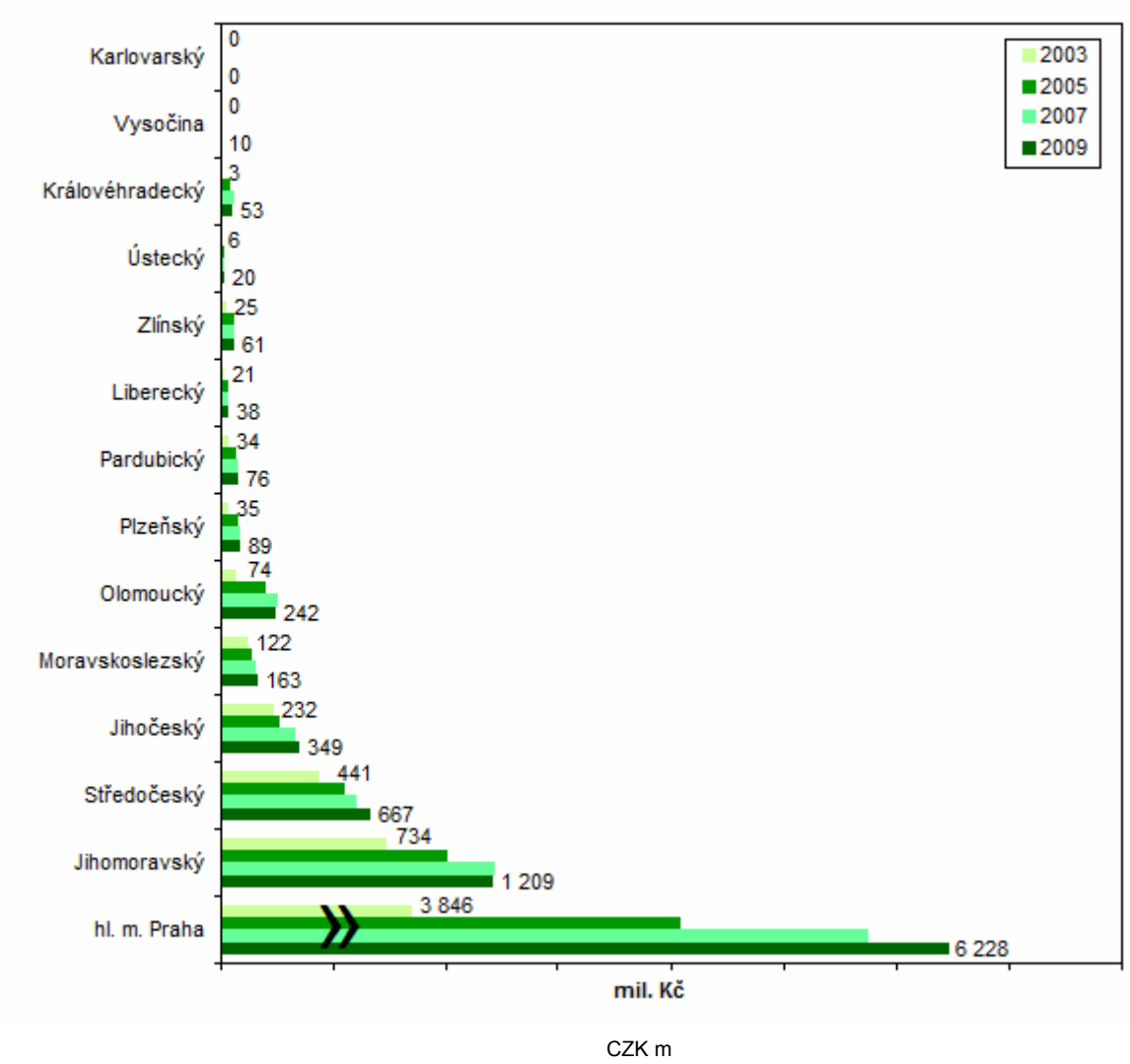
The Universities group encompasses public universities set up in accordance with Act No 111/1998 Coll., state universities set up by the state, and private universities set up by legal or natural persons.

Other research institutions [1] – this group comprises state organizations partly funded from public funds (SPO), organizational units of the state (OSS) and public research institutions (VVI) set up in accordance with Act No 341/2005 Coll., with the exception of AS CR institutes.

[1] Where an organization became a public research institution in 2007, it is reported under this group of beneficiaries in the graphs for the whole of the monitored period.

The category of **Other Legal and Natural Persons** comprises individuals and institutions that are not classified under any of the groups above (e.g. joint stock companies, limited liability companies, publicly beneficial companies, foundations, civic associations, etc.).

A.1.15 Institutional support for R&D research programmes by region



Source: RD&I IS, Central Programmes Register (CEZ)

In the Czech Republic, the larger part of institutional support for research programmes is concentrated in two centres: Prague, Brno, and the Central Bohemian and South Moravia regions which surround them. The share of institutional support for recipients for research programmes in these three (*sic - trans.*) regions amounts to almost 88% of the overall value of support, resulting in extreme regional disparities. At the other end of the spectrum is the Karlovy Vary region, which receives no institutional support at all. This inequality of distribution of R&D support in the Czech Republic corresponds to the location of R&D resources and capacity.

The regional inequality of R&D support in the Czech Republic is given by the unequal distribution of R&D resources and capacities within the Czech Republic. To a certain extent these inequalities are also the cause of the varying economic and innovative level of the individual regions.

Table A.4 NUTS2[2] regions with the highest and lowest R&D expenditure

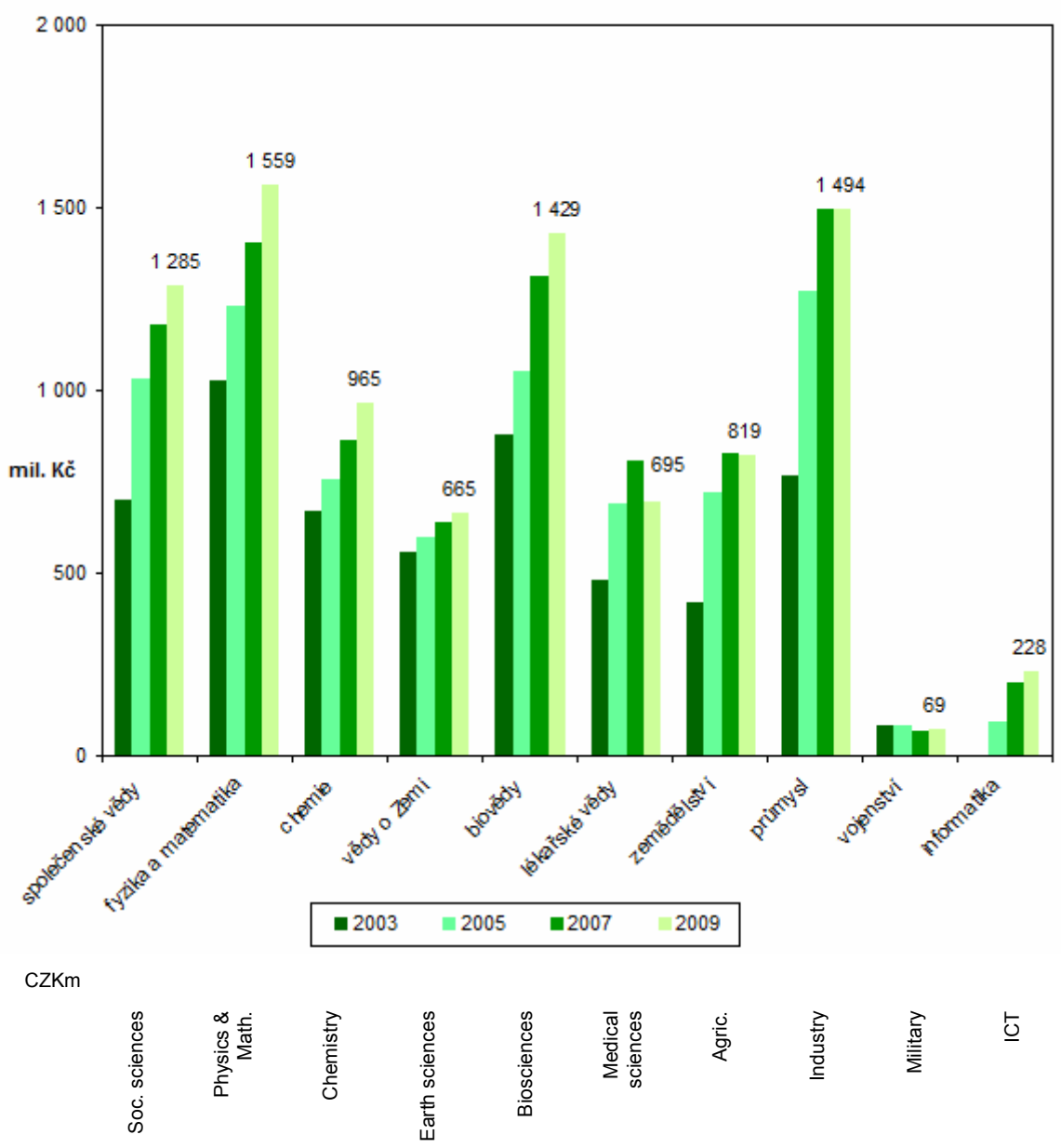
Regions with the highest R&D expenditure	*%GDP*	*Regions with the lowest R&D expenditure*	*%GDP*
Braunschweig (DE)	8,70	Zachodniopomorskie (PL)	0,16
Västverige (SE)	6,03	Åland (FI)	0,16
Stuttgart (DE)	4,66	Opolskie (PL)	0,15
Oberbayern (DE)	4,60	Swietokrzyskie (PL)	0,06
Pohjois-Suomi (FI)	4,60	Severozapaden (BG)	0,01

Source: Regional Differences in the EU's Innovative Potential, V. Čadil, ERGO, March 2007, data for 2004.

It is clear from Table A.4 that the variations in economic level and level of R&D support by individual region are characteristic for the whole of the EU. In 2004 the average GDP/inhabitant in the EU-27 calculated according to purchasing power parity (PPS) was €21503. In 2004 Prague was in 12th place among the EU-27 regions with a GDP/inhabitant of 157% of the EU-27 average. The highest value was achieved by the Inner London region (303% of the EU-27 average) and the lowest by the Romanian region of Vest (39% of the EU-27 average).

[2] NUTS-2 – Nomenclature of Territorial Units for Statistics. Level '2' indicates associated provinces; in the Czech Republic these are the highest territorial administrative units

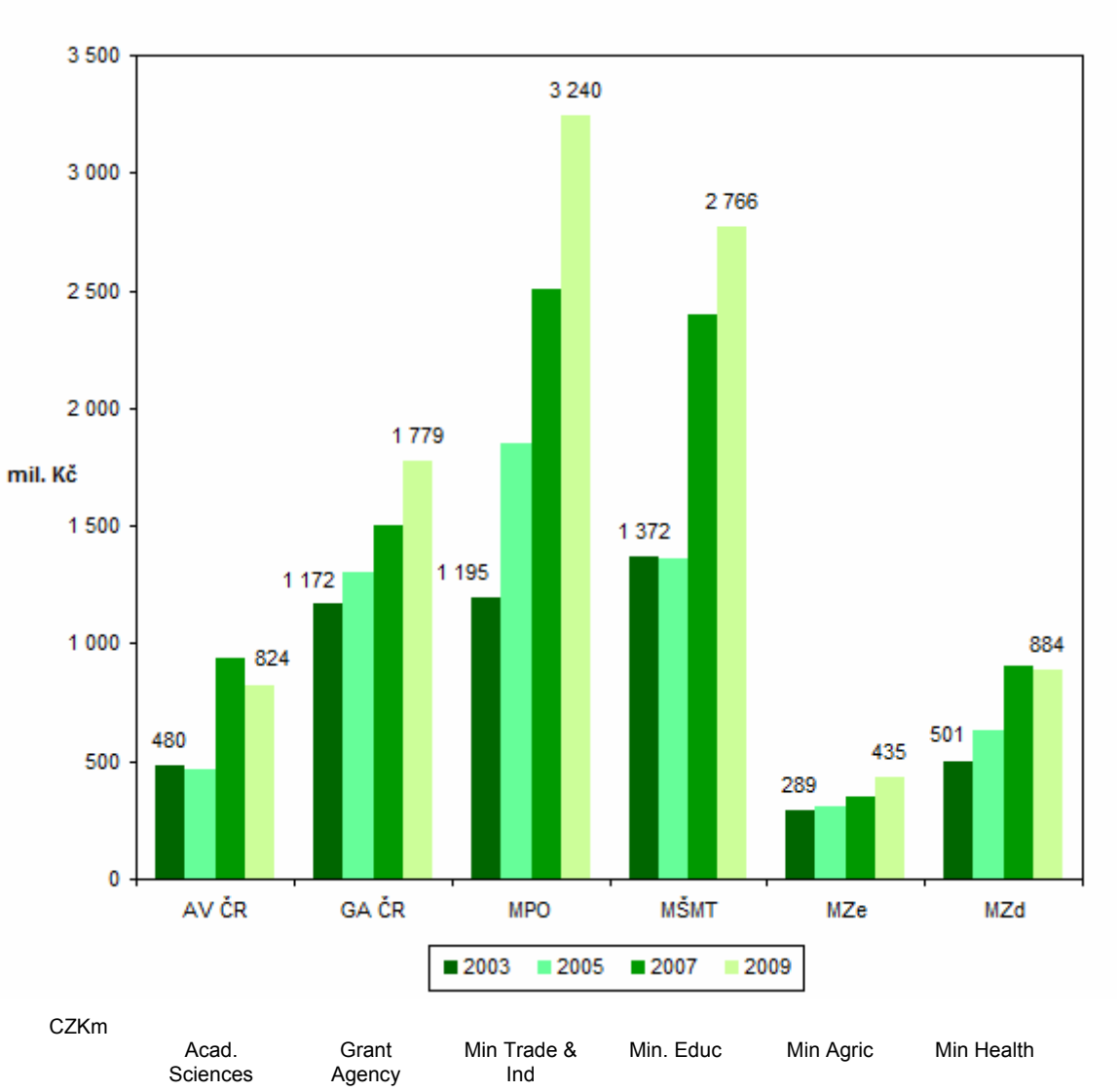
A.1.16 Institutional support for R&D research programmes by discipline



Source: RD&I IS, Central Programmes Register (CEZ)

Graph A.1.16 shows expenditure on institutional support for research programmes for the principal scientific disciplines under review in the RD&I IS. In 2009 for the first time there was a stagnation or reduction in institutional support for research programmes in several disciplines. In the areas of social science, physics and mathematics, chemistry, Earth sciences, bioscience and information science there was continued growth in institutional support. The largest relative growth in expenditure from 2003 was noted in the fields of agriculture and industry, in spite of stagnation in 2009.

A.1.17 Targeted support for R&D from selected providers

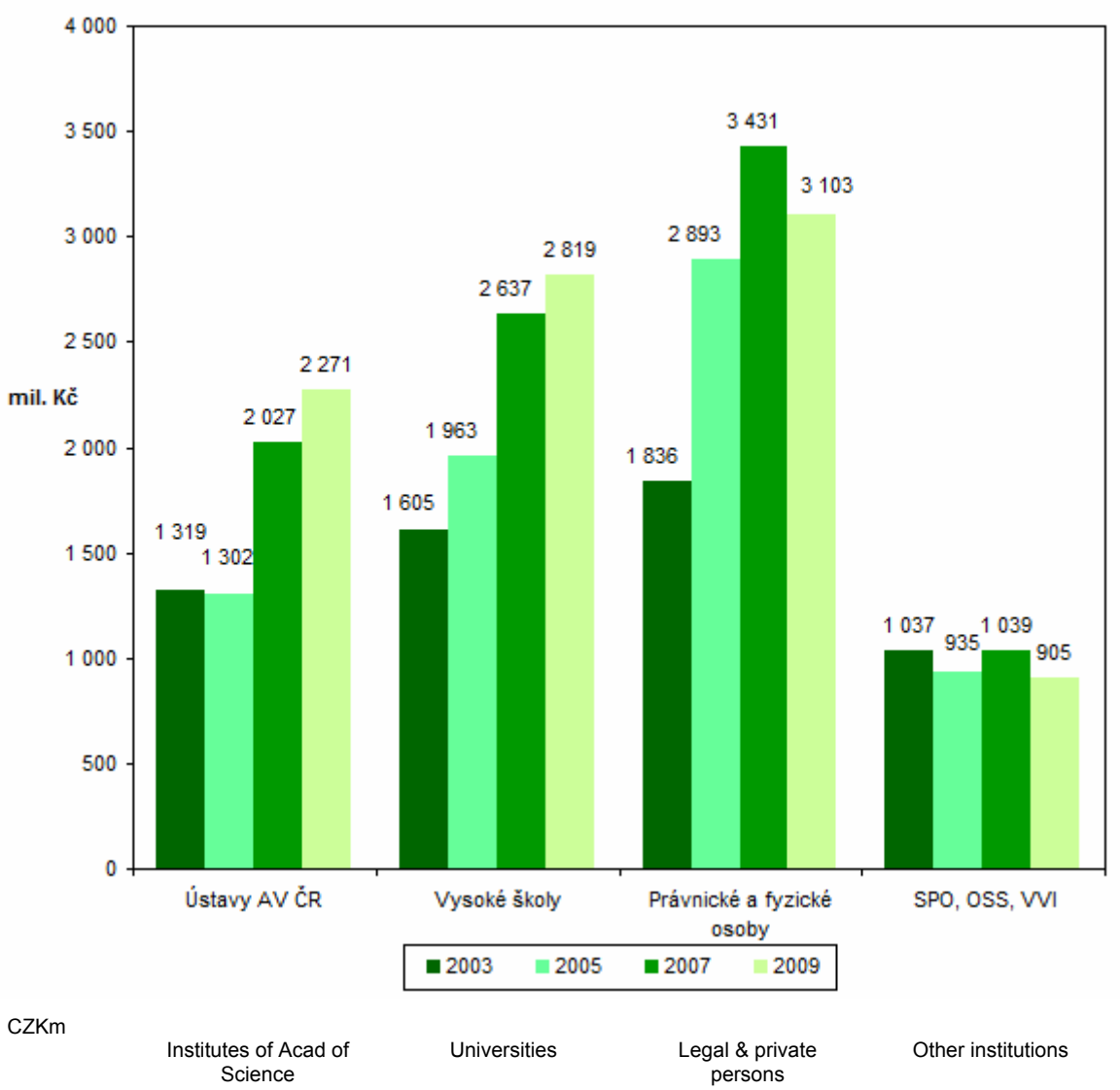


Source: Czech Republic state budget for 2003 to 2009

The six largest providers of targeted supported given here distribute more than 82% of total targeted support.

The rapid growth in targeted support in the period under scrutiny concerns the Ministry of Trade and Industry (up nearly threefold) and the Ministry of Education, Youth and Sport (doubled). Targeted expenditure supporting mainly fundamental research i.e. the Czech Science Foundation and the Academy of Sciences of the Czech Republic, grew much more slowly.

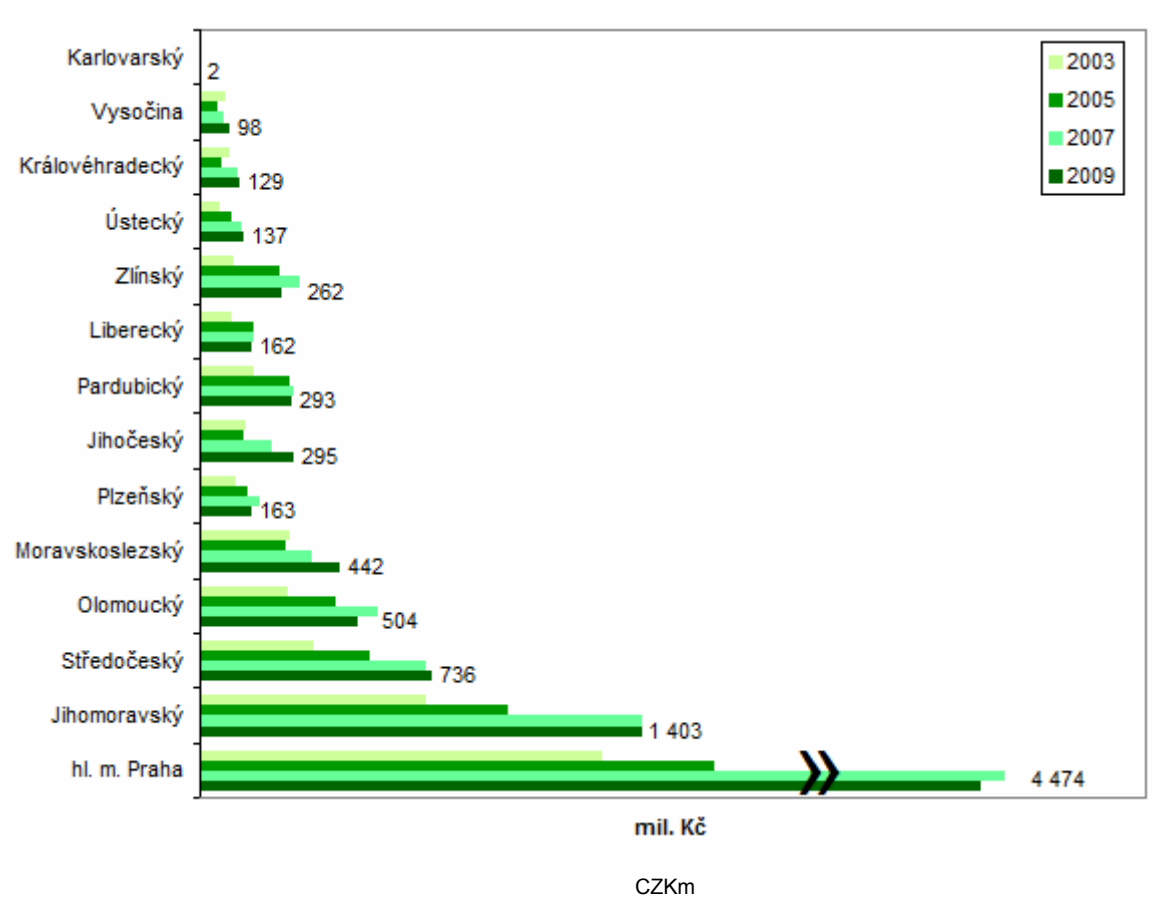
A1.18 Targeted R&D support by groups of recipients



Source: RD&I IS, Central Project Register (CEP)

With the exception of a deviation in 2005, the Institutes of the Academy of Sciences of the Czech Republic show stable growth in the use of target funds. In view of their overall larger and ever increasing capacity the universities are achieving higher values, but their speed of growth is however slowing quickly. Over recent years other Legal and Natural Persons entities have shown exceptional growth rates for the use of targeted funds, but in 2009 it fell below the level of 2006.

A.1.19 Targeted R&D support by region



Source: RD&I IS, Central Project Register (CEP)

The distribution of targeted support by region on the whole matches graph A.1.15 which shows the distribution of institutional support. Both graphs together demonstrate indirectly the size of research capacity in individual regions.

Table A.5 Comparison of the development of shares in overall institutional and overall targeted aid for R&D in selected regions

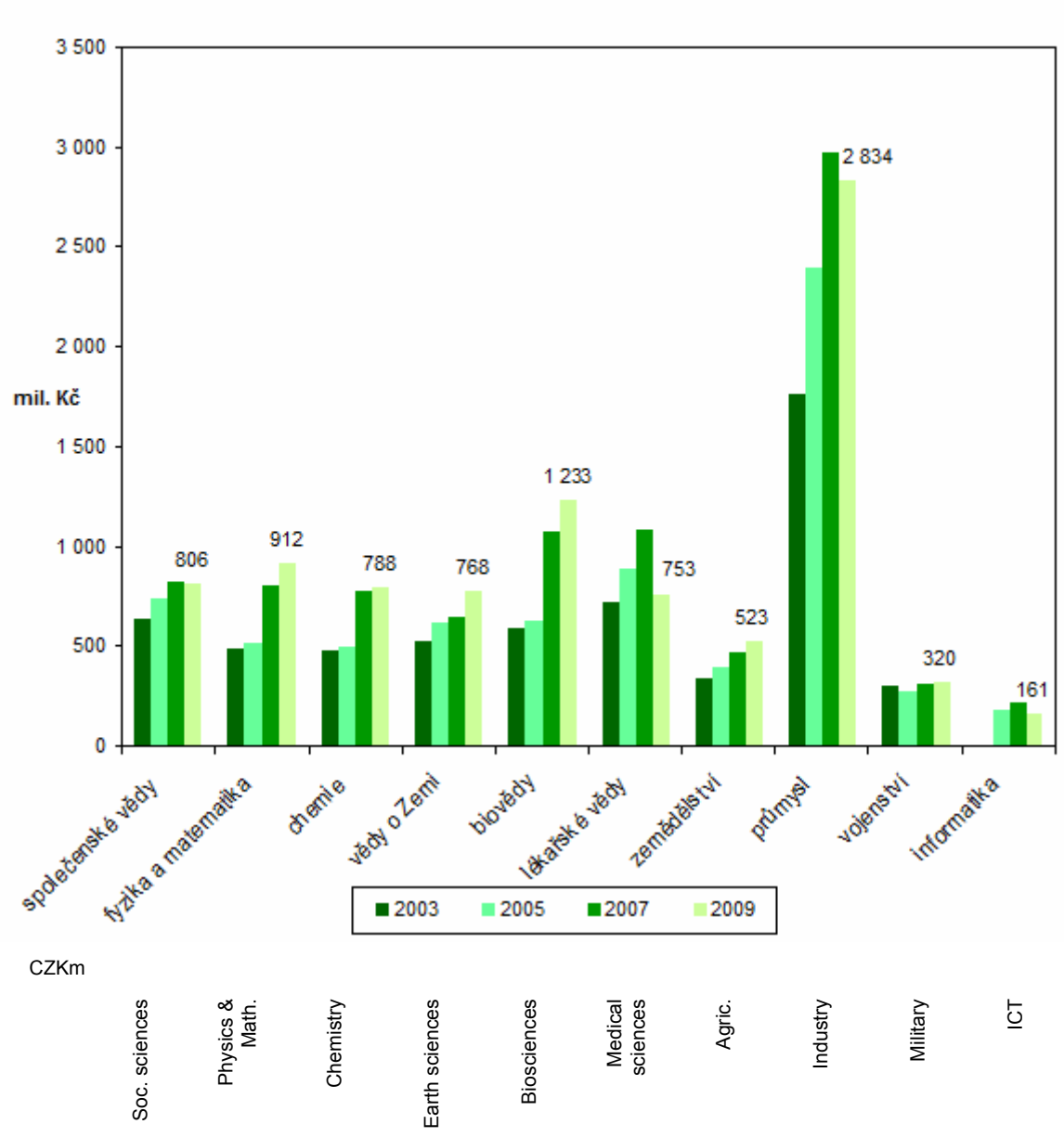
Region	*2003*	*2005*	*2007*	*2009*
Institutional R&D support in %				
Prague	69,0	67,1	66,8	67,7
Prague and the Jihomoravský and Středočeský regions	90,1	87,9	87,5	88,0
Targeted R&D support in %				
Prague	56,5	51,2	49,8	49,2
Prague and the Jihomoravský and Středočeský regions	75,1	72,6	73,0	72,7

Source: RD&I IS, Central Projects Register (CEP)) Central Programmes Register (CEZ)

Note: Support for Ministry of Defence classified programmes proposals in individual years is added to the institutional support in Prague.

Shares in the overall targeted R&D support in Prague and in the three provinces with the highest uptake of R&D support are lower than for institutional support, which corresponds with the fact that in these regions are concentrated most of the universities and public research institutions. The share of institutional support used in Prague is more or less constant, while targeted support in the capital is dropping in relative terms. In spite of this, targeted support is regionally concentrated to a significant degree and is out of step with the need to develop competitiveness and innovation in the regions.

A.1.20 Targeted R&D support for by discipline

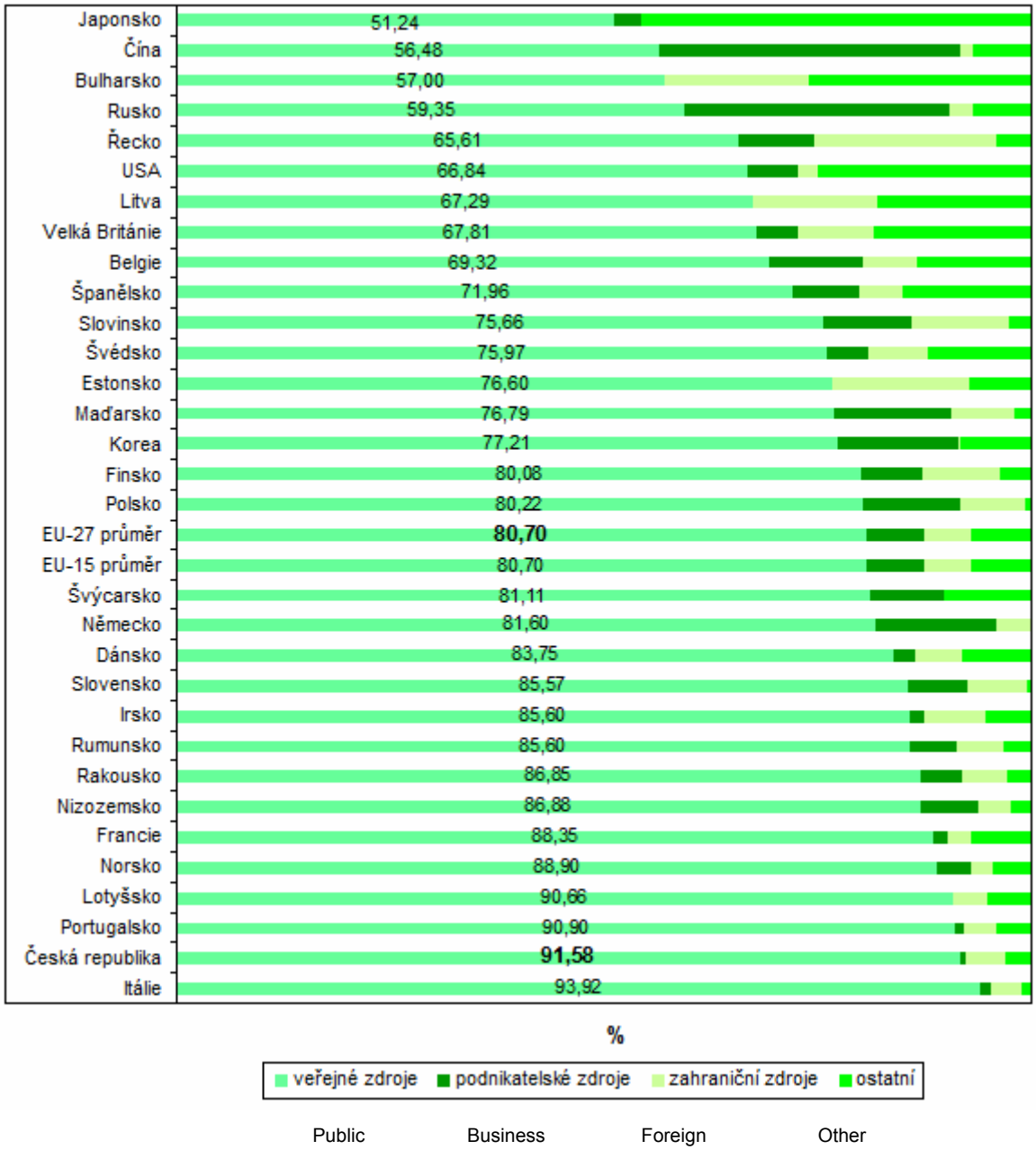


Source: RD&I IS, Central Project Register (CEP)

The constantly growing overall volume of targeted support was used by different disciplines to differing degrees. The varying rates of growth of targeted support used in individual disciplines, or even the surprising fall (medical sciences, industry, information science) may be linked to the nature of the scientific field and the focus of the research programmes announced

by the providers. Traditional the biosciences were the most successful in this, where in the period under scrutiny their volume of targeted funds used grew more than twofold.

A.1.21 Share of individual R&D finance sources in universities in 2007



Source: OECD, Main Science and Technology Indicators, May 2009 (MSTI 2009/1) Eurostat, July 2009 and own ČSÚ calculations, figures for 2007

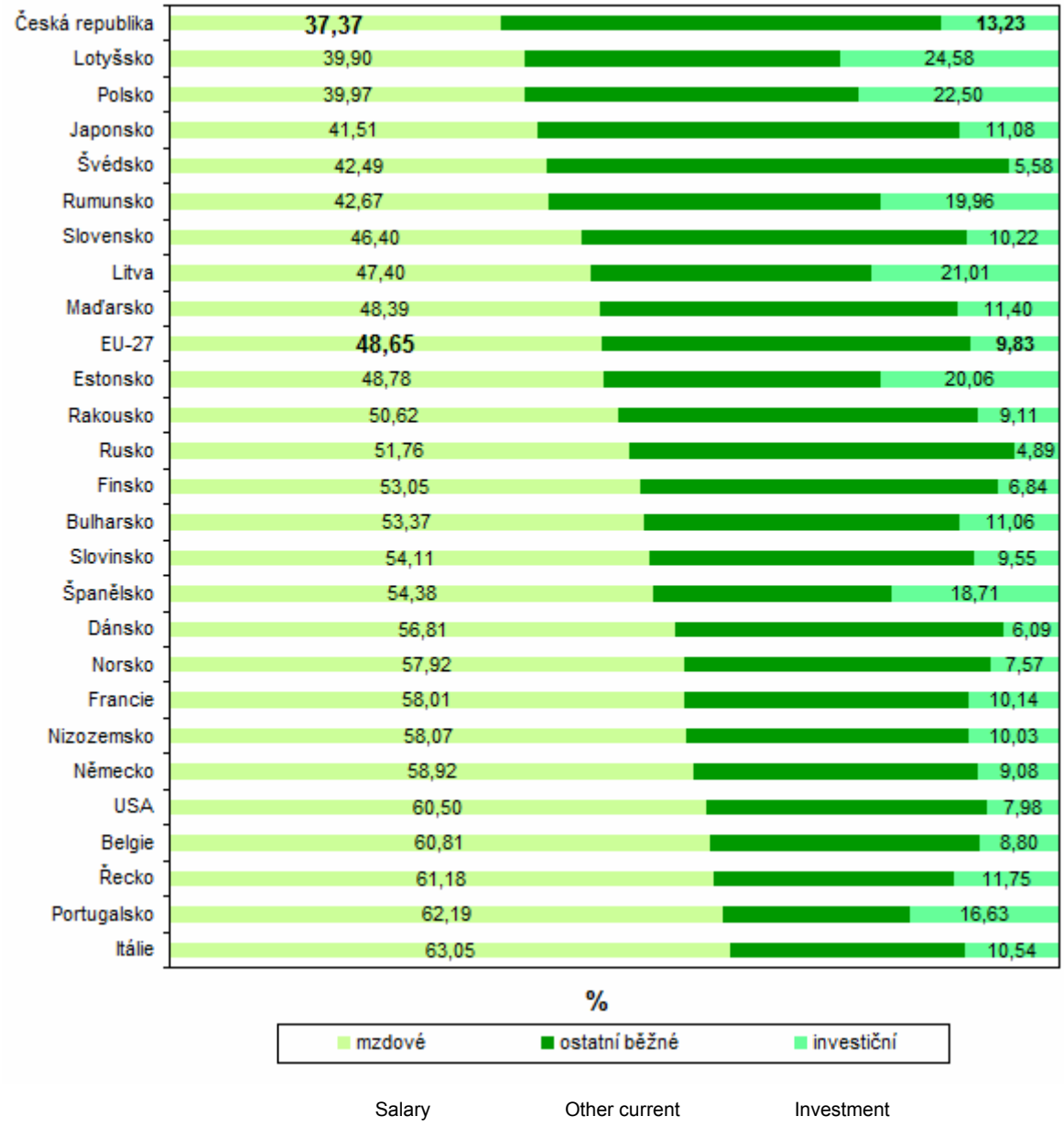
Note: 2003 Netherlands, 2005 (Belgium, Portugal, Greece, Switzerland), 2006 (Denmark, France, Ireland, Italy, Germany, Austria, Spain, EU-15, Bulgaria, EU-27, Korea)

The graph displays interesting information in a number of respects. The remarkably similar data for the EU-15 and EU-27 averages show that in Europe the task of supporting research at universities falls to a decisive extent on public funds, and that with only isolated exceptions (Bulgaria, Germany, Hungary, Poland, Belgium and Slovenia) universities cannot depend on business sources of funds. Surprisingly, this is also true of the United States which is usually

presented as a model of a country in which business sources of funds play a significant part in the financing of university research. The extreme structure of R&D sources for universities in the Czech Republic is nevertheless a cause for concern. Of the 29bn CZK of business R&D funds in 2007, 0.24% went to universities, 5.29% to the government sector and 94.47% to business.

The "Others" expenditure category is not clearly defined. Its shares were calculated from the shares of the other three categories.

A.1.22 Total R&D expenditure by cost type in 2007



Source: OECD, Main Science and Technology Indicators, May 2009 (MSTI 2009/1) Eurostat, July 2009 and own ČSÚ calculations

The graph shows some remarkable extremes: the lowest share of salary costs is in the Czech Republic (37.37%), the highest share of other current expenditure is in Sweden (51.92%), with

a very low level of investment expenditure in Sweden (5.58%), Denmark (6.09%) and Russia (4.89%). Great differences may result from the differing methods for reporting costs and assessing their admissibility.

The following table shows the cost structure for individual sectors in the Czech Republic.

Table A.6 Cost structure for R&D in individual sectors in the Czech Republic in 2007

Costs	*Salary*	*Other current*	*Investment*
Business (BERD)	34,8 %	53,8 %	11,4 %
Government (GOVERD)	37,5 %	41,3 %	21,2 %
University (HERD)	46,5 %	43,2 %	10,3 %
Private non-profit	43,8 %	55,4 %	0,8 %
Total Czech Republic (GERD)	37,4 %	49,4 %	13,2 %

A.2 Human resources in research and development

There can be no doubt that the decisive part in the creation of human resources for R&D is played by the universities, which does not however in the slightest diminish the importance of the training of science workers in all other R&D institutions, and in particular at the Institutions of the Academy of Sciences of the Czech Republic . The primary task here is the training of a sufficient number of highly qualified, if possible leading scientific workers in doctoral studies, which must be a priority for every university which aspires to be a research type university.

For this reason, the effective assessment and a constant improvement in the quality of postgraduate study must be a permanent aim. However, the growth of R&D places, and doubtless will increasingly place, new and concrete requirements on postgraduate study. Such study will evidently also increase its importance in the whole area of so-called ongoing education, since in all probability there will be an increased number of workers who in their careers will gradually come into direct contact with research and for whose careers it will be essential to complete postgraduate studies even late in life. It is a requirement that today postgraduate study offers its students broad skills not only in the area of their own scientific work and its methodology, but also allows them to acquire experience in publication and in international scientific cooperation.

The possibility of extending the standard period of study on postgraduate study programmes from three to four years is of particular significance in that it allows us to include in postgraduate study at least part of what was earlier taken to be part of the post-doctoral phase in the development of a scientific researcher. Also indisputable is the need to deepen cooperation, within postgraduate study, between universities and other scientific and research institutions, which is directly enabled at the institutional level by paragraph 81 of the Universities Act.

However, the issue of securing human resources for R&D also affects undergraduate study, from at least two points of view. First, it is hard to image an adequate level of postgraduate study which is not based on a high-quality level of undergraduate study. However in addition undergraduate study also provides for R&D direct human resources outputs in the form of highly qualified specialists in technical areas and in additional service support, information technology and services, for managerial and organisational activities, the dissemination of scientific knowledge, technologies and so on. Nor should one overlook the importance of well-trained secondary school workers, particularly in the area of R&D services.

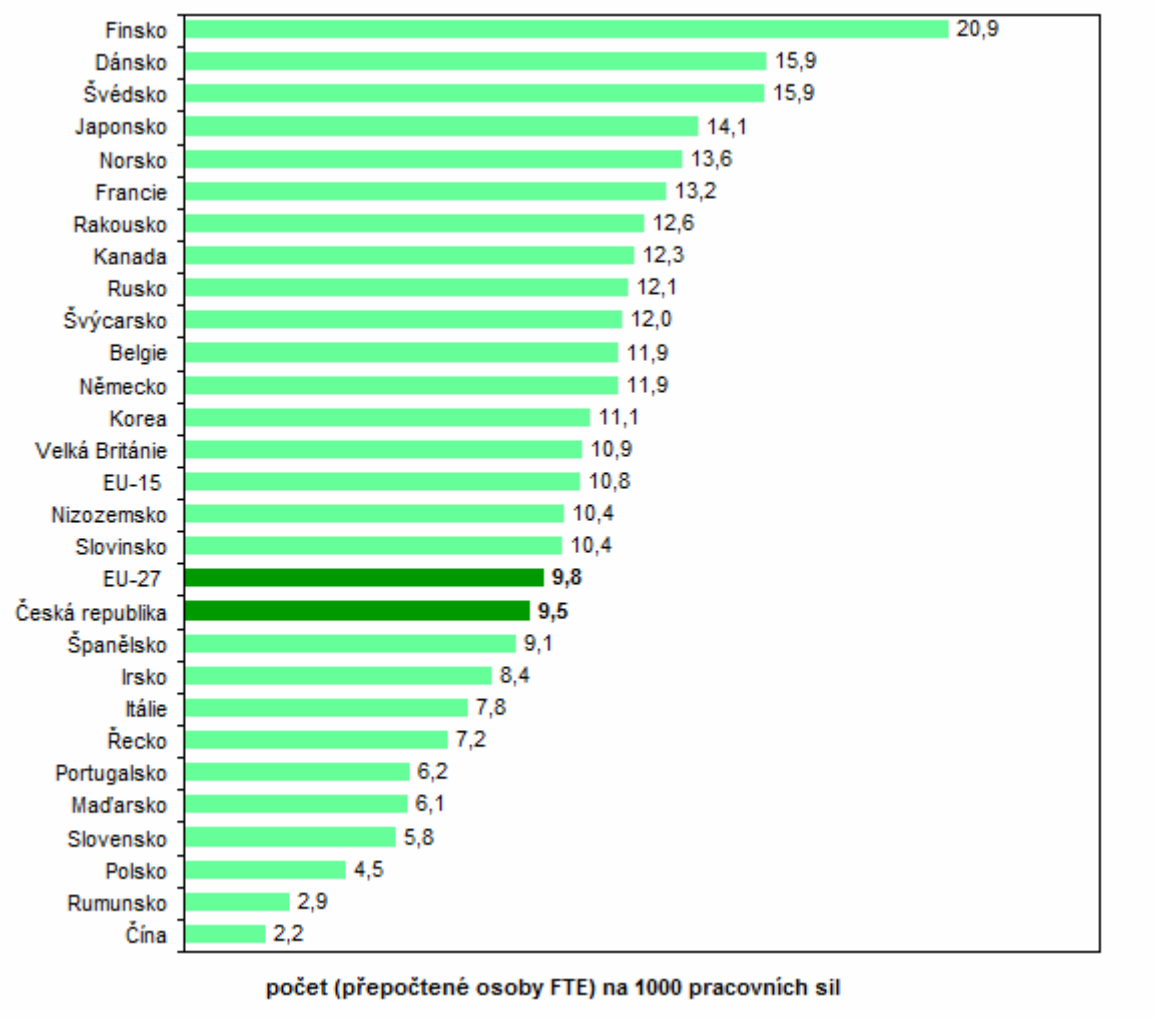
If the whole R&D is to function well, the research teams must be composed of specialists of different kinds. The primary group is without doubt scientific workers able to achieve scientific results of international standard and able to expand the boundaries of human knowledge in the true sense of the phrase. But their creative scientific activities need to be supported by a broad group of workers of service nature, given technical, organisational and administrative support. This is where those who apply new scientific knowledge to practical applications belong (applied research in the sense that this is usually used), while also essential are manager-type organisers who arrange for the dissemination of new knowledge, methods and technologies to users, and in the end to the whole of society. Nor should we overlook those able to apply new scientific knowledge in a teaching environment, i.e. to integrate it quickly and effectively into teaching and education in all its breadth.

If we work from the characteristics for so-called fundamental and applied research as usually applied in the Czech Republic, they do not unfortunately include one area, very important in practice, which we may call for working purposes call "monitoring - transfer" research. Because it is not realistic to assume that the financial resources of the state and society are today sufficient to enable us to aspire across the whole spectrum of scientific disciplines to

such research as would be part of the absolute world elite and would move its level forward. However in a number of branches of science it is so to speak a matter of life and death to maintain contact with this global elite, to resolve certain problems in the field in question, adopt foreign discoveries and to add to them here in a practical and economic sense.

Research of this nature can (in addition to fundamental and applied research) find favourable conditions particularly in universities, since a close connection to teaching activities here appears as a significant accelerator with effective positive effects on human resources for R&D. And even if the existence of specific research in universities offers options for financing research of this type, here it is also necessary to seek out and find new financing options.

A.2.1 Number of R&D personnel (Full-Time Employees)



Number (FTE equivalents) per 1000 employees

Source: OECD, Main Science and Technology Indicators, May 2009 (MSTI 2009/1) Eurostat, July 2009 and own ČSÚ calculations, figures for 2007

Note: 2004 (Switzerland), 2005 (Canada), 2006 (France, Italy, EU-15)

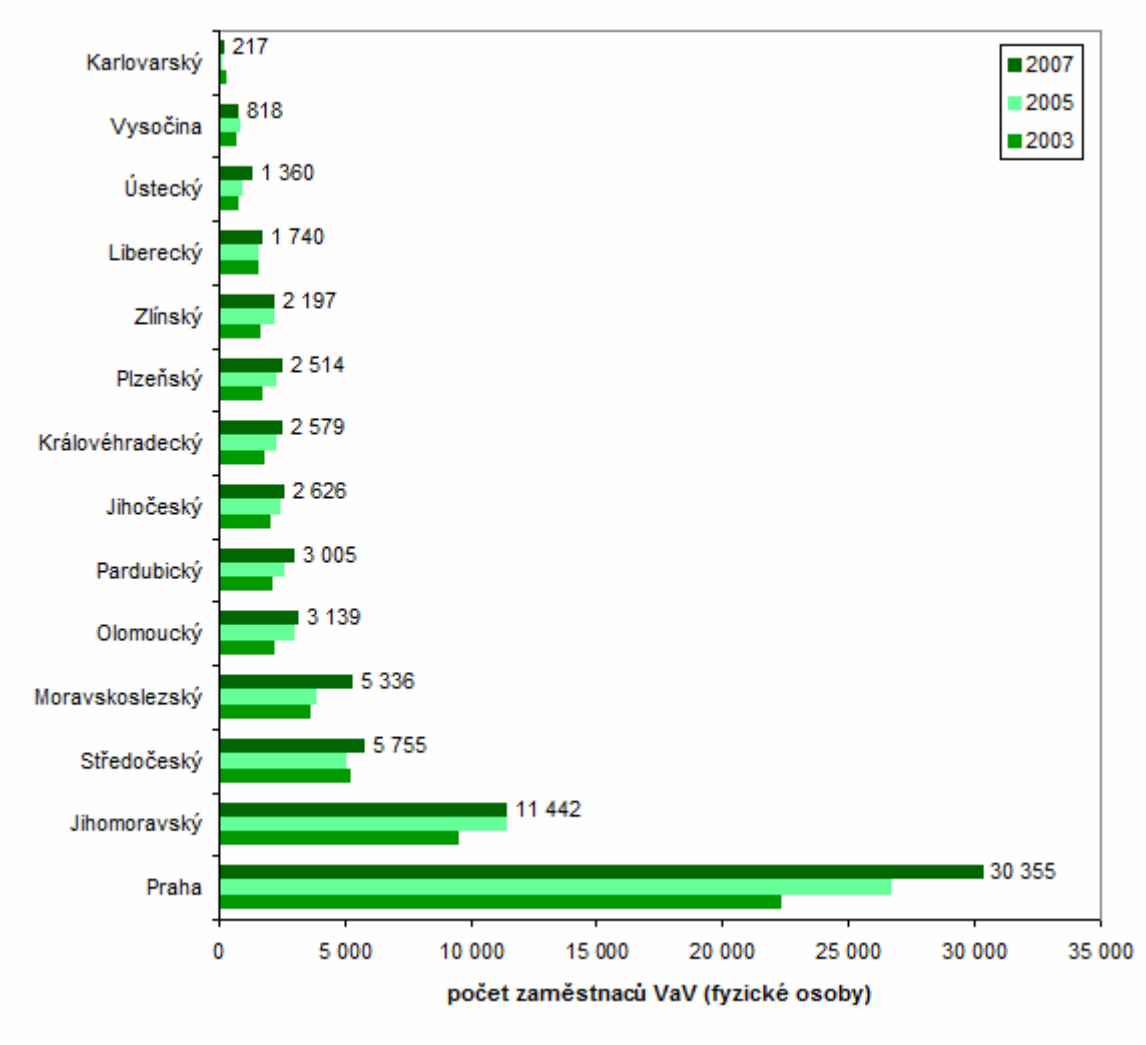
The number of people in R&D are monitored in two ways. The registered number of employees includes all R&D employees irrespective of whether they are full- or part-time workers. The FTE indicator of R&D employees offers the most precise picture regarding the actual time spent on R&D activities among employees in the field of research. One FTE is tantamount to one year's work by an employee devoted 100% to R&D activities. For employees who are also involved in other activities, only the time they actually spend on R&D is counted. In the Czech Republic, between 2004 and 2005 there was a change in the methodology used for FTE conversions, resulting in a relatively high rise in the indicator values between 2004 and 2006.

According to the OECD definition in the Frascati Manual, R&D personnel are researchers carrying out research directly, as well as technicians, administrative staff and other workers at research centres in individual organizational units. R&D personnel also include employees who procure direct services for research purposes, e.g. R&D managers, administrative officials, and secretaries.

With 9.5 (FTE) persons employed in R&D per 1,000 members of the workforce, in 2007 the Czech Republic was almost level with the EU-27 average (9.8). However the urgency need to grow research, development and innovation undoubtedly justifies an aspiration to at least get close to the EU-15 average over a few years, which demands intensive and multi-lateral support for the growth of R&D human resources.

The values of this indicator in other new member states, with the exception of Slovenia (10.4), were well below the EU-27 average (Hungary – 6.1, Slovakia – 5.8, Poland – 4.5). In the global comparison, the country at the bottom of the chart is China (2.2). The highest values were achieved by the Scandinavian countries (Finland – 20.9, Denmark and Sweden – 15.9) and Japan (14.1).

A.2.2 Developments in the number of R&D personnel by region



No. of R&D employees (individuals)

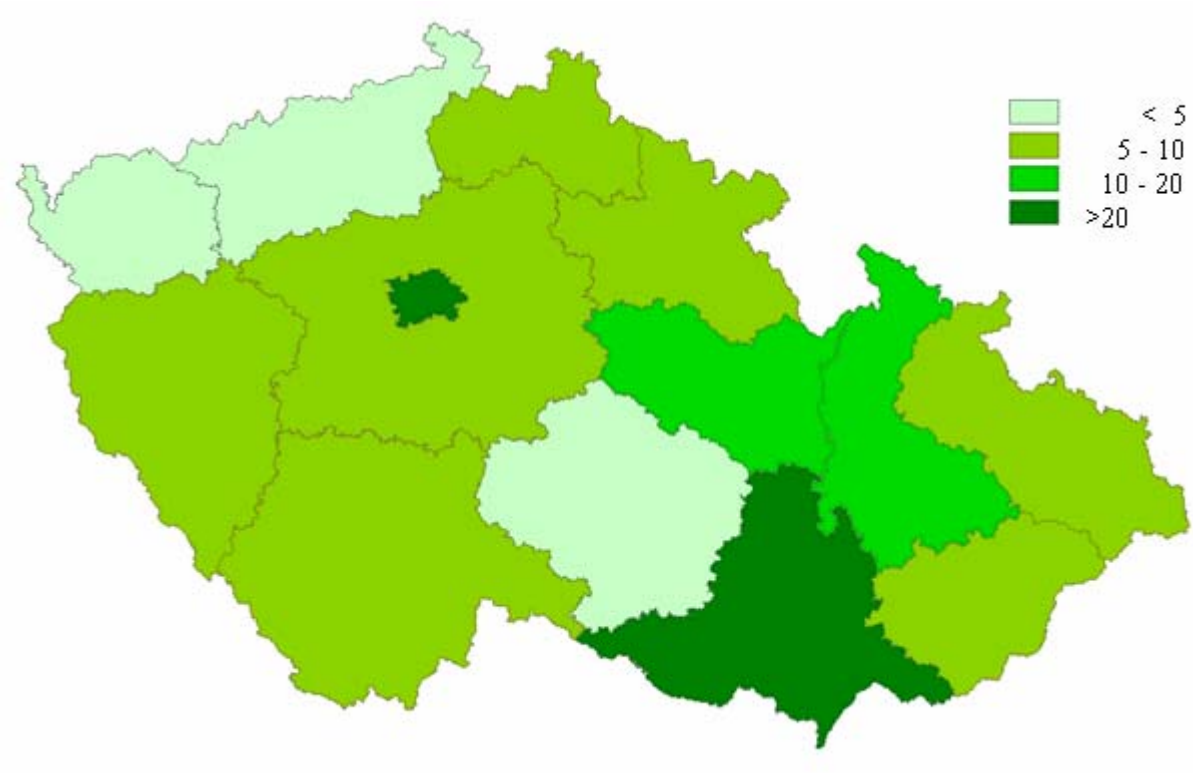
Source: Czech Statistical Office, VTR 5-01 investigation

Note: Recorded number of employees as at 31.12. for the calendar year in individuals (HC–headcount). This indicator includes all people employed in research and development regardless of their employment terms.

Most R&D activity is concentrated mainly in the centre of Prague and also in the centre of Brno. 30355 people were employed in R&D in Prague in 2007.

The number of these employees has increased by eight thousand in Prague since 2003. In the Jihomoravský region just under 12 thousand people worked in R&D in 2007, with the increase since 2003 being just under two thousand. The Středočeský and Moravskoslezský regions had relatively high numbers of people employed in R&D in 2007 (5755 and 5336 respectively). In the other regions the number of those employed varied between one and three thousand people. An exception to this were the Vysočina and Karlovarský regions with less than 1 thousand people employed in research.

A.2.3 Share of R&D personnel per 1000 employees by region

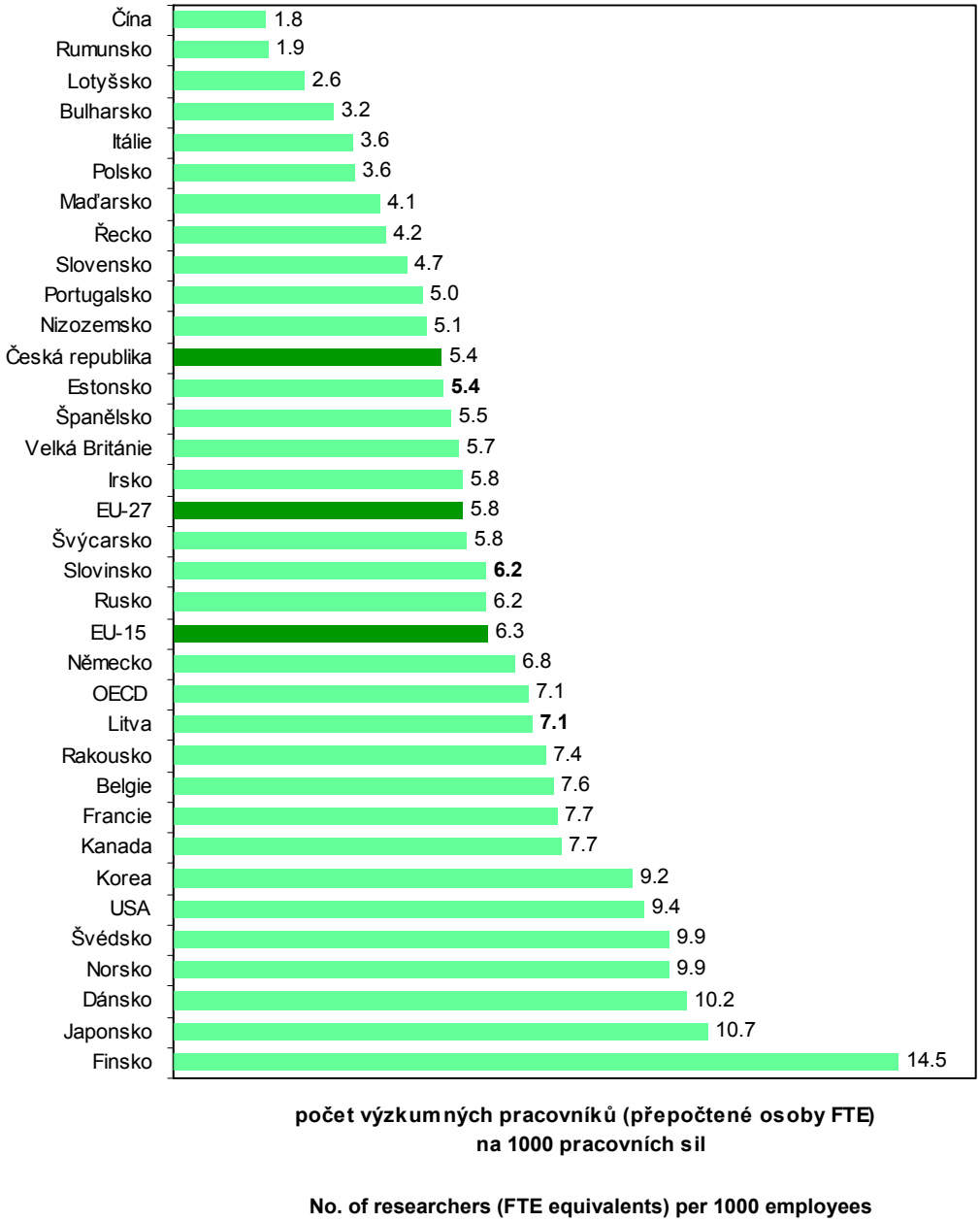


Note: The graph shows FTE equivalents

Source: Czech Statistical Office, Annual Statistical Investigation of Research And Development (VTR 5-01)

It is evident from the cartogram that, as with the number of R&D personnel (individuals), the number of R&D personnel per 1,000 employees is highest in Prague. In 2006, 45 persons per 1,000 employees were employed in research and development in the capital. The Jihomoravský region came second in this category, (21 R&D personnel per 1,000 employees). The lowest values are reported in provinces which have the fewest employees in research and development, i.e. the Karlovarský, Ústecký and Vysočina regions. In these places, approximately 3 people per thousand work in research and development. In all other regions, the number of research and development personnel per thousand employees varies between 8 and 12.

A.2.4 Number of researchers



Source: OECD, Main Science and Technology Indicators, May 2009 (MSTI 2009/1) Eurostat, July 2009 and own ČSÚ calculations, figures for 2007

Note: 2004 (Switzerland), 2005 (Canada), 2006 (France, Ireland, Italy, EU-15, USA, OECD)

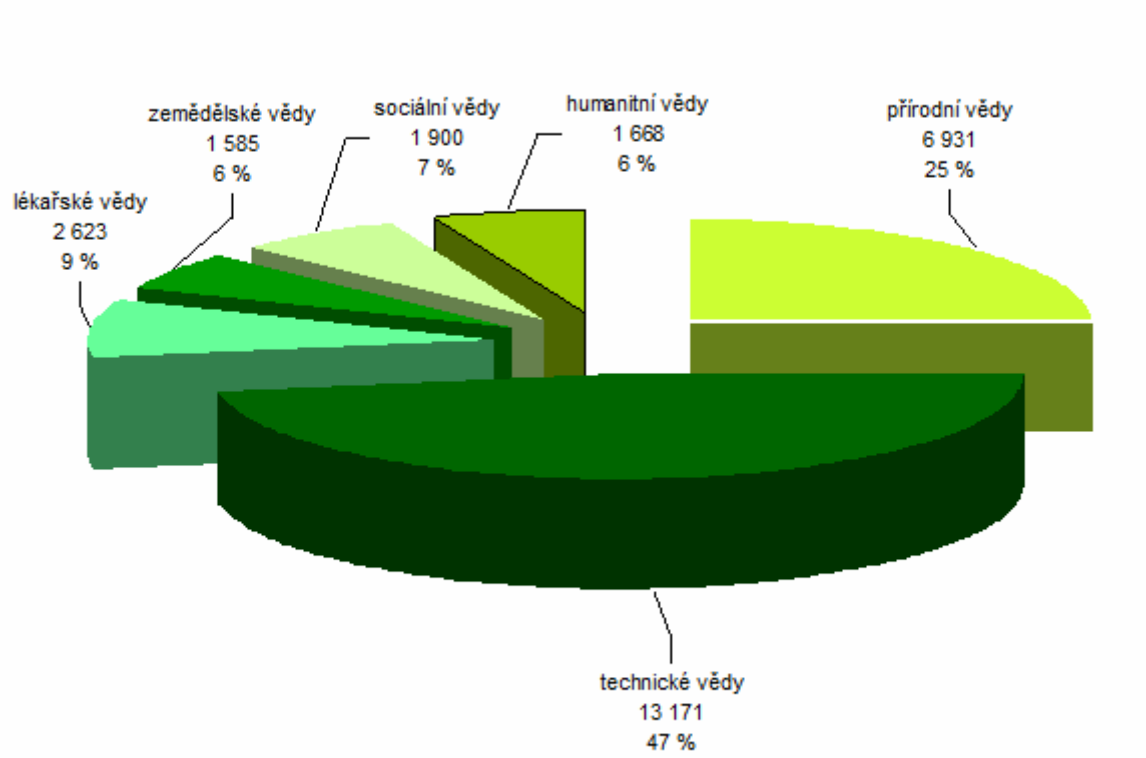
Researchers are generally defined as persons addressing the concept or creation of new knowledge, products, processes, methods and systems, or managing such projects. Researchers are the most important group of R&D personnel. The most commonly used indicator for international comparisons of the number of human resources in R&D is the number of researchers per 1,000 people in the workforce.

In 2007, the highest number of researchers per 1,000 people in the workforce was reported, as in the case of R&D personnel, in the Scandinavian countries (Finland – 14.5, Denmark - 10.2, Norway and Sweden – 9.9). The Czech Republic (5.4) together with Slovenia (6.2)

achieved values close to the EU-27 average (5.8). The other new member states were again below the EU-27 average in this indicator (Slovakia – 4.7, Hungary – 4.1, Poland – 3.6).

The necessary support for the development of human resources in the category of one's own researchers is to be found in particular in the development and improved quality of postgraduate study.

A.2.5 Number of Researchers by discipline (FTE)



Lékařské vědy	Zemědělské vědy	Sociální vědy	Humanitní vědy	Prírodní vědy	Technické vědy
Medical sciences	Agricultural sciences	Social sciences	Humanities	Natural sciences	Engineering

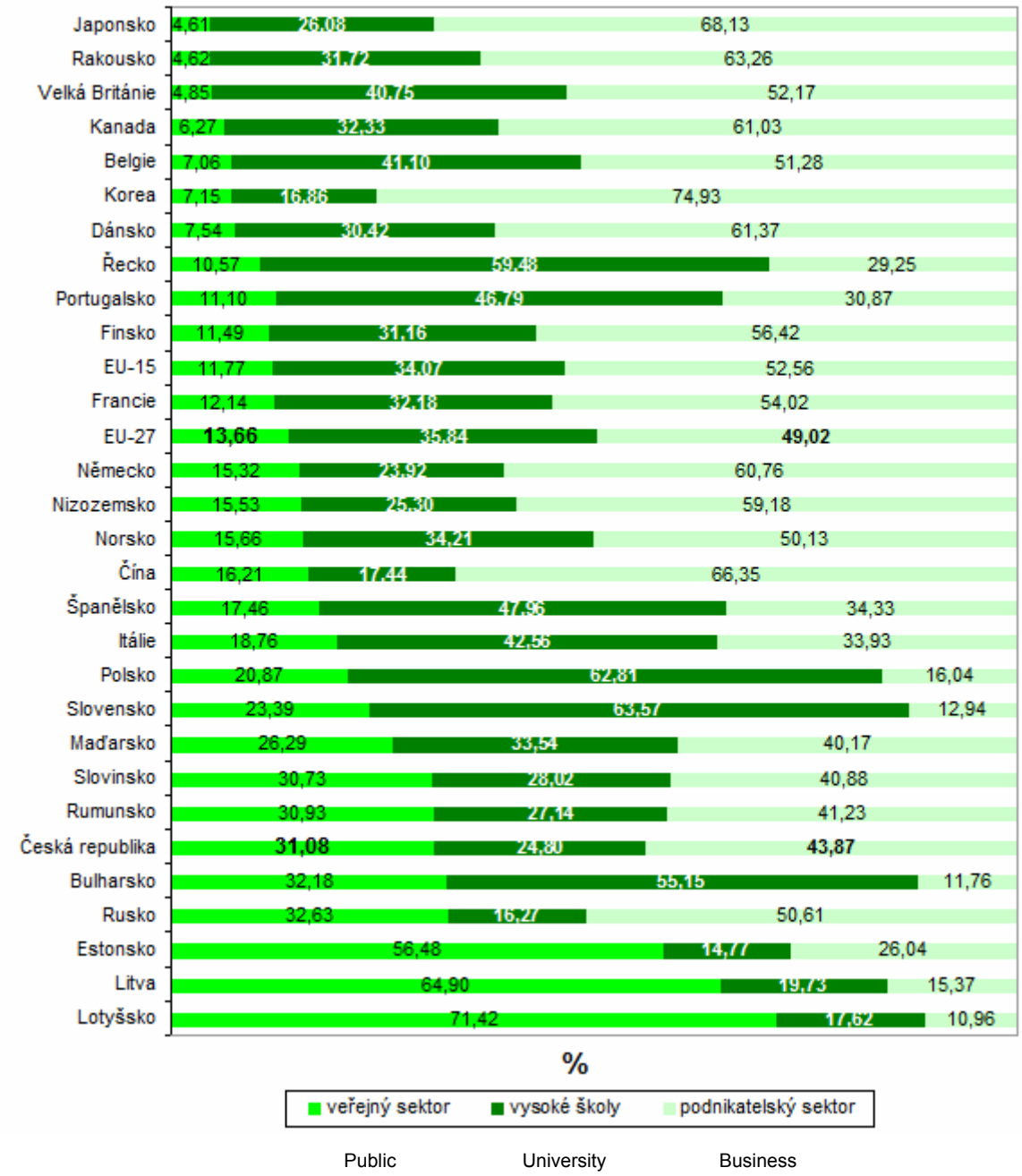
Source: Czech Statistical Office, VTR 5-01 investigation

Note: The graph shows FTE equivalents

Over the long run the highest proportion of researchers in the Czech Republic has been in engineering (47%). The second largest discipline is natural sciences (25%), followed by social sciences and the humanities (13%), medical sciences (9%) and agricultural sciences (just 6%).

