IGNITING
INNOVATION

Rethinking the Role of Government in Emerging Europe and Central Asia

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HARNESSING QUALITY FOR GLOBAL COMPETITIVENESS IN EASTERN EUROPE AND CENTRAL ASIA

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IGNITING INNOVATION:
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What is the contribution of this book?

- Identify new trends in technology upgrading and innovation in the Europe and Central Asia region

- Focus on getting the policy design and implementation right, given the legacy issues and institutional failures

  - Building on the lessons from 10 years of analytic and operational work in the region:
    - Poland 2020 Report
    - Croatia Science and Technology Project
    - Technical Assistance in Bulgaria, Romania, Russia, etc
Overview of the Book

Why Innovation Matters
- and what the government should do about it

Acquiring technology from abroad
- leveraging the resources of foreign investors and inventors

Connecting research to firms
- options for reforming public R&D institutes

Bringing innovations to market
- boosting private incentives through public instruments
How large are investments in innovation in the region?

What role can government intervention play in stimulating public and private R&D?
R&D Intensity in the Region is Low

- R&D-to-GDP in the region is 0.9%, half the OECD and EU27 averages, and in general it is not increasing.

Source: Authors’ calculations based on UNESCO and USPTO data for 2007.
... And Tends to be “Inefficient”

- Innovation outputs are comparatively low in light of inputs

Source: Authors’ calculations based on UNESCO and USPTO data for 2007.
Interventions have not spurred innovation

- Inciting private innovation has proven difficult
  - 63% of all R&D in OECD is funded by industry and 30% by government
  - In Europe and Central Asia, the proportions in financing are reversed

- Instruments put in place by governments have not been able to stimulate innovative activity
  - Pipeline for pure innovation falls flat as funding goes to absorption
  - 2008: 87% of private sector investment in Poland was directed to investment in machinery, equipment, etc
Challenges ahead

- In the short-term, R&D is likely to remain depressed
  - Uncertainty about the economic outlook is holding back private investments in technology upgrading and R&D
  - Ongoing fiscal consolidation is restricting public R&D programs
  - In contrast, Korea instituted anti-cyclical support for innovation
To what extent are countries in Europe and Central Asia able to leverage knowledge flows and cross-national technology cooperation?

What is the role of openness to trade and FDI and participation in global networks?
Inventive activity has increased, driven by international linkages

- International co-invention contributes to the quality of patents and raises the quality of inventive efforts in post-transition countries

Note: The graph tracks total counts of patents in which at least one inventor is based in one of seven ECA countries: Bulgaria, the Czech Republic, Hungary, Poland, the Russian Federation, Slovenia, and Ukraine. “Purely indigenous patents” are those generated by a team whose members are all based in a single ECA country.

Source: Authors’ calculations based on the USPTO Cassis CD-ROM, December 2006 version.
Germany plays a central role in new co-invention patterns

Source: Authors’ calculations based on data from the European Patent Office.
Eastern Europe and Russia are losing their edge to China and India

Note: The graph compares counts of patents in which at least one inventor is based in one of the EU12 countries with those of China, India, and the Russian Federation.

Source: Authors’ calculations based on the USPTO.
Acquiring Technology from Abroad

- International linkages are particularly important for absorption and innovation
  - Transition to export status increases absorption by about 33%
  - Joint venture with a multinational increases absorption by 41%
What is the role of public R&D institutes (RDIs) in the region?

How can RDIs be rendered more effective?
The State of RDIs in the region

- 1990s: Ad hoc overhaul of RDIs during the transition
- Case studies of 21 RDIs across Eastern Europe, Russia and Central Asia reveal:
  - Confusion between public and private roles.
  - Isolation from other innovation actors and market.
  - Governance, culture, staffing and staff incentives reflect another era.
  - Weak scientific and commercial output.
How to improve public research

- Difficult to restructure existing RDIs

- But, opportunities to create new models that:
  - Broker technology and redefine strategy continuously
  - Motivate performance through funding
  - Revitalize governance & management
RDIs need to be technology brokers, not lone inventors

- Impossible to stay on cutting edge for all customer needs
  - Work with global firms to acquire industrial knowledge
  - Focus competencies on market relevance and fit
  - Create internal competition to develop areas of strength
  - Enhance staff mobility with industry
  - Do not invent, co-invent
  - Transfer knowledge rather than “packaged” technology
Choose an institutional model that has the flexibility to restructure to stay relevant

- Finland’s VTT underwent restructuring 4 times in 13 years
  - 1994: 4 divisions & 39 labs replaced by 9 independent institutes
  - 2002: 6 operating units + 4 service centers
  - 2006: 7 customer centers
  - 2007: 9 customer centers
Introduce funding schemes that motivate performance

- Competitive funding
- Performance contracts
Public RDI funding in the region is often based on government handouts

Composition of income of public RDIs

- **Industry contracts**
- **Foreign governments or international organizations**
- **University contracts**
- **Competitive grants and public contracts**
- **Government subsidies**


Eastern Europe: Nuclear-1, Bio-2, Bio-3
Performance-based funding incentives can enhance market-orientation

Objective
- Keep ratio of industry to institutional funding within a desired range.

Strategy
- Additional 0.4 euro of funding for each euro raised from industry.
- Falls to 0.1 euro if industry revenues fall outside 35-55% range.

Professionalize management

- Institutional autonomy
- Non-profit foundation
- Government-owned contractor operated
How can countries select the “right” support instruments?

What are the lessons from global examples?
Vision
Reality
The *how*: financial support instruments

- **Matching grants**: Preserve private risk; additionality
- **Soft loans**: Only low-risk apply
- **Tax credits**: Start-ups have no profits to use credit

- How to subsidize *Venture Capital while preserving private risk*?
Conceptual failures due to lack of “smart” money in different countries

Mentoring has a positive effect on investment returns of early stage startups

Angel investors who meet with their ventures

Several times per year

Several times per month

1.1 x returns

3.7 x returns

What makes successful innovation policy?

Complementary assets:

Israel
- Office of the Chief Scientist
- Sequencing of instruments
- Tapping the Diaspora
- R&D grants and procurement

Finland
- Stakeholder ownership in policy-making
- Good institutional framework
Policy Implications

- Facilitate trade, FDI and entrepreneurial start-ups and spinoffs
- Support collaboration of local researchers and foreign investors

- Restructure RDIs to better focus R&D efforts and commercialize outputs
- Rethink support instruments
- Sequence instruments to meet different gaps
THANK YOU!

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