

IGNITING INNOVATION

*Rethinking the Role of
Government in Emerging Europe
and Central Asia*

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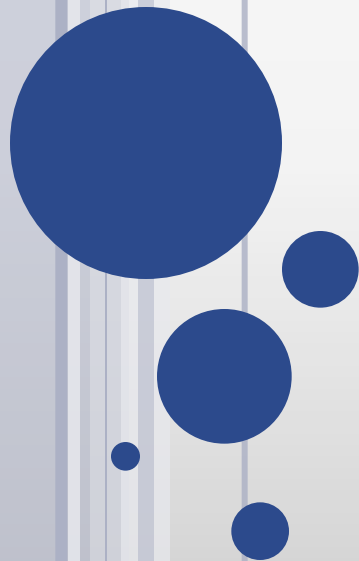
HARNESSING QUALITY FOR GLOBAL COMPETITIVENESS IN EASTERN EUROPE AND CENTRAL ASIA

Jean-Louis Racine, *Editor*



IGNITING INNOVATION: Rethinking the Role of Government in Emerging Europe and Central Asia

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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

Why Innovation Matters



Acquiring
Technology
from Abroad



Connecting
Research to
Firms



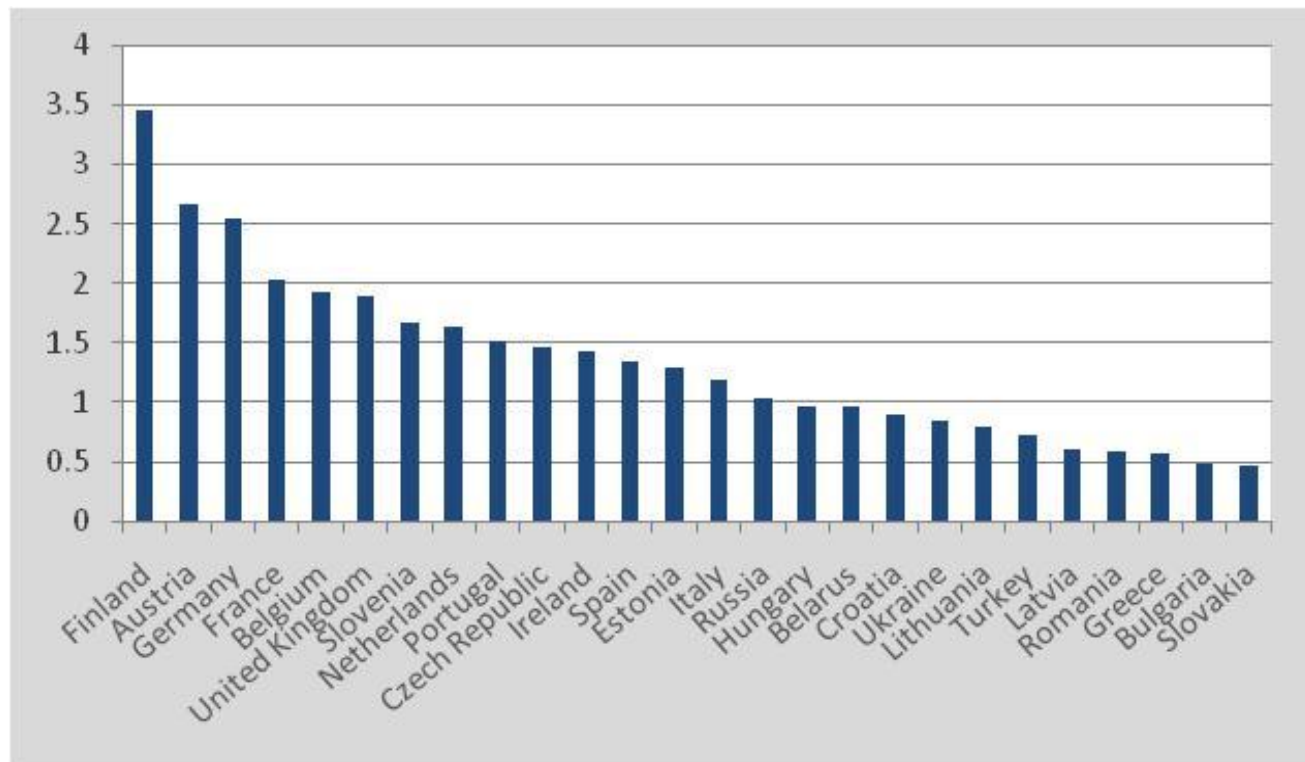
Bringing
Innovations to
Market

- 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

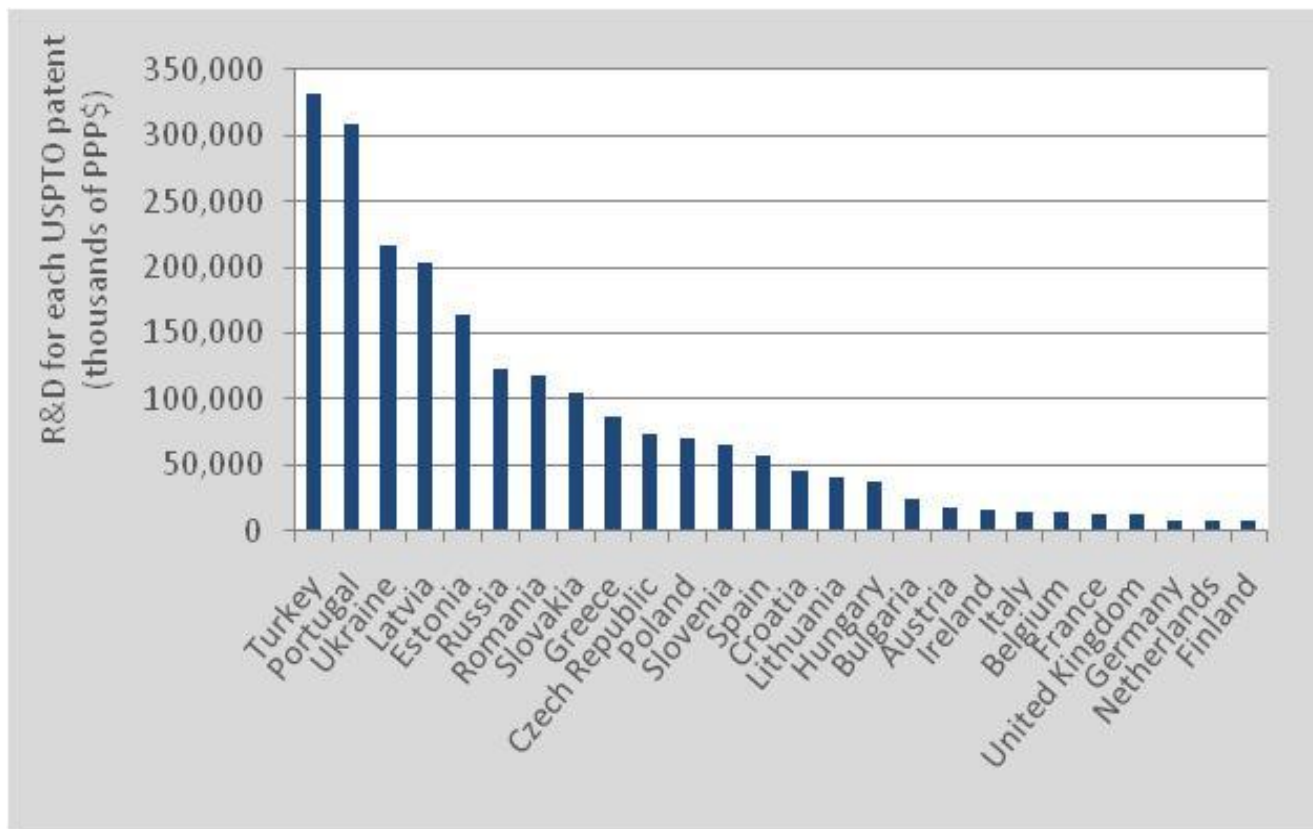
- R&D-to-GDP in the region is 0.9%, half the OECD and EU27 averages, and in general it is not increasing.



