Book title:

“Holistic Innovation Policy: Theoretical Foundations, Policy Problems and Instrument Choices”

by

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A holistic Innovation Policy =

A policy that integrates all public actions that influence or may influence innovation processes.

It takes all determinants of innovation into account.

Themes in the book title

- The **theoretical foundations** of a holistic innovation policy
- The **identification of policy problems** and additionality
- The **choice of innovation policy instruments**

In the beginning there was the linear model =

- Innovations are generated by a process consisting of well-defined, consecutive stages, e.g.
    - Basic research
    - Applied research
    - Development work
    - Resulting in new products and processes
    - Growth, employment, etc

    - It was **supply-push** and **partial** in **stressing mainly research** as a determinant of innovations
    - However, **research does not automatically lead to innovations**, and research is **never sufficient** to achieve innovations

The systems of innovation (SI) approaches

- Have completely **replaced the linear view** in innovation research, but not in innovation policy.

- Have paid most attention to the **components** of systems (e.g. organisations and institutions)

- Have been saying less about the **dynamic processes** that occur in the systems and how they change

The **theoretical foundation** of a holistic innovation policy

- Is a specific version of the systems of innovation approach which we call **the system activities approach.**
- It defines innovation systems in terms of **ten activities** that are the determinants of innovation processes.
- It is broader and more general than most other variants of the SI approach. **An holistic innovation policy requires such a broad approach.**

The activities

- **The activities influence the direction and speed of the development and diffusion of innovations**

- The activities captures what **occurs** in the systems

- It is by **influencing** these **activities** that enterprises and public agencies can affect the innovation processes through their **strategies** and **policies**

10 Important Activities in Innovation Systems:

1. R&D
2. Education and training
3. Formation of new product markets
4. Articulation of quality requirements
5. Creation and changing organizations
6. Interactive learning
7. Creating and changing institutions
8. Incubation
9. Financing of innovation processes
10. Consultancy services

However

- Innovation policies are still normally practiced in a *partial* way, focusing on only one or a few of the determinants of innovation processes or activities in innovation systems. *Partial* and *holistic* innovation policies represent the extremes on a continuum from very partial to fully holistic ones, and we therefore speak of the *degree* to which an innovation policy is partial or holistic.

- This means that innovation policy practice is currently massively lagging behind innovation studies and innovation research when it comes to being broad-based, demand-oriented, or holistic.

Identification of policy problems

- The existence of a policy problem in a concrete context (region, country, etc.) has to be identified through **empirical analysis**. This book provides the theoretical and conceptual foundations upon which that analysis can be framed. Put differently, a 'policy problem' exists if the objectives in terms of innovation performance are not achieved by private organisations.
- Following from that, there might be **obstacles and barriers** in the innovation systems. They are the possible deficiencies, imbalances, bottlenecks, etc. in the activities of the innovation system that might be the causes behind the low innovation performance of that system.

EAS of the INNOVATION SYSTEM	POLICY-RELEVANT OBSTACLES AND BARRIERS IN THE INNOVATION SYSTEM	COMMONLY USED POLICY INSTRUMENTS	UNINTENDED NEGATIVE CONSEQUENCES OF POLICY
owledge creation d Research & velopment (R&D)	• Insufficient levels of investment in R&D. • Lack of complementarity between investment sources in R&D. • High uncertainty & large time-lag between investment and returns. • Research paradox and the poor social rates of return of research investments.	• Basis 'in-block' support. • Competition-based public support. • Tax incentives. • Intellectual Property Rights. • Public-Private partnerships.	• Lack of additionality and crowding-out. • Public R&D support does nc promote disruptive knowledge. • Unbalanced public support between curiosity-driven R&D and strategic R&D; anc or between 'research' and 'development', and betwee other types of knowledge. • Focus on the quantity not o the quality of R&D. • Undefined goals of public R&D investment

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ucation, training, d skills	• Insufficient skills & competences due to low levels of education and/or brain-drain. • Time-lag between firms' short-term needs and long term development of skills & knowledge. • Dependence on foreign knowledge competences.	• Regulation, organisation, and funding of the education systems including vocational training. • Migration policies (including reverse brain-drain instruments).	• Old-fashioned pedagogics & not developing knowledge competences for 21st century. • Insufficient & inflexible vocational training.

