SUPPORT OF INNOVATION AT REGIONAL LEVEL

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Introduction

Innovation has been broadly recognized as an important factor of economic growth [22, 28]. Lots of theories and approaches have been developed in order to explain the way how regions and states could profit from innovations. The aim of this article is to evaluate different forms of regional innovation support in the regional innovation strategies as one of the tools for support of innovation at the regional level and by the regional level in V4 countries. Regional innovation strategies represent good example of actual strategic thinking of different regional self-governments. Evaluation of these strategies allows us to compare the theory of innovation support with the suggested practical application of these theories.

1. Support of Innovation

The systems of innovations can be found in all levels of the economy, such as having a national, regional and sectoral perspective [12]. Several studies dealing with innovation and innovation system were done on national level [15]. Now, there is a paradoxical consequence of globalization in which the ever greater integration of national and regional economies into the global one is accentuated, rather than minimized, the significance of the local context for innovative regions and localities [32]. There are several differences between national and regional level. Compared to national level, regions are important for the proximity of all actors and possibility to create social capital [21]. Geographic proximity has the potential to create competitive advantages in the terms of interaction, learning, access to skills and cooperation in development and business [29]. Regional economies can be understood as the places of collective technological learning [5]. Innovations are observed mainly in strongly concentrated regions in term of human capital or institutional density, using the advantage of agglomeration effects. Strong interaction between learning, social capital and agglomeration effects leads experts to paying more attention to the regional level of innovation, resulting in concepts such as industrial districts, innovative milieu [6] and more recently regional innovation systems [8,10,16] or learning regions [1,7]. These concepts try to identify the precondition for economic growth of regions, basically based on innovation and learning. These concepts are not developed to complex theories, but identify some key issues related to innovation activities in the region. Despite some ambiguity in the theories [17], all concepts have shown the increasing importance of innovation governance on regional level. We could support these theories by several studies showing that regional policy has some impact on innovation capacities of region [9].

Regional governments are not in an easy position. The competitiveness of regions largely depends on internal learning and innovation capacities. The regional economies and its interaction with innovation processes are very complex and do not share in administrative power of the government, so it is very difficult to govern innovation process. The effectiveness of public policies on innovation then depends on the capacity of policy makers to comprehend innovation as a system [19, 26]. Innovation requires clusters and networks. Networking could be considered the most challenging concept for administration and the key notion in theories of government public governance [17]. Basically, there are four main functions of regional self-government [14, 20]:

1. Operational function refers to the level of development projects. Here we are at the level of the daily implementation of abstract concepts into particular actions and tangible benefits. It is this operational level where the real effects of the governance system can be most effectively measured.
2. Strategic function refers to regional development programmes. They include a detailed

analysis of strengths, weaknesses, opportunities and threats of the region concerned, some strategic options and the setting of priorities. These include preparation of regional innovation strategies, which are discussed later.

3. Organisational function refers to the required organisational and management structures to be able to implement either operational or strategic tasks.
4. Symbolic function feeds the first three realms back to the region as an integral space of action and identification. The point is to embed the strategies, the programmes and the projects in a flow of symbolic communication, which easily hooks into regional people's world views.

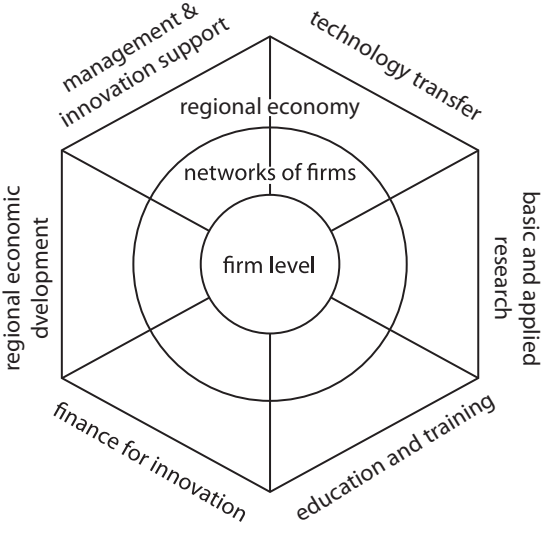
Within these functions, regional self-governments try to support the innovation with different tools. According to Koschatzky and Gundrum [13] public (regional) technology and innovation promotion can have three major tasks:

- activation of potential regional resources for the development and application of new technology,
- inter-linkage of region-specific resources in regional innovation networks that comprise all the relevant actors in industry, science and policy, and
- integration of regional networks into supra-regional technology co-operation systems.

