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Co-ordination of Research Policies with the Western Balkan Countries

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# WBC innovation systems in focus – contribution to the WBC-INCO.NET final publication

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# Introduction and Background

This deliverable is contribution to the WBC-INCO.NET final publication: "*R&D and Innovation in Western Balkans. Moving towards 2020*", "*Part III: WBC Innovation Systems in Focus*" (available in printed and online pdf format here: http://wbc-inco.net/object/document/13962).

The WBC-INCO.NET final publication consists in general of three parts: while the first part is focusing on policy issues, the second part presents some of WBC-INCO. NET's findings and third part puts the term Innovation in focus of discussion.

The **first part** entitled "Moving towards 2020: New Horizons for RTD and Innovation in the Western Balkan Region" is discussing the development of RTDI policies and initiatives in Western Balkan region towards 2020 while including also articles on current strategic approaches in/for the region – Regional R&D Strategy for Innovation, SEE 2020 Strategy, EU Strategy for the Danube Region. Some of the articles included in this part have been presented and discussed during the **WBC-INCO.NET final conference in Vienna**, on March 27/28 such as articles provided by Slavo Radošević and Peter Polajnar. Some insights from the conference are summarised in an article provided by Mićo Tatalović. The readers are also invited to visit the conference website http://towards2020.wbc-inco.net/ and download the presentations and audio files of their interest which are publicly available.

The **second part** "Science and Research in WBC – WBC-INCO.NET's Findings" includes several reports compiled by the project WBC-INCO.NET on the situation of Science and Research in the Western Balkans and the coordination of relevant policies and initiatives in: Albania, Bosnia and Herzegovina, Croatia, FYR of Macedonia, Montenegro, Serbia, and Kosovo*.

The **third part** "WBC Innovation Systems in Focus" at hand puts the focus on Innovation and discusses a broad range of topics – from innovation infrastructures, needs and capacities to smart specialisation, innovation and brain drain and RTDI evaluation. This third part includes also some of the WBC-INCO.NET's findings which are related to innovation issues.

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# 1. Mapping of Innovation Infrastructures

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Seven exhaustive reports[1] have been prepared by the WBC-INCO.NET consortium together with external experts on the mapping of innovation infrastructures in summer 2011[2], covering several important aspects of the National Innovation Systems (NIS) and presenting the status quo of innovation institutions and programmes in Albania, Bosnia and Herzegovina, Croatia, the FYR of Macedonia, Kosovo, Montenegro, and Serbia, respectively. The aim was to develop a kind of directory presenting a comprehensive status quo of innovation institutions and programmes in the Western Balkan countries. So, at least for the time of writing of the reports, the main actors forming the NIS have been identified and described:

- Innovation-related key government institutions and
- Key programmes as well as
- Key innovation infrastructures, such as
    - Technology and Innovation Centres (TICs),
    - Clusters,
    - Technology and Science Parks (TSPs),
    - Business Start-up centres (BSCs),
    - Technology Incubators (TIs),
    - and other related organisations.

The mapping is based on extensive desk research carried out by the Centre for Social Innovation (ZSI) with input from local project partners (relevant ministries and agencies), complemented by a review of national experts who updated the institutional descriptions, contact details, etc. based on their knowledge and additional interviews they carried out. Draft reports have been circulated to all mapped stakeholders for review and additional input – and so we believe that we have arrived at a reasonably complete list. Despite the utmost effort of the authors to provide an accurate picture at the time of writing, some contact and content information may have become obsolete in the course of time. But also the historical perspective is of interest, and other projects are invited to build upon the results and to update the mapping, just as WBC-INCO.NET has also built on a previous exercise. Similar reports have been prepared during the FP6 project SEE-SCIENCE.EU in 2007, and therefore a comparison over time can be made between the data available from 2007 and from 2011, as outlined in the table below.

[1] These reports are accessible at http://www.wbc-inco.net/object/document/121802.html

[2] The activity was carried out by the Centre for Social Innovation (ZSI) in cooperation with all partners from the region and expert subcontractors. We would like to thank all contributors.

| | Albania | Bosnia and Herzegovina | Croatia | FYR of Macedonia | Kosovo* | Montenegro | Serbia |
|---|---|---|---|---|---|---|---|
| TICs | 2 (±0) | 7 (+5) | 9 (+3) | 7 (+1) | 1 (+1) | 2 (+2) | 5 (+1) |
| Clusters | 2 (-2) | 5 (+2) | 7 (-4) | 13 (+5) | 1 (-2) | 1 (+1) | 30 (+14) |
| Technology and Science Parks | 0 (±0) | 2 (+2) | 5 (+2) | 3 (+3) | 1 (±0) | 0 (±0) | 5 (+1) |
| Business Incubators / Start-up Centres | 2 (±0) | 17 (+4) | 25 (+1) | 4 (-6) | 5 (+1) | 3 (+1) | 17 (+4) |
| **Total** | 6 (-2) | 31 (+13) | 46 (+2) | 27 (+3) | 8 (±0) | 6 (+4) | 57 (+20) |

**Table 1: Nr. of mapped innovation infrastructures 2011 (and change compared to 2007)**

Hence, the Western Balkan region overall shows a positive tendency in the development of innovation infrastructures. The countries with the fastest growing innovation landscape between 2007 and 2011 were Bosnia and Herzegovina and Serbia. The FYR of Macedonia, Montenegro and Croatia achieved a slight increase. While the increase in Montenegro does not seem to be notable in absolute terms, compared to 2007, when a total of only two innovation infrastructures were active, the increase can be described as a significant improvement. While the development in Croatia is rather stable, innovation infrastructures in the FYR of Macedonia showed significant volatility with 10 establishments being closed down and 13 emerging from 2007-2011. Despite this positive tendency in general, Albania and Kosovo* could not enhance their innovation systems with additional infrastructures.

Based on the mapping, which was done country by country, providing titles, short descriptions, contact data, contact persons, and keywords characterising the innovation infrastructure, the newly opened innovation infrastructures have been one of the foci of the analysis.

**Technology and Innovation Centres** are traditionally closely linked with the universities and their primary focus lies on technology transfer between different stakeholders such as the university, research, and business sectors. As such, TICs may also provide incubation services and other management services for companies. Croatia was the country with the largest number of technology and innovation centres in the WBC, followed by Bosnia and Herzegovina, the FYR of Macedonia, and Serbia. Countries particularly successful in strengthening these institutions are Kosovo*, Albania, and Montenegro.

**Business clusters** are associations of manufacturers or service providers from a certain field that, by means of mutual cooperation and collaboration with research institutes, educational providers, or management service providers, aim at achieving synergy effects. In the WBC, clusters orientated towards wood, fruit and vegetable processing, agriculture, or tourism have a long tradition. In recent years, the trend has shifted towards industry fields with a higher added value, such as mechanization, the automotive industry, or ICT. Clusters that stand out are characterized by a bottom-up structure, proximity to the market, and a strong business affiliation. The countries with the strongest clustering initiatives are Serbia, the FYR of Macedonia, Croatia, and Bosnia and Herzegovina. Albania, Montenegro, and Kosovo* are countries with a less developed cluster scene. Croatia is again the WBC forerunner in the transition towards sectors with a more sophisticated value chain. The FYR of Macedonia is also experiencing this shift, with 4 out of 9 clusters dealing with mechanization or ICT.

**Technology and science parks** provide facilities for innovation projects such as business support and knowledge transfer services that involve a wide range of actors such as businesses, education institutions, industry and financial support services. For this purpose, physical facilities as well as infrastructures are made available. Croatia and Serbia both have five operating technology and science parks, followed by the FYR of Macedonia with three, Bosnia and Herzegovina with two parks, and Kosovo* with one park, while there are no technology and science parks in Albania or Montenegro. There are numerous models of financing in place. Whereas usually, the investment is being provided by the local authorities, national ministries, or universities, private business parks or national and international donor-driven parks are being set up as well. Due to the size of the projects, a combination of numerous financial strands is common practice as well.

**Business start-up centres or technology incubators** hope to attract small start-up companies that, for a limited time period, enjoy free or reduced rents. Apart from use of office space, they have the option to use business infrastructure as well as intellectual or business services. After a certain time, the start-up companies are expected to become independent and leave the protected area of the incubator. There are 25 business incubators and start-up centres located in Croatia and 17 each in Serbia and Bosnia and Herzegovina. Five facilities have been mapped in Kosovo*, four in the FYR of Macedonia, three in Montenegro, and, lastly, two in Albania.

But when scrutinizing the infrastructures that were closed during the period of observation, further facets can be observed:Of all innovation infrastructures, business clusters, as the easiest facility to set up, are also the most prone to closure after the provided assistance from donors is over. In total, 16 out of 45 clusters operating in 2007 had to be closed. Croatia, Albania, Kosovo*, and Bosnia and Herzegovina are the countries with the most volatile business cluster environment. More than 45% of the incubators have been closed from 2007 onwards.

Business incubators and start-up centres rank second in this category. 15 (14 incubators and one start-up centre) out of 66 business incubators and start-up centres have had to be closed down since 2007. Kosovo* has closed all three of its business incubators (only one start-up centre has remained open). The FYR of Macedonia also stands out in this respect, as six out of ten operating business incubators and start-up centres (in particular, eight incubators and two start-up centres) were closed down from 2007 to 2011.

Technology and science parks, as the most capital-intensive facilities, exhibit relative sustainability in their activities in general. After the bulk of requirements is overcome, and once the projects are up and running, they succeed to fulfil and pursue their mission. Moreover, technology innovation centres that are commonly linked to universities show sustainability in their actions as well.

The current state of the innovation infrastructures has to be seen in the broader context of the national policy settings. With national strategies and subsequent action plans that are favourable and backed with efficient resources for implementation, it is possible to achieve the goals and contribute to establishing a healthy innovation environment. The legal framework in the Western Balkan region has advanced and became more mature from 2007 to 2011. As a supportive measure, in countries that are still struggling with a lack of innovation facilities, numerous international donors are offering funding schemes for businesses.

The national mapping was complemented by a regional comparison and conclusions, such as:

- A number of donor-driven initiatives perish after the donor withdraws their funding from the project. Therefore, it is recommended to conduct measures that would foster the sustainability of the project's results and impact.
- Involvement of national actors in donor-driven initiatives feeds local knowledge and ownership into the project, which seems to have positive effects on the sustainability of the facility. As indicated by our experts, local knowledge cushions the first phase of a facility's existence, when a donor-driven facility is still trying to find the right direction, sustainability, and a market.
- Bottom-up initiatives, after they reach the level of financial stability, prove to be very appropriate models for facilities to survive. Clear business affiliation from the start is another factor that has positive effects on sustainability.
- National programmes aimed at enhancing the numbers of different innovation infrastructures also positively affect and encourage the growth of the sectors. Moreover, it proves to be a good practice to include different categories of innovation facilities (incubators, clusters, TSPs) in the national action plans so as to develop a diverse and comprehensive innovation system.
- Ministries responsible for innovation are key actors that encourage, through their strategies and various funding models, the development of innovation infrastructures. However, due to the financial crisis, they were forced to cut back the budget for these activities. To create a healthy and stimulating national innovation landscape, however, substantial initial investment is needed. Therefore, it is recommended to provide an adequate financial framework for setting up innovation facilities. It is also important to have enough well-educated staff managing the innovation policy who are capable of driving the process forward.
- In a few cases, co-ordination and co-operation between different innovation-relevant ministries at the state level seems to be limited. It is recommended to enhance the level of this cooperation so as to formulate a comprehensive and well-functioning strategy and to have a collaborative and effective network in place when it comes to implementation.
- Numerous international programmes are present in WBC when it comes to business development and innovation infrastructures. These programmes vary greatly in size, scope, and programming. Next to that, the general lack of awareness of the programmes, their regulations, and frameworks hampers the participation rate of WBC organisations. Therefore, awareness campaigns accompanied by relevant trainings seem to be crucial to fully exploit the potential of the programmes by national actors.

# 2. Conclusions of Innovation Dialogue Fora

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**Introduction**

WBC-INCO.NET established the Innovation Dialogue Forum (IDF) series of meetings as a means to facilitate a dialogue between stakeholders across the Triple Helix of innovation (Government – Research – Industry) and across borders in the WBC Region[3], on supporting regional and local development through innovation. Participants in the Innovation Dialogue Fora were WBC-INCO.NET partners, especially policy makers and the WBC Innovation Group of Experts, but also representatives of innovation program managing authorities from national and international funding agencies, and other experts at regional, national and EU level plus representatives from business associations and individual companies who could contribute to the innovation policy development. During the three meetings (in Becici on 8-9 November 2010, Ohrid on 25 May 2011 and Tirana on 12-13 June, 2012) participants surveyed the innovation landscape of the WBC, discussed specific initiatives (such as the SEE-ERA.NET PLUS project and the World Bank led "Western Balkans Regional R&D Strategy for Innovation") and exchanged ideas for Regional actions to increase innovation activities and to enhance research-business relation, including inter-sectoral mobility

In the 1st IDF at Becici the participants examined and discussed the innovation system in each WBC and then went on to discuss Regional prospects and relevant experiences. The aim was to obtain an overview of the national innovation systems and mostly of the Regional innovation demands and to arrive in a first set of recommendations through identification of potential innovation support actions at a Regional level. In the 2nd IDF at Ohrid the discussion focused on two pre-defined initiatives: the "Best Technological Innovation Competition" and the "Western Balkans Regional R&D Strategy for Innovation". After these two initiatives were discussed in detail, participants engaged in discussion of four more specific ideas: the "Creation of a Regional voucher scheme", the "Creation of Regional projects in the frame of existing schemes (e.g. EUREKA)", the "Adoption of a Regional approach towards international institutions/programs" and the "Creation of a Regional training program on innovation management". Finally in the 3rd IDF at Tirana the participants discussed and debated a series of ideas that were collected following a call to "submit concept notes contributing to a future action plan to increase Innovation Capacities in the whole Region of the WBC" and also surveyed the current situation in WBC related to Knowledge Transfer from Universities and Public Research Institutes.

The IDF series succeeded in bringing together experts and stakeholders from all the WBC and beyond and provide an opportunity to exchange ideas on Regional cooperation for innovation as well as discuss specific planned or on-going activities and initiatives, allowing for better stakeholder engagement in their development. The following paragraphs summarize the main discussion points of the three Innovation Dialogue Fora.

[3] The word "Region" is used here with a capital R to distinguish between the supra-national "Western Balkan Countries Region" and the sub-national NUTS 2 regions that each country of the EU consists of.

**On the current situation and the future of innovation systems in the WBC**

The current situation in the WBC is characterized by the lack of policy coordination, the scarcity of statistical data, the difficulty of bringing innovation to society and the difficulty of bridging the R&D and market worlds. There are scarce established mechanisms to provide systematic links between research support organizations and the finance sector and the access to capital for SMEs and innovative start-ups is very limited. It is worth noting that a lot of these difficulties are shared with other countries (and most importantly with neighbor EU member states) although their intensity may vary. Despite the problems, the universities of the Region still produce goods students that need to be exposed to entrepreneurship and innovation and some local initiatives supporting start-up creation and innovation activities demonstrate existing capacity.

In order to facilitate the development of the national innovation systems it is important to coordinate mechanisms, initiatives and projects; to emphasize bottom-up approaches; to differentiate between R&D spending and innovation spending; to acknowledge and support social innovation and non-science based innovation and to bring together scientific and entrepreneurial/ managerial skills.

At a Regional level there is a need to improve coordination and synergies among policy makers and transfer good practices not by simple copy but by studying and taking into account the local conditions. Already established mechanisms such as Technology Transfer mechanisms, Science and Technology Parks and anti-Brain Drain schemes need to be studied, evaluated for their impact and transferred between countries and local communities taking into account the specific local conditions. Every current or future initiative should include build-in monitoring mechanisms with defined statistically measurable outcomes allowing market impact assessment. Specific skills are significant in this effort, so the Region should opt for the appropriate training programs that are particularly important for granting the right skills to young researchers. A Regional approach towards policy and program initiatives would help avoid the duplication of effort and would lead to a common and consolidated approach regarding barriers that freeze innovation support efforts. Political support will remain crucial for driving these efforts forward and the sustainability of all initiatives is regarded as a key element that would allow the time for the efforts to flourish and to bear fruits with a long-term perspective and benefit. Important issues that need to be addressed in the future include:

- The definition of the Regional dimension (what is the role of local initiatives; what is the role of neighbor EU countries; how to transfer knowledge from countries with complex systems to countries with beginner or infancy systems).
- The coordination of available funding (i.e. through national budgets, HORIZON 2020, IPA, other donors' contributions) in order to achieve multiplying effects and avoid duplication of efforts.
- Ownership of innovation initiatives and programs by the Ministries of Science and Technology, other public entities, academic institutions, business and society and enhanced stakeholder involvement in their development and implementation.

In terms of specific planned or on-going initiatives, the IDF discussed the planned "**WB Technology Fund"** which aims to create a 100M € equity investment fund focused on technology and will be managed by EIF (European Investment Fund). (According to the plan in the 1st phase 25M € will be drawn from IPA funds and € 10M will be contributed by the

WBC). The discussion emphasized the need for commitment of the WBC governments and the need for the approval of IPA funds for the specific initiative. Participants agreed that in order to succeed the initiative should emphasize private capital leverage and should guarantee the independence of the management and investment decisions.

The "**Western Balkans Regional R&D Strategy for Innovation"** was also discussed in all the three IDF meetings, which coincided with its period of preparation (the final Strategy was adopted on October 2013, about 1.5 year after the 3rd IDF). It was agreed by all participants that a Regional Strategy should reflect the vision of the WBC and should make reference to specific initiatives that would benefit the WBC. The expansion of the outreach of the Strategy would be possible by enhancing communication within the countries so as to better reflect the interests of more stakeholders. The significance of adopting a complementary approach with existing initiatives was emphasized so as to avoid duplication of effort. Initiatives should be headed towards the specialization of research through identifying concrete topics for follow-up. Another important issue was the management and implementation of the Regional Strategy that required formal, political commitment. Potentially, a Regional Body would be responsible for lobbying for commitment and for pushing related reforms. Sustainability dictated thinking on the benefits of the Regional approach and the next steps following the actual formulation of the Strategy. This meant looking for further funding sources and also securing the budget share at national level.

**Suggestions for future activities**

A large number of ideas for enhancing innovation at the national and Regional level were discussed during the three IDF. These came up as a result of round table discussions, brainstorming sessions, structured discussions on pre-defined topics and a series of proposals received as a result of an open call to submit ideas. The suggestions are summarized below in three thematic strands: on innovation policy; on supporting research/business cooperation and on strengthening business R&D and innovation.

**Suggestions on innovation policy**

- Adopt Smart Specialization Strategy approach to national and local planning for R&D and Innovation, even though this is not a formal requirement for WBC.
- Provide technical support to WBC in carrying out the self-assessment required under Innovation Union Annex I.
- Enhance knowledge on evaluation methodologies of innovation policies by organizing a specialized training workshop for WBC and carrying out peer review evaluations of innovation policy measures in WBC.
- Organise a systematic evaluation of Innovation Climate as a tool for policy decision making and as an indicator of innovation.
- Introduce innovation in Public Administration Reform (Open Government, Open Data) and modernize (governance in) the public sector with extensive use of ICT
- Initiate a Regional Foresight Exercise as a tool for Regional innovation planning
- Teach creativity and entrepreneurship at the secondary school level as a means to promote entrepreneurship and innovation to society.
- Explore power of the media including social media in new innovative ways in order to change public opinion on entrepreneurship and the relation between research and the market.

- Undertake capacity building initiatives towards social innovation and non-technical innovation.
- Use legislation to foster innovation i.e. tax incentives for companies to hire R&D personnel and Public Procurement to promote innovative products and service
- Improve IPR protection as a tool to increase marketing of innovations.
- Create Regional projects in the frame of existing schemes (e.g. EUREKA)

**Suggestions on strengthening of research / business cooperation**

- Create a funding mechanism for companies to submit projects to universities/ research centers (voucher type scheme)
- Develop a virtual laboratory for research innovation and entrepreneurship using a web platform and on-line services
- Introduce common PhDs in scientific topics of common interest with the potential for attracting business development and support.
- Support Joint European Research Projects/JERPs funded by the SEE-ERAnet plus program to prepare for introduction to market.
- Organize summer schools for young researchers on career in the knowledge society and international cooperation and on Innovation Management
- Create a Regional researcher mobility scheme for the WBC targeting intra WBC mobility as well as WBC – EU MS mobility.
- Establish dialog and communication between science and industry by using a variety of instruments such as thematic workshops, brokerage events, mobility schemes to foster science and industry cooperation.
- Organise a WBC-wide Best Technological Innovation Competition (based on the established experience of the University of Novi Sad)
- Initiate Blue Sky projects of academia – industry cooperation, without pre-defined outcomes, that will rely on the participants' creativity and interaction.
- Develop a Regional MSc training program on Innovation in South East Europe
- Create a Program to connect researchers in the WBC with WBC-researchers living and working abroad (diaspora)
- Provide seed money for start-up projects/companies. Engage EIB / EUREKA / EC Venture Capital Fund
- Twinning of best practices between innovative clusters in EU Member States, Associated Countries and the WBC
- Promote creation of spin-off companies within faculties

**Suggestions on increasing business R&D and Innovation**

- Create a Regional network of innovation officers. An Innovation Officer is as an employee that should operate within the SME as a driver of innovation.
- Provide strategic Innovation consultancy to SMEs and establish an innovation coaching scheme to train entrepreneurs on innovation management and problem solving

- Increase business development in incubated SMEs via international networking and co-incubation of companies with high growth potential in global markets.
- Develop business and innovation support structures through establishment of network of interdisciplinary business incubators that provide support to start-up companies and carrier development.
- Create a social Innovation fund in order to provide new, effective and innovative solutions to key socio-economic challenges.
- Create a Regional venture capital fund and a Regional business angels network
- Organize a Regional competition: on “Women in S&T and Innovation”
- Create a Regional inter-sectoral mobility scheme

# 3. Survey on Future Market Research and Innovation Needs in the Western Balkan Countries

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*The article is based on the on the report by IPTS in collaboration with Institute Ivo Pilar available at: http://wbc-inco.net/object/document/7423*

*A previous version of this text was published as an EFP-brief at: http://www.foresight-platform.eu/wp-content/uploads/2013/01/EFP-Brief-No.-244_Research-and-Innovation-Needs-in-the-Western-Balkan-Countries.pdf*

## Introduction

Within the WBC-INCO.NET project, a survey was developed to support innovation capacities in the WB region. The survey aimed to pinpoint both present and likely future research and market needs, as well as identify possibilities for collaboration in the region.

The survey was carried out in two rounds, the second building on the results of the first. Two questionnaires were jointly designed by JRC-IPTS and Ivo Pilar. These addressed, consecutively, market and research stakeholders.

The findings have supported other activities of the initiative and have contributed to provide a clear overview of the region's current situation and future needs with regards to innovation.

## Methodology

The methodology employed consisted of five phases:

1. A literature review on innovation was undertaken to clarify the focus of the questionnaires. Such review led to focus the survey on the following aspects:
    a) Importance of different stakeholders in the innovation process;
    b) Specific actions that can improve regional cooperation as well as innovation;
    c) Factors necessary to stimulate regional cooperation divided in human resources, entrepreneurship infrastructure, expert assistance and cooperation between industry and research, fiscal and financial obstacles, and both national and local regulations;
    d) Likely outcomes of enhanced regional cooperation.
2. The first questionnaire was submitted to selected firms in the WB region.
3. Building on the results of the first questionnaire and with the aim to compare results, a second questionnaire was sent to research stakeholders in the region.
4. A statistical analysis was conducted for both questionnaires, and results crossed with one another.
5. Results were circulated within the consortia for final refinements.
6. The response rate of the industry questionnaire (first round of the survey) was low. Only 20 firms replied (half of which from the IT sector). On the other hand the response rate for the researchers' questionnaire was higher.

**Interesting results: Industry survey (first wave)**

Given the low response rate, the results cannot easily be generalised. Nevertheless, some interesting features emerged from the exercise. It is important to notice that all the companies but one, were domestically oriented, in other words they served basically local customers.

The firms were asked their opinion in relation to the importance of 14 stakeholders' for firms' innovation capacities. Their responses indicate that, for the survey respondents the three most important stakeholders are:

1. Employees in the own enterprise or enterprise group
2. Professional and industrial associations
3. Universities and colleges

On the other hand, the three least important stakeholders are:

12. Cluster networks
13. Suppliers and customers from the WBC region
14. Venture capital firms/angel investors

These reflect the current level of development of the innovation system, where actors such as business angles, or systemic network interactions, are not perceived as relevant.

The industry survey also asked (through open questions), where the business saw potential for innovative development and interaction with the research sector to occur. The following areas appeared promising:

- Environment surveillance through ICT.
- Automation of information management systems through artificial intelligence and agent based software.
- Selling of goods and services through social networks and on-line data mining.
- Legal research to reach an agreement for trade of ICT services and products within the Western Balkans.
- Research on new approaches and frameworks to enhance FDI and cross-regional investments in the region

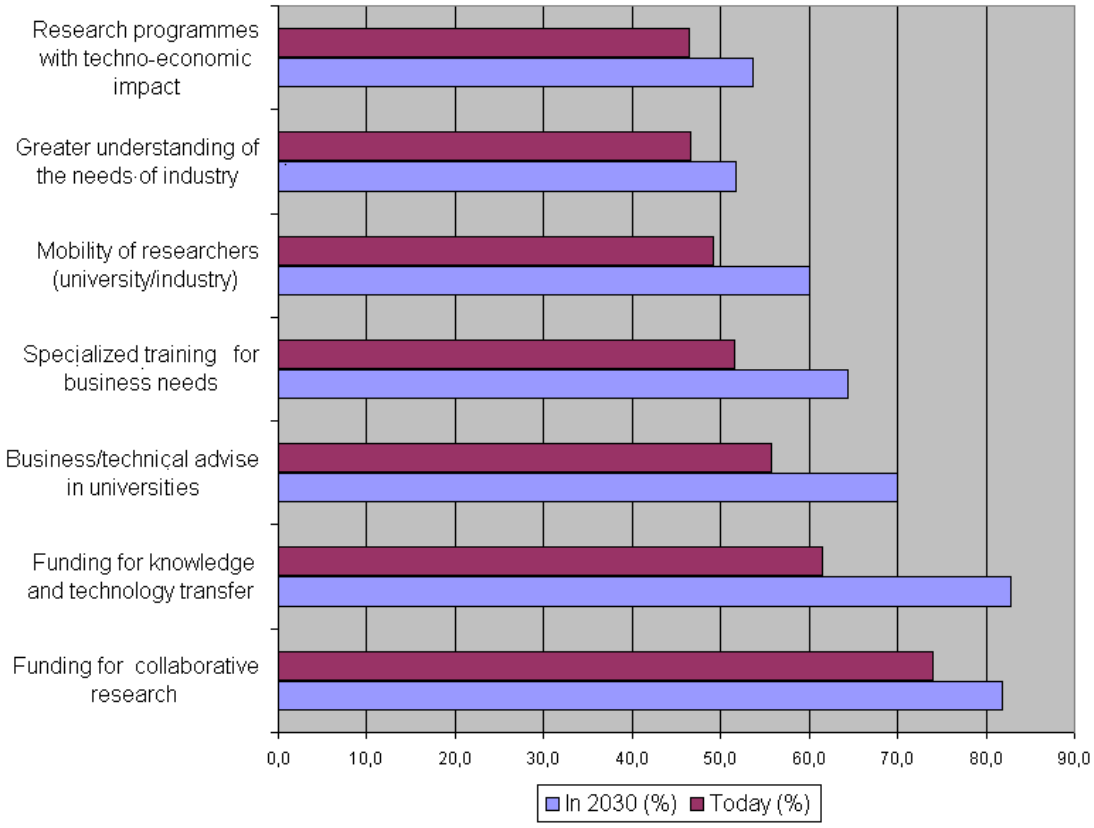
**Interesting results: research stakeholders survey**

The second wave of the survey has highlighted that funding as well as consultations and dialogue between stakeholders in the region is perceived as the most important action for improving cooperation between business and research in the region, both presently and in the future.

