

# CES

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## **Supporting Industry-Science Relations in European Regions: Good Practices – the Case of the Czech Republic**

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## **Abstract**

The paper presents examples of practices in the support of industry-science relations on the regional level in the framework of development of national R&D and innovation policy and regional policy in the Czech Republic. The first part explains the broader context of instruments enhancing innovation and transfer activities. The second part focuses on regional dimension of R&D and innovation policy. The third part evaluates one of the support programmes Prosperity with regional implications directed to development of innovation infrastructure. It must be stressed that only recently a shift to innovation performance has become somewhat more pronounced in the economic policy of the Czech Republic. Science-industry linkages (especially between university and business sectors) can be considered as one of the key weaknesses of the national and regional innovation systems. The history of regional policy itself has been quite short in the Czech Republic and its innovation focus is mostly absent in regional development strategies and, above all, in policy practice. There are no specifically regional innovation instruments available (except slight differences in the share of financing support in favour of disadvantaged regions); however, most programmes certainly may have strong regional implications.

## **1. General context: instruments of enhancing innovations and transfer of knowledge at a central level**

Support instruments are presented within the context of the shift towards a more pronounced innovation focus of the related policy, in particular under the influence of EU accession process and Lisbon strategy priorities. This has been reflected in the key policy documents concerning R&D and innovation support, including the operational programmes for structural funds, directed to the most pronounced weaknesses of national innovation system. Consequently, the current discussion concentrates mainly on: more efficient use of public R&D resources; utilization of EU structural funds in operational programmes in the next programming period (2007-2013); on persisting of fragmentation of the Czech research (discussion about reduction of number of research projects and preparing of larger projects); on applicability of R&D results in commercial practice including increasing of patent activities, the role of R&D at universities, science-industry linkages, indirect instruments for R&D support in business sector, stimulation of foreign direct investment in R&D activities.

### **1.1 From R&D support to innovation policy**

National R&D and innovation policy priorities increasingly reflect the weaknesses and strengths of the Czech national innovation system, particularly since 2000. In the first stage, there were efforts directed especially to systemization of public R&D support (definition of the positions and roles of providers and receivers of R&D resources). Formally these efforts were presented in the National Policy of R&D in the Czech Republic, approved by the government in 2000. Another development stage of NIS policy was markedly influenced by the accession to the EU and represented by the documents of National Programme of Research I and National Research Policy for 2004-2008. They had already reflected Lisbon strategy targets and experience with National Reform Programme.

A more qualitative change in NIS policy towards innovation support and achieving more pronounced innovation impact can be observed in development of National Innovation Policy for 2005-2010; towards more systemic approach to R&D support stressing the evaluation of results (efficiency of inputs), including the favoured linkage between R&D outputs and new technology, products and processes, resource concentration through direction to limited number of R&D themes in National Research Programme II, decreasing role of institutional financing of R&D in favour of project-specific support.

More attention has been gradually given to innovation as a source of competitiveness, to the linkage between innovations and entrepreneurship, to the role of R&D in (business) innovation, and to the partnerships of actors from diverse institutional sectors. These accents have been particularly materialized in National Reform (Lisbon) Programme and in the set of Operational programmes for 2007-2013 (R&D for Innovation, Education for Competitiveness, Innovation and Enterprise). In their formulation, the experiences of the former round of operational programmes in 2004-2006 have been reflected as well as the results of international comparisons and domestic and foreign expertise in R&D support for innovation (including the relevant EU documents).

### National Innovation Policy

An attempt at a systematic policy approach to the weaknesses of the Czech national innovation system is presented in the document of National Innovation Policy (defined in 2005 and to be updated in 2007) which includes so-called strategic targets: (1) strengthen research and development as a source of innovation - increasing R&D expenditure and its restructuring/redirection to industrial research and project-specific programmes, define long-term subject priorities of R&D, strengthen the linkage between R&D inputs and achieved outcomes, use the EU funds effectively and efficiently, ensure intellectual property protection of R&D results, support to creation of new R&D organization, provide indirect support to innovation-oriented R&D, (2) establish well-functioning public private partnerships – development of joint programmes including diverse institutional agents, support to mobility between science and industry, support to creation of new companies based on R&D (spin-offs) and knowledge-technology transfer centres, (3) provide human resources for innovation – change funding system of higher education institutions, increase of science and technology participation rates, education and training of R&D workers, remove the (internal and external, including international) mobility barriers, (4) increase administrative efficiency of research, development and innovation governance. Forty eight concrete measures have been proposed for achievement of the NIP objectives, including responsibilities, deadlines and indicators of the implementation success.

### National Research Programme

The thematic focus of national R&D support has been reflected in National Research Programme I (2004-2009) and National Research Programme II (2006-2011). The targeted research topics have been selected on the base of technology foresight to include the most prospective science and technology fields. National Research Programme I consists of five thematic programmes (I-V) and three cross-cutting programmes (A-C). The thematic and cross-cutting programmes are further divided into sub programmes — the so-called partial programmes. Public tenders on the presentation of project proposals are announced for these individual NRP parts. The six providers include: Ministry of Education, Academy of Science, Ministry of Industry and Trade, Ministry of Environment, Ministry of Agriculture, Ministry of Labour and Social Affairs. National Research Programme II consists of seven programmes, of which four are topical (TP1-4) and three cross-cutting (human resource development. Public funds related to NRP II have been centralized only in the budgetary chapters of the Ministry of Education, Youth and Sports (MEYS) and the Ministry of Industry and Trade (MIT). These ministries fulfill the roles of the providers and MEYS is also the coordinator of NRP II. It has been envisaged that the system of multiple thematic will continue in the form of National Research Programme III, with increasing stress being put on an appropriate identification of prospective technology developments with strong impact on innovation and competitiveness.

### Operational Programmes 2007-2013

The National Development Plan of the Czech Republic for the period of 2007 – 2013 (NRP) represents a strategic document for the future period of implementing EU programmes in the Czech Republic, including a proposal for the structure and aim of individual assistance programmes and the method of their implementation at the national level. The global aim of the NRP is the change in the social and economic environment in the Czech Republic, in accordance with sustainable development

principles, in order to make it an attractive place for investment, work and life of the people. As to the R&D and innovation support, the key role is assigned to the operational programmes R&D for innovation and Enterprise and Innovation, more specifically Education for Competitiveness (including the support for development of human resource capacity for R&D, partnership and networks between public and private sectors, intersectoral horizontal mobility).

The **Research and Development for Innovations** operational programme is administered by MEYS and its global aim is to strengthen the research, development and innovative potential of the Czech Republic, thus providing for growth, competitive advantage and the creation of work opportunities in the regions with the help of universities, research institutions and other relevant entities. The specific goals include: strengthening R&D capacities at the regional level and providing for their efficient exploitation at the regional, national as well as European level, fast and effective transfer of the results of research and development and strengthening educational capacities at the university level. The priority axes include: expansion of the research and development capacities (development of research workplaces in regions with development potential, development of top quality European Excellence Centres for EVP, development of capacities for targeted research and regional development), development of capacities for cooperation between the public and private sectors in research and development (development of regional capacities for technical research, protection of intellectual property at universities and research institutions, an increase in the targeted information campaigns concerning R&D and their effect on innovations, strengthening university capacities for tertiary education), and development of capacities of universities in tertiary education.

The **Enterprise and Innovation** operational program is administered by MIT and its goal is to increase, before the end of the programming period, the competitive advantage of Czech economy and to approximate the innovation output of the industry and service sectors to the top European countries. The specific goals include: intensification of the activity of small and medium size businesses, increase in innovative activities within industry, intensification of the introduction of innovations, technologies, products and services, increase in the effect of the energy use in industry and support of the use of renewable, or secondary energy sources (except for incinerators), support of cooperation of the industry sector with research and development, making the use of human potential in industry more efficient, increase in the quality of entrepreneurial infrastructure, intensification of development of consultancy services for businesses and intensification of development of business information services. The priority axes include: creation of companies, development of companies, efficient energy, services for business development and innovation, with these including especially: an increase in the innovative output of companies and in the capacities available for industry research and development as well as improvement of the business and innovation environment (cooperation platforms, infrastructure for human resource development, business infrastructure).

## **1.2 Governance, key actors and instruments of R&D and innovation support**

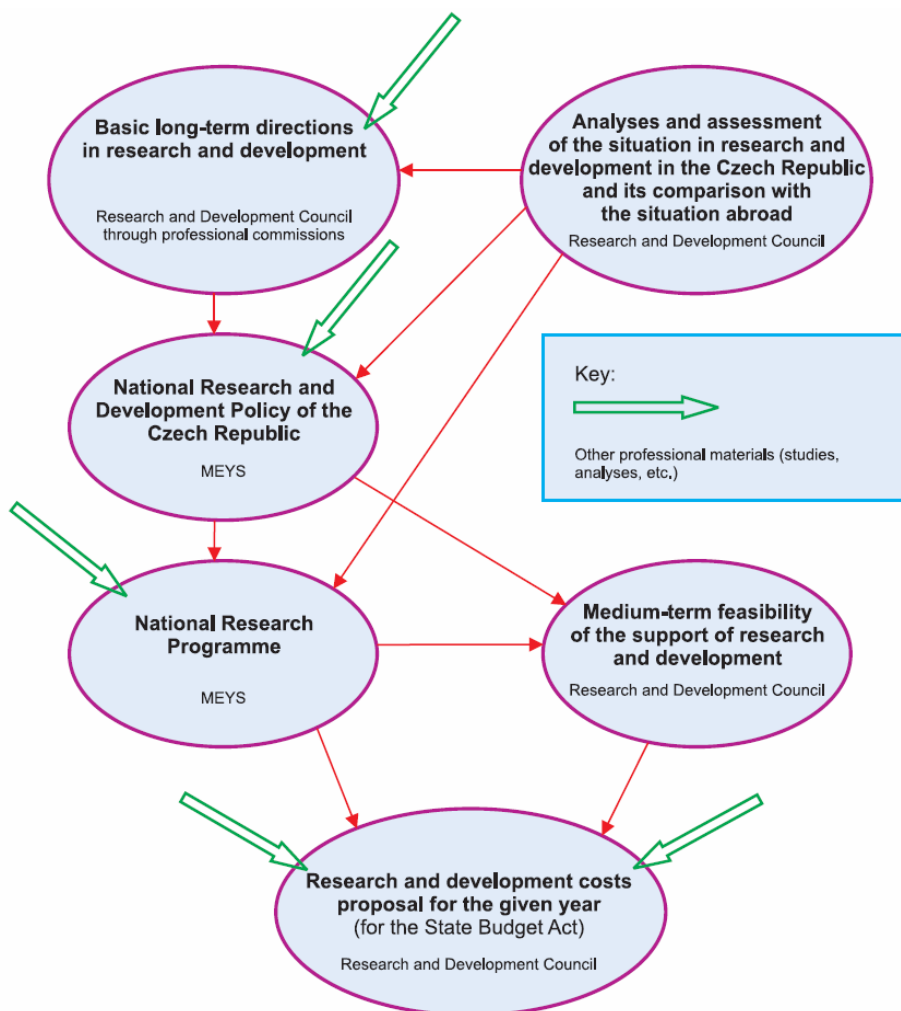
The implementation structure of the Czech Republic in R&D has been rather complicated (even if certain simplifications were made). There are number of R&D programme providers (every ministry has it own R&D programme, there are Grant

Agencies of the Czech Republic and Academy of Sciences) with diverse implementation system. Still the linkages between the individual programmes and projects are rather weak. Certain simplification of the R&D implementation structure have come with the dominant role of Ministry of Education and Ministry of Industry and Trade in R&D programme provision since the National Research Programme II and preparation of operational programmes. However, the other R&D providers will keep their competences in this area as well.

