THE WORLD BANK EXPERIENCE ON RESEARCH & INNOVATION IN THE WESTERN BALKANS

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Financial Instruments Supporting Innovation Workshop
March 1st - 2nd, 2017, Belgrade, Serbia
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• The World Bank portfolio on research, innovation and technology in the Western Balkans: few lessons

• The Western Balkans R&D Strategy
  • Knowledge Transfer in the Western Balkans

• Investment Readiness Program: pilot instrument for facilitating knowledge transfer
• **Long and diversified experience** in the Western Balkans in the area of research and innovation: Croatia and Serbia (institutional reforms of science sector; technology transfer; financing innovation); Montenegro (technology transfer) and Macedonia (firm innovation and technology adoption).

• **Different instruments and funding**: Croatia and Montenegro (World Bank Loans); Serbia (World Bank Loan and EU TF plus); Macedonia (TF multiple donors).

• **Some results** (STP I, Croatia): 69 new research contracts with industry (EUR 10.9 million. Establishment of 5 TTOs. 3 spinoffs (EUR 2.0 million plus). 12 licensing agreements, including with the Massachusetts Institute of Technology and Brown University, reaching about EUR 800,000.

• **LESSONS: TECHNOLOGY TRANSFER REQUIRES MORE THAN FINANCE –** Broader Reforms; Holistic Approach
  - Research excellence
  - Better definition of IP rights and IP management capacity
  - Different regime for TTOs (not standard public sector organizations)
  - Simplification of rules for collaboration science-industry and getting the incentives rights for the behavior of key agents (researchers, TTO officers etc)
  - Bridging the ‘value of death” for PoC, Prototype and early stage/VC funding.
Part II

THE WESTERN BALKANS R&D STRATEGY FOR INNOVATION
THE WESTERN BALKANS R&D STRATEGY FOR INNOVATION – SUMMARY OF TECHNICAL ASSISTANCE

18 Months Fact-Based EU funded Consensus Building Exercise

4 High Level Workshops with representatives from governments, research institutes, universities and private sector from all beneficiary entities, as well as international experts

7 Policy Reviews of key institutions, policies and programs: Country Papers

3 Technical Studies (The State of Scientific Performance of the WBCs; Survey of the status of research infrastructure and technology transfer activities; and Assessment of Data Availability on Research and Innovation) and 5 technical notes

12 Visits to the region
Outreach exercise and broader consensus building between 12/2011 and 8/2013

100+ people involved – representatives of university, research institutes, private sector, government from each country

Website: http://www.worldbank.org/en/events/2013/10/24/balkans-innovation-event

Video: Research for Innovation: The moment for action
The Strategy represents a set of policy and institutional reforms, and selected join (regional) investments to increase the impact of R&D investments and innovation. A common view on how to jointly address the challenges of the research and innovation sector in the region.

- The document proposes to invest more and better in the research and innovation sector thereby helping to promote knowledge-based economies that will generate higher-value-added jobs and stronger growth.

- Countries intended to mobilize additional resources from public and private sources, to reach an average of 1.5% of GDP on Gross R&D expenditures at the regional level by 2020.

On October 25, 2013, the ministers responsible for science and education in seven Western Balkans countries - Albania, Bosnia and Herzegovina, Croatia, Kosovo* Former Yugoslav Republic of Macedonia, Montenegro, and Serbia - signed a declaration endorsing the Strategy.

The regional strategy complements and strengthens national strategies, policies and programs. It informs the research and innovation pillar for the South Eastern Europe 2020 Strategy and aims to leverage other innovation-related initiatives such as the Enterprise Development and Innovation Facility (EDIF).
TABLE 1: A Framework for Coordinated Policy Action: The Western Balkans Regional R&D for Innovation Strategy

