Empirical applications in Evolutionary Economic Geography

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structure of lecture

- 4 empirical applications in evolutionary economic geography
  1. agglomeration externalities: related variety
  2. regional diversification: entry and exit of industries
  3. entrepreneurship: experienced entrepreneurs
  4. clustering from an evolutionary perspective

- not an exhaustive list: f.i. the structure and evolution of networks in space

- literature
  - Boschma and Frenken (2011)
  - Frenken et al. (2007)
  - Neffke, Henning and Boschma (2011)
  - Boschma and Wenting (2007)
1. agglomeration externalities: related variety

- regional growth: not necessarily a question of MAR externalities versus Jacobs’ externalities

- what matters for regional growth: sectors that are technologically related in a region

- the higher related variety in a region, the higher regional growth: effective knowledge transfer requires some but not too much cognitive proximity between sectors in a region

- empirical studies on regional growth in the Netherlands, Italy, Finland, Britain and Spain

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1. agglomeration externalities: related variety

- need to measure the effect of related variety not only at the regional level but also at the firm level

- need to open the black box of local knowledge spillovers between related industries: through which mechanisms (like labor mobility, etc.)?

- regional growth may also depend on extra-regional knowledge flows that bring new variety into the region

- do inflows of extra-regional knowledge related (not identical) to the regional knowledge base matter? new knowledge that can be understood and exploited by related sectors in the region and, thus, be transformed into regional growth

- does related variety matter along all stages of the life cycle of industries?
2. regional diversification: entry (and exit) of industries

• how do regions develop new growth paths?

• in the long run, related variety is also a major input for regional diversification: new industries branch out of existing industries

• regional branching: new industries grow out of technologically related industries, in which new firms recombine and exploit the knowledge and skills taken from local related industries

• many case studies on regional branching, but no systematic study

• evidence of branching at the national level (Hausmann and Klinger, 2007; Hidalgo et al., 2007)

• countries tend to expand and diversify into export sectors that are closely related to their existing export mix

• countries specialised in the more dense parts of industry space have more opportunities to diversify and sustain higher economic growth rates

2. regional diversification: entry (and exit) of industries

• branching process tends to occur at the regional level: transfer mechanisms tend to have a local bias:

(1) experienced entrepreneurs: locate near their parent

(2) related diversification of firms: occurs mainly within existing plants at the same location

(3) related labor mobility: most employees change jobs in same region
2. regional diversification: entry (and exit) of industries

- **creative destruction** (Schumpeter): rise and fall of industries in regions

- depending on the degree of **technological relatedness** with existing industries in a region?

- two research questions

  (1) **rise of new industries**: do industries have a higher probability to enter a region when these are technologically related to pre-existing industries in a region?

  (2) **fall of existing industries**: do industries have a lower probability to exit a region when these are technologically related to pre-existing industries in a region?

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2. regional diversification

- long-term analysis of 70 Swedish regions 1969-2002


- **co-occurrence analysis**: to determine the degree of **technological relatedness** between each pair of industries

- Sweden: product data at the plant level for the period 1969-2002: product data assigned to standard industry codes (a total of 174 6-digit industries)

- co-occurrence of products that belong to different industries in the portfolios of plants: economies of scope

- control for profitability and size of industries

- we calculated the average degree of technological relatedness between each pair of industries in the period 1969-2002
2. regional diversification

- in order to determine whether entries and exits of industries in a region are affected by the degree of technological relatedness with other industries in the region, we aggregated our data to 70 Swedish regions.

- then, we developed an indicator to determine how close an industry is to all other industries in a region: technological closeness.

- defined as the number of industries in a region that an industry is technologically related to above a certain threshold.
2. regional diversification

- (1) we estimated the **entry probability** of an industry in a region, and how that is affected by the closeness of the new industry to a region’s portfolio
  - 2,766 events of an industry entering a region
  - outcome: industries that are technologically related to pre-existing sectors in a region have a higher probability to enter the region

- (2) we also estimated the **exit probability** of an industry in a region, and how that is affected by its closeness to the region’s portfolio
  - more than 3,464 events of an industry exiting a region
  - outcome: the more unrelated an industry is to the other industries in a region, the higher its probability to exit the region
entry and exit probabilities

average industry space in Sweden 1969-2002, with the evolution of the production structure of Linkoping
2. regional diversification

• thus, systematic evidence:

(1) regions tend to diversify by branching into new industries that are technologically related to their current industries: path dependent process

(2) the same applies to the destruction process: existing industries tend to disappear from a region when these are not technologically related to other existing industries in the region

• what are the effects of the entry of new industries that bridge two technology clusters in a region?

• what are the regional implications of changes in industry space?

• does industry space differ from country to country?

• through which mechanisms (entrepreneurship, labor mobility, networks) do new industries connect to existing industries?

3. entrepreneurship: experienced entrepreneurs

• through entrepreneurship, new industries emerge, but these do not start from scratch: relatedness is again crucial (Klepper)


• main findings:

1. **experienced entrepreneurs** (with relevant knowledge from related industries like engineering, cycle and coach making) are crucial for first stage of the industry lifecycle: experienced entrepreneurs have a higher survival rate, in comparison to other types of entrepreneurs

2. **British regions with these related industries** had a higher probability to develop the new automobile industry: effective knowledge transfer from the old to the new requires relatedness at the regional level: regional diversification or branching

• how about role of **labour mobility**?
4. clustering as an evolutionary process

- clusters are analysed by entry and exit patterns along the life cycle of an industry over time

- regional entry rates dependent on number of firms in the industry across regions: each firm is a potential source for spinoffs

- **spinoff dynamics**: more successful firms produce more and more successful spinoffs at the regional level: path-dependent process

- this makes that clusters, once established, are **self-reproducing**, even if localization economies are absent or negative

- longitudinal studies: global fashion industry, US and British car industry, US tire industry, US semiconductors, Dutch publishing industry, global video game industry, German laser industry, etc.

- why in some places and not in other places: **place-dependent process**: regions with related industries out of which new industries branch

4. clustering as an evolutionary process

- true for each industry?: localization economies might still matter for firm survival in project-based, creative industries

- not sure what spinoffs really inherit from parent organizations?

- effect of major disruptions: dynamic capabilities?

- role of institutions: co-evolution of industry and institutions in regional settings?

- effect of position of each entrant in knowledge network during the lifecycle of industry?

- role of M&A activity: driver of spatial clustering?
5. concluding remarks

• an outline of a number of recent empirical advances

• evolutionary economic geography is still under construction (like e.g. network dynamics)

• empirical studies with longitudinal data (not always easy to find)