Smart Specialisation and regional innovation policy in the Nordic countries

Bjørn T. Asheim
Professor
University of Stavanger; CIRCLE, Lund University; and BI-Norwegian Business School, Oslo
uis.no

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Why is Smart Specialisation important?

- Smart Specialisation (SS) is probably the single largest attempt ever of an orchestrated, supranational innovation strategy to boost economic growth through diversification, and, as such, deserves to be watched closely. It will be the basis for European Structural and Investment Fund interventions in R&I as part of the future Regional and Cohesion Policy’s ambition to the European 2020 jobs and growth agenda.

- Provide a framework/platform for promoting and implementing a broad based innovation policy, which is a very critical potential taking into account the failure of the linear, R&D based innovation policy of EU since Lisbon 2000.
What is Smart Specialisation?

- It is not about ‘specialisation’ as we know it from earlier regional development policies (e.g. cluster policies)
- It is about diversification or diversified specialisation > ’smart diversification’ would perhaps have been a better term
- Regions should identify domains of existing and potential competitive advantage, where they can build capabilities and specialise in a diversified way compared to other regions
- New recombinations based on related variety (regional branching)/combinations of knowledge bases as well as on unrelated variety supported by a public innovation policy
- Aim for a ’high road strategy’, i.e. innovation based competition and not a ’low road strategy’ i.e. cost based competition
- Product differentiation creating unique products and services
What is Smart Specialisation?

- The ‘smart’ in SS refers to the way these domains of competitive advantage should be identified.
- This strategy is called ‘entrepreneurial discovery’.
- Emphasised that this should be understood broadly, i.e. not basically as the efforts of a single entrepreneur.
- Van der Ven (1999) talks about ‘the entrepreneur’ as one type of leadership of the ‘innovation journey’ to be played by a core network of interacting actors from the Regional Innovation System (firms, universities, PRIs and government institutions).
- A better term would perhaps be ‘innovation discovery’ to place SS within a (regional) innovation system perspective emphasizing the need for a public innovation policy/funding and exploration as well as exploitation.
What does Constructing Regional Advantage (CRA) mean?

- Creating competitive advantage by promoting (a Chamberlinian monopolistic competition based on) product differentiation resulting in unique products and services
- CRA can be adapted as an innovation strategy in all kinds of industries, sectors, and regions
- Builds on the differentiated knowledge bases and related variety theoretical perspectives
- Perfect fit with SS promoting diversified specialisation
- Basic assumption also in the innovation systems approach
- Strengthening of regional innovation systems policies
Differentiated knowledge bases

- Knowledge creation and innovation take place in all kind of industries but is done in different ways, needs different kinds of knowledge and skills and requires different forms of innovation support.
- No type of knowledge should a priory be considered superior with respect to generating economic growth and innovation. All knowledge bases can be used - alone or in combinations - to create product differentiation.
- Characterise the nature of the critical knowledge which knowledge creation and innovation processes in different industries cannot do without (ontological, generic category).
- Distinguish between three different knowledge bases:
  - a) analytical (science based)
  - b) synthetic (engineering based)
  - c) symbolic (art based)
## Differentiated knowledge bases: A typology

<table>
<thead>
<tr>
<th><strong>Analytical</strong> (science based)</th>
<th><strong>Synthetic</strong> (engineering based)</th>
<th><strong>Symbolic</strong> (art based)</th>
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</thead>
<tbody>
<tr>
<td>Developing new knowledge about natural systems by applying scientific laws; <em>know why</em></td>
<td>Applying or combining existing knowledge in new ways; <em>know how</em></td>
<td>Creating meaning, desire, aesthetic qualities, affect, intangibles, symbols, images; <em>know who</em></td>
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<tr>
<td>Scientific knowledge, models, deductive</td>
<td>Problem-solving, custom production, inductive</td>
<td>Creative process</td>
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<td>Collaboration within and between research units</td>
<td>Interactive learning with customers and suppliers</td>
<td>Experimentation in studios and project teams</td>
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<td>Strong codified knowledge content, highly abstract, universal</td>
<td>Partially codified knowledge, strong tacit component, more context-specific</td>
<td>Importance of interpretation, creativity, cultural knowledge, sign values, implies strong context specificity</td>
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<tr>
<td>Meaning relatively constant between places</td>
<td>Meaning varies substantially between places</td>
<td>Meaning highly variable between place, class and gender</td>
</tr>
<tr>
<td>Drug development</td>
<td>Mechanical engineering</td>
<td>Cultural production, design, brands</td>
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Different modes of innovation

