Evidencing the benefits of cluster programmes – towards a framework of effects

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Background and research problem

• Since 1990s, broad academic grounding and use of cluster-based programmes as part of industrial, innovation and regional development policies (Porter, 1998; Pitelis et al, 2006; Karlsson, 2007; Ketels et al, 2012; Aranguren et al, 2017; among many others)

• Recent revival through smart specialisation strategies, industrial modernisation and internationalisation efforts, as well as to address societal challenges (Aranguren & Wilson, 2013; European Commission, 2012; Saha et al, 2018)

• Although use of cluster policies widespread and expanding, no recognised norms for evaluation (Schmiedeberg, 2010; Uyarra & Ramloga, 2012; Smith et al, 2018)
  - Complex effect logic
  - Existing practice focused on firm-level benefits
  - Not capturing value of collaboration and regional systemic change

• Limits understanding of impacts and policy learning
How can we frame the different effects of cluster policy to support better evaluation practice and fuel policy learning?
Method

- Review of academic literature
- Comparative analysis of six cluster programme impact analyses in five countries
- Articulation of "framework of effects"
- Further development and testing through
  - TCI Cluster Evaluation working group
    (international groups of researchers, practitioners and policymakers)
  - Research project with Swedish Vinnväxt programme
## Synthesis of literature review

<table>
<thead>
<tr>
<th>IMPACTS OF CLUSTERING (THEORY)</th>
<th>IMPACTS OF CLUSTER POLICY (SPECIFIC POLICY PROGRAMMES)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INNOVATION IN FIRMS</strong></td>
<td>Positive impact (driven by firm connections with other firms/actors within and outside of cluster)</td>
</tr>
<tr>
<td><strong>PRODUCTIVITY OF FIRMS</strong></td>
<td>Positive impact (particularly for smaller firms and new ventures)</td>
</tr>
<tr>
<td><strong>EMPLOYMENT IN FIRMS</strong></td>
<td>Positive impact (but more limited evidence)</td>
</tr>
<tr>
<td><strong>WIDER REGIONAL IMPACTS</strong></td>
<td>Some evidence of positive impact on wages and on employment growth</td>
</tr>
</tbody>
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Comparative review of cluster programme effect analyses in 5 countries

Effect analyses from 6 cluster programmes

• Innovation Network programme, Denmark
• Pôle de Compétitivité (PdC) programme, France
• Collaborative Network Programme (CNP), Northern Ireland
• Norwegian Innovation Clusters Programme*
• Regional Cluster Programme, Tillväxtverket, Sweden
• Vinnväxt – regional growth through dynamic innovation systems, Vinnova, Sweden

Results found across the case studies

• Innovation capacity, knowledge exchange and innovation performance
• New partners, new collaborative activities
• Improved economic performance (e.g. turnover, employment, export)
• Wider regional impacts (e.g. start-ups, reputation of the region, policy influence)

*A more recent programme-level evaluation was published following the Tillväxtverket report
## Selected results from case studies

<table>
<thead>
<tr>
<th>Innovation</th>
<th>Denmark</th>
<th>France</th>
<th>Northern Ireland</th>
<th>Norway</th>
<th>Sweden (TVV)</th>
<th>Sweden (Vinnova)</th>
</tr>
</thead>
<tbody>
<tr>
<td>55% of companies have or plan to develop new products, services or processes as a result of cluster activities</td>
<td>2500 collaborative R&amp;D projects generated innovations, of which 75% are new products or processes</td>
<td>56% of companies engaged in collaborative research, development or design activities</td>
<td>434 new collaborative research and innovation projects (2016)</td>
<td>65% of companies perceive cluster initiative supports innovation and renewal</td>
<td>27% of companies have introduced new products or services</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Collaboration</th>
<th>Denmark</th>
<th>France</th>
<th>Northern Ireland</th>
<th>Norway</th>
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<th>Sweden (Vinnova)</th>
</tr>
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<tbody>
<tr>
<td>Companies gain new collaborations with other companies (49%), with knowledge institutions (36%), with public sector actors (23%) and with international partners (14%)</td>
<td>60% of companies gained new collaboration partners as a result of cluster activities</td>
<td>54% of companies reported that CNPs had had a significant impact on helping companies establish and maintain business contacts</td>
<td>Each cluster company establishes an average of 11 new collaboration partners each year</td>
<td>57% of companies perceive cluster initiative contributed to new R&amp;D contacts</td>
<td>50% of companies initiated new collaborations with other companies or research actors as a result of cluster activities</td>
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</table>

