

INNO-Policy TrendChart –
Innovation Policy Progress Report

CZECH REPUBLIC

2009

PREFACE

Innovation is a priority of all Member States and of the European Commission. Throughout Europe, hundreds of policy measures and support schemes aimed at innovation have been implemented or are under preparation. The diversity of these measures and schemes reflects the diversity of the framework conditions, cultural preferences and political priorities in the Member States.

PRO INNO Europe® is an initiative of the Directorate-General for Enterprise and Industry (DG ENTR) which aims to become the focal point for innovation policy analysis, learning and development in Europe, with a view to learning from the best and contributing to the development of new and better innovation policies in Europe. Run by the Innovation Policy Directorate of DG ENTR, it pursues the collection, regular updating and analysis of information on innovation policies at national and European level.

INNO-Policy TrendChart serves the 'open method of coordination' approach laid down by the Lisbon Council in March 2000. It supports policymakers and innovation support measure managers in Europe by providing summarised and concise information and statistics on innovation policies, performances and trends. It is also a European forum for benchmarking and the exchange of good practices in the area of innovation policy.

INNO-Policy TrendChart products

INNO-Policy TrendChart, previously the TrendChart on Innovation, has been running since January 2000. It currently tracks innovation policy developments in all 27 EU Member States, plus Brazil, Canada, China, Croatia, Iceland, India, Israel, Japan Norway, Switzerland, Turkey and the US. The INNO-Policy TrendChart website (¹) provides access to the following services and publications, as they become available:

- a database of innovation policy measures in the 39 countries;
- a news service and related innovation policy information database;
- annual policy monitoring reports for all countries covered;
- the European Innovation Progress Report, an annual synthesis report bringing together key points in the INNO-Policy TrendChart.

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The report covers the period from July 2008 to June 2009.

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¹ See <http://www.proinno-europe.eu/index.cfm?fuseaction=page.display&topicID=52&parentID=52> online

CONTENTS

EXECUTIVE SUMMARY: PUBLIC SUPPORT FOR INNOVATION – A SNAPSHOT	I
1. MAIN TRENDS AND CHALLENGES IN THE NATIONAL INNOVATION SYSTEM.....	1
1.1 RECENT ECONOMIC TRENDS AND MARKET DEVELOPMENTS	1
1.1.1 <i>The credit crisis and its effect on innovation activity</i>	2
1.2 RECENT TRENDS IN THE NATIONAL INNOVATION PERFORMANCE	3
1.3 IDENTIFIED CHALLENGES	8
2. PUBLIC SUPPORT TO INNOVATION	12
2.1 MAIN OBJECTIVES FOR INNOVATION POLICY	12
2.2 INNOVATION GOVERNANCE SYSTEM	17
2.2.1 <i>Governmental bodies</i>	17
2.2.2 <i>Main bodies managing implementation of policies</i>	18
2.3 PUBLIC FUNDING FOR INNOVATION	19
2.3.1 <i>Review of the current range of support measures for innovation</i>	19
2.3.2 <i>New or modified support measures</i>	22
2.3.3 <i>Strengths and weaknesses in the innovation policy support system</i>	22
3. INNOVATION POLICY AND COMPETITIVENESS: AN APPRAISAL	24
3.1 THE ABILITY OF POLICY TO ADDRESS CHALLENGES	24
3.2 EFFECTIVENESS OF POLICY DESIGN	26
3.2.1 <i>Innovation policy governance</i>	26
3.2.2 <i>Process of delivery</i>	27
3.3 IMPACT OF PUBLIC SUPPORT FOR INNOVATION	27
3.3.1 <i>Conclusions: possible future actions and opportunities for innovation policy</i>	28
ANNEXES	30

Exhibits

Exhibit 1: Comparable indicators of economic performance..... 2
Exhibit 2: European Innovation Scoreboard: country pages 6
Exhibit 3: Main innovation policy challenges 10
Exhibit 4: Main innovation policy documents..... 16
Exhibit 5: Number of support measures per category 20
Exhibit 6: Three main impact indicators of the OP EI (2007–2013) 28

Executive Summary: public support for innovation – a snapshot

1. Main trends in the National Innovation System

The Czech Republic is currently undergoing a transition from an efficiency-driven economy to an innovation-driven economy. The Czech economy has a strong basis and tradition in technical and mechanical engineering fields, which is reflected through a relatively high contribution from the medium-high-tech sector which creates added value for the Czech economy. A considerable openness of the Czech economy is another important characteristic, which stimulates domestic companies to increase production efficiency. On the other hand, the openness of the Czech economy significantly contributed to a rapid spill-over of the recent economic crisis and the way out will therefore largely depend on economic recovery abroad. As far as the impact on innovation is concerned, the economic crisis may trigger a shift in business strategies from long-term competitiveness to short-term survival, which might cause less investment into innovation activities at least as far as product and process innovations are concerned. On the other hand, the pressure on businesses during the economic crisis may force entrepreneurs to cut excessive costs and make an effort to increase the efficiency of business processes. In this respect organisational innovation in the business sector may be stressed. From the long-term perspective the crisis may be used for the restructuring and diversification of Czech production and looking for new markets and market niches. As a response to the crisis, the Czech government approved the National Anti-Crisis Plan (prepared by the National Economic Council in February 2009), which sets out measures for helping citizens and companies to survive the crisis period. At the same time, measures such as shortening of capital amortization periods for tax purposes or state paid re-qualification trainings for temporarily redundant employees might have longer-term effects on increase in innovation-based competitiveness of the Czech Republic.

According to the European Innovation Scoreboard 2008 the Czech Republic belongs to the group of moderate innovators with innovation performance below the EU-27 average. Nevertheless, the speed of improvement of innovation performance is higher than that of the EU-27. Relative strengths, compared to the Czech Republic's average performance, are in firm investments, innovators and economic effects. On the other hand, relative weaknesses are in human resources, finance and support and throughputs.

Based on the recent economic trends as well as trends in national innovation performance, the following three main challenges in the Czech national innovation system have been identified:

- lack of cooperation between the research sector and the business sector;
- lack of human resources for innovation;
- inefficiency in use of public resources for R&D and innovation.

2. Main developments in public support for innovation

The current policy mix remains rather stable in the Czech Republic and only moderate adjustments of existing measures have been carried out during the reporting period. Current public support put emphasis on higher utilisation of the financial resources from EU Structural Funds. Among eight sectoral Operational Programmes, three of them involve issues of R&D and innovation:

- Operational Programme 'Enterprise and Innovation' (OP EI);
- Operational Programme 'Research and Development for Innovation' (OP RDI);
- Operational Programme 'Education for Competitiveness' (OP EC).

At the level of innovation governance, the *Reform of the Research, Development and Innovation System in the Czech Republic* was approved by the government in March 2008. As a strategic document it summarizes and gives reasons for the necessity of actions towards removing barriers in the Czech R&D system, which hamper research and innovation activities. The reform focuses especially on simplification and increasing efficiency of the R&D support system, encouraging excellence in R&D, and facilitating the application of R&D results in innovation, strengthening the cooperation between the public research and industry, establishing a more flexible organisational structure of public research organisations, improving availability of qualified human resources for R&D and innovation, and intensifying the Czech Republic's involvement in international research, development and innovation cooperation.

One of the central actions of the reform was the approval of the new *National Policy of Research, Development and Innovation in the Czech Republic for 2009–2015* in June 2009. The new National Policy of RDI 2009–2015 elaborates the objectives set by the reform into concrete actions and measures together with a time schedule and responsibilities for the implementation of the objectives. The new National Policy of RDI 2009–15, together with an accompanying legislative mix, create a framework which is aimed at increasing the efficiency of public support for research, development and innovation (RDI) and consequently the contribution of such support for the economy and society. The major upcoming changes to the public support system are the establishment of one central coordination body responsible for research, development and innovation (due 2013) and the reduction of the number of budget chapters through which research and development (R&D) in the Czech Republic is supported. This measure will be accompanied by the establishment of the Technology Agency of the Czech Republic, whose role will be to concentrate on the targeted funding of the applied research and development. Higher efficiency of the public support system is to be achieved also by a more effective approach to the evaluation of the research and development.

3. Appraisal of National Innovation Policy

The main innovation policy targets as announced in the key policy documents (National Reform Programme, Reform of the Czech RDI system and the new *National Policy of Research, Development and Innovation in the Czech Republic for 2009–2015*) are consistent with the current needs for improvement of the national innovation system. The innovation policy mix which consists of existing measures and actions proposed for implementation in the near future is appropriate in terms of a response to the main innovation challenges. Also the recently elaborated evaluation of several innovation policy programmes has proven to have encouraging effects on innovation activities in businesses and has contributed to the development of a favourable environment for these activities in the Czech Republic.

On the other hand, the Czech system of research, development and innovation can be assessed as inadequate in terms of effectiveness, flexibility and appropriateness of innovation governance, which results *inter alia* in the insufficient quality of R&D results and the detachment of public research from industrial needs. It is however positive that these shortcomings in the RDI system have been addressed in the current in-depth reform of the Czech RDI system aimed at improving innovation governance due to coordination of policy actions, defragmentation of R&D public support and more intensive inclusion of the private sector into joint public-private research projects.

The expected future actions of the Czech innovation policy will be oriented particularly on the following two aspects:

- the efficient use of Operational Programme 'Enterprise and Innovation' for encouraging innovation activities in the business sector and the efficient utilisation of the new OP RDI for improving and enlarging the capacity of research organisations;
- institutional changes of the research, development and innovation governance together with constituting the Technology Agency of Czech Republic with responsibility for implementing target support of applied research in the Czech Republic.

1. Main trends and challenges in the National Innovation System

1.1 Recent economic trends and market developments

The recent financial crisis has quickly spilled over to the economy and both the euro area and the US have been in a recession since the second and the third quarters of 2008, respectively. Economic problems of advanced economies have extended to emerging economies; industrial production fell in many countries and even the volume of the world trade fell sharply. In addition to these difficulties the inflation rate has been coming close to zero.

An unfavourable development of external environment has become and apparently will be the main cause of crisis in the Czech economy in the following period. The Czech economy reached a cyclical peak in the third quarter of 2007 proceeding then to the deceleration of gross domestic product (GDP) growth. In the fourth quarter of 2008 crisis from external environment fully affected the Czech economy. Further economic development will significantly depend on the speed of economic recovery in Europe (especially in Germany which is the main export partner for Czech companies). The GDP is expected to fall by 2.3 % in 2009 as forecasted by the Ministry of Finance in April 2009 ⁽²⁾.

As for expenditures, household consumption has not been hit by the crisis so far although after considerable growth in previous years, it has been losing its dynamics since early 2008. For the entirety of 2008, increase in household consumption reached 2.8 %. Further growth of consumption could be hindered by increasing unemployment and growing uncertainty about future economic growth followed by household efforts to save more to cover risks related to the crisis. On the other hand, low inflation and government anti-crisis measures may help boost household consumption. Government consumption increased by 0.9 % in 2008. In the following period, government institutions are expected to curtail its spending as regards both government sector employment and purchase of goods and services. Gross fixed capital formation increased by 3.1% in 2008. With respect to the current uncertain situation the private sector is expected to reconsider or postpone many investment plans. Enthusiasm of foreign investors to invest or reinvest in the Czech Republic will depend on the situation in their home countries. Decline in investment in housing construction is also expected. . On the other hand, decline in firm investments could be slowed down by some government anti-crisis measures (VAT refund for company cars, faster depreciation of new investments, or acceleration of highway construction). In addition, investment in infrastructure with contributions from EU structural and cohesion funds may play role in moderating the decrease of business investment. The contribution of net export in goods and services to real GDP growth reached 2.1 percentage points in 2008. This result was achieved even with unfavourable external conditions and exceptionally strong Czech currency. However, in 2009 foreign trade will be fully affected by global recession.

Although the inflation rate reached 6.3 % in 2008, a significant slowdown in growth of consumer prices has been recorded since October 2008. Year on year (YOY) growth of consumer prices slowed down to 2.2 % in the first quarter of 2009 and disinflation development thus corresponds to price development in other European countries. Despite the risks of simultaneous economic downturn and drop of consumer prices, low inflation may become an important factor stabilizing household consumption (see paragraph above).

Rate of unemployment reached its minimum in the second quarter of 2008 (4.2 %) and since then the unemployment has been growing. For the entirety of 2008, the unemployment rate reached 4.4 %. As consequence of the crisis, growth of unemployment rate is expected, whereas the intensity will depend on the importance of reduced or shutdown businesses in respective regions and on the capability to substitute promptly lost jobs. Rate of unemployment is expected to reach 6.1 % in 2009.

General government deficit reached 1.5 % in 2008, which is by some 1.4 percentage points better than set by the initial fiscal target. However, the negative impact of the economic crisis has been

² Ministry of Finance (2009)

observed on the revenue side of the government budget in later 2008 (lower receipts from VAT and social security contributions). At present general government deficit is expected to reach 4.5 % of the GDP in 2009. It is however probable that due to worsening effects of the crisis and the election cycle, further anti-crisis or pre-election measures will be adopted that will further deepen the budget deficit.

Unlike in other European countries the Czech financial sector does not suffer from direct effects of the crisis. The Czech banking sector is healthy, liquid and prefers provision of lesser volume of more expensive credits to creditworthy clients. Although new credits to non-financial businesses recorded year on year contraction in January 2009, a month later they returned to growth.

Exhibit 1: Comparable indicators of economic performance

Indicator	National performance		EU-27 average	
	2004	2008	2004	2008
GDP per capita in PPS (EU-27=100)	75.1	81.3 ^(f)	100	100
Real GDP growth rate (% change previous year)	4.5	3.2	2.5	0.9
Labour productivity per person employed (EU-27=100)	68.0	73.1 ^(f)	100	100
Total employment growth (% change previous year)	0.3	1.2 ^(f)	0.7	0.9
Inflation rate (average annual)	2.6	6.3	2.0	3.7
Unit labour costs (growth rate)	-2.9	2.5	-1.4	0.6
Public balance (net borrowing/lending) as a % of GDP	-3.0	-1.5	-2.9	-2.3
General government debt as a % of GDP	30.4	29.8	62.2	61.5
Unemployment rate (as % of active population)	8.3	4.4	9.0	7.0
Foreign direct investment intensity	2.7	3.0 ⁽²⁰⁰⁷⁾	0.9	3.4 ⁽²⁰⁰⁷⁾
Business investment as a % of GDP	21.1	19.6 ⁽²⁰⁰⁷⁾	17.2	18.7 ⁽²⁰⁰⁷⁾

Source: Eurostat - Structural Indicators and Long-term Indicators <http://epp.eurostat.ec.europa.eu>

Key: (f) forecast; (2007) latest available year (for example: 2007)

The overall competitiveness of the Czech Republic has improved over the last five years. According to the Global Competitiveness Index (see WEF 2008) the Czech Republic ranked 33rd among 134 countries (14th place among EU-27 countries). According to the IMD Index (see IMD 2009) the Czech Republic reached 29th place in 2009 (12th place among EU-27 countries). Based on the relative GDP per capita in PPS the Czech Republic is currently undergoing a transition from an efficiency-driven economy to an innovation-driven economy (see the WEF approach). To maintain future competitiveness, it will be necessary to continuously push the technological limits of production while introducing technological and non-technological innovations.

1.1.1 The credit crisis and its effect on innovation activity

The Czech Republic, with a small and open economy, has been hit by the worldwide fall in demand at the end of 2008. Compared to other EU countries, the Czech economy features several strengths, which can help to manage the impacts of the financial crisis, but also some weaknesses, which on the other hand increase the risk of negative effects on the real economic development. Considering the strengths, the Czech financial sector is relatively strong and sound and the Czech economy has not been hit directly by the financial crisis. In addition, macroeconomic stability and low foreign indebtedness are other positive aspects of the Czech economy, which provide to a certain extent enough space for active anti-crisis economic policy. Finally, the Czech Republic applies a flexible exchange rate regime and negative effects from abroad; thus, it be partly absorbed by the change in exchange rate of the Czech koruna. On the other hand, a high share of cyclically sensitive sectors in the economic structure (namely the automotive industry) belongs to the main weaknesses of the Czech economy with respect to potential negative effects of the current crisis. Furthermore, the recovery of the Czech economy is due to its openness and significant dependence on economic recovery abroad (especially in Germany and Slovakia).