Skills and qualified personnel (i.e. scientists and engineers) are also perceived as critical to enable regional cooperation, whereas the quality of regional research institutions (i.e. technical universities and colleges) and communication infrastructure is perceived as needing improvement.

Respondents were also asked to assess the importance of various factors influencing university-industry collaborations at two points in time: now and in 2013. The graph reports the proportion of respondents that have classified each factor as *highly important*.

**Figure 1: Important factors for university-industry cooperation today and 2030**




Interestingly, all the factors assessed are perceived as important by more respondents in relation to the future than to the present, suggesting that researchers feel that other barriers need to be overcome in the short-term.

**Industry and research: diverging views on the needs for research and innovation**

Combining the results achieved through the double survey consultation, the following points can be highlighted:

- The most important actions for improving cooperation between business and research in the region, both presently and in the future are: (1) more funding for knowledge/technology transfer activities and expert consultations and (2) more funding for collaborative research between universities and businesses.
- Whilst state and local regulations as well as expert assistance, seem critical for innovative performance today, investment in human resources and in infrastructure emerges as crucial to enhance cooperation in the future.
- The answers given by industry and those given by researchers on the most important actions for improving regional innovation activities differ substantially. The three actions least important for industry are among the four more important for researchers, namely:
    - common programmes for mobility of personnel in the region between universities and business to establish
    - cooperation between science and industry, consistent legal framework aimed at facilitating foreign direct investments in the WB region, and a progressive

- liberalisation and mutual opening of the service market within the WB region.

- The only action which comes as important for both business and researchers (ranking third for both of them) is that of developing regional initiatives for large infrastructural projects. Such an outcome highlights the need for enhanced communication and understanding between these two groups of stakeholder in order to achieve at a joint agenda.
    - Finally, from the research topics identified by industry as important to trigger regional innovation through collaboration, those that seem to appeal also to research stakeholders are:
    - Environment
    - Surveillance through ICTs, automation of information management systems
    - Through artificial intelligence and agent based software, and new
    - Approaches and frameworks to enhance FDI and cross-regional investments in the region.

**Conclusions**

A strong divergence between the views of industry and research in terms of present and future actions as well as areas for collaborations has emerged. This call for policy measures aimed at improving communication between the two types of stakeholders to facilitate the move towards a common agenda.

Presently, a strong need is felt also for policies providing more funding for knowledge/technology transfer activities and expert consultations as well as collaborative research between universities and businesses.

The critical issues emerged in the survey called for further analysis and discussion. In particular, it is suggested that industry and the research community gather to discuss the following aspects:

- Investment in knowledge and technology sharing, expert consultations and collaborative research
- Decrease in regulation
- Strengthening of human resources
- Improvements in infrastructure (including (ICT)
- Building awareness on innovation benefits
- Fostering mobility
- Enhancing communication between different stakeholders

# 4. Comparative analysis of the innovation capacities in the WBC with emphasis on joint cooperation needs in the field of innovation

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## 1. Introduction

The last enlargement of the European Union (EU) by two new members Bulgaria and Romania shifted the focus of the European Union from Southeast Europe towards the Western Balkan Countries (WBC) as the area where future integration is expected. WBCs are neighbouring countries to the EU and potentially its important partners for trade, investments, innovation development, etc. At the same time much of the Balkans lags behind the rest of the EU in technology accumulation and innovation capacities. That certainly calls, after two decades of transition to market economy, for application of the new growth models which would be more relied on innovation and research. One of the possibilities to foster innovation in the Balkan region is to intensify innovation cooperation following the concept of the regional innovation system. In order to provide a background analysis for better regional innovation cooperation, the WBC-INCO.NET project has initiated a comparative study of innovation capacities of the WBC and analysis of the factors which could improve the regional innovation cooperation.

## 2. Methodology and limitations

The comparative analysis of the WBCs' innovation systems and capacities is based on a complex analysis that includes a survey of innovation needs based on two on-line questionnaire targeted at entrepreneurs and researchers (from April to May 2011), mapping of the WBC Innovation Infrastructures carried out by the Centre for Social Innovation[4], reports of national experts about the national systems, etc. Since the response rate on the on-line questionnaires was rather low the results based on this survey are more indicative than conclusive. Yet, this is a firs attempt if this kind of research in WBC.

It should be also noted that the main findings of the background analysis are certainly limited since a comprehensive comparative analysis of innovation systems of the seven individual countries would need much more human and financial resources, as well as *in situ* experience to understand the details of how the respective research and innovation systems work in practice.

## 3. Comparative analysis

The comparative analysis of the national innovation systems (NIS) includes the examination of four components: /1/Research capacities; /2/ Innovation sub-system for entrepreneurship

[4] ZSI (2011), Mapping of the WBC Innovation Infrastructures. Study carried out by the Centre for Social Innovation (ZSI) within the WP 8.1 of the WBC-INCO.NET-ENHANCED

and non-research driven innovation; /3/ Innovation sub-system and policy programmes for research-driven innovation; /4/ Governance of innovation.

### 3.1 Research capacities and policies

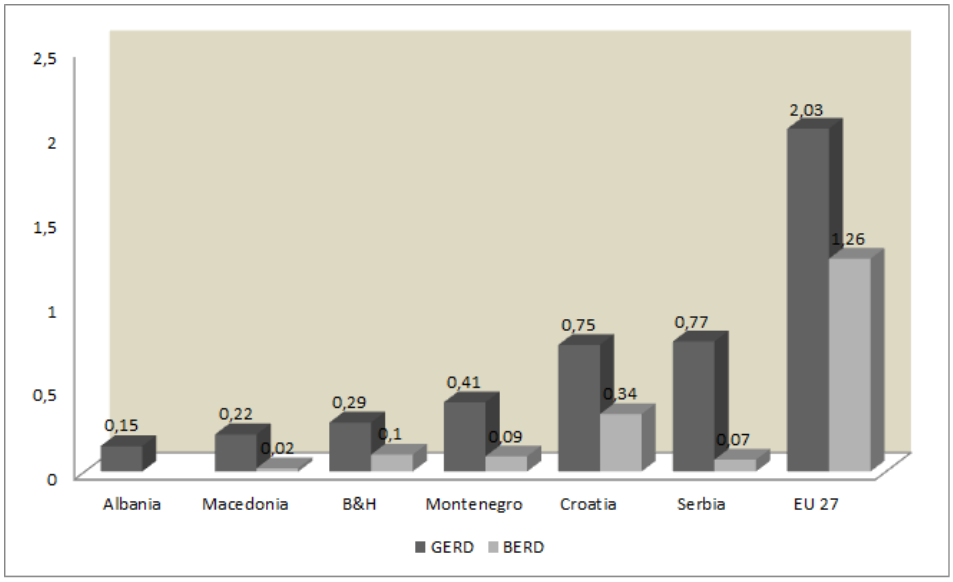
Science and research have a marginal role in the economic development of the WBCs, which is not only opposed to the goals of European Strategy 2020 for transition to the knowledge economy, but also threatens the production capabilities of companies and their absorption capacities of foreign knowledge and innovation that make the core of economic activity in the WBCs. The economic strategy and model of the WBCs with a strong reliance on capital inflows and external knowledge, de-industrialisation and excessive tertiarisation resulted in weak and, in some countries like Croatia and Macedonia declining research sectors characterised by the low R&D investments, innovation-deficient business sectors, brain drain, as well as limited ICT utilization

The WBCs' research systems significantly differ in research intensity, manpower, institutional complexity and performance abilities. The most developed systems are established in Croatia and Serbia, which have the highest investment in R&D, above 0.75% of GDP, but they are still significantly lower than the EU average (Figure 1). Although these countries have rather mature research and higher education systems inherited from ex-Yugoslavia, currently the systems require comprehensive reforms in order to achieve satisfactory levels of scientific excellence and involvement of the research sector in national economy.

FYR Macedonia, Montenegro and Bosnia and Herzegovina have rather small research communities, not exceeding 2,000 researchers, but have a good perspective to catch up with Croatia and Serbia. Based on the analysis carried out within the WBC-INCO.NET project and other sources like ERAWATCH reports5, it can be said that the institutional set up for R&D and higher education in these countries is mostly in place, as well as research policies and strategies. They are focused on increased investments in R&D, research excellence, international mobility, integration into ERA and connection between research and business sectors with the economy. By contrast, the research system of Albania and Kosovo are in an infancy phase, due to political and economic specificities. For example, according to the available data, the government of Kosovo invested in 2010, for the first time, €1m for research for public institutions, while the Albanian government undertook a deep reform of the scientific research system in 2006 to harmonize it with the European model.

**Figure 1. The WBCs by Gross expenditure on R&D (GERD) and Business expenditure on R&D (BERD) in 2011or closest (% of GDP)**

[5] http://erawatch.jrc.ec.europa.eu/erawatch/opencms/information/country_pages/




Note: the data for Kosovo are missing
Source: ERAWATCH country reports

The most critical part of the research systems in all the WBCs is the business research sector, where R&D investments are extremely low (Figure 1), illustrating a lack of interest for R&D and weak technological capacities. Although the Croatian business sector invests in R&D incomparably more than other WBCs, this is far below the investments needed to create a critical mass of researchers and resources for technological accumulation and knowledge-based innovation.
Despite significant differences, the WBCs share many common problems in the research sectors, such as: lack of manpower, low international and sectoral mobility of researchers, low participation in the Framework Programmes, obsolete scientific equipment, weak abilities for university- industry collaboration and commercialisation of research results.

### 3.2 Institutions and policy programmes for fostering entrepreneurship and non-R&D driven innovation

Policy programmes and the institutional set–up for entrepreneurship and non-R&D based innovation are the most developed part of the innovation systems in all the WBCs due to the adoption of the European Charter for Small Enterprises in 2003, which recommended ten key policy areas of action to support SMEs. The implementation of actions was subjected to regular monitoring and evaluations resulting in two comprehensive studies of SME policy index carried out by the OECD[6]. As of 2010, all the WBCs have in place the basic legal and regulatory frameworks necessary for entrepreneurship and business development. In terms of company registration, for example, almost all of the WBCs have made significant progress in simplifying registration processes, and reducing the costs and time taken to register new

[6] *Policy indexes 2007 and 2009 - Progress in the Implementation of the European Charter for Small Enterprises in the Western Balkans*, OECD 2007 and 2009

firms. The development of more targeted enterprise support measures – for start-ups, export-oriented firms or those led by women – remains more uneven across the WBCs.
According to the level of implementation both SME Policy Indexes distinguish three groups of WBCs. The first group, made up of Albania, Bosnia and Herzegovina, and Kosovo, has an institutional and legal framework underpinning SME policy that is still largely reliant on ad hoc intervention and pilot projects, and is in need of further concretisation. A second group, made up of the FYR Macedonia, Montenegro and Serbia, largely completed the legislative and institutional framework supporting SME policy and entered the policy implementation phase. The third group includes Croatia alone, which was highlighted as the most advanced country in terms of SME policy and entrepreneurship development. However, it was also stressed that there have been significant policy developments in Serbia across a wide range of dimensions. The country has moved rapidly from the phase of policy elaboration and definition of strategy objectives to policy implementation in areas such as support to innovative companies, start-ups, provision of business services and information dissemination through online services. The FYR Macedonia and Montenegro have made significant progress relating to human capital and provisions of business support services, while they are relatively weak in the key areas of supporting SME competitiveness and technological capacity.
These findings are supported by the mapping of the WBCs' innovation infrastructures carried out by ZSI which revealed that innovation infrastructures in the WBCs mainly include standard business and innovation supporting institutions like business incubators, entrepreneurial zones, clusters, technology and innovation centres, etc. Their operability and effectiveness significantly varies across countries, following the pattern already outlined in the SME policy indexes.
Although the INCO-NET study does not provide an estimate of the number of different innovation institutions, there are certainly several hundreds of them in the WBCs. Only Croatia counts for more than 200 different institutional entities to support business innovation. It is interesting to note that business incubators and clusters are the most spread innovation facilities in the WBCs. Business clusters are the easiest facility to set-up, as well as to close down, after the assistance from donors is over. Similarly, it leaves wide scope for interpretation due to its fuzzy, polycentric and hybrid nature. The great difficulty is to assess which of these clusters are really operational and which exist only formally.

### 3.3 Institutions and policy programmes for fostering R&D-driven innovation

Innovation policies for R&D-driven innovation usually involve specialised institutions and programmes for strengthening the interaction between different innovation sectors and involve tailored-made programmes for science-industry cooperation and commercialisation of R&D results. Such supporting programmes for R&D based innovation and science-industry interface institutions like technology transfer centres, technology parks, science parks, etc. are the weakest component of the innovation systems in the WBCs.
Only Croatia has devised so far a complex set of such institutions and programmes, due to the comprehensive innovation policy introduced at the beginning of 2001. It resulted in several funding institutions (e.g. Business Innovation Agency-BICRO, Unity through Knowledge Fund), various programmes for university-industry cooperation (RAZUM, TehCro, IRCro, KonCro, PoC, TEST, etc.) as well as programmes funded by the European Union and the World Bank (SIIF, STP) focused on transfer and commercialisation of university research.
Although Serbia has not developed a similarly comprehensive system for supporting research-based innovations as Croatia, it has created some highly successful programmes, such as the competition for the Best Technological Innovation in Serbia focused on the creation of

university spin-offs at the University of Novi Sad. It has created more than 60 spin-off companies within last the 5-6 years. FYR Macedonia has made a significant progress in 2012 when the Innovation Strategy for the period 2012-2020 was adopted, as well as some other initiatives like legislation for university spin-off companies, etc. In B&H, such programmes are mostly in a pilot phase, while in Albania, Kosovo and Montenegro they are at a very early stage of policy elaboration.

The most common type of intermediary institutions is the technology park (in some places named science or industrial park). Croatia and Serbia have around five operating technology and science parks each, followed by FYR of Macedonia with three, B&H with two, and Kosovo with one (Industrial park in Drens). Albania and Montenegro have no technology/science parks at the moment. However, the first initiatives for a technology park in Montenegro were launched in 2012. Technology transfer centres are mostly developed in Croatia, followed by Serbia and FYR Macedonia.

The development of the wider institutional context needed to support R&D-driven innovation such as financial tools for investing in research commercialisation (e.g. venture capital), intellectual property regulations in academia or technology foresight exercises are poorly developed in the WBCs. Only Croatia and Serbia established advisory services for intellectual property rights achieved by universities. According to the available data only Croatia and Montenegro launched fiscal (tax) incentives for fostering research in companies. Only Croatia has launched a programme on venture capital (VenCro), but the initiative was stopped due to the lack of interest of potential stakeholders. However, the Croatian network of business angels and private investors interested in investing in innovative companies (CRANE) is rather active. Technology foresight exercises are not carried out in any of the WBCs.

### 3.4 Innovation governance

WBCs' innovation systems are highly centralised, "top-down" systems coordinated by the line ministries, primarily the ministries of science/education in the domain of R&D-based innovation and the ministries of economy/entrepreneurship for supporting business infrastructure and innovation. This strong hierarchical governance model is typical for less developed countries and technological followers that suffer from a lack of market forces and established relationships between innovation stakeholders for driving technological development by the "invisible hand" of business interests and mutual co-evolution.

The lack of a co-evolutionary process between technologies, institutions and businesses requires high-policy level interventions to foster entrepreneurship and innovation. However, a strong "division of labour" and competences within the line ministries exists even in the countries with the most developed innovation infrastructure (like in Croatia) and points to the lack of cooperation and synergy between the government bodies. Although all the WBCs, except Kosovo, have the strategic documents related to research policies in place, they are not coordinated with innovation policies and do not have much influence on the economic strategy in general. The most ambitious countries in the utilisation of knowledge for economic development are Croatia, which has been running university-industry cooperation programmes for about a decade, and Serbia, which perceives academic institutions as a primary source of new knowledge production and innovation.

The main difficulties with strategic documents in many WBC countries are related to the:

- Large number of strategic documents in different areas with a low-level of implementation;
- "Europeanisation" of innovation and research policies, which does not have much in common with solving the problems of national or local economy.

For example, Serbia has produced from 2005 to July 2011 around 90 strategic documents on innovation, SMEs, research and technology. On the other hand, many strategic documents, at least in Croatia, present only a copy the European schemes and approaches, while lacking a down-to-earth analysis of national competences, national innovation needs and corresponding strategies. It is symptomatic that industrial policy is very poorly represented in the strategic plans of the WBCs, although it should have an important role in strategic development concerning the backwardness in technological accumulation of the companies and a modest role of research for economy. During the transition period, industrial policy in the WBCs has focused on the financial rehabilitation and privatization of traditional industries that have lost their technological dynamism and have dragged entire economies into structural crisis and unemployment (e.g. shipbuilding sector in Croatia). From the available data, only FYR Macedonia, Croatia and Serbia have adopted some sort of industrial policies, but without action plans for the implementation.

## 4. Summing up

In the last 10 years, the WBCs made significant progress in innovation policy, in terms of infrastructures and supporting programmes for SMEs and entrepreneurship, while supporting programmes and institutions for research based innovation are rather modest. As expected, the former programmes and institutions are more common in the WBCs with less developed innovation systems, while the latter programmes are mainly limited to Croatia and Serbia. The WBCs have not, except Croatia and Serbia, initiated/developed specific policy programmes and supporting measures aimed at supporting inter-sectoral knowledge flows and interactivity, such as programmes for science-industry cooperation, research commercialisation, academic spin-offs, intellectual property rights in academic community, etc. The most common measure for supporting science-industry links is reduced to establishing intermediary institutions like technology parks and technology transfer centres, but with no evidence about their achievements.

It is rather difficult to estimate performance and efficiency of the WBCs' innovation systems due to their current instability and fluctuation, and lack of transparent and systematic data.

Based on their experience in establishing institutions and supporting programmes for innovation, the following characteristics of the WBCs can be identified:

- Kosovo – lack of innovation structure, strategy and programmes for both research-based and non-research based innovation;
- Albania and B&H – beginners in establishing supporting measures, policy elaboration and definition of strategy for non-research based innovation; intermediary institutions in the phase of infancy;
- Montenegro and FYR Macedonia – familiar with establishing and implementation of innovation infrastructure for SMEs end entrepreneurship (non-research based innovation);
- Serbia – complex innovation infrastructure for SMEs/ entrepreneurship, while programmes and intermediary institutions for science-industry cooperation are moderately developed;
- Croatia – complex innovation infrastructure for SMEs/entrepreneurship and developed policy-mix for science-industry cooperation, yet with the modest influence on economic development.

In conclusion, the comparative analysis of innovation performance in the WBCs tentatively distinguishes three groups of countries (Table 1). Croatia and Serbia belong to first group which develops complex innovation systems, yet not fully functional in all parts. Their role and activities will be crucial for the development of regional cooperation within the WB region. B&H and FYR Macedonia and Montenegro form the second group of countries which have a good perspective to catch up with Croatia and Serbia. They are rather familiar with the development of some innovation system components (e.g. R&D systems), but they are beginners (or moderate) in other components especially those related to science-industry cooperation. The third group of countries are small and geographically isolated economies (Albania and Kosovo) whose innovation systems are in the beginning phase (Albania) or infancy (Kosovo).

**Table 1. A tentative categorization of the WBCs by innovation performance**

| | **Research system** | **Entrepreneurship and SMES (non-R&D based innovation** | | **R&D-based innovation** | |
|---|---|---|---|---|---|
| | | **Programmes** | **Institutions** | **Programmes** | **Institutions** |
| Croatia | Complex | Complex | Complex | Complex | Complex |
| Serbia | Complex | Complex | Complex | Moderate | Moderate |
| FYR Macedonia | Familiar | Familiar | Familiar | Beginner | Moderate |
| B&H | Familiar | Moderate | Moderate | Beginner | Moderate |
| Montenegro | Familiar | Beginner | Moderate | Beginner | Beginner |
| Albania | Beginner | Beginner | Beginner | Beginner | Beginner |
| Kosovo | Infancy | Infancy | Infancy | Infancy | Infancy |

**Infancy**-almost no experience; **Beginner**-establishing a few institutions/ programme; **Moderate**- establishing several institutions/programme; **Familia**r-there is a track record in institutions/programmes; **Complex**-existing system of institutions and programmes

Due to the different development levels of innovation systems in the WBCs, different measures or specific policy mixes need to be put in place. For example, in Kosovo and Albania important measures should be directed towards setting up the R&D system, while in Serbia and Croatia reforms of R&D and higher education systems are needed to achieve both scientific excellence, international recognition and deeper involvement of universities in the local and national economies.

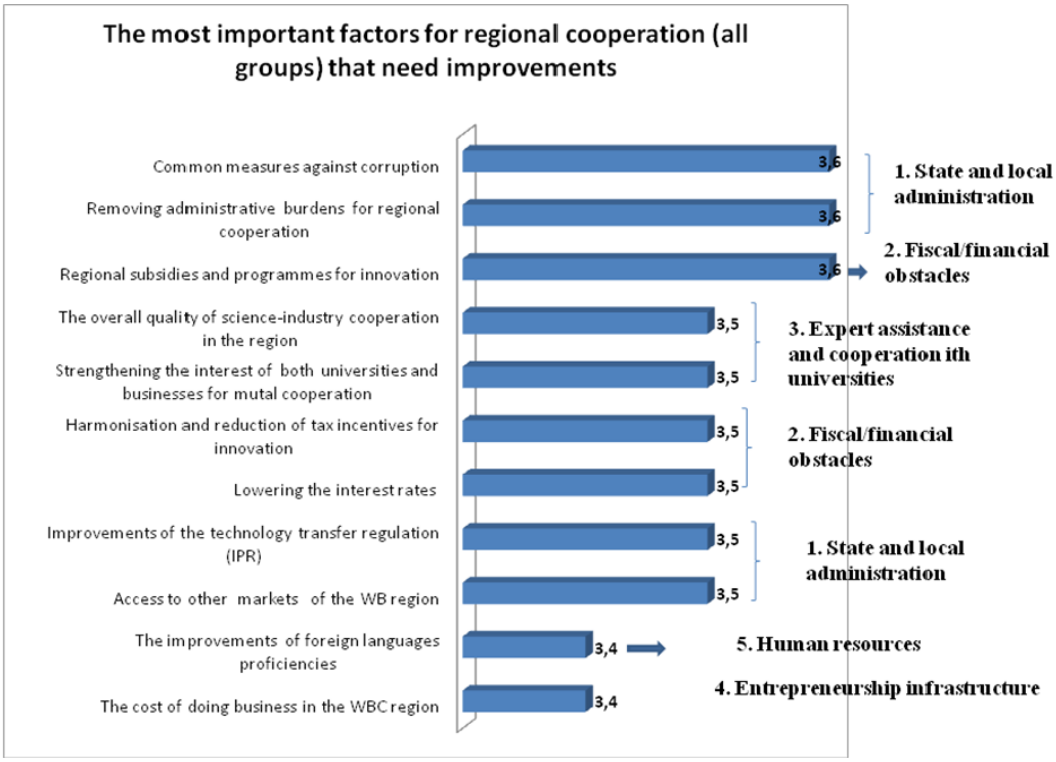
## 5. The analysis of joint cooperation needs for better innovation and science-industry cooperation

This analysis is based on on-line questionnaires targeted at entrepreneurs and researches. Only several results will be presented here while the detailed analysis is provided in the project report.[7]

1. Companies estimate that **the most important factors for their innovation capacity** are the employees of their own enterprise or enterprise group and the professional and industrial associations. The third place is shared between the conferences/trade fairs/exhibitions and universities/ colleges. The least important are the venture capital firms and the companies from the WBC region;
2. As far as **outcomes of regional cooperation** are concerned, the entrepreneurs perceive WB region as the opportunity for gaining the new markets and for upgrading the efficiency of their companies by lowering the cost of businesses. They estimate that they would benefit the most from three equally important factors: /1/ access to new markets, /2/ availability of the possible regional financial initiatives (e.g. Regional Investments Bank, e.g. Western Balkan Investments Fund), and the /3/ lower costs of doing business (e.g. the cost of real estate, utilities, lower labour costs, etc.);
3. The **most important factors which need improvements** for better regional innovation cooperation are classified as "State and local administration" and the "Fiscal/financial obstacles" which include: /1/ common measure against corruption at the national level, /2/ removing administrative burdens for regional cooperation and /3/ more subsidies and programmes for innovation at the regional level (Figure 2).

**Figure 2.** The most important factors for regional cooperation that need improvements

[7] Švarc, J., Aralica, Z., Lažnjak, J., Perković, J., Račić, D., Bečić,E., Poljanec-Borić, S. (2011), Comparative analysis of the innovation capacity in the WBC with particular focus on joint cooperation needs, Deliverable, D8.51, Institute of Social Sciences Ivo Pilar, Zagreb, December , 2011.




Scale: 1-No importance; 2-little importance; 3- medium importance; 4- high importance

4. The **science-industry cooperation** is also recognised as an important factor for strengthening the innovation capacities and regional cooperation. The three factors for better science-industry cooperation are recognized as particularly important: /1/ more funding for collaborative research between universities and businesses; /2/ more funding for knowledge/technology transfer activities and expert consultations and /3/ greater understanding by researchers of the needs of business companies and industry. The least important is the "Introduction of regular business/technical advising services at universities for the needs of businesses". It might indicate that companies already have experienced such advising activities without an impact on their businesses.

   - When comparing the answers given by companies and those given by researchers on the **most important actions for improving regional innovation cooperation,** they seem to differ substantially (Figure 3).The three actions least important for companies are among the four most important for researchers. They include /1/ the common programmes for mobility of personnel in the region between universities and business to establish cooperation between science and industry; /2/ consistent legal framework aimed at facilitating foreign direct investments in the WB region; /3/ progressive liberalisation and mutual opening of the service market within the WB region. By contrast, companies prefer funding and financial support for improving regional innovation cooperation such as the regional venture capital fund. However, both the parties recognized the need for large infrastructural programmes as the driver of regional innovation cooperation (ranked 3rd).

