

Economics of Networks - Robin Cowan and Charmianne Lemmens

Topics to cover

1. Introduction (R)

Tuesday 28 October 14.00-16.00 (MAAS)

Thursday 30 October 14.00-16.00 (SB)

Cowan, R. "Network models of innovation and knowledge diffusion" in *Clusters, Networks and Innovation*, S. Breschi and F. Malerba (eds.) Oxford University Press: Oxford, pp. 29-53, 2005. Available also as a MERIT working paper.

Only the first half is necessary at this point.

Vega-Redondo, F. (2007) *Complex Social Networks* "Chapter 1: Introduction"

Kirman, A. 1992. "Whom or what does the representative agent represent?" *Journal of Economic Perspectives* vol 6(2), pp. 117-136.

C. A. Hidalgo, 1 B. Klinger, 2 A.-L. Barabási, 1 R. Hausmannd (2007) "The Product Space Conditions the Development of Nations" *Science* 317: 482 - 487

DOI: 10.1126/science.1144581

Supplementary material at <http://www.nd.edu/~networks/productspace/index.htm>

2. Strategic Alliances (C) **Friday 31 October 14.00-16.00**

Network embeddedness and the exploration of novel technologies: technological distance, betweenness centrality and density (downloadable from www.duysters.com under "downloads")

Collaboration and Innovation: a review of the effects of mergers, acquisitions and alliances on innovation (downloadable from www.duysters.com under "downloads")

The Allied Enterprise (downloadable from www.duysters.com under "downloads")

3. Social Networks: An Overview (C)

Monday 3 November 14.00-16.00

Borgatti, S.P. and Foster, P. 2003. The network paradigm in organizational research:

A review and typology. *Journal of Management*. 29(6): 991-1013 [[pdf](#)]

Cross, R., Parker, A., & Borgatti, S.P. 2002. Making Invisible Work Visible: Using

Social Network Analysis to Support Strategic Collaboration. *California*

Management Review. 44(2): 25-46. [[pdf](#)]

Gulati, R. 1998. Alliances and Networks. *Strategic Management Journal*. **19** 293-317.

Gulati, R., M. Garguilo 1999. Where do interorganizational networks come from?

American Journal of Sociology. **104**(5) 1439-93.

4. Data and Methodology (C):

Thursday 6 November 14.00-16.00

Borgatti, S.P. and Molina, J.L. 2005. Toward ethical guidelines for network research

in organizations. *Social Networks*. 27(2): 107-117 [[pdf](#)]

Borgatti, S.P. and Molina, J-L. 2003. Ethical and strategic issues in organizational

network analysis. *Journal of Applied Behavioral Science*. 39(3): 337-350.

[[pdf](#)]

UCINET software guide http://www.analytictech.com/ucinet/Ucinet_Guide.doc

Marsden, P. V. (1990). Network data and measurement. *Annual Review of Sociology*, 16,435-463.

5. Social Capital and Structural Holes (C)

Monday 10 November 14.00-16.00

Ahuja, G. 2000. Collaboration Networks, structural holes, and innovation: A

longitudinal study. *Administrative Science Quarterly*. 45 425-455.

Granovetter, M. (1973). The strength of weak ties. *American Journal of Sociology*,

78:1360-1380

Walker, G., B. Kogut, W. Shan. 1997. Social capital, structural holes and the

formation of an industry network. *Organization Science*. 8(2) 109-125.

6. Game Theory (R)

Wednesday 12 November 14.00-16.00

Jackson, M. (2005): "A survey of network formation models: stability and

efficiency," in G. Demange and M. H. Wooders (eds.), *Group Formation*

in Economics: Networks, Clubs, and Coalitions, Cambridge: Cambridge

University Press, available at Jackson's website at Stanford: "A Survey of Models of Network Formation: Stability and Efficiency"

Jackson, M. O. and A. Wolinsky (1996): "A Strategic model of social and economic networks," *Journal of Economic Theory* 71, 44-74.

Vega-Redondo, F. (2007) *Complex Social Networks* "Chapter 6: Search, diffusion, and play in coevolving networks"

7. Centrality and Power (C)

Friday 21 November 14.00-16.00

Freeman, L. (1979). Centrality in social networks: Conceptual clarification. *Social Networks*. 1, 215-239.

Bonacich, Phillip. 1987. Power and Centrality: A Family of Measures. *American Journal of Sociology* 92: 1170-1182.

8. Theory of Small worlds and Scale Free Networks (R)

Monday 24 November 14.00-16.00

Watts and Strogatz, 1998, "Collective dynamics of "small-world" networks, *Nature*, Jun 4, 393 (6684), 440-2.

Baum, JAC , AV Shipilov, TJ Rowley 2003. "Where do small worlds come from?" *Industrial and Corporate Change*, Volume 12, Number 4, pp. 697-725.

