BAVARIAN GRADUATE PROGRAM IN ECONOMICS

Economic Geography and Urban Economics

2-6 September 2024

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Overview: Economic geography and urban economics examine the agglomeration and dispersion forces that shape the spatial distribution of economic activity both across cities and regions, and across neighbourhoods within cities. While these questions have a very long tradition in economics, work in this area has substantially increased over the last five to ten years. This module will provide an introduction to the state of the art in modelling and empirical work currently used in this literature. The aim is to concentrate on a few key ideas that are essential for work in this area rather than to provide an encyclopedic overview of all aspects of work in this area.

Prerequisites: The models used in this area are inherently general equilibrium and a good working knowledge of microeconomics is required. The empirical work relies on both reduced form and structural estimations. The module assumes that you have a working knowledge of reduced form techniques, such as difference in differences, regression discontinuity, and instrumental variables. You do not need to have prior knowledge of structural estimation and these techniques will be explained during the module.

Time Plan: The general time plan for the week is as follows:

09:00-10:30	Session 1
10:30-11:00	Break
11:00-12:30	Session 2
12:30-14:00	Lunch
14:00-15:30	Session 3
15:30-16:00	Break
16:00-17:30	Session 4

The week starts with a welcome meeting and dinner on Sunday the 1st of September at 19:00. On Thursday there will be a group discussion about research strategies after dinner from 20:00 until 21:30 in addition to the regular sessions. On Friday the day ends at lunchtime with no afternoon sessions. The regular daily sessions will be used for more lecture style material and group discussions as described in more detail below. Lecture slides and detailed instructions for the discussion sessions will be made available ahead of the module.

Exam: The course will be examined with a 90 min open book exam. The style of questions will be discussed during the module.

Software: If students have access to a laptop with Matlab and Stata (or R), they should bring this to the module. Time permitting, we will use Matlab and Stata for some empirical work towards the end of the week.

Topics: The timings below are very approximate and the speed at which we proceed depends on questions and class discussion. We will cover topics 1 to 5 in reasonable detail during the week. The final topic contains material that we can cover in part depending on time available.

(1) Introduction and Background (Monday)
A brief review of the long history of economic geography and urban economics and its current popularity. Overview of the monocentric city model and the Rosen-Roback framework and spatial equilibrium.

Discussion Session: Does an increase in city amenities reduce wages?

(2) Economic Geography: Theory (Monday and Tuesday)
The quantitative economic geography literature following Krugman (1991). We look at a basic model and various possible extensions and encounter model inversion for the first time.

Discussion Session: Can we increase aggregate output by moving workers to more productive cities?

(3) Economic Geography: Empirics (Tuesday)
Empirical evidence for the effects of changes in market access predicted by economic geography models and the possibility of path dependence of economic activity. A first look at model counterfactuals.

Discussion Session 1: The long-run effects of portage.
Discussion Session 2: The impact of European regional policy.

(4) Quantitative Urban Model: Theory (Wednesday)
Modelling residence and workplace choices within the city and their implied commuting flows. How do neighbourhoods react to changes in amenities and productivity?

Discussion Session: Key properties of the Frechet distribution.

(5) Quantitative Urban Model: Empirics (Wednesday/Thursday)
How to estimate the qualitative urban model including model inversion and model counterfactuals. Reduced form evidence in favour of the model.

Discussion Session 1: Estimating a quantitative urban model.
Discussion Session 2: The effect of banning cars in Berlin as a model counterfactual.

(6) Further Topics in Spatial Economics (Thursday/Friday)
Topics under this heading include (a) Commuting gravity and granularity (b) The relationship between density and productivity. (c) Speed differences across cities.

Discussion Session: Estimating a commuting gravity equation.

Detailed Reading List:

The starred readings below are key papers in the literature that will be discussed in some detail during the module. Looking at these papers ahead of the module will be very good preparation for the module.

Broad Surveys

* Redding, Stephen and Esteban Rossi-Hansberg (2017) "Quantitative Spatial Models," *Annual Review of Economics*, 9, 21–58.

