Lecture 1: Introduction to Urban and Regional Economics

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ECON-L6000 - Urban and Regional Economics
Aalto University School of Business

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Course roadmap
Basic Information

- **This course:** Urban and Regional Economics - ECON-L6000.
- **Instructors:** Prottoy Akbar (prottoy.akbar@aalto.fi) and Pablo Warnes (pablo.warnes@aalto.fi).
- **Office hours:** by appointment.
- **Teaching Assistant:** Tuomas Markkula. (tuomas.markkula@aalto.fi)
- **Lecture Locations:** L101/Q102 (Mon), G202/Q102 (Thu).
- **Class Times:** Mon & Thu, 10:15 - 12:00
Course pre-requisites

This course is targeted at PhD students.

- We will assume appropriate familiarity with economic concepts and quantitative methods e.g. at the level of:
  - Advanced Econometrics 1 and 2 (ECOM-R314 and ECOM-R315)
  - Advanced Microeconomics 1 and 2 (26045 and ECON-L2200)

- Familiarity with topics not assumed, but may be useful e.g.
  - Urban Economics (REC-E3500)
Objectives

Our goal is to familiarize you with cutting-edge research methods and questions in urban economics.

In the process, we will address questions such as:

- What makes people and economic activity concentrate or disperse across space?
- What determines the price that people are willing to pay for particular places?
- How can we use economics to understand the internal structure of cities?
- What can we say about the sizes, locations, and distribution of activities across cities?
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Getting to know everyone

▶ Please say your:
  ▶ name,
  ▶ program,
  ▶ year in program,
  ▶ research interests (if any)
  ▶ what motivated you to join this class?
  ▶ preferred pronouns (if desired)
Agenda For Today

- Assignments and Grading
- Introduction to Urban and Regional Economics
  - Some motivating facts
  - Some Motivating Theory
  - What is Urban Economics? What is Regional Economics?
Assignments and Grading

- 4 referee reports (20%)
- A paper replication
  - Problem Set 1 (20%)
  - Problem Set 2 (30%)
- 1 paper presentation (30%)

Collaboration is highly encouraged, but everyone must hand in their own referee reports and problem set solutions. Presentations will also be individual.
Assignments and Grading: Referee Reports

▶ For 4 topics (lectures) starting from lecture 3:
  
▶ Write **short** referee report for paper assigned.

▶ See guide on MyCourses on what we expect from this short referee report.

▶ Reports must be handed in (electronically) before the lecture on that topic.

▶ Later today we will send link to a poll where you will list your preferences for papers/topics to write reports on. We will use those preferences to assign you the 4 referee reports.
Assignments and Grading: Presentation

- Each student will choose a paper from a list of papers to present on one of the two last lecture dates.

- Goal: present the paper as if you were the author. Be ready to defend it (with reasonable arguments), but also accept it’s potential shortcomings.

- Later today we will send you a link to a poll where you will list your preferences for topics to present on. We will use those preferences to assign a paper on each topic to each student.
Assignments and Grading: Replication Problem Sets

- Probably the most time consuming assignments.

- We will give you a problem-set-style guide on how to replicate a specific paper:

- Part 1 is due halfway through the course: **May 22**

- Part 2 is due two weeks after the end of classes: **June 15**
Help outside of lectures

▶ Tuomas is here to help!

▶ TA sessions:
  1. May 11, 13:15-14:45
  2. June 1, 13:15-14:45

▶ Zulip chat:
  https://urban-regional-2023.zulip.aalto.fi/
    ▶ Click here for how-to guide
Ungraded but expected: Readings for each class

See MyCourses for list of papers by topic:

▶ For referee reports
  ▶ We **will** discuss them in class. So, read even if you are not assigned to write a report for this topic.

▶ For final presentation
  ▶ May help to read closer to the class on the topic (rather than wait till before the presentation).

▶ Papers referenced in lectures

▶ Other useful references on the topic

We will update this list as we progress through the course.
Other opportunities to engage with course topics

1. Trade, Regional and Urban Economics (TRUE) seminar series
   - Mondays 16:00-17:00, Economicum
   - https://www.helsinkigse.fi/events/organiser: trade-regional-and-urban-economics

2. PhD Student workshop
   - June 6, 2023 (tentative)
   - Call for papers/abstracts to be sent out soon.
Some stylized facts
The World is Increasingly Urban: Population

- Around 1900, 16% of the world’s population was living in cities (Bairoch 1988).

