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Regional Innovation Monitor

Regional Innovation Report (Central Hungary)

To the European Commission
Enterprise and Industry Directorate-General
Directorate D – Industrial Innovation and Mobility Industries

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PREFACE

The Regional Innovation Monitor (RIM)[1] is an initiative of the European Commission's Directorate General for Enterprise and Industry, which has the objective to describe and analyse innovation policy trends across EU regions. RIM analysis is based on methodologies developed in the context of the INNO-Policy Trendchart which covers innovation policies at national level as part of the PRO INNO Europe initiative.

The overarching objective of this project is to enhance the competitiveness of European regions through increasing the effectiveness of their innovation policies and strategies. The specific objective of the RIM is to enhance the scope and quality of policy assessment by providing policy-makers, other innovation stakeholders with the analytical framework and tools for evaluating the strengths and weaknesses of regional policies and regional innovation systems.

RIM covers EU-20 Member States: Austria, Belgium, Bulgaria, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, the Netherlands, Poland, Portugal, Romania, Slovakia, Spain, Sweden and the United Kingdom.

This means that RIM will not concentrate on Member States where the Nomenclature of territorial units for statistics NUTS 1 and 2 levels are identical with the entire country (Estonia, Latvia, and Lithuania), Malta which only has NUTS 3 regions, Slovenia which has a national innovation policy or Cyprus and Luxembourg which are countries without NUTS regions.

The main aim of 50 regional reports is to provide a description and analysis of contemporary developments of regional innovation policy, taking into account the specific context of the region as well as general trends. All regional innovation reports are produced in a standardised way using a common methodological and conceptual framework, in order to allow for horizontal analysis, with a view to preparing the Annual EU Regional Innovation Monitor reports.

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[1] http://www.rim-europa.eu

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Executive Summary

1. Introduction: Main trends and challenges in the Regional Innovation System

Central Hungary (CH) – encompassing Budapest and Pest county – is the economic, commercial, financial, administrative and cultural centre of Hungary. CH is the most developed region: it generated 49.6% of Hungary's GDP in 2009. Practically all its economic, social, institutional, educational and R&D-related performance indicators are far above the national average. GDP per capita amounted to €25,837 in 2009[2] (2.8 times higher than the region ranking last in this respect), and was 109.5% of EU27 average. Regional GDP has more than doubled between 2000 and 2009 hence currently CH accounts for nearly half of Hungary's GDP. Hungary features by far the largest inter-regional dispersion in terms of GDP per capita.

Recent developments in economic performance have been ambiguous. The region's clear leadership has not only remained unchallenged, but the extraordinary development gap between CH and less developed regions has even increased in the past decade. However, indicators of urban development and quality of life are mediocre compared to several other European capital regions of similar development level – because of a longstanding lack of systematic regional development strategy design and implementation.

The main drivers of regional performance are high-value knowledge intensive services. The biggest challenge jeopardising both regional economic performance and the shift to innovation-driven growth is the unfavourable turn in Hungary's fiscal and regulatory environment. Drastic cuts in the public funding of education, science, technology and culture, healthcare, public transport and other public services also limit the opportunities of innovation-intensive sectors and reduce the attractiveness of the region both to science and technology related business and to cultural and creative industries.

In line with its central role, and its status as an economic, educational and innovation hub, innovation performance indicators are also outstanding in CH – compared to the national average –, which reflects a high concentration of research capacities in the capital

Innovation performance – even in the case of this outstanding region within Hungary – is meagre in comparison to the international average. International benchmark categorisations point to non-negligible gaps between CH and advanced knowledge hub regions in terms of a wide variety of indicators. Regional GERD amounted to €736m in 2009. Regional R&D intensity (regional GERD over regional GDP) was far above the national average in 2009 (1.5% versus ~1%) but still behind the EU27 average of 1.9%.

2. Major innovation challenges and policy responses

Challenge 1: Improve the stability of STI policy with respect to the issues of cohesion or competitiveness

National STI policy has been inconclusive as to whether competitiveness should be regarded as the main priority that shapes the allocation of scarce resources, or whether policy should rather focus on relatively less developed regions and promote cohesion when deciding about the allocation of innovation support funding. The textbook-type, usual trade-off between competitiveness and cohesion has impeded the formulation and implementation of a long-term, predictable national STI strategy in which CH's position would be clearly assessed and region-specific development conceived.

The main challenge is therefore to dismiss political considerations, find out and define the role of CH in the national innovation system and conceive appropriate long-term predictable innovation strategies at both levels. Regional innovation policy decision-makers address this challenge by adopting a more proactive stance, trying to increase the visibility and the legitimacy of the regional innovation agency and increasing efforts to establish linkages with new stakeholders.

[2] This report calculates with HUF/€ exchange rate of 250 for the years 2004-2007; 265 for 2008; and 275 for 2009.

Challenge 2: Improve the governance of regional innovation, eliminate policymaking and implementation frictions, and enhance the willingness to co-operate for common goals

Several important constituents of social capital are missing e.g. trust is low in international comparisons, commitment to co-operate is lacking in Hungary, rivalry is prevalent, actors' autonomy and risk taking capability and willingness to work for the community is inferior to what the country's development level suggests.

These shortcomings have been especially significant in CH and they have prevented the design and implementation of a coherent, forward looking regional innovation strategy (RIS). Competition among the stakeholders for authority i.e. for power to decide about the allocation of scarce resources proved an effective barrier of joint initiatives and of the design and implementation of a RIS. Internal (intra-regional innovation agency) conflicts of interests have also been enhanced by conflicts between the regional development agency and the regional innovation agency (RIA). An important challenge is therefore to improve governance and change values and attitudes by enhancing regional identity and by empowering one specific actor within the RIA, and entrusting it with the coordination and implementation of RIS.

Changes in the external environment rather than in the policy itself contribute to the solution of this challenge. The phasing out of regionally decentralised innovation funding, the shift towards centrally managed operational programmes as the unique source of funding and the parallel weakening of regional actors eliminate intra-regional conflicts of interest. If regional stakeholders remain committed to the strategic, mid-term improvement of the regional innovation performance, they have to align their forces and co-operate.

Challenge 3: Enhance the recognition of regional scientific excellence through improved commercialisation and intensification of international RTD linkages

Regional scientific and technological strengths include ICT, biotechnology and life sciences, environmental and medical technologies. Other centres of excellence with outstanding innovation potential can be found in food, packaging and automotive industries related research organisations. Excellence in research was enhanced by recent large-scale investments co-funded by European Union Structural Funds that enabled the improvement of R&D infrastructure in universities. World-class research infrastructure and intangible assets are, however, still poorly exploited and inventions born in CH's PROs and university laboratories are rarely turned into business success. The market for technology is still functioning poorly in Hungary, and the channels for technology transfer are inefficient. With regional innovation performers' deficient innovation management skills, and meagre local financing opportunities, the best option for exploiting and enhancing the existing innovation potential is to promote international co-operation.

Policy addresses this challenge through the launch of 'iMarket' (innovation market) services that include the identification of innovative projects, a search for pre-commercial procurement possibilities, and match-making services (finding technology partners and parties interested in the new products and solutions) both at national and at international level.

3. Innovation policy governance

INNOREG, the Central Hungarian Regional Innovation Agency (RIA) is the designated main regional actor of regional innovation policy. It is the coordinator of the regional innovation network. INNOREG's autonomy is quite limited: it is constrained to the representation of the region in innovation-specific discussions (e.g. with the National Office for Research and Technology, or within the network of the Hungarian RIAs) and to the design of various regional innovation management actions, events and services.

As for implementation, INNOREG's autonomy was restricted to determining the range of key strategic sectors that would receive targeted support in the framework of the regionally decentralised programmes. Annual calls of the region-specific national innovation support programmes were last announced in 2009. Since then no more decentralised government funding for the support of regional innovation exists in Hungary, the allocation of regionally earmarked EU Structural Funds specific grants is decided upon centrally. Although the amount designated to regional innovation support has significantly increased, operational programmes (OPs), *including the so-called regional operational programmes* are managed by the National Development Agency. Thereby INNOREG's (and other

RIAs') institutional autonomy with respect to the funding of innovation strategy implementation has been reduced to zero.

The main challenge faced by regional innovation policy-makers is the centralisation of coordination to the national level and the shift towards OPs as the main (unique) funding mechanism. Following the elections in April, 2010, the new Hungarian government restructured the national innovation system and is currently in the process of reorganising the territorial system of public administration, i.e. the national-regional-local distribution of tasks and authorities. Representatives of INNOREG, similarly to those of other RIAs can only hope their network would be sustained and their in-depth knowledge of both the regional innovation stakeholders (their network capital) and of the regional innovation specifics, perspectives and bottlenecks considered an asset too valuable to be left to decay. The three-year period of funding INNOREG's activities will end in February, 2012.

4. Conclusions: future actions and opportunities for innovation policy

Although Central Hungary could easily have capitalised on its existing knowledge and technology endowments and multiplied the impact of its support actions, innovation policy stakeholders (at all levels) have failed to do so. As a consequence of their lacking vision (and mid-term strategy) and of the failure to position this regional unit in the national innovation system, spontaneous development was not reinforced by policy levers. However, deficiencies in strategy design and implementation, alongside inter-organisational rivalries have not been manifested in regional innovation performance indicators. The indicators themselves have significantly improved over the past decade and the gap between the developed CH region and the rest of Hungary has sizeably increased. This is however the result of spontaneous development driven by agglomeration forces: mainly because of the fact that Hungarian innovation performers are concentrated in this region. Nonetheless analysts and the interviewed policy stakeholders acknowledge that regional innovation performance has been inferior to its potential.

Nevertheless regional innovation actions have also produced some positive outcomes, especially in the field of improving innovation culture. Over the past decade, regional SMEs have become somewhat more committed to innovation than before. Due to regional innovation intermediaries' systematic work, regional SMEs have accumulated some knowledge about the available innovation management services and have become aware of the importance of non-technological innovations. Industry-university co-operation has intensified and innovation performers participate in international research undertakings (and networks of excellence) is increasingly frequent.

The outstanding (within Hungary) regional innovation achievements – including research universities' scientific results; the emergence of a layer of technology-based, born global entrepreneurs; the performance of gazelles in knowledge-based sectors; the innovative results of MNEs' local research departments, etc. – reflect on the one hand a spontaneous development based on existing endowments and on the other hand the impact of national innovation policy schemes, rather than the impact of the regional innovation strategy or the beneficial consequences of regional innovation institutions' activities.

Future policy actions include:

- At the national level, CH's position within the national innovation system should finally be identified, and an appropriate mid-term strategy conceived – in partnership with regional level stakeholders.
- At the regional level, involvement in strategy design and implementation should be intensified. CH's innovation policy stakeholders have to become more proactive, launch bottom-up initiatives, and contribute to the positioning of the region both at the national level and internationally. Regional innovation strategy and policy schemes should *complement* the national strategy and the schemes. Regional policy governance should work in partnership with the national level so as to *reinforce* each other's impacts.
- Overall, STI schemes should lay increased emphasis on commercialisation aspects. R&D infrastructure building and support to R&D & promotion of scientific excellence are not sufficient. Carefully designed policy instruments should target knowledge exploitation and technology transfer. By stimulating technology-based entrepreneurship and strengthening the 'demand side' (instead of the traditional policy focus on the supply side of innovation), the market for technology can unfold its multiplier effects.

1. Introduction: Main trends and challenges in the Regional Innovation System

1.1 Recent trends in regional economic performance

Central Hungary (CH) – encompassing Budapest and Pest county – is the economic, commercial, financial, administrative and cultural centre of Hungary. Economic transformation and foreign direct investment driven modernisation have produced substantial structural change in CH's economy. This was manifest in the rapid development of the services sector (in particular of financial intermediation, telecommunication, commerce, and logistics); in the rapidly shrinking weight of traditional manufacturing sectors (textile & clothing, heavy industries etc.), and in the expansion of high-tech industries (ICT, electrical and optical equipment, pharmaceutical industry) and knowledge-based services (business services, software development, etc.). As Central Hungary attracted the dominant part of FDI inflows (two thirds of the total FDI stock), the development of the region has considerably reinforced spatial disparities, and has further enhanced the disproportionate concentration of national economic performance in this region.

Central Hungary is the most developed region in Hungary: it generated 49.6% of Hungary's GDP (in 2009). CH hosts the head offices of one third of all registered companies, including the majority of foreign investment enterprises. The region is characterised by developed infrastructure, high motorway density, good accessibility, intensive entrepreneurship and a high share of foreign investment. Practically all economic, social, institutional, educational and R&D-related performance indicators are considerably above the national average. GDP per capita amounted to €25,837 in 2009 (2.8 times higher than the region ranking last in this respect), which was 109.5% of the EU27 average. According to Eurostat, Hungary features by far the largest dispersion among regions in terms of GDP per capita: the value of this indicator amounted to 36.9 in 2007, while the EU27 average was 28.3. Moreover, internal disparities have significantly increased since 2000 (dispersion in 2000 was 32.4).

CH has 2,971,276 inhabitants (January, 2011) which is ~30% of total population. In contrast to a general reduction of the population, CH was the only region to experience a population growth in the 2000s (5% since 2001). Its area is 6,916 sq km. CH is a rapidly aging region. The aging index (the number of inhabitants over 65 relative to that of children under 14) increased from 109 to 116.9 between 2001 and the beginning 2011. The region started aging earlier than other regions, in 2001 the region's aging index was by far the highest in Hungary (the national average being 91.3). At present CH's aging index is relatively favourable, ranking 4th among the Hungarian regions.

Regional GDP has more than doubled between 2000 and 2009 (having increased by 224.6%). This resulted in the region's increased contribution to Hungary's GDP (from 43% to 49.6%). The dominant part (79.6%) of regional GDP was produced in Budapest. In 2009, the region's GDP per capita was 169.1% of the national average (up from 159.8% in 2000).

Sectoral GDP per capita compared to national average is a telling indicator: it reveals that CH's economic structure is substantially different from that of other regions. Services contributed 77% to regional GDP in 2009, which is 10% higher than the national average. Although CH specialises in services, the performance of industry is also substantial: the region's share in Hungary's total industrial GDP is 37%. In contrast, agriculture plays a marginal role in regional GDP: less than 1% compared to the national average of 3.3 %. The share of industry (mining and manufacturing) was 18.6% in regional GDP, that of construction: 3.6% in 2009.

In summary, CH's economic structure reflects the way that it is the commercial, financial, and services centre of Hungary (with a particularly large share of tourism, financial and real estate, educational and health services compared to the Hungarian average).

