
Policies for Cluster Creation: Lessons from the ISRN Research Initiative

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Context

- *Innovation Systems Research Network (ISRN)*
- *Established in 1998 to support interaction among researchers and their partners*
 - *SSHRC, NSERC, NRC funding*
 - *Diffuse research findings to public and private sector partners*
- *ISRN cluster initiative launched in 2001*
 - *Support from SSHRC and other federal and provincial partners*
- *To investigate the process of cluster development in:*
 - *knowledge-intensive and traditional sectors*
 - *metro and non-metro regions*
- *Structure mirrors regions being studied*
 - *Research methodologies tailored to regions being studied*
- *Builds upon the capabilities and partnerships of ISRN*
 - *Links with extensive network of government partners*
 - *Strong network of international collaborators – RAC*

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The Innovation Systems Approach

- *network of institutions that interact to initiate, import and diffuse new technologies*
 - *government policy*
 - *corporate R&D*
 - *education and training system*
 - *structure of industry*
- *patterns of interaction between firms as collective learning process in acquisition and use of new knowledge*
 - *internal organization of firms*
 - *network of interfirm relationships*
 - *role of public sector*
 - *degree of R&D intensity*
 - *nature of R&D organization*

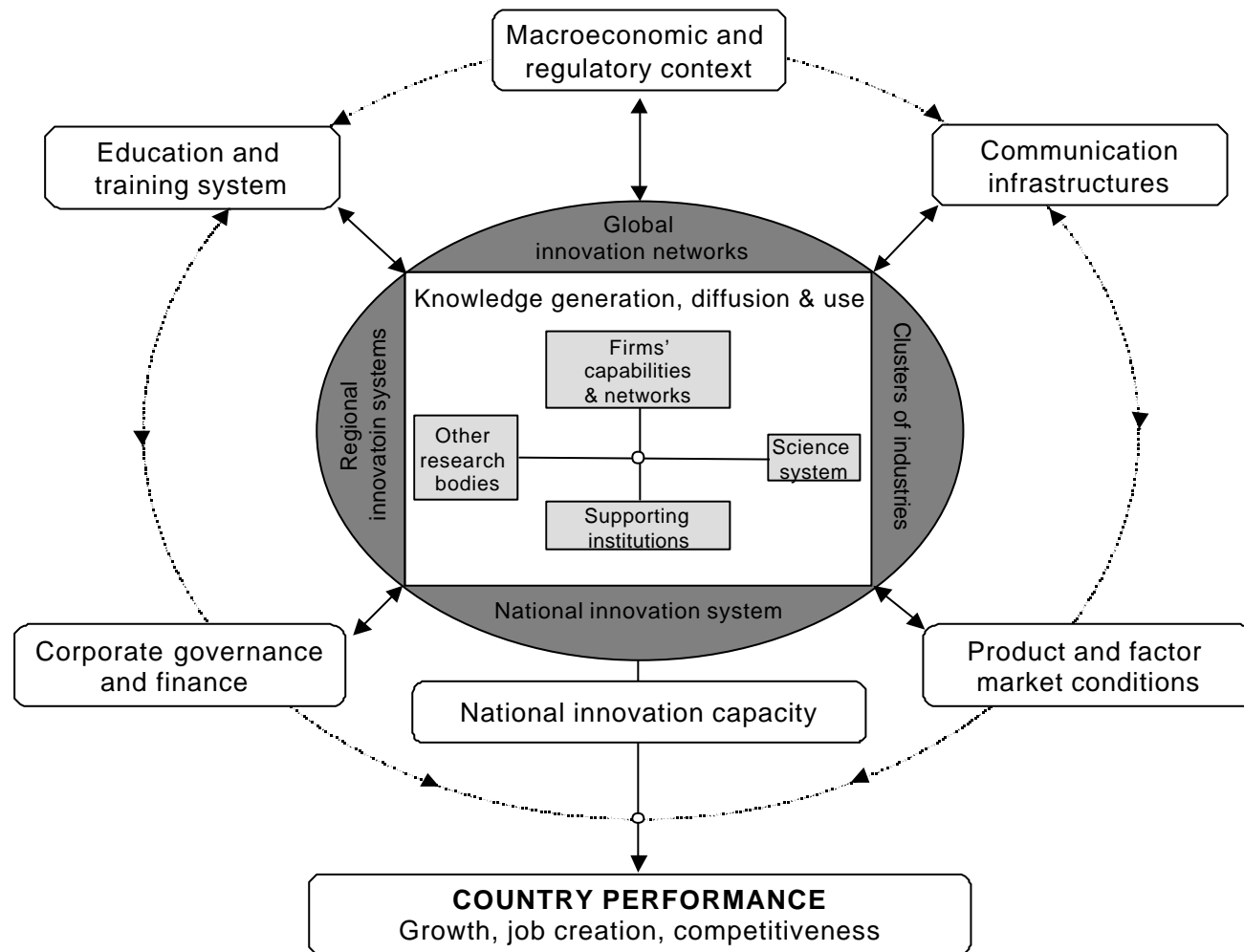


Elements of the Innovation System

- *Private firms - especially R&D performers*
- *Science System - S&T infrastructure*
 - *Public research institutions*
 - *Private and cooperative research organizations*
 - *Technology transfer agencies*
- *Government Programs*
- *Networks to facilitate knowledge and technology transfer*
 - *Including business organizations*
- *Education and Training System*
 - *Including local labour markets and training institutions*
- *Financial system - support for technology financing*



National System of Innovation



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Spatial Scales

- *National*
 - *Industry structure*
 - *Corporate organization and governance*
 - *Legal/regulatory framework*
 - *Fiscal (taxation) and macroeconomic environment*