It is obvious that the financial and economic crisis makes access to money difficult and taking risks more expensive. This may trigger a shift in business strategies from long-term competitiveness to short-term survival, which might cause less investment into innovation activities at least as far as product and process innovations are concerned. On the other hand, the pressure on businesses in the

time of economic crisis may force entrepreneurs to cut excessive costs and make an effort to increase the efficiency of business processes. In this respect organisational innovation in the business sector may be stressed. From the long-term perspective the crisis makes it also clear that a one-side oriented economic structure which relies on only few sectors makes the economy highly vulnerable in a time of crisis. The economic downturn driven by the loss of demand from industrial customers should operate as an incentive for the restructuring and diversification of Czech production and for opening new markets and market niches.

As a response to the crisis, the Czech government created the National Economic Council at the beginning of January 2009 and entrusted it with a task to 'analyse the risks and potential impacts of the global financial crisis on the Czech Republic, and to propose measures, steps and tools to mitigate or eliminate the potential impacts of the global financial crisis on the Czech Republic'. The National Economic Council released the National Anti-Crisis Plan on 18 February 2009. This plan was approved by the government as a solution which will help citizens and companies to survive the crisis period. In the following paragraph several activities with expected longer-term effects on innovation have been selected.

With the aim to maintain jobs the government has made it possible for companies to use money from the European Social Fund for requalification training. Instead of making them redundant, companies can send their employees for training and have their wages paid by the state. This anti-crisis measure may have a long-term positive effect on the capabilities of the work force and its flexibility to respond to the changing needs of knowledge-based economic development. Investment activities of companies have been stimulated by shortening of capital amortization periods for tax purposes. It is expected that this acceleration will make up to 9 billion CZK available for additional investments and ongoing operations. In addition, the self-employed and companies employing a maximum of five employees need not to pay advance tax payments in 2009, which provide them with liquidity for investment in tools and equipment. Considering the direct support for R&D and innovation, the National Anti-Crisis Plan suggested to increase public investment in this field by 8% in the next three years. Although the new government follows the approach of the previous government and considers R&D and innovation as one of the current highest priorities, the budget constraints do not allow for increasing public investment in this field by the proposed amount. Nevertheless, public investments in RDI, together with investments in transport infrastructure belong to the only two budget items, which will not be decreased in the next year.

To conclude this section, the economic crisis will certainly have an impact on innovation activities of businesses. While investments in product and process innovation may decrease despite the governmental stimulating measures, the introduction of organisational innovation is expected to develop. Another effect of the economic crisis may be on restructuring of the Czech economy in terms of greater diversification of production. In this respect a shift to higher value added production may take place. The speed of this restructuring will heavily depend on the flexibility of Czech companies.

1.2 Recent trends in the national innovation performance

The Czech Republic has an economy with a strong basis and tradition in technical and mechanical engineering fields, which is reflected in a relatively high contribution from the medium-high-tech sector to create added value to the Czech economy. A considerable openness of the Czech economy is another important characteristic, which stimulates domestic companies to increase production efficiency. Although relatively lower production costs still play a role in maintaining competitiveness of Czech companies, the most recent Community innovation survey (CIS 4) has shown that domestic companies have begun to advance other factors of competitiveness and have increased their investment in innovation.

According to the European Innovation Scoreboard 2008 (EIS 2008) the Czech Republic belongs to the group of 'moderate innovators' with innovation performance below the EU-27 average. Nevertheless, the speed of improvement of innovation performance is higher than that of the EU-27. Relative strengths, compared to the Czech Republic's average performance, are in firm investments, innovators and economic effects. On the other hand, relative weaknesses are in human resources, finance and support and throughputs.

Human resources

In comparison with other European countries there is a significantly lower number of researchers per 1000 labour force in the Czech Republic (approx. 80 % of the EU-15 average). There is a particular lack of young researchers and of middle-aged (between 35 and 55 years of age) managerial research staff with international experience.

Also the number of students and graduates from universities, including doctoral studies still remains low in comparison with most of the European countries. In the 20 to 29 age group, the Czech Republic has 26.4 graduates per 1000 of the corresponding age population (compared with approx. 40 in the EU average); nevertheless the average annual increase was 12.7%. There is a lower share of graduates in science & engineering fields in the overall number of graduates, which can exert a negative influence on the further development of a knowledge-based economy in the Czech Republic.

Finance and support

Although the governmental expenditures on R&D have been growing in the Czech Republic faster than in other European countries, their relative amount (considering the number of inhabitants and economic maturity) is still below the EU average (0.55 % GDP in the Czech Republic compared to 0.65 % in the EU-27). Public support is provided to a wide spectrum of fields, which results in supporting many projects of a smaller scope and this weakens the potential for excellence creation. Furthermore, the allocation of funds is not adequately tied up with the ex-post evaluation of research results. This leads not only to an insufficient quality of research work outputs being reflected in a lower number of scientific publications and their citations, a lower number of patents, new technologies, products and services, but also to a lower motivation of researchers to perform high-quality work.

Financing of innovative activities by venture capital in principle does not exist in the Czech Republic. The reasons are partly the tax barriers (multiple taxation)³, partly the growth rate of companies inadequate to requests of venture capitalists and partly to an insufficient demand for this type of financing tied with the concerns of entrepreneurs about the loss of independence in decision-making. Many Czech enterprises also do not attain a sufficient year on year growth required by venture capitalists. Public support is insufficient in this area too.

Firm investments

The intensity of innovation (share of expenditure on innovation in the overall turnover of innovation companies) has significantly increased in the Czech Republic over the past few years and at present (with 2.4 %), it has reached the average intensity of innovation in the EU. The increase in innovation intensity shows that Czech companies have begun to recognize the importance of innovation for maintaining competitiveness and have increased the volume of investments in innovation activities. Considering the structure of expenditures on innovation, purchase of machinery and equipment is the dominant component. On the other hand, Czech companies spent significantly less on in-house R&D activities. These results indicate that the innovation process in Czech enterprises is generally characterised by adopting advanced technologies, processes and other methods related to production. This transfer takes place especially from foreign controlling companies to subsidiary companies located in the Czech Republic.

Business expenditures on R&D have been growing in the recent years in the Czech Republic. However, with 1 % of the GDP they still reach neither the level of advanced EU-15 countries nor the level desired by Lisbon strategy (Barcelona targets). Czech private research is concentrated mainly in enterprises with foreign capital that have a long-term concept of development, including R&D. At present the share of expenditure on R&D carried out in multinational corporations or in foreign companies runs close to 60%. This may have a positive effect on innovation activities in the Czech Republic, since corporate R&D is strongly associated with the international R&D in multinational corporations, which open an access to the most up-to-date knowledge and technologies and allow developing cooperation with other R&D facilities within the corporation. As for sectoral aspects the prevailing part of R&D spending is carried out by medium-low-tech industries.

³ Income from investment projects (dividends) is liable to withholding tax at a venture fund level and furthermore at the level of individual partners (investors) of the venture capital fund. In addition, capital gains of the venture capital fund are subject to corporate taxes. This tax environment discourages establishing venture capital funds in the Czech Republic.

Linkages & entrepreneurship

Cooperation between research and industry is still insufficient in the Czech Republic, which could be demonstrated *inter alia* by a very low share of private financial resources in R&D expenditures in the public sector. Lack of cooperation between these two sectors is reflected in the detachment of the process of knowledge creation and its transformation into practical applications. Reasons can be seen, among other things, in different approaches and motivations of the public and private sectors to knowledge transfer and in the environment that does not sufficiently stimulate researchers to cooperate with the industry. Also the cooperation inside the business sector in joint innovation activities (e.g. within clusters) is underrated by both the enterprises and state administration.

Throughputs

In the number of European Patent Office (EPO) patent applications per 1 million inhabitants the Czech Republic ranked with less than 10 EPO patent applications per million inhabitants far behind the advanced EU-15 countries. Although the Czech Republic has a lower number of R&D personnel compared to advanced EU countries, its ranking does not improve when comparing the number of patents per 1000 R&D personnel. A relatively large proportion of patents coming from Czech inventors are owned by foreign companies. A thorough analysis of research outputs proved that Czech research is not capable of satisfying the needs of business, in which the purchase of licences and know-how from abroad prevails (see Klusáček, Kučera, Pazour 2008a). Payments of Czech subjects for purchases of licenses and trademarks from abroad have increased year on year and since 1996 payments in EUR have nearly doubled.

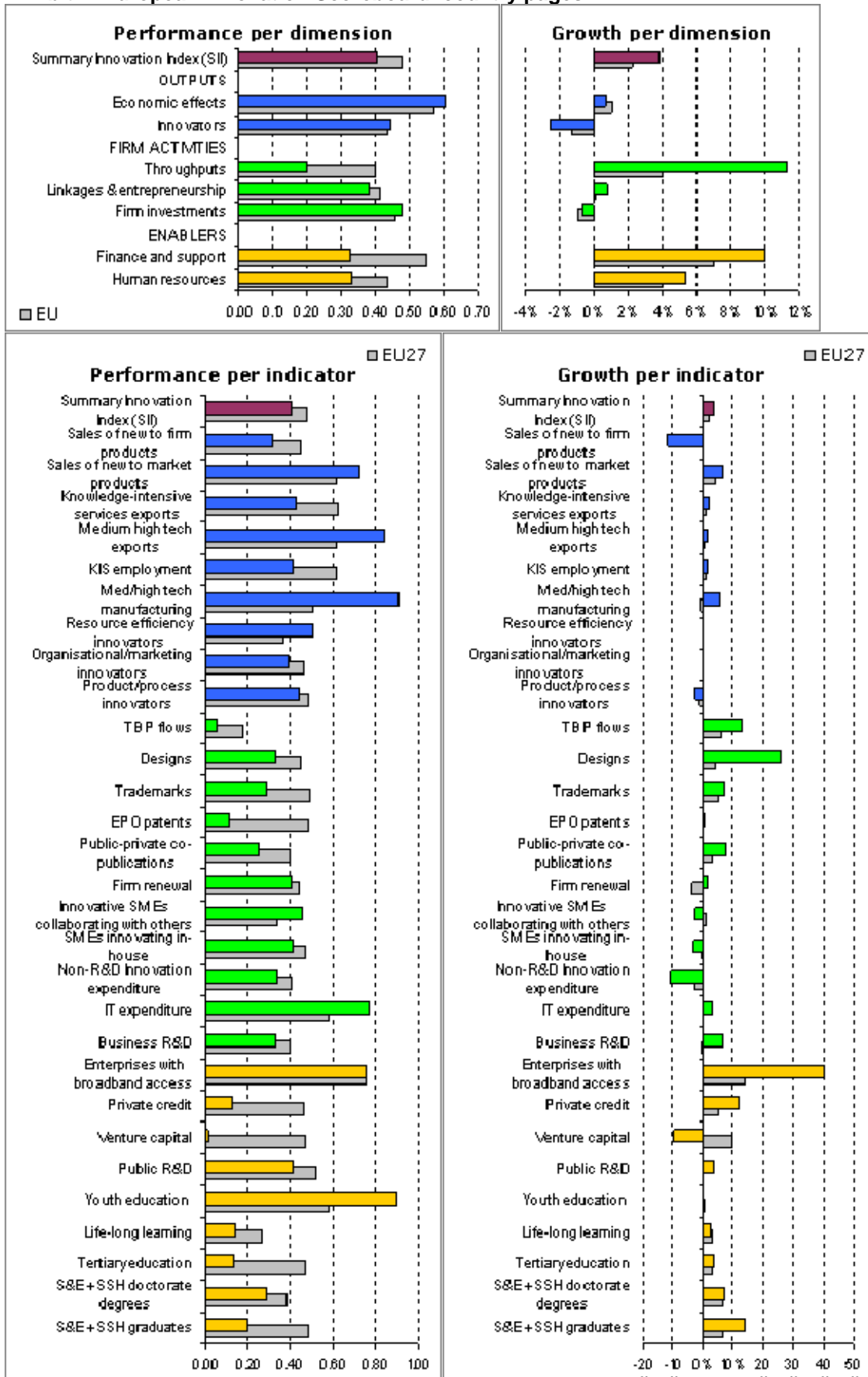
Innovators

Despite the fact that the share of innovation companies in the Czech Republic is below the EU-27 average (35 % in the Czech Republic compared to 39 % in the EU-27), the progress in the number of innovation companies means that innovation in the business sector plays an increasingly important role. A significant effect on this development comes from foreign direct investments to the manufacturing industry, through which new technologies and innovative processes to companies in the Czech Republic diffuse. As regards a type of innovation, there is a growing trend of implementing process innovation together with innovative products. In addition, there is a gradual increase in the significance of non-technical (in particular organisational) innovation.

Economic effects

The increase in the share of turnover of innovative products in the total turnover of all innovative enterprises is another indicator, which testifies to the increase in the significance of innovation in the business sector of the Czech Republic. It is positive that there is not only an increase in the share of turnover of innovation new to the firm (approx. 8 % of the total turnover) but also of innovation new to the market (approx. 16 % of the total turnover). Increase in quality and expansion in the range of products and services are considered by innovative companies to be the most significant effect of implemented innovation.

Despite the relatively weaker position of the Czech Republic in throughputs, human resources and finance and support (see above), these categories have been the main drivers of the improvement in innovation performance over the past five years. In particular the improvement in these categories results from strong growth in community designs (26.0 %), technology balance of payments flows (13.1 %), science and engineering (S&E) and social sciences and humanities (SSH) graduates (14.1 %), private credit (11.8 %) and broadband access by firms (40.1 %).

Exhibit 2: European Innovation Scoreboard: country pages


	2001	2002	2003	2004	2005	2006	2007	2008	Growth
SII				0.344	0.346	0.368	0.392	0.404	3.9%
ENABLERS									7.4%
Human resources									5.4%
1.1.1 S&E and SSH graduates	14.6	15.2	15.6	19.3	22.4	25.8	--		14.1%
1.2.2 S&E and SSH doctorate graduates	0.54	0.65	0.73	0.76	0.82	0.86	--		7.0%
1.1.3 Tertiary education	11.6	11.8	11.9	12.3	13.1	13.5	13.7		3.6%
1.1.4 Life-long learning	--	5.6	5.1	5.8	5.6	5.6	5.7		2.8%
1.1.5 Youth education	90.6	92.2	92.1	91.4	91.2	91.8	91.8		-0.1%
Finance and support									10.0%
1.2.1 Public R&D expenditures	0.48	0.47	0.48	0.44	0.49	0.52	0.55		3.5%
1.2.2 Venture capital (3-year average)	--	--	0.020	0.006	0.008	0.004	0.007		-9.6%
1.2.3 Private credit	0.39	0.29	0.30	0.32	0.36	0.41	0.47		11.8%
1.2.4 Broadband access by firms	--	--	20.0	38.0	52.0	69.0	77.0		40.1%
FIRM ACTIVITIES									4.1%
Firm investments									-0.6%
2.1.1 Business R&D expenditures	0.72	0.73	0.76	0.79	0.91	1.03	0.98		6.6%
2.1.2 IT expenditures	--	--	--	2.8	3.0	3.2	--		3.4%
2.1.3 Non-R&D innovation expenditures	--	--	--	1.40	--	0.88	--		-11.0%
Linkages & entrepreneurship									0.8%
2.2.1 SMEs innovating in-house	--	--	--	31.7	--	28.0	--		-3.1%
2.2.2 Innovative SMEs collaborating with others	--	--	--	12.9	--	11.7	--		-2.5%
2.2.3 Firm renewal (SMEs entries + exits)	4.4	3.5	4.0	4.7	--	--	--		1.5%
2.2.4 Public-private co-publications (2-year avg.)	--	6.9	6.4	5.5	10.2	12.6	--		7.8%
Throughputs									11.3%
2.3.1 EPO patents	7.0	8.6	11.3	10.9	7.3	--	--		0.6%
2.3.2 Community trademarks	2.7	2.4	8.2	27.1	21.2	32.9	47.1		7.1%
2.3.3 Community designs	--	--	1.8	10.7	39.2	51.5	67.7		26.0%
2.3.4 Technology Balance of Payments flows	--	0.22	0.25	0.19	0.42	0.39	--		13.1%
OUTPUTS									0.2%
Innovators									-2.6%
3.1.1 Product/process innovators (SMEs)	--	--	--	35.5	--	32.0	--		-2.6%
3.1.2 Marketing/organisational innovators (SMEs)	--	--	--	39.1	--	36.2	--		--
3.1.3 Resource efficiency innovators									
3.1.3a Reduced labour costs	--	--	--	16.9	--	18.2	--		--
3.1.3b Reduced use of materials and energy	--	--	--	13.7	--	14.2	--		--
Economic effects									0.7%
3.2.1 Employment in medium-high/high-tech manuf.	9.18	8.95	8.72	9.02	9.43	10.39	10.85		5.6%
3.2.2 Employment in knowledge-intensive services	9.59	9.45	10.17	10.04	10.12	10.33	10.92		1.8%
3.2.3 Medium/high-tech manufacturing exports	--	57.9	58.4	60.1	59.2	61.3	--		1.4%
3.2.4 Knowledge-intensive services exports	--	32.9	27.2	30.1	35.7	35.5	--		1.9%
3.2.5 New-to-market sales	--	--	--	7.7	--	9.9	--		6.7%
3.2.6 New-to-firm sales	--	--	--	7.8	--	4.7	--		-11.9%

Source: <http://www.proinno-europe.eu/index.cfm?fuseaction=page.display&topicID=464&parentID=51>

Regarding the regional distribution of innovation activities, it is obvious that the greatest potential is reached by national centres of education and research, which also have a strong concentration of highly qualified personnel and innovation infrastructure. These regions (Prague and Southern Moravia) also attract the largest volume of foreign investment oriented towards sectors with higher added value. More comprehensive analysis of regional differences and specifics in innovation performance and potential is available in Pokorný et al. (2008).

