Holistic Innovation Policy

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A holistic innovation policy (Edquist 2014 + 2019 Policy Book)

- integrates **all** public actions that influence or may influence innovation processes
- can rely on the **systems of innovation approach** as its theoretical basis
- requires a very **broad** and **general** definition of systems of innovation

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

These **activities** are the **hypothetical determinants** of the development and the diffusion of innovations. Together with the innovations as such, they may be said to **define** an innovation system.

Policy is **not** a separate activity – but a part of **all** the ten activities

Conclusions on four topics, based on recent publications:

1. Innovation policy must be holistic to be efficient: Borrás-Edquist ”**Holistic Innovation Policy: Theoretical Foundations, Policy Problems and Instrument Choices**”, *Oxford University Press*, March 2019.

2. The Swedish National Innovation Council is a unique form of governance for developing a holistic policy: Edquist ”**Towards a holistic innovation policy: Can the Swedish National Innovation Council (NIC) be a role model?”,** *Research Policy,* October 2018.

3. Public procurement can be innovation-enhancing – if functions are described, not products: Edquist ”**Developing strategic frameworks for innovation related public procurement”**, *European Commission*, Nov 2017.

4. Measuring innovation is crucial, but the EU Summary Innovation Index is flawed and prevents the development of efficient innovation policies: Edquist, C., & Zabala-Iturriagagoitia “**On the meaning of innovation performance: is the synthetic indicator of the Innovation Union Scoreboard flawed**?, *Research Evaluation*, June 2018.

For publications, see: http://charlesedquist.com

First topic: Holistic Innovation Policy

A holistic innovation policy (Edquist 2014)

- integrates **all** public actions that influence or may influence innovation processes
- can rely on the **systems of innovation approach** as its theoretical basis
- requires a very **broad** and **general** definition of systems of innovation

Different definitions!

- The SI approach usually, in its different versions, defines innovation in terms of **determinants** of innovation processes, although **different determinants** are emphasized in different versions:
  - Lundvall: ”**the structure of production” and ”the institutional set-up**” ”jointly define a system of innovation
    = partial
  - Nelson singles out: **organizations suporting R&D as the main sources of innovation**
    = basically linear

My definition (Edquist 1997) of systems of innovation includes:

"**all** important economic, social, political, organizational, institutional and other **factors/determinants** that influence the development, diffusion and use of innovations, as well as the innovations themselves".

There are **very large differences** in scope between definitions of innovation systems: Lundvall, Nelson, Edquist, etc = **IMPORTANT!**

All determinants!

- If all factors that influence innovation processes are not included in a definition, one has to argue **which potential factors shall be excluded** – and why.

- This is **impossible**, since we do not know the determinants of innovations systematically and in detail at different points in time.

- For example, we **did not know** that interactive learning was so important for innovation processes in the 1980's

More instrumental: **10 Important Activities** in Innovation Systems:

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Policy is **not** a separate activity – but a part of **all** the ten activities

But policy is still linear!

- Innovation **researchers** have **abandoned** the **linear view** since decades. **Completely replaced by systems approach**.
- But **innovation policies** in practially all countries are **still partial, and most often linear** (emphasizes research)
  - Indicated also by the dominance of the expression ”**science and technology policy**” and/or ”research and innovation policies”
  - Also: provision of R&D results is the most important **innovation** policy instrument
- Innovation policy is **far behind** innovation research
- We should not think in terms of ”STI policy”

A communication failure

- **The policy community** = policy-makers (adm/bureaucrats) and (elected) politicians
- The dividing line is **between** these two categories, i.e. within the policy community. Governance matters!
- Elected politicians take final decisions and they often still reflexively believe in the linear view.
- THIS IS AN EXAMPLE OF A COMPLETE **COMMUNICATION FAILURE** BETWEEN INNOVATION RESEARCHERS AND POLITICIANS.
- AND **ALSO** BETWEEN POLICY-MAKERS AND POLITICIANS.