The highest rise between 2000 and 2007 was recorded in social sciences (more than a six-fold increase from 311 to 1 900 researchers), medical sciences (almost a threefold increase from 909 to 2 623 researchers), followed by engineering (a doubling from 6 203 to 13 171 researchers).

A.2.6 Share of the number of researchers in the public, business and university sectors, of the total number of researchers



Source: OECD, Main Science and Technology Indicators, May 2009 (MSTI 2009/1) Eurostat, July 2009 and own ČSÚ calculations, figures for 2009; data for the Czech Republic Czech Statistical Office 2009, others 2007

Note: 2004 (Switzerland), 2005 (Canada), 2006 (France, Ireland, Italy, EU-15)

In 2006, the proportion of the total number of researchers (FTE equivalent) in the public sector in Europe was highest in the new member states (Slovenia – 30.7%, Hungary – 26.3%, the Czech Republic – 31.08%). This is due to the fact that extensive academies of sciences and numerous ministerial research institutions existed in these countries, which remain a strong tradition. However, since 2002 this indicator has contracted in these states.

In the EU-27 as a whole, in 2007 13.7% of all researchers were employed in the public sector. Countries hovering around this average were France (12.1%), Germany (15.32%). Values markedly lower than the European average were achieved by Austria and Great Britain, where the share of researchers employed in the public sector was never more than 5%. Of the non-European states, the smallest proportion of researchers in the public sector existed in Japan and Canada.

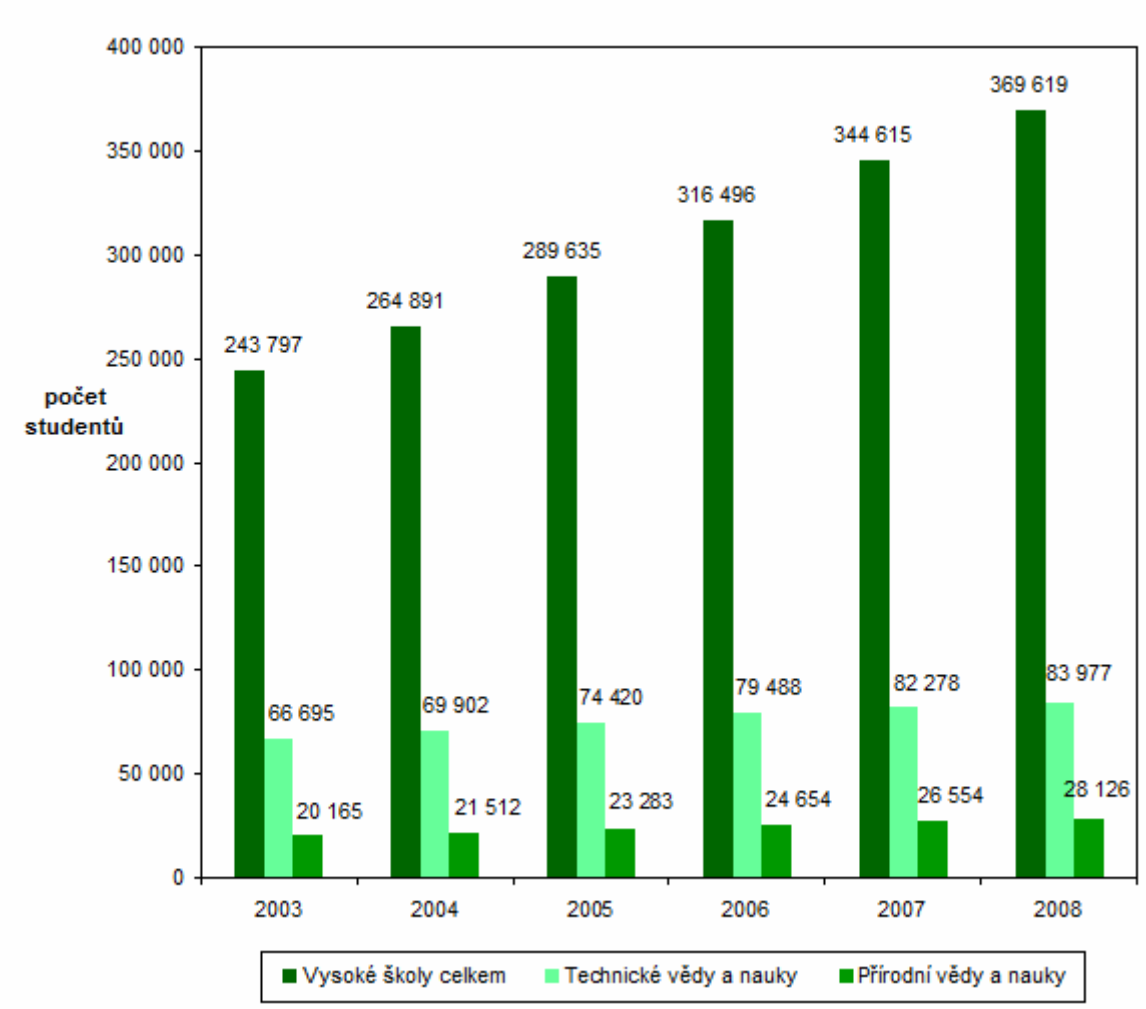
Of the total number of all researchers, the highest proportion of the number of researchers at universities among the monitored countries was reported by Poland and Slovakia. In 2007, a high proportion of researchers in the university sector could also be found in Greece. In 2007, other monitored countries achieved values below the EU average, which stood at approximately 36%. Of all researchers, the lowest proportion of researchers employed in the university sector in 2007 was documented in Russia and Korea. In the Czech Republic, 24.8% of all researchers worked in the university sector in 2006, a moderate increase compared to 2002.

Of the total number of researchers, the highest proportion of the number of researchers operating in the business sector in 2006 could be found in Japan (68.1%). Of the European countries, the highest share was reported by Austria (63.3 %). Conversely, the lowest representation of researchers in the business sector existed in the new member states of Bulgaria (11.8%) and Slovakia (12.4%). The Czech Republic had the highest share of researchers in the business sector of all the new member states (43.9%). The lower share of researchers in the business sector in former socialist countries is caused by the persistent high proportion of fields of manufacturing and services that are not research intensive.

The European Commission considers the low share of R&D in the business community compared to the USA and Japan to be a major threat to the EU's knowledge economy. A Commission publication[3] of June 2007 states that the more than 85% mismatch between R&D aid intensity in the EU and among its principal competitors is rooted in the difference in R&D financing in the private sector (when the EU is compared with the USA). This can be attributed to the differing structure of businesses and the fact that cutting-edge technology (e.g. in the field of information technology) is less developed in the EU.

[3] Key figures of science, technology and innovation, EC, June 2007

A.2.7 Number of students registered at universities in the Czech Republic



Source: Institute for Education Information (UIV)

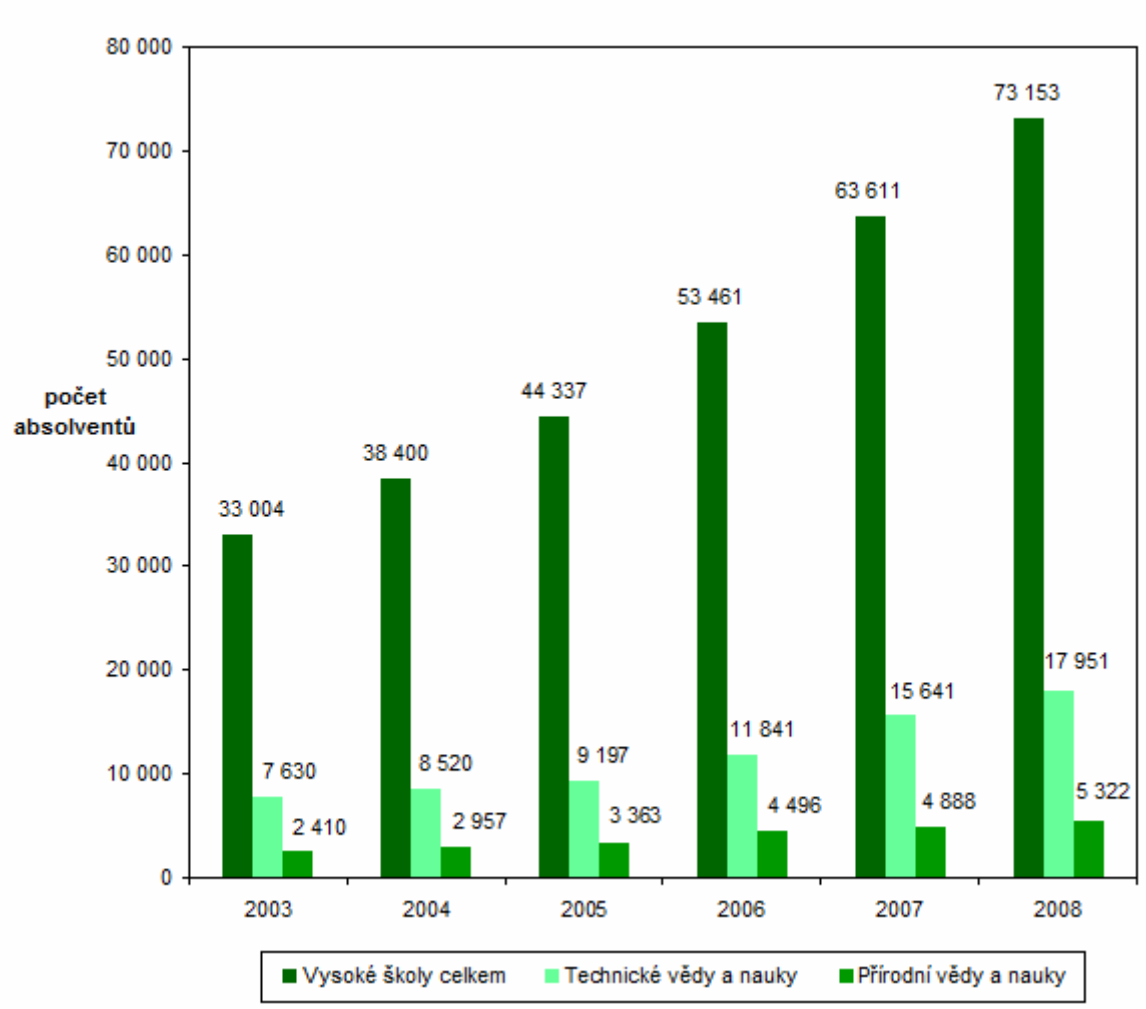
Note: Data as at 31.12. for the year

University study in the Czech Republic takes place as bachelor, master and doctoral programmes; students and can take the form of full-time courses, distance learning, or a combination of the two. Study programmes are subject to accreditation awarded by the Ministry of Education, Youth and Sport.

The total number of university students in the Czech Republic has risen in each of the years under review; but where the growth rate in 2006 and 2007 was 8.8%, in the following year it was only 7.2% In the natural sciences under review the growth rate also fell, from 7.7% in 2007 to 5.9% in 2008 and in engineering sciences from 3.5% in 2007 to 2.06% in 2008.

The year-on-year increase in the total number of university students in 2007-2008 is not as high as in 2005-2006, and for engineering study programmes is actually appreciably lower (from 6.8% to 2.1%); the numbers enrolled for natural sciences stagnated at 5.9%

A.2.8 Number of university graduates in the Czech Republic



No. of students Universities Total Engineering Sciences Natural Sciences

Source: Institute for Education Information (UIV)

The total number of university graduates in all study programmes in the Czech Republic is steadily rising. In 2008 it reached 222% of the 2003 level, with 221%% in natural sciences and 235% in engineering.

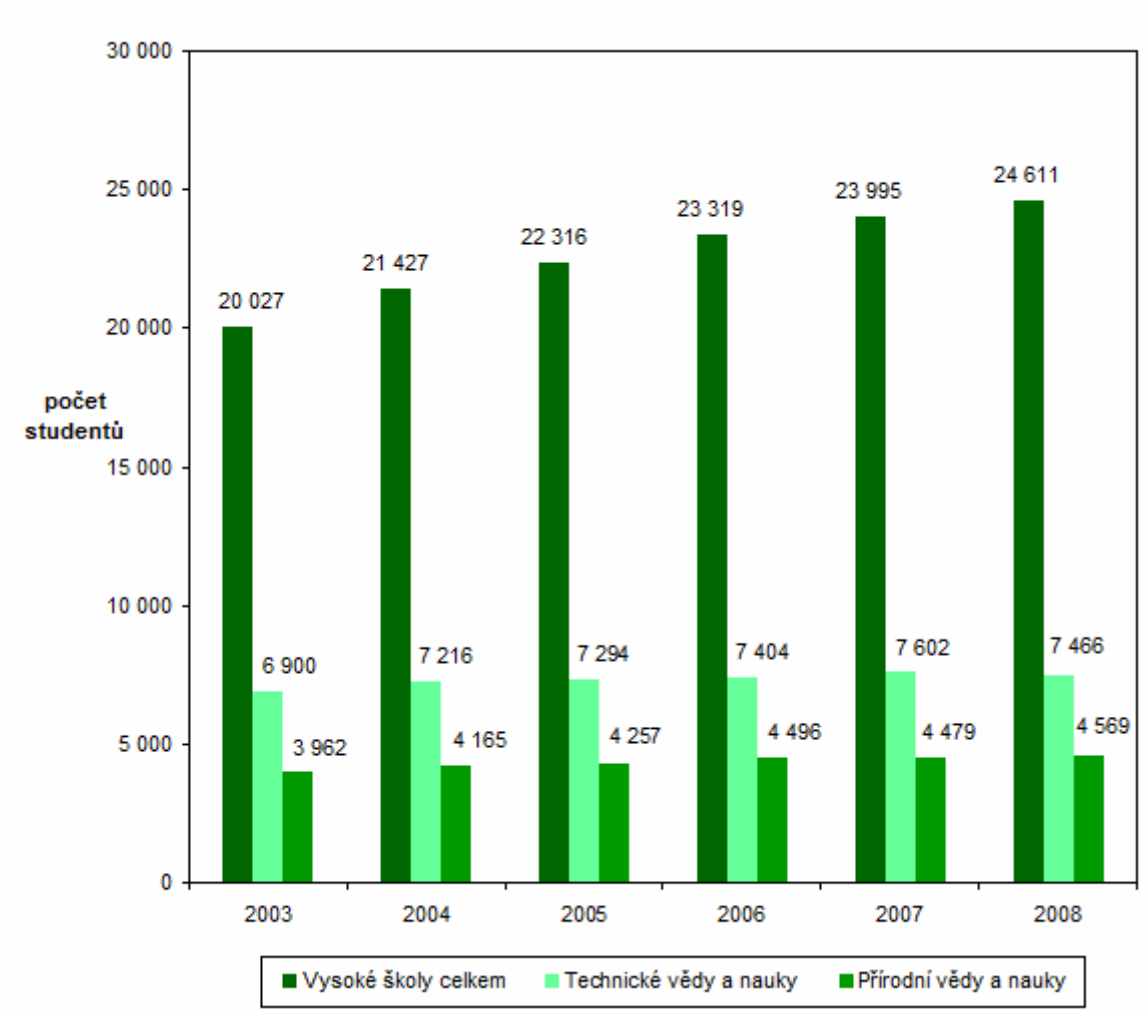
Even so, we remain a country where only a very low proportion of the population holds a university degree (14% in the 25-34 age category); the gross graduation rate for universities is also one of the lowest among OECD countries.

International cooperation under the so-called Bologna process strives to harmonise the system of European university education with the aim of achieving openness, structure, improved quality, enabling mobility of students and academics and, using the European Credit Transfer System (ECTS), making their mutual recognition easier. The Czech Republic has been a participant in the Bologna process since its inception in 1999.

In harmonisation emphasis is placed on the tertiary level of structured study, that is, on the quality of postgraduate doctoral programmes, the integration of teaching and research and on students' interdisciplinary knowledge which can be applied in practice. The most recent ministerial communiqué in April 2009 from Leuve/Louvain-la-Neuve emphasises the role of university education as the corner stone of the development of research capability, innovation and creative thinking. It also calls for the initiative of the state and university institutions themselves in striving to retain young researchers and securing professional development for

them. The member states also agreed that at a time of economic crisis university education is closely linked to research as a motor for innovation and economic growth.

A.2.9 Number of students enrolled in doctoral study programmes in the Czech Republic



No. of students Universities Total Engineering Sciences Natural Sciences

Source: Institute for Education Information (UIV)

Doctoral courses aim to guide students towards independent scientific and creative activity in avenues of R&D. Compared to 2006, the number of doctoral students at universities in the Czech Republic has increased by 3.4%; while the number in natural science programmes has virtually stagnated, engineering subjects have registered growth of 3.0%

The growth rate in the number of doctoral students fell from 2.9% in 2007 to 2.5% last year. Following a slight reduction in 2007 there was growth in natural sciences of 2% Engineering registered growth in 2007 of 2.7%, but last year this showed a marked decline to 1.8%

A significant initiative in this direction may be the Individual National Projects implemented as part of the Education for Competitiveness Operational Programme (see Chapter D), which falls into the support area of the System Framework for Tertiary Education and Development of R&D Human Resources:

- Support for engineering and the natural sciences

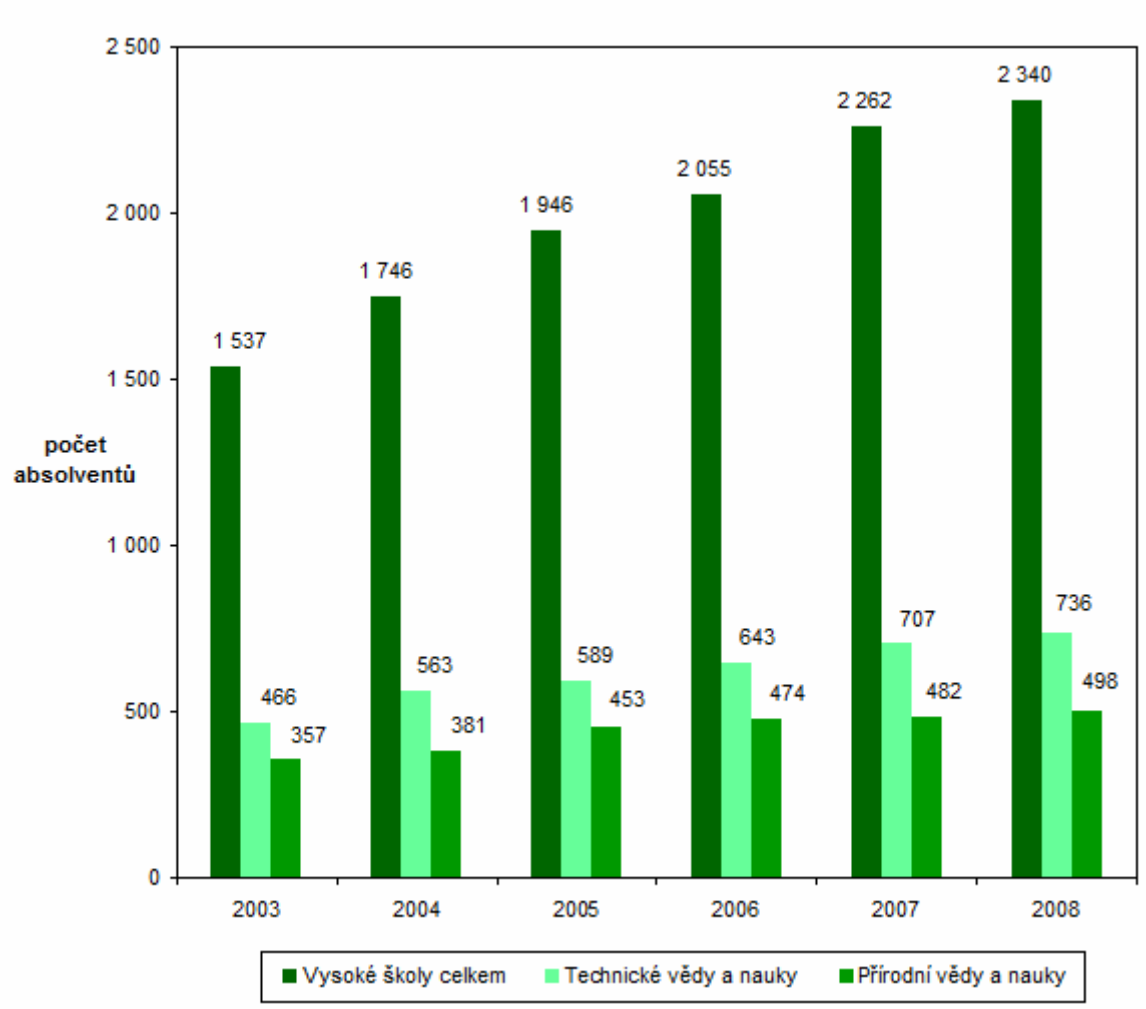
- An international audit of research, development and innovation in the Czech Republic and implementation of its results in strategic documents
- Assessment of the quality of tertiary education
- System support for efficient management of tertiary education institutions and research and development organisations
- Efficient transfer of knowledge and research and development findings into practice, and their subsequent use
- A national qualifications framework for tertiary education

The projects are being undertaken as on one of the priorities of the Ministry of Education, Youth and Sport and will run until 2012.

In particular this will be an Analysis of Conditions for Personal and Profession Growth mainly for young scientific researchers in various types of research organisations and the effectiveness of postgraduate study and an analysis of relations between the academic sphere and industry. The results of the project will be implemented in an update of the Reform of the Research, Development and Innovation System and of the National Research, Development and Innovation Policy in the Czech Republic for the period 2009 to 2015 with the aim of increasing the effectiveness of public support and will also be used to complete the comprehensive system of assessment for the results of research and development, which will secure objective distributions of institutional support. A methodology will be prepared for assessing the quality of tertiary education which the structure of domestic tertiary education institutions and the environment in which they operate.

The whole assessment system will link into the European system with the standards of the European Association for Quality Assurance in Higher Education (ENQA) There will also be a resolution of the question of the support and development of effective management principles, particularly of support economic and administrative process in tertiary education institutions and in research organisations. There will be a description of a system and methodology for the implementation of efficient transfer of knowledge formed as part of research and development activities into practice with emphasis on a system of protection and commercial use of intellectual property, commercialisation of the results of research and development and implementation of cooperation with the application sphere. The aim of the last project is to create a national qualifications framework for tertiary education which will cover the outputs of this education for the individual levels of tertiary education and specifically, for specific education areas, and will also be compatible with the qualifications framework within the European university education space.

A.2.10 Number of doctoral graduates in the Czech Republic



No. of students Universities Total Engineering Sciences Natural Sciences

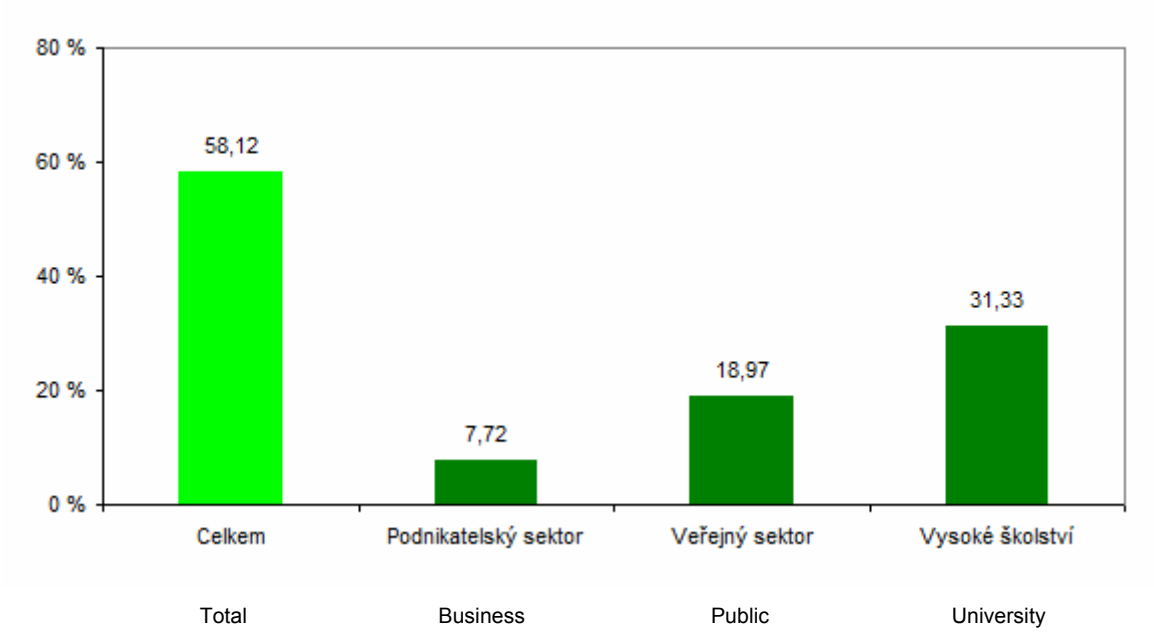
Source: Institute for Education Information (UIV)

The growth rate for doctoral graduates fell overall from 10.1% between 2006 and 2007 to 3.4% in the 2007-2008 period. At the same time engineering sciences showed a slowing down in the growth of graduates from 9.9% to 4.1%, while in the natural sciences by contrast the growth rate increased from 1.6% to 3.3% over the same period. The growth in humanities and social sciences is more marked, between 2006 and 2007 it was 11.4% and in the 2007-2008 period as high as 23%

In spite of the fact that since 2003 the number of doctoral graduates has increased by roughly 52%, the number of graduates is still alarmingly small. The success rate of study in doctoral programmes is, like that in masters programmes, low - since 2003 the number of successful doctorands has risen from 7.6% to 10.5% in 2008.

More detailed data sets maintained by the Institute for Education Information indicate that the lowest success rate among doctoral students can be found in natural sciences and engineering. The conclusion stress the need to monitor on a multi-lateral basis the development and improvement in quality of doctoral study, while paying particular attention to the natural science and engineering fields. However the Czech Republic does not attain a desirable value for the number of doctoral graduates per 1000 population in the 25-34 age range, just like most European countries. One of the reasons for this is the high failure rate for this level of study.

A.2.11 Share of doctoral graduates employed as researchers in the Czech Republic in the public and university sectors (2007)



Source: Czech Statistical Office, VTR 5-01 investigation

Doctoral graduates are qualified to do scientific research. However, according to the Green Paper on R&D&I in the Czech Republic[4] only one-third of these graduates work in research.

Graph A.2.11 illustrates the share of PhD holders employed as researchers or R&D personnel from all employed doctoral graduates in the relevant sector in 2007.

By their economic status most respondents are employees, with most of them working as scientific and specialist researchers. Almost half of these are science teachers in universities. From the perspective of employment, most PhD holders work in the public sector – approximately half of them work in the tertiary education sector and a third in public research organisations, which include the Institutes of the Academy of Sciences of the Czech Republic . Approximately 13% of respondents work in the business (private) sector.

The most important motivation for doctoral graduates when selecting a career in research is the creative nature and innovative potential of the work. The high degree of independence also offers relatively strong motivation for doctoral graduates to pursue a research career. Conversely, the pay or working conditions are rarely a determining factor.

Eurostat is currently evaluating an extensive survey (CDH) in 40 countries worldwide relating to the work carried out by doctoral graduates. The national guarantor for the Czech Republic is the Czech Statistical Office; the project is supported by the Academy of Sciences of the Czech Republic , the Ministry of Education, Youth and Sport and the Research and Development Council.

Table A.7 Number of researchers by level of qualification

Individuals	*2005*	*2006*	*2007*

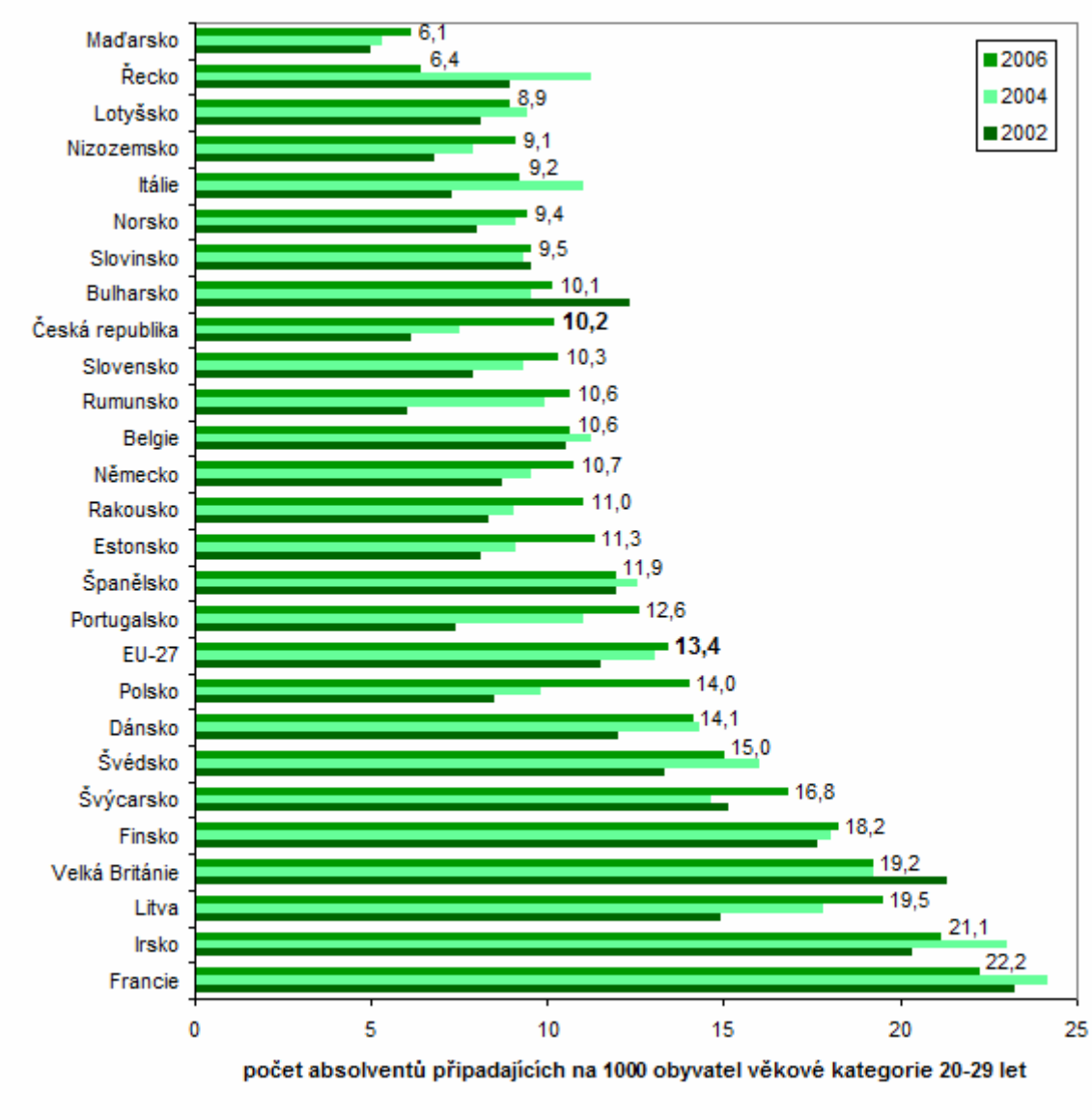
[4] Klusáček, K. and Coll.: Green Book of research, development and innovation in the Czech Republic. Academy of Sciences of the Czech Republic Technology Centre, March 2008

Total	37 542	39 676	42 538
Doctoral/postgraduate	16 090	15 949	17 527
University	18 497	20 524	21 539
Technical college	323	379	412
Standard secondary, secondary technical	2 531	2 739	2 945
Other	102	86	116

Source: Czech Statistical Office, VTR 5-01 investigation

Note: The table lists numbers of individuals

A.2.12 Number of all graduates of tertiary education science and engineering studies in the 20-29 age group



No. of graduates per 1000 population in 20-29 age group

Source: Eurostat, July 2009 and own ČSÚ calculations

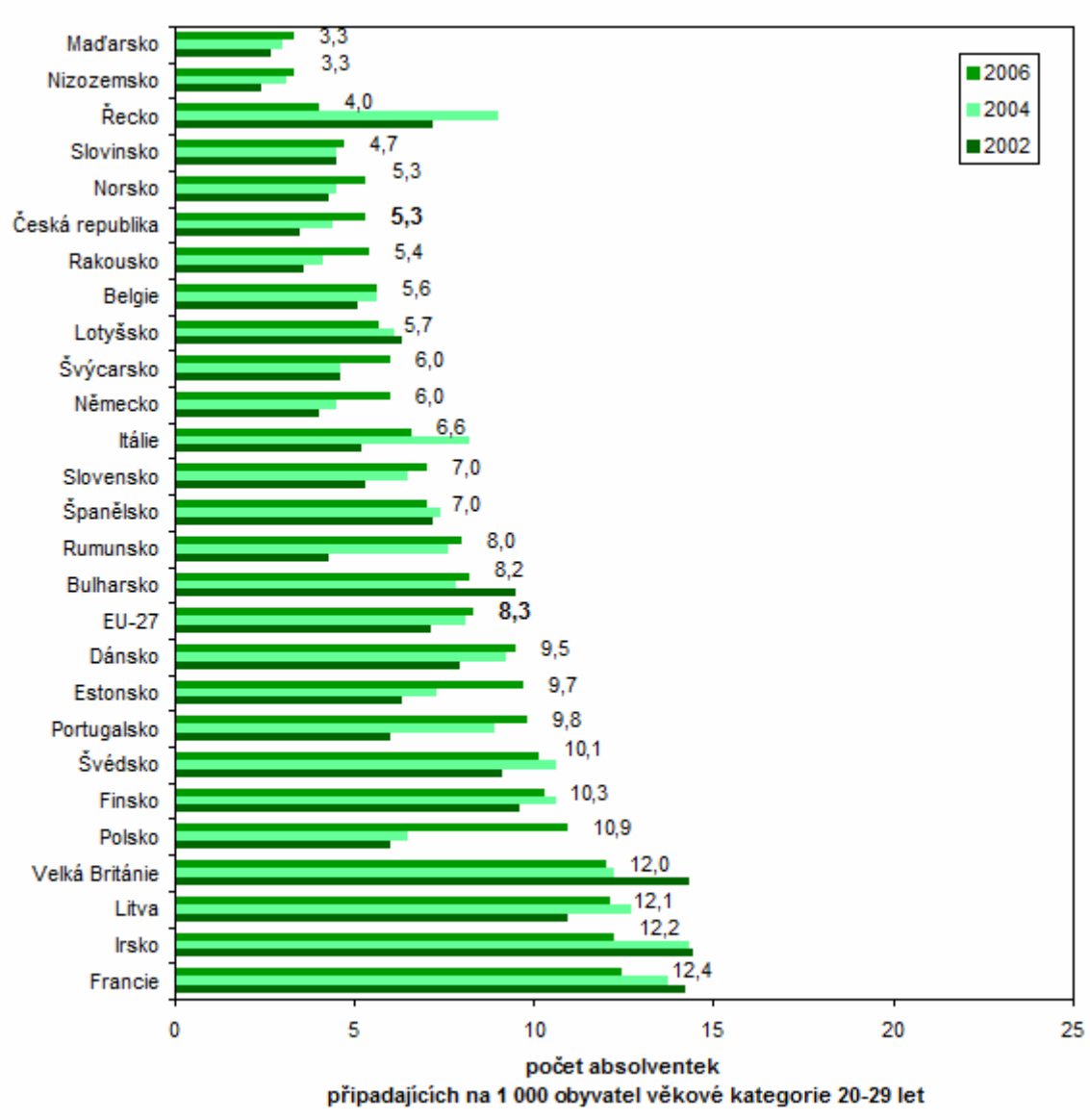
The numbers of all science and engineering graduates (men and women) at tertiary level per 1,000 inhabitants in the age category 20-29 are rising in the countries under review, with the exception of the United Kingdom. The Czech Republic reports the second lowest numbers of science and engineering graduates; the Czech Republic has 10.2 graduates per 1,000 inhabitants in the age category 20-29 (Hungary is lowest with 6.1).

Obviously, the indicator for the Czech Republic is influenced by the still markedly lower share of the Czech population that has attained full higher education.

Of the total population of the Czech Republic, there is a relatively large percentage of engineering graduates. The share of the total number of engineering graduates aged 25-64 of the total number of university graduates in that age group is approximately 35%, which is well above the EU-25 average of 20% of engineering graduates. However, the current structure of

graduates suggests that this result is influenced by older graduates, as the proportion of fresh graduates in these disciplines is currently lower.

A.2.13 Number of all female graduates of tertiary education science and engineering studies in the 20-29 age group



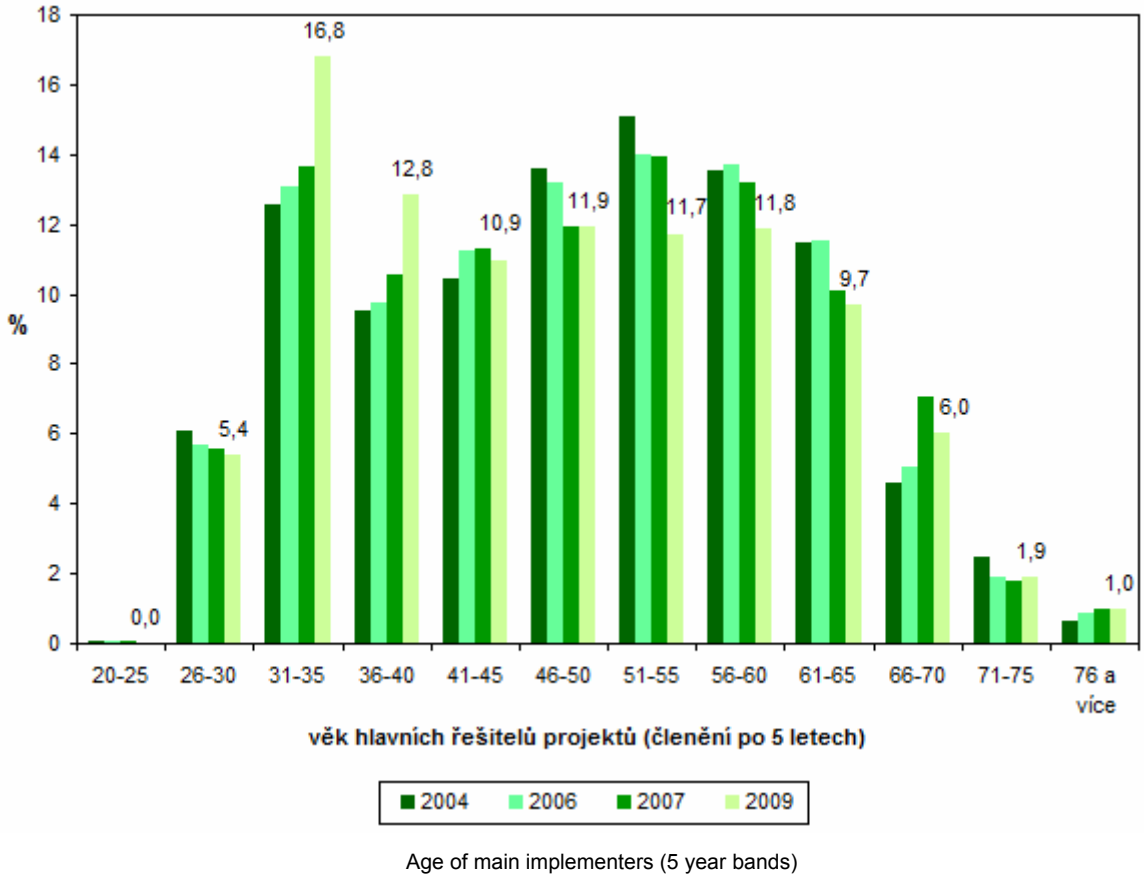
No. of female graduates per 1000 population in 20-29 age group

Source: Eurostat, July 2009 and own ČSÚ calculations

In terms of the number of female science and engineering graduates at tertiary level per 1,000 inhabitants in the 20-29 age category, the Czech Republic is 21st or 22nd ; in terms of the total number of graduates we are 18th. In the EU, female students generally show substantially lower interest in science and engineering than in social sciences and humanities. According to Eurostat[5] statistics in 2004 female students accounted for 54.8% of all students in tertiary education in the EU, but in terms of science they accounted for 37.5% of all students and in engineering the figure was just 24%

[5] Eurostat 2008

A.2.14 Numbers of R&D projects in the Czech Republic, by age of principal implementers

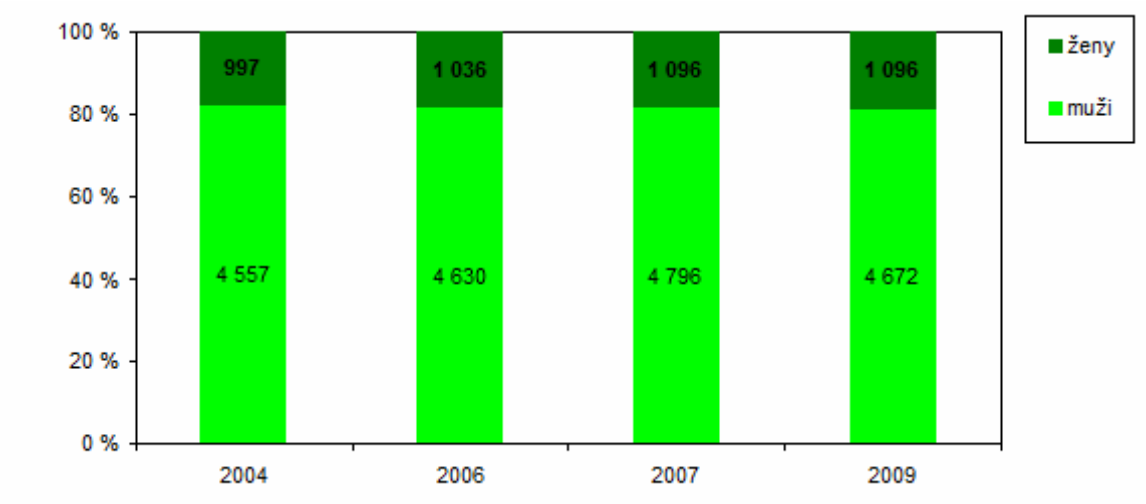


Age of main implementers (5 year bands)

Source: RD&I IS, Central Project Register (CEP)

A positive fact is the rapid growth in the proportion of younger researchers up to the age of 40. In spite of this the share of older researchers over 60 years of age remains relatively high, which will doubtless put great pressure on the regeneration of human resources in R&D in years to come.

A.2.15 Numbers of R&D projects in the Czech Republic, by gender of principal implementers



(ženy - women muži - men)

Source: RD&I IS, Central Project Register (CEP)

The overriding majority of principal implementers of projects in the Czech Republic are men; this situation is similar to the RDI sphere and to managerial positions in the private sector. Men account for more than three quarters of all principal implementers. Between 2002 and the present, to all intents and purposes the share of women among the principal implementers has stagnated (there has been growth of a single percentage point). In 2009, just over 80% of men and just under 20% of women were principal project implementers.

Conclusions:

- Support the development and improvement in quality of doctoral study, lift limits on the number of doctoral students financed by the state, by using a high-quality combined form permitting completion of doctoral study by a larger number of suitable candidates from outside
- Improve the quality of masters study as the natural base for doctoral study and to this end use dissertation work especially, and pay thorough attention to linking scientific knowledge, innovation and R&D popularisation into the whole area of secondary education, and into elementary schools.
- Support the creative development of younger researchers in the post-doctoral phase of their professional development, particularly in the area of international contacts, leading-edge publishing activities, involvement in responsibility for implementing demanding scientific projects and acquiring a broad spectrum of the so-called soft skills needed for dissemination, practical applications and effective popularisation of new finds and all results achieved through R&D
- Multi-lateral support for the development of lifetime education and the improvement of the professional qualifications of service and other support workers throughout R&D
- Also monitor the securing of human resources in the areas of so-called "monitoring" research i.e. in those fundamental research sectors where it is a current priority task to maintain contact with the world elite, to assess and transfer to the Czech Republic information on achieved results and to add value to them here in the process of exploitation.

Chapter B - Outputs of research and development

This separate chapter on RDI outputs has four parts. Compared to last year's analysis, there are rather more graphs and tables. The comments on the individual indicators (parameters) include additional data shedding more light on the tables and graphs, or explaining their mutual relations. If data have been used which are not given in the tables and graphs, these can be found in the RD&I IS.

Table B.1 Numbers of main indicators in Chapter B

Chapter part	*Title:*	*Number of indicators*
B	RDI outputs	81
B.1	Outputs from RDI financed from public funds	8
B.2	Assessment of research and development and their results in 2008	8
B.3	Bibliometrics	58
B.4	Patent applications, patents and licences granted	7

Part B.1 contains current data from the R&D Results Information Register (RIV), which is part of the R&D Information system (R&D IS) operated by the Research and Development Council. This part sets out the structure of the R&D results achieved among the key groups of state R&D aid recipients.

Part B.2 contains the results of the RDI evaluation conducted in 2008. The R&D evaluation system is being developed further; this issue has been addressed inter alia by the Commission on the Evaluation of RDI Results, an advisory body to the Research and Development Council.

Part B.3 evaluates publication output – the number of publications and citations thereof in periodicals monitored by Thomson Reuters. A bibliometric evaluation was conducting by drawing on the National Scientific Indicators database 2008.

As in the data from the preceding analysis it can be stated there has been a gradual, moderate improvement in RDI publication performance in the Czech Republic when compared with developed countries. However, the Czech Republic still lags far behind the developed countries used in the comparison of this indicator. The root causes of this situation are the substantially lower relative overall expenditure on RDI, the lower number of researchers, and the lesser demands placed by providers of state aid on the quality of RDI in fundamental research.

Part B.4 encompasses patent applications and patents granted by three patent offices: the Industrial Property Office of the Czech Republic (UPV), the European Patent Office (EPO) and the United States Patent and Trademark Office (USPTO). Data were taken from the most recent yearbooks published by these offices. This part also contains basic information about the number of valid licences for patents and designs granted by entities in the Czech Republic and the amount of fees collected for these licences. These figures are drawn from the Czech Statistical Office's regular annual statistical survey (LIC 5-01)

The Czech Republic lags far behind the other developed countries in the comparison in terms of patenting activities. One of the root causes in this case is the structure of industry, with a low share of the most advanced technologies and the persistent relatively high competitiveness of

Czech industrial companies in foreign markets in areas not requiring intensive R&D. However, this competitiveness is based on low labour costs and seems set to weaken quickly in the coming years.

Obviously, RDI expenditure in the individual countries compared must be taken into consideration when assessing RDI performance based on the number of publications, citations, patent applications and patents granted. The indicator of RDI expenditure as a percentage of the gross domestic product (GDP) is of scant informative value in performance comparisons given the sizeable gaps in GDP in individual countries. A more appropriate indicator is RDI expenditure per capita or per employee in an assessed country, either translated from the national currency into USD or EUR in accordance with the current exchange rate, or on the basis of purchasing power parity (PPP). However, because the numbers of RDI personnel relative to the population or number of employees differs considerably, the most objective indicator seems to be total RDI expenditure per RDI employee.

Half of both public and private RDI costs is still comprised of costs for machines, apparatus, equipment, software, etc., the share of salary costs on overall RDI expenditure in the Czech Republic is over one-third. The data are not however calculated on a PPP basis.

Of the countries under review the Czech Republic reports the lowest expenditure on salaries and high expenditure on other costs (including overheads) and low expenditure in investment (see graph A.1.21). This reason is the primary reason for the "brain drain" and points out at the same time the manifest inefficiency of cost management systems at levels in science, from providers to individual scientific bodies, which simply use allotted money inefficiently. On the basis of these facts as well the justification can be seen for the changes arising from the Reform of the Research, Development and Innovation System approved by the Czech government.

B.1 Outputs from RDI financed from public funds

B.1.1 Numbers of registered R&D results by type of result and year of application

Type of Result	Year of Application				
	2004	2005	2006	2007	2008
Publication category					
Article in specialist periodical (J)	24 762	26 271	30 036	32 426	31 218
Specialist book (B)	1 936	2 023	2 625	2 418	2 223
Chapter in specialist book (C,K)	3 268	3 895	5 514	6 165	5 274
Article in proceedings (D)	26 202	28 065	30 697	31 870	23 164
Publications Total	***56 168***	***60 254***	***68 872***	***72 879***	***61 879***
Patents category					
Patent (P)	173	159	184	184	162
Applied output category					
Prototype, applied methodology, functional sample (S) up to 2008	257	334	1 471	2 460	226
Trial operation, verified technology, variety, breed, medical treatment (Z)	420	587	323	368	538
Results with legal protection (utility model, industrial model) (F)	1	6	6	17	184
Technically applied results (prototype, functional sample) (G)	7	13	159	165	1 023
Results implemented by provider (results implemented in legal standards) (H)	7	16	18	31	58
Specialised maps with specialist content (L)	3	3	0	16	132
Certified methodologies (N)	0	1	36	31	320
Software (R)	3	15	22	53	648
Research report containing classified information (V)	1 295	1 148	1 069	678	37
Total applied outputs	***1 993***	***2 123***	***3 104***	***3 819***	***3 166***
Other results category					
Audiovisual production (A)	2 268	2 230	2 505	1 332	906
Conference organisation (M)	334	462	558	603	654
Workshop organisation (W)	217	356	439	452	425
Exhibition organisation (E)	61	63	88	88	82
Other results (O)	403	2 224	809	1 094	1 294
Total other results	***3 283***	***5 335***	***4 399***	***3 569***	***3 361***
Total	***61 617***	***67 871***	***76 559***	***80 451***	***68 568***

Source: RD&I IS, Results Information Index (RIV) dated 7. 9. 2009, used in the recorded form on the basis of data delivered by individual providers.

Note: The type abbreviations are used based on the key valid for CEP, CEZ, RIV, VES data structures

The table includes the numbers of all result records put into the RIV, i.e. results from 2004 to 2008, used for assessing research activity results for individual organisations designated by the

providers as research organisations. The results of the assessment were used as the basis for proposing the distribution of institutional research support, experimental development and innovations funds for 2011. Changes in the numbers and structure of the results, particularly in 2007 and 2008, in comparison to data given in previous Analyses are caused by the high level of adjustments and changes made to RIV data by the providers over this year. To a certain extent this is also caused by the direct impact of the assessment methodology (see Chap. B.2.) on the RDI budget.

Of particular significance is the marked decline in result D - article in proceedings in 2008. This is caused by the relatively low points evaluation of this type of results and also by the fact that only contributions to proceedings recorded in the Reuters ISI Proceedings database are assessed. If this trend is maintained in the next few years, or if the decline in the number of these results continues, this will be a confirmation of the improved quality of so-called publication results.

The numbers of other publication results are stable, with small year-on-year growth rates. For result J - article in specialist periodical, there was a jump in 2006 in the recorded number, but in the following two years the number remained roughly the same. This trend shows the improvement in both quantity and quality of published articles, in spite of the fact that the assessment up to 2007 only includes articles in journals included in Reuters databases, Erich, Scopus and in the limited group of specialist periodicals published in the Czech Republic.

The group of typically applied results showed a growth between 2005 and 2008 of 50% in their number, but in the following years this number stabilised. For the highly value points assessment of result type P - patent there is no significant growth in its number, which has been at roughly the same level since 2004.

Other applied results up to 2007 show an annual growth of approx. 20% in number, but in 2008 a 20% reduction was recorded. If there is a return in the next few years to growth this would be a result both of a shift in perception of this results category and of the significance of these results for practical application. The use of applied results in practice thanks to co-financing of these research activities in line with the current needs of the market, where the "sale" of such results is clearly defined by current needs and economic effect, is thus a good criterion.

As a result of closer definition of individual types of applied results, there has been a shift of numbers between their categories (see result type S in 2007 and result G in 2008). A confirmation of this fact is also the jump in the numbers of result G - prototype, functional sample, between 2007 and 2008 (these are so-called technically applied results, with the greatest potential for being "sold").

The growth in the number of results between 2007 and 2008 (excluding result type V - research report containing classified information) confirms a change in the move from the criticised "softness" i.e. simplicity and low financial demands for their creation, to a higher quality of applied results. The only difficult category from the quality standpoint is result type R - software, but then again this could be a result type with high utilisation potential.

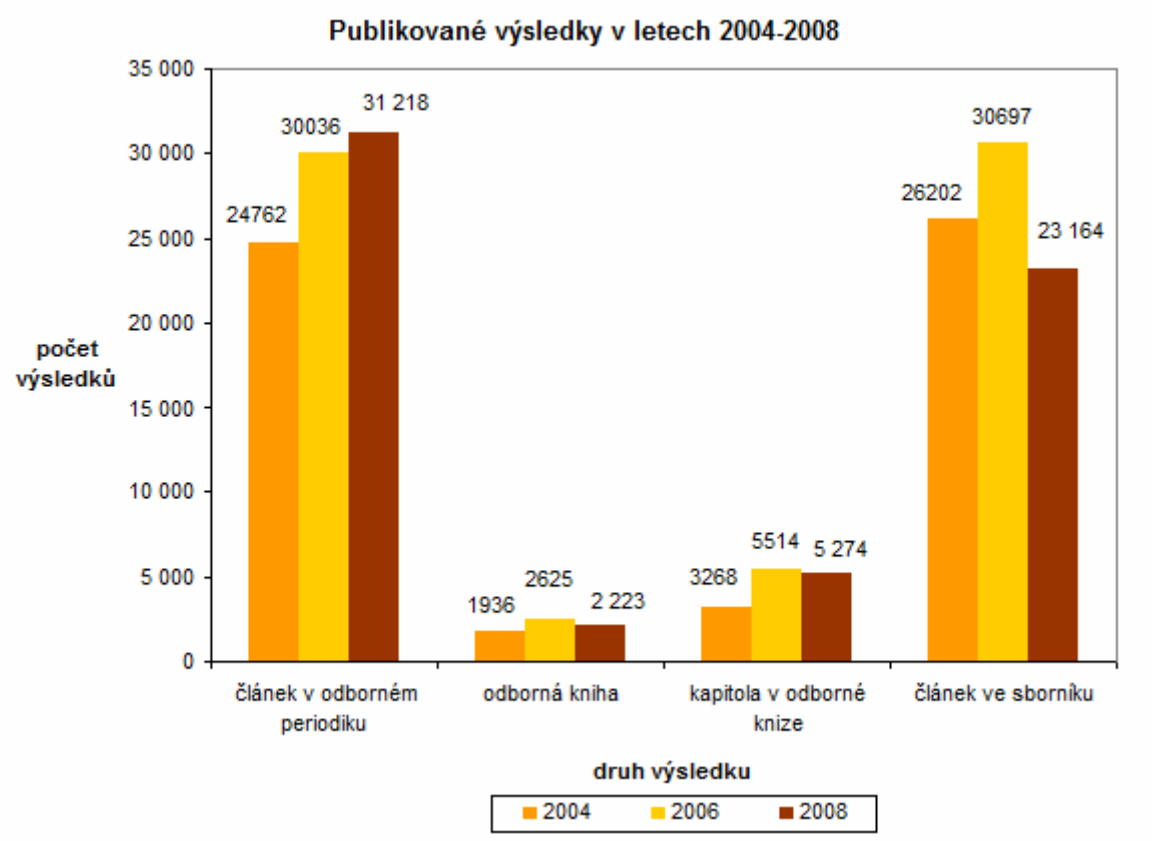
The gentle decline in the number of other results, i.e. unevaluated results which should primarily be focused on the popularisation of research activity results, is a further positive effect in the change in thinking in determining the significance, usability and possible benefit of individual result types.

These generally positive trends, were they to be maintained over a long-term horizon of at least 5 years, should be confirmed by a growth in the share of co-financing of research activities and the acquisition by research organisations of further sources of funds for their growth. To support these trends it is necessary for support also to be secured from individual

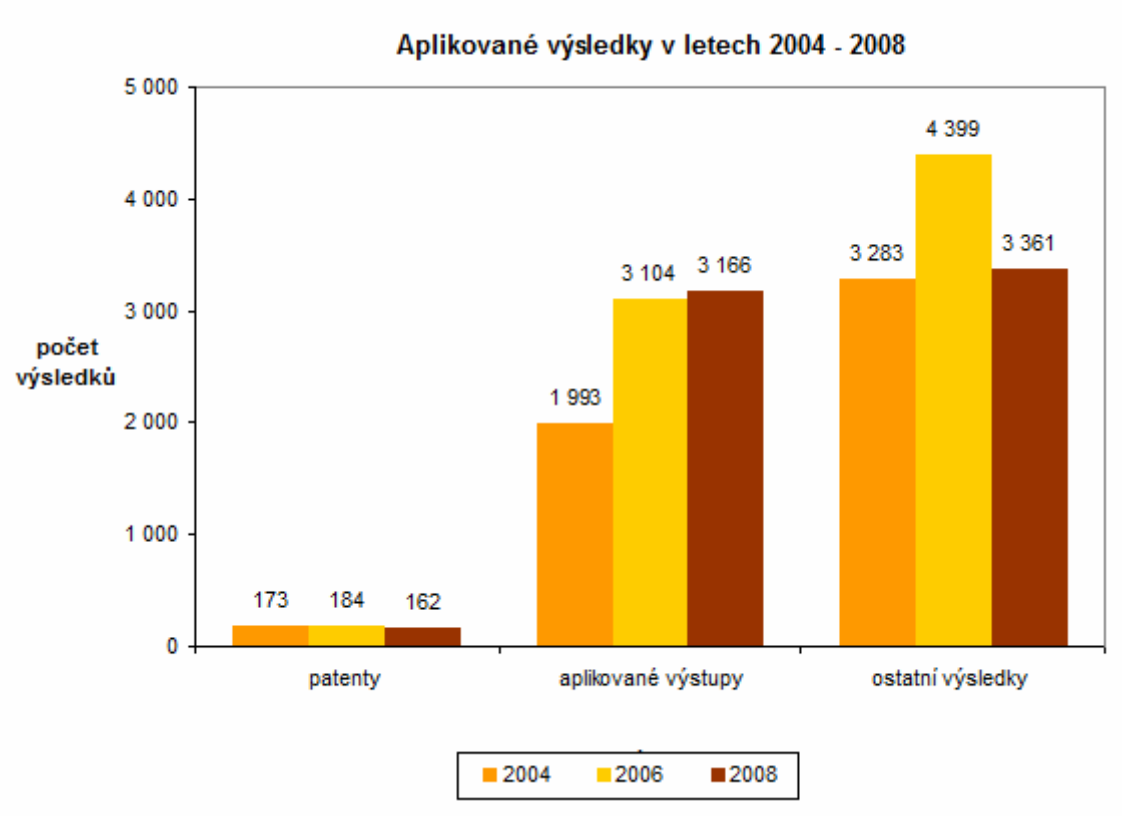
providers, whose responsibility is based on the expertise of the advisory evaluation bodies appointed by them.

For greater clarity the data from the preceding table (numbers of publication and applied results) are given in the following two graphs.

Results published 2004-2008



Applied results 2004-2008



No of results | Patents | Applied outputs | Other results

B.1.2 Numbers of registered R&D results by group of recipients and type of result, 2004 - 2008

Type of Result *Publication category*	*AS CR*	*Universities*	*Other research institutions*	*Legal and private persons*
Article in specialist periodical (J)	35 700	86 811	18 392	3 810
Specialist book (B)	2 079	7 366	1 385	395
Chapter in specialist book (C,K)	6 626	14 462	2 569	459
Article in proceedings (D)	17 469	107 968	9 199	5 362
Publications Total	***61 874***	***216 607***	***31 545***	***10 026***
Patents category				
Patents (P)	239	340	76	207
Applied output category				
Prototype, applied methodology, functional sample (S) up to 2008	525	2 022	931	1 270
Trial operation, verified technology, variety, breed, medical treatment (Z)	113	460	430	1 233
Results with legal protection (utility model, industrial model) (F)	7	104	64	39
Technically applied results (prototype, functional sample) (G)	377	684	37	269
Results implemented by provider (results implemented in legal standards) (H)	5	31	78	16
Specialised maps with specialist content (L)	3	82	59	10
Certified methodologies (N)	2	98	220	68
Software (R)	97	499	64	81
Research report containing classified information (V)	670	2 269	638	650
Total applied outputs	***1 799***	***6 249***	***2 521***	***3 636***
Other results category				
Audiovisual production (A)	533	6 445	1 050	1 213
Conference organisation (M)	451	1 730	238	192
Workshop organisation (W)	390	867	273	359
Exhibition organisation (E)	37	150	123	72
Other results (O)	623	3 784	922	495
Total other results	***2 034***	***12 976***	***2 606***	***2 331***
Total	***65 946***	***236 172***	***36 748***	***16 200***

Source: RD&I IS, Results Information Index (RIV) dated 7. 9. 2009, used in the recorded form on the basis of data delivered by individual providers.

Note: The type abbreviations are used based on the key valid for CEP, CEZ, RIV, VES data structures

From the numbers of results and their distribution in the table certain features characteristic of individual recipient groups are evident.

Public research institutions set up by the Academy of Sciences of the Czech Republic are bodies which operate predominantly in fundamental research, and work in the field of applied research to a lesser extent. Characteristic of these bodies are publication results, which absolutely predominate by number. Of interest is the number of result type P - patents, which achieves comparatively as high a number as for other recipient groups. This fact shows that this result type cannot be simply applied only to the area of applied research, but also has its place in fundamental research.

Of the number of results included in the other results category, i.e. unevaluated, it is clear that suitably large emphasis is given to the popularisation of results (with the majority of results falling into this category). It remains an open question for which field of science the popularisation of results has any significance, and whether the commitment of state funds to this has any measurable effective impact.

Universities represent another large and significant group of recipients (in addition to the Academy of Sciences of the Czech Republic); they operate both in fundamental and in applied research. Within this recipient group there is a large predominance of the number of publication results, with a slightly higher level of publication in proceedings (i.e. result type D) than of articles in specialist periodicals (type J). This fact is a reflection of their predominance in organising seminars at universities. If young researchers, particularly from doctoral study programmes, take part in this research activity, this state of affairs must be seen as positive. Within the training of young researchers of high potential acquisition of much-needed experience and knowledge occurs, both in the presentation of results and in the establishment of contacts, which is of particular benefits when this is through international conferences.

Universities are the recipient group with the highest number of result type P - patents. They also report the highest absolute number of applied results, which is however still very small in comparison with their publication results. The reason for the low number of applied results is the predominance of the ratio of fundamental research to applied research. A further reason is the predominant focus of universities on teaching and not on dealing with the problems of manufacturers. In the other results category the comments given in the paragraph above apply in their entirety.

In assessing this smallest recipient group from the perspective of breakdown and numbers of results, one should first state that in contrast to both preceding recipient groups, this group works with financial resources which an order of magnitude smaller. These are departmental public research institutions, state organisations and organisations supported by the state which were set up historically for the needs of applied research, i.e. to deal with questions associated with direct implementation - the implementation of results in "manufacturing" organisations.

In spite of the foregoing it is immediately clear that for this type of recipient the number of publication results is significantly higher (by an order of magnitude) than the numbers for applied results. The relationship between these results ought however to be exactly the opposite, taking into account the need to look at specifics, e.g. in agriculture, healthcare, the environment and other non-industrial branches. The same is the case for the high number of other results. One may state that probably every applied result was also popularised, but that popularisation does not bring about, based on co-financing of research activities, the required economic effect, with the exception of agriculture and fisheries where 100% grants are allowed.

The root causes of this situation can be seen both in the predominance of financing of fundamental research over applied, and in the excessively broad conception of applied research, and not lease in the lack of researchers who are able to "sell" a result and thereby ensure not only economic added value, but also a link between applied research and the outside world. Financial participation from manufacturers is not always necessary, cooperation can be established on a non-monetary basis.

The way out of this situation is on the one hand to increase the proportion of financial support for applied research as such, be it for a transitional period, on the other to provide rewards for assessments for achieved - applied results, in the same way that fields of science included in NRRE are rewarded (see Chap. B.2). A further prerequisite is cooperation between founders and support providers so that the activities of these bodies show the prerequisites for implementation - sale of results, so that research activities are planned with direct reference to the needs of the real world, or at least to the assumption of actual use of the results. Based on the creation of motivational conditions evaluations can then be conducted, followed by the possible adoption of further measures.

The group of other legal and private entities is private bodies, both manufacturing as well as those dealing to a large extent with research activity. In many cases these bodies contribute necessary co-financing of research activities, more precisely, on the basis of cooperation they implement, using some form of loan of researchers, the current needs of "manufacturing". This fact is attested by the second highest number of applied results, with a predominance of the result types Prototype, applied methodology, functional sample (S), and Trial operation, verified technology, variety, breed, medical treatment (Z). Result type P - patents is high for this recipient group within the recorded number, while the involvement of private entities in the creation of patents guarantees their usability, that is, at least a guarantee of their competitiveness with respect to other firms. In spite of this data this group also shows more than half their results as publication against the total number of recorded results.

In conclusion one should state that the number of individual result types are not an indicator of the quality level of individual results. Based on the numbers given and the recipient groups one can only state that for research activities in general there is a predominance in the Czech Republic of publication results with a low share of applied results and a relatively high number of other results in relation to the group of applied results. In particular the high number of published results is caused by the predominant financing of fundamental research and a not insignificant part is certainly also played by the fact that scientific workers are focused mainly on the publication of their results, and do not refer to the direct needs of the outside world.