The number of registered companies amounted to 591,232 at the end of 2010, which was 34% of the total. The number of active enterprises was however much lower at 274,673. The intensity of entrepreneurship activity (number of active enterprises per thousand inhabitants) is the highest in Hungary at 93.3 (in 2009) versus 69, which is the national average. In Budapest, the respective indicator is 109. Higher-than-the-average entrepreneurship is explained with the concentration of economic activity in this region and with the above average development level of supporting institutions and industries. The latest data for enterprises with foreign investment are available for the end 2009: their number was 20,552, which is 70% (!) of the total. In fact, the regional stock of FDI was 66.1% of the total. Total investment was particularly intensive in the region compared to average

investment performance at 43 % (in 2009). Investment per capita was by 45% higher than the national average in the second half of the 2000s.

The region has a lower unemployment rate than the rest of Hungary at 8.9% in 2010 compared to the national average of 11.2%. Employment increased by 4.7% since 2000 and the activity rate was much higher than the otherwise quite low national average (59.1 versus 55.4%) in 2010. The region's relatively high development level (and relatively high living costs) explains why average wages are substantially (by 20.8% in 2010) higher in CH than the national average.

Similarly to Hungary as a whole, CH was seriously affected by the economic crisis that started in 2008. Over a period of two years, the number of unemployed doubled, reaching 120,500 in 2010. However, the general phenomenon: "the more developed a region is the more its economic performance and employment drop at times of crisis" was not as clear-cut as in other developed regions of Hungary. Unemployment rapidly increased, but GDP did not decline (regional GDP decreased by a mere 0.5% 2008 in current prices). In contrast to an overall drop in the rate of gross fixed capital formation in 2009 (by 5%), regional investment increased by 4.4% compared to 2008. This increase was mainly due to economic actors' investments in machinery and equipment, which increased by 6.3%.

In summary, the region's clear leadership has not only remained unchallenged, but the extraordinary development gap between CH and less developed regions has even increased in the past decade – as a result of spontaneous development, driven by FDI inflows and agglomeration forces. This produced non-negligible political and cultural backlash: no single political party has ever included the strategic development of Budapest into its campaign promises. Moreover, the development of the capital region was missing also from official economic development programmes (Ágh, 2006). As a consequence, both Budapest and Central Hungary are in a chronic and acute shortage of strategic vision: the region's development has been spontaneous and isolated from the other parts of the economy (this tendency is reinforced by the hub and spoke transport infrastructure of Hungary). Instead of being a driver of growth, the development of the capital is perceived (by stakeholders in other regions) to be at the expense of the rest of Hungary (a zero sum or even negative sum game).

However, the lack of a political will for strategic development has produced important deficiencies (obvious in international comparisons) mainly in the quality of public services, but also in the development level of infrastructure and of business services – necessary for a capital city of this size to become a centre for international business.

One of CH's major weaknesses is that the development of transport infrastructure does not keep pace with the requirements of rapidly increasing traffic: congestion is an increasingly serious problem. The radial network of roads produces congestion at the centre. As for the capital, persisting financial problems and shortage of funding result in below-the-optimal level of urban development. Consequently the quality of public services (e.g. health services, public transport services) that face acute funding shortages is also poor in international comparison. There are deficiencies in governance (cf. Egedy & Kovács, 2010): the two-tier administrative system of Budapest, with its overlapping responsibilities and conflicting political interests hinders the design and the implementation of an integrated urban development strategy. Both the capital and its 23 districts have municipal governments with independent functions and powers, i.e. the local governments of both the capital itself and its 23 districts have equal status and power – a phenomenon that is unique in Europe.

The main drivers of regional performance are services in general, and high-value knowledge intensive services[3] such as ICT in particular, as well as cultural & creative industries. The biggest challenge jeopardising both regional economic performance and the shift to innovation-driven growth is the unfavourable turn in Hungary's fiscal and regulatory environment that reduces the attractiveness of the capital as a base for high value services such as banking and insurance. Moreover, drastic cuts in the public funding of education, science and technology and culture (as well as of healthcare, public transport and other public services) also limit the opportunities of innovation-intensive sectors and reduce the attractiveness of the region both to science and technology related business and to cultural

[3] According to Eurostat, the share of persons employed in business services was 23.6% in 2007, which is somewhat below the respective figures of other central regions of Europe (e.g. Prague: 24.8; Berlin: 30.6).

and creative industries. The indicators of urban development and quality of life[4] feature an increasing lag compared to various other European capital regions.[5]

1.2 Recent trends in regional innovation performance

Although Hungary's RTDI performance lags considerably behind that of advanced EU Member States, a survey of innovation-related indicators in CH would fare much better in an international comparison. In fact, in line with its central role, and its status as an economic, educational and innovation hub, innovation performance indicators are outstanding in CH, compared to the national average, which can be explained with the high concentration of research capacities in the capital (Table 1). CH hosts the Hungarian Academy of Sciences and the majority of HAS-affiliated research institutes. Being a higher education centre, there is also a high concentration of university-based research. The headquarters of the European Institute of Innovation and Technology is also located in CH. A large share of the head offices of R&D-intensive multinational enterprises (MNEs) is located in CH. Several large MNEs have production facilities in other regions, but have established R&D or technology competence centres in Budapest. The value of regional innovation performance indicators reflect this concentration: therefore, indicators should be assessed in the context of an overall meagre innovation performance of the economy.

Nevertheless, innovation performance – even in the case of this outstanding region within Hungary – is meagre in international comparison. OECD's recent categorisation exercise (Marsan & Maguire, 2011) classified the region as a *medium-tech manufacturing and service provider*, rather than a knowledge hub.[6] Other taxonomies of regional innovation performance (e.g. Wintjes & Hollanders, 2010) have also failed to include CH in the most innovative categories: according to the cited authors, CH – together with Prague and Bratislava – are '*public knowledge centres*' rather than *metropolitan knowledge-intensive services regions* (such as Brussels, Berlin, Stockholm or London) or *high-tech regions* (such as North Brabant). International benchmark categorisations point to non-negligible gaps between CH and advanced knowledge hub regions in terms of a wide variety of indicators.

As for CH's innovation performance indicators, regional GERD amounted to €736m in 2009, which is a slight increase (5%) compared to 2008. Regional R&D intensity (regional GERD over regional GDP) was far above the national average in 2009 (1.5% versus ~1%) but still behind the EU27 average of 1.9%. The number of researchers (FTE) was 14,080, working at altogether 1,471 R&D organisations. Beyond absolute numbers, the indicator 'researchers (FTE) as a percentage of persons employed' can be one of the best indications of the research orientation of a region. In the case of CH it was 1.15% in 2009: double of the national average of 0.56%.

Table 1

Benchmarking key regional innovation performance indicators, 2009

Share in total (%)

	No. of R&D organisations	No. of researchers FTE	GERD
South Transdanubia	7.2	4.0	2.5
Central Transdanubia	6.5	5.6	5.6
West Transdanubia	7.9	5.2	4.8
North Hungary	7.2	4.5	4.1
North Great Plain	11.2	8.6	10.0
South Great Plain	12.4	9.3	7.7
Central Hungary	**47.6**	**62.9**	**65.5**

[4] The Urban Audit Programme of Eurostat specified nine dimensions of 'quality of life': demography, social aspects, economic aspects, civic involvement, training and education, environment, transport and travel, culture and leisure, innovation and technology. See also the operationalisation exercise and data in Morais–Camanho, 2011.

[5] This is the consensus opinion of Hungarian researchers publishing on metropolitan development and governance issues (e.g. Tosics, Ágh). International comparative statistics, e.g. the Eurostat Urban Audit provide data up till the mid-2000s and fail to reflect recent tendencies.

[6] Prague or Vienna for example were classified as *knowledge-intensive city/capital districts*; Stockholm and the Danish capital region as *knowledge and technology hubs*.

Source: CSO

Regional innovation performance indicators have shown a significant improvement over the past half a decade: compared to 2005 GERD increased by 45% and the number of researchers (FTE) has nearly doubled. Despite this progress achieved in a short period of five years, this improvement was not sufficient to catch up with the EU27 average, or achieve the objective of the Lisbon strategy of 3% R&D-intensity. Although the majority of innovative and R&D-intensive enterprises is concentrated in CH, the share of public investment in RTD financing is still quite high at roughly 40%, and the share of foreign capital in R&D financing is the highest in Hungary, at 16% versus 12.35%. This is mainly due to the fact that the majority of PROs and of HEI-affiliated research institutes (which rely on public funding for R&D) are concentrated in this region.

Regional innovation performance and the relatively high share of public funding in total R&D expenditures can also be explained by the region's above average ability to capture national resources designated to support innovation. According to data on the distribution of national resources for innovation support purposes, CH absorbed 60% of total innovation support from the National Research and Technological Innovation Fund (KTIA) between 2004 and 2008 and a similar share of the innovation-related funding of the Economic Competitiveness Operational Programme (Source: Borsi, 2010, p. 66). In a way this performance is self-evident, because actors able to capture both programme funding and institutional funding are concentrated in CH. On the other hand, this skewed distribution reflects the inability of national STI policy to reduce regional disparities.

Employment in high-tech industries and in knowledge-intensive services as a share of total employment was 7.29% in 2008, more than double the EU27 average of 3.7% and also above the national average of 5.07% (Eurostat). CH is well endowed in Hungary's core innovation resource: human capital. The share of the population aged between 25 and 64 with a tertiary education was 28.9% in 2008, more than double the region ranking last in this respect (North Hungary) but far inferior to the top European capital regions of inner London and Oslo (both 48.3%). According to Eurostat, practically 100% of CH's population aged between 20 and 24 years participated in tertiary education in 2008, which was similar to several other developed regions in the European Union. This indicator is however bound to worsen considerably in the near future with the new Higher Education Act to be adopted at the end of 2011. The recent sharp expansion in higher education enrolment will be shunted, in line with the sharp reduction in the number of publicly funded universities and the number of students. The planned structural change is guided by the principles of 1) reducing the budgetary contribution to higher education and 2) diminishing the excessive weight of the capital in higher education.

Hungarian performance with respect to lifelong learning is in general well below the European average: the share of the population aged between 25 and 64 participating in education and training was 30.8% of the EU27 average in 2010. As for the regional data – as might be expected CH is above the national average: 4.3% (150% of the national average). The share of households with broadband access was 60% in 2009 (Eurostat), which was the highest in Hungary (the national average being 52%).

Beyond these hard indicators, some softer and more qualitative types of information suggest that CH is duly aspiring for the status of a knowledge region – at least by Hungarian standards. Cooperation between the science and business communities is much more intensive than in other Hungarian regions. Universities in Budapest have developed knowledge clusters, and intensified cooperation with the business sphere. Improved results in these respects were achieved due to unprecedented investment activity in research and technology infrastructure, co-funded by the European Union. As to non-technological innovation activity, according to a recent survey firms in CH were also more active in this respect than in other regions. (Source: Csizmadia and Grosz, 2011, p. 110)

Regarding innovation output indicators, CH contributed 71% to Hungary's total EPO filings between 2000 and 2008. In 2010 the number of (Hungarian and foreign language) publications related to the region was 22,776: 57% of the total.

In summary, similarly to economic performance, Hungary's innovation performance is also concentrated in CH. Above average performance with respect to innovation was further reinforced in the past decade. This can be explained with structural factors, i.e. with the region's above average share of innovative foreign enterprises and with its specialisation in knowledge-intensive services and in high-tech industries. Moreover, CH's knowledge hub status: the fact that it hosts the majority of higher education institutions and public and private research organisations also account for its above average ability to capture national and European resources designated to support innovation.

1.3 Identified challenges

Though the preconditions for innovation-driven development are better in CH, than in other regions, cultural and policy barriers have resulted in an innovation performance that is inferior to the region's innovation potential. Hence, the main challenges identified below will not include the usual challenges that otherwise also apply – e.g. the necessity of 1) increasing stakeholders' commitment to innovation; 2) facilitating new technology-based entrepreneurship for local SMEs; 3) improving Triple Helix linkages and technology transfer – but rather governance-type and mentality related challenges will be enumerated.

Challenge 1: Improve the stability of STI policy with respect to the issues of cohesion or competitiveness

Since the concentration of research, development and innovation is high above the national average in CH, which is also reflected by performance indicators, national STI policy has always been inconclusive on whether competitiveness should be considered the main priority that shapes the allocation of scarce resources, or whether policy should rather focus on relatively less developed regions and promote cohesion. Arguments for competitiveness, (i.e. that support should be channelled into regions characterised by relatively strong innovation actors rather than granted to stakeholders in relatively weaker regions) include the above average absorption capability of CH, which ensures an above average multiplier effect of central support. Moreover, central support may in principle trigger inter-regional spillovers. The main argument for cohesion, i.e. for channelling scarce central funding to underdeveloped regions is the necessity of a balanced territorial development.

In Hungary, this textbook-type, usual trade-off has impeded the formulation and implementation of a long-term, predictable national STI strategy in which CH's position would be clearly assessed and region-specific development conceived.

The main challenge is therefore to dismiss political considerations, and to find out and define the role of CH in the national innovation system and conceive appropriate long-term predictable innovation strategies at both levels.

Challenge 2: Improve the governance of regional innovation, eliminate policymaking and implementation frictions, and enhance the willingness to co-operate for common goals

As demonstrated by various international surveys (e.g. European Values Studies, e.g. Halman and Voicu, 2010; Csepeli, Prazsák, 2011) in Hungary several constituents of social capital are below the optimal level: trust is low in international comparisons, commitment to co-operation is meagre, rivalry is prevalent, actors' autonomy and risk taking capability and willingness to work for the community is inferior to what the country's development level suggests.

According to regional stakeholders these shortcomings have been especially significant in CH and they have prevented the design and implementation of a coherent, forward looking regional innovation strategy (RIS). [7] Competition among the stakeholders for authority i.e. for the power to decide on the allocation of scarce resources proved an effective barrier of joint initiatives and of the design and implementation of a RIS.

Internal rivalry was exacerbated by traditional conflicts between Budapest and Pest County (Tosics, 2008). CH as a 'planning statistical region' was created in the framework of a top-down regulatory mechanism aimed to comply with European cohesion and regional policies, in order to adopt the European NUTS system, carry out meso-level public administration reforms and create regions which are eligible for European regional assistance (Pálné, 2007). In reality, despite some administrative antecedents e.g. the creation of the Budapest Agglomeration Development Council in 1997, bottom-up co-operation has never developed between Budapest and its agglomeration. Following the official establishment of CH (by the Act on Regional Development and Physical Planning in 1996) substantial political efforts were made by Pest County regional public administration officials to achieve the separation of CH into Budapest and Pest County region (so that the relatively underdeveloped agglomeration can get access to relatively more resources from the EU Structural Fund).

[7] This is practically a unanimous opinion of all interviewed stakeholders (including the ones responsible in principle for the design and implementation of the strategy, and including other interviewed RIS-officials of other regions, not mentioned here). The other side of the coin is, that even in the case of well-designed, coherent strategies (as in the case of some other regions) the implementation system did not take strategic considerations into account, as described in the case study on South Transdanubia).

Internal (intra-regional innovation agency) conflicts of interests have also been enhanced by conflicts between the regional development agency and the regional innovation agency (RIA). An important challenge is therefore, to improve governance (and change values and attitudes) by enhancing regional identity and by empowering one specific actor within the RIA, and entrusting it with the coordination and implementation of RIS.