Second Topic: The Swedish National Innovation Council (NIC)

A new from of governance of innovation policy!

The Swedish set-up

- There is a **Research Policy Council** since decades – chaired by the Minister of Research - (just like in many other countries)
- From 2015 we also have a **National Innovation** (Policy) **Council (NIC)**– created and chaired by the Prime Minister
  - The NIC consists of **10 external advisors** from industry, unions and academia
  - In addition to the PM, the following **ministers** participate
    - Finance
    - Industry/Innovation
    - Research
    - The environment (and deputy prime minister)

Purpose of *Research Policy* article = to answer 4 questions

1. Has Swedish innovation policy recently been moving in the direction of a **more holistic innovation policy**? If so, how and in what respect?

2. **Has the Swedish National Innovation Council (NIC) had an influence** on Swedish innovation policy and has it played a role in the transition towards a holistic innovation policy? Which role and how?

3. **Have conceptual advancements**, such as innovation systems (in a wide sense), functional public procurement, and holistic innovation policy **played a role** in the changes in Swedish innovation policy?

4. Can Sweden serve as **a role model for other countries and regions** in these respects?

The operation of the National Innovation Council

- The NIC Secretariate is placed in the office of the PM, i.e. **above** all Ministries
- The PM is personally charing the 4 – 7 hour meetings
- **No reports** are written by the members of the Council
- An agenda is sent out to the members about a week before the meetings – no attachments are accompanying it
- The **agenda** is created by the PM and his staff, including the Main Secretary for the council – in interaction with other ministers and also, sometimes, with external members of the Council
- **Presentations** at the meetings are held by ministers (council members and others), external council members and invited experts

Follow-up after meetings

- The external members give advice and comments and the government decides whether to absorb proposals or not.
- **No official minutes** are taken.
- But informal notes are made.
- The State secretaries of the five Ministers have **meetings after Council meetings** to discuss what to implement and how. The state secretary of the PM is charing these meetings.
- Between NIC meetings individual council members are sometimes involved in discussions with the administration or with ministers on specific issues.

Issues discussed in the Council

- A very **wide range of issues** have been discussed, related to innovations and to **many** determinants of innovation processes

- In the RP article I show that two major issues have led to decisions in Parliament and in Government:

  - **State risk capital provision (not addressed in this presentation),**

  - **Innovation-enhancing public procurement (will come back to this)**

Separate policies for innovation and research!

- The **dominance of the linear view** in the research policy community cements the linear approach to innovation policy

- Also: In those (20-30) countries with a ”Council” in this policy area the councils cover research as well as innovation policy.
  - Normally called Science, Technology and Innovation Councils or Research and Innovation Policy Councils – sametimes chaired by a leading politician (at least formally)

- In this way research policy continues to dominate over innovation policy – and **innovation policy is considered to be a ’footnote**’.

- One way to increase the degree of holism in innovation policy is to **separate innovation policy from research policy**

Hence: Two Councils in Sweden

1. The Research Policy Council has **marginally** addressed innovation policy and only in a **linear** manner (as an ’appendix’ to research)
2. The National Innovation Council is **not** a science and technology (STI) policy council
3. NIC **focusses** on innovation and deals with research only as one of many determinants
4. NIC is a means to **escape the linear model**!
5. The **Councils in all other countries are partial and linear**, i.e. dominated by research.

The Swedish NIC – answers to the four questions

- Swedish innovation policy has become more holistic during the last four years.
- The Swedish NIC has played a major role in this transition.
- Conceptual specifications and advancements have played a role in this process (e.g. innovation systems, additionality, holistic innovation policy, functional procurement).
- Sweden can serve as a role model for other countries in these respects.

Next logical step:

- The Swedish government presents an ”**innovation bill**” to parliament (which has never happened in any country).

- It would mean a **consolidation of innovation policy as an independent policy area** (just like ”research policy”, but **separate** from research policy).

- I made a specific such proposal in an article in the largest Swedish newspaper in 2016.