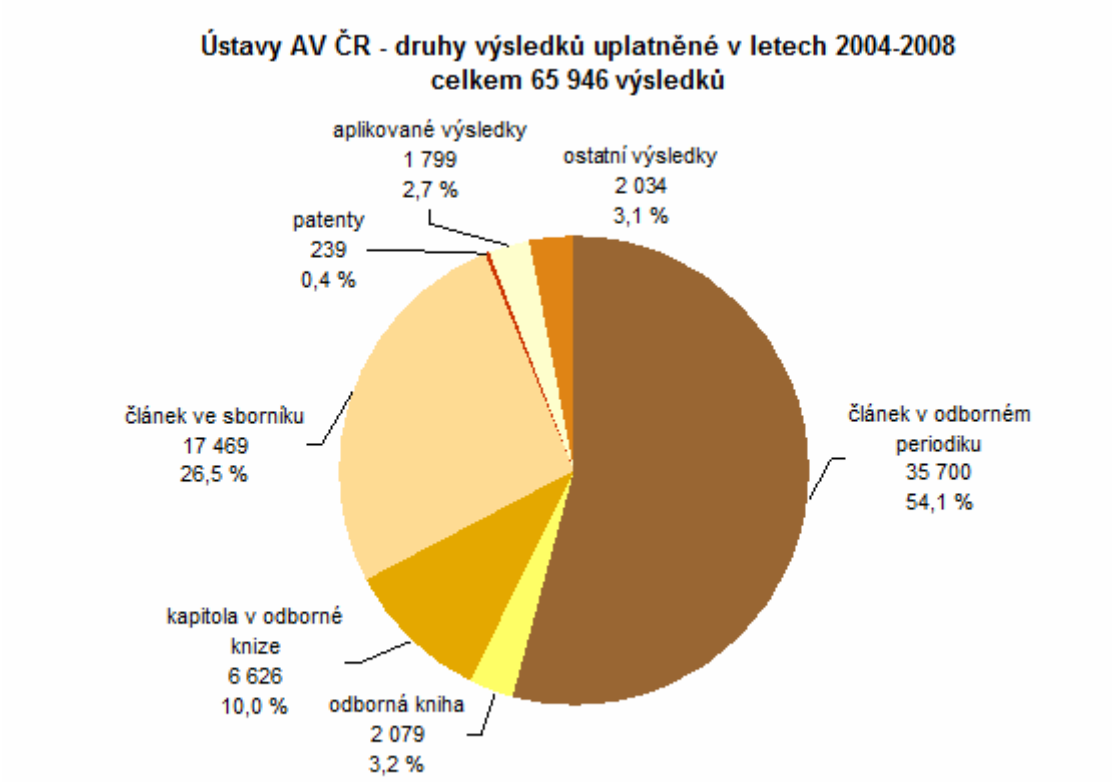
An equally serious root cause of low implementation rate and application of results is the inadequately developed system for management of the results life cycle:

NEEDS AND TRENDS IN THE OUTSIDE WORLD → SCIENTIFIC WORKER → RESULT → USABLE RESULT → EMPLOYEE ARRANGING ITS USE → SALE-APPLICATION → FEEDBACK OF OUTSIDE WORLD NEEDS

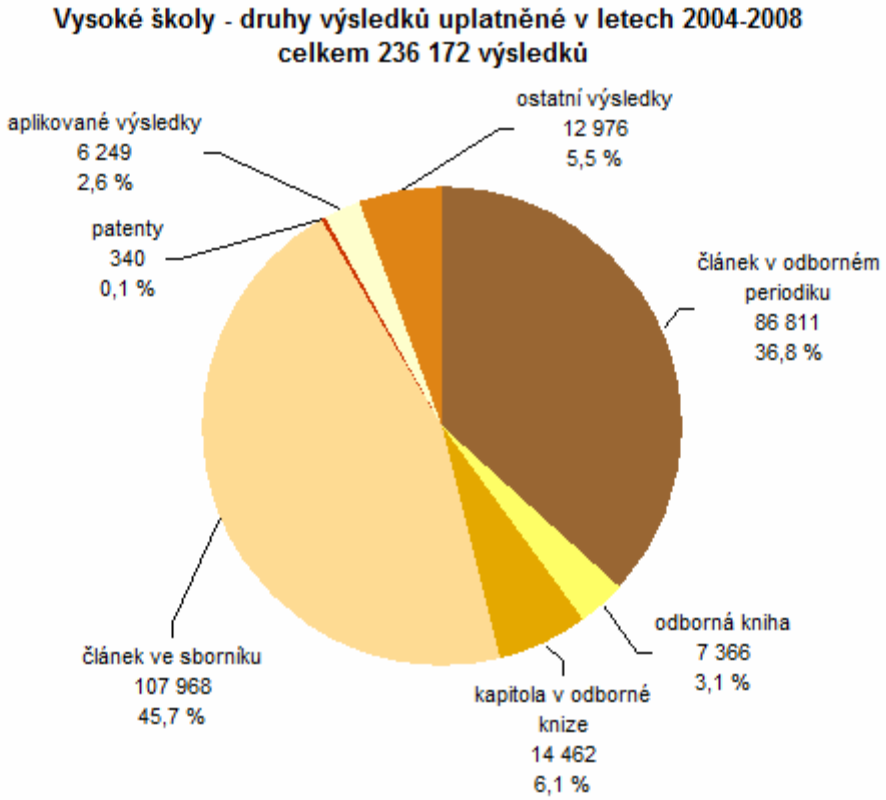
A similar inadequacy is also the connection of fundamental research results to applied research. The cause of this is to be seen in the low level of communication between recipients and providers, both at the level of recipients among themselves, and at the level of providers among themselves, which is limited in most cases to bilateral communication when approving providers' new research programmes.

For greater clarity the numbers of publication, applied and other results are given for each recipient group in the following four graphs. From all of these graphs the share of applied results in relation to publication and other results can clearly be seen. Only for the group of other legal and private entities does the ratio of applied results including patents approach a 1/4 of all results.

Institutes of the Academy of Sciences of the Czech Republic - result types 2004-2008
65946 results in total

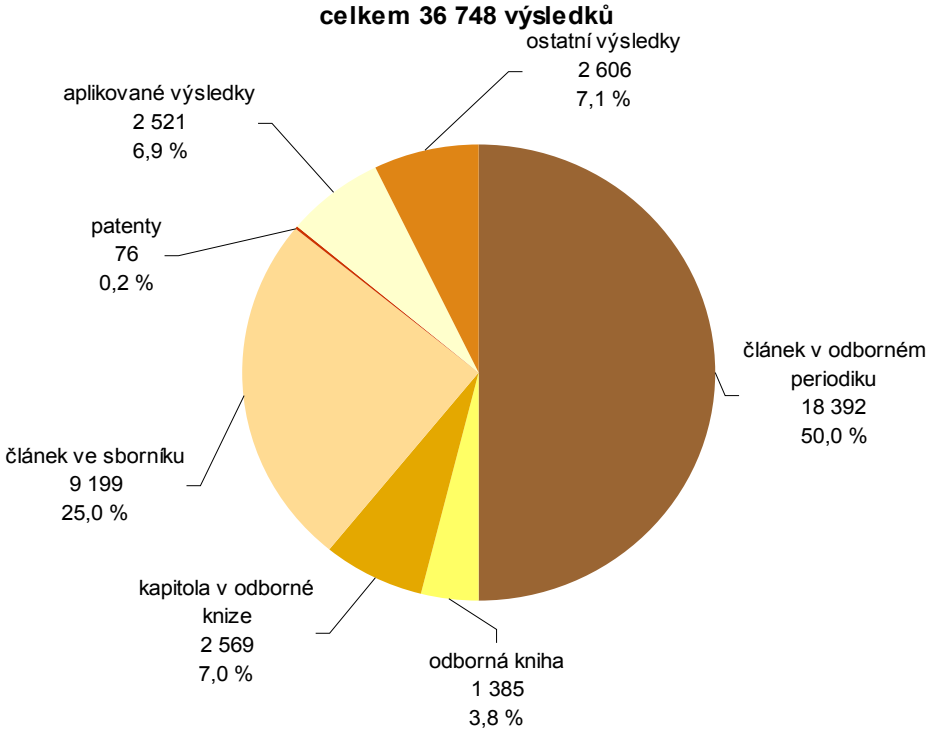


Universities - results types 2004-2008
236172 results in total



Other research institutions - result types 2004-2008
36748 results in total

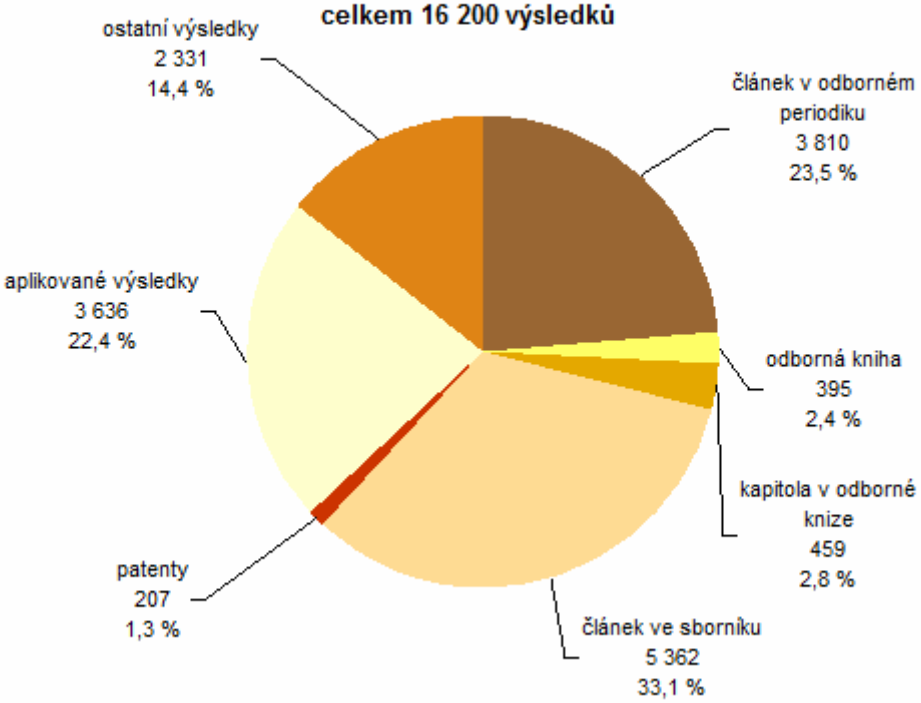
SPO, OSS, VVI - druhy výsledků uplatněné v letech 2004-2008
celkem 36 748 výsledků



Other legal and private persons - result types 2004-2008

16200 results in total

Ostatní právnické a fyzické osoby - druhy výsledků uplatněné v letech 2004-2008
celkem 16 200 výsledků



Key to preceding pie charts (4)

Článek v odborném periodiku	Odborna kniha	Kapitola v odborné knize	Článek ve sborníku	Patenty	Aplikované výsledky	Ostatní výsledky
Article in specialist periodical	Specialist book	Chapter in specialist book	Article in proceedings	Patents	Applied results	Other resuluts

B.2 Assessment of research and development and their results in 2008

B.2.1 Methodology for evaluation, results objectivity and further approach changes

The evaluation of RDI and the results thereof in 2008 ('2008 Evaluation') was carried out by the Research and Development Council pursuant to Government Resolution No 644 of 23 June 2004 on a proposal for an evaluation of research and development and the results thereof. This evaluation is carried out every year and up to 2008 was designed to assess the efficiency of aid beneficiaries and grantors in the use of aid, and how and with what result they capitalize on the state aid granted from the national budget.

The first evaluation was conducted in 2004, when the Methodology for the Evaluation of Research and Development and the Results Thereof in 2004 was first published; this Methodology, in accordance with Government Resolution No 1167 of 19 November 2003, drew on the Analysis of the Existing State of R&D in the Czech Republic and a Comparison with the Situation Abroad in 2003. As the evaluation results are used by the Research and Development Council as one of the bases for preparing draft national budget expenditure on research and development. This use of the Methodology is the reason for its refinement on an ongoing basis, not only by way of adjustments to the scoring (the weights) of individual registered results, but also in terms of the methods of calculations, their definition and the creation and supplementation of related databases of research activities (i.e. RDI projects, research programmes, arising from aid for specific research at universities).

The proposed Methodology for the Evaluation of Research and Development in 2008 (hereinafter the Methodology) came about as a result of a meeting of the Commission for Evaluating Research and Development Results (hereinafter the Commission), which is an advisory body to the Council, and other specialist commissions of the Council.

The evaluation of research and development results in 2008 was carried out in accordance with the Reform of the System of Research, Development and Innovation in the Czech Republic, approved by the government on 26th March 2008, in its Resolution No. 287 (hereinafter RDI Reform).

When compared to evaluations performed in earlier years, major changes took place:

- No evaluation was made of the efficiency of recipients and providers
- Only those research organisations which can be recipients of research and development institutional support are included in the evaluation of research organisation results
- The resulting evaluation of research organisations will be used as the main criterion for the distribution of institutional support to the relevant providers of this support
- All research organisation results registered and applied over the last 5 years were included in the evaluation, regardless of from what kind of funds they were supported.

The Methodology is divided into two parts, the assessment of the results of research organisations, and the assessment of RDI programmes completed in 2007.

The Methodology for Evaluating Research Organisation Results takes account only of results which were achieved by individual research organisations in managing various research and development activities, without regard to the source financial funds for these activities.

The evaluation of research organisations' results is, from the point of evaluation methods, a ranking characterised by the evaluation of outputs by the same measures, and does not contain any recommendations, does not assess support programmes, and does not take into account the differences between subjects and fields. The performance criteria used consist of a system of points for individual results. The results of the measurement are summarised in a list, in order. The compression of information is a principal function of this Methodology, and serves to provide access to information on a larger number of heterogeneous organisations and their evaluation in accordance with the criteria used in the Methodology.

Only when evaluating completed RDI programmes do we work with an indicator (the SR Index) which expresses the level of efficiency of public support provided in implementing all projects as part of an evaluated RDI programme, since all these projects are financed fully or in part from the Czech state budget and it includes all projects which were implemented within a given RDI programme using public support, regardless of the legal form or type of project participant (recipient or co-recipient).

For fields included in the National Excellence Reference Framework (NRRE)[6], the evaluation was conducted in a national-Czech environment in view of the specifics of these fields of science. Here then, (with some exceptions) the results need not be published in the Web of Science and for this reason Czech (and Slovak) scientific journals have a higher points score than in other fields. A similar approach was adopted for results type B (specialist book).

The main purpose of evaluating institutions' results was to acquire data which was used for the proposed distribution of funds for the institutional support of research, experimental development and innovation for the following year, as defined in the RDI Reform.

With regard to the approved RDI Reform the description and structure of data transferred to the Results Information Index (hereinafter the RIV) was adjust so that the evaluation could be conducted in a corresponding manner.

By evaluation of research organisation results (hereinafter "results evaluation") is meant the transfer of all the results of a given research organisation onto to a numerical scale (i.e. quantification of results). Results evaluation is performed exclusively on the basis of valid data transferred to the RD&I IS.

By research organisation is meant any body (e.g. university or research institute) without regard to its legal form (set up under public or private law) or to its mode of financing, whose activity is to conduct research and disseminate the results arising through teaching, publishing or technology transfer; all profit thereby arising is invested back into research activities. For bodies where there might be pressure from shareholders or members, the principle must be maintained that these people will not have priority access to research capacity or the results of research.

In particular these are public research institutions (in line with Act No. 341/2005 Coll.), universities (in line with Act No.111/1998 Coll.), organisations supported by the state (in line with Act No.219/2002 Coll. and 250/2000 Coll.), state organisations (in line with Act No.219/2000 Coll. and 250/2000 Coll.) and other organisation which all of the requirements of

[6] NRRE - National Reference Framework for Excellence; includes the following disciplines (by R&D IS: AA - Philosophy and Religion, AB - History, AC, Archaeology, Anthropology and Ethnology, AD - Politics and Political Science, AE - Management, administration, AI - Language Sciences - AJ - Literature, Mass Media, Audiovisual, AL, Art, Architecture, Cultural Heritage, AM - Teaching and Education

the Community Framework for state support for research, development and innovation (2006/C 323/01).[7]

Only those results were evaluated which arose from the activities of a research organisation and also meet the definitions for the individual results types and all other prerequisites for inclusion in the RD&I IS.

In the case of the universities results were evaluated for complete universities, i.e. all their parts (faculties, university institutes). In order to subsequently expand the evaluation the results evaluation was divided into its individual parts. For state organisations, the results evaluation was performed by organisational unit.

Conducting the evaluation is an obligation arising from the Act on support for research and development. Its purpose is not to make one-on-one comparisons of research organisations nor to establish a success ranking. The aim of the achieved results evaluation is to obtain objective facts, used after analysis for:

a) The provision of information to the government, the Chamber of Deputies, the public and others

b) As the basis for preparing expenditure proposals for the institutional support of research organisations

In assessing results a further determining indicator was the year in which a result was achieved, that is, the year in which the result was implemented (article printed, patent awarded, etc.). The result evaluation in 2008 included all achieved results, for which the achievement date lay between 2003 and 2007 inclusively. Results which have yet to appear (so far in print etc.) are recorded in the RIV from 2006, but were not included in the results evaluation in 2008.

A result was included in the evaluation for the research organisation which submitted it. This is the body (so, a research organisation as well) whose researchers, or students in a doctoral study programme, shared in the origination of the result and are given as the result's authors.

Individual results submitters submit data to RIV using the appropriate support providers, who have the legal responsibility to check the results, do a check on the existence of the result being reported, to verify whether the result being submitted matches the definition of the specific result type and is correctly classified by field.

In the event that other authors have shared in the result (either domestic or foreign), who were not separate submitters of the result to RIV, for the result evaluation that proportionate part of the result was used which fell to the submitter's (research organisation's) authors, with a minimum of 1/20.

As part of the evaluation of results recorded in the RIV and transferred to providers by 8th September 2008 inclusive, the Council then conducts a check on them, as a result of which results are not included in the evaluation which do not match the definition of the specific result type valid at the time the result was implemented.

In this way a complete data set is generated which is subsequently subjected by the RD&I IS operator, that is the Council, to an evaluation process in several mutually dependent steps.

First multiple incidences of identical results are eliminated i.e. cases of repeat submission of the same result data by the same submitter. If more than one body (or authors from different bodies) have shared in the origination of a result, and these bodies have submitted the result,

[7] The list of organisations meeting the requirements for research organisation according to the Community Framework for State Support for Research, Development and Innovation (published in the Official Gazette of the EU on 30th December 2006) was created on the basis of decisions of individual support providers, from whom research organisations will obtain institutional support.

then for the evaluation of the results for each of the bodies a share is calculated for the result according to the number of authors who shared in the origination of the result. The awarding of points to each consolidated result with a points evaluation was done according to the data in this table:

Table B.2 Points evaluation for individual result types

Result Type			I - NRRE fields	II- Other fields
J_{imp}	Article in an impact journal		**5 + 140 × Factor** [1)]	
J_{neimp}	Article in a reviewed journal	Globally recognised databases [2)]	**12**	**8**
		List of reviewed periodicals [2)]	**10**	**4**
B	Specialist book	World language [3)]	**40**	**40**
		Other languages		**20**
D	Article in proceedings		**8**	
P	Patent[4)]		**40 / 200** [4)] **500** [5)]	
Z (T)	Trial operation, verified technology, variety, breed, medical treatment		**100** [6)]	
S	Prototype, applied methodology, functional sample, authorised SW, utility model, industrial model		**40** [6)]	
V	Research report containing classified information		**50** [7)]	

[1)] Factor = Convex function of a normal distribution of a journal within the field by IF, where:
Factor = (1 - N) / (1 + (N / 0,14)), where: N = (P - 1) / (Pmax - 1)
P= the rank of a journal in the field in question according to the Web of Science ranked in descending order by IF
Pmax = the total number of journals in the field in question according to the Web of Science
In the event that an IF journal is included in more than one field, for the purposes of evaluation that field will be used which will achieve the best ranking in the field in relation to the total number of journals in the field (i.e. if a journal is in field A with a total of 10 journals, and the journal according to IF will be in 6th place, and in field B with a total of 60 journals, the journal will be in 10th place, field B will be used; the calculated points for field A =17.5, for field B = 61.8).

[2)] the distinction between "Globally recognised databases" and "List of reviewed periodicals" is given in part B.3.1.2. of the Methodology.

[3)] by a world language is meant English, Chinese, French, German, Russian and Spanish.

[4)] a Czech or other national patent, with the exception of US and Japanese patents granted (but not yet used) or used by the owner / used on the basis of a valid licensing agreement; included in this category will also be included any patent for which the RD&I IS does not contain data on the issuer's country.

[5)] European or international patent (European Patent Office, US Patents and Trademarks Office), US and Japanese patent

[6)] the distinction between result types Z and S has been maintained since 2006, until then these results were included under code T; results included in the 2008 Evaluation under result type T will be evaluated as Z results i.e. with 100 points

[7)] in accordance with §4 letter g) of Government Regulation No. 267/2002 Coll. only a report containing classified information in accordance with special legal regulations constitutes such a result - see Part B. 3.1.2. of the Methodology.

Results with a point score are defined in Appendix No. 1 of the Methodology: Article in a specialist periodical (result type J in the RD&I IS data table), specialist book (result type B), article in proceedings (result type D), patent (result type P), trial operation, verified technology, variety, breed, prototype, applied methodology, functional sample, authorised software (result types Z and S, or T), research report as a result containing classified information by special legal regulations (result type V).

In the event that a scientific journal has been included as a specialist periodical in the Web of Science[8] database, that result was awarded the points value for J_{imp}.

In the event that a scientific reviewed journal is a specialist periodical and is not included in the Web of Science database (so-called non-impact), such a result was awarded the points value for J_{neimp}. This result matched the definition for result type J and was published in a periodical recorded in one of the globally recognised databases or in a Czech periodical included on the List of Reviewed Non-Impact periodicals published in the Czech Republic.

For the evaluation of type B results, the evaluation of type C (chapter in specialist book) results were included in the results evaluation, so that the individual chapters could be set out as a type B result.

When evaluating national patents (Czech or other national patent, with the exception of a US or Japanese patent) account was taken of whether the patent is used on the basis of a valid licence agreement or used by its owner (for economic benefit) or not used at all.

Result type V (research report) is, in accordance with §4 letter g) of Government Regulation No. 267/2002 Coll., a valid research and development result only in the event that it contains classified information in line with special legal regulations. In any other case such a result may not be used, not even in the case of projects implemented "for the needs of state administration".

Other results, or rather result types under RD&I IS not given above, have been marked as results without point values for the purposes of evaluating results. For the purposes of evaluating programmes under Part C of the Methodology they were evaluated for the event that such result types are, as expected and required results, contained in the RDI programmes approved and possibly notified by the European Commission.

The following were also not evaluated as independent results in 2008: result types A (audiovisual production or electronic document, unless these are electronic versions of result types J or B), C (chapter in a book - unless included as a result), D (article in proceedings) - unless the proceedings were not recorded in the Thomson Reuters ISI Proceedings database, E (exhibition organisation), W (workshop organising), M (conference organising) and the new O (other results which cannot be classified in types A, B, C, D, E, J, M, P, S, V, W, Z - according to the RD&I IS data structure).

For results type A (electronic document): the electronic version of a result which has also been published in another form (e.g. printed) is not counted again in the evaluation.

The output for the results evaluation was:

1. A standardised table - results aggregated by research organisation (additionally by their parts) ranked alphabetically by group according to the legal form of the research organisation, published 31st January 2009 on www.vyzkum.cz

Subsequently the Council used the results evaluation outputs acquired in this way for the expenditure proposal for the state RDI budget for 2010, with an outlook for 2011 and 2012. The guidelines for the research and development budget preparation, which was intended for individual administrators of budget chapters offering RDI support, and including a reductions or increase in the limits of the approved medium-term research and development expenditure outlook for 2010 and 2011 by results evaluation, was prepared by 31st January 2009. The proposal for the RDI expenditure state budget for 2010 with the outlook for 2011 and 2012 was submitted to the government in June 2009.

[8] The IF values and list of journals with IF were taken from the database Journal Citation Report from Thomson Scientific Ltd (London), 2007.

Outputs from the results evaluation are a criterion which is taken into account when assessing new requirements from providers for new and changes to existing grants from the state budget into RDI.

2. Evaluation of results RDI programmes completed in 2007 (hereinafter "programme evaluation"). A programme for the purposes of evaluation is taken to mean a RDI programme or a public contract for RDI which was financed on the basis of a favourable government decision and at the same time where the implementation of individual projects was completed by 31. 12. 2007. For an overview of such programmes the separate part of the RD&I IS with the title Records of Public Tenders in RDI (hereinafter "VES") is used. The evaluation of programmes is an evaluation of the effectiveness of RDI public support provided. By this is meant the comparison of all results for a given RDI programme and the overall RDI expenditure from the state budget to implement research activities performed as part of the programme in question. Programme evaluation does not and will not deal with the evaluation of individual research activities performed as part of a programme.

The aim of programme evaluation is to provide the government, the public and so on a complete and analysed set of information on results acquired through the provision of public support for the RDI activities of individual providers and to provide the Council with information on how individual RDI support providers meet their own defined programme goals, as given in the approved programme proposals, while the results of this evaluation are and will be used by the Council when assessing new programme proposals.

The programme evaluation contains all completed projects for which public support has been provided as part of a given programme.

The basis evaluation criterion was the average value of the SR Programme Index, which was determined as the share of the points of all results with a point value of projects of all evaluated completed programmes and the total public support incurred in their implementation. The evaluation was performed by comparing the value of the SR Index for each evaluated completed programme with the average value of the SR Programme Index.

The data were prepared in a working table which for each evaluated programme contained data on individual projects, including data on costs incurred and results achieved. The data in the table were divided into groups according to the comparison of their SR Index value with the average SR Index value of programmes

- Above-average programmes (green group) - programmes in which the results added significant value to funds expended, the SR Index value is more than 130% of the average SR Index value of programmes
- Average programmes (grey group) - programmes in which the results added average value to funds expended, the SR Index value is in the range of 70% to 130% (incl.) of the average SR Index value of programmes
- Below-average programmes (yellow group) - programmes in which the results failed to add adequate value to funds expended, the SR Index value is less than 70% of the average SR Index value of programmes

In evaluating programmes completed during 2007 the Council also used aggregate evaluation reports submitted by the relevant providers at the end of the completed programmes. Account is taken of these reports in programme evaluation only as an incremental source of information, since the providers are in fact evaluating themselves.

The results of programme evaluation were submitted to the Council for approval and were subsequently to the government as an aggregate evaluation of programmes for 2007, using the following structure in line with Point II.1.a) of Government Resolution No. 644 dated 23rd June

2004, where individual providers were to secure evaluation as part of their activities, mainly maintaining the general evaluation principles explicitly stated in Point 5:

- Evaluation is to be regular, repeated after a certain interval (i.e. not just an initial proposal evaluation, but ongoing evaluation and concluding evaluation).
- A specific goal is set out in advance, which can be specific for each case and which is to be achieved in the given time, and on which it may be decided whether it was achieved or not.
- The evaluation criteria are known in advance and are binding, clearly formulated (so as to be mutually consistent), quantifiable, measuring, assessable, and related to the goal in question.
- These principles are value both for the initial evaluation (proposal evaluation) and for ongoing and concluding evaluations.

B.2.2 Evaluated results handed over to individual providers

Provider	Results of fundamental research					Results of applied research		
	Article in specialist periodical, of which			Specialist book	Article in proceedings	Patent	Trial operation, verified technology	Prototype, applied methodology
	Impact	Reviewed Czech	SCOPUS, ERIH world databases					
	No/points							
Academy of Sciences of the Czech Republic	6 777,94	1 226,95	2 758,09	3 663,68	579,23	73,93	85,64	366,79
	305 904,64	7 529,79	27 856,64	42 608,20	4 633,87	10 072,74	8 563,69	14 671,48
Czech Office of Mines	0,00	0,00	0,00	4,00	0,00	0,00	15,00	23,00
	0,00	0,00	0,00	35,00	0,00	0,00	1 500,00	920,00
Czech Geodetic and Cadastral Office	3,26	4,50	2,00	0,00	0,20	0,00	9,50	14,83
	115,69	18,00	16,00	0,00	1,60	0,00	950,00	593,33
Czech Science Foundation	3 413,66	1 480,57	1 549,21	2 020,27	835,56	21,06	26,17	222,86
	136 730,31	8 357,18	13 418,12	30 728,91	6 684,51	3 247,81	2 616,67	8 914,36
Ministry of Transport	4,67	36,63	2,00	16,38	3,37	0,00	12,17	62,58
	198,93	148,03	16,00	397,13	26,93	0,00	1 216,67	2 503,28
Ministry of Culture	26,98	214,45	149,64	369,83	1,00	0,00	13,58	14,20
	654,44	1 295,79	1 694,09	3 895,98	8,00	0,00	1 357,98	568,10
Ministry For Regional Development	0,00	13,67	5,00	38,24	0,00	0,00	0,00	0,50
	0,00	72,67	48,00	1 064,56	0,00	0,00	0,00	20,00
Ministry of Defence	124,08	113,11	139,82	89,41	34,57	7,14	43,50	41,41
	4 005,86	482,46	1 122,60	1 121,16	276,53	285,71	4 350,00	1 656,33
Ministry of Trade and Industry	47,14	83,12	17,46	16,07	19,70	21,59	133,26	185,93
	1 718,42	332,47	139,66	203,95	157,62	2 401,89	13 326,07	7 437,33
Ministry of Labour and Social Affairs	1,00	74,68	44,50	227,22	0,00	0,00	0,00	11,75
	9,88	430,73	386,00	2 587,97	0,00	0,00	0,00	470,00
Ministry of Education, Youth and Sport	6 268,94	5 001,96	5 151,95	5 709,13	1 176,33	115,67	272,95	1 477,57
	243 134,97	26 667,54	44 456,64	72 635,70	9 410,61	10 425,18	27 295,42	59 102,72
Ministry of the Interior	8,50	71,33	0,00	52,64	1,00	0,00	13,00	11,50
	592,59	454,33	0,00	1 324,47	8,00	0,00	1 300,00	460,00
Ministry of Health	969,28	480,99	1 872,18	341,44	41,66	4,05	9,67	1,00
	34 435,65	1 923,98	15 013,29	2 474,94	333,29	161,90	966,67	40,00
Ministry of Agriculture	345,01	706,10	327,98	292,38	29,93	24,15	76,67	291,95
	11 960,34	2 925,40	2 640,53	2 713,74	239,41	1 426,00	7 666,67	11 678,01
Ministry of the Environment	95,31	310,73	102,74	153,89	7,07	7,00	125,48	377,88
	4 621,92	1 250,92	827,90	1 154,03	56,57	280,00	12 548,00	15 115,38
Ministry of Foreign Affairs	9,17	58,00	14,00	115,00	0,00	0,00	0,00	0,00
	223,25	568,00	168,00	1 800,62	0,00	0,00	0,00	0,00
Czech National Security Office	0,00	0,00	0,00	0,00	0,00	0,00	15,00	12,00
	0,00	0,00	0,00	0,00	0,00	0,00	1 500,00	480,00
State Agency for Nuclear Safety	6,93	9,00	0,00	1,61	0,00	1,00	35,07	17,00
	114,76	36,00	0,00	29,29	0,00	40,00	3 506,82	680,00
TOTAL	***18 101,87***	***9 885,79***	***12 136,57***	***13 111,19***	***2 729,62***	***275,59***	***886,66***	***3 132,75***

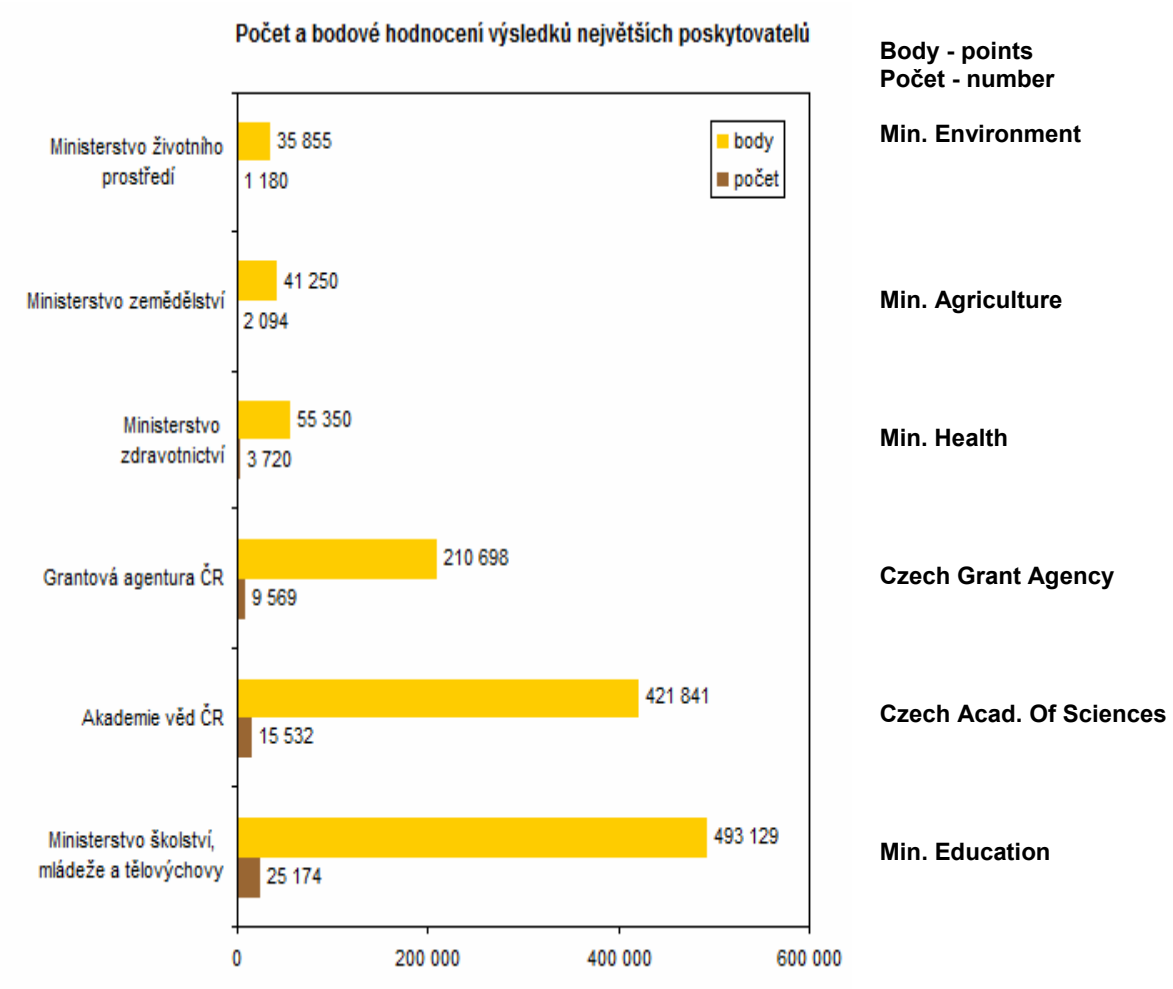
	744 421,65	*52 493,29*	*107 803,47*	*164 775,65*	*21 836,94*	*28 341,23*	*88 664,66*	*125 310,32*

Table B.2.2 uses only data on research organisation results which have been designated by the providers themselves, i.e. these are not results for all bodies registered in the RD&I IS. The decimal places in the number of results and in the points value arose from the method of dividing the result point values between various submitters.

The distribution in the number of result types under review for individual providers is typical overall for the area of research activities supported by the provider in question. For the Ministry for Regional Development, Ministry of Foreign Affairs and Ministry of Agriculture, providers for whom the share of support for applied research predominates a high predominance of publication results over application results is reported. In the case of the first and second of this, these are providers only for applied research, in the case of the third it is also a provider within the three subprogrammes of the National Research Programme, all ending in 2009.

B.2.3 Evaluation of the largest providers

No. and points evaluation of results of largest providers

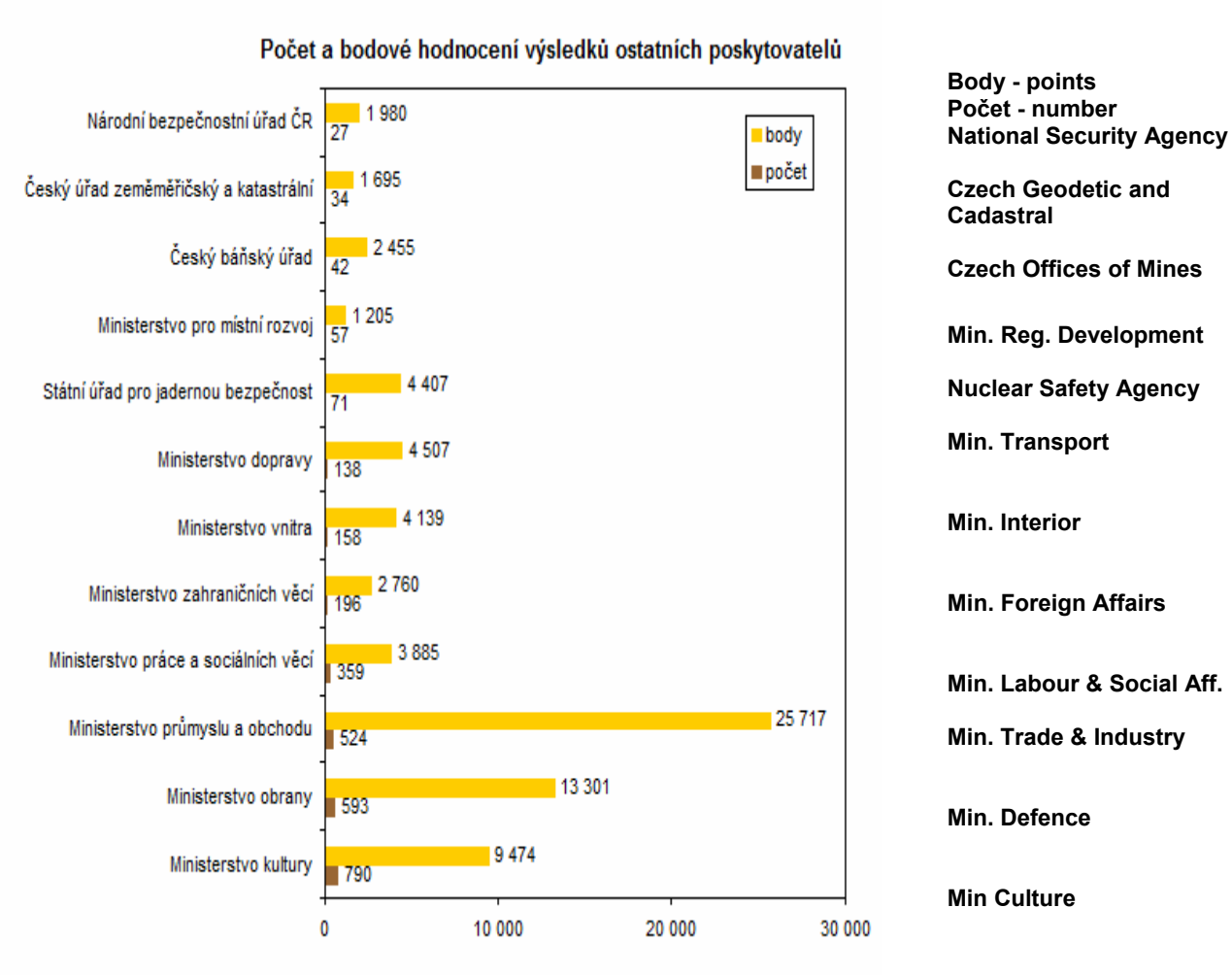


Source: RD&I IS, 2008 Evaluation

From the graph attached evaluating the largest providers who have reported more than 1 000 evaluated results in the period under scrutiny it is clear that the largest number of results, just

like the value of their points evaluation is concentrated in two providers: the Ministry of Education, Youth and Sport and the Academy of Sciences of the Czech Republic . These two dominant providers are followed by the Czech Science Foundation which, on the basis of the Reform of the System of Research, Development and Innovation approved by the Czech government will gradually take over the role of the Academy of Sciences of the Czech Republic in the area of targeted financing, i.e. will be the organiser of public tenders in the area of fundamental research, hitherto organised by the Academy of Sciences of the Czech Republic .

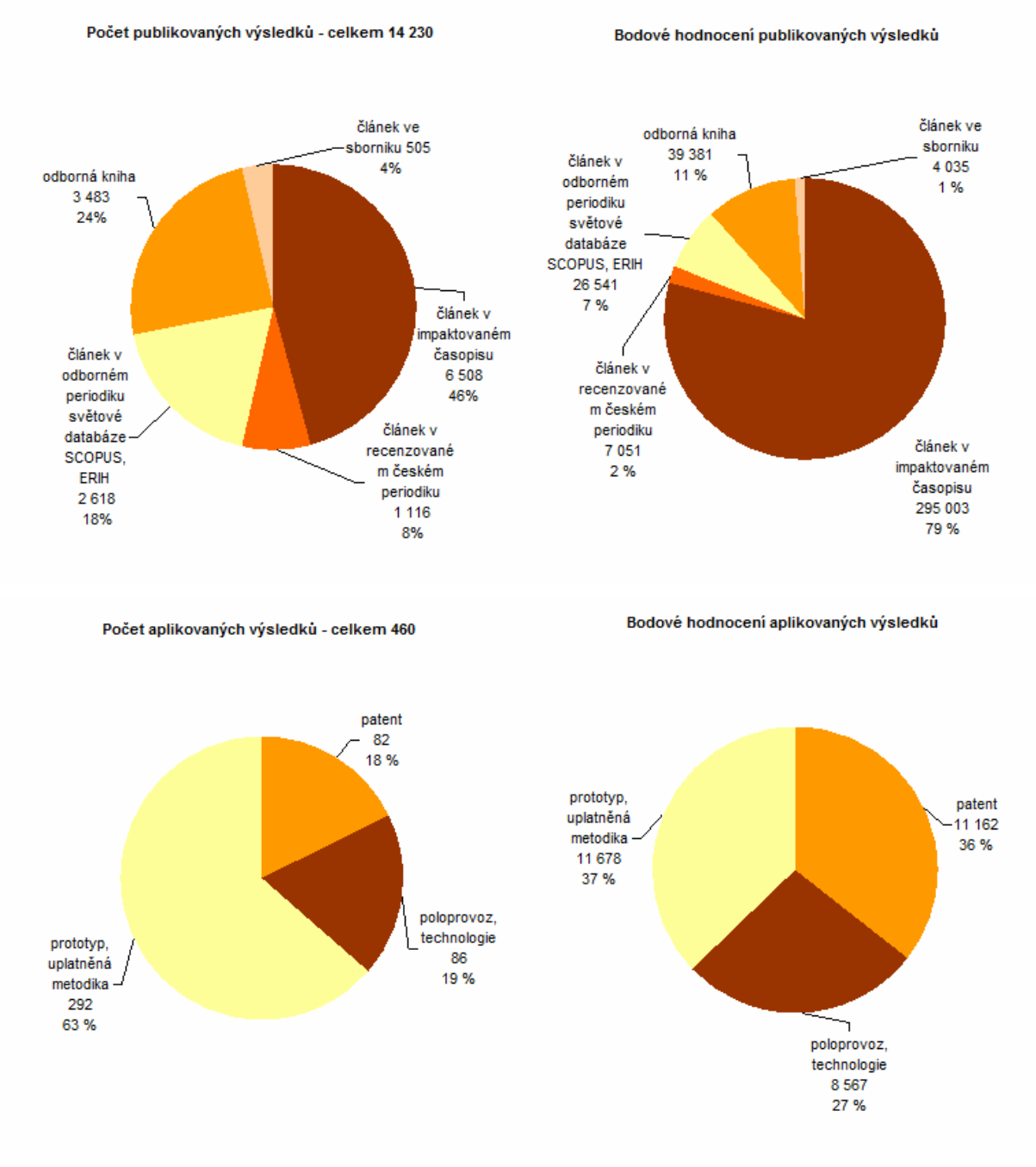
B.2.4 Evaluation of other providers



Source: RD&I IS, 2008 Evaluation

One of the other important providers is the Ministry of Trade and Industry. However this provider has for industrial research and development its specifics mainly in the compulsory system of co-financing on the part of individual recipients. The very existence of this mechanism is often a more important indicator of quality than formal reporting of any kind of applied result, that is, of its point value. The true economic benefit of an organisation which co-finances a given research activity is considered, abroad as well, as a full indicator of quality.

B. 2.5 Evaluation of AVCR Institutes by structure of result types



Source: RD&I IS, 2008 Evaluation

The graphs contain all 54 public research institutes set up by the Academy of Sciences of the Czech Republic. The structure of the results matches well the primary focus on fundamental research of the Academy of Sciences of the Czech Republic Institutes.

Graphs with typically applied results contain mainly result types prototype and applied methodology, followed by the result type trial operation and verified technology. For the period under scrutiny 2003 to 2008 82 patents were also registered. An interesting indicator is the use, or sale, of applied results. This fact is only recorded in the RD&I IS from 2008 onwards. From the data available it can be seen that in the Evaluation have been included 25 patents applied in 2007 of which 16 are used by a third party on the basis of a licensing agreement.

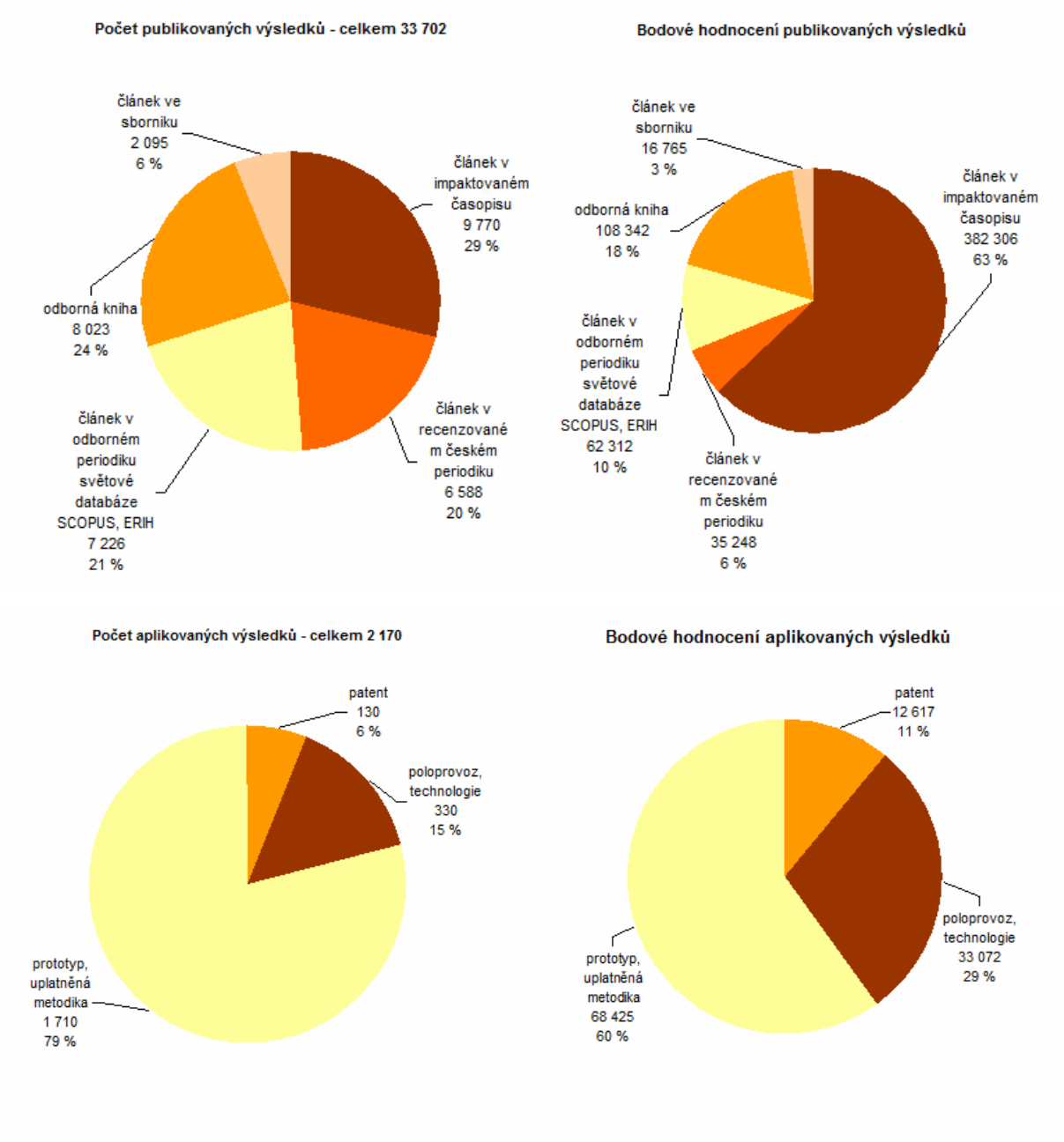
From these data it can be seen that the Academy of Sciences of the Czech Republic, which is focused mainly on fundamental research, has the most effective applied research of all of the recipient groups.

Other applied results, which are not directly usable, can be designated a burden to the whole RDI support system, since the time and finances expended on their development can be more effectively spent on priority publication results, particularly from the standpoint of focus on fundamental research.

In this regard one should also mention that there is very little or no linkage for mutual connection of individual activities for the model:

FUNDAMENTAL RESEARCH=PUBLICATION RESULT → RELATED APPLIED RESEARCH=APPLIED RESULT=IMPLEMENTATION → SALES

B.2.6 Evaluation of universities by structure of result types



Key to preceding pie charts

článek v impaktovaném časopise	článek v recenzovaném časopise	Článek v odborném periodiku SCOPUS, ERH světoé databaze	odborná kniha	článek ve sborníku
Article in an impact journal	Article in a reviewed journal	Article in specialist periodical in SCOPUS, ERH world database	Specialist book	Article in proceedings

Patent	poloprovoz, ověřená technologie	prototyp, uplatněná metodika
Patent	Trial operation, verified technology	Prototype, applied methodoloty

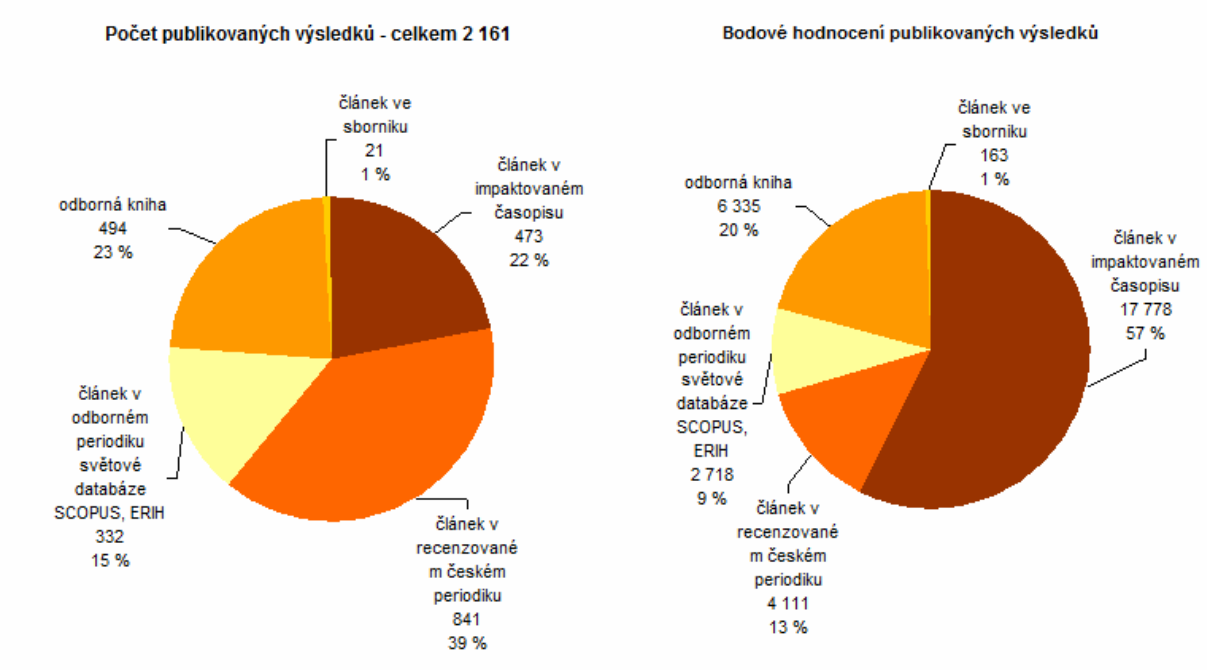
Source: RD&I IS, 2008 Evaluation

The graphs include 24 universities, in a structure with captures 176 organisation units such as faculties, institutes and other parts of universities. The diversity of the results structure is given by the involvement of universities in both fundamental and applied research.

The structure of applied results contains mainly result types prototype and applied methodology, followed by the result type trial operation and verified technology. For the period under scrutiny 130 decisions to grant patent protection were also registered. An interesting indicator is the use, or sale, of patents and licences. This fact is only recorded in the RD&I IS from 2008 onwards. From the data available it can be seen that in the Evaluation have been included 44 patents applied in 2007 of which 12 are used by a third party on the basis of a licensing agreement.

For other applied results the same principle of evaluation by their benefit, as mentioned in the commentary to the preceding graph. In this connection one may state that in the use, or sale, of applied results one may see not only direct financial benefits, but also the further possibility of non-financial gains, e.g. in the form of cooperation in implementing other research activities, or in the form of verifying the functionality and saleability of results in companies, operations etc.

B.2.7 Evaluation of public research institutions by structure of result types



Key to preceding pie charts

článek v impaktovaném časopise	článek v recenzovaném časopise	Článek v odborném periodiku SCOPUS, ERH světoé databaze	odborná kniha	článek ve sborníku
Article in an impact journal	Article in a reviewed journal	Article in specialist periodical in SCOPUS, ERH world database	Specialist book	Article in proceedings

Patent	poloprovoz, ověřená technologie	prototyp, uplatněná metodika
Patent	Trial operation, verified technology	Prototype, applied methodoloty

Source: RD&I IS, 2008 Evaluation

The graphs contain all 19 public research institutes, excluding those set up by the Academy of Sciences of the Czech Republic .

The type composition of the results for these research institutes should be clearly focused on the conduct of applied research. Indeed, the relatively small number of publication results matches this, but the latter is unfortunately still accompanied by a very low number of results from applied research.

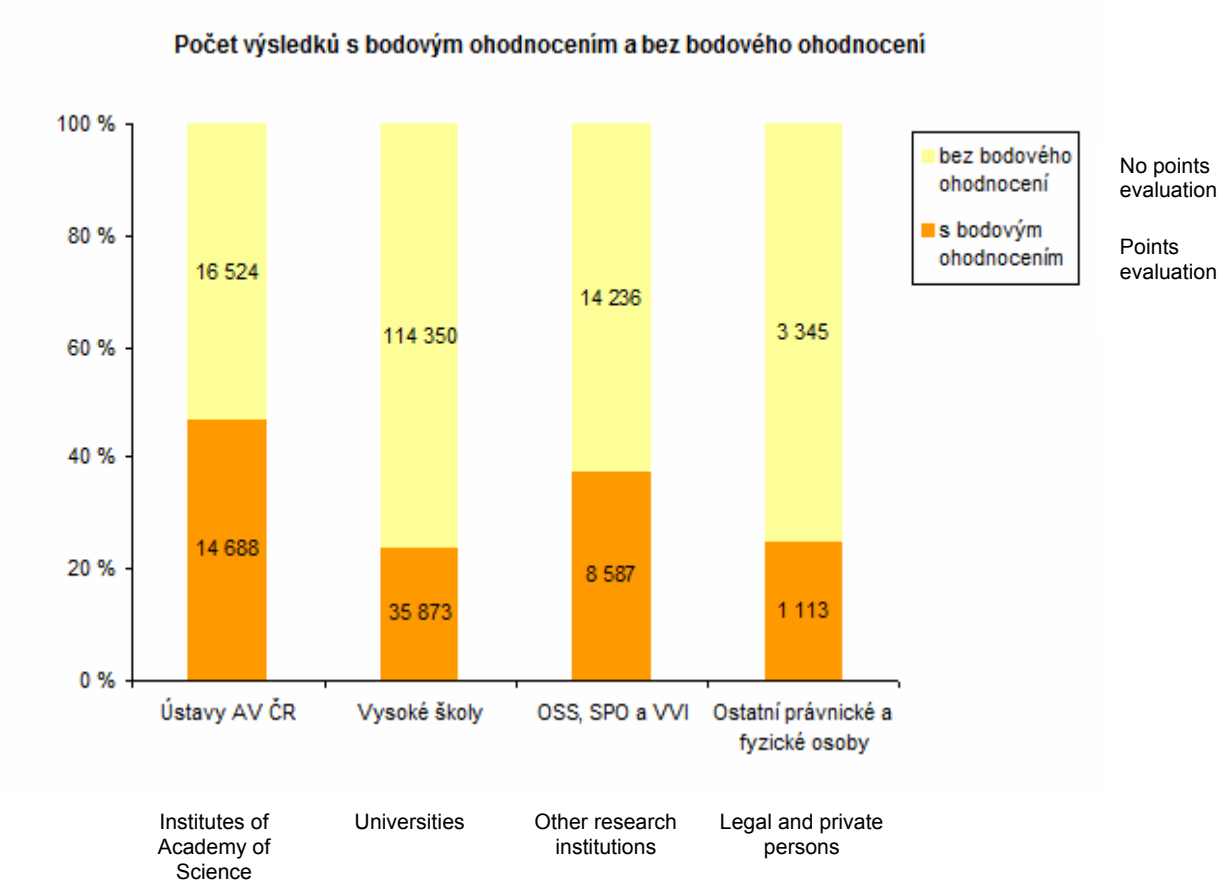
This results structure, where there is long-term persistence of fundamental research results at the expense of applied results, demonstrates the inefficiency of applied research conducted in this way at these institutions. This is caused predominantly by the poor orientation of these organisations within their options for implementing results. The research activities are sufficiently focused on the current needs of the outside world in the individual areas of the economy, particularly of industry.

This effect is supported by inefficient management both on the part of providers and the institutions themselves. In the individual public research institution research is undertaken with little planning and the prerequisites are not developed for the implementation or sale of results. A way forward to changing this approach and increasing the attractiveness of the sale of results can be seen in the involvement of manufacturers in research; these contribute co-financing, if they put their own financial resources into research activities in cooperation with public research institutions, they keep a much closer on the latter in monitoring the return on their invested funds. In this way their monitoring function is much more effective than the role played by the individual founders.

Of course for publication results it is true that their role in promoting a particular result is a necessary one, justified and irreplaceable. On the other it must be clearly defined that articles perceived in this way cannot be clearly considered to be the result of fundamental or applied research. Scientific articles, as they are defined in the description of result types, do not and should not be used for the popularisation of science.

The structure of applied results contains mainly result types prototype and applied methodology, followed by the result type trial operation and verified technology. Over the period under scrutiny a total of 28 decisions to grant patent protection were registered, however not a single patent is used by a third party on the basis of a licensing agreement. This kind of applied research certainly cannot be considered to be either efficient or effective. For other applied results the same principle of evaluation by their benefit, as mentioned above.

B.2.8 Share of results with point values and without point values by recipient group



Source: RD&I IS, 2008 Evaluation

The number of results without a point value is high (148 455) and includes on the one hand results with a zero value and on the other results which were excluded from the RD&I IS on the basis of checks. The most common reason for the exclusion of results was the incompatibility of the result with the result type definition (see the Methodology for the Evaluation of Research and Development 2008), consisting for example of the lack of an ISSN or ISBN code, with the consequent inability to verify the existence of the result, or of a low number of pages which fails to meet the prescribed limit, of an inability to confirm the granting of a patent, or issue of an application for a patent, and so on.

The graph contains only results from those bodies designated by individual providers as being research organisations. The number of all results put into the RD&I IS by providers is higher still, at cca. 193 thousand. This high number is caused by a failure to meet, or very lax meeting of providers' legal obligations when assessing results submitted to them and also points to errors in communication between providers and research activity grant recipients.

It is clear from the graph, that the "production" of unevaluated results is very high and outnumbers evaluated results. From the type composition of unevaluated results it is clear that these are those kind of result types which are mainly for popularisation, or the transfer and sale of results (e.g. the organising of exhibitions, conferences or workshops).

This can be shown by comparing the number of patents granted and the number of recorded cases of the way in which they are used, where a total of 326 patents were granted (from 2003 to 2007) but only 101 are used by a third party on the basis of a licence agreement.

Another large, numerically not insignificant group of unevaluated results are results classified as type D - article in proceedings. Evaluation was done only on contributions to proceedings which were recorded in the Thomson Reuters ISI Proceedings database, other proceedings were not evaluated.

A not insignificant group are also results marked V - research report, where only those results were evaluated which, in accordance with §4 letter g) of Government Regulation No. 267/2002 Coll., on the RD&I IS, contained classified information according to special legal regulations.

On the basis of these examples one can state that the financial resources expended on unevaluated results are not being used effectively.

One of the causes of the high number of unevaluated J^{neimp} result types consists of the current nature of the results of research activities. If a specific issue which is the subject of research has already been resolved, no cannot expect such results to be published in prestige periodicals. These results then appear on the periphery of the interest of the scientific community, which is matched by the level of their publication in second-class periodicals.

B.3 Bibliometrics

This chapter follows the lines established in previous years and in some areas offers new and more detailed information. Nevertheless we given here only an overview of the basic bibliometric indicators on the numbers of articles in specialist journals and their citation rate.

The bibliometric information given here covers only the field of impact journals monitored by Thomson Reuters (TR) in its National Scientific Indicators 2008 database (NSI). This company deals inter alia with quality indicators for specialist journals throughout the world. Where a periodical satisfies all the prescribed criteria and is of professional quality, it may be included among impact journals and the articles published in it are then monitored by the TR database. At present, there are the number of impact specialist journals exceeds 10,000. They are classified into 25 basic groups by specialization and, at the lowest level, into 250 disciplines. It should be borne in mind that a national journal included recently in a discipline in the TR database can be the cause of a significant jump in the year-on-year growth of absolute and relative production of articles and citations for a particular country in a given discipline.

Bibliometric information is a very valuable guide to identifying strong and weak points in a country's fundamental research, somewhat less so in applied research and very little in experimental development. However, bibliometric indicators offer only one of the possible views and must always be correctly interpreted while being aware of their possible shortcomings.

The TR database contains an absolute majority of the reputable international journals and most specialist journals. But the database does not by any means cover all specialist journals and a number of national journals are not included in the database In particular, journals at a lower level and of lower importance at national level are unevenly represented in the database, so that the resulting indicators may be affected by selection errors - that is by whether or not a particular discipline in the TR database covers local national journals. Incomplete coverage of journals by the TR database can cause a selection error which is more likely for more detailed division of disciplines. The lowest level of representation within the TR database is for humanities journals where most publishing is done in specialist monographs.

The bibliometric information based on the NSI database, which is a simplified version of the base TR database, can be used as an indirect, but relatively good measure of the volume of research results and subsequent reactions of the academic community to them. By contrast, the information is not a measure of actual research productivity, that is, it tells us nothing about quality in relation to the volume of funds and other resources invested.

The following basic bibliometric indicators are presented in the section that follows:

Relative production of publications – revealing the publication activity achieved in locations in a particular state. The number of articles from 2004 to 2008 per 1,000 inhabitants in the given state or per researcher (the registered number of researchers expressed as individuals, i.e. the headcount). It should be borne in mind that here only articles from journals contained in the TR database are counted. Moreover there are also enormous differences in prestige and citation rate between impact journals in the TR database. Here the so-called impact factor is measured, which is not taken into account in relative production of publications. A certain indicator of research quality in international comparison can also be whether an article has been published in a foreign periodical or in a specialist periodical of national significance. But nor is this factor reflected in this short overview.

Relative production of citations – revealing the degree to which articles are cited in a particular state, that is the reaction of the academic community to research results published in

journals in the TR database. The number of citations from 2004-2008 is relativised in view of the population (1,000 inhabitants in the given state) or the number of researchers (the registered number of researchers expressed as individuals).

Relative citation index (RCI) – compares citation rate of authors from a particular state with the average citation rate from around the world. It is given a the share of a state's citation index (the average number of citations per article) and the world citation index (the total number of citations in relation to the total number of articles in the world). A state's relative citation index is equal to 100%, which means that the standard of bibliometric quality is average, above 100% is above-average, and below 100% is below-average on a global scale.

Relative citation index of disciplines (RCID) – compares the standard of the bibliometric quality of productions of a particular state in a given discipline with the average global standard for that discipline. It is given as the share of a national citation index in a discipline and the average global citation index in the same discipline multiplied by one hundred, i.e. as a percentage. A relative citation index of a discipline in a particular state equal to 100% therefore means that this is an average global bibliometric level.

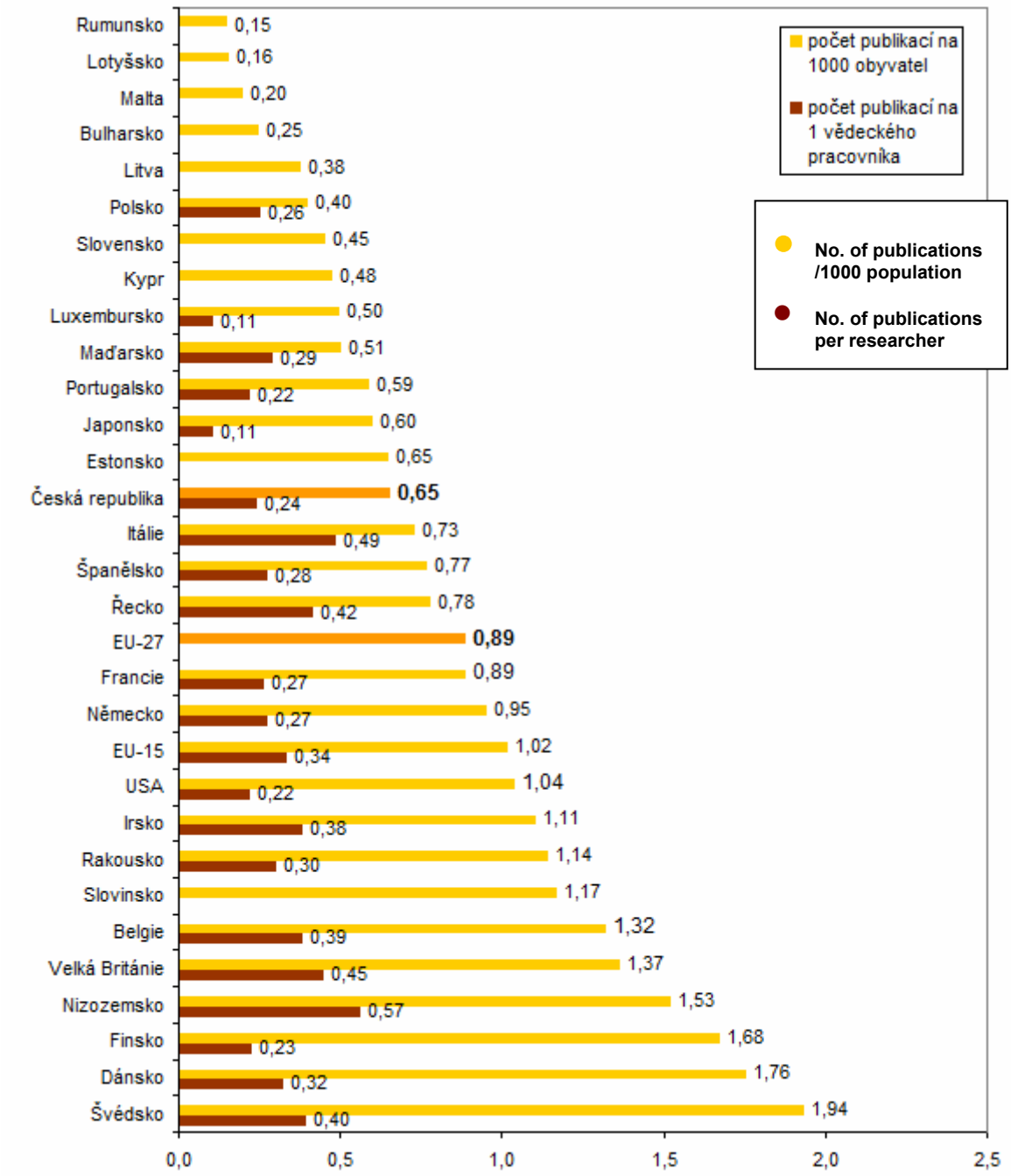
For a number of reasons the RCID cannot itself be used as an unambiguous measure of research quality. First, all the indicators given here, including RCID, take into account only articles and citations reported in the TT database, which does not cover the entire field of research results, and applies in particular to the humanities, but also to some disciplines in the social and other sciences.

The RCID indicator should always be interpreted in conjunction with the r**elative production of publications** indicator. A high or low RCID value does not of itself necessarily correspond to high or low research quality.