To sum up, the overall national innovation performance of the Czech Republic according to the EIS indicators has further improved, and the summary innovation index currently reaches 85 % of the EU average. Extraordinary results have been reached in economic effects of innovation, namely in the rise of share of turnover of innovative products. This fact points to an increasing role of innovation in competitiveness of the Czech business sector. On the other hand, several shortcomings of the national innovation system still persist. The most significant drawbacks are evident on the side of both human and financial resources for innovation. As for human resources, there is particularly a lack of

young researchers and S&E graduates with qualifications corresponding to the current needs of innovation companies. Concerning financial resources for RDI, the major weaknesses can be observed in lack of equity investments (venture capital) and ineffective allocation of public expenditures for R&D. More comprehensive analysis of the Czech innovation system (⁴) points to the fact that relatively lower availability of qualified human resources and inefficient public spending on R&D may hamper RDI activities in the Czech Republic in the future. Therefore we think that increased attention should be paid to reform of the educational system and to more efficient system for allocation of public resources for R&D.

1.3 Identified Challenges

Based on the overview of development in the main dimensions of innovation described in section 1.2, the Czech Republic faces particularly the following challenges (see also Exhibit 3):

- lack of cooperation between the research sector and the business sector;
- lack of human resources for innovation;
- inefficiency in use of public resources for R&D and innovation.

These challenges have been also identified in recent analytical studies (see Klusáček, Kučera, Pazour, 2008a and 2008b) elaborated in order to formulate strategic documents for reforming the system of RDI in the Czech Republic (see below).

The Czech innovation system has both developed a network of educational and research institutes and a tradition and strong basis of the industrial and technical sector. Nevertheless, innovation carried out in the business sector is based on adopting existing technologies from abroad and not on utilising knowledge from the research sector. Czech companies innovate largely by purchasing foreign machines and equipment, which they adapt to their own production process or completely replace this process with new technologies. Innovation is thus based in particular on adapting knowledge developed abroad. Investments of foreign companies in the Czech Republic play a significant role in the diffusion of advanced technology into Czech companies, which leads to the transfer of knowledge and know-how and to the increase in effectiveness of production in domestic companies. Innovation based on utilisation of in-house developed R&D results or R&D results developed by domestic research institutes in the Czech Republic is realised only to a limited degree. The fact that Czech companies insufficiently utilize the capacity of research institutes in the innovation process is a result of the lack of cooperation between the research sector and the business sector. The causes for the lack of cooperation between research and business, which would lead to an effective knowledge transfer, can be found in the areas of infrastructure, human resources, awareness of intellectual property rights and the system of evaluation of research and development.

An important pre-condition for intensifying cooperation between these sectors, which would lead to the implementation of R&D results in innovation, consists in developing a functioning infrastructure for knowledge transfer including its qualified staff for technology transfer. Despite the fact that innovation infrastructure has begun to develop in individual regions over the past few years, an effectively functioning infrastructure for knowledge transfer is still missing. This role is usually played on one hand by technology transfer centres, which usually stem from universities and on the other hand by business incubators creating an environment for start-up enterprises. In the Czech Republic there is a lack of qualified staff for technology transfer centres, which are knowledgeable about both the research environment and also the needs of industrial practice and the development of market trends. Existing business incubators are often reduced to renting space at subsidised prices but the extent of services facilitating knowledge transfer remains inadequate. Funding opportunities for the development of a functioning infrastructure for knowledge transfer are available from the EU Structural Funds, which should be invested in providing more effective services for knowledge transfer between research and business sectors, which would strengthen the cooperation between these sectors. Furthermore, the system of evaluation of R&D results financed from public sources plays a significant motivation role in strengthening links between research and industry. A change in the system of evaluation of R&D financed from public sources and linking public support of R&D to results of this

⁴ See Klusáček, Kučera, Pazour 2008a.

evaluation would provide an opportunity for stimulating knowledge transfer by placing emphasis on industrial utilisation (i.e. potential for commercialisation) of applied R&D results.

Another aspect in this field is a very low level of awareness of industrial property rights in the Czech Republic, which is reflected on one hand in an insufficient utilisation of protection of R&D results and on the other hand in the isolation of research activities. Motivation measures addressing ownership of industrial rights generated by universities and research institutes represent another important precondition for increasing intensity of research activities directed towards industrially applicable results.

Insufficient cooperation between public research and industry belongs to the main challenges identified in the *National Reform Programme of the Czech Republic 2008-10*. This challenge is addressed from various aspects by all four policy objectives set by this *Reform Programme*:

1. *Support of innovative activities and protection of intellectual property rights* emphasises the utilisation of protection of intellectual property rights, which is one of the main conditions for successful commercialisation of R&D results in innovation.
2. *Support for research and development capacities* is aimed at increasing innovation activities of small and medium-sized enterprises (SMEs) and at deepening cooperation of companies with R&D institutions.
3. *Support of cooperation between academic and business field* directly addresses the above identified challenge by stressing development of infrastructure for technology transfer and innovation.
4. *Support in establishment of entrepreneurial field entity groupings* emphasises establishment of regionally and nationally concentrated groupings (clusters or technology platforms), which the cooperation between the public and private sectors, entrepreneurial entities and science research and educational institutions.

With respect to human resources for innovation, there is a substantially lower number of researchers in the Czech Republic in comparison with EU-15 countries. As mentioned above there is particularly a lack of middle-aged managerial research staff with international experience. One of the main reasons for the lack of researchers is an insufficient differentiation by the quality of research work and its benefits and the persisting allocation of wage funds according to the years of work. This results in a lack of interest among young people in scientific career and a brain-drain of researchers to other countries or from research to other positions. Today, the lack of qualified research staff has already become an essential limiting factor in further development of industrial R&D. In addition, the lack of researchers can be perceived as critical in relation with the prepared operational programmes, which will be utilised among other things for developing or expanding research capacities in the Czech Republic and which will be financed from the EU Structural Funds in the period from 2007 to 2013 (Operational Programme 'Research and Development for Innovation').

The comparatively lower share of graduates in science & engineering fields does not correspond with labour market demands, which is another threat for innovation-based competitiveness of the Czech economy. Furthermore, the graduate skills often do not fulfil the expectations of enterprises; the graduates lack self-reliance necessary for problem solving, as well as adequate flexibility. In the area of elementary and secondary education only little emphasis is put on developing the skills of an individual's independent thinking and creativity. The educational system in the Czech Republic is not flexible enough; the system of management of institutions of higher education fails to meet today's requirements and neither the age structure of pedagogues is optimal. The participation of inhabitants in lifelong learning is insufficient and decreases with age.

The lack of science and engineering graduates and low number of researchers are identified as a challenge and subsequently addressed by the *National Reform Programme of the Czech Republic 2008-10* within the IG 7 – to increase and improve investment in R&D, in particular by private business. The policy objective in this area aims at achieving improvement in the field of human resources through national programmes, resources of cohesion policy, measures set by the Reform of Research, Development and Innovation System of Czech Republic and legislative modifications of tertiary education.

In the Czech Republic public support for research, development and innovation is significantly fragmented. The system of public support is too complex and the support is allocated through many small and medium-sized research programmes. This fragmentation leads to smaller projects being

supported, which in turn does not allow reaching critical mass for cutting-edge research and thus excellence of Czech research cannot be widely achieved at international level. The reason is *inter alia* a lack of clear prioritisation of research directions based on recognized methodologies (foresight).

There is a negative prevalence of institutional support of R&D at the expense of project-based support. The distribution of financial resources in the form of institutional support is currently not sufficiently connected with the evaluation of results of scientific work. This results not only in an insufficient quality of research output (low citation rate of Czech scientific publications, low number of patents, etc.) but also in the lower motivation of researchers to perform a high-quality scientific work.

The importance of effective and efficient use of public funds for RDI activities increases in the context of ongoing economic downturn and consequent lack of private sources for these activities. Decrease of private investment in RDI with subsequent negative impact on business competitiveness growth should be substituted in a time of economic crises with an increase of public expenditures in RDI.

A significant opportunity to improve the situation of a knowledge-based economy of the Czech Republic in the coming years consists of financial resources from EU Structural Funds 2007–13, which may positively contribute both to the development of human resources for R&D and to innovation and the extension of research and innovation infrastructure, as well as to the improvement of cooperation between public research and the business sector and make the commercialisation of new knowledge from research more effective. Effective utilisation of these financial resources for a successful development of a knowledge based economy is the key question. There is a risk of an inadequate increase in R&D capacities, which may subsequently lack financial resources for their efficient operation.

Efficient use of public resources for R&D and innovation also belongs to policy objectives set by the *National Reform Programme of the Czech Republic 2008-10*. In this field the *Reform Programme* relies especially on the Reform of research and development and innovation system in the Czech Republic, which is currently in progress.

Exhibit 3: Main innovation policy challenges

Description of challenge	Relevant indicators and trends
<p>1. The main challenge of the Czech innovation system is the lack of coordination between the processes of creation, transfer and use of new knowledge. This weakness is most notably felt in inadequate linkages between public research and business sectors. Commercialisation of R&D results and transformation of new knowledge into innovation is hindered by insufficient utilisation of intellectual property rights (IPR) protection.</p>	<ul style="list-style-type: none"> • Share of university and public research organisation R&D expenditures financed by business sector <i>Private sources permanently form less than 1 % of total expenditures on R&D realised in the public sector.</i> • Public-private co-publications (EIS indicator 2.2.4) <i>With 37 % of the EU average this indicator shows relatively low collaboration between business sector researchers and public sector researchers in the Czech Republic. Recent trend indicates slight improvement in this area.</i> • Indicators of the IPR protection: EPO patents per million population (EIS indicator 2.3.1), Community trademarks per million population (EIS indicator 2.3.2), Community designs per million population (EIS indicator 2.3.3) <i>In spite of a positive trend in use of IPR protection these indicators remain comparatively very low. The Czech Republic reached 7 % of the EU level in EPO patents (2.3.1), 38 % in Community trademarks (2.3.2) and 55 % in Community designs (2.3.3).</i>

<p>2. An insufficient number of researchers in all sectors still remains an important challenge in the area of human resources for RDI. The lack of researchers can be perceived as critical in particular in relation to the prepared operational programmes, which will be utilised among other things for developing or expanding research capacities in the Czech Republic (co-financed from the EU Structural Funds).</p>	<ul style="list-style-type: none"> • Number of researchers in FTE per 1000 labour force <i>With approx. 5.5 researchers per 1000 labour force the Czech Republic reached about 80 % of the EU-15 average. However, the growth in the number of researchers in the Czech Republic is significantly higher than in most EU countries.</i> • S&E and SSH graduates per 1000 population aged 20-29 (EIS indicator 1.1.1) <i>CR reached one of the lowest values in this indicator among the EU countries. It was at about 64 % of the EU average. Nevertheless, the high average annual increase over the past five years promises improvement of this position.</i> • S&E and SSH doctorate graduates per 1000 population aged 25-34 (EIS indicator 1.1.2) <i>Similar to the previous indicator the relative number of S&E and SSH doctorate graduates in the Czech Republic is lower than in the EU (at approx. 77 % of the EU level). Likewise a positive trend may be observed.</i>
<p>3. Another important challenge is the inefficient allocation of public financial resources for RDI, where public support to certain extent fails in stimulating enterprises to carry out R&D and innovation activities.</p>	<ul style="list-style-type: none"> • Public R&D expenditures (EIS indicator 1.2.1) <i>The public expenditures on R&D have been growing in the Czech Republic faster than in other European countries; however, their relative amount is still below the EU average (0.55 % GDP in the Czech Republic compared to 0.65 % in the EU-27).</i> • Business R&D expenditures (EIS indicator 2.1.1) <i>Business R&D expenditures reached less than 1 % of GDP in the Czech Republic, which is at about 84 % of the EU average. Moderate growth of the business expenditure on R&D (BERD) over the past years indicates some increase in business R&D activities.</i> • Share of target-oriented funding for R&D <i>In public expenditure on R&D in the Czech Republic institutional funding prevails. Target-oriented funding makes up approximately 45 % of all public expenditures on R&D and its share has remained practically unchanged for the past few years.</i> • Venture capital investments (EIS indicator 1.2.2) <i>The Czech Republic is one of the European countries at the bottom of the scale in indicators of venture capital investment (as % of GDP). Even past trend does not indicate any improvement in this field.</i>

2. Public Support to Innovation

2.1 Main objectives for innovation policy

The framework of the innovation policy in the Czech Republic in recent years was given by the National Innovation Policy (NIP) (2005-10). For the first time, the Czech Republic's government adopted a strategic document, which focused on innovation. In more specific terms, it addresses the principal problems (also reflected in Challenges of the National Innovation System – Chapter 1.3) related to the innovation system in the Czech Republic and defines four broad strategic objectives:

1. to strengthen research and development as a source of innovation;
2. to establish working cooperation between the public and private sector;
3. to secure sufficient human resources for innovation;
4. to make public administration in research, development and innovation more effective.

The Policy consists of 48 concrete targets as steps towards achieving the above strategic objectives. For each target, responsibilities, deadlines and success indicators of their implementation are specified. The NIP as such is implemented by a number of bodies within the state administration, depending on the tasks assigned to them.

Most of the 48 targets have been successfully implemented, especially within the first two objectives; a number of measures was carried out to strengthen research and development as a source of innovation and cooperation between the public and private sector was to a certain extent enhanced (see also Chapter 3.1.1). As to the human resources for innovation (objective three), most of the measures were implemented only partially. Legislative measures as well as measures within objective four, which concerned structural changes in the system of research, development and innovation administration and support, in many cases have not been implemented. Instead, they have been incorporated into more recent strategic documents (see below).

Although the measures implemented within the National Innovation Policy did contribute to the overall improvement of the Czech national innovation system, they didn't manage to overcome all of the main barriers of the system. One of the main remaining barriers, which is also one of the main challenges of the national innovation system presented in this *Country Report*, is the low interaction and cooperation of public research institutes with industry. This shortcoming was thought to be system-based – embedded in a not efficiently-working innovation system. For that reason, a necessity to formulate system measures of a broader innovation policy emerged.

This plan to formulate new broader strategic documents emerged in the late 2007; since then, there has been an intensive policy debate about the future constitution of the Czech R&D and innovation governance system. A Green Paper on Research, Development and Innovation in the Czech Republic had been published (see Klusáček, Kučera, Pazour, 2008a), evoking this debate, which consequently resulted in publishing a White Paper on Research, Development and Innovation in the Czech Republic in the second half of 2008 (see Klusáček, Kučera, Pazour, 2008b). These analytical and conceptual documents then created a background for new system measures and new RDI policy.

This broader plan to reform the Czech research, development and innovation system was approved by the government on 26 March 2008 as the *Reform of the Research, Development and Innovation System in the Czech Republic*. It summarises and explains the need to take action to remove barriers in the Czech R&D and innovation system, which hamper research and innovation activities. The Reform plan sets out seven key objectives:

- Efficiency of the R&D support system. The essential feature in achieving this objective is improvement of the evaluation system for public financed R&D.
- Simplification of the R&D support by reducing the number of budget lines which allocate public resources to R&D activities from the present level of 22, while at the same time simplifying the

administrative procedures for R&D support. Simplification of the administrative procedures for R&D support will be further achieved through establishment of the Technology Agency, which will be responsible for providing support to industrial research projects.

