



DIMETIC Doctoral European Summer School
Session 3 – October 8th to 19th, 2007
Maastricht, The Netherlands
DIME Network of excellence - SAL1

MODELLING, SYSTEMS AND DYNAMICS

Final Programme

Week I : REGIONAL INNOVATION SYSTEMS, CLUSTERS, AND DYNAMICS (October 8th to 12th)

Coordinators

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Outline of the week :

This week focuses on the local clusters, regional innovation systems and some related topics. Especially it is shown how local clusters can be treated theoretically, with the statistical analyses of spatial data and with the help of cases studies. The concept of regional innovation systems is presented and the local factors that influence the innovativeness within a region are discussed. Finally, the topics of how local circumstances influence entrepreneurship and what role spin-offs play in a region are addressed.

Teaching staff

Thomas BRENNER, Max-Planck Institute for Economics, Jena, Germany
Guido BÜNSTORF, Max-Planck Institute for Economics, Jena, Germany
Phil COOKE, Cardiff University, U.K.
Bent DALUM, IKE, University of Aalborg, Denmark
Olav SORENSON, Rotman School of Management, University of Toronto, Canada.

Monday, October 8th

- 09:00 – 09:30: Bent DALUM: Welcome and Introduction
- 09:30 – 11:00: Phil COOKE: Regional Innovation Systems
- 11:15 – 12:45: Phil COOKE: New Developments in Regional Innovation Systems
- 14:00 – 16:00: Bent DALUM: The Cluster Concept: Relevant, Outdated or Confusing?
- 16:15 – 17:45: PhD presentation n°1 : Balázs LENGYEL ; junior discussant : Teodora CORSATEA, senior discussant : Phil COOKE

Tuesday, October 9th

- 09:00 – 11:00: Thomas BRENNER: Local Clusters: Concepts, Theory and Facts
- 11:15 – 12:45: PANEL DISCUSSION: Developments and Questions in Regional Innovation Systems with Thomas BRENNER, Phil COOKE and Bent DALUM

- 14:00 – 16:00: Bent DALUM: Case Studies of Local Clusters
- 16:15 – 17:45: PhD presentation n°2 : Marco CAPASSO; junior discussant : Luisa FERREIRA LOPES; senior discussant : Thomas BRENNER

Wednesday, October 10th

- 09:00 – 11:00: Thomas BRENNER: Measuring Regional Innovation Systems
- 11:15 – 12:45: Bent DALUM: Construction of Regional Advantage: Top-Down and Bottom-up? Does Any of These Approaches Work?
- 14:00 – 16:00: Thomas BRENNER: Local Clusters: Policy Issues
- 16:15 – 17:45: PhD presentation n°3: Serena NOVERO; junior discussant : Cristina LINCARU; senior discussant : Bent DALUM

Thursday, October 11th

- 09:00 – 11:00: Olav SORENSON: Research designs for studying entrepreneurship
- 11:15 – 12:45: Olav SORENSON: Entrepreneurship and the institutional environment
- 14:00 – 16:00: Guido BÜNSTORF: Quantitative methods
- 16:15 – 17:45: PhD presentation n°4: Teodora CORSATEA; junior discussant: Allan DAHL ANDERSEN ; senior discussant: Olav SORENSON

Friday, October 12th

- 09:00 – 11:00: Olav SORENSON: Entrepreneurship and social networks
- 11:15 – 12:45: Guido BÜNSTORF: Spin-off entrepreneurship
- 14:00 – 16:00: Guido BÜNSTORF: Spin-off-based cluster formation
- 16:15 – 17:45: PhD presentation n°5: Sanna Kaisa SEPPÄNNEN; junior discussant: Yuriy MOYSEYENKO; senior discussant: Guido BÜNSTORF

Related literature

To Phil Cook

- Cooke, P (2004) "The Role of Research in Regional Innovation Systems: New Models Meeting Knowledge Economy Demands", *International Journal of Technology Management* Vol. 28, pp. 507-533.
- Cooke, P. (2005) "Regional Knowledge Capabilities and Open Innovation: Regional Innovation systems and Clusters in the Asymmetric Knowledge Economy", in Breschi, S. and Malerba. F. (eds). *Clusters, Networks and Innovation*, Oxford University Press.