**Figure 3. Importance of regional innovation actions for improving regional innovation cooperation**

| | Companies | Researchers - today | Researchers in 2030 |
|---|---|---|---|
| Establishing regional venture capital fund | 1 | 6 | 11 |
| Creating a regional financing programme for innovation | 2 | 4 | 6 |
| Developing regional initiatives for large infrastructural projects | 3 | 8 | 3 |
| Common large scale technology programmes | 4 | 12 | 9 |
| Joint regional approach towards international funding institutions (WB, EU) | 5 | 10 | 7 |
| Harmonisation and opening of the government's procurements markets | 6 | 5 | 5 |
| Strengthening regional innovation clusters in selected sectors | 7 | 11 | 12 |
| Common apprentice (trainee) programmes of young experts | 8 | 7 | 10 |
| Common educational programmes for technical skills, innovation management, | 9 | 9 | 8 |
| Common programmes for mobility of personnel in the region between | 10 | 3 | 1 |
| Consistent legal framework aimed at facilitating foreign direct investments in the | 10 | 1 | 2 |
| Opening and liberalisation of the service market within the WB region | 12 | 2 | 4 |

## 6. Conclusions

The analyses reveal that WBC differs significantly in overall development and related innovation capacities. For example, there is almost a four-fold difference in per-capita income between the richest (Croatia with €10,246 GDP p/c) and poorest (Kosovo with €2,650 GDP p/c) country in the region[8] as well as in performance of the national innovation systems (NIS) and governance abilities to advance innovation competences.

Despite the differences, WBC share many similarities that provide a platform for mutual cooperation and possible development of the regional innovation system. One of the most substantial similarities is a nature of their competitive advantages which refers to non-research based innovation and technology efforts that include absorption of foreign technologies and mastery of production capability. Science and research is a residual of their present economic models and not a vital element of development. It calls for policy measures and instruments for strengthening innovation capacities at national and regional level and productive use of research and education.

Due to the different level of development of NIS in WBC the different measures and policy mix should be put in place. For example, in Kosovo UN Res.1244 important measures should be directed towards setting up the research system while in Serbia and Croatia the reforms of

[8] Kosovo Agency for Statistics http://esk.rks-gov.net/eng/

research system are needed in order to achieve scientific excellence and involvement of research sector in national economy.

The survey-based studies on regional innovation needs reveals that entrepreneurs and researchers recognised two factors as the most important for fostering regional cooperation:

- removing the state and local administrative burdens and procedures for regional cooperation including the measures against corruption;
- improvements of science- industry cooperation which include, among others, strengthening the interest of both companies and universities for mutual cooperation; more intensive science-industry cooperation assumes more subsidies for technology transfer programmes at the national and regional level.

It is worthwhile noticing that entrepreneurs, unlike researchers, think that the biggest obstacle to science-industry cooperation is the lack of understanding of researches of the needs of businesses. It points to the communication barriers between entrepreneurs and scientists, lack of understanding of each other needs. It demands establishing of different forms of dialog and communication channels among these two spheres.

The concrete joint actions to be taken for better regional innovation cooperation perceived by entrepreneurs include establishing of the regional venture capital fund and the regional financing programme for innovation. In contrast, researchers perceived mobility, legal framework for fostering direct foreign investments) and liberalisation of service market (probably for R&D services) as the most important.

Finally, both parties recognised the lack of the large infrastructural projects for fostering regional innovation cooperation. It calls for identifying and creating infrastructural projects that are sufficiently large and capital intensive to involve several all interested countries and stakeholders in the region like ICT, transportations, energy resources, clean technologies, etc.

# 5. Is the Triple Helix model relevant for innovations in WBC?

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## 1. Introduction

The Triple Helix model of university-industry-government relations (e.g. Leydesdorff 1997, 2000; Etzkowitz, 2008) was perceived as mostly irrelevant to the WBCs because of well-known deficiencies of the three "helices", such as low scientific capacities both in the private and the public sectors, low R&D investments, absence of cutting-edge technologies and the lack of strategic innovation governance. The recent "Triple Helix Systems of Innovation" concept (Ranga and Etzkowitz, 2013) introduces a new vision by bridging key features of the Triple Helix model with the innovation systems theory (Carlsson and Stankiewicz, 1991; Carlsson et al., 2002; Carlsson, 2003; Edquist 1997). A Triple Helix System is defined, similarly to an innovation system, as a set of components, relationships and functions that generate and promote innovation. The components include institutional and individual players that can be further differentiated into R&D and non-R&D innovators, the relationships consists of five different types of activities among which technology transfer, collaboration and collaborative leadership are particularly salient, while functions are realised through a set of activities in the Knowledge, Innovation and Consensus spaces. The concept of spaces provides a framework for assessing the efficiency of Triple Helix interactions based on the performance, interaction and co-evolution of institutions within and among the spaces. The new model recognises the role of "non-R&D innovators" and acknowledges that a large part of the innovation process is not technology- and R&D-driven. Due to these features, the Triple Helix systems concept offers a new perspective for analysing innovation in the WBCs and strengthens the argument that Triple Helix innovation can exist also in technology laggards like the WBCs, albeit in incipient forms. Additional arguments in favour of using this approach include:

- Existing measures to stimulate economic growth based on mere encouraging entrepreneurship and non-R&D innovation have not proved to be successful, at least judging by the general economic indicators
- WBCs' competitiveness in the long-run is not sustainable without increasing their abilities for absorption and creation of new technologies, including application of radical innovation and disruptive technologies; this is due to the restructuring of global economy which shifted the traditional labour-intensive manufacturing typical for WBCs to the Far East making the key industries of WBC uncompetitive on world markets;
- In countries with a weak business R&D sector, the university is the main generator and disseminator of knowledge, as well as a promoter of advanced and disruptive technologies that may bring changes in the economic structure;

Adopting a Triple Helix Systems perspective of innovation in the WBCs also brings us closer to EU policies that give growing recognition to the importance of industry and re-industrialization (EC, 2012a) and smart specialisation (RIS 3, 2012) all over Europe. Smart specialisation, in particular, follows the same theoretical foundations as Triple Helix and innovation systems (e.g. the triad of research, business and government sector) to support industry needed for Europe to reverse the declining role of industry and compete with USA and Asia (EC,2012). Industry has important spill-over effects because it is based on constantly emerging new technologies and innovations and encourages therefore, scientific research, technological accumulation and learning. It also embodies the results of university research, providing them with social and economic relevance. The basic dilemma is about the drivers of industrial development and research in less developed countries: is entrepreneurship sufficient or university research plays also an important role?

## 2. Impediments to and perspectives of Triple Helix systems in the WBCs

The *pros* and *cons* for the Triple Helix in WBCs starts from the basic assumption that perspectives of Triple Helix innovation in the WBCs are strongly correlated with the performance of their innovation systems, which build the Triple Helix Knowledge, Innovation and Consensus spaces. In other words it assumed that impediments and perspectives of implementing Triple Helix systems in the WBCs depend on the performance and maturity of the main components of the WBCs' innovation systems which provide the inputs for the Triple Helix system. The analysis of the WBCs' innovation performance is based on a comparative study of the WBCs' national innovation systems carried out within the FP7 WBC-INCO.NET project (Švarc at al, 2011). It identifies the three main findings regarding the WBC's abilities to implement Triple Helix Systems for strengthening their innovation capacities. First, the constitutive elements of Triple Helix systems are still incipient in all the WBCs, with significant differences between countries in the degree of development. Serbia and Croatia are the most advanced, due to the relatively developed research systems, more sophisticated production capacities and experience in governance of R&D and non-R&D based innovation. Montenegro and B&H have medium capacities according to their innovative performance, while FYR Macedonia is somewhere in the middle of these two groups, having made good progress in improving its R&D system and fostering non-R&D based innovation. Albania and Kosovo are way behind because of the immaturity of structural components of their innovation systems, and their main concern is to establish an efficient R&D system, improve the innovative capabilities of companies and overall innovation management of system. Second, the differences among WBCs in Triple Helix implementation are due to disparities in the performance, maturity and efficiency of the main components of the innovation systems, which provide at the same time the "inputs" for the Triple Helix spaces, components and relationships that enable the functioning of a Triple Helix system. Thirdly, considering these country differences, the prospects for the development of Triple Helix systems need to be also differentiated.

Due to the variability of available data on innovation performance in the WBCs and complexity of Triple Helix systems which requires more financial and human resources for detailed analyses, a clear and straightforward systematization of countries by their perspectives to developing Triple Helix systems is not possible at this stage. However, by analogy with the differences in the development of the main components of the WBCs' innovation systems, a tentative classification is made to classify the WBCs by the

development level of the Triple Helix spaces and the overall perspectives to establish Triple Helix systems (Table 1).

**Table 1. A tentative categorization of WBCs by potential for developing Triple Helix spaces**

| | **Knowledge space** | **Innovation space** (non-research based innovation) | **Innovation space** (research based innovations) | **Consensus space** | **TOTAL** Statist regime of TH |
|---|---|---|---|---|---|
| Croatia | Very good | Very good | Good | Modest | GOOD |
| Serbia | Very good | Very good | Good | Modest | GOOD |
| FYR Macedonia | Good | Good | Moderate | Weak | MEDIUM/GOOD |
| B&H | Moderate | Moderate | Modest | Weak | MEDIUM |
| Montenegro | Modest | Modest | Modest | Weak | MEDIUM |
| Albania | Weak | Modest | Very weak | Very weak | LOW |
| Kosovo | Weak | Modest | Very weak | Very weak | LOW |

The analysis revealed that all the WBCs, even the most developed in terms of Triple Helix interactions, are under a statist regime of Triple Helix model (Triple Helix I) (Etzkowitz and Leydesdorff, 2000), where government plays the lead role, driving university and industry, and even this regime is patchy. A move towards a Triple Helix II model (led by industry) is also a great challenge for all the WBCs, including the most developed – Croatia and Serbia. The main impediments come from the deficiencies of the production sector, which is mainly low-and medium-tech and rarely needs cooperation with the research sector. Economy in the WBCs is dominated by large and un-reformed state-owned companies that are not fully exposed to market competition which would urge them to innovate. A new layer of SMEs has been established in traditional sectors which are not based on R&D and innovation, and consists largely of micro companies with less than 10 employees having modest capacities to perform or absorb research. The analyses for Croatia indicate, for example, that, overall, SMEs invested less than 1% of total revenues in research and development, an amount of around €88 million in 2008 (MEC, 2012) .

The transition to a balanced model (Triple Helix III) which assumes co-evolution of helices and is characterised by interaction between knowledge-producing institutions, industry and government, may appear at first sight as an unrealistic task. However, a closer analysis for the majority of the WBCs, it could prove a feasible objective if envisioned as a process where universities could take an active, if not leading role, by strengthening government-university and university-industry dyads. The fact that companies are not able to create advanced technology and apply competitive technologies makes room for universities to become more involved in the transfer of new knowledge and innovation for the needs of industry. Government support, or a stronger government-university dyad, is essential in achieving this objective, and could have an amplifier effect by further strengthening the university-industry dyad. Although such a model is still far from the balanced model of Triple Helix III, it could be seen as a precursor, giving universities a chance to fill the gap and overcome the weaknesses of a dormant and inefficient production sector and government sector. Global competitiveness depends nowadays on new, advanced and cutting-edge technologies which are technologically and economically disruptive and can be mediated by universities. Although universities could have a lead role in certain technological advanced sectors, the

core of economic activities remains within business companies. Therefore, one of the most important steps towards implementation of the Triple Helix systems is to change the economic strategy to revitalize industry and improve technological competences of companies and allow universities to take a mediating position, if not a lead where possible.

## 3. Conclusions

The fact that a large part of the innovation process in the WBCs is not technology or R&D-driven reduces the relevance of the standard Triple Helix model, focused on the prominent role for the university, for studying innovation in the WBCs. However, the concept of the Triple Helix systems offers a new, down–to-earth analytical framework that takes into account that many countries are not able to generate appropriate structures for knowledge production, transfer and application built upon coordinated efforts of the Triple helix elements of university, industry and government.

From the perspective of Triple Helix models (TH I, II and III) that were extensively discussed during the last decade, the comparative analysis of innovation performance in the WBCs revealed that these countries mostly apply a statist Triple Helix model (TH I), driven by the government, which is however, not fully functional in any of the WBCs. There are also significant differences between the WBCs in their abilities to apply the Triple Helix model for strengthening the innovation capacities of national economies. The differences are due to disparities in the performance, maturity and efficiency of the main components of their innovation systems. How could these countries then move towards Triple Helix systems, considering that their innovation systems provide the "inputs" for the Triple Helix Knowledge, Innovation and Consensus spaces, components and relationships?

The immaturity and dysfunctions of the spaces inhibit mutual co-evolution through interaction and cooperation that provide the essence of a Triple Helix system. This suggests that that the main reason for weak Triple Helix functioning is not so much in the lack of interaction, but in weaknesses related to each of the individual TH components - innovation governance, scientific and higher education systems and innovation, and technological capacities of companies. Empowering each of these sectors through a stronger mediating, if not leading role of the university in university-government and university-industry dyads, appears, therefore, as a prerequisite for the co-evolution of helices and successful implementation of Triple Helix Systems.

One of the key messages coming from studying the possible implementation of Triple Helix systems in the WBCs is to strengthen industrial innovation and entrepreneurship. More precisely, the main challenge is to propel entrepreneurship spirit or capital (Audretsch, 2009) (and make innovation and research more attractive for business sectors and industry. These challenges are more related to the standard business development, managerial skills, technological accumulation and supportive business environment than to the exploitation and commercialisation of scientific research.

This is an unavoidable step towards achieving sufficiently mature helices which support each-other through a process of mutual co-evolution, feed-back loops and synergy. However, since the Triple Helix components across the WBCs are very unevenly developed, each country should apply own specific policy mix for upgrading the helices. For example, Kosovo and Albania should focus on establishing the research and higher education systems, as well as business supporting institutions, while Croatia should focus on the reforms of the same systems and institutions for their greater efficiency and self-sustainability. Less developed countries require further sophistication of entrepreneurship infrastructure like high-speed

internet, while others are more challenged by production sophistication and entering global markets.

In addition to revitalisation of business competences, innovation policies in WBCs should also be more focused on instruments which accelerate innovation through more direct regional cooperation among companies to achieve goals like economies of scale, pooling resources, connection into the regional value chain, sharing common infrastructure and other resources. Regional cooperation in innovation, business and research could reinforce mutual learning and better use of resources. The primary aim is to improve business competitiveness and relevance on international markets, which would have a positive feedback on both R&D and education. Future research should, therefore, pay more attention to business cooperation and identification of barriers that impede it. For example, the analysis performed within the WBC-INCO.NET project revealed that both entrepreneurs and researchers perceive the state and local administrative burdens and procedures as the greatest barriers to regional cooperation. While business people see it as an obstacle to access new markets, researchers are more concerned about barriers to mobility, which is for them an important component of quality research. Given that the knowledge about the nature and impact of administrative barriers is rather scarce, it could be worthwhile identifying in the future the red tape which impedes regional innovation cooperation.

The limited innovative capabilities, on the one hand, and the need for global competiveness usually based on research and innovation, on the other hand, lead to the conclusion that WBCs have to act on two fronts simultaneously. The first front includes policy measures to improve the production capacities and to strengthen the entrepreneurial spirit in the region. This front is crucial for immediate or short-term recovery. The whole region could benefit from spatial proximity, a common market of more than 20 million persons, as well as from involving companies into the common innovation process on the regional level supported by the similar values and understanding of technological and commercial processes.

The second front refers to improving research and educational capacities to increase the economic impact of R&D, along the principles of smart specialisation. The World Bank's *Western Balkans Regional R&D Strategy for Innovation* (World Bank 2013) could provide an excellent starting point on this matter.

In short, the WBCs should play on both terrains - technological mastery in the industrial sector and frontier research in the universities. The implementation of these two tasks requires not only technological advancements and research capacities, but also more profound socio-cultural changes in order to bring back the trust in hard work, innovation and entrepreneurialism as drivers of progress and enrichment on both individual and broader socio-economic level. Since the development of non-research based innovation and traditional sectors are emerging as crucial for sustainable development in the WBCs, future research should be more concentrated on technological upgrading of these sectors.

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# 6. How to implement Good practice examples in the Western Balkans – four pilot projects

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***Introduction***

Based on the principle of the Open Method of Cooordination, the European Commission and many Member States have promoted for many years the convergence and standardisation of innovation policies towards the 'best-practice' policy. However, over the last decade the insight has been widely acknowledged that what may work good in one region or country, may not be the best policy instrument for all other regions or countries[9]. With new governance concepts, such as 'Smart Specialisation' the idea is rather a differentiation of policy that is promoted.

Still regions and countries can learn from policy instruments that have been developed elsewhere. The idea is not to copy-paste, or transfer the policy instruments, but to adopt some aspects, some design-features and adapt these useful elements to the situation in a different context of the concerning Western Balkan countries.

In this chapter we focus on learning, rather than on inventions. Learning by doing, learning by using and learning by interacting. Learning refers to policy-learning as well as to learning to innovate. Learning by policy makers from existing policy instruments invented elsewhere, and learning by SMEs from the experience that is provided by the concerning four support mechanisms.

Instead of offering a temporary incentive by reducing the cost of doing R&D to invent new products, these four schemes change the behaviour of the participating SME, and this change in behaviour often does not stop when the support stops, because they have learned lessons and gained experience in innovation and have tasted the benefits of their new behaviour. The behaviour of the SMEs (their perceptions, their routines, their awareness) is changed: by addressing SME problems with external knowledge through vouchers, by the organised self-reflection of Strategic Innovation, by the lessons learned from an Innovation Officer, or from learning to go international from 'Soft landing'.

WBC-INCO.NET dedicated a special Work Package to the topic of innovation support. The objectives were to:

(1) provide an overview on the innovation systems of the Western Balkan countries and the key RTDI stakeholders of the region,

(2) identify future research / market needs and to analyse the needs in innovation policy and innovation support,

[9] Nauwelaers, C. & R. Wintjes (2002), "Innovating SMEs and Regions: The Need for Policy Intelligence and Interactive Policies". Technology Analysis & Strategic Management, vol. 14, 2, pp.201-215.

(3) identify good practices of innovation activities, policies and instruments from EU Member States/Accession Countries as well as from Western Balkan countries (WBC) suitable to be adapted to the needs of the region and to develop adaptation schemes for selected ones,

(4) identify policy measures to improve the framework conditions for innovation and then to define joint actions,

(5) organise and promote a dialogue of the regional research and innovation stakeholders in South East Europe at political and analytical level (through Innovation Dialogue Fora, the establishment of a WBC Innovation Group of Experts and the support by a large networking conference),

(6) organise trainings for innovation stakeholders and auditors, support agencies and researchers in the fields of technology transfer and market innovation needs with a view to bridging the gap between research and industry (with an emphasis on strengthening the market position of SMEs).

This chapter focuses on the third point: identification of good practice examples of innovation schemes and their adaptation schemes. In order to elaborate proposals for the implementation of good practice examples in the WBC, the project partners in charge of this activity carried out the following undertakings in order to enable the respective regional stakeholders to learn from the experiences of other regions:

- identification and comparison of good practice examples of innovation policy approaches and instruments of EU Member States and the Western Balkan countries suitable for the adaptation/transfer to the WBC, such as analysis of direct and indirect support measures for innovation activities (incl. tax measures);

- selection of some of these good practice examples of innovation policies, instruments and activities, especially suitable to be adapted to the needs of the region and their interest; then presentation to and discussion with WBC stakeholders;

- development of adaptation schemes for selected good practice examples taking into account the institutional and political environment in the WBC and their presentation to and discussion with WBC stakeholders.

A number of good practice examples of EU Member States and the Western Balkan countries were identified, listed and described in a project deliverable available at the project's website.[10] This includes innovation policies, instruments, infrastructure, measures, programmes and running activities. Liaison with the Regional Competitiveness Initiative (OECD) and the project on the WBC Regional R&D Strategy on Innovation (Worldbank and Regional Cooperation Council) were particularly sought also in relation to this task.

[10] D8.50

On the basis of the comparative analysis performed also in the Workpackage on Innovation Support, good practice examples suitable for the adaptation to the circumstances and needs of the region were selected. As part of WBC-INCO.NETs Work Package 8 on Innovation support, selected good practice examples of innovation measures adaptable to the region or to some individual countries of the Western Balkans were considered in view of their transfer and future implementation. This was performed in four steps:

(1) The project team collected 45 good practice examples of innovation schemes (programmes, instruments and measures aiming at supporting innovation activities) from EU Member States and Western Balkan countries and presented the examples in a project deliverable[11]. Table x gives an overview over the innovation schemes. The schemes were chosen by matching them to the needs identified in another Task of WBC-INCO.NETs Work package 8 on Innovation Support.

**Table 1: Overview on the good practice examples matched to the needs identified**

| Market/Research need identified in the WBC | Number in text | Good practice example | Country |
|---|---|---|---|
| | | **From EU Member States** | |
| Regional voucher scheme (companies to submit projects to universities) | 3.1 | Research Voucher Scheme | Netherlands |
| | 3.21 | Voucher scheme for science-business cooperation | Bulgaria |
| Network of regional innovation and technology auditors, carry out regional SME Innovation Audits | 3.2 | Strategic Innovation | Netherlands, Belgium, Germany |
| Develop the regional market for innovation and research | 3.3 | Integrated Destination Management System | Germany - Bulgaria |
| Regional venture capital fund & incubation services | 3.4 | Soft landing Platform Services | Germany - Croatia |
| | 3.5 | VenturelabTwente | Netherlands |
| Regional training programme for technical skills, entrepreneurship etc. | 3.6 | KOpEE | Germany |
| | 3.15 | Genomnanotech Regional Knowledge Center | Hungary |
| Large–scale technology programme which should involve all innovation stakeholders at the national level for modernisation (structure of the national economies is dominated by the low-tech sector) | 3.7 | Dutch Polymer Institute (and Polymer Innovation Programme) | Netherlands |
| Harmonise and open-up governments | 3.8 | Small business Innovation Research | Netherlands |

[11] http://wbc-inco.net/object/document/7884; D8.50 “Good practice examples of innovation policy approaches and instruments in the EU Member States and the Western Balkans” submitted in November 2011

| | | | |
|---|---|---|---|
| procurement markets | | (SBIR) | |
| Regional financing programme for innovation activities in companies | 3.9 | Energy Subsidy Scheme | Netherlands |
| Programmes for science-industry cooperation should be adapted to the needs of the SMEs (vouchers, regional awards, regional training centres, various mobility programmes among countries and sectors, apprenticeship, etc.) | 3.10 | VINNVÄXT | Sweden |
| Foster wisely the programmes for research commercialisation and establishment of intermediaries (science parks or TTCs) so as not to create a false impression of progress and modernisation | 3.11 | Knowledge Management Centre (KMC) | Hungary |
| | 3.12 | Regional University Knowledge Centre for Vehicle Industry/Széchenyi István University, Győr | Hungary |
| Regional training programmes on innovation management | 3.13 | Semmelweis International Bio-Entrepreneurship Programme (SIBE) | Hungary |
| Strategic visions of development of NIS (analytical studies based on technology foresight exercise or assessments) | 3.14 | Future for Moldova | Germany / Moldova |
| Regional Innovation Coaching Scheme | 3.16 | Innovation Officer | Netherlands |
| Greater understanding by researchers of the needs of business companies and industry | 3.17 | Kplus/COMET | Austria |
| Network of clusters in selected sectors | 3.18 | Support to accredited innovation clusters | Hungary |
| Programmes for large regional infrastructure projects | 3.19 | Regional University Knowledge Center for Environmental - and Nanotechnology | Hungary |
| | 3.20 | Szeged Neurobiological Knowledge Centre (SNKC) | Hungary |
| | | **From WBC** | |
| Programmes for large regional infrastructure projects | 4.1 | BIZ Incubator | Serbia |
| | 4.8 | Techno Park Zagreb | Croatia |
| | 4.9 | Techno Park Varaždin | Croatia |
| | 4.10 | BIOS Incubator Osijek | Croatia |
| | 4.11 | Innovation and Entrepreneurship Centre (IEC) Zenica | Bosnia and Herzegovina |

| | | | |
|---|---|---|---|
| | 4.12 | Innovation Centre Banja Luka (ICBL) | Bosnia and Herzegovina |
| | 4.13 | University Entrepreneurship Centre (UPC) | Bosnia and Herzegovina |
| | 4.14 | BIT Centre Tuzla | Bosnia and Herzegovina |
| | 4.18 | Incubator Inventivnost | Montenegro |
| | 4.19 | R&D Service Centre | Montenegro |
| | 4.20 | ICK | Kosovo under UNSCR 1244 |
| | 4.21 | NCDIEL | FYR of Macedonia |
| | 4.22 | YES Foundation | FYR of Macedonia |
| | 4.23 | BSC Bitola | FYR of Macedonia |
| | 4.24 | MIR Skopje | FYR of Macedonia |
| Regional „Best technological innovation competition“ | 4.2 | Competition for Best Technology Innovation | Serbia |
| Harmonise and open-up governments procurement markets | 4.3 | Grant Scheme Innovation Projects | Serbia |
| | 4.5 | RAZUM Programme | Croatia |
| | 4.6 | Proof of Concept Programme | Croatia |
| | 4.7 | TEHCRO Programme | Croatia |
| | 4.16 | Olive saplings production | Albania |
| | 4.17 | Support on Sustainable Agriculture in Albania (SASA Project) | Albania |
| Network of clusters in selected sectors | 4.4 | Vojvodina ICT Cluster | Serbia |
| Regional research infrastructure roadmap in collaboration with industry | 4.15 | Research laboratory for the production of *Pleurotus* mycelium | Albania |

(2) Eight of these examples were chosen as the most suitable and presented and discussed during a First Review Meeting on Innovation Good Practice Measures held in April 2012 in Tirana/Albania. At the end of the meeting, participants from the Western Balkans answered a questionnaire in order to identify the four schemes that seemed the most feasible and interesting for an implementation in their countries. The results and the most highly ranked schemes are given in table x2.

**Table 2: Table presenting the results of the analysis of the evaluation forms**

| Nr. of example presented in meeting | Name of good practice example | Ranking of feasibility (1=high, 9=low) | Rank |
|---|---|---|---|
| 1 | Innovation Voucher | 2,8 | 1 |
| 6 | Soft landing platform services | 3,9 | 2 |
| 3 | Innovation Officer | 4,3 | 3 |
| 2 | Strategic Innovation | 4,4 | 4 |
| 8 | VINNVÄXT | 4,6 | 5 |
| 7 | Integrated destination management system | 4,9 | 6 |
| 4 | Knowledge Management Centre (KMC) | 5,7 | 7 |
| 5 | KOpEE | 6,0 | 8 |

(3) Out of these chosen eight measures, four selected good practice examples were looked at in more detail during a Second Review meeting in April 2013 in Skopje/FYR of Macedonia. During the meeting, possible adaptation schemes were developed for these four measures in view of an implementation in the Western Balkan region. These four schemes are**: Innovation Officer, Strategic Innovation, Innovation Voucher Scheme and Soft Landing Platforms**. WBC Participants again answered a questionnaire indicating which of the schemes would be the most feasible and interesting for implementation in their countries.