- Encouragement and support of excellence in R&D, and facilitation the application of R&D results in innovation. Along with the above-mentioned improvement of the R&D evaluation system, more emphasis will be placed on excellent results in basic research and on applicable results in industrial research.
- Strengthening the cooperation between the research sector and the users of R&D results by providing project-oriented support to research projects that are co-financed by the private sector. The project-oriented support of industrial research will be provided by the new established Technology agency. Furthermore, it is proposed to extend the current indirect support of R&D (tax relieves) to R&D purchased by enterprises from public research institutions and universities.
- Establishment of a more flexible organisational structure of public research organisations in order to promote better collaboration with the business sector and to create suitable conditions for the commercialisation of research results.
- Provision of qualified human resources for R&D and innovation. This objective is primarily addressed within the framework of the Operational Programme Education for Competitiveness. Simplification of the conditions for hiring researchers from third countries is also planned.
- Intensification of the Czech Republic's involvement in international research, development and innovation cooperation, especially within the European Research Area.

The Reform plan will be followed by a set of legislative, financial and organisational actions to improve the management and coordination of research, development and innovation policy. Most measures proposed by the Reform plan are to be implemented by the end of 2010.

One of the actions is the approval of the *National Policy of Research, Development and Innovation in the Czech Republic for 2009–2015*. This document was approved by the government on 8 June 2009 and replaces the previous National Research and Development Policy of the Czech Republic for 2004-08 and starting from 2010 it will also replace the National Innovation Policy 2005-10. The new *National Policy of Research, Development and Innovation in the Czech Republic for 2009–2015* is the first strategic document that deals with the Czech innovation system as a whole (incl. R&D, innovation and education). The National Policy of RDI 2009-15 consists of nine main objectives:

1. Establish a strategic management of RDI at all levels based on systematic impact assessment of the National Policy as well as analyses of RDI.
 - Establishment of a single coordination body at the national level with responsibility over the entire area of research, development and innovation. This body is to be established in 2013 through the transformation of the current Research and Development Council.
 - Establishment and operation of the Technology Agency of the Czech Republic by 2010 as a means of a more effective implementation structure of the public support system for RDI. The current rather fragmented support to the applied research will be merged into the single implementation agency.
 - Continuous realisation and updating of the National Policy by long-term support of systematic evaluation and assessment of the RDI system as well as a think-tank for RDI policy.
 - Strengthen the managerial governance of universities and research institutes with the goal of stirring up their third role – their cooperation with industry. The intention is to incorporate a convenient number of representatives of other sectors (industry, public sector etc.) to management boards of the universities and research institutes.
2. Target the public support to RDI in line with demands of sustainable development;

- Reassess the priorities of applied research, development and innovation with respect to needs of the sustainable economic, social and environmental development of the Czech Republic. The priorities will be set by independent and expert methods.
 - Target the public support to RDI according to the above set priorities, together with a clear identification of the amount of financial support per each priority. At the same time, stress will be put on interconnection of the basic research with subsequent phases of the innovation process.
3. Increase the efficiency of the public support to R&D;
- Provide institutional support to R&D according to evaluation of R&D results of research institutions. This evaluation will be regular, transparent and motivational. The evaluation will be based on bibliometrics, patenting activity, and other indicators of utilisation of R&D results.
 - Increase the share of public support to R&D dedicated to the project-based R&D. The goal is to reach a ratio of project-based and institutional R&D to 60:40 in 2015.
 - Consistently evaluate programmes of project-based support; according to the assessment of the current programmes, new programmes will be set up or current programmes modified.
 - Support the establishment and development of large infrastructure for R&D at the sustainable mechanism of its financing being set up. This goal is to be largely supported by the Operational Programme 'Research and Development for Innovation'.
 - Expand the current RDI information system to ensure better management of knowledge in both the state administration, and the private sphere.
4. Utilize the R&D results in innovation processes and enhance the cooperation of the public and private sector in RDI;
- Support creation of strategies at the level of research institutes, focused on utilisation of R&D results and intellectual property rights.
 - Motivate researchers in applied research to focus on research that would be utilised in innovation and cooperation with private companies by creating a relevant system of research evaluation.
 - Set up a programme focused on support of commercialisation of R&D results at universities and public research institutes, including support of spin-offs, patent applications, etc.
 - Support for establishment and development of RDI infrastructure at the regional level in connection to the large RDI infrastructures on one side and to industry on the other. The goal is to create a dense and functioning network of entities providing a sufficient capacity for both individual research activities, and satisfaction of innovative firms' demands.
 - Set up a programme of support to large projects encompassing the entire 'research – development – innovation' cycle as a result of cooperation between research institutions and private companies.
 - Set up a programme of support for innovation activities in SMEs with the focus on support of testing the operability of a prototype.
 - Support the cooperation of SMEs and research institutes by providing innovation vouchers for joint RDI.
 - Assess the possibility of the establishment of venture capital funds being subsidised by private and public financial means.
 - Support the development of high-quality consulting services strengthening RDI activities in SMEs and utilisation of R&D results.
 - Support the development of technology platforms at the national and the international level in order to increase the knowledge flow among subjects.
5. Intensify the Czech Republic's involvement in international RDI cooperation;

- Support for organizations providing information on possibilities of involvement in various European programmes as well as complex services enhancing the involvement of Czech research teams in international programmes.
 - Create favourable conditions within the research institutes leading to higher involvement of the research teams in international programmes.
 - Actively participate in the development of European Research Area (ERA) and in activities of recognized international research institutes.
6. Provide qualified human resources for RDI;
- Create a system of postdoctoral positions.
 - Create support programmes for researchers (especially post-graduates and young researchers) on research fellowships in research institutes both in Europe and worldwide. The programmes (in the form of grants) will also secure that the researchers will return to their home research institute.
 - Support of further utilisation of university graduates' knowledge in applied R&D and innovation, or in knowledge-intensive sectors.
7. Create an environment stimulating RDI in the Czech Republic;
- Increase the quality of RDI promotion in media. The idea is to create a web portal providing current information on RDI (results, upcoming events etc.).
 - Support activities focused on promotion of RDI and its contribution to society.
 - Promote Czech RDI results abroad.
8. Ensure the compatibility and linkages of the National Policy with other sectoral policies;
- Strengthen the responsibility of a central coordination body in the preparation and the implementation of policies focusing on RDI in order to secure the compatibility and interconnection of the RDI policies (e.g. health care, agriculture, national security, etc.) with industrial, regional and social policies.
 - Strengthen the production and utilisation of background, analytical as well as foresight and assessment studies for the preparation of conceptual and strategic documents and consequent policies.
9. Ensure consistent evaluation of the RDI system;
- Continuously evaluate the implementation and impacts of individual measures of the *Reform of the Research, Development and Innovation System in the Czech Republic* and the *National Policy of Research, Development and Innovation in the Czech Republic for 2009 - 2015*.
 - Finalise the methodology of R&D evaluation and implement a system of continuous and objective evaluation of the support system to RDI at all levels.
 - Evaluate the system of RDI with the involvement of a renowned and experienced international agency in order to secure an objective evaluation.

The *National Policy of Research, Development and Innovation in the Czech Republic for 2009 - 2015* together with an accompanying legislative mix (e.g. amendment of the Act no. 130/2002 Coll. on public support of R&D), further specify the principles set by the Reform of the Research, Development and Innovation in the Czech Republic and create a framework, which increases the efficiency of public support to RDI and consequently the contribution of such support for the economy and society.

Another major document establishing the strategic framework and priorities of R&D and innovation is the National Strategic Reference Framework of the Czech Republic 2007–13 and consequently Operational Programmes for the programming period 2007–13, drawing financial support from EU Structural Funds. Among the 8 sectoral Operational Programmes, three of them involve issues of R&D and innovation:

- Operational Programme 'Enterprises and Innovations' (OP EI);
- Operational Programme 'Research and Development for Innovation' (OP RDI);
- Operational Programme 'Education for Competitiveness' (OP EC).

The three Programmes deal with R&D and innovation issues from different perspectives. The OP EI (under responsibility of Ministry of Industry and Trade, MIT) focuses on support of the business development and the transfer of research results to industry. It also supports the establishment of new innovative businesses and the development of existing firms by improving their innovative potential, and exploitation of modern technologies. Moreover, it aims at the improvement of the infrastructure and services for businesses and enhances cooperation between companies and research institutions. This Programme operates with the total amount of EUR 3 040 million.

On the other hand, OP RDI (implemented by Ministry of Education, Youth and Sports, MEYS) is predominantly focused on strengthening the R&D and innovative potential especially through universities, research institutions and their cooperation with the industry. It supports the purchase of new equipment and modern technologies for research workplaces in order to improve the R&D infrastructure. The major part of the total available support within this OP is dedicated to the support of large R&D infrastructure in research institutions (EUR 2 070,7 million); the amount of EUR 229,8 million is then aimed at the establishment and development of technology transfer centres as well as investment projects focused on commercialisation. The development of research infrastructure in tertiary education institutions is supported by EUR 414,1 million.

Finally, OP EC (also implemented by MEYS) aims at quality improvements in and the modernisation of system for tertiary and further education, their interconnection with comprehensive lifelong learning systems for the sake of the overall improvement of human resources for R&D and innovation. Through this Operational Programme, the support innovation policy targets is provided predominantly via programming priority 'Tertiary Education, Research and Development' in which the sum of EUR 626.5 million (35 % of the total amount available within this OP) will be allocated by the end of programming period.

Since the region of Prague is not eligible to draw financial support from the Structural Funds within the Objective Convergence, two special Operational Programmes within the Objective Competitiveness and Employment were set up for this region. These Operational Programmes (Prague – Adaptability and Prague – Competitiveness) also partly tackle the issues of R&D and innovation. However, in comparison to the above-described Operational Programmes, the financial support of innovation policy within these Prague Programmes totals only approximately EUR 138 million for the entire programming period. The Operational Programmes for Prague are under the responsibility of the Prague City Hall.

The above-mentioned Operational Programmes will also be utilised as a substantial means of support for the activities and programmes proposed within the *National Policy of Research, Development and Innovation in the Czech Republic for 2009–2015*.

Exhibit 4: Main innovation policy documents

Main innovation policy documents	Approved
<i>National Innovation Policy of the Czech Republic for 2005 - 2010</i>	7 July 2005 by the Government
<i>Operational Programme 'Education for Competitiveness'</i>	12 October 2007 by the European Commission
<i>Operational Programme 'Enterprise and Innovation'</i>	3 December 2007 by the European Commission
<i>Operational Programme 'Research and Development for Innovation'</i>	1 October 2008 by the European Commission
<i>Reform of the Research, Development and Innovation System in the Czech Republic</i>	26 March 2008 by the Government
<i>National Policy of Research, Development and Innovation in the Czech Republic for 2009 - 2015</i>	8 June 2009 by the Government

To sum up, the previous National Innovation Policy 2005–10 and National Research and Development Policy for 2004–08 have been phasing-out and thus giving place to the new *National Policy of Research, Development and Innovation in the Czech Republic for 2009–2015*. Together with a set of supportive legislative measures such as the amendment of Act No 130/2002 on public support to R&D, the *National Policy of Research, Development and Innovation in the Czech Republic for 2009 - 2015* is aimed to address the main shortcomings of the Czech innovation system from a more comprehensive standpoint. This effort is and will be accompanied by the overall reform of the innovation governance system that will make the system more efficient (see the next chapter).

2.2 Innovation governance system

2.2.1 Governmental bodies

Since the last *Country Report* for 2008, the overall governance structure has not changed and no significant shifts of responsibilities among the major governmental bodies occurred in the Czech Republic.

The Ministry of Education, Youth and Sports (MEYS) is a central body of the state administration responsible for preschool and school institutions, primary and secondary schools, universities, science policy, research and development, including international cooperation in this field, academic degrees, physical education, sport, tourism and state representation in sports. The ministry is administrating the OP EC (2007–2013) as well as the OP RDI (2007–2013). Within its competence for R&D issues, the ministry is responsible for formulating national R&D policy and supervising its realisation by giving its opinion on proposed R&D programmes, identifying priorities by means of a National Research Programme (NRP), administering the NRP, preparing R&D legislation, and the international cooperation strategy of the Czech Republic for R&D.

The Research and Development Council (R&D Council) is an advisory body to the Government of the Czech Republic in the area of R&D. The R&D Council was assigned the role of a coordination body for the NIP (2005–2010) by a Government resolution in October 2005, since no ministry is responsible for innovation policy issues. In 2009 by the amendment of Act No 130/2002, the Council was renamed to Research, Development and Innovation Council (RDI Council) and was given a broader range of responsibilities (e.g. responsibility over the implementation process of the *National Policy of Research, Development and Innovation in the Czech Republic for 2009 - 2015*).

The Ministry of Industry and Trade (MIT) is a central body of state administration for national industrial policy, trade policy, foreign economic policy, power engineering, gas engineering, treatment of oil, natural gas, solid fuels, exploitation of mineral resources, for a range of industries, foreign trade, SME-related issues, and also for technical standardisation, industrial research and technology development. The Ministry of Industry and Trade is a management authority of the OP EI (2007–2013).

Following the ongoing financial crisis, a special government advisory body was set up, the National Economic Council (NEC). The NEC was created on 8 January 2009 as a consultative body of experts advising the government on economic issues. Its primary task is to analyse the risks and potential impacts of the global financial crisis on the Czech Republic's economy, and to propose measures, steps and tools for their mitigation or elimination. The council has 10 members, and its activities are led and coordinated by the Prime Minister of the Czech Republic. The council is apolitical and consists of leading experts in the Czech Republic's economics institutions and wider economic environment.

The major upcoming changes to the innovation governance system proposed by the new *National Policy of Research, Development and Innovation in the Czech Republic for 2009–2015* are the establishment of one central coordination body responsible for RDI (due in 2013) and also reducing the number of the budget chapters, through which R&D in the Czech Republic is supported. This measure will be accompanied by the establishment of the Technology Agency of the Czech Republic, whose role would be to concentrate the targeted funding for applied R&D (see also Section 2.2.2).

Higher efficiency of the public support system is also expected to be achieved by the adoption of a more effective approach to the evaluation of the R&D. The level of utilisation of R&D results in innovation, especially in industry, will be one of the indicators, and therefore more attention will be

paid to raising the share of the project-based support rather than the general institutional support of R&D.

2.2.2 Main bodies managing implementation of policies

Among the bodies managing the implementation of policies concerning the national innovation system in the Czech Republic, the most significant are the following.

CzechInvest is an investment and business development agency under the MIT. Its responsibility is to attract foreign investment and support the development of Czech companies through its consultancy services and development programmes, as well as through links with the EU Structural Funds. CzechInvest is the main implementing agency of the OP EI.

Besides the state agencies, state strategies and individual regional policies related to economic sectors are implemented through the Czech-Moravian Guarantee and Development Bank. The bank provides assistance to SMEs by enabling an easier access to financial capital, sharing their business risk and reducing their project costs through different types of support tools, such as bank guarantees, preferential loans and financial subsidies. This bank also participates in implementing non-grant support provided from the OP EI.

The Czech Science Foundation is an independent institution providing targeted support to projects of fundamental research. The basis of the funds available is provided by the state budget.

According to the Act No 130/2002 and its Amendment No 110/2009, the Technology Agency of the Czech Republic will be established by 2011 and will gain the role of a central body for targeted financial support for applied R&D.

The Technology Centre of the Academy of Sciences of the Czech Republic (Technology Centre AS CR) provides strategic, analytical and foresight studies as well as strategies on RDI for the government bodies, especially the MEYS and the RDI Council. It also unites the National Contact Points of the EU Framework Programmes, who serve as information providers and promoters for research organisations in the Czech Republic. Moreover, Technology Centre AS CR is the national coordinator of the Enterprise Europe Network, encompassing advisory services for SMEs, technology transfer centres as well as information services on European programmes of subsidies.

The Association of Innovation Entrepreneurship of the Czech Republic is an association of both domestic and foreign associations, companies and research institutes of which innovation is their bottom-line. By organising various conferences, workshops or contests, this association contributes to the promotion of RDI in entrepreneurship in the Czech Republic.

The Czech Chamber of Commerce is an association representing the entrepreneurial sector. It represents the interests of private enterprises. The Czech Chamber of Commerce is also an advisory body designing new legislative measures concerning the entrepreneurial environment.

