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

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THE WORLD BANK PORTFOLIO IN THE WESTERN BALKANS ON R&I

- **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 – <u>Broader Reforms; Holistic Approach</u>**
  - 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

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

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

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

Video: Research for Innovation: The moment for action

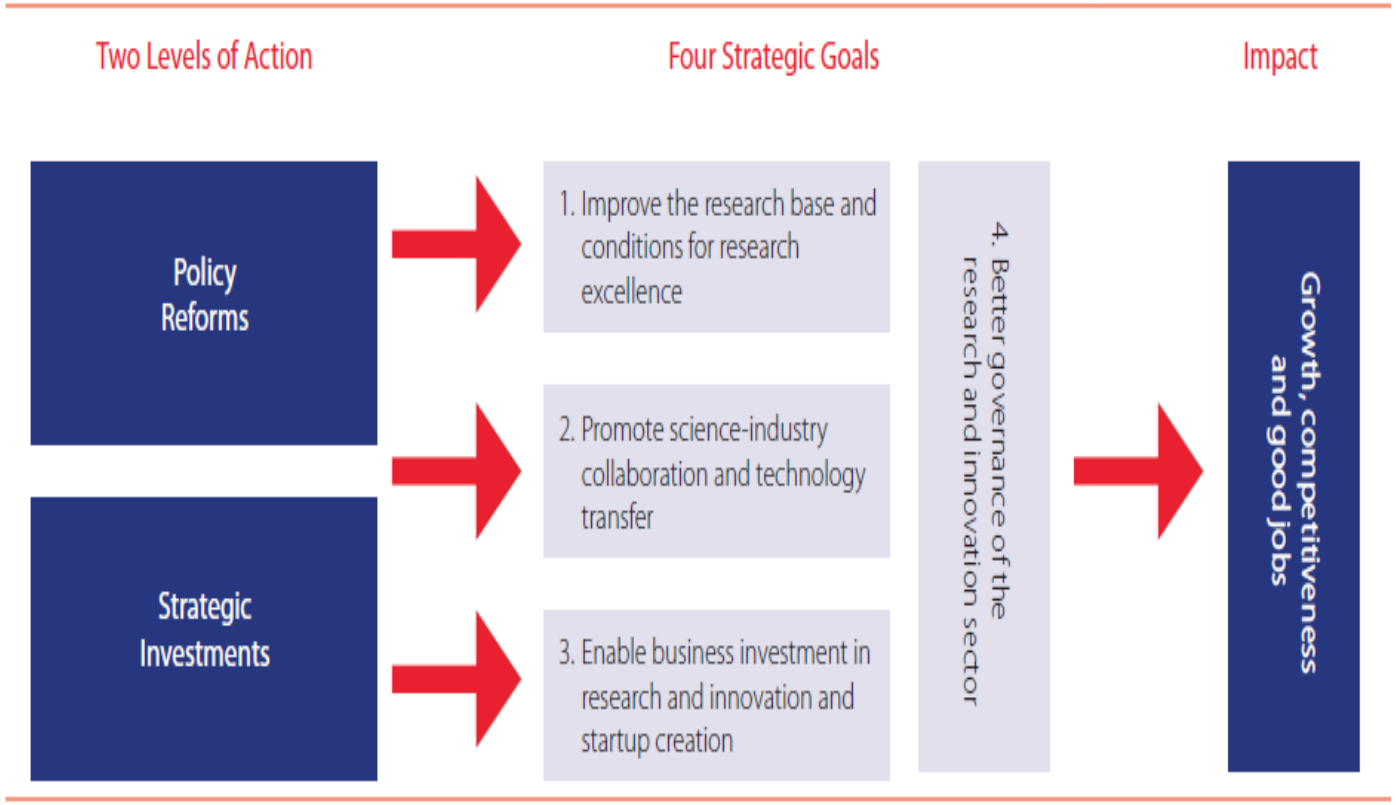
THE WESTERN BALKANS R&D STRATEGY FOR INNOVATION: POLICY REFORMS AND SELECTED INVESTMENTS

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- relted initiatives such as the Enterprise Development and Innovation Facility (EDIF).