EAS of the INNOVATION SYSTEM	POLICY-RELEVANT OBSTACLES AND BARRIERS IN THE INNOVATION SYSTEM	COMMONLY USED POLICY INSTRUMENTS	UNINTENDED NEGATIVE CONSEQUENCES OF POLICY
nctional ocurement emand-side)	• Lack of innovation dynamics in the economy and in the public sector. • Innovation lock-in. • Opportunity costs if not developing technology and innovative solutions to complex societal and economic problems.	• Public procurement that can enhance innovations, e.g. functional specifications and functional procurement	• Description of products as a basis for public procurement • Repetitive description of existing products • Demand for obsolete products and lack of enhancement of innovation.

EAS of the INNOVATION SYSTEM	POLICY-RELEVANT OBSTACLES AND BARRIERS IN THE INNOVATION SYSTEM	COMMONLY USED POLICY INSTRUMENTS	UNINTENDED NEGATIVE CONSEQUENCES OF POLICY
ganisational ange: trepreneurship & rapreneurship	• Weak levels of entrepreneurship and new entrants in the economy. • Low intrapreneurship in established firms. • Poor selection environment does not reward entrepreneurial activity.	• Instruments aiming at creating variation and selection environment. • Instruments promoting entrepreneurial culture. • Disseminating best practices of innovation management practices.	• Ineffective policies unable to create variation and selection environments • Policies strengthen the incumbents discouraging new entrants.

AREAS of the NOVATION SYSTEM	POLICY-RELEVANT OBSTACLES AND BARRIERS IN THE INNOVATION SYSTEM	COMMONLY USED POLICY INSTRUMENTS	UNINTENDED NEGATIV CONSEQUENCES OF POI
eraction and tworking	• Unexploited potential due to insufficient interaction and networks. • Network partners do not have complementary knowledge assets. • Lack of critical mass of interactions and networks. • Interactions and networks are creating innovation lock-ins. • No positive network externalities (such as knowledge spill-overs).	• Promoting collaboration between academia and industry. • Promotion of local and regional investment, knowledge development and branding. • Encouragement of industry's interactions with academia.	• Policy reinforces innovation lock-i • Mainly local not international networking.

AREAS of the NOVATION SYSTEM	POLICY-RELEVANT OBSTACLES AND BARRIERS IN THE INNOVATION SYSTEM	COMMONLY USED POLICY INSTRUMENTS	UNINTENDED NEGATIVE CONSEQUENCES OF POLIC
anging titutions	• Lack of incentives to invest in immaterial assets • Lack of a level playing field for market interactions. • High level of contextual uncertainty. • Negative economic and knowledge externalities.	• Intellectual Property Rights. • Competition regulations. • Publicly-sponsored technical standards • Mechanisms for conflict-resolution	• Limited effectiveness the regulation: genera insufficient incentives and/or high costs of compliance. • Unbalance between private benefits and so benefits of the instruments, particula regulation. • Standards promoting technical lock-in. • Lack of adaptability of regulation & red tape.

REAS of the INOVATION SYSTEM	POLICY-RELEVANT OBSTACLES AND BARRIERS IN THE INNOVATION SYSTEM	COMMONLY USED POLICY INSTRUMENTS	UNINTENDED NEGATIVE CONSEQUE OF POLICY
ncing early e vation	• Lack or low levels of seed capital funding: capital market supply is underdeveloped (few, unspecialised venture capital firms, few business angels, etc). • High uncertainty and risk	• Direct public support of entrepreneurial and seed-funding activities in firms (soft loans, grants, equity). • Support to venture capital industry. • Tax incentives to investors. • Regulatory incentives for private investment.	• Public instruments never manage to stimulate priva risk capital markets due to weak capital investment culture and/or a weak entrepreneurial culture. • Direct public support crow out private investors in th venture capital market • Contradicting goals or unc situations about who shou benefit from successful di public support • Public risk capital goes ma to mature sectors

Agenda for innovation policy and innovation research

- A continuation along the holistic policy trajectory would profit greatly from **further research** on the basis of the partial/linear vs holistic categories. The **utopian end-result** could be a general theory of (the determinants of) innovations. It would attempt to identify all important determinants of the development and diffusion of innovations and their relative weights for different classes of innovations – knowledge that we do not currently possess. Thereby the most important instruments of innovation policy would also be identified.
- Some people argue that it is not possible to talk about **causality** and **explanation** in an innovation context. We agree that causality is a complex thing in the social sciences. However, we **cannot do without knowing about the main causes, determinants, and policy instruments** if we want to understand innovation systems or if we want to be able to pursue effective innovation policies.