These tasks could be performed at three levels – a firm, networks of a firm and regional economy (see Scheme 1). The problems remain, however, in relation to the co-ordination of regional activities at the national level and among regions. There are often a number of organisations involved in the implementation of initiatives and the distribution of duties is not always unambiguous or clear. Insufficient co-ordination of activities between administrative sectors at the national level has turned out as one of the weaknesses. Without co-ordination there is a danger of duplication of activities and inefficient use of scarce resources [29].

We also could see six different fields of support in the Scheme 1. Each region is unique, so it is very difficult to set up appropriate mix of these policies. There are different levels of social capital or problems of path dependency [28]. However, there were several studies trying to identify key support activities or areas in these fields. Atkinson [2] identified seven crucial areas to support innovation: 1) knowing your region's economic function in the global economy, 2) creating a skilled workforce, 3) investing in an infrastructure for innovation, 4) creating great

Fig. 1: Main components of innovation support



Source: Braczyk [4]

quality of life, 5) fostering an innovative business climate, 6) reinventing-and-digitizing-government, and 7) taking regional governance seriously. We could see shift from supply oriented policies centred on infrastructure buildings to policies supporting "soft" factors such as human and social capital or cooperation between companies and universities. Strong support for "soft" factors development measures could also be found in other studies [6, 7, 25, 30].

Other types of studies try to identify the weakest points in present innovation strategies. The PAXIS Survey [5] identifies several problematic areas viewed by respondents in selected regions to foster innovation: There is a lack of Private-Public Partnership funding; There are no attractive taxation rules for risk capital and equity investment; New entrepreneurs have difficulties in establishing linkages to networks or consortia of like-minded businesses, finance is not available at all stages of the new enterprise development; and lastly: A clear process model does not exist or is not used. Nauwelaers [18] identifies decreasing attention of support on finance and risk sharing, know-how technology, market access and information and human resources. One of the main problems remains in systemic support of innovation. Many times policy instruments do not form the system and are not user-oriented. Sometimes strategies also lead to the problem of path dependence or lock in. This usually means they are oriented on existing, not new problems in the regions.

Another open question lies in sector selection for innovation support. The regional economy is a complex system which goes beyond the development of sectoral policies delineated in isolation. It involves more than specific efforts to increase spending on R&D, support to SMEs, or support to high-tech activities. It focuses on developing integrated approaches based on the characteristics of different territories. It establishes networks of institutions and stakeholders, creates space for them to develop constructive dialogue and uses their inputs in the decision-making process. This approach of this 'third generation', innovation is newly supported by the European Commission. It is not considered as a linear process that starts with research, eventually leading to development, translated later into growth in the territories that have more capabilities. There is a product of policy-mix including several bodies and stakeholders in which the territories, their specificities and conditions are paramount [11]. On the other hand, specialization is very important to gain regional competitive advantage. Functioning innovation systems include strong input suppliers and demanding customers, firms which compete with each other for a customer, but also co-operate [26]. Some new studies supported concept of related variety as a solution to specialization [10, 7].

Special attention in innovation support goes to research activities. There is a tendency to promote research as the solution to all innovation problems, as if research can solve all the problems industry and society are facing. Moreover, there is also a tendency to use the words ´research´ and ´innovation´ interchangeably, as if these two concepts were synonymous. Many companies, especially in the so-called low-tech industries, do not innovate through investments in R&D. They focus on incremental improvements in products and production technique [29]. Also it is not enough to perform research; that research needs to be commercialized to have the full economic effect. More important than research programmes, technology parks and incubators efforts are the people-to-people commercialization programmes. Building links between universities and local industry clusters, promoting externships for students and faculty, and creating other linkage programmes are important policies [2]. But especially in R&D, innovation policies should avoid building "cathedrals in the desert" [23]. Emphasis on innovation has some limitations. Regions need to have at least moderate level of knowledge infrastructure. Innovation support (especially that through R&D support) better suited to advanced regions [9]. This could also be observed in regional strategies in central European countries, as it will be discussed later.