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

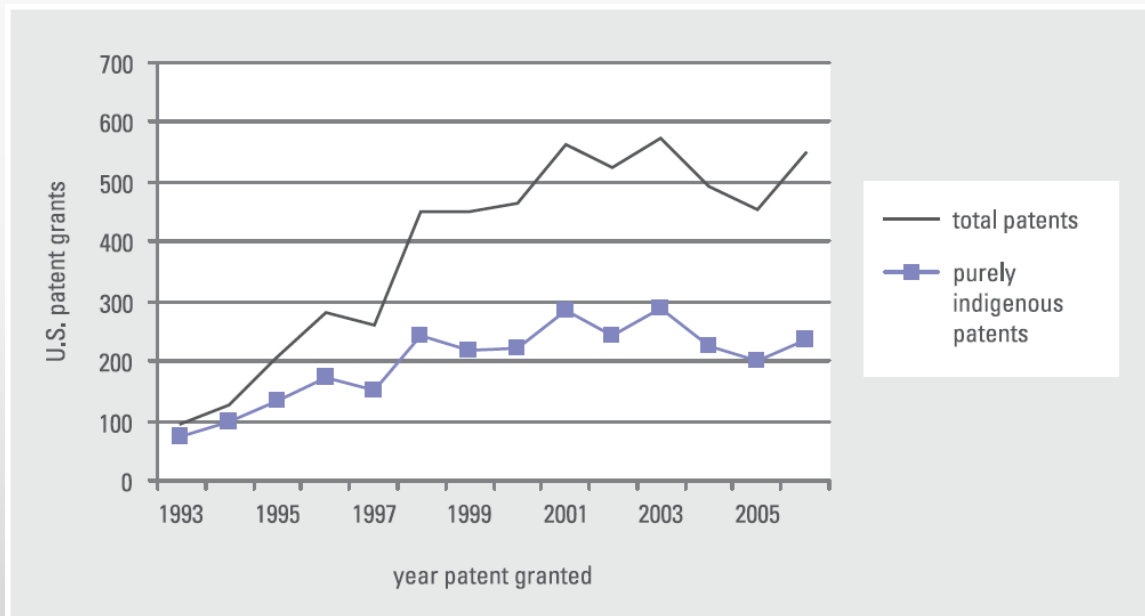


- To what extent are countries in Europe and Central Asia able to leverage knowledge flows and cross-national technology cooperation?
- What is the role of openness to trade and FDI and participation in global networks?



Inventive activity has increased, driven by international linkages

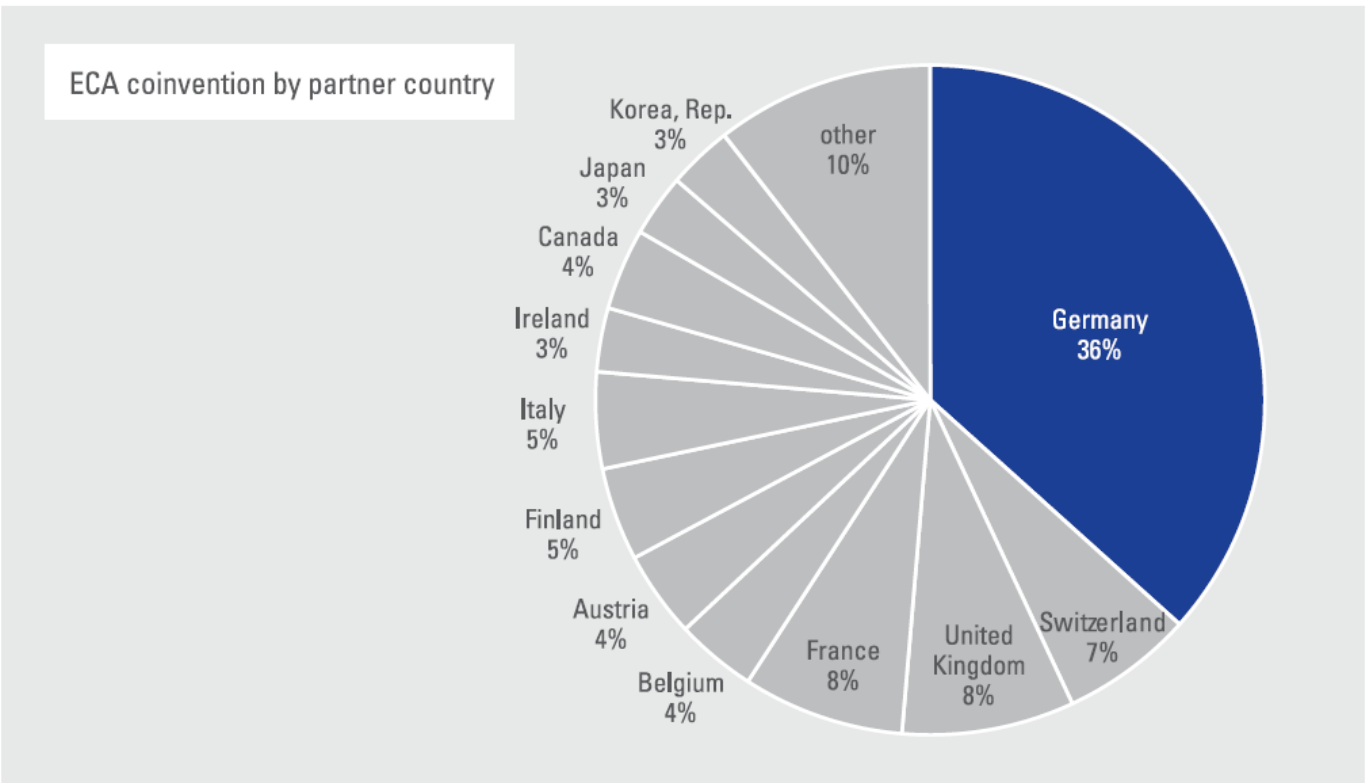
- International co-invention contributes to the quality of patents and raises the quality of inventive efforts in post-transition countries