Redding, Stephen (2024) "Quantitative Urban Models," prepared for Handbook of Regional and Urban Economics 2025.

Fujita, M., P. Krugman, and A.J. Venables (1999) *The Spatial Economy: Cities, Regions and International Trade*," Cambridge: MIT Press.

Monocentric City and Rosen-Roback

Alonso, William (1964) *Location and Land Use: Toward a General Theory of Land Rent*, Cambridge: Harvard University Press.

Mills, E. (1967) "An Aggregative Model of Resource Allocation in a Metropolitan Area," *American Economic Review* 57(2), 197-210.

Muth, R. (1969) *Cities and Housing*, Chicago: University of Chicago Press.

Rosen, Sherwin (1979) "Wage-Based Indexes of Urban Quality of Life," in *Current Issues in Urban Economics*, edited by P. Mieszkowski and M. Straszheim. Baltimore: Johns Hopkins University Press.

Roback, Jennifer (1982) "Wages, Rents, and the Quality of Life" *Journal of Political Economy*, 90(4), 1257-1278.

Economic Geography Model

* Redding, Stephen and Daniel Sturm (2008) "The Costs of Remoteness: Evidence from German Division and Reunification," *American Economic Review*, 98(5): 1766-1797.

* Redding, Stephen (2016) "Goods Trade, Factor Mobility and Welfare," *Journal of International Economics*, 101: 148–167.

* Allen, Treb and Costas Arkolakis (2014) "Trade and the Topography of the Spatial Economy," *Quarterly Journal of Economics*, 129(3): 1085–1140.

Allen, Treb, Costas Arkolakis, and Xiangliang Li (2024) "On the Equilibrium Properties of Spatial Models," forthcoming *American Economic Review: Insights*.

Allen, Treb and Dave Donaldson (2020) "Persistence and Path Dependence in the Spatial Economy," NBER Working Paper, 28059.

Allen, Treb and Dave Donaldson (2022)"Persistence and Path Dependence: A Primer" *Regional Science and Urban Economics*, 94, 103724.

Balboni, Clare (2024) "In Harm's Way: Infrastructure Investments and the Persistence of Coastal Cities, forthcoming *American Economic Review*.

Bleakley, Hoyt and Jeffrey Lin (2012) "Portage and Path Dependence," *Quarterly Journal of Economics*, 127(2): 587–644.

Breinlich, Holger (2006) "The Spatial Income Structure in the European Union—What Role for Economic Geography?" *Journal of Economic Geography*, 6(5): 593-617.

Davis, Donald R. and Jonathan Dingel (2020) "The Comparative Advantage of Cities", *Journal of International Economics*,123, 103291.

De La Roca, Jorge and Diego Puga (2017) "Learning by Working in Big Cities," *The Review of Economic Studies*, 84(1): 106-142

Donaldson, Dave (2018) "Railroads of the Raj: Estimating the Impact of Transportation Infrastructure," *American Economic Review*, 108(4-5): 899–934.

Gaubert, Cecile (2018) "Firm Sorting and Agglomeration," *American Economic Review*, 108(11): 3117-3153.

Helpman, Elhanan. (1998) "The Size of Regions," in *Topics in Public Economics: Theoretical and Applied Analysis*, ed. David Pines, Efraim Sadka, and Itzhak Zilcha, 33–54. Cambridge: Cambridge University Press.

Kleinman, Benny, Ernest Liu, and Stephen Redding (2023) "Dynamic Spatial General Equilibrium", *Econometrica*, 91(2), 385–424.

Krugman, Paul (1991) "Increasing Returns and Economic Geography," *Journal of Political Economy*, 99(3): 483 – 499.

Redding, Stephen, Daniel Sturm and Nikolaus Wolf (2011) "History and Industry Location: Evidence from German Airports," *Review of Economics and Statistics*, 93(3): 814-831.