To Thomas Brenner

- T. Brenner (2004): "Local Industrial Clusters - Existence, Emergence and Evolution", London: Routledge.
- M.E. Porter (1990): "Competitive Advantage of Nations", London: Macmillan.

To Bent Dalum

Lecture 1:

- Martin, R. and Sunley P. (2003) "Deconstructing Clusters: Chaotic Concept or Policy Panacea?", *Journal of Economic Geography*, Vol. 3, pp. 5-35.
- Giuliani, E. (2005) "Cluster Absorptive Capacity: Why Do Some Clusters Forge Ahead and Others Lag Behind", *European Urban and Regional Studies*, Vol. 12, No. 3, pp. 269-288.

Lecture 2:

- Dalum, B., Pedersen, C.R. O. and Villumsen, G. "Technological Life-cycles: Lessons from a Cluster Facing Disruption", *European Urban and Regional Studies*, Vol. 12, No. 3, pp. 229-246.
- Dahl, M.S., Ostergaard, C.R. and Dalum, B. (2006) "Entrepreneurial Founder Effects in the Growth of Regional Clusters: How Early Success is a Key Determinant". Paper submitted for publication.. An edited version of DRUID Working Paper 2005-18 at www.druid.dk: http://www.druid.dk/wp/pdf_files/05-18.pdf

Lecture 3:

- Feldman, M. and Martin, R. (2005) "Constructing Jurisdictional Advantage", *Research Policy*, Vol. 34, pp. 1235-1249.
- Fromhold-Eisebith, M. and Eisebith, G. (2005) "How to Institutionalize Innovative Clusters? Comparing Explicit Top-Down and Implicit Bottom-Up Approaches", *Research Policy*, Vol. 34, pp. 1250-1268.
- Cooke, P. and Leydesdorff, L. (2006) "Regional Development in the Knowledge-Based Economy: the Construction of Advantage", *Journal of Technology Transfer*, Vol. 31, pp. 5-15.

To Guido Bünstorf

- Klepper, S. and S. B. Sleeper. "Entry by Spinoffs." *Management Science*, 51 (2005): 1291-1306.
- Buenstorf, G. and S. Klepper. "Heritage and agglomeration: the Akron tire cluster revisited." *Max Planck Institute of Economics: Papers on Economics and Evolution*, #0508 (2005).

To Olav Sorenson

- Sorenson, O., and P.G. Audia (2000). "The social structure of entrepreneurial activity: Geographic concentration of footwear production in the United States, 1940-1989," *American Journal of Sociology*, 106: 424-462
- Sorenson, O., and T.E. Stuart (2001). "Syndication networks and the spatial distribution of venture capital investments," *American Journal of Sociology*, 106: 1546-1588
- Stuart, T.E., and O. Sorenson (2005). "Social networks and entrepreneurship." Pp. 211-228 in Alvarez, Agarwal and Sorenson (Eds.), *The Handbook of Entrepreneurship: Disciplinary Perspectives*. Berlin: Springer-Verlag

Week: 2: "THE ECONOMY AS A COMPLEX EVOLVING SYSTEM: NETWORK THEORY, EVOLUTIONARY MODELS AND COMPUTATIONAL TOOLS" (October 15th to 19th, 2007)

Coordinators:

Giorgio FAGIOLO, Scuola Superiore S. Anna, Pisa, Italy,
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Outline of the week: The second week of the Maastricht session provides students with an introduction into evolutionary models and computational tools. The lectures offer an overview of the main modelling approaches as well as their empirical applications. Special emphasis will be on methodological aspects.

Lecturers

Robin COWAN (BETA, University Louis Pasteur - UNU-MERIT, Maastricht University)
Giorgio FAGIOLO (Sant'Anna of Advanced Studies, Pisa)
Koen FRENKEN (Utrecht University)
Andreas PYKA (Bremen University)
Maïder SAINT-JEAN (Bordeaux University)
Angelo SECCHI (Sant'Anna of Advanced Studies, Pisa)
Gerald SILVERBERG (UNU-MERIT, Maastricht University)
Marco VALENTE (University of L'Aquila)
Bart VERSPAGEN (ECIS, Eindhoven Technical University)
Paul WINDRUM (Manchester Metropolitan University Business School)