Challenge 3: Enhance the recognition of regional scientific excellence through improved commercialisation and intensification of international RTD linkages

With the high concentration of research capacities (Table 1) CH's innovation performance is too diversified to allow for easy prioritisation and a well-conceived smart specialisation strategy. Regional scientific and technological strengths include ICT, biotechnology and life sciences, environmental and medical technologies. Other centres of excellence with outstanding innovation potential can be found in food, packaging and automotive industry related research organisations.

Excellence in research was enhanced by recent large-scale investments co-funded by European Union Structural Funds that improved R&D infrastructure at universities. World-class research infrastructure and intangible assets are, however, still poorly exploited and inventions born in CH's PROs and university laboratories rarely turn into business success stories. The market for innovation is functioning still poorly in Hungary, and channels of technology transfer are inefficient. With regional innovation performers' deficient innovation management skills, and meagre local financing opportunities, the best option for exploiting and enhancing the existing innovation potential is to promote international co-operation. MNEs with Hungarian subsidiaries have already established linkages with the major universities and centres of excellence, but better communication and linkage building may multiply international awareness of CH's innovation potential and of its tangible and intangible RTD assets.

2. Innovation policy governance

2.1 Institutional set-up, coordination and implementation mechanisms

The Hungarian system of territorial governance is marked by the excessive fragmentation of public administration, high competencies and broad responsibilities at the micro-level, and weak legitimacy, decision-making power and instruments at the meso-level (Pálné, 2009).

There are 188 settlements with local self-governments in CH (cf. Ágh, 2007 on the fragmentation of public administration and the ongoing struggle for freedom and autonomy which split regions into smaller units and resulted in poor administrative efficiency). In Budapest there are 23 elected governments for the 23 districts plus one for the entire city (a two-tier administrative structure). The meso-level includes the county's self-government (Pest county) and the regional administration of Central Hungary: both are weak and their competencies are ambiguous (the 1990 Act on Local Governments followed the principle that local government autonomy means that the meso-level should not possess a controlling role over the settlements (Pálné Kovács, 2011).

Despite the fact that formally and in principle the regional development agency is the key actor of regional development, its institutional autonomy is relatively limited given that the management of EU Structural Funds has always been strongly centralised in Hungary. Operational programmes, *including the so-called regional operational programmes* are managed by the National Development Agency. Regional Development Councils and their working agencies are simple intermediary organisations, responsible for programming and strategy preparation but without any real decision-making power.

CH's 2001-2006 regional development programme did not specifically mention the issue of innovation among its development priorities. Nevertheless, along with the general trend of formal decentralisation in the early 2000s, the national innovation policy started to take the regional dimension increasingly into account. The first milestone of the regional devolution of innovation related tasks and responsibilities, was the 2003. XC. Act on the Research and Technological Innovation Fund, which prescribed that 25% of the Fund's yearly income[8] should be designated to regional innovation purposes. The starting regional orientation of the national innovation strategy coincided with an EU FP5 project the objective of which was to prepare regional innovation strategies

[8] The income of the Fund grew from €141.6m in 2004 to €189.2m in 2008 (Source: Borsi et al. 2010).

for the participating regions' (CH, Central Transdanubia, Umbria and Brandenburg). It was in the framework of this project that CH's RIS was prepared, and some years later the region's main innovation intermediary organisations formed a consortium and established the Central Hungarian Regional Innovation Agency (hereafter INNOREG) as a public benefit association, to coordinate the implementation of RIS.

INNOREG is the designated main regional actor of regional innovation policy. It is the coordinator of the regional innovation network. Since INNOREG signed a subcontracting agreement with consortium members to carry out the tasks related to regional innovation strategy implementation, the scope of INNOREG's activity and authority has been somewhat different from those of the other Hungarian RIAs: it started its activities as a network of intermediary innovation organisations, rather than as a 'regional innovation agency'[9] responsible for strategy design, and for the coordination of strategy implementation.

During the first years of its activity, INNOREG started to establish linkages with the main regional innovation stakeholders, establishing a network of information centres (IIA-points: Innovation–Information–Advice), and launching various innovation management services. The services portfolio of INNOREG's founders, which were intermediary organisations themselves, were enhanced and improved, and negotiations about the first joint actions were started. Following the first three-year period of INNOREG's activity NKTH contracted an independent body, the Federation of Technical and Scientific Societies (MTESZ), to evaluate the RIAs' performance and make recommendations about the further improvements to the institutional set-up. The positive evaluation that followed (MTESZ, 2008) prompted NKTH to continue and upgrade its programme aiming to strengthen regional innovation institutions. A new tender "to support regional innovation agencies' R&D-and-innovation related tasks" was announced in 2008 and INNOREG started its second three-year term in 2009 already in an agency form, as a regional innovation agency. The grant, a predetermined yearly amount of ~€350,000 to €400,000 will cover the costs of INNOREG's activities for three years between 2009 and February 2012.

RIS implementation or rather the practical tasks of regional innovation support were in practice unrelated to the formal RIS document (see section 2.2), and rather more relevant to the management of the centrally announced regionally decentralised innovation support programmes (Baross Gábor Programme and Innocheck). As a result of the rivalry between the RIA and the RDA, INNOREG's activities were constrained to the management and the monitoring of the latter programme. Other activities included the launching of innovation management services, the organisation of conferences and exhibitions and other innovation related events such as participation in tenders, linkage building with regional innovation stakeholders, with the representatives of other Hungarian RIAs and with international stakeholders. Despite a more or less diversified portfolio of events and actions, neither the term coordination, nor strategy implementation applies to INNOREG's activity: it rather consisted of *a range of ad hoc actions*, negotiations, and linkage building events.

In the meantime, a parallel strategy formulation process started, in line with the National Spatial Development Concept (adopted in 2005) that centred upon the creation of development poles. The Concept stipulated five (later seven) Hungarian pole cities (including Budapest) that ought to become centres of innovation-based development. The Pole Programme of each selected city concentrated on the development of a city specific and region-specific scientific discipline and technological field, and on the promotion of innovative clusters. When the programme was launched the government declared that pole cities will receive €400m (altogether) for the implementation of their strategies.

In the framework of this programme a new strategy was prepared by the Regional Research Centre of the Hungarian Academy of Sciences and the Metropolitan Research Institute (Barta, 2006). The strategic programme targeted the innovation-based development of Budapest and its agglomeration (the name Central Hungary was not explicitly mentioned in the strategy). Specifically, the strategy targeted the development of three clusters in the fields of ICT, eco-industry and health industry. A new organisation, Innopolisz Consulting Ltd. was created, which was responsible for the management of innovation promotion programmes, for consultancy in innovation management issues, for the marketing of the results, fundraising etc.

Eventually, no regionally decentralised amount was allocated to the pole cities for the implementation of their strategies. Stakeholders in the pole cities could instead submit project proposals and apply for funding from various OPs of the New Hungary Development Plan. Although OPs were more or less

[9] Later INNOREG was converted into a par excellence regional innovation agency but it had no special impact on its position vis á vis its founding intermediary organisations.

related to pole strategies and stakeholders who submitted tender applications occasionally made reference to the newly conceived pole strategies, OP-based Pole Programme implementation was obviously fragmented and partial. Moreover, instead of a decentralised management of strategy implementation, supervised by one regional organisation with an overview of the whole strategy (and responsible for the coherent mid-term development of the region), funding was managed centrally by the National Development Agency.

Over time there were important structural changes in the funding of regional innovation that resulted in power shifts away from the (otherwise weak) regional level to the national level. Regionally decentralised innovation programmes managed jointly by NKTH and the regions have been dwarfed by the amounts available from EU co-financed, centrally managed OPs targeting innovation (e.g. support of accredited innovation clusters, support of enterprises' R&D activities etc.). Although Central Hungary is the only Hungarian region that does not fall under EU Convergence Objective (it belongs to the Phasing-In Regional Competitiveness and Employment Objective) the Central Hungary Operational Programme (CHOP) – the main priority axis of which is the strengthening of R&D and the development of a knowledge-based economy – opened up never-before-seen opportunities for regional innovation stakeholders. In the 2007-2013 programming period, as a result of the increase of financial allocation to core 'Lisbon' activities, an unprecedented amount of funding became available for RTDI efforts. CH's stakeholders trying to receive funding for their RTDI related efforts were thus effectively channelled towards OPs. At the same time several measures limited the scope of objectives that could be supported by the Research and Technological Innovation Fund. Hence, the autonomy of the regional innovation agency was reduced through financial means.

As far as horizontal coordination mechanisms are concerned, INNOREG is deeply embedded in the region: it has established linkages with practically all actors of the regional innovation system including universities, PROs, private research performers, innovation intermediary institutions, innovative SMEs as well as MNEs that are characterised by local R&D-intensive activity. INNOREG co-operates with the Hungarian Innovation Association, with the Public Foundation for the Progress of Industry (IFKA), with national and regional chambers of commerce and with enterprise development agencies. It participates in joint actions with other Hungarian RIAs. Horizontal co-operation among regional innovation agencies has become formalised through the creation of RIAs' network (RIÜNET) that has provided an opportunity for active dialogue and information sharing across RIAs and between RIAs and the National Office for Research and Technology.

Following the elections in April, 2010, the new Hungarian government restructured the national innovation system and is currently in the process of reorganising the territorial system of public administration, i.e. the national-regional-local distribution of tasks and authorities. Past ambiguous decentralisation steps have given way to a clear reversal of decentralisation.

As for the new structure of the national innovation system, strategy formulation is currently the responsibility of the Ministry for National Economy. Policy implementation (in terms of the allocation of funding, i.e. support to innovation activities) pertains to the responsibility of the Ministry of National Development. The National Innovation Office (NIH: the previous National Office for Research and Technology) participates in strategy preparation (together with the newly created National Research Innovation and Science Policy Council).[10] NIH is expected to 1) manage international relations in the field of technological and research co-operations 2) analyse international technological trends and 3) provide consultancy services to innovative SMEs. However, as a result of radical downsizing, the majority of experts were fired (others had to quit) and currently NIH has little capacity for strategy preparation. Regional innovation related assignments are currently not included in NIH's task and responsibility portfolio, though they are enumerated among the stated objectives of the Office.

The administration and the management of the Research and Technological Innovation Fund, which used to be the responsibility of NIH, has since been transferred to the National Development Agency. According to stakeholders who read the unofficial first draft of the new national innovation strategy (no official first draft has been published yet) regional aspects of innovation are not mentioned in the national strategy.[11] Representatives of INNOREG, like other RIAs, had hoped their network would be sustained and their in-depth knowledge of both the regional innovation stakeholders (their network

[10] The Council, established by Government Decree No. 1279/2010, is operating as a governmental advisory and pre-decision making body. Its mission is to provide management advice to every important emerging strategic and financial question and problem of the RDTI sphere.

[11] On the other hand, a number of political declarations emphasised the importance of the regional dimension of innovation and the necessity to maintain RIAs.

capital) and of the regional innovation specifics, perspectives and bottlenecks would be considered an asset too valuable to be left to decay. However, after the three-year period of funding RIAs' activities ended in mid-2011, (as will INNOREG's in February, 2012) and no new programme was announced. Regional innovation agencies tried to survive by shifting from a non-profit basis of operation to a market-based one. They started intensive lobbying activities for a new round of support,[12] given that the activities they carry out and the services they provide are par excellence 'developmental state'-type activities. At the same time they intensified their international activities: they actively participate in EU-funded, in many cases SSH-specific programmes (e.g. CENTROPE, South East Europe Programme, CIP, INTERREG, IPA and FPs).

As for international co-operation, CH is represented in ERRIN, the European Regions Research and Innovation Network by the Public Foundation for the Progress of Industry (IFKA). IFKA is also a member of Technology Innovation International, the European Association for the Transfer of Technology Innovation and Industrial Information. INNOREG's founding organisations Innostart and Valdeal are members of EBN, European Business & Innovation Centre Network. Innostart is also a member of EBAN, the European Business Angel Network and of Enterprise Europe Network. Central Hungary is not represented in the Lisbon Regions Network, and in Pro-Inno Networks. In contrast to other RIAs (e.g. that of Dél-Dunántúl), CH has no representation office in Brussels. It tries to establish linkages with EU DGs, the Committee of Regions and other Brussels-based European regional associations through one of its members,[13] a member of the European Parliament.

As a result of INNOREG intensive efforts to participate in EU-funded programmes, it was recently engaged in EU FP7 IDEAL-IST project that enhances the services and networking activities of National Contact Points (NCPs) in the field of ICT (a key sector and technology in CH's smart specialisation strategy). INNOREG's founders, CHIC and Innostart are much more active and successful in international project participation. CHIC participated mainly in renewable energy related projects (e.g. Coach Bioenergy project, EMPRES etc.). Over the past 15 years Innostart participated in 60 national and international EU-co-funded projects. Examples include SEED-REG, which aims to improve innovative SMEs' access to finance by interregional exchange of experience and know-how in early-stage financing policies and DIGIBIC, a creative industries network

By way of summary, the changes that have taken place since the second half of the 2000s feature a zig-zag pattern. In the mid-2000s national innovation policy's partial and half-hearted shift to a regional governance of innovation was driven by Hungary's EU accession, i.e. by the necessity to establish 'EU-compatible' institutions, and by the opportunity to get access to Structural Funds resources that support regional innovation. For the past couple of years the trend for regional innovation promotion is marked by the centralisation of coordination to the national level and a shift towards OPs as the main (unique) funding mechanism. Recentralisation accelerated since 2010 and RIAs have become practically powerless, formal institutions, devoid of funding. With this U-turn the multi-level governance of science, technology and innovation policies was practically eliminated in Hungary.

2.2 Degree of institutional autonomy

In the 1999 Amendment to the 1996 Act on Regional Development and Physical Planning regional development councils were stipulated to be established in NUTS 2 regions (with delegated members, public administration actors), whose responsibilities – together with their agency type work organisations – include the design of regional development plans (programming and strategic planning) and the allocation of the decentralised regional development subsidies (Somlyódyné Pfeil, 2006). The development councils constituted the framework for the co-operation of different organisations. In the 2000s, when national innovation policies started to take the spatial/regional dimension into account, the science and technology policy experts of regional *development* agencies started to prepare innovation strategies (often together with specialised consultancy firms). Regional innovation agencies (RIAs) were founded some years later as a response to a tender announced by the

[12] Given that the RIAs have made important steps towards becoming self-financing, and have developed a range of services that can be provided on a for profit basis, the amount of the annual grant they currently apply for is only one third of previous yearly grants: €100,000. This amount is however not included into Hungary's draft budget of 2012.

[13] INNOREG as a public benefit association has currently more than 40 members, firms, NGOs and private persons. It tries to involve all possible stakeholders and improve thereby its lobbying power and multiply its network linkages.