<table>
<thead>
<tr>
<th>Strategic Goal/ Metrics</th>
<th>Key Policy Reforms and Strategic Investments</th>
<th>Short-Term Outputs</th>
<th>Long-Term Outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Improve the research base and conditions for research excellence</td>
<td>Metrics: Citations and citation impact; cooperation within the region and with external partners; share of young researchers employed; participation in Horizon 2020.</td>
<td>• Promote the collaboration of local scientists and the scientific diaspora (with full return of scientists as an open possibility rather than a target).</td>
<td>• Eliminate any bias against young researchers that may exist in the research system in comparison to EU member countries (for example, in career opportunities).</td>
</tr>
<tr>
<td>1.1 Slowing down brain drain and supporting “brain gain,” investing in human capital</td>
<td>• Advance the reforms to promote mobility of researchers within the region and between the region and foreign countries (brain circulation).</td>
<td>• Continue investing in the qualifications of scientists and researchers (capacity building, especially in those countries in earlier stages of development).</td>
<td>• Consider implementing policies to promote young, talented scientists, the scientific diaspora, and “star scientists.”</td>
</tr>
<tr>
<td>1.2 Improving access to modern research facilities and availability of research funding</td>
<td>• Enable the common use of large research facilities, optimizing the use of available equipment.</td>
<td>• Continue enhancing participation in tertiary education.</td>
<td>• Gradually increase the amount of public funds available for research and innovation.</td>
</tr>
<tr>
<td>1.3 Reforming the incentive regime for researchers’ performance</td>
<td>• Deepen coordination among research organizations for better planning of investments in research infrastructure (avoiding duplication of public investments in expensive equipment).</td>
<td>• Encourage collaboration within the ERA, especially Horizon 2020.</td>
<td>• Consider earmarking funds for research.</td>
</tr>
</tbody>
</table>

(continued on next page)
The Action Plan: Four Programs. The Action Plan describes the joint investments to be undertaken by the beneficiary countries in the following areas:

- a research excellence (young researcher/ international collaboration) fund program;
- a networks of excellence program;
- a technology transfer program; and
- an early-stage start-up program.

It proposes the creation of the Western Balkans Innovation Strategy Exercise (WISE) Facility - a nonprofit organization that will support systematic capacity building, learning and policy improvement in the region.

All the initiatives are accompanied by concept notes describing the governance structure of the programs, proposed operational procedures, eligibility criteria; as well as of expected outcomes, outputs and costs.
Part 3
WESTERN BALKANS VC ACTIVITY/INVESTMENT READINESS PROJECT
Objective: help beneficiary countries to develop their venture capital industry and facilitate startups’ access to capital.

Addresses both sides of the problem:

**DEMAND-SIDE**

Venture Capital Activities

Provide an assessment of the ecosystem for venture capital activities and contribute to its improvement through policy advice and support to institutional and policy reforms

Albania, Croatia, Macedonia, Serbia

**SUPPLY-SIDE**

Investment Readiness Pilot

Increase the investment readiness of entrepreneurs in the region by assisting with the design and implementation of a pilot program for mentoring/nurturing the transformation of entrepreneurial ideas into business propositions

Croatia, Kosovo, Macedonia, Montenegro, Serbia
INVESTMENT READINESS PILOT: EXPERIMENT DESIGN

• Technology transfer instrument with measureable impact

• Five-country randomized experiment in Croatia, Kosovo, Macedonia, Montenegro and Serbia to test the effectiveness of the program.

• A sample of 346 innovative SMEs was randomly divided into two groups:
  ◦ Treatment group: received a high-cost and intensive program, and a
  ◦ Control group: received access to an inexpensive online-only basic investment readiness course.

• A group of 66 independent judges was used to do the scoring. Judges were blind to treatment status, and were not provided with any information about the company in advance of scoring.

• Panels of five judges were assigned to judge a session of 6 firms (3 treatment, 3 control) at a time, then rotated.

Firms were scored on 6 factors (weighted):

Team: the skills and capabilities of the entrepreneur and his or her team

Technology: the degree of innovativeness and technological advancement

Traction: indications of measureable market success

Market: commercial market attractiveness and size of the potential market

Recent business progress: the amount of progress firms have made during the last three months (time elapsed since initial application)

Presentation performance
PILOT PROGRAM IMPACT: DISTRIBUTION OF TREATMENT VS CONTROL

Figure 1a: Baseline Distributions of Investment Readiness for Treatment and Control Groups

Baseline Score Distributions by Treatment Status

Baseline investment readiness score

Treatment Control

Figure 2: Distribution of Investment Readiness Scores after Program as Scored by Judges