Barabási, A.-L. and R. Albert (1999): "Emergence of scaling in random networks," *Science* 286, 509-12.

Barabasi, A.L. *Linked: The New Science of Networks* (Perseus, Cambridge, MA, 2002) (BOOK AVAILABLE IN THE UNIVERSITY LIBRARY)

9. Networks and Performance (R)

Wednesday 26 November, 14.00-16.00

node performance (subject to revision)

Cowan, Robin, Nicolas Jonard and Jean-Benoit Zimmermann "Bilateral Collaboration and the Emergence of Networks" *Management Science*, vol 53(7), pp. 1051-1067, 2007.

Guimerà, Roger , Brian Uzzi, Jarrett Spiro, and Luís A. Nunes Amaral, "Team Assembly Mechanisms Determine Collaboration Network Structure and Team Performance" *Science* 29 April 2005: Vol. 308. no. 5722, pp. 697 - 702

Walter W. Powell, W.P., Kenneth W. Koput, Laurel Smith-Doerr, Jason Owen-Smith " Network Position and Firm Performance: Organizational Returns to Collaboration in the Biotechnology Industry" www.stanford.edu/~woodyp/Rso1.pdf

aggregate performance (subject to revision)

Cowan, Robin and Nicolas Jonard, "Structural Holes, Innovation and the Distribution of Ideas" vol (2), pp 93-101, *Journal of Economics of Interaction and Co-ordination*", DOI: 10.1007/s11403-007-0024-0, 2007.

Cowan, Robin and Nicolas Jonard, "Network Structure and the Diffusion of Knowledge" *Journal of Economic Dynamics and Control*, 28(8) pp. 1557-1575, 2004.

Cowan, Robin and Nicolas Jonard "The Dynamics of Collective Invention", *Journal of Economic Behavior and Organization*, vol 52(4) pp. 513-532, 2003.

Wilhite, A. 2001. Bilateral Trade and 'Small-World' Networks [Computational Economics Volume 18, Number 1 / August, 2001](#) DOI: 10.1023/A:1013814511151 Pages 49-64

10. Discussion on network project: Q&A session (C&R)
Friday 28 November, 14.00-16.00

Freeman, Linton C. 2000. Visualizing Social Networks. @ Journal of Social Structure 1. (Electronically available at <http://www.cmu.edu/joss/content/articles/volindex.html>)

11. Presentations

TIME TO BE DETERMINED

Additional Optional Readings

This list is not exhaustive by any means.

Albert, R., H. Jeong, and A.-L. Barabási (1999): "Diameter of the worldwide web," *Nature* 401, 130-131.

Calvó-Armengol, A. (2004): "Job contact networks," *Journal of Economic Theory* 115, 191-206.

Calvó-Armengol, A. and M. O. Jackson (2004): "The effects of social networks on employment and inequality," *American Economic Review* 94, 426-454.

Calvó-Armengol, A. and Y. Zenou (2004): "Social networks and crime decisions: the role of social structure in facilitating delinquent behavior," *International Economic Review* 45, 939-958.

Castilla, E. J., H. Hwang, E. Granovetter, and M. Granovetter (2000): "Social Networks in Silicon Valley," in C.-M. Lee, W. F. Miller, M. G. Hancock, and H. S. Rowen, editors, *The Silicon Valley Edge*, Stanford: Stanford University Press.

Conley, T. G. and C. R. Udry (2001): "Social learning through networks: the adoption of new agricultural technologies in Ghana," *American Journal of Agricultural Economics* 83, 668-673.

- Fafchamps, M. and S. Lund (2003): "Risk-sharing networks in rural Philippines," *Journal of Development Economics* 71, 261-87.
- Munshi, K. (2003): "Networks in the modern economy: Mexican migrants in the US labor market," *Quarterly Journal of Economics* 118, 549-597.
- Opp, K. D. and C. Gern (1993): "Dissident groups, personal networks, and spontaneous cooperation: the East German revolution of 1989," *American Sociological Review* 58, 659-680.
- Price, D. J. de S. (1965): "Networks of scientific papers," *Science* 149, 510-515.
- Redner, S. (1998): "How popular is your paper? An empirical study of the citation distribution," *European Physical Journal B* 4, 131-134.
- Newman, M. E. J. (2001): "The structure of scientific collaboration networks," *Proceedings of the National Academy of Sciences USA* 98, 404- 409.

Evaluation:

Course evaluation will consist of the following group exercise. How many groups, and how big depends on the number of people taking the course for credit, but the project is to do a network analysis of an existing (real) network. We will discuss this in more detail in class, but the project will consist of several sub-tasks:

- 1) deciding on a network to analyse
- 2) deciding the nature of the questions to be asked and answered
- 3) gathering data, which probably involves doing a questionnaire
- 4) encoding the data
- 5) analysing the data
- 6) writing up the results.