

The Johns Hopkins University
Zanvyl Krieger School of Arts and Sciences
Applied Economics Department in Applied Economics

SYLLABUS

440.618 Microeconometrics

Instructor: Christopher Adams
Email: cpadams@jhu.edu
Class Time: 6:00 - 8:30 pm Thursdays
Start: September 6 2018
Final: December 13 2018

Office Hours: Before and after class as needed or by appointment

Website: <https://sites.google.com/view/adamsmetrics/>

Overview: This course will cover a range of advanced econometric techniques frequently encountered in microeconomic analysis, the analysis of individual-level data on the economic behavior of individuals or firms. We will review classical regression and cover relevant econometric theory of cross section and panel data models. We will focus on the identification of causality and treatment effects using experiments, bounds and behavioral assumptions. Methods such as Instrumental Variable (IV), Difference-in-Difference (DiD) will be emphasized. We will also cover other advanced topics such as mixture models, factor models, and machine learning. By the end of the course, students will have a good understanding of applied microeconometrics by putting it into practice. They will have learned how to approach and analyze significant research questions using micro-data and appropriate estimation techniques.

Prerequisites: Statistics and Econometrics

Textbook: *Microeconometrics - Methods and Applications* by Cameron and Trivedi

Grading:

1. Participation - 5%
2. Homework - $4 \times 10\% = 40\%$. These assignments will predominantly consist of computational exercises, though they will include some analytical questions as well. Students are encouraged to work together on these assignments. For exercises involving computation, your code must be submitted.
3. Paper - 30% (Draft 10% Due 11/8, Final 20% Due 11/29). With a new data set or novel question, conduct standard analysis, or alternatively, with an existing data set replicate previous analysis. Provide a discussion of the problems and issues with the analysis

performed. Conduct a simple alternative analysis that accounts for the problems raised. The draft paper should outline the question(s) of interest, provide a short literature review, describe the data source and the proposed empirical framework for the analysis, as well as include some descriptive statistics. The final paper should include the empirical results, as well as interpretation and discussion of those results.

4. Final - 25%. The final will follow the homework assignments closely.

Tentative Schedule:

Introduction

9/6

- Theory: Introductions. Causality, treatment effects and uncertainty.
 - Text: Ch 2, 25
- Application: Should we subsidize college?
- Practical: Introduction to R
 - [Download Rstudio and R](#)
 - [R for Researchers \(UW-Madison Social Science Computing Cooperative\)](#)
 - [Data \(from Google Drive\)](#)

Causality, Experiments and Identification

9/13

- Theory: Ordinary Least Squares
 - Text: Ch 4.1-4.4
- Application: Returns to Schooling
 - [Card \(1993\), Using Geographic Variation](#)
- Practical: Card's Returns to Schooling data
 - [Data \(from Google Drive\)](#)
 - [R for Researchers: OLS \(UW-Madison SSCC\)](#)

9/20

HW1 Due 6.30pm

- Theory: Ordinary Least Squares
 - Text: Ch 4.1-4.4
- Application: Returns to Schooling
 - [Card \(1993\), Using Geographic Variation](#)
- Practical: Card's Returns to Schooling data
 - [Data \(from Google Drive\)](#)

9/27

- Theory: Instrumental Variables
 - Text: Ch 4.9, 25.7
 - [Imbens and Wooldridge \(2007\), What's New in Econometrics: LATE](#)
- Application: Returns to Schooling

- [Card \(1993\), Using Geographic Variation](#)
- Practical: Estimating IV on Card data
 - [Data](#)

10/4

HW2 Due 6.30pm

- Theory: Instrumental Variables
 - Text: Ch 4.9, 25.7
 - [Imbens and Wooldridge \(2007\), What's New in Econometrics: LATE](#)
- Application: Returns to Schooling
 - [Card \(1993\), Using Geographic Variation](#)
- Practical: Estimating IV on Card data
 - [Data](#)

10/11

- Theory: Identification and Bounds
 - Text: Ch 2, 25
 - [Rubin \(1974\), Estimating Causal Effects](#)
 - [Imbens and Wooldridge \(2007\), What's New In Econometrics: Bounds](#)
 - [Manski \(1990\), Nonparametric Bounds on Treatment Effects](#)
 - [Angrist, Treatment Effects](#) (thanks to Jeremy for the pointer)
- Application: Bounds on Returns to Schooling
 - [Manski and Pepper \(2000\), Monotone Instrumental Variables](#)
- Practical: Estimate bounds on Card data
 - [Data](#)