Post-treatment Investment Readiness Distributions by Treatment Status

Semifinals investment readiness score

Treatment Control
Thank you!
THE VALUE OF REGIONAL COOPERATION

• **STABILITY** of programs and policies (including predictability of funding);

• **MERITOCRACY** (as the rule of the game for the research community);

• **SCALE** (avoiding duplication and reaching appropriate *critical mass* in key sectors)

• **GOVERNANCE** and results orientation; cost reduction by rationalizing the usage of resources

• **POSITIVE PEER PRESSURE**, helping the development of country reforms
GERD (more recent data) in WBC is below what would have been expected given country’s development levels.
One patent in Croatia requires approximately three times more R&D investments than in the US.
## RESEARCH COMMERCIALIZATION AND INDUSTRY SCIENCE COLLABORATION: POLICY REFORMS

<table>
<thead>
<tr>
<th>Intermediate Goals</th>
<th>PROPOSED ACTIONS</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Build expertise and infrastructure for Intellectual Property Rights (IPR) management</td>
<td><strong>POLICY REFORMS</strong>&lt;br&gt;Reform of IPRs legal Framework for publicly-funded research&lt;br&gt;Employment and Higher Education Laws encourage commercialization and collaboration with industry</td>
<td>• Increased share of research pool coverage by TTO services&lt;br&gt;• Increased number of research results disclosed to TTOs&lt;br&gt;• Increased number of patents and other IPRs&lt;br&gt;• Increased licensing activity&lt;br&gt;• Larger number of spinoff companies&lt;br&gt;• Higher number and value of licensing agreements &amp; spinoff companies&lt;br&gt;• Increased volume of contract research</td>
</tr>
<tr>
<td>Promote higher levels of industry-science collaboration</td>
<td><strong>INVESTMENT</strong>&lt;br&gt;<strong>TECHNOLOGY TRANSFER OFFICES</strong>: provide assistance in the management and commercialization of research outcomes; training and expertise development for TTOs; link with TT intermediaries.&lt;br&gt;<strong>FUNDING</strong> of Prototype Development and Proof-of-Concept; and Grants for industry-science collaboration</td>
<td></td>
</tr>
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</table>
TECHNOLOGY TRANSFER PROGRAM; PROPOSED INVESTMENTS AT REGIONAL LEVEL

• Technical Assistance activities.
  o Establish tech transfer offices
  o Training in tech transfer management
  o Mentoring in tech transfer activities
  o Transplanting best practices (e.g. IP rights, etc)

• Matching grants for research-industry collaboration.
  o Provide up to 50% of funds for joint research, matched by the private sector
  o Applicants from industry or academia
  o Maximum support of EUR 200,000 over 2 years

• Technology parks for research-industry collaboration.
  o Assist governments in identifying demand for, designing, and implementing science and technology parks.
  o Cofinancing programs as needed
  o Restructuring of existing parks
Table 3: Impact of Program on Investment Readiness as Scored by Judges

<table>
<thead>
<tr>
<th></th>
<th>Overall Readiness Score</th>
<th>Team Score</th>
<th>Technology Score</th>
<th>Traction Score</th>
<th>Market Score</th>
<th>Progress Score</th>
<th>Presentation Score</th>
<th>Std Dev of Judge Scores</th>
<th>Selected to go to Finals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Base Specification</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assigned to Treatment</td>
<td>0.284**</td>
<td>0.167</td>
<td>0.372**</td>
<td>0.206</td>
<td>0.268*</td>
<td>0.373***</td>
<td>0.372**</td>
<td>0.006</td>
<td>0.115*</td>
</tr>
<tr>
<td></td>
<td>(0.126)</td>
<td>(0.150)</td>
<td>(0.152)</td>
<td>(0.130)</td>
<td>(0.137)</td>
<td>(0.137)</td>
<td>(0.164)</td>
<td>(0.049)</td>
<td>(0.068)</td>
</tr>
<tr>
<td><strong>Including Judge Fixed Effects</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assigned to Treatment</td>
<td>0.409***</td>
<td>0.369**</td>
<td>0.476***</td>
<td>0.295**</td>
<td>0.463***</td>
<td>0.440***</td>
<td>0.514***</td>
<td>-0.017</td>
<td>0.090</td>
</tr>
<tr>
<td></td>
<td>(0.135)</td>
<td>(0.158)</td>
<td>(0.174)</td>
<td>(0.142)</td>
<td>(0.139)</td>
<td>(0.143)</td>
<td>(0.191)</td>
<td>(0.051)</td>
<td>(0.076)</td>
</tr>
<tr>
<td>Sample Size</td>
<td>211</td>
<td>211</td>
<td>211</td>
<td>211</td>
<td>211</td>
<td>211</td>
<td>211</td>
<td>211</td>
<td>211</td>
</tr>
<tr>
<td>Control Mean</td>
<td>2.908</td>
<td>3.042</td>
<td>2.970</td>
<td>2.541</td>
<td>3.406</td>
<td>2.794</td>
<td>3.042</td>
<td>0.723</td>
<td>0.122</td>
</tr>
<tr>
<td>Control Std. Dev.</td>
<td>0.903</td>
<td>1.068</td>
<td>1.031</td>
<td>0.947</td>
<td>0.940</td>
<td>0.937</td>
<td>1.145</td>
<td>0.317</td>
<td>0.328</td>
</tr>
</tbody>
</table>