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.

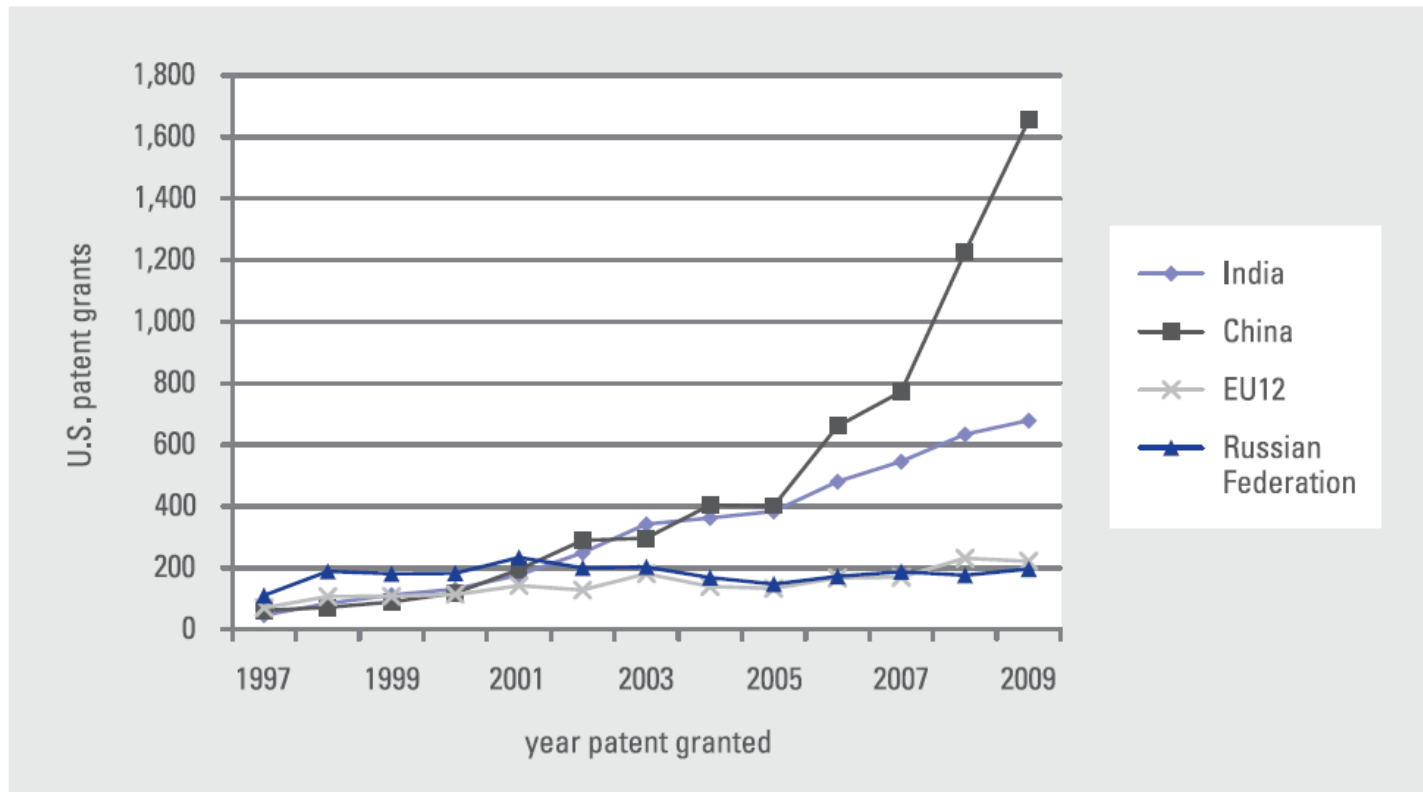
Source: Authors' calculations based on the USPTO Cassis CD-ROM, December 2006 version.