### Governance structure

The governance structure of formulating policy and thematic priorities in the support of R&D is illustrated in figure 1. The key conceptual role is played by R&D Council (the government body) which is headed by the prime minister.

**Figure 1: Stages of preparation of R&D support from public resources in the Czech Republic according to the law No. 130/2002 – the main documents and actors**



Source: R&D Council.

The principal responsibilities of the R&D council are to draw up long-term fundamental trends and schemes, or those imposed by the government for the development of research and development in the Czech Republic through its advisory bodies, which have been established as expert commissions involved in the respective trends of

research and development; process regular annual analyses and assessments of the research and development situation in the Czech Republic, compare them with foreign countries and submit the findings to the government; develop a mid-term draft forecast for research and development support and estimate the total costs of research and development covered from individual budget chapters and propose their allocation; assess opinions concerning research and development documents submitted to the government, conduct negotiations with the advisory bodies of the European Communities on research and development and with the research and development councils of the individual Member States of the European Communities but also other countries; act as administrator and operator and approve the rules for the operation of the Research and Development Information System, propose to the government to appoint and/or remove the Chair and other members of the Board of the Czech Republic Grant Agency, fulfils any other tasks and duties set forth in the Act on the Support of Research and Development and special legal regulations

#### Fiscal and financial support and its providers

The stages of preparation of financial public support are illustrated on figure 2. The scheme also demonstrates (rather complicated) system pro finance providers and recipients. The left part of the figure shows the preparatory stage of the state budget — from suggestions by the administrators of individual budgetary chapters (GA CR, AS CR, and sectors) to the approval of the budget by Parliament. It is clear that the most important role in the creation of the research and development budget is played by the Research and Development Council, while the Ministry of Finance is the most important in proposing the final level of the budget. The Ministry of Finance assigns funds to individual administrators of the budgetary chapters after the state budget is approved by Parliament. The cycle presented in Figure 2 lasts usually for about one year. Proposals for individual budgetary chapters are prepared for each following year in the period May—July in the given year and the assigned funds are available in the period March—June in the following year.

Grant Agency of the Czech Republic (GA CR) was established in April 1993 by the Czech law No. 300/1992 (novel No. 130/2002) as an independent institution that should promote progress over the whole range of scientific and technological development. Grants are provided to all kinds of Czech state and private research and development institutions and to private persons who are Czech citizens and reside permanently in the Czech Republic. Foreign private persons and institutions can cooperate in work on the grant projects. The basis of the funds available is provided by the state budget, but contributions from other sources, such as the industry, foundations, private donations, etc., are also possible. Public competition is arranged in regular intervals for scientific grants, the proposals are peer reviewed and the selected projects are funded, with tight control of the use of the finances granted. The general policy of GA CR stresses high-quality interdisciplinary projects, those carried out in cooperation of several institutions (Academy of Sciences, universities, industrial research institutions, etc.), projects involving international cooperation and proposals fitting in certain priority areas. The main emphasis in the work of GA CR consists in support for projects of basic research, i.e., grant projects whose subject is selected by the applicant. The greatest amount of support is earmarked for standard projects; a program of post-doctoral projects was commenced in 1997 and a program of doctoral projects in 2003.

Academy of Sciences of the Czech Republic (AS CR) was established by Act No. 283/1992 Coll. as the Czech successor of the former Czechoslovak Academy of Sciences. It is set up as a complex of 53 public research institutions and employs about 7,000 employees. The primary mission of AS CR and its institutes is to conduct basic research in a broad spectrum of the natural, technical and social sciences and the humanities. This research, whether highly specialised or interdisciplinary in nature, aims to advance developments in scientific knowledge at the international level, while also taking into account the specific needs of both Czech society and national culture. Scientists of the Academy institutes also participate in education, particularly through doctoral study programmes for young researchers and by teaching at universities as well. The Academy also fosters collaborations between applied research and industry. In addition to basic institutional financing of research objectives of Academy institutes, target-oriented financing is being more widely applied to carry out research projects and grants selected on the basis of public competition. AS CR was the first institution in the Czech Republic to establish its own Grant Agency which financially supports research projects selected through a peer-review procedure involving reviewers from abroad. Individual Academy institutes obtain additional financial resources by participating in national as well as international research programmes. The Academy has also been assigned financial responsibility for 71 scientific societies.

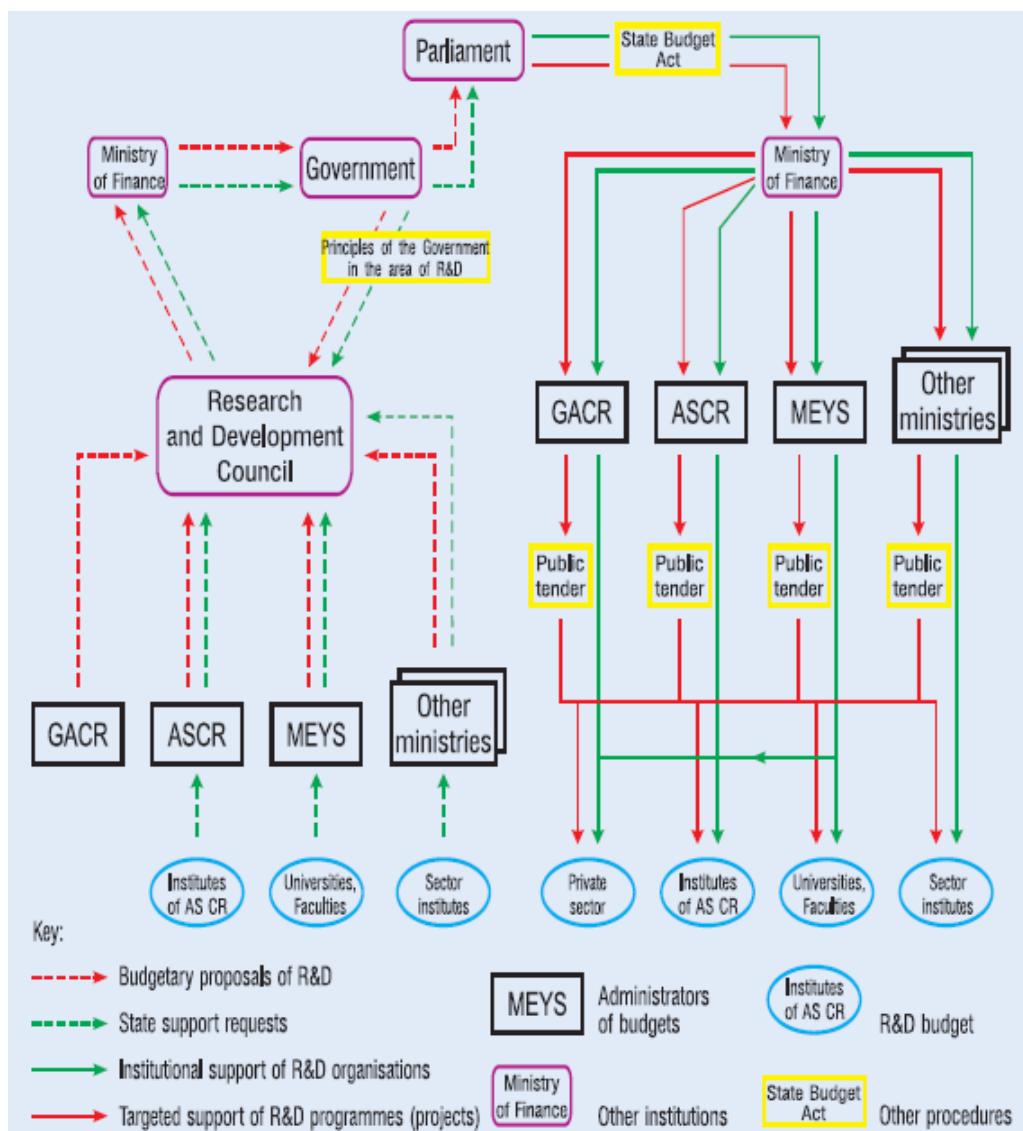
Ministry of Education, Youth, and Sports (MEYS) – is the central administration authority responsible for research and development and is responsible particularly for the following: preparation of the National Research and Development Policy, preparation of priorities included in National Research Programme, implementation of research priorities in areas not included in the competences of providers, preparation of legal regulations covering research and development and the assessment of impacts of other legal regulations on research and development, international cooperation in research and development has got a specific position among sectors involved in the public supported research and development. MEYS is responsible for two operational programmes in 2007-2013: R&D for innovation, Education for competitiveness.

Ministry of Industry and Trade (MIT) – one of the key providers of R&D support in industrial research, engineering and technology development, programmes in NRP II and is responsible for operational programme Enterprise and Innovation in 2007-2013 (former Industry and Enterprise in 2004-2006). *Czechinvest* – the government agency for business and investment support - is a contributory state-operated organization under the Ministry of Industry and Trade of the Czech Republic. Its aim is to strengthen the competitive advantage of Czech economy through supporting small and medium-size businesses, business infrastructure, innovation and the acquisition of foreign investments in the area of production, strategic services and technological centres. In order to facilitate the communication between the state, entrepreneurs and the EU, Czechinvest manages the entire support of the processing industry, using both EU and state budget funds. Additionally, Czechinvest promotes the Czech Republic abroad as a place suitable for allocating mobile investments; it is the sole organization that may submit requests for investment incentives to governing bodies; it also supports Czech companies that are interested in joining the supply chains of multinational companies. Through its services and development programmes, Czechinvest contributes to the development of local companies, Czech and foreign investors and the business environment as a whole.



*Czech-Moravian Guarantee and Development Bank (CMZR Bank)* - long-term goals and primary business are focused on providing assistance to small and medium-sized enterprises (SMEs) with the aim to enable them easier access to financial capital, share their business risk and reduce their project costs through different types of support tools as bank guarantees, referential loans and financial subsidies or grants. Besides that, CMZR Bank also participates in the realization of state policy aimed at the support financing specific projects helping to improve regional technical infrastructure and panel-block houses reconstruction. CMZR Bank is the only development bank in the Czech Republic with the mission to facilitate the implementation of the government nation-wide economic strategy, as well as the individual regions policy related to economic sectors, which require support of public finance.

**Figure 2: Stages of preparation of public financial support from state budget**



Source: R&D Council.

