

E471 Empirical topics in International Trade

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Objectives

The goal of this course is to introduce students to central and recent empirical work in international trade. We will discuss the derivation and estimation of gravity models for international trade and develop an understanding of state-of-the-art empirical techniques used in international economics, including recent difference-in-differences methods for evaluating trade policy. The lecture is complemented by a tutorial in which we learn to handle and visualize trade data, replicate empirical studies and estimate gravity models using the statistical program R.

Writing code is no longer the hard part of empirical work. Throughout the course, the emphasis is on the core skills you need to conduct empirical research: stating precisely what an estimate is meant to measure, knowing what the code must do to deliver it, and checking that it did. After attending the course, students will be able to analyze trade data, evaluate existing research and carry out their own empirical research in international economics.

Prerequisites

Ideally you took the course International Trade Theory (E421). At the very least, you should have knowledge at the level of *Feenstra & Taylor, International Economics*, or *Krugman, Obstfeld & Melitz, International Trade Theory and Policy*. You should have taken Advanced Microeconomics (E424). Ideally, you took Advanced Microeconometrics (S422) or, at the very least, you should have knowledge at the level of *Wooldridge, Introductory Econometrics*.

No prior experience with R is required. The first tutorial sessions cover setting up R and RStudio, organizing a project, and how R finds your files; the pace of the first weeks will be adjusted to the background of the group.

Laptop requirements for this course

For this course, you need to bring a laptop to every session to run R and RStudio.

- Supported devices: Windows laptops (not in S mode), Apple Mac laptops, and Linux laptops.

- Not supported in class: iPads, Android tablets and Chromebooks. They either cannot run R and RStudio or need setup steps we cannot support in class.

If you only have a Chromebook or tablet, you can use R in the browser through Posit Cloud (formerly RStudio Cloud). Its free plan is limited in memory (1 GB) and monthly hours (25), so you will not be able to work with some of the larger datasets, and you may run out of hours. Where Posit Cloud is not enough, you can reproduce the analysis on the computers in the department's PC lab.

Course material

All course materials will be made available on ILIAS.

Evaluation

Evaluation is based on two components, weighted equally. Both are mandatory, and you must pass both to pass the course.

1. **Group data project with presentation and discussion (50%)**: you will work in groups of 3 to 4 people. Each group works on an empirical question with a given dataset, carries out the analysis in R, and presents its results. The presentation is followed by a discussion in which each member of the group should be able to explain the choices made in the analysis and what the code does. You will hand in your presentation slides and the script producing all your results.
2. **Written exam (50%)**: an individual, in-class written exam of 90 minutes.

Syllabus

1. Introduction: The structure of international trade. Empirical approaches to international trade. Analyzing trade flows with R. (6 units: 1 lecture, 5 R sessions)
2. The gravity model: Introduction. Traditional gravity. An intuitive starting point. (2 units: 1 lecture, 1 R session)
3. Structural gravity: A first theoretical foundation. The “border” puzzle. (2 units: 1 lecture, 1 R session)
4. Gravity estimation: From theory to empirics. Challenges, solutions and best practices. Interpretation of gravity estimates. (2 units: 1 lecture, 1 R session)
5. Partial equilibrium trade policy analysis: Regional trade agreements, WTO accession and unilateral trade policy. (2 units: 1 lecture, 1 R session)
6. Staggered difference-in-differences approach to estimating gravity models. (4 units: 2 lectures, 2 R sessions)
7. Measuring the effects of recent tariff episodes. (2 units: 1 lecture, 1 R session)

References

Bowen, H., A. Hollander and J. Viaene (2012), *Applied International Trade*, 2nd ed., Palgrave Macmillan, [Link to E-book](#)

Caliendo, L. and F. Parro (2022), Trade Policy, in G. Gopinath, E. Helpman and K. Rogoff (eds.), *Handbook of International Economics*, Vol. 5, Elsevier, 219–295.

Feenstra, R.C. (2016), *Advanced International Trade: Theory and Evidence*, 2nd ed., Princeton University Press (20 copies available in the University Library)

Head, K. and T. Mayer (2014), Gravity Equations: Workhorse, Toolkit, and Cookbook, in G. Gopinath, E. Helpman and K. Rogoff (eds.), *Handbook of International Economics*, Vol. 4, Elsevier, 131–195.

Larch, M., S. Shikher and Y.V. Yotov (2025), Estimating Gravity Equations: Theory Implications, Econometric Developments, and Practical Recommendations, *Review of International Economics* 33(5), 1066–1092.

Nagengast, A.J. and Y.V. Yotov (2025), Staggered Difference-in-Differences in Gravity Settings: Revisiting the Effects of Trade Agreements, *American Economic Journal: Applied Economics* 17(1), 271–296.

Yotov, Y.V., R. Piermartini, J.-A. Monteiro and M. Larch (2016), *An Advanced Guide to Trade Policy Analysis: The Structural Gravity Model*, WTO Publications, [Link](#)

Further selected readings on each topic will be given during the course.

R resources

[R for Data Science \(2e\)](#), Wickham, Çetinkaya-Rundel and Golemund

[ggplot2: Elegant Graphics for Data Analysis](#), Wickham, Navarro and Pedersen

[Data Visualization: A Practical Introduction](#), Healy