Clusters and Start-Up Location Choice

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Boston? San Francisco? NYC?
Agglomeration and Location Choice

- Metrics of spatial concentration
- Rationales for why clusters forms ...
- ... frameworks to evaluate attributes that cities offer by industry
- Incumbent firms and start-ups
- Local economic growth and stability
SF Rocks! But now where??
This patch of land produced as many industrial patents over the last 30 years as the bottom 29 states combined.
Zip code 95054 produced the most industrial patents of any SF zip code (>20,000, would be 17th largest state)
Firms in zip code 95054 cited zip code 95134 the most in their work (13% of all external citations)
Firms in zip code 95054 cited these three zip codes the most in their work (29% of all external citations)
We visualize technology draws for a zip code by connecting the corners of the tech zones.
On average, the top three external zips contain 41% of local external citations
This visualization can take many forms ... although it typically is directional
Firms in zip code 95134 ... second largest for patenting ... cited these three zip codes the most in their work
Firms in zip code 94304 ... third largest for patenting ... cited these three zip codes the most in their work.
Adding the 4th – 6th largest zip codes for patenting
The 11 zip codes with the most patenting in the SF Bay Area and their primary spillovers ranges
The “core” contains 18 of the top 25 zip codes for patenting (and all spillovers); the longest side is 25 miles in length.
Geographical features and transportation shape the core and its underlying spillovers
Building out the northwestern access to the core
Building out the northeastern access to the core
The 7 largest zip codes for patenting that are not contained in the core itself (#12, 13, 17, 19, 22, 24, 25)
Some basic properties:
Small, overlapping regions
Directional transmissions
Access the core -> other sides
Role of transportation costs
Hmm... I love theory, how can I organize this?

Further grouping and organizing the technology flows ... multiple, overlapping spillover zones ... none transverses the whole span
Theory: The formation of an agglomeration bubble ...

Sequential entry, no foresight, & potential sites fixed
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Marginal entrant indifferent over open sites ...

No previously populated sites are within spillover range
Simple backbone for the maximum radius...

Benefits, Costs

Benefits – Generic Decay Function

Distance
Simple backbone for the maximum radius...

Benefits, Costs

Benefits – Generic Decay Function

Fixed Cost of Doing Business

Maximum Radius

Distance
A slower decay yields a longer maximum radius
The marginal entrant is currently indifferent...
Agglomeration forces with a large maximum radius ... produce fewer, larger, and less dense clusters
On the other hand, all sites are chosen at random if the maximum radius is very small.

One would choose the same pattern regardless of spillover strength with a general decay function only... the fixed costs provide the additional theoretical traction to test with data.
Further Theory Notes

• First micro-foundation for continuous metrics of local agglomeration

• Very tractable foundation for extensions
  – Natural advantages (e.g., mines, state capitals)
  – Dynamically moving clusters
  – Industry evolution and cluster access
  – Structures on how flows happen through the core

• Estimate patterns using continuous densities
  – Patent data: technology spillovers
  – Census data: Labor pooling v. natural advantages
Ranges of Localization by Industry Traits

Fraction of Industries Localized

Distance in Miles

Primarily Dependent upon Natural Resources and Material Inputs

Intermediate Dependencies

Primarily Dependent Upon Labor and Technology Linkages

Longer spillover radius -> fewer, larger, and less dense clusters
Ranges of Localization by Technology Type

Longer spillover radius -> fewer, larger, and less dense clusters
Some Implications

• Not just a question of SF, NYC or Boston... exceptional heterogeneity in direction of resource flows locally

• Evidence that an attribute (e.g., labor flows) spans a geographical region does NOT indicate that the individual interactions do so

• Entrepreneurs need to be aware of the “fault lines” of a cluster and choose their locations and entry strategies accordingly
Open Questions

• How well are locations priced?
  – Real estate and wage markets price well overall
  – Hypothesis of opportunities when looking for an individual start-up in a specific industry...

• When should locations be changed?
  – Firm needs change with growth and maturity
  – Switching sites, however, brings disruption costs
  – Models of optimal transitions

• How to evaluate jointly with city choice?
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