- In 2022, 56% of the world’s population is urban (World Bank 2022).
  - More people in cities today than in the world in 1970.

- By 2050, nearly 70% of the world’s population will be living in cities!
The World is Increasingly Urban: US

Figure 1
U.S. Population in Urban and Metropolitan Areas, 1790-2010

Figure 1: Before 1950, the urban share only includes residents living in incorporated places. From 1950 onward, the urban share includes residents living in both incorporated and unincorporated places. Data on urban population shares are from the U.S. Census Bureau. Metropolitan area population shares were calculated using data and the contemporaneous definitions provided by IPUMS in each year.

from Boustan et al (2013)
The World is Increasingly Urban: Developing Countries

Most of the new urbanization is coming from developing countries.

- Urban share of population is 80% in high-income countries but only 50% in developing countries.

- From 1970 to 2020, India went from about 20% urban population to 35% urban population.

- From 1970 to 2020, China more than tripled its urban population: from about 18% to more than 60% (World Bank 2022).

- About 75% of this urban pop. growth came from rural to urban migration (Zhang and Song 2003).
Urban Population is very agglomerated

- Although 55% of the population is urban, cities only occupy 3% of the world’s land.
- Most countries look like this:
Urban Population is very agglomerated: Finland

Helsinki:

- 0.2% of land area
- 19% of population
- 30% of GDP

Why so much concentration? We must benefit from “agglomeration economies”.
Urban growth is peripheral

Most urban population growth in the US since 1950 has been suburban (Boustan and Shertzer 2013).
Urban land is expanding

- Expansion of urban land consumption is expected to outpace urban population growth by 50% in the next 30 years (World Bank 2022).

- This will imply a very large investment in urban infrastructure.
  - Transportation economics is a closely related field.

- Most of which will be concentrated in developing countries.
Agglomeration: Economic activity is even more concentrated

- More than 80% of global GDP generated in cities.

- With only half the people in cities, this means an average urban resident is 4 times more productive than the average rural resident.

- Cities consume two thirds of global energy consumption and account for more than 70% of greenhouse gas emissions (World Bank 2022).
Agglomeration: Larger cities are more productive

Figure 1. Productivity and City Size

Notes: Units of observation are Metropolitan Statistical Areas under the 2006 definitions. Population is from the Census, as described in the Data Appendix. Gross Metropolitan Product is from the Bureau of Economic Analysis.

The regression line is log GMP per capita = 0.13 [0.01] \times \log \text{population} + 8.8 [0.1].
R^2 = 0.25 \text{ and } N = 363.

from Glaeser and Gottlieb (2009)
Agglomeration: Larger cities offer higher wages

from Behrens and Robert-Nicoud (2015)
Agglomeration and its benefits are persistent from Glaeser and Gottlieb (2009)

Figure 2. Income Over Time

Notes: Units of observation are Metropolitan Statistical Areas under the 2006 definitions, using Metropolitan Divisions where applicable. Data are from the Census, as described in the Data Appendix.

The regression line is $\text{Income}_{2000} = 0.77 \, [0.03] \times \text{Income}_{1970} + 3.75 \, [0.26]$. $R^2 = 0.60$ and $N = 363$. 
Costs of density: Higher housing costs

from Behrens and Robert-Nicoud (2015)
Costs of density: Higher infant mortality rates

Figure 2: Urban and Rural Infant Mortality Rates: Massachusetts, 1880 to 1915

Sources and Notes: See Data Appendix. Urban is defined as the 32 largest municipalities in Massachusetts in the Registration Report of 1898. Rural is defined as all other populations in each of the counties. The minimum urban population in 1880 is 4,159 and is 15,250 in 1915. The data are from the Annual Registration Reports and mortality rates are aggregates within the urban and rural designations.

from Alsan and Goldin (2019)
Costs vs benefits of agglomeration

- Cities offer higher productivity, wages, proximity to urban amenities, etc., but also higher living costs, pollution, road congestion, risk of disease and mortality, etc.

- People choose locations by trading off these costs against benefits. This is what we call a "spatial equilibrium".
  - It’s why people concentrate, but in different places.
  - No one city is so attractive that everyone resides there.

- Similar spatial patterns can also be seen within cities.
Some Motivating Theory
The Spatial Impossibility Theorem: Costless mobility

Consider an economy with CRS production technology, perfect competition, a homogeneous set of locations and where movement of factors across locations was costless and frictionless.

Any inequalities in profits, prices and utility would be eliminated by the movement of factors across space.