- ’How Europe’s Economies Learn. Coordinating Competing Models’: Different modes of innovation (Lorenz and Lundvall, 2006)
  1. **STI** (Science, Technology, Innovation) - *analytical* knowledge/basic research (science push/supply driven) and *synthetic* knowledge/applied research (user/market/demand driven)
  2. **DUI** (Doing, Using, Interacting) - *Competence* building and *organisational* innovations - *synthetic* and *symbolic* knowledge (user/market/demand driven)
  3. Combining modes of innovation (STI/DUI) makes firms perform better (Berg Jensen et al., 2007)
  4. Firms sourcing broadly (both R&D and experience based knowledge) are the most innovative (Laursen and Salter, 2006)
Combining knowledge bases: illustrating empirical examples
Broad based innovation policy

- More R&D driven innovation policies are very seldom the only answer to improving regional innovativeness and competitiveness as
- Regions’ economic structure are heterogenous, where a one dimensional R&D based policy will not work. A customised regional innovation policy is needed - not the least for peripheral areas (Constructing Regional Advantage/Smart Specialisation)
- Many drivers of innovation (supply, user, demand (latent), market, social, and employee driven)
- Many types of innovation (radical vs incremental; product, process, organisational, market)
- Many regions and nations starting to have a stronger focus on this problematic. Thus, the idea of a *broad based innovation policy* get increasingly more support
- Needs both *narrow* and *broad* RIS to be implemented
Regional Innovation Systems (RIS) narrowly (I) and broadly (II) defined

- (I) A RIS is constituted by two sub-systems and the systemic interaction between them (and with non-local actors and agencies):
  - The knowledge exploration and diffusing sub-system (universities, technical colleges, R&D institutes, technology transfer agencies, business associations and finance institutions)
  - The knowledge exploitation sub-system (firms in regional clusters as well as their support industries (customers and suppliers))
- (II) A wider system of organisations and institutions supporting learning and innovation, and their interactions with firms in the region. Integrating innovation policy with education and labour market policies (learning regions)
Theoretical perspectives: Innovation systems

- A dynamic perspective on innovation and learning in the promotion of economic growth with an active role of government stimulating learning and innovation (i.e. the ‘high-road’ strategy).
- Innovation as interactive learning (between T-H stakeholders (+ civil society) as well as within firms and organisations)
- Linking exploration and exploitation (e.g. Strong R&I milieus)
- Innovation at the centre of economic growth
- IS both selection environments (shaping selection processes) and sources of new variety creation (shaping creativity)
Existing and future competitiveness

- Strengthening existing industries through incremental process innovations in existing technological trajectories securing high productivity or by incremental product innovation based on combining knowledge bases - *path extension* (positive lock-in)

- Upgrading existing industries by changing technological trajectories through regional branching based on related variety or a combination of knowledge bases - *path renewal*

- Promoting emerging industries (radical (product) innovations) building on newly created, R&D based knowledge - *path creation*

- SS should take account of all these dimensions but especially focus on facilitating regional diversification through new path development (path renewal and path creation)
Barriers to new path development

- Very few firms have the capacity of both securing path extension and investing in new path development
- Ambidexterity - capacity of the firm of promoting both exploration and exploitation
- Not only a question of size (even many large firms are not doing this systematically) but also of organisational forms of the firm (exposure to financial markets)
- The economic system has become more and more characterised by short termism (lack of patient capital, quarterly financial reporting etc.) - firms organised as holdings as well as family firms and public owned firms not listed on the stock markets exceptions
- Need public agencies and policies to promote new path development - VINNOVA (Swedish Governmental Agency for Innovation Systems, established in 2001) and The Entrepreneurial States of Northeast Asia (Japan, Taiwan, South Korea) as examples
National and regional context (Denmark)

- NDR belongs to the innovation leaders among European regions according to the European Regional Innovation Scoreboard
- NDR’s prioritised sectors the same as the ones prioritised at the national level
- NDR has prioritised *clusters* (ICT, Food, construction industry, health and life science, maritime sector) and *networks* (tourism, experience economy, energy) and *front technologies* (energy, health and life science and transport)
- Industrial structure has a dual character:
  1. On the one hand the traditionally dominating industries mostly SMEs, depending on an experience based mode of innovation (food, construction, maritime and tourism)
  2. On the other hand the research and knowledge intensive, mostly emergent, sectors representing front technologies
Blue Maritime cluster (GCE) - Ålesund

- One of the very few complete maritime clusters in the world
- 13 design companies, 14 ship yards, 20 ship-owners, 169 equipment suppliers, 22,500 employees (220 companies)
- 40% of the world’s most advanced offshore fleet is controlled by the region’s ship owners - second largest offshore fleet in the world after USA
- Most companies home-bread but an increasing number of international players (Rolls-Royce Marine, V.Ships, VARD (Fincantieri), Bourbon)
- High pace of innovation, prototypes, competition, cooperation, informal communication, unique know-how within the field of advanced marine operations for the global offshore industry
The Norwegian ’innovation context’

