E673: Microeconometrics

Spring 2023

Instructor:	Stefan Weiergraeber	**Time:**	MW 1:15pm–2:30pm
Email:	sweiergr@iu.edu	**Room:**	SY 137

Course Pages:

- All announcements and course materials will be posted on Canvas. Please check it regularly.

Office Hours: Monday 2:50pm–4:30pm or by appointment

Objectives: The purpose of this course is to prepare students to understand and conduct cutting-edge research in the field of Microeconometrics and Applied Microeconomics. After having taken this course students should be able to critically assess empirical papers in fields such as IO, labor, trade, et cetera. Many of the methods discussed in class will also be helpful to empirically analyze macroeconomic questions using microdata. Although the focus of this class is on applied work, we will also discuss the underlying econometric theory. The (approximately) first 8 weeks cover some core topics on panel data analysis and discrete-choice models. In the second half of the semester, we will tailor the course towards your interests discussing important methods used in recent econometric and empirical papers. Several tutorial sessions will complement the lectures with data-based exercises.

Prerequisites: E571, E572, E671 or equivalent first-year graduate Econometrics.

Main References: There is no required textbook for this course. Depending on the topics we will cover, I will draw material from the following recommended textbooks and lecture notes.

- Jeffery M. Wooldridge, *Econometric Analysis of Cross Section and Panel Data*, The MIT Press, 2nd edition 2010.
- Kenneth E. Train, *Discrete Choice Methods with Simulation*, Cambridge University Press, 2nd edition 2009.
- A. Colin Cameron and Pravin K. Trivedi, *Microeconometrics: Methods and Applications*, Cambridge University Press, 2005.
- Joshua D. Angrist and Joern-Steffen Pischke, *Mostly Harmless Econometrics: An Empiricist's Companion*, Princeton University Press, 2009.
- Fumio Hayashi, *Econometrics*, Princeton University Press, 2000.
- Bruce E. Hansen, *Econometrics*, Lecture notes available on his webpage

A key part of the course is to introduce you to structural econometrics, and how economists can design better empirical analyses by combining economic theory and econometric methods. There are plenty of excellent textbooks that you can use to refresh your knowledge about the theoretical models most relevant in your field.

Software: For the empirical exercises you are free to choose which software to use. Personally, I recommend using MATLAB, Python or R. If necessary, we will use several tutorial sessions to introduce you to the fundamentals of the software.

Grading Policy: Homeworks (25%), student presentation (25%), referee report (25%), final take home exam (25%). Please see the syllabus page on Canvas for more information, especially on the student presentation and the referee report.

Important Dates:

> Student Presentations: TBD (depending on how many student take this class)
> Final Exam: The final exam will be cumulative, 24-hour take home and open book. It will take place on May 1, 2023 starting at 10:20am.

Tentative Course Outline:

Week 1: Introduction & review of estimation techniques .....
Week 2: Review of estimation techniques & linear panel models: RE & FE .....
Week 3: Linear panel models: FD, dynamic panels .....
Week 4: Difference-in-Differences & repeated cross sections .....
Week 5: Regression discontinuity design .....
Week 6: Production function estimation .....
Week 7: Introduction to discrete-choice models .....
Week 8: Logit models .....
Week 9: GEV models .....
Week 10: Probit models .....
Week 11: Overview: Estimating demand for differentiated products .....
Week 12: Overview: Best practices for empirical work .....
Week 13: Student Presentations I: Platform markets and consumer search .....
Week 14: Student Presentations II: Topics in discrete-choice models .....
Week 15: Student Presentations III: Topics in firm conduct .....
Week 16: Student Presentations IV: Strategic firm behavior in the cable TV industry .....