(4) As a follow up, four Task Force Meetings were organised from November 2013 to February 2014 to draft for each of these four schemes a pilot project for its implementation in one of the Western Balkan countries or in the region. Representatives of one or two Western Balkan countries took part in the meetings, where the results – seven pilot projects - were presented also to high-level decision makers.

As guiding questions for the discussion during the Task Force Meetings, the following questions were used:

- Why is this measure interesting for country to be launched as pilot project addressed to support innovation activities in country?
- What are objectives?
- What is target group? If SMEs, what kind of SME's?
- Who could be possible knowledge providers?
- Who could be the agency that selects/contacts SMEs?
- Answers to point 3 of feasibility study (Setting-up of measure in WBC - proposed structures).

In order to give the project partners from all Western Balkan countries the opportunity to make use of these results, the pilot projects will be made available at an exchange platform under the wbc-inco.net website.

***Results***

The results of the Task Force Meetings are documented as adaptation schemes (pilot projects for the schemes **Innovation Officer, Strategic Innovation, Innovation Voucher Scheme and Soft Landing Platforms.**) serving as supporting documents for the implementation of the measure for the WBC partner Ministries. They contain information on the implementing institution, budget, time frame, order of steps to be taken, capacity needed, accompanying measures etc. as guideline with the following content obligatory per measure:

1. Description of the measure
2. Development of the measure in country of origin
   - 2.1. Implementing agency
   - 2.2. Budget:
     - 2.2.1. Administration of the measure
     - 2.2.2. Financing the implementation of the measure
   - 2.3. Human resources:
     - 2.3.1. Management
     - 2.3.2. Operational staff
   - 2.4. Users (beneficiaries, clients) of the measure
   - 2.5. Procedure for implementation:
     - 2.5.1. Public calls, ToR (Term of Reference) for would-be applicants
     - 2.5.2. Criteria for selection
     - 2.5.3. Procedures for selection
     - 2.5.4. Awarding of applicants
     - 2.5.5. Procedure for complaints
   - 2.6. Monitoring of implementation of measure:
     - 2.6.1. Reporting
     - 2.6.2. Interim evaluation of the implementation of the measure
   - 2.7. Evaluation of the measure:
     - 2.7.1. Ex-post evaluation of the results
     - 2.7.2. Cost-benefit analysis
     - 2.7.3. Impact evaluation
   - 2.8. Publication and dissemination of the information about implementation, results and impacts of the measure
3. Setting-up of measure in WBC - proposed structures:
   - 3.1. Organisational structure(s) of implementing agency
   - 3.2. Human resources:
     - 3.2.1. Management
     - 3.2.2. Operational staff
   - 3.3. Possible users of the measure
   - 3.4. Procedures for implementation of the measure:
     - 3.4.1. Public calls
     - 3.4.2. Selection and awarding of users
     - 3.4.3. Monitoring of the implementation of the measure
     - 3.4.4. Evaluation of the realisation of the measure
     - 3.4.5. Publicity of the implementation, results and impacts of the measure
   - 3.5. Budget:
     - 3.5.1. Administration of the measure
     - 3.5.2. Financing the implementation of the measure
4. Possible barriers and obstacles in implementation of the measure in WBC
5. Concluding remarks

6. (optional): Conditions for involvement of the authors of the measure in setting-up of measure in WBC

Finalising this procedure, four documents on pilot projects were created ans compiled in a deliverable available at the project's website:

1. Pilot Project Strategic Innovation (Montenegro);
2. Pilot Project Innovation Officer (Serbia and Bosnia and Herzegovina);
3. Pilot Project Strategic Innovation Voucher Scheme (Croatia and Kosovo*);
4. Pilot Project Soft Landing Platforms (Albania and FYRof Macedonia).

***Outlook***

For many years R&D has been regarded as the single source for technological change and innovation and for many years the single message from EU innovation policy makers was to increase R&D expenditures.

However, increasing innovation in an economy can be supported in many ways, since the source for innovation can come from diverse knowledge and innovation activities. Basically we can distinguish support to exploration activities and support to exploitation activities. Besides economic benefits from the capacity to generate new technology, there are also economic benefits from absorbing and using technology developed elsewhere, and the capacity to diffuse technology and reach international markets.

For many years the focus has been on strengthening science and R&D and subsequently on the venturing and incubation of inventions into new high-tech products and industries which are characterised by high growth, productivity and competitiveness. This innovation policy model is relevant for R&D intensive firms and regions which are at the technological frontier. For firms, sectors, regions and countries who are positioned further from this top level frontier in terms of technology and competitiveness, this innovation policy model is less relevant. Cooke (2013)[12] and Asheim et al. (2013)[13] point at the relevance of a contrasting model of innovation which is characterised by learning by 'Doing, Using and Interacting' (DUI) which seems especially relevant for promoting catching-up in innovation performance, and for designing regional innovation policy instruments for SME's.

The four innovation policy schemes addressed in this chapter do not concern subsidies for R&D activities (exploration, inventions), but they are SME schemes that support the exploitation of knowledge and innovation for economic purposes.

Both the four schemes and the organised policy process we organised fit to the 'doing-using-interacting' kind of learning in innovation (policy) and catching-up. The tools are useful to

[12] Cooke (2013), 'Towards DUI Regional Innovation Systems'. Utrecht University Papers in Evolutionary Economic Geography (PEEG), number 1321.

[13] Asheim, B., M. Bugge, L. Coenen & S. Herstad (2013), What Does Evolutionary Economic Geography Bring To The Policy Table? Reconceptualising regional innovation systems. Working Paper 2013/05. CIRCLE, Lund University.

increase the demand for and use of innovation rather than supply-side policies (R&D subsidies) that fit the Science-Technology-Innovation model. The schemes and the organised policy learning events are rather problem driven and benefit from applying existing solutions (and policy schemes), and learning from experience (behavioural additionality). Rather than mere subsidizing the invention of radical new technologies (or innovation policy instruments from scratch) the policy mix has been strengthened with pilot schemes in the Western Balkans which are based on learning by doing, using and interacting, which is a promising innovation model for catching-up.

# 7. Smart Specialisation – an Overview

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Below, an overview on Smart Specialisation as a concept is provided, while the next article focuses the lessons learnt and recommendations for the Western Balkan region.

## The concept of Smart Specialisation

Smart Specialisation is a concept that fits very well with the endeavours at the European level calling for more efficient and effective regional development and innovation policies, avoiding overlaps and imitation as well as for transparent priority setting processes involving a range of crucial actors, among them government, businesses and creative providers such as ICT, research, and educational providers. Research and innovation strategies for smart specialisation (RIS3) are extensively described in the RIS3 Guide published by JRC and available at http://s3platform.jrc.ec.europa.eu.

The concept of Smart Specialization is "one where each region builds on its own strengths, to guide priority-setting in national and regional innovation strategies". (European Commission 2012) The objective of the Smart Specialization Strategy is to increase the impact and relevance of R&D through a fact-based consultative process that allows for "self-discovery" (David, Foray and Hall 2009). A smart specialization approach works with the industrial and economic grain of the country or region, using capabilities that have been developed over time to underpin its innovation potential.

**Key steps for developing a RIS3 are:**

1. Analysis of regional context/potential

   Assessing existing regional assets, identifying regional competitive advantages and weaknesses, and analysing and assessing the potential for innovation-driven differentiation are crucial in order to detect emerging niches for smart specialization.

   Identification of all relevant stakeholders: firms, universities, technology centers, venture capitalists, innovation support agencies, and intermediaries. The final questions to be answered are: which areas have critical mass; which sectors have growing activity; which sector contain new firms and faster-growing firms; which areas companies are investing in.

   Several methods can be used to collect and treat information for such analyses. Some of the methods that should be implemented in this phase are: regional profiling, quantitative studies of STI potential, case studies, capabilities, SWOT approach, surveys, and foresight.

2. Governance

   At the beginning of an RIS3 design process, it is necessary to define its scope and its expected goal, with a view to ensure participation of key actors and secure ownership of the orientations defined in the strategy. Defining the scope of the RIS3 is crucial, since

different stakeholders will have different expectations and agendas with respect to the questions at stake, often restricted to their own areas of action (EU, 2012)

Regional policy makers should initiate an informal assessment process and invite representatives from selected leading enterprises and lead institutions to go through the questions and report their results. Their co-operation is essential to identifying a limited set of regional specialisations and develop a shared (and hence smart) vision and priorities. (Mahr A., Hartmann C., 2012). Key players are:

*Regional leading enterprises and entrepreneurs*: the leading industrial players, hidden champions, and key entrepreneurial innovators have the expertise on the market potential of new ideas, technology, and knowledge, as well as the economic base that already exists in a region.

*Regional policy makers and implementers*: Members of regional governments and intermediary institutions are invited to organise such initial self-assessments, to assess the governance sector of their region, to reconcile the expertise and interests of the two other groups and prepare a political RIS3 decision. This should cover all relevant government departments (enterprise, research, education, finance, etc.).

*Regional lead institutions*: Representatives of the regional science, knowledge, and creative sector, i.e. universities, research and technology organisations or innovation and design centres concentrate expertise on a region's specific knowledge profile.

3. Vision for the future

In order to establish a successful strategy, it is essential to create a shared vision of the region's potential and the main directions for its international positioning, to formulate different scenarios based on analyses and debate where the region wants to go, and produce a positive attitude towards the future. At this stage, the purpose is to create a willingness to act towards a region's transformation and to support the regional consensus necessary to run the other steps.

The vision should be defined to justify social and economic goals. It should guarantee a better life for citizens, reducing brain drain, and creating better living conditions.

4. Selection of priorities

The main feature of a smart specialization strategy is to make smart choices. That means to help the main actors choose national priorities and to direct resources to areas that have the greatest potential for development in the region. The selection process needs to be based on quantitative as well as qualitative information on the different possible domains for a national/regional smart specialization.

Prioritisation always entails risks for those who have to select those few domains that, as a result, will get privileged access to public funding. Common approaches followed in the past, which should not be repeated, were (EU, 2012):

- Spreading the money across the most powerful lobbies with the frequent outcome that there were too many priorities aiming at preserving the status quo rather than to look at future opportunities, or
- Imitating other regions. In that case, if the choice proved to be a mistake, at least this was a mistake others had made as well. At the end of the day, the regions contributed

to produce a system with too many small sites doing the same things and where economies of scale were left unexplored.

In order to avoid common problems, it is necessary to involve all stakeholders in a process of entrepreneurial discovery. Such an open, participatory process is the best guarantee for avoiding both the risk of capture by interest groups and the risk of lock-in into traditional activities.

5. Policy mix, roadmaps, and action plans

Once the national priorities have been defined, the next step to be taken is to create an action plan elaborated by the RIS3 management bodies. This included the definition of challenges that prioritized areas are faced with, delivery mechanisms, a definition of actors involved, and responsibilities, measurable targets, timeframes, and the identification of funding sources.

Implementing a smart specialisation strategy contains a certain amount of risk, particularly when selecting priority areas. This selection can greatly change the direction of development of the region. In this regard, it is recommended to do experiments to collect enough information and reduce the uncertainty of the application of strategies. The best types of experiment are pilot projects launched during the design of a smart strategy. The purpose of the pilot projects is as follows (EU, 2012):

- Feeding the strategy with new information on regional innovation potential (they contribute to the 'entrepreneurial discovery process'); Publicizing the fact that the strategy is going to be concretely implemented rather than remaining a concept; contributing to the communication of the RIS3 as a whole;
- Testing new or unconventional policy support approaches on a small scale before possible extension, thus limiting the accompanying risks.

If such learning mechanisms are properly introduced in pilot projects, they can provide a model for performance-based funding mechanisms, which are notoriously difficult to impose on existing programmes or actions maintained over time without such a provision.

6. Monitoring and Evaluation

A system of evaluation, although the last step, should be involved in the strategy from the beginning. In order to work properly, it is necessary to set clearly defined and measurable objectives. The strategy must be flexible to economic transformations and ready to coordinate the objectives in line with changes in economic conditions.

Establishing indicators for monitoring and evaluation plans should be defined at two levels: at the level of strategy and at the level of the action plan. The goal of monitoring is to determine whether the planned activities are carried out in the right direction and whether funds are used properly. Monitoring is carried out by the main actors involved in the implementation of strategy.

The aim of the evaluation is to assess the effects of the strategy implementation. Evaluation should be carried out by independent experts.

Monitoring and evaluation should complement each other and to effectively contribute to solving problems in the implementation of a smart specialization strategy. The following questions cover the main features that these strategies should contain (EU, 2012):

- Is the strategy based on an appropriate stakeholder involvement? How does it support the entrepreneurial discovery process of testing possible new areas?
- Is the strategy evidence-based? How have areas of strength and future activity been identified?
- Does the strategy set innovation and knowledge-based development priorities? How have potential areas of future activity been identified? How does it support the upgrading of existing activities?
- Does the strategy identify appropriate actions? How good is the policy mix?
- Is the strategy outward looking and how does it promote critical mass/potential?
- Does the strategy produce synergies between different policies and funding sources? How does it align/leverage EU/national/regional policies to support upgrading in the identified areas of current and potential future strength?
- Does the strategy set achievable goals and measure progress? How does it support a process of policy learning and adaptation?

***The RIS3 Self-Assessment. Key Motivation, Concept and Application***

The RIS3 KEY is an output of the project of the OECD TIP working party on Smart Specialisation (2011-2012). It has been directly built upon the practical needs of regional policy makers. Its draft versions were tested and commented on by stakeholders from several European regions and the experts from the European Commission DG REGIO in three iterative rounds. Its final version was presented at the OECD working group meeting in Paris in May 2012.

The RIS3 Self-Assessment Key is an easy-to-use tool to unlock the idea of Smart Specialisation for regions; a quick first assessment of their status and potential that is needed to prepare a SWOT analysis; a checklist of easily understandable questions for the assessment of the science / knowledge & creative sector, the enterprise sector, the government sector, and the regional innovation system as a whole; a complement to the first steps of the RIS3 Guide.

The RIS3 Self-Assessment Key helps to mobilise relevant stakeholders in all three triple helix spheres of the regional innovation system; to start communication between enterprises, the science sector and the regional government; to develop a shared language and understanding of the potentials and challenges for sustainable growth in your region; to make first steps towards a shared and mutually supported vision of the future in your region;

The RIS3 self-assessment key helps to start a dialogue within the regional triple helix.

The RIS3 Self-Assessment Key consists of four parts:

- Brief introduction
- Guiding questions for the self-assessment
    - Assessment of the status and potential of the Enterprise Sector
    - Assessment of the status and potential of the Science / Knowledge & Creative Sector
    - Assessment of the Government Sector
    - Assessment of the Innovation System as a whole
- Brief Guidance for the self-assessment process

- Glossary explaining technical terms

Five steps to make use of the S3 Self-Assessment key are:

- Initiate the self-assessment process and identify the relevant stakeholders in the enterprise and the science, knowledge & creative sector
- Prepare for the self-assessment: contact relevant stakeholders, distribute the guiding questions, and organise necessary milestones
- Perform the self-assessment for each sector by stakeholders stemming from the respective sector
- Perform an assessment of each sector with a mutual outside view (i.e. enterprises assess the science and the governance sector and vice versa)
- Prepare a first SWOT analysis as a starting point for the S3 process. Use identified strengths, weaknesses, opportunities, and threats for the development of a shared vision

Taking into account the diversity of regional development and institutional needs of the European Union, attitudes on the Smart Specialisation strategy significantly diverge. They range from very positive (in the regions where the current innovation policy is in line with the new concept) to scepticism in cases where Smart Specialisation brings anxiety and uncertainty. The general opinion is that it is very important to maintain flexibility in the implementation of the strategy, as well as exercise to strengthen the growth potential of various sectors and individual initiatives such as clusters. Implementation of the strategy of Smart Specialisation is not a guarantee of long-term regional economic success. The evaluation of the regional strategy is necessary in order to maintain regional innovation system on a successful level. The concept of Smart Specialisation should not be understood as a tool for changing the structure of innovation policy in the region but as a way to strengthen and support regional innovation policies based on existing innovation capacity.

The EC considers investing more in research, innovation, and entrepreneurship as a crucial component for the future success of Europe. As a result, the EC has decided that the submission of a Smart Specialization Strategy should be an ex ante conditionality for access to Structural Funds in the 2014-20 period.[14]

**Disseminating the concept through WBC-INCO.NET**

Within the WBC-INCO.NET project two workshops were organised focusing the topic of the "Smart Specialisation":

1. The first workshop – a two-day training event on Smart Specialisation, was organised by WBC-INCO.NET and co-financed by Central European Initiative (CEI), which allowed participants from the Danube Region to participate at the event. It took place on 11-12 April, 2013 in Belgrade, Serbia. The training gathered participants from Serbia, Albania, Austria, Bosnia and Herzegovina, Croatia, Greece, Czech Republic, the FYR of Macedonia, Germany, Hungary, Italy, Romania, Slovenia, Montenegro, Spain, and Ukraine and was carried out by experienced trainers from five countries (Austria, Spain, Slovakia, Greece, and Germany). The training introduced the

[14] Source: EC Smart Specialization Platform Website: http://s3platform.jrc.ec.europa.eu

participants to the theory and practice of developing and implementing national/regional "Smart Specialisation Strategies" (RIS3). This in turn would help to maximise the use of EU regional funds for research and innovation activities to further economic and social objectives, and importantly, achieve greater synergy between EU structural and competitive funds (Horizon 2020). The training was rated very successful regarding the evaluation of the transferred knowledge and the organization following the feedback from the participants (e-mails and evaluation forms).

2. The second workshop was organised in Skopje, on November 20-21, 2013. This workshop was used e.g. to present and discuss results of the pilot self-assessment exercise for the research and innovation system of FYR of Macedonia as a pilot country which was also prepared within WBC-INCO.NET. Please refer to the article prepared by Zaharis et.al on the results of the pilot self-assessment exercise for the research and innovation system of FYR of Macedonia in this publication.

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# 8. Innovation Strategies for Smart Specialisation (RIS3) – lessons learnt and recommendations for the Western Balkans

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**Training workshop on smart specialisation for South East European countries in Belgrade: Lessons for the region**

Smart specialisation has become one of the cornerstones of the EU's new Cohesion Policy. Policy-makers in EU regions and member states have to design and adopt innovation strategies for smart specialisation (RIS3) in order to spend European Regional Development Funds for research and innovation. This ex-ante conditionality is a novel element of the current and streamlined European Structural and Investment Funds (ESIF) for the period 2014-2020, which integrate all relevant funding instruments for regional and rural development, fisheries and social affairs.[15] For non-EU member states in the Western Balkan, this is not a legal requirement. Still, important lessons can be learnt from Central and Eastern Europe and the modernisation creation innovation eco-systems. This is why this workshop was organised as a first step of a learning journey that seeks to foster policy learning between EU and non-EU states and regions in the realm of place-based innovation. In this first workshop, presentations on the concept of RIS3, on-going activities in EU regions and the importance of synergies with Horizon 2020 were followed by case studies on Upper Austria, Bratislava and Crete. RIS3 is a dynamic and evolutionary process that is deeply grounded in a continuous entrepreneurial discovery process in which governments are rather facilitators than in a hierarchical position. The process stresses the need to concentrate resources by developing distinctive and original areas of specialisation based on existing strengths. In this understanding, RIS3 is a useful exercise for both innovation leaders and for less developed regional innovation systems. Horizon 2020, the successor to the 7$^{th}$ Framework Programme, offers valuable additional resources that will be distributed through competitive selection procedures. It shares similarities with Cohesion Policy funding but also differs in many respects. With a view to potential synergies between both funding streams, cohesion funding can be seen as useful to build necessary capacities and a basis for excellence-based projects in Horizon 2020. Based on Article 185 TFEU Initiatives, the EU Strategy for the Danube Region will also benefit from EU funding for the joint implementation of (parts of) national research and development programmes in similar ways that the Baltic region has been able to do. Another central question raised pertained to the RIS3 requirements for non-EU states. Despite the fact that smart specialisation is not a legal requirement for acquiring funds from the Instrument for Pre-accession, (potential) candidate countries should start the RIS3 process

[15] EU Regulation (1303/2013/EU). Regulation of 17 December 2013 laying down common provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund, the European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund and laying down general provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund and the European Maritime and Fisheries Fund.

very early (OECD, 2013). Experience shows that an inclusive and truly bottom-up process generates better innovation results, but also takes very long to establish and implement. Other challenges voiced at the workshop related to the demographic problems of most Western Balkan states (ageing, brain drain) and the difficulties to counter these trends with higher productivity and valued added in economic activities in economically very demanding times that are marked, among others, by massive de-industrialisation and pre-dominance of low-tech sectors with limited value added.

In order to highlight some challenges in the design of RIS3, participants worked on case studies from their home countries (Albania, Slovenia, FYROM, Hungary and Croatia) based on short scoping documents that they had to prepare prior to the workshop. These documents described the current economic structure of their country or region and asked for information following a similar structure as the peer review templates used by the Smart Specialisation Platform that regularly conducts such policy learning exercises in the EU.[16] The main difference was that the participants were divided into 5 country groups (6-7 participants per group), with those coming from the discussed countries not being in their country's group. After the group discussions each group presented their findings based on the first five steps of the RIS3 Guide. These steps were: analyse existing strengths and potentials, include relevant stakeholders through participatory governance mechanisms, preparing an innovation vision, prioritise strong and promising economic activities and design appropriate instruments and define financing to implement the strategy (European Commission, 2012). Feedback was given by the country representatives who had drafted the scoping documents. The main advantage of this approach was to allow participants to get an outside view on science and technology policy and the smart specialisation potential in their country. Most of the issues raised concerned governance questions and priority setting, something that is strikingly similar to the challenges identified by many regional policy makers in EU member states.

**Fostering regional innovation through smart specialisation: FYROM as a pilot country**

As a second step in this learning journey, WBC-INCO.NET organised a follow-up workshop for which a comprehensive analysis of FYROM's innovation system was conducted by looking at government, business and the knowledge sector. Before discussing this case study, the lessons learnt from the peer-review process in the EU were summarised to provide the background for discussions. Participants were particularly interested in the effectiveness of voluntary peer review and the current stage of developing RIS3 in EU member states and regions. This was followed by a presentation of the initial self-assessment for FYROM. Based on this, again a practical exercise followed in which participants identified and discussed innovation objectives, key priorities, and action points based on the self-assessment of FYROM.

After this exercise, the World Bank's Innovation Strategy for the Western Balkans was briefly discussed. There are still many uncertainties concerning the financing of the strategy's implementation. The strategy mainly refers to Chapter 25 (Science and research) of the *acquis communautaire*, which is surprising given the vast funding volume new EU member states can expect to receive from ESIF. Cohesion Policy is very likely to continue to be an important pillar of EU innovation support also after 2020. Moreover, the territorial dimension is largely missing in the strategy. Interesting case studies from still young EU member states provided useful insights for Balkan countries and concluded the workshop. In Slovenia, the RIS3

[16] http://s3platform.jrc.ec.europa.eu/peer-review.

process has so far shown unsatisfactory progress due to continuous re-assignments of competencies between ministries and implementation problems with regard to legal provisions. In Estonia, the strategy process has already advanced substantially. Yet, there is a risk of implementation problems for the future, also because the regional and local level authorities have not been fully involved in the process. The national development fund Arengufond has turned out to be a highly trusted intermediary that was able to gather all relevant stakeholders and especially businesses. In this sense, it provided an important value added. Finally, Croatia has had difficulties in streamlining various policy documents. It was not yet clear if up-coming choice of priorities will reduce the very large number of the 12 recently established clusters. Getting these strategic issues right will be crucial since Croatia will receive approximately 7.5bn EUR cohesion and regional funding in the current programming period.

In sum, the learning journey was an interesting manifestation of the very similar challenges both former and current transition states face when reforming or establishing more effective innovation systems. One recurrent challenge is particularly the lacking trust between public authorities and companies. Companies often distrust public institutions that they perceive as ineffective managers, corrupt or steered by informal elite relations (Hellman and Kaufmann, 2003). But how can policy-makers create trust as a basic pre-condition for participatory innovation strategies? Earlier pessimist views about the impossibility to create trust have been convincingly refuted by research on socio-economic relations (Sabel, 1993). State institutions can build trust by "operating through social networks and associations", showing full commitment and giving them real ownership (Ansell, 2000: 310). This is how state-run development agencies like Arengufond can become central intermediaries whom companies and other stakeholders can trust and who can effectively moderate between different interests in the RIS3 process. Non-state stakeholders must be taken seriously, only then they can also take government initiatives in the realm of innovation policy seriously (Radosevic, 2011).

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# 9. The Results of the Pilot Self-Assessment Exercise for the Research and Innovation System of FYR of Macedonia

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## Introduction

This article presents the results of the pilot self-assessment exercise for the research and innovation system of FYR of Macedonia with the aim to produce the baseline for developing a Regional Innovation Smart Specialization Strategy (RIS3) for the country. The analysis that follows is based on the guide titled ***"Getting started with the RIS3 Key"*** produced by Joanneum Research and the Austrian Federal Ministry of Science and Research. Based on a comprehensive analysis of each one of the 3 sectors (Enterprise sector; Science Knowledge and Creative Sector and Government Sector) an assessment of the smartness of the regional innovation ecosystem and the connections between the three sectors is being presented followed by an initial Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis of the R&D and Innovation System of the country. Consequently an initial attempt to conclusions and recommendations based on this analysis is being presented followed by some lessons learned applicable to all WBC.

The pilot self-assessment exercise corresponds to the steps 1-3 and partially step 5 of the RIS3 Key as indicated in the following table (adapted from the "Getting started with the RIS3 Key" guide):

| | |
|---|---|
| **Step 1** | Initiate the self assessment process and identify the relevant stakeholders for the in the enterprise and the science, knowledge & creative sector |
| **Step 2** | Prepare for the self assessmenrt: contact relevant stakeholders, distribute the guiding questions and organise necessary milestones |
| **Step 3** | Perform the self assessment for each sector by stakeholders stemming from the respective sector |
| **Step 4** | Perform an assessment of each sector with a mutual outside view (i.e. enterprises' assessment of the science and the governance sector and vice versa). |
| **Step 5** | Prepare a first SWOT analysis as starting point for the S3 process. Use identified strenghts, weaknesses, opportunities and threats for the development of a shared vision |

In order to follow up with steps 4-5 of the RIS3 Key the country should:

- Engage stakeholders in offering an "outsider's" view of each sector (i.e. by organizing a workshop where government and academia stakeholders assess the enterprise sector and equivalent workshops for the other two sectors) and
- Finalize the SWOT presented in chapter 6, with insights of the "outside view" assessments and use it to develop a shared vision for the country

## Assessment of the smartness of the regional innovation and growth policy framework

1. How well does the science / knowledge & creative sector interact with the regional economy (i.e. do you have industry-science co-operations in you region, privately endowed chairs at universities, joint research infrastructures, and/or pro-active technology transfers, contract research, living labs, student placement schemes, brokerage and technology demonstration events, share of regional business representatives in university management boards)? Which sectors are most active in this respect and where do you have potential for improvement?

