

Statistics 521: Applied Econometrics II

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Office hours: MTuTh, 4:30–6, and by appointment

Class hours and location: MW 1:30–2:50, G86 JMHH

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Course web site

Statistics 521 is using Canvas. You can gain access by going to <https://wharton.instructure.com/courses/215983>. All notes, homework assignments and data sets for the course will be distributed and managed via the website.

Note for non-Wharton students: If you do not have a Wharton computing account, you will need to establish one to access the website. The account also provides access to the computing labs in Wharton and to the intranet. To get an account, go to

<http://apps.wharton.upenn.edu/accounts/class>

After you have requested your account, allow some time for activation.

Wharton students and students who have recently taken a Wharton course have existing accounts.

Materials

Class notes. As noted above, these will be available on Canvas. I will post notes in advance of the lectures. Each posting will provide material for one or more lectures.

Econometric Analysis of Cross Section and Panel Data, 2nd ed., by Jeffrey M. Wooldridge, MIT Press, 2010. This is the course text. Part of it was covered in Statistics 520 during Fall 2011. I expect to cover Chapters 1–6; parts of Chapters 7–8 and 12–16. This plan may be revised as we proceed. This collection of chapters will revisit some of the treatment in Statistics 520. The coverage will extend that given in Statistics 520.

(Optional) *Mostly Harmless Econometrics, An Empiricist's Companion*, by Joshua D. Angrist and Jörn-Steffen Pischke, Princeton University Press, 2009. Part of this book was also covered in Statistics 520 during Fall 2011. I highly recommend you read it. It is written in a refreshing and entertaining style. However, don't be fooled—it can be quite sophisticated and challenging.

(Optional) *Econometrics*, by Fumio Hayashi, Princeton University Press, 2000. Hayashi's treatment differs from that of Wooldridge. His presentation tends to be more mathematical, and it addresses concepts and topics from time series as it proceeds (we will consider only a few issues from time series). Moreover, Hayashi introduces the generalized method of moments (GMM) early in his presentation, noting that ordinary least squares and two-stage least squares are special cases. I encourage you to do some reading in Hayashi. It is instructive and very helpful to see an alternative presentation of econometrics.

Software

The R package will be used in lectures and for homework. R is free software and is available at www.r-project.org.

I expect to use JMP 9 software occasionally in class for plots of data. JMP has excellent graphics.

Course overview

The aims of this course are to study basic econometric techniques. The emphasis will be upon the understanding and use of econometric methodology, and the written communication of the results of data analysis. Topics we will cover include conditional expectation, linear projection, ordinary least squares estimation, instrumental variables estimation, systems of equations, panel data models, M-estimation, maximum likelihood, the generalized method of moments, discrete response models, and some issues in time series analysis. We will explore mathematical and statistical foundations, as well as the application of statistical methodology. We will employ results from linear algebra extensively.

Course requirements

There will be about six homework assignments. These will include theoretical exercises and the analysis of data and interpretation of the findings, and the presentation of well-organized and clearly written reports. The homework is designed to teach and to give experience in the use of econometric methodology. You are encouraged to consult with each other in doing the homework, and also to contact me and/or the teaching assistant for help. *You must submit your own writeup.* Homework must be submitted by the due date specified for the assignment.

Students will submit a final project. This will involve replicating the analysis presented in an empirical paper, and possibly presenting further analyses of the data set used in the paper. As an alternative, you may use a data set of your own choosing and carry out an original analysis. A major goal of this exercise is organization and presentation of a carefully written report. Prior to starting the project, you should submit a brief (not more than one page) project proposal for my review. This proposal is required.

There are no examinations. The course grade will be calculated as 80 per cent homework and 20 per cent final project.

Calendar

There are 27 classes (Monday–Wednesday schedule).

The first class is Wednesday, 11 January.

There is no class Monday, 16 January (Martin Luther King, Jr. holiday).

The drop period ends 17 February.

There are no classes 5 March and 7 March (Spring break week).

The last class is Monday, 23 April.