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THE WESTERN BALKANS R&D STRATEGY FOR INNOVATION: POLICY AND INSTITUTIONALREFORMS

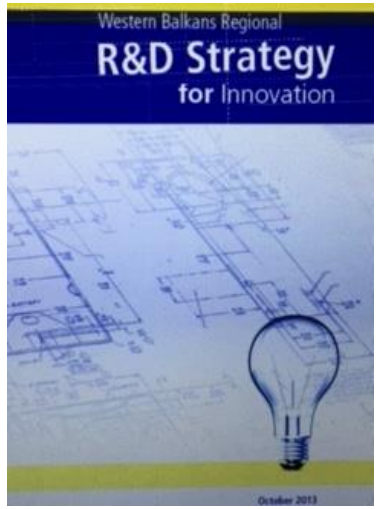


TABLE 1: A Framework for Coordinated Policy Action: The Western Balkans Regional R&D for Innovation Strategy

Key Policy Reforms and Strategic Investments		
Strategic Goal/ Metrics	**Short-Term Outputs**	**Long-Term Outputs**
1. Improve the research base and conditions for research excellence Metrics: Citations and citation impact; copublications within the region and with external partners; share of young researchers employed; participation in Horizon 2020.		
1.1 Slowing down brain drain and supporting "brain gain"; investing in human capital	• Promote the collaboration of local scientists and the scientific diaspora (with full return of scientists as an open possibility rather than a target). • Advance the reforms to promote mobility of researchers within the region and between the region and foreign countries (brain circulation). • Continue investing in the qualifications of scientists and researchers (capacity building, especially in those countries in earlier stages of development).	• Eliminate any bias against young researchers that may exist in the research system in comparison to EU member countries (for example, in career opportunities). • Consider implementing policies to promote young, talented scientists, the scientific diaspora, and "star-scientists." • Continue enhancing participation in tertiary education. • Encourage collaboration within the ERA, especially Horizon 2020.
1.2 Improving access to modern research facilities and availability of research funding	• Enable the common use of large research facilities, optimizing the use of available equipment. • Deepen coordination among research organizations for better planning of investments in research infrastructure (avoiding duplication of public investments in expensive equipment). • Mobilize funding outside the region for research and innovation	• Prepare and systematically update "infrastructure roadmaps" to increase selectivity in aligning investments with the priorities of the national research and innovation strategies. • Gradually increase the amount of public funds available for research and innovation. • Consider earmarking funds for research.
1.3 Reforming the incentive regime for researchers' performance	• Progressively reduce the use of cost-based noncompetitive funds for research institutes and increase the use of competitive funds. • Review career development rules and remuneration policy, emphasizing transparency and academic performance, including by encouraging research with a high impact factor.	• Improve career selection through clear, transparent, and merit-based recruitment policies as illustrated by the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers.

(continued on next page)

THE WESTERN BALKANS R&D STRATEGY FOR INNOVATION: SELECTED INVESTMENTS (ACTION PLAN)

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

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	SUPPLY-SIDE
Venture Capital Activities	Investment Readiness Pilot
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	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
Albania, Croatia, Macedonia, Serbia	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

