COURSE GOALS AND DESCRIPTION

Course Description

This course aims to connect microeconometric methods with empirical practice. Topics include linear and nonlinear models, causal inference (instrumental variables, difference-in-differences, regression discontinuity, matching, synthetic controls), and techniques for correct statistical inference (robust tests under weak identification, clustering, bootstrap, randomization inference). The course will be taught by example, using a published paper as an illustration for the techniques to be discussed. The discussion will focus on what tools are appropriate for what type of data and empirical questions. The course provides ample opportunity to practice using the tools covered with real data sets from published articles. It also offers training in scientific writing and proper techniques of presenting empirical results.

Course Objectives

1. To introduce the most important and commonly used econometric tools for microeconomic applications. The focus in this course is on reduced form methods.

2. To illustrate the use of linear models in microeconomics, emphasizing both the practical implementation of these models and the application of these models to the question of causal inference.

3. To familiarize students with modern statistical and econometric software (Stata and MATLAB) in order to use these models and techniques. A self-study Matlab tutorial will
be provided. Problem sets using Stata will focus on replicating published papers.

REQUIREMENTS

Students are expected to have completed the first year sequence in econometrics either in the Economics department or in AREC.

PRINCIPAL TEXT


SUPPLEMENTARY TEXTS

Cameron, A.C., and P.K. Trivedi, Microeconometrics, Methods and Applications, Cambridge, 2005.

ADDITIONAL GENERAL REFERENCES

In addition to the above texts, below is a list of additional texts that may be helpful as background reading.

GRADING POLICY

Econometrics Quiz 0%
Homework 50%
Final Exam 50%

Problem Set Due Dates

“PS short” are short problem sets that will be recorded as handed in on time/not handed in on time but will not be part of the final course grade if handed in on time. “PS long” are longer problem sets that require carefully typed answers, and that will be graded as part of the course grade.

9/16 PS 1 short due
9/30 PS 1 long due
10/7 PS 2 short due
10/21 PS2 long due
10/28 PS3 short due
11/18 PS3 long due
12/9 PS4 long due

FINAL EXAM: Final Exam Week – Take Home Exam.

UNIVERSITY AND GRADUATE SCHOOL RULES AND REGULATIONS:

University policies can be found here: https://policies.umd.edu/In particular:
- https://policies.umd.edu/research/university-of-maryland-intellectual-property-policy

All graduate school policies can be found here: https://gradschool.umd.edu/course-related-policies
OURSE OUTLINE AND TIME TABLE

All references to AP as well as papers listed under Applications and discussed in class are required reading. Other papers discussed in class are recommended, with an understanding that more technical material is outside the scope of the course.

1. **Causal Inference, Experimental Ideal, Rubin Causal Model**

   **References:**
   AP, ch1


2. **Linear Regression, Regression Control, Dummy variables and Interactive Effects**

   **References:**
   AP, ch3

   **Applications**


   Jacob, Brian and Jens Ludwig (2012), The Effects of Housing Assistance on Labor Supply:

3. **Instrumental Variables – Basics, LATE**

   References:
   AP, ch4

   *Applications*


   *Econometric Theory*


w25691, NBER.


4. Difference in Difference
References:
AP, ch5

Applications


Richardson, G. and W. Troost (2009), Monetary Intervention Mitigated Banking Panics During the Great Depression: Quasi Experimental Evidence from a Federal Reserve District Border, 1929-1933.

Theory


De Chaisemartin C. and X. D’Haultfoeuille (2018), Fuzzy Differences in Differences,
5. **Synthetic Controls**

**Applications**


**Theory**


Ferman, B: On the Properties of the Synthetic Control Estimator with Many Periods and Many Controls, JASA, 2021, 1764-1772.

6. **Matching, Inverse Probability Weighted Estimation**

References:
Applications


Econometric Theory


7. Regression Discontinuity

References:
AP ch 6.

Applications


Econometric Theory


8. **Instrumental Variables – Weak instruments, Many Instruments, Robust Inference**

*Applications:*


*Econometric Theory*


Hausman, Jerry, Whitney Newey, Tiemen Woutersen, John Chao, Norman Swanson (2012), Instrumental variable estimation with heteroskedasticity and many instruments, Quantitative Economics 3, 211–255


Kleibergen, Frank (2005), Testing parameter in GMM without assuming that they are identified. Econometrica, Vol 73, 1103-1123.


9. Robust Standard Errors, Clustering, Bootstrap, Randomization Inference

References:
AP ch 8.

Econometric Theory

Andrews, I and M. Kasy, Publication Bias


Cameron, A. C., Gelbach, J. G., and D. L. Miller (2008), Bootstrap-Based Improvements for Inference with Clustered Errors, Review of Economics and Statistics, 90, 414-427