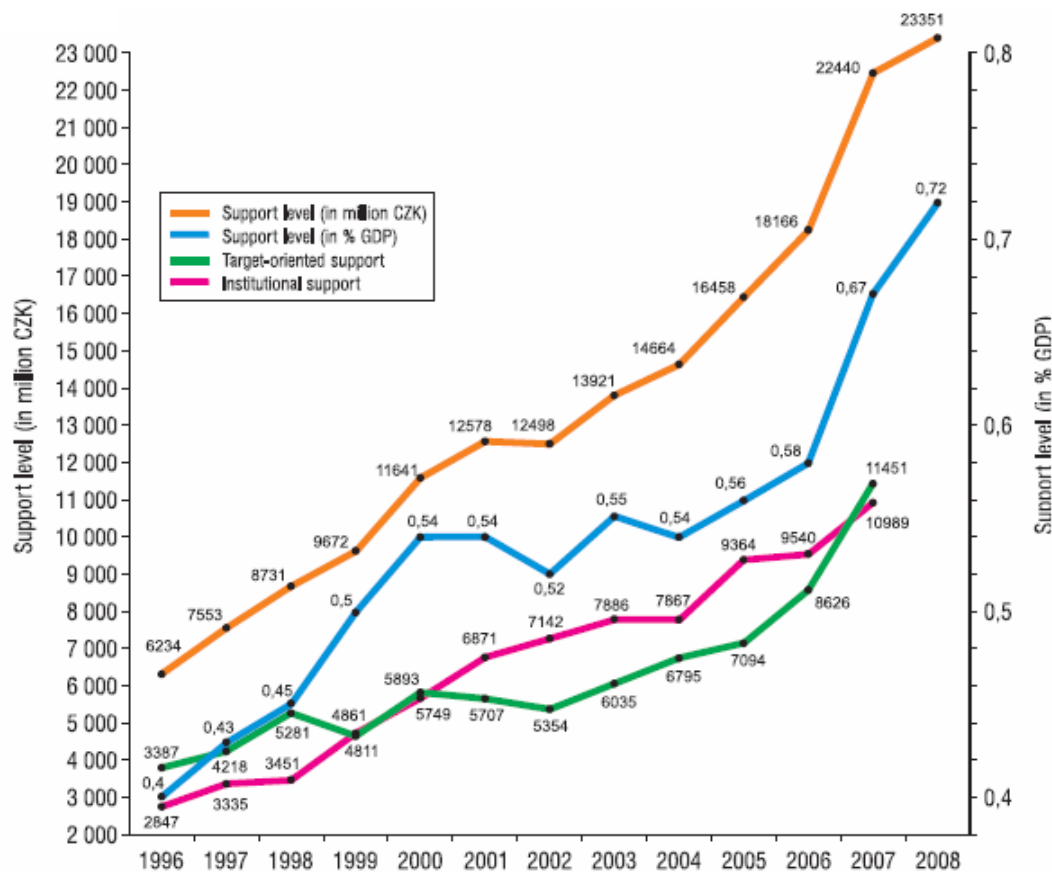
The public support of research and development is basically provided in two forms as (1) institutional funding, and (2) target-oriented (project-specific) funding, i.e. the support of research projects (the red lines in Figure 2): (a) grant projects, i.e. the projects proposed by natural or legal entities, (b) programme projects, i.e. the projects fulfilling programmes

announced by the providers. Programmes are proposed and announced by administrators of the budgetary chapters and assessed by the Research and Development Council. They are approved by the government, (c) public contracts, i.e. the projects, in which the state administration determines parameters of results. As the state is the only user, public tenders are announced in accordance with the Act No. 40/2004 Coll. The administrators of the state budgetary chapters assign target-oriented funds as (1) subsidies assigned to legal and natural persons and by funding activities of allowance and budgetary organizations undertaking the projects, the results of which are determined for publishing, for needs of the state administration bodies, or for more users, (2) loans (the returnable financial aid) to legal and natural persons undertaking projects, the results of which are determined for a single user only (with the exception of results determined for needs of the state administration bodies).

### Budget trends in R&D and innovation support

Budget trends show up an increasing financial support of R&D activities and increasing share of project-specific financing (which reflects one of the key targets of R&D policy), see Figure 3. An increase of the total funds, up to CZK 18 166 million, i.e. by 10.4 % is expected in 2006. When compared with 2005, it shows only a negligible increase in the GDP share by 0.58 %, a significant increase in the funds assigned to research and development, and also the increase in the GDP indicator is envisaged in the period 2007—2008, it has been assumed that the target-oriented funds will be higher in 2007, for the first time since 2000, than the institutional funds. This trend corresponds with the higher support of the applied (especially the industrial) research and development.

**Figure 3: Development of public support of R&D in the Czech Republic**



Source: R&D Council.

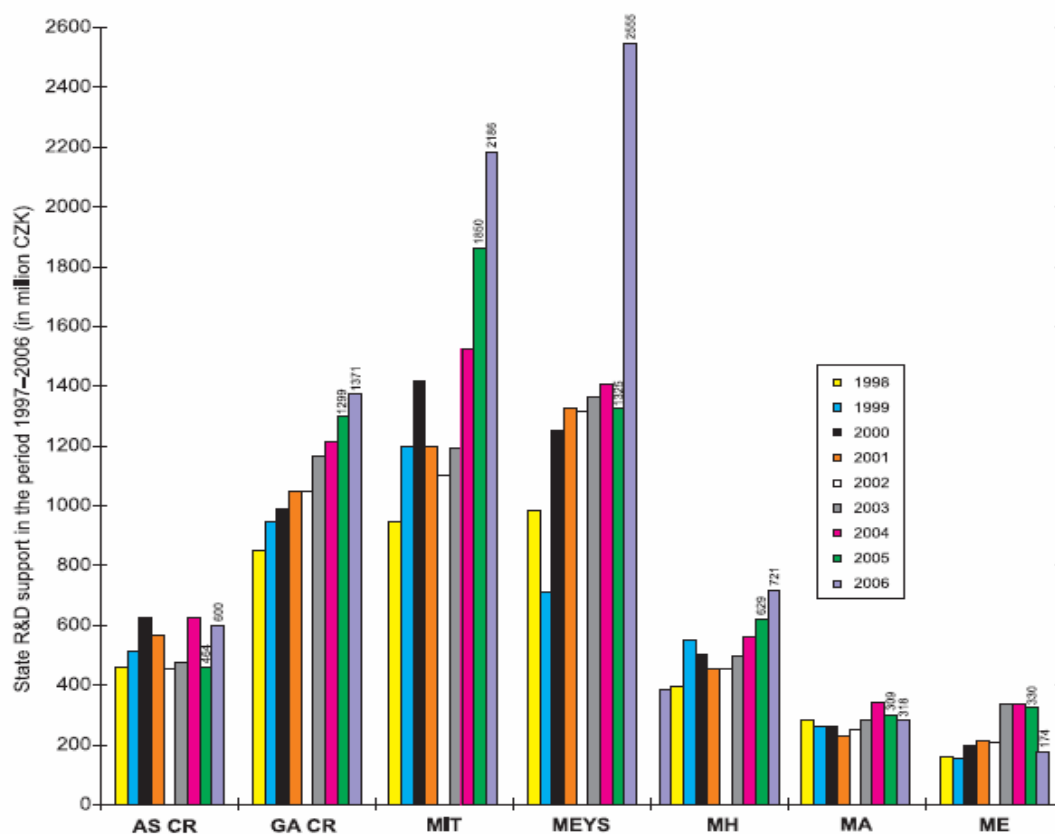
According to Barcelona targets the GERD in % of GDP is to reach 3 % in 2010 (the share of public expenditure 1 %), the business enterprise sector (BES) share in R&D finance is to reach 66 %. In the Czech Republic the share of BES in financing R&D reached 52.8 % in 2004 and 54.0 % in 2005 (the share of BES in performing R&D reached 63.7 % and 64.5 % respectively). As compared to the EU-25 averages, in the Czech Republic, there is higher share of government sector in R&D funding, and lower share of foreign and other national sectors.

**Table 1: Development trends in R&D financing in the Czech Republic**

|                |          | 1997  | 1998  | 1999  | 2000  | 2001  | 2002  | 2003  | 2004  | 2005  |
|----------------|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| GERD           | % GDP    | 1.08  | 1.15  | 1.14  | 1.21  | 1.20  | 1.20  | 1.25  | 1.26  | 1.42  |
| BERD           | % GDP    | 0.68  | 0.74  | 0.71  | 0.73  | 0.72  | 0.73  | 0.76  | 0.80  | 0.92  |
| Public funding | mil. EUR | 251.8 | 291.1 | 322.4 | 388.0 | 419.3 | 416.6 | 464.0 | 488.8 | 548.6 |
|                | % GDP    | 0.43  | 0.45  | 0.50  | 0.54  | 0.54  | 0.52  | 0.55  | 0.54  | 0.56  |

Source: EUROSTAT, OECD, CZSO.

**Figure 4: The development of target-oriented (project-specific) support according to the individual providers**



Notes: AS CR – Academy of Sciences, GA CR – Grant Agency, MIT – Ministry of Industry and Trade, MEYS – Ministry of Education, MH – Ministry of Health, MA - Ministry of Agriculture, ME – Ministry of Environment. Source: R&D Council.

The structure of individual providers shows Figure 4. The target-oriented support of R&D is given to R&D projects on the basis of results of public tenders. GA CR and AS CR provide for the support of grant projects. Other providers, including AS CR, support the programme projects, which make parts of by them announced R&D programmes, and public orders related to R&D. The target-oriented support of R&D with the MIT funds will increase by 18 % in 2006, when compared with 2005 because

solutions of the NRP II projects will commence and the programmes IMPULS and TANDEM will be strengthened (by 48 %, by 56 % respectively). The target-oriented support of R&D with funds of AS CR will increase by 29 % in 2006, when compared with 2005 (the commencement of the programme Nanotechnology for the Society). The target-oriented support of R&D with MEYS funds will increase by 93 % in 2006, when compared with 2005 (especially because of the started solutions of NRP II projects and new projects by the research centres for the basic research). The target-oriented support with the funds of GA CR increases every year. It will increase by 5.5 % in 2006, when compared with 2005. The target-oriented support from the MH funds will increase by 14.6 % in 2006, when compared with 2005. It will decrease by 3.2 % in the case of MA and by 43 % in the case of ME (the progressive finalization of several sectoral programmes and NRP I projects).

An important financial sources directed to the support of R&D activities include structural funds of European Union. Of 26 mld. EUR for the Czech Republic to be received in 2007-2013, 8 % are devoted to research and technology development projects and 11.8 % to the support of innovation in business enterprises, further sources are directed to human resources development for research activities, founding of technology platforms, partnership networks, mobility of researchers, popularization of science and innovation etc. In total, the structural funds should provide round 5.5-6 mld EUR for the support of research, development and innovation.