Although some promising exceptions exist in the form of entrepreneur-savvy professors, the linkages between academia and industry by all attributes (joint publications, licensing, funded research, spin-off companies, etc) can be considered as very weak. To address the institutional barriers that inhibit knowledge transfer, the government has recently (June 2012) adopted legislation that creates a framework for the establishment of incubators, technology parks, centres for technology transfer (that is, TTOs) and university spin-off companies. According to the programme, among others, up to €20.000 in grants are envisioned for co-financing spin-off companies.
Many intermediary schemes for enhancing academia-industry linkages have been established with donor funding, but most of them proved unsustainable after funding stopped. The most successful initiatives from the academic sector seem to stem from the departments of mechanical and electrical engineering and informatics at Ss Cyril and Methodius University in Skopje. A new generation of young citizens will benefit from the mandatory entrepreneurship classes in high schools which are followed-up by similar, more focused, elective courses at Universities (e.g., the Dept of Mechanical Engineering at Ss Cyril and Methodius University with the support of the Dept of Economics).

2. How do the government sector, the science / knowledge & creative sector, and the economic sector interact – i.e. are strategic RTDI policy priorities set jointly? Is there a shared development of regional innovation strategies? Is there a shared regional innovation system governance?

There is recent evidence of interaction between the "triple helix stakeholders" in the preparation of the Innovation Strategy of the Republic of Macedonia (ISRM 2012-2020) and the National Strategy for Scientific R&D Activities 2020 (NSSRA 2020) . According to ERAWatch Country Profile 2012:
*"For the purpose of preparing the ISRM 2012-2020 and NSSRA 2020, in the period 2011-2012 broad consultations were undertaken with all important stakeholders. The consultation processes were coordinated by the responsible ministries, ME for the ISRM 2012-2020 and MES for NSSRA 2020. Each ministry first sent a draft version of the strategy to all university units, MASA and business associations such as chambers of commerce, and after the ministry collects comments and suggestions from these bodies. The ministry decided which suggestions will be adopted for the final version of the policy".*
However real buy-in of both Strategies from the science/knowledge sector and the economic sector remains a challenge and will primarily depend on the way these Strategies are going to be implemented in terms of efficient and transparent allocation of resources and distribution of responsibilities. The new Law on Innovation activity foresees an "*Entrepreneurship and Innovations Committee for Monitoring the Development and Commercial Exploitation of Innovations"* (article 6). The Committee will be chaired by the President of the Government and will comprise of 11 ministers and 5 "*innovation activity experts"* Although chairing by the Prime Minister and the participation of a large number of Ministers demonstrates a high

level of commitment it should be pointed out that there is no guaranteed participation of the economic sector.

3. Is your existing regional innovation policy framework based on inter-departmental/inter-ministerial/inter-agency co-ordination and co-operation covering relevant policies (in particular between research/science policies and, economic development policies, but also with regard to other relevant policies such as for instance education, employment and rural development policies)? Does it assess/take into account the existing level of policy co-ordination within the region?

The Innovation Framework currently consists of a series of newly adapted Strategies (i.e. ISRM, NSSRA, Industrial Policy, SME policy etc) that seek to complement each other and present an overall framework for competitiveness and development. However implementation seems to be allocated to a big number of committees and agencies that may have overlapping responsibilities, competing goals and most importantly need to take stock of a limited number of skilled personnel. The committees are:

a. Committee for Education, Science and Sports
b. Committee for Competitiveness
c. Committee for Entrepreneurship and Innovation
d. Committee for Technological Development
e. National Committee for Development of Research and Technological Development
f. National Entrepreneurship and Competitiveness Council
g. Scientific council
h. Entrepreneurship and Innovations Committee for Monitoring the Development and Commercial Exploitation of Innovations" (to be established under the new Law on Innovation Activity)

The agencies are:

- Agency for the promotion of entrepreneurship
- European Information and Innovation Centre
- A new "entity for encouraging innovative activities in priority areas of science and technology" which under the new Law on Innovation Activity will be *"…. Established for the purpose of conducting activities for encouraging innovation activities in priority areas of science and technology, determined by the Innovation Strategy…"*

Lack of coordination of the policy-making is cited as one of the major challenges for the country's innovation system in the OECD 2011 review*: "Currently, the responsibility for innovation is split between several institutions, including in particular the Ministry of Education and Science and the Ministry of Economy, but there is a lack of policy co-ordination between the two ministries."* (OECD 2011). It is hoped that better co-ordination can be established under the new Innovation Law which foresees: "*the Government ….shall adopt a Strategy for Innovation for a seven-year period, upon a proposal of the Ministry of Education and Science (…) in cooperation with the Ministry of Economy"*. MoES seems to gradually get a lead authority on innovation: article 8 of the new Law established its

competences regarding innovation. It still remains to be seen if this can be feasible in terms of human resources and budget availability.

4. What are the main challenges your region will be facing in the next decade (economically, environmentally, socio-demographically etc.)? What are the main opportunities / emerging sectors? How can the regional enterprise sector and the science / knowledge & creative sector be mobilized to respond jointly to these challenges and opportunities?

Some of the main challenges foreseen in the next decade relate to the retention of human capital, the brain drain that has plagued the country, the infrastructural integration into trans-european networks (including but not limited to transport and research); and protection of the environment. With respect to the socio-demographic aspect, the country should benefit from adopting and implementing some aspect of social integration policy that should help foster the inter-ethnic dialogue and collaboration, and have a cohesive effect on the population.

5. What are the main challenges your region is facing with respect to RTDI performance (i.e. what are the major bottlenecks for a better overall innovation performance)? How can these bottlenecks be overcome by formulating and implementing jointly a RIS3 strategy?

The main challenges include the formation of RTDI niches, boosting the activities of the few relatively active research groups through international collaborations, leveraging the diaspora potential, and taking advantage of the new large-scale research infrastructures in nearby countries. Hindrances to overcome include the lack of funding for startups, and the virtual absence of VC. Raising the entrepreneurial spirit among the academic researchers and creating enabling environment for the formation of university startups should help improve the overall innovation performance. Last but not least, the academic sector has a long-term record of nepotism, plagiarism, and corruption. These practices must be eradicated, and transparent and meritocratic evaluations by international standards must be implemented. That should help mitigate the RTDI isolationism.

6. Do scientific, technological, creative or skills strengths and specializations fit to your regional economic needs? Where is the best match – where do you see the strongest mismatch?

The ICT sector is probably the single case where adequate knowledge supply and business prospects (growth, employment and tradable services) converge. The two export-oriented sectors (automotive parts and pharmaceuticals) seem to cover their needs in-house. In Genetics and Seismic Engineering there seems to be a considerable supply of knowledge that has not been commercially exploited up to now, while in agricultural research and aquaculture the supply of knowledge that is relevant to the country's economic specialisation is rather minimal. The networks of excellence include agricultural research, renewable energy, nanotechnology for healthcare mentioned in WB report. The government has been supportive with respect to the establishment of new labs, but there appears to be a dearth of matching supplies / consumables.

7. Do perceptions of the enterprise sector and the science / knowledge & creative sector with regard to future promising technologies and products correspond?

Cooperation between the science and the enterprise sector is almost non-existent. According to a GfK survey on companies and various aspects of innovative capabilities, contacted in 2011 and cited in the OECD 2011 review: *"less than 9% of companies have some links with Universities and 5% with research centres"*. Further more according to the same study*: "… the aspirations of the companies show that, as far as cooperation with other stakeholders is concerned, limited number of changes are to be expected in the short term (…) The main evolution regards the increased willingness to cooperate with (…) foreign research institutions (11%)"* which indicates towards a lack of trust in the potential of the domestic R&D sector. *This lack of cooperation points toward a big* gap between enterprise and science sector's perceptions, goals and expectations.

8. How do your regional strengths and specialisations match, complement and build upon the profiles of your neighbouring and partner regions? In which fields could enhanced crosssectoral co-operation create competitive advantages for an even larger region?)

The large diversification of the limited and consistently underfunded research base at the national level results into fragmentation and further minimises the chances of specialisation. As discussed in point 5 above, one option is to focus research funding on very promising, following a scrutinised assessment by international standards, research groups; another option, proposed by WorldBank, is to aggregate similar research groups at the regional level and re-orientate them towards joint research endeavours that could impact the entire region. The WB's Regional R&D Strategy for the Western Balkan Countries suggests marine research, agricultural research, renewable energy and nanotechnology for healthcare as promising fields for co-operation. Both scenaria could benefit from access to ESFRI research infrastructures under planning in neighbouring EU member-states (Bulgaria, Croatia and Greece) and over-the-borders clustering activities funded by cross-border EU-funded projects.

**SWOT analysis of the R&D and Innovation System of the country**

**1. Strengths**

S1: Commitment of the government at a high level to pursue innovation and adhere to the EUROPE 2020 goals, as demonstrated by a series of strategies adopted (i.e. Innovation Strategy, Industrial Policy, SME Policy) and the preparation of the Law on Innovation Activity.

S2: Availability of data through the countries' statistical office.

S3: Country with the most favorable business climate in the SEE region.

S4: Relatively cheap, yet educated labor force (highly skilled human capital).

S5: Strong concentration of researchers in and around the capital city of Skopje provides potential for interdisciplinary research.

S6: Very positive trends in international co-authorships since 2000.

S7: An established and outward looking research base in Medicine and Engineering; evidence of *regional (SEE)* excellence in Engineering, Agricultural and Biological Sciences, Materials and Environmental Sciences.

S8: Strong regional (SEE) linkages in terms of scientific publications and EU-funded research projects.

S9: Increasing participation (including SMEs) to FP7 programs

## 2. Weaknesses

W1: Lack of institutional dialogue tradition and arrangements.

W2: Lack of an evaluation and monitoring system that would estimate impact of interventions. Lack of evidence on the success of interventions and strategies implemented the previous years.

W3: Complexity of the institutional arrangements (i.e. overlapping of responsibilities, large number of committees and agencies)

W4: Lack of cooperation culture between high tech enterprises.

W5: Lack of public-private partnerships.

W6: Weak capacity for firm-level technology absorption.

W7: Poor work ethics.

W8: Very limited R&D investment from the business side (BERD).

W9: Weak performance in R&D spending (GERD); declining trends over time; underfunded research system, especially research infrastructure and equipment.

W10: The structure of the research system in terms of staffing and the actual funding are not in line with performance and outcomes.

W11: Research and higher education are not assessed according to international standards.

W12: Very limited linkages to high-ranking research universities.

W13: Very limited evidence of commercialization of research outcomes.

W14: Inability to sustain most of the donor-sponsored academia-industry linkage infrastructures.

W15: High unemployment, low productivity and high trade balance deficit

W16: Small number of researchers and inadequate distribution of them across sectors

W17: Very limited access to finance for SMEs and start-ups

## 3. Opportunities

O1: New Innovation Strategy (including the establishment of the Innovation Fund) and new Law on Innovation Activity providing the baseline for developing of innovation in the country, much-needed funds and potential for firm sophistication and improved competitiveness

O2: New Western Balkans Regional R&D Strategy for Innovation providing a platform for development of R&D and Innovation at a regional level by building on regional competencies and pockets of excellence.

O3: EUROPE 2020 targets and possibility of participation of the country to HORIZON 2020

O4: New programming period IPA funds (to be directed to education, research and innovation)

O5: Continuous support in terms of capacity building and analysis from international organizations such as the OECD, the EC and the WB

O6: Focus on export which becomes an issue of paramount importance for growth and development due to the limited size of the domestic market.

O7: Obtain access to ESFRI infrastructures in neighboring EU member states.

O8: Continuous donor-support in terms of infrastructure and capacity building.

O9: Leverage the Diaspora as an opportunity for knowledge transfer and research ecosystem development (though involvement in evaluation and assessment activities).

O10: Introduction of new higher education evaluation systema that allowas students to evaluate the work of professors

O11: Allocation of funds to the creation of new laboratories

### 4. Threats

T1: Continuation of the economic crisis at the EU and country level may endanger budgetary appropriations for innovation (as defined at the Innovation Strategy and associated Action Plan)

T2: Unavailability of human resources to implement the Innovation Strategy

T3: Committees and Agencies have overlapping mandates leading them to competition instead of cooperation.

T4: Dichotomy of declarative support vs. actual performance in implementing interventions at the level of global best practices.

T5: Brain drain rates have been relentlessly increasing, as the number of qualified researchers in the business sector has been steadily decreasing.

T6: Growing gap in research capacity with respect to better funded regional research systems.

## Conclusions and recommendations

### 1. Enterprise Sector

The enterprise sector in the former Yugoslav Republic of Macedonia is comprised of four key national industries: (*i*) ICT, (*ii*) agribusiness & food processing, (*iii*) apparel, and (*iv*) automotive components. Relative to the rest of the European rivals, relative competitive advantages are displayed by these four sectors, as well as the production of generic pharmaceuticals.

Clustering and collaboration between firms is limited; so are the public-private partnerships, which in the high tech sector are virtually non-existent. Even though there is a handful of highly innovative companies, these operate in a technological discontinuum with the rest of the country's economy: they are independent and have limited interactions with other national countries and/or universities. This should be improved if the country intends to help its economy transition into some form of triple-helix innovation.

The FDI numbers of the country present a major problem for future sustainable growth. The manufacturing sector is the leading exporter and strengthening this sector could substantially reduce the notoriously high trade deficits. Yet the current manufacturing facilities are technologically obsolete due to low levels of investment in fixed assets. This is an impediment to the sector's competitiveness.

Entrepreneurship and entrepreneurial spirit cannot thrive in an environment that is not supportive of innovation, creation, flow and absorption and adequate diffusion of technologies. This type of environment is dependent on the existence of certain framework conditions, such as business-friendly climate, unimpeded access to finance, coherent set of rules pertaining to intellectual property rights and sound competition law.

Foreseen economic (and social) challenges include the reversal of the country's extraordinary high rate of brain drain; the need for markedly increased investment in R&D in the enterprise sector; and internationalization of the economy so that it can increase its high tech export capacity.

## 2. Academic & Research Sector

The key issues that were identified with respect to the status of the academic/research sector in the former Yugoslav Republic of Macedonia's innovation system include:

- a small and fragmented research base, coupled with an unbalanced distribution of researchers by sector, age and ethnic origin;
- continuously underfunded research infrastructures;
- low investments in applied research and innovation and a low level of private investment in R&D that seem to follow decreasing trends;
- very weak linkages between academia/research and enterprises;
- a very opaque STI & HEI governance system that does not reward scientific merit, excellence and achievement and lacks a feedback loop for assessment and self-improvement;
- brain-drain;

Some very recent initiatives such as the National Innovation Strategy 2012-20 and the new law on Innovation Activity indicate that the Government is aware of the key challenges; however, proper and timely execution in a country with a history of unfinished reforms remains to be seen.

We strongly recommend that a quality assurance system for higher education, based on international standards and methods, is urgently needed to support the quality and the relevance of the skills of university graduates and orientate the universities' policies towards excellence in education *and* research *and, if applicable*, technology transfer. The scientific Diaspora could play a critical role here, as unbiased and critical assessors with a good level of contextual awareness.

We welcome the provisions of the new law on Innovation Activity that are related to technology transfer by the universities but we believe that a countrywide legal and policy framework that would clarify the relationship of HEIs and enterprises is still missing. The transposition of the recent (2009) EU guidelines or other international best practices is highly recommended as a very needed next step.

The country's small and fragmented research base is in need of a mid-term adjustment in terms of staffing and funding that would probably follow the introduction of a quality assurance system for higher education and research mentioned above; there are two options available: supporting, in terms of funding and staffing, of a cohort of promising research groups to become excellent at the European or international level, and integrating others

within wider regional research groups so that critical mass is created and common research problems are addressed.

Although the need for enhanced industry-science collaboration is evident, we note that so far, the most successful mode of commercialising university research is the establishment of spin-off companies by entrepreneurial-savvy academics; we strongly suggest that stimulating, by means of financial support and policy, this trend might be a promising mid-term measure that would create new, knowledge-intensive, jobs and new entrepreneurial ecosystems around the country's universities.

Given the low effectiveness of measures to repatriate the scientific Diaspora, we suggest that in the following years the government's policies should put emphasis on exploiting the Diaspora as an opportunity of expending the country's knowledge base, diffuse existing knowledge created outside of the country and enhance the receptivity of existing innovation. We suggest inbound mobility programmes, joint doctorates and research fellowships as the most promising alternatives.

## 3. Government / Policy

The adoption of the Innovation Strategy and the establishment of an Innovation Fund together with some institutional initiatives provide an initially positive environment for the promotion of development through research and innovation. However there exist several weaknesses that need to be addressed in the near future:

- The government should emphasise coordination of initiatives and programs and clearly define responsibilities among ministries, committees and agencies in order to maximize benefits and avoid duplication of efforts.
- Establishment of a dialogue on an institutional level, including open public consultation on future programs and initiatives is necessary for stakeholder engagement.
- A monitoring and evaluation system for current and future programs and initiatives should be put in place. This will help define expected impact from each intervention and measure its success based on predefined measured outcomes.
- A more rigorous and effective procedure for the evaluation of proposals submitted for funding to national funding programs is needed. The extensive experience of the operation of the EU's FP programs and other relevant initiatives could be utilized towards this end.

It is further suggested that public procurement is used as an instrument to support innovation in the country. This will require a major shift in the programming and implementation processes of public procurement programs in all major public sector organisations.

Finally, the government should encourage cross-border cooperation with neighbouring countries and especially the WBC including academia – enterprise cooperation across borders and the establishment of WBC-wide centres of excellence. This will help overcoming the small size of the local ecosystem and allow for networking and synergies of a wider range for both academics and industry. The "Western Balkans Regional R&D Strategy for Innovation"

that was adopted on October 2013, provides a framework for this cooperation, but it needs commitment, political support and resources from all the WBC in order to succeed.

A major task of the government, in the current timeframe, is the negotiation of the IPA funds with the European Commission. It is important that R&D and Innovation are a major priority for the IPA funds of the 2014-2020 programming period.

**Lessons for the Western Balkan Countries**

Smart Specialization Strategy for Research and Innovation has, in the recent years developed into a major strategic design tool for EU countries and their regions. The EU has created a support platform within the framework of IPTS (http://s3platform.jrc.ec.europa.eu/home) where experience is being accumulated and exchanged and has made the development of RIS3 strategy a major ex-ante conditionality for accessing structural funds. Currently all EU regions and countries are preparing their RIS3 plans to be submitted and incorporated in their programming documents for the structural funds of the 2014 – 2020 period.

It should be emphasized that RIS3 is not a conditionality for the WBC countries and thus adopting this methodology is not mandatory. However, taking into account that all the WBC have signed or are in the process of signing Stabilization and Assessment Agreements with the EU and are indeed characterized as either candidate or potentially candidate countries, adopting an S3 approach on their planning for Research and Innovation can have a major impact in their path to EU integration. Moreover RIS3 adoption will allow WBC to take better advantage of their participation to HORIZON 2020, remain in the same pace with their neighbouring EU Member States and align their research and innovation priorities across borders. Taking RIS3 into account into their IPA funding design can have long term impact in building up a robust innovation ecosystem. Since a RIS3 strategy is designed to be a continuously monitored and updated process that allows regions/nations to adopt, learn, design and redesign, going through the exercise is an excellent preparation for a country in its way to become an EU member state.

Upon reflection, there are several lessons to be learned for the WBC through the pilot activity of fyrMacedonia described in the current report:

On selection of the application space:

RIS3 methodology has been designed to be implemented at the regional (NUTS 2) level of the EU countries. However, even within the EU member states, there are some countries that, based on their size or their uniformity of their situation, have chosen to implement it at a national level. Size is a decisive factor of course, but other factors like regional disparities/ similarities, history of industrial and technological development etc could play a role when deciding if a country will develop RIS3 at a national or a regional level. For WBC that are rather small compared to the average EU MS and have not yet adopted a regional approach to economic development, the option of developing a RIS3 at a national level is a sensible one, although there might be cases where a more regional approach might be adopted. In the case of selecting the whole country as the "domain" for RIS3 development, what needs to be avoided is the concentration of the analysis and the resulting priorities on the capital and the research/ industrial capacities around it. A specific effort should be made to include the capacities, capabilities and priorities of the whole country.

On methodology and procedure:

The main methodological tool used was the ***"Getting started with the RIS3 Key" guide.*** This is a tool that is simple enough to be used by countries that do not have a long tradition in designing and implementing Innovation policies. It allows for clear definition of the role,

capacities and priorities of the different stakeholders and provides a "roadmap" for building consensus through a process of mutual assessment between the stakeholders. The strong part of the guide is the provision of a series of guiding questions for the self-assessment of each one of the three sectors: Enterprise sector; Science, knowledge and Creative sector and Goveremnt sector and also for the assessment of the smartness of the regional innovation and growth policy framework. Using the guide allows countries (or regions) to build the base for developing a vision and priorities for their RIS3 strategy.

On ownership of the procedure and engagement of the stakeholders:

Ownership of the RIS3 procedure by the competent science, technology and innovation authorities and support at the highest level is of outmost importance for the success of the exercise. Clearly linking the results of the exercise with the allocation of funds (national or IPA funds) is an implicit prerequisite for the successful engagement of the stakeholders who need to be convinced that this is not going to be just another "academic" exercise of little "real life" consequences.

RIS3 methodology is a bottom-up approach based on entrepreneurial discovery. In order to succeed in it the creative and innovative parts of all the levels of stakeholders need to be engaged. Some tips:

- At the level of government: Engage all governmental organisations and agencies that have some role to play on supporting research and innovation, ensuring competitiveness, support extroversion and attract FDI. These may be very different agencies but they all have to play a role in Smart Specialization and can provide valuable insights from different perspectives.
- At the level of academia/ research: Engage researchers that have achieved high level of internationalization (though publications but also though participation to collaborative research) but also researchers who have gone into the opposite world have, have tried to create a company or have cooperated with industry and have valuable insight to offer. Try to identify pockets of excellence by studying journal publications and FP participation records.
- At the level of enterprise: Do not restrain participation to the level of industry representing organisation. Try to engage innovative and extrovert companies who have experience that can be shared and multiplied. Engage the young entrepreneurs and he community of start-ups if available. Learn from the experience (both positive and negative) of intermediary and business support organisations (especially new economy support organisations like incubators and accelerators).

On sources to be used for the initial assessment:

Based on the experience of fyrMacedonia the following (usually) available sources could be used in the process of developing the country's current situation:

- **For the Enterprise sector:** Statistical data and sectoral distribution from the statistics office; data on FDI (either form the statistics office or the body designated by the government to facilitate FDI) ; Business Climate Surveys; deliverables of WBC-INCO.NET project such as the "D8.48: Report on the mapping of the WBC Innovation infrastructures"; reports on research, innovation and competitiveness of the country published by OECD, World Bank, ERAWATCH, INNOTREND, UNESCO

and many other EU organisations, international organisations and private companies; report form Cluster Observatory.

- **For the Science/ knowledge and creative sector:** Publication data from the Web of Science; data on FP7 participation (successful participation as well as FP7 proposal participation); statistics on researchers per discipline and sector and statistics on research expenditures (from the statistics office); data on brain drain and on scientists of the Diaspora; national funding programs for R&D participation over the past 3-5 years).
- **For the Government sector:** National Strategies on Research, Innovation, Competitiveness, Industrial policy, Education policy, Vocational education etc; relevant legislation (i.e. on IPR, innovation funding, technology transfer etc); expenditure for innovation, research and education the past 3-5 years; impact assessment reports for past national and EU (IPA) funding programs; future IPA funding preparation documents.

On the value of the exercise:

WBC face similar problems in their efforts to create an innovation and competitiveness environment. What comes as a surprise is that a lot of EU MS face similar problems (as demonstrated when the November 20-21, 2013 workshop at Skopje discussed the cases of Slovenia, Estonia and Croatia). Difficulties such as lack of cooperation between industry and the research sector, brain-drain, poor policy coordination, lack of will for cross-border cooperation, are common also in these countries. A systematic approach towards building consensus on research and innovation policies, such as the one suggested by the RIS3 methodology, can go a long way into addressing these problems. RIS3 is a new concept not only for the WBC but also for the EU member states that are going through similar difficulties both at a procedural and at a content level. WBC can learn from the different approaches that are being used and take advantage of the fact that RIS3 is not yet mandatory for them, in order to build a more relaxed and robust strategy that will address both their developmental needs and priorities and the ambitious targets set by EUROPE 2020. RIS3 preparation will help WBC to overcome isolation by linking their developmental paths to those of their neighbours (both EU member states and other candidate and potentially candidate countries). It will also ensure that future funding from the IPA instrument will be used in a structured way in order to achieve maximum results in terms of long term competitiveness and development. Finally a well designed RIS3 strategy will help WBC and their researchers and industry enhance participation in the HORIZON 2020 and prepare for eventual EU accession.

# 10. How to effectively engage stakeholders in Research and Innovation Strategies for Smart Specialisation (RIS3)

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## 1. Introduction

In the wake of Europe's tense economic situation, public austerity is limiting the scale and scope of public intervention, which has reinforced the impetus for policy-making efforts that are more effective (in achieving goals) and efficient (in terms of investing resources). In response to this challenge, the RIS3 concept had hence been adopted as a leading mechanism for the new EU programming period 2014-2020 to incentivising effective priority-setting amongst governments and public administration, thus making the resources allocated more productive. The RIS3 concept includes proposals as to how to make the processes of priority-setting and implementation of the strategies more effective, considering that strategic objectives can only be effectively achieved when the conditions for their implementation are effective, such that the "right" entities are involved and at the "right" time; that their roles, rights and responsibilities are clearly defined and communicated; that the modes of interaction and their management are appropriate; that proper means for assessing progress are in place, and; that the mechanisms for reviewing and adjusting the strategy are suitable.

Along these lines of argument, this chapter raises a number of key questions concerning the engagement of stakeholders in RIS3 processes:

- What is meant by engagement? Information, participation, collaboration?
- Who would desire a participatory approach and why?
- Who are the relevant stakeholders?
- What are their interests?
- How can they effectively be involved (and when)?

In so doing, rather than analysing which priorities are set in different socio-economic, spatial-structural or geo-political contexts, it looks at how the right stakeholders can be engaged appropriately so as to identifying meaningful and relevant (ambitious, though achievable) priorities and successfully governing their implementation.