National Office for Research and Technology in 2004, aiming at the establishment of as independent institutions to manage the regions' innovation activities.

Given its special organisational status, INNOREG's autonomy is quite limited: it is constrained to the representation of the region in innovation-specific discussions (e.g. with NKTH),[14] or within the network of the Hungarian RIAs (RIÜNET) and to the design of various regional innovation management actions, events and services. In principle, INNOREG is entitled to design and update CH's RIS. In reality however, the first and so far the only existing RIS was published in 2004, and prepared long before the foundation of INNOREG. CH's RIS was prepared by one of the later founders of INNOREG: CHIC, the Central Hungarian Innovation Centre and the related work was supported by the European Union's Fifth Framework Programme. The document was discussed by the Innovation Committee of the regional development agency in 2005, which asked for an updated version before it was submitted to the regional development council for formal acceptance. Since 2005 no additional, formal, written updates have been prepared. One reason for this deficiency (i.e. a lack of an updated regional innovation strategy, which is unique in Hungary) lies in the fragmented organisational setup and unclear distribution of responsibilities of INNOREG. The other reason is that officials in CH are probably more aware than their counterparts in other Hungarian NUTS 2 regions of the fact that regional innovation strategies are hardly taken into account in any respect and at any level in Hungary: RIS are just formal documents without any significant influence on the distribution of resources (cf. Horváth, 2010 about regional development strategies).

As for implementation, INNOREG's autonomy is even more restricted than that of other RIAs. On the one hand the content of regionally decentralised innovation support programmes have been decided upon centrally (by NKTH), and the RIAs' role has been restricted to determining the range of key strategic sectors that would receive targeted support in the framework of regionally decentralised programmes.[15] Out of the two main support programmes, over time the Baross Gábor Programme has become nearly identical in all regions,[16] and INNOREG's experts (similarly to experts in other RIAs) could only contribute to the design of the programme by suggesting sectoral priorities that would be taken into account by the otherwise identical calls. As for selection and decision-making, officials of the regional *development* agency were entitled to decide about the winning applications: INNOREG's officials only participated in the management tasks of the application procedures. As for the other major support measures: there was the Innocheck programme, which provided relatively small amounts of support funding to applicants in the form of innovation vouchers – over time INNOREG succeeded in making decision-making its own responsibility.

Annual calls for these two region-specific innovation support programmes were last announced in 2009. Since then no more decentralised government funding for the support of regional innovation exists in Hungary, the allocation of regionally earmarked EU Structural Funds specific grants is decided upon centrally. Although the amount designated to regional innovation support has significantly increased (funding is available now exclusively from the European Structural Funds), the management of the operational programmes (OPs) (as well as their design and decisions about the allocation of funding) is centralised by the National Development Agency. Thereby INNOREG's (and other RIAs') institutional autonomy with respect to the funding of innovation strategy implementation has been reduced to zero.

Although there may be valid reasons for a centralisation, (e.g., the described rivalry between organisations, the stated difference between Budapest and the county, preference of cohesion over more concentration – challenge 1), this is a question of principles. In fact, under certain circumstances centralisation may eliminate the deficiencies of decentralised management – in certain countries authoritarian political leadership is clearly more efficient than previous democratic experiences. In the long run however, as documented by various econometric analyses, democratic management / public administration etc. methods and democratic institutions fare better.

2.3 Availability and use of policy intelligence tools

[14] Since the end of 2010, the new name of the Office is National Innovation Office (NIH). In this report the old name and abbreviation will be used.

[15] According to NKTH officials' view, "full" decentralisation resulted in a multitude of highly diversified programmes, which was very difficult to administer and monitor. Therefore NKTH prepared a menu of programmes and regions could select from this menu and take region-specific features into account. This made the process of regional innovation policy implementation more efficient and easier to manage and administer.

[16] The 2008 and the earlier Baross Gábor calls still reflected regional specifics, but in 2009 the texts of the calls were already identical in the case of every region.

INNOREG's founding organisations, which were also innovation support organisations, have a long experience in innovation management. Innostart for example, is an accredited member of EBN BIC. This means the quality of its incubation and innovation management activities is certified. This is not surprising given its intensive participation in EU co-funded projects, the objective of which has been the exchange of experience and transfer of know how, Innostart has accumulated vast experience in the use of various policy intelligence tools, with respect to the support of technology-oriented start-ups; identification of local and regional innovative projects; early-stage financing; technical assistance to innovative SMEs; business incubation; design of local / regional development or innovation strategies, project engineering; project evaluation etc.

Valdeal Innovations Zrt. (another key intermediary innovation support organisation) developed its own integrated innovation management methodology based on American and German models adapted to the Hungarian and Central European business environment, these include technology evaluation, and viability studies, to financial & organisational and business planning, coaching, fundraising, marketing and commercialisation up till the expansion of the start-up firm. Both CHIC (another founding organisation of INNOREG) and Valdeal have a significant track record in EU co-funded project participation and have a broad overview of European best practice concerning project identification, incubation and development.

As for the application of evidence-based methods: evidence is in principle available in the form of statistical data, analyses and regional innovation intermediaries' databases. Hungarian regional innovation data – as part of an international comparison – is available in the Regional Innovation Scoreboard, on the PRO-INNO EUROPE website. Statistical data on regional economic and innovation performance is regularly compiled and published by the Central Statistical Office. The Regional Research Centre of the Hungarian Academy of Sciences has an office in Budapest (its centre is in Pécs, South Transdanubia, while regional institutes can be found in several other Hungarian cities) and Budapest-based researchers are also involved, among others, in CH-specific analyses, published in the Research Centre's discussion papers series. The Central Hungary Operational Programme (CHOP) applies SWOT analysis, benchmark comparisons in the field of innovation performance assessment. One section of CHOP contains an evaluation of the implementation of the regional operational programme between 2004 and 2006: it lists the main deficiencies of implementation and formulates a strategy about how to avoid these deficiencies in the current programming period.

Hence, the main deficiency in the context of development and innovation strategies is not the lack of modern policy intelligence and evidence-based methods: they are formally applied. The main deficiency is rather that strategies are often no more than wish lists: their implementation remains ad hoc and partial since the link between individual strategy items and funded programmes is missing or at least ambiguous. These problems are magnified by significant delays in funding. On the other hand, modern policy intelligence tools are applied mainly to support and improve upon the profit-based regional innovation management activities of the regional intermediary organisations, such as the identification of promising start-ups, early-stage financing; technical assistance to innovative SMEs; business incubation, etc. These tools are not applied to evaluate and assess the impact of non-profit activities related to regional innovation strategy implementation.

2.4 Key challenges and opportunities

At a time when **unprecedented amounts of funding** are available **from EU Structural Funds for innovation purposes**, **the main challenge** faced by innovation policy decision-makers **is to design programmes that use this opportunity effectively and that contribute to long-term innovation-based development in the region.** European Union Structural Funding offers the opportunity to overcome the trade-off between excellence and cohesion in CH. If utilised systematically to underpin growth based on regional scientific excellence the resulting spillovers and the intensifying linkages may turn the region into an effective driver of national growth.

Another challenge is to improve both the quality of the region's public services (especially health and transport services) and support cultural and creative industries. This would address the challenges of the recent deterioration of these services and the acute funding shortages of these industries – both of which are crucially important for a capital region.

To address these challenges and benefit from these opportunities the regional institutional base must be reinforced, just as governance and policy coordination must be improved: this will embody a move from government to (multi-level) governance.

However, the reality is that **the ongoing processes reflect a shift in the opposite direction**. The weakness of the meso-level is a historical legacy, which Hungary has been unable to overcome. **EU accession and acquis driven decentralisation and the creation of meso-level institutions proved to be only a formal, de jure action**. **The recurring use of hierarchical solutions**, justified by the necessity of adopting fiscal austerity measures, and distrust between national- and regional-level institutions **hindered the development of meso-level institutional capacities and prevented regional institutions from safeguarding their autonomy**. The main instruments of recentralisation were financial mechanisms.

Since 2009, no decentralised tender calls targeting regional innovation have been announced (neither Baross Gábor, nor Innocheck programmes). The disbursement of past contracted innovation support was suspended by the new government in 2010, the contracts were reviewed and recipients' political and business linkages were evaluated (as opposed to their performance and the results of the proposed activities). The disbursement of obligations has therefore suffered long delays. 2010 and 2011 were 'blind spots' for regional innovation. The positions of both INNOREG and other RIAs are still unclear in the new national innovation system. Most probably their network will be maintained, but the central funding of their activities will be reduced to a minimum, which prevents them functioning as a stakeholder in partnership-based governance of regional innovation. Instead of being the main coordinating and supporting actors of regional innovation, entrusted with strategy design and implementation (or at least with the coordination of implementation) they will instead become regional innovation intermediary organisations with profit-based activities. On the other hand, due to their intensive participation in EU co-funded projects, they will become research performers themselves.

Therefore, the amount the central budget can save will produce huge opportunity costs. Regional operational programmes will allocate huge amounts of funding to promote, among other things, regional innovation objectives. However, **the allocation of funding will be devoid of strategic considerations, and will not be based on region-specific policy intelligence. Hence, funding will probably result in suboptimal results: policy efficiency and the long-term multiplier effects of funding will be jeopardised and no coherent regional innovation strategy will be implemented.**

3. Innovation Policy Instruments and Orientations

3.1 The regional innovation policy mix

Although regional innovation literature has reached a consensus on the idea that multiple types of innovation systems co-exist within countries (Marsan & Maguire, 2011; Wintjes & Hollanders, 2010; OECD, 2011; for Hungarian specifics see: Lengyel & Leydesdorff, 2011), the innovation policy mix of CH (as it is in other Hungarian regions) contains hardly any region-specific elements.[17] OECD (2011) presents a telling figure (3.1, p. 125) that shows the number of innovation policy instruments used by national and regional governments in 21 OECD economies. The gap is by far the largest in Hungary: the ratio of regional to national instruments is the lowest of all.[18] In CH's case, the small number of instruments used specifically at the regional level can be partly explained by the extraordinary concentration of innovation activities in this region. Nevertheless, the fact that policy levers in CH are more or less identical to those at the national level reflects a deficiency of multi-dimensional approaches to innovation policy-making in Hungary. In fact the number of regionally decentralised instruments[19] indicated in the cited OECD book was only valid in the second half of the 2000s, up till 2009. In 2010 there was only one (phasing out) regionally decentralised instrument in place, that of NKTH's tender supporting the functioning of RIAs. Hence, the orientation and content of regionally

[17] Baross Gábor Programme, Innocheck Programme and the programme that funds the establishment and the functioning of RIAs.

[18] This is partly due to the extraordinary large number of national STI policy measures. See Havas, 2011 about the 'Hungarian paradox' of poor innovation performance despite a complex network of institutions and organisations that form the national innovation system, and a wide portfolio of STI policy measures.

[19] According to OECD, 2011 this number was two – in reality there were three instruments (as detailed in section 3.1) that can be labelled as par excellence regionally decentralised, not including the Central Hungarian Operational Programme that has always been managed centrally. Note that regional budgetary allocations do not necessarily refer to regional decision-making power: in Hungary the budgets of regional OPs are obviously decentralised, decisions however have remained at the national level.

decentralised instruments analysed below are restricted to the regionally implemented instruments, though policy measures co-financed by the EU Structural Funds are also included.

Governance and horizontal innovation and research policies

The first measure that (indirectly) targeted regional innovation governance was the European Commission's FP5 RIS INNOV-AXIS programme aiming to support regional innovation strategy design in accession country regions (and ensure the transfer of know how by including advanced economy regions as twin-regions). It was in the framework of this programme that CHIC (that later became one of INNOREG's founding organisations) prepared the RIS of CH, with contributions from Innostart and other consultancy firms. The adoption of the updated strategy by Pro Regio Regional Development Agency coincided with NKTH's tender aiming to establish and grant support to the functioning of regional innovation agencies that ensure systematic strategy implementation. This latter measure is the longest lasting one in the region, seeing as it was renewed in 2008 and will end in February 2012.

As for horizontal innovation and research policies, the most important measures in place are those, announced in the frame of the Central Hungary Operational Programme focusing on the development of accredited innovation clusters, and technology centres / co-operation research centres (targeting industry-university/PRO co-operation and technology transfer). Cluster programmes were related both to horizontal co-operation, and to the promotion of specific industries / technologies. Support to the development of accredited innovation clusters was continued in the framework of the Enterprise Development Operational Programme of the New Széchenyi Plan.

Research and technologies

Direct support to regional innovation performers' R&D activities was one of the most important targets of regionally decentralised innovation support measures. The annually announced Baross Gábor Programmes (a regionally decentralised programme) supported innovative firms' and industry–university/PRO consortia's research projects, as well as innovation performers' investments into R&D infrastructure or into technology development. Regionally decentralised Innocheck programmes provided indirect support to stakeholders' innovation efforts (the programme promoted small and micro-sized firms' demand for innovation services in the form of innovation vouchers that could be used to purchase of innovation related services (business and technological consultancy services, feasibility studies, marketing, IPR issues related consultancy, incubation services etc.).

Direct support for regional innovation stakeholders' RTDI activities was granted by several CHOP measures either under headings referring directly to the support of market oriented R&D activities, or under headings that supported accredited innovation clusters. In reality, these latter project proposals made little reference to cluster related co-operation activities: instead they have tended to detail the content of the proposed R&D action (performed by members of accredited clusters).

The New Széchenyi Plan, launched in 2011 as a substitute for the New Hungary Development Plan[20] has not announced regional OPs, only functional ones. Nevertheless, several measures announced under functional headings, such as the Science Innovation Programme (SIP) and the Enterprise Development Programme (EDP) are earmarked regionally. In the framework of SIP two programmes were earmarked for CH: one supported regional stakeholders' innovation efforts, the other granted support to the commercialisation of SMEs' R&D results. On the other hand, EDP's policy instruments targeted regional enterprises' (SMEs') investments into technology development. Other EDP measures granted support to SMEs' process development projects. EDP also provides support to non-technological innovation, specifically to the development of e-commerce targeted at regional stakeholders.

Human resources

The regional *innovation* policy mix does not target human resources in terms of supporting higher education institutions' education activity. In Hungary this is actually supported by regional *development* policy (by Structural Funds co-financed operational programmes). Priority 3 of the New Hungary Development Plan (Social Renewal) targets among other things tertiary education, specifically the development of human resources necessary for research development and innovation.

The Social Renewal Programme (and also the Social Infrastructure Programme that supported investments into HEIs' educational infrastructure) granted funding to universities and some other

[20] The plans are the framework documents for allocating the financial resources provided by the EU Structural Funds together with the national contributions.

HEIs the volume of which proved unprecedented, previously unimaginable! These measures have contributed to the 1) improvement of educational services; 2) launching of university-based research projects; 3) development of competence centres, 4) establishment of organisations specialised in the transfer and commercialisation of universities' scientific results; 5) large-scale investments into universities' R&D- and educational infrastructure etc.