2. Innovation Strategies

The regional innovation strategies are one of the main policy tools for support of innovation at regional level. Specialized innovation policies have been established in Western European countries from the beginning of 1980s, mainly in France, the UK and Spain. Now, in Europe, the EU has tried to stimulate regional innovation strategies in over 100 regions but the results have been modest [7]. The formulation of a strategy is perceived as a tool to deal with the future. As we

mentioned above, an innovation system is a complex, dynamic, and open-ended system, so there is a question if it is even possible to plan and steer a complex system. Precisely in this dilemma rests the role of a strategy and its relevance. However, strategy could also be seen as an ongoing tool for the innovation process.

Regional innovation strategies (RIS) in V4 countries are relatively a new phenomenon. The oldest innovation strategies are less than ten years old and according to our research only very few regions approved more than one innovation strategy [24]. In this situation it is very difficult to evaluate the effectiveness and efficiency of implementation of RIS. We rather concentrate on creation of innovation strategies in V4 countries and analyze measures for innovation support in 29 regional innovation strategies from V4 countries (8 Slovak regions (Bratislavský kraj, Nitriansky kraj, Trnavský kraj, Trenčiansky kraj, Žilinský kraj, Banskobystrický kraj, Prešovský kraj and Košický kraj) 9 Czech regions (Praha, Jihomoravský kraj, Zlinsky kraj, Jihočeský kraj, Pardubický kraj, Liberecký kraj, Ústecký kraj, Moravskosliezsky kraj, Kralovohradecky kraj), 7 Polish regions (Malopolskie, Slaskie, Mazowiecke, Opolskie, Lodzskie, Wielkopolskie, Zapadnopomorskie) and 5 Hungarian regions (Közép-Dunavidék, Közép-Dunántúl, Dél-Dunántúl, Nyugat-Dunántúl, Dél-Alföld). We concentrate on identifying measures, which were considered as a priority in the strategies. In order to be a priority, suggested measures must fulfil two conditions:

- must be mentioned as a separate point in the strategy,
- must contain at least one measurable and particular action or indicator for such a measure.

In the first stage after analyzing all the strategies we created the list of measures which were most often repeated in strategies and at the same time created global activities (see Fig. 1 below) and thus we analyzed again all the strategies and their activities were added to this list. All measures were case by case evaluated by three experts.

We analyzed measures based on the emphasis which was put on them in the strategies. There were many other statements in the strategies regarding nearly all the possible activities, but wetake them into consideration only if they have been strictly tied to the aims, priorities or indicators. If any activity in the strategy contained several measures of the list of created measures, both measures were assigned to the given strategy. For example, if in the strategy there was the activity of "creating of technological centre in the cooperation with university and enterprises", we took into consideration that given strategy would contain the measure of "cooperation between universities and enterprises", as well as the measure of "technology parks and incubators". The list was laid out as broader measure, the strategies mostly contained several detailed points. In this case they were counted for each strategy only once. For example, if the strategy contained activities of "presentation days for enterprises" and the other activity of "creating of web site for improving the information", these activities would be counted as a strategy only once at the point of "promotion and information dissemination".

The total number of measures is shown in the Figure 1, where we can see that the most frequent measure used in regional innovation strategies is the support of clusters and networks creation. In most cases there is the ambition of creating partly formalized groups on the sector principle, which will be able to develop the needs of their members. In some cases there is the ambition of supporting common projects of companies within clusters. It is in line with views considering the role of strategy as a system that covers and generates synergies and collaboration between different administrative policy areas and bodies as well as a continuing learning process [4].