To this end, this chapter briefly recalls the basic meaning of strategic planning and analyses the scope of "governance" as it is postulated by the concept of smart specialisation; it reflects on the prevalent different modes of governance identifiable in different political and social-local contexts ("politics of place") in order to inspire their adaptation to the new challenges for R&I policy-making in the context of smart specialisation; it proposes methods and practices of organising stakeholder engagement for implementing "collaborative" policy processes and concludes with identifiable success factors for stakeholder engagement in light of the requirements of smart specialisation.

## 2. Smart specialisation strategies – postulating a new paradigm for governing complex policy processes?

Before attending to the specific requirements for governing smart specialization processes, let us recall the basic meaning and purposes of strategic planning and stakeholder engagement as they can be found in the pertinent literature of planning theory.[17]

Strategic planning can be described as a method to exercising power, to creating benefit towards shared and public interests, to making efficient and effective use of public resources, and to providing security for implementing activities, e.g. investments. Strategic planning is, therefore, a policy-driven (not interest-driven), coordinative, knowledge-rich and future-oriented approach, which is only likely to flourish in particular modes of governance (these will be discussed in section 3.).

Stakeholder engagement is an indispensable element of such an understanding and is a way to identifying the development forces at work in a region, to aligning varying interests (towards a shared policy-vision), to bringing together different levels of knowledge, to building relations (between relevant actors), to creating consensus (on objectives, priorities, activities), and to making strategies more likely to be implemented, reviewed, redesigned and their objectives to be achieved.

An important consideration when engaging stakeholders or employing participatory approaches, respectively, is that these processes do not stop with the agreement or endorsement of a strategy but spans all stages of policy-making. This includes the planning stages as well as the implementation and review/evaluation stages as a basis for the adjustment and redesign of a strategy. (Figure 1)


**Figure 1: Participative Policy Process**
Source: King Baudouin Foundation and the Flemish Institute for Science and Technology Assessment (viWTA) (2005), p. 9

Based on these basic considerations, let us recall what are the requirements for "good governance" when engaging in an RIS3 process, as they are stipulated by the RIS3 Guide[18].

RIS 3 is based on a wide view of innovation including, for example non-technological**,** social, public sector and service innovation. The well-known 'Triple Helix' model of governance, promoting the involvement of three major spheres of actors – government, industry and education and research institutions, seems no longer sufficient in the context of smart specialisation, since its scope extends beyond the supply-side (legislators, regulators,

[17] see, for example, Patsy Healey (1997)

[18] http://s3platform.jrc.ec.europa.eu/wikis3pguide/-/wiki/Main/PART+III+Step+2

knowledge-providers, product developers etc.) and includes the demand-side, that is, the users of innovation and those affected by innovative products, processes and service (consumers, civic society). Therefore, more traditional practices of engaging 'elites' in a strategy process should be rethought by adopting a ‚quadruple helix' model, incorporating stakeholders of different types of actors and levels of decision-making, including e.g. non-profit organisations representing citizens, that should participate actively in the design and implementation of RIS3. Such a more complex and inclusive governance structure should also be able to prevent strategies be 'hi-jacked' by particular interest groups and lobbies. In order for all stakeholders to own and share the strategy, the RIS3 concept requires that responsibility is spread more widely across actors involved through ‚collaborative leadership', ensuring that all actors have a role and can take the lead in specific phases or on certain activities of RIS3, according to their specific capabilities and capacities. Due to this complexity and flexibility, RIS3 demands that effective mechanisms are in place allowing the strategy processes to be moderated and potential conflicts to be managed. To this end, 'boundary spanners' are proposed; certain individuals or organisations that could facilitate the RIS3 process based on interdisciplinary knowledge or proven experience in interaction with different actors.

With these aspects of RIS3 governance in mind, it becomes clear that engaging stakeholders in a RIS3 process is highly demanding as it extends far beyond a mere information of actors or the formal involvement of stakeholders through, e.g. public consultation. On Arnstein's 'Ladder of citizen participation' (Figure 2), this mode of participation would be found on the very highest steps of the ladder, while other forms – unidirectional, top-down and less interactive ones, i.e. steps 1-5 on the ladder – are highly unsuitable for designing and implementing RIS3.


**Figure 2: Arnstein's Ladder of citizen participation (1969)**
Source: Healey (1997), p. 26 (modified)

## 3. Modes of governance and implications for smart specialisation processes

Given the demanding conditions required by RIS3, it seems beneficial to look at current practices of governing complex processes, and at the way decisions are taken, choices are made, relations are built, and consensus is achieved in a given geo-socio-political context. Such specific circumstances could be termed "politics of place", as they describe the region- or country-specific relations between institutions and individuals and the distribution of competences and interests and hence define a place-specific culture of political negotiations and decision-making. They also determine the answers to the questions raised at the beginning of this chapter regarding '*what is meant by engagement?*', '*who would want a participatory approach?*' and '*who are relevant stakeholders?*'.

In order to identify such specificities for a given region or country, it is worthwhile to consider different governance traditions that are typically prevalent in western democracies, and which could serve as benchmarks of governance systems against the RIS3 requirements, by acknowledging their differences in the way actors are involved, negotiations are conducted and decisions are reached. In particular, identifying what is a "good" decision in the specific context may help understanding the circumstances specific to a given region or country, which should be incorporated in the design of the governance structure for smart specialisation.

Four modes of governance are particularly widely employed in (predominantly western) democracies:

1. Representative democracy
2. Pluralist democracy
3. Corporatism
4. Clientelism

These four modes are looked at below by specifically addressing two underlying questions: Who represents a political community? To whom must their actions be legitimated?

**Representative democracy**

A main characteristic of a representative democracy is the prominent role of institutions of formal government. Government officials and experts are the key actors in articulating ‚public interest'. It is hence marked by steep hierarchical bureaucracies ('apex' structure) where actions are justified to seniors and politicians rather than to people. The focus of reasoning would typically be on technical and legal aspects of the policy objectives. This governance mode may work well in homogeneous societies where the representation of opinions is supposedly less complex, but not in culturally diverse ones.

The 'good decision' would be one where public interest is articulated by government. This model is widely challenged today because politicians and officials are subject to all kinds of influences, which are hidden from the public and therefore unaccountable. Moreover, it is virtually impossible to aggregate the high diversity of interests and accumulate the vast knowledge about issues and concerns of businesses and citizens in a society and an economy that is more and more dependent on international – particularly European – interaction. Finally, the model is unsuitable to promote growing public participation, since this would challenge the role of representatives itself. Therefore, in a representative democracy there is a tendency to limit public engagement to formal procedures of consultation.

**Pluralist democracy**

In a pluralist democracy, the diversity of interests is recognised, ensuing that different interest groups compete in the definition of the agenda of governmental actions. The role of politicians is typically to arbitrate between the individual interests, claims and preferences.

A 'good decision' in such a system is one which everyone can agree upon, however requiring that all issues on which participants cannot agree are eliminated.

This model is challenged as it favours minimalist solutions to ones where the common benefit would be greatest. Strategy development degenerates into a practice of mediating between competing interests and of bargaining with stakeholders. It entails a risk of NIMBY-style politics[19], minimising the willingness of government to involve the public.

**Corporatism**

Corporatism is characterised by a routinised practice of collaboration between government, major business organisations and trade unions determining economic and social policy. It assumes a ‚shared-power' world, but – unlike in a pluralist system – only among a few. Although not hierarchical, corporatism exhibits an ‚apex' structure with a dominant role assigned to major organisations. In such a system, stable consensus can be achieved, capable of coordinating various policies across long-term time horizons and even overriding changing political majorities. Due to its capacity for flexibility it allows mutual learning between organisations involved and thus avoids competitive politics (as is the case in pluralist systems).

The 'good decision' is the one which best achieves the public interest defined by corporate alliances, where reasoning is conducted in terms of ‚instrumental rationalism', that is, with a focus on scientific knowledge interpreted with regard to certain interests.

Corporatism is challenged for a variety of reasons: small or disparate entities are often ignored (e.g. SMEs, citizens); social change is barely considered, but undermines the corporatist model, since the consensus achieved is regarded as unrepresentative, unable to learn, innovate, and adapt to new conditions; strategy process flourishes at the expense of a narrow agenda with the risk of not considering important and potentially productive niches of development.

**Clientelism**

A key feature of clientelism is the existence of interactive relationships of politicians and government officials with their social networks. It arises where the role of governance is to distribute and allocate resources, such as taxes, programme funds, or building permits. Clientelism is more likely in systems with less developed administrative procedures or a policy-driven governance culture. Politicians and officials become ‚gatekeepers' in managing flows of resources; they act as patrons with bands of clients who benefit from decisions, e.g. in exchange for a vote.

[19] NIMBY stands for 'not in my backyard'. It symbolizes an attitude where the common benefit is acknowledged but at the same time controverted by individual interests. A good example in Germany would be acknowledging the need to enlarge the energy grid for realizing the 'energy turn' while opposing the idea due to the risk that the electrical lines could – quite literally – cross one's own backyard.

Correspondingly, the 'good decision' is the one which best sustains such 'patronage' relations. The risks of clientelism are obvious, with decision-making processes being hidden from public or democratic scrutiny, and priorities meeting particular rather than public interests or policy objectives.

**Newer forms of governance**

The models discussed above are to some extent simple generalisations, however attempting to capture the commonalities of systems of current practice. They show that for a governance effort to be legitimate, the challenge is to find more inclusionary ways of collaboration and consensus-building. The same is required by the RIS3 concept, which demands nothing less than a paradigm shift in the way strategies are developed, implemented, evaluated and redesigned. The magic to work would be to combine the strengths of the governance models practiced while eliminating their weaknesses and avoiding that new weaknesses arise with the recombination of certain features.

Trends in the evolution of governance systems, on which the RIS3 concept builds, range from criteria-driven approaches (focusing on „hard infrastructure" in the form of regulatory criteria and performance targets), to entrepreneurial consensus-building (emphasising „soft infrastructure" in terms of institutional capacity and consensus-building mechanisms) to inclusionary argumentation (aiming to combine both 'hard' and 'soft' infrastructure). This latter approach represents a model of participatory discursive democracy. It is based on collaborative argumentation about key questions, such as

- What are the issues?
- How are these understood by different groups of society?
- What constitute problems?
- What are the options for acting on them?
- How may these affect the various members of a community?
- How may choices impact on different members?

A fundamental feature in such a system is a structure through which *giving rights to be heard* goes with *responsibility to listen*. The 'good decision' here would be one for which decision-makers are accountable and which is legitimate, as it is based on collaborative discussion, thus good reasons can be given for it if challenged.

Healey (1997and 2005) suggests that in a functioning governance system of inclusionary argumentation, challenges to decisions made would be the exception rather than the norm, since in such a system, the rights to challenge would be clearly described and trust toward such a governance system would consequently develop among participants.

Based on these modes of governance discussed and the impetus to find more sophisticated forms of managing strategy-development processes, what could be appropriate ways to engage relevant stakeholders in a RIS3 process that comes close to meeting the aims desired by the concept?

## 4. Organising stakeholder engagement

There is not one definition of a stakeholder[20]. However, in general terms, a stakeholder can be any individual or organisation that

[20] For an overview see, for example, Bryson (2003), p. 3

- takes – or is involved in taking – a decision,
- influences a decision by setting particular framework conditions,
- is affected by a decision,
- is meant to implement a decision or an action foreseen in a strategy,
- contributes intelligence (knowledge, know-how, expertise) to the strategy process.

Identifying the relevant stakeholders is determined by the specific strategy process. Considering that RIS3 is related to research and innovation, and that it can have a regional and/or a national dimension, stakeholders can come from a vast variety of different sectors (across the economy, research fields, and technology areas, but also across society) and be equipped with very different levels of formal or informal power, influence and interest. Goddard's (2011) '*connected region*' exemplifies the roles of different spheres of actors in a research and innovation-focused regional setting, with the institutions not being just *in* the region but *of* the region, incorporating a regional identity and a strong sense of ownership, which is based in strong partnerships and on a shared understanding of the challenges and on how to overcome them (Figure 3). The oppositional situation would be a 'disconnected region' where spatially-blind policies are implemented back-to-back but not integrated.

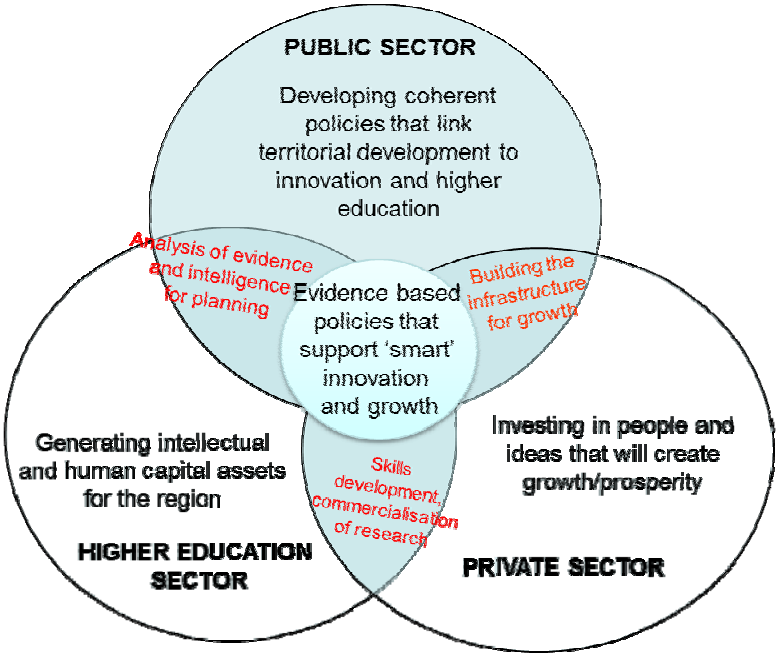


**Figure 3: The connected region**
Source: Goddard (2011) (modified)

The design of strategy-making processes as well as the implementation and review of the strategy itself take place in different 'participatory scenes' where power is dispersed and power relations are unequal. According to scholars of governance theory, the settings in which different stakeholders can be engaged are

- **Forums**, which encompass a wide range of stakeholders, emphasising on the creation and communication of 'meaning', that is, values, preferences, perspectives, and fears.
- **Arenas**, in which key groups are involved (sponsors and champions, coordinating groups, planning teams, and various advisory or support groups), with a key role in

policy-making and implementation, agenda-setting, planning, and budgeting of policy action.

- **Courts**, which includes 'boundary spanners' and formal institutions, tasked with the management of conflict and the enforcement of underlying norms and rules.[21]

Engaging stakeholders in practice is not 'rocket science'. However, in order to best utilise the potential of each stakeholder and to curtail possible risks of involvement, it is critical to employ suitable methods to organize the engagement of a variety of stakeholders. It requires the choice of techniques according to the specific local conditions and purpose of stakeholder engagement. A number of handbooks and guides can be found in literature presenting many such techniques for practical use[22].

Let us now see what could be suitable steps to arrive at an inclusionary and integrated while effective strategic approach to stakeholder engagement as they are postulated by the RIS3 concept. The following process could be suitable:

**Step 1: getting started by choosing participants for a stakeholder analysis**

A strategy process is typically initiated by an actor formally in charge of – or playing an indispensable role in the implementation of – a policy (often called *'champions'*), or a *'sponsor'* involved in the financing of possible actions. A brainstorming within a small group of such stakeholders or their representatives, could help starting the stakeholder analysis by exploring who else has a 'stake' in an issue and subsequently identifying additional suitable participants of the process (snow-balling technique). A suitable tool could be the *Basic Stakeholder Analysis Technique*[23], which offers a way of identifying stakeholders and their interests, clarifying stakeholders' views of a focal issue (e.g. a policy goal), identifying some key strategic issues, and beginning the process of identifying coalitions of support and opposition.

**Step 2: performing a stakeholder analysis**

The stakeholder analysis should take place by involving a larger group of participants to consider the actual or potential power of each identified potential stakeholder, its legitimacy, its capacity to mobilise resources and to get attention among groups of actors not directly involved. A key task is to identify possible positive and negative consequences of involving – or not – other stakeholders or their representatives in the strategy-making exercise. A possible technique to use could be a *Stakeholder Influence Diagramme* (Figure 4). It indicates how the stakeholders could exert influence on the strategy-making process (Importance) and in which fields (Interest), and how they are likely to influence one another (Relations with other actors). Informational inputs can be obtained through, e.g. the use of interviews, questionnaires, the setting up of focus groups, or other targeted information gathering techniques.

[21] See, for example, Healey (1997), p. 259-260

[22] See, for example, King Baudouin Foundation and the Flemish Institute for Science and Technology Assessment (viWTA) (2005) or Bryson (2003)

[23] cf. Bryson (2003), p. 13

| Stakeholder | Importance (influence on decision-making / implementation, mandate, knowledge, network / contacts, financial capacity etc.) High / low | Interest (demand, claims, preferences) High / low | Relations with other actors strong / weak |
|---|---|---|---|
| Actor 1 | | | |
| Actor 2 | | | |
| Actor 3 | | | |

**Figure 4: Stakeholder Influence Diagramme**
Source: author's representation based on Bryson (2003)

### Step 3: identifying the roles of stakeholders

For a strategy-making process to be effective, it is pivotal to identify various groups who will have some role to play in the strategy-making effort: sponsors and champions, coordinating groups, planning teams, and various advisory or support groups. A suitable technique could be the *Power versus Interest Grid* (Figure 5), which array the stakeholder's interest (in a political sense) in the issue at hand, and the stakeholder's power to affect the issue's future. Four categories of stakeholders emerge from such an analysis: *Players* who have both an interest and significant power; *subjects* who have an interest but little power; *context setters* who have power but little direct interest; and the *crowd* which consists of stakeholders with little interest or power.[24] Power versus interest grids typically help determine which players' interests and power bases must be taken into account in order to address the issue at hand. They may also help highlight coalitions to be encouraged or discouraged, what behavior should be fostered, and whose support should be sought or who should or could be encouraged to opt-in. The result of this is that each stakeholder will be subject of different forms of consideration and treatment: *players* need to be directly engaged with an active role to ensure that the strategy-making process is being effectively conducted (such as leading on specific tasks or themes, or managing conflict as boundary spanners); the *subjects'* (users or those affected by the policy) interests need to be considered to ensure that the policy is relevant. The *context setters* will need to be controlled and committed to the strategy's goals in order to contain the risk that power is exercised in opposition to the strategy; and the *crowd* needs to be observed to avoid unintended adverse effects of the strategy-making process. Finally, the use of such a grid could provide information on how to convince stakeholders to change their views. It can even be used to help advance the interests of the relatively powerless, allowing for enabling and advocacy measures.[25]

[24] cf. Bryson (2003), p. 14-15

[25] ibid.

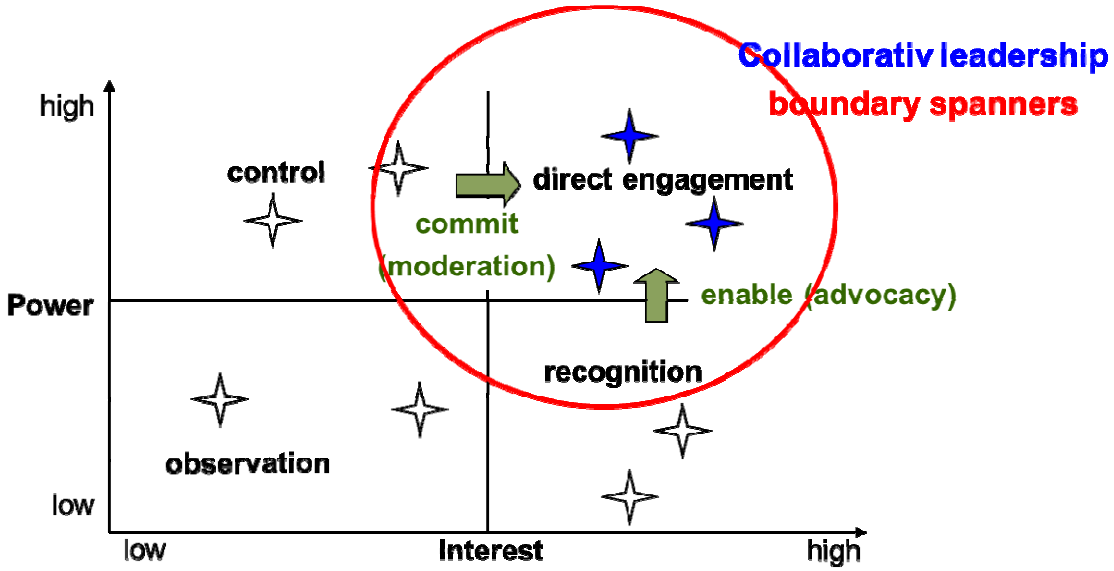


**Figure 5: Power vs. Interest Grid**
Source: author's representation

### Step 4: planning for stakeholder participation

With the knowledge gathered until now about the various possible stakeholders, the subsequent task is to respond to or engage different stakeholders in different ways over the course of a policy or strategy change effort. A possible technique, which is specifically designed for the purpose of planning for stakeholder participation is the *Participation Planning Matrix* (Figure 6). The matrix identifies the role of each stakeholder in various strategic management functions including, for example; organising participation; creating ideas for strategic interventions; building a winning coalition around proposal development, review, and adoption; and Implementing, Monitoring and Evaluating Strategic Interventions. The levels of participation range from a minimum of simply informing stakeholders through to empowerment in which the stakeholders or some subset of them are given final decision making authority. Each level has a different goal and makes a different kind of promise, implicitly or explicitly. The matrix enables planners to consider appropriate responses to the demands of different stakeholders and, as a result, reaping the benefits of taking stakeholders seriously while avoiding entailing risks of inappropriately responding to or engaging stakeholders.

| Stakeholders to Approach by Which Means: | | | | |
|---|---|---|---|---|
| **Inform** | **Consult** | **Involve** | **Collaborate** | **Empower** |
| **Promise: We will keep you informed** | **Promise: We will keep you informed, listen to you, and provide feedback on how your input influenced the decision.** | **Promise: We will work with you to ensure your concerns are considered and reflected in the alternatives considered, and provide feedback on your input influenced the decision.** | **Promise: We will incorporate your advice and recommendation to the maximum extent possible.** | **Promise: We will implement what you decide.** |

**Figure 6: Participation Planning Matrix**
Source: Bryson (2003), p. 39 (modified)

## 5. Conclusions: engaging stakeholders through good governance in light of smart specialisation

The review of prevalent governance systems has shown that there can be no ‚one-size-fits-all'-method of managing strategic policy-making processes. What works for one region may not work as well for another. Therefore, every regional or national constituency needs to derive and adapt the model most suited for its individual purposes. Thus, being able to read the 'politics of place' becomes a critical skill.

In this sense, also the way collaborative leadership is construed, structured and executed needs to be adapted to the local culture of governance, in order to secure ownership of the strategy, which in turn means to commit powerful actors (the *players* but also the *context setters*) to the commonly agreed policy goals. It also means to minimise the purchase of external expertise and services (e.g. experts, analyses), making it possible to identify all relevant – and also new – stakeholders such as social entrepreneurs while keeping control over the process through ‚boundary spanners'. This will increase the likelihood that the full research and innovation potential can be exploited.

Recalling the demands of the RIS3 concept in terms of governance clarified the sophisticated nature of the partnership approach required. However, considering that RIS3 is about making the best educated bet on the future of a region or country, exercising partnership and shared leadership are also the most promising strategies to minimising risks ('all stakeholders collectively are less likely to make the wrong bet') and share these among the stakeholders.

Considering the dynamics created by RIS3 as a complex strategy, maintaining it as a 'living' entity is a pre-requisite to catalyse progress towards the common goals. This entails securing iterative processes in which communication channels between stakeholder are kept open in a well-managed dialogue and collaboration is ensured throughout the whole process of strategy

design, implementation, monitoring, review and evaluation, so that re-adjustments can be made based on changing conditions.

In conclusion, the RIS3 concept offers a paradigm that is not really new. Rather new, however, would be its proper implementation.

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# 11. Innovation and Brain Drain in the Western Balkans

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## Introduction

Human capital formation and accumulation have created challenges to most of the developing countries in terms of striving to achieve economic growth. Human capital is inevitably linked to issues of innovation, successful technology transfer, and economic growth. The most persistent challenge in this respect has been the phenomenon of high rates of brain drain, i.e. droves of highly educated labor force (scientists/researchers) leaving their native countries in search for better life. In the WB countries this problem has been pervasive and ubiquitous for years. The reasons behind brain drain are twofold: on one hand, globalization generates agglomeration of human capital in places where it is already in abundance; on the other hand, host countries gradually impose conditions to filter highly educated immigrants through selection policies (World Bank, 2008). Two concepts prevail in the discussion about the impact of highly educated migration on the economic development. One refers to brain drain as a phenomenon that negatively impacts the sending country's human capital accumulation and fiscal revenue (Bhagwati and Hamada, 1974). Proponents of this view accentuate the need for implementation of restrictive public policies targeted at restricting highly educated labor mobility. The other concept focuses on the nature of highly educated Diaspora acting as a powerful force in promoting economic development through a variety of instruments, such as remittances, trade, foreign direct investment (FDI), and knowledge transfer. Globalization has drastically improved access of technological latecomers to advanced technologies, helping low-income countries to raise per capita income (Mayer, 2000), exemplified in the rapid development of high-tech companies in India and China as a result of their Silicon Valley Diaspora (Saxenian, 2002a).

Migration, if certain conditions are met, can lead to human capital accumulation and influence the net increase of the educational level of the sending country (Beine *et al.*, 2001, 2008). Yet only a handful of studies examines the impact of highly educated migration on the economic development, or engages in the analysis of empirical data pertaining to high human capital emigration rates in small developing countries (reviewed in Stankovic *et al.*, 2013). These few studies provide no empirical data about the brain drain effect on the fiscal system, nor do they measure the size of the benefits for the migrants themselves in the process of emigration (Gibson and McKenzie, 2010).

Docquier and Marfouk's (2006) definition of immigrants as foreign-born workers does not consider the fact whether the education was gained in the home or in the host country. This can lead to overestimation of brain drain and construct a false picture of the variations of this phenomenon across the analyzed countries (Rosenzweig, 2005). To rectify this, Beine *et al.* (2007) use the age at which immigrants enter the host country as an indicator of where the education was acquired. Their results indicate that the size of the country and the emigration rate are inversely correlated, i.e., the average highly educated emigration rates are seven times higher in small countries in comparison to those in large countries (Docquier and Marfouk,

2006). Highest emigration rates have been observed in middle-income countries, where people have both the motive and the financial means to emigrate.

**Benefits of Agglomeration of Knowledge**

Knowledge is unevenly distributed; it is typically located in clusters. This results in stratification and differentiation of centre and periphery, where underdeveloped peripheral countries (i.e., WB countries from the point of view of this article) and regions become impoverished in terms of human capital. The peripheral countries do not achieve high incomes at the expense of developed central regions, which in turn benefit from disproportionately increased revenues. As a consequence, the North-South development gap constantly increases. Less developed regions have a shortage of highly educated staff that would otherwise enable higher capital profitability. Capital circumvents these regions, and thus the average productivity remains low. This in turn encourages more talented people to leave, perpetuating the brain drain phenomenon in a vicious circle, in a phenomenon known as the "Mezzogiorno effect" – named by the region of Southern Italy where it is ubiquitous.