 - *Framework of industrial relations and labour training*
 - *Financial system*
 - *Government policy*
- *State/Provincial*
 - *Regional areas of specialization*
 - *Research infrastructure – higher education sector*
 - *Specialized training institutions*
 - *Industrial attraction and retention*
 - *Government policy/support*
- *Local /Cluster*
 - *Civic governance*
 - *Physical /communications infrastructure*
 - *K-12 education system*

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Sources of Competitive Advantage in Regional Economies

- *Distance Matters*
 - *Strong geographic spillovers between public research centres and industrial R&D*
- *Knowledge and practices transferred between firms*
 - *'untraded interdependencies' - technological spillovers*
 - *not always codified or explicit - ie. tacit dimension*
 - *transferred through networks*
- *Networking - based on trust*
 - *shared intelligence of group of firms*
 - *grounded in a regional economy*
- *Social capital - shared norms and trust*
 - *facilitates cooperation among firms and sectors*



Cluster Characteristics

- *Defined as:*
 - *“a geographically proximate group of interconnected companies and associated institutions in a particular field linked by commonalities and complementarities” (Porter)*
- *Competitive advantage of clusters:*
 - *Superior access to specialized inputs reduces transaction costs - availability of specialized and experienced personnel*
 - *‘thick labour market’*
 - *‘diverse specialization’ – focus on core competences and increases flexibility*
 - *Improves capacity to innovate through access to knowledge*
 - *Stimulates process of firm formation through startups and spinoffs*



Critical Factors for Cluster Emergence

- *Strong, diverse and tech-savvy talent pool*
 - *Florida's three 'T's*
- *Presence of established pillar companies with global reach*
- *Strong knowledge infrastructure*
 - *research university, government labs etc.*
- *Specialized support services such as*
 - *Tech-savvy law and accounting firms*
- *Risk tolerant venture capital and angel investors*
- *Entrepreneurial culture that nourishes innovation*
- *Sustained development strategies by civic entrepreneurs and local governments (social capital)*



