RUHR UNIVERSITÄT BOCHUM RUB

Empirics of Innovation and Business Clusters

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Lecturer

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Course objectives

The purpose of the course is to equip students with essential knowledge and analytical skills in applied innovation economics and business cluster research. Both research fields can be linked by the empirical observation that firm-based innovation activities typically show a distinct geographical pattern and mainly take place in economic 'hot spots' (such as the Silicon Valley). Building on this stylized fact of spatial business organization, the course seeks to investigate why firms conduct research & innovation (R&I) activities and aims at measuring the R&I effects on different performance indicators at the firm, sectoral and regional level. In this context, innovation surveys and databases (e.g. the *Stifterverband* R&D survey, see www.stifterverband.org/-forschung-und-entwicklung) will be introduced and analysed with the help of statistical tools. In order to better understand to role played by business clusters and agglomeration forces in fostering innovative activities, the course further provides an introduction to the basic concepts of modelling and mapping the emergence of clusters, both theoretically as well as with the help of empirical data. Finally, implications for innovative firms and policy makers in the fields of science and technology (S&T) and regional policy will be discussed.

Course content

Although the course is divided into two thematic parts, a strong focus lies on carving out the interconnectivities between the two study areas when analysing real-world phenomena:

Part I: Applied Innovation Studies

Concepts of Innovation • Modelling Innovation Processes and their Determinants • Measurement of Innovation • Introduction to Innovation Surveys and Databases • Statistical Tools for Analysing Innovation Surveys • Implications for Innovative Firms and S&T Policy Makers

Part II: Business Cluster Analysis

From Agglomeration to Business Clusters • Modelling Spatial Location Decisions of Firms and the Emergence of Business Clusters • Mapping Business Clusters: Tools and Applications • Linking Economic Performance, Agglomeration Forces and Innovation Activities

Prerequisites

There are no particular prerequisites for course participation. However, students should be familiar with the basic concepts of *Micro- and Macroeconomics*. Moreover, students should have

some prior knowledge in *Statistical Analysis*, preferably in an applied context. Finally, some basic knowledge in *Applied Econometrics* and experience in working with *Statistical Software Packages* (in particular: Excel, STATA) is helpful for this course. *Note:* You may find helpful introductions to STATA on the web (e.g. https://www.youtube.com/watch?v=QaI_a_l2jqo).

Instructional methods

The course uses a mix of lectures and applied work (computer based). Regarding the latter, students will work with an education-use file of the *Stifterverband* R&D survey, further innovation databases such as the *European Innovation Scoreboard* as well as web-based tools for mapping and analysing business clusters such as the European and U.S. Cluster Observatories (see, e.g., www.clusterobservatory.eu, www.clustermapping.us). An introduction to statistical modelling with STATA will be given as well.

Reading list (essential background readings are marked by a "*")

Angrist, J.; Pischke, J.S. (2009): "Mostly Harmless Econometrics. An Empiricist's Companion", Princeton University Press: Princeton

*Atkinson, R.; Ezell, S. (2012): "Innovation Economics: The Race for Global Advantage", Yale University Press: Yale.

Baptista, R.; Swann, P. (1998): „Do Firms in Cluster innovate more?", in: *Research Policy*, Vol. 27, pp. 525-540.

Capello, R. (2007): "Regional Economics", Routledge: London & New York.

*Cohen, W. (2010): "Fifty Years of Empirical Studies of Innovation Activity and Performance", in: Hall, B.; Rosenberg, N. (Eds.): "Handbook of the Economics of Innovation", Chapter 4, pp. 129-213.

Crawley, A.; Pickernell, D. (2012): "An appraisal of the European Cluster Observatory", in: *European Urban and Regional Studies*, Vol. 19(2), pp. 207-211.

*Duranton, G.; Martin, P.; Mayer, T. and F. Mayneris (2010): "The Economics of Clusters", Oxford University Press: Oxford.

Fornahl, D.; Brenner, T. (2009): "Geographic concentration of innovative activities in Germany", in: *Structural Change and Economic Dynamics*, Vol. 20, pp. 163-182.

*Greene, W. (2011): "Econometric Analysis", 7th edition, Pearson, [Chapter 17: Discrete Choice].

Guiso, L.; Schivardi, F. (2010): "What determines entrepreneurial clusters?"; in: *Journal of the European Economic Association*, Vol. 9(1), pp. 61-86.

*Hong, S.; Oxley, L.; McCann, P. (2012): "A Survey of the Innovation Surveys", in: *Journal of Economic Surveys*, Vol. 26(3), pp. 420-444.

*Kline, S. J.; Rosenberg, N. (1986): "An overview of innovation", in: Landau, R.; Rosenberg, N. (Eds.): "The positive sum strategy: harnassing technology for economic growth", Washington DC, National Academic Press, pp. 275-305.

McCann, P. (2006): "Modern Urban and Regional Economics", 2nd edition, Oxford University Press: Oxford.

OECD (1999): "Boosting Innovation: The Cluster Approach", Paris: OECD, available at: http://www.oecd-ilibrary.org/science-and-technology/boosting-innovation_9789264174399-en

OECD (2001): "Innovative Clusters: Drivers of National Innovation Systems", Paris: OECD, available at: http://www.oecd-ilibrary.org/science-and-technology/innovative-clusters_9789264193383-en

*OECD (2005): "OSLO Manual. Guidelines for Collecting and Interpreting Innovation data", 3rd edition, Paris: OECD, available at: http://www.oecd.org/sti/inno/oslomanual-guidelinesforcollectingandinterpretinginnovationdata3rdedition.htm

*Porter, M. (2000): Location, Competition and Economic Development: Local Clusters in a Global Economy, in: *Economic Development Quarterly*, 14(1), pp. 15-34.

Porter, M. (2003): "The Economic Performance of Regions", in: *Regional Studies*, Vol. 37, No. 6/7, pp. 549-578.

Rosenbusch, N.; Brinckmann, J.; Bausch, A. (2011): "Is innovation always beneficial? A meta-analysis of the relationship between innovation and performance in SMEs", in: *Journal of Business Venturing*, Vol. 26, pp. 441-457.

Saric, S. (2012): "Comparative Advantages through Clusters", Springer Gabler: Wiesbaden.

*Swann, P. (2009): "The Economics of Innovation", Edgar Elgar Publishing.

Uyarra, E.; Ramlogan, R. (2012): "The Effects of Cluster Policy on Innovation – Compendium of Evidence on the Effectiveness of Innovation Policy Intervention", Manchester Institute of Innovation Research, Working paper, available at: http://www.nesta.org.uk/publications/effects-cluster-policy-innovation.

van der Panne, G. (2004): "Agglomeration externalities: Marshall versus Jacobs", in: *Journal of Evolutionary Economics*, Vol. 14, pp. 593–604.

Time schedule

6-8 hours of teaching per day (an hour lasts 45 minutes).
Morning: Lecture from 08.30 to 10.00 and 10.30-12.00.
Afternoon: Lecture from 13.00 to 14.30 and 15.00-16.00*. *=not every day

Assessment

Group work (50%) plus final exam (50%). The group work consists of a key-note paper and presentation based on a course-related topic selected by the students. A list of potential topics will be posted prior to the course. The final exam covers the entire lecture materials and combines theoretical and empirical tasks.