Harald Bathelt, Dieter Kogler
& Andrew Munro

Social Foundations of Regional Innovation and the Role of University Spin-offs

Paper presented at the
10th Annual Conference of the
Innovation Systems Research Network
in Montreal, Quebec, 1-3 May 2008

1. Introduction: The Case of the Waterloo Region

- Focus: to understand processes driving regional innovation
- Case: Waterloo region (Kitchener/Guelph CMAs)
- Successful regional development (especially since the 1970s)
  - High economic growth/low unemployment
  - Successful regional transformation from traditional manufacturing to new technologies, i.e. IT
  - Successful start-ups around UW
  - Firms, such as RIM, Open Text, Sybase
- Region has become a hot spot for academics/politicians to learn about successful regional transformation
- BUT: knowledge behind this success is inconclusive

1. Introduction: The Case of the Waterloo Region

- The region is clearly not a true industry cluster
  - Quite heterogeneous: large vs. small firms; old vs. new industries; manufacturing vs. services
- No simple evolutionary explanation due to a lack of coherence
  - Highly fragmented: no value-chain focus
- Despite success reports: notable restructuring/threat of an upcoming crisis
- **Goals:**
  - How have university spin-offs influenced regional restructuring?
  - Have IT-related start-ups developed local networks and cross-sectoral linkages?

Structure of Presentation

1. Introduction: The Case of the Waterloo Region
2. Organizational Ecology and University Spin-offs
3. Research Approach and Methodology
4. University Start-up/Spin-off Processes in the Waterloo Region
5. Producer-User Linkages and Knowledge Flows
6. Conclusion

2. Organizational Ecology and University Spin-offs

- Organizational ecology: emphasis of start-ups in organizational/ technological change (*Hannan & Freeman 1977, 1993*)
- Hypothesis: organizational change results from the selection of organizations rather than from adjustments within organizations
  - Selection follows different principles creating legitimacy: (a) efficiency, (b) reliability, (c) accountability
  - Organizations themselves become the object of selection
- Selection processes prioritize high reliability/accountability
  - Large established firms
  - BUT: routines make them resistant to change

2. Organizational Ecology and University Spin-offs

- Organizations are viewed as not structurally adaptable:
  - Adjustments are consensual and therefore suboptimal
  - Due to uncertainties, the best adaptation is unknown
  - Structural inertia results/adaptations are slow
- **Critique:**
  - Large established firms dominate in many sectors
  - Permanent learning/adaptation is underestimated
- University spin-offs
  - Have a large potential for technological change
  - BUT: little legitimacy in the market
- Our model combines results from organizational ecology with organizational learning

2. Organizational Ecology and University Spin-offs

- **Argument:**
- University spin-offs have little legitimacy/large potential
  - If they can link to local networks, they gain legitimacy
  - Local networks, in turn, provide incentives for established firms to learn/adapt
- Established firms benefit from “trans-local pipelines” which provide legitimacy in wider markets
  - They likely grow faster than start-ups if they can adapt permanently
- BUT: small firms grow faster through these networks
  - This opens possibilities for global linkages

3. Research Approach and Methodology

- In some studies, university spin-offs are defined narrowly as being a direct outcome of university research
- In others, firms started by a graduate are seen as spin-offs

→ Both definitions are problematic

- **Our definition includes firms that are based on**
  - Knowledge produced/circulated at the university
  - Founders who met at/through the university
  - Business opportunities around the university core

(a) University spin-offs: from university research or university-industry joint ventures

(b) University-related start-ups: decentralized, often unsponsored

(c) Different locations vs. co-location of the founders

→ Semi-structured interviews

4. University Start-up/Spin-off Processes in the Waterloo Region

- Goal – how embedded are University-related spin-offs?
- Firms captured software-focused
- One third drew core technology from university research (5)
- BUT: almost half said the university played no role (7)
- Where the university played a key role in the creation of core technologies, its role decreased over time (5)
- Only few firms indicated that they remain actively involved in activities at the University
  - Neither receives significant inputs to innovation

4. University Start-up/Spin-off Processes in the Waterloo Region

- Inventor-own IP policy
  - Attributed as a cause for the growth of the region
  - However, their number/size is limited
  - Rate of firm formation decreased substantially

- Weak relationships between the University and these start-ups are the overwhelming norm

5. Producer-User Linkages and Knowledge Flows

- Goal – investigate the impact on local networks and innovation

A. Suppliers

- 8 out of 14 firms: suppliers relatively unimportant
- 11 out of 12 firms: local supplies 20% or less
- Key supplies not drawn from the region
- Not surprising in a software context
- 3 firms that indicated significant role in ideas generation were in hardware; global players who draw from global supply chains
- Location of suppliers was not deemed to be important

5. Producer-User Linkages and Knowledge Flows

B. Customers

- Location of customers was seemingly not important to innovation
- 6 of 7 firms said southern Ontario sales < 5%
- 13 of 15 indicated customers were important for innovation
  - Each firm indicated customers as one of the key sources for new ideas
  - Customers were not key in problem solving
- Problem-solving was mainly based on Internet communities or international corporate networks

6. Conclusion

- Empirical data: regional customers, suppliers and universities do not play large role in innovation processes; no other regional sources

To gain legitimacy firms can:

- (a) Build a customer base quickly. Easier for software firms
- (b) Link up with other firms in the region. In CTT Region firms are diversified, limiting opportunities for local network creation
- (c) Firms that are acquired by larger entities rely on corporate networks

6. Conclusion

- University spin-off firms create little local buzz
  - Firms in our sample are local, stand-alone firms in the regional economy with strong external customer linkages
- Positive benefits are from the University skill flows (primarily in the form of graduates), but these are generic skill flows, not the specialized knowledge that the firms need

- The role of University of Waterloo spin-offs as sources of persistent knowledge transfer mechanisms have likely been over-stated

- This is very different from the image of the region