<table>
<thead>
<tr>
<th>Economic performance</th>
<th>Denmark</th>
<th>France</th>
<th>Northern Ireland</th>
<th>Norway</th>
<th>Sweden (TVV)</th>
<th>Sweden (Vinnova)</th>
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<tr>
<td>Companies in R&amp;D collaboration increase productivity with an average of 9% a year over 9 years</td>
<td>Created turnover of £15,36 M; safeguarded £16,28 M</td>
<td>Cluster companies experience 7,3% higher sales revenue (compared to control group)</td>
<td>71,2% of cluster companies with higher revenue growth and 50,9% with higher employment growth compared to national average for the sector</td>
<td>Faster revenue growth per employee (over last 5 years) in cluster companies relative to control group</td>
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</table>

<table>
<thead>
<tr>
<th>Other effects</th>
<th>Denmark</th>
<th>France</th>
<th>Northern Ireland</th>
<th>Norway</th>
<th>Sweden (TVV)</th>
<th>Sweden (Vinnova)</th>
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<tr>
<td>Companies in clusters experience significantly higher probability of participating in other innovation programmes</td>
<td>Collaborative R&amp;D projects led to creation of 93 start-ups</td>
<td>51% of companies reported that CNP has had a significant impact on improving the image of their sector</td>
<td>313 new international collaboration projects (2016)</td>
<td>Cluster programme contributed to new collaboration between policy actors on regional and national levels and with clusters in other countries</td>
<td>Strengthened capability to manage structural change</td>
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<td>313 new international collaboration projects (2016)</td>
<td>114 new cluster-to-cluster collaboration projects (2016)</td>
<td>Cluster programme contributed to new collaboration between policy actors on regional and national levels and with clusters in other countries</td>
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## An initial framework of effects

<table>
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<tr>
<th>ELEMENTS OF DIRECT/BEHAVIORAL EFFECTS</th>
<th>EXAMPLE INDICATORS</th>
<th>ELEMENTS OF INDIRECT EFFECTS</th>
<th>EXAMPLE INDICATORS</th>
</tr>
</thead>
</table>
| **INNOVATION AND INNOVATIVE CAPACITY** (BEHAVIORS, PERCEPTIONS AND PERFORMANCE EXPERIENCED BY INDIVIDUAL COMPANY OR OTHER ACTOR) | • Competence development of staff  
• Knowledge exchange (between companies and universities/other actors)  
• Capacity to innovate; involvement in collaborative research and innovation projects  
• Introduction of new products/services | **FIRM-LEVEL ECONOMIC PERFORMANCE** (BEHAVIORS, PERCEPTIONS AND PERFORMANCE EXPERIENCED BY INDIVIDUAL COMPANY OR OTHER ACTOR) | • Revenue growth  
• Productivity growth  
• Employment growth  
• Export growth |
| **COLLABORATION AND COLLABORATIVE DYNAMICS** (INTER-ORGANISATIONAL/GROUP/COLLECTIVE LEVEL BEHAVIORS OR PERFORMANCE OF ACTORS DIRECTLY INVOLVED IN THE INITIATIVE) | • Engagement of different actor groups (level/critical mass and diversity)  
• Linkages and dynamics of linkages between actors over time (# and types of collaborations)  
• Capacity to collaborate | **COMPETITIVENESS AND INTERNATIONAL ATTRACTIVENESS** (INTER-ORGANISATIONAL/GROUP/COLLECTIVE LEVEL BEHAVIORS OR PERFORMANCE OF ACTORS DIRECTLY INVOLVED IN THE INITIATIVE) | • Entrepreneurship; new companies  
• Attraction of investment or talent  
• Entry into new markets |
| **SYSTEM LEVEL** (CHANGES IN PERFORMANCE, STRUCTURES, POLICIES AND INSTITUTIONAL ARRANGEMENTS OF BROADER INNOVATION SYSTEM) | • Broader spillover effects on the region (e.g. regional GDP growth, resilience/capacity for transformation)  
• Changes to regional/national innovation system or policies |
Cluster programme framework of effects  
(following several iterations with groups of practitioners, policymakers and researchers)