At the comparison level of entire countries or groups of disciplines presented here, where the citation indicators are calculated as an average of dozens or hundreds of articles, these indices are a relatively good indicator of quality. In view of the fact that the significance, material quality and results benefit of fundamental research is usually demonstrated after a number of years, citation indices are one of only a few relatively quickly accessible aggregate indicators.

This year a different method for calculating RCID values was chosen; this is based on a different time interval for calculation than in previous years, when the interval was from 1981 to 2007, whereas now it is from 1990 to 2006. In addition a different initial data set was used, the 10.2 option in the NSI manual as "1 year periods cited to present: This option provides annual paper counts and citation counts from a given year through the current year. E.g. papers from 1990 and citations to those papers from 1990-2006".

B.3.1 Comparison of selected countries by relative production of publications



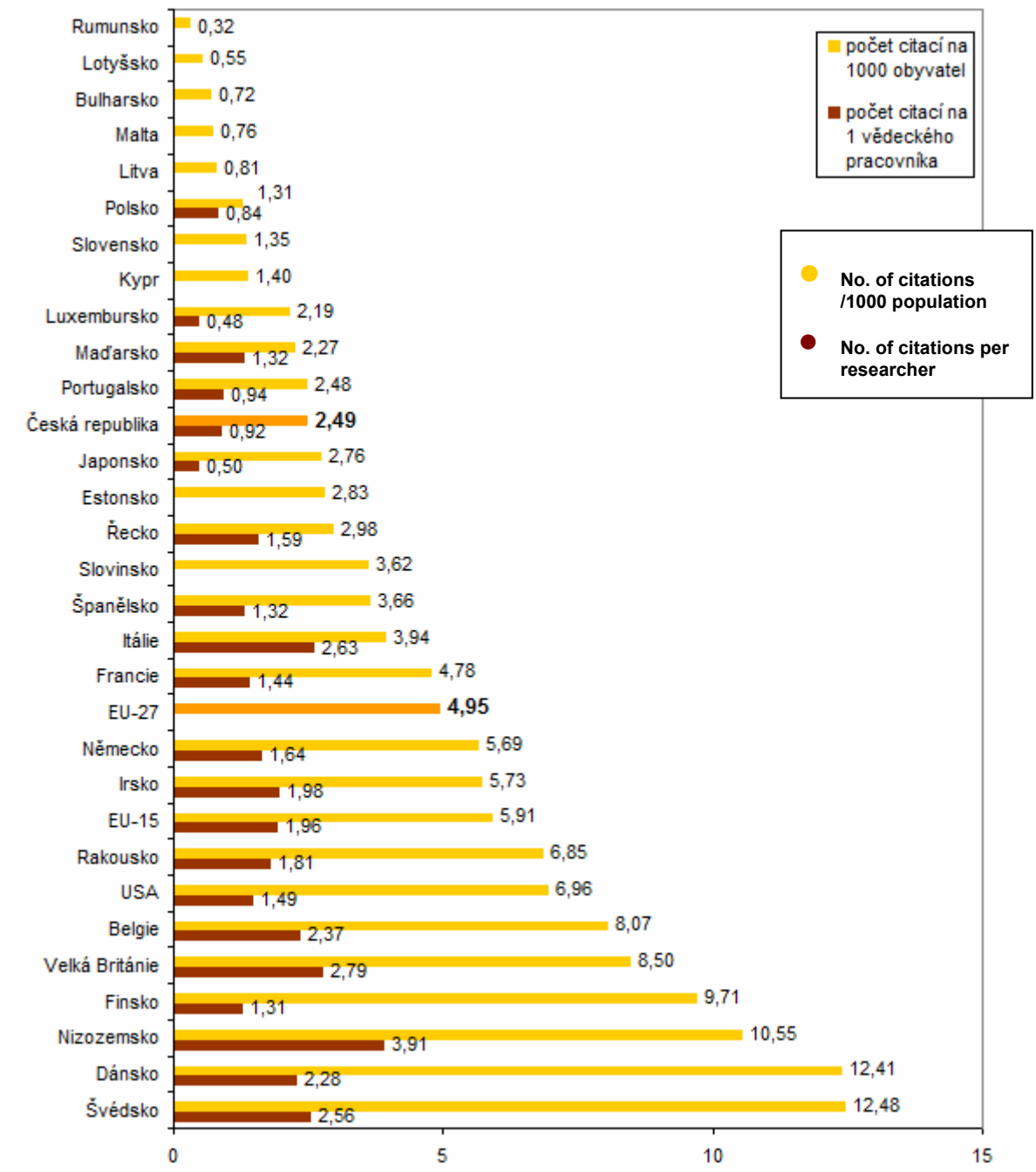
Source: Thomson Reuters National Science Indicators, 1981-2008

Note: Related to the average number of inhabitants from 2003-2008 or the latest available data on the number of researchers.

In the international comparison of publication activity relative to the population for 2004-2008, the Czech Republic remains below average. The relative production (per 1 000 inhabitants) of 0.65 is not only below the EU-15 average (1.02), but below that of the current EU-27 (0.89). Relative production which is twice as high is achieved by the Scandinavia counties, the Netherlands, Great Britain and Belgium. By contrast lower values than that of the Czech Republic are achieved by most EU member states from the expansions of 2004 and

2007, with the exception of Slovenia. Expressed in relation to the number of researchers, the Czech Republic achieved over the last five years a higher value (0.24: on average 24 articles are published in impact journals per 100 researchers) than for example the USA (0.22) and Finland (0.23), but lower than Italy (0.49) and Greece (0.42). Normalisation through the number of researchers is made difficult by possible inconsistencies in the reporting of this date between countries and interpretation of the value of this relative indicator as a measure of RDI effectiveness requires great care and a knowledge of details which are not given here.

B.3.2 Comparison of selected countries by relative production of citations

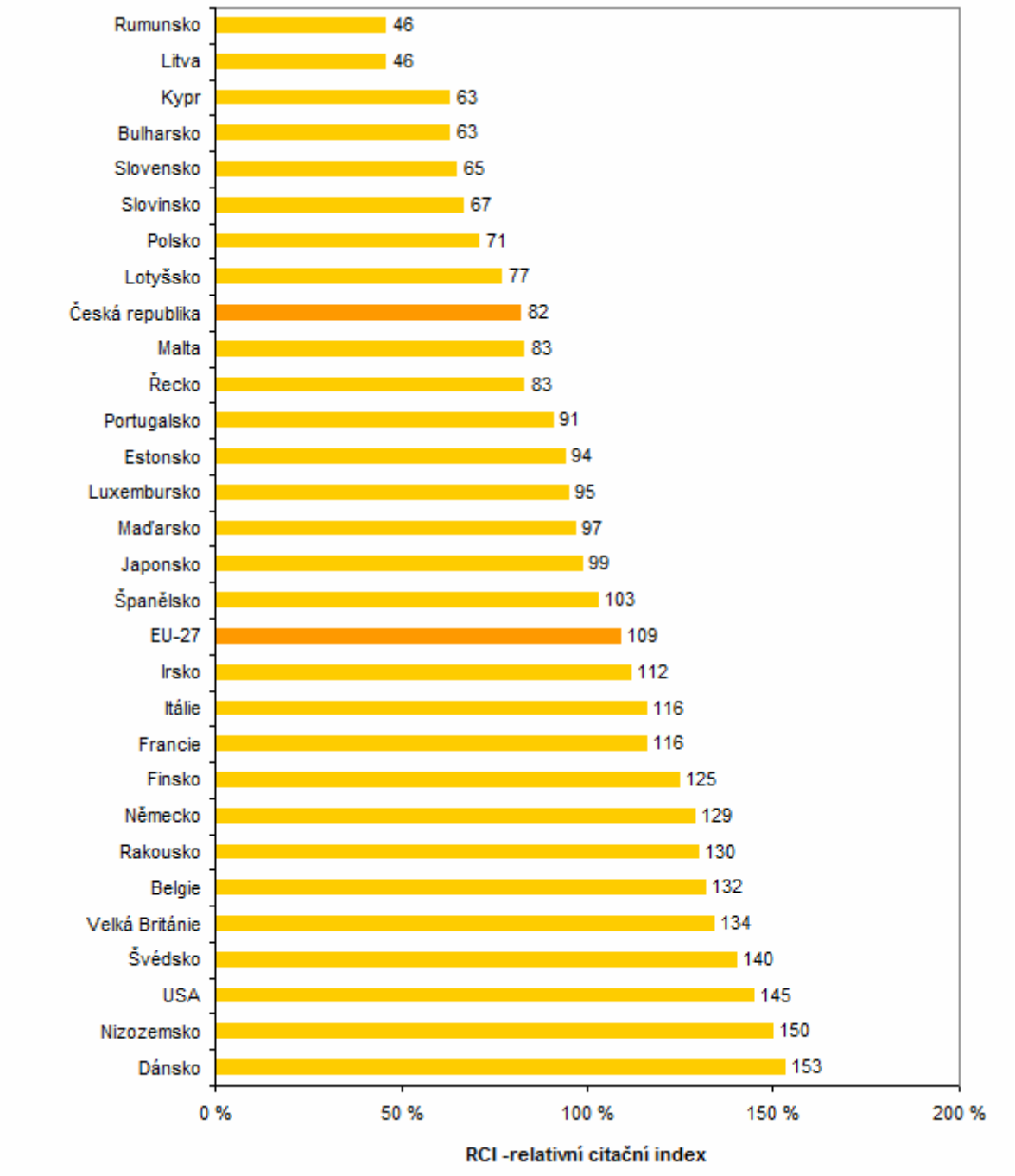


Source: Thomson Reuters National Science Indicators, 1981-2008

Note: Related to the average number of inhabitants from 2003 to 2007 or the latest available data on the number of researchers.

The relative production of citations across countries an even greater spread than the relative production of publications. This is caused by the fact that countries reporting higher relative production of articles also have a higher relative citation rate for these articles. The ranking of countries by production of citations related to 1 thousand inhabitants is however very similar to that in graph B.3.1. The highest values are again reported by the Scandinavia counties with the Netherlands, Great Britain and Belgium, with the lowest values from the new EU member states from 2004 and 2007. The differences in the citation rate are marked. For example the average citation rate for articles by authors from the Czech Republic is one-fifth of that for authors from Denmark and less than half of the EU-15 average.

B.3.3 Comparison of selected countries by relative citation index



RCI - Relative Citation Index

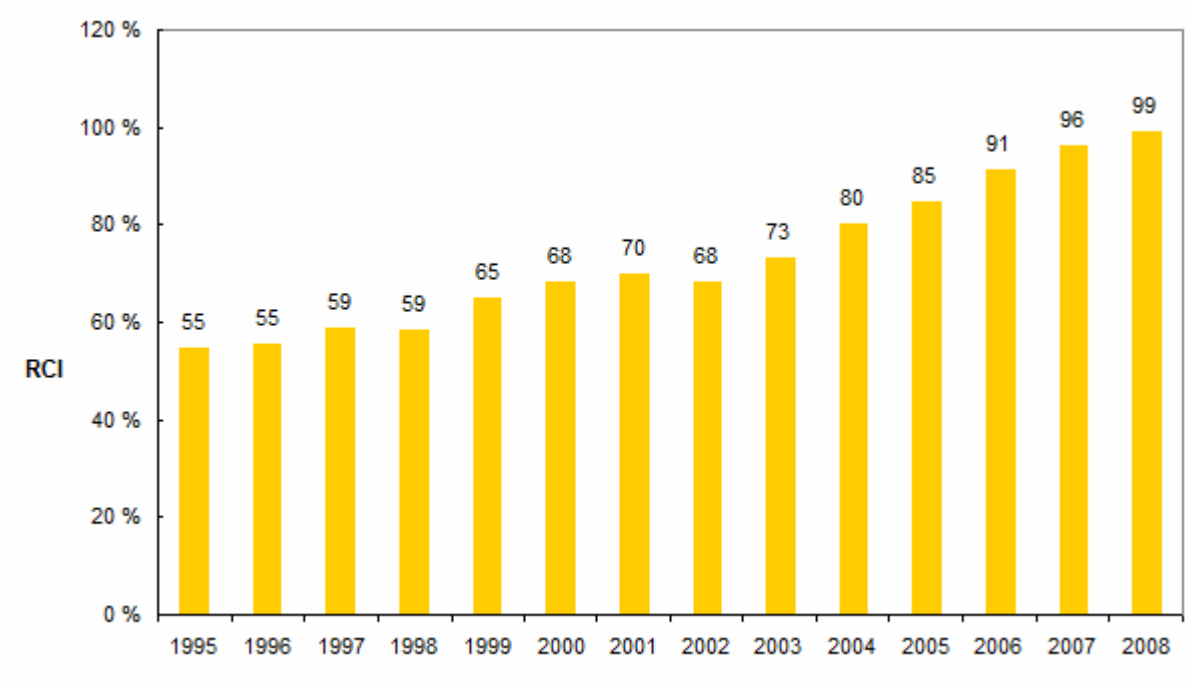
Source: Thomson Reuters National Science Indicators, 1981-2008

Note: Data for 2004 to 2008

The relative citation index says more about the level of articles published in a given country in relation to other countries. It relates the number of citations to the number of articles which is the measure of the response and interest of the academic community in research results in the articles described.

The average value of the Czech Republic's relative citation index was 82% for the last five years 2004-2008 (compare 79% for the 2003-2007 period), which is still substantially below the EU-27 average of 109% However most other new member states achieve values which are even lower than that of the Czech Republic. Only Hungary (97%), Estonia (94%) and Malta (83%) came ahead of the Czech Republic. The highest relative response to articles for European countries, almost twice as high as that for the Czech Republic, is reported by the Netherlands and Denmark.

B.3.4 Development of the relative citation index for the Czech Republic



Source: Thomson Reuters National Science Indicators, 1981-2008

Note: Data for 2003 to 2008

The relative citation index for the whole of the Czech Republic has grown over the last few years at a rapid rate and it 2008 reached a value of 99%, which represents a growth of a full half over its value in 2002. In view of the fact that the relative citation index of a country measures a country against the rest of the world, one may state that articles from the Czech Republic in impact journals have already achieved the global average. But one should be reminded that the "world" here means not only the EU-27, the USA and Japan as given in the earlier graphs, but the entire world. A slowing down in the growth rate of the Czech RCI is also evident in the last few years, so that in the next few years a steady state is to be expected rather than any marked growth.

Table B.5 Baseline bibliometric indicators in the Czech Republic and the world

Parameter	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*
P1	5 431	5 399	6 388	6 439	6 791	8 629
C1	46 532	42 097	39 503	27 489	15 390	3 750
C1/P1/	8,57	7,80	6,18	4,27	2,27	0,43
P	875 242	854 158	981 781	981 747	977 792	1 158 247
C	10 277 345	8 310 425	7 172 491	4 584 124	2 306 188	509 072
C/P	11,74	9,73	7,31	4,67	2,36	0,44
(C1/P1)/(C/P)	0,73	0,80	0,85	0,91	0,96	0,99
P1/P	0,62	0,63	0,65	0,66	0,69	0,75
C1/C	**0,45**	**0,51**	**0,55**	**0,60**	**0,67**	**0,74**

Source: Thomson Reuters National Science Indicators, 1981-2008

Note: P1 = number of publications in the Czech Republic; P = number of publications in the world; C1 = number of citations in the Czech Republic; C = number of citations in the world

In 2008, a total of 8629 articles by Czech authors were published in TR database impact journals. This represents a doubling of the number of articles published in 2000 (4340). Over the same period the number of articles in the world grew by only 50 percent. However, the growth in the Czech Republic was also determined by the growth in the number of Czech journals included in the TR database

The C1/P1 and C/P shares (share of citations published articles) given in the table are falling over time as a consequence of the fact that articles published recently cannot be cited so frequently as older articles. However the relative citation index (C1/P1)/(C/P) has this time factor removed, because it relates to average global values in which this period is equally long or short in individual years.

As lines P1/P and C1/C show, the share of articles from the Czech Republic to global production of articles has grown from 5 to 7 per thousand. The share of citations rose from 3 to 7 per thousand. At the same time it is clear that the growth of both of these shares in the last two years (2007 and 2008) has in effect stopped, which does not of course mean an end to growth in absolute numbers, which have grown markedly not only in the Czech Republic but also in the world as a whole.

B.3.5 Development of the relative citation index of disciplines and the number of publications

The National Science Indicators database makes it possible, among other things, to judge the standard of individual disciplines based on the relative citation index of disciplines (RCID for definition see the introduction to this chapter), of which the database distinguishes some 250. Here however the RCID values are given only for the broader groups of disciplines which were given for the most in earlier years. The detailed results for all 250 disciplines are given in Appendix No. 3. In this year's edition the RCID for groups of humanities disciplines are not given, where findings are disseminated mainly in other ways than in journal articles and RCID based on the TR database have little forecasting value. Bibliometric information from these disciplines can be provided only by an extended citations analysis, for which the necessary publication and citation database has yet to be created in the Czech Republic.

Of the total number of 250 disciplines, 63 reached an RCID value of greater than 100% in the Czech Republic in 2004; in 2008 this was 86 disciplines. It should at the same time be noted that a number of disciplines vary on a year-on-year bases around an RCID value of 100%, so that the number of disciplines which exceeded RCID= 100% from 2007-2008 was 49, while during the same period the number falling below this value was 26. The relatively high year-on-year variability of RCID is given by the fact that the RCID is determined in a number of smaller disciplines by the small number of publications.

This part provides a basic overview for larger disciplines or groups of disciplines. For each group of disciplines the time trend of the value of the relative citation index for the discipline in question is given separately. Within the individual groups of disciplines the same measure is maintained, so that orientation in the graphs and indicator data series is simplified. The horizontal line depicts the average RCID value of 100%, that is the value matching the global average in the discipline in question.

The time trend of relative production of articles related to country population (1 million inhabitants) is given separately for the Czech Republic and EU-15 countries. In this the section differs from last year's version when only the total number of publications was given. As has already been mentioned the RCID value represents an average only for articles from a particular country in journals included in the TR database. A high RCID value may therefore be simply the result of the fact that in a discipline no national journal publishing less cited articles exists and for the country in question the TR database reports very few articles which are at the same time often cited, resulting in a high RCID value. By contrast a markedly low RCID can simply be the result of the fact that in a discipline the TR database contains only a few cited national journals from the country in question.

When interpreting trends and changes in the RCID and the relative number of publications it is necessary to bear in mind that changes need not be caused only by quality but may also be determined by a change in reporting. For example the mere inclusion of a national journal with a low citation rate in the TR database can year-on-year multiply the number of reported articles and at the same significantly lower the RCID value.

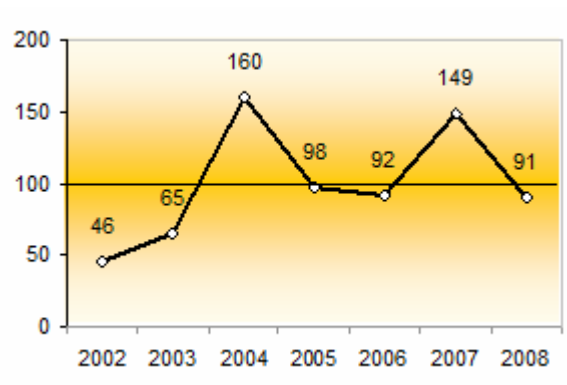
Finally it should be remembered that none of the indicators given allows us to identify the causes of good or bad results for a discipline in a given country. None of the indicators takes account of the volume of resources which have gone into a discipline over recent years, the number of science workers in the discipline and the material background for the discipline in a given country. The citation response and relative production of articles measured in these indices are a result also of such factors as existing publication practice in a given country in the discipline in question and the motivation to publish in impact journals.

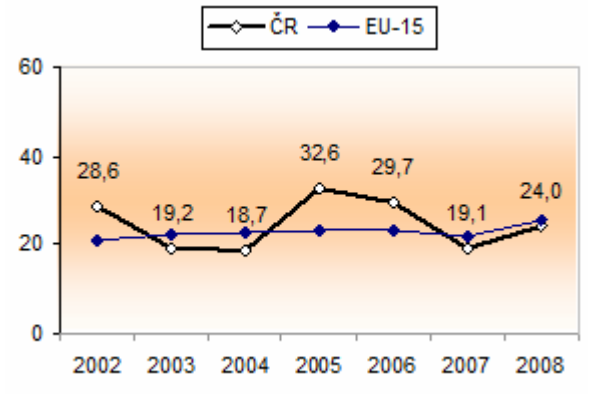
Data on the RCID and relative production of articles for all 250 disciplines which are given in the NSI database, are given in Appendix No. 3. Those Czech disciplines which report both a high RCID and high relative production of articles can be designated important. Whereas in 2002 there were only 6 such disciplines (veterinary sciences, metallurgy and industrial metallurgy, mathematics, entomology, electrochemistry, analytical chemistry), in 2008 there were as many as 24 disciplines outside the humanities.

Non-life sciences

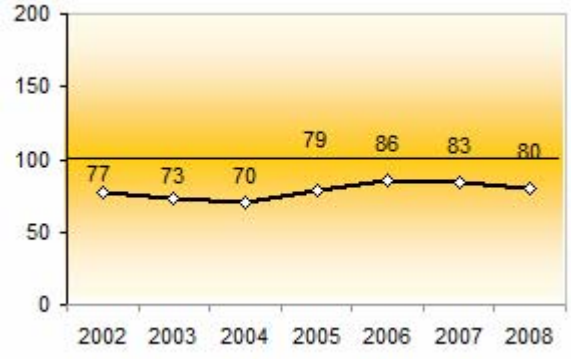
Interdisciplinary physics - RCID

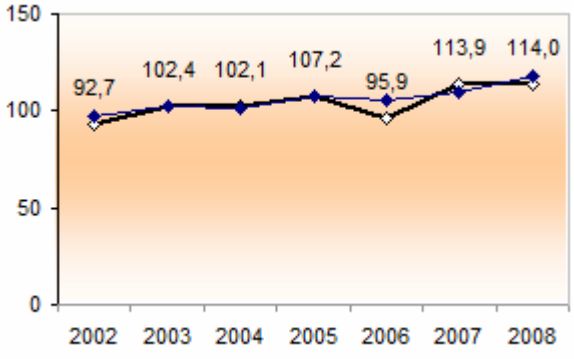
Publications per 1 million inhabitants



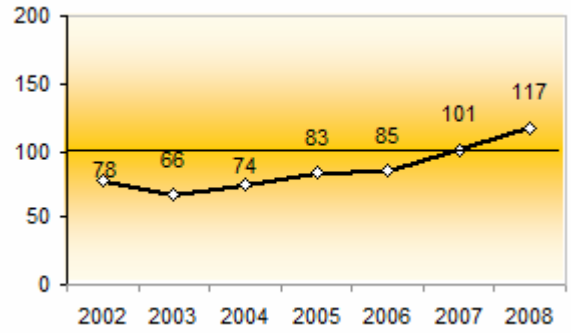


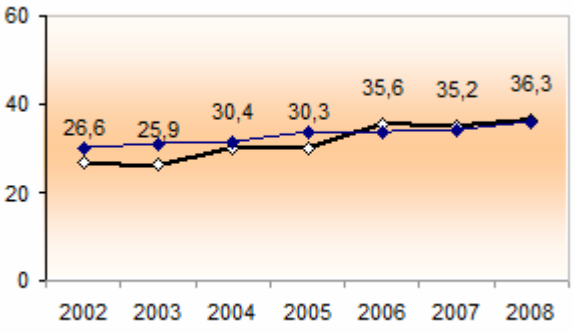
Applied physics, condensed matter, Materials sciences - RCID



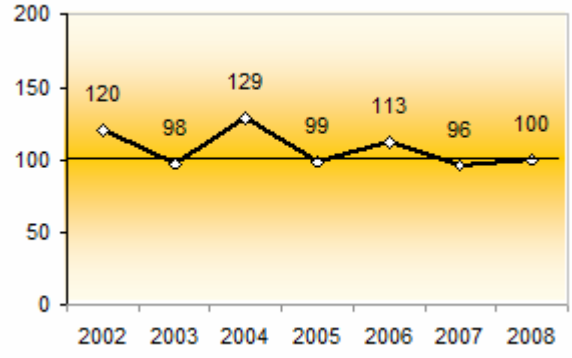


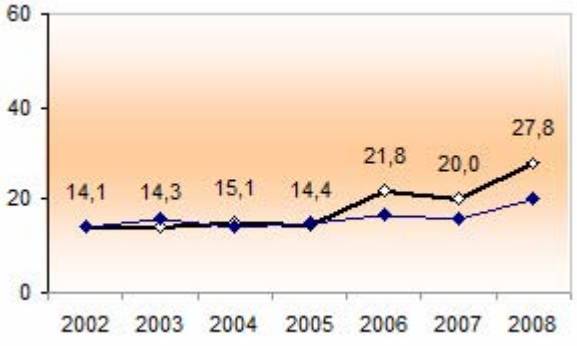
Physical chemistry - RCID





Mathematics - RCID

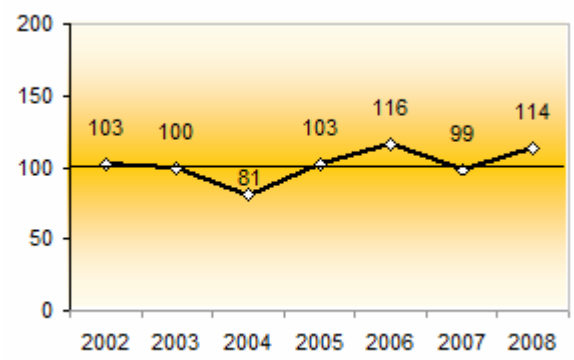




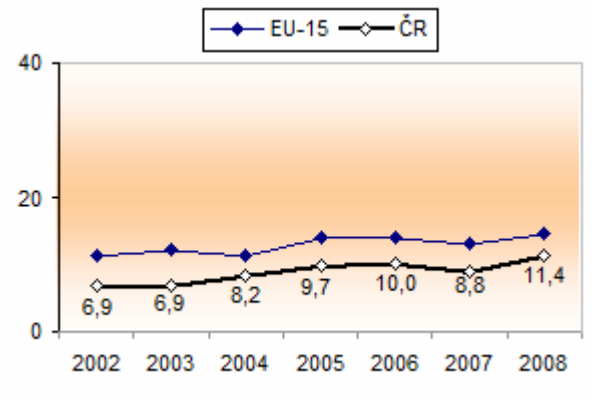
The non-life sciences group reports a relative number of publications (in relation to 1 million inhabitants) almost the same as the EU-15 average. Only in the discipline of Mathematics does the number of publications exceed the EU-15 average. In all of these disciplines there is also an average citation rate for articles which is close to the global average, although there are clear relative differences trends between disciplines.

Chemical sciences

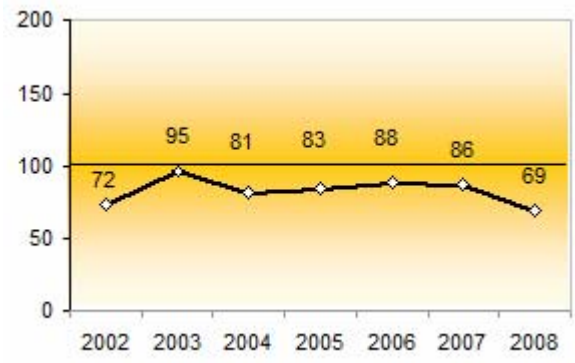
Chemical engineering - RCID

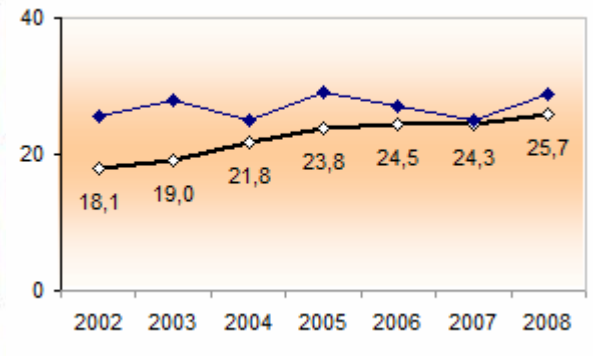


Publications per 1 million inhabitants

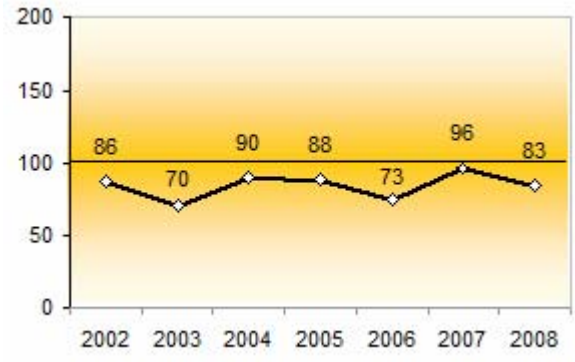


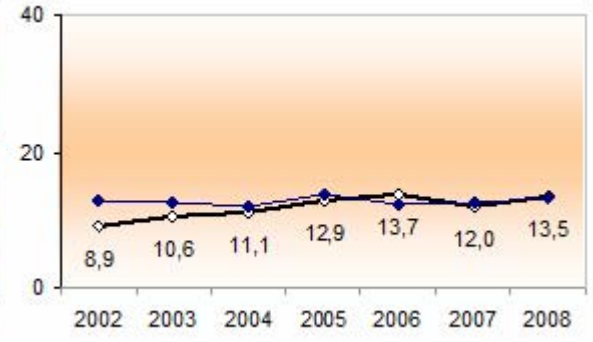
Organic chemistry, polymer sciences - RCID



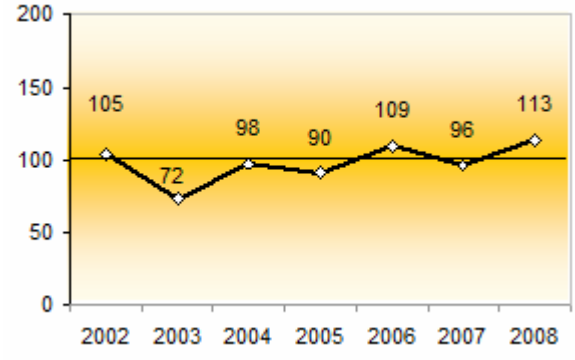


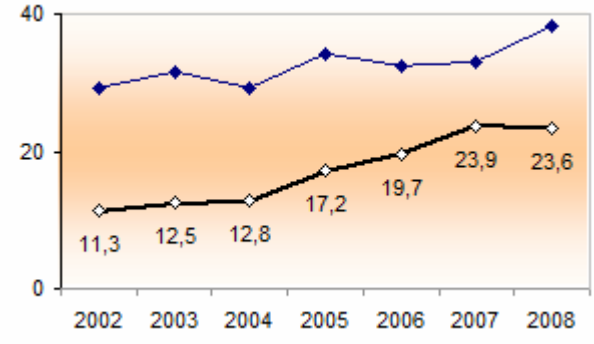
Inorganic and nuclear chemistry RCID





Pharmacology and toxicology RCID

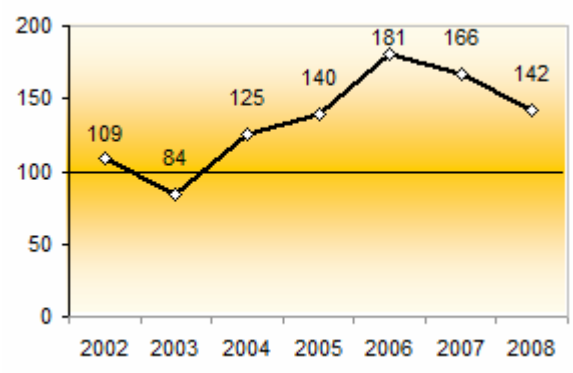




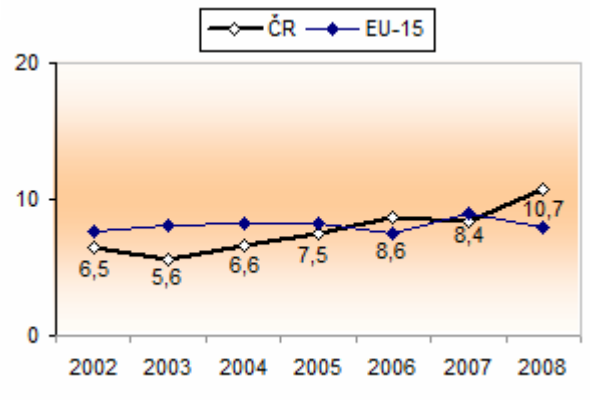
Within the chemical sciences group there are clear, more marked differences between individual disciplines. Where relative production is concerned, in all disciplines in the period under scrutiny there was a clear trend towards catching up with the EU-15 average, and in the case of organic chemistry, polymer sciences and inorganic and nuclear chemistry the volume of article production normal for the EU-15 was achieved. In the remaining disciplines of chemical engineering and pharmacology and toxicology there is still a clear shortfall. In these disciplines the RCID over 100% is relatively high. This is clearly an example of how a relatively small number of high-quality publications leads to a higher RCID.

Engineering

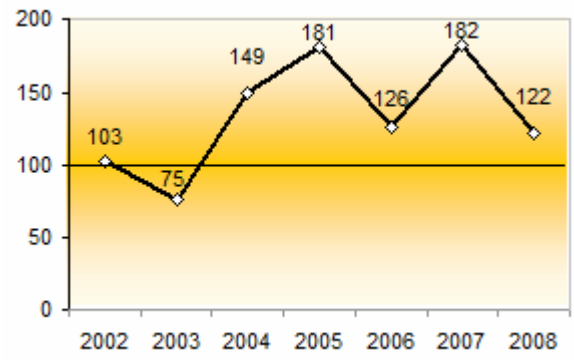
Spectroscopy - RCID

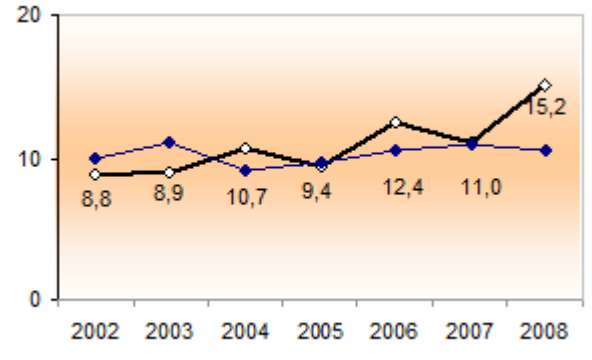


Publications per 1 million inhabitants

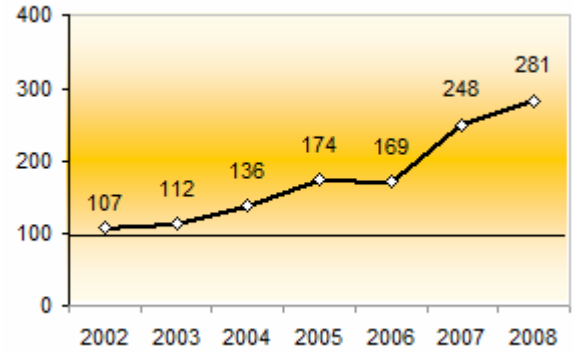


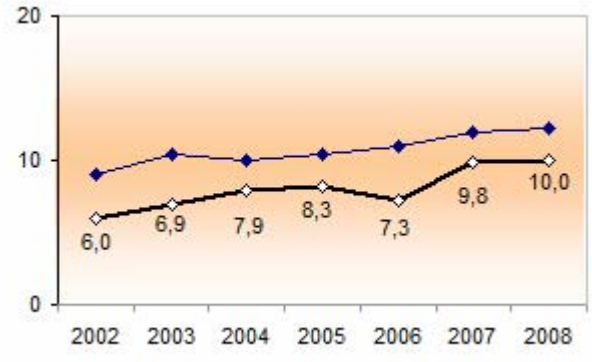
Nuclear engineering - RCID





Instruments - RCID

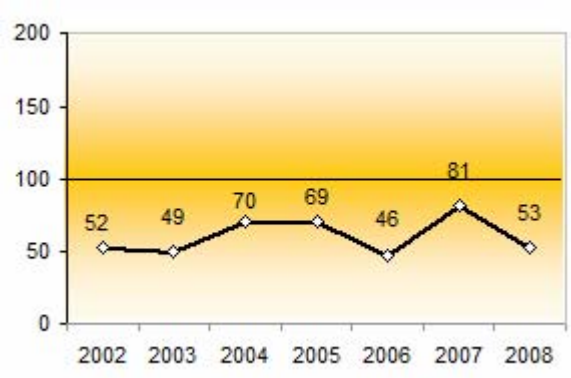




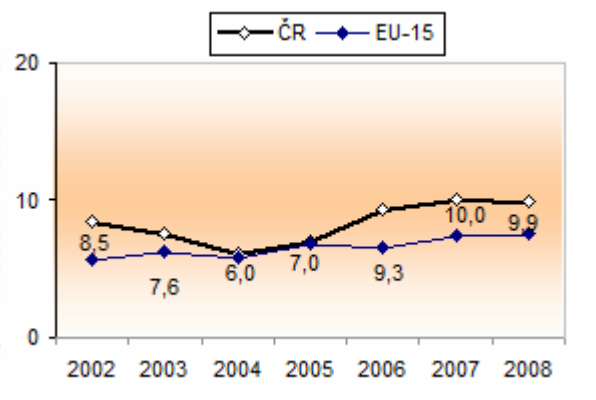
The engineering group seen through the RCID index is well ahead of the global average and with the exception of the instruments discipline achieves a journal production volume which is comparable with the EU-15.

Life sciences

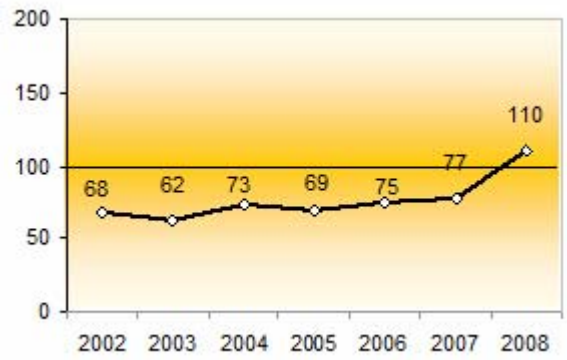
Biology-RCID

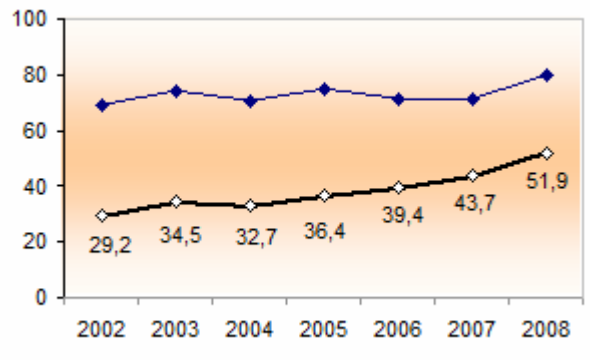


Publications per 1 million inhabitants

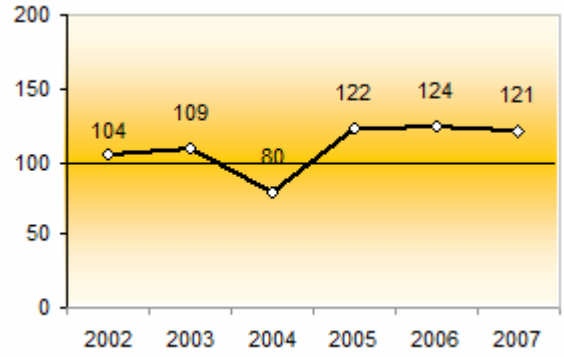


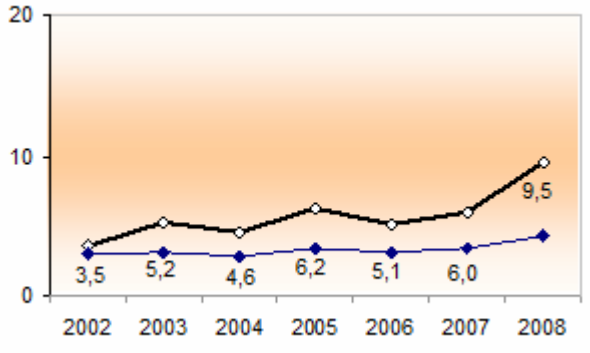
Molecular biology a genetics- RCID



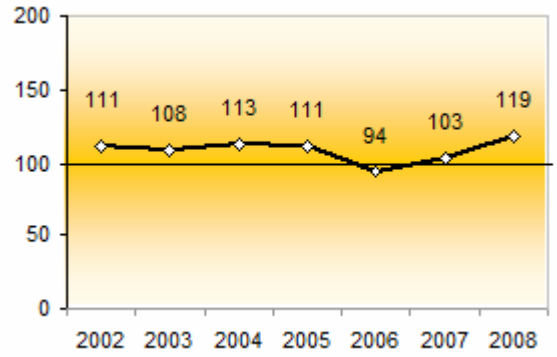


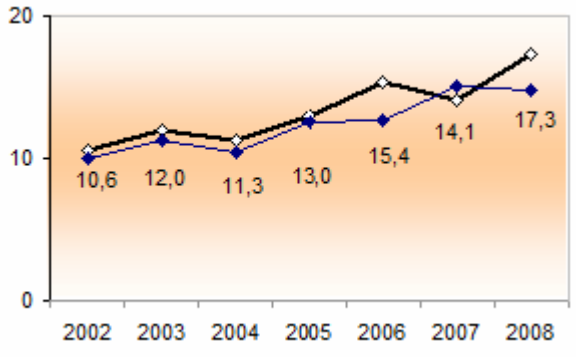
Entomology- RCID





Veterinary medicine - RCID

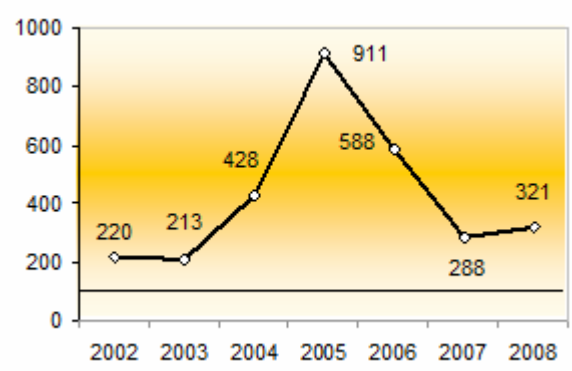




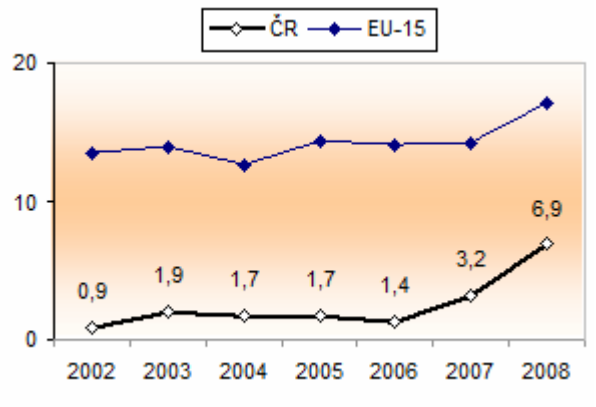
The life sciences group, when seen through the RCID index and relative production volume is relatively heterogeneous. The special standing of Czech entomology is clear, for example.

Medical sciences

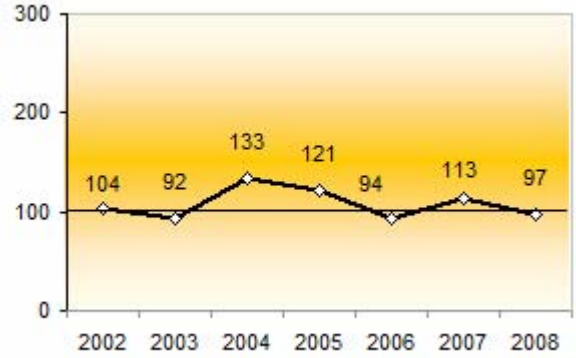
General and internal medicine - RCID

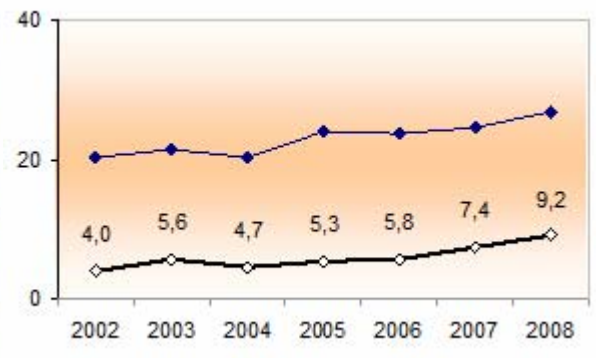


Publications per 1 million inhabitants

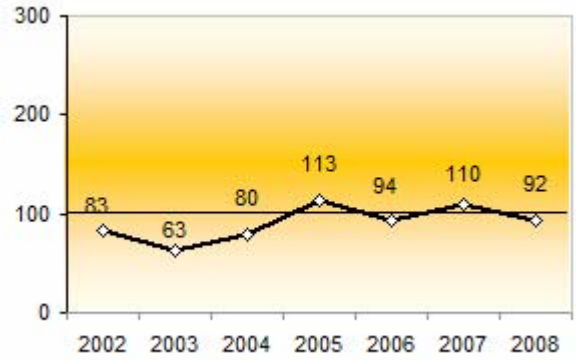


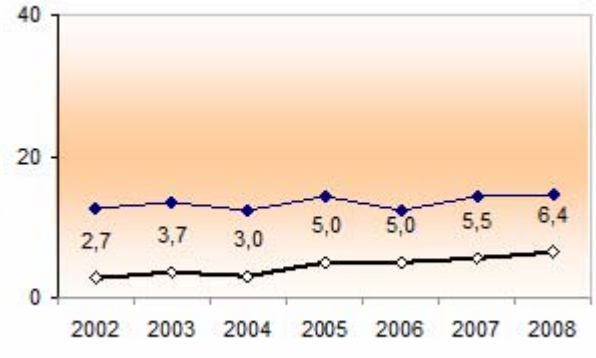
Cardiology, respiratory medicine - RCID



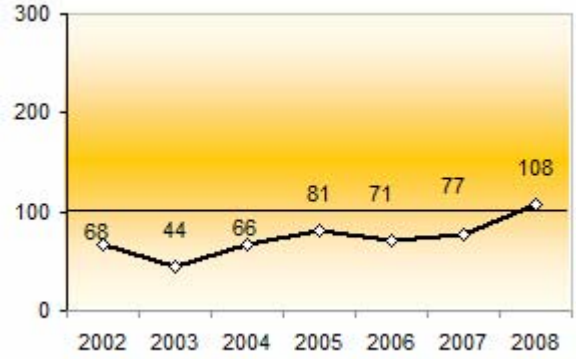


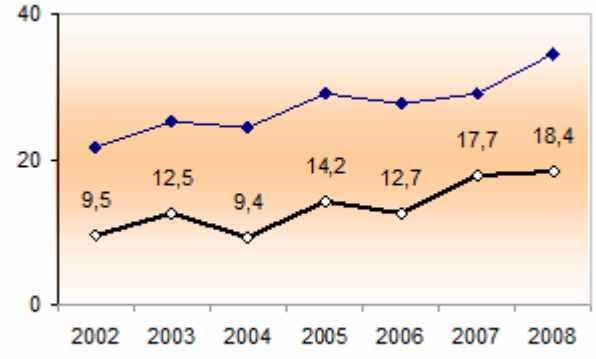
Haematology - RCID





Oncology -RCID

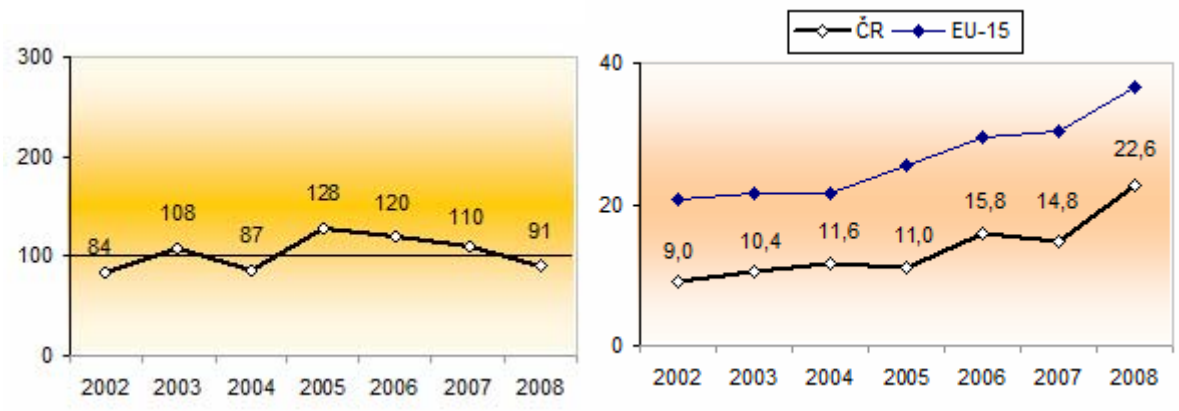




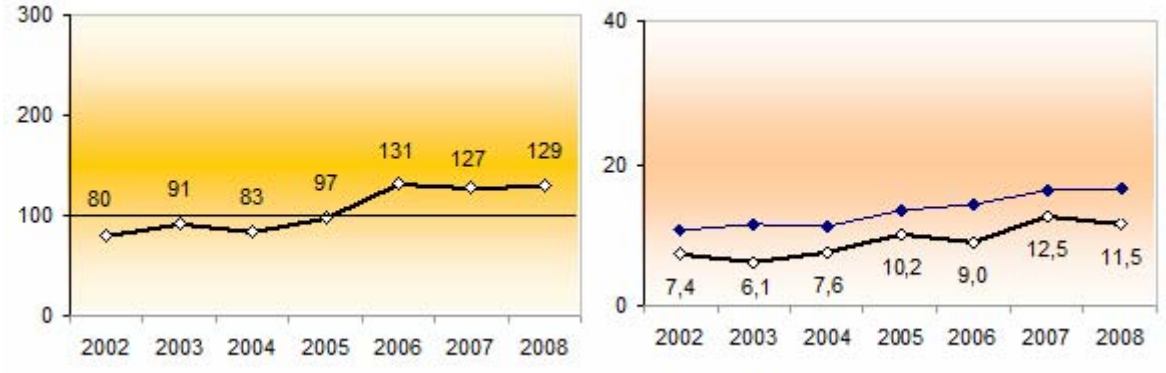
The medical sciences group is shown to be very specific, where relatively high RCID values are reported (e.g. in General and internal medicine), but on the other there is a clear enormously low relative production of articles in these disciplines when compared to the EU-15 average. It is clear that Czech medical research in published very little indeed in impact journals, but this small number of articles has a high to very high citation response throughout the world.

Environmental sciences

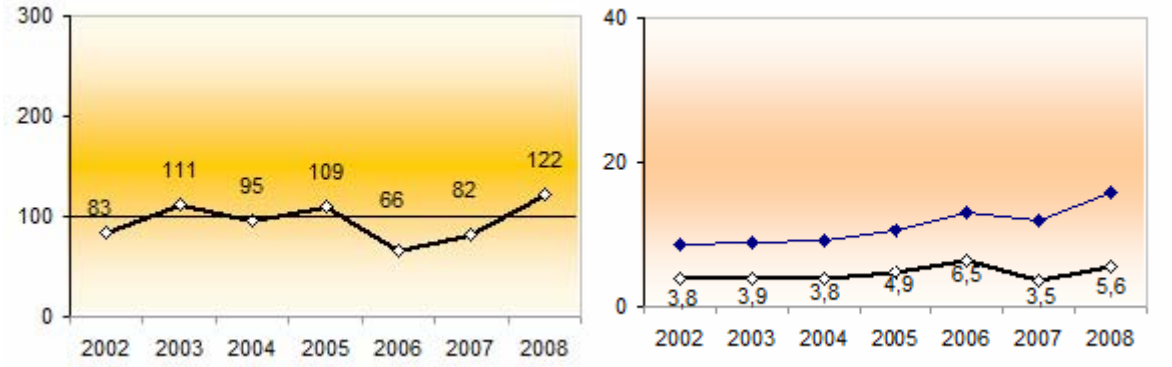
Environmental studies, geography - RCID Publications per 1 million inhabitants



Ecology -RCID



Environmental engineering, energy - RCID

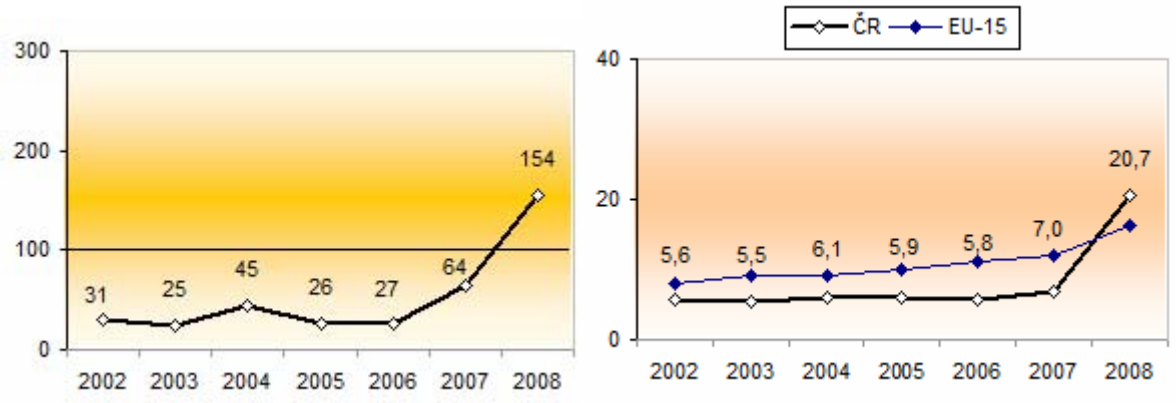


The environmental sciences group reports a systematically low relative volume of article production, but an average to above-average RCID.

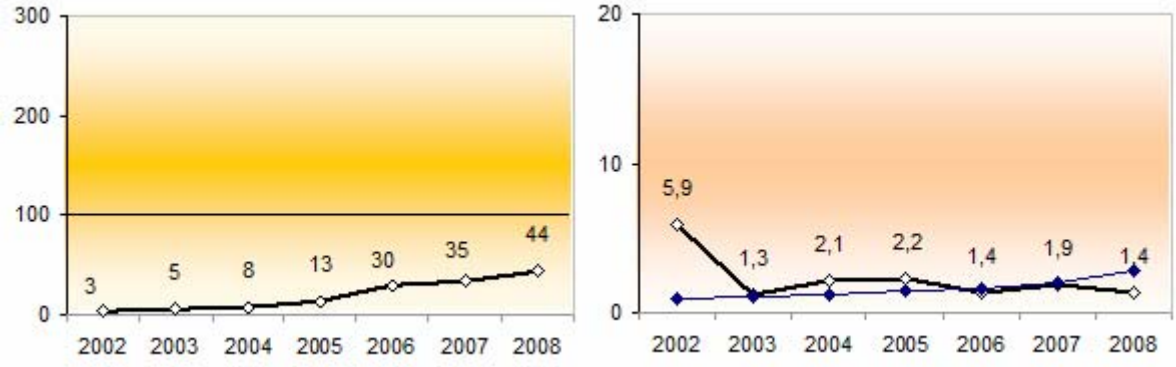
Social sciences

Economics - RCID

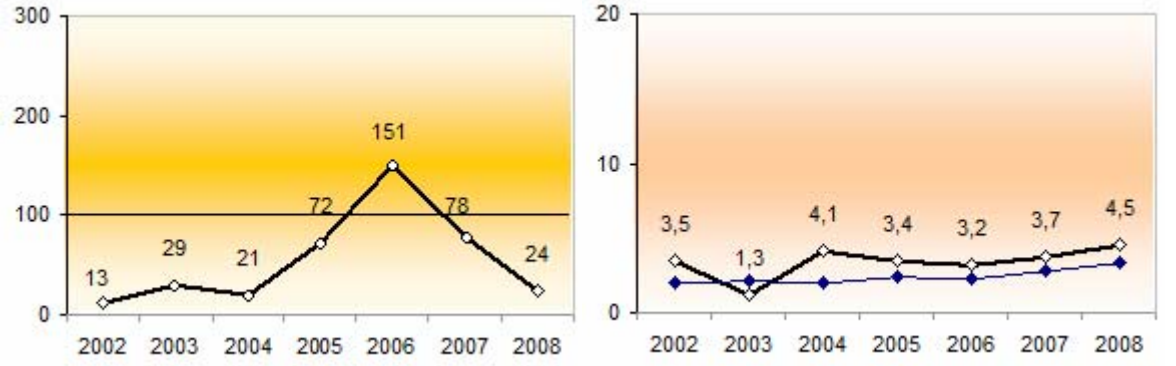
Publications per 1 million inhabitants



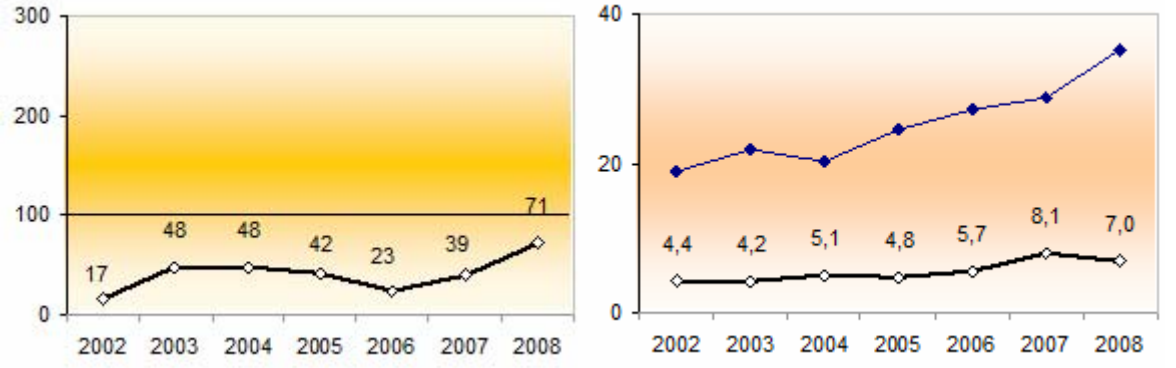
Business sciences and finance - RCID



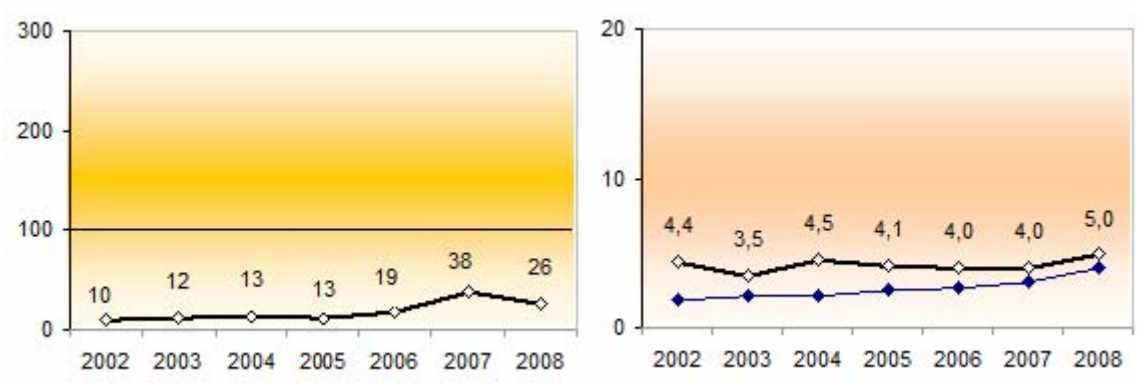
Sociology -RCID



Psychology - RCID



Political science - RCID

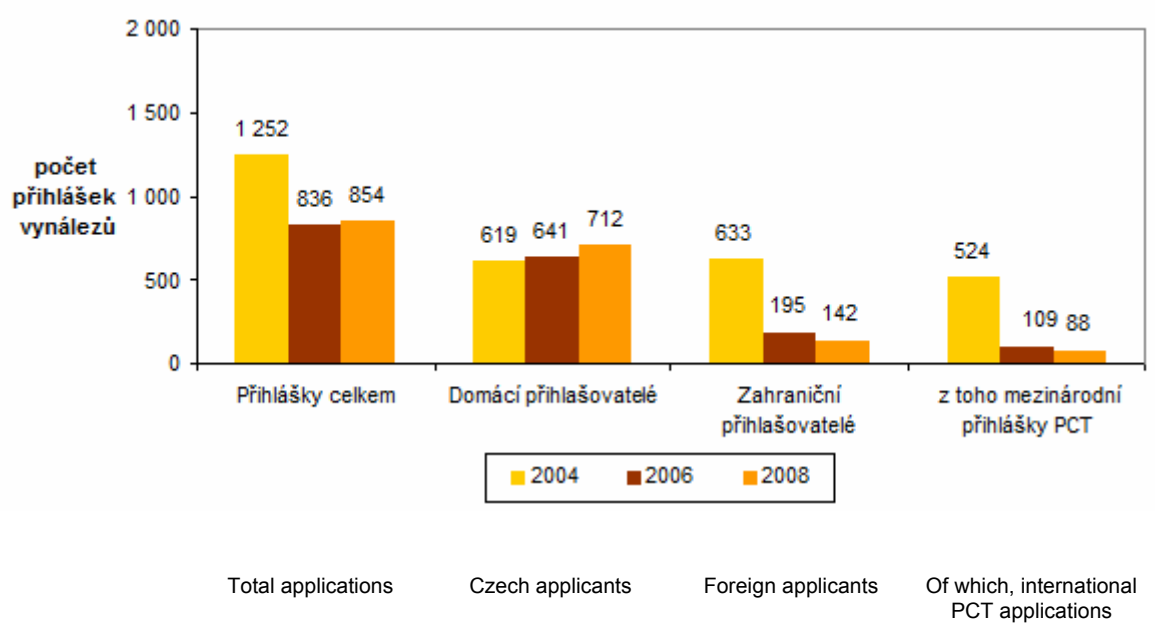


The results for the social science disciplines are very varied. All five of the disciplines given report, with the exception of two exception observations (in 2008), very low RCID values, well below 100% and in comparison with most of the other groups of disciplines also a very low relative production of articles. In the case of the economics, business sciences and finance, sociology and psychology disciplines the low RCID value is given mainly by the fact that their calculation is dominated by articles printed in national journals which have relatively low citation rates. If these low citation rate journals were not included in the TR database the reported production would be much lower and in turn the RCID would be much higher. Whereas the rapid growth in the number of articles in the economics discipline in 2008 is certainly due to the inclusion of new national journals in the TR database, the rapid growth in the RCID in sociology and economics in 2008 is due to the surprisingly low growth in the citation rate in these disciplines throughout the world. The Czech discipline of psychology comes out worst in the comparison. Although this behavioural sciences discipline worldwide is the subject of intensive publication activity, the relative production in the Czech Republic is extremely low and in spite of this, the RCID for psychology is also low.

Data on the RCID and relative production of articles for all 250 disciplines which are given in the NSI database, are given in Appendix No. 3. Those Czech disciplines which report both a high RCID and high relative production of articles can be designated important. Whereas in 2002 there were only 6 such disciplines (veterinary sciences, metallurgy and industrial metallurgy, mathematics, entomology, electrochemistry, analytical chemistry), in 2008 there were as many as 24 such disciplines outside the humanities.

B.4 Patent applications, patents and licences granted

B.4.1 Industrial Property Office (ÚPV) patent applications

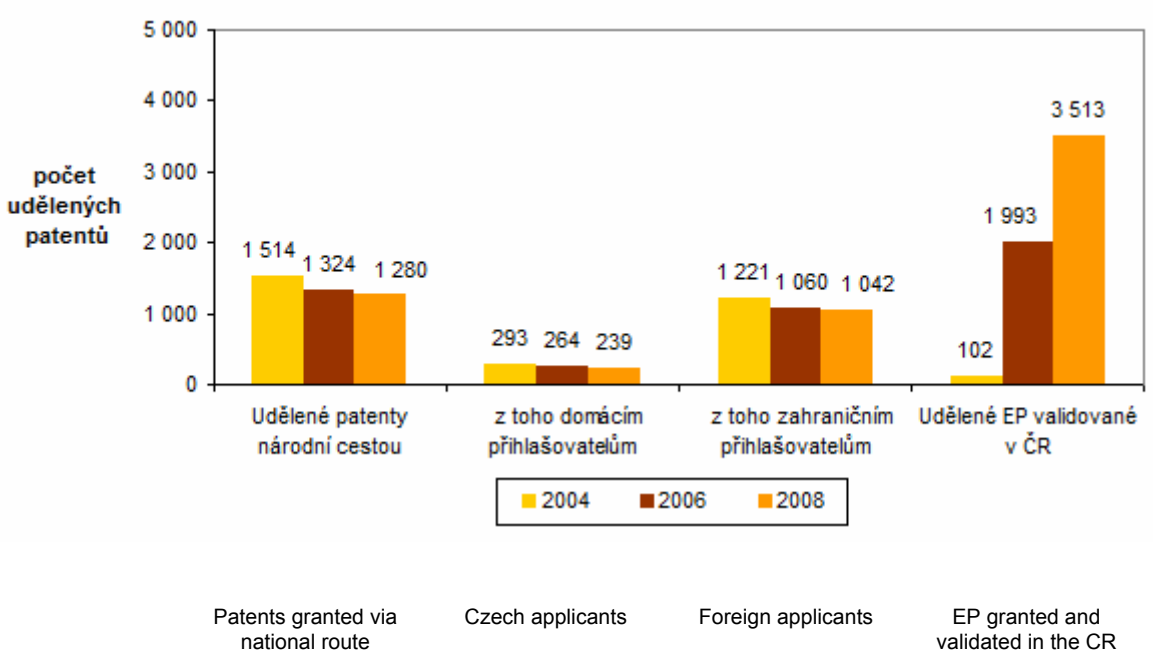


Source: Industrial Property Office 2008 Annual Report

In 2008 there was no revival in applications. The number of patent applications submitted by domestic applicants stagnated compared with 2007, when 712 applications were made. This is still the second highest number in the last decade, but in view of the potential of science, research and industrial development it is not satisfactory.

The naturally declining trend in the number of patent applications submitted in the Czech Republic by foreign applicants over the last few years has not changed even in 2008. Foreign applicants increasingly choose the method of application which is permitted by the Czech Republic's membership of the Convention on the Grant of European Patents.