Third topic: Functional Procurement for Innovation

Public Procurement (PP)

- PP is when public agencies (national, regional, local) buy goods and services

- Very large:
  - 700 billion SEK in Sweden = 19 % of GDP
  - 2 trillion Euros in the EU = 15 – 20 % of GDP in member states

- PP works from the **demand** side

Currently: Description of **products**

- Most public procurement is done in a **routine-like manner**: the same product as last year is demanded and described: often cut-and-paste.

- Even **obsolete** products are demanded, although better alternatives already exist. Simply describing the previously procured product makes it **difficult or impossible for new products to be accepted**.

- **To describe an innovation (a non-existing product) is impossible**

- This is a **major obstacle to innovation**

Description of **functions/problems**

- **Functional specifications** is when the procuring organization **describes a function** that shall be performed **instead of the product** that shall perform it. Or describes a **problem** that shall be solved.

- It is a matter of **what** shall be achieved rather than **how** it shall be done.

- **Example**: The Public Transportation Agency buys a decibel level instead of a sound barrier or quiet asphalt

- This means **larger flexibility** for a potential supplier: **more creativity, more innovativeness and more competition**

Paradox:

To achieve innovation by means of procurement we should pursue **functional** procurement *rather than* **innovation** procurement.

- Innovation procurement **demands** innovations.
- Functional procurement **makes innovations possible** – but does not require them.

Current **policy initiatives** in Sweden on public procurement

- Public procurement was discussed as an innovation policy issue at the first meeting of the NIC in February 2015.

- The issue has been discussed two additional times in NIC after presentations by the minister in charge of procurement.

- Individual discussions have taken place between members of NIC and the minister and his staff – partly organized by the main secretary of the NIC

- The minister created a new separate **public agency for ”procurement support”** from September 2015. To support innovation-related procurement is an important task for the agency.

A national strategy for public procurement

The new Prime Minister from September 2014 appointed a **minister responsible** for procurement.

This minister has developed a **National Government Procurement Strategy**, and how innovaton can be a part of this has been discussed in detail in NIC.

Quotes from the procurement strategy

- "There is a large potential in using procurement as an instrument to enhance development and **innovation**."
- "The public sector can also enhance innovation in suppliers by, in procurement, **demand functions** rather than ready solutions."
- "By **requiring functions** instead of having specific requirements with regard to goods and services, the creativity and ability to innovate of the potential suppliers are enhanced."
- "To **demand functions can increase competition** in the procurement, since a larger number of firms and organizations can respond to the tenders, which is beneficial particularly for small and medium-sized firms."
- "… your agency **formulates functional requirements** and emphasizes the result that shall be achieved instead of specific requirements with regard to the goods and services."
- "… your agency uses assistance from the initiatives and means of support that The National Agency for Public Procurement has developed to **formulate functional requirements in procurement**."

- Innovation-related procurement in the form of **functional procurement is important in the strategy**.

(EU Procurement Directives 2014: Recital 74

Drawing up the technical specifications in terms of functional and performance requirements generally allows that objective to be achieved in the best way possible. **Functional and performance-related requirements** are also appropriate means to favor innovation in public procurement and **should be used as widely as possible.**”

Proposal for the future

- The proportion of the regular procurement that is performed in functional terms shall be increased by 5 percentage points per year during the next 5 years.

- When 25 % has been achieved after these 5 years, the programme should be evalutaed and new decisions taken.

- This would **liberate creativity and innovation** in a very large part of the economy, since **it would concern 5 % of GDP!!!** This is **five times** the public R&D budget.

- It would also **increase competition - between suppliers and between products.**

Consequences:

- If implementation works well, Sweden will be the first country to **systematically use functional public procurement as an innovation policy instrument.**

- This will be a major step towards a **holistic innovation policy –** since this instrument works from the demand side and accounts for 15 - 20 % or GDP.