<table>
<thead>
<tr>
<th>Level</th>
<th>Short-term results (1-3 years)</th>
<th>Long term effects (3-10 years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual Actor (A)</td>
<td>Cluster participants</td>
<td>Cluster participants &amp; beyond</td>
</tr>
<tr>
<td></td>
<td>(direct/immediate results claimed by cluster participants)</td>
<td>(indirect/subsequent effects that can be observed over time)</td>
</tr>
<tr>
<td>Perceptions &amp; Behaviours</td>
<td>- Competence development</td>
<td>(Economic) Performance experienced by individual actors</td>
</tr>
<tr>
<td></td>
<td>- Knowledge exchange</td>
<td></td>
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<tr>
<td></td>
<td>- Capacity to innovate</td>
<td></td>
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<tr>
<td></td>
<td>- Involvement in collaborative activities</td>
<td></td>
</tr>
<tr>
<td>Collaborative Group/Cluster Initiative (C)</td>
<td>Perceptions &amp; Behaviours</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Engagement of different actor groups</td>
<td></td>
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<tr>
<td></td>
<td>- Dynamics of linkages over time</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Perceived value of collaboration</td>
<td></td>
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<tr>
<td>Collaboration Infrastructure</td>
<td>- Quality of cluster management</td>
<td></td>
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<tr>
<td></td>
<td>- Leadership</td>
<td></td>
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<td></td>
<td>- Processes</td>
<td></td>
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<tr>
<td>Territorial System (S)</td>
<td>Competitiveness and international attractiveness of innovation eco-system</td>
<td>Effectiveness of business and innovation support system</td>
</tr>
<tr>
<td></td>
<td>- Changes in behaviours and performance of system</td>
<td>- Changes in structures, policies and institutional arrangements</td>
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## Framework of effects – example indicators

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</table>
| Individual Actor (A) | • Introduction of new products/services  
• Prototypes and patent applications  
• Articles (academic, other)  
• New markets and customers  
• Change in strategy | • Revenue growth  
• Productivity growth  
• Employment growth  
• Export growth  
• Improved market share/position |
| Collaborative Group/Cluster Initiative (C) | • # and different types of actors engaged in the cluster initiative  
• #, types and volume of collaborative activities  
• New innovation partnerships  
• Willingness/perceived value of collaborating around a shared strategic direction  
• Labelling of cluster management quality (ESCA approach) | |
| Territorial System (S) | | • Devpt of skills and education/labour market  
• Entrepreneurship/new companies  
• New investment  
• Devpt of (R&I) infrastructure  
• Stronger international visibility/engagement  
• New connections between sectors/systems  
• Transition to low carbon/circular economy  
• Stronger social inclusion  
• Changes to structures or working practices among business/innov support actors  
• Changes to policies, standards, procurement procedures, etc.  
• Changes to (regional development) strategies, resource mobilisation and financial allocations |
Scope of evaluation

Project  Organisation  Programme/Policy
Conclusions and Next Steps

• No "one model fits all" for cluster evaluation
  - Different scopes (POP)
  - Different objectives and types/levels (ACS) of results to look for
  - Different types of data and approaches for data collection

• Resulting POP-ACS frameworks can be useful tools
  - To 'set boundaries' of evaluation efforts
  - To inspire efforts to evidence the range of effects/contributions from cluster programmes
  - To support learning (within and between cluster/collaborative initiatives and on policy level)

• Further research required
  - To elaborate types of system level effects
  - To test alternative methods for data collection and analysis of collaborative and system level effects – improving monitoring and learning processes
Thank you!

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