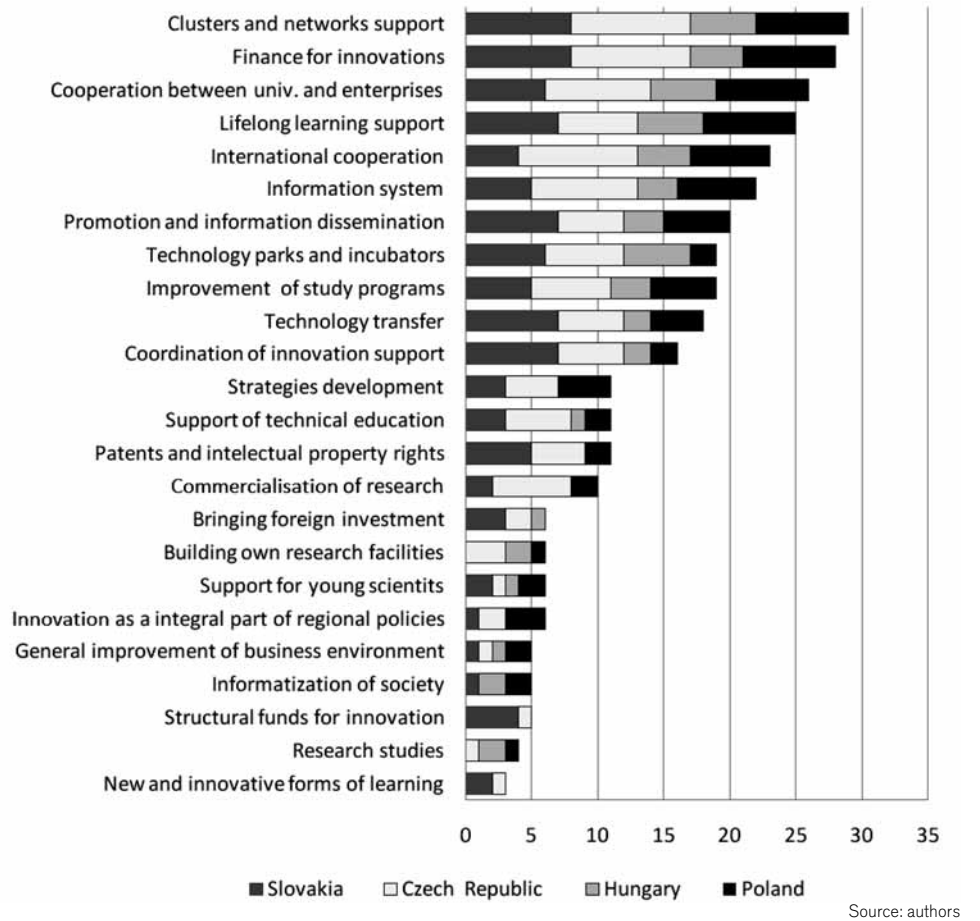
Other key measures are assuring finance for innovation, lifelong learning support and the support of cooperation of the universities with companies. In lifelong learning support there is possible to observe different approaches in strategies. Some strategies take in this support on universal level with measures focused on total continual increase of labour force qualification. Another big group of measures focused on creation and realization education programmes tended to the development of competencies for innovation (project management, quality control, methods and ways of innovation). In the third group there are measures tended to strengthen science and technical education. These measures are more often concentrated on secondary rather than tertiary education. Within the universi-

ties and companies cooperation there were often used especially common research and development projects, closer cooperation in education programmes creation or mobility and exchange between universities and companies programmes. In Poland and Hungary there is also often used the spin off programme support.

A little less attention in RIS was paid to information activities and building institutions supporting innovation creation and transfer (especially technical science parks and technological incubators). That partly results from the fact that some regions already have built at least some basic institutions supporting innovation development and also at least partial system of know-how dissemination. Within information activities there was the necessity of homogeneous information system building, which would connect all concerned institutions.

Among the very surprising findings can be included a small number of strategies, which would deal with research commercialization (besides the Czech Republic), connection of innovation strategies with other political strategies in regions. There are nearly no measures dealing with information society or IT development although ICT and innovation tend to be closely related. Firstly, ICT itself is a technological innovation. Secondly, ICT also affects innovation in a broader sense since it supports the creation of

Fig. 2: Regional innovation strategies measures (number of strategies containing selected measures)



Source: authors

new and better applications and production processes [12].

Thanks to development of most strategies from EU projects there is a very positive fact of defining of measurable indicators, which is often absent in other regional strategies developed not as a part of some EU projects.

Within the measures no differences have occurred in particular types of regions. If we consider 4 metropolitan regions of capital cities, measures would correspond with total result of all regions. More visible difference had been found only in higher support of building supporting institutions (especially technical science parks) and in the support of transfer of technologies. By contrast there was total absence of technical education support or information society development. More visible differences as among particular types of regions occurred among particular countries, especially in some types of measures. The differences among them are shown in the Figure 2.