B.4.2 Patents granted by the UPV

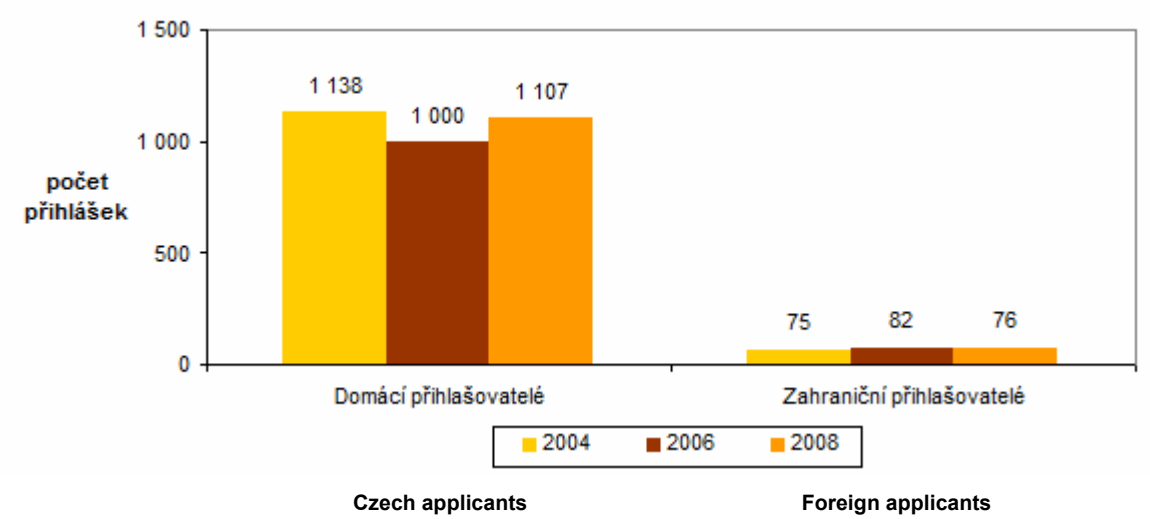


Source: Industrial Property Office Annual Report 2008

The rapidly growing number of patents which have come into force in the Czech Republic in recent years (in 2008 there were 1280 patents granted nationally, with 3513 validated European patents) speaks positively of the growth of business interest in our market. The fact that only 5% of the owners of patents granted are domestic applicants does not however speak well of the appropriate development and appreciation of the significance of patent protection on the part of our companies and research and academic sphere.

Foreign applicants have gained the dominant share of patents which are valid in the Czech Republic (73%) in the form of a European patent. The growth in European patents which met the requirements for validity in the Czech Republic (i.e. have gone through so-called validation) was 28% between 2007 and 2008, whereas in comparison to 2006 this number almost doubled. This growth will exhaust itself in roughly three years as it reaches a stable level, as it did in those member states of the European Patent Convention who acceded to the Convention earlier.

B.4.3 UPV utility model (design) applications



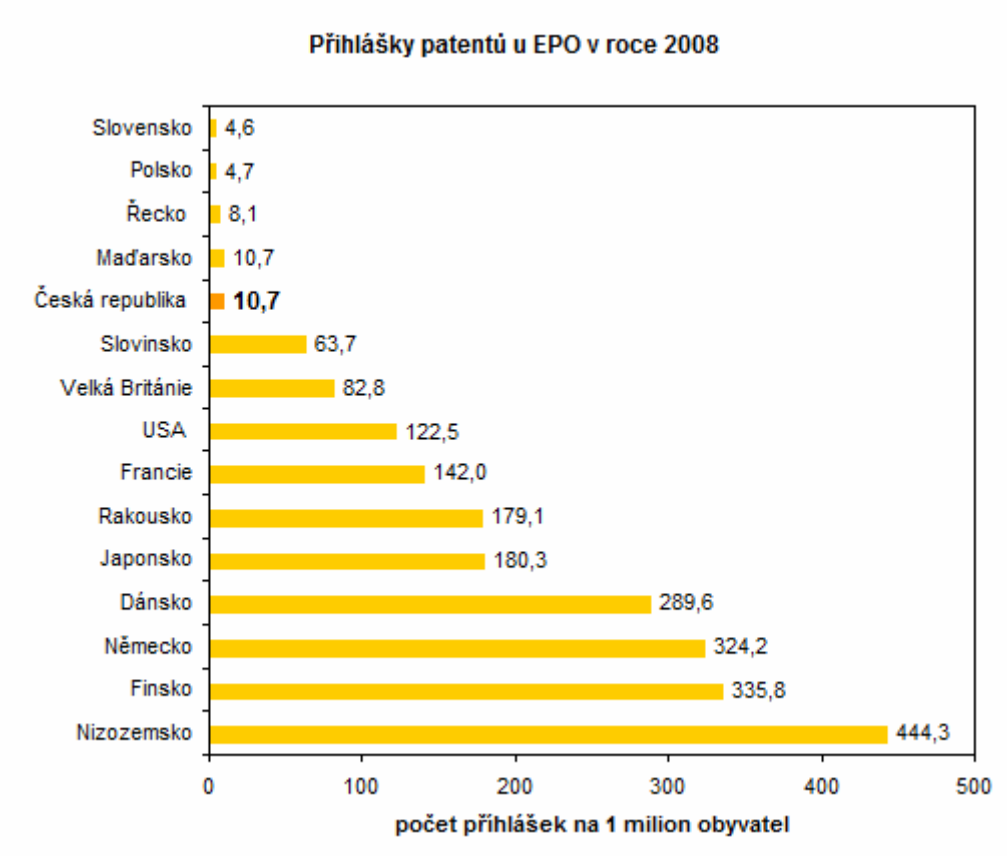
Source: Industrial Property Office Annual Report 2008

The statistics for 2008 in essence confirmed the stability of the number of utility model applications. The number of applications submitted matches the overall average for recent years.

Of foreign applicants the lead is held by Slovak applicants, who submitted over 30 applications. The breakdown of disciplines from utility models come is also comparable with recent years. Most of them come from construction, second place held by measurement which replaced transport, the third discipline was the health and entertainment area, as in 2007.

B.4.4 EPO patent applications

Patent applications at the EPO in 2008

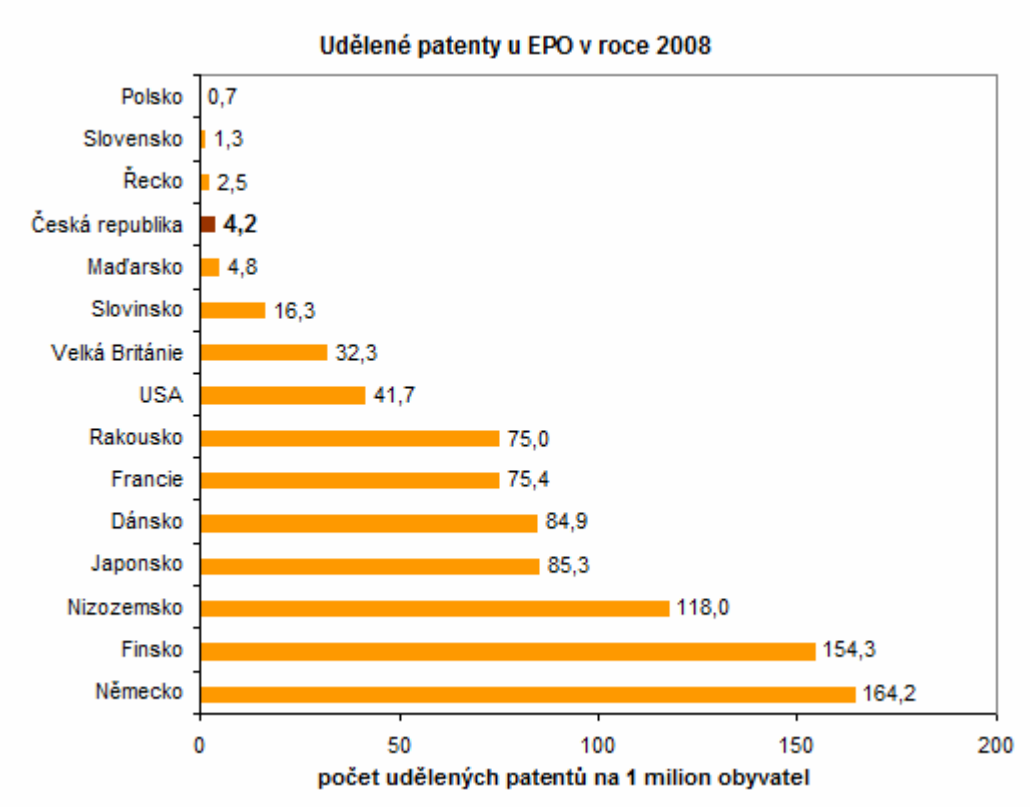


Applications per 1 million population

Source: European Patent Office Annual Report 2008

B.4.5 Patents granted by the EPO

Patents granted by the EPO in 2008



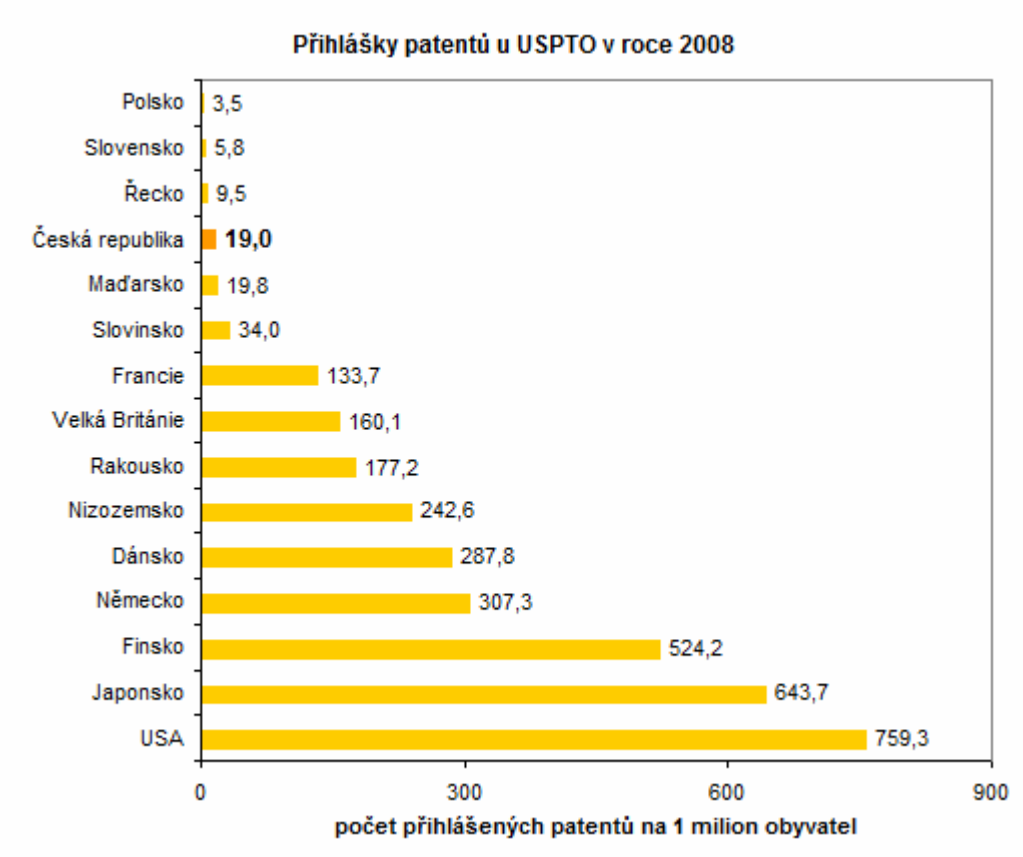
Patents granted per 1 million population

Source: European Patent Office Annual Report 2008

From the graphs it is clear that the number of patent applications at the EPO rose only slightly compared with the value for 2007, which was 9.3; the number of patents granted rose similarly, where the number reported for 2007 was 3.6 and that for 2008 is slightly higher at 4.2. In comparison with the data given in the Analysis of the State of Research, Development and Innovation in the Czech Republic and Comparison with the Situation Abroad in 2008 (ISSN 978-80-87041-49-9), the trend for patents granted at the EPO is one of slow growth.

B.4.6 USPTO patent applications

Patent applications at the USPTO in 2008

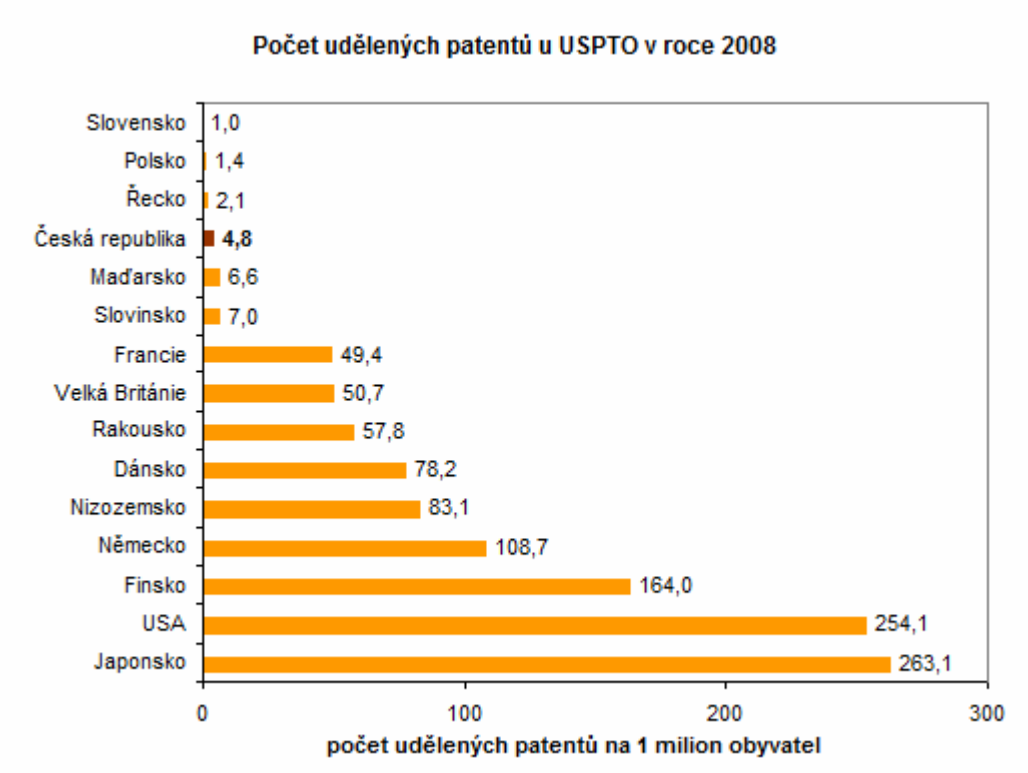


Applications per 1 million population

Source: USPTO, Patent Statistics Report for Viewing – 2008

B.4.7 Patents granted by the USPTO

Patents granted by the USPTO in 2008



Patents granted per 1 million population

Source: USPTO, Patent Statistics Report for Viewing – 2008

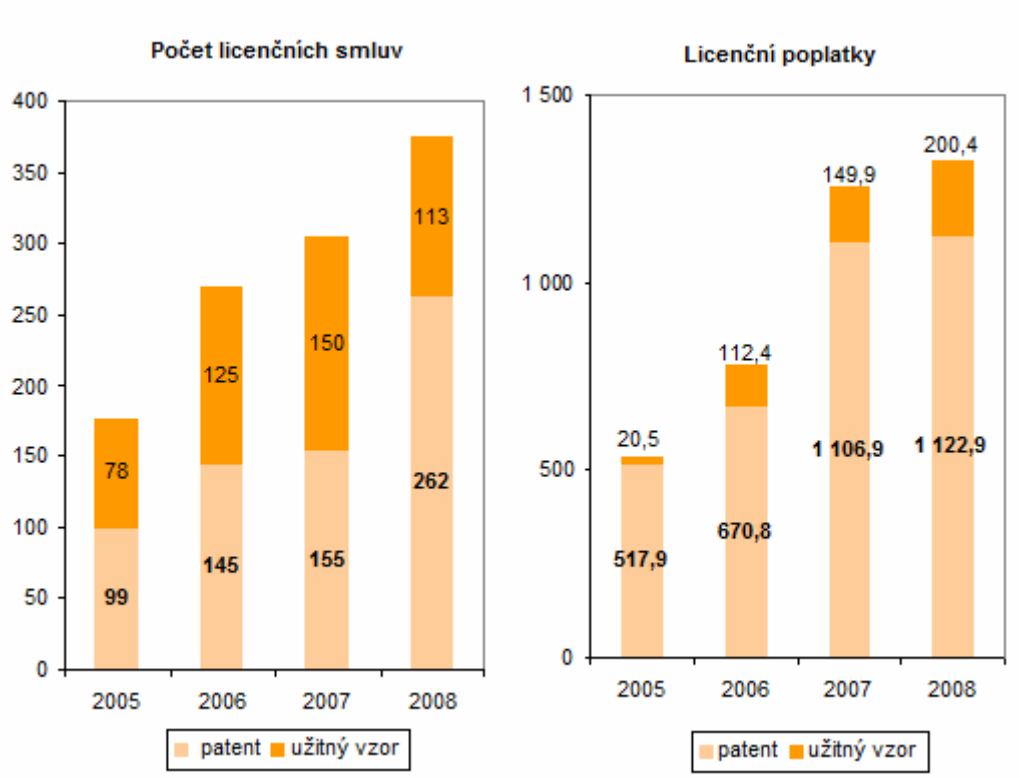
From the graphs it is clear that the number of patent applications at the USPTO compared with the value reported for 2007, which was 9.9, is 10 higher. The number of patents granted rose similarly, where the number reported for 2007 was 3.8 and that for 2008 is 4.8. In comparison with the data given in the Analysis of the State of Research, Development and Innovation in the Czech Republic and Comparison with the Situation Abroad in 2008 (ISSN 978-80-87041-49-9) from 2003 to 2007, when the values both for applications submitted and patents granted were almost the same, 2008 in patents granted at the USPTO a unit higher, but is still low in comparison with leading countries around the world which achieve a number of granted patents which is approx ½ of the number of patent applications submitted.

B.4.8 Number of valid licences for patents and utility models granted in the Czech Republic

Table B.4 Licences for patents and utility models granted in the Czech Republic

Indicator	*2005*	*2006*	*2007*	*2008*
Valid licensing agreements - total	177	267	305	375
Of which concluded in the year under review	36	100	92	58
Subject of licensing agreement				
Patent	99	145	155	262
Utility model	78	125	150	113
Size category of licensor				
Small (0-49 employees)	89	175	197	244
Medium (50-249 employees)	36	42	39	50
Large (250+ employees)	52	53	69	81
Industrial category of licensor				
Agriculture	1	16	13	14
Industry	25	34	84	93
Construction	1	8	11	8
Services	150	212	197	260
Of which research and development (OKEČ 73)	45	40	25	24
Country of origin of contractual partner (licensee)				
Czech Republic (domestic)	143	217	250	296
Foreign	34	53	55	79
License fees total (CZK mill.)	538,4	783,2	1 256,8	1 323,4
Of which: from licences concluded in the year under review	15,7	55,2	131,3	175,2
Subject of licensing agreement				
Patent	517,9	670,8	1 106,9	1 122,9
Utility model	20,5	112,4	149,9	200,4
Size category of licensor				
Small (0-49 employees)	201,1	18,4	31,5	60,8
Medium (50-249 employees)	6,5	42,5	122,7	8,5
Large (250+ employees)	510,8	722,3	1 102,6	1 254,1
Industrial category of licensor				
Agriculture	0,0	0,8	0,4	0,3
Industry	46,3	123,2	136,8	168,4
Construction	0,0	0,1	24,7	20,9
Services	492,1	659,1	1 094,8	1 133,8
Of which research and development (OKEČ 73)	470,4	601,3	950,3	908,8
Country of origin of contractual partner (licensor)				
Czech Republic (domestic)	.	21,6	43,4	71,5
Foreign	.	761,6	1 213,4	1 251,9

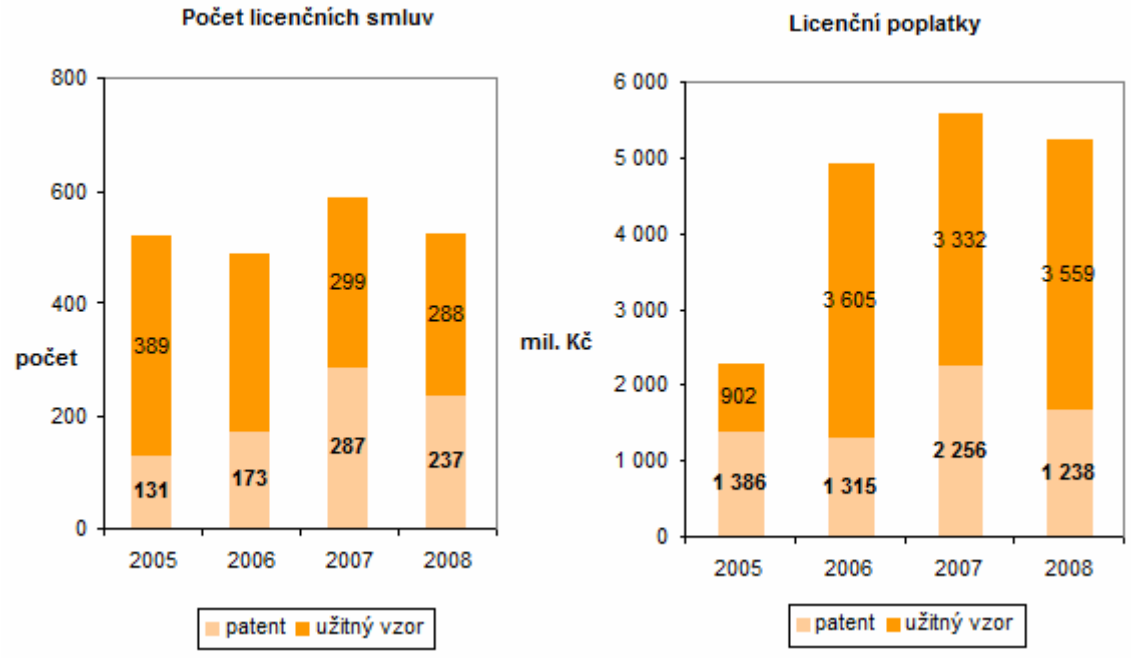
Source: Czech Statistical Office, Annual Statistical Investigation into Licences (LIC 5-01)



Patent Utility model

Source: Czech Statistical Office, Annual Statistical Investigation into Licences (LIC 5-01)

B.4.9 Number of valid licences for patents and utility models licensed (acquired) by bodies in the Czech Republic



Patent Utility model

Source: Czech Statistical Office, Annual Statistical Investigation into Licences (LIC 5-01)

Table B.5 Licences for patents and utility models licensed (acquired) in the Czech Republic

Indicator	*2005*	*2006*	*2007*	*2008*
Valid licensing agreements - total	520	489	586	525
Of which concluded in the year under review	51	89	105	79
Subject of licensing agreement				
Patent	131	173	287	237
Utility model	389	316	299	288
Size category of licensee				
Small (0-49 employees)	166	207	273	213
Medium (50-249 employees)	167	142	191	154
Large (250+ employees)	187	140	122	158
Industrial category of licensee				
Agriculture	3	7	25	13
Industry	362	320	419	386
Construction	22	10	10	12
Services	133	152	132	114
Country of origin of contractual partner (licensor)				
Czech Republic (domestic)	350	356	438	376
Foreign	170	133	148	149
License fees total (CZK mill.)	2 288,3	4 920,1	5 588,3	5 244,5
Of which: from licences concluded in the year under review	71,3	106,6	277,6	228,6
Subject of licensing agreement				
Patent	1 386,3	1 314,8	2 256,4	1 685,0
Utility model	902,0	3 605,3	3 331,9	3 559,4
Size category of licensee				
Small (0-49 employees)	81,6	64,4	169,6	32,7
Medium (50-249 employees)	316,6	489,0	352,2	176,7
Large (250+ employees)	1 890,1	4 366,7	5 058,4	5 035,0
Industrial category of licensee				
Agriculture	0,0	0,2	0,4	0,0
Industry	1 928,4	4 725,1	5 222,4	4 996,5
Construction	38,1	2,0	9,5	11,5
Services	321,8	192,8	347,9	236,4
Country of origin of contractual partner (licensor)				
Czech Republic (domestic)	.	130,4	214,4	77,6
Foreign	.	4 789,7	5 373,9	5 166,8

Source: Czech Statistical Office, Annual Statistical Investigation into Licences (LIC 5-01)

Chapter C – Innovation and competitiveness

C.1 Encouraging innovation in the Czech Republic

C.1.1 Support for innovation in the Czech Republic

Support for innovation under programmes run by the Ministry of Industry and Trade in 2007-2013

For the period 2007-2013 the main instrument for direct support for innovation is the "Enterprise and Innovation 2007-2013 Operational Programme" which reflects the priority areas of the Ministry of Trade and Industry's innovation policy and at the same time links this policy up with the regional dimension of economic and political measures. The Prosperity programme is focused on supporting the infrastructure for innovation, the Innovation programme on supporting the introduction of innovation and increasing patent activity, and the Cooperation programme focuses on supporting regional and supra-regional cooperation. The Potential programme supports the science and research infrastructure of companies. More about these programmes in given in Chapter D.2.1.

Competitiveness and Innovation Framework Programme 2007-2013

In 2008, the implementation of the Community framework programmes 'Competitiveness and Innovation 2007-2013' (CIP) continued to operate; it consists of three sub-programmes. Each sub-programme has its own steering committee, work programme and system for the organization of calls. The common horizontal theme is the promotion of eco-innovations, financial instruments for small- and medium-sized enterprises (SME) and the European Enterprise Network (EEN). The total allocation for the 2007-2013 implementation period is EUR 3.621bn

Further to this programme the "European Action for small- and medium-sized enterprises: business without barriers" conference was organised on 13-14 May 2009 in Prague, at the initiative of the Czech EU Presidency and in conjunction with the European Commission. This conference saw the announcement of European Enterprise Awards, which were awarded for innovative approaches to supporting business in small- and medium-sized enterprises.

The **Entrepreneurship and Innovation Programme** (60% of the overall budget) is geared towards support for innovative small- and medium-sized enterprises. The largest activity under this programme are the new financial instruments provided by the European Investment Fund (EIF) – risk capital for highly innovative businesses, and loan guarantees for small and medium-sized enterprises, as well as microcredit.

The Information and Communication Technology Policy Support Programme (20 % of the overall budget) promotes the broader use of information and communication technology by citizens, state administration and businesses within the scope of the i2010 initiative. Specific activities aim to:

a) create a Single European Information Space and internal information market for products and services

b) stimulate innovation by expanding and investing in ICT

c) foster an open information society with greater efficiency and effective services in the public interest and to enhance the quality of life

The Intelligent Energy for Europe Programme (20 % of the overall budget) contains three priorities:

a) to raise energy efficiency and the increase the rational use of energy sources

b) to increase Member States' investments in new and renewable energy sources and energy diversification

c) to enhance energy efficiency and apply new and renewable sources in transport.

The CIP and its instruments are promoted via Executive Agency for Competitiveness and Innovation through the Enterprise Europe Network, the member centres of which provide uniform business support services throughout Europe.

In the Czech Republic, this network is operated by the BISONet consortium managed by the AVCR Technology Centre. As an example of activities we might mention the organising of a total of 70 different events in support of business and SMEs. Almost 2500 people took part in these events.

The Business and Innovation Sub-Programme

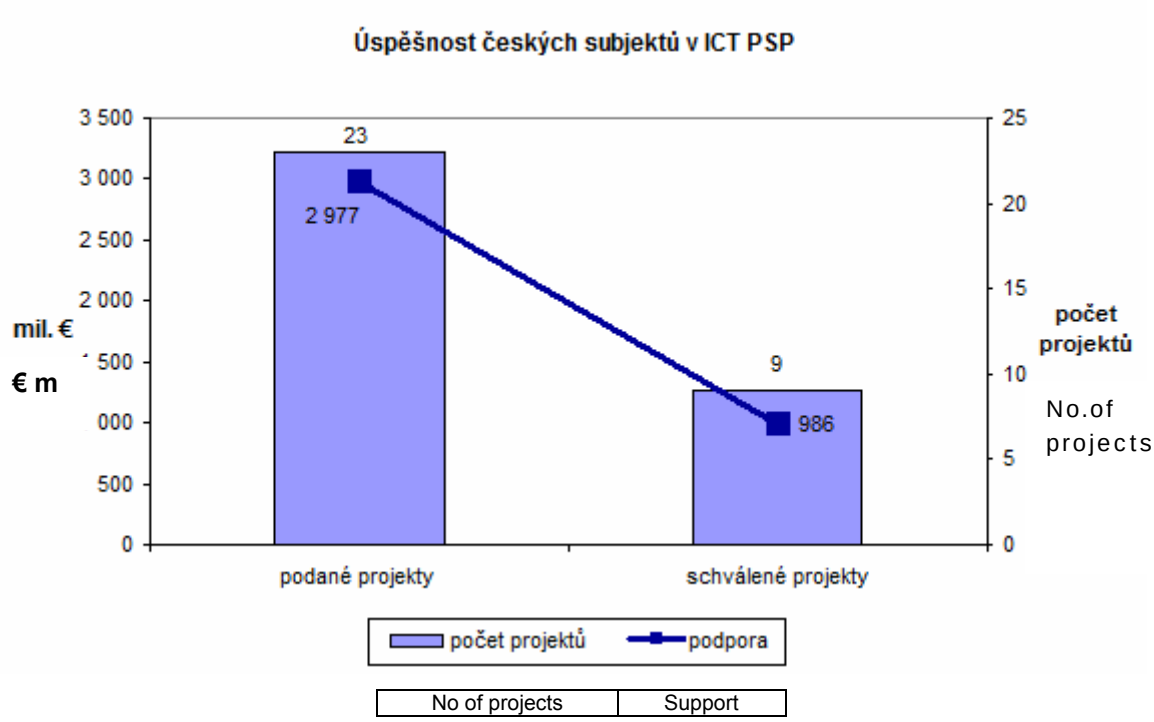
Approx 20 calls for submission of projects are announced every year within the Business and Innovation Sub-Programme. Calls are differentiated thematically and by condition and the themes are rarely repeated. In 2008 the main announced calls concerned the Europe Innova and Pro Inno activities. The first call was also made for projects focused on eco-innovation. The Czech Republic also received a grant to organise a conference to close the May 2009 European Week of Small- and Medium-sized Enterprises. Prizes were also announced during the conference for benefits in business.

The ICT PSP Sub-Programme

One or two calls are normally made under the ICT Policy Support and Intelligent Energy for Europe II sub-programme twice a year; these cover all areas of the working programme for the year in question.

12 Czech companies were involved in the 2nd call for the CIP ICT PSP community programme in 2008 in a total of 9 projects. None of the companies was involved in more than one project at a time. Three projects had 2 Czech companies involved. No Czech company held the role of coordinator. The total budget for projects with Czech representation was €1.750m, of which a grant from the EU made up €0.925m

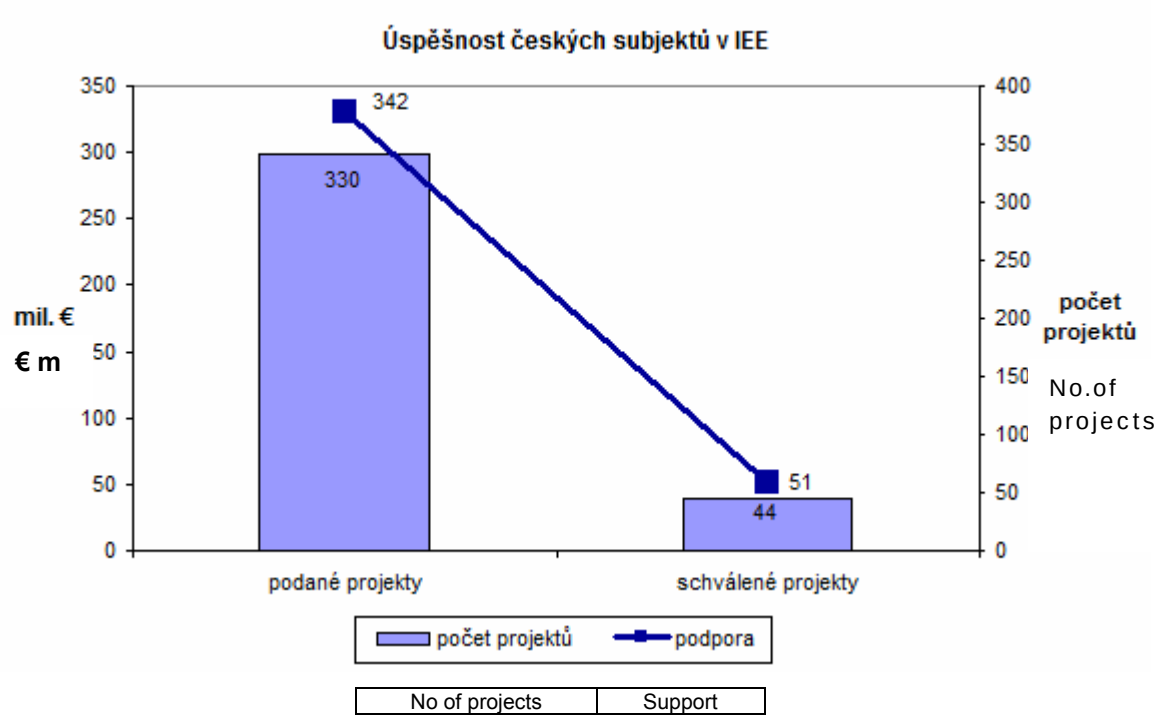
Following evaluation of the project proposals 4 projects with Czech representation were accepted for financing, a success rate of 33% Of all Czech companies involved in the 2nd call, 5 were successful, i.e. 42% Czech companies were allocated a total of €434,055, of which €394,053 had to be co-financed by the Czech companies from their own funds.



Source: Ministry of Trade and Industry

The Intelligent Energy for Europe II Sub-Programme

In the 2008 call for the Intelligent Energy for Europe II programme there were a total of 342 projects which were accepted by the European Commission, requiring altogether €330m in co-financing. The evaluation was conducted in the autumn of 2008 with the help of 83 experts. A total of 44 projects (+ 5 projects on the reserve list) and 10 agencies (+ 1 agency on the reserve list) were recommended for co-financing. €51m, i.e. 17% of the total amount requested, was awarded in grants for co-financing of projects.



Source: Ministry of Trade and Industry

In 2008 the Czech Republic gained slightly higher support for co-financing from the EU within the IEE programme than in 2007. The success rate for projects submitted on behalf of the Czech Republic is very satisfactory - 28% for 2008, as compared to 23% for 2007.

In most cases applicants from the Czech Republic are participants in consortia created for the purpose. Only a small number of these take part in projects in the role of project coordinator, in 2008 the Czech Republic gained slightly higher support for co-financing from the EU within the IEE programme than in 2007.

C.1.2 State support for industrial research and development

For the period 2009 to 2017 the principal instrument for direct support of industrial research and development is the TIP programme of the Ministry of Trade and Industry. This programme was approved by the Czech government on 22.8.2007 in Regulation No. 942 and notified by the European Commission on 20.11.2008 under No. N662/2007 in line with the Community Framework for state support for research, development and innovation (2006/C 323/01).

The receipt of applications for the programme will be accompanied each year by a public tender. This will be always be announced in the preceding year, with the last competition to be announced for 2014. Project implementation must be started in the year, for which the public tender has been announced. The termination of implementation for all projects is set for 2017 with the implementation period for individual projects being set at up to four years (48 months).

The aim of the TIP programme is to provide support for research and development projects conducted in the phase preceding the launch of products or processes in the competitive conditions of the marketplace, to secure research and development for rational industrial manufacturing for the future, to strengthen manufacturing in the Czech Republic and then in the European Union, to secure sustainable development in all its aspects, i.e. economic, social and environmental, to secure the smooth and continuous generation of research and development findings for industrial manufacturing and to secure their continuous and effective use.

Projects must also inter alia bring about significant motivational effects for further research and development activity in the sense of Part 6 of the Community Framework.

In addition to supporting research and development, the programme also enables support for small- and medium-sized enterprises on costs associated with acquiring and recognising patents or other rights to industrial ownership in the sense of Art. 5.3 of the Community Framework.

In view of the fact the notification of the programme by the European Commission occurred throughout 2008, the first public tender for the TIP programme for 2009 was announced only on 21.1.2009. The results of the public tender were published on 30.6.2009. Of 620 projects submitted to the tender, 441 projects were recommended.

A repeat public tender for the TIP programme for projects begun in 2010 was announced on 24.6.2009. The results of the public tender will be published on 8.3.2010.

C.1.3 Innovation for competitiveness

During the Czech Presidency of the European Union the Council for Competitiveness adopted Key Communications for 2009 (5.3.2009) - the contribution of the Council for Competitiveness to the Spring European Council. In these Key Communications for 2009 there are 2 priorities out of 5 which are directed at the issue of competitiveness and innovation. These are the priority areas concerning:

Improving the framework conditions for industry with special focus on innovation and competitiveness in small- and medium-sized enterprises (key is to improve the framework conditions for industry mainly by meeting the priorities of the Lisbon Strategy, giving enterprises, particularly small and medium sized, access to finance, to increase and make more effective grants for investment and infrastructure, to improve energy efficiency, support the availability and quality of professional education, introduce the principles contained in the European Act on small businesses, support innovations, the Community patent and patent legislation)

Increasing and improving the quality of investment in knowledge, education and research (key is to increase investment in education, science and innovation, to create conditions for the free movement of scientists, knowledge and technologies - the so-called "fifth freedom" (European Research Area), to support joint scientific programmes and infrastructure in research within the EU and scientific and technology cooperation with third countries).

INCOM Conference

Lichtenstein Palace, Prague, 22. – 23. January 2009

Through this conference the Czech Republic offered the possibility of setting up the Prague Innovation Forum as a standing advisory group to the European Commission, which would formulate inputs to the formation of European Union innovation policy. The aim of the conference was to analyse EU innovation policies and in particular the policies of the new member states. Experience has in fact shown that existing EU innovation policies are much more effective in the surroundings of the highly technologically developed older member states

than in the new member states. An expert group[9] consisting of 9 major experts from the USA and the EU prepared a number of studies for INCOM which were presented at the conference and submitted for comprehensive discussion in several round tables.

The conference dealt with five problem areas:

- Specific national approaches to growth policy and the implications for the new member states
- Innovation policy in individual sectors: consequences for the new member states
- EU innovation policy: the need to achieve a differentiated approach for individual countries
- Multinational companies, globalisation and innovation systems: the impact on the policies of new member states.
- Innovation policies focused on demand

The specialists who took part, including representatives of the European Commission and the OECD, came to the following conclusions:

The Lisbon Strategy (2000) and in particular the Barcelona goal of increasing investment in R&D in the EU to 3% of GDP by 2010 (of which 2/3 will be invested by the private sector), **cannot be achieved** mainly because the majority of member states have not aligned their innovation strategy in R&D with the level of their economic development and with their industrial potential. It was therefore proposed to set up a multinational council for competitiveness which would assist in the appropriate development of national innovation policies and contribute to a deepening of pan-European cooperation in this area and propose measures for the more effective use of existing policies and instruments, such as the method of open coordination, the European networks of research and innovation agencies (ERANET a INNONET).

There must be further **development of European instruments to secure appropriate financing of RDI**. In particular this means more efficient linkage of public funds and private investment. It is in this sector that the new member states differ very markedly from the older member states. Where older member states have available significant capital to finance the innovation which determines global supremacy in demanding technologies, a major part of investment in the new member states is incurred on transferring existing technologies from the older member states. Any level of direct foreign investment in the new member states is interpreted as a positive characteristic of the growth of a given national economy. As a rule these investments indicate activities other than the innovation which the older member states are striving for. These differences need to be borne in mind when forming European innovation policies and new member states can no longer rely on their competitive advantage, which is based on lower input costs.

The absorption and innovation capacity of a country depends substantially on the **quality of its education system**, and in particular on the preparation of specialists in cognitive sciences. However, member states have a very varied level of support for education, particularly in respect of the level of investment in the educational system. The OECD PISA studies show that those new member states with higher expenditure on their education system deal better with the demands of a knowledge society and thereby higher levels of competitiveness. New member states should make much more use of proven financial instruments, e.g. tax breaks for

[9] Members of the expert group: Ph. Aghion (Harvard University, USA), J. Edler (Manchester Business School, UK), A.Kadeřábková (Centre for Economic Studies, CZ), R. Narula (University of Reading, UK), S.Radoševič (London School of Economics, UK), A. Reid (Technopolis, BE), A.Reinstaller, F. Unterlass, M. Bohem (Östereichisches Institute für Wirtschaftforschung, AT).

employees and companies which support improved professional skills. It has been shown that such support is more efficient that the creation of state-managed programmes for improving qualifications. In any case, the current financial crisis means a major opportunity to restructure existing systems of professional training and building a country's innovation capacity.

New member states should make maximum **use of structural funds to build up support services** specific to individual branches of industry. Foreign investment agencies should create programmes to integrate foreign investors' plans into national development programmes, which very often link into international programmes, and not to rest at acquiring isolated investments which do not link to difficult innovation and the acquisition of high-level technologies. Analysis is need of the possibility of setting up a support coordination body which would help pan-European value chains and networks and assist their linking-in to global chains.

A fundamental problem of the knowledge economy in new member states is the **weak demand from industry for research, development and innovation.** A national economy should have its own strategic vision and innovation policy should be part of this. However, such a vision must encompass the whole of society, it cannot be built on technological foresight alone. Whereas the methods for generating the vision may be general or universal, the vision itself must reflect national traditions and match up uniquely to the needs of society in a particular country. Public programmes need to be formulated so as to lead to a search for the most efficient technologies and for industrial investment thus to be stimulated and supported. New member states have so far failed to provide sufficient stimulus for demand for innovation using public contracts. There is a need to improve the performance of state administration in this and to eliminate negative phenomena such as non-objective evaluation of public tenders, protectionism, renationalisation of public contracts, etc.

The formation, conduct and **evaluation of national innovation policies is insufficiently developed.** Here also there is a need to develop systematic professional training, both for non-governmental organisations which would analyse and assess research, development and innovation policies, and for state administration which should be more active in formulating appropriate programmes, including methods for evaluating them.

The Conference recommended that the **framework programmes allocate appropriate funds to analysing research, development and innovation** in selected groups of countries, and in the new member states in particular. We must create a system of indicators and method for analysing programme impact in specific situations in individual countries and thus contribute to the creation of a research, development and innovation policy based on evidence so obtained.

EUFORDIA Conference

Prague Congress Centre, 24.-25. February 2009

The impetus for organising the EUFORDIA conference (EUropean FOrum on Research and Development Impact Assessment) came from the meeting of the France - Czech Republic - Sweden group which was preparing inter-linked programmes for their presidencies of the EU Council. From the very beginning the Czech Republic advocated the European Commission assessing framework programmes for research and technical development not only according to the number of projects begin, or teams working on their implementation, but also taking into account an analysis of results achieved in these projects. The Czech Republic, with the support of both of the other two countries, advocated the European Commission's creation of a database system which would record project results. The implementation of such a plan is not easy, since it places great demands both on the administration of framework programmes, and on project implementers themselves and must necessarily be accompanied by a pan-European discussion which will deal with the evaluation of results and the impact of framework programmes. The EUFORDIA conference had as an aim to create a relevant discussion forum which will deal with this issue on a systematic basis. Preparation of conference topics was managed by an international programme committee.[10]

EUFORDIA was devoted to the following four topics:

- Ex-post evaluation of the 6th Framework Programme, organised by the European Commission in 2008
- Evaluation of the 6th Framework Programme and its impact at the level of individual topic priorities, at national level
- The principles and techniques for the ex-post evaluation of the 6th Framework Programme and its impact
- International experience of evaluating large research and development programmes

EUFORDIA was the first international forum at which a comprehensive report on the ex-post evaluation of the 6th EU Framework Programme, organised by the European Commission, was

[10] Chairman: I. Wilhelm, Government Representative of the Czech Republic, Members: Chairman, Office for the Protection of Competition, V.Albrecht, Technology Centre of the Academy of Sciences of the Czech Republic , M. Chvojka, Ministry of Education, Czech Republic, F. Cunningham, European Commission, M.L.Gaillard, Ministry of Education and Research France, S.Kuhlmann, Universita Twente, the Netherlands, M.Makarow, European Science Foundation, G.Marklund, Vinnova, Sweden, N.Reeve, European Commission, C.M.Riera, Ministry of Education and Science Spain, J.Syka, Czech Grant Agency, J.Vaněček, Technology Centre of the Academy of Sciences of the Czech Republic , M.Weber, European Court of Auditors, Luxembourg, N. Witzanyová, Ministry of Education, Youth and Sport Czech Republic.

presented. The report was prepared by a group of 13 experts led by Ernst Rietschel from the Leibniz Society (Germany). Delegates stated that the report responded to many more questions than reports on previous framework programmes and thus represented a significant improvement.

Nevertheless this report deals only peripherally with the issue of evaluating results achieved and therefore EUFORDIA calls on the European Commission to move to develop a results database. This database should be made available to national administrations to the maximum extent possible, for the purpose of further analysis.

National analyses of their involvement in the 6th Framework Programme and its impact were presented by representatives from Sweden, Spain and the Czech Republic. The Swedish study of the impact of the 6th Framework Programme was very comprehensive, dealing with the involvement of industry and university centres, and analysed the impact of involvement in the individual priorities of the 6th Framework Programme. It was shown that involvement in the framework programme is of major significance for those industrial sectors whose products must meet pan-European standards (e.g. motor car exhaust gas composition). The Spanish study analysed the reasons for, and impact of, involvement at the level of individual teams, institutions and at national level. The Czech study was, inter alia, focused on a bibliometric analysis of results achieved in 6th Framework Programme projects which were distinctive for their wide international cooperation. These three studies have differing outcomes and also differed in their data processing methodology.

EUFORDIA recommended that the studies on involvement and impact lead to internationally comparable results and conclusions and called on member states to exchange "good practice", in the choice both of indicators and of analyses of their mutual correlation, and correlation with other quantities. EUFORDIA also recommended the preparation of a methodology which would permit the analysis of the impact of the framework programme on national R&D programmes and on innovation systems.

EUFORDIA also stressed that it is also necessary to monitor the mutual links between the framework programme and structural funds, particularly in the area of growing research capacity.

Delegates stated that evaluation of the framework programme must be based on a precisely formulated "intervention logic" which indicates in advance how to assess the effectiveness of achieved results and their impact, in view of the public funds expended on the framework programme. EUFORDIA requests that the European Commission prepare such an "intervention logic" and present it at the ex-ante evaluation of the 8th Framework Programme, whose preparation will soon begin. At the same it recommended that the Commission take into account at this ex-ante evaluation the experience and recommendations which the member states have come to in their national studies on the impact of their involvement in the 6th Framework Programme.

In accordance with the international experience discussed, particularly from the USA (National Science Foundation) and the Republic of Korea, EUFORDIA called on member states to have their proposed national research and development programmes permit to the maximum extent possible the evaluation of achieved results and develop methodologies for analysing their impact on society.

C.2 International comparison of innovation performance according to the European Innovation Scoreboard (EIS 2008)

The Scoreboard is published annually by the European Commission. The Scoreboard and its methodology were prepared on the basis of a requirement of the European Council stemming from its spring summit in Lisbon in 2000. Its mission is to contribute to the open method for the coordination of national policies within the EU. The aim of this evaluation is not to establish a ranking list of countries, but to seek out reasons for success and lack of success and ways to implement the best approaches while respecting the specifics of individual countries. The European Innovation Scoreboard is regarded as an effective tool for the benchmarking of innovation policies.

The methodology is being steadily modified. The most significant changes occurred in 2005, when the European Innovation Scoreboard was completely revised in collaboration with JRC 1 and in 2008, when the structure of the indicators was substantially changes and a number of new indicators introduced. An evaluation was conducted for individual indicators, including trends; the Summary Innovation Index and its trends were also assessed. The EIS 2008 evaluation by individual indicators included certain other countries in addition to the EU-27 member states.

The following table is structured in three blocks (enablers, business activities and outputs) giving seven groups of indicators and 29 individual indicators for 2008 and their data sources including the reference year.

Table C.1 Indicators

	Enablers - Human Resources	
1.1	Graduates of natural science, engineering, social science and humanities university disciplines (per 1000 population aged 20-29)	Eurostat (2006)
1.2	Doctoral studies graduates of natural science, engineering, social science and humanities university disciplines (per 1000 population aged 25-34)	Eurostat (2006)
1.3	Population with tertiary education (per 100 population aged 25-64)	Eurostat (2007)
1.4	Participation in lifetime learning (per 100 population aged 25-64)	Eurostat (2007)
1.5	Youth education attainment level (% of population aged 20-24 having completed at least upper secondary education)	Eurostat (2007)
	Enablers - Finance and Support	
2.1	Public R&D expenditures (% of GDP)	Eurostat (2007)
2.2	Risk Capital (% GDP)	EVCA/Eurostat (2007)
2.3	Credit provided by the private sector (in relation to GDP)	IMF (2007)
2.4	Broadband network penetration by company (% of companies)	Eurostat (2007)
	BUSINESS ACTIVITIES - Company Expenditure	
3.1	Business R&D expenditures (% of GDP)	Eurostat (2007)
3.2	ICT expenditures (% of GDP)	EITO/Eurostat (2006)
3.3	Innovation expenditure without R&D expenditure (% of turnover)	Eurostat (2006)
	BUSINESS ACTIVITIES - Links and Business	
4.1	SMEs innovating in-house (% of SMEs)	Eurostat (2006)
4.2	Innovative SMEs cooperating with others (% of SMEs)	Eurostat (2006)
4.3	Company renewal (SMEs established and cancelled) (% of SMEs)	Eurostat (2005)
4.4	Joint publications (public-private) per 1m population	Thomson Reuters/CWTS (2006)
	BUSINESS ACTIVITIES - Performance	
5.1	EPO patent applications (per million population)	Eurostat (2005)
5.2	Community trademarks (per million population)	OHIM /Eurostat (2007)
5.2	Community industrial designs (per million population)	OHIM/Eurostat, (2007)
5.4	Technology balance of payments (% of GDP)	World Bank (2006)
	OUTPUTS - Innovators	
6.1	SMEs introducing product or process innovations (% of SMEs)	Eurostat (2006)
6.2	SMEs introducing marketing or organisational innovations (% of SMEs)	Eurostat (2006)
6.3	Efficiency of enablers for innovators, unweighted average of:	
	Proportion of innovators for whom an innovation has significantly reduced working costs	Eurostat (2006)
	Proportion of innovators for whom an innovation has significantly reduced material and energy costs	Eurostat (2006)
	OUTPUTS - Economic effects	
7.1	Employment in medium-high and high-tech process industries (% of total workforce)	Eurostat (2007)
7.2	Employment in knowledge-intensive services (% of total workforce)	Eurostat (2007)
7.3	Export by in medium-high and high-tech process industries (% of total export)	Eurostat (2006)
7.4	Export in knowledge-intensive services (% of total services export)	Eurostat (2006)
7.5	Sales of new-to-market products (% of turnover of all firms)	Eurostat (2006)
7.6	Sales of new-to-firm products (% of turnover of all firms)	Eurostat (2006)

In all the following evaluation tables, prepared on the basis of EIS 2008 data, the following are used for comparison:

Bold: More than 20% better than the EU-27 average

Italics: More than 20% worse than the EU-27 average

Normal: Within a band of plus or minus 20% of the EU-27 average

Table C.2 ENABLERS - Human Resources

	University graduates	*Doctoral Studies graduates (Ph.D.)*	*Population with university education*	*Lifetime education*	*Young people with completed secondary education*
	1)	*2)*	*3)*	*4)*	*5)*
EU-27	40,3	1,11	23,5	9,7	78,1
Finland	**38,3**	**2,17**	**36,4**	**23,4**	86,5
Denmark	46,8	**0,93**	**32,2**	**29,2**	70,8
France	**62,0**	1,13	*26,8*	*7,4*	82,4
Germany	*25,9*	**1,56**	*24,3*	7,8	72,5
Netherlands	*36,0*	*0,87*	**30,8**	**16,6**	76,2
Austria	*21,6*	**1,72**	*17,6*	**12,8**	84,1
Greece	*25,3*	*0,58*	*22,0*	*2,1*	82,1
Great Britain	**52,0**	**1,61**	**31,9**	26,6	78,1
Czech Republic	*25,8*	*0,86*	*13,7*	*5,7*	**91,8**
Hungary	*30,2*	*0,42*	*18,0*	*3,6*	84,0
Slovakia	*24,4*	*0,89*	*14,4*	*3,9*	**91,3**
Slovenia	*41,0*	0,96	**22,2**	**14,8**	**91,5**

Key:

1) Share of science, engineering, social science and humanities graduates in the total population aged 20-29 (%)
2) Share of doctoral studies graduates in science, engineering, social sciences and humanities per 1000 persons aged 25 - 34 (%)
3) Share of population with university education per 100 population aged 25 - 64 (%)
4) Share of people who have in the four weeks prior to the survey taken part in some kind of lifetime learning activity, per 100 population aged 25 - 64 (%)
5) Share of people who have completed secondary education (full, or incomplete) aged 20-24 (%)

Table C.3 ENABLERS - Finance and Support

	Public R&D expenditures (% of GDP)	*Risk Capital (% GDP)*	*Credit provided by the private sector (in relation to GDP)*	*Broadband penetration (% of firms)*
	1)	*2)*	*3)*	*4)*
EU-27	0,65	0,107	1,31	77,0
Finland	**0,94**	**0,163**	*0,84*	91,0
Denmark	**0,88**	**0,088**	**2,02**	80,0
France	0,74	0,099	1,23	*89,0*
Germany	0,76	*0.049*	1,17	80,0
Netherlands	0,67	0,107	**1,95**	87,0
Austria	0,75	*0,037*	1,29	72,0
Greece	*0,41*	*0,008*	*0,91*	72,0
Great Britain	0,64	**0,483**	**1,90**	*78,0*
Czech Republic	*0,55*	*0,007*	*0,47*	*77,0*
Hungary	*0,46*	*0,026*	*0,62*	*70,0*
Slovakia	*0,27*	*0,007*	*0,42*	*76,0*
Slovenia	*0,60*	--	*0,81*	*79,0*

Key:

1) All R&D expenditure in the public sector and universities as % of GDP.
2) Investment of risk capital into early phases of business and into business expansion as % of GDP.
3) Credit provided by commercial banks and other financial institution in relation to GDP
4) Non-financial business (with 10 or more employees) using broadband connections (as % of the total number of companies in this segment)

Table C.4 BUSINESS ACTIVITIES - Company Expenditure

	Business R&D expenditures (% of GDP)	*ICT expenditures (% of GDP)*	*Innovation expenditure without R&D expenditure (% of turnover)*
	1)	***2)***	***3)***
EU-27	1,17	2,7	1,03
Finland	**2,51**	**3,2**	--
Denmark	**1,65**	**3,2**	*0,51*
France	1,31	3,1	*0,33*
Germany	**1,77**	**2,9**	1,07
Netherlands	1,03	**3,3**	*0,29*
Austria	**1,81**	2,8	--
Greece	*0,15*	*1,2*	*0,74*
Great Britain	1,08	**3,5**	--
Czech Republic	*0,98*	*3,2*	0,88
Hungary	*0,49*	*2,5*	*0,72*
Slovakia	*0,18*	*2,5*	**1,51**
Slovenia	*0,94*	*2,2*	1,12

Key:

1) All R&D expenditure in the business sector as % of GDP.
2) All expenditure on ICT in the market as a whole (as % of GDP).
3) All expenditure on innovation in companies (excluding R&D expenditure) as % of GDP.

Table C.5 BUSINESS ACTIVITIES - Links and Business

	SMEs innovating in-house	*SMEs working with others on innovations*	*Company renewal (SMEs established and closed down)*	*Joint publications (public-private)*
	1)	***2)***	***3)***	***4)***
EU-27	30,0	9,5	5,1	31,4
Finland	**40,9**	**27,5**	0,7	**83,1**
Denmark	**40,8**	14,9	--	**108,7**
France	28,3	**11,5**	--	27,9
Germany	**46,3**	9,0	**--**	**45,9**
Netherlands	27,3	**12,5**	*6,3*	**83,7**
Austria	**41,1**	**18,0**	--	**58,0**
Greece	32,7	**13,3**	**--**	*8,7*
Great Britain	--	**10,7**	*10,3*	**54,7**
Czech Republic	28,0	11,7	4,7	*12,6*
Hungary	*13,2*	*6,5*	*8,7*	*16,9*
Slovakia	*17,9*	*7,2*	4,8	*4,5*
Slovenia	--	**15,1**	*2,2*	**28,2**

Key:

1) Share of SMEs (small and medium sized enterprises) which have introduced new products or processes (in-house), against total number of SMEs (%).

2) Share of SMEs cooperating with others on innovations (% of SMEs)

3) Company renewal in % (share of all newly founded and closed-down SMEs with at least 5 employees) (% of SMEs.

4) All research publications arising from cooperation between the public and private sectors given in the Web of Science database (per 1m population).

Table C.6 BUSINESS ACTIVITIES - Performance

	EPO patent applications	*Community trademarks*	*Community industrial designs*	*Technology balance of payments (% of GDP)*
	1)	*2)*	*3)*	*4)*
EU-27	105,7	124,6	121,8	1,07
Finland	**267,6**	**137,3**	**116,8**	**1,61**
Denmark	**174,6**	**212,1**	**280,4**	**--**
France	119,2	*94,4*	107,5	*0,42*
Germany	**275,0**	**187,7**	**222,6**	*0,47*
Netherlands	**173,3**	**195,8**	**135,3**	**1,21**
Austria	**183,1**	**237,1**	**284,6**	*0,50*
Greece	*6,5*	*41,9*	*7,0*	*0,15*
Great Britain	91,4	**153,1**	*87,1*	0,99
Czech Republic	*7,3*	*47,1*	*67,7*	*0,39*
Hungary	*7,8*	*26,0*	*18,3*	**1,49**
Slovakia	*5,8*	*20,6*	*18,0*	*0,43*
Slovenia	*32,2*	*68,7*	*50,5*	*0,46*

Key:

1) EPO patent applications (per million population)
2) New Community trademarks (per million population)
3) New Community industrial designs (per million population)
4) Accepted and paid licence fees (% of GDP, b.c US$]

Table C.7 OUTPUTS - Innovators

	SMEs introducing product or process innovations	*SMEs introducing marketing or organisational innovations*	*Efficiency of enablers for innovators*	*Reduction in working costs*	*Reduction in material and energy costs*
	1)	*2)*	*3)*	*4)*	*5)*
EU-27	33,7	40,0	--	18,0	9,6
Finland	**44,7**	**--**	--	*10,7*	*5,2*
Denmark	35,7	**45,4**	--	*11,5*	*7,3*
France	29,9	41,3	--	**34,9**	**15,9**
Germany	**52,8**	**68,1**	**--**	*15,1*	9,5
Netherlands	32,9	*29,0*	--	*16,6*	10,5
Austria	**47,8**	**54,9**	--	*11,9*	9,7
Greece	37,3	**51,3**	**--**	**26,2**	**20,7**
Great Britain	*25,1*	**30,3**	--	**--**	**--**
Czech Republic	32,0	**36,2**	--	*18,2*	**14,2**
Hungary	*16,8*	*26,4*	--	*6,2*	*7,2*
Slovakia	*21,4*	*21,5*	--	*8,0*	10,8
Slovenia	31,7	--	--	**28,4**	**17,2**

Key:

1) SMEs which have introduced a new product or new process (% of SMEs).
2) SMEs which have introduced marketing or organisational innovations (% of SMEs)
3) Efficiency of enablers for innovators (unweighted average of the next 2 indicators:
4) Innovating firms who state their product or process innovation has had a very significant import on reducing working costs per unit of production (% of total number of innovating firms).
5) Innovating firms who state their product or process innovation has had a very significant import on reducing material and energy consumption per unit of production (% of total number of innovating firms).

Table C.8 OUTPUTS - Economic effects

	Employment in medium-high and high-tech process industries	*Employment in knowledge-intensive services*	*Export by medium-high and high-tech process industries (% of total export)*	*Export in knowledge-intensive services (% of total services export)*	*Sales of new to market products*	*Sales of new to firm products*
	1)	*2)*	*3)*	*4)*	*5)*	*6)*
EU-27	6,69	14,51	48,1	48,7	8,60	6,28
Finland	6,20	**18,45**	54,8	**49,7**	8,29	5,10
Denmark	6,03	**15,37**	41,2	**67,2**	*3,79*	*4,05*
France	6,35	15,76	58,9	--	*6,16*	5,56
Germany	**10,72**	15,58	**65,5**	*53,8*	9,12	**10,11**
Netherlands	*3,15*	**17,97**	*48,3*	*39,9*	*6,02*	*4,87*
Austria	6,66	14,15	53,2	*31,3*	*6,56*	7,08
Greece	*2,38*	*11,06*	*28,3*	*51,8*	**16,60**	**9,04**
Great Britain	5,40	18,64	*58,2*	*8,9*	*3,70*	*4,81*
Czech Republic	**10,85**	**10,92**	**61,3**	*35,5*	9,93	*4,72*
Hungary	**8,82**	*11,35*	**69,3**	*25,6*	7,82	*2,70*
Slovakia	**9,89**	*9,86*	57,2	*20,8*	7,79	**8,95**
Slovenia	**9,09**	*10,89*	*54,2*	*20,7*	*5,83*	7,50

Key:

1) Share of total employment (%).
2) Share of total employment (%).
3) Share of the value of exports for the relevant category to overall exports (%).
4) Share of the value of exports for the relevant category to overall exports by EBOPS classification (%).
5) Share of the value of sales of new or significantly improved products for all companies (novelty from the point of view of the market as a whole) against turnover from all companies (%)
6) Share of the value of sales of new or significantly improved products for all companies (novelty from the point of view of the company and not the market as a whole) against turnover from all companies (%)

According to the EIS 2008 results the position of the Czech Republic in a number of areas is still not satisfactory. Nevertheless one can note as positive the overall slight improvement and certain favourable growth trends. This is also documented by its inclusion earlier in the EIS 2007 in the group of countries designated "moderate innovators" and not as before in the group of countries "catching up". "Moderate innovators" report lower innovation performance than the EU-27 average, but have higher growth trends. In this regard it is expected of the Czech Republic that it will reach the EU average in the EIS analyses Summary Innovation Index during the next 10 years.

Division of EU member states into four groups according to their innovation performance (EIS 2008), in order:

Innovation leaders: Sweden, Finland, Germany, Denmark, Great Britain.

Innovation followers: Austria, Ireland, Luxemburg, Belgium, France, Netherlands.

Moderate innovators: Cyprus, Estonia, Slovenia, Czech Republic, Spain, Portugal, Greece, Italy. (Summary Innovation Index value somewhat lower than the EU average).

Countries catching-up: Malta, Hungary, Slovakia, Poland, Lithuania, Romania, Latvia, Bulgaria.

According to the Summary Innovation Index the Czech Republic placed 1°6th in the EIS 2008 database among EU-27 member states (behind Estonia and Slovenia of the new member states). But the shortfall behind the countries leading on innovation is however still very marked.

In comparison with the EU-27 average it can be seen that the Czech Republic has its relatively strong points in the indicator groups - company expenditure, innovators and economic effects, and that its relatively weak points can be identified mainly in the area of intellectual property (in the long term, the relatively worst results), in the finance and support indicators group (a particularly weak position in financing through risk capital) and in the human resource indicators group (with the exception of a long-term leading position on the indicator for young people with completed secondary education.

C.3 Competitiveness according to the Global Competitiveness Report for the World Economic Forum (WEF)

The Global Competitiveness Report has been prepared each year since 1979 for the annual meeting of the World Economic Forum. The latest edition contains information about 134 countries and thus remains the most extensive publication of its kind. All data are presented solely for the individual countries, and therefore there is no evaluation of the EU-15, EU-25 or EU-27. The partner organization for the Czech Republic is the CMC Graduate School of Business in Čelákovice.

The competitiveness of countries is evaluated primarily based on the Global Competitiveness Index (GCI), which replaced the Growth Competitiveness Index (Growth CI) used in previous years. The GCI consists of a combination of hard data and the results of opinion surveys (the Executive Opinion Survey). Details on the methodology and in-depth data can be found in: M. E. Porter, K. Schwab, X. Sala-i-Martin, F. Paua, The Global Competitiveness Report 2008 - 2009, World Economic Forum, Geneva, Switzerland 2008.

The GCI has a structure built on the so-called 12 pillars of economic competitiveness: (1) Institutions, (2) Infrastructure, (3) Macroeconomic stability, (4) Health and primary education, (5) Higher education and training, (6) Goods market efficiency, (7) Labour market efficiency, (8) Financial market sophistication, (9) Technological readiness, (10) Market size, (11) Business sophistication and (12) Innovation. All the described pillars are interlinked. This means that if only one of them has a high value, this cannot be interpreted as high competitiveness in a particular country.

Pillars 1–4 represent the basic requirements of competitiveness and play a key role in less developed economies (factor-driven economies) based on unskilled labour and natural resources.

Pillars 5–10 represent the efficiency enhancers of competitiveness and have the most noteworthy influence on economies based on production process efficiency and production quality (efficiency-driven economies).

Pillars 11–12 encompass the innovation factors behind competitiveness and are significant for economies based on the application of the most advanced production processes culminating in new products (innovation-driven economies).

In this structure, the Czech Republic is classified in the innovation-driven economies, i.e. in the third level of economic development. It has thus improved it position compared with last year when it was in the transitional phase between the second and third level. Most of the new EU member states from Central and Eastern Europe (Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia) are included in this transitional phase, only Slovenia of these countries is in the third group along with the Czech Republic.

In the evaluated set of 134 countries, the United States of America remains the world's most competitive economy, in first place in the innovation and efficiency factors for competitiveness. This extremely productive economy is the home of many highly developed and innovative firms with access to an outstanding university system and sound cooperation between the education and business sector in the field of R&D. As last year, Switzerland, Denmark and Sweden were place immediately behind the United States. Nor were there any significant changes in the rest of the top ten countries, with the traditional holders: Singapore, Finland, Germany, the Netherlands and Japan. Canada came in in 10th place, Great Britain fell out of the top ten.

Table C.9 Global Competitiveness Index (GCI)

	2008 - 2009	*2007 - 2008*	*2006 - 2007*
USA	1	1	6
Switzerland	2	2	1
Denmark	3	3	4
Sweden	4	4	3
Finland	6	6	2
Germany	7	5	8
Netherlands	8	10	9
Japan	9	8	7
Canada	10	13	16
Great Britain	12	9	10
Korea	13	11	24
Austria	14	15	17
Norway	15	16	12
France	16	18	18
Belgium	19	20	20
Ireland	22	22	21
Spain	29	29	28
China	30	34	54
Estonia	32	27	25
Czech Republic	33	33	29
Slovenia	42	39	33
Portugal	43	40	34
Lithuania	44	38	40
Slovakia	46	41	37
Italy	49	46	42
Russia	51	58	62
Poland	53	51	48
Latvia	54	45	36
Hungary	62	47	41
Greece	67	65	47
Romania	68	74	68
Bulgaria	76	79	72

Source: M. E. Porter, K. Schwab, X. Sala-i-Martin, F. Paua: „The Global Competitiveness Report 2008-2009, World Economic Forum, Geneva, Switzerland 2008.

Table C.9 contains the ranking of selected countries in 2008 - 2009 based on the Global Competitiveness Index. The Czech Republic's position has not changed since last year, remaining in 33rd place. Of the new EU member states it is headed only by Estonia in 32nd place. However, this country, like most other new EU members, also saw its position deteriorate slightly over the year. The largest drop of the new EU member states was recorded by Hungary, which fell by 15 positions.

