

National innovation systems – theoretical foundations and implications for economic development



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Structure of this lecture

- Development and diffusion of the concept
- Different competing versions – the broad and the narrow
- NSI and economic theory
- NSI and economic development

Constitution of innovation systems

- Constitution of Innovation System
 - Elements – focus on firms
 - Relationships – focus on interorganisational networks
 - Processes – focus on interactive learning
- Innovation systems differ in terms of
 - specialisation - what they do
 - institutions and routines – how they operate
 - mode of innovation - how they innovate.
- NSI are open, and evolving - but their characteristics are stubborn and have roots far back in history. - Cf. Danish Agro 1880 and Swedish Iron Cannons 1650

Diffusion of the concept

- National innovation system – historical roots List (1841)
 - A critical response to Adam Smith
 - Innovation as important as allocation - Active state to promote 'mental capital'
- Freeman 1983 and 1987
 - Unpublished OECD-paper 1983
 - Book on Japan 1987
- Today Googles gives more than 5000 hits in all kinds of countries
 - Policy makers (president of China)
 - Scholars (economic geographers)
- Handy, dialectical and useful concept – and a synthesis of modern innovation research

Three different delimitations of innovation systems

- Extended R&D-systems – linking knowledge institutions to production (Nelson and Mowery).
- Extended production systems – focus on learning by doing, using and interaction in the production system (Freeman and Aalborg).
- Extended production and competence building systems – + linking education and labour market systems to innovation (DISKO and Lundvall 2002).

Theoretical perspective on innovation and learning: as socially embedded

- Innovation is a process that is:
 - Cumulative – From Babbage to Shockley
 - Path dependent – Making electronics components smaller
 - Context dependent – Different innovation styles in UK and Japan and between sectors and regions
 - Interactive – Firms do seldom innovate alone
- Innovation and learning
 - You learn from what you do
 - Innovation as joint production of innovation and competence
 - Learning is a socially embedded process – social capital matters!!

The theoretical perspective on know-how knowledge as localized

- Distinction between information and skill – know-about and know-how – is crucially important
- Competence and skill are always partially local since they are partially tacit – moving people helps!
- Competence is layered in people and organisations but not least in the relationships between people and organisations (rejection of methodological individualism) - moving people is not enough!
- Only full codification leading to complete deskilling of doers and thinkers would make knowledge completely rootless (neo-classical world). Impossible in a context of on-going innovation.

Theoretical perspectives

	Rational choice	Learning
Allocation	Neo-classical	Austrian economics
Innovation	Innovation managem.	Compet. building

Allocation mystery vs. innovation mystery

- The classical question: How can we get optimal allocation of resources in a market economy
 - Answer: through perfect competition – **the invisible hand**.
- A different question: How can the economy bring forward product innovations in a market economy.
 - Answer: Through organised markets and long term relationships – **the visible handshake**.

New agenda for growth analysis

	Easy to reproduce	Difficult to reproduce
Tangible	Production capital	Natural capital
Non-tangible	Intellectual capital	Social capital

Social capital and the small country paradox

- Small size (cf. The costs of respectively production and reproduction of knowledge) and low tech specialisation should be a serious handicap for small countries and especially for Denmark but small countries perform better than big ones in the new economy – why?
- In 'the learning economy' speedy adjustment, learning and forgetting is rooted in social relationships. Trust, loyalty and ease of communication is easier to establish in culturally homegeneous nations with shared responsibility for the costs of change.

Have innovation systems anything to say about development?

- “To a little boy with a brand new hammer the whole world looks like a nail”

However, the aim is to:

- Identify weaknesses in the SI approach when it comes to analyse economic development and find ways to improve it.

We need to understand better

- The formation of innovation systems
- The openness of national systems
- The role of power relationships (conflict aspects of learning)
- The broader institutional context supporting competence building.

Why Applying NSI to the South?

Some common roots:

- Friedrich List, Albert O Hirschman, Gunnar Myrdal
- Institutions matter, linkages matter, cumulative causation

New tendencies in development thinking.

- (1) Increasing focus on capabilities rather than resource endowments (Amartyar Sen)
- (2) A new focus on knowledge as development factor (World Bank)
- (3) Institutions as “root causes” of development (World Bank and IMF)

These three dimensions may be integrated into the NSI-approach and they might be transformed by the integration.

The missing capability

- Enhancements of the “capabilities people have to live the kind of lives they have reason to value” (Amartya Sen, 1999) have both instrumental and substantive value in development.
- Includes political freedoms, economic facilities, social opportunities, transparency guarantees and protective security.
- But very little on learning capabilities.
- Learning capabilities have both instrumental and substantive value.

Learning capabilities and economic development

- How are individuals, communities, firms and organizations geared to learning and innovation?
- Is there a ‘learning culture’? (or rather, what kind of learning culture is there?)
- Is there an adequate institutional and infrastructural underpinning of learning?
- How are broadly based learning capabilities formed and developed?

Which institutions are important?

The World Bank and The IMF are, increasingly, focusing on institutions. But mostly on how institutions that:

- Channel information,
 - Define and enforce property rights,
 - Regulate competition,
 - Contribute to “good governance” and restrict corruption
- I.e. mostly on transaction costs.
- Important – yes. But what about the institutional underpinning of learning and innovation?

The national system of innovation and competence building

- A broad definition of national systems of innovation (as a system creating and using innovation and competences) fits both with the new focus on capabilities and the focus on institutions.
- But why national?
 - The political and social institution of the nation state
 - The role of national government
 - The role of national education and labour markets
 - The openness of the national system