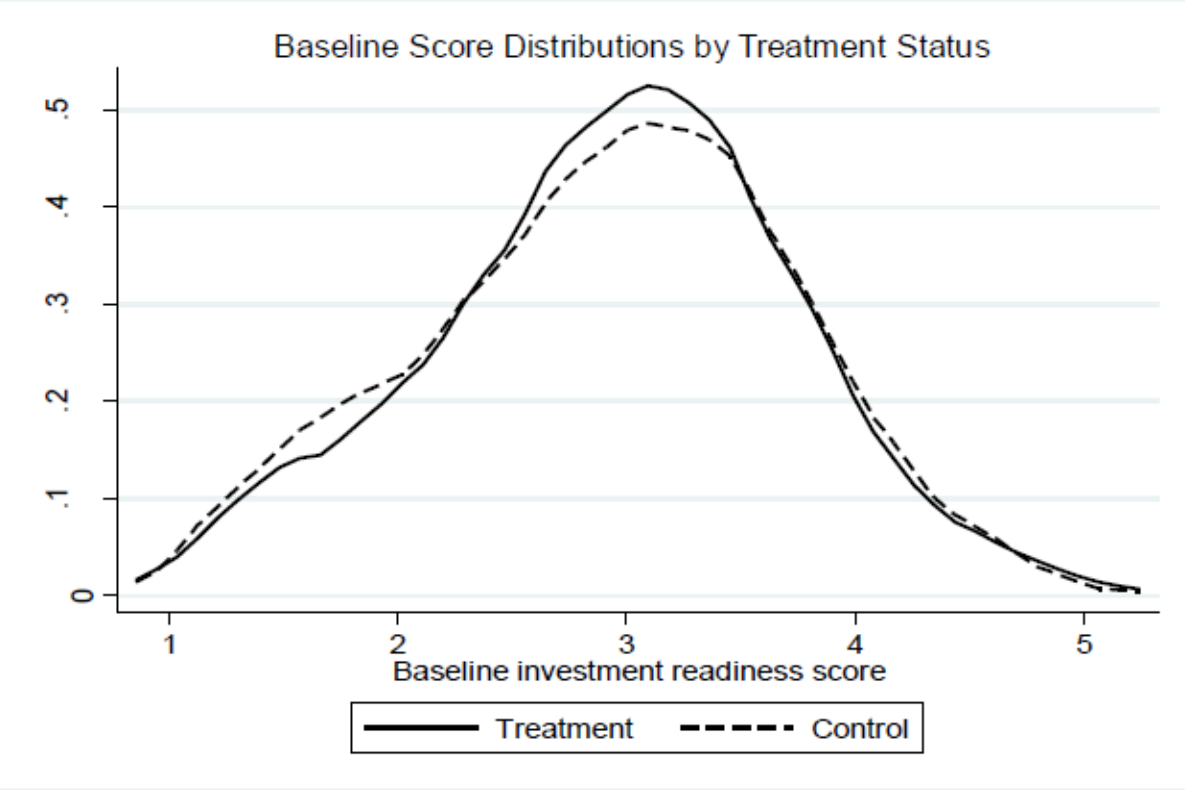
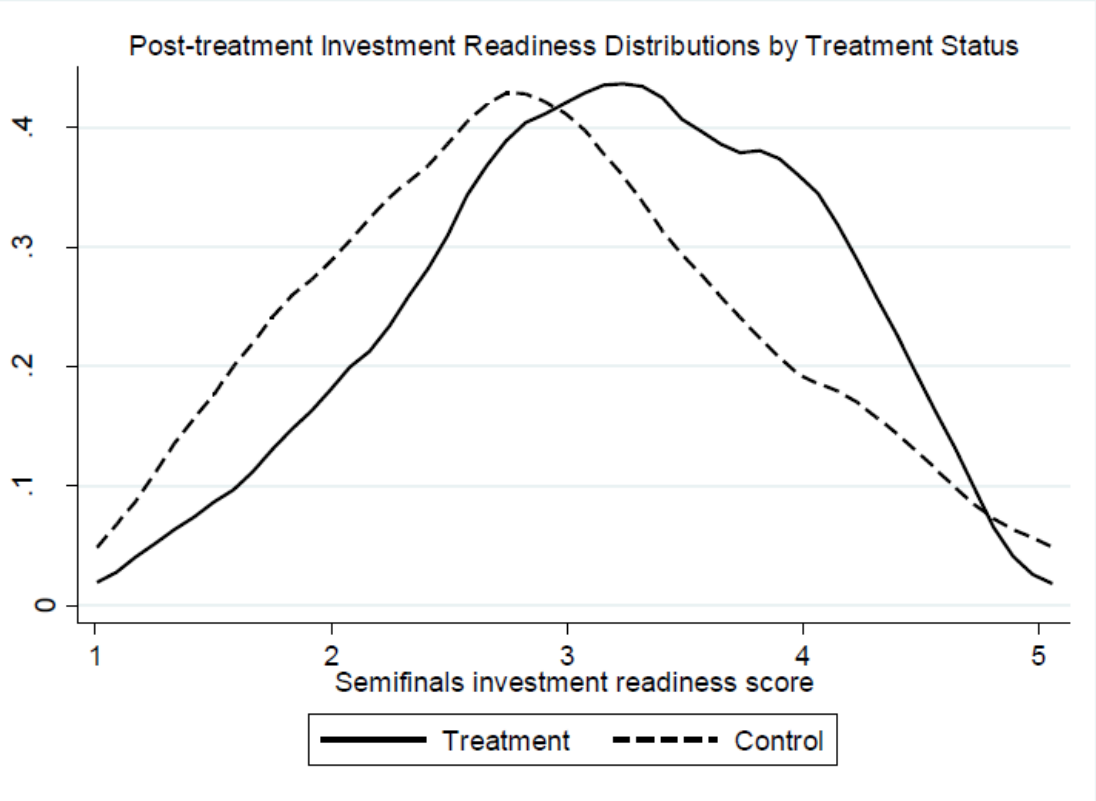