Redding, Stephen and Anthony J. Venables (2004) "Economic Geography and International Inequality," *Journal of International Economics*, 62(1): 53 – 82.

Quantitative Urban Model

* Ahlfeldt, Gabriel, Stephen Redding, Daniel Sturm and Nikolaus Wolf (2015) "The Economics of Density: Evidence from the Berlin Wall," *Econometrica*, 83(6): 2127-2189.

Almagro, Milena and Tomas Dominguez-Iino (2024) "Location Sorting and Endogenous Amenities: Evidence from Amsterdam" conditionally accepted *Econometrica*.

Brinkman, Jeffrey and Jeffrey Lin (2024) "Freeway Revolts! The Quality of Life Effects of Highway," forthcoming *Review of Economics and Statistics*.

Burchfield, Marcy, Henry Overman, Diego Puga, and Matthew A. Turner (2006) "Causes of Sprawl: A Portrait from Space," *Quarterly Journal of Economics*, 121(2): 587–633.

Fujita, Masahisa and Hideaki Ogawa (1982) "Multiple Equilibria and Structural Transition of Non-Monocentric Urban Configurations," *Regional Science and Urban Economics*, 12(2), 161-196.

Heblich, Stephan, Stephen Redding and Daniel Sturm (2020) "The Making of the Modern Metropolis: Evidence from London," *Quarterly Journal of Economics*, 135(4), 2059-2133.

Lucas, Robert E. and Esteban Rossi-Hansberg (2002) "On the Internal Structure of Cities," *Econometrica*, 70(4): 1445–1476.

Monte, Ferdinando, Stephen Redding and Esteban Rossi-Hansberg (2018) "Commuting, Migration and Local Employment Elasticities," *American Economic Review*, 108(12), 3855-3890.

Redding, Stephen and Daniel Sturm (2024) "Neighborhood Effects: Evidence from Wartime Destruction in London," NBER Working Paper No. 32333.

Tsivanides, Nick (2024) "The Aggregate and Distributional Effects of Urban Transit Infrastructure: Evidence from Bogota's TransMilenio," forthcoming *American Economic Review*.

Zarate, Roman David (2023) "Spatial Misallocation, Informality and Transit Improvements: Evidence from Mexico City", Revise and Resubmit *American Economic Review*.

Commuting Gravity and Granularity

* Dingel, Jonathan and Felix Tintelnot (2023) "Spatial Economics for Granular Settings", revise and resubmit *Econometrica*.

Head, Keith and Thierry Mayer, 2014, Gravity Equations: Workhorse,Toolkit, and Cookbook, Chapter 3 in Handbook of International Economics, Editor(s): Gita Gopinath, Elhanan Helpman, Kenneth Rogoff, Elsevier, Volume 4, Pages 131-195.

Density and Productivity

* Combes, Pierre-Philippe, Gilles Duranton and Laurent Gobillon (2008) "Spatial Wage Disparities: Sorting Matters!" *Journal of Urban Economics*, 63(2): 723-742

Combes, Pierre-Philippe, Gilles Duranton, Laurent Gobillon and Sébastien Roux (2010) "Estimating Agglomeration Economies with History, Geology, and Worker Effects" in *Agglomeration Economics*, Edward L. Glaeser (ed.), NBER, Cambridge, MA.

Ciccone, Antonio and Robert E. Hall (1996) "Productivity and the Density of Economic Activity," *American Economic Review*, 86(1): 54–70.

Melo, Patricia C., Daniel J. Graham, and Robert B. Noland (2009) "A Meta-Analysis of Estimates of Urban Agglomeration Economies," *Regional Science and Urban Economics*, 39, 332–342.

Speed Differences

* Akbar, Prottoy, Victor Couture, Gilles Duranton and Adam Storeygard (2023) "Mobility and Congestion in Urban India" *American Economic Review* 113(4), 1083–1111.

Couture, Victor, Gilles Duranton, and Matt Turner (2018) "Speed" *Review of Economics and Statistics*, 100(4), 725-739