2.3 Public funding for innovation

2.3.1 Review of the current range of support measures for innovation

The thematic focus of the measures supporting RDI in the Czech Republic addresses to a certain degree the main challenges of the innovation system, presented in Chapter 1.3 of this *Country Report*.

The support measures are analysed more thoroughly in the Innovation Policy Support factsheet in Annex 1. Both the factsheet and this review are based upon information contained in the ERAWATCH-TrendChart Policy Measure database, which distinguishes the following five main categories:

- governance & horizontal research and innovation policies;
- research and technologies;
- human resources (education and skills);
- promote and sustain the creation and growth of innovative enterprises;
- markets and innovation culture.

Since the majority of policy measures is generally oriented towards the business sector, the highest number of the measures are to be found in the category of 'promote and sustain the creation and growth of innovative enterprises' (see Exhibit 5). Policy measures within this category support innovation, particularly in the manufacturing and services sector (see Innovation Policy Support factsheet in Annex 1), which is consistent with the strong industrial basis of the Czech economy as well as the current need for transition to production with higher added value. The significance of this support is also reflected in the amount of financial means, which these measures provide. A major part of policy measures in these categories consists of programmes operated within the OP EI. In addition to sectoral innovation support, policy measures in this category are oriented towards the promotion of innovative start-ups, including gazelles (see Innovation Policy Support factsheet in Annex 1). This support is provided in the form of direct support for businesses (grants, loans, guarantees) as well as support of innovation infrastructure that creates favourable conditions for starting a business (innovation centres, business incubators, etc.).

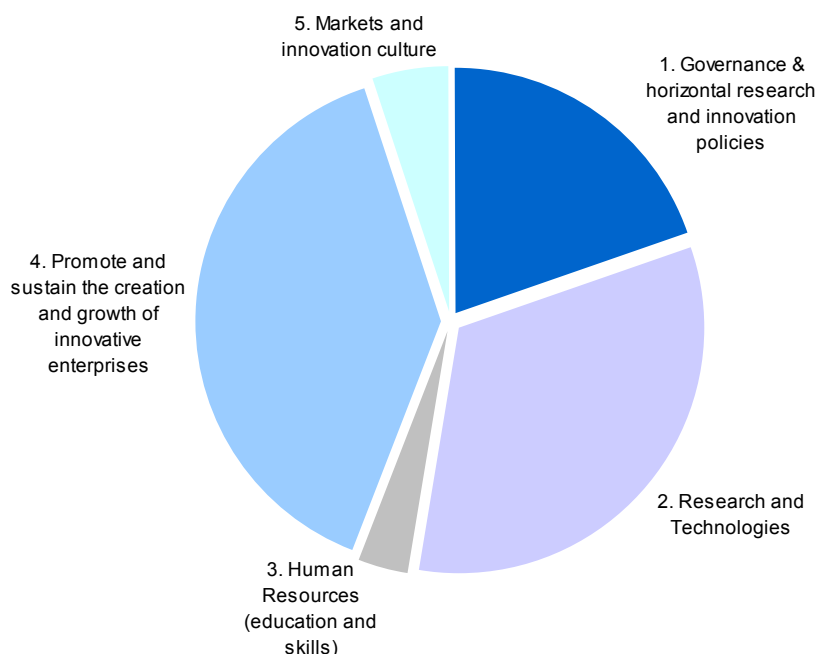
The category of 'research and technologies' is the second largest category in terms of number of innovation policy measures. The high number of measures as well as the financial means ensured by the higher budget allocation in this category reflects one of the most significant challenges faced by the Czech Republic, namely the weak cooperation between research and industry. For this reason, measures focus heavily on cooperation in R&D by supporting joint projects with research institutes and public-private partnerships. A number of measures with a relatively considerable budget are also aimed at supporting business R&D activities. Indirect support of business R&D in form of tax relief on R&D costs is another important measure.

A large number of policy measures with a significant amount of financial resources is evident in the category of 'governance & horizontal research and innovation policies'. These policy measures are mainly national thematic research programmes (administered by several ministries), which finance a substantial body of industrial research in the Czech Republic. In addition, measures within this category encompass long-term strategic RDI policies, which set up the strategic framework of RDI as well as fundamental conditions for the national innovation system in the Czech Republic.

The category of 'markets and innovation culture' is of a rather marginal significance on account of the range of support measures. The majority of policy measures in this category is focused on providing consultancy services and fiscal incentives to improve the use of IPR protection, which reflects one of the present innovation policy challenges, namely insufficient utilisation of IPR protection. Attention in the innovation policy is also paid to the diffusion of innovative technologies, products and services.

Although lack of human resources is one of the main innovation challenges in the Czech Republic, the category of 'human resources (education and skills)' is rather underestimated in terms of number of measures and budget allocation, as compared to the other categories of public support. The measures within this category are focused mainly on mobility of researchers and career development (e.g. long-term contracts for university researchers). Improvement in the policy response to challenges faced in this field might be expected after implementation of the OP EC and activities proposed by the new *National Policy of Research Development and Innovation in the Czech Republic for 2009–2015*.

Exhibit 5: Number of support measures per category



Source: TrendChart-ERAWATCH database of support measures (data downloaded on 5 June 2009); analysis by Technopolis Group and Technology Centre AS CR.

The priorities of the public support system to RDI have somehow changed in recent years. Besides the efforts of the overall structural change of the system of public support to RDI (see Chapter 2.1), there has also been a shift in orientation at the level of public support measures. According to the current structure of the support measures, greater emphasis is put on technology transfer and cooperation between research institutes and private companies. In other words, the main focus of these efforts is to achieve a more intensive inclusion of the private sector into joint public-private research projects. The stress laid on collaborative projects and utilisation of R&D results will in turn be reflected in the evaluation of the R&D performance in research institutes. This shift of priorities is reflected also in the priorities of the new *National Policy of Research, Development and Innovation in the Czech Republic for 2009–2015*, presented in Chapter 2.1 of this *Country Report*.

The above-mentioned shift is consistent with the provision of sounder support to R&D in businesses and private enterprises. These measures aim to increase the private sector expenditures on RDI and facilitate diffusion of new technologies in enterprises. This policy focus reflects appropriately the present needs of the innovation enterprises in the Czech Republic, whose innovation activities are based mainly on adopting advanced technologies, processes and other methods related to production.

The Czech innovation policy measures take the form of grants, subsidies or tax incentives (see Figure 7 in the Innovation policy support factsheet in Annex 1). This diversification allows the provision of support in appropriate form to beneficiaries of the national innovation system at various phases of the innovation process. Since grants are used both for supporting R&D activities and for implementing innovation in businesses, subsidised loans and guarantees are particularly suitable for innovation

start-ups, i.e. businesses that are just starting out. In the near future, an extension of the current tax incentives scheme for R&D is further expected. In addition to tax incentives provided for in-house R&D, research purchased from research organisations will also be deductible from the tax base.

Besides the national budget, the EU Structural Funds are also very important sources of funding for innovation policy measures. These funds (channelled through Operational Programmes) are used to co-finance approximately 60 % of the overall number of support measures (see Figure 6 in the Innovation policy support factsheet in Annex 1). The financial means are provided through OP EI, OP RDI, OP EC and in the Prague region through parts of Operational Programme Prague – Adaptability, and Operational Programme Prague – Competitiveness. Within these Operational Programmes, the above-mentioned shift is reflected in the focus of their priorities. The EU Structural Funds are utilised mainly for creating infrastructure for R&D, technology transfer and innovation, and for encouraging innovation activities in the business sector.

The public expenditures on innovation support have increased over the past 5 years, particularly due to the implementation of EU Structural Funds in the Czech Republic. The public sources (EU Structural Funds combined with national sources) designated for innovation in businesses have increased from approximately EUR 140 million per year in the period 2004 through 2006 to more than EUR 500 million per year in the period 2007 through 2013. Annual public expenditures on R&D have also increased over the past 5 years, namely from approximately EUR 580 million in 2004 to nearly EUR 920 million in 2008. A growing trend in the public expenditures on R&D performed in the business sector is also evident. These expenditures have increased from approximately EUR 140 million in 2004 to EUR 200 million in 2008.

While aware of the somewhat simplified and generalised approach followed, we also tried to estimate the share of financial resources designated for various categories of measures (see Figure 2 in the Innovation policy support factsheet in Annex 1). A major part of public financial resources on RDI (more than 20 %) is used to support sectoral innovation in manufacturing, which is consistent with the strong industrial basis of the Czech economy and the current need for transition to production with higher added value. This focus on innovation in manufacturing has been observed over the whole period since 2004. A considerable amount of public finances on RDI is aimed at increasing cooperation between public research organisations and companies in R&D projects. The high share of financial resources focused on this issue, which amounts to 20 %, reflects the fact that public-private cooperation belongs to the obligatory conditions in many programmes of public support of industrial R&D. The emphasis of public support to innovation firms is increasingly placed on start-ups, which amounts to nearly 14 % of total public support of R&D and innovation in businesses. The greater focus on innovation start-ups is reflected in four programmes of the OP EI (2007–13), namely 'Start' (CZ 52), 'Progress' (CZ 49), 'Guarantee' (CZ 54) and partly 'Prosperity' (CZ 53).

In addition to the present innovation policy effort to utilise efficiently the unique opportunity of the EU Structural Funds for increasing innovation-based competitiveness of the Czech Republic, changing the overall system of public support for RDI in order to make it more efficient and transparent is also part of the major current ambitions of the Czech innovation policy. These structural measures concern not only the system of public support, but also try to address the main challenges of the innovation system (e.g. by targeting support to knowledge and technology transfer between research institutes and industry, stimulating closer cooperation between these two sectors, intensifying international cooperation in RDI or improving availability of qualified human resources for RDI).

In our opinion, this mix which is composed of innovation support measures largely funded by EU Structural Funds and non-financial structural measures provides a solid framework leading to a higher orientation of Czech businesses toward RDI activities. If these measures are to be ranked in terms of their present and future significance, the order would be as follows:

- 'Innovation' (CZ 59);
- 'Potential' (CZ 57);
- 'Prosperity' (CZ 53);

- *Reform of the Research, Development and Innovation System in the Czech Republic* leading to formulation of the *National Policy of Research, Development and Innovation in the Czech Republic for 2009–2015*;
- Act No 130/2002 Coll. and its Amendment No 110/2009 Coll. on public support to R&D.

'Innovation' (CZ 59) is a means of support aiming to raise the innovation potential in Czech businesses. The financial support channelled through this measure is drawn from the OP EI. The programme subsidises two types of projects: firstly, innovation projects of enterprises (especially SMEs) utilising new, original solutions, and secondly, projects of public research institutions, universities, individuals and SMEs related to the protection of industrial property rights. In the second case, the programme contributes to the protection of intangible goods in forms of patents, utility models, industrial designs and trademarks. Since its launch, the measure has been highly successful in terms of number of applicants; their demands often highly exceeded the planned yearly allocation of financial support.

The principal objective of 'Potential' (CZ 57) is the support of industrial RDI. In more specific terms, support is provided to companies' new or extended RDI infrastructure, and at the same time to create a number of working positions to be filled by highly-qualified researchers. This is the most significant measure providing support to industrial RDI and it operates also within the OP EI.

'Prosperity' (CZ 53) draws also financial support from the OP EI. The aim of this measure is based on main findings of the assessment of the previous measure 'Prosperity' of the former OP EI (2004-06). In this programming period, the measure is focused on the support of innovation infrastructure (particularly science and technology parks), as well as the establishment and operation of Business Angels networks and new non-subsidy financial instruments to support start-ups. This measure is one of the very few dealing with venture capital issues.

The *Reform of the Research, Development and Innovation System in the Czech Republic* as a strategic document gives reasons for actions towards removing barriers in the Czech R&D system, which hamper research and innovation activities. It sets out major objectives and key areas of action. On the basis of the reform plan, the new *National Policy of Research, Development and Innovation in the Czech Republic for 2009–2015* was formulated. It specifies principles set by the *Reform of the Research, Development and Innovation in the Czech Republic* and sets out specific measures, which will help increase the efficiency of the public support to RDI and consequently will contribute to growth of competitiveness and quality of life in the Czech Republic.

Act No 130/2002 Coll. and its Amendment No 110/2009 Coll. on public support to R&D create a legislative basis for the simplification of the Czech RDI system. In this respect, creation of the Czech Technology Agency belongs to the main measures.

2.3.2 New or modified support measures

Since the elaboration of the Czech Republic's *Country Report* for 2008, no support measure was introduced or substantially modified in the list of country measures presented at the website of INNO-Policy TrendChart. The only major development in the country measures occurred at the end of 2008; European Commission approved the OP RDI. Since then, preparation work for its implementation has intensified. The MEYS is the authority responsible for the implementation of this Operational Programme.

Since this Operational Programme will also support large R&D projects as one of its programming priorities, a preliminary list of all the proposed projects was composed. The final list of projects to be supported through this Operational Programme will be made known in the second half of 2009.

2.3.3 Strengths and weaknesses in the innovation policy support system

The main strengths and weaknesses in the current set of measures can be described according to their capability to address the main challenges of the national innovation system in the Czech Republic. Weak cooperation between research and industry (Challenge 1) has been addressed by a

variety of measures, but still new measures have been proposed (e.g. innovation vouchers). On the other hand, lack of researchers and S&E graduates (Challenge 2), i.e. human resources for RDI, are still underestimated by both the number of support measures and their sizes in terms of budget. However, this challenge is expected to be addressed by the OP EC and other measures proposed in the new *National Policy of Research, Development and Innovation in the Czech Republic for 2009–2015*. Similar conclusions can be drawn for the inefficient allocation of public financial resources for research (Challenge 3). The *National Policy of Research, Development and Innovation in the Czech Republic for 2009–2015* aims to combat these deficiencies by setting up new priorities for the Czech support system for RDI. Besides proposing new measures that would make the entire system more effective and transparent in the near future, stress is also laid on the effective utilisation of financial resources derived from EU Structural Funds. Furthermore the issue of the lack of human resources for RDI is addressed in this policy document more thoroughly than in former policies concerning RDI.

At the level of innovation policy governance, high fragmentation and lack of coordination (especially in R&D support) are among the main weaknesses. These weaknesses are, however, addressed in the *Reform of the Research, Development and Innovation System in the Czech Republic* and the new *National Policy of Research, Development and Innovation in the Czech Republic for 2009–2015*. Since only a short time has elapsed since the implementation of these reform documents, their impact on the Czech national innovation system is not evident as yet.

3. Innovation policy and competitiveness: an appraisal

3.1 The ability of policy to address challenges

In this section, building on the analysis of the previous chapters, we investigate how well the Czech innovation policy identifies and addresses the challenges described in Chapter 1.3. The policy response examined in this section covers both policy measures already implemented and policy documents that set out strategy, targets and actions for the future.

It is fair to say that the current innovation policy in the Czech Republic responds to all three main challenges identified in Chapter 1.3. These challenges are further addressed in recently approved reform documents (*National Reform Programme of the Czech Republic for 2008–2010*, *Reform of the Research, Development and Innovation system in the Czech Republic* and the new *National Policy of Research, Development and Innovation in the Czech Republic for 2009–2015*).

Assessment of responses to Challenge 1: Lack of cooperation between the research and the business sector

Since January 2007, state-owned research institutions have been transformed into public research institutions. This transformation, which was enabled by the new law on public research institutions, allows these institutions to commercialise their research results by creating spin-offs.

Considering the existing policy mix, the OP EI (2007–2013) includes four programmes closely related to the transfer of R&D results into business practice and the IPR issues. Firstly, the programme 'Potential' (CZ 57) aims to strengthen the development capacities of enterprises and to promote cooperation between enterprises and R&D institutions. Secondly, the programme 'Cooperation' (CZ 55) supports the establishment and development of clusters, technology platforms and other cooperation projects. Thirdly, the programme 'Prosperity' (CZ 53) focuses on providing support for the establishment and further development of infrastructure for industrial research, technological development and innovation. Finally, the programme 'Innovation' (CZ 59) addresses IPR issues. National programmes supporting industrial research, which are implemented by the MIT, namely 'TANDEM' (CZ 83), 'IMPULS' (CZ 84) and 'TIP' (CZ 86), partly aim to promote to closer cooperation through industrial research projects.

In addition, strengthening cooperation between public research and industry is among the main targets of the new *National Policy of Research, Development and Innovation in the Czech Republic for 2009–2015*. The new *National Policy of Research, Development and Innovation in the Czech Republic for 2009–2015* places emphasis on collaborative research and in particular, supports applied research projects with joint participation of research organisations and businesses. The introduction of a system of innovation vouchers is another important policy measure aiming to increase research cooperation between industry and public research. This system should be ready to be implemented (after assessing inevitable legislative changes) in 2013.