Figure 2: Distribution of Investment Readiness Scores after Program as Scored by Judges



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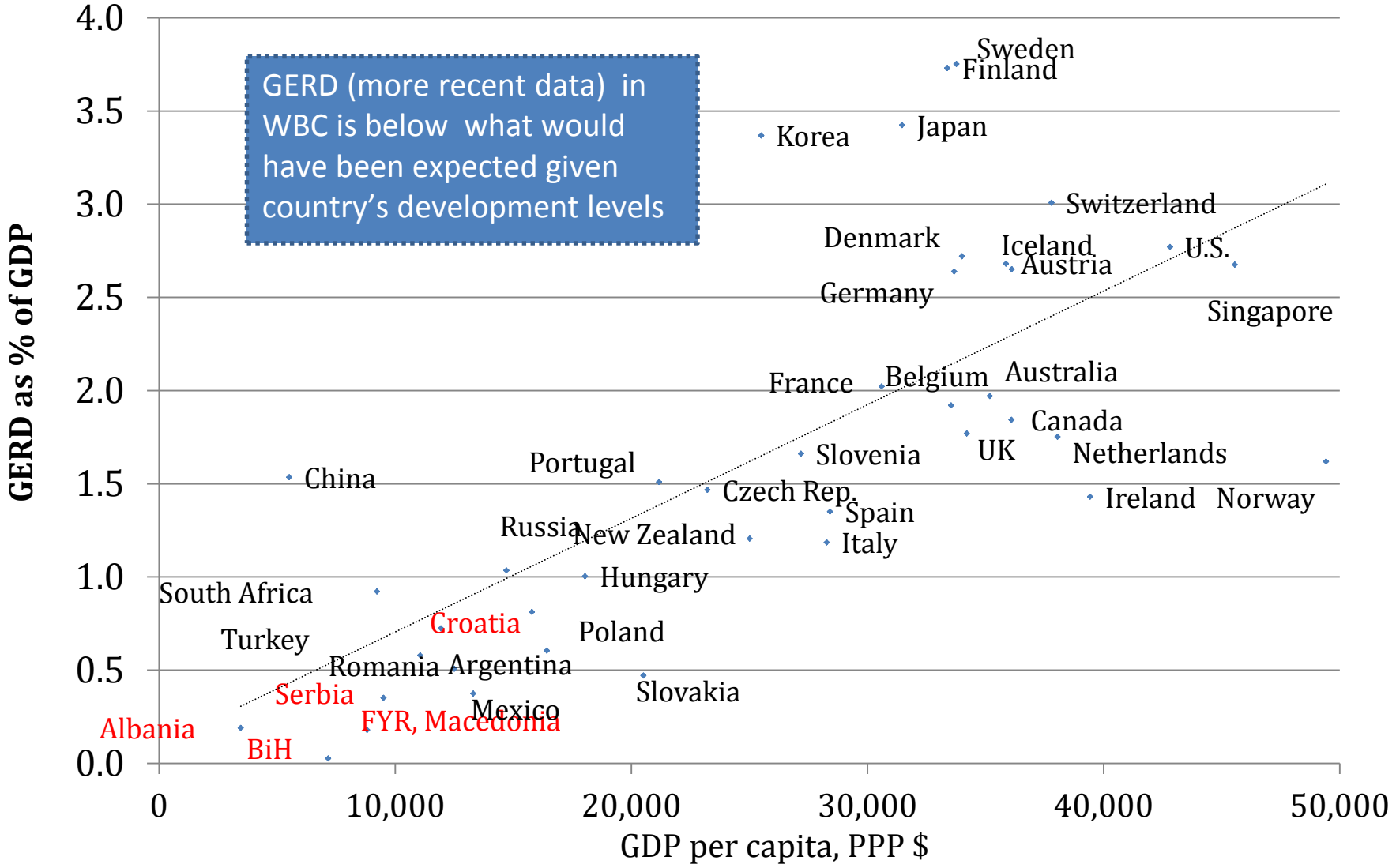
Thank you!