Table C.10 Global Competitiveness Index (GCI) – Basic competitiveness requirements (Pillars 1–4)

		1. pillar	*2. pillar*	*3. pillar*	*4. pillar*
	Total of pillars 1 - 4	*Institutions*	*Infrastructure*	*Macroeconomics*	*Health and primary*
USA	22	29	7	66	34
Switzerland	2	5	3	10	17
Denmark	4	3	8	12	4
Sweden	6	4	13	15	8
Finland	1	2	9	8	1
Germany	7	14	1	40	24
Netherlands	10	10	12	36	11
Japan	26	26	11	98	22
Canada	8	15	6	43	6
Great Britain	24	25	18	58	19
Korea	16	28	15	4	26
Austria	9	11	10	44	13
Norway	14	7	27	17	12
France	13	23	2	65	9
Belgium	18	21	16	60	3
Ireland	32	17	53	47	14
Spain	27	43	22	30	35
China	42	56	47	11	50
Estonia	30	33	40	23	28
Czech Republic	45	72	50	42	29
Slovenia	38	49	36	33	21
Portugal	37	35	26	82	33
Lithuania	46	55	46	52	52
Slovakia	52	73	64	49	44
Italy	58	84	54	100	30
Russia	56	110	59	29	59
Poland	70	88	96	50	39
Latvia	55	60	58	71	48
Hungary	64	64	57	115	49
Greece	51	58	45	106	40
Romania	87	89	105	76	66
Bulgaria	82	111	95	54	68

Source: M. E. Porter, K. Schwab, X. Sala-i-Martin, F. Paua: „The Global Competitiveness Report 2008-2009, World Economic Forum, Geneva, Switzerland 2008.

Table C.10 shows the ranking of selected countries in the evaluation of Pillars 1-4 (basic competitiveness requirements). In this evaluation, the Czech Republic fared worse than in the evaluation of efficiency and innovation competitiveness factors (see the C.11 tables below). The evaluation of the institutional environment (72nd). i.e. the standard of the judiciary, the transparency of legislation, the degree of corruption and the level of bureaucracy and regulation

is very low, while the evaluation of health and primary education in this summary is relatively high (29th).

Table C.11 Global Competitiveness Index (GCI) – efficiency enhancers for competitiveness (Pillars 5–10)

		5. pillar	*6. pillar*	*7. pillar*	*8. pillar*	*9. pillar*	*10. pillar*
	Total of pillars 5 -	*Higher Education*	*Efficiency of the*	*Efficiency of the*	*Financial market*	*Technological readiness*	*Market size*
USA	1	5	8	1	9	11	1
Switzerland	8	7	6	3	21	5	35
Denmark	3	2	4	5	4	3	46
Sweden	9	3	7	26	8	2	30
Finland	13	1	11	23	12	14	52
Germany	11	21	15	58	19	18	4
Netherlands	7	11	3	30	11	1	18
Japan	12	23	18	11	42	21	3
Canada	5	9	16	7	10	9	14
Great Britain	4	18	19	8	5	8	6
Korea	15	12	22	41	37	13	13
Austria	20	17	5	39	33	16	32
Norway	14	10	20	14	13	4	44
France	16	16	21	105	25	20	7
Belgium	21	6	12	79	23	23	25
Ireland	19	20	9	15	7	24	48
Spain	25	30	41	96	36	29	12
China	40	64	51	51	109	77	2
Estonia	26	19	24	29	28	17	90
Czech Republic	28	25	33	28	47	33	38
Slovenia	37	22	50	61	46	30	70
Portugal	34	37	45	87	43	32	43
Lithuania	43	26	48	49	56	38	69
Slovakia	32	45	35	36	31	36	56
Italy	42	44	62	126	91	31	9
Russia	50	46	99	27	112	67	8
Poland	41	34	65	62	68	46	20
Latvia	47	33	52	32	39	41	79
Hungary	48	40	66	83	61	40	45
Greece	57	38	64	116	67	59	33
Romania	54	52	67	97	60	48	42
Bulgaria	65	61	77	60	74	53	58

Source: M. E. Porter, K. Schwab, X. Sala-i-Martin, F. Paua: „The Global Competitiveness Report 2008-2009, World Economic Forum, Geneva, Switzerland 2008.

In the table tracking the ranking of countries based on an evaluation of efficiency enhancers (Pillars 5-10), the Czech Republic came 28th overall This ranking is the closest to its aggregate

GCI standing (33rd). Of the efficiency enhancers, by far the worst factor is financial market sophistication, which indicates the relatively low credibility and transparency of the banking and financial sector. Of the new EU member states from Central and Eastern Europe, only Estonia (26th) does better in the evaluation of efficiency enhancers.

Table C.12 Global Competitiveness Index (GCI) – innovation factors (Pillars 11–12)

		11. pillar	*12. pillar*
	Total of pillars 11 - 12	*Business sophistication*	*Innovation*
USA	1	4	1
Switzerland	2	2	3
Denmark	7	5	10
Sweden	6	7	5
Finland	5	10	2
Germany	4	1	8
Netherlands	9	8	12
Japan	3	3	4
Canada	16	18	13
Great Britain	17	17	17
Korea	10	16	9
Austria	12	6	15
Norway	18	15	19
France	14	9	16
Belgium	15	11	14
Ireland	20	19	21
Spain	29	24	39
China	32	43	28
Estonia	40	50	31
Czech Republic	25	29	25
Slovenia	33	34	33
Portugal	43	48	35
Lithuania	49	49	55
Slovakia	53	53	58
Italy	31	21	53
Russia	73	91	48
Poland	61	62	64
Latvia	84	83	93
Hungary	55	68	45
Greece	68	66	63
Romania	75	78	69
Bulgaria	92	92	96

Source: M. E. Porter, K. Schwab, X. Sala-i-Martin, F. Paua: „The Global Competitiveness Report 2008-2009, World Economic Forum, Geneva, Switzerland 2008.

Table C.12 suggests that the Czech Republic achieves its best results in the evaluation of innovation factors (pillars 11-12), where it came 26th out of 134 countries. In this evaluation, it

remains the best among the new EU members and is even in front of some ‘old’ EU Member States (Greece, Spain, Portugal and Italy).

Chapter D – The Czech Republic's involvement in international projects

D.1 The Czech Republic's involvement in the EU 7th Framework Programme

From the very beginning, which dates to 1984, EU framework programmes have been focused mainly on target-oriented research, whose goals are formulated in working programmes issued by the European Commission. However the **7th Framework Programme (FP7)** represents an important change, since for the first time it contains a substantial portion of the overall budget for the support of fundamental research. Of course a basic change also consists of the unusually large increase in the budget: FP7 will have at its disposal annually a budget which is some 40% higher than for FP6. The basic aims of FP7 of course follow on from FP6, since FP7 is also to make a significant contribution to meeting the Lisbon Strategy. For this reason FP7 takes over the whole spectrum of project types from FP6 and in addition has a number of programme initiatives which should lead to more efficient use of the capacity of European research locations. FP7 thus extends projects which strengthen both regional cooperation between regions and between national research and development systems and further strengthens existing trends for linking private and public resources, thus contributing to the creation of an economic environment based on knowledge production.

A substantial change has also occurred on the "Czech side". In many cases the European Commission provides only a portion of the costs for a team's involvement in a project. According to Act 110/2009 Coll. universities, public research institutions and a number of other organisations can request of the Ministry of Education, Youth and Sport that it increase its institutional funding up to the level where, in conjunction with the European Commission contribution it covers 100% of their team participation costs in a FP7 project.

As before, the **7th EURATOM Framework Programme,** which is focused on special areas of the peaceful use of atomic energy, runs in parallel with FP7. The rules for participation in this programme are the same as those for FP7. However, there is now an entirely new **Framework Programme for Competitiveness,** which offers a number of financial instruments to support small- and medium-sized enterprises in the knowledge economy and in terms of topics is focused on information technologies and the energy issue.

The total budget for FP7 is €50.521bn for the newly established European Union fiscal period 2007-2013. The budget's structure in given in Table D.1.7.The Framework Programme is made up of four concrete programmes. The specific programme **SP1 "Cooperation"** supports target-oriented research, that is, research based on the needs of society. This programme is divided into ten thematic priorities which follow on clearly from the range of themes of the preceding FP6. Just as in earlier framework programmes each priority has its own detailed work programme, referred to in European Commission calls for submission of project proposals. FP7 was initiated on 21st December 2006, when the first calls were issued covering almost the total spectrum of its priorities.

The value of an European Commission contribution to a team involved in implementing an FP7 project depends on the type of activity (varying from 30% of the total cost for demonstration activities, to 50%-75% contribution for research activities, up to 100% contribution for project coordination, or for those implementing coordination and support activities, that is, projects in which the European Commission takes a special interest).

Project proposals for the thematic priorities of the specific Cooperation Programme, which are submitted by international consortia, pass through a demanding review system which follows on from the positive experiences from FP6. This is a peer review system in which an independent team of experts classifies a project proposal in accordance with clear set criteria. These include not only assessment of the scientific quality of the proposed solution, but also the ability to mobilise the necessary critical capacity to achieve the research goal and not least, the ability to implement the results achieved through the research activities. In a ranking of evaluation project proposals also have the opportunity to obtain a European Commission contribution. The success of a project is also resolved during the course of contraction negotiations between the implementing consortium and the European Commission, which assume the meeting of a whole number of formal requirements, of which the most important is the signing of a consortium agreement between the participating teams (concerning the value of knowledge invested by the teams at the beginning of the project, the management of funds during project implementation and, in particular, the handling of the results obtained).

The specific programme **SP2 "Ideas"** supports blue-sky research work. For this programme no research targets are set, but the areas and disciplines for research are defined. Project proposals may be submitted by researchers from throughout the world, but projects must be implemented in EU locations. The "Ideas" programme is managed by the autonomous European Research Council (ERC). The ERC sets up commission, which on the basis of peer review select and recommend submitted project proposals for financing. A proposal's worth is decided exclusively by its scientific excellence assessed by two criteria: First, the professional capability of the proposer, secondly the proposal itself, i.e. the manner in which it exceeds the bounds of current knowledge in the given area.

The specific programme **SPS "People"** support lifetime learning for researchers and is a direct continuation of the "Marie Cure Events" which already have an established tradition from earlier framework programmes. The range of these events (in effect stipendia) is of course adapted to current and newly anticipated needs.

The specific programme **SP4 "Capacity"** has as its goal the strengthening of the research capacity within the European research space. It supports the development of research infrastructures, research on behalf of small- and medium-sized enterprises, the linking-up of knowledge regions, the development of research potential, the activities of "science in society" and international cooperation with third countries.

D.1.1 The structure and budget of FP7

The principal source of information from which this report is drawn is the European Commission E-E-CORDA database which national administrations have received in two versions. The first version contains statistical data for all project proposals received by the European Commission in response to 110 calls for project submissions issued by the end of 2008. There are 37 698 project proposals, prepared by 187 532 teams from throughout the world. The second version of the E-CORDA database contains statistical data for successful project proposals which have gone forward to contract discussions. There are 3 551 project proposals, prepared by 21 497 teams from throughout the world.

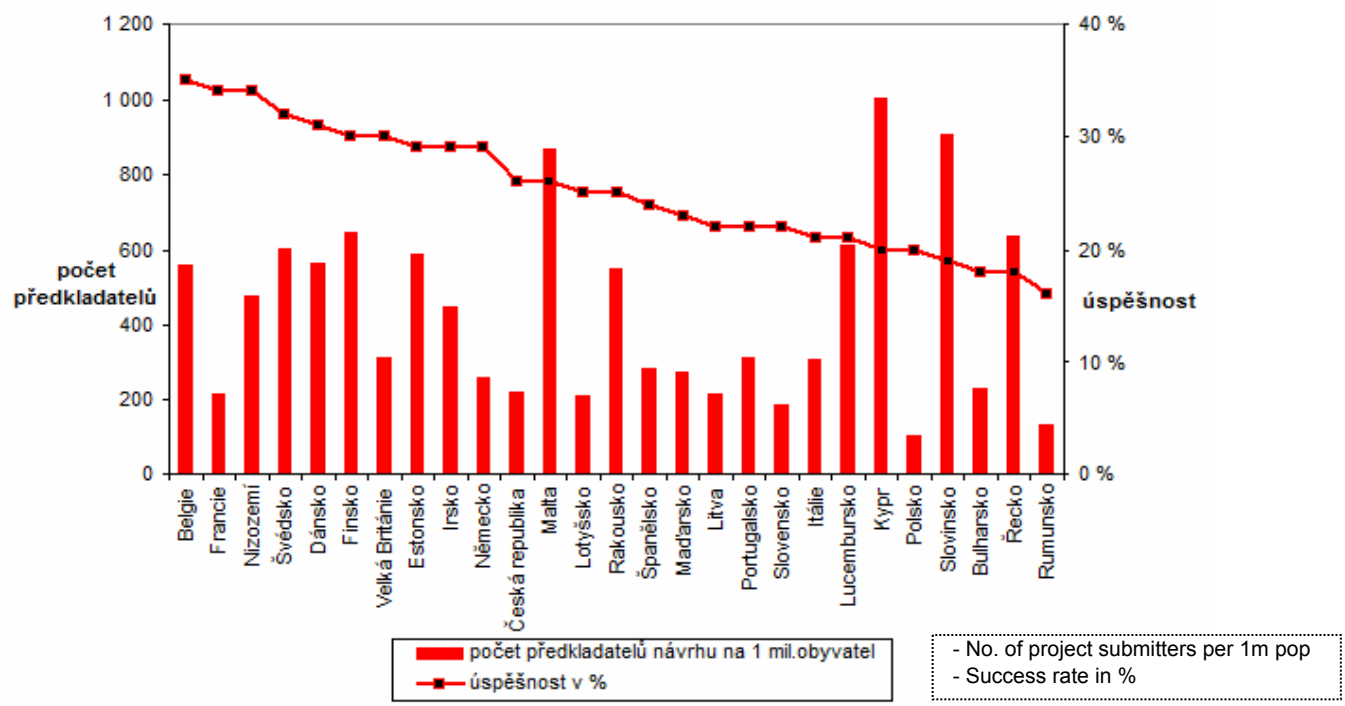
This report give data for proposed and successful projects from the first two years of FP7.

Table D.1 The structure and budget of FP7

	€ m
7. EU Research and Development Framework Programme 2007 - 2013	50 521
SP1 Cooperation	32 413
Thematic priorities:	12 438
Health	6 100
Food, agriculture, fisheries and biotechnology	1 935
Information and communication technologies	9 050
Nanoscience, nanotechnology, materials and new manufacturing technologies	3 475
Energy	2 350
Environment (including climate change)	1 890
Transport (including air transport)	4 160
Socio-economic sciences and the humanities	623
Security research	1 400
Space research	1 430
SP2 Ideas (support for blue-sky research work)	7 510
SP3 People (Marie Curie events)	4 750
SP4 Capacity	4 097
Research infrastructures	1 715
Research on behalf of small- and medium-sized enterprises	1 336
Knowledge regions	126
Coherent development of research policies	70
Activities in international cooperation	180
Non-nuclear activities of the Joint Research Centre	1 751
Euratom Framework Programme (for 2007 - 2011)	2 751

Source: E-CORDA database of contracted FP7 projects, European Commission, June 2009.

D.1.2 Success rate of EU-27 teams in FP7 calls



Source: E-CORDA database, internal calculation by the AVCR Technology Centre, February 2009

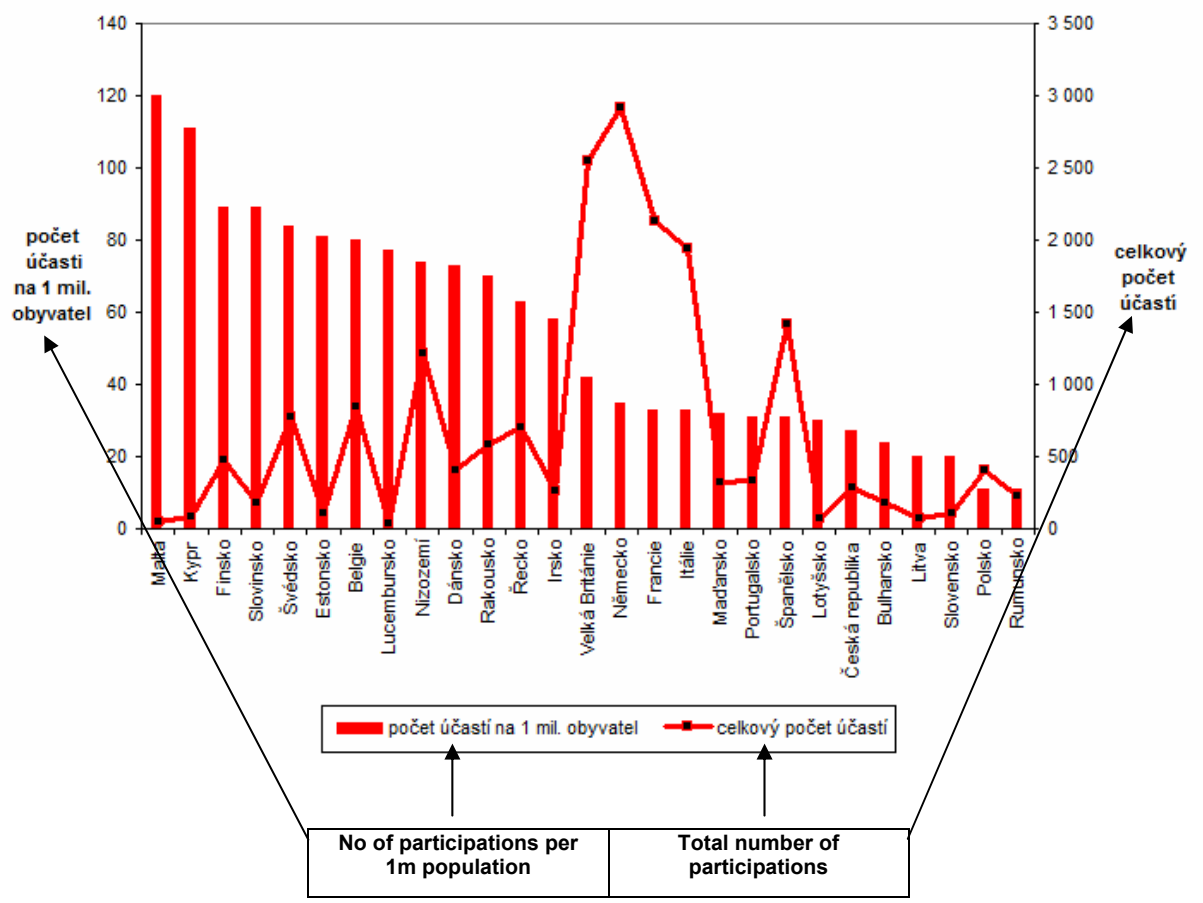
The bar graphs shows the total numbers of evaluated proposals per 1 million population. The highest level of activity in preparing proposals is traditionally reported by small countries Cyprus, Slovenia, Malta, Luxembourg and smaller and medium-sized countries such as Finland and Greece. This group of very active countries divides into two sub-groups: whereas Finland and Malta are involved in the preparation of proposals which are more than averagely successful, the success rate of Cyprus, Slovenia and Greece is noticeably lower than the average success rate for the EU. Large countries which have strong national research and development systems, that is Germany, Great Britain, France, Italy, Spain, had less than half the number of proposers per 1 million population than small countries. In the Czech Republic 2 327 teams were involved in preparing project proposals, so that there were 224 project proposers per 1 million population, the fourth lowest number of all the EU-27.

Countries are ranked in the graph by the success rate of their proposals, shown in the graph by a broken line (scale on the RH side).A total of 439 Czech teams worked on preparation of projects which were included in the main list and the success rate for Czech teams was therefore 25.6% which places the Czech Republic in 12th place among EU-27 countries, or in third place among the new member states, behind Estonia and Malta. It can thus be shown that Czech teams find their consortium partners among the most successful European teams.

From the figure it is clear that the medium to large countries, i.e. Austria, Belgium, Bulgaria, Denmark, Greece, Finland, Hungary, the Netherlands, Portugal, Sweden, with which the Czech Republic is usually compared, have overall a higher number of proposal per 1 million population than the Czech Republic. As a result of this the Czech Republic will be involved in implementing a smaller number of projects than most of these countries which are of comparable size. The Czech Republic should draw on the experience of the northern countries

Finland, Sweden, Denmark, Belgium and the Netherlands which per 1 million population submit high numbers of project proposals of high quality. In contrast to this some southern countries (Spain, Portugal. Bulgaria) are, it is true, involved in the preparation of a large number of project proposals, but do this in consortia which are not particularly successful, so that the projects prepared by them do not gain EU support.

D.1.3 Participation of EU-27 teams in successful FP7 projects



Source: E-CORDA database, internal calculation by the AVCR Technology Centre, February 2009

The broken line in the graph links points indicating the absolute numbers of EU-27 team involvements in FP7 projects, recorded by the European Commission as of 25. 2. 2009 as "successful" and therefore moved into contract discussions, of which it may be expected that they will become successfully contracted projects. This is a total to this date of 2 769 projects, on whose implementation 18 437 locations from throughout the world will be working (some locations work on implementing more than one project and therefore we speak of the number of involvements). Participants in these projects are requesting a European Commission contribution of €6652m.

The bar graph also give the involvement of EU-27 countries calculated per 1 million population. The countries in the graph are ranked by the value of this relative indicator.

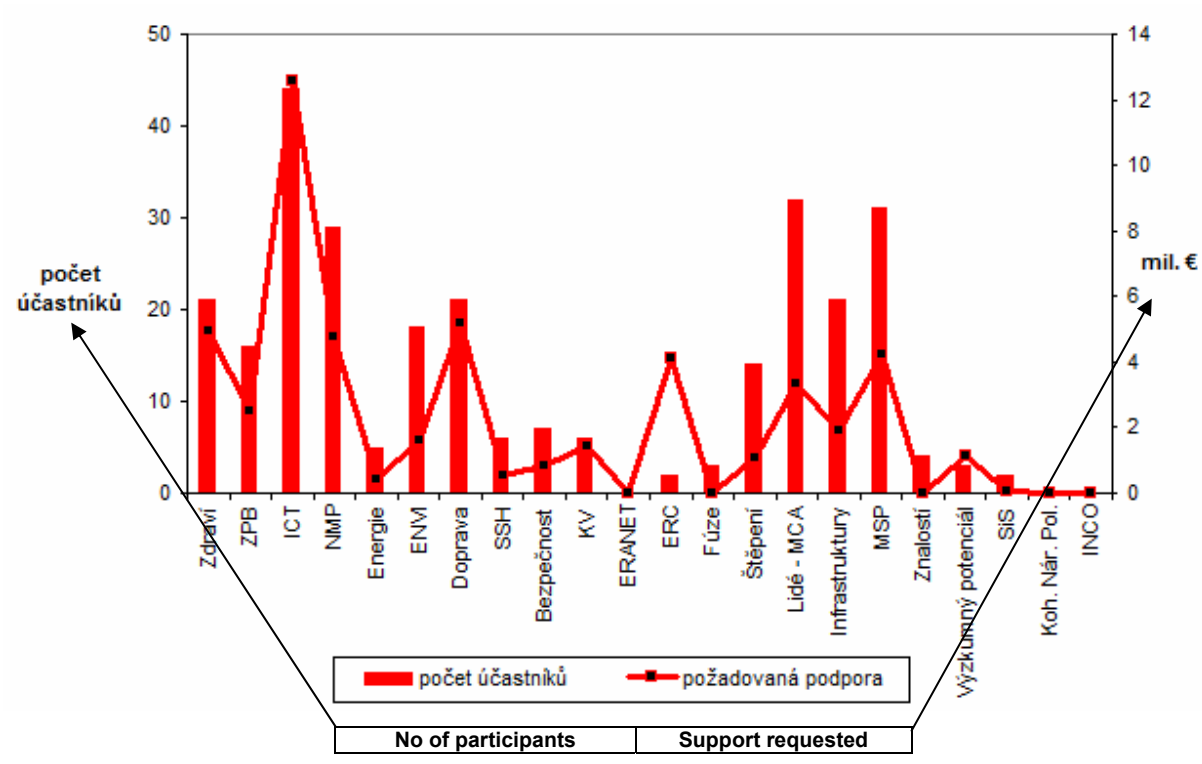
The projects referred to include 225 projects in whose implementation 285 teams from the Czech Republic will be involved; this represents approx. 1.6% of the involvement of all EU countries, that is less than would correspond to the percentage of the Czech Republic to the EU

population as a whole. By its involvements per 1 million population the Czech Republic ranks in 22nd place among EU-27 countries. By this indicator within FP7 this is a repeat of the ranking which the Czech Republic held consistently during the earlier FP6. It should be pointed out that the last 11 countries in the graph (i.e. beginning with Italy) spend overall a lower percentage of GDP on research and development than does the Czech Republic. Thus so far it has not been shown that the possibility of top-up financing of participation costs using an increase in institutional funds has brought about the desired effect, i.e. has led to an increased involvement of the Czech Republic in the FP.

Czech participants are going into projects with an overall budget of €69.731m and are requesting support from the European Commission to the value of €51.081m.

When calculating per 1 million population the largest involvement is from Malta (120 involvements per 1 million population), Cyprus (111 involvements), the Nordic countries of Finland and Sweden are about 85 involvements, similar to Slovenia and Belgium. Based on this indicator the involvement of Great Britain, Germany, France and Italy is roughly half that of the Nordic countries mentioned. With 27 involvements per 1 million population the Czech Republic thus reports three times lower participation than the Nordic countries. By contrast the lowest level is reported by Poland and Romania (overall less than 12 involvements per 1 million population).

D.1.4 Participation of the most successful Czech team in selected FP7 programmes



Source: E-CORDA database, internal calculation by the AVCR Technology Centre, February 2009

The columns in the graph show in order the numbers of involvements of Czech teams in projects falling within the individual thematic priorities of the specific programme SP1 Cooperation and other specific programmes - see the FP7 structure in Table D.1. The

EURATOM programme is included after the first two specific programmes, since within it, as in these two programmes, projects focused on research predominate.

From the bar graph it is clear that the Czech Republic has most involvements in the ICT thematic priority, for which the largest budget was allocated in previous calls. In other positions from the thematic priorities are research in nanotechnology, transport and health. However the bar graph clearly shows that the second largest number of participants is in projects for the specific programme SPS "People" (study tours) and in research on behalf of small- and medium-sized enterprises.

As far as the contributions which Czech teams will request from the European Commission are concerned, it should be stated only some of the projects have yet completed contract discussions and the data are not yet complete. This applies particularly for Marie Curie activities. For the moment it seems that the largest contribution will be obtained overall by teams in the following priorities: ICT (€12.6m), Transport (€5.6m), Health (€5.0m), NMP (€4.8m), and Research on behalf of Small- and Medium-Sized Enterprises (€4.2m). Total costs for two fundamental research projects (ERC) will exceed €4m and these will be paid for in full by the European Commission.

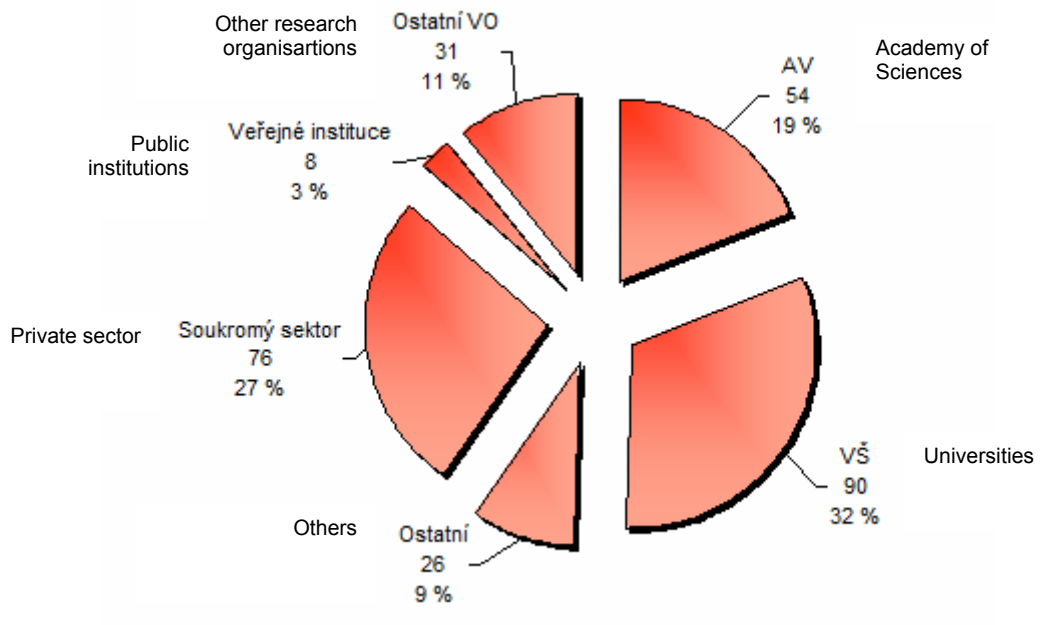
It should however be taken into account that the value of support gained strongly depends on the size of the budget allocated so far for the priority in question. The largest budget is held by the 2nd thematic priority ICT and by contrast the smallest budget of all is allocated to support coherent development of policies and in line with this Czech teams gained in these two priorities the largest and smallest overall support. Therefore in addition to the absolute size of support requested, an important measure of participation is the share of supported obtained by Czech teams out of the total amount distributed under a given priority.

Overall, Czech teams are competing for 0.85% of the so far allocated FP7 budget for EU states and in relation to this value participation in individual priorities can be [assessed] as above or below average. It can be seen that the largest share, of 3.95% of overall support for EU teams is gained by the Czech Republic in SP2, for the development of "knowledge regions and research potential (support for convergent and outlying regions)" and also a major support part is gained by small- and medium-sized enterprises (2.98%). Because the data for projects in the specific programme "People" are incomplete, we cannot yet evaluate this "third most successful Czech programme". Of the thematic priorities the Czech Republic is most successful in Transport (1.6%), FAB (1.22%) and NMP (1.16%), in Space Research and Security 1% of the budgets allocated to these priorities were obtained. In all other priorities Czech teams obtained much less than 1% of the allocated budgets. In the Health and ICT priorities which have the largest budgets at their disposal, Czech teams obtained 0.59% and 0.69% respectively of the apportioned budgets.

Another reference limit for evaluating the success rate comes from the fact that in 2007 and 2008 the membership charge of the Czech Republic was always more than 1% of the overall EU budget and the Czech Republic therefore always contributed at least 1% of the budget for a given priority. Therefore a priority can be considered successful if the Czech Republic obtains at least 1% of its budget.

This criterion suggests that Czech teams are relatively unsuccessful in those priorities with the largest budgets. If this trend continues the Czech Republic will be ranked among those countries which subsidise the FP7 budget, i.e. its own teams will obtain less from the FP budget than the country contributes.

D.1.5 Structure of the involvement of individual Czech Republic R&D sectors in FP7 projects



Source: E-CORDA database, internal calculation by the AVCR Technology Centre, February 2009

The structure of Czech participants is divided up by these categories:

AV - indicates public research institutions set up by the AV CR in accordance with Act No 341/2005 Coll.

Other VO - indicates all other research organisations (other public research institution (VVI) set up in accordance with Act No. 341/2005 Coll., with the exception of institutes of the Academy of Sciences of the Czech Republic and research organisations whose founder can be either the state or a private body)

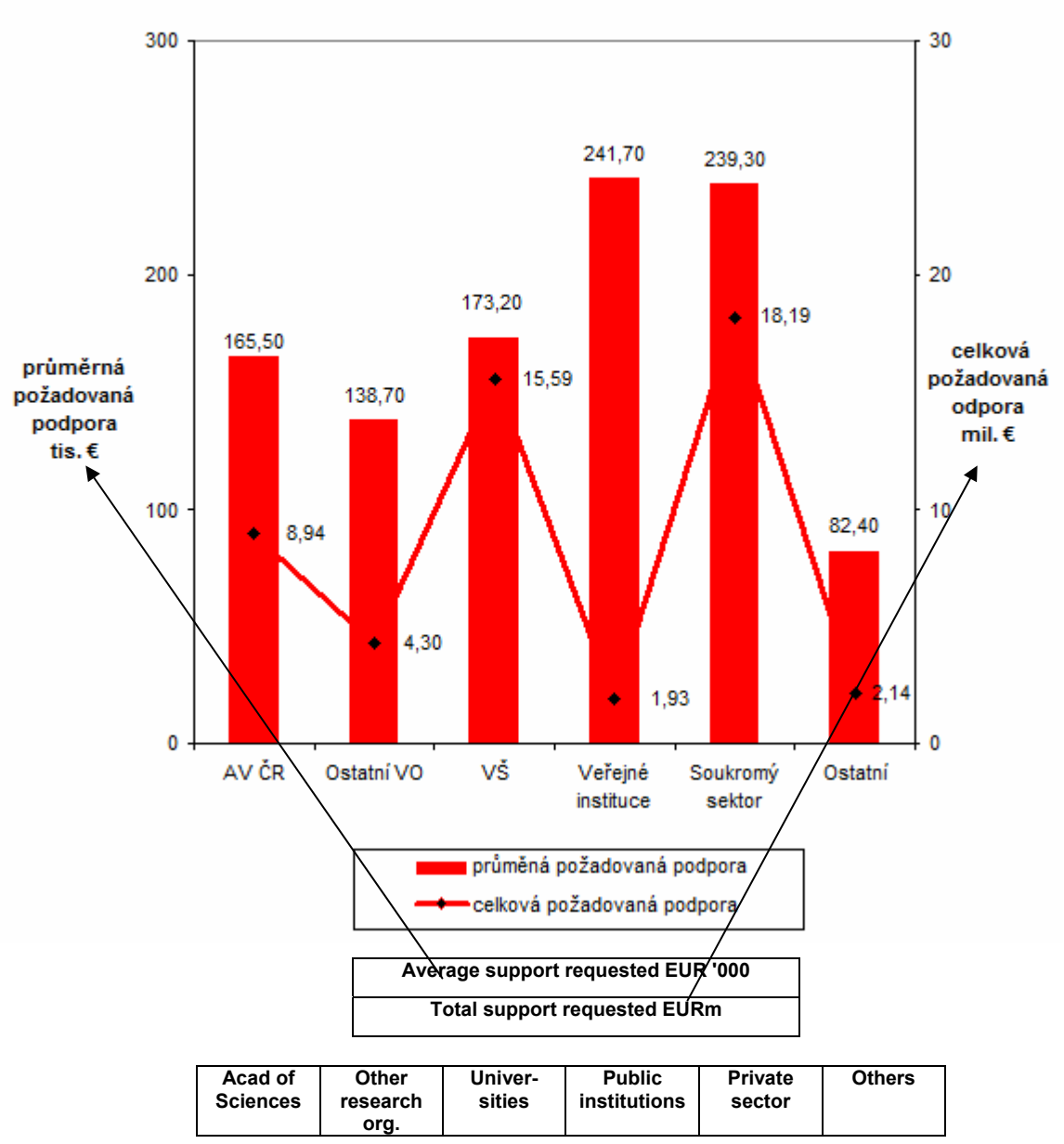
VŠ - indicates universities

Public institutions - indicates non-research public organisations (e.g. state, regional or municipal administrative bodies)

Private sector indicates in particular industrial companies

Others indicates teams not belonging to the aforementioned categories (teaching hospitals, non-university teaching institutions, project result end-users, etc.).

From the graph it is clear that the largest number of participants come from universities. The aggregated research sector (i.e. Academy of Sciences of the Czech Republic and other VO) does not exceed the number of participations from universities. The presence of the private sector among Czech participants is relatively large, which is particularly noticeable in comparison with the other new member states.



Source: E-CORDA database, internal calculation by the AVCR Technology Centre, February 2009

The bar graph shows that overall the greatest support was contracted for by teams from the private sector, with the universities in second place. The research sector (i.e. the Academy of Sciences of the Czech Republic and VO in aggregate) did not in total reach the support level attained by the universities. In FP7 for the first time the Czech Republic came close to and began to behave like most European countries: in these, it is normal for universities to obtain overall higher support than the research sector itself.

The support which teams from the private sector obtain for their participation is relatively large, at some 30% of the total support for Czech teams, which puts the Czech Republic clearly in first place among all the new EU member states. The ability of institutions to take part in projects with appropriately large team capacity is of fundamental importance in FP7, where a large part of the budget goes toward the implementation of large projects. The broken line in the graph then shows that the average support level per participation is highest in the private sector, which indicates that industrial companies are not taking part "to test things out", but that their participation is aimed at achieving certain results. High average support is also requested by non-research public organisations. The supported requested by them varies significantly,

whereas state administrative bodes request no support, regional and municipal bodies are involved in extended projects (i.e. municipal transport) and therefore request a high level of support. The average support requested by teams from the Academy of Sciences of the Czech Republic or the universities, has stagnated at the level it had it FP6.

A deeper analysis shows that as a rule Czech participants finance only a very small share of total project costs, that is, the obtain only a small part of the support which the European Commission provides overall for project implementation. In view of the fact that universities and public research organisations may request an increase in their institutional funds so that the costs of their participation in FP7 projects are 100% covered by public funds, their small share of project financing indicates their passive institutional policy. A low share of project financing in fact means a low level of influence on how they are implemented and most likely is a precursor of a small share of the use of the end results, which in the end leads to a weak position for the Czech Republic in the processes of building a European research space.

D.2 Involvement of the Czech Republic in Operational Programmes

D.2.1 The Operational Programme Enterprise and Innovations

Infrastructure for industrial research and development is also supported in 2007-2013 as part of the Operational Programme Enterprise and Innovations (OPEI) the implementation of which is co-financed from European Union structural funds. OPEI is made up of a total of 15 individual support programmes, of which three support the aforementioned infrastructure for research and development. These are the Potential, Prosperity and Cooperation programmes. Support is provided mainly for the acquisition of long-term assets (land, building, equipment); in addition operating costs for the constructed infrastructure are also paid, in the form of a grant de minimis. The provision of support is governed by European Commission Regulation No. 1083/2006, No. 1080/2006, No.1998/2006 and No. 800/2008. The level of support is set in line with the Regional Map for the Intensity of Public Support for Regions in the Czech Republic at 36-60% of eligible expenditure, exceptionally up to 75% Applications are received through calls announced as a rule annually. Projects are evaluated on an ongoing basis and payments made ex-post.

The aim of the **Potential** programme is to provide support for projects focused on developing existing, or building new, industrial research and development centres. Support recipients are businesses, particularly small- and medium-sized enterprises. When evaluating projects emphasis is put for example on cooperation with research and development centres, the effective commercialisation of results and support for regions with concentrated support from the state, as specified in Government Regulation No. 560 dated 17. 5. 2006. In 2008 grants to an overall value of 992m CZK were provided as part of the Potential programme, in 2009 this is 544m CZK so far.

The **Prosperity** programme supports the establishment and development of science and technology parks, business incubators and technology transfer centres. Recipients are mainly municipalities and universities, for whom support is provided to 75% of eligible expenditure, although support is also provided to businesses. In 2008 no support was provided under this programme, the figure in 2009 to date is 61m CZK.

The **Cooperation** programme is focused on support for cooperative trade groupings at regional and supra-regional level - clusters and technology platforms. The recipients are associations of businesses, scientific research, educational and other support institutions, in the case of technology platforms also existing trade associations. Support has been provided since 2009. So far 80m CZK has been provided for the activities of clusters, and 60m CZK for the activities of a technology platform.

D.2.2 The Education for Competitiveness Operational Programme

OP Vzdělávání
pro konkurenceschopnost

The Education for Competitiveness Operational Programme (OP VK) is a multi-year thematic programme managed by the Czech Ministry of Education, Youth and Sport, within

which it is possible during the 2007-2013 programme period to draw on funds from the European Social Fund (ESF), one of the European Union's structural funds.

The Education for Competitiveness OP focuses on the development of human resources through education in all its varied forms, with emphasis on a comprehensive system of lifetime training, the creation of a suitable environment for research, development and innovation activities and stimulation for cooperation between participating organisations.

The global aim of the Education for Competitiveness OP 2007-2013 is the development of an education-based society with the purpose of strengthening the competitiveness of the Czech Republic by means of the modernisation of the systems of elementary, tertiary and further education, linking them into a comprehensive system of lifetime training and improving conditions in research and development.

The specific aims of the Education for Competitiveness OP represent ways leading to meeting this global aim:

1. Development and improved quality of elementary education with an emphasis on improving graduates' key skills, in order to improve their employability and increase their motivation for further education.

2. Innovation in tertiary education linked to research and development activity, to greater flexibility and creativity of graduates employable in the knowledge economy, to making conditions more attractive for research and development and to the creation of comprehensive and efficient instruments to support the innovation process as a whole.

3. Strengthening the adaptability and flexibility of human resources as a basic factor in the competitiveness of the economy and sustainable development of the Czech Republic, by means of support for further education in terms of both demand and supply.

4. Creation of a modern, high-quality and efficient system of lifetime learning by means of the development of the systems of elementary, tertiary and further education, including the linking together of these individual parts of a system of lifetime learning.

Priority axis 1: Elementary education

Support Areas:

1.1 Improving quality in education

1.2 Equal opportunities for children and pupils with special educational needs.

1.3 Further education for employees in schools and educational establishments

Priority axis 2: Tertiary education, research and development

Support Areas:

2.1 Higher special (secondary) education

2.2 University education

2.3 Human resources in research and development

2.4 Partnerships and networks

Priority axis 3: Further education

Support Areas:

3.1 Individual further education

3.2 Support for the supply of further education

Priority axis 4: A systematic framework for lifetime learning

Support Areas:

4.1 A systematic framework for elementary education

4.2 A systematic framework for tertiary education and development of human resources in research and development

4.3 A systematic framework for further education

Priority axis 5: Technical assistance

Support Areas:

5.1 Programme management, audit and evaluation

5.2 Programme awareness and publicity

5.3 Absorption capacity of organisations implementing a programme

D.2.3 The Research And Development for Innovation Operational Programme

The Research and Development for Innovation Operational Programme (OP VaVpI) is one of the important operational programme which contributes to strengthening the growth in competitiveness of the country and its orientation towards a knowledge economy. Together with the Business and Innovation Operational Programme and the Education for Competitiveness Operational Programme the OP VaVpI represents a mutually connected system of interventions which seeks to secure the long-term sustainable competitiveness of the Czech economy and the target regions within the Convergence Objective.

The global aim of the OP VaVpI is to strengthen the research, development and innovation potential of the Czech Republic, contributing to a growth in competitiveness and the creation of highly skilled jobs so that the regions of the Czech Republic become significant concentrations of these activities in Europe.

Specific aims of the OP VaVpI:

1. The creation of a limited number of leading-edge centres with high-quality R&D infrastructure, capable of being involved in international cooperation as part of the ERA and ESFRI, to generate findings which can be used in the applications sector.

2. To secure regional R&D capacity designed for the generation and transfer of findings and the strengthening the cooperation of R&D institutions with the applications sector.

3. To securing conditions for technology transfer, protection, dissemination and application of results, R&D popularisation, availability of scientific information and the improved effectiveness of R&D policy.

4. Support for the teaching infrastructure at universities linked to research with direct impact on the growth and improved quality of human resources for R&D activities and better preparedness of graduates for the world of work.

Priority axis 1 - European centres of excellence

The principal aim of the intervention is the creation of a limited number of centres of excellence, well equipped R&D centres with modern, often unique infrastructure and critical mass such they are able to contribute to the linkage and greater integration of leading Czech R&D teams with leading international research organisations and European research infrastructures. The intervention will contribute to the establishment of internationally attractive partners in the Convergence regions - research organisations with clear research programmes and high quality. As a consequence of the intervention an important "bridge" will be established between the Czech regions and key foreign partners from both public and private sectors, which will give access to the international know-how, contacts and technologies available in the developed regions.

The aim is to identify, support and strengthen the best research teams, who will receive the best material conditions for their growth and development and at the same time the opportunity to investigate and research new topics and establish contact and strategic partnerships with leading international partners (both private and public). It is assumed that thanks to these contacts and cooperation, the centres will be able to accelerate the generation and transfer of new technologies and know-how into practice. A very important function for these centres will be the provision of high-quality training for students (especially postgraduate students) and young scientists and at the same time a link between research and education innovation activity, thus contributing to technology transfer.

Priority axis 2 - Regional R&D Centres

The Czech Republic is inadequately covered by a network of R&D institutions ready for cooperation with the applications sector and in tune with its needs. The existing infrastructure of this type is inadequately equipped for successful cooperation from a material and technical point of view, and a major part of it is concentrated in the capital city (see also A.1.14 and A.1.18). At the same time demand in rising for R&D results which can be used in the private sector. It is exactly here that the applications sector lacks appropriate partners with the infrastructure and human resources necessary for cooperation. The problem is the small number of R&D institutions which are focused on this, the inadequate and outdate facilities of existing institution (generally former departmental research institutes). For this reason it is necessary to upgrade the capacity of application-oriented research organisations with the potential to become sought-after partners for cooperation with the applications sector; their activity should be driven by demand from the applications sector.

At the same time these research organisations should be able to provide training for employees, offer practical solutions to technology problems, as well as expert services and should be able to transfer their results into the regional economy. The intervention will support the establishment and development of well equipped R&D centres focused on applied research and strengthen their cooperation with the application sector (businesses, hospitals, etc) according to the needs of the region.

Priority axis 3 - Commercialisation and popularisation of R&D

The commercialisation of the knowledge and results from research establishments supported by state funds is a situation which is very unfavourable in the Czech Republic. The efficiency (outputs not matching input resources) and application relevance are in fact generally very low. There is a general lack of awareness of the need to focus R&D activities on commercially usable applications, there is no awareness of the protection of intellectual property. There are no instruments to allow researchers and students with commercially viable ideas to co-finance the critical phase from the origin of an idea up to its commercial implementation and the founding of a company. The application sector is not ready to capitalise on commercially usable knowledge from research organisations, because in many cases there are no specialised

departments to gather this information together and disseminate it. The capacity is lacking for commercially usable R&D results to be taken to the stage where they are verified and adopted by commercial organisations for further use. Often the professional staff who would direct partners from the commercial sector to the appropriate researchers are missing. In a similar way accessible information on potential commercially interesting R&D results is not available.

For these reason support for commercialisation and technology transfer is also one of the cornerstones of the proposed Reform of the R&D and Innovation System in the Czech Republic. This is also a decisive and basic theme in the whole OP strategy. The main aim of support is to support the commercialisation of R&D results in research organisations particularly by supporting systems for commercialising, protecting and using intellectual property, including the establishment and development of centres for technology transfer within research organisations. In addition to this, the intervention will also support the financing of the stage from scientific finding to the proof of concept stage.

The intervention has as its aim a change in the approach of Czech research organisations towards cooperation with the users of results and an improvement in the economic relevance of their activities. The proposed intervention will improve the quality the systems for R&D results commercialisation in research organisations by supporting the establishment, or developing existing capacity for commercialisation and cooperation with the applications sector.

The low efficiency of the Czech R&D system is caused mainly by the inadequately developed resources focused on improving the quality of the public support system and by an inadequately developed evaluation culture. It is in fact essential to improve the quality of evaluation at the level of the whole of the national R&D support system (procedures, methods, information systems) and at the same time to strengthen the evaluation of individual centres and teams (with emphasis on management systems and cooperation with the applications sector), as well as to improve the quality of the long-term research direction system (e.g. making use of foresight). The proposed interventions should improve the quality of the system of R&D support from public funds.

R&D also suffers from insufficient supply in the provision of information and popularisation, and that in spite of great interest from the public. It is therefore essential to strengthen the country-wide debate on R&D and to support projects which can raise the reputation and positive views of R&D. The popularisation of science, technology and research activities in general is an important and basic condition for maintaining the interest of the younger generation in careers in science. The publication of science results and an improvement in access to sources of scientific information is one of the basic conditions for quick dissemination of scientific findings and their subsequent practical use.

The aim of this intervention is to improve the efficiency and quality of R&D organisations in the Czech Republic by introducing new elements of evaluation and strategic management of R&D policy. This aim will be achieved by projects for the gradual improvement in the quality of R&D policy (esp. analyses, studies, system evaluations). At the same time an aim of this intervention is also to strengthen the positive perception of research and development by the wider public. To this end activities will be supported which generate interest among the public, and especially the younger generation (science teaching centres, exhibitions, etc.). Not least an aim of this intervention is to support access to sources of scientific information and improve access for the public to the results of scientific activity (specialised databases, internet sources etc.).

Priority axis 4 - Infrastructure for university teaching linked to research

The present university infrastructure is not able to deal with the demand for university education, which has been growing constantly since the early 1990s. The overall deficit is also evident in the inadequate capacity of space for teaching and offices for lecturers and doctoral

students, particularly in cases where the current level of education and teaching does not match the subsequent needs for R&D and innovation. The often unsatisfactory state of this infrastructure does not permit multi-purpose use in line with modern research and educational trends and in some cases does not even meet hygiene and safety standards. Universities for the most part do not have sufficient instrument and laboratory equipment to conduct research (Priority axes 1 and 2 are to react to these needs). At the same time they often lack modern teaching aids and computer teaching rooms. The capacity of libraries is often limited and access to sources of information, including specialist foreign literature, is not at the requisite level. The important point is that these obstacles are of a general nature and all areas of tertiary education are facing a legacy of underfinanced educational infrastructure, combined with a recent dramatic increase in the number of students.

This fact, together moreover with one of the lowest shares of the adult population with completed tertiary education in the EU, represents a significant obstacle to the future development of the knowledge economy in the Czech Republic. The proposed interventions have as their aim the elimination of the negative legacy of the backlog of insufficient funding from the past, and selective support for universities which actively work to modernise their study plans and educational methods and take account in them of the needs of the labour market. The main aim of this priority is to support the development of a high-quality infrastructure for universities with the aim of increasing the capacity of tertiary education and creating the conditions to improve the quality of education. This type of investment represents an essential prerequisite for a necessary quantitative and qualitative growth in the availability of human resources for research and innovation.

Priority axis 5: Technical assistance

Support includes programme management, audit, monitoring and evaluation, programme awareness and publicity and absorption capacity on the part of organisations implementing the programme.

Chapter E – Exceptional results in research, development and innovation in 2008

This chapter follows up on a similar chapter in the previous RDI Analyses. The Chairman of the Research Development and Innovation Council asked for documentation related to the prizes awarded. Data on the prizes awarded on the basis of the Czech Head competition were acquired from publicly available documents from the Česká hlava, s.r.o. company which organises the competition.

The Czech Head project to promote scientific and technical knowledge was first held in 2002, it comprises a set of interlinked activities to popularize science and enhance the social standing of domestic engineers and scientists as the main drivers of the country's economic prosperity. Every year, the project culminates in the award of national Czech Head prizes for leading figures in science and engineering. The prizes are awarded on the basis of a public competition arranged by Česká hlava s.r.o. and the Czech Head Endowment Fund (*Nadační fond Česká hlava*). The reputation of this project has gradually risen. In 2005, the competition was expanded to include the category 'National Prize of the Government of the Czech Republic', renamed 'Czech Head National Government Prize' in 2007.

The Czech Head National Government Prize is awarded as a financial prize for exceptional results in R&D to the individual who achieved those results. The financial prize, CZK 1 million, is provided out of the national budget, from resources earmarked for R&D. The Government of the Czech Republic decides who to award the prize to on a proposal from the Research and Development Council. In the competition, prizes are awarded in other categories. The details are given in part E.3 of this chapter.

This chapter provides basic information about the following numbers of awards.

Czech Head National Government Prize	1
Prize of the Chairman of the Research Development and Innovation Council	1
Awards presented by ministries and other institutions	
Ministry of Trade and Industry	2
Ministry of Education, Youth and Sport	4
Ministry of Health	3
Ministry of Agriculture	2
Ministry of the Environment	3
Academy of Sciences of the Czech Republic	3
Czech Science Foundation	4
Other awards presented in the Czech Head competition	6
TOTAL prizes awarded	**29**

E.1 Award presented by the Government of the Czech Republic

Czech Head National Government Prize 2008

Prize awarded to:

Prof. Ing. Pavel Hobza, DrSc., FRSC

his lifetime scientific contribution in the areas of computational and theoretical chemistry

Professor Pavel Hobza is a leading expert in computational chemistry and molecular modelling. He is one of the founders of the scientific field of non-covalent interactions and especially their applications to problems in biology. He is best known in the scientific world for his discovery of the false hydrogen bond. A further fundamental find by Prof Hobza is his definition of the role of tiered interactions in DNA and proteins and the role of dispersal energy in biomacromolecules. All of these results are of exceptional significance for an important part of the natural sciences, biodisciplines.

Based on his work in close contact with experimental centres in Europe and overseas, as a member of the Learned Society of the Czech Republic, the European Academy of Sciences, the British Royal Society of Chemistry and the editorial boards of five European and Czech scientific chemistry journals, Prof. Hobza has reached an honourable first place in citation responses. He has become without question the most cited Czech scientist (the number of citations now exceeds 12 000).

The scientific, teaching and organisation activities of Professor Hobza meet the most demanding standards. He lectures at Charles University and Palacký University, and has been a guest lecturer at the University of Montreal and the Technische Universität München. He is the leading scientific researcher at the Institute for Organic Chemistry and Biochemistry of the Academy of Sciences of the Czech Republic , public research institution.

Prize of the Chairman of the Research Development and Innovation Council

Prize awarded to:

Prof. MUDr. Cyril Höschl, DrSc., FRCPsych.

Professor Höschl is one of our lead psychiatrists and was the founder and first researcher in the scientific field of psychoneuroendocrinology from the 1970s in Czechoslovakia. He is the world's leading author of priority works on the use of calcium channel blockers in psychiatry. In connection with this he created a prominent neuropsychiatric school which has trained a number of important figures in the field. In the medical field he has developed important teaching activities, including international work.

One of Prof. Höschl's merits is his skill as a populariser, with his ability to give easy-to-understand explanations of complicated scientific information to the lay public as well. Because of this he has become the most important promoter of neurobehavioural science and psychiatry. He is the author of 18 books, 650 articles in the daily press, and has broadcast 450 radio and 140 television programmes. This means that in the popularisation of science he is currently in the Czech setting an almost incomparable figure, with a broad range of world-class research work behind him.

Prof. Höschl resume of course includes work in major foreign posts, such as President of the Association of European Psychiatrists and President of the European Federation of Academies of Medicine. He holds the post of Head Physician of the Psychiatry Clinic at the 3rd Medical Faculty of Charles University. For all of the aforementioned reasons he was awarded the Prize of the Chairman of the Research Development and Innovation Council for 2008, as recognition for his promotion and popularisation of research and development.

E.2 Awards presented by ministries and other institutions

E.2.1 Ministry of Trade and Industry, Gold Medal - International Engineering Fair, Brno 2008

Award presented to:

Prof. Ing. Miroslav Václavík, CSc., Textile Equipment Research Institute Liberec, a.s.

for research, simulation, modelling and application of electronic cams in control systems for manufacturing equipment.

This is a new type of drive for the working elements of mechanisms, particularly in handling and manufacturing equipment. The movement of output elements of a mechanical differential generating the required movement is a superposition of two inputs. The first input movement is derived from a classical articulated or cam mechanism, the second programmable input motion is derived from an electronic cam. The result is a synergy of both inputs, i.e. the cooperation of power effect and a flexible change in the motion function. This electromechanical drive system makes full use of the latest SW and HW products and secures dynamically demanding applications.

Ing. Jan Otoupalík, ZKL Brno, a.s.

for research and development of NEW FORCE spherical roller bearings with increased service life.

The new type of NEW FORCE double-roller spherical roller bearings applies findings from applied research and mass-optimised form of a massive brass retaining ring. The concept and design were verified by the manufacturer in a series of tests. The technical standard of the product and its technological implementation correspond to the most modern scientific finds and technologies. Spherical roller bearings are one of the most precise engineering products, manufactured to a tolerance of just a few μm. This new series of bearings is advantageous for users in their greater reliability and lower maintenance costs. Classical roller bearings, although relatively cheaper to purchase, have a negative impact on the operation of expensive equipment. The new bearings, with their greater reliability and service life, also protect the high acquisition cost of machines and equipment by reducing the risk of production outages from unplanned operational stoppages. NEW FORCE bearings are intended for the most demanding mounting of gearboxes, railway vehicles, presses, rolling mills, pumps, machine tools, energy equipment and so on.

E.2.2 Ministry of Education, Youth and Sport Prize

Award presented to:

Prof. Dr. Ing. Karel Bouzek, Institute of Inorganic Chemistry, Institute of Chemical Technology, Prague.

for scientific work on the topic of using conducting polymers as catalyst carriers for low-temperature fuel cells.

This scientific work was published from 2000 - 2008 in prestigious international specialist journals. Professor Bouzek in addition to the electrocatalytic properties of polymers also devotes himself to proposing a methodology for fixing conducting polymer on the surface of ion-selective membranes and the characteristics of composites prepared in this way. From the results achieved so far he has followed on with his current project devoted to the issue of hydrogen technologies for fuel cells, transport and energy use. The international recognition of the results achieved is documented also by the fact that his team has been invited to the implementation of a European project focused on the issue membrane and catalyst research for PEM type high-temperature fuel cells.

Prof. MUDr. Martin Petřek, CSc., Palacký University in Olomouc, Institute of Immunology of the Medical Faculty, and Teaching Hospital, Olomouc

for his research and results in the immunology of interstitial pulmonary illnesses.

This research is directed at understanding the mechanisms for the onset and development of illnesses of the pulmonary interstitia, particularly sarcoidosis. In 2006, Prof Petřek's team announced in the leading specialist journal the American Journal for Respiratory and Critical Care Medicine that they had succeeded in decoding that part of the protein profile which determines the direction that pulmonary infection in sarcoidosis will take. Currently Prof. Petřek in conjunction with pneumologists and molecular biologists in Olomouc, Germany and Great Britain is looking at the genomics and prosthesis of pulmonary fibrosis. Prof Petřek's research results have met with significant response abroad: he lectures at international conferences, and his work is cited in prestigious journals ((Nature Immunology, Nature Genetics, Annals of Medicine and others). Thanks to his activities Olomouc has become one of the European research centres for interstitial pulmonary diseases.

Prof. MUDr. Miloš Grim, DrSc., Institute of Anatomy, 1st Medical Faculty, Charles University, Prague

for his body of work "The neural crest, its derivatives and their differentiation, neural crest stem cells, their isolation and application"

Professor Grim, the head physician of the Institute of Anatomy of the 1st Medical Faculty in Prague is a major scientist and specialist in experimental and molecular embryology. Inter alia Prof. Grim's experimental team works on neural crests during ontogenesis and especially on the fate of cells which have their origin in this crest; it has also developed a very efficient method for isolating and propagating multipotent stem cells from hair follicles. This sent of 10 primary scientific cells represents a complete study which has achieved a significant shift in knowledge in this area of embryology. His work so far includes 269 publications, of which 82 are original research works and 13 are chapters in monographs.

Medal, 1st Class, Ministry of Education, Youth and Sport

Award presented to:

Doc. RNDr. Pavel Krtouš, Ph.D., Institute of Theoretical Physics, Mathematics and Physics Faculty, Charles University, Prague

for his body of work on "Hidden symmetries in the space-time of a multi-dimensional black hole and their consequences"

In his work Dr. Krtouš has contributed to our understanding of the properties of the space-time of multi-dimensional black holes. He has shown that the motion of particles and the behaviour of fields in the vicinity of these holes is governed by equations with very special properties connected with the so-called hidden symmetries of the black holes being studied. He has also contributed in a major way to the proof that the very structure of multi-dimensional black holes is fully determined by the existence of hidden symmetries. These results were achieved in conjunction with a leading team at the University of Edmonton in Canada. The investigation of multi-dimensional gravitation is a rapidly developing field with motivation especially from gate cosmologies and string theories. These discovered properties of a multi-dimensional black hole are the theoretical generalisation for objects, now already astronomically verified, predicted by Einstein's theory of gravitation in three spatial dimensions.

E.2.3 Ministry of Health, Ministry of Health Prize 2008

Award presented to:

RNDr. Šárka Pospíšilová, PhD., Brno Teaching Hospital

for characterising the gene expression of leukaemic cells using DNA chips and its use for molecular diagnosis and predicting response to treatment

DNA chip analyses have permitted the definition of new molecular markers for leukaemia. The expression of genes LAG3, LPL and ZAP70 in patients with chronic lymphocyte leukaemia correlates significantly with the prognosis for the illness; gene expression profiles in acute childhood lymphatic leukaemia permit differentiation of cytogenetic subtypes of the illness.

Prof. MUDr. Vladimír Komárek, CSc.; 2nd Medical Faculty, Charles University, Prague

for computer analysis of speech and all-night EEG recordings for children with dysphasia

The development of a method for the objective evaluation of speech impediments and EEG characteristics of children with developmental dysphasia (developmental speech defect), the creation of a database of standardised speech extracts for children with developmental dysphasia, evaluation of the changes in children's speech using modern methods of artificial intelligence.

Winner of the honourable mention from the Minister of Health, 2008.

Prof. MUDr. Vladislav Třeška, DrSc.; Plzeň Medical Faculty, Charles University, Prague

for increasing the resectability of liver metastases of colorectal cancer through combined stage procedures.

The results of this clinical study showed the real possibility of increasing, using combined stage procedures, when the patient undergoes an average of two to three operations, the operability of primary and secondary tumours from the original to 15-20% to 40-50%

E.2.4 Ministry of Agriculture, Ministry of Agriculture Prize for the best applied research and development result, 2008

Award presented to:

Ing. Jaroslav Váňa, CSc., Plant Production Research Institute

for equipment for the conversion of wood chips into sugars, lignin and furfural.

The solution involves the unique design of the equipment for using biomass as a renewable source of energy in converting wood chips from timber production and processing, or from clearance and maintenance in parks and forests, with the purpose of producing of so-called second generation sugars fermentable into bioethanol and the generation of lignin and furfural co-products. The functionality of the equipment was verified in laboratory and test operation models. The benefits for users of using this technology lie in its high economic efficiency with minimum risk to investment plans. Costs for the production of bioethanol are 40% lower compared with conventional agrodistilleries.

Minister of Agriculture Prize for young scientists, 2008

Award presented to:

Mgr. Hana Štěpánová, Veterinary Medicine Research Institute

for determining the dependencies of early postnatal development of the pig immune system: Redistribution of T lymphocyte subgroups.

Flow cytometry in combination with tricolour immunoflorescent detection of surface molecules was used to characterise the postnatal changes in the proportion of lymphocyte subpopulations in the blood and selected lymphoid tissues of pigs. Substantial results were gained in particular when studying the proportion of gamma/delta T-lymphocytes, which especially after birth play an important role in protection against infections. From a practical standpoint the data acquired are part of our knowledge of the development of the pig immune system after birth, which together with information on functional development gives an integrated view of the possibility of inducing protective immunity of pigs through vaccination early after birth, which has an economic impact on pig farming.

E. 2.5 Ministry of the Environment, Prize of the Minister of the Environment

Award presented to:

RNDr. Miloš Anděra, CSc., National Museum

for long-term research in zoology and outstanding popularisation of science and nature protection.

Dr. Anděra has published over 80 scientific publications and specialist works including a number of monographs devoted to our fauna which are a reflection of his work on a long series of research and grant-aided projects both here and abroad. He has added value to the knowledge acquired and the extensive databases documenting the development of our mammalian animal life as principal author and editor of a nine-volume series of monographs of the provisional version of the Atlas of Mammals in the Czech Republic (1995-2007), which de facto replaces the hitherto missing volume of Mammalian Fauna of the Czech Republic. In addition to his scientific work he has devoted himself in an important manner to the popularisation of zoology and nature protection. Within the National Museum he arranges editorially for the publication of the series Czech Nomenclature of Animals (12 volumes to date) and in addition to his scientific works is the author of more than 100 popular educational articles (in the magazines Živa, Vesmír, Ochrana přírody and others) as well as many books, e.g. about our mammals or about animals which are extinct or under threat. He has gained the greatest recognition in recent years for his Encyclopaedia of Czech Nature (2003) and Encyclopaedia of European Nature (2007).

For his definitive contribution to the publication of the twelve-volume encyclopaedia The World of Animals he was awarded the Albatros Publishing House Annual Prize for 2001. The culmination of his book output is the extensive encyclopaedic National Parks of Europe, which is unique so far of its type in collating information about all the national parks in Europe including those in Eastern Europe (Russia, Ukraine, etc.).

Doc. RNDr. Martin Braniš, CSc., Environmental Institute, Natural Sciences Faculty, Charles University, Prague

for life-time teaching, scientific and publishing activities in ecology and environmental protection.

Together with centres from many European countries he has worked since 1993 also without interruption on EU framework projects, especially in the areas of pollution and air quality. He is a member of the subject council for doctoral studies at several Czech universities in the disciplines of engineering, natural sciences and socially oriented environmental studies. He lectures for the public as part of non-governmental organisation projects and programmes.

He is the author and co-author of more than a hundred specialist texts in scientific periodicals, monographs and proceedings, the author of university and secondary school textbooks, popular magazine monograph articles and dozens of expert reports. He works with Czech Radio (Meteor, Leonardo) and Czech Television (Nedej se, Na větvi etc.).

MUDr. Radim Šrám, DrSc., Institute of Experimental Medicine at the Academy of Sciences of the Czech Republic

for his pioneering lifetime work on the impact of hazardous substances from the environment on human health.

From 1964 - 1982 Dr. Šrám worked on mutagenesis through the external environment, the study of genotoxicity on mammalian models and the human population. He contributed significantly to the development of a system of laboratory genotoxicology as part of public health. From 1982 - 1991 he worked in ecologic genetics and also on the effects of antioxidants in the ageing process and mental illnesses. From 1990 he has studied the impact of mycotoxins on genetic damage in uranium mineworkers. In 1990, together with Prof. Jelínek a Dr. Kotěšovec, he proposed the Teplice Programme (Impact of Environmental Pollution on Population Health) which was implemented as a Czech Ministry of the Environment project over 1991 - 1996 with the support of PHARE EC II HEA/18-CZ. From 1997 - 1999 he was the coordinator of the Teplice Programme II and from 2000 - 2002 the "Air Pollution and Health" programme. Since 1992 he has worked on the use of molecular epidemiology methods to evaluate the impact of air pollution on the health of the population.

Original findings were obtained on the impact of air pollution (especially PM 2.5 and carcinogenic polycyclic aromatic hydrocarbons) on pregnancy outcomes - IUGR, birth weight, damage to genetic material and the current impact of genetic polymorphism (the increased incidence of DNA adducts and the genome frequency of translocations in city policemen and bus drivers), the significance of oxidative stress and its relation to the incidence of respiratory complaints in children. With his transfer to the Institute of Experimental Medicine at the Academy of Sciences of the Czech Republic in 1991 Dr. Šrám was able gradually to develop a laboratory which was unique in the Czech Republic in studying the impact of air pollution on humans, using the latest molecular epidemiology methods.