As for the real impact of the innovation policy on strengthening the cooperation between public research and industry, there is some evidence in the structure of the Czech Academy of Sciences' budget (the main public research institution in the Czech Republic). The share of commercial resources (i.e. from various kinds of interaction with the business sector) in the overall budget has increased from 14 % in 2001 to 22 % in 2008. The reform steps proposed in the new *National Policy of Research, Development and Innovation in the Czech Republic for 2009–2015* aim to maintain this positive trend in the future.

Assessment of responses to Challenge 2: Lack of researchers and S&E graduates

For the present programming period 2007 through 2013 of the EU Structural Funds, OP EC was designed solely to improve the quality of human resources in the Czech Republic. In particular, the

implementation of priority axis 2 called 'Tertiary education, research and development' may have a significant impact on the improvement of human resources for RDI. Within this priority axis, new support systems for entrepreneurial attitude and innovative solutions in institutions that provide tertiary education and public R&D organisations will be designed and implemented. Continuing education for employees in R&D departments, employees' mobility between R&D departments and the business sector, cooperation between tertiary educational institutions and the private sector in the creation and realisation of study programs will be supported.

This challenge is also addressed by the new *National Policy of Research, Development and Innovation in the Czech Republic for 2009–2015*, in which ensuring quality human resources for RDI is one of the nine key innovation policy targets (more in Chapter 2.1). The new *National Policy of Research, Development and Innovation in the Czech Republic for 2009–2015* put emphasis on international and horizontal mobility of young researchers. In this respect, the aim is to promote internships for doctoral students and young researchers at prominent European and world workplaces, which will enable their involvement in international research projects. Students will also be encouraged to stay at prestigious foreign universities, where they can get their first international experiences and establish contacts with top experts. Mobility between public research and industry will be intensified by creating programmes that will allow young researchers and S&E graduates to participate in research projects of businesses (especially SMEs).

An important condition for the successful policy response to this challenge is sufficient differentiation of high education institutions (HEIs) according to their quality. This will enable the identification of prestigious research institutions (faculties, institutes, etc.), where top researchers and experts will be educated. The differentiation of HEIs should also help adjust the graduates' profile and their capabilities according to the labour market demands. For this purpose, the reform of the tertiary education system is essential. In order to start the discussion on Czech's education system reform, the *White Paper on Tertiary Education* was elaborated in 2008. Further developments in the reform of the tertiary education system will mainly depend upon political power and will.

To conclude, the policy response to this challenge is in a stage of either early implementation (the OP EC) or political discussion (reform in the tertiary education).

Assessment of responses to Challenge 3: Inefficient allocation of public financial resources for RDI

Increasing the efficiency of the system through which public support of RDI is provided belongs to key targets of the *Reform of the Research, Development and innovation system in the Czech Republic* document and the new *National Policy of Research, Development and Innovation in the Czech Republic for 2009–2015*. Fulfilling this target, which is a fundamental condition for well-balanced development of the national innovation system, should be achieved by means of several measures focused on activities such as strategic management, coordination and evaluation. According to these measures, the innovation policy mix should be purposefully coordinated with the contribution of one single competent body established for the implementation of the innovation policy. This coordination should contribute to mitigating the risk of duplicities in financing public RDI projects, including projects of international cooperation (Operational programmes, Framework programmes, etc.).

Another step forward, which can help increase the efficiency of public expenditure on RDI, is the introduction of regular and consistent *ex post* evaluation of R&D results and impact. The new *National Policy of Research, Development and Innovation in the Czech Republic for 2009–2015* sets out to create a methodology for complex (multi-component) evaluation of results of the fundamental and applied R&D. This methodology should be used for the regular evaluation of research institutions, whose ultimate purpose is the allocation of institutional support for R&D.

Regarding the support of innovation, the policy mix is mainly reflected in the National Strategic Reference Framework of the Czech Republic (2007–2013) and considering the strict rules for the allocation of financial resources from EU Structural Funds, the innovation support system is expected to be more efficient than the national system of support to R&D. The regular monitoring and evaluation of operational programmes have without question a positive impact on evaluation culture in the RDI policy in the Czech Republic.

Overall assessment of policy responses

Generally, it can be said that the main innovation policy targets announced in the key policy documents (namely *National Reform Programme of the Czech Republic for 2008 - 2010*, *Reform of the Research, Development and Innovation system in the Czech Republic* and the new *National Policy of Research, Development and Innovation in the Czech Republic for 2009 – 2015*) are consistent with the current needs for improvement of the national innovation system. The policy responses, which have already been implemented in the existing policy mix (namely OP EI, OP RDI, OP EC and national programmes for support of industrial research), address adequately the main innovation challenges. On the other hand, the implementation of policy actions that aim to reform the tertiary education system and the innovation governance system (one coordinating body) and were proposed in the recently approved innovation policy documents will strongly rely on political support and power. The speed and intensity of the proposed reform measures will therefore depend on the results of the parliamentary elections in autumn 2009. In addition, the success, speed and method of implementation of the proposed reform steps will be strongly influenced by the speed of recovery from the present economic crisis.

3.2 Effectiveness of policy design

3.2.1 Innovation policy governance

Governance of the Czech innovation policy features several drawbacks and presently belongs to the highly discussed topics in the Czech Republic. The formation of policies establishing favourable conditions for the development of a knowledge-based economy falls under the competence of several central bodies of the state administration (see Chapter 2.2.1). This fragmentation of competencies can be considered as an important drawback of the national innovation system, which leads to inefficient public spending on R&D, high administration costs and rigidity of the innovation governance system. Therefore, the *Reform of the Research, Development and Innovation system in the Czech Republic* document approved in 2008 can be considered to be a significant step forward towards enhanced effectiveness of the RDI system in the Czech Republic.

One of the main targets of the *Reform of the Research, Development and Innovation system in the Czech Republic* and the subsequent *National Policy of Research, Development and Innovation in the Czech Republic for 2009–2015* is to increase the efficiency of innovation governance by establishing strategic management of RDI at all levels. At national level, this target will be achieved through the establishment of a single competent body responsible for the innovation policy (in a broader sense) and for the coordination of public support for RDI. According to the *National Policy of Research, Development and Innovation in the Czech Republic for 2009–2015*, this coordinating body will be headed by a governmental official.

An important condition for increasing the efficiency of public support for R&D is the systematic evaluation of R&D results produced by individual research organisations. While some providers have been carrying out a systematic evaluation of publicly funded research in the Czech Republic since 1993 (evaluation of research plans was introduced in 1999 and the first uniform evaluation methodology was approved by the Government in 2004), the allocation of funds is not yet connected with the *ex post* evaluation of the results of research work. According to the *National Policy of Research, Development and Innovation in the Czech Republic for 2009–2015* document, a new methodology for the evaluation of research results should be established, which will take into account new components of evaluation, e.g. training of graduate students (doctoral students) and education in R&D management, dissemination of R&D results, technology transfer and IPR management, etc. The new methodology should provide the basis for the allocation of institutional support for R&D.

The strategic management of RDI is not adequately appreciated in the Czech Republic. This is reflected, among other things, in the above-mentioned fragmentation of support activities. Besides an insufficient systematic evaluation of the effectiveness of support activities, strategic needs for the development of the Czech Republic have not been determined. Furthermore, the demand for applied R&D is not systematically monitored. One of the objectives of the new *National Policy of Research, Development and Innovation in the Czech Republic for 2009–2015* is therefore to identify research

directions that help satisfy societal needs. Attention will be paid to these research directions while formulating the R&D policy and for the allocation of public R&D funds.

As an integral part of policy measures for RDI co-financed by EU Structural Funds in the programming period 2007 through 2013, new coordination mechanisms between responsible ministries have been set out. During the formulation of the National Strategic Reference Framework and the individual Operational Programmes, it was agreed that the MEYS will be responsible for the supply of innovation and the MIT, which represents the business community, will be responsible for the demand for innovation. The Operational Programmes, of which the two ministries are in charge (the MIT of OP EI, and the MEYS of OP RDI and OP EC), provide support along the entire innovation process without overlap.

3.2.2 Process of delivery

The fragmentation of responsibilities for innovation policy at national level results in disagreement or overlaps between measures striving to attain the same target. It is, however, positive that many drawbacks in the innovation governance system have already been addressed in the *Reform of Research, Development and Innovation System in the Czech Republic*. Within this document the number of budgetary chapters, which define the allocation of public resources for R&D activities in the Czech Republic, will be decreased from 22 to 11. This step is a necessary precondition for the simplification of administrative procedures concerning support of R&D. Along with a substantial decrease in the number of providers of R&D support, a new Technology Agency will be established. The legal basis for the establishment of this agency is provided by the amendment of the Act on support of research, development and innovation (Act No 130/2002 Coll. approved in April 2009), which entered into force in July 2009. The new Technology Agency will start its operation in 2011 and will be allocating most of the public funds reserved for the support of targeted and applied research and innovation (approximately 10 % of the total public expenditures on R&D). This will result in a significantly simpler and more transparent system of public support for RDI that will be further accompanied by a decrease in administration expenses for both suppliers and recipients.

The increasing emphasis placed on strategic innovation governance in the Czech Republic (coordination, prioritisation, evaluation, etc.) requires analytical and conceptual insight into the national innovation system. Strengthening the systematic evaluation, and producing analyses and outlook studies that provide an adequate basis for the formulation of policies that aim to develop a knowledge-based society in the Czech Republic became therefore an important target of the new *National Policy of Research, Development and Innovation in the Czech Republic for 2009–2015*. For this purpose, an analytical professional organisation will be funded on a long-term basis.

3.3 Impact of public support for innovation

The framework for measurement and quantification of the impact of public support for innovation outlined in this section comply with EC methodology for measuring the effects of operational programmes co-financed by EU Structural Funds. The reason for the application of this methodology is primarily the utilisation of EU Structural Funds (particularly the OP EI) as the main tool for supporting innovation in the Czech Republic.

In November 2008, three innovation policy measures implemented within the OP EI (2004 – 2006) were the subject of evaluation, namely 'Inovace' (CZ 29), 'Prosperita' (CZ 25) and 'Klastry' (CZ 26). The evaluation (see Technology Centre AS CR, 2008) focused on the effects of these programmes on the innovation potential of individual regions of the Czech Republic. The comprehensive evaluation of outputs and results brought forward that the full range of implications for the implementation of these programmes has not been revealed as yet. Nonetheless, analysis of the supported projects showed that qualitative changes in the innovation environment of the Czech Republic and its regions have slowly started to happen. As for the preliminary outcomes of the evaluated programmes, these include increase in added value, turnover and employment rate. In total, the added value in supported companies increased by 11.5 % after the project implementation, the average registered number of employees increased by 2.1 %, and the number of R&D personnel increased by 189 (from 1 663 to 1 852). The turnover of supported companies has increased by 53.8 %. It has been also proven that the supported companies strengthened their competitiveness on challenging markets, gained new

contracts, extended their own R&D activities and deepened their cooperation with universities and R&D institutions.

The OP EI (2007 – 2013) sets three main impact indicators, which can be easily monitored by using Czech Statistical Office data. These three indicators have been derived from the overall objective as well as from the specific objectives set down by this Operational Programme. Although two of these indicators (BERD and Employment in R&D) are not real indicators of the long-term effect of its implementation on macroeconomic performance and/or structural change, in our opinion, they can be applied as general criteria for the assessment of whether the public support for innovation affects innovation activities of the business sector.

Exhibit 6: Three main impact indicators of the OP EI (2007–2013)

Indicator	Specification	Base line (year)	Target value–2015
Expenditures on R&D in business sector	Gross domestic expenditures on R&D in business sector in % of GDP	0.77 % (2005)	1.50 %
Employment in R&D	Total number of employees in R&D per 1000 employees	9.1 (2005)	10.8
Production in high-tech sector	Share of added value in high-tech manufacturing and high-tech services of the business sector in total added value of the manufacturing and service sector (%)	7.5 % (2003)	9.5 %

Source: *Operational Programme 'Enterprise and Innovation' for 2007 – 2013*

The target values of these indicators were determined on the basis of qualified estimates calculated by the workgroup, consisting of the MIT professional staff, implementation agencies for the previous operational programme and external experts that was established for this purpose.

The recent development of indicators chosen for monitoring effects of the OP EI shows a positive trend and based on the assumption that this trend will continue, it seems reasonable to expect that the target values for 2015 will be met. However, the recent economic downturn can negatively effect the indicators' future development. In particular, the growth of expenditures on R&D in the business sector, which have risen from 0.77 % in 2005 to 0.97 % in 2007, might slow down as a consequence of the reconsideration of business strategies and the greater focus that firms put on short-term survival than on long-term competitiveness. In light of this, the target value for 2015 set at 1.50 % of GDP might be threatened. As far as the employment in R&D is concerned, data from 2007 show rapid growth compared with 2005. The number of employees in R&D per 1000 employees reached a maximum value of 10.0 in 2007, and this indicator has further approached the target value for 2015. Production in the high-tech sector also shows a positive trend. In 2007 the share of added value in the high-tech sector reached 9.1 % (compared to 7.5 % in 2003), which is promising with respect to the target value of 9.5 % that is expected to be achieved by 2015. Although it would be naïve to believe that the positive development of these indicators is solely the result of innovation policy measures, this Operational Programme has without any doubt an encouraging effect on the innovation activities of businesses and on the development of a favourable environment for these activities in the Czech Republic.

3.3.1 Conclusions: possible future actions and opportunities for innovation policy

The current policy mix remains rather unchanged in the Czech Republic and only moderate adjustments of existing measures have been carried out during the period that this report covers. Assessment of the innovation policy mix has revealed that it can be appropriate with respect to the main innovation challenges addressed. Since these challenges have not changed radically over the past few years, stability and continuity of the policy mix can be considered an asset. Most of the policy measures focus on providing direct innovation support for the manufacturing sector, which complies

with the strong industrial basis of the Czech economy and its current need for transition to production with higher added value. Furthermore, many innovation policy measures aim to strengthen R&D co-operation as a response to the most evident challenge of the national innovation system. Although there is only little evidence about the impact of public support on innovation activities (partly due to the short time since the launch of their operation and partly due to insufficient evaluation in the Czech Republic), recent improvement in the overall innovation performance provide proof that the orientation of the policy mix is fairly accurate.

Regarding the innovation policy governance, assessment of the Czech system of RDI has revealed that it can be inadequate in terms of effectiveness, flexibility and appropriateness, which results *inter alia* in insufficient quality of R&D results and detachment of public research from industrial needs. It is however positive, that the shortcomings in the RDI system have been addressed in the current in-depth reform of the Czech RDI system.

The expected future actions of the Czech innovation policy will be oriented towards two particular directions. First, strong emphasis will be placed on the efficient use of EU Structural Funds that can encourage innovation activities in the business sector. The action that needs to be taken in this direction will be to go on with the successful implementation of OP EI, which is focused on increasing the innovation-based competitiveness of Czech businesses. At the same time, considerable attention will be paid to the efficient utilisation of the new OP RDI for improving and enlarging the capacities of research organisations. An important action towards this direction will be to build up research infrastructure while taking into account the availability of financial resources and highly qualified research staff for its operation in the future. For this reason, the key condition for the sustainability of the built R&D capacities will be the close co-operation of research organisations with the industry.

Secondly, the future innovation policy actions in the Czech Republic will be oriented towards institutional changes of the RDI governance. As proposed in the *Reform of the Research, Development and Innovation System in the Czech Republic*, innovation governance should be more efficient through the coordination of policy actions, defragmentation of R&D public support and more intensive inclusion of the private sector into joint public-private research projects. An important action in this direction will be the establishment of the Technology Agency of Czech Republic which will be responsible for the implementation of targeted support for applied research in the Czech Republic (action set by the *National Policy of Research, Development and Innovation in the Czech Republic for 2009–2015*).

Aiming to improve the Czech innovation governance system, the MEYS invited tenders for the in-depth international audit of the Czech innovation system. The objective of this audit will be 'to develop an external and independent evaluation of the current RDI system in the Czech Republic'. Results of the audit will be used by a team of experts 'to create an effective system supporting RDI in the Czech Republic, which will establish an favourable environment for research activities and enhance the position of the Czech Republic within international research field'. The audit will last 18 month, starting in September 2009. Once the audit is finished in January 2011, the implementation phase will start and is expected to last until December 2011.