ANNEX

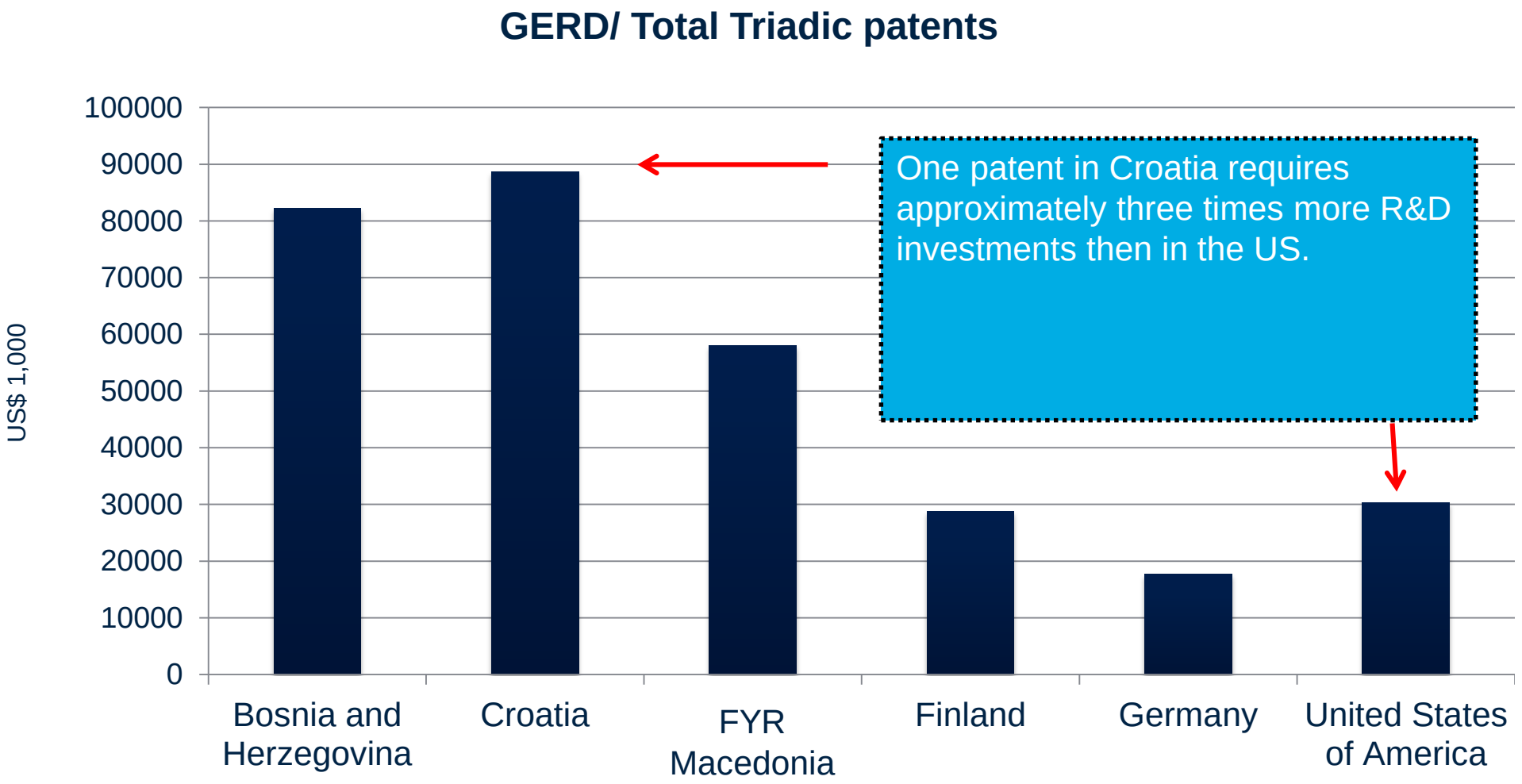
THE VALUE OF REGIONAL COOPERATION

- **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

Low R&D Investment Levels



COSTLY RESULTS OF R&D INVESTMENTS



RESEARCH COMMERCIALIZATION AND INDUSTRY SCIENCE COLLABORATION: POLICY REFORMS

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

TECHNOLOGY TRANSFER PROGRAM; PROPOSED INVESTMENTS AT REGIONAL LEVEL

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

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

- Technology parks for research-industry collaboration.
  - Assist governments in identifying demand for, designing, and implementing science and technology parks.
  - Cofinancing programs as needed
  - Restructuring of existing parks

INVESTMENT READINESS IMPACT

Table 3: Impact of Program on Investment Readiness as Scored by Judges

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

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.

