Applied Econometrics - TD

Jean-Baptiste Guiffard (CREST, Telecom-Paris)

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About Me

Jean-Baptiste Guiffard

- **Position**: Post-doctoral researcher at Telecom Paris (2024 - 2026)
- PhD in Economics, Université Paris-1 Panthéon-Sorbonne (2024)
  - Thesis: *Essays in Digital Economics: Three Impact Evaluations of Broadband Internet*

My Research

- **Research Fields**: Digital Economics, Development Economics, Industrial Organization
- **Publications**:
  - Valuing the Virtual: The Impact of Fiber to the Home on Property Prices in France – *Telecommunications Policy* (2024)
  - Impact of Broadband Internet on Preventive Healthcare in Senegal (with P. Kergall) – *Economie et Statistique* (2024)
- **Working papers**:
  - *From Connection to Coordination: High-Speed Internet and Protests in Africa*
  - *Welfare Cost of Mobile Spectrum (Mis)allocation*
  - *From Bytes to Business: Mobile Broadband, Firm Creations, and Digital Divide in Tunisia*

Course Overview

How econometric methods can be used to answer causal questions in the social sciences.

- Explore why drawing causal links in social sciences is often difficult.
- Overcoming these challenges by learning advanced econometric techniques to tackle these issues.
- Applications on more complex real-world data.

By the end of this course

You will be able to...

- Explain when and why econometrics is useful for answering empirical questions.
- Locate and critically engage with the latest empirical economics studies.
- Assess the strengths and limitations of econometric methods used in academic research and policy evaluation.
- Use econometric techniques to evaluate business decisions and public policies.

$\rightarrow$ Apply what you learnt in a group project

Today's Agenda

1. Forming Groups: Organize into groups of 4 or 5 students.
2. Choosing a Topic: Select a research question that interests your group.
3. Start Researching: Begin searching for relevant academic papers to guide your project.

Choose Your Question

Select a relevant and interesting causal question to study.

Here are some examples (seen in course):

- What is the impact of immigration on local wages?
- Does minimum wage harm employment?
- Can microfinance reduce poverty?
- How much of the gender wage gap is explained by children?
- What roles do nature and nurture play in intergenerational skill transmission?
- Does mobile money foster development?
- Do gender quotas in politics improve women's lives?
- Does corporate investment respond to corporate tax changes?
- Does labor supply respond to in-work benefits (e.g., EITC)?
- How responsive is labor supply to tax rates?
- Does basic income discourage labor supply?
- How does a better school affect children's outcomes?
- Does access to external finance boost productivity?

Develop Your Question

Motivate the Question: Why is this question significant in economic research and real-world policy?

Identify Relevant Papers: Look for research in journals and platforms such as:

- *Journal of Economic Literature*
- *Journal of Economic Perspectives*
- *Annual Review of Economics*
- *Voxeu.org*
- *Voxdev.org*

Project Structure

Your project should include the following elements:

Motivation : Provide a brief overview of why the question is important to explore.

Literature Review

Paper 1: Discuss the methods and results of the first paper.

Paper 2: Present the methods and findings of the second paper.

Synthesis: Compare and contrast the findings from both papers. What insights can be drawn?

Evaluation Criteria

- Active Participation (Lectures & Tutorials): Individual grade: 30%
- Oral Presentation: Individual grade: 20%
- Final Paper: Group grade: 50%

Attention: Important Guidelines for Topic and Paper Selection

Topic Selection:

- **Focus on Microeconometrics**: The topic should be related to applied econometrics and microeconomic questions.

Paper Selection:

- Only Empirical Papers with the methods seen in class (not theoretical papers). Published in Reputable Journals
- Ensure the papers are published in high-quality journals (e.g., Journal of Econometrics, Review of Economics and Statistics, American Economic Review).
- Prefer articles published a few years ago (avoid papers published within the last 5 years) to ensure the robustness of the findings $\rightarrow$ There are many refinements and complexifications of the methods seen in class
- Choose papers with clear methodologies that are well explained, so you can easily understand and apply the techniques in your own project.

Quick overview of different impact evaluation methods

Experiments (Randomized Control Trials - RCT)

- Participants are randomly assigned to treatment and control groups.
- This randomization eliminates selection bias, ensuring that differences in outcomes can be attributed to the treatment.
- Commonly used to evaluate the causal impact of interventions (e.g., policies, programs).

Instrumental Variables (IV)

- Used when there is endogeneity (e.g., unobserved factors affecting both treatment and outcome).
- An **instrument** (a variable correlated with the treatment but not with the outcome) is used to isolate the causal effect of the treatment.
- Often applied when randomization is not feasible, and there is concern about omitted variable bias.

Regression Discontinuity Design (RDD)

- Exploits a cutoff point (e.g., income threshold) to assign treatment to those just above the cutoff.
- Compares individuals just below and above the cutoff to estimate the causal effect of the treatment.
- Useful when random assignment is not possible, but there is a clear rule for receiving treatment.

Panel Data

- Uses data collected over time for the same individuals or entities.
- Helps control for unobserved heterogeneity by examining within-individual changes over time.
- Ideal for studying dynamic changes and capturing individual-specific effects.

Difference-in-Differences (DiD)

- Compares the changes in outcomes over time between a treatment group and a control group.
- Useful for evaluating policy changes or interventions that affect one group but not the other.
- Applied when pre-treatment and post-treatment data are available for both treated and control groups.

Event Studies

- Analyzes the impact of a specific event (e.g., policy change, financial crisis) on an outcome over time.
- Typically examines the event's effect before, during, and after its occurrence.
- Used to study the effects of unexpected shocks or events on various outcomes.

Matching

- Matches treated units with similar untreated units based on observable characteristics.
- Aims to create a synthetic control group that resembles the treatment group as closely as possible.
- Used when randomization is not possible but an observational study is required.

Synthetic Control

- Constructs a synthetic control group by combining multiple untreated units to match the characteristics of the treated unit before the treatment.
- Allows for a comparison of treated and synthetic control group outcomes.
- Applied when studying the effect of an intervention on a single unit (e.g., country, region) over time.

How to analyze the articles ?

Example of the RCT Checklist

1. Failed randomization?
2. Non-random attrition?
3. Imperfect compliance?
4. Lack of power?
5. Hawthorne effects?
6. Spillovers on the control group?
7. Scalable?
8. External validity?

During This Session and Beyond

First Session Organization

- Form your groups.
- Define your research topic.
- Start searching for relevant articles.

Upcoming Sessions Organization

- Each session, groups will present their progress for 10 minutes.
- Present what you've accomplished and discuss any challenges or questions.

Prepare for Next Week:

- Finalize your research question.
- Find and review two relevant articles.
- Be ready to present your work (10 minutes max) and ask questions for feedback.