Policies:

- **Academic Integrity:** As a student at IU, you are expected to adhere to the standards and policies detailed in the Code of Student Rights, Responsibilities, and Conduct. When you submit an assignment with your name on it, you are signifying that the work contained therein is yours, unless otherwise cited or referenced. Any ideas or materials taken from another source for either written or oral use must be fully acknowledged. If you are unsure about the expectations for completing an assignment or taking a test or exam, be sure to seek clarification beforehand. All suspected violations of the Code will be handled according to University policies. Sanctions for academic misconduct may include a failing grade on the assignment, reduction in your final course grade, a failing grade in the course, among other possibilities, and must include a report to the Dean of Students, who may impose additional disciplinary sanctions.

- **Special circumstances:** Students requiring any type of special classroom/testing accommodation for a disability, religious belief, scheduling conflict, or other impairment that might affect his or her successful completion of this course must personally present the requested remedy or other adjustment in written form (signed and dated) to the instructor, i.e. supporting memorandum of accommodation from the Office of Disabilities Services for Students. Requests for accommodations must be received and authorized by the instructor in written form no less than two weeks in advance of need. No accommodation should be assumed unless so authorized. In the event of needs identified later in the course, or for which an adjustment cannot be made on a timely basis, a grade of "I", Incomplete, for the course will be given to accommodate the unanticipated request.

- **Exam absences:** In the event of a catastrophic (and documented) occurrence which necessitates an absence from a scheduled exam, the student should immediately seek the instructor's *permission to miss an exam.* If approval is granted, the weights of the student's scores for the other exams will be re-adjusted proportionately, so as to make up for the missed exam. If completed documentation is not presented within one week after a missed exam, or if no *permission to miss a exam* has been obtained prior to the exam date, the missed exam will received a score of zero points.

READING LIST

In the following I provide a list of papers from which you can choose for your student presentation. Please pick one of the paper and claim it by responding in the relevant Canvas discussion (on a first-come-first-serve basis). For a list of the referee report papers, please see the relevant Canvas page, where I uploaded the papers directly.

Paper List for Student Presentations

[4] Daniel A Ackerberg. "Advertising, learning, and consumer choice in experience good markets: an empirical examination". In: *International Economic Review* 44.3 (2003), pp. 1007–1040.

[5] Daniel A Ackerberg, Kevin Caves, and Garth Frazer. "Identification properties of recent production function estimators". In: *Econometrica* 83.6 (2015), pp. 2411–2451.

[6] Daniel A Ackerberg, Marc Rysman, et al. "Unobserved Product Differentiation in Discrete-Choice Models: Estimating Price Elasticities and Welfare Effects". In: *RAND Journal of Economics* 36.4 (2005), pp. 771–788.

[24] Steven Berry, James Levinsohn, and Ariel Pakes. "Differentiated Products Demand Systems from a Combination of Micro and Macro Data: The New Car Market". In: *Journal of Political Economy* 112.1 (2004), pp. 68–105.

[26] Steven Berry and Ariel Pakes. "The pure characteristics demand model". In: *International Economic Review* 48.4 (2007), pp. 1193–1225.

[31] Steven T. Berry and Philip A. Haile. "Identification in Differentiated Products Markets Using Market Level Data". In: *Econometrica* 82 (2014), pp. 1749–1797.

[39] Timothy F Bresnahan. "Competition and collusion in the American automobile industry: The 1955 price war". In: *The Journal of Industrial Economics* (1987), pp. 457–482.

[51] Gregory S Crawford, Oleksandr Shcherbakov, and Matthew Shum. "Quality overprovision in cable television markets". In: *American Economic Review* 109.3 (2019), pp. 956–95.

[52] Gregory S Crawford and Matthew Shum. "Uncertainty and learning in pharmaceutical demand". In: *econometrica* 73.4 (2005), pp. 1137–1173.

[53] Gregory S Crawford and Ali Yurukoglu. "The welfare effects of bundling in multichannel television markets". In: *American Economic Review* 102.2 (2012), pp. 643–85.

[54] Gregory S Crawford et al. "The welfare effects of vertical integration in multichannel television markets". In: *Econometrica* 86.3 (2018), pp. 891–954.