INVESTMENT READINESS IMPACT CONT'D

Table 4: Heterogeneity in Impacts on Investment Readiness

	Overall Readiness Score	Team Score	Technology Score	Traction Score	Market Score	Progress Score	Presentation Score	Std Dev of Judge Scores	Selected to go to Finals
Assigned to Treatment	0.203	0.014	0.405**	0.138	0.009	0.314	0.249	0.020	0.177*
	(0.178)	(0.208)	(0.193)	(0.192)	(0.180)	(0.197)	(0.230)	(0.062)	(0.101)
Assigned to Treatment*Baseline Readiness below Median	0.210	0.378	-0.083	0.183	0.646**	0.169	0.310	-0.019	-0.179
	(0.254)	(0.305)	(0.317)	(0.251)	(0.275)	(0.270)	(0.335)	(0.105)	(0.127)
Sample Size	211	211	211	211	211	211	211	211	211
Control Mean	2.908	3.042	2.970	2.541	3.406	2.794	3.042	0.723	0.122
Control Std. Dev	0.903	1.068	1.031	0.947	0.940	0.937	1.145	0.317	0.328

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.

WESTERN BALKANS

REGIONAL R&D STRATEGY FOR INNOVATION

TECHNICAL ASSISTANCE PROJECT

GROWTH THROUGH RESEARCH AND INNOVATION: THE MOMENT FOR ACTION

With job creation stagnant and economic growth stalled, the Western Balkans region faces an intensifying need to create knowledge-based economies that can generate higher-value-added jobs and stronger growth. Hoping to foster synergies among their similar interventions and build on a growing collaboration, governments from the seven economies in the Western Balkans developed a regional strategy for research and innovation. In line with the Countries' European integration processes and the goals of the European Union's growth strategy "Europe 2020," the overarching objective was to increase the impact of research and innovation on economic growth and employment opportunities. The Strategy identifies priorities, recommends policy and institutional reforms and is accompanied by an Action Plan detailing initiatives to be implemented at the supra-national level. The Strategy was presented in October 2013, at the Ministerial Meeting held in Zagreb, Croatia, and serves as a framework for a collective effort to promote the Western Balkans' most urgent priority: increasing innovation, growth and prosperity.

Research, Innovation and Firm Performance in the Western Balkans

Innovative firms grow 10 percent faster in sales and 6 percent faster in labor productivity than non-innovative firms.

Firm R&D expenditures significantly contribute to sales (by 14 percent) and labor productivity growth (by 7 percent).

When "firm R&D", training and infrastructure services are compared, R&D is shown to have the highest correlation to sales growth.

Source: Iootty (2012). Background paper for the technical assistance project.

The Western Balkan region faces complex economic and macroeconomic challenges. On the structural front, a legacy of unfinished reforms still prevents many economies from reaping the benefits of investments in research and innovation — despite the progress they have achieved in recent years. At the macroeconomic level, adverse circumstances required governments to adopt austere fiscal policies and continue financial markets related public and private investment available for research and innovation.

The Countries share a common set of problems, such as brain drain, low business expenditures on R&D and outdated research infrastructure. Yet to restore the competitiveness of their economies and accelerate growth, more and better investments in research and innovation are critically important for the Western Balkans.

During the development of the Strategy, policy notes and studies have been commissioned. Country profiles for each beneficiary Country were developed, study tours to two regional "networks of excellence" were organized, and four Consensus building exercises — to the format of innovation roundtables — have taken place. Throughout the process, close collaboration with similar regional initiatives has been promoted. On the basis of this work a Strategy outline has been developed. The second half of the project involved further discussions with stakeholders regarding the Strategy and Action Plan. The results of the Consultation process were incorporated into the draft of the Strategy. The Strategy Currently has the support of the leading universities, research institutes, private sector associations, and ministries of the science and education in the region.

The Joint Statement of the Ministerial Conference — held in Sarajevo 2010 — expressed the interest of the region in developing a joint strategy on research and innovation.