- Norway has none regions that are innovation leaders, three regions are innovation followers, and the rest moderate innovators (below the EU average).
- Møre og Romsdal is thus a moderate innovators even if containing a world leading, knowledge intensive cluster.
- Innovation mostly DUI based, where application development is the most important form of innovation (not registered in CIS surveys). With respect to R&D, D - technological development - is the most important activity. In the maritime cluster, there is very little R. The HEI system in the county also has low R capacity.
- Aalesund has now just got a SFI, which will strengthen the R capacity.
- Reflects the structure of exploration (centre) and exploitation (periphery) structure of the Norwegian economy.
Innovation Norway’s Cluster Programs

- Three levels of development/phases of cluster development:
  1. **Arena** program - emergent clusters at a regional level (20)
  2. **Norwegian Centres of Expertise** (NCE) - mature clusters with a leading national position and a strong export orientation (12)
  3. **Global Centers of Expertise** (GCE) - mature clusters with a global position as knowledge hubs (2)

- Most of these clusters (especially NCEs and GCEs) found within Norway’s 4 leading industrial sectors (oil/gas, maritime, metal melting, marine)

- Mostly aiming at path extension (also in the Arena program) with only few examples of new path development. The new GCE has started emphasizing new path development
How to make traditional industries more innovative?

- Strengthen the absorptive capacity of firms relying on an experience-based innovation mode by making them able to increase their research-based competence (e.g. functional food). Research has shown that firms combining modes of innovation (R&D and experience-based) and sourcing broadly (both R&D and experience-based knowledge) are the most innovative (combining knowledge bases).

- Capability building promoting short cycle technology-based sectors (synthetic/engineering knowledge base) securing technology-based specialisation.

- Move traditional industries into high value-added niches through combining knowledge bases, where intangible knowledge (i.e. symbolic knowledge) is especially important.
Innovation strategies in traditional industries (path renewal)

- Using the *symbolic* knowledge base to obtain *product differentiation*:
  1. Fashion using branding and design (symbolic knowledge): Zara
  2. Food and beverages through branding and design (symbolic knowledge): Grey Goose and Balik salmon as well as organic production (also increased quality): Denmark (dairy sector)
  3. Tourism: Go upmarket by creating unique products/services/experiences (symbolic knowledge base): Ice hotel in Northern Sweden and The Santa Claus Village in Rovaniemi (crossing the magical Arctic Circle) - platform policy
New sources of growth: Knowledge-based capital (KBC) (OECD Review of Sweden’s Innovation Policy, 2013)

- KBC comprises *intangible* assets used in production and owned by business, such as:
  1. Computerised information (software and databases)
  2. Innovative property (patents, copyrights, trademarks, designs (Apple - increased importance of symbolic knowledge base))
  3. Economic competencies (including *brand equity, firm-specific human capital, networks of people and institutions*)
  4. The *organisational know-how* that increases enterprise efficiency
  5. Aspects of *advertising and marketing*

- Large and growing business’ investments in KBC as a key source of changes in productivity and GDP
Innovation strategies for emergent industries (new path creation)

Promoting emerging industries (radical (product) innovations) building on newly created, R&D based knowledge - path creation

- Oslo cancer cluster based on research at University of Oslo and the university hospitals (e.g. a specialist cancer hospital)
- 3B’s Research Group, University of Minho
- Regenerative medicine in Tampere
- Supporting ‘front technologies’ developed at Aalborg University within energy (energy efficiency), health and life sciences (medical technology), transport (intelligent transport) and ICT (embedded software)

Applying a R&D based strategy is a costly development and differentiating strategy with a high failure rate and long term perspectives for a positive outcome (long time from exploration to exploitation).
The role of the public sector in a SS strategy

- Use public procurement for innovation as a central instrument
- Health and welfare are confronted with huge societal challenges due to aging of society which requires these sectors to operate in a smarter way
- Combining user-driven, open and social innovation approaches
- NDR is responsible for the health sector, and represents a large and critical customer (together with Aalborg municipality)
- Building a new, large university hospital close to Aalborg university
- Can mobilise most of the ‘front technologies’ in the region (energy efficiency, health and life science, logistics and ICT)
Value added of applying a SS strategy

- Provide bench learning with EU regions - ’streamline’ Horizon 2020 applications
- The design and implementation of a SS strategy has to be based on a ’correct’ understanding of the key concepts:
  1. Broad based policy (knowledge base approach) to avoid the R&D bias with only a STI perspective - still strongly present in EU policy/Horizon 2020 (e.g. in Spreading excellence and widening participation - focusing on least developed EU members)
  2. SS = diversified specialisation possible in all industries
  3. ED = involves all TH partners + civic society (social innovation)
  4. Public sector has an important role to play through PPI (social and welfare sectors)
Thanks for the attention

bjorn.t.asheim@uis.no

or

Bjorn.Asheim@circle.lu.se

www.circle.lu.se