Monday, October 15th

9.00 -9.30	Koen FRENKEN Welcome and practicalities
9.30 - 11.00	Gerald SILVERBERG Lecture 1: Nonlinear dynamics and evolutionary economics
11.15 - 12.15	PhD presentation n°1: Lise ARENA ; junior discussant : Marco CAPASSO; senior discussant: Koen FRENKEN
13.30 - 15.00	Gerald SILVERBERG Lecture 2: Percolation models
15.15 - 18.00	Marco VALENTE Lecture 3: Introduction to LSD

Tuesday, October 16th

9.00 - 11.00	Robin COWAN Lecture 4: Competing technologies
11.15 - 12.15	PhD presentation n°2: Cristina LINCARU; junior discussant: Sanna Kaisa SEPPÄNNEN; senior discussant: Gerald SILVERBERG
13.30 - 15.00	Robin COWAN Lecture 5: Counterfactuals and the problem of empirical analysis of path dependent systems
15.15 - 16.15	PhD presentation n°3: Zakaria BABUTSIDZE; junior discussant: Lise ARENA; senior discussant: Marco VALENTE
16.30 - 18.00	Koen FRENKEN Lecture 6: NK-models

Wednesday, October 17th

- 9.00 - 11.00 Angelo SECCHI
Lecture 7: Stochastic models of firm growth
- 11.15 - 12.15 PhD presentation n°4: Yuriy MOYSEYENKO; junior discussant: Minh YOON;
senior discussant: Robin COWAN
- 13.30 - 15.00 Andreas PYKA
Lecture 8: Variety and economic development
- 15.15 - 16.15 PhD presentation n°5: Allan DAHL ANDERSEN ; junior discussant : tbd ; senior
discussant: Angelo SECCHI
- 16.30 - 18.00 Bart VERSPAGEN
Lecture 9: Mapping technological trajectories using network techniques

Thursday, October 18th

- 9.00 - 11.00 Giorgio FAGIOLO
Lecture 10: An introduction to the statistical analysis of agent-based models
- 11.15 - 12.15: PhD presentation n°6: Luisa FERREIRA LOPES ; junior discussant : Mikko
POHJOLA ; senior discussant: Andreas PYKA
- 13.30 - 15.00 Giorgio FAGIOLO
Lecture 11: Exploration and exploitation in an evolutionary growth model
- 15.15 - 16.15 PhD presentation n°7: Minh YOON; junior discussant: Zakaria BABUTSIDZE;
senior discussant: Paul WINDRUM
- 16.30 - 18.00 Paul WINDRUM
Lecture 12: Neo-Schumpeterian simulation models and history-friendly
modelling

Friday, October 19th

- 9.00 - 11.00 Maïder SAINT-JEAN
Lecture 13: Co-evolution of supply and demand: the case of environmental
innovation
- 11.15 ^ 12.15 PhD presentation n°8: Sjoerd HARDEMAN; junior discussant : tbd ; senior
discussant: Maïder SAINT JEAN
- 13.30 - 15.00 All
Evaluation meeting

Readings

Lecture 1: Nonlinear dynamics and evolutionary economics

🍏 Silverberg, G. and Lehnert, D., 1996, "Evolutionary Chaos':
Growth Fluctuations in a Schumpeterian Model of Creative Destruction", in
W. Barnett, A. Kirman and M. Salmon, (eds), Nonlinear Dynamics in
Economics, Cambridge: Cambridge University Press.

🍏 Silverberg, G. and Verspagen, B., 1996, "From the Artificial to
the Endogenous: Modelling Evolutionary Adaptation and Economic Growth", in
E. Helmstädter and M. Perlman, (eds), 1996, Behavioral Norms,

Technological Progress and Economic Dynamics: Studies in Schumpeterian Economics, Ann Arbor, MI: University of Michigan Press.

Lecture 2: Percolation models

🍏 Silverberg, G., 2002, "The Discrete Charm of the Bourgeoisie: Quantum and Continuous Perspectives on Innovation and Growth", *Research Policy*, 31: 1275-1289.

🍏 Silverberg, G. and Verspagen, B., 2003, "Brewing the future: Stylized facts about innovation and their confrontation with a percolation model", ECIS Working Paper, Eindhoven, www.tm.tue.nl/ecis/Working%20Papers/eciswp80.pdf.

🍏 Silverberg, G. and Verspagen, B., 2007, "Self-organization of R&D search in complex technology spaces", *Journal of Economic Interaction and Coordination*, Sept. 2007.