HEI-specific R&D projects of the Social Renewal Programme were continued by New Széchenyi Plan's SIP.

Technology-oriented entrepreneurship

The main regionally decentralised instrument designed to promote the establishment and growth of technology-based enterprises was the Innocheck programme, which gave innovation vouchers to SMEs so that they could be used among other things for incubation purposes, for the preparation of feasibility studies, or for the purchase of technical assistance services.

Business incubation is relatively developed in CH: there are many bridging institutions that operate partially on a profit basis and partially as public benefit foundations. The two main organisations that specialise in business incubation and innovative start-up financing are CHIC and Innostart, which received regular funding from NKTH to carry out specific services on a public benefit basis. In the case of Innostart regular public (NKTH) funding covered the organisation's membership fee in the European Business Network.

A national programme with regional implications that focused on the support of technology-oriented entrepreneurship was the Regional University Knowledge Centre (RUKC) Programme.[21] RUKC was an integrated university-based programme involving knowledge generation, diffusion and exploitation. University-based research projects involving industry-university co-operation, technology transfer and the establishment of spin-off companies were targeted for funding by the programme. RUKC programmes were announced three times in the period between 2004 and 2006. The programme provided support to altogether 19 universities, seven of which were CH-based.

Support for technology-oriented entrepreneurship gained a new impetus with the Structural Funds co-funded programmes, which were aimed at stimulating universities' technology transfer activities (Social Renewal Programme of the New Hungary Development Plan) supporting the establishment of business incubators and supporting the development of the incubators' services portfolios (CHOP business incubator programme). CH innovation stakeholders can also access JEREMIE funding instruments. JEREMIE, i.e. "Joint European Resources for Micro to medium Enterprises" is an initiative of the European Commission together with the European Investment Bank and the European Investment Fund, launched in 2005. In Hungary, the venture capital (VC) part of the JEREMIE initiative was introduced in 2009, (the micro loan and SME working capital financing programmes started earlier). JEREMIE VC programme was launched with the aim of improving Hungarian SMEs' access to capital in the early ("seed" and start-up) and growth stages of an innovation project. In the framework of the JEREMIE initiative eight Hungarian VC Funds were created. Only one of them, Euroventures IV VC Capital Fund is entitled to carry out VC investment in CH, on the basis of equity co-investment (with other private investor/s).

Markets and innovation culture

The most important element of INNOREG's activity was its contribution to the improvement of regional innovation culture. In INNOREG's case, the dominant part of the regionally decentralised funding aimed at supporting the establishment and the functioning of RIAs was used for financing regional innovation awareness actions and information provision. Innovation information points were established throughout the region providing consultancy services and information about regional innovation activities and results, particularly focusing on INNOREG and its members' services and fundraising possibilities. These activities contributed to compiling a continuously increasing regional innovation database to be used later for policy intelligence purposes. Furthermore, INNOREG organised a series of conferences and workshops and business partner meeting events in the framework, where promising projects and best practice cases were presented. There were also fundraising and tender participation possibilities. Regional innovation culture has also been enhanced through various prizes being established (such as the 'Most Innovative Product' and the 'Regional Innovation Grand Prize'). Both INNOREG and its founding organisations contributed to the preparation of innovation management and cluster management textbooks and training curricula, and

[21] From 2005 on this programme was renamed Pázmány Péter Programme

provided accredited training services. INNOREG's website was used for the communication of region-specific innovation related news (an online regional innovation magazine: KOINE was founded).

Table 2

The regional innovation policy mix

Name of scheme / Policy objective	BGP	Innocheck	Financed by INNOREG	CHOP	Other
Institution-building, institutional capability accumulation	X		X		X
R&D activities (corporate)	X	X		X	X
R&D activities (HEI- and PRO-based)	X			X	X
R&D infrastructure development	X			X	X
SMEs' product development activity		X		X	X
Technological development in SMEs		X		X	X
Technology-oriented entrepreneurship	X		X	X	X
Science-industry co-operation and technology transfer	X	X	X	X	X
Human resources development			X	X	X
Innovation stakeholders' participation in international projects	X		X		X
Improvement of regional innovation culture	X		X		X

BGP = Baross Gábor Programme, CHOP = Central Hungary Operational Programme, Other = other OPs including Economic Development Operational Programme and Social Renewal Operational Programme as well as national innovation policy schemes

Source: compilation by the author

3.2 Appraisal of regional innovation policies

In contrast to other Hungarian RIAs, INNOREG's operation is characterised by the network model rather than the single agency model: in other words, it is a network of intermediaries and innovation services providers. Previous sections (2.1 and 2.2) have already detailed that this type of organisational set-up has constrained the agency's room to manoeuvre. At the same time national policies kept trying to reverse initial decentralisation moves and restrict RIAs' autonomy through financial mechanisms.

It has to be stressed that the evaluation of the efficiency of the regional innovation agency's policy can be justified only if it possesses a sufficient amount of autonomy that it can design and implement a set of actions. In INNOREG's case this condition does not apply. Nevertheless it is fair to say, that despite various problems beyond its control, INNOREG's performance was below its potential. Firstly, it failed to co-ordinate policy across intervention fields and levels. Although by the time of INNOREG's foundation its founding organisations had developed ample expertise in innovation management (from facilitating knowledge generation to knowledge diffusion and knowledge exploitation), and had established linkages with major regional, national and a number of international stakeholders, their existing knowledge assets and their enhanced activities have failed to produce the expected synergy effects.[22]

Secondly, INNOREG did not even strive to design and facilitate the implementation of a strategic vision. A major problem that limited the efficiency of regional innovation policies was the lack of a coherent roadmap in the field of innovation. Without targeted funding INNOREG has not made any efforts to design a mid-term strategy, identify region-specific innovation challenges, select priorities, set targets or try to align national and regional policy implementation.

Both INNOREG and its founding organisations (and also other innovation / development policy stakeholders within CH and in Hungary, at the national level) had an old, outdated idea of what

[22] This was the opinion shared by several of the interviewed stakeholders (No. 2, 4, 5 and 6) and the Vice-President for Fund Handling and Regional Affairs of the National Innovation Office (interviewed when preparing the regional innovation report on South Transdanubia) also shared this view.

(regional) innovation policy-making was about. Instead of trying to conceive a mid-term vision about the way the regional innovation system should look like, and contributing to strategy implementation, they were simply concerned with the redistribution of funds available for regional innovation purposes. Since this is the aspect of policy-making that has over time become increasingly centralised, regional innovation policy was obviously considered inefficient, by all stakeholders. In fact, policy failed to produce the expected synergies, or at best its multiplier effects have been restricted to selected success stories.

Nevertheless INNOREG's activity has had some clear merits as well. As a learning organisation over time it has managed to find its place within the regional innovation system. It has built a dense network of linkages and accumulated in-depth knowledge about regional innovation stakeholders, which allowed it to adjust flexibly to changes in the external environment.

INNOREG has undeniable merits in promoting regional innovation culture, and raising awareness among stakeholders of innovation issues, including previously non-innovating regional SMEs. It is worth noting that according to the interviewed stakeholders this was their main ambition: hence if success is the function of the fulfilment of ambitions, this activity was really successful.

Another achievement was that INNOREG's officials have initiated a systematic evaluation and monitoring of the Innocheck programme, the only programme where INNOREG could independently decide how to allocate funding. Thereby INNOREG contributed to policy learning and this activity has triggered non-negligible learning effects among support recipients. Innocheck also proved highly efficient in terms of raising stakeholders' awareness of the importance of non-technological innovations, such as the introduction of modern management techniques; the alignment of technical ideas to market needs through market screening and feasibility studies; the benefits of careful business model selection, and related organisational innovations, etc. In summary, this programme has raised the awareness of innovation performers to the fact that non-technological factors are important prerequisites for turning an invention into a business success.

Some external factors have also had an impact on the efficiency of policy delivery. Policy cycles and recurring fiscal austerity measures produced a major negative impact, mainly by reducing the predictability of policy implementation. Another negative external factor has been the usual delay with the transfers of central support[i] both to corporate and university grant recipients and to intermediary organisations responsible for innovation policy implementation.

3.3 Good practice case

As expected for a region where the majority of national innovation activity is concentrated, CH abounds in innovation success stories. A survey of a selection of them reveals that high performance cannot be linked to specific policy schemes, as actors have generally received support from various sources (including regional, national, EU Structural Funds co-funded, and EU RTD Framework Programmes).

As for a good practice case in terms of *policy practice,* the lack of evaluation by independent experts makes the selection somewhat biased. When asked about their suggestions of a good policy practice case, the interviewed stakeholders unanimously opted for the Central Hungarian Innovation Prize (CHIP) founded by INNOREG. Stakeholders' selection is motivated neither by the availability of credible evidence of success, nor by the strategic orientation and real innovativeness of the scheme but rather by the fact that this was the only scheme established at the regional level. The other instruments were to some extent regionally decentralised, but they were all established at the national level, and regional stakeholders were simple intermediaries in these programmes.

CHIP was founded jointly by INNOREG and the Central Hungarian Regional Development Council in 2007. Inspiration came from the national innovation prize: the Hungarian Innovation Grand Prize was established by the Hungarian Innovation Association in 1991 and has been announced annually every year since then. The idea of establishing a similar prize at the regional level was first criticised by national innovation stakeholders, given that in Central Hungary it is difficult to distinguish outstanding regional innovation performance from that of the national level. INNOREG's officials argued that the SME focus of the regional prize is a clear distinguishing element. In contrast to similar regional innovation prizes established by other RIAs CHIP is not accompanied by even a symbolic amount of funding: it is a certificate of achievement and a glass sculpture handed over to the recipients at the award ceremonies.

Allocated first in 2009, it generated a good response from innovative firms (14 applications were submitted), hence application procedures for the prize were announced again in 2010. Three prizes are distributed, rewarding regional SMEs' innovation performance.

Synergies with national and regional measures are ensured by the fact that awarded recipients were usually supported by other national and regional policy schemes that contributed to their innovation generation. CHIP on the other hand contributes to dissemination and diffusion of new solutions, products and technologies, because the award ceremony enhances the marketing and PR efforts of innovative firms. Thereby CHIP enhances regional innovation culture.

As of 2009, INNOREG also contributes its expertise to the screening and the assessment of the applications for the Hungarian Innovation Grand Prize (HIGP). In an effort to increase its visibility, it participates at HIGP ceremonies and awards a special prize to a selected SME applicant, called the 'Prize for the Most Innovative Product'. This prize includes a voucher that entitles the recipient to a package of Innostart's (INNOREG's founding organisation's) innovation management services.

3.4 Portfolio of innovation support measures

Given that the majority of national innovation activity is concentrated in CH (table 1), it is more appropriate to analyse the national innovation strategy and policy mix that applies to the CH region, than it is to concentrate on purely regional measures. Hence, in CH's case the innovation policy mix consists of 1) regionally decentralised measures; 2) INNOREG's (and consortium members') support activities; 3) the regional operational programme (CHOP); 4) the national policy mix and 5) other OPs targeting innovation.

Regionally decentralised measures including NKTH's tenders to finance RIAs' activities, Baross Gábor and Innocheck programmes supported:

- institutional capacity building and the functioning of institutions responsible for the coordination and governance of the regional innovation system
- R&D performers' investments into R&D infrastructure;
- corporate R&D activities, as well as higher education institutions- (HEIs) or public research organisations- (PROs) based R&D activities;
- Innovation performers' purchase of research and technology services;
- Innovation stakeholders' participation in international projects; and
- Technology-oriented entrepreneurship.

INNOREG's policies have mainly focused on the promotion of regional innovation culture (section 3.1). Other policy initiatives included project generation: in a co-operation agreement between Innostart and the Hungarian Academy of Sciences (HAS), Innostart's experts screened the research results of various HAS-institutes and selected the ones with promising commercialisation opportunities.

The third constituent of the regional innovation policy mix (though its management was not decentralised) was the Central Hungarian Operational Programme. Taking regional specifics into consideration, a substantial part of this programme focused on the support of RTDI activities (as opposed to other regional operational programmes that provided funding mainly to the development of the regional infrastructure, of tourism, and of health and educational services). 80% of projects that have received support from CHOP targeted innovation in one form or another, and 34.8% of total CHOP funding was allocated to support innovation purposes (Source: RDA Statistical Database, author's calculations).

Several CHOP project calls were announced in support of market-oriented R&D activity. Direct support was granted to business enterprises' process development and technology development efforts, as well as to non-technological innovations (e.g. quality certificates, e-services, etc.). Projects of CHOP that supported the establishment and the development of industry-university R&D centres, innovation and technology parks, and accredited innovation clusters proved highly popular, triggering responses from a great number of potential beneficiaries. Other calls envisaged institutional development, e.g. they supported the establishment or the development of technology incubator centres, and technology-oriented industrial parks. A few projects targeted the development of specific technologies, mainly that of environmental technologies.

The importance of the national innovation policy mix is demonstrated by the fact that between 2005 and 2009 CH recipients were allocated 60.8% of total national support from the Research and Technological Innovation Fund (source: author's calculation from NKTH, 2010 data). National policy schemes to support innovation are highly diversified each individual policy objective is supported by a number of partly overlapping policy measures (Havas, 2011).[23] The ones that were considered important by regional actors were the following:

- National Technological Platform Programmes
- National Technology Programme (Strategic Research Programme)
- Programme for the retention of R&D workforce
- Apponyi Albert programme aiming to support researchers' mobility;
- Basic research programmes financed by the National Scientific Research Fund.

The fifth constituent of the regional innovation policy mix consists of the operational programmes co-financed by EU Structural Funds. The innovation activity of regional stakeholders was specifically targeted by the Economic Development Operational Programme (EDOP), the Social Renewal Programme and the Social Infrastructure Programme (section 3.1. and 2.2).

Although no statistics are available yet on the regional level distribution of total funding from the above-enumerated five groups of policy instruments, according to the interviewed stakeholders EU Structural Funds co-financed policy schemes provide by far the largest amount of support to regional innovation objectives. The share of this funding keeps increasing with the phasing out of regional policy instruments, and especially with the quasi elimination of national innovation policy schemes since 2010. Reflecting an old, traditional and more or less outdated perception of innovation policy, a very large share of innovation related funding from the operational programmes was allocated to achieve physical development purposes: development of science and technology parks, clusters' infrastructure, investments into universities' and PROs' research lab equipment etc. The other traditional target of innovation policy instruments is the support of public and private innovation performers' research projects was considered of near equal importance. Funding from both national, and increasingly EU-sources targets the R&D efforts of innovative firms.

National innovation funding started to decrease in 2009 due to fiscal austerity induced annual freezes in the National Research and Technological Innovation Fund (KTIA). In 2010, HUF 16 billion (about 33 % of the total annual income) was frozen, followed by another freeze of HUF 9 billion in 2011. Since 2010 the only programme funded from KTIA is the support of bilateral scientific and technological co-operation with foreign partners.