In the context of WB countries' relatively high rates of highly educated emigration and also in the context of formulating sound brain gain or brain circulation public policies, several questions resonate: What is the starting point of the "Mezzogiorno effect", and whether WB countries, through implementation of targeted public policies, can affect their qualification as a periphery or centre? Should WB countries undertake public policies aimed at generating indigenous human capital by subsidizing education and scientific research? Should they undertake public policies aimed at attracting and importing of human capital that has already been created abroad, and funded by another country (Lucas, 1990)?

Brain drain for one country equals brain gain for another. High brain drain rate negatively impacts the sending (i.e., home) country in several aspects. First, it might lead to increased global level inequality (Bhagwati and Hamada, 1974), creating substantial losses in the economy of the home country. It might also generate deficit in certain professions, making distinct professional profiles emigrate in disproportionately large numbers. This might be exacerbated by different types of governmental public policy measures aimed at prevention of brain drain, such as discouraging professional programs for acquisition of easily mobile skills, e.g., nurses (Poutvaara, 2004). These public policy measures are presumably focused on creating professionals who will be unable to leave the country easily (e.g., lawyers). However, in the long run this might lead to hyperinflation of those professions, leaving the problem with the deficit professions unsolved.

The relative degree of possibility to emigrate affects the decision as to whether people will invest in acquiring tertiary education diploma. If a certain type of education is an immigration card, this will act as an additional stimulus for investment in human capital. Uncertain emigration prospects when deciding about entering tertiary studies may influence the decision to (not) invest in acquiring new skills and competences. In the short term, this is beneficial for the sending country in terms of not losing additional human resources (Beine *et al.*, 2001). In this respect, countries combining relatively low levels of human capital and low rates of highly educated emigration evidence net profit. However, most developing countries record huge losses in human capital in the form of brain drain. Only a handful of large developing countries net insignificant benefits by balancing low human capital levels with low highly educated emigration rates (Beine *et al.*, 2008).

**Benefits of Brain Drain**

Potential benefits from brain drain include: remittances, return migration/brain circulation, and various diaspora externalities. There are two motives behind remittances: altruism and exchange (Beine *et al.*, 2006). Altruism is usually directed at immediate family members, whereas remittances, most often motivated by exchange, represent compensation for services done on behalf of immigrants by someone in their native country. Such transfers are intrinsic to temporary migration, signaling the willingness of immigrants to return home. It is unclear whether highly educated migrants transfer more funds than less educated ones. The highly educated often emigrate with their family, severing their ties with the native country. In this respect– at aggregate level – brain drain migration generates less income from remittances (Faini, 2006).

Return migration is rare among highly educated persons who left their country, unless the return is not preceded by considerable growth of the national economy (Milio *et al.*, 2012). For instance, less than one-fifth of Taiwanese and South Koreans with doctorates in engineering who completed their studies at US universities in the 1970s chose to return to their home countries. However, after two decades of rapid economic growth in Taiwan and South Korea, the share of students returning upon graduation increased to two-thirds. The same trend has been observed with Chinese and Indian students who graduate in the USA and return home, suggesting that the return of highly qualified persons is a consequence rather than the cause of economic growth (Commander *et al.*, 2003).

A number of social studies stress the potential of Diaspora externalities. Mobility of highly educated migrants might contribute towards reducing transaction and other types of information costs, facilitating trade, FDI, and technology transfer between the host and the home country (Kugler and Rapoport, 2006).

**Brain drain trends in WB countries**

The dissolution of the past regimes, weak economic structure, low level of industrial production, low performance results of the educational system, high level of public debt, high unemployment level, low contribution of SMEs to innovation, and the lack of motivation, commitment and trust, had enormous negative impact on human capital development in the WB countries. Two contemporaneous processes have been taking place, one associated with "external" brain drain, i.e. experts leaving the country for better professional fulfillment abroad, and the other associated with "internal" brain drain, i.e. specialists leaving their professions for better paid jobs in the private and/or informal sector of the economy (UNESCO, 2004). The educational and scientific systems of the WB countries share low level of investments (less than 1% of GDP) in research and development (Stankovic *et al.*, 2013). This is a result of several intertwined structural problems, including budgetary constraints imposed by restrictive monetary and fiscal policies, de-industrialization, high transaction costs of societal transition, external accounts imbalances, low national investment and savings rates, and limited FDI inflows (UNESCO, 2004). EU enlargement is particularly problematic for new member countries from the WB region. It is likely that the skilled and innovative individuals will leave WB to look for their luck in other EU countries as the freedom of movement becomes facilitated by membership (Fischer *et al.*, 1997).

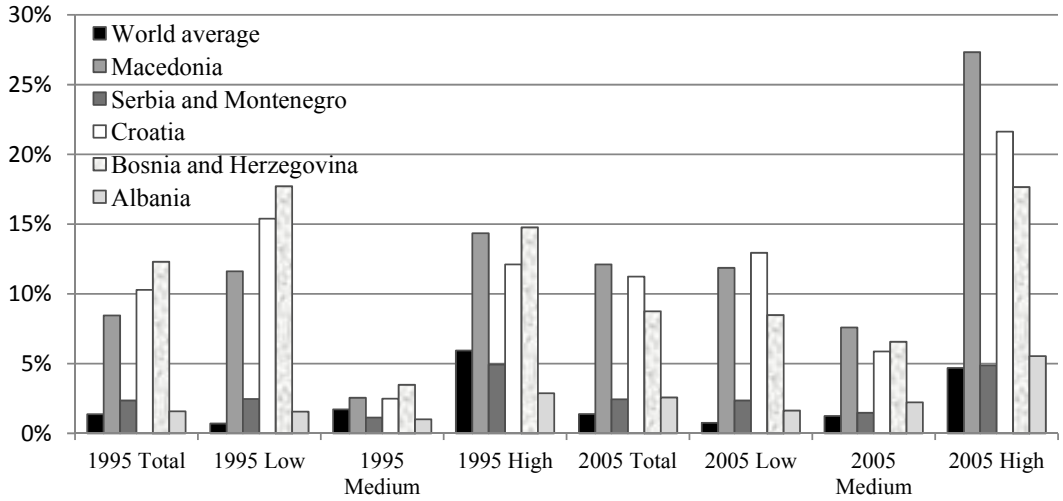


**Figure 1.** Emigration rate by educational level 1995–2005, selected WB countries.
*Source*: Docquier *et al.* (2011)

Even though most WB countries have undertaken education strategies and action plans geared towards increasing the tertiary enrolment rates, this has not resulted in substantial decrease in brain drain. On the contrary, brain drain rates have been relentlessly increasing, with FYR of Macedonia leading the WB pack (Figure 1, Table 1); Croatia and Bosnia & Herzegovina (BiH) follow suit. In fact, in 2010 FYR of Macedonia had a stock of emigrants of approximately 447.100, which is almost 22% of the country's population (World Bank, 2011). Albania and Serbia have much lower brain drain rates, which have remained relatively stable over time and are slightly higher than the world average. The largest relative increase in emigration is found in the group of highly educated individuals (Figure 1).

| | *Brain drain 0+ years age* | | *Brain drain 12+ years age* | | *Brain drain 18+ years age* | | *Brain drain 22+ years age* | |
|---|---|---|---|---|---|---|---|---|
| *Country* | 1990 | 2000 | 1990 | 2000 | 1990 | 2000 | 1990 | 2000 |
| Albania | 17,4 | 14,3 | 17,3 | 14,1 | 17,1 | 13,9 | 16,1 | 13,2 |
| Bosnia & Herzegovina | | 23,9 | | 23,2 | | 22,9 | | 21,9 |
| FYR of Macedonia | | 29,1 | | 26,9 | | 25,9 | | 24,1 |
| Croatia | | 24,1 | | 22,1 | | 20,7 | | 18,9 |
| Serbia & Montenegro | | 13,7 | | 13,3 | | 12,9 | | 12,3 |

**Table 1**. International skilled migration, estimates controlling for age of entry, percentages. *Source*: Beine *et al.* (2007).

**Intellectual Mobilization of the WB Highly Educated Diaspora: Brain Circulation**

The so-called brain circulation paradigm goes beyond the classic brain drain-brain gain dichotomy, and relies on notions such as globalization and transnationalism (Gaillard and Gaillard, 1997). The brain circulation paradigm is based upon several preconditions, the most important being the possibility for brain exchange between countries, increase in temporary migration flows, and increase in return migration flows (Milio *et al.*, 2012).

A number of KAM (Knowledge Assessment) variables are of particularly high significance for brain circulation (Stankovic *et al.*, 2013).[26] These are shown in Table 2 across several WB countries. While the list of variables is not inclusive, it points toward the major issues that influence brain drain/brain gain. KAM variables are normalized on a scale of 0 to 10 relative to other countries in the comparison group:

| | *FYR of Macedonia* | *Croatia* | *Serbia* | *Albania* | *BiH* |
|---|---|---|---|---|---|
| Human development index, 2010 | 7.71 | 9.86 | 3.68 | 4.38 | 3.61 |
| Control of corruption, 2009 | 5.62 | 5.82 | 5.21 | 4.18 | 4.52 |
| University-company research collaboration (1-7), 2010 | 5.27 | 4.66 | 5.27 | 0.15 | 1.98 |
| Availability of venture capital (1-7) | 5.42 | 2.44 | 3.21 | 2.44 | 1.37 |
| Patents granted by the USPTO, avg. 2005-2009 | 3.36 | 6.71 | 5.07 | 2.4 | 3.63 |
| High-tech exports as % of manuf. exports, 2009 | 3.59 | 7.18 | n/a | 2.44 | 3.59 |
| Firm-level technology absorption (1-7), 2010 | 1.91 | 3.44 | 0.53 | 3.44 | 1.53 |
| Public spending on education as % of GDP, 2009 | n/a | 7.43 | 7.43 | n/a | n/a |
| Brain drain (1-7), 2010 | 1.07 | 1.22 | 0.46 | 2.98 | 0.46 |
| Difficulty of hiring index, | 7.87 | 1.77 | 0.92 | 3.4 | 2.13 |

[26] *See* Knowledge Assessment Methodology 2012. KAM is an interactive benchmarking tool created by the World Bank's Knowledge for Development Program, available at www.worldbank.org/kam (accessed on March 10, 2014).

| 2010 |
|---|

**Table 2.** Values for selected KAM variables in WB countries. *Source*: World Bank (2013).

The return migration flows are primarily influenced by public policy measures undertaken by governments in order to influence the mobility of highly educated migrants (Johnson and Regets, 1998; Saxenian 2002b). Government programs targeting brain circulation influence the nature and intensity of exchange relationships between highly educated migrants, sending countries and destination countries (Saxenian, 2002c). Due to the mostly transient and "fluid" character of the Diaspora networks, it is extremely difficult to measure and assess the impact of these networks on the economic growth of the sending country (Meyer, 2001). For Diaspora networks to serve as hubs for knowledge and expertise transfer and dissemination, certain preconditions in the sending country should be met, such as adequate legal, economic and political infrastructure and human capital, and most important of all, supportive governmental public policies. These policies can aim towards establishment of industrial clusters linked to science and university parks, establishment of innovative start–ups by entrepreneurial returnees, and promotion of activities undertaken by expatriates acting as "transnational professional communities" between the sending and the destination country (Saxenian, 2002b). Many authors find positive correlation between the incoming FDI from the USA and number of tertiary graduates residing in the USA (Javorcik *et al.*, 2006; Kugler and Rapoport, 2007; Docquier *et al.*, 2011). However, these effects cannot be extrapolated to all developing countries, since, as already pointed out, certain preconditions should be met (Skeldon, 2009).

Several public policy mechanisms can be deployed by the WB countries in order to discourage high brain drain rates. These involve policies aimed towards: (*i*) return of migrants into their home country; (*ii*) restriction of international mobility of own and foreign highly educated citizens; (*iii*) recruitment of highly educated international migrants; (*iv*) reparation of the human capital loss; (*v*) Diaspora options, or resourcing of expatriates; and (*vi*) retention via development of adequate educational sector policies aimed towards economic growth. Out of all of these public policy measures, only public policies aimed at attracting migrants to return to their home country, public policies influencing formation of Diaspora networks, and retention public policies are viable options in terms of brain circulation. Most often, governments undertake a mélange of these public policies, linking the technological growth with retention policies, e.g. Asian countries, and/or Diaspora networks, e.g. South American countries (Lowell and Findlay, 2002).

In recent years, the WB countries have achieved certain progress in the area of human capital development by enacting and implementing national strategies and actions plans pertaining to innovation, science, and higher education (OECD, 2010). Despite encouraging reforms in this field, the WB countries' governments face number of challenges. The brain drain generates a gap between the supply and the demand of certain skills, leading to distortions in the highly educated population labor market. This is one of the main reasons why the private sector encounters difficulties with recruitment of highly skilled personnel in certain professions. The lack of coherent, holistic and strategic public policy approach sustains the vicious brain drain cycle in these countries. This is a consequence of the fragmented, *ad hoc* cooperation between governmental institutions responsible for creation of public policies on human capital development. One possible public policy instrument would be the implementation of a holistic, inclusive approach to education, science, technological development and innovation.

Creating and sustaining substantial - and not only formalistic - institutional ties is essential in this regard.

The highly educated and skilful workforce contributes to the development of innovative capacities of the private sector, of the academia, and of the society as a whole. The number of highly skilled migrants – innovators – can be used as an indicator of the human development potential of one country. The number of innovators and inventor migration can be captured from census data. To supplement the census data, patent data have the potential to cast light on the migration trends of inventors. For example, the number of patent filings tends to correlate with the degree of innovation, and with the relative investments in R&D, thus indicating the efficiency of one country's policies in generating human capital. Patent Cooperation Treaty (PCT) patent applications provide useful information. They have the unique characteristic that they record both the residence and the nationality of the applicants. This has to do with the requirement under the PCT that only nationals or residents of a PCT contracting state can file PCT applications. As a result, nationality and residence information are available for 80.6% of the inventors. PCT records offer good coverage of inventor nationality and residence information for all countries between 2004 and 2011. Taking advantage of this fact, and focusing on inventor migration as captured in patent applications, a recent study attempted to globally map inventor migration (WIPO, 2013).

Figure 2 illustrates the migration of inventors from Europe. Different from the other regions analyzed, the majority of migrant inventors from Europe do not move to the US, but stay in Europe and Central Asia – with most of them moving specifically within and to Western Europe. The high income status of Western Europe, language ties, and the opening of European labor markets may explain the large intra-regional inventor flows (WIPO, 2013).

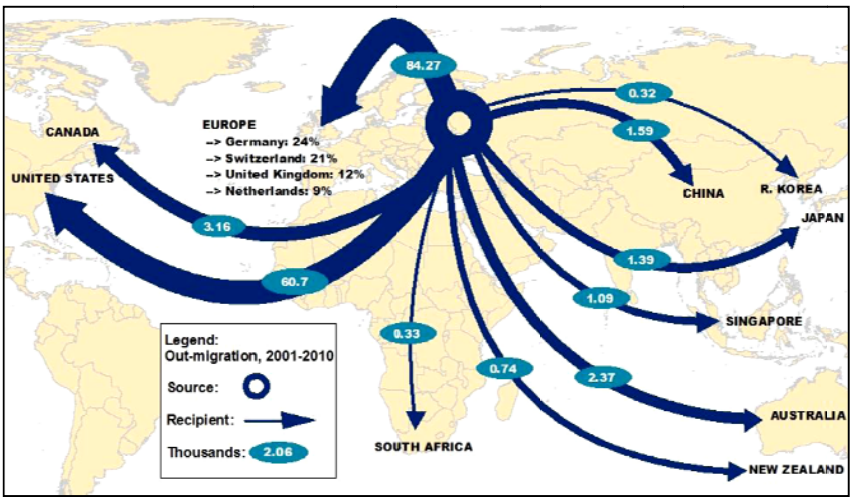


**Figure 2.** Where do inventors from Europe go? *Source*: WIPO (2013).

High brain drain rates represent net transfer of human capital, in the form of educational costs, from low-income to high-income countries. Emigration of the highly educated workforce strata which directly contribute to production, e.g. engineers and scientists, might result in reduced innovation and technology transfer rates in the domestic economy (Kapur and McHale, 2005). The emigration rates of scientists, engineers and doctors are, in general, higher than the emigration rates of the labor force that has non-technical university education (e.g. lawyers). When local conditions and opportunities are limited, certain levels of emigration rate can be positive for the sending country, due to the possible positive effect of

technology transfer from the Diaspora. However, certain preconditions need to be fulfilled in order for positive externalities of brain drain to occur. If the sending country represents relatively small economic market (as in the case of all WB countries), it is very likely that the brain drain will cause significantly adverse labor market changes that will affect all sectors of the local economy. The likelihood that a young man who earned his doctorate in the USA will remain there after completing doctoral studies decreases with the increase in the average per capita income in the home country. However, this is not the sole factor affecting the decision to return. This decision is influenced by other factors such as quality of living conditions, density of research networks, and size of the host country Diaspora. Factors that could positively affect the decision to return to the home country are family proximity, cultural familiarity, and the desire to participate in the technological progress of the home country.

Due to the alarmingly high rates of brain drain, the WB governments should formulate public policies aimed towards encouraging brain circulation. The brain drain is a complex issue that occurs as a result of a variety of mutually overlapping factors, out of which the most important is the level of economic development of the home country. For instance, the economic development of the country is the main reason for the return of South Korean highly educated immigrants to their home country. However, the lack of opportunities for economic development is not the only obstacle to the return migration. The 2005 study of the Albanian Institute for International Studies pointed out the fact that the young educated Albanians do not return to their home country due to the inappropriate business practices of the employers in terms of recruitment and selection, nepotism and lack of transparency in the public administration and in the academia (OECD, 2010).

"Piloting Solutions for Alleviating Brain Drain in South East Europe" financed by UNESCO and Hewlett-Packard is one of the pioneering brain circulation projects in WB (Gabaldón *et al.*, 2005). This project was designed to support research and reduce brain drain by creating opportunities for advancement of young WB scientists in their home countries. Universities from the WB countries received assistance in the form of grid technologies and start-up capital for financing scientific cooperation and exchange with their counterparts in the Diaspora. Since all WB countries share similar socio–economic conditions, the regional approach to brain circulation will be an effective public policy instrument. Therefore, it would have been beneficial if the activities of the above mentioned project became sustainable in the long run. Another effective public policy in this regard would be the creation of Diaspora knowledge networks (e.g., similar to the Colombian Red Caldas).

The highly educated Diaspora creates an opportunity for a potential gain to the home country. The educated WB expatriates create a pool of potentially useful human capital for the countries of origin. The challenge lies in mobilizing these brains in order to involve them in promoting the economic growth of the region, building a sustainable brain circulation network. WB countries can benefit from other countries' successful experiences, e.g. India, where the partnerships between the private sector and the academia, twinning project with technology institutes from the USA and the technology transfer led by the Silicon Valley Diaspora have greatly influenced the rise of Bangalore as one of the world's IT centers. Institutional factors play a major role in brain circulation. Looking at the examples of India, China, and other countries, returning migrant communities are not replicating Silicon Valley around the world. It is more appropriate to see the emerging regions as hybrids, combining elements of the Silicon Valley industrial system with inherited local institutions and resources (Saxenian, 2005). Universities should motivate talented lecturers and students to spend short periods of research and study abroad. Also, the institution of exchange programs is an excellent means of encouragement of highly educated Diaspora scientists to return to their

home country and provide lectures or engage in collaborative projects with their counterparts. All these endeavors need to rely on stable long-term strategies to promote economic growth and democracy in the WB countries, leaving no way to nepotism and corruption, two of the main culprits for the long socio-economic *status quo* of the WB countries (Quaked, 2002). The main preconditions for brain circulation can be found in the "well developed scientific infrastructure, higher investments in the science sector, and the stability of a consolidated democratic government that assures human rights and academic freedoms" (Horvat, 2004).

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# 13. RTDI Evaluation in South East Europe – Reflections based on the experiences of EVAL-INNO27

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## 1. Introduction

The complexity and heterogeneity of innovation systems requires from ERDF[28] and IPA countries[29] strategic intelligence to design, implement, and follow up research, technological development, and innovation (RTDI) measures at different spatial levels (local, national, regional, and European) by addressing issues of relevance, efficiency, efficacy, impact, and sustainability. For this purpose, evaluations are one of the most essential tools for evidence-based decision-making. This is especially true in the South-East Europe[30] region which is characterised by an adoption and adaptation of new[31] RTDI policies, programmes, and (support) institutions and a transformation of funding towards competitive schemes. At the same time, however, a lack of methodological and procedural know-how on the part of both evaluators and awarding authorities concerning purpose, design, and use of evaluations has become obvious.

In the face of the dynamic developments in terms of designing, establishing, and implementing new RTDI instruments in the South-East Europe region, helped especially by the availability to the "new" EU Member States of structural funds, providing significantly higher amounts of fresh money compared with the accession phase and accession funds, the "Steering Platform for Research for Western Balkan Countries" as soon as 2010 identified the need for better and more pro-active use of evaluations to avoid an instrumental arbitrariness and called for regional solutions. Also the EU INNO-Appraisal project (Edler et al. 2010), which took stock of and assessed appraisal exercises, such as evaluations in the area of innovation policy across Europe, identified a significant difference of the application and use of evaluations between more advanced RTDI countries and especially the new EU Member States, not to mention non-EU member states in the so-called Western Balkan region.

The EVAL-INNO project was designed in 2010 with the key development objective of strengthening regional as well as national evaluation capacities in order to improve the

[27] The authors would like to thank all EVAL-INNO partners for their contributions, which have been integrated in this summative article. We acknowledge especially the reports prepared by Lena Tsipouri and Nikos Sidiropoulos from the University of Athens, Centre for Financial Studies, which form a substantial input to this article.
[28] ERDF = European Regional Development Fund; applicable to EU Member States only
[29] IPA = Instrument for Pre-Accession Assistance; provided on the basis of the European Partnerships of the potential candidates and the Accession Partnerships of the candidate countries, which means the Western Balkan countries, Turkey, and Iceland. In our regional context, we mean the Western Balkan countries.
[30] The "South-East Europe region" is here defined administratively by the geographical borders stipulated by the South East Europe Transnational Cooperation Programme.
[31] "new" is meant here as new in the regional context.

framework conditions for innovation policies, programmes, institutions, and projects. The operational project goals were

- to promote the role of RTDI evaluation as a crucial condition for a reflexive learning innovation system;
- to develop the needed capacities and competencies for comprehensive RTDI evaluations; and
- to provide procedural and methodological know-how and tool-kits on the part of both evaluators and awarding authorities.

In early 2014, after a positive funding decision for the project granted by the South East Europe Transnational Cooperation Programme and after almost three years of implementation, it is time for a review of the situation.

The underlying broad structural starting point for the project was that innovation capacities and results in the South East Europe region are too limited and that, therefore, public interventions are necessary and consequently increasingly implemented to stimulate meaningful innovation activities. However, under tight financial regimes, public spending for innovation has to identify the right rationales and mechanisms for performance-based innovation funding from the start. To secure an optimum use of taxpayer money, principles of good governance have to be respected. Evaluations are considered to be a proper tool for ensuring transparency and accountability. They contribute to an efficient new public management. Also, the right application of evaluations has to be learned in policy systems with continuously increasing complexity (e.g. caused by vertical, and intrinsically sometimes quite different spatial intervention levels [local, national, regional, European, global], as well as caused by an increasing complexity of rules and regulations [national/European/global] and by the emergence of horizontal multi-level policy systems cutting across previously more separated policy fields and stakeholder arenas [see for instance the Triple Helix Concept or the "knowledge triangle" approach, to name just two prominent paradigmatic cross-policy field examples]). Ex-ante, interim, terminal, and ex-post evaluations have to be properly and meaningfully tendered, and they have to be implemented so as to secure strategic intelligence building and evidence-based decision making.

The reasons for commissioning evaluations can be manifold. They can serve the need for legitimisation of public interventions and, thus, justify the use of public funds. Similarly, evaluations can satisfy information needs to show the public how funds are being used and to what effect. In general, however, evaluations often fulfil a learning function, which basically means to do things better in the future based on analytical evidence and judgement provided by the evaluation and to allow a better steering of planned or implemented interventions (e.g. for establishing more relevant policy objectives or to improve the design and implementation of certain interventions). Sometimes evaluations also support the mediation function if they are – intentionally or not – balancing interests (e.g. of programme owners and of target groups) and help to improve the understanding and dialogue about diverging, or sometimes even conflicting, interests.

## 2. Isolation and Compartmentalisation in the Field of STI Evaluation

When EVAL-INNO was conceived, an obvious finding was that evaluation experts in the South-East Europe region are rarely institutionalised in professional evaluation associations or other relevant networking bodies. Those regional capacities with RTDI evaluation experience are usually individual experts conducting evaluations pre-dominantly on their own. Moreover,

the core group of beneficiaries of RTDI-related evaluations, which are usually considered to be those public authorities who are in charge of planning evaluations and commissioning them internally or externally, are a few in number, rarely have a formal evaluation education or job description, and are only loosely connected to peers in other units, policy fields, and countries. Thus, the following two key challenges were identified:

Key challenge "one":

- Beneficiaries of evaluations at policy-level are dispersed across sectors and governance levels, but exchange among them is limited

Key challenge "two":

- Lack of systematic exchange with evaluators in EU and globally

The relative isolation of beneficiaries of evaluations from each other, as postulated in key challenge "one" above, remains a fact. EVAL-INNO did not target this "compartmentalisation" at national level. As a trans-national activity, it "logically" supported the development of a regional zone for encounter and interaction across the existing "compartments" in the field of STI, which seem to exist in any administrative entity. A rare example at the national level to combat administrative "compartmentalisation" of programme owners and programme managers from the field of Science, Technology, and Innovation (STI) is the Austrian Platform for Research and Technology Policy Evaluation (FTEVAL), which was also featured during the training sessions organised by EVAL-INNO as a good practice example in establishing a conscious evaluation culture in a rather short period of time in an agglomerated policy field (science policy, technology, and innovation policy).

FTEVAL was also considered as a model for a regional platform, which could contribute at this level as an alternative to a stepwise breakup of the existing compartments at the local and national levels without, however, replacing necessary national efforts. In this sense, the regional platform kicked off by EVAL-INNO did indeed provide a zone for encountering and interaction at the regional level by bringing experts from different national and regional administrations into contact with each other. Although this was only made possible thanks to the South East Europe Transnational Cooperation Programme, the programme itself was at the same time obstructing an even better exchange due to its blatant rigidity in terms of limiting the reimbursement of travel expenses of officials from public authorities to attend the final project conference in Vienna (to give just one example). Besides such operational difficulties, the South East Europe Transnational Cooperation Programme was perceived by many of its beneficiaries as a mixture of a highly relevant programmatic intervention in terms of its contents and intervention logic, but at the same time as administratively extremely heavy and unnecessarily rigid in a way that the administrative overhead caused by the programme cannibalised its eminent thematic and content-related virtues. But this might be a finding (or not) of a programme evaluation of the South East Europe Transnational Cooperation Programme and not an issue to be further extended in this article.

