Course Syllabus

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Econ 220C

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Department of Economics, UCSD
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Please do not share any course materials online outside of UCSD.

Course Description

The primary goal of Econ 220C is to introduce tools necessary to understand and implement empirical studies in economics focusing on issues other than time-series analysis. This course contains four parts.

1. Part I consists of some background information on causality and structural equations.
2. Part II deals with panel data models: (a) static panel data models (b) dynamic panel data models.
3. Part III tackles econometric theory of extremum estimation. This part is also a preparation for estimating the nonlinear microeconometric models in the next part.
4. Part IV of the course deals with nonlinear microeconometric models:
    1. discrete choice models;
    2. censored and truncated regression models,
    3. sample selection models; and
    4. evaluation of treatment effects.

    While Part IV focuses mainly on cross sectional data, it also covers panel Probit/Logit, panel Tobit, and panel attrition models. From an econometric theory perspective, the unifying framework for Part IV is the asymptotic theory of extremum estimators covered in Part III, which includes GMM as a special case.

We will study different issues in the specification, estimation, and testing of the above models with cross-sectional data and with panel data. The emphasis of the course is on both econometric ideas and econometric techniques.

For some of the problem sets, you will have to deal with actual data or perform simulation experiments. You should become familiar as soon as possible with some general features of the econometric package that you choose. MATLAB is still widely used by econometricians. Stata is popular among applied micro economists. R has been widely used in statistics but not as much in economics. Python has become popular in the machine learning community. You are welcome to use any any programming environment. However, the sample codes that I will post will be in MATLAB and/or Stata.

We have a site license for MATLAB and Stata. For MATLAB, check out **here. (https://blink.ucsd.edu/technology/computers/software-acms/available-software/matlab.html)** Information on downloading and installing Stata is provided on the main page of the course.

Web Page

The course materials will be posted on **canvas.ucsd.edu**. You can make anonymous comments via the course web page.

Text Book

Required Text

Wooldridge, Jeffrey (2010): Econometric Analysis of Cross Section and Panel Data, MIT press, 2nd Edition.
This is the main text for the course.

Recommended Texts

Cameron, A. C. and Trivedi, P.K. (2005): Microeconometrics: Methods and Applications. This book touches a few topics that Wooldridge's book does not. One example is GEE (Generalized Estimating Equations), which is as important in statistics as GMM in econometrics.

Cameron, A. C. and Trivedi, P.K. (2010): Microeconometrics Using Stata. This is a good source to learn **Stata commands (http://www.stata-press.com/data/mus.html)** for microeconometrics.

Mostly harmless econometrics (http://www.mostlyharmlesseconometrics.com/). While I do not agree with many points in the book, it is a good book in an overall sense, especially for those who plan to work on applied microeconomics. If you plan to work on econometrics, you should also read the book. It is important for a theoretical econometrician to be able to communicate with applied economists.

Mastering 'Metrics: The Path from Cause to Effects (http://masteringmetrics.com/) is a less demanding version of **Mostly harmless econometrics (http://www.mostlyharmlesseconometrics.com/)**. If you feel that your background is not strong enough to read the latter, I encourage you to read "Mastering 'Metrics" first.

Causal Inference: the mixtape (https://mixtape.scunning.com/) is an up-to-date text on causal inference methods in econometrics. It touches upon the most recent advances in this area and caters to an applied audience.

Lecture notes will be posted. Despite my best efforts, the lecture notes will still have typographical errors. If you see them, please tell me about them! Doing so will benefit not only you, but also your classmates and any future students of this course. Also, please feel free to let me know if you have any question on any part, and I may rewrite it.

Grading Policy

Grades for Econ 220C will be determined as follows:

20%: Four problem sets, each carrying a weight of 5%.

30%: Midterm, **2:30-4:30pm on May 3, 2024.**

50%: Final Exam

If the class average of the weighted scores is below 70 points, points will be added to all scores to bring the class average to 70 points (no adjustment will be made if the class average is above 70). Based on the possibly adjusted weighted score, the letter grade will be assigned using the following scale:

[90, 100] A+
[85,90) A
[80, 85) A-

[75, 80) B+
[65, 75) B
[55, 65) B-

< 55 C+

If the left tail is too fat, a transform such as max(sqrt(x)*10,x+5) may be applied to exam scores or the weighted scores so that the number of C+'s is small. In any case, the professor reserves the right to make a change to the grading standard.

Office Hours

Yixiao Sun: Mondays, 10:30 am - 11:30 am, SDSC 189E

Haoyu Wei: to be arranged.

TA Section: to be arranged.

General References: Panel Data

Arellano, M. (2003): Panel Data Econometrics. Oxford University Press

Arellano, M. and B. Honore (2001): "Panel data models: some recent developments", in J. J. Heckman and E. E. Leamer (eds), Handbook of Econometrics, Vol. 5, North Holland.

Baltagi, B. H. (2013): Econometric Analysis of Panel Data, Third Edition, John Wiley & Sons, 5th Edition

Chamberlain, G. (1984): Handbook of Econometrics: Chapter 22, Panel Data

Heckman, J. and B. Singer, Handbook of Econometrics: Ch. 29 -Econometric Analysis of Longitudinal Data

Hsiao, C. (2014): Analysis of Panel Data, Cambridge University Press, Third Edition

General References: Microeconometrics

Amemiya. T. (1985): Advanced Econometrics, Cambridge, Harvard University Press. Classic reference on extremum estimation

Cameron, A. C. and Trivedi, P.K. (2005): Microeconometrics: Methods and Applications.

Cameron, A. C. and Trivedi, P.K. (2010): Microeconometrics Using Stata

Deaton, A. (1997): The Analysis of Household Survey, The John Hopkins University Press

Greene, W. H. (2003): Econometric Analysis, Ch 22.

Hayashi (2000): Econometrics, Princeton University Press.

> Both Greene and Hayashi are good reference books but they are weak on the "economics side" of Econometrics.

Kenneth Train (2009): Discrete Choice Methods with Simulation, Second Edition, Cambridge University Press.

A **zip archive** **(https://eml.berkeley.edu/books/choice2.html)** is available for download (2 MB), containing all the chapters.

Maddala, G.S. (1987): Limited Dependent and Qualitative Variables in Econometrics, Classic reference on Limited Dependent and Qualitative Variables.

Wooldridge, Jeffrey (2010): Econometric Analysis of Cross Section and Panel Data, MIT press.