3.5 Towards smart specialisation policies

While the 2004 RIS specified only horizontal priorities including 1) "the improvement of the business environment for regional SMEs" (and enhancing their commitment to co-operation with other regional actors, multinational enterprises, innovation intermediary agencies etc.); 2) the "development of product and processes" (through training activities, fundraising etc.); and 3) the "diffusion of innovation culture" (CHIC, 2004); the Budapest Development Pole Strategy (Barta, 2006) already envisaged the targeted development of selected sectors and technologies. The strategy listed three technologies / sectors to be supported: ICT, including the development of information society, biotechnology and medical technologies (MediPole), and environmental technologies (EcoPole).

The pole strategy marked a clear policy shift towards smart specialisation. It reflected the recognition that regional innovation policy has to address not only RTDI issues, but societal and environmental challenges as well. In this respect it can be considered exemplary that ICT development envisaged not only knowledge generation and industry-university co-operation, but also considered information society aspects. With the selected technologies and industries the strategy tried to build on existing endowments, enhance the development of the region's existing scientific assets, attract and concentrate talent and promote the diffusion and the commercialisation of scientific results.

As described previously (in section 2.2) the funding allocated to the support of the implementation of pole strategy objectives (various calls of Structural Funds co-financed OPs) was not unambiguously linked to the actions described in the strategy, which reduced the coherence of its implementation.

[23] See ProInno Europe's annual reports: "Inno-Policy Trendchart, Hungary" for a detailed portfolio of national policy measures.

Nevertheless OPs targeting the development of ICT, health and environmental technologies-related university-based competence centres have effectively promoted competitiveness, poles-based, smart specialisation. The number of cluster members increased rapidly because private firms have recognised the opportunity of supported research projects and have complemented the initial funding with their resources and contributed to the transfer and the diffusion of technology. Knowledge clusters have accumulated a dense network of industry-university linkages.

One of the success stories is the establishment and evolution of the Mobility and Multimedia Cluster, MMC (founded in 2007). The Cluster – with its 70 member organisations and €25m stock of research projects (in 2011 cluster members altogether participated in 22 RTDI projects) – is the key actor of the ICT Pole. The cluster itself was supported by CHOP (support to accredited innovation clusters) and several cluster members received EU SF support independently or in consortia. The cluster also gained support in the frame of the National Technology Platform Programme. Cluster members have developed a wide range of new products, services and solutions, participated in international projects and were represented in international and EU-level events (CEBIT, ICT Proposers' Day, ICT2008 conference etc.). As an independent initiative, cluster members conceived of a national info-communication strategy and organised events in which national innovation policy stakeholders could discuss it with the representatives of business and academia. In summary, MMC's history and evolution is in sharp contrast with that of INNOREG: here member organisationsal capacities and competencies have produced non-negligible synergy and multiplier effects at cluster level.

The main success factors of the 'pole programme' were the activity and the ambitions of stakeholders in the three selected sectors. They have recognised the opportunity offered by the initial document (i.e. the 'Strategic Concept of Budapest Development Pole') and have systematically participated in all kinds of related tenders. They have thereby achieved a range of complementary investments that support the given scientific and technological fields related to their RTDI efforts. Actors have systematically communicated their achievements making reference to the respective cluster every time. Thereby, they have *invigorated the initial concept* of the three poles, which contributed to its sustainability. Hence, in contrast to other strategic programmes (e.g. RIS) the policy document of the pole programme did not remain on paper even if – according to stakeholders – the project co-financing type coordination i.e. the lack of a targeted national programme that would fund the implementation of the programme was an important deficiency.

3.6 Future orientations and opportunities

We can conclude this report by reiterating the main lesson, the case of what a region with a relatively outstanding innovation performance can offer – given the context of a relatively underdeveloped national innovation performance. In relatively developed regions (especially in capital regions) multi-level partnership-based planning, governance and strategy implementation is even more indispensable than in other regions, because of a relatively higher institutional density, and increased complexity of development / innovation issues.

Although Central Hungary could easily have capitalised on its existing knowledge and technology endowments and multiply the impact of support actions, innovation policy stakeholders (at all levels) have failed to maximise the impact of policy intervention. As a consequence of a lacking vision (and mid-term strategy) and of the failure to position this spatial unit in the national innovation system, **the spontaneous development of stakeholders was not reinforced by policy levers**. Deficiencies in strategy design and implementation, alongside inter-organisational rivalries and actors' over-politicised behaviour (instead of multi-level partnership-based co-operation) have, however, not been manifest in regional innovation performance indicators. The indicators themselves have significantly improved over the past half a decade and the gap between the developed CH region and the rest of Hungary has sizeably increased. This is however the result of spontaneous development driven by agglomeration forces: mainly by the fact that Hungarian innovation performers are concentrated in this region.[24]

Regional innovation actions have produced some positive outcomes, especially in the field of increased awareness (improvement of innovation culture). Regional SMEs' have become somewhat more committed to innovation than before. **Due to regional innovation intermediaries' systematic work, regional SMEs have accumulated some knowledge about the available innovation management services and have become aware of the importance of non-technological**

[24] As formulated by Borsi & Bajmóczy (2009, p. 942), „among the Hungarian regions, it is only Central Hungary the innovation indicators of which compare to European NUTS 2 regions."

innovations. Industry-university co-operation has intensified and innovation performers participate in international research undertakings (and networks of excellence) increasingly frequently.

In summary, **the outstanding** (within Hungary) **regional innovation achievements**, including the scientific results of research universities; the emergence of a layer of technology-based, born global entrepreneurs; the performance of gazelles in knowledge-based sectors; the innovative results of MNEs' local research departments, etc. –**reflect** on the one hand a **spontaneous development based on existing endowments** and on the other hand **the impact of national innovation policy schemes – rather than the impact of the regional innovation strategy** or the beneficial consequences of the activities of the regional innovation institutions.

Future policy actions should **break with previous practice** in two main regards. Firstly, at the national level **CH's position within the national innovation system should finally be identified**. Secondly, a **region-specific innovation strategy should be conceived of and implemented in a partnership-based process with regional stakeholders**.

In the case of knowledge-intensive capital regions where national innovation activity shows a high concentration, both levels have to contribute to strategy design. At the regional level, however, involvement in strategy design and implementation should be intensified. Regional innovation strategy and policy schemes should *complement* the national strategy and the schemes, regional policy governance should work in partnership with the national level so as to *reinforce* each other's impacts. CH's innovation policy stakeholders have to become more proactive, launch bottom-up initiatives, and contribute to the positioning of the region both at the national level and internationally.

Future opportunities depend on the direction of the restructuring within the regional and the national innovation systems. In the likely scenario of maintaining only a formal regional innovation system with power- and resourceless institutions, it is up to the corporate, the HEI- and the PRO-based regional innovation stakeholders to pursue their activities within an increasingly centralised system: grab the funding opportunities offered by the Structural Funds, carry out RTDI activities, try to commercialise the results, and try to become increasingly connected globally, and exploit the opportunities European and global linkages offer.

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Appendix B Stakeholders consulted

1. Zoltán Hantos, vice-president of CHIC, Central Hungarian Innovation Centre (5 October 2011)
2. Tivadar Lippényi, Former vice-president of the National Innovation Office (26 September 2011)
3. Gábor Magyar, Senior officer, Innopolis Pole Programme, Director of ICT Development Programme (12 September 2011)
4. Attila Márta, vice-president, INNOREG Regional Innovation Agency of Central Hungary (30 September 2011)
5. András Révai, president, INNOREG Regional Innovation Agency of Central Hungary (5 October 2011)
6. Gábor Szabó, Former chairman of INNOREG Regional Innovation Agency of Central Hungary (23 September 2011)

[i] The time requirement of the selection process (decisions on the winning project applications) has also been prohibitively long. According to Borsi (2010), between 2004 and 2009, the average time that elapsed between applicants' submissions of a project proposal and the signing of the contract on funding by NKTH and the winners was 200 days. The cited report notes, that in the case of Baross Gábor and Innocheck Programmes this time requirement was much higher than the average. (pp. 161-163)

Appendix C Repository information

Baseline regional profile

- MAGYARORSZAG
- KOZEP-MAGYARORSZAG
- Region Central Hungary
- NUTS Code HU10

Regional Profile

Introduction

Central Hungary is the economic, administrative and cultural "heart" of the country, it is Hungary's most developed region. Its share in Hungary's GDP was 48.1 % (2008), mainly due to the high share of Budapest (37.7 %), and has been growing over time.The region encompasses one NUTS 3 regions (Pest county) and the capital of Hungary, Budapest. It has a total population of 2.951 million in 2010 (3.4 % more than in 2001), on an area of 6,919 sq kms. Thus it is home to almost one third of Hungary's total population. The population of Budapest is 1.722 million, up by 1.4 % since 2001.

Repository

Support measures

- Pázmány Péter Programme Regional University Knowledge Centers
- Innocheck plus Central Hungary (ten rounds)
- Baross Gábor Programme Central Hungary Region 2009 Development of R&D Infrastructure (REG_KM_INFRA_09)
- Baross Gábor Program Central Hungary Region 2009 R&D projects (REG_KM_KFI_09)
- Elite Research University scheme
- Central Hungary Regional Innovation Prize
- Support of commercialisation of innovations in the Central Hungary region
- Support of enterprises' complex technological innovations in the region of Central Hungary

Policy documents

- Central Hungary Operational Program 2007-13
- Central Hungary Operational Programme Action Plan 2011 - 2013
- The Regional Information Society Strategy of Central Hungary
- Strategic Plan of the Central Hungary Region 2007-13, "The creative region"
- Regional Innovation Strategy of Central Hungary

Organisations

- Pro Regio Agency
- Innoreg (Regional Innovation Agency of Central Hungary)

- Valdeal Innovations Zrt.
- CHIC Central Hungarian Innovation Centre

Economy

The region's GDP per capita was 4,387 thousand HUF (€17.461 [1]) in 2008, the highest in Hungary. This is 104.1 % of EU27 and more than 160 % of the national average. Budapest's indicators are 139.2 % of EU and 221.9 % of the national average. The region's economy is centered around services: they account for more than 77 % of gross value added in the region (82.2 % in Budapest), while the national average is 66.2 %.

The number of registered companies was 568,209 (end 2009), 33.7 % of total. 393,396 of the region's firms are registered in Budapest. The number of companies with foreign capital was 20,328 (2008), representing 70.1 % of total. The share of the regional stock of FDI in Hungarian total was 64.4 %.

The region's unemployment rate is lower than the national average (6.6 % versus 10.0 % in 2009), while its activity rate was the highest (58.7 % versus 54.7 %). Budapest has the best indicators (6.2 % and 59.7 % respectively) in Hungary. The number of inhabitants receiving state aid was quite low, underlining the high level of development: only 7 % of total recipients and 0.5 % of the population of the region.

Central Hungary is an aging region, the aging index: the number of old age (>65) inhabitants relative to that of children (0-14) increased from 109 to 115.6 between 2001 and 2009. Both data are higher then the national average. Life expectancy indicators are better than the national average. This latter can be explained by the relative wealth of the region.

Central Hungary is the economic centre of the country; its economic performance is outstanding in Hungarian comparison. However, this performance is concentrated to the capital, Budapest and its agglomeration. Thus, inside the region, there are at least three distinct parts with different level of development, different economies etc. The region, and inside it Budapest is specialised to a great extent on services, and it is the hub of creative, knowledge based activities in the country, such as R&D, computer activities, informatics, business services etc. Related employment is concentrated here and agglomeration effects play an important role in the location of these. Its share in the value added of these activities amounts to more than half of Hungarian total.

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[1] Annual average exchange rate: 251.25 HUF= 1 EUR

Research, Development & Innovation

Hungarian R&D is concentrated to a great extent geographically, Central Hungary, and inside it Budapest is the main hub in that respect. There were 1,332 research centres in the analysed region, of which 1,152 in Budapest. These represented 47.2 % and 40.8 % of the Hungarian total, respectively. The number of R&D staff was 17,669 in 2008, which represents almost 65 % of the Hungarian total. Regional GERD amounted to 172,244.8 million HUF (€685.55 million) in 2008, 64.7 % of total. This is 1.33 % of regional GDP, higher than the national average of approximately 1 %. Higher education research institutions, together with business enterprises R&D are most probably dominating in the region.

The majority of the research institutions of the Hungarian Academy of Sciences are located in Budapest. There are numerous university-based research centres as the region (Budapest) is also the centre of Hungarian tertiary education with around half of Hungarian students attending universities in the region. Many well-known multinationals established R&D centres in the region (mainly in Budapest). There are research projects, which have been established by private and public partners, such as Transportation Informatics and Telematics Knowledge Centre. Budapest hosts science parks as well. Infopark, Central and Eastern Europe's first technology and innovation park is sandwiched between two universities: Eötvös Lorán University and University of Technology and Economics. It is home mainly to ICT firms and to the European Institute of Innovation & Technology. Moreover, there are numerous clusters operating in the region, representing collaboration of industry, academia and local SMEs. There are many industrial parks, but the number of incubators is relatively low.

As for innovation output indicators, in 2008 the number of Hungarian and foreign language publications related to Central Hungary was 12,816 and 10,141, respectively, which represented 58.2 % and 63.9 % of the total.

Governance

The main governance level for the design and implementation of innovation policy is at NUTS 2. The main actor is the Regional Innovation Council of Central Hungary and its working agency (Regional Innovation Agency of Central Hungary -INNOREG). INNOREG is a consortium, which was the winner of the National Office for Research and Technology's call for proposal of Regional Innovation Agencies. The leader of the consortium is Infopark, its members are Budapest Enterprise Agency, CHIC Central Hungarian Innovation Centre, Business Innovation Centre Gödöll, INNOSTART National Business and Innovation Centre, Pest County Foundation for Enterprise Promotion and Pro Régió Agency Central Hungary Regional Development Agency Ltd. INNOREG participates in innovation strategy design as well as in the measurement of regional innovation and in the monitoring and evaluation of regional innovation programmes. INNOREG's main aims are to harmonize regional innovation processes, to ensure the information flow between economic actors, to coordinate funds for innovation, to expand national and international relations, to provide innovation services and to integrate them into a

unified system.

In 2004, an innovation strategy document was prepared. In 2005, a supplement was added. Regional innovation strategy observes the guidelines and priorities stipulated in the Central Hungarian Operational Programme of the New Hungarian Development Plan and the Strategic Plan of the Central Hungarian Region.

As for funding, the most important organization is the Research and Technological Innovation Fund (national level). 25 % of the Fund's resources have to be spent on regional innovation objectives. 40 % of this funding is decided upon by the regions and 60 % is centralised though the region can make proposals concerning its use. The Central Hungary Operational Program may also provide funding to innovation-specific regional objectives together with EU-funded programmes.