As to the fiscal instruments, in 2005 a 100% deduction of R&D expenditure from the profit base used to calculate corporate tax was introduced. The deduction can be made on a range of expenses including purchases of capital goods that will be used in research activities, patent and trademark registrations and evaluations of research outcomes by certified companies. Notably, this measure applies only to in-firm R&D, *i.e.* outsourcing of research activities and purchases of intangible research outcomes produced elsewhere (a license, for example) cannot be deducted. Understandably, the deductions do not apply to expenditure related to direct R&D subsidy. Gifts and transfers of real estate assets that will be used for research purposes are tax exempt. Furthermore, preferential lease of publicly owned properties is under consideration. This new measure is intended to boost the development of the innovation infrastructure – the creation of a new technology park, for example. As the R&D allowance is recent, it is difficult to gauge its effects and therefore whether more, or less, scope for tax support should be considered.

### **1.3 Support of science-industry linkages**

Czech innovation policy broadly aims to encourage both more private-sector research and a more market-driven approach to research by public-sector institutions and universities. The strong orientation toward technology development and its application can be particularly observed in the Operational programmes for 2007-2013 implemented by Ministry of Trade and Industry (and its agency Czechinvest). It can be expected that stronger participation of business sector in (intramural) R&D funding will also support an increase in the share of applied and experimental research. A more difficult to achieve will be the increase of experimental research in the institutions traditionally oriented to basic research, *i.e.* higher education institutions and Academy of Sciences. One possible way would be to motivate them for development of more intense linkages with business sector, to increase the share of

project-specific funding (as compared to institutional one) and to press on the more pronounced relation between the R&D inputs and their innovative outputs (including their commercial exploitation).

The links between business and universities remain limited in the Czech Republic due to the less prestige position of higher education institutions within the national innovation system. According to the Soviet model, the R&D activities were moved to the Academy of Sciences away from universities which have not yet grown up to a comparable level to the Academic or industry research institutes (private or public). The less intensive links between universities and businesses may be partly ascribed also to the legal difficulties related to the linkages between public and private partners. Rather strong segment of applied industrial research had been almost completely destroyed in the first half of 90s, the dominant position of Academy of Sciences in basic research has remained unchanged (including very limited linkages to business sector), and university research activities are developing rather slowly with negligible share of business sector in university R&D financing. There are some examples in technology transfer centres of the more pro-active Czech universities which, however, could not compensate for this structural problem. So far there has been only limited number of programmes specifically supporting science-industry linkages, or at least collaborative projects involving more partners. They include Nanotechnology for society, TANDEM, and Research centres.

#### National support

**Nanotechnology for Society (AS CR)** - the main objective of the programme is to achieve significant progress in the development of research and in the practical utilization of nanotechnologies and nanomaterials in the Czech society. The programme objective is, at the same time, the creation of a platform including AS CR, universities, and the industrial sector in the Czech Republic. This platform should ensure the long-term development of this area of science. The analysis of the current situation organized within this area of science has shown that only a specific, unified and focused programme supporting the development in the research of nanotechnologies in the Czech Republic can contribute to the change in the not favourable situation existing in the area. The finalization of this programme is expected in 2010.

**TANDEM (MIT)** - the programme focuses on the support of projects within the target-oriented research, the results of which will be utilized within the consequent industrial research and development, in new products, technologies, and services. The solution of these projects will be completed by target-made groups made from diverse organizations. Each project in this programme must ensure, at the same time, the transfer of results from the level of the basic or target-oriented research to the level of the industrial research and development. The programme will finish in 2010. The objective of the programme is the improvement of the cooperation of industrial organizations with research workplaces (academic, university, and other ones), the theoretical and technological support of small and medium-size enterprises, the improvement of the competitiveness of future products and technologies, and significant improvements in transfers of results of the basic research to industrial applications.

**Research Centres (MEYS)** – the aim of the programme is to gather all important research capacities within centres that will provide for effective transfer of knowledge among individual research stages to the entities that use them. The Centres are composed of research units of entities that provide, in a comparable extent, for the goal fulfillment. The research units must share a common research programme. Targeted support to a project selected within a public competition in the research and development area is set based on the proposed approved costs of the project and the requested support amount that must be calculated in accordance with the conditions set within the declared competition. The targeted support is provided to a recipient who then submits its part to a co-recipient.

#### Operational programmes: specific measures

**1) 2004 – 2006:** Within the Community support in the first programming period, the Czech Republic implements four operational sector programmes as well as a regional programme - the Joint Regional Operational Programme (SROP). The support of research and development activities and technological development is included in the operational programme Industry and Enterprise, divided into programmes supporting business environment and competitive advantage.

#### Industry and Enterprise (OPIE)

Support programmes under the OPIE secure comprehensive support for small and medium—sized enterprises in particular, with the use of resources of the EU structural funds, i.e. the ERDF, and are focused in particular on the support of: building and development of industrial research and development infrastructure and supporting its linking to the tertiary sector, business real estates, training centres for professional education, development of the production base of small and medium—sized enterprises, usage of the non—traditional energy sources by small and medium—sized enterprises (hereinafter the SMEs), etc.

#### Development of business environment: Prosperity, Clusters

**Prosperity** - the aim of the programme is the support of the infrastructure for industrial research and development and innovation and the improvement of the environment for technology oriented companies including start—ups and spin—offs. The programme pays special attention to the establishment and development of business incubators and science and technology parks as well as technology transfer centres. The support is given in the form of a grant up to 75 per cent of eligible costs of the project. The amount of the grant is 3—150 million CZK per one project. A project can be focused on both construction work, purchase of tangible and intangible assets and activities and services supported by the programme, such as consultancy services for SMEs or co—operation between SMEs and research and development institutions. The applicant must be a legal person and carry out activities as an operator of a science and technology park, a business incubator or a technology transfer centre and these activities should be anchored in its articles. The eligible costs are, for example, costs of real estates and land, construction or reconstruction of a building, operational costs, costs of working meetings, seminars and workshops and costs of subsidized rental of offices and laboratories for innovative businesses in a business incubator.



of purchase of patents, know—how etc. As for small and medium—sized enterprises, it is possible to give a grant to personal and other operational costs.

**2) 2007 – 2013:** Formation and development of science and industry linkages are included in the supported priorities especially in the programmes focused on enterprise and innovation and within it specifically on increasing innovation performance and improving business and innovation environment.

#### Enterprise and Innovation (OPEI)

The OPEI is aimed at increasing the competitiveness of the industry and enterprise, keeping the attractiveness of the Czech Republic, its regions and cities for investors, supporting innovations, speeding up the implementation of the R&D results into the production sector namely due to the stimulation of the demand for the R&D results and commercialization of the results, supporting the entrepreneurial spirit and economic growth based on knowledge, increasing the use of new technologies, innovative products and ICT. The support includes all NUTS 2 regions except Prague. The shares of support are differentiated according to the size of enterprises (see Table 2).

**Table 2: Conditions of public regional support 2007-2013**

|                      | Small enterprise | Medium enterprise | Large enterprise |
|----------------------|------------------|-------------------|------------------|
| All NUTS (except SW) | 60 %             | 50 %              | 40 %             |
| Southwest 2007-2010  | 56 %             | 46 %              | 36%              |
| Southwest 2011-2013  | 50 %             | 40 %              | 30%              |

Source: OPEI.

#### Innovation performance: Innovation, Potential

Innovation - the aim of the subprogram is to stimulate and increase the innovation activities of enterprises in manufacturing and services through subsidies for the implementation of innovation projects by enterprises (especially the SMEs) and for projects implemented by public research institutions, universities, physical entities and SMEs aiming to protect industrial ownership rights. By fulfilling the project goal, long-term competitive advantage, sustainable growth and balanced regional development of Czech economy will be strengthened. In respect to sustainable development, the programme has a special focus on supporting ecologically effective innovations (eco-innovations).

*Innovation project* is a project focusing at one of the following activities: a) increasing technical and utility value of products, technologies and services (product innovation), b) increasing the effectiveness of processes of production and service provision (process innovation), c) introducing new methods of organizing corporate processes and cooperation with companies and public institutions (organizational innovation), d) introducing new sales channels (marketing innovation). The *Protection of Industrial Ownership Rights* project focuses mainly on: activities aiming at the protection of industrial ownership rights in respect to inventions (in a form of patents), technical solutions in a form of utility designs both in the Czech Republic and abroad, as well as foreign industrial designs or foreign trademarks.

Potential - the aim of the subprogram is to enhance the research capacities of enterprises (especially SMEs), strengthen the cooperation between enterprises and R&D



institutions, create high-skill jobs, and improve conditions for the involvement of enterprises in national and European R&D programmes. The project involves the creation or extension of a development centre, (department) focused on research, development and innovation of products and technologies, including specific software and applications that are its part, leading to the implementation of technological innovations or an improvement in current products, product ranges, production processes and technologies if there are grounds to believe that these will be transposed into and used during production.

#### Business and innovation environment: Cooperation Platforms (Cooperation, Prosperity)

Cooperation - the subprogram supports the establishment and further development of co—operational corporation forms — clusters, poles of excellence, technology platforms and others, development of mutual cooperation among businesses and businesses and universities, improvement of linkages among the business segment, research and universities. This programme follows the Clusters programme that was implemented as a part of the operational programme Industry and Enterprise (2004 – 2006).

*Cluster* is a group of regionally linked companies (entrepreneurs) and associated institutions and organizations - especially including the institutions of tertiary education (universities, higher vocational schools) – the linkages among which have the potential to enhance and increase their competitive advantage. The companies involved compete against each other but, at the same time, are forced to deal with a number of similar problems (education of employees, dealing with the same suppliers, cooperation with R&D capacities, insufficient research sources etc.). Thanks to the cooperation in these areas, they may overcome a number of limitations, thus gaining competitive advantage and that is something hard to imitate. Therefore, this is a mutually beneficial partnership among companies, universities and regional institutions that has a number of advantages for all entities involved. *Pole of excellence* is a cooperative group of research, business and other entities within a clearly defined area of involvement, focusing on R&D of high technologies, implementing joint activities based on cooperation of research institutions with industry. Poles of excellence have a potential to attract research professionals, investors and key players in a particular industry and to increase a share of non-public expenditures in R&D. *Technology platform* is a cooperating professional group associating industrial companies, professional associations and alliances, research and financial institutions, national bodies of public administration, association of users and consumers involved in research, development and innovations in an important technological area at national or international level. The aim of the group is to create, support and implement mid-term to long-term visions of future technological development and coherent dynamic strategy for achieving a vision that involves important issues of the future economic growth, competitive advantage and sustainable development in the Czech Republic and Europe.

Prosperity - the subprogram supports establishing and further development of infrastructure for industrial research, technology development and innovations aimed at realization of new technologies and competitive products and services. Besides supporting innovation infrastructure for newly established innovation companies, the programme also focuses on supporting creation, activities and further development of business incubators or business innovation centres (BIC, PIC etc.). Additionally, the programme supports the Business Angels network as well non-subsidiary financial tools supporting the creation of small and medium-size enterprises.