Fourth topic: Measuring innovation is crucial, but the EU Summary Innovation lindex is counterproductive and expensive rubbish

No policy at all is better than a policy that is not based on a clearly identified policy problem.

- Only interventions that are **important** for the innovation system, but are, at the same time, **not** carried out by private organisations, should be **stimulated or performed** by public organisations – and, of course, only if they have the **ability** to do so.

- A **policy problem = a low innovation performance** (output compared to input = a ratio) for a certain category of innovations.

Identification of policy problems

- The existence of a policy problem in a concrete context (region, country, etc.) has to be identified through **empirical analysis**. 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.

The Summary Innovation Index (SII) of the Innovation Union Scoreboard (IUS):

- Policy-makers and politicians need to identify innovation policy **problems** and their **causes** = **indicators** and **data** to **measure innovations** and identify their **determinants** are crucial

- The SII is a composite index calculated as an average of 25 sub-indicators – all given the same weight

- The SII claims to measure **”EU Member States’ Innovation Performance”** by calculating the **Summary Innovation Index (SII)**

- The SII is intended to be useful for policy design and to have a real impact on policies – according to the European Commiussion

The SII does not measure innovation performance at all, because:

- If we want to measure performance, such as efficiency or productivity of a firm, a country, a region or an innovation system, we must always have a ratio or a fraction between a nominator and a denominator.

- The same output can be achieved with a **lot of** resources or with a **small amount** of resources – Therefore we have to relate outputs to inputs.

- **For example:** Productivity = total production divided by number of employees

- The 25 indicators in the SII is a simple **average** of **input** indicators (e.g. R&D expenditures) as well as **output** indicators (e.g. actual product innovations) – No distinction is made between outputs and inputs. They have no nominator and no denominator.

- The SII method is like calculating the average between total production and number of employees to measure performance of a firm = **it has no meaning as a measure of innovation performance.**

Alternatives

- **If** a composite index shall be constructed by means of aggregation **at all**, it has to be firmly based on robust conceptual and theoretical work – the IUS is not.
- However, the best analysis is to use **all** or many of the different (25 or more) indicators to understand the **details** of the dynamics of the innovation systems: weaknesses and strengths.
- Also **qualitative** information should be used.
- **That would be a way to identify ”problems” and their ”causes”.**
- Then policy **instruments** can be selected to solve or mitigate the problems (if we also know the main causes of the problems).

The ’ideal’ solution:

- A theoretically-based index on innovation system performance should include:
  - Proper measures if innovation output *as such (in a narrow sense)*, and
  - All determinants of innovation processes (activities) as input indicators.
  - This would account for the relations between all input resources (determinants) and the resulting innovations

- Such an approach would correspond to a **total (or multifactor)** productivity measure for innovation systems – instead of a **partial** productivity measure

- It would provide a systemic and holistic basis for the identification of policy problems and their causes (instead of a partial/linear one).

- This may **sound simple**. It is **not**. But **it is a proper objective for the OECD Blue Sky innovation indicator work during the next ten years.**

Agenda for innovation policy and innovation research (1)

- A continuation along the policy trajectory discussed here 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.

Agenda for innovation policy and innovation research (2)

- Some people argue that it is not possible to talk about **causality** and **explanation** in an innovation context.

- I 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.

Thanks!

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5: Not included

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

Rationales for policy intervention

Two conditions must be fulfilled for public intervention to be motivated in a market economy:

(1) Private actors must fail to achieve the objectives formulated; i.e. a '**policy problem**' must exist.

(2) Public actors must have the **ability** to solve or mitigate the problem.

A Policy Problem = Low innovation performance (output as compared to input) in the innovation system.

Additionality (sometimes also called market supplementation) **is crucial**:

- Refers to the division of labor between what private and public organizations do.
- Central to this concept is that activities that are important for the system, should be performed by public organizations only if they are not (or cannot be) carried out by private organizations.
- Public innovation policy is sometimes needed, but must not replace, duplicate, or crowd out what private actors can accomplish.