

Economics 522b
Econometrics
Fall 2009

Professor R. L. Oaxaca
McClelland 401QQ
Office Hours: TR 12:30-1:30 p.m.,
or by appointment

SYLLABUS

This course is a continuation of Econ 522a, and its objective is to provide a rigorous treatment of additional econometric methods that have become standard tools. These include qualitative and limited dependent variables, panel data methods, time series, and nonlinear structural models. **Prerequisites:** Econ 522a.

- Required: Greene, William H., *Econometric Analysis*, 6th ed. (Prentice Hall, 2008)
Econ 522b Class Materials
- Optional: Goldberg, S., *Introduction to Difference Equations*. (Dover, 1986)
(out of print but may be available on the internet)
- Optional: Kennedy, P., *A Guide to Econometrics*, 6th ed. (Blackwell, 2008)

Class materials and notes for this course will be available for downloading from the following website: <http://u.arizona.edu/~rlo>. Once you have arrived at the website just click on the label "Teaching". The website may also be accessed by following the links from the UofA website <http://www.arizona.edu> to the Eller College of Management, Department of Economics.

COURSE POLICIES & REQUIREMENTS

I. Exams

A. Schedule

1. Midterm - Thursday, October 15, 2009
2. Final - Thursday, December 17, 2009 (2 - 4 p.m.)

B. All exams will be closed book, however the use of calculators is permitted.

II. Determination of the Final Course Grade

A. There are a total of 400 points possible from the exams.

1. The midterm exam is worth 200 points.
2. The final exam is worth 200 points.

B. There are a total of 100 points possible from graded take-home problem sets.

C. Letter Grade Guidelines

- A 455+ points
- B 405-454
- C 330-404
- D 280-329
- E 0-279

III. Take-Home Problem Sets

- A. Take-home problem sets involving computer applications will be assigned throughout the semester.
 - 1. Students may work together in groups of 3 or less on these assignments, i.e. no more than 3 names may appear on a completed assignment.
 - 2. Each completed assignment must include supporting computer printout in order to receive credit.
- B. Available Econometrics/Statistical Programs
 - 1. Students are free to use whatever software package and system they find the most convenient.
 - 2. Partial listing of available econometrics/statistical software programs suitable for this course:
 - LIMDEP (student version) - available at www.prenhall.com/greene
 - LIMDEP - McClelland 335 and McClelland 401RR
 - GAUSS - McClelland 401RR
 - SAS - University PC site license and McClelland 401RR
 - 3. STATA - McClelland 401RR

COURSE OUTLINE AND READING LIST

I. Qualitative and Limited Dependent Variables

A. Discrete Choice/Qualitative Dependent Variables Models

Greene, *Econometric Analysis*, 6th ed., Chapter 23 (pp. 770-793, 813-817, 831-835, 841-847).

Kennedy, *A Guide to Econometrics* Chapter 16.

Davidson, R. and J.G. MacKinnon, *Econometric Theory and Methods*, 2004, Chapter 11 (pp. 451-458).

Horrace, William C. and Ronald L. Oaxaca, "Results on the Bias and Inconsistency of Ordinary Least Squares for the Linear Probability Model," *Economic Letters* Volume 90, Issue 3, (March 2006), pp. 321-327.

B. Limited Dependent Variables

Greene, *Econometric Analysis*, 6th ed., Chapter 24 (pp. 863-889).

Kennedy, *A Guide to Econometrics* Chapter 17.

Davidson, R. and J.G. MacKinnon, *Econometric Theory and Methods*, 2004, Chapter 11 (pp. 466-471, 481-489).

Heckman, James, "The Common Structure of Statistical Models of Truncation, Sample Selection, and Limited Dependent Variables and a Simple Estimator for Such Models," *Annals of Economic and Social Measurement*, 1976, 5: 475-92.

II. Panel Data Techniques

A. Pooled Cross-Section, Time Series Models

Greene, *Econometric Analysis*, 6th ed., Chapter 8 (pp. 172-175), Chapter 9 (pp. 185-188).

B. Fixed Effects and Random Effects

Greene, *Econometric Analysis*, 6th ed., Chapter 9 (pp. 180-213).

Kennedy, *A Guide to Econometrics* Chapter 18.

Baltagi, Badi, *Econometric Analysis of Panel Data*, Chapter 2.

Oaxaca, Ronald L. and Iris Geisler, "Fixed Effects Models with Time Invariant Variables: A Theoretical Note," *Economic Letters*, vol. 80, No. 3, September 2003, 373-377.

Oaxaca, Ronald L. and David Dickinson, "The Equivalence of Panel Data Estimators Under Orthogonal Experimental Design," January 2005 (unpublished).

III. Time Series

A. Linear Difference Equations

Goldberg, S., *Introduction to Difference Equations*.