Policy

The main objective of Central Hungary's regional innovation strategy is that the region becomes the integrator of Hungarian R&D&I and one of the leading European centres of product and technology innovation. It is to be achieved through the development of infrastructure and human resources and the realisation of a socially conscious, innovation-led Hungarian model, which help the development of local SMEs. Innovation policy implementation follows three main strategic priorities: improvement of the environment of SMEs, development of products and technologies, spread of innovation culture.

The region's Innovation Strategy developed these priorities into more concrete objectives. Actions include setting up an interactive company database, monitoring demand from multinationals, improving conditions of access to capital, promoting cooperation between companies (clusters and virtual companies).

Emerging hot technological fields are numerous. Accredited clusters operate among others in the production of medical instruments, in biotechnology, in packaging techniques, in multimedia, in information technology, in ecology and in sewage technology. In five universities and in numerous research institutes projects deal with a plethora of topics in many cases in cooperation with private companies.

In the framework of various schemes around a hundred innovative projects were co-financed. In Baross Gábor, regional R&D infrastructure and R&D projects were funded in universities, research institutes, foundations and collaborating private enterprises. In INNOCSEKK and INNOCSEKK plus, innovative projects of private companies were funded.

A specific strategy for the regional information society was elaborated in 2005, prepared under the aegis of the Regional Development Council. In this document those tasks were determined which can be carried out more efficiently at local or regional level than centrally.

Support measure

- MAGYARORSZAG
- KOZEP-MAGYARORSZAG
- Region Kozep-Magyarorszag
- NUTS Code HU10

Support Measure

Title of measure

Pázmány Péter Programme Regional University Knowledge Centers

Full title

Pázmány Péter Porgram Regionális Egyetemi Tudásközpontok

Duration

From: 2005
To: 2009

Policy objectives

- 2.1.1. Universities

Presentation of the measure

The programme supports the establishment of regional university knowledge centres in order to commercialise R&D results and create intensive science-industry cooperation. Grants are awarded for a period of three years.

Keywords

- Science-industry cooperation

Budget, source and type of funding

Currency: **HUF**

Source of funding	2005	2006
National public funds	6,000,000,000	2,500,000,000

Regional public funds
EU Structural funds
Private funds
Other

Form of funding provided

- Grants

Policy learning

Extent to which the measure can be considered as a success and worthy of policy learning

There is evidence of an impact of the measure based on verifiable indicators or an evaluation (e.g. sales generated from new products, jobs created, etc.)

Evaluation report links

- Information Technology Innovation and Knowledge Center
- e-Science Regional University Knowledge Center
- Elektronikus Járm és Járműirányítási Tudásközpont

Evidence of outcomes based on evaluation and other evidence

Positive factor was the support to broadening and strengthening science-industry links with active role from companies as well. Another important element was the requirement of sustainability after the support expired.

Do's and Don'ts

Transparent and well-funded measure, which was repeated annually.

This measure is recommended as an example of regional good practice to policy-makers from other regions:

Yes

Organisation(s) responsible

- National Office for Research and Technology

Support measure

- MAGYARORSZAG
- KOZEP-MAGYARORSZAG
- Region Kozep-Magyarorszag
- NUTS Code HU10

Support Measure

Title of measure

Innocheck plus Central Hungary (ten rounds)

Full title

Innocsekk plusz Közép-Magyarország (10 forduló)

Duration

From: 2008
To: 2010

Policy objectives

- 2.2.3. R&D cooperation
- 5.3.2. Consultancy and financial incentives to the use of IPR
- 2.2.1. TT Support infrastructure

Presentation of the measure

It is aimed at supporting innovation in small sized enterprises, stimulating demand for innovation services, as well as at knowledge transfer between regional knowledge centres and local small sized firms. Support is provided for a project idea, product innovation, process innovation and organisational innovation (different ceilings). The preparation of feasibility studies can also be supported as well as the procurement of incubation or of R&D services, of consultancy services, market research services, IPR-related services, patent/trademark application etc. Among the numerous winning projects there were projects aimed at the development of medical precision instruments, others for researching medicament, many dealt with the development of telecommunications equipments and specific softwares. The measure had ten rounds and more than five company projects were supported in each round.

Keywords

- Applied business research
- Innovation support services
- Knowledge transfer

Budget, source and type of funding

Currency: **HUF**

Source of funding	2008	2009	2010
National public funds	4,000,000,000	4,000,000,000	4,000,000,000
Regional public funds			
EU Structural funds			
Private funds			
Other			

Form of funding provided

- Grants

Policy learning

Extent to which the measure can be considered as a success and worthy of policy learning

There has been a positive response by beneficiaries to the measure (e.g. over-subscribed in terms of requested versus available budget) but it is too early to judge results or impact

Evidence of outcomes based on evaluation and other evidence

Many innovative companies applied and many of them received support. Support was substantial especially in the case of new product ideas. However, in some cases the companies which were awarded do not seem to be active (for example no website can be found or the company name can be found only on the "blacklist" of companies with sizeable arrears) while they received large amounts of public money. Thus transparency in the decision making process and double-checking of the companies submitting a proposal is indispensable.

Overall the project had a positive effect in terms of providing additional financing for innovative projects proposed either by companies or by cooperating companies and research institutes and/or universities. Because of fostering cooperation it had additional positive impact. The only problem is with transparency. According to an interview made with a decision-maker, evaluations were made but they are not available for the public.

Do's and Don'ts

The most importan 'do' is transparency in decision-making. It is necessary to

double-check the applicant companies. Data about the number of applications, information about the results of evaluations and the success rate of projects are missing.

This measure is recommended as an example of regional good practice to policy-makers from other regions:

No

Organisation(s) responsible

- National Office for Research and Technology

Support measure

- MAGYARORSZAG
- KOZEP-MAGYARORSZAG
- Region Kozep-Magyarorszag
- NUTS Code HU10

Support Measure

Title of measure

Baross Gábor Programme Central Hungary Region 2009 Development of R&D Infrastructure (REG_KM_INFRA_09)

Full title

Baross Gábor Program Közép-Magyarországi Régió A kutatás-fejlesztési infrastruktúra fejlesztése (REG_KM_INFRA_09)

Duration

From: 2009
To: 2010

Policy objectives

- 2.1.4. Research Infrastructures

Presentation of the measure

The main objective of the measure is to finance the modernisation of the scientific

R&D infrastructure in the region in institutes and companies operating in technical and natural sciences. One of the weaknesses of regional innovation activity was identified in the lack of modern R&D infrastructure. Amount per application was set between HUF10m to 100m. Priority was given to those proposals which were aimed at developing a new product which can become competitive even in international comparison. Besides universities and academic institutions applying for financial support to upgrade their laboratories, also two companies were awarded grants: one in biotechnology and one in metallurgy.

Keywords

- Research infrastructure

Budget, source and type of funding

Currency: **HUF**

Source of funding	2010
National public funds	
Regional public funds	690,098,000
EU Structural funds	
Private funds	
Other	

Form of funding provided

- Grants

Policy learning

Extent to which the measure can be considered as a success and worthy of policy learning

There has been a positive response by beneficiaries to the measure (e.g. over-subscribed in terms of requested versus available budget) but it is too early to judge results or impact

Evidence of outcomes based on evaluation and other evidence

No data is available about the number of applications. 16 projects were selected, mainly proposed by universities (there were only 2 projects submitted by companies). Overall the lack of interest from private companies seems to be a weakness of the project. Evaluation of the measure is not possible yet as none of the financed projects has been finished.

Do's and Don'ts

Private companies should be better targeted. Information should be specifically "spread" to private companies about the measure.

This measure is recommended as an example of regional good practice to policy-makers from other regions:

No

Organisation(s) responsible

- National Office for Research and Technology

Support measure

- MAGYARORSZAG
- KOZEP-MAGYARORSZAG
- Region Kozep-Magyarorszag
- NUTS Code HU10

Support Measure

Title of measure

Baross Gábor Program Central Hungary Region 2009 R&D projects (REG_KM_KFI_09)

Full title

Baross Gábor Program Közép-Magyarországi Régió K+F-projektek (REG_KM_KFI_09)

Duration

From: 2009
To: 2010

Policy objectives

Presentation of the measure

The measure's objective is to support R&D activities which make possible the development of new products, technologies and services and to support co-operation between R&D institutes and companies. Priority is given to projects which result in new products which are innovative and competitive in international

comparison as well. Support is given in the amount of between HUF10m and HUF150m. As R&D co-operation between R&D organisations and companies is at a low level in the region, this measure seeks to support this kind of co-operation activities. Six projects were selected and given financial support. Two of these by the national authority (NKTH) and the four other by the Central Hungary Regional Development Council. Two of them are projects of research institutes and four represent co-operation between private companies and R&D insititutes. Medical sciences, biotechnology, pharmaceutical R&D and ICT research are the main supported areas of the projects.

Keywords

- Science-industry cooperation
- Applied business research

Budget, source and type of funding

Currency: **HUF**

Source of funding	2010
National public funds	565,638,000
Regional public funds	
EU Structural funds	
Private funds	
Other	

Form of funding provided

- Grants

Policy learning

Extent to which the measure can be considered as a success and worthy of policy learning

It is too early to judge the success of the measure (e.g results of first call for proposals still not known).

Evidence of outcomes based on evaluation and other evidence

Detailed information is not available yet as the projects have not been finished thus this can not be judged.

Do's and Don'ts

No data is available about the number of applications, thus the success can not be

judged. Six projects were awarded with a total amount between HUF20m and HUF150m. The National Office for Research and Technology and the Regional Development Council separately decided about the winning projects. There were only four projects involving co-operation between private companies and R&D institutes.

This measure is recommended as an example of regional good practice to policy-makers from other regions:

No

Organisation(s) responsible

- National Office for Research and Technology
- Pro Regio Agency

Support measure

- MAGYARORSZAG
- KOZEP-MAGYARORSZAG
- Region Kozep-Magyarorszag
- NUTS Code HU10

Support Measure

Title of measure

Elite Research University scheme

Full title

Elit Kutatóegyetemi cím odaítélése

Duration

From: 2009
To: 2010

Policy objectives

- 2.1.1. Universities

Presentation of the measure

Universities could apply in Hungary for being awarded the title of "elite research university" and thus getting extra-funding for research from the government. Those universities are eligible which

- carry out a substantial basic and applied research,
- their R&D&I activity is significant both in Hungarian and in international comparison,
- have outstanding results in postgraduate education and
- have wide international linkages.

The main objective of the measure was to contribute (indirectly) to universities' strategy preparation and to promote their research orientation. The promised additional funding and the prestige of the title prompted the applying universities to elaborate a coherent mid-term research strategy. They have surveyed their investment needs in R&D infrastructure, and built linkages with interested industrial partners, planned joint research actions that will partially be supported from the budget.

Keywords

- Universities

Budget, source and type of funding

Currency: **HUF**

Source of funding	2010
National public funds	27,000,000,000
Regional public funds	
EU Structural funds	
Private funds	
Other	

Form of funding provided

- Grants

Policy learning

Extent to which the measure can be considered as a success and worthy of policy learning

There has been a positive response by beneficiaries to the measure (e.g. over-subscribed in terms of requested versus available budget) but it is too early to judge results or impact

Evidence of outcomes based on evaluation and other evidence

Many universities applied, the extra funding was very attractive. However, many

criticised the final results due to the lack of transparency in the decision-making process.

Do's and Don'ts

A better and more transparent decision-making process.

This measure is recommended as an example of regional good practice to policy-makers from other regions:

No

Organisation(s) responsible

- National Office for Research and Technology

Support measure

- MAGYARORSZAG
- KOZEP-MAGYARORSZAG
- Region Kozep-Magyarorszag
- NUTS Code HU10

Support Measure

Title of measure

Central Hungary Regional Innovation Prize

Full title

Kzép-Magyarországi Régió Innovációs Díj

Duration

From: 2009
To: 2009

Policy objectives

- 5.1.1. Support to the creation of favourable innovation climate (e.g. awareness campaigns)
- 5.1.2. Innovation prizes incl. design prizes

Presentation of the measure

An annual prize for innovative micro small and medium sized enterprises of the region which achieved outstanding results based on an innovation (product, service, technology, process) carried out/introduced in the period between 2006-2008. (Announced again in March 2010, for the period 2007-9.) The winning enterprise is entitled to present the prize on its documents and PR materials. The winner is invited to the Parliament for the prize-awarding celebration of Hungarian Innovation Prize. It is also entitled to present its innovative product, service, technology or process in the online magazin of regional innovation agencies and on the website of the Central Hungary Regional Innovation Agency. Special prizes are also awarded.

Keywords

- Innovation culture

Budget, source and type of funding
Form of funding provided

- Other

Policy learning

Extent to which the measure can be considered as a success and worthy of policy learning

The measure has achieved its intended targets in terms of results (e.g. number of enterprises investing in innovative projects, people trained)

Evidence of outcomes based on evaluation and other evidence

The prize can be evaluated as a successful measure. A high number of applications were received, there was a good media coverage, thus it contributed to the increase in the awareness about the impacts of innovation. The winner company and those to which special prizes were awarded received intense media attention.

Do's and Don'ts

Reaching all potentially interested companies with the information about the prize.

This measure is recommended as an example of regional good

practice to policy-makers from other regions:

Yes

Organisation(s) responsible

- Innoreg (Regional Innovation Agency of Central Hungary)

Support measure

- MAGYARORSZAG
- KOZEP-MAGYARORSZAG
- Region Kozep-Magyarorszag
- NUTS Code HU10

Support Measure

Title of measure

Support of commercialisation of innovations in the Central Hungary region

Full title

Innovációs eredmények hasznosításának támogatása KKV-k részére a Közép-magyarországi régióban

Duration

From: 2011
To: 2011

Policy objectives

- 5.3.2. Consultancy and financial incentives to the use of IPR
- 2.3.1. Direct support of business R&D (grants and loans)
- 4.1.1. Support to sectoral innovation in manufacturing

Presentation of the measure

The measure is in a way the continuation of the Baross Gábor and of Innocheck programmes that used to support SMEs' product development and market access. The new measure supports innovative SMEs' market access and IPR affairs (patent and trademark applications). It aims to contribute to the diffusion of new technologies. Supported activities also include the procurement of production machinery related to the new prototypes and the hiring of new employees. The

minimum amount of support that can be applied for is HUF 5m (EUR 18,500), the maximum is HUF 25m (EUR 92,500).

Keywords

- Small and medium-sized enterprises
- Intellectual property rights
- Entrepreneurship

Budget, source and type of funding
Form of funding provided

- Grants

Policy learning

Extent to which the measure can be considered as a success and worthy of policy learning

It is too early to judge the success of the measure (e.g results of first call for proposals still not known).

Evidence of outcomes based on evaluation and other evidence

The programme started as of March 1st, 2011, therefore it is too early to see its impact.

Do's and Don'ts

Transparency and monitoring is important, as well as prompt transfers once selection was made and contracts signed.

The programme requires 35 % co-financing from the part of the recipients. This is an excessively high percentage in the case of Hungarian SMEs.

Advance payments are advisable.