A problem faced by almost any regional initiative is its institutionalisation and sustainability. Whereas champions, owners, and, thus, ownership can more easily be identified at the national level, it is difficult to identify regional "owners" and to create regional "ownership" when no regional champion exists or is mandated through a diplomatic inter-governmental process. Such a political process could hardly be implemented by EVAL-INNO itself. Nevertheless, a business model for a sustainable institutionalisation of the regional platform was developed, which is based on a membership model under which the presumptive members, i.e. ministries and agencies in charge for STI policies, would have to pay a yearly

membership fee of a few thousand Euros to access and use the services provided by the platform.

EVAL-INNO successfully contributed to tackling the second key challenge by providing a systematic exchange with evaluators in the EU, especially through trainings organised by the project. It became evident, however, that without (co-)funding of travel costs, participation of evaluators from economically less developed South East European countries in pertinent European or international STI evaluation conferences or workshops would remain very limited. An indication of this was the low participation rate of these countries in the largest STI evaluation conference organised in 2013, the FTEVAL conference "Evaluation of STI policies, instruments and organisations: new horizons and new challenges" which took place in Vienna in November 2013, although FTEVAL was intensively collaborating with EVAL-INNO and even provided a dedicated after-conference session on the issue of "Supporting RTDI evaluation culture: The way forward in Southeast Europe and Central Europe – Lessons learnt from the Conference".

## 3. Human Capital Shortcomings in the field of STI Evaluation

Based on its pre-project analysis, the developers of EVAL-INNO identified a lack of STI evaluation capacities in the South-East Europe region, which is another key challenge for developing sound STI evaluations:

**Key challenge "three":**

- Lack of certified evaluators for programme, institutional, and policy evaluations in the field of innovation as well as methodological deficits and weaknesses

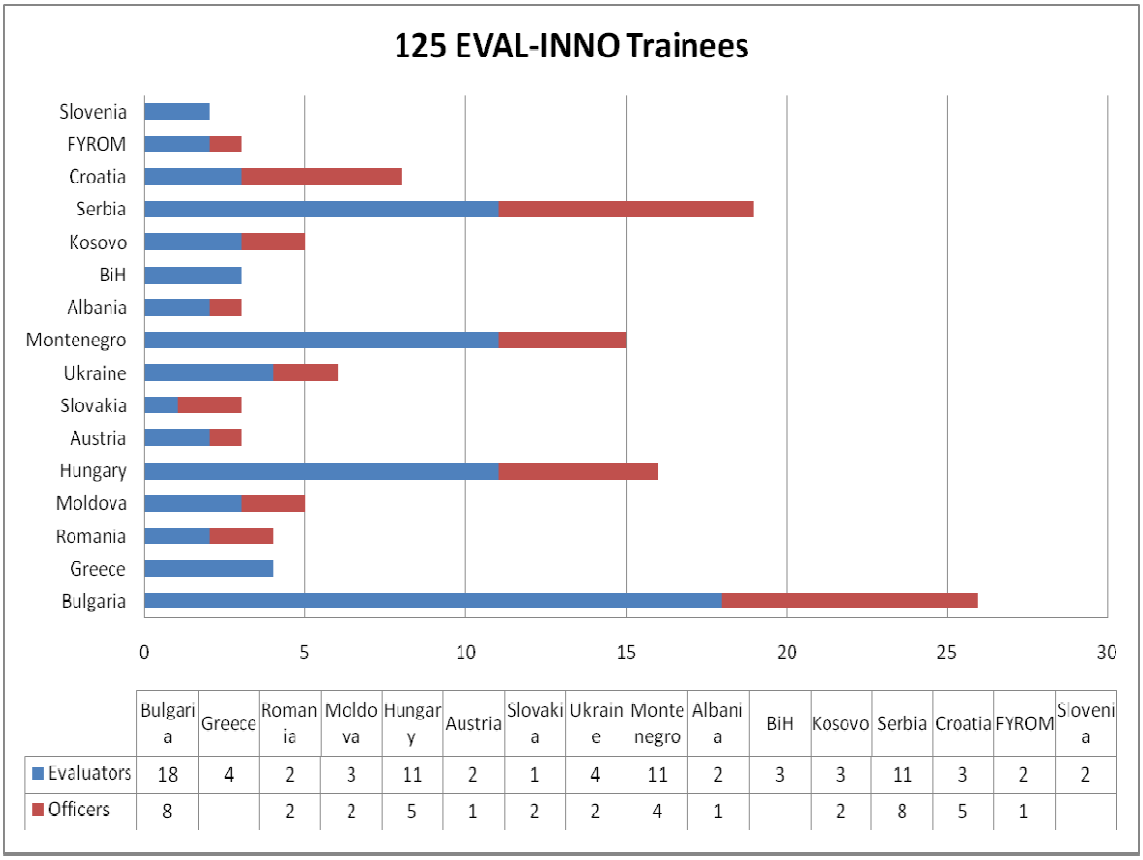
To mitigate key challenge "three" was a central goal of EVAL-INNO. The project organised four training weeks in Sofia, Budapest, Podgorica, and Belgrade. The two target groups of these trainings were evaluators on the one hand and programme owners and programme managers on the other. In other words, the target groups were those who conduct external evaluations and those who commission external evaluations. During these four training weeks, 125 trainees, consisting of 82 evaluators and 43 programme officers, were trained. These trainees came from 16 countries from all over the South East-Europe region. The mobilisation of EVAL-INNO in this regard was very high and was definitely also facilitated by an earnest need and factual demand. In this regard, EVAL-INNO amply demonstrated its relevance and effectiveness. Also, the mobilisation of trainers was highly effective and the offered diversity was appreciated by the trainees: For the four five day's long trainings provided for the evaluators, 24 lectures and 9 group exercises were implemented. For the training of the programme managers, which each lasted in total four days, 20 lectures and one group exercise was executed. 12 lecturers with different national background taught and produced educational material for lectures and group exercises.

Fig. 1[32] shows the origin of the trainees: 15 or even more trainees each came from Bulgaria, Serbia, Hungary, and Montenegro. This huge participation from these countries is not surprising given the fact that these were the host countries for the four training weeks. The

[32] This section is based on statistics provided within the project by Tsipouri, L. and Sidiropoulos, N., University of Athens, 2013.

local hosts for the trainings succeeded in mobilising national communities interested in STI evaluation. Also the numbers of trainees from Croatia, Ukraine, Moldova, and Kosovo was high, which is an indication for the regional outreach of EVAL-INNO because no institution from any of these countries was a member of the EVAL-INNO consortium.

In the two training weeks provided to the evaluators, which were organised in non-EU Member Countries (i.e. in Belgrade and especially in Podgorica) the number of participants who had never participated in similar events before was higher than the number of participants who had. As regards the two training weeks organised in EU Member States, one can conclude that in Sofia the participation of these two groups was balanced and in Budapest the number of newcomers was lower than the number of participants who had already participated in similar events before. As regards the participation of programme owners and programme managers, newcomers by far outnumbered those who had already participated in a similar event before, which is evidence that EVAL-INNO really could contribute to mitigating key challenge "one" mentioned above at the regional level.




| | Bulgaria | Greece | Romania | Moldova | Hungary | Austria | Slovakia | Ukraine | Montenegro | Albania | BiH | Kosovo | Serbia | Croatia | FYROM | Slovenia |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Evaluators | 18 | 4 | 2 | 3 | 11 | 2 | 1 | 4 | 11 | 2 | 3 | 3 | 11 | 3 | 2 | 2 |
| Officers | 8 | | 2 | 2 | 5 | 1 | 2 | 2 | 4 | 1 | | 2 | 8 | 5 | 1 | |

**Fig. 1: Origin of Trainees Participating in the STI Evaluation Training Weeks organised by EVAL-INNO**

As shown in Fig. 2, almost 90% of the participating trainees from the target group "evaluators" were "most satisfied" or at least "satisfied" with the content of the trainings offered by EVAL-INNO. Only the training week in Podgorica received a lower appreciation rate, with 74% approval ("most satisfied" and "satisfied") in this regard. No single participant from this group was "rather dissatisfied" nor "not at all satisfied".

As regards the target group of programme owners and programme managers, the appreciation was high as well (80 % approval for "most satisfied" and "satisfied"), but slightly less than compared with the target group of "evaluators", with some dissatisfaction expressed during

the trainings in Budapest (17% "rather dissatisfied") and Sofia (9% "rather dissatisfied). This relative dissatisfaction may have been caused by the heavy methodological orientation of the trainings during the first two days. 33% of this target group who participated in the training week in Budapest stated that the training was too advanced (22% in Belgrade, 9% in Sofia and 0% in Podgorica). On the other hand, the training was perceived as too basic by 36% of the programme managers participating in the training week in Sofia and by 11% of the participants from this target group in Belgrade (0% in Podgorica and Budapest). A second reason for the expressed level of dissatisfaction of a few participants from the target group of programme owners and programme managers could be the sub-optimal response of the training curriculum to the needs of the target group. During the trainings, it became obvious that programme managers from the "new" EU Member States were deeply concerned by the evaluation requirements stipulated by the structural funds, which was an issue not sufficiently anticipated by EVAL-INNO. This also constitutes an area for a possible future support intervention for which a high demand is very likely.

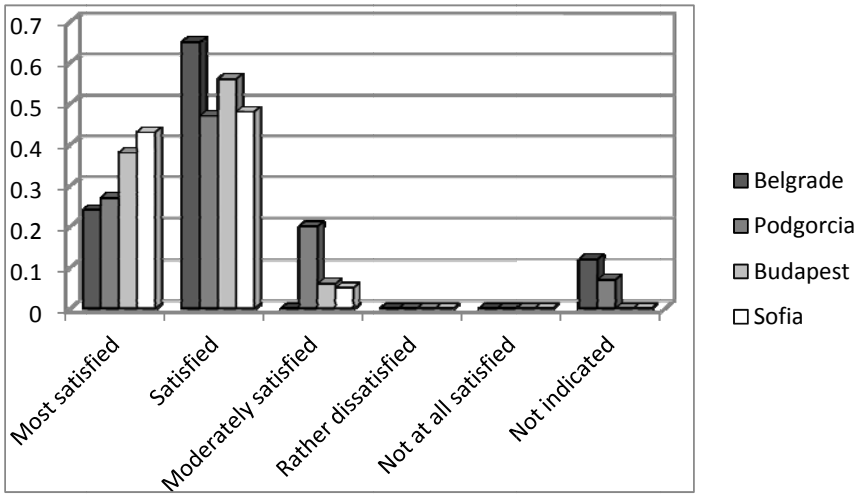



**Fig. 2: Satisfaction of the Trainees from the Target Group "Evaluators" Participating in the STI Evaluation Training Weeks organised by EVAL-INNO**

As regards the overall quality of the trainings provided by EVAL-INNO, around 95% of the participating target group of evaluators would recommend the training to their colleagues, and almost 100% of the target group of programme owners and programme managers indicated that they would recommend the EVAL-INNO training to their colleagues. Based on the feedback of the trainees, the coordinators of the training work package, Ms. Lena Tsipouri and Mr. Nikos Sidiropoulos, suggested for the future a better selection of the trainees based on CV evaluation instead of the first come first served principle, a better selection of trainers through a central selection process based on international quality standards, and the provision of more practical case studies and more time for discussion.

## 4. Varying Degree of Maturity of public procurement of RTDI evaluations

During inception of EVAL-INNO the low number of published STI-related evaluation studies and reports by most of the countries located in the South-East Europe region (with the exception of Austria) became obvious. This was also confirmed by the findings of the INNO-Appraisal project published in 2010. The main assumptions for this low use of STI

evaluations are that, although there is a need for RTDI evaluations for effective, evidence-based policies, most SEE countries lack an evaluation culture and skills that can play a crucial role in reversing the situation and help these countries adopt models that will allow them to rapidly improve their policy performance.

Argumentum e contrario, another assumption was that there might be a lack of sufficient knowledge of professional tendering procedures to obtain the best evaluation results and that there might be shortcomings to make the best use of the obtained evaluation results in the relevant STI policy cycles.

**Key challenge "four":**

- Lack of knowledge of professional tendering procedures (incl. public procurement laws) to obtain the best evaluation results

In order to respond to this key challenge, the participating EVAL-INNO countries were benchmarked towards each other based on the formal institutional rules for RTDI evaluation procurement, informal behaviours and precautions, implementation processes and last but not least the maturity and skills of the actors in the field of RTDI policy and on the RTDI evaluation market. For this comparative study, the following methods were used: literature and document research, database inquiries (search on using the CPV Code "Research and Development" and keyword "evaluation" for all participating EVAL INNO countries), and interviews. The benchmarking exercise aimed to quantify and compare topics and parameters that were difficult to measure. A methodology was developed that reflects both the status quo and the willingness to change. Objective indicators and subjective judgements were combined to arrive at partial indicators and a synthetic one. While recognising the limitations of this methodology, it can be considered as a first attempt, which, if further refined and systematically reported, may evolve into a useful input for monitoring and benchmarking of RTDI evaluation systems (Tsipouri, L. and Sidiropoulos, N., 2013).

The conceptual framework (Tsipouri, L. and Sidiropoulos, N., 2013) used to compare and benchmark the performance of the countries is based on the decomposition of the policy cycle and the procurement process into the following stages:

- Identifying the requirements and user readiness
- Market intelligence
- Tendering process (Terms of reference: background, data availability, questions, and methods)
- Assessing tenders and awarding contracts
- Managing contract delivery

As the different stages were too detailed to study, in particular in countries where only few RTDI evaluations were tendered until recently, it was decided to transform them into related categories (e.g. institutional set up, implementation processes etc.). The institutional setup for tendering RTDI evaluations was decomposed into a formal part (rules when and how to tender) and an informal part (behavioural routines). Further categories taken into account for the benchmarking exercise were the implementation processes referring to assessment and management of RTDI evaluations (see Tsipouri and Sidiropoulos 2013 for a detailed methodological description). In this way, the conceptual framework resulted in a few interconnected categories, against which all countries were benchmarked: the institutional

setup (formal and informal), the implementation process, and market agents consisting of awarding authorities on the one hand and professional evaluators on the other.

| | Formal Set-Up | Informal Set-Up | Implementation | Awarding Authorities | Evaluators |
|---|---|---|---|---|---|
| Austria | 5 | 4 | 4 | 3 | 4 |
| Bulgaria | 1 | 2 | 2 | 2 | 3 |
| Greece | 1 | 2 | 2 | 2 | 3 |
| Hungary | 2 | 2 | 2 | 2 | 3 |
| Montenegro | 1 | 1 | 2 | 1 | 2 |
| Serbia | 1 | 1 | 2 | 1 | 1 |

**Table 1: Aggregated results of the benchmarking**

The aggregated results of the benchmarking exercise are shown in Table 1, which clearly demonstrates that Austria can be used as a benchmark for the EVAL INNO countries in all chosen categories. Austria seems to be well ahead of the other countries and close to an excellent performance.

Formal rules for public procurement should, in theory, be the same for all Member States, whereas the potential future member states are expected to gradually transpose the pertinent EU directives into their national legislation. However, Member States are allowed to impose stricter rules than those foreseen by the directives. In addition, one should keep in mind that the informal rules, namely the choice of awarding authorities to go for lower budgets and less strict procedures is also a fact. In order to benchmark the formal rules in the scrutinised countries (Austria, Bulgaria, Greece, Hungary, Montenegro, and Serbia), the following parameters were used:

1. The budget thresholds for general provisions for public tendering
2. The existence (or not) of special provisions for RTDI evaluations (e.g. specific thresholds; individual selection procedures etc.)
3. Explicit legislation (or not) regarding the legal obligation of awarding authorities to evaluate their programmes or organisations.
4. The existence (or not) of evaluation standards.

As regards the assessment of the formal institutional set up for tendering RTDI evaluations, the distances in-between the analysed countries are large. Austria is highest rated with 5 points (out of 5); Hungary is in the middle with a score of 3 and the rest only scored 1 point.

Given the homogenous and unified formal rules on thresholds, what is maybe even more important for the institutional set up comes from nationally embedded routines, namely the informal rules that influence the behaviour of awarding authorities. The following parameters were used for comparison:

1. The frequency of evaluations
2. The type of evaluations
3. The willingness to improve
4. The existence of champions

As a result, Austria, with limitations in international tendering and a willingness to experiment, was rated 4 points (out of 5); Hungary, Bulgaria, and Greece were in the middle with 3 points each, for different reasons, and the two IPA countries again scored 1 point only.

In order to assess the implementation of procuring and using RTDI evaluations, the following parameters were used for the benchmarking exercise:

1. *Smooth process*, meaning that once RTDI evaluations are tendered, there are usually no complaints, at least not formally.
2. *Time to contract:* This is a particularly relevant variable: if the time to contract is long, the whole process is delayed and it is unlikely that the evaluation will feed into the next policy cycle on time.
3. *Use of Monitorin*g and its quality, which is assumed to depend on the qualification of individual officers and the culture of the awarding authorities.
4. *Content* of the terms of reference for tendering external evaluations, which is crucial for procuring and obtaining good evaluations. More often than not, awarding authorities refrain from ambitious ToR with regard to the content to avoid being exposed and instead formulate standardised requests, rarely requiring innovative approaches or methodologies.
5. *Adoption of recommendations,* which is a subjective indicator based on the perception of both awarding authorities and evaluators, as they were expressed during the study visits.

As a result of this investigation, Austria scores highest again, with room for improvement, while all other countries are in serious need of improving the more difficult parts of the implementation process (see Table 2).

| | Smooth process | Time to contract | Monitoring | Content | Adoption of recommendations | Comments per country |
|---|---|---|---|---|---|---|
| Austria | Yes | *** | Good/variable | Variable | 60% | Implementation is smooth but can be further improved |
| Bulgaria | Yes | *** | Limited/variable | Standard | 40% | Need to improve monitoring, content of the ToR and relevance of recommendations |
| Greece | Yes | * | Limited | Standard | 20% | " |
| Hungary | Yes | ** | Limited/variable | Standard | 40% | " |
| Montenegro | Yes | ** | Limited | Standard | 30% | " |
| Serbia | Yes | ** | Limited | Standard | 30% | " |
| Comments per parameter | In all countries visited the process was smooth | Ways to minimise time to contract are important and need | In three countries the monitoring varies; in the rest it is in general limited. Good | The balance between standardised content in the ToR, request for more | Improving the need to discuss/adopt recommendations and the way how to embed them into the policy | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | and no particular training needs are identified | to be stressed during the training | monitoring should be included in the training modules. | ambitious exercises and avoidance of over-specification is an important element for the training | cycle is another important element for the training modules | |

**Table 2: The implementation process of RTDI evaluations: assessing country performance**

A good RTDI market is composed of demand (awarding authorities), supply (evaluators), and intermediaries (other stakeholders). They all play a role in organising and executing good tenders. Awarding authorities are the crucial element on the demand side. It is for them to decide when to launch evaluations, what budget to dedicate, to monitor implementation, and choose whether and which recommendations to implement (or not). The following parameters were used to assess the awarding authorities:

1. Number of awarding authorities
2. Experience in evaluation market/needs
3. Experience in drafting Terms of Reference (ToR)
4. Willingness to experiment
5. Willingness to participate in EVAL-INNO trainings

While Austrian authorities exist in high numbers and are experienced, they expressed limited interest in the EVAL INNO activities and trainings, which, however, might be caused by the existence of FTEVAL, i.e. their own national RTDI evaluation platform, which also provides similar activities and trainings. Conversely, the less experienced Bulgarian authorities proved more eager to experiment and learn. In Greece (more skills than willingness) and Hungary (more willingness than skills), skills and willingness are mixed and led to average scores, whereas for the IPA countries Montenegro and Serbia, the scores were low and the usefulness of EVAL INNO trainings was assessed highest.

The following parameters were used to assess the supply side:

1. Number of evaluators
2. Experience of evaluators
3. Willingness to participate in EVAL-INNO trainings

Not surprisingly, the benchmarking result showed that Austrian and Greek evaluators are more experienced and less interested in training. There is an emerging market for evaluators in all countries and in addition a demand for evaluations from international organisations.

## 5. Improving access to information, standards and good practices

Another concern of EVAL-INNO was to improve the access of stakeholders in the South East Europe Region to relevant RTDI evaluation information, standards and good practices. Moreover, the project aimed at contributing a few inspiring RTDI evaluations in the region by conducting two RTI programme evaluations and one benchmarking exercise evaluating the performance and practices of R&D institutions from the region vis-à-vis societal needs and societal impact.

**Key challenge “five”:**

- Difficulties to access RTDI evaluation information and good practices and general lack of completed good-practice evaluations in the region under scrutiny

In order to tackle key challenge "five", EVAL-INNO implemented different activities:

a) Publication of RTDI Evaluation Standards
b) Publicly accessible web-based databases (to search for evaluators etc.)
c) Implementation of pilot evaluation exercises, which can be considered to be inspiring practices for the region

The publishing of RTDI evaluation standards by EVAL-INNO in 2012 2012 in Bulgarian, English, Greek, Hungarian, Montenegrin, and Serbian was motivated to provide support to conduct proper and meaningful tenders to procure RTDI evaluations as well as to implement them in such way as to secure strategic intelligence building and evidence-based decision-making. Especially in countries with an emerging evaluation culture and a yet underdeveloped evaluation market, RTDI evaluation standards can help stakeholders to agree on priorities and to establish a road map leading to a high quality national RTDI evaluation policy. The EVAL-INNO standards offer a guideline for programme owners on how to plan, tender, and conduct evaluations. As the market for RTDI evaluations develops, it is important to adopt clear rules and ethics for commissioning institutions and evaluators to ensure responsible behaviour, credibility of results and cost-effectiveness. The standards also include recommendations on how to design an evaluation framework before launching a tender and describe the basic elements of Terms of Reference.

The standards have been drawn up in an interactive process involving experts from six countries through discussion of and reflection on existing RTDI experiences and framework conditions in the South-East Europe region. It is the first attempt of this kind at the regional level. The authors have not been working from scratch 're-inventing the wheel', but rather were using the existing practice of evaluation standards from EU countries (especially the Austrian Evaluation Standards in Research and Technology Policy[33]) and the USA[34]) as successful examples of good practice and trying to adapt them as comprehensibly, concisely, and usefully as possible to the particular situation and needs of the region.

The standards are published on the EVAL-INNO website (http://www.eval-inno.eu), which also makes accessible several databases, which were stocked with

- 180 profiles of evaluators (cut-off date of this article was 12 March 2014), including demographic data and information about previous evaluation experience of the evaluators;
- 159 profiles of other relevant stakeholders (e.g. ministries, agencies, funds, intermediaries) from the region;
- 291 templates informing about RTDI strategies at different level and scope relevant for the region under scrutiny;
- 229 templates summarising RTDI programmes from several countries including information about the design of the programme and its evaluation;

[33] Evaluation Standards in Research and Technology Policy (full-length version), Platform – Fteval, Vienna
[34] Further reading can be found in the literature list at the end of this article.

- information about 271 RTDI infrastructures to enable identification of potential service providers or project partners.

Finally, methodological guidelines for programme evaluation and a benchmarking manual have been developed and used for three evaluation exercises conducted by EVAL-INNO, namely

- evaluation of innovation projects funded by the Ministry of Education, Science and Technological Development of the Republic of Serbia in 2011;
- a strategic benchmarking of the research response ("practices") of R&D organisations from Austria, Bulgaria, Greece, Hungary, Montenegro, and Serbia on societal needs to generate societal impact ("performance"), and
- a pilot evaluation of the voucher scheme for innovative SMEs, a programme managed by the Directorate of Development of SMEs in Montenegro.

Document analysis of the legal and the economic context, reviews of good practices/ examples of similar schemes in other countries, case studies, face-to-face interviews, focus groups, surveys, and analysis of secondary statistics were employed for these pilot evaluation exercises, which all produced eminent results and recommendations which were fed back to the programme owners for consideration. Unfortunately, there is not enough room to go into the details of the findings due to the complex contextual peculiarities of these evaluations, which each would require a separate article.

## 6. Conclusion and Outlook

Since May 2011 EVAL-INNO, a project funded by the South East Europe Transnational Cooperation Programme has addressed and supported the qualitatively hardly standardised and organisationally fragmented endogenous RTDI evaluation potential in the South-East Europe region. Through a structured approach, the project has contributed to an improvement of the cognitive foundations and instrumental application of evaluations as a policy intelligence tool to achieve a traceable impact on a reflective innovation policy and to prepare the region for an informed implementation of and contribution to the "Europe 2020" strategy.

EVAL-INNO has focused on capacity building and institutional support. Its main target groups were policy-makers and policy-delivery systems, innovation infrastructures, and (potential) RTDI evaluators. An easily accessible and systematically structured web-based Regional RTDI Evaluation Platform was programmed, subdivided into four distinct databases which were continuously updated to meet the information needs of both evaluators and awarding authorities (agencies, ministries). Specific training modules were prepared for them and implemented with an emphasis on methodological and procedural issues. Moreover, regional RTDI evaluation standards were published in six languages and programme evaluations as well as a comparative benchmarking of R&D organisations was carried out based on sound methodological designs.

Despite several improvements stimulated by EVAL-INNO and also influenced through external developments, a still unsatisfactory level of deployment of evaluation in RTDI policy-making has to be ascertained. Most structural key challenges which we still face today were also relevant three years ago when the project started.

Based on the input and tools provided by EVAL-INNO, we suggest the following steps be realised by the authorities responsible for research, technology, and innovation policy in the economically less developed countries of the South-East Europe region:

1. Adopt RTDI evaluation standards (those suggested verbatim or an adapted variation) agreed upon by all relevant national stakeholders.
2. Start with a commitment to regularly evaluate larger RTDI programmes and public R&D organisations (incl. universities) by external evaluators. Three to four years might be needed for this first stage, in which programmes will set out clear objectives and a budget earmarked for evaluation ranging from 1–2% of their total funds (depending on the size of the programme) is secured.
3. During this process, commissioning organisations will gain experience, evaluators will be trained on the job (learning by doing), and a market for RTDI evaluations will be created, which will constantly improve its services.
4. Make the regional RTDI evaluation platform sustainable based on small yearly membership fees, which enables encountering and interaction at the regional level by bringing experts from different national and regional administrations into contact with each other and which centrally provides high-quality trainings on evaluation methods and evaluation processes.
5. Programme owners will, based on training, learning on the job, and their own experience, increase their ambitions for RTDI policies by tendering more complex evaluations (portfolio and system evaluations), whereas national public, private non-profit, and profit-oriented evaluators (institutions who perform evaluations) will emerge to respond to the increasing market demand for sound RTDI evaluations in South East Europe.

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