[62] Jean-Pierre Dubé, Günter J Hitsch, and Peter E Rossi. "State dependence and alternative explanations for consumer inertia". In: *The RAND Journal of Economics* 41.3 (2010), pp. 417–445.

[69] Amit Gandhi and Jean-François Houde. *Measuring Substitution Patterns in Differentiated-Products Industries*. Tech. rep. National Bureau of Economic Research, 2019.

[75] Ronald L Goettler and Brett R Gordon. "Does AMD spur Intel to innovate more?" In: *Journal of Political Economy* 119.6 (2011), pp. 1141–1200.

[80] Gautam Gowrisankaran. "A Dynamic Model of Endogenous Horizonal Mergers". In: *RAND Journal of Economics* 30 (1 1999), pp. 56–83.

[81] Gautam Gowrisankaran and Marc Rysman. "Dynamics of consumer demand for new durable goods". In: *Journal of political Economy* 120.6 (2012), pp. 1173–1219.

[94] Igal Hendel and Aviv Nevo. "Intertemporal price discrimination in storable goods markets". In: *American Economic Review* 103.7 (2013), pp. 2722–51.

[95] Igal Hendel and Aviv Nevo. "Measuring the implications of sales and consumer inventory behavior". In: *Econometrica* 74.6 (2006), pp. 1637–1673.

[99] Han Hong and Matthew Shum. "Using price distributions to estimate search costs". In: *RAND Journal of Economics* 37 (2 2006), pp. 257–275.

[118] Phillip Leslie. "Price Discrimination in Broadway Theater". In: *RAND Journal of Economics* 35 (3 2004), pp. 520–541.

[127] Brian McManus. "Nonlinear pricing in an oligopoly market: the case of specialty coffee". In: *RAND Journal of Economics* 38 (2 2007), pp. 512–532.

[159] Oleksandr Shcherbakov. "Measuring consumer switching costs in the television industry". In: *The RAND Journal of Economics* 47.2 (2016), pp. 366–393.

Guidance for reading empirical papers

The following questions might help you to become a better critical reader of empirical papers. Thinking through them as you read may help you organize your thoughts and prepare a discussion in class. Naturally, some questions will be more or less relevant for a specific paper than others.

1. What are the objectives of the paper? For example: development of a new method for estimation or testing? estimation of policy-relevant parameters/distributions? counterfactual simulations? testing a model versus alternative models? measurement of an effect predicted by theory or intuition?

2. Why is the paper important according to the authors?

3. Does the paper address an interesting economic question?

4. What methodological challenges does the author overcome? What methodological challenges limit the paper?

5. What is the theoretical foundation upon which the empirical model is based? How appropriate is the model for the empirical application?

6. How tight is the relationship between the theoretical and empirical models, for example, are key estimating equations derived from the economic model or is the model used to derive testable restrictions?

7. What data do the authors use? What is the unit of observation? Can you imagine other types of data to which the analysis might be better applied?

8. What are the key variables in the empirical model? How well do these correspond to the quantities they are intended to measure?

9. What are the sources of randomness in the empirical model? Are these in the theoretical model too?

10. What is assumed to be exogenous and what is endogenous?
11. Intuitively, what variation in the data identifies the key components of the empirical model?
12. If the paper uses a structural approach:
    (a) Why do the authors estimate a structural model?
    (b) Are there overidentifying restrictions of the model that could be tested? Do the authors perform these tests?
13. If the paper uses a descriptive or reduced-form empirical analysis:
    (a) What are the advantages of using a descriptive analysis for the questions being addressed in the paper? Are there limitations?
    (b) Are the economic interpretations of the estimates and hypotheses clear? Are these the interpretations given by the authors?
14. Are there importance factors left out of the empirical model? If so, what can you say about the likely effect on the empirical results?
15. What conclusions do the authors reach based on the analyses? What alternative interpretations of the results are plausible? Do the authors provide evidence against these alternatives? Can you think of other ways to test some plausible alternatives?
16. What are the most important contributions of the paper in your opinion?
17. What are the most important shortcomings of the paper? Can you think of approaches to address them?