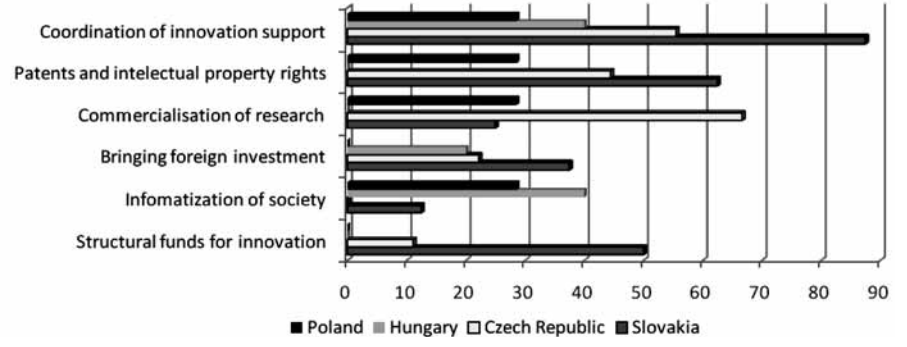
The Slovak Republic regions pay attention to coordination of innovation tools, inflows of foreign direct investments oriented on innovation support or adequate usage of structural funds [31]. By contrast Hungarian regions excel in innovation strategies connection and informatization development. On the other hand patent protection and research commercialization are not priorities in their strategies. The Czech Republic regions pay special attention to research commercialization.

This similarity shows the fact that in V4 countries national level is still a determining power for innovation support. Strategies are often used to adapt to available national programmes or to other possibilities of financing. Based on our experience we can also observe that inspiration for strategies creation regions is derived from other strategies already carried out in the country and from strategies of similar regions within other countries of the European Union.

During the process of strategies evaluation some interesting conclusions were found out:

- Most of the strategies are designed very widely with a lot of measures, which are practically impossible to fill up in determined horizons. All the types of regions had tried to use all the scales of measures directed to creation of high-innovative region, which however is not very realistic. For example, the strategy of the Prešov region (the most lagging region in Slovakia) would require at least 30m EUR of capital expenditure to fulfil all goals according to our estimation. The yearly capital budget of region is 20 m EUR, but more than 70% of the budget is allocated to transport, culture and social activities.
- Strategies varied according to the approach to sectors. Almost half of the strategies contained measures based on sectoral principle, five strategies were entirely based on this principle. On the other hand a big part of the strategies did not deal with the sector definition of specialization of regions at all.
- Another difference is the orientation of RIS on companies. The strongest support of companies having RIS is in Hungary, where the support of companies was in the centre of RIS implementation. To some extent it was also the situation in Poland and the Czech Republic. RIS in Slovakia were more markedly oriented in the public sector. In all the countries me-

Fig. 3: Percentage of strategies in the countries which have particular activities as a priority



Source: authors

asures oriented on existing companies were obtained, and the most of RIS had also special measures for new innovative companies support. These measures were absent more visibly in the Slovak Republic.
- Implementation of strategies is often divided into many different institutions, while regional governments play a minority role with suggesting different measures and often do not play the coordinating roles of these institutions.

It has to be considered that this analysis contains measures which regional governments plan to carry out, therefore it gives a picture about their perception of innovations in a region, as well as about the real ability of regions that raises their innovation potential. The best way for documentation is in the field of financial sources for innovations. This activity can be seen in almost every strategy. Almost none of regions is able to devote sources for innovation support. According to RIS proposals the majority of measures should be financed from structural funds or from national budgets. The real strategy of implementation mostly depends on external factors. That was shown also in the creation of innovation strategies, when the crucial role is played by financing from the European Union funds. Thanks to them all studied innovation strategies had been created. Regions do not dispose with almost any of their own innovation supporting funds, which is a huge difference compared to some advanced countries. As an example we can use a lot of funds and initiatives in northern European countries [29].

3. Innovation Support Policy as a Part of Regional Development Policy

One of six poles of innovation support is to incorporate innovation support into regional development policy as we can see in the Scheme 1. This aspect is very rarely mentioned in all innovation strategies, so we compare innovation strategies with regional development strategies. It has been done only for the Slovak regions.

We identified that innovation strategies were not fully consistent with regional development strategies as we see in the Figure 3. Some of these differences could be due to some shifts between the approval of these two documents in each region (but it was never more than three-year difference). Regional development strategies are much more oriented on the usage of structural funds. We could see it in the special case of hard university infrastructure, which could be largely financed through the structural funds. Each region has this measure in regional development plans despite the fact the regions cannot influence these activities. If we use the „triple helix" concept, measures are too separated and without clear synergy effect. Key measures in regional development plans are the support of clusters and building of research infrastructure (mainly technology parks and incubators) [27].