Germany plays a central role in new co-invention patterns



Note: Patent applications taken out from 1992 to 2005.
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



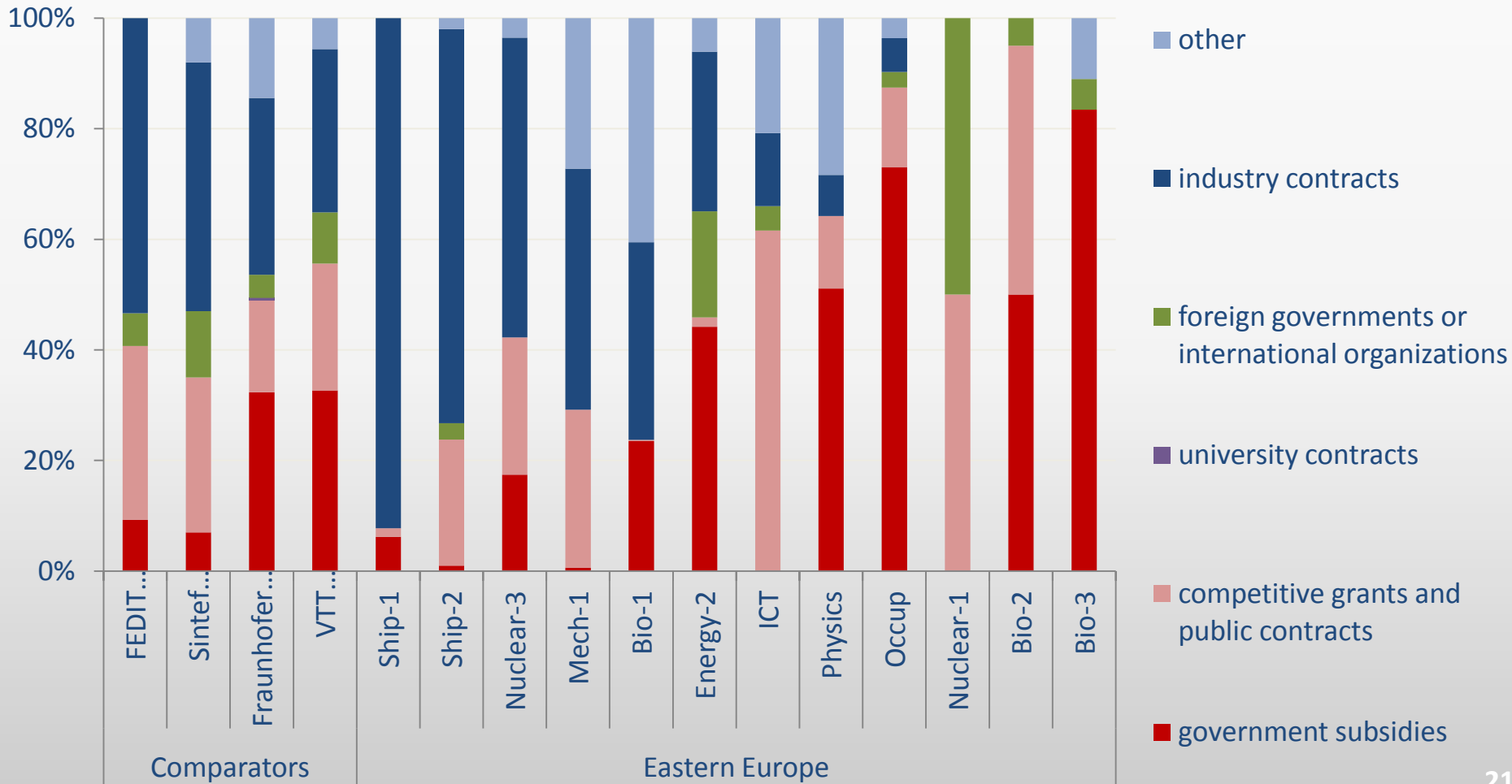
- Finland's VTT underwent restructuring 4 times in 13 years
 - 1994: 4 divisions & 39 labs replaced by 9 independent institutes
 - 2002: 6 operating units + 4 service centers
 - 2006: 7 customer centers
 - 2007: 9 customer centers