*Business incubator* is an environment mostly for start-up innovation businesses that, based on predefined conditions, take advantage of discounted rent and services provided by the incubator's administrator and that are able to push through with their product on the market within a reasonable timeframe. *Scientific-technological park* is an entity focusing on science, technology, innovative business and professional education that functions in close cooperation with universities, scientific organizations and research institutions. It has two main functions: innovative and incubation. *Technology transfer centre* is an entity that cooperates with universities on providing services that help transfer technologies into companies at both national and international level, also providing for the sources necessary for implementing technological transfers as well as professional consultancy in respect to intellectual and industrial property. *Business Angels* are entities that are willing to invest their capital into newly established innovation businesses with high growth potential.

## **2. Support of regional R&D and innovation activities**

The regional aspects of R&D and innovation support in the Czech Republic are presented in the context of development of the regional policy which has been, actually, rather short. Strong regional repercussions have been related particularly to the foreign direct investment inflows supported by massive incentives since the end of 90s. Regional dimension of R&D or innovation support has been rather weak so far or even absent and only recently there can be seen attempts for a more systemic approach to incorporating innovation support into regional development strategies.

### **2.1 Development of regional policy and the role of FDI in regional development**

During the early 90s, regional policy in the Czech Republic was of marginal importance, in part due to small interregional differences and generally low unemployment rate. The official regional policy was very modest and consisted only of a limited support to small and medium size firms (in the form of soft loans) in assisted regions selected on the basis of the unemployment rate (e.g. more than 5 % in 1996). During the late 90s, the situation changed because of the growing unemployment rate and its regional differences, calling for an appropriate political reaction which was also supported by a social democratic government coming to power in 1998. Its most visible measure was the introduction of a strongly region-based policy of generous investment incentives. An additional impetus to the formation of Czech regional policy was the forthcoming accession to the European Union which also required an adaptation of institutional structures for implementation of EU Cohesion Policy, introduction of a multi-annual policy planning, systematic monitoring of policy results, as well as introduction of the principles of regional consensus and partnership into regional development policy. Only in January 2001, 14 self-governing regions were created in the Czech Republic.

Attraction of FDI and development of industrial parks and business zones soon became the most distinct result of policy support which had most visible impact on the development of its regions. There is a noticeable change in the structure of FDI inflows into Czech Republic which can be seen in a gradual shift from low-cost, assembly plants in sector such as electronics to industries with higher value added such as automotive or precision engineering, to investment in strategic services (service centres – accounting and tax offices, call centres, IT support and repair centres) and, most recently, in applied R&D centres or technology centres. With the arrival of more sophisticated investors, the requirements for policy support shifted from the traditional hard instruments such as

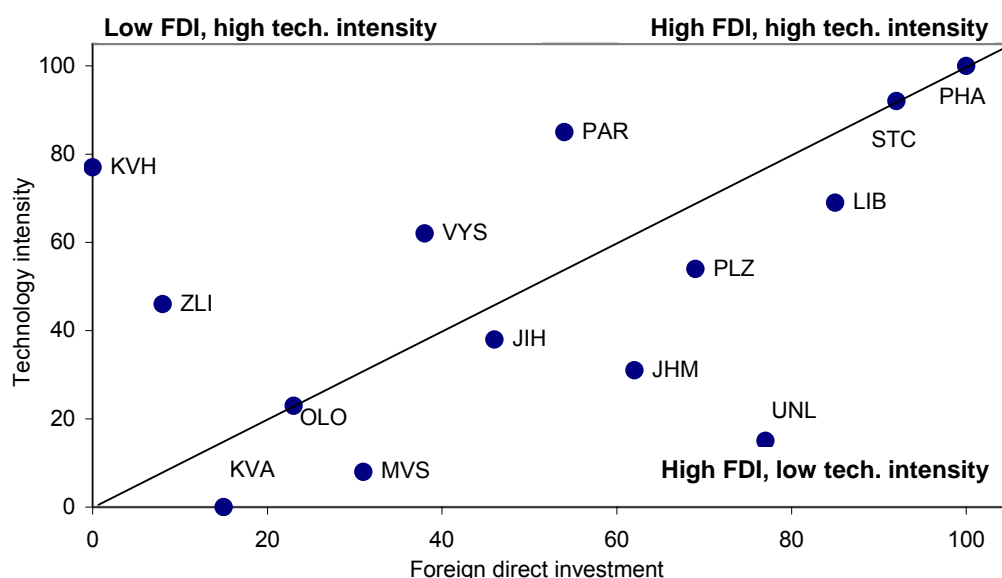
provision of infrastructure in industrial zones to soft measures such as development of local subcontracting networks, development of clusters and thematic networks, support to collaborative links with universities and research centres, as well as support for local start-ups and innovative companies through business incubators. However, in the Czech case the generally accepted recognition of the importance of local or regional approach in innovation and technology policy was still not fully accommodated and the need to involve local actors in the design and implementation of such policies had to face a number of challenges.

#### Qualitative structure of value added and foreign direct investment

In terms of technology and knowledge intensity, the **structure of regional value added** is to be assessed. Technology intensive industries are grouped according to the NACE classification (industry-based classification of economic activities). Regions generating higher share of value added in these industries have a faster GDP growth, capable of stronger competitive advantage on world markets. In transition economies, the inflow of **foreign direct investment** is an important indicator of the innovation capacity (or the technology transfer capacity). These investments bring about important technology changes, also positively affecting employment and the total economic output of the region. The FDI level in 2004 was the highest (disregarding the special position of Prague) in the Regions of Central Bohemia and Liberec (here it showed a very pronounced increase from the 2002 levels).

Figure 6 shows an interesting comparison of different regions based on FDI and the higher technology/intensive value added level. Interregional differences are very significant, showing a division into four groups based on combining the levels of both indicators. The most favourable situation is in the regions with high FDI, i.e. Prague and the Regions of Central Bohemia, Liberec and Pilsen. On the contrary, the Ústecký Region and the Regions of South Moravia and South Bohemia show low FDI levels and technology intensity. The worst situation in this respect, i.e. the lowest levels of FDI and technology intensity is in the Regions of Karlovy Vary, Moravia-Silesia and Olomouc.

**Figure 6: Rating of regions based on FDI (in 2004) and the level of gross value added in high and medium-high tech industries (in 2005), percentile**



Sources: Czech Statistical Office, Czech National Bank, own calculations

## 2.2 Regional R&D policy and regional innovation performance

The regional dimension of the R&D policy in the Czech Republic is included in the National Research and Development Programme as one of the system priorities; however, its outline is of just a very general and formal nature. Regional aspects are understood as assisting regional universities and their mutual cooperation. Even though the underestimation of the regional structure of organizing the R&D process and the need for applying regional aspects in the R&D policy are both addressed, the proposed implementation reflects these needs insufficiently. The system priority of regional R&D aspects is only fulfilled by cross-sectional programme of international cooperation. Based on interviews with selected representatives of state administration, it has been concluded that regional aspects of this policy are very difficult to grasp and, as a result, they are misunderstood and insufficiently enforced. The possibility of increasing the amount of funds provided to regions defined according to the map of public support in the Czech Republic represents the only tool reflecting regional differences. Nevertheless, this tool is commonly employed for the purposes of any public support.

The Harmonization NPR&D document of February 2006, covering the period of 2004 - 2006 with NIP and other relevant documents of the EU and Czech Republic, put higher stress on regional aspects. This document proposes some new measures that are tied to structural funds, with regional aspects being only mentioned as a special assistance to regional institutions and small and medium enterprises in the regions when participating in EU R&D Framework programmes. More significant changes are expected from the currently drawn National Research Programme III. The support will be tied to structural funds, and especially to the OP Research and Development for Innovations. The analysis of strategic documents and interviews has also indicated that the regional dimension of the R&D policy depends, to a certain extent, on the activity of the entities applying for support. The state administration has only programme tools available - it may offer certain programmes but their fulfillment depends on who applies for them.

### Regional innovation output

In spite of the **research and development** data being limited in respect to their informative value when assessing innovation output, their use has been best defined so far, making them the most frequently used method. In any case they reflect one of the important prerequisites of innovation activity and technological ability. At the same time, it needs to be stressed that in regions, positive research and development externalities may influence the development of other regions. Nevertheless, expenditure and employment in this area are an important indicator of possibilities for regional development, with a direct impact on GDP growth and human resource quality. Statistical data for individual research institutions (of a given region) monitor especially internal costs of research and development and the number of employees in various categories. As far as the institutional aspects are concerned, the statistics include business and government sectors as well as the sectors of higher education and non-profit public institutions.

**Table 3: Expenditure and employment in research and development and their institutional structure**

|           | Expenditure and employment in research and development |            |                 |             |                          |            |                   |              | 2005 innovation system structure (v %) |             |             |             |             |             |
|-----------|--|------------|-----------------|-------------|--------------------------|------------|-------------------|--------------|--|-------------|-------------|-------------|-------------|-------------|
|           | Expenditures   |            |                 |             | Employment               |            |                   |              | Expenditures                           |             |             | Employees   |             |             |
|           | per capita.<br>CR=100                                  |            | % GDP<br>(GERD) |             | per 1,000<br>inhabitants |            | structure<br>in % |              | Business                               | Govem.      | HEI         | Business    | Govem.      | HEI         |
|           | 2001   | 2005       | 2001            | 2005        | 2001                     | 2005       | 2001              | 2005         |  |             |             |             |             |             |
| <b>CR</b> | <b>100</b>   | <b>100</b> | <b>1.20</b>     | <b>1.42</b> | <b>5.1</b>               | <b>6.4</b> | <b>100.0</b>      | <b>100.0</b> | <b>64.5</b>                            | <b>18.7</b> | <b>16.4</b> | <b>51.1</b> | <b>23.6</b> | <b>24.8</b> |
| PHA       | 314  | 327        | 1.83            | 2.22        | 18.1                     | 22.7       | 40.7              | 40.8         | 46.9                                   | 30.9        | 21.1        | 35.1        | 38.6        | 25.3        |
| STC       | 232  | 181        | 3.00            | 2.76        | 3.7                      | 4.4        | 8.0               | 7.7          | 86.9                                   | 13.1        | 0.0         | 76.1        | 23.9        | 0.0         |
| JHC       | 47   | 62         | 0.62            | 0.99        | 3.0                      | 3.9        | 3.6               | 3.7          | 53.9                                   | 28.0        | 17.6        | 42.2        | 31.3        | 25.7        |
| PLZ       | 43   | 50         | 0.55            | 0.74        | 3.3                      | 4.2        | 3.5               | 3.5          | 71.9                                   | 0.9         | 26.7        | 50.1        | 3.7         | 44.7        |
| KVA       | 8  | 6          | 0.12            | 0.11        | 0.8                      | 0.5        | 0.4               | 0.2          | 94.6                                   | 5.4         | 0.0         | 89.5        | 10.5        | 0.0         |
| UNL       | 22   | 17         | 0.33            | 0.30        | 1.2                      | 1.2        | 2.0               | 1.5          | 90.3                                   | 1.5         | 8.2         | 78.0        | 1.9         | 20.1        |
| LIB       | 61   | 63         | 0.84            | 1.12        | 3.4                      | 3.7        | 2.8               | 2.5          | 85.6                                   | 1.1         | 13.3        | 66.1        | 0.7         | 33.1        |
| KVH       | 45   | 52         | 0.59            | 0.82        | 2.8                      | 4.1        | 3.0               | 3.5          | 47.6                                   | 28.3        | 24.0        | 59.3        | 25.6        | 15.1        |
| PAR       | 71   | 78         | 1.01            | 1.35        | 4.0                      | 5.2        | 3.9               | 4.0          | 88.5                                   | 0.0         | 11.3        | 88.0        | 0.0         | 11.8        |
| VYS       | 22   | 34         | 0.31            | 0.57        | 1.1                      | 1.7        | 1.1               | 1.3          | 97.8                                   | 2.2         | 0.0         | 96.5        | 3.5         | 0.0         |
| JHM       | 97   | 100        | 1.27            | 1.54        | 8.0                      | 10.1       | 17.6              | 17.4         | 49.2                                   | 20.6        | 30.1        | 45.2        | 20.5        | 34.2        |
| OLO       | 42   | 52         | 0.64            | 0.95        | 2.9                      | 4.7        | 3.6               | 4.6          | 70.4                                   | 0.6         | 28.6        | 54.9        | 0.2         | 44.7        |
| ZLI       | 42   | 65         | 0.60            | 1.14        | 2.4                      | 3.8        | 2.8               | 3.4          | 93.8                                   | 0.1         | 6.2         | 74.9        | 0.1         | 24.9        |
| MVS       | 50   | 42         | 0.78            | 0.73        | 2.9                      | 3.1        | 7.1               | 5.9          | 77.1                                   | 3.2         | 19.4        | 57.7        | 6.1         | 36.0        |