Strong emphasis will also be placed on creating a new methodology for the evaluation of R&D results and on establishing linkages with to the future public financing of R&D activities. The need for a new methodology results from the increasing emphasis placed on producing applied R&D results to be used in innovation and on the efficient allocation of public expenditures for R&D. This will also increase the demand for newly identified R&D priorities, which will reflect the social, health and economic needs of the Czech Republic.

Annexes

Annex 1: Innovation Policy Support factsheet – Czech Republic

The information in this Innovation Policy Support factsheet is based upon information contained in the ERAWATCH-TrendChart Policy Measure database. The ERAWATCH-TrendChart Policy Measure database consists of inputs from TrendChart correspondents and ERAWATCH correspondents. The authors (TrendChart correspondents only) can not make representation as to the accuracy or completeness of information contained in the database. Opinions in this factsheet constitute authors' judgment.

Figures in the Innovation Policy Support factsheet have been prepared as a result of simple count of policy measures and their estimated budgets classified in particular policy measures categories. Since definitions of individual categories are of different complexity and most of measures overlap definition of single category the displayed results can be skewed towards broader defined categories.

The information in the Innovation Policy Support factsheet is provided for informational purposes only. It is published for the assistance of readers but is not to be relied upon as authoritative or taken in substitution for the exercise of judgement of the policy mix. The authors assume no responsibility for any misunderstandings or even losses that might result because of reliance on this information.

Would you have any comment, remark or suggestion please feel free to contact the authors of this report.

GENERAL OVERVIEW

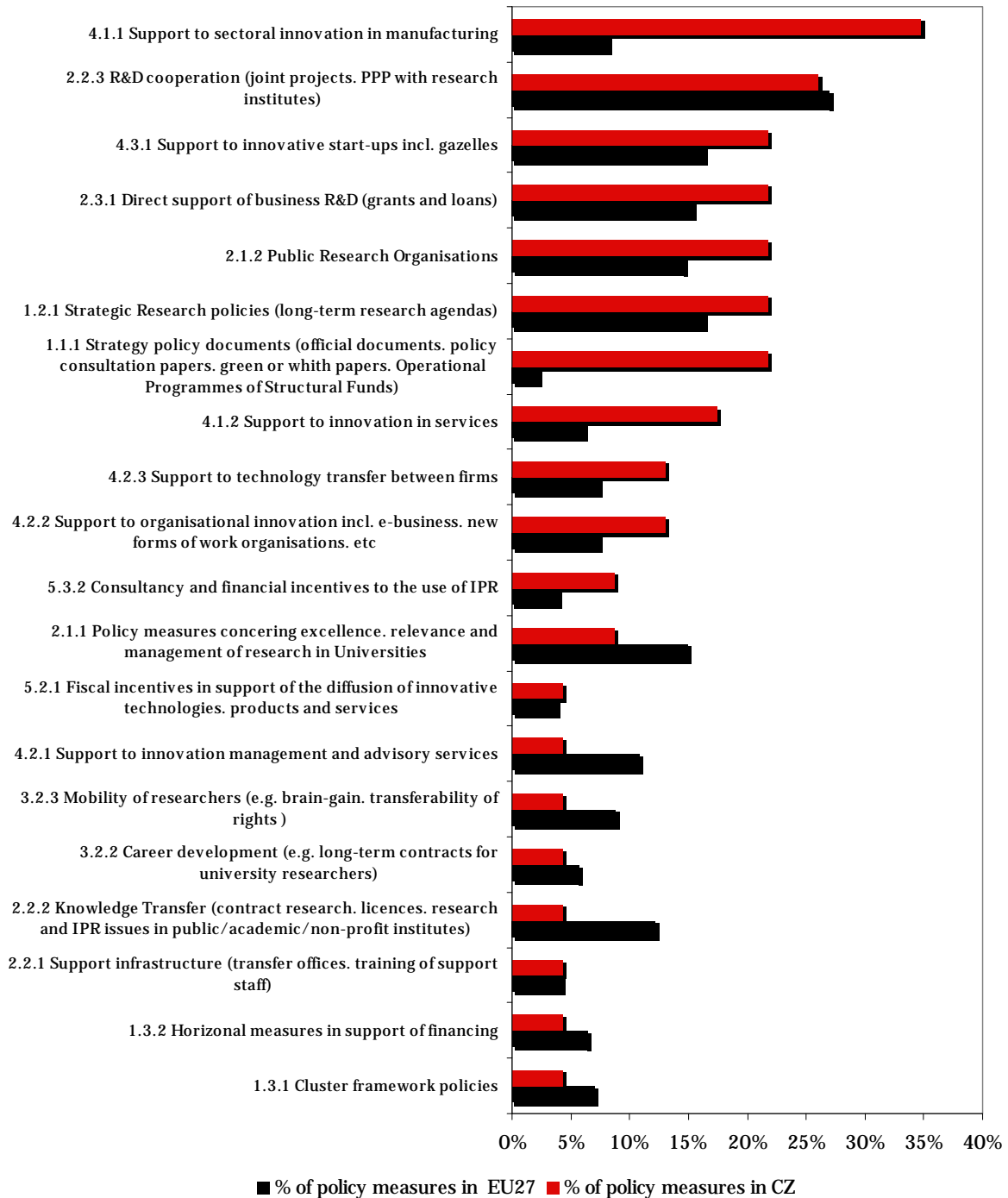
Main policy priorities addressed by the support measures

Main policy priorities addressed by the support measures have been identified on the basis of a simple count of RDI policy measures followed by estimation of budget allocated for these measures. A single support measure could be assigned up to four policy priorities. In that case each indication of priority has been counted as one. In the figure bellow priorities are presented as percentage of all country support measures and compared to the equivalent shares on the EU level.

Simple count of RDI policy measures in the Czech Republic indicates⁵ emphasis placed on stimulating innovation in manufacturing industry. This innovation policy focus might be considered as consistent with strong industrial basis of the Czech economy and current need for transition to production with higher added value. Second area addressed by number of policy measures, i.e. intensification of R&D co-operation, also responses to the present most evident challenges of the Czech innovation system. In both of these categories the Czech innovation policy is more active than the EU average. On the other hand less policy measures focus on improving management at and knowledge transfer from universities and other research organisation. However, stronger policy focus in this area is proposed in the new National Policy of RDI 2009 - 2015 in connection with increasing third role of universities.

⁵ Simple count of policy measures does not take into account their size in terms of budget and hence their importance in innovation policy. Therefore, these results must be interpreted very cautiously.

Figure 1. Main priorities addressed by the support measures in Czech Republic in a comparative perspective



Source: TrendChart-ERAWATCH database of support measures (data downloaded on 5 June 2009); analysis Technopolis Group

Main policy priorities and their estimated budget

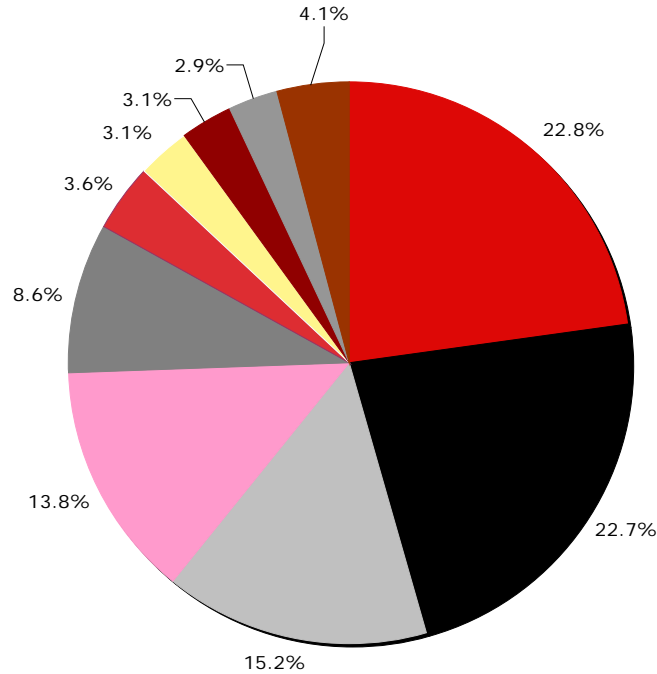
Basic information about innovation policy priorities based on a simple count of support measures is now extended by taking into account budgets of individual policy measures. The calculations include both the already executed and planned budgets (e.g. allocations for EU Structural Funds 2007-2013 programmes). In order to estimate an annual budget, overall budgets (or budgets available for indicated periods) were divided by the duration of the measure. For the purpose of policy measures categorisation the estimated annual budgets of support measures were attributed only to main policy priority (one priority per measure).

Specific case is the Operational Programme Enterprise and Innovation that is described in the TC/EW database as a whole (Strategic policy document) and its parts (individual programmes) also as individual measures within various categories. In order to prevent double-count of one budget we have excluded the Operational Programme as a strategic document from the analysis. Individual programmes that are operated within this Operational Programmes have been included in the analysis as separate policy measures in different categories.

Based on the estimated budget analysis, major part of financial resources is used to support sectoral innovation in manufacturing and R&D co-operation. In both categories the measures reach over 20 % of the total allocation to innovation policy measures. Major part of policy measures in these categories consists of programmes operated within the Operational programme Enterprise and Innovation, which as a whole focuses on increasing innovation-based competitiveness of the Czech industry. Significant amount of financial resources is allocated through the policy measures categorised under Strategy policy documents. These policy measures are particularly national thematic research programmes (administrated by several ministries), which finance the main part of industrial research in the Czech Republic. Around 14 % of the budget for innovation policy is earmarked for support to innovative start-ups. This support is provided in form of direct support of businesses (grants, loans, guarantees) as well as support of innovation infrastructure that creates favourable conditions for starting business (innovation centres, business incubators, etc.).

Considering the number of policy measures and their budget simultaneously (Figure 3), the greatest emphasis of innovation policy is placed on support to sectoral innovation in manufacturing. In this category there are both the highest number of policy measures and the largest amount of allocated financial resources. The comparison of numbers and annual budgets of individual policy measures in each category further shows that several policy areas are addressed by a larger number of smaller policy measures in terms of budget. This is particularly the case of support to innovative start-ups, where the share of measures addressing this priority exceeds the share of budget devoted to this priority.

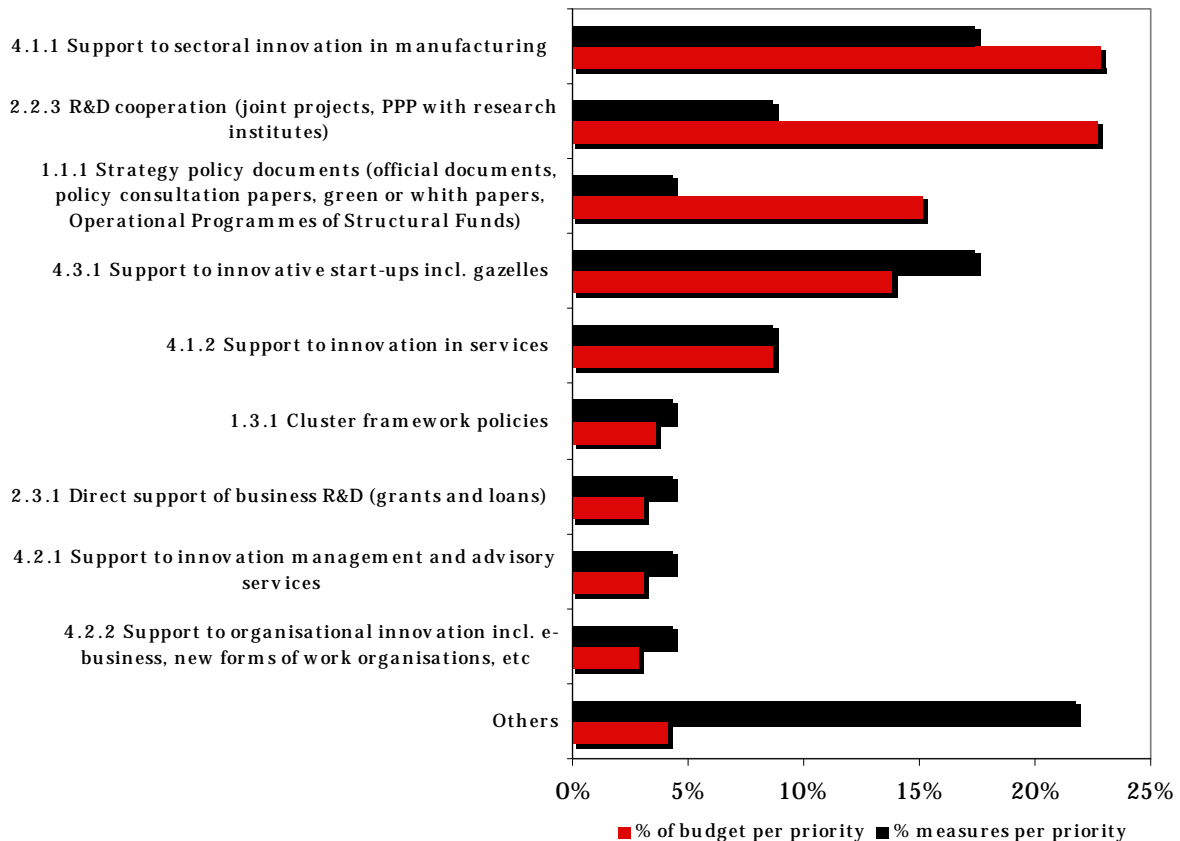
Figure 2. Estimated annual budget allocations per policy priority in Czech Republic



- 4.1.1 Support to sectoral innovation in manufacturing
- 2.2.3 R&D cooperation (joint projects, PPP with research institutes)
- 1.1.1 Strategy policy documents (official documents, policy consultation papers, green or white papers, Programmes of Structural Funds)
- 4.3.1 Support to innovative start-ups incl. gazelles
- 4.1.2 Support to innovation in services
- 1.3.1 Cluster framework policies
- 2.3.1 Direct support of business R&D (grants and loans)
- 4.2.1 Support to innovation management and advisory services
- 4.2.2 Support to organisational innovation incl. e-business, new forms of work organisations, etc
- Others

Source: TrendChart-ERAWATCH database of support measures (data downloaded on 5 June 2009); analysis Technopolis Group

Figure 3. Estimated annual budget spent on policy priority and number of support measures in Czech Republic



Source: TrendChart-ERAWATCH database of support measures (data downloaded on 5 June 2009); analysis Technopolis Group

PROFILE OF PUBLIC INTERVENTION IN INNOVATION

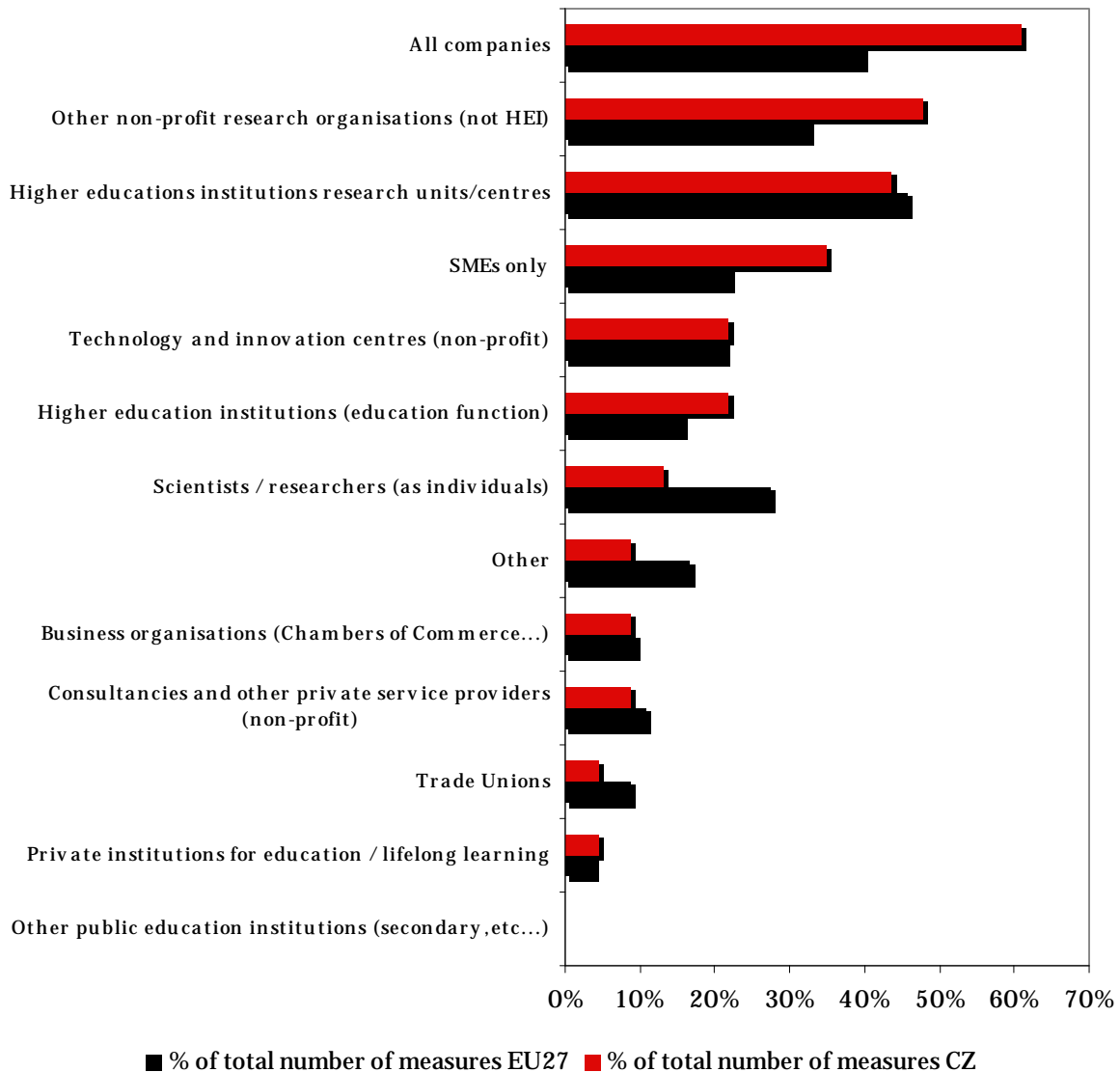
Target groups of support measures

Following figure depicts the distribution of innovation policy measures according to groups of targeted subjects. In this case a single support measure could be assigned to more than one target group and target groups do not need to be equal to the groups of eligible recipients.