In September 2011, the World Bank and the European Commission signed an agreement to support the development of the strategy. The technical assistance (TA) is financed with EUR 1.5 million through a Multi-Beneficiary Instrument of Pre-Accession Assistance (IPA).

Beneficiary entities are Albania, Bosnia Herzegovina, Croatia, Kosovo*, FYR Macedonia, Montenegro and Serbia.

(*) This designation is without prejudice to positions on status, and is in line with UNSC 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.

A Steering Committee composed of the beneficiary entities, the European Commission and the Regional Cooperation Council oversaw the project implementation.

An Advisory Body composed of stakeholders of the national innovation systems and all the aspects guided the development of the Strategy.

As part of a broader consensus-building effort, between January and September 2013, the World Bank team visited all participant entities.

WESTERN BALKANS REGIONAL R&D STRATEGY FOR INNOVATION

THE WESTERN BALKANS INNOVATION STRATEGY EXERCISE FACILITY (WISE)

Policy stability and continuity of reforms are critical challenges faced by Western Balkan Countries in improving the quality of public expenditures on research and innovation. In addition, the sector also needs to address the governance-related obstacles common to developed economies. The Western Balkans Regional R&D Strategy for Innovation identified a number of strategic objectives and policy reforms that—if implemented—could significantly increase the impact of the research and innovation sector on the region's economic growth and job creation.

Objective: The objective of the Western Balkans Innovation Strategy Exercise Facility (WISE Facility) is to promote policy stability and continuity of reforms in the Western Balkans' research and innovation sector. This sector-wide approach will ultimately help improve the quality of public expenditures on research and innovation and thereby increase the sector's contribution to economic growth and job creation.

The WISE Facility will (1) advocate for the implementation of the policy reforms agenda for the research and innovation sector and (2) manage the implementation of the four proposed regional programs in collaboration with national partners. In addition, the WISE Facility will provide a platform for the coordination, monitoring, and evaluation of donors' support to research and innovation in the region, including serving as a "technical secretariat" for the discussions under the R&I pillar of the SEE 2020.

Description: Conceived as a small and agile not-for-profit organization with a strong emphasis on results orientation and rigorous evaluation, the WISE Facility will concentrate on two main Components:

- *Technical assistance and advisory services.* The technical assistance and capacity building Component will perform the following functions: (1) facilitate policy dialogue among policy makers in the region in which the WISE Facility will play an enabling role; (2) provide analytic and advisory services, which will consist of studies on technology and policy trends, international good practices, and the like, according to the reforms and programs considered; (3) conduct monitoring and evaluation (M&E), including monitoring the implementation of the policy reforms, measuring progress, and evaluating its impacts; and (4) providing a data infrastructure.
- *Program design, monitoring, and evaluation.* This Component will consist of the design, monitoring, and evaluation of the four proposed programs: the Research Excellence Fund, the Networks of Excellence Program, the Technology Transfer Program, and the Early-Stage Start-Up Program. All four are detailed in separate project proposals.

Structure and Governance: A Supervisory Board (SB) for the WISE Facility Composed of one representative from each beneficiary Country will be appointed. The SB will be responsible for overseeing and guiding the operations of the facility. The structure of the facility will include an executive director, two directors (one for technical assistance and one for program design, monitoring, and evaluation), and eight senior or program managers. Corresponding to each of the activities described in figure xx overview.

The Joint Statement of the Ministerial Conference — held in Sarajevo 2010 — expressed the interest of the region in developing a joint strategy on research and innovation.

The World Bank and the European Commission in September 2011 signed an agreement to support the development of the strategy. The technical assistance is financed with EUR 1.5 million through a Multi-Beneficiary Instrument of Pre-Accession Assistance (IPA).

The regional strategy complements and strengthens national strategies, policies, and programs. It adds to a number of regional initiatives and serves, in particular, as the core of the research and innovation (R&I) pillar for the South East Europe 2020 Strategy. It also develops the research and technology transfer segments of the "innovation chain" in the region, aiming to leverage other innovation-centric initiatives such as the Enterprise Development and Innovation Facility.

WISE facility activities will include the coordination of periodic regional meetings, the advocacy of policy reforms, and the dissemination of good practices and policy guidelines. It will also strengthen the capacity of Western Balkan countries to conduct monitoring and evaluation of innovation policies.