E.2.6 Academy of Sciences of the Czech Republic , Academy of Sciences of the Czech Republic Prize for outstanding results of major scientific significance

Award presented to:

Doc. RNDr. Eduard Feireisl, DrSc., Mathematics Institute of the Academy of Sciences of the Czech Republic

Prof. RNDr. Antonín Novotný, CSc., Université du Sud Toulon Var, France

for their monograph "Singular limits in thermodynamics of viscous fluids"

The monograph deals with singular limits in mathematical theory problems of the flow of viscous, compressible and heat-conducting fluids. The general approach is founded on the original theory of weak solutions for these systems of equations, developed by the authors over the last five years. The close relation of this issue with problems in acoustics is shown, particularly with various acoustic models of the Lighthill type. These findings are of major importance both for the general theory of partial differential equations and for their numerical modelling in fluid mechanics.

Collective: Prof. MUDr. Jiří Forejt, DrSc., Ing. Zdeněk Trachtulec, Dr., RNDr. Soňa Gregorová, Ing. Petr Jansa, CSc., Mgr. David Homolka a Mgr. Ondřej Mihla, Institute of Molecular Genetics of the Academy of Sciences of the Czech Republic

for their body of work on functional genetics and the genomics of the domestic mouse as a model mammalian system

This science team has introduced a new mouse model for the aneuploid syndrome, segmental trisomy TS43H and verified the impact of supernumerary copies of genes on learning ability and levels of mRNA in the brain. The team also created a first series of chromosomally substitute strains in which one pair of chromosomes was always replaced by an homologous part from a different mouse subtype, Mus m. musculus, and for the manipulation of their genome prepared a genome library from the donor subtype in artificial bacterial chromosomes. The science team discovered and also positionally cloned the first gene for hybrid sterility in vertebrates. The set of strains was, as the newest instrument for the analysis of quantitative marks and for system biology, accepted into the worldwide collection of genetically defined mouse strains The discovery of the gene for hybrid sterility in vertebrates was published in the highly prestigious journal Science, and with exceptional response (commentaries in the Journals Nature and Nature Reviews Genetics).

Czech Academy of Science Prize for particularly successful implementation of programme and grant-aided projects

Award presented to:

Collective headed by: Institute of the History of Art of the Academy of Sciences of the Czech Republic

for research into the library of Ferdinand of Tyrol - cultural, historical and art history aspects

This is a reconstruction of the library holding of Ferdinand of Tyrol which was once one of the most important Renaissance library collections. A catalogue of the library was prepared, accompanied by very high-quality parallel studies. The catalogue will serve as an heuristic aid for cultural history, library science and for the history of the individual sciences which the Ferdinand collection affects (history of art, music, historiography etc.). For incunabula it was possible to identify the author of 80% of the records, the title of 75% of the records was identify and the specific edition for 30% of records. In addition to this successful identification the library was successfully analysed by monograph, which opens up the study and comparative material to a broad spectrum of historians and bibliologists, especially in a Central European context. The printed version of the publication has an extensive resume in German.

E.2.7 Czech Science Foundation, Prize of the Chairman of the Czech Science Foundation

Award presented to:

Doc. Ing. Ladislav Bocák, Ph.D., Natural Science Faculty, Palacký University, Olomouc

for elucidating the development of neoteny (gender maturity in larvae) and speciation in the superfamily Elateroidea (order Coleoptera).

Based on molecular data the diversity of beetles on a global scales was studied, including neotenous groups and detailed study of the speciation processes and rates of speciation. The findings are of fundamental importance for the study of beetle diversity.

Prof. Ing.Evžen Kočenda, Ph.D., Charles University, Prague, CERGE

for the theoretical bases and empirical evaluation of the performance, efficiency and behaviour of Czech companies from the transformation to European integration:

A formulation and estimation (qualified estimates based on research, investigation and structuring of the issue) of econometric specifications which secure non-distorted estimates of

company performance and efficiency in the presence of ownership and other forms of endogeneity.

doc. Ing. Jan Macháč, DrSc., Electrical Engineering Faculty, Czech Technical University, Prague.

Prof. Ing. Václav Švorčík, DrSc., Chemical Technology Faculty, Chemical Technology Institute, Prague

Ing. Vladimír Hnatowicz, DrSc., Nuclear Physics Institute of the Academy of Sciences of the Czech Republic

for metamaterials, nanostructures and their applications.

The theoretical analysis, proposal and preparation of functional samples of metamaterials with isotropic response, i.e. artificial materials showing negative permitivity or permeability. Mastering of simple and repeatable preparation of very thin metal-insulator-metal structures, modelling and experimental determination of their parameters. Clarification of the preparation of metal-insulator-metal structures has fundamental significance for the training of highly skilled researchers in this field.

Special Recognition from the Chairman of the Czech Science Foundation

Award presented to:

Mgr. David Matějíček, Ph.D., Agronomy Faculty, Mendel Agricultural and Forestry University, Brno

For methods of establishing oestrogens and progestogens in parts of the environment.

The use of separation techniques for selective, sensitive, reproducible and timely establishment of the presence of oestrogens and progestogens in soils and sediments from the point of view of their use in the diagnosis of environmental burden.

E.3 Other awards presented in the Czech Head competition

E.3.1 INVENCE, ŠkodyAuto a.s. Prize

The prize is awarded for a discovery or exceptional initiative undertaken in the last few years.

Prize awarded to:

Prof. Ing. Miroslav Šťastný, DrSc., Department of Mechanics, Applied Sciences Faculty, West Bohemian University in Plzeň

for successful resolution of problems with the steam turbine on the first block of the Temelín nuclear power station.

When this facility was brought on-line in 2001, during low-level operations of the turbine high-frequency vibrations were recorded in the high-pressure pipework of the block's secondary circuit. The supplier of this non-nuclear part of the first Temelín block was Škoda Power which put together a team of specialised headed up by Prof. Šťastný. After thorough analysis of the problem Prof. Šťastný came to the conclusion that the undesirable vibration was caused by the unsuitable structure of steam flow in the regulatory valves and proposed a design change to the valves and a subsequent reconstruction of the whole flow area. The proposed changes led to stabilisation of steam flow so that not only vibration but noise levels were significantly reduced. The successful proposals by Prof. Šťastný were also used in the building of the second Temelín block.

E.3.2 PATRIA, Unipetrol a.s. Prize

This prize is awarded to a person whose professional and managerial qualities have been successfully used abroad over the last few years.

Prize awarded to:

Prof. RNDr. Josef Paldus, DrSc., FRSC., Distinguished Professor Emeritus, and Adjunct Professor Quantum Theory Group, Department of Applied Mathematics University of Waterloo, Waterloo, Ontario, Canada

for research in theoretical quantum chemistry and applied mathematics.

Professor Josef Paldus is one of the world's most acknowledged Czech scientists in theoretical and quantum chemistry and applied mathematics. Together with his colleague Jiří Čížek he has developed a new computational method for calculating the chemical properties of molecules and their behaviour on the basis of primary quantum principles. For a number of years this approach has been regarded as one of the most accurate and most efficient methods for calculating the properties of molecules in quantum chemistry. However, the idea for the new method and the first attempts at its mathematical formulation date back to the period before they emigrated. Their continuation of the development and perfecting of the method in Canada then meant a significant milestone in the development of the field of theoretical chemistry and provided a useful research instrument for a wide range of areas of chemistry.

E.3 INDUSTRIE, Kapsch s.r.o. Prize

The prize is awarded for the most prominent technological or manufacturing innovation.

Prize awarded to:

Optaglio, s. r. o., Ing. Libor Kotačka, Ph.D.

for his work: "ANGELES - Holography and diffraction optics"

The Optaglio company and its team under the management of Ing. Kotačka have developed a new method for manufacturing security elements on the basis of holography - Nanogravure. "The aim was to create the kind of security element which would allow even members of the public to verify the authenticity of a document, stamp or banknote at first glance and without any doubt, under normal conditions and without any kind of special instrument", said Ing. Kotačka. The Nanogravure technology is intended primarily for the marking of the authenticity of state documents - passports, identity documents - and of banknotes. Using conventional holography the final element has shades of colour which change according to the viewing angle of light falling on it. The new Nanogravure method works with non-holographic elements which in contrast to conventional holographic images allow the depiction of any kind of relief (i.e. a personal portrait). The motif depicted appears in full 3D and a metallic version looks like a coin relief, but of course the third dimension is only apparent and cannot be felt. The whole of a security element can also be augmented with a number of hidden security elements, identifiable only using deeper checking. The complex production process for the security element, for which instruments with high precision and sensitivity are required, minimise the risk of forgery.

E.3.4 DOCTORANDUS, Siemens Prize for Innovative Approach

The prize is awarded for the most prominent initiative, professional or initiative activity by a student on a doctoral studies programme.

Prize awarded to:

Mgr. Alena Čížková, Institute of Inherited Metabolic Disorders, 1st Medical Faculty, Charles University, Prague

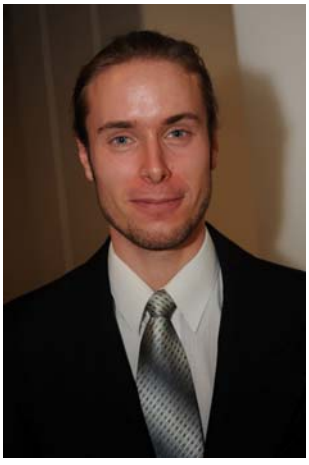
for the study of the molecular basis for disorders of mitochondrial ATP synthase.

Postgraduate student of biochemistry and pathobiochemistry at the 1st Medical Faculty of the Charles University Mgr. Alena Čížková has uncovered the basis of a serious illness, disorders of mitochondrial ATP synthase. This occurs very frequently in the Roma population and manifests as a serious of symptoms immediately after birth - severe defects to the brain and heart, physical deformities of various parts of the body and also varying degrees of mental retardation. Alena Čížková has determined that the disease is caused by the mutated TMEM70 gene and has thus opened up the possibility for targeted prenatal diagnosis, as well as the long road to finding a cure, she used various DNA chip methodological approaches to clarify the molecular basis of selected genetically condition illnesses, especially disorders in one of the cell organells - mitochondria. DNA chips serve to analyse and evaluate the genetic sample in question. Alena Čížková also published information about her work in world-renowned specialist periodicals - BMC Genomics and Nature Genetics.

E.3.5 GAUDEAMUS

Bc.Vladimír Soukup, Natural Sciences Faculty, Charles University, Prague

for his work on the topic: "Oral morphogenesis in the Mexican axolotl: developmental origin of tooth germs in evolutionary contexts"



The development of teeth in relation to their embryonic origin was long considered by scientists to have been clearly clarified long ago, so that the work of Vladimír Soukup was of the greater interest for that. Using experimental embryology methods, he was in fact able to show that teeth could develop in animals not only from the external embryonic layer, the so-called ectoderm (as had been assumed until recently), but also surprisingly from the internal embryonic layer, the so-called entoderm. The development of a tooth thus clearly does not depend just on any one of these embryonic layers but on a third embryonic tissue the so-called neural crest. This is a key cell population from which are developed a number of other body tissues, part of the nervous system, cartilage and bone.

E.3.6 SPECIAL PRIZE of the Czech General Health Insurance Co.

Prize awarded to:

MUDr. Radim Šrám, DrSc., Institute of Experimental Medicine at the Academy of Sciences of the Czech Republic

for the results of his long-term project to evaluate the risks of the impact of air pollution on the health of the population.

Since 1992 he has worked on the use of molecular epidemiology methods to evaluate the impact of air pollution on the health of the population. In his research he has focused mainly on dust particles containing carcinogenic materials (polyaromatic hydrocarbons and others) and their effect on human DNA. Dr Šrám developed this unique work during his long-term study of the impact of air pollution on pregnancies in the districts of Teplice and Prachatice. He determined that air pollution can have a negative impact on the foetus as early as the first month of pregnancy, so that newly-born babies have low birth weights and in middle age have an increased risk of cardiovascular diseases, hypertension or diabetes. The impact of air pollution was also monitored in Prague where city policemen and city bus drivers took part in the study. The measurement showed the clear relationship between long-term residence of the people being monitored in air polluted with polyaromatic hydrocarbons and damage to chromosomes and also between the incidence of fine dust particles and damage to parts of their DNA. According to Dr. Šrám the results indicate that the level of current air pollution will lead to an increased incidence of cardiovascular diseases in the population which lives in it.

List of Abbreviations Used

AS CR	Academy of Sciences of the Czech Republic
6. FP	6. European Union Framework Programme
AIP ČR	Czech Association of Innovative Entrepreneurship
CA	coordination activities
CEP	Central Project Register (CEP)
CEZ	Central Programmes Register (CEZ)
CIS 4	Community Innovation Survey
ČBÚ	Czech Office of Mines
ČSÚ	Czech Statistical Office
ČÚZK	Czech Geodetic and Cadastral Office
EIS 2006	European Innovation Scoreboard 2006
EK	European Commission
EPO	European Patent Office
ERA	European Research Area
EU	European Union
EU-15	EU countries - Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, Great Britain, Greece
EU-25	EU-15 + Czech Republic, Estonia, Cyprus, Lithuania, Latvia, Hungary, Malta, Poland, Slovakia and Slovenia
EU-27	All EU member states (EU-25 + Bulgaria+Romania)
Eurostat	European Statistical Office
Frascati	OECD manual for statistical measurement of scientific and technology activities
GA ČR	Czech Science Foundation
GBAORD	Government Budget Appropriations or Outlays for R&D by Socio-economic Objectives
GCI	Global Competitiveness Index
GERD	International acronym for total (gross) R&D expenditure
Growth CI	Growth Competitiveness Index
GDP	Gross Domestic Product
ICT	Information and communication technologies
IMD	International Institute for Management Development, Lausanne, Switzerland
RDI IS	Research, development and innovation information system
ISOP	Ministry of Trade and Industry IS
JRC	Joint Research Centre
MD	Ministry of Transport
MO	Ministry of Defence
MI	Ministry of Information Technology
MPO	Ministry of Trade and Industry
MPSV	Ministry of Labour and Social Affairs
MS	Ministry of Justice
SME	Small or Medium Sized Enterprise
MSTI	Main Science and Technology Indicators, OECD
MŠMT	Ministry of Education, Youth and Sport

MV	Ministry of the Interior
MZ	Ministry of Health
MZe	Ministry of Agriculture
MZV	Ministry of Foreign Affairs
MŽP	Ministry of the Environment
NBÚ	Czech National Security Office
NMS	New Member States (EU)
NSI	National Science Indicators
NUTS-2	Nomenclature of Territorial Units for Statistics. Level "2"
OECD	Organisation for Economic Cooperation and Development (OECD)
OON	Other Personnel Expenses
OP	Operational Programme
OP PP	Industry and Business Operational Programme
OP VK	The Education for Competitiveness Operational Programme
OP VaVpI	The Research And Development for Innovation Operational Programme
OSF	Ministry of Trade and Industry Structural Funds Dept.
PCT	Patent Cooperation Treaty
PPP	Purchasing Power Parity
RCI	Relative citation impact (of a country/region)
RCID	Relative citation impact of a discipline (for a country/region)
RII	Results Information Index
RPC	Relative Production of Citations
RPP	Relative Production of Publications
RDIC	Research Development and Innovation Council
SB	Czech state budget
SSA	Specific Support Activities
SANS	State Agency for Nuclear Safety
TC AV	Academy of Sciences of the Czech Republic Technology Centre
IPO	Industrial Property Office
USPTO	US Patents and Trademark Office
R&D	Research and Development
RDI	Research Development and Innovation
RD for I	Research and Development for Innovation
VES	Public Tender Records
EC	Education for Competitiveness
Universities	University (state, public, private, commercial)
RP	Research plan
WEF	World Economic Forum
WIPO	World Intellectual Property Organisation

Appendices

Appendix 1. Basic parameters of selected countries

	Number of inhabitants mil	*GDP per capita in $mPPP*		*Total R&D expenditure - constant 2000 prices in $m PPP*		*State R&D (GBAORD)*		*Researchers (FTE equivalents)*	
	2007	**2000**	**2007**	**2000**	**2007**	**2000**	**2007**	**2000**	**2007**
Belgium	10,246	282,179	375,830	5,564	6,051	1,595	2,272	30,540	35,937
Bulgaria	8,170	49,615	86,381	258	366	213	242	9,479	11,203
Czech Republic	10,273	153,830	248,025	1,861	3,215	..	1,439	13,852	27,878
China	1,269,962	2,976,464	6,882,201	26,870	87,088	..	..	695,062	1,423,381
Denmark	5,338	153,675	196,349	..	4,383	1,169	1,561	..	29,572
Estonia	1,370	13,575	27,318	81	273	46	139	2,666	3,690
Finland	5,176	132,704	183,519	4,440	5,706	1,301	1,777	34,847	39,000
France	60,751	1,532,924	2,077,833	32,919	36,145	14,722	15,493	172,070	..
Ireland	3,800	108,858	196,183	1,221	2,098	331	962	8,516	..
Italy	56,942	1,455,705	1,813,180	15,229	..	9,358	11,665	66,110	..
Japan	126,926	3,246,288	4,293,498	98,774	124,567	21,197	29,227	647,572	709,974
Canada	30,689	873,008	1,269,588	16,689	19,688	4,568	..	108,492	..
Korea	47,008	772,766	1,201,770	18,494	37,017	5,007	10,854	108,370	221,928
Lithuania	2,373	29,368	59,885	84	230	85	204	7,777	8,489
Latvia	3,500	18,235	39,896	178	441	33	136	3,814	4,223
Hungary	10,211	125,265	188,591	976	508	..	..	14,406	17,391
Germany	82,188	2,130,227	2,829,084	52,281	58,811	16,787	21,836	257,874	284,305
Netherlands	15,922	467,652	642,383	8,533	9,103	3,610	4,642	42,088	44,116
Norway	4,491	162,052	251,661	..	3,429	1,056	1,798	7,777	8,489
Poland	38,256	403,782	613,318	2,602	3,024	1,538	1,935	55,174	61,395
Portugal	10,226	174,522	242,033	1,323	2,218	1,018	1,887	16,738	27,986
Austria	8,012	230,222	308,661	4,469	6,835	1,428	2,131	..	31,352
Romania	22,443	126,901	271,829	468	1,014	178	1,015	20,476	18,808
Russia	147,423	1,115,277	2,087,447	11,709	19,590	5,234	8,398	506,420	469,076
Greece	10,917	200,760	318,134	..	1,541	619	939	..	20,817
Slovakia	5,401	59,201	108,355	384	414	213	229	9,955	12,354
Slovenia	1,989	34,712	53,991	482	721	174	282	4,336	6,450
United Kingdom	58,886	1,533,454	2,168,062	27,823	32,876	10,346	..	161,352	175,476
United States	282,433	9,764,800	13,741,600	268,121	307,780	83,613	141,890	1,289,782	..
Spain	40,264	857,440	1,417,366	7,780	13,771	5,168	15,272	76,670	122,624
Sweden	8,872	245,981	335,110	..	10,752	1,729	2,702	..	47,762
Switzerland	7,209	227,672	308,620	5,758	..	1,457	..	26,105	..
EU15	377,978	9,529,683	13,142,030	**..**	**..**	**..**	**..**	**..**	**..**
EU27	482,657	10,558,993	14,869,932	183,334	219,753	75,267	..	1,108,506	1,360,332
OECD	1,130,021	27,505,844	38,727,730	607,192	743,196	196,851	..	..	..

Source: OECD, Eurostat, Czech Statistical Office calculations

Appendix 2 - Evaluated results aggregate by research organisation and ranked by group by legal form of institution

Standardies table (TabS) in line with the Methodology for evaluating R&D results for 2008

Information about research organisation					Total evaluated results		J- Article in specialist periodical		B- Book (chapter in book)		D- Article in proceedings		P - patent		Z (T) - trial operations, technology verification		S - prototype, applied methodology		V - research report		No points evaluation
Legal form group	Company registration number	Title:	Legal form	Organis. unit	Number	Points	Number	Points	Number	Points	Number	Points	Number	Points	Number	Points	Number	Points	Number	Points	Number
INSSKUKOD	INSICOP	INSNAZP	INSDRUKOD	PRIORJPOD	POCUZN	BODUZN	POCJ	BODJ	POCB	BODB	POCD	BODD	POCP	BODP	POCZ	BODZ	POCS	BODS	POCV	BODV	POCNEU
VVS	61384984	Akademie múzických umění v Praze	VVS	Yes	136,80	2 190,41	102,40	1 024,00	19,40	566,41	0,00	0,00	0,00	0,00	0,00	0,00	15,00	600,00	0,00	0,00	111,66
VVS	60461446	Akademie výtvarných umění v Praze	VVS	Yes	10,73	235,58	4,53	127,62	5,80	104,76	0,40	3,20	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	92,11
VVS	60460709	Česká zemědělská univerzita v Praze	VVS	Yes	1 241,24	11 560,62	880,83	9 038,71	324,62	1 750,29	25,12	200,95	3,40	136,00	2,40	240,00	4,87	194,67	0,00	0,00	6 611,76
VVS	68407700	České vysoké učení technické v Praze	VVS	Yes	3 834,19	87 631,11	1 869,63	35 199,49	476,49	5 472,09	648,21	5 185,66	52,08	3 616,67	110,77	11 076,67	677,01	27 080,53	0,00	0,00	15 254,82
VVS	62156462	Janáčkova akademie múzických umění v Brně	VVS	Yes	50,00	1 916,00	3,00	36,00	47,00	1 880,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	137,50
VVS	60076658	Jihočeská univerzita v Českých Budějovicích	VVS	Yes	989,25	21 439,94	738,68	17 267,40	229,42	3 126,32	6,21	49,71	3,00	120,00	6,65	665,00	5,29	211,50	0,00	0,00	1 870,46
VVS	00216224	Masarykova univerzita	VVS	Yes	4 135,92	78 607,74	2 830,57	59 043,32	1 083,02	17 164,21	207,03	1 656,21	3,10	124,00	2,20	220,00	10,00	400,00	0,00	0,00	9 302,18
VVS	62156489	Mendelova zemědělská a lesnická univerzita v Brně	VVS	Yes	1 094,52	17 024,07	920,49	13 749,60	147,01	2 420,74	14,42	115,39	1,00	40,00	3,92	391,67	7,67	306,67	0,00	0,00	5 121,00
VVS	61988987	Ostravská univerzita v Ostravě	VVS	Yes	327,99	5 135,27	138,63	2 780,49	168,68	2 189,31	20,68	165,47	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	1 106,41
VVS	47813059	Slezská univerzita v Opavě	VVS	Yes	197,16	4 064,74	125,04	2 792,67	65,13	1 216,07	7,00	56,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	536,55
VVS	46747885	Technická univerzita v Liberci	VVS	Yes	434,67	10 199,97	210,19	3 538,22	78,98	1 085,75	50,75	406,00	9,50	700,00	17,67	1 766,67	67,58	2 703,33	0,00	0,00	3 288,48
VVS	62690094	Univerzita Hradec Králové	VVS	Yes	81,31	1 566,70	37,33	539,71	35,14	956,32	8,83	70,67	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	493,50
VVS	44555601	Univerzita Jana Evangelisty Purkyně v Ústí nad Laber	VVS	Yes	294,03	5 112,59	123,11	3 222,81	168,17	1 811,78	1,00	8,00	0,00	0,00	0,00	0,00	1,75	70,00	0,00	0,00	988,61
VVS	00216208	Univerzita Karlova v Praze	VVS	Yes	12 072,96	246 365,97	8 993,73	197 451,23	2 897,18	41 552,51	111,13	889,04	16,03	3 572,52	11,75	1 175,00	43,14	1 725,67	0,00	0,00	13 020,27
VVS	61989592	Univerzita Palackého v Olomouci	VVS	Yes	1 686,28	40 331,83	1 293,85	30 839,83	337,19	6 869,31	34,03	272,21	18,43	2 199,38	0,67	66,67	2,11	84,44	0,00	0,00	1 979,76
VVS	00216275	Univerzita Pardubice	VVS	Yes	1 005,79	21 670,31	693,95	17 597,38	182,41	2 633,49	125,35	1 002,77	1,25	183,33	2,33	233,33	0,50	20,00	0,00	0,00	3 144,44
VVS	70883521	Univerzita Tomáše Bati ve Zlíně	VVS	Yes	379,71	6 169,33	221,14	4 650,68	57,48	709,98	101,08	808,67	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	2 678,41
VVS	62157124	Veterinární a farmaceutická univerzita Brno	VVS	Yes	516,46	8 080,20	483,28	7 761,86	15,60	159,33	17,38	139,01	0,00	0,00	0,20	20,00	0,00	0,00	0,00	0,00	801,30
VVS	61989100	Vysoká škola báňská - Technická univerzita Ostrava	VVS	Yes	815,71	12 911,74	444,34	6 382,78	253,44	2 436,37	56,32	450,59	0,00	0,00	19,63	1 963,33	41,97	1 678,67	0,00	0,00	4 942,61
VVS	61384399	Vysoká škola ekonomická v Praze	VVS	Yes	1 530,45	12 125,89	585,99	4 021,57	899,41	7 711,96	44,05	352,37	0,00	0,00	0,00	0,00	1,00	40,00	0,00	0,00	5 617,39
VVS	60461373	Vysoká škola chemicko-technologická v Praze	VVS	Yes	1 454,75	41 733,55	1 231,63	37 556,35	99,18	793,55	90,25	721,97	12,93	1 105,02	12,10	1 210,00	8,67	346,67	0,00	0,00	4 873,74
VVS	75081431	Vysoká škola technická a ekonomická v Českých Bud	VVS	No	1,00	7,00	1,00	7,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	21,81
VVS	00216305	Vysoké učení technické v Brně	VVS	Yes	2 658,24	62 100,45	1 325,61	18 769,35	188,32	2 618,10	397,79	3 182,32	7,00	740,00	120,00	12 000,00	618,52	24 740,67	1,00	50,00	14 926,39
VVS	49777513	Západočeská univerzita v Plzni	VVS	Yes	924,45	20 955,92	324,41	6 468,07	243,42	3 112,90	128,63	1 029,00	2,00	80,00	20,44	2 044,05	205,55	8 221,91	0,00	0,00	4 120,61
STI	62933591	Agentura ochrany přírody a krajiny České republiky	OSS	No	11,45	568,24	3,43	20,10	0,96	22,52	0,00	0,00	0,00	0,00	4,06	405,62	3,00	120,00	0,00	0,00	21,94
STI	68081758	Archeologický ústav AV ČR, Brno, v. v. i.	VVI	No	116,41	1 723,99	65,24	791,78	51,17	932,21	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	110,88
STI	67985912	Archeologický ústav AV ČR, Praha, v. v. i.	VVI	No	241,80	3 694,52	133,83	1 711,37	104,54	1 799,72	0,43	3,43	0,00	0,00	1,00	100,00	2,00	80,00	0,00	0,00	351,20
STI	67985815	Astronomický ústav AV ČR, v. v. i.	VVI	No	239,69	7 243,02	183,81	6 735,90	9,34	134,89	46,53	372,23	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	223,44
STI	68081707	Biofyzikální ústav AV ČR, v. v. i.	VVI	No	277,42	11 262,59	262,67	11 176,10	14,75	86,49	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	78,43
STI	60077344	Biologické centrum AV ČR, v. v. i.	VVI	No	590,65	18 561,34	519,82	17 652,25	68,40	737,95	0,50	4,00	0,43	17,14	1,50	150,00	0,00	0,00	0,00	0,00	329,74
STI	67985939	Botanický ústav AV ČR, v. v. i.	VVI	No	577,36	11 293,83	320,95	10 854,18	252,82	394,92	3,09	24,73	0,00	0,00	0,00	0,00	0,50	20,00	0,00	0,00	181,75
STI	49366378	CASRI Praha	SPO	No	15,00	526,67	0,00	0,00	9,67	193,33	0,00	0,00	0,00	0,00	2,00	200,00	3,33	133,33	0,00	0,00	32,51
STI	45249130	CENIA, česká informační agentura životního prostředí	SPO	No	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	2,00
STI	44994575	Centrum dopravního výzkumu, v.v.i.	VVI	No	76,72	2 217,49	22,07	213,48	8,02	186,72	1,50	12,00	0,00	0,00	0,00	0,00	45,13	1 805,28	0,00	0,00	365,87
STI	00209775	Centrum kardiovaskulární a transplantační chirurgie	SPO	No	26,20	393,85	24,86	392,41	1,33	1,44	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	14,85
STI	00237752	Centrum pro studium vysokého školství, v.v.i.	VVI	No	74,33	899,54	64,93	652,33	9,40	247,20	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	52,17
STI	00025798	Česká geologická služba	SPO	No	658,23	15 725,64	385,95	6 336,74	50,86	388,84	6,24	49,91	0,00	0,00	5,71	570,91	209,48	8 379,24	0,00	0,00	967,44
STI	00020699	Český hydrometeorologický ústav	SPO	No	7,12	149,00	2,92	21,00	1,20	8,00	0,00	0,00	0,00	0,00	0,00	0,00	3,00	120,00	0,00	0,00	65,87
STI	00177016	Český metrologický institut	SPO	No	2,50	100,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	2,50	100,00	0,00	0,00	9,67
STI	00023761	Endokrinologický ústav	SPO	No	115,17	1 444,93	95,08	1 385,34	19,42	32,93	0,00	0,00	0,67	26,67	0,00	0,00	0,00	0,00	0,00	0,00	34,64
STI	68378076	Etnologický ústav AV ČR, v. v. i.	VVI	No	203,77	2 635,89	99,33	1 096,00	104,43	1 539,89	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	218,57
STI	65269705	Fakultní nemocnice Brno	SPO	Yes	91,32	1 357,74	90,32	1 355,74	1,00	2,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	35,90
STI	00179906	Fakultní nemocnice Hradec Králové	SPO	No	167,72	2 194,06	147,94	1 992,32	17,78	185,74	2,00	16,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	79,16
STI	00064173	Fakultní nemocnice Královské Vinohrady	SPO	No	2,50	20,00	2,50	20,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,33
STI	00064211	Fakultní nemocnice Na Bulovce	SPO	No	26,30	828,11	25,30	826,68	1,00	1,44	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	24,43
STI	00098892	Fakultní nemocnice Olomouc	SPO	No	31,02	396,66	29,27	376,27	1,75	20,39	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	52,39
STI	00669806	Fakultní nemocnice Plzeň	SPO	No	227,53	2 750,31	194,42	2 550,52	33,11	199,80	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	69,20
STI	00843989	Fakultní nemocnice s poliklinikou Ostrava	SPO	No	9,26	120,75	8,26	100,75	1,00	20,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	2,33
STI	00159816	Fakultní nemocnice u sv.Anny v Brně	SPO	No	34,86	501,73	31,26	459,93	1,00	21,00	2,60	20,80	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	29,42
STI	00064203	Fakultní nemocnice v Motole	SPO	No	310,56	5 308,56	272,31	5 030,55	33,64	241,22	4,60	36,80	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	155,83
STI	00064190	Fakultní Thomayerova nemocnice s poliklinikou	SPO	No	2,00	16,00	2,00	16,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	3,00
STI	67985955	Filozofický ústav AV ČR, v. v. i.	VVI	No	832,97	11 282,24	473,67	5 499,00	358,30	5 775,24	1,00	8,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	443,52
STI	68378271	Fyzikální ústav AV ČR, v. v. i.	VVI	No	1 145,49	45 059,07	1 007,79	43 614,54	22,58	307,09	110,24	881,89	1,00	40,00	1,00	100,00	2,89	115,56	0,00	0,00	307,98
STI	67985823	Fyziologický ústav AV ČR, v. v. i.	VVI	No	404,08	13 497,99	376,04	13 366,82	25,38	88,50	2,00	16,00	0,67	26,67	0,00	0,00	0,00	0,00	0,00	0,00	68,11
STI	67985530	Geofyzikální ústav AV ČR, v. v. i.	VVI	No	123,95	3 299,64	109,76	3 202,67	13,19	88,98	1,00	8,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	113,55
STI	67985831	Geologický ústav AV ČR, v. v. i.	VVI	No	225,68	5 496,39	143,81	2 507,91	45,40	251,81	1,00	8,00	0,00	0,00	21,83	2 183,33	13,63	545,33	0,00	0,00	172,58
STI	67985963	Historický ústav AV ČR, v. v. i.	VVI	No	590,09	6 840,09	171,67	1 984,67	418,42	4 855,42	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	317,15
STI	00072486	Husitské muzeum v Táboře	SPO	No	0,33	1,33	0,33	1,33	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,50

Appendix 2 - Evaluated results aggregate by research organisation and ranked by group by legal form of institution

Standardies table (TabS) in line with the Methodology for evaluating R&D results for 2008

Information about research organisation					Total evaluated results		J- Article in specialist periodical		B- Book (chapter in book)		D- Article in proceedings		P - patent		Z (T) - trial operations, technology verification		S - prototype, applied methodology		V - research report		No points evaluation
Legal form group	Company registration number	Title:	Legal form	Organis. unit	Number	Points	Number	Points	Number	Points	Number	Points	Number	Points	Number	Points	Number	Points	Number	Points	Number
INSSKUKOD	INSICOP	INSNAZP	INSDRUKOD	PRIORJPOD	POCUZN	BODUZN	POCJ	BODJ	POCB	BODB	POCD	BODD	POCP	BODP	POCZ	BODZ	POCS	BODS	POCV	BODV	POCNEU
STI	00023001	Institut klinické a experimentální medicíny	SPO	No	699,26	10 782,26	606,55	10 254,37	81,16	435,51	11,55	92,38	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	78,62
STI	00023841	Institut postgraduálního vzdělávání ve zdravotnictví	SPO	No	5,43	106,60	4,76	39,93	0,00	0,00	0,00	0,00	0,00	0,00	0,67	66,67	0,00	0,00	0,00	0,00	3,20
STI	00023205	Institut umění - Divadelní ústav	SPO	No	6,97	138,67	5,00	60,00	1,97	78,67	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	7,00
STI	00092738	Jihomoravské muzeum ve Znojmě, příspěvková orgar	SPO	No	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	1,67
STI	67985971	Knihovna AV ČR, v. v. i.	VVI	No	8,50	111,56	1,00	4,00	7,50	107,56	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	12,83
STI	00209805	Masarykův onkologický ústav	SPO	No	77,98	1 347,98	76,98	1 327,98	1,00	20,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	46,77
STI	67985921	Masarykův ústav - Archiv AV ČR, v. v. i.	VVI	No	85,13	1 573,86	18,67	200,67	66,47	1 373,19	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	162,70
STI	67985840	Matematický ústav AV ČR, v. v. i.	VVI	No	290,84	7 505,15	251,89	6 950,02	26,42	454,86	12,53	100,27	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	249,96
STI	61388971	Mikrobiologický ústav AV ČR, v. v. i.	VVI	No	446,82	15 775,11	361,53	13 447,17	34,88	117,53	0,62	4,93	9,05	515,48	1,00	100,00	39,75	1 590,00	0,00	0,00	582,77
STI	60162694	Ministerstvo obrany/G38 Univerzita obrany	OSS	Yes	550,33	11 870,04	346,07	4 967,69	85,68	1 084,77	36,73	293,87	7,14	285,71	37,50	3 750,00	37,20	1 488,00	0,00	0,00	2 090,06
STI	00007064	Ministerstvo vnitra/ K12 Policie ČR - Úřad služby krim	OSS	No	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	1,00
STI	00007064	Ministerstvo vnitra/K01 Policie ČR Kriminalistický ústa	OSS	No	19,00	1 592,02	8,00	492,02	0,00	0,00	0,00	0,00	0,00	0,00	11,00	1 100,00	0,00	0,00	0,00	0,00	11,00
STI	00007064	Ministerstvo vnitra/K06 Policie ČR - Útvar zvláštních č	OSS	No	2,00	200,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	2,00	200,00	0,00	0,00	0,00	0,00	2,00
STI	00007064	Ministerstvo vnitra/K13 Generální ředitelství HZS - Ins	OSS	No	30,50	840,00	0,00	0,00	19,00	380,00	0,00	0,00	0,00	0,00	0,00	0,00	11,50	460,00	0,00	0,00	132,33
STI	00007064	Ministerstvo vnitra/K02 Generální ředitelství HZS - Te	OSS	No	1,00	20,00	0,00	0,00	1,00	20,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	36,00
STI	00094871	Moravská galerie v Brně	SPO	No	13,95	317,14	2,00	22,00	11,95	295,14	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	75,62
STI	00094943	Moravská zemská knihovna v Brně	SPO	No	5,40	188,00	0,00	0,00	4,40	148,00	0,00	0,00	0,00	0,00	0,00	0,00	1,00	40,00	0,00	0,00	14,00
STI	00094862	Moravské zemské muzeum	SPO	No	178,23	1 893,86	114,09	1 047,78	64,14	846,07	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	204,97
STI	00092142	MUZEUM JANA AMOSE KOMENSKÉHO	SPO	No	4,00	104,00	2,00	24,00	2,00	80,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	2,00
STI	00097969	Muzeum Komenského v Přerově, příspěvková organiz	SPO	No	3,08	57,20	1,50	23,27	1,58	33,93	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	3,92
STI	75079950	Muzeum umění Olomouc	SPO	No	1,00	12,00	1,00	12,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	2,00
STI	00088382	Muzeum východních Čech v Hradci Králové	SPO	No	4,72	42,89	3,50	14,00	1,22	28,89	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	5,83
STI	00090735	Muzeum Vysočiny Jihlava, příspěvková organizace	SPO	No	2,75	11,00	2,75	11,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	6,33
STI	70979821	Národní archiv	OSS	No	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	2,24
STI	68403569	Národní bezpečnostní úřad ČR	OSS	No	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	10,00
STI	00023281	Národní galerie v Praze	SPO	No	5,09	203,62	0,00	0,00	5,09	203,62	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,80
STI	14450551	Národní informační a poradenské středisko pro kultur	SPO	No	5,14	131,55	0,00	0,00	3,81	78,21	0,00	0,00	0,00	0,00	0,00	0,00	1,33	53,33	0,00	0,00	6,29
STI	00023221	Národní knihovna České republiky	SPO	No	23,03	1 427,60	2,00	12,00	2,00	22,00	1,00	8,00	0,00	0,00	11,08	1 107,50	6,95	278,10	0,00	0,00	51,83
STI	00023825	Národní lékařská knihovna	OSS	No	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	5,00
STI	00023272	Národní muzeum	SPO	No	203,51	2 104,52	157,19	1 409,52	46,32	695,01	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	200,29
STI	75032333	Národní památkový ústav	SPO	No	318,61	3 087,28	105,20	1 218,73	201,99	1 081,41	0,00	0,00	0,00	0,00	5,51	550,48	5,92	236,67	0,00	0,00	713,89
STI	00023299	Národní technické muzeum	SPO	No	6,53	201,37	1,00	12,00	5,53	189,37	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	18,72
STI	00094927	Národní ústav lidové kultury	SPO	No	13,52	258,87	9,00	78,00	4,52	180,87	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	13,76
STI	75075741	Národní zemědělské muzeum Praha	SPO	No	15,50	181,85	2,00	14,00	13,50	167,85	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	19,00
STI	67985998	Národohospodářský ústav AV ČR, v. v. i.	VVI	No	171,67	1 674,98	144,17	1 408,11	27,50	266,87	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	187,73
STI	00023884	Nemocnice Na Homolce	SPO	No	17,96	376,39	16,96	336,39	1,00	40,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	9,22
STI	68378009	Orientální ústav AV ČR, v. v. i.	VVI	No	84,70	1 190,39	31,00	364,00	53,70	826,39	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	68,00
STI	00023311	Památník národního písemnictví	SPO	No	2,25	90,00	0,00	0,00	2,25	90,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	10,00
STI	48135445	Policejní akademie České republiky v Praze	OSS	No	88,51	1 358,77	58,75	492,08	29,76	866,69	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	148,53
STI	00023752	Psychiatrické centrum Praha	SPO	No	191,16	1 985,39	140,22	1 700,34	50,70	283,16	0,24	1,89	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	51,56
STI	68081740	Psychologický ústav AV ČR, v. v. i.	VVI	No	108,77	1 171,16	69,87	656,83	38,57	511,66	0,33	2,67	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	150,97
STI	00083232	Severočeské muzeum v Liberci	SPO	No	4,00	51,61	0,00	0,00	4,00	51,61	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	13,00
STI	00100595	Slezské zemské muzeum	SPO	No	22,33	286,61	12,33	94,88	10,00	191,74	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	36,00
STI	68378017	Slovanský ústav AV ČR, v. v. i.	VVI	No	115,82	1 520,32	69,50	818,00	46,32	702,32	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	122,61
STI	68378025	Sociologický ústav AV ČR, v. v. i.	VVI	No	438,67	4 314,93	217,33	1 785,02	220,33	2 429,92	0,00	0,00	0,00	0,00	1,00	100,00	0,00	0,00	0,00	0,00	766,23
STI	00088455	Správa KRNAP	SPO	No	0,43	11,33	0,33	1,33	0,00	0,00	0,00	0,00	0,00	0,00	0,10	10,00	0,00	0,00	0,00	0,00	6,60
STI	00583171	Správa národního parku a chráněné krajinné oblasti Š	SPO	No	17,83	629,33	2,50	16,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	15,33	613,33	0,00	0,00	16,50
STI	61387142	Státní technická knihovna v Praze	SPO	No	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	6,00
STI	70565813	Státní ústav jaderné, chemické a biologické ochrany,	VVI	No	45,03	3 203,97	1,79	29,30	1,00	20,00	0,00	0,00	0,00	0,00	24,25	2 424,68	17,00	680,00	1,00	50,00	25,12
STI	63108089	Státní ústav radiační ochrany	OSS	No	30,80	1 483,25	15,79	199,82	0,61	9,29	1,14	9,14	1,00	40,00	12,25	1 225,00	0,00	0,00	0,00	0,00	154,96
STI	75010330	Státní zdravotní ústav	SPO	No	225,40	3 686,03	201,35	3 501,17	21,72	134,19	1,33	10,67	0,00	0,00	0,00	0,00	1,00	40,00	0,00	0,00	172,46
STI	60457856	Středisko společných činností AV ČR, v. v. i.	VVI	No	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	3,00
STI	00069850	Středočeské muzeum v Roztokách u Prahy	SPO	No	8,00	32,00	8,00	32,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	2,00
STI	00101435	Technické muzeum v Brně	SPO	No	1,00	1,91	0,00	0,00	1,00	1,91	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	3,00
STI	00023442	Uměleckoprůmyslové museum v Praze	SPO	No	11,21	182,19	0,00	0,00	11,21	182,19	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	19,81
STI	00209813	Úrazová nemocnice v Brně	SPO	No	21,85	332,89	20,85	312,89	1,00	20,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	35,37
STI	68081715	Ústav analytické chemie AV ČR, v. v. i.	VVI	No	158,92	8 804,39	130,97	8 295,62	21,45	98,76	0,00	0,00	0,00	0,00	2,50	250,00	4,00	160,00	0,00	0,00	66,23
STI	61388980	Ústav anorganické chemie AV ČR, v. v. i.	VVI	No	168,75	6 792,36	152,92	5 995,72	2,62	14,20	1,45	11,60	7,44	337,51	4,33	433,33	0,00	0,00	0,00	0,00	201,37

Appendix 2 - Evaluated results aggregate by research organisation and ranked by group by legal form of institution

Standardies table (TabS) in line with the Methodology for evaluating R&D results for 2008

Information about research organisation					Total evaluated results		J- Article in specialist periodical		B- Book (chapter in book)		D- Article in proceedings		P - patent		Z (T) - trial operations, technology verification		S - prototype, applied methodology		V - research report		No points evaluation
Legal form group	Company registration number	Title:	Legal form	Organis. unit	Number	Points	Number	Points	Number	Points	Number	Points	Number	Points	Number	Points	Number	Points	Number	Points	Number
INSSKUKOD	INSICOP	INSNAZP	INSDRUKOD	PRIORJPOD	POCUZN	BODUZN	POCJ	BODJ	POCB	BODB	POCD	BODD	POCP	BODP	POCZ	BODZ	POCS	BODS	POCV	BODV	POCNEU
STI	48511005	Ústav archeologické památkové péče Brno, veřejná v	VVI	No	0,50	6,00	0,50	6,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	5,00
STI	47325011	Ústav archeologické památkové péče severozápadníc	VVI	No	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	1,00
STI	68081766	Ústav biologie obratlovců AV ČR, v. v. i.	VVI	No	189,03	4 228,66	163,60	4 016,94	24,18	150,05	0,00	0,00	0,00	0,00	0,20	20,00	1,04	41,67	0,00	0,00	111,35
STI	68378033	Ústav dějin umění AV ČR, v. v. i.	VVI	No	531,84	4 489,02	152,08	1 780,83	377,76	2 692,19	2,00	16,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	321,67
STI	61389030	Ústav experimentální botaniky AV ČR, v. v. i.	VVI	No	186,30	8 596,98	165,00	6 616,14	12,70	61,18	1,50	12,00	6,60	1 857,67	0,50	50,00	0,00	0,00	0,00	0,00	59,91
STI	68378041	Ústav experimentální medicíny AV ČR, v. v. i.	VVI	No	143,46	7 731,92	141,51	7 726,79	1,95	5,14	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	38,21
STI	67985882	Ústav fotoniky a elektroniky AV ČR, v. v. i.	VVI	No	193,28	7 211,33	120,71	6 238,66	12,03	287,11	57,36	458,89	1,25	50,00	1,67	166,67	0,25	10,00	0,00	0,00	232,40
STI	61388955	Ústav fyzikální chemie Jaroslava Heyrovského AV ČR	VVI	No	403,80	19 452,92	369,39	18 971,17	30,21	167,01	2,60	20,80	1,60	293,94	0,00	0,00	0,00	0,00	0,00	0,00	120,29
STI	68378289	Ústav fyziky atmosféry AV ČR, v. v. i.	VVI	No	160,19	4 579,61	146,13	3 960,02	5,10	73,26	1,63	13,00	0,00	0,00	4,00	400,00	3,33	133,33	0,00	0,00	106,00
STI	68081723	Ústav fyziky materiálů AV ČR, v. v. i.	VVI	No	191,12	7 838,54	173,41	7 623,90	9,21	85,27	7,84	62,70	0,00	0,00	0,67	66,67	0,00	0,00	0,00	0,00	398,56
STI	61389021	Ústav fyziky plazmatu AV ČR, v. v. i.	VVI	No	144,48	3 547,38	123,24	3 151,48	4,17	27,33	13,57	108,57	1,50	60,00	2,00	200,00	0,00	0,00	0,00	0,00	227,11
STI	68145535	Ústav geoniky AV ČR, v. v. i.	VVI	No	142,29	2 867,56	79,43	999,69	32,86	386,53	9,33	74,67	0,00	0,00	9,67	966,67	11,00	440,00	0,00	0,00	362,14
STI	00023736	Ústav hematologie a krevní transfúze	SPO	No	190,81	3 782,99	187,24	3 711,08	2,00	9,05	0,00	0,00	1,57	62,86	0,00	0,00	0,00	0,00	0,00	0,00	154,75
STI	67985858	Ústav chemických procesů AV ČR, v. v. i.	VVI	No	280,26	14 486,62	261,06	12 447,28	8,00	27,34	0,25	2,00	10,95	2 010,00	0,00	0,00	0,00	0,00	0,00	0,00	407,65
STI	67985807	Ústav informatiky AV ČR, v. v. i.	VVI	No	314,84	6 542,23	184,44	4 478,90	54,42	324,20	49,77	398,15	0,00	0,00	4,88	487,50	21,34	853,48	0,00	0,00	334,28
STI	61389005	Ústav jaderné fyziky AV ČR, v. v. i.	VVI	No	318,82	11 344,16	304,47	10 742,20	7,39	178,36	2,95	23,60	0,00	0,00	4,00	400,00	0,00	0,00	0,00	0,00	136,14
STI	61382981	Ústav leteckého zdravotnictví Praha	SPO	No	10,00	448,00	6,00	48,00	0,00	0,00	0,00	0,00	0,00	0,00	4,00	400,00	0,00	0,00	0,00	0,00	35,00
STI	61389013	Ústav makromolekulární chemie AV ČR, v. v. i.	VVI	No	452,52	21 146,28	415,19	17 678,69	16,44	92,69	1,53	12,23	18,30	3 256,00	1,07	106,67	0,00	0,00	0,00	0,00	322,36
STI	48546054	Ústav mezinárodních vztahů, v.v.i.	VVI	No	185,75	2 686,30	75,17	897,08	110,58	1 789,23	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	434,44
STI	68378050	Ústav molekulární genetiky AV ČR, v. v. i.	VVI	No	310,84	12 756,91	182,09	7 662,24	2,67	68,67	2,42	19,33	1,17	46,67	1,00	100,00	121,50	4 860,00	0,00	0,00	70,34
STI	61388963	Ústav organické chemie a biochemie AV ČR, v. v. i.	VVI	No	581,55	26 821,06	504,47	23 740,55	16,06	154,20	32,54	260,30	20,21	2 335,01	0,00	0,00	8,28	331,00	0,00	0,00	186,50
STI	68378068	Ústav pro českou literaturu AV ČR, v. v. i.	VVI	No	457,29	4 805,81	198,50	2 337,00	258,79	2 468,81	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	507,03
STI	00020681	Ústav pro hospodářskou úpravu lesů Brandýs nad Lal	OSS	No	0,92	11,72	0,00	0,00	0,92	11,72	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	5,50
STI	67985874	Ústav pro hydrodynamiku AV ČR, v. v. i.	VVI	No	53,68	1 206,27	40,34	963,73	6,00	45,21	3,00	24,00	0,00	0,00	0,00	0,00	4,33	173,33	0,00	0,00	235,10
STI	61384020	Ústav pro informace ve vzdělávání	SPO	No	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	3,50
STI	68378092	Ústav pro jazyk český AV ČR, v. v. i.	VVI	No	364,60	4 920,78	209,47	2 467,60	149,42	2 226,32	0,86	6,86	0,00	0,00	0,43	42,86	4,43	177,14	0,00	0,00	435,73
STI	00023698	Ústav pro péči o matku a dítě	SPO	No	35,34	400,34	34,68	387,01	0,67	13,33	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	1,78
STI	68378114	Ústav pro soudobé dějiny AV ČR, v. v. i.	VVI	No	245,25	3 662,88	65,23	760,57	180,02	2 902,32	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	344,07
STI	68081731	Ústav přístrojové techniky AV ČR, v. v. i.	VVI	No	181,49	6 045,20	89,28	3 122,23	4,00	4,61	49,38	395,03	0,00	0,00	16,17	1 616,67	22,67	906,67	0,00	0,00	245,91
STI	68378122	Ústav státu a práva AV ČR, v. v. i.	VVI	No	258,23	2 925,43	133,00	1 318,00	122,23	1 487,43	0,00	0,00	0,00	0,00	0,00	0,00	3,00	120,00	0,00	0,00	139,95
STI	67985891	Ústav struktury a mechaniky hornin AV ČR, v. v. i.	VVI	No	123,12	2 438,54	103,42	2 033,29	7,73	80,24	4,79	38,34	1,67	66,67	0,00	0,00	5,50	220,00	0,00	0,00	215,55
STI	67179843	Ústav systémové biologie a ekologie AV ČR, v. v. i.	VVI	No	145,76	3 404,62	120,53	3 105,84	24,04	178,78	0,00	0,00	0,00	0,00	1,20	120,00	0,00	0,00	0,00	0,00	139,96
STI	68378297	Ústav teoretické a aplikované mechaniky AV ČR, v. v.	VVI	No	101,42	2 093,95	56,95	1 360,95	18,89	368,34	20,58	164,67	0,00	0,00	0,00	0,00	5,00	200,00	0,00	0,00	349,46
STI	67985556	Ústav teorie informace a automatizace AV ČR, v. v. i.	VVI	No	249,27	7 212,50	168,34	5 832,56	22,64	387,54	45,72	365,73	0,00	0,00	2,07	206,67	10,50	420,00	0,00	0,00	572,96
STI	61388998	Ústav termomechaniky AV ČR, v. v. i.	VVI	No	180,32	4 414,89	130,84	3 186,87	25,93	385,61	14,05	112,40	0,50	250,00	2,00	200,00	7,00	280,00	0,00	0,00	971,17
STI	67985904	Ústav živočišné fyziologie a genetiky AV ČR, v. v. i.	VVI	No	114,56	4 111,70	109,03	4 023,29	5,53	88,41	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	54,16
STI	61383082	Ústřední vojenská nemocnice Praha	SPO	No	24,96	469,67	17,83	301,52	3,13	44,14	3,00	24,00	0,00	0,00	1,00	100,00	0,00	0,00	0,00	0,00	50,63
STI	00098604	Valašské muzeum v přírodě v Rožnově pod Radhoště	SPO	No	4,00	70,00	3,00	30,00	1,00	40,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	6,00
STI	00075078	Vlastivědné muzeum Dr. Hostaše v Klatovech	SPO	No	2,00	80,00	0,00	0,00	2,00	80,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	11,23
STI	00100609	Vlastivědné muzeum v Olomouci	SPO	No	2,75	49,73	2,75	49,73	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	1,61
STI	00064165	Všeobecná fakultní nemocnice v Praze	SPO	Yes	855,34	15 310,92	733,77	14 106,13	115,06	738,75	2,01	16,04	0,00	0,00	4,50	450,00	0,00	0,00	0,00	0,00	480,44
STI	14450542	Východočeské muzeum v Pardubicích	SPO	No	6,00	65,55	3,00	24,00	3,00	41,55	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	10,00
STI	00025950	Výzkumný ústav bezpečnosti práce, v.v.i.	VVI	No	20,40	592,00	3,67	17,33	5,73	134,67	0,00	0,00	0,00	0,00	0,00	0,00	11,00	440,00	0,00	0,00	118,28
STI	00025615	Výzkumný ústav geodetický, topografický a kartografi	VVI	No	46,82	1 910,99	15,76	227,77	0,00	0,00	4,03	32,27	0,00	0,00	9,50	950,00	17,52	700,95	0,00	0,00	148,16
STI	00020702	Výzkumný ústav lesního hospodářství a myslivosti, v.	VVI	No	203,87	4 208,88	130,95	895,84	22,00	316,38	0,00	0,00	0,00	0,00	16,00	1 600,00	34,92	1 396,67	0,00	0,00	347,95
STI	00027049	Výzkumný ústav meliorací a ochrany půdy, v.v.i.	VVI	No	98,56	2 993,91	26,07	183,50	5,83	84,35	0,00	0,00	0,00	0,00	1,00	100,00	65,65	2 626,07	0,00	0,00	186,95
STI	00027022	Výzkumný ústav potravinářský Praha, v.v.i.	VVI	No	62,74	2 169,70	31,85	715,55	3,58	18,34	2,14	17,14	9,10	364,00	6,87	686,67	9,20	368,00	0,00	0,00	109,81
STI	45773009	Výzkumný ústav práce a sociálních věcí, v.v.i.	VVI	No	168,83	1 954,40	42,23	301,93	126,60	1 652,47	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	347,65
STI	00027006	Výzkumný ústav rostlinné výroby, v.v.i.	VVI	No	552,19	9 444,64	376,83	4 413,31	69,52	435,77	6,68	53,47	6,32	252,67	9,60	960,00	83,24	3 329,43	0,00	0,00	1 433,13
STI	00027073	Výzkumný ústav Silva Tarucy pro krajinu a okrasné z	VVI	No	149,62	7 820,39	36,02	471,08	17,69	279,41	2,07	16,57	7,00	280,00	55,00	5 500,00	31,83	1 273,33	0,00	0,00	440,08
STI	00027162	Výzkumný ústav veterinárního lékařství, v.v.i.	VVI	No	305,15	10 641,99	268,70	8 784,66	7,75	91,73	0,70	5,60	2,00	540,00	3,00	300,00	23,00	920,00	0,00	0,00	159,83
STI	00020711	Výzkumný ústav vodohospodářský TGM, veřejná výzk	VVI	No	269,96	9 782,60	100,25	848,81	43,44	306,18	0,00	0,00	0,00	0,00	59,62	5 961,47	66,65	2 666,14	0,00	0,00	901,87
STI	00027251	Výzkumný ústav zemědělské ekonomiky a informací	SPO	No	59,67	612,99	37,13	193,94	21,03	299,05	0,00	0,00	0,00	0,00	1,00	100,00	0,50	20,00	0,00	0,00	183,99
STI	00027031	Výzkumný ústav zemědělské techniky, v.v.i.	VVI	No	182,30	4 372,58	104,02	510,90	24,78	286,59	0,00	0,00	0,70	28,00	23,92	2 391,67	28,89	1 155,43	0,00	0,00	437,80
STI	00027014	Výzkumný ústav živočišné výroby, v.v.i.	VVI	No	367,60	7 321,73	305,05	5 244,22	15,25	187,78	3,25	26,00	3,13	125,00	1,70	170,00	39,22	1 568,73	0,00	0,00	610,92
STI	00228745	Západočeské muzeum v Plzni	SPO	No	2,62	75,64	2,28	62,31	0,33	13,33	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	4,67
STI	71009396	Zdravotní ústav se sídlem v Ostravě	SPO	No	8,56	149,71	7,56	138,82	1,00	10,89	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	11,47
POO	26784246	Agritec Plant Research s.r.o.	POO	No	8,75	329,17	5,75	77,17	0,00	0,00	0,00	0,00	0,00	0,00	2,20	220,00	0,80	32,00	0,00	0,00	43,76

Appendix 2 - Evaluated results aggregate by research organisation and ranked by group by legal form of institution

Standardies table (TabS) in line with the Methodology for evaluating R&D results for 2008

Information about research organisation					Total evaluated results		J- Article in specialist periodical		B- Book (chapter in book)		D- Article in proceedings		P - patent		Z (T) - trial operations, technology verification		S - prototype, applied methodology		V - research report		No points evaluation
Legal form group	Company registration number	Title:	Legal form	Organis. unit	Number	Points	Number	Points	Number	Points	Number	Points	Number	Points	Number	Points	Number	Points	Number	Points	Number
INSSKUKOD	INSICOP	INSNAZP	INSDRUKOD	PRIORJPOD	POCUZN	BODUZN	POCJ	BODJ	POCB	BODB	POCD	BODD	POCP	BODP	POCZ	BODZ	POCS	BODS	POCV	BODV	POCNEU
POO	25328859	Agrotest fyto, s.r.o.	POO	No	129,36	1 379,37	110,52	799,26	4,59	19,78	0,29	2,33	0,25	10,00	0,00	0,00	13,70	548,00	0,00	0,00	86,90
POO	26788462	Agrovýzkum Rapotín s.r.o.	POO	No	22,67	195,39	19,72	109,02	1,10	12,08	0,00	0,00	0,00	0,00	0,00	0,00	1,86	74,29	0,00	0,00	45,50
POO	26722445	Centrum výzkumu Řež s.r.o.	POO	No	36,13	1 273,70	25,86	923,42	2,93	28,95	0,25	2,00	0,00	0,00	0,60	60,00	6,48	259,33	0,00	0,00	23,14
POO	26316919	COMTES FHT s.r.o.	POO	No	6,55	277,49	4,65	193,49	0,00	0,00	0,50	4,00	0,00	0,00	0,40	40,00	1,00	40,00	0,00	0,00	34,52
POO	14864347	Chmelařský institut s.r.o.	POO	No	17,59	437,90	10,54	171,64	1,00	1,87	3,05	24,40	0,00	0,00	2,00	200,00	1,00	40,00	0,00	0,00	139,62
POO	25870807	MATERIÁLOVÝ A METALURGICKÝ VÝZKUM s.r.o.	POO	No	4,35	289,62	0,00	0,00	0,60	4,62	0,00	0,00	0,00	0,00	2,25	225,00	1,50	60,00	0,00	0,00	34,05
POO	25797000	SVÚM a.s.	POO	No	9,63	300,85	4,67	115,80	0,00	0,00	0,67	5,33	0,00	0,00	0,13	13,04	4,17	166,67	0,00	0,00	37,50
POO	25794787	SVÚOM s.r.o.	POO	No	16,67	156,97	11,30	82,86	4,20	17,45	0,00	0,00	0,00	0,00	0,17	16,67	1,00	40,00	0,00	0,00	112,37
POO	47718684	ŠKODA VÝZKUM s.r.o.	POO	No	22,16	1 132,17	4,80	47,74	2,00	1,71	1,50	12,00	0,00	0,00	8,61	860,71	5,25	210,00	0,00	0,00	179,62
POO	25271121	VÝZKUMNÝ A ŠLECHTITELSKÝ ÚSTAV OVOCNÁŘ	POO	No	104,16	851,25	11,33	133,36	75,58	194,96	8,35	66,80	0,00	0,00	1,67	166,67	7,24	289,46	0,00	0,00	182,54
POO	00010669	Výzkumný a zkušební letecký ústav, a.s.	POO	No	338,15	16 100,48	63,35	340,48	1,00	20,00	1,00	8,00	6,67	266,67	80,33	8 033,33	185,80	7 432,00	0,00	0,00	166,12
POO	60109807	Výzkumný ústav bramborářský Havlíčkův Brod, s.r.o.	POO	No	39,80	988,23	26,80	148,90	4,50	90,00	0,33	2,67	0,17	6,67	7,00	700,00	1,00	40,00	0,00	0,00	126,88
POO	26722861	Výzkumný ústav mlékárenský s.r.o.	POO	No	6,18	175,00	2,00	8,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	4,18	167,00	0,00	0,00	5,80
POO	60193697	Výzkumný ústav pivovarský a sladařský, a.s.	POO	No	72,19	499,15	49,71	336,87	19,70	37,95	1,00	8,00	0,83	33,33	0,75	75,00	0,20	8,00	0,00	0,00	112,52
POO	44569181	Výzkumný ústav pro hnědé uhlí a.s.	POO	Yes	33,33	366,95	27,83	203,79	1,50	3,17	0,00	0,00	4,00	160,00	0,00	0,00	0,00	0,00	0,00	0,00	104,54
POO	26232511	Výzkumný ústav stavebních hmot,a.s.	POO	No	62,01	3 905,96	2,33	26,46	1,00	2,00	0,00	0,00	4,00	160,00	25,51	2 550,83	29,17	1 166,67	0,00	0,00	285,12
POO	46709002	Výzkumný ústav textilních strojů Liberec, a.s.	POO	No	90,30	5 830,00	0,00	0,00	0,00	0,00	1,00	8,00	9,00	1 920,00	11,50	1 150,00	68,80	2 752,00	0,00	0,00	38,00
POO	26296080	Zemědělský výzkum,spol. s r.o.	POO	No	16,17	221,58	14,67	101,58	0,00	0,00	0,00	0,00	0,00	0,00	1,00	100,00	0,50	20,00	0,00	0,00	58,74
OST	63839172	CESNET z.s.p.o.	ZSP	No	73,34	2 720,31	18,67	356,23	0,50	0,08	18,83	150,67	0,00	0,00	13,33	1 333,33	22,00	880,00	0,00	0,00	774,34
OST	60456540	Technologické centrum AV ČR	ZSP	No	20,50	213,66	13,00	132,00	7,50	81,66	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	83,61
TOTAL					**60 262,76**	**1 333 776,55**	**40 124,21**	**904 718,40**	**13 111,20**	**164 775,65**	**2 729,62**	**21 836,95**	**275,59**	**28 341,23**	**886,65**	**88 664,65**	**3 133,50**	**125 339,67**	**2,00**	**100,00**	**129 993,37**

Note: The column Org. unit gives the indication of the existence of organisational units (subordinate parts) of the appropriate research organisations. If indication "Yes" is given in the companion standardised table the evaluated organisational units are given.