Cluster Case Studies

- *Size and composition of the cluster*
- *History of the cluster's evolution, including key events (intentional and accidental)*
- *Relationships between firms*
- *Relationships between firms, research infrastructure, other institutions/organizations*
- *Geographical structure of these relationships*
- *Role of finance capital (especially angel investors and venture capitalists)*
- *Role of local social capital and 'civic entrepreneurs'*



Common Themes

- *Learning*
 - *Old and new industries*
 - *In-house and inter-firm*
 - *Local buzz and global pipelines*
- *Labour*
 - *Talent and creativity*
 - *Thickness, opportunities, depth of local labour market*
- *Leadership: @ 2 scales*
 - *Firm: managerial talent differentiates one firm from another (e.g. Steel)*
 - *Community: 'civic entrepreneurs' (e.g. Ottawa telecom, Calgary wireless)*



Common Themes

- *Legislation/Laws/Labs: Public sector role*
 - *Institutions, regulatory frameworks*
 - *Research infrastructure*
 - *Public labs, universities, colleges*
 - *Collective assets*
 - *AGT*
 - *Local agencies ('animateurs')*
- *Location*
 - *A more nuanced understanding of its importance*
 - *Tension between local and non-local relationships, flows*
 - *Specificity: respecting regional, national, sectoral, historical variation*



Two 'models' emerging

- *Type I: Regionally embedded, anchored*
 - *Global knowledge flows important*
 - *But local knowledge/science base is a major contributor*
 - *Local universities/research institutes are an important part of this base*
 - *One or a few lead, 'anchor' firms or institutions*
- *Type I: Examples*
 - *Montreal biotech*
 - *Ottawa telecom/photonics*
 - *Hamilton steel (esp. Dofasco)*



Two 'models' emerging

- *Type II: 'Entrepot'*
 - *Much of knowledge base acquired through market transactions, global sources*
 - *Local institutions, firms exploit this knowledge effectively and combine it with local assets, capabilities for success*
- *Type II: Examples*
 - *Montreal aerospace*
 - *Saskatoon agri-biotech*
 - *Calgary wireless*



Key cluster indicators

- *Flows, dynamics*
- *Inflows*
 - *Capital*
 - *VC, FDI, M&A*
 - *People*
 - *Stars, post-docs*
 - *Talent (other highly skilled labour)*
- *Outflows*
 - *Products (goods, services) to world markets*
- *Knowledge/learning: embodied, other*
 - *IP (licensing; other codified forms)*



Key cluster indicators: Local social dynamics

- *Co-operation, networks*
- *Competition*
- *Circulation of labour, entrepreneurs*
- *Community-level associative governance*
- *Key elements, assets, drivers: "what is it that anchors this industry in this region?"*



Key cluster indicators: History and path dynamics

- *Discontinuities, shocks*
- *Resilience, robustness*
- *Adaptation, evolution*
- *Learning from success*
 - *spinoffs, demonstration effects*
- *Learning from failure*
 - *release of surplus assets: key to next wave of prosperity*



Policy Implications

- *Importance of social factors and institution building*
- *Linkages between elements of the system*
 - *Especially research infrastructure and clusters*
 - *Not just a 'supply-push' phenomenon*
- *Importance of demand side of innovation system*
 - *Absorptive capacity – at both firm and regional level*
 - *Knowledge is not a 'free good'*
- *National policies impact at the local level*
 - *Interact with the other spatial scales*
- *Growing role of networks and clusters*
 - *Talent as a key attractor – 'Competing on Creativity'*
 - *Combination of educational resources and quality of life factors*



Policy Implications II

- *Requires broad mix of policies*
 - *Support for upgrading innovative capacity of firms*
 - *Infrastructure to promote rapid diffusion of technologies*
 - *Support growth of SME's through networking and interaction*
 - *Creation and retention of 'talent' is critical*
 - *Stimulate both supply of and demand for new knowledge*
 - *Role of financial system*
- *Critical role of strategic planning and regional foresight at the local and community level*
 - *Coordinate federal agencies at local level*

