Agglomeration, Clusters, and Productivity: Some Thoughts and Questions

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Driving City and Cluster Growth?

Causal

- Innovation breakthroughs
- High-growth entrepreneurship (VC)
- General entrepreneurship
- Innovation broadly defined

Correlation
B: Correlation between Scores and Outcomes

Log (1+Return multiple) vs. Average score from partners at time of first investment
Making Omelets: View from 2007

- VC investments during 1986-1997: 364%
- Matched sample: 66%
- Failure Rate: 75%
- Net Job Impact: 67%
Business Dynamics

• Growth is retained by larger firms in up-or-out dynamic process
• Lowers average age structure of city and city’s top employers
• The interaction to Hsieh-Klenow and Akcigit-Alp-Peters is fascinating
Spatial Ranges

• “Regional” evidence on agglomeration forces
  – Duranton and Overman (2005, 2008)
  – Ellison et al. (2010), etc.

• “Local” evidence on agglomeration interaction
  – Arzaghi and Henderson (2008)
  – Studies of patent citations, commuting, etc.
Theory: The formation of an agglomeration cluster ...

Unoccupied site

Maximal spillover radius

Marginal entrant is currently indifferent across available sites as none are within the maximal radius of interaction with the existing cluster
Simple backbone for the maximal radius...

Benefits, Costs

Benefits – Generic Decay Function

Distance
Simple backbone for the maximum radius...

Benefits, Costs

Benefits – Generic Decay Function

Maximal Radius

Fixed Cost of Doing Business

Distance
A slower decay yields a longer maximum radius

Benefits, Costs

Benefits – Generic Decay Function

Distance

Fixed Cost of Doing Business

Maximal Radius
Returning to our example ...
... a larger radius changes cluster’s shape and size

A longer maximal radius would induce the marginal entrant into entering the cluster as site X can now interact, creating fewer, larger, and less dense clusters.
Imagining patent citations with the model ...

An A->B->C->D example of patent citations in the cluster, where patents in location A cite patents in location B, those in B cite location C, and those in C cite location D.
Fig. 3a: Patent citation distances within clusters

Citation Rate Relative to Random Baseline

Distance in Miles

First Generation Citations

Second and Third Generation Citations
Internal Structures

• How do cluster structures shape the matching and spillovers needed?
• Roles of constrained labor, family firms, immigration, and so forth
• Roles of advances in information and communication technologies
Open Questions Everywhere