Problem in creation and implementation of innovation strategies is the fact that regional governments as the main creators of plans of economic and social development do not support creation of innovation, neither in financial content point of view, nor when we had evaluated suggested measures for innovation support. We also try to measure the possibility of local governments to influence the implementation of suggested measures. We divide the measures into four groups:
- measures, which could be implemented directly by local governments in terms of present competencies, financial and personal capacities - full control in Fig 4,
- measures, which local governments could carry out with the help of regionally based partners, partial control by the governments (technology parks, incubators, development agencies, high schools) - majority control in Fig 4,
- measures, which could be carried out only with independent partners in the region (universities, enterprises) – minority control in Fig 4,
- measures, which could be carried out only with support of someone outside the region (mainly the state) – nearly no control in Fig 4.

Only 7 % of them were directly influenced by regional governments (most of them were measures for information and advertising activities). Regional governments could be in more than half of the measures only as a supportive partner institution. They do not have any influence on fulfilling suggested measures (as shown in the Figure 4).

Regional government could be in more than half the measures only as a supportive partner

Fig. 4: Comparison of some different measures used in innovation strategies and regional development strategies (number of strategies containing selected measure)

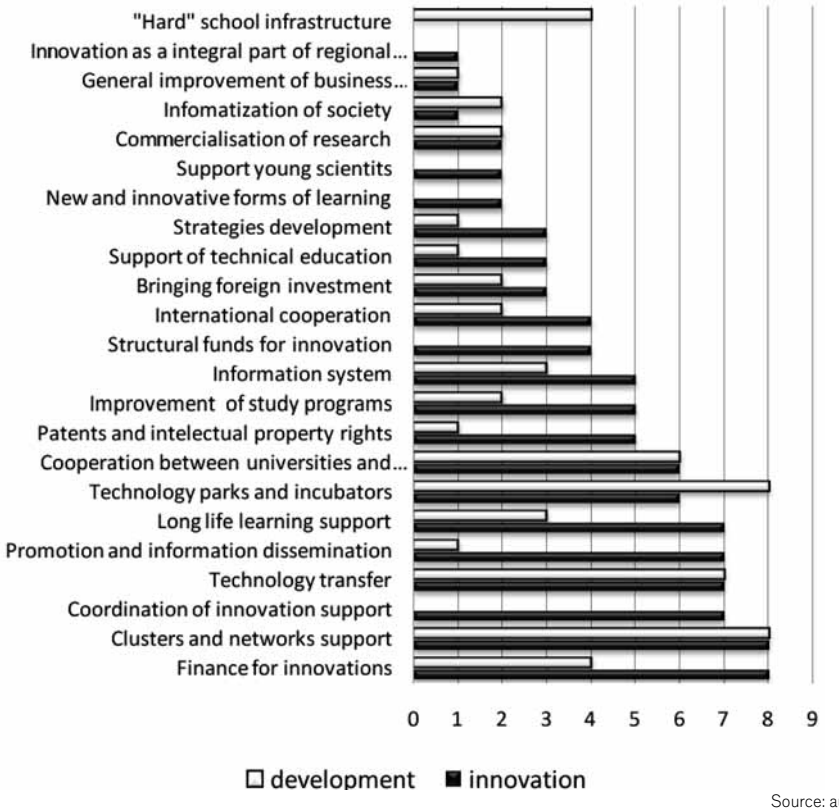


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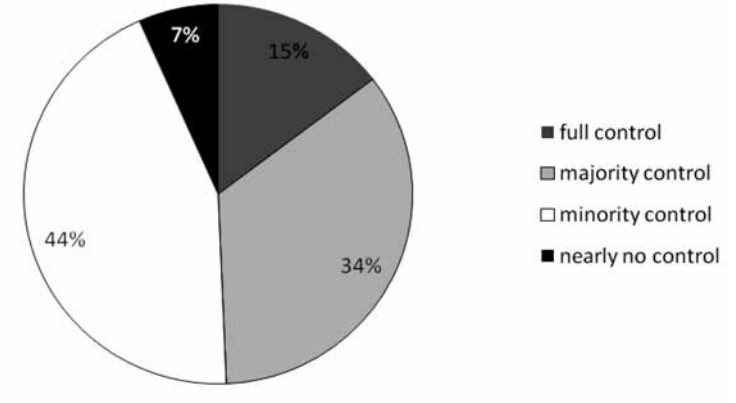
Fig. 5: Division of activities into the strategies according to the level of implementation control by regional gevernments



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institution. This does not have any influence on fulfilling suggested measures (as shown in the Figure 4).