“At spatial equilibrium, the remuneration of each production factor must then be the same across regions.” (Fujita and Thisse 2009)

No spatial concentration of activity or populations!

But that's not true in reality, is it?
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The Spatial Impossibility Theorem: Transport costs

Let’s now add transport costs to our very simple model. Factor mobility is still frictionless, but trading goods between locations is costly.
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![Graph showing the relationship between price and distance, indicating that price increases with distance.](image)
The Spatial Impossibility Theorem: Transport costs

Let’s now add transport costs to our very simple model. Factor mobility is still frictionless, but trading goods between locations is costly.

- As a result, all locations become autarkic: they will produce for their local market and consume all the production locally.
- No transport costs are paid and no one travels.
The Spatial Impossibility Theorem: No trade across space

- Starrett (1978): “Consider an Arrow-Debreu economy with a finite number of agents and locations. If space is homogeneous and transport is costly, then there is no competitive equilibrium involving transportation.”

- But does not coincide with reality: where not everything is produced/consumed everywhere, and activity and people agglomerate!
Duranton and Puga (2004):

"To justify the existence of cities, perhaps the simplest argument is to invoke the existence of indivisibilities in the provision of certain goods or facilities. Consider a simple example: an ice hockey rink. This is an expensive facility with substantial fixed cost ... While having a community of 1,000 people share a rink is feasible, building a rink for each of those people at 1/1,000th of the usual scale is not."
The Spatial Impossibility Theorem: key assumptions

- If economic activities are perfectly divisible, then in any competitive equilibrium, each location operates autonomously.
- Only when economic activities are not perfectly divisible or splitting them involves extra costs, the location of the activity (and transportation) becomes important.
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- Other assumptions can be relaxed too:
The Spatial Impossibility Theorem: key assumptions

- If economic activities are perfectly divisible, then in any competitive equilibrium, each location operates autonomously.
- Only when economic activities are not perfectly divisible or splitting them involves extra costs, the location of the activity (and transportation) becomes important.
- Other assumptions can be relaxed too:
  - Space is not homogeneous $\Rightarrow$ space is heterogeneous.
  - CRS world $\Rightarrow$ externalities in production or consumption.
  - Markets are imperfectly competitive.
Alternative models of distribution of economic activity

- **Comparative Advantages**
  - Spatial heterogeneity between regions or neighborhoods in productivity or amenities.

- **Agglomeration Externalities**
  - Spatial interactions that yield increasing returns to agglomeration external to the firm: knowledge spillovers, business communications, face-to-face communication, etc.

- **Imperfect Competition**
  - Firms are no longer price-takers, but have some form of market power (e.g. monopolistic competition).
“Urban Economics” VS “Regional Economics”
What is Urban Economics?

Fujita and Thisse (2009): “[Urban Economics] aims to explain the internal structure of cities, that is, (i) how land is distributed among plants, offices, dwellings, and infrastructure, and (ii) why cities have one or several central business districts. The basic concept of urban economics is the land market, which serves to allocate both economic agents and activities across space.”
What is Regional Economics?

Fujita and Thisse (2009): “In contrast, economic geography or, to use the most common terminology, New Economic Geography (henceforth, NEG) has a well-defined and yet broad objective: it is the first body of economics that seeks to provide a detailed description of spatial inequalities that emerge as the outcome of a full-fledged general equilibrium model.”
Our view on the subject

- Urban Economics as a field has changed a lot since Fujita and Thisse (2009). A lot of the “full-fledged general equilibrium” modelling of economic geography has appeared in urban econ. as well.

- But the key distinctive feature of urban and regional economics is that it takes the idea of space seriously when thinking about economic questions.
Next Class
Spatial equilibrium: canonical urban models

What determines the spatial distribution of people and economic activity?

1. **within cities**
   - The Alonso-Muth-Mills model
   - a.k.a the monocentric city model
   - following *Alonso (1964), Mills (1967) and Muth (1969).*

2. **across cities**
   - The Rosen-Roback model
   - following *Rosen (1974) and Roback (1982).*
Reading for next class


As you read, try to answer on your own:

▶ What are the key features of cities that the Alonso-Muth-Mills model tries to explain?

▶ What is the key compensating differential in this model?

▶ What are they key assumptions of the model?

▶ How does utility vary throughout the city? Why do we see this variation?

▶ Explain equation 5 in Brueckner (1987).

▶ How do the “closed-city” and “open-city” versions of the model differ? Which variable becomes endogenous, and which is exogenously fixed in each case?
References


References