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



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

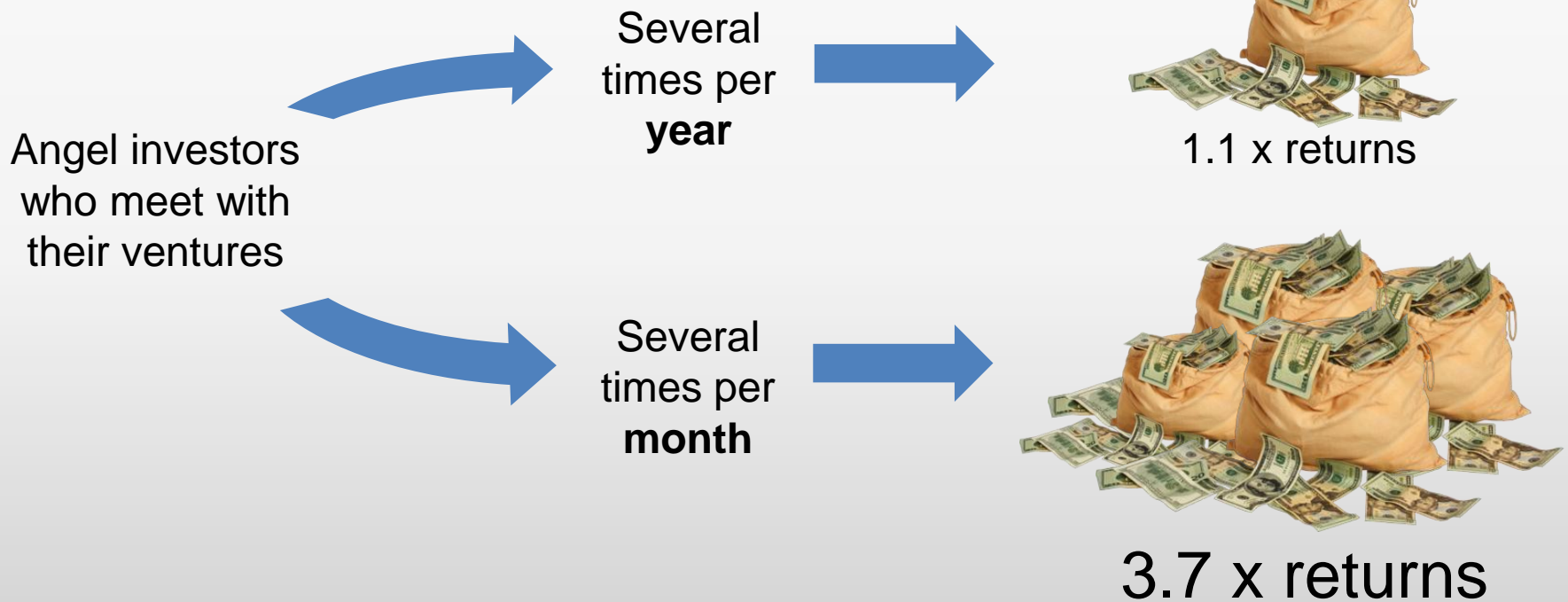


The *how*: financial support instruments

- *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



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

Acquire
Technology from
Abroad

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

Connect
Research to
Firms

- Restructure RDIs to better focus R&D efforts and commercialize outputs

Bring
Innovations to
Market

- Rethink support instruments
- Sequence instruments to meet different gaps

THANK YOU!



*Rethinking the Role of
Government in Emerging Europe
and Central Asia*