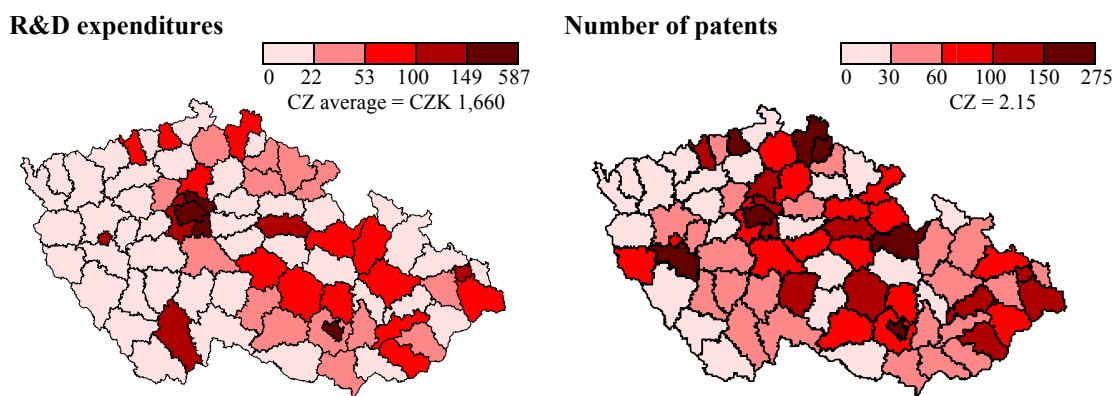
Source: Czech Statistical Office – Research and Development indicators for the Czech Republic, period 2001 - 2005; own calculations.

The basic data on the research and development activities at the regional level may be found in Table 3. This comparison clearly shows the prominent position of Prague in terms of both expenditures and number of employees, with the exception of the R&D intensity of value added. Another important centre of innovation output is the Region of South Moravia. On the other hand, the position of the Olomouc region has been significantly below the average in the long-term view. The relatively very positive results of the Region of Central Bohemia owe to a high concentration of automotive research capacities. The regions show significantly high differences in terms of relative intensity of research activities (employment in R&D compared to R&D expenditures per capita or the R&D intensity of regional GDP). The structure of expenditure on research and employment according to institutional sectors reflects the nature of the **regional innovation system**. In terms of expenditures, one may identify whether the innovation system of particular regions has a significantly higher share of the business sector or the government sector (Prague, South Bohemia, Hradec Králové, South Moravia), or the university sector (especially the Regions of South Moravia, Pilsen and Olomouc).

Because of the low number of units at the regional level and the internal heterogeneity of regions, the CZSO data do not reflect sufficiently the character of regional R&D financing distribution. Due to this reason, the data on specific public R&D expenditures from the Central Register of Projects have been used as well. Between 1996 and 2003, 55 % of these funds were allocated to the Prague metropolitan area, with the city of Prague itself receiving 48 % (i.e. CZK 8.3 mld.). The share of the second region – the City of Brno district - reached 13 %. As is apparent from the regional distribution of the funding per capita (see Figure 7), an interconnection exists between the position of a particular region and the presence of a university (or an important college). Together with Prague (and its facilities), the districts of Brno, City of Pilsen and Ostrava, as well as České Budějovice and Pardubice dominate the Czech Republic. Only these 8 districts received average to above-average R&D funding as compared to the country average,

with this being most apparent in the district of Prague East. Another very significant feature of regional R&D expenditure is their lower intensity in western Bohemia. When analyzing the data from CEP in relation to the surface and GDP, it may be concluded that public R&D expenditures during the applicable period were allocated extremely unevenly in favour of the most economically developed regions of the country.

**Figure 7: R&D expenditures according to CEP and the number of patents registered per 1 inhabitant of the applicable district, 1996-2003, ČR = 100%**



Source: Macešková, Žižalová (2006).

One of the measurable outputs of the efficiency of specific public expenditure on R&D are the granted patents. Figure 7 shows that the output of research activities is connected mostly to the presence of an innovation business entity.

### 2.3 Regional development and innovation strategy

Following the decentralization of competences in 2001, the programming documents called **Regional development strategy** were formulated in individual NUTS3. However, they mostly lack a systemic approach to innovation activities and their integration into a comprehensive support of regional competitiveness. Apart from the weakness of the development actors at regional level (both the regional authorities and regional development agencies), the other obstacle to regional innovation policy is a general lack of co-operation and a weak application of the principle of partnership to regional development planning culture. This is most clearly demonstrated by a low involvement of the business community which often lacks organizations that would be representative of their interest and could act as an intermediary between the public sector and individual enterprises. Any business associations that exist in the Czech Republic are nation-wide organizations. The regional coverage by their branches is very uneven; in most regions these associations are completely absent. Moreover, there is a lack of awareness and understanding of the issue of innovation policy by regional policy makers. The elected regional representatives took-up their role as recently as in 2001 and from the outset were overwhelmed by the need to start execution of the most basic administrative functions. At the same time, the process of negotiation of transfer of new competences from the national level was still ongoing, sometimes being highly controversial (e.g. transfer of indebted hospitals) and it has only been accomplished by 2005. The new regions had to fight the central administration for more financial resources and for more flexibility over their use, i.e. for a shift from state grants to more flexible own revenues. Consequently, the issues like innovation policy or R&D

were, at least for the first years, clearly beyond the scope of majority of newly elected representatives. Moreover, the official competences of regions in the sphere of R&D (as enacted in the legislation) are marginal and the regions are often struggling to cover even the policy areas that are clearly assigned to them by the law.

The key problems that have been until recently hindering the development of coherent innovation policy at the regional level are the lack of sufficiently strong regional actors competent and qualified to design and deliver innovation policy; the lack of genuine partnership in defining development priorities that should be based on mutual respect among the key players and should reflect longer term development ambitions and needs of the business sector; and the lack of awareness on the side of policy makers of the importance of research and innovation for long-term development of the region and generally a very formal nature of development strategies. There are, clearly, exceptions and some of these problems are more profound in some regions while in other they may not be that critical. Nonetheless, these are generic problems similar to most Czech regions. The regional innovation strategies (RIS) that started to be formulated by some Czech regions from the early 2000s were launched mainly as an instrument that should help the region to address these problems and challenges.

#### Regional innovation strategy - the case of BRIS in Prague

In years 2002-2004, the **Bohemian Regional Innovation Strategy** has been elaborated on the initiative of Technology Centre of Czech Academy of Science making use of EU funding. The Technology Centre had 3 foreign partners (partners from London, Aachen, and Rotterdam) and 2 regional partners (City of Prague and Centre for Regional Development). The project was based on two key principles: first, a focus on the needs of the region and respect for specific regional features, and second, stress on building the consensus among important regional players in the field of innovation. In order to identify the requirements and specific features of the Prague region, several analytical studies were conducted. These analyses were complemented by a relatively detailed regional field study of 490 SMEs and 60 research organizations, with the aim of identifying needs, barriers, and recommendations in the field of innovation generation. The main findings of analytical studies were summarized in SWOT analysis and subsequently were used also for identification of priority areas of the Bohemian Regional Innovation Strategy and to propose the first set of projects specified in the Action Plan. On the basis of SWOT analysis 7 strategic areas (marked A-G in the list below) and 15 priority measures were proposed (see Table 4).

Currently the City of Prague updates its Strategic Plan (which was originally approved in year 2000) in which the BRIS is to be incorporated. Moreover, this document was prepared in parallel with both Prague Single Programming Documents (SPD) for Objective 2 and 3 and therefore, all these documents are relatively coherent. For example, some of priorities and priority projects envisaged in BRIS Action Plan were already implemented with the support provided via Prague SPDs. For example, with support from SPD for Objective 2, Charles University established its Centre for transfer of technology and knowledge.

**Table 4: Strategic thematic areas and priority measures of Bohemian Regional Innovation Strategy**

| Thematic area   | Proposed measures  |
|---|--|
| A. Competitive sector of innovative enterprise  | A.1 Support to the formation and development of regional sectoral clusters<br>A.2 Support to progressive and hi-tech branches in the region  |
| B. Active involvement of the R&D base in the development of innovative entrepreneurship | B.1 Strengthening technology transfer, commercialization of R&D results and cooperation between R&D institutions and the business sphere<br>B.2 Support to establishing spin-off companies<br>B.3 Greater involvement of enterprises in R&D at regional and European level |
| C. Human resources innovation   | C.1 Training system for a dynamic labour market<br>C.2 Lifelong learning for a knowledge-based economy   |
| D. Consulting services and innov. infrastructure  | D.1 Development of a regional innovation infrastructure<br>D.2 Qualified consulting and services for innovation  |
| E. Financing innovation   | E.1 Public financial support to innovation, entrepreneurship and building the innovation infrastructure<br>E.2 Stimulation of the use of commercial resources for innovation   |
| F. Innovation as a part of regional development   | F.1 Innovation culture and framework conditions for innovations<br>F.2 Coordination of activities and strategic management of regional development in the field of innovation  |
| G. Interregional cooperation  | G.1 Cooperation with EU regions and transfer of time-tested practices<br>G.2 Prague – national initiation and innovation centre  |

Source: BRIS (2005).

#### Single Programming Document for Prague (2004-2006)

The support programme for Prague is co-financed by the European Social Fund (50 %) and the national public sources – the state budget and the budget of the Capital City of Prague. The main goal of the programme is an efficient labour market based on skilled workforce, competitive advantage of employees, use of R&D potential of the region, social integration of disadvantaged groups and equality of opportunities while respecting principles of sustainable development. The total sum allocated for the JPD 3 programme for the period of 2004 – 2006 is EUR 117.6 mil.