Notes:
Robust standard errors in parentheses. Regressions control for randomization strata. *, **, *** indicate significance at the 10, 5, and 1 percent levels respectively. Judge fixed effects controls for which five of the sixty-five judges judged a particular firm.
### Table 4: Heterogeneity in Impacts on Investment Readiness

<table>
<thead>
<tr>
<th></th>
<th>Overall Readiness Score</th>
<th>Team Score</th>
<th>Technology Score</th>
<th>Traction Score</th>
<th>Market Score</th>
<th>Progress Presentation Score</th>
<th>Std Dev of Judge Scores</th>
<th>Selected to go to Finals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assigned to Treatment</td>
<td>0.203</td>
<td>0.014</td>
<td>0.405**</td>
<td>0.138</td>
<td>0.009</td>
<td>0.314</td>
<td>0.249</td>
<td>0.020</td>
</tr>
<tr>
<td></td>
<td>(0.178)</td>
<td>(0.208)</td>
<td>(0.193)</td>
<td>(0.192)</td>
<td>(0.180)</td>
<td>(0.197)</td>
<td>(0.230)</td>
<td>(0.062)</td>
</tr>
<tr>
<td>Assigned to Treatment * Baseline Readiness below Median</td>
<td>0.210</td>
<td>0.378</td>
<td>-0.083</td>
<td>0.183</td>
<td>0.646**</td>
<td>0.169</td>
<td>0.310</td>
<td>-0.019</td>
</tr>
<tr>
<td></td>
<td>(0.254)</td>
<td>(0.305)</td>
<td>(0.317)</td>
<td>(0.251)</td>
<td>(0.275)</td>
<td>(0.270)</td>
<td>(0.335)</td>
<td>(0.106)</td>
</tr>
</tbody>
</table>

**Notes:**

Robust standard errors in parentheses. Regressions control for randomization strata. *, **, *** indicate significance at the 10, 5, and 1 percent levels respectively. Regressions also control for level effect of having a baseline investment readiness score below the median of 3.
GROWTH THROUGH RESEARCH AND INNOVATION: THE MOMENT FOR ACTION

While job creation remains a major concern, the Western Balkans region faces economic challenges that threaten to undermine its future competitiveness. Research and innovation must be a key pillar in the region’s development strategy. Investing in research and innovation can help address the region’s economic challenges and enhance its competitiveness.

The Western Balkans Innovation Strategy Exercise Facility (WISE) is designed to support the implementation of national innovation strategies in the Western Balkan countries. The WISE strategy exercise involves a comprehensive assessment of the national innovation systems and provides a framework for developing and implementing national innovation strategies.

PRIORITY TOPICS

1. Strengthening the institutional framework
2. Increasing public and private investment in R&D
3. Enhancing human capital development
4. Promoting horizontal and vertical linkages within and between companies
5. Strengthening R&D management and governance
6. Improving access to finance and risk capital

The WISE strategy exercise will be implemented over a period of three years, with the first phase focusing on the assessment and second phase on the development and implementation of national innovation strategies.