Regional Innovation Systems: mapping regional innovation potential and building ecosystems of co-operation

Alasdair Reid

Managing Director REID Consulting (www.reidconsulting.eu)
Policy Director, EFIS Centre (www.efiscentre.eu)

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What I will talk about:

• Regional innovation (eco)systems – key concepts
• Mapping and analysing regional innovation systems
  • From standard indicators to emerging methods
  • Examples of mapping regional innovation systems
  • Online S3 – a policy toolkit
• New policy instruments for strengthening regional innovation systems
  • From programmes to building multi-actor platforms
  • From investing in a region to inter-regional innovation partnerships
Regional innovation (eco)systems

• Regional Innovation System theory emphasises that regional competitive advantage is based on proximity between actors, the way actors and institutions are interconnected and how innovation processes are governed based on organisational and ‘cultural’ values and framework conditions

• Regional economic development strategies increasingly seek to foster and embed entrepreneurial or innovation ecosystems:
  • a network of interconnected organizations, organized around a focal firm or a platform, and incorporating both production and use side participants, and focusing on the development of new value through innovation (Auto 2014).
In a world of open innovation ecosystems: internal and external linkages become critical!

Mapping the Regional innovation system

• Most studies look at a standard sets of indicators including:
  • Research intensity (by sector)
  • Propensity to innovate (by sector)
  • Technology diffusion (proxies such as ICT or training expenditure)
  • Research inputs and outputs (public expenditure, publications, patents, etc.)

• Also need to measure system dynamics indicators:
  • Number, type of collaborative projects (university-industry, etc.);
  • Propensity to co-operation (e.g. from Community Innovation Survey)
  • Revenue of public/academic R&D labs from private contracts,
  • Number/types of networks (cross-sectoral, ‘triple helix’, etc.);
  • Attraction power (creative people, foreign investment, etc.).
Assessing regional systems of innovation

Regional endowments
- Governance system
- Innovation ‘culture’/ social capital

National factors
- Corporate governance
- R&D system
- Higher education structures

Firm-specific factors
- Propensity to innovate
- Entrepreneurial attitudes
- Endogenous competencies

Sector specific factors
- Technology (life-cycles, etc.)
- Finance (access to...)
- Markets (local/global demand)

Network organiser
Network alignment

Based on: Radosevic (2000)
Next generation tools

• Big, open and linked data offer opportunities for more dynamic and real time analysis of regional innovation systems
• Data from webscraping, meeting apps, investor platforms (crowdfunding), etc. can map technology specialisation over time and by location
• Open data on public support (grants, loans, equity) by sector or technology (e.g. using key words) can be used to identify emerging specialisations and focus of business (innovation) activity
• Develop “nowcasting” tools to anticipate emerging innovative niche.
• Still difficult due to lack of data to assess value chain dynamics, export linkages and specialisation, foreign investment flows, etc.
In what tech topics do different parts of Wales specialise?

Using data from a meeting app, NESTA was able to illustrate the tech topic specialisations of Wales and its principal towns, based on levels of networking in them. For each topic and year, it is possible to examine the topics where a location has some activity, and focus on those topics that have a relatively stronger locational presence than the UK overall.

Source: www.Arloesiadur.org
How is public funding driving innovation – the case of the Highlands & Islands of Scotland

<table>
<thead>
<tr>
<th>Funding body</th>
<th>Period</th>
<th>Number of companies</th>
<th>Value of support</th>
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</thead>
<tbody>
<tr>
<td>HIE</td>
<td>Support provided since financial year 1st April to 31st March 2009-10 to 25 January 2017</td>
<td>204 companies for which a value for grant-in-aid (GIA) or advice cost is recorded</td>
<td>£182,095,517</td>
</tr>
<tr>
<td>Scottish Government RSA</td>
<td>Grants awarded between financial years 2010/11 and 2014/15</td>
<td>10 firms received funding (12 grants in total)</td>
<td>£9,505,000</td>
</tr>
<tr>
<td>SMART Feasibility &amp; Development Interface Scotland</td>
<td>Innovation Vouchers &amp; follow-on vouchers awarded from September 2011 to January 2012</td>
<td>19 firms received funding (24 grants)</td>
<td>£13,746,460</td>
</tr>
<tr>
<td>Innovate UK</td>
<td>Giants awarded from 2007-7 to 2016-17</td>
<td>134 grants of which 127 innovation vouchers (98 funded by HIE and 89 by SFC), plus 7 follow-on vouchers (HIE funded)</td>
<td>£2,764,273</td>
</tr>
<tr>
<td>EU R&amp;D funding</td>
<td>2007-13 Framework Programme (FP7 2013-16 Horizon 2020)</td>
<td>35 organisations awarded funding in 56 FP7 and 35 Horizon 2020</td>
<td>£15,151,839 £12,075,982</td>
</tr>
</tbody>
</table>

**Identify pattern of funding by key sectors or technologies**

Compile and clean open or semi-open datasets on public funding

And map localised (sub-regional) clusters of investment

Opening up regional innovation systems – example of value chain mapping

• Inter-regional value chain mapping in emerging clusters or new technology fields can help to identify complementarities and synergies that can be exploited by regional clusters.