Conclusion

The support of innovation is a relatively new phenomenon for all studied regions. Most of themprepared the first regional innovation strategy within the last three years. They contain a very complex measures to support innovations. The main problems in these regions are related to the lack of financial resources for innovations directed by governed regional bodies. This situation is much worse than in western European countries. Most of the sources for innovation come from European funds. This causes a very unusual situation for two metropolitan regions – Praha and Bratislava. Both of them are above average in all indicators F related to innovation infrastructure (qualified workforce, universities, labs) as well as innovation results (e.g. patents). However, in the following years a vast majority of public funds for innovation will go to other regions in these countries, so there will be a real danger of the „cathedrals in the desert" as mentioned above. Moreover, there are very common measures in all innovation strategies, showing the tendency of „go for all" in the regions not fully specialized in the most effective ways of innovation support.

Regions in central Europe also suffer from the lack of coordination in innovation policies. We showed, the governements are not (to the large extent) able to control innovation support instruments in their regions. We could see the creation of regional innovation centres in Slovakia as an example. These centres will be created from EU support in all the regions, but they should be specialized according to the national innovation strategy, so that the regions may have very little chance to influence orientation of these centres. Moreover, the centres with their sectoral specialization should serve companies from the whole country.

To sum up there are some policy recommendations for innovation support in these regions:

- There is a need for better specialization of the regions (and consequently their innovation strategies). This could also results in reduction of suggested measures for innovation support and higher concentration of the support for key priorities. The strategies look very similar among the regions despite the great differences between them.
- It is necessary to reconsider relatively low level of the third generation innovation policy measures in the innovation strategies. Much more attention is paid to "hard" compare to "soft" infrastructure, especially in the situation of insufficient financial sources.
- There is a need for paying attention to the effictiveness of using the structural funds and "cathedral in the desert" projects in less developed regions. We could already observe some examples of failure of EU supported projects, such as the unsuccessful virtual incubator in Rimavská Sobota.
- It is necessary to work on developing a clear system of regional and national innovation support in order to avoid duplicity and to set up clear competences together with financial and administrative responsibility.
- More attention needs to be paid to the permanent process of creation and evaluation of RIS and more precise definitions of expected achievements.
- There is a need for more integration of innovation strategies into regional development strategies.
- And more attention has to be paid to metropolitan regions as main innovation centres and to strong concentration of national sources to these regions (out of structural funds).

It is necessary to say that we analyzed only the supposed measures in the strategies, the real innovation procesess will have much more influence on the implementation of each strategy. We also expected a much bigger differences among the regions in this phase of innovation support, but we have to wait a few years to be able to analyze all these aspects for all strategies.

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ABSTRACT

SUPPORT OF INNOVATION AT REGIONAL LEVEL

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The aim of this article is to evaluate the support of innovation on the regional level and the regional levels in V4 countries. We analyse regional innovation strategies in these countries. The regional development strategies are relatively new phenomenon in V4 countries. Most of the regions created their strategies less than five years ago and many of them have been still in implementation phase, so we concentrate more on the creation of innovation strategies rather than on their implementation.

The paper has two main parts - theoretical background containing the examples and reasons for innovation support at the regional level as well as key problems for governance of innovation support, mainly the problem of complexity of innovation support, which goes behind officially established borders.

The second part compares activities and measures of 29 regional innovation strategies in these regions and identifies some key differences among them. We found out more similarities among the regions from the same country rather than similarities among the regions with similar level of development (e.g. in metropolitan regions). We deal with some key issues for regional innovation strategies – appropriate level and the role of regional self-governments for creation of strategy, sectoral dimension of RIS or "building cathedral in the desert" problem. We also identify dominance of hard infrastructure measures in the strategies. We also compare specific innovation strategies with general regional development strategies in order to identify key differences in governing creation of these strategies.

We suggested some improvement in the process of creation and implementation strategies. The concentration of priorities and resources is of crucial importance for success. Better evaluation process is needed to be able to more prioritise the suggested activities and to be more specific on particular regional needs.

Key Words: *support of innovation, regional innovation strategies, V4 countries, governance, regional development, regional innovation policy, regional government, regional competitiveness.*

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