Lecture 3: Introduction in LSD

🍏 <http://www.business.aau.dk/~mv/Lsd/lsd.html>

Lecture 4: Competing technologies

🍏 Arthur, W.B. (1989) *Competing Technologies, Increasing Returns, and Lock-In by Historical Events*. *The Economic Journal*, 99 (394): 116-131.

🍏 Bikhchandani S., Hirshleifer D., Welch I. (1992) A theory of fads, fashion, custom, and cultural change as informational cascades. *Journal of Political Economy*, 100(5): 992-1026.

Lecture 5: Counterfactuals

🍏 Cowan, R., Foray, D. (2002) Evolutionary Economics and the Counterfactual Threat: On the nature and role of counterfactual history as an empirical tool in economics, *Journal of Evolutionary Economics*, 12: 539-562.

Lecture 6: NK-models

🍏 Frenken, K., (2006) Technological innovation and complexity theory, *Economics of Innovation and New Technology*, 15(2): 137-155.

🍏 Frenken, K., Schwoon, M., Alkemade, F., Hekkert, M. (2007) A complex systems methodology to transition management, Paper presented at the DRUID Summer Conference, Copenhagen, Denmark, download at: <http://www2.druid.dk/conferences/viewpaper.php?id=1423&cf=9>

Lecture 7: Stochastic models of firm growth

🍏 Sutton, J. (1998) *Technology and the Market Structure*, Chapter 10.

🍏 Bottazzi, G. and A. Secchi, (2007) "Explaining the Distribution of Firms Growth Rates", *RAND Journal of Economics*, 37, 235-256.

Lecture 8: Variety and economic development

🍏 Saviotti, P., Pyka, A. (2004), Economic Development by the Creation of new Sectors, *Journal of Evolutionary Economics*, 14(1): 1-36.

🍏 Saviotti, P., Pyka, A. (2004), Economic Development, Qualitative Change and Employment Creation, *Structural Change and Economic Dynamics*,

15(3): 265-287.

Lecture 9: Mapping technological trajectories using network techniques

🍏 Dosi, G. (1982) Technological paradigms and technological trajectories. A suggested interpretation of the determinant and direction of technological change. *Research Policy* 11, 147-162.

🍏 Verspagen, B. (2007) Mapping Technological Trajectories as Patent Citation Networks: a Study on the History of Fuel Cell Research, *Advances in Complex Systems*, vol. 10, pp. 93-115.

Lecture 10: An introduction to the statistical analysis of agent-based models

🍏 Windrum, P., Fagiolo, G. and Moneta, A. (2007, "Empirical Validation of Agent-Based Models: Alternatives and Prospects", *Journal of Artificial Societies and Social Simulation*, 10, 2, available at: <http://jasss.soc.surrey.ac.uk/10/2/8.html>.

🍏 Pyka, A. and Fagiolo, G. (2005) "Agent-Based Modelling: A Methodology for Neo-Schumpeterian Economics". In: Hanusch, H. and Pyka, A. (Eds.), *The Elgar Companion to Neo-Schumpeterian Economics*, Edward Elgar, Cheltenham.

Lecture 11: Exploration and exploitation in an evolutionary growth model

🍏 Fagiolo, G. and Dosi, G. (2003), "Exploitation, Exploration and Innovation in a Model of Endogenous Growth with Locally Interacting Agents", *Structural Change and Economic Dynamics*, 14: 237-273

Lecture 12: Neo-Schumpeterian simulation models and history-friendly modelling

🍏 Malerba, F., Nelson, R.R., Orsenigo, L. Winter, S.G. (1999) History friendly models of industry evolution: the computer industry, *Industrial and Corporate Change*, 8(1): 3-41.

🍏 Windrum, P. (2004) Neo-Schumpeterian simulation models, In: Hanusch, H. and Pyka, A. (Eds.), *The Elgar Companion to Neo-Schumpeterian Economics*, Edward Elgar, Cheltenham, available at <http://edocs.ub.unimaas.nl/loader/file.asp?id=856>

Lecture 13: Co-evolution of supply and demand: the case of environmental innovation

🍏 Saint Jean M. (2005) Coevolution of suppliers and users through an evolutionary modelling ^ The case of environmental innovations, *European Journal of Economic and Social Systems*, 18(2): 255-284.

🍏 Schwoon, M. (2006) Simulating the adoption of fuel cell vehicles, *Journal of Evolutionary Economics*, 16(4): 435-472.