A measure in the area of **cooperation and innovation** has been implemented within the adaptability and innovation priority. The global goal is to enhance the quality of cooperation among individual R&D institutions and the business sector. Specific goals include: providing employees and employers with knowledge that will enable them to overcome problems when introducing new technologies, thus contributing to their competitive advantage; building the base of a system for educating students, Ph.D. students and young science professionals that will provide them with knowledge necessary for founding new technology-oriented firms; creating the base of a system for educating managers in R&D, industrial companies and professional organizations, providing them with professional knowledge for managing innovation process; creating and expanding information system for a fast implementation of R&D results; developing joint innovation programmes for universities, research institutions and the business sector, including mechanisms for transfers of technology, know-how as well as professionals; creating a base in Prague of a functional system of training and consultancy centres and business incubators that will support achievement of the aforementioned goals. The activities supported include: stronger involvement of employers, motivation of universities and scientific organizations, implementation of scientific results and research, activities promoting new technologies, internships and professional staff training, support of both existing and new consultancy companies,



support of the creation and development of technology-oriented companies, founding new technological spin-offs, creating partnerships between R&D institutions and businesses.

### Operational Programme Competitiveness Prague (2007-2013)

The support within the **Development of Innovation Environment and Partnership between the R&D Base and Practical Implementation** subprogram will focus on projects developing innovation infrastructure, i.e. scientific parks, incubators, innovation centres, centres of excellence etc., which will provide for using the R&D potential within the territory of the capital city. Consultancy and innovation centres will also be important in terms of innovations and technology transfers. Activities will also focus on Prague role as the source for the growth of innovation capacities of the entire country. Because of the still insufficient linkages between the research base and day-to-day practice, the activities will also involve creation of partner ties among research institutions, Academy of Sciences of the Czech Republic, universities and businesses, providing for effective use of the innovation structure created. Another item will include support of R&D leading towards practical applications, or supplier research for small and medium businesses. Due to synergy effects, innovations tied to other areas supported by the programme will be monitored as well.

The **Support of Favourable Business Environment** subprogram will focus on strengthening basic factors of productivity growth and their effectiveness, involving, besides others, transfer of R&D results into practice, development of innovation abilities of existing businesses, support of establishing technology-oriented companies, improving business infrastructure and the use of material base of the city, more effective use of travel industry opportunities, increasing the quality of educational processes in direct connection to knowledge-based economy and solving issues of employing certain groups of inhabitants of the city. An equally important part involves the stimulation of new forms of cooperation among companies, city administration, business associations, non-profit sector and research and other institutions. It will be especially aimed at clusters, technology platforms and other progressive organizational structures providing for new information, communication and coordination methods during the transfer of know-how, creation of supply and demand for innovation activities, promotion of good practices, rational use of the city space etc. Support of business acumen will be aimed at creating environment for creation and development of technology-oriented companies, with specific support of small and medium size businesses. Its integral part will also encompass corresponding finance tools (seed and venture capital, advantageous credits etc.), creation and improvement of entrepreneurial services, application of targeted consultancy, education and marketing.

### **3. Practices of regional innovation policy – programme Prosperity**

Within the Operational Programme **Industry and Enterprise**, carried out between 2004 and 2006, the Prosperity programme was implemented as well. This programme was a reaction to the insufficient communication and cooperation between the research and business sectors. Creation of a favourable environment for cooperation between both parties, i.e. support to creating suitable business innovation networks among universities, research institutions and businesses, is an effective solution to this problem. The programme focuses mainly on supporting infrastructure for industrial research, technological development and innovations.

### 3.1 The subject of support

The programme supported the foundation, development and activities of two types of innovation infrastructure:

- *Science-technology parks (STP), business incubators (BI)* – create conditions for creation and development of small and medium innovation businesses focus on carrying out new technologies and competitive products and services. Regardless of being placed in an incubator or STP, firms may use technical facilities from office technology, meeting and conference facilities to laboratories, workshops and other specialized facilities according to the STP or BI focus. Innovation businesses from the MSP category that are placed in the business incubator may receive a subsidy for rent and consultancy services provided by the incubator's operator.
- *Technology transfer centres (TTC)* – help transfer technologies into companies, also providing professional consultancy and consultancy in terms of protecting intellectual and industrial property. The centre also cooperates with research institutions and universities, providing its services at both local and international levels. The activities also include preparation of technology and cooperation exchanges, participation in exhibitions, conferences and seminars, procurement of sources for development of businesses etc. The centre may also recommend business plans of innovation firms to venture capital companies.

The projects could also include investment and non-investment proposals, i.e. the project could involve construction works, technologies and equipment for laboratories, operating employee wages, travel expenses etc. The project had to be carried out in the territory of the Czech Republic, outside of the Prague Region. Another condition necessary for admission was a proof of cooperation with a university or important institution. The advantage of the programme was the wide variety of supported – approved – costs and the available support of up to 75 % of all approvable costs, with the maximum subsidy possibly reaching CZK 150 million if construction works were involved or CZK 30 million if the project contained no construction works.

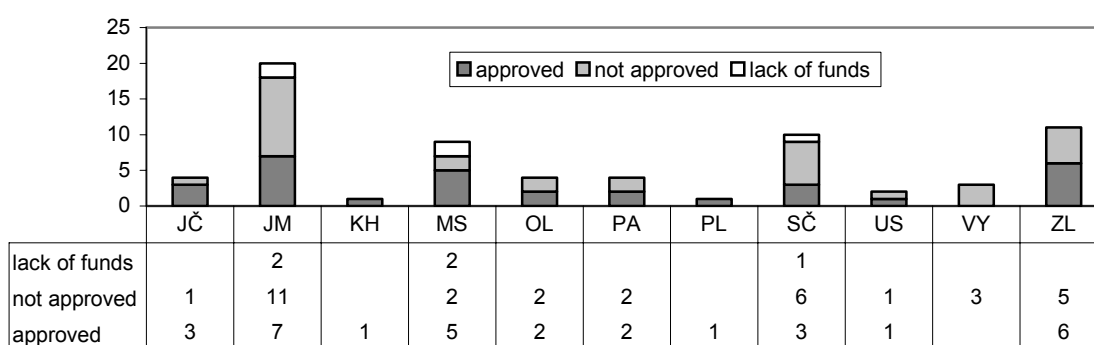
### 3.2 Programme assessment

Regional Czechinvest offices started to accept Prosperity applications as of July 1, 2004. The application deadline expired on September 29, 2006, with all awarded funds being claimable until June 30, 2008. Out of a total of 69 projects submitted within the Prosperity programme (2004 - 2006), 31 of them were approved for support. The programme was allocated funds of EUR 55,648, totaling CZK 1.6 mld. based on the CZK – EUR exchange rate at the date of terminating application assessment. The total amount has been drawn completely. It needs to be said that other entities applied for the subsidy and even though they had complied with all conditions, offering projects of equal quality to the already approved ones, they were not supported due to a lack of funds in the programme. The subsidy was thus awarded to 46 % of all projects submitted. The average requested subsidy per approved project was CZK 53 million.

The number of applications submitted as well as the resulting number of projects approved for implementation differed significantly among the regions of the Czech Republic. Presumed linkages with university cities were confirmed. In terms of regions, the highest number of applications were submitted in the Jihomoravský Region (20 projects submitted,

i.e. 29 % of all projects). The Zlínský and Středočeský Regions came in second, both with 10 projects. No projects were submitted in the Liberecký and Karlovarský Regions. Figure 8 shows project success rate in the individual regions of the Czech Republic. The fact that private entities were also submitting applications is very positive. These applications amounted to 45 % of the application total, while the regions, cities and organizations founded by them submitted 20 % of applications, universities 16 %, research institutions 12 % and the current operators of science-technology parks only 7 % of all applications.

**Figure 8: Number of projects submitted within the programme Prosperity in regions of the Czech Republic**



Source: Czechinvest.

### Programme results

The allocated subsidies will support the creation and operation of more than 31,700 m<sup>2</sup> of STPs and 30,000 m<sup>2</sup> of business incubators. This area will then be used for supporting more than 530 firms. Technology Transfer Centres have planned 400 transfers of technologies into companies. 190 new jobs should be created directly by the subsidy applicants (employees of STPs, BIs, TTCs), with 2,200 new jobs being created by the supported firms located in the science-technology parks or business incubators.

**Table 5: Newly created m<sup>2</sup> and the number of firms supported by STPs, business incubators and TTCs**

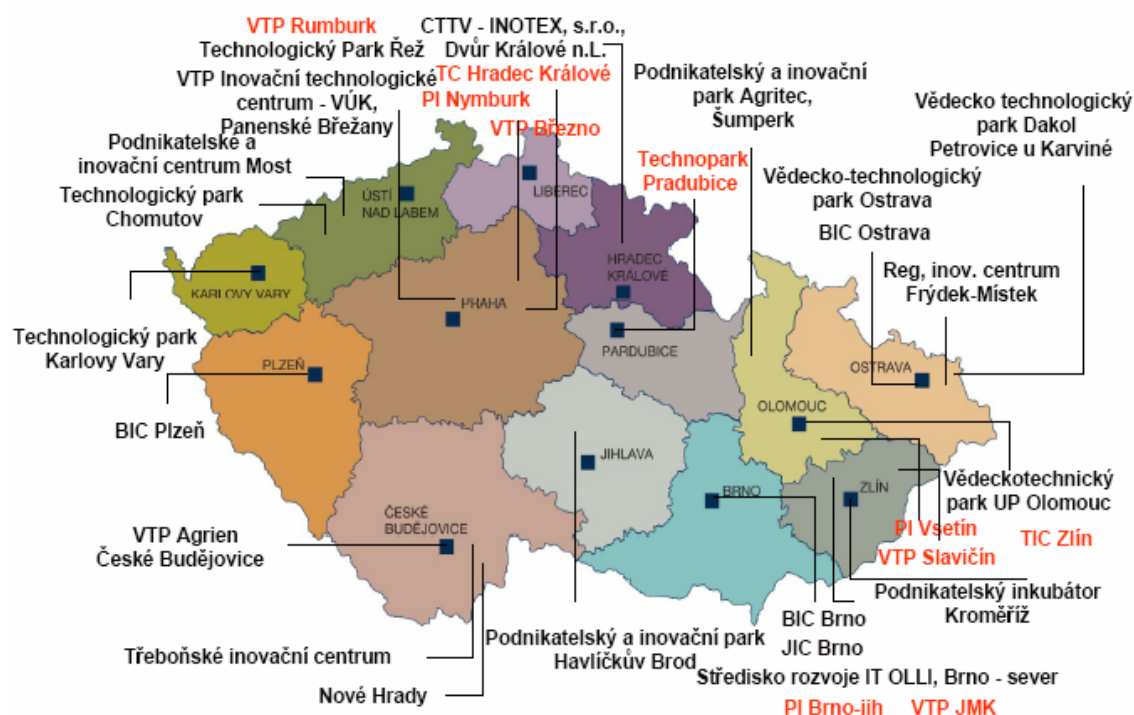
|       | Surface created - m <sup>2</sup> |        |        | Number of firms |
|-------|----------------------------------|--------|--------|-----------------|
|       | current                          | new    | total  |                 |
| STP   | 5,824                            | 31,736 | 37,560 | 178             |
| BI    | 4,220                            | 30,554 | 34,774 | 357             |
| TTC   | 62                               | 2,355  | 2,417  | 404             |
| Total | 10,106                           | 64,645 | 74,751 | 939             |

Note: The current surfaces are those already operated by the applicants at the time of application submission. These projects were mostly supported in terms of development of the current surfaces or their extension. New surfaces include completely new m<sup>2</sup> that were supported by the Prosperity programme. As for TTCs, the figures indicate the number of technologies transferred into firms. Source: Czechinvest.

