Economics 628
Topics in Applied Econometrics I
Term 1, 2017-2018

Instructors:

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Course Webpage: http://faculty.arts.ubc.ca/hkasahara/econ628.html

Time and Location: Monday and Wednesday from 12:00-13:30, Neville Scarf 203

Office Hours: Friday 10:00-11:00 and 13:30-14:30 or by appointment
Teaching Assistant: Jasmine Hao, haojasmine@gmail.com

References:

Various journal articles.
Newey, W K. and D. McFadden (1994) [Newey and McFadden]
A.W. vand der Vaart (1998) *Asymptotic Statistics*, Cambridge University Press.
Wooldridge, J. (2010). *Econometric Analysis of Cross Section and Panel Data*, 2nd Edition, MIT Press. [Wooldridge]
Hansen, B. (2016) *Econometrics* [Hansen]
Cameron, C. and P. Trivedi (2005). *Microeconometrics*, Cambridge Univ Press. [CT]
Train, K. (2009). *Discrete Choice Methods with Simulation*, Cambridge Univ Press. [Train]

Course Description: This course covers topics in applied econometrics including (1) estimation of nonlinear models, (2) linear panel data analysis, (3) Bootstrap, (4) simulation-based estimation methods, (5) OLS, IV, and LATE, (6) structural models, (7) cluster sampling. The emphasis will be on learning how to use various applied econometric techniques. There will be seven homework assignments that will require analyzing the data and writing computer codes in Matlab, and they will be an important part of the final grade. For some assignments, I will also ask you to do assignments using STATA but, unless it is explicitly asked to use STATA, you need to complete your assignments in Matlab. No work will be accepted after the lecture on the due date, unless a written proof of the emergency situation that causes the delay is provided. The final exam has two-parts: a theory part and a computer programming (take-home) part.

Grading: Assignments (20% of the final grade), Final theory exam (40%), Final programming exam (40%).

Matlab:

I strongly recommend using Matlab over other softwares in this course. Lectures and problem set questions and solutions will primarily use Matlab. UBC IT has a license agreement with Mathworks that allow student to use Matlab including all toolboxes on UBC owned computer. See

http://it.ubc.ca/services/desktop-print-services/software-licensing/matlab.

Tomlab:

One advantage of using Matlab is that we have a department wide license to use the Tomlab software (https://tomopt.com/tomlab/), where we have licenses for the following packages:

- SOL (i.e NPSOL, SNOPT, NLSSOL) General package of linear and nonlinear optimizers and solvers.
- Knitro for nonlinear solvers, etc. Good alternative to SOL ones, especially for MPEC problems.
- CGO (for costly global optimizer http://tomopt.com/tomlab/optimization/costly.php)
- LGO (for global optimization and costly global with/without derivatives: http://tomopt.com/tomlab/optimization/glb.php)
- MAD (auto-differentiation, used within other libraries)

You can download the latest copy of Tomlab from the following links:

- To download for windows: http://tomopt.com/dist/tomlab-osx64-clang-setup.dmg
- For OSX: http://tomopt.com/dist/tomlab-osx64-clang-setup.dmg

I will forward an email message from Jesse about how to setup Tomlab in your computer including the departmental license.

Course Outline and Readings

***Required Readings**

1. Estimation of Nonlinear Models

   - Limited Dependent Variables (Discrete Choice/Censored Variables/Sample Selection): Wooldridge (Chapters 15.1-15.7, 16.1-16.7, 17.1-17.6)*, CT (Chapters 14-16), Imbens and Wooldridge (2007, Lecture 11), Amemiya (1985, Chapters 9-10), Train (2003, Chapter 3), Heckman (1979).
   - Nonlinear Panel Data: Wooldridge (Chapters 15.8 and 16.8)*, Arellano and Honoré (2001, Sections 4-5), CT (Chapter 23), Heckman (1981), Chamberlin (1984), Butler and Moffit (1982).
   - Example: Goldberg (1995), Tybout and Roberts (1997)

2. Linear Panel Data Analysis

   - Strict Exogeneity Assumption and Random Effects/Fixed Effects/First Difference: Wooldridge (Chapter 10)*, CT (Chapter 21)
   - Dynamic Panel Regression and GMM: Wooldridge (Chapter 11)*, Bond (2002)*, Arellano and Bond (1991), Blundell and Bond (1998), Arellano and Bover (1995), Arellano and Honoré (2001, Sections 1-3), Bond (2002), CT (Chapter 22)
   - Example: Blundell and Bond (2000), Ziliak (1997)

3. Bootstrap

   Hansen (Chapter 10)*, Efron and Tibshirani (1998), Hall (1992), Horowitz (2001), Flachaire (2005)

4. Simulation-based Estimation Methods (Maximum Simulated Likelihood, Methods of Simulated Moments, Indirect Inference)

   - Train (Chapters 5, 9, and 10)*, Gourieroux, Monfort, and Renault (1993)*, Stern (1997), Smith (2010), CT (Chapter 12), Gourieroux, Monfort, and Renault (1993), McFadden (1989), Pakes and Pollard (1989), McFadden and Ruud (1994), Keane (1994), Geweke, Keane, and Runkle (1994), Hajivassiliou and McFadden (1998), Smith (1993), Gourieroux and Monfort (1996), Gallant and Tauchen (1996)

- Example: BLP (1995), Hyshop (1999).

5. OLS, IV, and LATE

   Angrist and Imbens (1994)*, Imbens and Wooldridge (2007, Lecture 5), Angrist and Pischke (2009, Chapter 4), Hahn, J. P. Tood, and W. van der Klaauw (2001)

6. Structural Models

   - Simultaneous equation: structural vs. reduced-form coefficients (Ch. 31-33 of Goldberger (1991))*.
   - Counterfactuals, causality, and identification problems (Sections 1, 2, 4, 5, and 6 of Ch. 70 in Heckman and Vytlacil (2005)), Chapters 1 and 2 of Angrist and Pischke (2009), Keane (2010).
   - Single-agent dynamic programming models: Kasahara and Shimotsu (2017)*, Rust (1987, 1994a, 1994b), Aguirregabiria and Mira (2010), Pakes (1994), Hotz and Miller (1993), Aguirregabiria and Mira (2002), Arcidiacono and Miller (2011)
   - Games: Su (2014)*, Su and Judd (2012)*, Aguirregabiria and Mira (2007)*, Bajari, Benkard, and Levin (2007)*, Aguirregabiria and Mira (2010), Pakes, Ostrovsky, and Berry (2007), Pesendorfer and Schmidt-Dengler (2008)
   - Examples: Rust (1987)*, Pakes (1986), Keane and Wolpin (1997)*, Das, Tybout, and Roberts (2007), Aw, Roberts, and Xu (2009), Benkard (1994)

7. Cluster Sampling and Cluster-Robust Standard Errors

   Angrist and Pischke (2009, Chapter 8)*, Cameron and Miller (2015)*, Cameron, Gelbach, and Miller (2011)*, Wooldridge (Chapter 20), Imbens and Wooldridge (2007, Lecture 8), Moulton (1990), Donald and Lang (2007),

References

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Cameron, C. and D. L. Miller (2015) "A Practitioner's Guide to Cluster-Robust Inference," *Journal of Human Resources*, 50: 317-372.

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Average Effect of Treatment for Individuals at the Margin," *Econometrica* 78, 377-394.

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