• Example from Vanguard Initiative pilot on Advanced Manufacturing EU Mapping for energy related applications in harsh conditions (2015)
Building online apps for regional innovation analysis and policy making – ONLINE S3

- Project is now testing a suite of apps developed for each stage of RIS3 process in four pilot regions:
  - Scotland
  - North Netherlands
  - Central Macedonia
  - Norte

- Trial versions of apps can be found online: see [www.onlines3.eu](http://www.onlines3.eu) & [http://www.s3platform.eu](http://www.s3platform.eu)
Open innovation systems and regional innovation policies

- Regions have limited influence on legal and regulatory environment for innovation (usually national role)

- Scope for policy action often also limited in terms of R&D and higher education / training systems!

- Governance (not just government) capacities at regional level are crucial.
  - Even regions with ‘limited powers’ can build ‘triple/quadruple’ helix innovation partnerships
### Regional innovation policy: towards experimental instruments

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<tr>
<th>Traditional Instruments</th>
<th>Emerging Instruments</th>
<th>Experimental Instruments</th>
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<tr>
<td>Technology funds</td>
<td>Public private partnerships for innovation</td>
<td>Cross-border research centres</td>
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<td>R&amp;D incentives/supports/grants</td>
<td>Research networks/poles</td>
<td>Open source-Open science markets for knowledge</td>
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<td>Support to scientific research and technology centres</td>
<td>Competitiveness poles</td>
<td>Regional Industrial Policy</td>
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<td>Support to infrastructure development</td>
<td>Competence centres</td>
<td>Innovation-oriented public procurement</td>
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<td>Human capital for S&amp;T</td>
<td>New generation of scientific and technological parks and clusters</td>
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<tr>
<td>Knowledge Generation</td>
<td>Science parks</td>
<td>Open source-Open science markets for knowledge</td>
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<td>Knowledge Diffusion</td>
<td>Technology Transfer</td>
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<td>Knowledge Exploitation</td>
<td>Offices and schemes</td>
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<td>Technology brokers</td>
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<td>Mobility schemes</td>
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<td>Talent attraction schemes</td>
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<td>Innovation awards</td>
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<td>Incubators</td>
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<td>Start ups support</td>
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<td>innovation services</td>
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<td>(business support and coaching)</td>
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<td>Training and awareness-raising for Innovation</td>
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<td></td>
<td>Innovation vouchers</td>
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<td>Certifications/accreditations</td>
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<td>Industrial PhDs</td>
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<td>Support to creativity</td>
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<td>Innovation benchmarking</td>
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# Next generation policies: innovative ecosystems

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<thead>
<tr>
<th>Characteristics</th>
<th>Programmes</th>
<th>Ecosystems</th>
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<tbody>
<tr>
<td>Objective</td>
<td>Leveraging innovation activity/spend in existing industries</td>
<td>Promoting new business models / emerging specialisation</td>
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<tr>
<td>Target / rationale</td>
<td>National competitiveness, market failures</td>
<td>Collaboration networks and processes, system failures</td>
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<tr>
<td>Complexity / risk</td>
<td>Low (clear goals)</td>
<td>High (experimental)</td>
</tr>
<tr>
<td>Leadership</td>
<td>Government officials / top-down</td>
<td>Lead companies, ‘policy entrepreneurs’</td>
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<tr>
<td>Main instrument / type of support</td>
<td>Funding R&amp;D and investment projects</td>
<td>Innovation platforms, strategic partnerships, skills and FDI attraction, regional ‘branding’</td>
</tr>
<tr>
<td>Operational level</td>
<td>National/regional</td>
<td>International – national – regional – local</td>
</tr>
<tr>
<td>Customisation</td>
<td>Low</td>
<td>High</td>
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An example – building the wave & tidal energy ecosystem in northern Scotland

Located in northern Scotland (Caithness & Orkney)

• Significant natural resource advantage recognised and long-term public-private strategy developed

• ESIF and national funds used to upgrade infrastructure (harbours, EMEC campus) and support development of tech-start-ups, etc.

• FP7/Horizon 2020 significant funder of pre-commercial R&D and testing projects

• Wave Energy Scotland initiative to attract international expertise & businesses for testing

• 2016, launch of the world’s first large-scale tidal energy farm!

• 2017 Surf ‘n’ Turf, a community initiative, successfully generated hydrogen from the action of tidal energy for the first time.

• 2017, EIB Funding requested for flagship MeyGen pre-commercial tidal array!
Beyond the boundaries – inter-regional ecosystems and co-investment

• Interregional cooperation can build on smart specialisation strategies and align priorities and roadmaps to achieve complementarities.

• Focus on an investment boost for demonstrators and pilots to help develop and deploy new markets and solutions to societal challenges (in KETs, offshore energy, 3D printing, smart grids, low-carbon transport water technologies, etc.),

• Upgrading regional clusters into world-class clusters through cross-border cooperation and networking in international value chains.
Vanguard Initiative model process for developing inter-regional innovation platforms

- Original model developed at request of DG REGIO in 2014.
- Adopted for three pilot actions
  - 3D printing
  - Offshore technologies
  - Efficient and Sustainable Manufacturing
- Now an inspiration to develop further thematic smart specialisations platforms – see
From shared priorities to co-investment

• It takes time, political will and technical expertise to agree on co-investment
• The roadmap and an investment plan - need to be industry led:
  • role for clusters as ‘gatekeepers’ to regional ecosystems;
• An inter-regional investment platforms are complex and not yet ‘proven’
  • cross-border investment frameworks risky for business angels and smaller investors
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Contact me at:
alasdair.reid@skynet.be &
reid@efiscentre.eu