The implemented Prosperity programme has brought a number of new impulses to innovation business practices in the Czech Republic. However, the applicants had to overcome certain obstacles - low practical experience not just with the preparation of more extensive projects co-financed by the EU structural funds but also with STP, BI and TTC operations. It was necessary to include the projects within regional development innovation strategies, map the potential of regions for using the services provided and to provide for the project financing even after the termination of subsidies, i.e. for the project sustainability. Another issue that a lot of the applicants had to face was the acquisition of adequately educated employees and managers. Czechinvest was lending a helping hand in this respect.

Benefits of the programme include especially an increase in the support for founding innovation technology-oriented businesses, creation of conditions for sustainable development of regions, more effective cooperation among universities, research institutions and industry and services, more favourable business environment, creation of new production and service companies, motivation of skilled staff to stay. Disadvantages of the programme include especially the possibility that STPs and BIs will not be populated by companies, which would result in a lack of funding, administration complexity of projects as well complexity of project implementation.

**Figure 9: Science-technology parks and business incubators**



Source: Czechinvest.

### The most common project problems

Non-compliance of the unaccepted projects with the Prosperity programme conditions was the major issue. Many projects lacked the fulfillment of the defined project goal which was the creation of infrastructure for industrial research, technological development and innovations as well as populating STPs and business incubators with preferably innovation-oriented small and medium size businesses. Quite often the project was oriented toward supporting the applicant company which is a subject of other programmes, with the Prosperity programme being unable to support this aim. Some of the submitted projects lacked in trustworthiness and reality in terms of setting tangible and intangible parameters. The requirements and expected results have to be in a corresponding balance. The usable STP/BI space for settled companies should be reasonably defined in comparison to other surfaces (conference facilities, parking lots and other surfaces with undefined purpose). Ownership must be clearly defined or a lease contract is to be proposed for the premises where STP, BI or TTC is to be located, preventing risks of bankruptcy and occurrence of disadvantageous conditions. Some projects failed due to formal mistakes that had not been sufficiently corrected. Very few of the submitters took advantage of the publicly accessible drafts of descriptive documents, such as business plan and feasibility study, leaving the

evaluators and opponents without sufficient information and answers to the questions they were to assess within the projects submitted.

**Box 1: List of technology parks**

**Existing parks**

- [|info|](#) Akademické a univerzitní centrum, Nove Hradky
- [|info|](#) BIC Brno, Podnikatel. a inovační centrum, s.r.o., Brno
- [|info|](#) BIC Ostrava, s.r.o., Ostrava
- [|info|](#) BIC Plzeň, společnost s ručením omezeným, Plzeň
- [|info|](#) CTTV - INOTEX, s.r.o., Dvůr Králové n.L.
- [|info|](#) Podnikatelské a inovační centrum Most, Most
- [|info|](#) Podnikatelský a inovační park Agritec, s.r.o., Šumperk
- [|info|](#) Podnikatelský a inovační park H. Brod, s.r.o., Havlíčkův Brod
- [|info|](#) Regionální inov. centrum Frýdek-Místek, s.r.o., Dobrá
- [|info|](#) Středisko rozvoje IT OLLI, s.r.o., Brno – sever
- [|info|](#) Technologický inkubátor VUT v Brně, s.r.o., Brno, U Vodárny 2
- [|info|](#) Technologický park Chomutov o.p.s., Chomutov
- [|info|](#) Technologický Park Řež, a.s., Husinec – Řež
- [|info|](#) TIC ČVUT Praha, Praha
- [|info|](#) Třeboňské inovační centrum (TIC), Třeboň
- [|info|](#) Vědecko - technologický park Ostrava, a.s., Ostrava
- [|info|](#) Vědecko technologický park Dakol, s.r.o., Petrovice u Karviné
- [|info|](#) Vědeckotechnický park UP v Olomouci, s.r.o., Olomouc
- [|info|](#) Vědeckotechnický park VZLÚ Praha, a.s., Praha
- [|info|](#) Vedecko-technologický park Žilina, Žilina
- [|info|](#) VTP Agrien, s.r.o., České Budějovice
- [|info|](#) VTP Inovační technologické centrum - VÚK, a.s., Panenské Břežany

**Parks in process of accreditation**

- [|info|](#) Podnikatelský inkubátor Kroměříž, s.r.o., Kroměříž
- [|info|](#) Technologické centrum Akademie věd ČR, Praha
- [|info|](#) Technologické inovační centrum, s.r.o., Zlín
- [|info|](#) Technologický park Karlovy Vary, s.r.o., Karlovy
- [|info|](#) Technologický park při VÚTS Liberec, a.s., U Jezu 525/4, Liberec

**Parks under preparation**

- [|info|](#) Laboratories, s.r.o., Brno
- [|info|](#) Podnikatelský inkubátor Vsetín,
- [|info|](#) Přerovský podnikatelský INKUBÁTOR,
- [|info|](#) Region.centrum progresivních technologií, Plzeň
- [|info|](#) Středočeské inovační centrum o.p.s., Zlatníky – Hodkovice
- [|info|](#) Výzkumný ústav pivovarský a sladařský, a.s., Brno

Note: Web links show more detailed information on the individual parks. Source: Association of Innovation Entrepreneurship ([www.aipcr.cz](http://www.aipcr.cz)).

### 3.3 Supporting activities

Between 2004 and 2006, Czechinvest carried out educational seminars helping to promote the Prosperity programme within the regions. They included meetings of project applicants within the Prosperity programme (the meeting was held in Nové Hradky and Třeboň in 2005 and in Ostrava in 2006) and Management Training for STPs, Business Incubators and TTCs (held in Brno in 2005).

#### Meeting of Prosperity programme applicants

The meetings of applicants had a very positive response. The aim of the seminars was to establish a tradition of future meetings of the Prosperity programme applicants, thus providing for the creation of new contacts and for sharing experience among applicants. The participants had an opportunity to: discuss the envisaged project with the project manager and other professionals, gain up-to-date information on the programme, learning of successfully implemented projects and the process of payment application as well as of monitoring and verification of the implemented projects. Czechinvest tried to provide a sufficient amount of quality information, clarify any programme issues, and gain information on the possible obstacles in order to help overcome them, thus facilitating the project implementation within the Prosperity programme.

#### Management training for STPs, business incubators and TTCs

Problems with building STP, BI and TTC teams occurred during the Prosperity project implementation phase. Due to this reason, Czechinvest organized STP Manager Training. The goal of the training was to remove issues concerning staffing for the creation and management of science-technology parks in regions, thus contributing to flawless operation of these entities.

### 3.4 Changes in the new programming period (2007-2013)

The number of applications submitted, the volume of requested subsidies and, at last but not least, the volume of projects the quality of which would have exceeded the minimum requirements for awarding the subsidy have all proved that there is a significant interest and need for implementing projects tied to the infrastructure supporting the creation and development of innovation firms. The Prosperity II programme, within the new Operational Programme Innovation and Enterprise for the period of 2007 to 2013, has taken into account the best practices of the Prosperity programme.

The support to creating and developing the **Business Angels** network – a tool for helping start-up business acquire capital, thus expanding financing options for their business plans and for their innovation-oriented projects - is an important new item. Some operational costs tied to the creation and development of networks will be paid within this programme. The basic activity of this network will include creation of databases of verified Business Angels investors and a database of business projects of small and medium size companies. The aim is to act as an intermediary for contacts between potential investors and interesting business plans of companies, in order to find financing for the latter. Activities identical to the finished Prosperity programme, such

as creation and further development of business incubators, science-technology parks and technology transfer centres, will be a part of the new programme as well. All these entities will have their investment costs and some of their operational costs paid.

## Conclusions

A debate on research and development policy in the Czech Republic has been undergoing a long-term transformation which only recently brings more visible outcomes in terms of shift towards innovation policy support and its higher efficiency, at least in the related strategic documents. Certainly, the move reflects the influence of EU membership, including the preparation of operation programmes for exploitation of structural funds. One of the key weaknesses of the Czech national innovation system lies in the underdeveloped science-industry linkages (and related missing link between basic and applied/experimental research) which are partly path-dependent and reflect the distortions inherited from the past. The support of science-industry linkages, therefore, brings an important challenge to the increase of innovation system effectiveness both on national and particularly on regional levels.

Despite a number of proclaimed policy intentions, however, regional dimension of innovation support has been still missing in the Czech Republic. Only recently, mostly due to the financing opportunity from EU funds, certain efforts have been made in formulation of so called regional innovation strategies. The problem is that the resulting programme documents are either of low professional quality or lack a clear strategy capable of bringing effective results. The formulated targets are often of general nature, they miss clearly defined priorities and related measures (including adequate financial resources from regional or national budgets). The key weaknesses include non-reflection of specificities of individual regional innovation system, passive role of its most important interest groups (businesses, universities and policy representatives) with minimum interactions across institutional sectors, and, consequently, insufficient integration of innovation strategy into development of regional competitiveness.

Consequently, the examples of regionally specific measures are very scarce in the Czech Republic, and they have not been systematically and independently evaluated as to their innovative effects in regional development. This is also the case of science-technology parks, business incubators and technology transfer centres supported within the programme Prosperity in the first programming period 2004-2006 with the intended continuation also in the period 2007-2013, as well as the case of the programme Clusters (in the new programming period called Cooperation). These activities possibly may represent a sort of regionally specific interactions; the question is if they bring any potential for regional innovation development in the near future. The missing evaluation of the previous experience with the undertaken measures presents a significant obstacle to increasing efficiency of the proposed new support programmes in innovation policy.

As to the regional innovation strategies, the most sophisticated example has been so far presented by the so called BRIS project in Prague (simultaneously undertaken in Pilsen). The question, however, remains about the practical feasibility of the strategy (and therefore its contribution to the regional innovativeness and competitiveness), which will depend on its inclusion in the long term development programme of the region, i.e. also its inclusion in development strategies of the key agents of regional economy. A more systemic question remains about a desirable form and intensity of

policy interventions from above or even from “abroad” in the support of regional innovation development as compared to the key role of the internal regional efforts (i.e. from bottom up). The related discussion points to a more general problem of the so far obscured role of regional policy in long-term economic development in the Czech Republic.

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