In the Czech Republic largest number of policy measures is oriented on business sector generally. More than 60 % of analysed innovation policy measures address all companies and around 35 % focuses on SMEs only. In both categories the Czech Republic reaches above EU average share.

Concerning public sector slightly higher share of innovation policy measures address public research organisations – excl. HEI than universities and other higher educations institutions. The later group is targeted by lower share of policy measures in the CR than in EU-27. The reason of the higher focus on research organisation than on HEI results from specific public R&D structure, where the Czech Academy of Sciences and its institutes (government sector) play an important role.

Figure 4. Target groups of support measures in Czech Republic compared to EU-27



Source: TrendChart-ERAWATCH database of support measures (data downloaded on 5 June 2009); analysis Technopolis Group

Aspects of innovation process targeted by measures

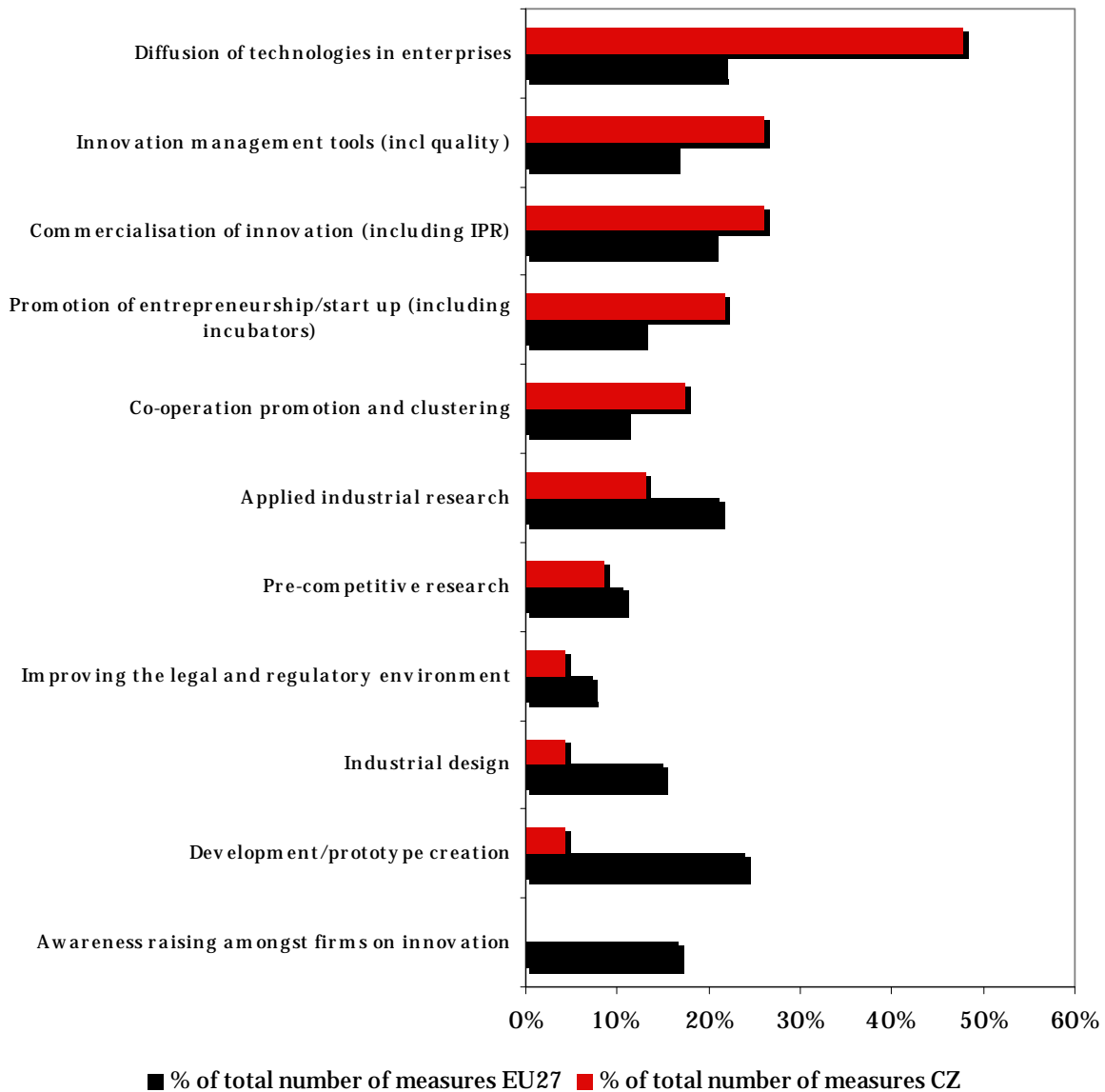
Another characteristic of the innovation policy mix profile is a focus on specific aspects of innovation process. Figure 5 shows percentage share of measures addressing various aspects of innovation process in the CR compared to EU-27. A single support measure could be assigned to more than one aspect of innovation process.

The largest number of innovation policy measures in the Czech Republic supports diffusion of technologies in enterprises (48 % of all measures). This is more than double compared to EU-27 average. With respect to the nature of innovation activities in Czech businesses based mainly on adopting advanced technologies, processes and other methods related to production, this policy focus appropriately reflects the present needs of the innovation enterprises in the CR.

Also next two aspects of innovation process, i.e. innovation management tools and commercialisation of innovation, which are addressed by significant number of policy measures in the CR, correspond to existing present challenges in the Czech innovation system.

Relatively lower share of measures focused on applied industrial research and pre-competitive research compared to EU-27 results from the Czech system of financing R&D, where applied and pre-competitive research is supported through smaller number of financially larger national thematic research programmes (see the General overview above).

Figure 5. Aspects of Innovation process targeted by measures in Czech Republic compared to EU-27



Source: TrendChart-ERAWATCH database of support measures (data downloaded on 5 June 2009); analysis Technopolis Group

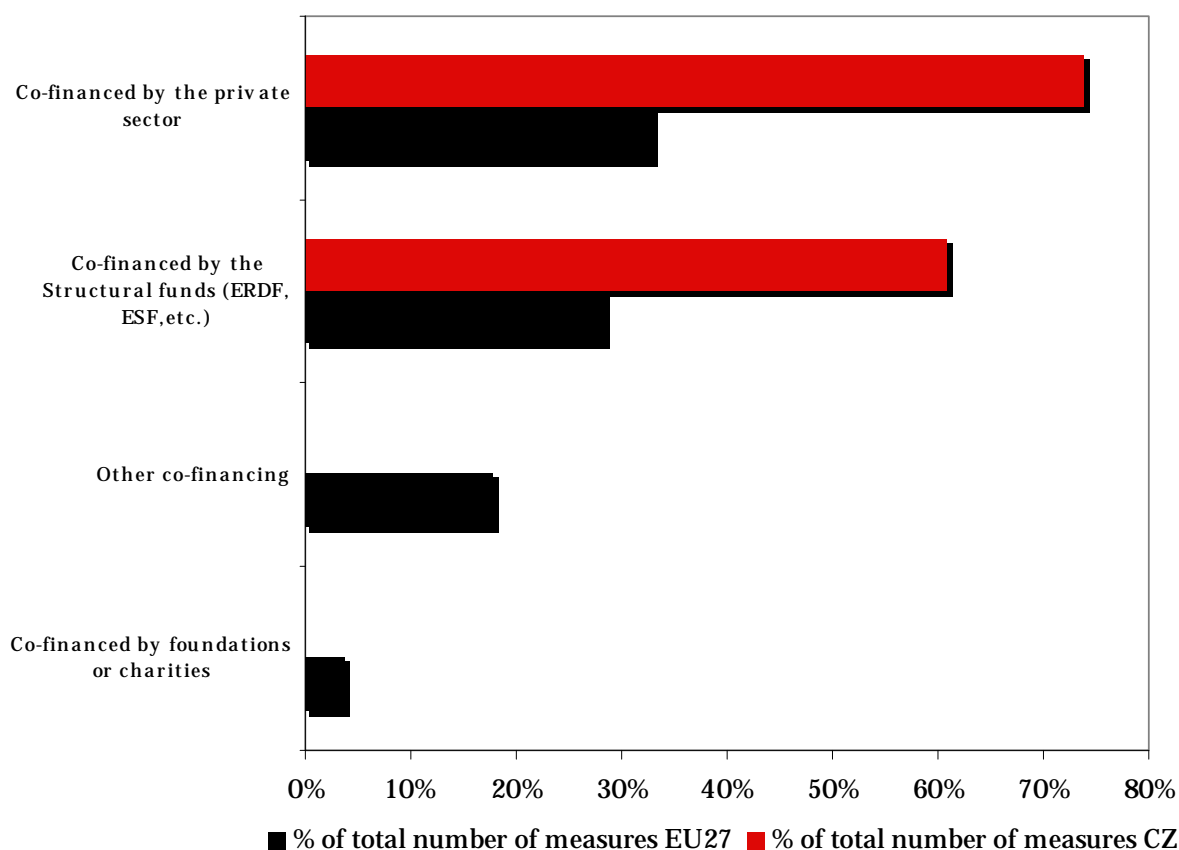
Sources of co-financing of support measures

Comparison of innovation policy measures based on source of co-financing is another aspect of innovation policy mix profile. Note, that a single support measure could be co-financed by more than one type of sources.

From this point of view two major sources are used to co-finance public support of innovation in the Czech Republic – private sector and EU Structural Funds. The high share of measures co-financed by the private sector can be explained by a strong policy focus on business sector (see above), where

financial participation of a company on supported project is required by the EU state aid rules and increases efficiency of public support. The EU Structural Funds are the second largest source of co-financing innovation support measures in the CR. This unique source is the main tool for supporting innovation in businesses in the CR.

Figure 6. Sources of co-financing of support measures in Czech Republic compared to EU-27



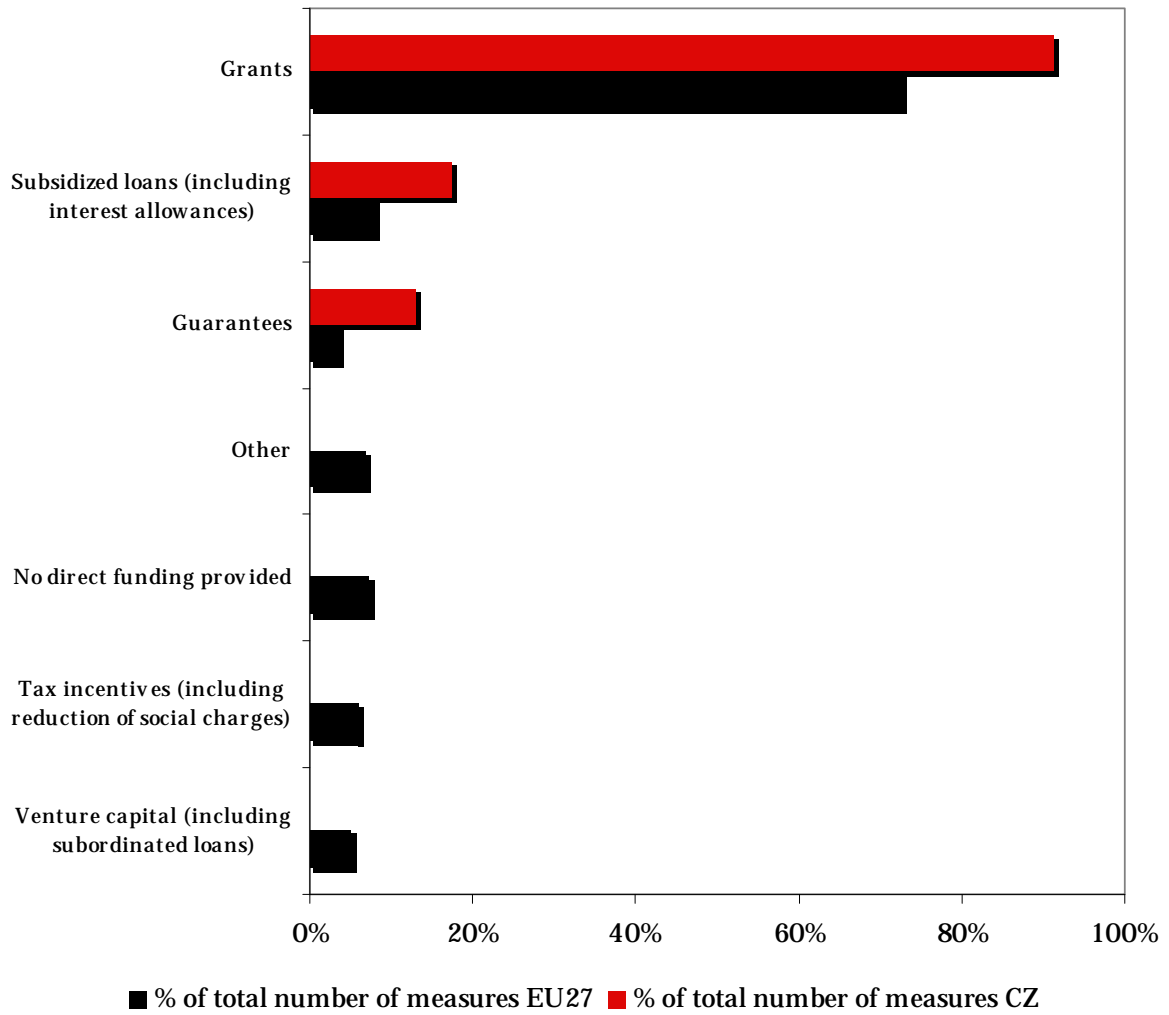
Source: TrendChart-ERAWATCH database of support measures (data downloaded on 5 June 2009); analysis Technopolis Group

Forms of funding of support measures

Last characteristic of innovation policy mix described in this factsheet is a form, in which the funding of innovation support is provided. Also in this case, funding of single support measure could be provided by more than one type of funding.

There are several forms of funding used to support innovation in the Czech Republic. Dominant share (more than 90 %) of innovation policy measures are provided in form of grants. Grants are used for supporting both R&D activities and implementing innovation in businesses. In addition to grants, subsidised loans and guarantees are also quite often used to support innovation in the CR. These forms of funding are especially appropriate for innovation start-ups, i.e. businesses with no history. Next to direct funding of RDI activities, also tax allowances (tax-deductible items) for R&D expenditures can be used in the CR.

Figure 7. Forms of funding of support measures in Czech Republic compared to EU-27



Source: TrendChart-ERAWATCH database of support measures (data downloaded on 5 June 2009); analysis Technopolis Group

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