Evolutionary Economic Geography: A review

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Selected list of publications

- Boschma and Lambooy (1999) *Journal of Evolutionary Economics*
- Boschma and Frenken (2006) *Journal of Economic Geography*
- Martin and Sunley (2006) *Journal of Economic Geography*
- Special issue in *Journal of Economic Geography* (2007)
- Special issue in *Economic Geography* (2009)
- Boschma and Martin (eds.) (2010) *Handbook on Evolutionary Economic Geography*, Edward Elgar
- Boschma and Frenken (2011) *Journal of Economic Geography*
- Papers in Evolutionary Economic Geography
  http://econ.geo.uu.nl/peeg/peeg.html

Evolutionary Economic Geography

- EEG combines evolutionary economics and economic geography
- Its ambition is to provide a general framework to understand economic processes in both historical and spatial contexts
- It reasons from the past to explain the present: “the explanation to why something exists intimately rests on how it became what it is” (Dosi, 1997, *Economic Journal*)
- It reasons from firm demography (entry-exit, spinoff, M&A)
- Dynamics stem from the recombination and selective transmission of knowledge and routines among firms in space and time
- EEG explains the uneven spatial distribution of economic activity as the outcome of contingent, yet path-dependent historical processes
- Applications: clusters, networks, regional growth

Comparison

	Neoclassical (economics)	**Institutional (geography)**	**Evolutionary (innovation studies)**
Methodology	Deductive Formal modelling	Inductive Appreciative theorizing	Both Both
Key assumptions	Optimising agent A-contextual	Rule-following agent Contextual (Macro)	Satisficing agent Contextual (micro)
Time	Equilibrium analysis Micro-to-macro	Static analysis Macro-to-micro	Out-of-equilibrium analysis Recursive
Geography	Neutral space Transport costs	Real place Place dependence	Neutral space → Real space Path dependence

Source: Boschma and Frenken (2006)

Structure of the remainder of the lecture

Three main empirical contributions of EEG thus far:

1. **clustering as an evolutionary process**
2. **structure and evolution of networks in space**
3. **agglomeration externalities and regional growth**

See: Boschma and Frenken (2011) *Journal of Economic Geography*

Clustering as an evolutionary process

- regional entry rates depend on number of existing firms in the industry and related industries (organizational-ecological principle)
- spinoff dynamics: successful firms produce more and more successful spinoffs at the regional level (evolutionary principle)
- WLO: a cluster emerges almost randomly from few successful firms
- little evidence, if any, for localization economies
- location of clusters is largely random, though regions with related industries have a higher probability to create a new industry (Klepper 2007 *Management Science,* and the famous "Detroit-dummy")
- industry evidence: cars, tire, semiconductors, publishing, laser, fashion design, video game, plastics, etc. (for a review Frenken et al. 2011 *Ecis working paper series*, Eindhoven)

questions that remain

- true for each industry?
- what spinoffs really inherit from parent organizations?
- endogeneity: do better organizations attract better employees in the first place?
- what determines the fidelity of transmission?
- what are policy implications for firms and governments?

Structure and evolution of networks

- Firm heterogeneity: some (cluster) firms are strongly connected, while others are not (Giuliani 2007, *Journal of Economic Geography*)

- Network formation (Balland 2012, *Regional Studies*)

  - firm features (e.g. absorptive capacity)
  - proximity (geographical proximity being only one of them)
  - Structural characteristics (preferential attachment, closure)

- Long-term evolution of networks (Balland et al. 2013, *Journal of Economic Geography;* Ter Wal 2013 *Journal of Economic Geography*)

  - Proximity changes as a consequence of network linkages
  - Effect of proximity may change over the lifecycle

Hardeman, Frenken, Nomaler, Ter Wal, 2012. "A proximity approach to territorial innovation systems"

- Example of recent work:
- PhD thesis 2013 Sjoerd Hardeman Eindhoven University of Technology
- Explaining network relations by (Boschma 2005, *Regional Studies*)
  - Cognitive proximity
  - Social proximity
  - Institutional proximity
  - Organizational proximity
  - Geographical proximity
- Characterizing "mode 1" and "mode 2" knowledge production (Gibbons et al. 1994, *The New Production of Knowledge*, Sage)
- Comparative analysis (e.g., Europe – North America)

Questions that remain

- what is going on in networks, anyway?
- directed or undirected networks?
- endogeneity: do networks enhance performance, or do firms want to connect to well-performing firms?
- community structures (Girvan and Newman 2002, *PNAS*)
- what about an evolutionary theory of infrastructure networks (PhD thesis 2013 Sandra Vinciguerra at Utrecht University)

Agglomeration externalities and regional growth

- related variety and spatial externalities

- regional growth: not necessarily a question of "MAR externalities versus Jacobs' externalities" (Glaeser et al. 1992, *Journal of Political Economy*)

- what matters for regional growth: sectors that are technologically, or otherwise, 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 (Frenken et al. 2007, *Regional Studies*)

- empirical studies on regional growth in the Netherlands, Italy, Finland, Britain, Spain and Germany (for a short review, see Castaldi et al. 2013, *Ecis working paper series*, Eindhoven)

Castaldi, Frenken, Los, 2013. "Related variety, Unrelated Variety and Technological Breakthroughs"

