# Econ 220C: Econometrics Spring 2003, University of California, San Diego Instructor: Yixiao Sun Email: <u>yisun@ucsd.edu</u> Office Hours: Thursdays, 4:00-5:00 and by appointment

# **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 two parts. The first part deals with panel data models: (1) static panel data models (2) dynamic panel data models and (3) other misc. panel topics. Multiple Equation GMM and Minimum Distance Estimator will be introduced and used to estimate some panel data models. The second part of the course deals with limited-dependent-variable models: (1) discrete choice models; (2) censored and truncated regression models, (3) sample selection models; and (4) evaluation of treatment effects. While the second part focuses mainly on cross sectional data, it also covers panel Probit/Logit, panel Tobit and panel attrition models.

We will study different issues in the specification, estimation and testing of these 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 and GAUSS are widely used by econometricians. It seems that more and more people starts using MATLAB. STATA seems to have gained increasing popularity in recent years among applied micro economists. SAS is another option.

# **Text Book**

Wooldridge, Jeffrey (2002): Econometric Analysis of Cross Section and Panel Data, MIT press. This is the main text for the course

# **Grading Policy**

Grades for Econ 220C will be determined as follows:

- 40%: Four problem sets, each carrying a weight of 10%. You may form a group with no more than three people and work together on the problem sets, but must hand in your own write-up of the answers.
- 20%: Midterm. No books or notes are allowed. It will cover Panel data topics. The date will be announced in class
- 40%: Final Exam. No books or notes are allowed. This will be on Thursday, June 12, from 8:00 a.m. to 11:00 p.m.

# **General References: Panel Data**

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, Badi H. (2001). Econometric Analysis of Panel Data, Second Edition, John Wiley & Sons, 2001

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

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

Hsiao, Cheng (2003). Analysis of Panel Data, Cambridge University Press

Kirshnakumar, J. and E. Ronchetti, editors (2000). Panel Data Econometrics: Future Directions, North-Holland, Amsterdam.

Lee, M. (2002). Panel Data Econometrics, Academic Press

Matyas, L. and P. Sevestre, editors (1996). The Econometrics of Panel Data: A Handbook of Theory and Applications, Kluwer Academic Publishers.

### **General References: Limited Dependent and Qualitative Variables**

Amemiya. T. (1985). Advanced Econometrics, Cambridge, Harvard University Press.

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

Greene, W. H. (2003). Econometric Analysis, Ch 21, 22.

Kenneth Train (2002). Discrete Choice Methods with Simulation, Cambridge University Press.

A <u>zip archive</u> is available for download (1.8M), containing all the chapters.

Maddala, G.S. (1987). Limited Dependent and Qualitative Variables in Econometrics.

# Journal Articles: Static Panel Data Models

Amemiya, Takeshi, and Thomas E. Macurdy (1986). "Instrumental Variable Estimation of an Error-Components Model." *Econometrica* 54: 869-881.

Breusch, Trevor S., Grayham E. Mizon, and Peter Schmidt (1989). "Efficient Estimation Using Panel Data." *Econometrica* 57: 695-700.

Chamberlain, G. (1982). "Multivariate Regression Models for Panel Data." *Journal of Econometrics* 18: 5-45.

Chamberlain, G. (1984). "Panel Data," in Griliches and Intriligator (eds.), *Handbook of Econometrics*, Volume 2. Amsterdam: North-Holland.

Hausman, J. (1978). "Specification Tests in Econometrics," Econometrica 46:1251-1272

Hausman, J., and W. E. Taylor (1981). "Panel Data and Unobservable Individual Effects." *Econometrica* 49: 1377-1398.

Im, K.S., S. C. Ahn, P. Schmidt and J. Wooldridge (1999). "Efficient Estimation of Panel Data Models with Strictly Exogenous Explanatory Variables," *Journal of Econometrics*, 93: 177-201

Maddala, G. S. (1971). "The Use of Variance Component Models in Pooling Cross Section and Time Series Data," *Econometrica* 39: 341-358.