Baumol, W.J., *Economic Dynamics: An Introduction*, 2nd ed., Chapters 9-12, 15, and 16.

Hamilton, James D., *Time Series Analysis*, Chapters 1 and 2.

B. ARIMA/ARMAX models

Greene, *Econometric Analysis*, 6th ed., Chapter 21, Chapter 22 (pp.739 -756).

Greenberg, E., and C.E. Webster Jr., *Advanced Econometrics: A Bridge to the Literature*, Chapters 3 and 4.

Hamilton, James D., *Time Series Analysis*, Chapter 3.

Harvey, *Time Series Models*, 2nd ed., Chapters 2, 3, 5 (pp. 113-134).

Davidson, R. and J.G. MacKinnon, *Econometric Theory and Methods*, 2004, Chapter 13 (pp. 556-575).

Dickey, D.A., and W.A. Fuller, "Distribution of the Estimators for Autoregressive Time-Series With a Unit Root," *Journal of the American Statistical Association*, June 1979, 74(366): 427-31.

Dickey, D.A., and W.A. Fuller, "Likelihood Ratio Statistics for Autoregressive Time Series With a Unit Root," *Econometrica*, June 1981, 49(4): 1057-72.

Phillips, Peter C.B. and Pierre Perron, "Testing for a Unit Root in Time Series Regression," *Biometrika*, 1988, 75(2): 335-46.

C. ARCH/GARCH Models

Greene, *Econometric Analysis*, 6th ed., Chapter 19 (pp. 658-667).

Davidson, R. and J.G. MacKinnon, *Econometric Theory and Methods*, 2004, Chapter 13 (pp. 587-599)

Bollerslev, T., "Generalized Autoregressive Conditional Heteroscedasticity," *Journal of Econometrics*, 1986, 31: 307-327.

Engle, R.F. "Autoregressive Conditional Heteroscedasticity With Estimates of the Variance of U.K. Inflation," *Econometrica*, July 1982, 50(4): 987-1007.

Hamilton, James D., *Time Series Analysis*, Chapter 21.

Harvey, Andrew C., *Time Series Models*, 2nd ed., Chapter 8 (pp. 275-285).

D. Co-integration and Error Correction

Greene, *Econometric Analysis*, 6th ed., Chapter 20 (pp. 689-691), Chapter 22 (pp. 756-767).

Kennedy, *A Guide to Econometrics* Chapter 19.

Davidson, R. and J.G. MacKinnon, *Econometric Theory and Methods*, 2004, Chapter 14.

Engle, R.F., and C.W.J. Granger, "Co-Integration and Error Correction: Representation, Estimation and Testing," *Econometrica*, March 1987, 55(2): 251–276.

Harvey, Andrew C., *Time Series Models*, 2nd ed., Chapter 8 (pp. 257–263).

E. Dynamic Simultaneous Equations Systems

Greene, *Econometric Analysis*, 6th ed., Chapter 20 (pp. 693–713).

Greenberg, E., and C.E. Webster Jr., *Advanced Econometrics: A Bridge to the Literature*, Chapter 5.

Harvey, Andrew C., *Time Series Models*, 2nd ed., Chapter 9 (pp. 342-356).

IV. Nonlinear Models

A. Equations Non Linear in the Parameters

Greene, *Econometric Analysis*, 6th ed, Chapter 11 (pp. 285-296, 298-307).

Davidson, R. and J.G. MacKinnon, *Econometric Theory and Methods*, 2004, Chapter 6.

B. Simultaneous Equations Non Linear in the Endogenous Variables

Amemiya, T. "The Nonlinear Two-Stage Least-Squares Estimator," *Journal of Econometrics*, July 1974, 2(2): 105-10.

Kelejian, H.H., and W.E. Oates, *Introduction to Econometrics: Principles and Applications*, 3rd ed., Chapter 8.

Kelejian, H.H. "Two Stage Least Squares and Econometric Systems Linear in Parameters but Nonlinear in the Endogenous Variables," *Journal of the American Statistical Association*, June 1971, 66(334): 373-74.

Evans, M.K. "Non-Linear Econometric Models," in *The Design of Computer Simulation Experiments*, T.H. Naylor, ed. Durham, N.C.: Duke University Press, 1968. pp. 371-92.

Howrey, E.P., and H.H Kelejian. "Simulation Versus Analytical Solutions: The Case of Econometric Models," in *Computer Simulation Experiments with Models of Economic Systems*, T.H. Naylor, ed. New York: John Wiley & Sons, 1971. Chapter 12, pp. 299-319.

Spivey, W.A., and W.J. Wroblewski, *Econometric Model Performance in Forecasting and Policy Assessment*, Washington, D.C.: American Enterprise Institute for Public Policy Research, 1979. Chapter 2.