Causality, Structure and Identification

10/18

HW 3 Due 6.30pm

- Theory: Choice Model
 - Text: Ch 14
 - [Imbens and Wooldridge \(2007\), What's New in Econometrics: Discrete Choice](#)
 - [Berry \(1994\), Estimating Discrete Choice](#)
- Application: Demand for BART
 - [McFadden \(1974\), Measurement of Urban Travel](#)
- Practical: Fishing data

10/25

- Theory: Choice Model
 - Text: Ch 14
 - [Imbens and Wooldridge \(2007\), What's New in Econometrics: Discrete Choice](#)
 - [Berry \(1994\), Estimating Discrete Choice](#)
- Application:
- Practical:

11/1

HW4 Due 6.30pm

- Theory: Roy Model
 - Text: Ch 16
- Application: Returns to Schooling
 - Text: Ch 16.7.1
- Practical: Returns to Schooling
 - [Data](#)
 - [NLSY97](#) (Google Sheets)
 - [Variable names \(pdf\)](#)
 - [NLS Investigator website](#)

11/8

Paper Due Draft 6.30pm

- Theory: Auctions
 - [Vickery \(1961\), Counterspeculation, Auctions and Competitive Sealed Bidders](#)
- Application:
- Practical:

Unobserved Differences

11/15

- Theory: Panel Data
 - Text: Ch 21, 22.6
 - [Card and Krueger \(1994\), Minimum Wage and Employment](#)
 - [Currie and Fallick \(1996\), Minimum Wage and Employment of Youth](#)
 - [Doudchenko and Imbens \(2016\), Balancing, Regression, Difference-in-Difference](#)
- Application: Minimum Wage
 - [Senate Testimony by Alan Krueger in 1995](#) (starts about 3.18.00)
- Practical: Minimum Wage
 - [Data](#) (Google sheet)
 - [Column Names](#) (Google Sheet)

11/22 Thanksgiving (No Class)

11/29

Paper Due 6.30pm

- Theory: Panel Data
 - Text: Ch 21, 22.6
 - [Card and Krueger \(1994\), Minimum Wage and Employment](#)
 - [Currie and Fallick \(1996\), Minimum Wage and Employment of Youth](#)
 - [Doudchenko and Imbens \(2016\), Balancing, Regression, Difference-in-Difference](#)
- Application:
- Practical:

12/6

Practice Problems (Not Due)

- Review
- Machine Learning

12/13
Final

Computing: In the course, I will use R to analyze problems and illustrate concepts. Students will need to bring a computer to class with R and R-Studio installed. R-studio (and link to R) are available here: <https://www.rstudio.com/products/rstudio/download/>. The software is free. I will cover basic R programming and set-up. Note that students may use alternative languages in their homework problems and the paper. Stata is available in the JHU computer lab, and can be purchased for home use at a student discount price: See <http://www.stata.com/order/new/edu/gradplans/campusgradplan/> You might also want to check the JHU's website with resources on using Stata: <http://www.stata.com/links/resources-for-learning-stata/>

University Ethics Statement: The strength of Johns Hopkins University depends on academic and personal integrity. In this course, you must be honest and truthful. Ethical violations include cheating on exams, plagiarism, reuse of assignments, improper use of the Internet and electronic devices, unauthorized collaboration, alteration of graded assignments, forgery and falsification, lying, facilitating academic dishonesty, and unfair competition. Report any violations you witness to the instructor. You may consult the associate dean of students and/or the chairman of the Ethics Board beforehand. See the guide on "Academic Ethics for Undergraduates" and the Ethics Board web site for more information.

Disability Resources: The Johns Hopkins University is committed to providing reasonable and appropriate accommodations to students with disabilities. Students in Advanced Academic Programs (AAP) who are in need of accommodations should visit <http://advanced.jhu.edu/current-students/current-students-resources/disability-accommodations/> for the appropriate steps and documentation needed. Requesting accommodations before the semester is preferable, but not required. The student should submit the Request for Accommodation Form prior to the beginning of each semester (s)he is registered to ensure that accommodations continue for that semester. Depending on the accommodation, there may be a time delay before accommodations can be implemented.