This measure is recommended as an example of regional good practice to policy-makers from other regions:

No

Organisation(s) responsible

- National Development Agency

Support measure

- MAGYARORSZAG
- KOZEP-MAGYARORSZAG
- Region Kozep-Magyarorszag
- NUTS Code HU10

Support Measure

Title of measure

Support of enterprises' complex technological innovations in the region of Central Hungary

Full title

Vállalatok komplex technológiai innovációjának támogatása a Közép-magyarországi régióban

Duration

From: 2011
To: 2011

Policy objectives

- 2.3.1. Direct support of business R&D (grants and loans)
- 4.1.1. Support to sectoral innovation in manufacturing

Presentation of the measure

The measure is a continuation of the Baross Gábor Programme and supports companies' product development and commercialisation activities in technical fields in life sciences, in agriculture and in natural sciences. In contrast to its predecessor, this measure requires 55 % co-financing by the recipients (Baross Gábor Programme provided 100 % support). Supported activities include the procurement of R&D-related machinery and IT, as well as IPR affairs and market access of newly developed products, The minimum amount that can be applied for is HUF 15m (EUR 55,500), the maximum is HUF 500m (EUR 1.85 million).

Keywords

- Applied business research

Budget, source and type of funding

Currency: **HUF**

Source of funding	2011
National public funds	
Regional public funds	
EU Structural funds	6,000,000,000
Private funds	
Other	

Form of funding provided

- Grants

Policy learning

Extent to which the measure can be considered as a success and worthy of policy learning

It is too early to judge the success of the measure (e.g results of first call for proposals still not known).

Evidence of outcomes based on evaluation and other evidence

Application period started as of 1st, March 2011. Therefore, it is too early to judge the impact.

Do's and Don'ts

The minimum amount is too large and co-financing requirements are excessive as well. Attention ought to be paid when drafting similar programmes that the target group should not be too limited.

This measure is recommended as an example of regional good practice to policy-makers from other regions:

No

Organisation(s) responsible

- National Development Agency

Policy document

- MAGYARORSZAG
- KOZEP-MAGYARORSZAG
- Region Kozep-Magyarorszag
- NUTS Code HU10

Policy Document

Central Hungary Operational Program 2007-13

Közép-Magyarország Operatív Program 2007-13

Organisation responsible

National Development Agency

Other organisation(s) involved

Pro Regio Agency

Content

Following a detailed analysis of the region, the document lists the main development projects for the period 2007-13 co-financed by the European Regional Development Fund. The basis is the region's strategic plan and related sectoral development programmes. The main aim of the operational programme is to increase the region's international competitiveness and facilitate its shift to innovation-based development. Direct support is provided to actions that enhance economic and employment growth. The programme sets out to improve the framework conditions for innovation and competitiveness by promoting accredited innovation clusters. It tries to increase the attractiveness of the region for knowledge-based and high-tech enterprises, by supporting investment into university-based R&D infrastructure. It envisages institutional development in the field of public services and formulates actions for the renewal of lagging settlements' infrastructure.

Year of publication

2006

Link to website

Link: http://www.proregio.hu

Policy document

- MAGYARORSZAG
- KOZEP-MAGYARORSZAG
- Region Kozep-Magyarorszag
- NUTS Code HU10

Policy Document

Central Hungary Operational Programme Action Plan 2011 - 2013

Közép-Magyarországi Operatív Program Akcióterv 2011-2013

Organisation responsible

National Development Agency

Other organisation(s) involved

Innoreg (Regional Innovation Agency of Central Hungary)

Content

The Action Plan summarises the priorities and the supported actions of the regional OP for the period of 2011-2013. It lists the relevant indicators measuring successful programme implementation and projects the values of these indicators by the end of the period. The priority of innovation-oriented development for example prescribes an annual increase of 14% of companies' R&D expenditures and an increase in support related investments of HUF 85b. 5,000 new jobs are projected to be created. Supported actions with regard to innovation include the support of the establishment and growth of clusters and the support of consultancy activities.

Year of publication

2010

Link to website

Link: http://www.nfu.hu/uj_szechenyi_terv

Policy document

- MAGYARORSZAG
- KOZEP-MAGYARORSZAG
- Region Kozep-Magyarorszag
- NUTS Code HU10

Policy Document

The Regional Information Society Strategy of Central Hungary

Közép-Magyarországi Régió Regionális Információs Társadalom Stratégia

Organisation responsible

Pro Regio Agency

Content

The document is based on the Hungarian Information Society Strategy, e-Europe and related regional documents. Besides describing and analysing developments in information society in the region, those tasks were determined which can be carried out more efficiently in local or regional level than centrally in the area of the information society. It contains a SWOT analysis on the Central Hungary region. On the basis of that it determines the following aims:

- to increase citizens' "IT-comfortability",
- development of the technical background, infrastructure,
- introduction of e-administration,
- development of network cooperation, rationalisation of resources,
- improvement of IT-supply in the region,
- increasing awareness about IT.

Year of publication

2005

Link to website

Link: http://www.proregio.hu/3/ristomor.zip

Policy document

- MAGYARORSZAG
- KOZEP-MAGYARORSZAG
- Region Kozep-Magyarorszag
- NUTS Code HU10

Policy Document

Strategic Plan of the Central Hungary Region 2007-13, "The creative region"

A Közép-Magyarországi Régió Stratégiai Terve 2007-13, "A kreatív régió"

Organisation responsible

Pro Regio Agency

Content

The strategic aim of the region is "to become a quality-based, affordable and pleasant region, providing a healthy environment for those living and working here, which fulfils the economic, environmental and social criteria of sustainability, an internationally leading creative region with a regional identity, the main organisational force in the Carpathian basin".

Three main obejctives: increasing economic competitiveness, strengthening social cohesion, realising liveable region.

Five priorities: supporting innovation oriented developments, improving human resources, improving public services, revitalisation of natural environment, developing the region's transport structure.

Innovation as a priority is promoted through:

- supporting SMEs through projects aimed at promoting cooperation networks, at enabling companies to become suppliers and through experimental enterprise development projects
- supporting R&D&I, and the use/application of their results.

As the main source of financing, the European Regional Development Fund and

local resources are pointed out.

Year of publication

2005

Link to website

Link: http://www.proregio.hu

Policy document

- MAGYARORSZAG
- KOZEP-MAGYARORSZAG
- Region Kozep-Magyarorszag
- NUTS Code HU10

Policy Document

Regional Innovation Strategy of Central Hungary

A Közép-Magyarországi Régió Regionális Innovációs Stratégiája

Organisation responsible

CHIC Central Hungarian Innovation Centre

Other organisation(s) involved

Pro Regio Agency

Content

The main objective of Central Hungary's regional innovation strategy is that the region becomes the integrator of Hungarian R&D and innovation and one of the leading European centres of product and technology innovation. It is to be achieved through the development of infrastructure and human resources and the realisation of a socially conscious, innovation-led Hungarian model, which help

the development of local SMEs.

Innovation policy implementation follows the three main strategic priorities: 1. improvement of the environment of SMEs, 2. Development of products and technologies, 3. Spread of innovation culture.

The region's Innovation Strategy developed these priorities into more concrete objectives. Actions include setting up an interactive company database, monitoring demand from multinational companies, improving conditions of access to capital and current assets, promoting cooperation between companies (clusters and virtual companies), development of human resources of the demand and supply sides, presenting and spreading modern product development methods.

Year of publication

2004

Link to website

Link: http://www.chic.hu/downloads/RIS%20-%20elozetes%20osszefogla ...

Organisation

- MAGYARORSZAG
  KOZEP-MAGYARORSZAG
- Region Kozep-Magyarorszag
- NUTS Code HU10

Organisation

Pro Regio Agency

Pro Regio Közép-Magyarországi Regionális Fejlesztési és Szolgáltató Nonprofit Közhasznú Kft.

Link: www.proregio.hu

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H-1146

Mission

The aim of the Central Hungarian Regional Development Council and its Pro Regio Agency is the development of Central Hungary. For this purpose, it pursues a

unified regional policy with an emphasis on services industry based on knowledge, agriculture based on ecology, the development of the business and cultural service sectors, and the establishment of a favourable environment for investors.

Activities

The Pro Regio Agency plays a central part in regional planning and development. It calls itself "The Strategic Partner".

Aims of the Pro Regio Agency are:

- monitoring and analysis of regional processes,
- setting up an EU conform programming and planning system,
- the effective fulfilment of the professional needs of its partners/clients,
- value added information flow, assisting partnership,
- supporting the Central Hungary Regional Development Council and its Committees,
- continuous enhancement of professional activities,
- conflict management.

Tasks of the Pro Regio Agency are:

- planning,
- programming and project management,
- provision of administration background,
- information and conflict management.

Planning and organising: as a background organisation, it supports the Regional Development Council and its Committees, developing, coordinating and managing regional projects; coordinates regional development tasks concerning human and economic resources, environmental conditions and infrastructure development. The Agency reviews local and regional concepts / programs, and itself prepares programs and projects if needed, including with the assistance of external experts. It also organises trainings, conferences and exhibitions.

Cooperation and networking: the Agency cooperates with regional actors (small-regions, local governments, chambers, civil organizations, companies and government bodies), with foreign organisations and participates in international projects.

Coordination and conflict management: it fulfils coordinating tasks between regional actors, promotes their cooperation in revealing common interests and tasks and harmonises their development aims and activities.

Collection and supply of information: the Agency monitors the Region's economic and social development. Its regular newsletter provides information on main events. Regional data, information on funding resources and studies are areavailable on CD. One can also visit the website of the Agency for information.

Organisation

- MAGYARORSZAG
  KOZEP-MAGYARORSZAG

- Region Kozep-Magyarorszag
- NUTS Code HU10

Organisation

Innoreg (Regional Innovation Agency of Central Hungary)

Innoreg (Közép-Magyarországi Regionális Innovációs Ügynökség)

Link: www.innoreg.hu

Páter Károly u. 1.
Gödöll,
H-2103

Mission

The main aims of the organisation are:

- To increase the international competitiveness of the region, to promote the innovation- and enterprise-oriented development of the knowledge economy;
- To prepare a map of the activities of organisations taking part in the innovation process, to coordinate and promote their co-operation in order to improve the efficiency of innovation;
- To improve regional stakeholders' awareness of and commitment to innovation;
- To carry out a range of innovation management services and contribute thereby to the expansion of innovative SMEs in the region.

Activities

In correspondence with its specific aims, Innoreg provides the following services:

1. Research of international trends, preparation of strategic forecasts, analyses and comments/suggestions.
2. Creation and maintenance of a databank about R&D activities in the region, and about the main stakeholders: organisations, institutions and private persons. Integration of these data into the countrywide information system.
3. Evaluation and registration of innovation centres, incubator houses and technology centres.
4. Information provision about funding opportunities for innovative SMEs, and partner search for joint applications.
5. Development of the network of technology transfer and innovation centres, dissemination of knowledge for innovation.
6. Organisation of innovation prizes, exhibitions, media events that provide publicity to innovative actors' results.
7. Promotion of the diffusion, production and use of new products and technologies by information provision about access to venture capital or to business angels' services etc.
8. Consultancy services in technical and legal areas.

Organisation

- MAGYARORSZAG
  KOZEP-MAGYARORSZAG
- Region Kozep-Magyarorszag
- NUTS Code HU10

Organisation

Valdeal Innovations Zrt.

ValDeal Innovációs Zrt.

Link: www.valdeal.com

2, Gyár utca
Budaörs,
H-2040

Mission

ValDeal's mission is

- to encourage the establishment of knowledge and technology intensive firms,
- to bridge the gap between science and business in Hungary by providing complex business incubation and acceleration services,
- to be a reliable partner of Hungarian inventors, innovative small and medium sized enterprises, universities, research organisations and investors in Hungary and in Central Europe,
- to become a prominent player in the Hungarian innovation market.

Activities

ValDeal is an innovation management consulting company, dealing with identification, business development and B2B sales of innovative ideas and marketable inventions in Hungary and in Central Europe. ValDeal collects, screens and selects marketable ideas and inventions, prepares them to enter the international market and acquires capital necessary to their growth. Targeted fields are: life sciences, engineering and information technology.

Organisation

- MAGYARORSZAG
  KOZEP-MAGYARORSZAG
- Region Kozep-Magyarorszag

- NUTS Code HU10

Organisation

CHIC Central Hungarian Innovation Centre

CHIC Közép-Magyarországi Innovációs Központ

Link: www.chic.hu

Gyár u. 2.
Budaörs,
H-2040

Mission

"Through its activities, Central Hungarian Innovation Centre aims to increase the competitiveness of the SMEs of the Central Hungarian Region. With its services it also intends to contribute to the development of the technology standards of SMEs and promote entrepreneurship, as well as aid up-to-date product development and project management methods."

"CHIC aims to be a centre of excellence in the following areas:

• Enterprises involved in utilization of renewable energies,

• Research in connection with the modern information society

• Teams that operate internet based "knowledge-banks"

• Organisations working in the field of knowledge-management (e.g.: invention e-marketplace)"

Activities

CHIC's latest activities concentrate on spreading information and helping exchange of information on living labs, open innovation, spin-offs and organising SME fora. It works in close cooperation with INNOREG.

However, the organisation offers a handful of acitivities to the SMEs of the Central Hungary region, including giving expert advice on economic and technological problems; product development and innovation management; organising company networks and clusters; company match-making; various trainings and event management. EurOffice (EOS) helps innovative SMEs in their internationalisation process by poviding information, finding foreign partners among others. EUKOMP helps Hungarian innovative SMEs and researchers to participate in European Union research and innovation programmes. It also helps the SMEs of the region in getting access to financial resources provided in the framework of various Hungary or EU financed programmes.

Appendix D Statistical data

Indicator	Közép-Magyarország (HU1)	Közép-Magyarország (HU1)	Közép-Magyarország (HU1)	EU27
	2000 or around	Previous year	Most recent	Most recent
GDP per capita (PPP)	16200	25900	26800	25100
	2000	2007	2008	2008
Change in GDP per capita	9,56	5,64	5,07	3,73
	2000-03	2006-07	2005-08	2005-08
Unemployment rate	3,575	4,75	5,675	6,98
	2000-03	2006-09	2007-10	2007-10
Change in unemployment ratee	-0,85	-0,38	-0,93	-0,30
	2000-03	2006-09	2007-10	2007-10
Tertiary education	0,26	0,32	0,33	0,30
	2000	2009	2010	2010
Government R&D expenditure	0,72	1,56	1,56	0,24
	2000	2007	2008	2008
Non-R&D innovation exp.	--	--	0,44	0,41
	--	--	2006	2006
Patents per mln popoluation	30,5	67,6	70,8	115,1
	2000	2005	2006	2006
Business R&D expenditure	1,26	2,80	2,88	1,21
	2000	2007	2008	2008
Higher education R&D expenditure	0,42	0,92	0,92	0,44
	2000	2007	2008	2008

Source: Eurostat and Community Innovation Survey

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