Groups of research organisation by legal form:

Group code	Group description	Inclusion by legal form - code	Inclusion by legal form - description
VVS	Public university	**VVS**	Public or state university
STI	State and public institutions	**SPO**	Organisation supported by the state
		OSS	State organisation or local authority unit
		VVI	Public research institution
POO	Legal entity recorded in the Commercial Register	**POO**	Legal entity recorded in the Commercial Register
OST	Other	**OPS**	Publicly beneficial company
		ZSP	Interest (trade) association of legal entities

Appendix 3 - Bibliometrics - RCID values for 250 scientific disciplines

Source: Thomson Reuters National Science Indicators, 1981-2008

	2002	2003	2004	2005	2006	2007	2008		2002	2003	2004	2005	2006	2007	2008
	RCID [%]								Article product per 1 million population [Czech Republic / EU-15 * 100) [in %]						
Acoustics	55	93	62	79	120	157	38		17	16	23	25	16	49	31
Agr Economics & Policy	-	101	121	-	466	-	340		0	36	44	0	29	0	1097
Agr Eng	35	-	-	363	154	253	427		14	0	0	16	26	23	22
Agr, Dairy & Animal Sci	55	44	76	64	71	107	139		206	156	175	165	143	120	135
Agr, Multidisc	76	136	101	217	189	55	45		12	27	23	26	44	78	99
Agronomy	35	30	71	90	99	105	161		139	173	130	103	76	81	245
Allergy	87	126	56	170	111	21	357		24	18	8	13	18	13	22
Anatomy & Morphology	47	83	159	74	106	136	135		50	79	99	70	79	50	79
Andrology	-	-	-	-	-	-	-		0	0	0	0	0	29	30
Anesthesiology	90	149	48	57	24	118	163		2	6	5	12	4	4	9
Anthropology	114	116	51	110	144	141	23		23	27	20	6	23	28	85
Arch	-	-	-	-	-	-	-		0	0	59	0	0	0	0
Archaeology	159	172	60	-	84	-	155		27	22	18	7	30	6	55
Area Studies	-	-	182	-	-	-	273		0	24	24	23	0	53	42
Art	-	-	149	-	74	-	976		24	26	9	27	53	30	49
Asian Studies	-	-	-	-	-	-	-		0	0	65	0	40	48	0
Astronomy & Astrophys	57	69	75	84	90	98	86		42	47	47	59	67	58	69
Automation & Cntrl Syst	46	73	70	119	113	95	121		29	42	45	52	36	33	44
Behavioral Scis	74	111	81	74	50	76	103		46	33	43	40	42	58	49
Biochem & Mol Biol	68	63	64	65	72	70	87		44	50	48	52	56	64	67
Biochem Res Methods	85	104	81	86	107	90	78		131	122	105	104	85	118	87
Biodiversity Conservation	152	111	185	210	292	215	71		26	34	28	52	61	76	54
Biol	52	49	70	69	46	81	52		160	130	109	108	151	141	137
Biol, Miscellaneous	-	-	-	-	-	-	-		0					0	0
Biophys	84	67	85	70	87	90	94		72	77	72	80	95	95	80
Biotech & Applied Microbiol	59	59	62	68	77	96	124		78	67	91	81	72	81	74
Business	-	37	50	-	13	139	-		0	11	16	0	13	7	6
Business, Finance	3	5	8	13	30	35	43		691	131	188	165	92	106	54

Appendix 3 - Bibliometrics - RCID values for 250 scientific disciplines

Source: Thomson Reuters National Science Indicators, 1981-2008

	2002	2003	2004	2005	2006	2007	2008		2002	2003	2004	2005	2006	2007	2008
Cardiac & Cardiovascular Sys	113	87	111	135	89	120	98		23	27	29	26	31	42	46
Cell Biol	47	48	64	59	66	67	71		37	49	36	45	42	42	57
Chem, Analytical	106	106	98	106	100	120	146		190	180	160	162	195	195	197
Chem, Applied	91	104	115	109	104	102	137		64	69	62	69	78	72	90
Chem, Inorganic & Nuc	86	70	90	88	73	96	83		72	85	95	98	115	98	105
Chem, Medicinal	120	97	99	111	114	116	79		52	64	51	50	80	88	72
Chem, Multidisc	55	45	41	44	58	48	69		137	129	134	127	127	163	138
Chem, Organic	81	92	86	89	92	89	57		57	63	73	66	74	87	80
Chem, Physical	78	66	74	83	85	101	118		92	87	102	94	110	107	105
Classics	-	-	-	-	-	-	-		0	0	0	16	0	0	0
Clinical Neurology	187	73	74	77	154	143	79		15	26	24	31	19	31	28
Communication	-	-	118	-	-	259	-		0	0	79	0	0	36	32
Comp Critical Reviews	-	-	-	-	-	-	-								
Comp Sci, A.I.	66	134	91	63	89	80	174		47	84	82	94	97	59	85
Comp Sci, Cybernetics	26	30	27	72	48	89	34		252	200	226	219	208	224	386
Comp Sci, Hardware & Arch	37	21	33	35	206	136	-		14	25	31	32	19	17	50
Comp Sci, Information Sys	73	83	123	64	69	149	33		27	32	13	29	34	29	39
Comp Sci, Interdisc Appls	85	48	75	45	98	47	33		39	61	55	40	35	69	47
Comp Sci, Software Eng	90	257	122	103	114	86	310		44	110	67	59	31	90	63
Comp Sci, Theory & Methods	68	144	96	139	163	111	158		49	69	61	68	63	74	98
Construction & Building Tech	81	48	80	32	90	54	92		37	56	46	55	71	41	41
Criminology & Penology	-	-	-	-	-	-	-		20	0	0	0	0	0	0
Critical Care Med	132	83	120	51	171	159	187		6	25	25	22	28	36	14
Crystallography	87	78	98	74	100	107	24		57	96	105	91	145	93	123
Cytology & Histology	-	-	-	-	-	-	-								
Dance	-	-	-	-	-	-	-		0	0	0	0	0	0	0
Demography	-	98	15	-	-	-	-		0	65	46	0	0	16	12
Dentistry, Oral Surg & Med	86	71	164	68	67	73	28		13	11	12	17	9	21	20
Dermatology	100	77	94	118	90	107	62		36	10	31	33	37	49	49
Developmental Biol	37	44	58	59	69	46	73		29	49	63	56	52	36	69

Appendix 3 - Bibliometrics - RCID values for 250 scientific disciplines

Source: Thomson Reuters National Science Indicators, 1981-2008

	2002	2003	2004	2005	2006	2007	2008		2002	2003	2004	2005	2006	2007	2008
Ecology	80	91	83	97	131	127	127		76	57	72	82	68	84	75
Economics	31	25	45	26	26	63	152		77	66	73	64	58	63	139
Educ & Educational Res	-	17	15	42	-	88	-		6	15	10	4	0	7	26
Educ, Scientific Disc	19	70	49	17	-	65	81		32	11	35	18	10	39	38
Educ, Special	75	-	-	-	-	-	-		78	0	0	0	0	0	0
Electrochem	132	106	113	115	121	144	234		138	130	107	105	129	149	120
Emergency Med	-	-	-	70	146	63	-		0	0	0	6	14	18	8
Endocrinology & Metabolism	59	65	68	68	82	73	75		27	42	39	40	50	68	79
Energy & Fuels	76	80	97	133	61	94	160		34	32	30	34	36	21	28
Eng, Aerospace	79	161	54	61	77	121	-		57	108	38	40	65	40	25
Eng, Biomed	69	50	140	78	81	66	89		31	52	26	47	40	31	30
Eng, Chem	103	100	81	103	117	99	115		65	62	77	74	75	72	82
Eng, Civil	137	141	94	162	95	20	46		23	24	25	32	37	37	37
Eng, Electrical & Electronic	83	161	96	90	91	88	86		29	33	37	32	36	29	69
Eng, Environmental	76	110	87	91	63	71	94		59	60	59	64	73	42	50
Eng, Geological	116	80	56	119	166	26	-		11	20	34	74	31	38	42
Eng, Industrial	152	81	99	79	27	151	363		25	33	12	55	19	19	9
Eng, Manufacturing	104	70	113	82	23	95	387		37	32	7	53	23	28	21
Eng, Marine	-	-	-	-	-	-	-		0	0	0	0	0	0	0
Eng, Mechanical	69	82	79	127	127	80	39		34	28	27	28	30	48	46
Eng, Multidisc	30	91	103	81	118	87	105		37	29	19	32	40	42	52
Eng, Ocean	-	-	-	-	-	-	-		0	0	0	0	0	0	0
Eng, Petroleum	-	25	-	127	-	-	-		0	31	20	74	41	17	14
Entomology	104	104	109	80	122	123	121		125	181	167	191	173	186	235
Env Scis	79	103	82	126	114	102	91		57	61	69	55	70	64	74
Env Studies	80	112	18	10	59	31	207		9	21	5	17	15	8	13
Ergonomics	10	69	-	48	53	-	-		47	52	30	26	12	59	20
Ethics	8	14	5	9	26	6	120		455	172	224	525	298	217	151
Ethnic Studies	-	-	-	-	-	-	-		0	0	45	0	0	0	0
Evolutionary Biol	70	85	126	107	97	81	103		69	49	75	72	91	99	84

Appendix 3 - Bibliometrics - RCID values for 250 scientific disciplines

Source: Thomson Reuters National Science Indicators, 1981-2008

	2002	2003	2004	2005	2006	2007	2008		2002	2003	2004	2005	2006	2007	2008
Family Studies	69	-	-	-	-	94	-		27	0	0	0	0	24	15
Film, Radio, Television	-	-	-	-	-	-	-		0	0	0	0	0	0	63
Fisheries	138	87	98	152	108	85	141		48	72	53	98	75	115	116
Folklore	-	-	-	-	-	-	-		62	0	0	0	0	0	0
Food Sci & Tech	71	77	68	84	88	68	158		51	57	59	68	71	65	129
Forestry	230	202	124	166	114	244	251		56	42	88	41	79	85	97
Gastro & Hepatology	61	114	129	62	210	154	109		19	20	16	19	22	24	34
Genetics & Heredity	68	60	97	79	81	95	150		47	46	51	49	65	65	75
Geochem & Geophys	66	72	67	70	67	63	77		87	99	91	77	103	88	130
Geography	125	55	-	-	74	109	36		7	6	0	5	4	21	70
Geography, Physical	65	78	51	56	215	60	113		39	41	7	22	41	33	61
Geology	86	47	121	125	97	117	148		16	35	72	43	44	31	64
Geoscis, Multidisc	98	77	107	83	91	86	92		61	58	50	46	56	54	93
Geriatrics & Gerontology	-	43	66	49	57	81	44		0	21	16	17	17	23	38
Gerontology	-	-	-	-	-	-	-		12	0	0	0	0	11	12
Hematology	83	63	80	113	94	110	93		23	30	27	38	44	43	48
History	-	-	-	-	-	99	-		3	4	0	8	3	32	2
History & Philosophy of Sci	38	-	-	-	83	-	-		11	12	0	10	10	17	0
History of Social Scis	-	-	-	-	-	-	-		0	0	0	0	0	0	15
Hlth Care Scis & Services	-	34	44	56	74	105	-		0	11	15	8	44	24	5
Hlth Policy & Services	-	-	-	-	-	-	-		0	0	0	0	0	0	5
Horticulture	104	35	149	111	93	22	79		26	10	44	23	77	25	147
Hosp Leisure & Sport Tourism	-	16	-	-	-	-	-		0	29	0	0	0	0	0
Humanities, Multidisc	62	-	-	-	285	-	-		16	0	0	0	8	15	7
Imaging Sci & Photo Tech	64	-	-	75	67	59	172		22	19	0	27	10	37	24
Immunology	75	71	71	66	81	73	67		40	40	35	43	39	38	36
Industrial Relations & Labor	-	-	-	-	-	-	-		0	0	0	26	0	0	0
Infectious Diseases	105	94	107	89	121	141	87		16	20	21	14	26	21	21
Info Sci & Library Sci	-	40	-	-	17	111	-		0	14	0	8	17	12	23
Instr & Instmn	107	112	136	173	170	249	278		71	70	82	83	70	85	84

Appendix 3 - Bibliometrics - RCID values for 250 scientific disciplines

Source: Thomson Reuters National Science Indicators, 1981-2008

	2002	2003	2004	2005	2006	2007	2008		2002	2003	2004	2005	2006	2007	2008
Integrative & Comple Med	277	-	24	91	138	184	-		22	0	46	31	35	68	0
International Relations	-	173	71	-	137	198	93		0	8	14	0	14	28	35
Lang & Linguistics	-	-	-	-	42	-	-		0	0	5	17	21	16	11
Law	28	-	-	63	32	-	-		28	0	0	10	30	10	18
Limnology	174	65	80	97	90	174	71		72	67	63	66	57	57	44
Linguistics	-	-	-	-	-	-	-		0	0	0	7	6	0	12
Lit, African, Aust, Can	-	-	-	-	-	-	-		0	0	0	131	0	0	0
Lit, American	-	-	-	-	-	-	-		0	0	0	0	0	0	0
Lit, British Isles	-	-	-	-	-	-	-		0	0	0	0	0	0	0
Lit, German, Dutch, Scand	-	-	-	-	-	-	-		0	0	0	0	0	0	0
Lit, Romance	-	-	-	-	-	-	-		0	0	0	0	0	12	11
Lit, Slavic	24	-	-	95	-	-	-		10118	9486	0	10118	9170	4878	3195
Literary Reviews	344	-	-	-	-	-	-		22	0	0	22	0	46	0
Literary Theory & Criticism	-	-	-	-	-	-	-		0	0	0	0	0	0	0
Literature	-	-	-	-	252	-	-		0	0	0	0	18	46	33
Management	70	-	125	313	42	-	-		10	0	3	2	5	2	42
Marine & Freshwater Biol	96	104	109	112	132	110	127		31	32	48	42	41	64	68
Mat Sci, Biomaterials	66	49	194	42	46	52	19		68	50	24	39	54	44	38
Mat Sci, Ceramics	86	104	101	120	170	85	79		146	191	168	138	239	148	206
Mat Sci, Char & Testing	138	147	83	72	80	115	89		85	90	121	47	110	64	61
Mat Sci, Coatings & Films	95	108	78	91	103	98	100		92	116	91	118	135	104	160
Mat Sci, Composites	36	75	65	69	164	156	180		56	68	77	98	84	74	70
Mat Sci, Multidisc	72	64	60	64	74	72	76		122	118	123	133	94	136	106
Mat Sci, Paper & Wood	-	16	13	18	-	-	-		0	32	53	22	8	27	41
Mat Sci, Textiles	62	63	85	105	99	210	99		169	165	142	91	290	164	332
Mathematical & Comp Biolog	58	87	13	59	223	57	18		38	19	18	24	12	13	26
Mathematics	120	98	129	99	113	95	99		102	92	108	97	134	130	140
Mathematics, Applied	86	103	119	95	108	95	70		92	109	89	92	111	131	126
Mathematics, Interdisc Appls	108	137	86	68	69	98	149		34	41	32	35	30	33	46
Mechanics	71	88	72	84	83	67	40		36	43	45	44	55	48	53

Appendix 3 - Bibliometrics - RCID values for 250 scientific disciplines

Source: Thomson Reuters National Science Indicators, 1981-2008

	2002	2003	2004	2005	2006	2007	2008		2002	2003	2004	2005	2006	2007	2008
Med Ethics	-	-	-	-	-	-	-		46	0	0	0	0	23	0
Med Informatics	-	17	161	43	35	71	-		0	21	28	7	69	22	11
Med Laboratory Tech	85	77	68	226	157	124	86		58	87	42	42	78	85	52
Med, General & Internal	220	213	428	911	588	288	320		7	15	15	13	10	24	43
Med, Legal	107	33	342	214	125	109	245		18	9	29	24	26	33	42
Med, Miscellaneous	-	-	-	-	-	-	-								
Med, Res & Experimental	64	75	99	76	59	115	59		34	38	39	53	40	51	45
Medieval & Renaissance Stud	-	-	-	-	-	-	-		0	35	0	0	0	0	0
Met & Met Engr	116	98	113	103	82	122	112		119	116	164	167	86	161	150
Metallurgy & Mining	-	-	-	-	-	-	-								
Meteorol & Atmospheric Scis	71	69	81	97	60	94	144		59	73	66	61	63	54	64
Microbiol	54	62	53	67	82	63	108		53	61	73	72	76	79	75
Microscopy	48	42	61	94	125	134	151		89	63	67	76	133	75	116
Mineralogy	43	98	87	92	47	57	23		65	99	79	100	124	92	107
Mining & Mineral Processing	295	164	98	251	167	118	78		18	35	98	78	49	112	919
Multidisc Scis	115	323	67	160	87	107	82		54	26	30	32	39	38	40
Music	16	-	111	-	-	-	-		69	0	20	226	197	223	61
Mycology	60	59	67	72	88	119	100		102	79	118	159	104	159	133
Nanoscience & Nanotechnolo	64	53	69	73	58	73	75		132	82	56	112	78	95	65
Neuroimaging	70	67	34	51	35	77	-		5	8	31	15	9	14	24
Neurosciences	32	32	37	34	55	59	45		41	44	49	57	44	60	86
Nuc Sci & Tech	104	75	149	181	126	182	120		93	84	123	101	124	103	150
Nursing	-	-	-	-	50	268	552		0	0	0	0	5	15	4
Nutrition & Dietetics	75	57	90	106	101	58	43		33	34	29	30	41	31	44
Obstetrics & Gynecology	104	84	138	141	116	180	121		20	23	15	18	30	38	39
Oceanography	379	127	120	121	69	181	61		2	4	5	7	8	8	6
Oncology	68	44	66	81	71	77	109		48	54	42	53	50	66	57
Operations Res & Mgmt Sci	68	158	114	126	43	116	119		27	19	15	28	22	20	14
Ophthalmology	54	147	74	70	110	57	31		23	11	12	20	12	19	23
Optics	115	104	109	98	89	81	61		82	76	79	77	66	82	69

Appendix 3 - Bibliometrics - RCID values for 250 scientific disciplines

Source: Thomson Reuters National Science Indicators, 1981-2008

	2002	2003	2004	2005	2006	2007	2008		2002	2003	2004	2005	2006	2007	2008
Ornithology	156	138	105	149	62	172	172		72	48	144	73	47	114	100
Orthopedics	113	52	130	84	118	97	164		32	19	23	14	18	23	103
Otorhinolaryngology	103	80	36	73	130	104	222		9	14	28	24	13	20	19
Paleontology	88	53	56	56	79	76	43		43	47	85	66	90	72	81
Parasitology	72	80	70	59	82	95	106		258	213	202	261	250	215	237
Pathology	64	84	97	70	54	65	108		35	46	42	49	46	53	63
Pediatrics	66	113	72	103	136	69	117		21	24	25	20	35	22	27
Peripheral Vascular Disease	87	336	112	76	121	78	59		28	26	31	23	48	56	47
Pharmacology & Pharmacy	93	71	93	92	101	87	98		39	35	38	49	48	61	47
Philosophy	22	37	14	41	71	60	361		171	57	86	180	192	153	148
Phys, Applied	91	66	72	78	83	94	97		75	92	81	78	77	68	82
Phys, Atomic, Mol & Chem	110	85	84	117	126	140	100		71	68	73	74	77	91	87
Phys, Condensed Matter	71	85	75	91	92	85	70		99	98	106	97	92	126	99
Phys, Fluids & Plasmas	101	133	93	83	83	142	95		40	33	44	53	48	60	72
Phys, Math	92	71	95	79	96	89	68		67	51	51	55	49	57	72
Phys, Multidisc	46	65	160	98	92	149	91		140	91	86	146	134	91	97
Phys, Nuc	95	154	139	276	130	131	295		70	83	70	86	81	85	98
Phys, Particles & Fields	68	80	81	102	114	119	109		59	44	74	68	61	73	64
Physiology	47	56	67	53	77	69	64		89	130	145	103	104	148	176
Planning & Development	-	-	21	-	53	125	-		0	0	8	6	6	6	10
Plant Scis	78	91	89	86	108	91	84		94	103	134	130	136	152	167
Poetry	-	-	-	-	-	-	-		200	0	0	0	0	0	0
Political Sci	10	12	13	13	19	39	26		243	174	213	170	156	140	128
Polymer Sci	65	102	76	79	86	80	103		105	87	124	119	132	128	119
Psych, Applied	-	-	129	-	-	240	199		0	0	10	0	0	12	10
Psych, Biological	-	230	67	105	56	115	49		13	13	26	21	43	33	30
Psych, Clinical	50	-	-	-	-	120	-		17	0	0	3	0	14	9
Psych, Developmental	-	23	140	89	183	134	156		0	7	6	11	5	9	8
Psych, Experimental	35	196	100	89	-	143	-		3	5	5	2	2	3	2
Psych, Math	-	-	-	-	-	-	-		0	0	0	0	0	0	0

Appendix 3 - Bibliometrics - RCID values for 250 scientific disciplines

Source: Thomson Reuters National Science Indicators, 1981-2008

	2002	2003	2004	2005	2006	2007	2008		2002	2003	2004	2005	2006	2007	2008
Psych, Multidisc	13	18	24	18	18	11	62		141	95	136	117	142	162	100
Psych, Psychoanalysis	-	-	-	-	-	-	-		0	0	0	17	0	0	0
Psych, Social	-	100	226	489	29	111	278		0	21	34	13	6	10	13
Psychiatry	53	76	82	83	106	101	75		11	15	12	11	10	19	20
Psycho, Educal	-	-	-	-	-	-	369		0	15	0	0	0	10	8
Psychology	72	119	30	90	61	47	126		3	11	7	3	3	12	11
Public Administration	-	69	126	-	147	-	-		0	12	30	0	20	0	8
Public, Env & Occ Hlth	68	52	92	118	136	99	105		22	28	24	19	34	32	42
Rad, Nuc Med & Med Imagin	45	75	44	53	64	62	97		26	23	34	23	27	39	53
Rehabilitation	71	126	9	66	179	48	100		16	9	9	16	24	30	11
Religion	-	-	-	-	-	-	-		0	0	0	7	0	0	7
Remote Sensing	73	57	-	78	168	48	166		27	54	0	37	37	28	16
Reproductive Biol	72	75	75	89	95	115	157		39	72	72	54	57	57	83
Respiratory System	76	105	210	79	108	40	87		19	31	17	21	19	16	21
Rheumatology	87	299	137	144	351	281	184		22	25	29	22	37	28	29
Robotics	-	-	-	-	-	-	-		0	0	0	0	0	0	10
Social Issues	-	75	118	-	55	98	-		19	15	29	0	11	32	9
Social Scis, Biomed	-	-	439	-	-	-	-		10	0	8	0	0	6	0
Social Scis, Interdisc	-	45	13	-	62	-	-		0	14	13	0	11	0	17
Social Scis, Math Methods	122	-	-	145	45	31	-		30	0	7	18	5	16	4
Social Work	-	-	-	-	-	-	-		0	0	0	0	0	0	0
Sociology	15	19	35	20	53	35	306		186	63	218	153	150	144	144
Soil Sciences	60	99	98	128	108	115	146		73	45	61	52	38	75	93
Spectroscopy	109	84	125	140	181	166	143		88	73	84	94	121	97	139
Sport Sciences	38	60	-	108	31	42	65		7	18	0	6	2	5	9
Statistics & Probability	59	38	70	60	104	44	73		30	36	49	35	53	42	60
Substance Abuse	-	44	19	17	180	54	162		0	27	20	38	17	64	35
Surgery	37	36	54	47	55	62	72		48	54	64	62	35	49	86
Telecommunications	7	194	21	27	126	151	66		10	10	11	7	16	14	21
Theater	-	-	-	-	-	-	-		0	53	0	38	0	0	0

Appendix 3 - Bibliometrics - RCID values for 250 scientific disciplines

Source: Thomson Reuters National Science Indicators, 1981-2008

	2002	2003	2004	2005	2006	2007	2008		2002	2003	2004	2005	2006	2007	2008
Thermodynamics	84	91	113	119	95	72	183		78	86	75	75	104	82	67
Toxicology	146	78	110	86	134	122	146		51	70	81	73	130	142	132
Transplantation	127	43	116	133	97	125	142		27	67	49	78	43	59	43
Transportation	-	-	-	-	-	-	-		0	0	0	0	0	13	0
Transportation Sci & Tech	351	-	260	-	187	-	197		11	0	13	0	18	0	41
Tropical Med	-	110	168	36	50	333	-		0	13	21	7	23	6	9
Urban Studies	185	292	-	-	-	66	273		14	12	0	0	0	24	32
Urology & Nephrology	77	61	95	98	105	65	132		17	36	25	38	35	33	29
Veterinary	111	108	113	111	94	103	118		113	113	116	112	129	99	125
Virology	33	33	99	58	42	71	52		26	42	33	34	43	37	42
Water Resources	112	137	109	121	81	53	112		68	50	75	35	79	48	63
Womens Studies	-	-	-	-	-	289	-		0	0	23	26	0	47	0
Zoology	84	85	78	52	78	91	83		93	99	88	94	109	106	135

	Numbers of articles per 1 million population EU-15								Numbers of articles per 1 million population Czech Republic						
Acoustics	2,834808	3,0192	2,9731	3,1575	3,5339	3,7439	3,7849		0,48582	0,48582	0,68015	0,77732	0,58299	1,84613	1,16597
Agr Economics & Policy	0,143405	0,2689	0,2202	0,2996	0,3329	0,3047	0,8323		0	0,09716	0,09716	0	0,09716	0	9,13347
Agr Eng	0,688856	0,6837	0,7452	0,5941	0,735	0,8425	1,7516		0,09716	0	0	0,09716	0,19433	0,19433	0,38866
Agr, Dairy & Animal Sci	3,485252	3,5493	3,8822	3,9949	4,6837	6,0025	5,4878		7,19018	5,53838	6,80152	6,60719	6,70435	7,19018	7,38451
Agr, Multidisc	3,239415	3,2189	2,8963	3,7874	3,7132	4,2612	4,5992		0,38866	0,87448	0,68015	0,97165	1,6518	3,30359	4,56673
Agronomy	4,194594	4,3303	3,5954	4,507	3,9539	4,0973	4,886		5,82987	7,48167	4,6639	4,6639	3,0121	3,30359	11,9512
Allergy	2,450688	2,6402	2,3278	2,927	3,2112	2,9321	3,5518		0,58299	0,48582	0,19433	0,38866	0,58299	0,38866	0,77732
Anatomy & Morphology	1,349543	1,5954	1,2778	1,8156	1,6056	1,5672	1,4827		0,68015	1,26314	1,26314	1,26314	1,26314	0,77732	1,16597
Andrology	0,253519	0,2817	0,2407	0,3483	0,3892	0,338	0,3201		0	0	0	0	0	0,09716	0,09716
Anesthesiology	4,419945	4,8117	4,064	4,781	4,4507	4,4968	5,1856		0,09716	0,29149	0,19433	0,58299	0,19433	0,19433	0,48582
Anthropology	1,27784	1,4648	1,4622	1,662	1,7055	2,0999	2,5045		0,29149	0,38866	0,29149	0,09716	0,38866	0,58299	2,13762
Arch	0,235594	0,1844	0,1639	0,1536	0,1178	0,1921	0,3739		0	0	0,09716	0	0	0	0

Appendix 3 - Bibliometrics - RCID values for 250 scientific disciplines

Source: Thomson Reuters National Science Indicators, 1981-2008

	2002	2003	2004	2005	2006	2007	2008		2002	2003	2004	2005	2006	2007	2008
Archaeology	1,070415	0,8732	1,1088	1,3803	1,2804	1,5416	2,1075		0,29149	0,19433	0,19433	0,09716	0,38866	0,09716	1,16597
Area Studies	0,41485	0,3969	0,3969	0,4148	0,5711	0,548	0,6914		0	0,09716	0,09716	0,09716	0	0,29149	0,29149
Art	0,801531	0,735	1,0346	1,0909	0,9116	0,9757	0,991		0,19433	0,19433	0,09716	0,29149	0,48582	0,29149	0,48582
Asian Studies	0,189499	0,1434	0,1485	0,2254	0,2433	0,2023	0,2356		0	0	0,09716	0	0,09716	0,09716	0
Astronomy & Astrophys	22,44031	23,267	24,42	26,397	28,43	25,7	31,495		9,42496	10,8824	11,4654	15,6435	19,1414	14,9633	21,862
Automation & Cntrl Syst	3,393063	3,265	3,2548	3,3931	4,0717	4,0947	5,137		0,97165	1,3603	1,45747	1,74896	1,45747	1,3603	2,23478
Behavioral Scis	3,367455	3,5518	3,8438	4,4097	4,8732	5,032	6,1382		1,55463	1,16597	1,6518	1,74896	2,04046	2,91494	3,0121
Biochem & Mol Biol	49,64884	52,443	48,742	52,865	49,103	48,891	52,368		21,7649	26,3316	23,611	27,4976	27,4004	31,4813	34,8821
Biochem Res Methods	9,008903	9,8002	9,9334	11,147	11,874	12,279	13,521		11,7569	11,9512	10,3966	11,5626	10,1051	14,4775	11,7569
Biodiversity Conservation	1,508313	1,6978	1,7055	2,0589	2,2228	2,6914	2,7221		0,38866	0,58299	0,48582	1,06881	1,3603	2,04046	1,45747
Biol	5,2983	5,8514	5,5032	6,4916	6,169	7,0883	7,2266		8,45332	7,57883	6,0242	6,99585	9,3278	10,0079	9,91078
Biol, Miscellaneous	0,005122	0	0	0	0	0,0307	0,0563		0	0	0	0	0	0	0
Biophys	10,58636	10,333	10,156	11,398	10,896	10,53	11,462		7,57883	7,96749	7,28734	9,13347	10,3966	10,0079	9,13347
Biotech & Applied Microbiol	12,98327	13,844	14,481	16,179	16,527	17,186	19,547		10,1051	9,23063	13,1172	13,1172	11,8541	13,9917	14,4775
Business	1,421245	1,7234	1,8182	2	2,2894	2,8553	3,3418		0	0,19433	0,29149	0	0,29149	0,19433	0,19433
Business, Finance	0,857869	0,9654	1,1396	1,3547	1,4853	1,8284	2,5275		5,92704	1,26314	2,13762	2,23478	1,3603	1,94329	1,3603
Cardiac & Cardiovascular Sys	11,91541	12,796	12,451	14,461	14,417	14,778	16,622		2,72061	3,49792	3,59509	3,78942	4,46957	6,21853	7,57883
Cell Biol	19,49283	20,579	20,238	22,655	21,557	22,691	23,201		7,28734	10,0079	7,38451	10,2994	9,13347	9,42496	13,2144
Chem, Analytical	12,83218	13,967	14,325	15,009	14,481	15,352	15,014		24,3883	25,1656	22,9308	24,3883	28,1777	29,9267	29,538
Chem, Applied	6,699059	6,8962	6,8476	8,6043	8,5941	8,8527	9,6593		4,27524	4,76106	4,27524	5,92704	6,70435	6,41286	8,64764
Chem, Inorganic & Nuc	12,4455	12,405	11,721	13,25	11,931	12,317	12,853		8,93914	10,5909	11,0768	12,9229	13,7002	12,0484	13,5059
Chem, Medicinal	5,060146	5,6158	5,4904	7,3674	7,0396	7,4289	8,9474		2,62344	3,59509	2,81777	3,69225	5,63554	6,51002	6,41286
Chem, Multidisc	15,83856	17,324	16,579	19,475	19,864	19,623	23,081		21,6677	22,3478	22,1535	24,777	25,1656	31,9671	31,7728
Chem, Organic	15,92307	16,63	15,175	17,821	16,663	15,675	18,471		9,0363	10,3966	11,0768	11,7569	12,3399	13,603	14,8662
Chem, Physical	28,80903	29,818	29,949	32,366	32,287	32,817	34,648		26,6231	25,9429	30,4125	30,3153	35,5622	35,1736	36,3395
Classics	0,524965	0,4353	0,589	0,5967	0,402	0,525	0,4866		0	0	0	0,09716	0	0	0
Clinical Neurology	18,26364	19,214	18,34	21,419	21,027	22,023	24,748		2,72061	4,95539	4,3724	6,70435	4,08091	6,80152	6,99585
Communication	0,514721	0,6351	0,4942	0,6453	0,7554	0,8143	1,2087		0	0	0,38866	0	0	0,29149	0,38866
Comp Critical Reviews	0	0	0	0	0	0	0		0	0	0	0	0	0	0
Comp Sci, A.I.	5,592793	9,3239	7,1933	8,4865	9,6517	6,4122	6,95		2,62344	7,87033	5,92704	7,96749	9,3278	3,78942	5,92704

Appendix 3 - Bibliometrics - RCID values for 250 scientific disciplines

Source: Thomson Reuters National Science Indicators, 1981-2008

	2002	2003	2004	2005	2006	2007	2008		2002	2003	2004	2005	2006	2007	2008
Comp Sci, Cybernetics	0,655565	0,8758	0,7734	1,0192	1,0269	0,9116	1,0064		1,6518	1,74896	1,74896	2,23478	2,13762	2,04046	3,88658
Comp Sci, Hardware & Arch	3,536468	3,8386	3,4648	4,2868	4,5633	4,5429	4,5096		0,48582	0,97165	1,06881	1,3603	0,87448	0,77732	2,23478
Comp Sci, Information Sys	3,651704	4,2817	3,8079	4,6299	5,7106	5,603	5,959		0,97165	1,3603	0,48582	1,3603	1,94329	1,6518	2,33195
Comp Sci, Interdisc Appls	6,665769	7,9282	7,0653	9,0729	9,2599	9,9154	11,383		2,62344	4,85823	3,88658	3,59509	3,20643	6,80152	5,34405
Comp Sci, Software Eng	3,498056	3,6133	3,6517	4,2561	4,4584	4,4353	5,7362		1,55463	3,98375	2,42911	2,52628	1,3603	3,98375	3,59509
Comp Sci, Theory & Methods	7,905197	21,357	27,526	25,255	26,422	6,2074	6,6478		3,88658	14,769	16,9066	17,101	16,6151	4,56673	6,51002
Construction & Building Tech	1,577454	1,7362	1,895	2,1127	2,1946	2,6325	4,0358		0,58299	0,97165	0,87448	1,16597	1,55463	1,06881	1,6518
Criminology & Penology	0,486552	0,5736	0,7478	0,7221	0,735	0,8425	1,0064		0,09716	0	0	0	0	0	0
Critical Care Med	3,003821	3,4366	3,0755	3,5185	3,8463	3,7541	4,1306		0,19433	0,87448	0,77732	0,77732	1,06881	1,3603	0,58299
Crystallography	5,636326	6,466	5,3598	6,6965	6,3841	6,927	6,4686		3,20643	6,21853	5,63554	6,12137	9,23063	6,41286	7,96749
Cytology & Histology	0	0	0	0	0	0	0		0	0	0	0	0	0	0
Dance	0,069142	0,0256	0,0307	0,0102	0,0384	0,0077	0,023		0	0	0	0	0	0	0
Demography	0,335465	0,4456	0,4225	0,4277	0,717	0,5941	0,7836		0	0,29149	0,19433	0	0	0,09716	0,09716
Dentistry, Oral Surg & Med	4,350803	4,5454	4,781	5,6517	5,4366	6,0281	7,8873		0,58299	0,48582	0,58299	0,97165	0,48582	1,26314	1,55463
Dermatology	5,626083	5,7772	5,0448	5,9129	5,5006	5,5954	6,4788		2,04046	0,58299	1,55463	1,94329	2,04046	2,72061	3,20643
Developmental Biol	3,959001	3,7439	4,0333	4,3098	4,1459	4,0205	4,2048		1,16597	1,84613	2,52628	2,42911	2,13762	1,45747	2,91494
Ecology	9,725928	10,679	10,522	12,476	13,293	14,883	15,383		7,38451	6,12137	7,57883	10,2023	9,0363	12,5342	11,4654
Economics	7,303409	8,3585	8,4097	9,1984	10,087	11,027	14,914		5,63554	5,53838	6,12137	5,92704	5,82987	6,99585	20,696
Educ & Educational Res	1,600502	1,9513	1,8719	2,3303	2,4712	2,6991	4,1408		0,09716	0,29149	0,19433	0,09716	0	0,19433	1,06881
Educ, Scientific Disc	0,911646	0,8835	0,8399	1,0858	0,927	0,9885	1,539		0,29149	0,09716	0,29149	0,19433	0,09716	0,38866	0,58299
Educ, Special	0,248398	0,3329	0,315	0,3713	0,3944	0,3816	0,4251		0,19433	0	0	0	0	0	0
Electrochem	3,303435	3,9667	4,0896	4,8246	5,1062	5,5902	5,6056		4,56673	5,14972	4,3724	5,05256	6,60719	8,35615	6,70435
Emergency Med	1,323935	1,2958	1,388	1,7311	1,4289	1,662	2,402		0	0	0	0,09716	0,19433	0,29149	0,19433
Endocrinology & Metabolism	12,91669	14,21	13,342	15,931	15,206	15,915	17,695		3,49792	5,92704	5,24689	6,41286	7,676	10,7853	13,8945
Energy & Fuels	4,035825	4,2253	4,2304	4,8374	6,466	5,9718	8,6555		1,3603	1,3603	1,26314	1,6518	2,33195	1,26314	2,42911
Eng, Aerospace	1,887311	2,2433	2,0384	1,9539	2,8322	1,7106	1,9206		1,06881	2,42911	0,77732	0,77732	1,84613	0,68015	0,48582
Eng, Biomed	4,663221	4,8783	4,5352	4,9167	6,0051	5,9923	7,137		1,45747	2,52628	1,16597	2,33195	2,42911	1,84613	2,13762
Eng, Chem	10,58636	11,209	10,635	13,165	13,27	12,328	13,833		6,89868	6,89868	8,16182	9,71645	10,0079	8,84197	11,3683
Eng, Civil	3,346969	3,644	3,4468	3,8873	5,265	5,5288	7,7003		0,77732	0,87448	0,87448	1,26314	1,94329	2,04046	2,81777
Eng, Electrical & Electronic	17,86416	21,078	21,052	23,234	24,614	26,589	28,107		5,14972	6,99585	7,87033	7,48167	8,84197	7,676	19,5301

Appendix 3 - Bibliometrics - RCID values for 250 scientific disciplines

Source: Thomson Reuters National Science Indicators, 1981-2008

	2002	2003	2004	2005	2006	2007	2008		2002	2003	2004	2005	2006	2007	2008
Eng, Environmental	4,128014	4,1767	4,3047	4,9987	5,7439	5,3367	6,4353		2,42911	2,52628	2,52628	3,20643	4,17808	2,23478	3,20643
Eng, Geological	0,845065	0,9808	0,8527	1,3086	1,2599	1,2625	1,621		0,09716	0,19433	0,29149	0,97165	0,38866	0,48582	0,68015
Eng, Industrial	1,918041	2,0871	2,3892	2,8092	2,5019	2,5967	3,3598		0,48582	0,68015	0,29149	1,55463	0,48582	0,48582	0,29149
Eng, Manufacturing	2,117784	2,4353	2,6223	2,9398	2,9065	2,781	3,1831		0,77732	0,77732	0,19433	1,55463	0,68015	0,77732	0,68015
Eng, Marine	0,122919	0,1255	0,0999	0,0794	0,0922	0,1076	0,1255		0	0	0	0	0	0	0
Eng, Mechanical	5,938501	6,9526	6,0333	7,5108	8,0281	7,9359	9,4135		2,04046	1,94329	1,6518	2,13762	2,42911	3,78942	4,3724
Eng, Multidisc	3,400746	3,6824	3,6543	3,9744	4,7989	4,6504	6,1895		1,26314	1,06881	0,68015	1,26314	1,94329	1,94329	3,20643
Eng, Ocean	0,527525	0,5813	0,5992	0,6018	0,7093	0,6837	0,7478		0	0	0	0	0	0	0
Eng, Petroleum	0,548012	0,6274	0,484	0,6581	0,7042	0,5839	0,7093		0	0,19433	0,09716	0,48582	0,29149	0,09716	0,09716
Entomology	2,796396	2,8963	2,7349	3,2625	2,927	3,2343	4,0563		3,49792	5,24689	4,56673	6,21853	5,05256	6,0242	9,52213
Env Scis	15,46213	16,128	16,504	19,001	21,897	21,618	26,947		8,74481	9,81362	11,4654	10,3966	15,2548	13,8945	20,0159
Env Studies	2,115223	2,3329	2,0871	2,8886	3,2906	3,79	4,3969		0,19433	0,48582	0,09716	0,48582	0,48582	0,29149	0,58299
Ergonomics	0,619714	0,7452	0,6402	0,7452	0,799	0,822	0,9629		0,29149	0,38866	0,19433	0,19433	0,09716	0,48582	0,19433
Ethics	0,44814	0,5659	0,4763	0,6479	0,717	0,8067	1,0909		2,04046	0,97165	1,06881	3,40076	2,13762	1,74896	1,6518
Ethnic Studies	0,117797	0,1793	0,2177	0,2356	0,233	0,3073	0,3534		0	0	0,09716	0	0	0	0
Evolutionary Biol	3,544151	4,3995	4,2791	4,9884	5,1139	5,4904	6,3303		2,42911	2,13762	3,20643	3,59509	4,6639	5,44121	5,34405
Family Studies	0,366195	0,42	0,3047	0,3969	0,3944	0,4046	0,6376		0,09716	0	0	0	0	0,09716	0,09716
Film, Radio, Television	0,138283	0,1204	0,1434	0,1946	0,1306	0,1152	0,1536		0	0	0	0	0	0	0,09716
Fisheries	2,435323	2,9526	3,0934	2,9603	3,1242	3,1242	3,2804		1,16597	2,13762	1,6518	2,91494	2,33195	3,59509	3,78942
Folklore	0,156209	0,128	0,2791	0,2254	0,1306	0,1332	0,1332		0,09716	0	0	0	0	0	0
Food Sci & Tech	10,38661	10,597	10,028	12,143	12,883	12,901	15,728		5,34405	6,0242	5,92704	8,25899	9,13347	8,35615	20,3074
Forestry	2,604336	2,548	2,5352	3,0781	2,7093	3,0755	3,4955		1,45747	1,06881	2,23478	1,26314	2,13762	2,62344	3,40076
Gastro & Hepatology	8,371263	9,1907	8,3124	9,5595	9,9538	10,274	11,311		1,55463	1,84613	1,3603	1,84613	2,23478	2,42911	3,88658
Genetics & Heredity	15,82576	17,575	17,895	18,087	18,397	18,871	22,745		7,48167	8,16182	9,13347	8,93914	11,9512	12,2427	17,0038
Geochem & Geophys	6,73235	8,0102	7,2419	8,8066	9,5185	9,1805	10,512		5,82987	7,96749	6,60719	6,80152	9,81362	8,06466	13,7002
Geography	1,421245	1,5339	1,5877	1,9334	2,2586	2,7631	2,9168		0,09716	0,09716	0	0,09716	0,09716	0,58299	2,04046
Geography, Physical	2,460931	2,8425	2,6274	3,4878	3,7644	3,5544	4,7785		0,97165	1,16597	0,19433	0,77732	1,55463	1,16597	2,91494
Geology	1,869386	1,918	1,8976	2,4993	2,4456	2,507	3,5032		0,29149	0,68015	1,3603	1,06881	1,06881	0,77732	2,23478
Geoscis, Multidisc	11,33411	12,666	13,293	14,727	16,868	14,632	19,38		6,89868	7,28734	6,60719	6,70435	9,42496	7,96749	17,9754
Geriatrics & Gerontology	2,053764	2,3687	2,484	2,7938	2,8835	2,571	3,5928		0	0,48582	0,38866	0,48582	0,48582	0,58299	1,3603

Appendix 3 - Bibliometrics - RCID values for 250 scientific disciplines

Source: Thomson Reuters National Science Indicators, 1981-2008

	2002	2003	2004	2005	2006	2007	2008		2002	2003	2004	2005	2006	2007	2008
Gerontology	0,819457	0,9449	0,9014	1,2266	0,9859	0,9014	1,6261		0,09716	0	0	0	0	0,09716	0,19433
Hematology	11,70799	12,305	11,278	13,122	11,324	12,881	13,365		2,72061	3,69225	3,0121	4,95539	4,95539	5,53838	6,41286
History	2,991017	2,2919	3,4007	3,603	2,7913	2,7682	3,982		0,09716	0,09716	0	0,29149	0,09716	0,87448	0,09716
History & Philosophy of Sci	0,873234	0,8323	0,8886	0,9424	1,0115	1,1114	1,37		0,09716	0,09716	0	0,09716	0,09716	0,19433	0
History of Social Scis	0,327783	0,4968	0,3816	0,4251	0,5992	0,5915	0,6684		0	0	0	0	0	0	0,09716
Hlth Care Scis & Services	2,42508	2,6863	2,6684	3,4443	3,3188	3,6645	4,2996		0	0,29149	0,38866	0,29149	1,45747	0,87448	0,19433
Hlth Policy & Services	0,719585	0,8886	1,0858	1,0935	1,2497	1,3188	1,9974		0	0	0	0	0	0	0,09716
Horticulture	1,833535	2,0307	1,7516	2,1255	1,7593	1,5775	2,2509		0,48582	0,19433	0,77732	0,48582	1,3603	0,38866	3,30359
Hosp Leisure & Sport Tourism	0,238155	0,3329	0,3303	0,3944	0,4225	0,5659	0,7785		0	0,09716	0	0	0	0	0
Humanities, Multidisc	1,247111	1,2343	1,3239	1,5928	1,283	1,2676	1,3649		0,19433	0	0	0	0,09716	0,19433	0,09716
Imaging Sci & Photo Tech	0,873234	1,0141	1,0679	1,0653	0,9936	1,0371	1,6031		0,19433	0,19433	0	0,29149	0,09716	0,38866	0,38866
Immunology	19,00628	19,421	17,951	20,614	19,869	20,115	22,269		7,676	7,77316	6,21853	8,84197	7,676	7,676	7,96749
Industrial Relations & Labor	0,284249	0,3355	0,3457	0,3764	0,356	0,3534	0,4533		0	0	0	0,09716	0	0	0
Infectious Diseases	8,035798	9,078	8,4071	9,9538	9,0883	10,346	11,326		1,26314	1,84613	1,74896	1,3603	2,33195	2,13762	2,33195
Info Sci & Library Sci	1,172848	1,3956	1,1472	1,283	1,7618	1,6517	2,1485		0	0,19433	0	0,09716	0,29149	0,19433	0,48582
Instr & Instmn	8,486499	9,8949	9,5774	9,9462	10,407	11,577	11,849		6,0242	6,89868	7,87033	8,25899	7,28734	9,81362	10,0079
Integrative & Comple Med	0,432776	0,4123	0,4251	0,6248	0,548	0,5711	0,6248		0,09716	0	0,19433	0,19433	0,19433	0,38866	0
International Relations	1,198456	1,2445	1,347	1,2266	1,3803	1,3931	1,9641		0	0,09716	0,19433	0	0,19433	0,38866	0,68015
Lang & Linguistics	1,390516	1,1344	1,8387	2,2663	1,8207	1,7977	2,6453		0	0	0,09716	0,38866	0,38866	0,29149	0,29149
Law	0,693977	0,8527	0,6889	0,9321	0,9629	0,9398	1,662		0,19433	0	0	0,09716	0,29149	0,09716	0,29149
Limnology	0,944936	1,2983	1,0807	1,4673	1,5314	1,3752	1,7593		0,68015	0,87448	0,68015	0,97165	0,87448	0,77732	0,77732
Linguistics	0,98847	1,0832	1,2241	1,4289	1,5211	1,4597	2,4225		0	0	0	0,09716	0,09716	0	0,29149
Lit, African, Aust, Can	0,046094	0,0179	0,0615	0,0743	0,0384	0,0589	0,0538		0	0	0	0,09716	0	0	0
Lit, American	0,007682	0,0179	0,023	0,0307	0,0307	0,0256	0,023		0	0	0	0	0	0	0
Lit, British Isles	0,281688	0,1767	0,2074	0,2049	0,2484	0,2228	0,1562		0	0	0	0	0	0	0
Lit, German, Dutch, Scand	0,31754	0,1869	0,4123	0,5019	0,4891	0,3841	0,4225		0	0	0	0	0	0	0
Lit, Romance	0,699099	0,7452	0,9219	1,1728	0,8271	0,8067	0,9014		0	0	0	0	0	0,09716	0,09716
Lit, Slavic	0,007682	0,0051	0,0051	0,023	0,0307	0,0179	0,0487		0,77732	0,48582	0	2,33195	2,81777	0,87448	1,55463
Literary Reviews	0,437897	0,2561	0,3764	0,4328	0,315	0,21	0,2766		0,09716	0	0	0,09716	0	0,09716	0
Literary Theory & Criticism	0,217668	0,2228	0,2202	0,2561	0,1921	0,2177	0,3611		0	0	0	0	0	0	0

Appendix 3 - Bibliometrics - RCID values for 250 scientific disciplines

Source: Thomson Reuters National Science Indicators, 1981-2008

	2002	2003	2004	2005	2006	2007	2008		2002	2003	2004	2005	2006	2007	2008
Literature	1,411002	1,3367	1,6671	2,2458	1,6594	1,6773	1,7413		0	0	0	0	0,29149	0,77732	0,58299
Management	2,965409	3,7721	3,6107	4,0025	4,3021	4,9244	5,8438		0,29149	0	0,09716	0,09716	0,19433	0,09716	2,42911
Marine & Freshwater Biol	8,07421	9,2419	7,9539	9,4442	9,7976	9,8975	10,932		2,52628	2,91494	3,78942	3,98375	3,98375	6,3157	7,38451
Mat Sci, Biomaterials	1,705494	1,7413	1,644	2	2,1408	2,192	3,1037		1,16597	0,87448	0,38866	0,77732	1,16597	0,97165	1,16597
Mat Sci, Ceramics	3,582563	3,557	3,9897	4,507	3,2932	3,5544	3,1063		5,24689	6,80152	6,70435	6,21853	7,87033	5,24689	6,41286
Mat Sci, Char & Testing	0,919328	1,0755	1,1242	1,2369	1,2317	1,2138	1,7465		0,77732	0,97165	1,3603	0,58299	1,3603	0,77732	1,06881
Mat Sci, Coatings & Films	4,140818	4,6248	4,8937	4,5326	4,8143	4,8732	4,9091		3,78942	5,34405	4,46957	5,34405	6,51002	5,05256	7,87033
Mat Sci, Composites	1,387955	2,1536	2,2817	2,1818	1,9718	1,4392	1,9539		0,77732	1,45747	1,74896	2,13762	1,6518	1,06881	1,3603
Mat Sci, Multidisc	28,08944	29,411	30,21	32,054	30,748	34,115	36,018		34,3962	34,5906	37,0197	42,7524	29,0522	46,2503	38,2828
Mat Sci, Paper & Wood	1,216381	1,2138	1,1088	1,3086	1,2266	1,0883	1,1985		0	0,38866	0,58299	0,29149	0,09716	0,29149	0,48582
Mat Sci, Textiles	0,57362	0,589	0,4097	0,4251	0,4686	0,5915	0,5557		0,97165	0,97165	0,58299	0,38866	1,3603	0,97165	1,84613
Mathematical & Comp Biolog	1,797683	2,0614	2,1178	2,8604	3,3367	3,79	4,5685		0,68015	0,38866	0,38866	0,68015	0,38866	0,48582	1,16597
Mathematics	13,83858	15,493	13,954	14,791	16,279	15,406	19,877		14,0889	14,2832	15,0605	14,3804	21,7649	20,0159	27,7891
Mathematics, Applied	12,34307	13,301	11,539	13,565	14,876	14,807	18,776		11,3683	14,4775	10,2994	12,4371	16,518	19,3357	23,611
Mathematics, Interdisc Appls	4,798944	5,4007	5,4776	6,9347	6,466	6,7554	8,1075		1,6518	2,23478	1,74896	2,42911	1,94329	2,23478	3,69225
Mechanics	8,596614	8,7221	9,0243	9,9615	11,38	11,029	12,983		3,10927	3,78942	4,08091	4,3724	6,21853	5,24689	6,89868
Med Ethics	0,212547	0,2586	0,2305	0,2971	0,3099	0,4174	0,5992		0,09716	0	0	0	0	0,09716	0
Med Informatics	1,380273	1,3623	1,3777	1,306	1,6876	1,7593	1,7823		0	0,29149	0,38866	0,09716	1,16597	0,38866	0,19433
Med Laboratory Tech	2,161317	2,0179	1,8719	2,5301	2,4968	2,5019	3,0038		1,26314	1,74896	0,77732	1,06881	1,94329	2,13762	1,55463
Med, General & Internal	12,87828	13,093	11,828	13,554	13,214	13,411	15,99		0,87448	1,94329	1,74896	1,74896	1,3603	3,20643	6,89868
Med, Legal	1,098584	1,096	0,9962	1,1985	1,1165	1,1626	1,6364		0,19433	0,09716	0,29149	0,29149	0,29149	0,38866	0,68015
Med, Miscellaneous	0	0	0	0	0	0	0		0	0	0	0	0	0	0
Med, Res & Experimental	7,894954	9,0012	8,7707	9,2983	9,6286	9,4519	11,06		2,72061	3,40076	3,40076	4,95539	3,88658	4,85823	4,95539
Medieval & Renaissance Stuc	0,268884	0,2766	0,2919	0,3278	0,2817	0,3329	0,4123		0	0,09716	0	0	0	0	0
Met & Met Engr	5,738758	5,6363	6,0435	5,7695	6,4225	5,854	5,8489		6,80152	6,51002	9,91078	9,61929	5,53838	9,42496	8,74481
Metallurgy & Mining	0	0	0	0	0	0	0		0	0	0	0	0	0	0
Meteorol & Atmospheric Scis	5,894967	8,3457	7,6645	8,548	9,749	8,6837	10,827		3,49792	6,12137	5,05256	5,24689	6,12137	4,6639	6,89868
Microbiol	15,48005	16,96	16,136	18,571	18,005	17,944	19,436		8,16182	10,2994	11,7569	13,4087	13,7002	14,0889	14,5747
Microscopy	0,870673	1,0858	1,0166	1,0166	1,096	1,0346	1,5032		0,77732	0,68015	0,68015	0,77732	1,45747	0,77732	1,74896
Mineralogy	2,097297	2,3611	2,2177	2,3278	2,1997	2,2177	2,5429		1,3603	2,33195	1,74896	2,33195	2,72061	2,04046	2,72061

Appendix 3 - Bibliometrics - RCID values for 250 scientific disciplines

Source: Thomson Reuters National Science Indicators, 1981-2008

	2002	2003	2004	2005	2006	2007	2008		2002	2003	2004	2005	2006	2007	2008
Mining & Mineral Processing	0,545451	1,6543	1,0909	1,5032	0,7964	1,4776	1,2266		0,09716	0,58299	1,06881	1,16597	0,38866	1,6518	11,2711
Multidisc Scis	2,704207	3,3495	3,2215	3,6056	3,4571	4,8553	4,5685		1,45747	0,87448	0,97165	1,16597	1,3603	1,84613	1,84613
Music	0,704221	0,4584	0,4763	0,6453	0,5429	0,5659	0,6325		0,48582	0	0,09716	1,45747	1,06881	1,26314	0,38866
Mycology	1,334178	1,4776	1,3137	1,6543	1,5877	1,4648	1,8259		1,3603	1,16597	1,55463	2,62344	1,6518	2,33195	2,42911
Nanoscience & Nanotechnolo	5,229159	4,7477	6,064	5,9948	7,2138	10,507	12,945		6,89868	3,88658	3,40076	6,70435	5,63554	10,0079	8,45332
Neuroimaging	1,897555	2,2894	2,5326	2,5762	2,1511	2,0486	2,041		0,09716	0,19433	0,77732	0,38866	0,19433	0,29149	0,48582
Neurosciences	26,80904	29,347	27,959	30,725	30,717	31,639	34,896		10,8824	13,02	13,603	17,4896	13,4087	18,8499	30,121
Nuc Sci & Tech	9,462165	10,604	8,7195	9,3572	10,061	10,627	10,105		8,84197	8,93914	10,6881	9,42496	12,4371	10,9796	15,1577
Nursing	1,198456	1,4187	1,3419	1,5032	1,8438	2,5121	2,7196		0	0	0	0	0,09716	0,38866	0,09716
Nutrition & Dietetics	5,661934	6,2048	5,3085	6,6939	6,6146	7,4673	9,1933		1,84613	2,13762	1,55463	2,04046	2,72061	2,33195	4,08091
Obstetrics & Gynecology	7,221463	7,2522	6,9833	8,4225	8,0998	8,4891	10,827		1,45747	1,6518	1,06881	1,55463	2,42911	3,20643	4,27524
Oceanography	4,650417	4,7964	4,2919	5,3649	4,8604	5,7772	6,1229		0,09716	0,19433	0,19433	0,38866	0,38866	0,48582	0,38866
Oncology	19,74635	23,252	22,282	26,707	25,378	26,704	31,961		9,52213	12,5342	9,42496	14,186	12,7286	17,6839	18,3641
Operations Res & Mgmt Sci	3,213807	3,5774	3,8002	3,7849	4,3303	4,9628	5,5032		0,87448	0,68015	0,58299	1,06881	0,97165	0,97165	0,77732
Ophthalmology	5,039659	6,0358	5,6645	6,3969	6,6735	6,635	7,4622		1,16597	0,68015	0,68015	1,26314	0,77732	1,26314	1,74896
Optics	10,81939	12,049	11,734	14,725	14,722	15,552	16,522		8,84197	9,13347	9,3278	11,2711	9,71645	12,8257	11,4654
Ornithology	0,942375	0,8067	1,0141	0,9347	1,0397	1,1933	1,2574		0,68015	0,38866	1,45747	0,68015	0,48582	1,3603	1,26314
Orthopedics	4,845038	5,1575	5,0729	6,3047	6,4558	6,6709	8,6017		1,55463	0,97165	1,16597	0,87448	1,16597	1,55463	8,84197
Otorhinolaryngology	3,41611	3,4571	3,1575	3,982	3,8489	3,9283	4,1357		0,29149	0,48582	0,87448	0,97165	0,48582	0,77732	0,77732
Paleontology	2,258628	2,6837	2,8527	2,927	3,4724	3,0986	3,621		0,97165	1,26314	2,42911	1,94329	3,10927	2,23478	2,91494
Parasitology	2,445566	3,0141	2,8322	2,9424	3,0269	3,4289	3,7644		6,3157	6,41286	5,73271	7,676	7,57883	7,38451	8,93914
Pathology	6,15873	7,1959	6,0384	6,4891	6,3457	6,5889	6,8322		2,13762	3,30359	2,52628	3,20643	2,91494	3,49792	4,27524
Pediatrics	7,789961	8,6555	8,0256	9,055	9,7567	9,7387	10,93		1,6518	2,04046	2,04046	1,84613	3,40076	2,13762	2,91494
Peripheral Vascular Disease	8,645269	9,7029	8,8194	10,23	8,7016	10,028	10,638		2,42911	2,52628	2,72061	2,33195	4,17808	5,63554	5,05256
Pharmacology & Pharmacy	21,57476	23,547	21,754	25,644	24,207	24,937	28,084		8,35615	8,25899	8,16182	12,5342	11,5626	15,1577	13,2144
Philosophy	1,475022	1,3521	1,5749	2,0512	1,7209	2,0307	2,4328		2,52628	0,77732	1,3603	3,69225	3,30359	3,10927	3,59509
Phys, Applied	22,92686	26,025	24,819	26,645	28,031	30,361	31,354		17,2953	23,9025	20,2102	20,696	21,5705	20,5989	25,8458
Phys, Atomic, Mol & Chem	16,46852	18,164	16,256	17,79	17,242	16,305	18,912		11,7569	12,3399	11,8541	13,1172	13,3115	14,8662	16,4208
Phys, Condensed Matter	28,46588	27,741	27,321	28,809	27,549	25,936	29,946		28,2749	27,1089	29,0522	27,9834	25,2628	32,6473	29,6352
Phys, Fluids & Plasmas	7,239389	6,8373	6,2176	8,8604	8,1715	6,7656	10,077		2,91494	2,23478	2,72061	4,6639	3,88658	4,08091	7,28734

Appendix 3 - Bibliometrics - RCID values for 250 scientific disciplines

Source: Thomson Reuters National Science Indicators, 1981-2008

	2002	2003	2004	2005	2006	2007	2008		2002	2003	2004	2005	2006	2007	2008
Phys, Math	9,249618	9,6517	8,3277	11,57	10,32	9,4238	13,152		6,21853	4,95539	4,27524	6,41286	5,05256	5,34405	9,52213
Phys, Multidisc	20,34301	21,232	21,68	22,381	22,192	21,096	24,704		28,5664	19,2386	18,6556	32,6473	29,7324	19,1414	23,9996
Phys, Nuc	8,194568	9,4468	8,0076	10,202	8,0409	7,9206	8,8834		5,73271	7,87033	5,63554	8,74481	6,51002	6,70435	8,74481
Phys, Particles & Fields	13,03705	14,233	14,335	17,255	14,028	14,794	16,953		7,676	6,3157	10,5909	11,6597	8,55048	10,7853	10,8824
Physiology	7,544124	8,2381	7,5108	8,3636	8,0204	9,0755	9,2317		6,70435	10,6881	10,8824	8,64764	8,35615	13,4087	16,2265
Planning & Development	1,167726	1,2753	1,1703	1,5672	1,5544	1,7004	1,8924		0	0	0,09716	0,09716	0,09716	0,09716	0,19433
Plant Scis	14,06137	14,668	12,786	15,511	14,074	14,466	16,218		13,2144	15,1577	17,101	20,1131	19,1414	22,0564	27,0117
Poetry	0,048655	0,0819	0,105	0,064	0,064	0,0743	0,0538		0,09716	0	0	0	0	0	0
Political Sci	1,802805	2,0102	2,0973	2,402	2,548	2,8399	3,8591		4,3724	3,49792	4,46957	4,08091	3,98375	3,98375	4,95539
Polymer Sci	8,609418	9,9308	8,6478	10,136	9,1907	8,3789	9,1395		9,0363	8,64764	10,6881	12,0484	12,1456	10,6881	10,8824
Psych, Applied	0,92701	1,0883	0,9936	1,1933	1,4084	1,5903	1,8848		0	0	0,09716	0	0	0,19433	0,19433
Psych, Biological	0,755437	0,7734	0,7606	0,9373	1,137	1,1805	1,2778		0,09716	0,09716	0,19433	0,19433	0,48582	0,38866	0,38866
Psych, Clinical	2,29704	2,5403	2,402	3,16	3,0678	3,4315	4,1178		0,38866	0	0	0,09716	0	0,48582	0,38866
Psych, Developmental	1,390516	1,475	1,5595	1,7285	1,9283	2,1255	2,402		0	0,09716	0,09716	0,19433	0,09716	0,19433	0,19433
Psych, Experimental	3,531347	3,9539	3,7772	4,5429	5,58	5,6927	6,2176		0,09716	0,19433	0,19433	0,09716	0,09716	0,19433	0,09716
Psych, Math	0,161331	0,2996	0,2279	0,2612	0,4123	0,3892	0,4789		0	0	0	0	0	0	0
Psych, Multidisc	2,61714	3,1549	2,7887	3,2292	3,4187	3,5902	4,7528		3,69225	3,0121	3,78942	3,78942	4,85823	5,82987	4,76106
Psych, Psychoanalysis	0,455823	0,5019	0,4712	0,5839	0,5506	0,507	0,5455		0	0	0	0,09716	0	0	0
Psych, Social	1,27528	1,3828	1,4417	1,5493	1,7567	1,9052	2,2689		0	0,29149	0,48582	0,19433	0,09716	0,19433	0,29149
Psychiatry	9,546672	11,05	10,904	13,401	11,956	13,647	16,01		1,06881	1,6518	1,26314	1,45747	1,16597	2,62344	3,20643
Psycho, Educal	0,555694	0,6632	0,6761	0,781	0,8246	0,9449	1,1575		0	0,09716	0	0	0	0,09716	0,09716
Psychology	2,906511	3,4673	2,9219	3,8489	3,8182	3,8924	5,5416		0,09716	0,38866	0,19433	0,09716	0,09716	0,48582	0,58299
Public Administration	0,650444	0,7913	0,6479	0,9962	0,968	0,9859	1,2189		0	0,09716	0,19433	0	0,19433	0	0,09716
Public, Env & Occ Hlth	9,713124	10,658	10,259	12,064	12,848	12,53	18,842		2,13762	3,0121	2,42911	2,33195	4,3724	3,98375	7,87033
Rad, Nuc Med & Med Imagin	12,52488	12,428	13,534	15,006	15,093	14,066	17,956		3,20643	2,81777	4,6639	3,40076	4,08091	5,53838	9,52213
Rehabilitation	1,866825	2,2279	2,0563	2,4686	2,4328	2,9552	3,5877		0,29149	0,19433	0,19433	0,38866	0,58299	0,87448	0,38866
Religion	1,136996	0,9603	1,1933	1,4622	0,991	1,1396	1,347		0	0	0	0,09716	0	0	0,09716
Remote Sensing	1,088341	1,452	1,3623	1,5698	1,5903	1,7055	2,3611		0,29149	0,77732	0	0,58299	0,58299	0,48582	0,38866
Reproductive Biol	4,253493	4,0742	3,7797	4,8246	4,2484	3,9462	4,443		1,6518	2,91494	2,72061	2,62344	2,42911	2,23478	3,69225
Respiratory System	6,747714	6,8962	6,169	7,58	7,2394	7,5134	7,7772		1,26314	2,13762	1,06881	1,55463	1,3603	1,16597	1,6518

Appendix 3 - Bibliometrics - RCID values for 250 scientific disciplines

Source: Thomson Reuters National Science Indicators, 1981-2008

	2002	2003	2004	2005	2006	2007	2008		2002	2003	2004	2005	2006	2007	2008
Rheumatology	3,572319	3,8617	4,3482	4,8066	4,6811	5,2624	5,9539		0,77732	0,97165	1,26314	1,06881	1,74896	1,45747	1,74896
Robotics	0,599228	0,6197	0,5608	0,6837	0,6556	0,7196	0,9833		0	0	0	0	0	0	0,09716
Social Issues	0,501917	0,6556	0,6709	0,7426	0,8656	0,9142	1,0858		0,09716	0,09716	0,19433	0	0,09716	0,29149	0,09716
Social Scis, Biomed	1,014078	1,1703	1,1754	1,3521	1,4827	1,5467	1,7746		0,09716	0	0,09716	0	0	0,09716	0
Social Scis, Interdisc	1,282962	1,4392	1,452	1,6543	1,7337	1,8259	2,3355		0	0,19433	0,19433	0	0,19433	0	0,38866
Social Scis, Math Methods	1,298327	1,4315	1,4443	1,6492	2,0077	1,854	2,3022		0,38866	0	0,09716	0,29149	0,09716	0,29149	0,09716
Social Work	0,519843	0,507	0,42	0,5583	0,5352	0,507	0,8118		0	0	0	0	0	0	0
Sociology	1,884751	2,0051	1,8745	2,2202	2,1306	2,5685	3,1114		3,49792	1,26314	4,08091	3,40076	3,20643	3,69225	4,46957
Soil Sciences	2,791275	2,9936	2,5557	3,3572	3,3418	3,6517	3,5698		2,04046	1,3603	1,55463	1,74896	1,26314	2,72061	3,30359
Spectroscopy	7,367429	7,6901	7,9001	7,9999	7,1702	8,5889	7,7029		6,51002	5,63554	6,60719	7,48167	8,64764	8,35615	10,6881
Sport Sciences	3,915467	4,845	4,2151	5,1728	5,2829	5,7336	6,1997		0,29149	0,87448	0	0,29149	0,09716	0,29149	0,58299
Statistics & Probability	5,101118	5,6107	5,58	6,5889	6,6274	7,2343	8,3149		1,55463	2,04046	2,72061	2,33195	3,49792	3,0121	4,95539
Substance Abuse	0,909085	1,0602	0,9526	1,2676	1,1626	1,2061	1,3777		0	0,29149	0,19433	0,48582	0,19433	0,77732	0,48582
Surgery	19,79244	21,106	19,022	23,26	22,299	23,137	26,789		9,42496	11,4654	12,2427	14,3804	7,87033	11,3683	23,1252
Telecommunications	2,842491	4,0384	3,4059	4,4686	5,0089	5,4443	6,1357		0,29149	0,38866	0,38866	0,29149	0,77732	0,77732	1,26314
Theater	0,166452	0,1844	0,2586	0,2586	0,1562	0,2817	0,2919		0	0,09716	0	0,09716	0	0	0
Thermodynamics	2,862977	3,0653	2,9885	3,3675	3,7234	3,452	4,466		2,23478	2,62344	2,23478	2,52628	3,88658	2,81777	3,0121
Toxicology	5,71315	6,1408	5,7388	6,3636	6,256	6,1664	7,8617		2,91494	4,27524	4,6639	4,6639	8,16182	8,74481	10,3966
Transplantation	5,131848	4,7554	4,1331	5,6082	5,2112	4,8015	5,2215		1,3603	3,20643	2,04046	4,3724	2,23478	2,81777	2,23478
Transportation	0,309857	0,3278	0,4353	0,5301	0,6837	0,7734	0,8195		0	0	0	0	0	0,09716	0
Transportation Sci & Tech	0,852747	0,8502	0,7478	0,9116	1,0781	1,2189	1,6466		0,09716	0	0,09716	0	0,19433	0	0,68015
Tropical Med	1,193334	1,4417	1,3905	1,3342	1,6773	1,5621	2,0538		0	0,19433	0,29149	0,09716	0,38866	0,09716	0,19433
Urban Studies	0,693977	0,7887	0,653	0,7657	0,7606	0,8015	0,904		0,09716	0,09716	0	0	0	0,19433	0,29149
Urology & Nephrology	8,192007	8,4558	8,9193	9,5467	9,096	10,448	10,865		1,3603	3,0121	2,23478	3,59509	3,20643	3,40076	3,10927
Veterinary	9,334125	10,581	9,7208	11,652	11,88	14,192	13,862		10,5909	11,9512	11,2711	13,02	15,352	14,0889	17,2953
Virology	4,919301	5,3188	5,3239	6,0717	5,877	5,9692	6,6914		1,26314	2,23478	1,74896	2,04046	2,52628	2,23478	2,81777
Water Resources	5,446827	5,4724	5,2855	6,3841	7,1472	6,4814	8,5172		3,69225	2,72061	3,98375	2,23478	5,63554	3,10927	5,34405
Womens Studies	0,271445	0,3534	0,4251	0,3739	0,3944	0,4174	0,6172		0	0	0,09716	0,09716	0	0,19433	0
Zoology	6,368716	6,7964	6,635	7,4443	7,7259	8,0819	8,6325		5,92704	6,70435	5,82987	6,99585	8,45332	8,55048	11,6597