- ***Ecis working paper series* 2013**
- **Hypotheses:**

Related variety facilitates innovation in general,

Unrelated variety facilitates technological breakthroughs

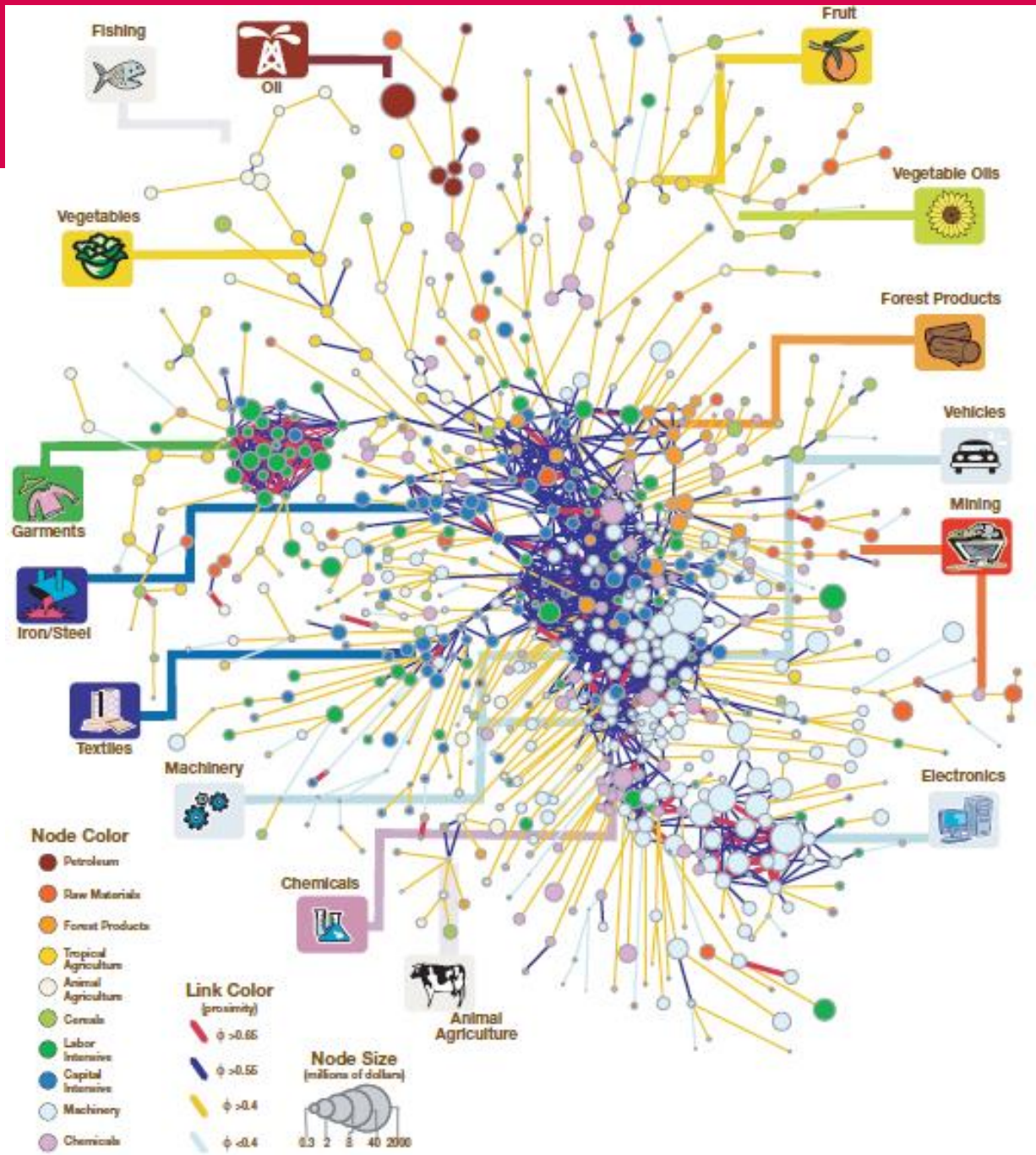
DV: *NUMPATENTS*		Model 1		Model 2		Model 3
	b	p-value	b	p-value	b	p-value
RD_{t-1}	0.170	0.000	0.017	0.511	0.021	0.455
$RDneighbours_{t-1}$			-0.002	0.904	0.001	0.964
state dummies			yes		yes	
trend			0.042	0.000	0.041	0.000
UV_{t-1}					-0.358	0.522
SRV_{t-1}					-0.280	0.576
RV_{t-1}					0.764	0.065
Deviance	682		44		25	
df	692		640		637	

DV: *SHARESUPER*		Model 1		Model 2		Model 3
	b	p-value	b	p-value	b	p-value
RD_{t-1}	0.098	0.000	0.084	0.005	0.105	0.001
$RDneighbours_{t-1}$			0.015	0.263	0.012	0.379
state dummies			yes		yes	
trend			0.117	0.000	0.099	0.000
UV_{t-1}					2.240	0.000
SRV_{t-1}					-1.292	0.014
RV_{t-1}					0.127	0.774
Deviance	2469		839		814	
df	692		640		637	

“Branching”

Countries and regions tend to diversify into related products, and are more successful if doing so (Hidalgo et al. 2007, *Science*; Neffke et al. 2011, *Economic Geography*)

If you are specialised in the more dense parts of the product space, you have more opportunities to diversify and sustain higher growth



questions that remain

- How to measure relatedness
- 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, spinoffs, networks, KIBS, etc.)
- need to distinguish between different stages of the industry life cycle: e.g. does related variety matter along all stages of the industry life cycle? (Henderson et al., 1995, *Journal of Political Economy*)

Conclusions about Evolutionary Economic Geography

- Outline of some recent empirical advances in EEG
- EEG is still under construction: some successful applications, but many gaps remain
- Promising topics ahead:
  - development studies
  - multinational organizations
  - global value chains
  - demography
  - geography of transitions
- Strong policy implications, but weak policy prescriptions
- Largely consistent with EU's "Smart Specialisation Strategy"