Mundlak, Y., (1978). "On the Pooling of Time Series and Cross Section Data", *Econometrica*, Vol. 46, pp. 69-85.

#### Journal Articles: Dynamic Panel Data Models

Ahn, S.C. and P. Schmidt (1995). "Efficient Estimation of Models for Dynamic Panel Data," *Journal of Econometrics*, Vol. 68, pp. 5-27.

Ahn, S. C., and Schmidt, P. (1999). "Estimation of linear anel data models using GMM," in *Generalized Method of Moments Estimation*, edited by L. Matyas

Anderson, T.W. and C. Hsiao (1981). "Estimation of Dynamic Models with Error Components," *Journal of the American Statistical Association*, Vol. 76, pp. 598-606.

Anderson, T.W. and C. Hsiao (1982). "Formulation and Estimation of Dynamic Models Using Panel Data," *Journal of Econometrics*, Vol. 18, pp. 47-82.

Arellano, M. (1989). "A Note on the Anderson-Hsiao Estimator for Panel Data," *Economic Letters*, 31, 337-341.

Arellano, M. and S. Bond (1991). "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations," *Review of Economic Studies*, Vol. 58, pp. 277-297.

Arellano, M. and O. Bover (1995). "Another Look at the Instrumental Variable Estimation of Error-Components Models," *Journal of Econometrics*, Vol. 68, pp. 29-51.

Blundell, R. and S. Bond (1998). "Initial Conditions and Moment Restrictions in Dynamic Panel Data Models," *Journal of Econometrics*, Vol. 87, pp. 115-143.

Hsiao, C., M.H. Pesaran, and A.K. Tahmiscioglu (2002). "Maximum Likelihood Estimation of Fixed Effects Dynamic Panel Data Models Covering Short Time Periods," *Journal of Econometrics*, Vol. 109, pp.107-150.

Keane, M.P. and D.E. Runkle (1992). "On the Estimation of Panel Data Models with Serial Correlation when Instruments are not Strictly Exogenous," *Journal of Business and Economic Statistics*, Vol. 10, pp. 1-29.

Kiviet, J. F. (1995). "On Bias, Inconsistency, and Efficiency of Various Estimators in Dynamic Panel Data Models," *Journal of Econometrics*, 68, 53-78.

Nickell, S. (1981). "Biases in Dynamic Models with Fixed Effects," *Econometrica*, Vol. 49, pp. 1417-1426.

Neyman, J. and Scott, E. L. (1948). "Consistent Estimation from Partially Consistent Observations," *Econometrica*, 16, 1-32.

Lancaster, T. (2000). "The Incidental Parameter Problem Since 1948," *Journal of Econometrics*, 95, 391-413.

# **Journal Articles: Discrete Choice Models**

Kim J. and D. Pollard (1990). "Cube Root Asymptotics," Annals of Statistics, 18,191-219.

Klein, R., and R. Spady (1993). "An Efficient Semiparametric Estimator for Discrete Choice Models", *Econometrica*, 61, 387-421

Horowitz J. (1992). "A Smoothed Maximum Score Estimator for the Binary Response Model," *Econometrica*, 60(3), May 1992, pp. 505-31.

Pagan, A., and A. Ullah (1999). Nonparametric Econometrics, Cambridge University Press.

D. L. McFadden, "Econometric Analysis of Qualitative Response Models," *Handbook of Econometrics*, II, Ch. 24. http://www.elsevier.nl/hes/books/02/02/024/c0202024.htm

Manski C. (1975). "Maximum Score Estimation of the Stochastic Utility Model of Choice," *Journal of Econometrics*, 3(3), pp. 205-28.

Manski, C. (1985). "Semiparametric Analysis of Discrete Response: Asymptotic Properties of the Maximum Score Estimator," *Journal of Econometrics* 27, pp. 313-333.

# Journal Articles: Censoring and Truncation Models

Chamberlain, Gary (1982). "Multivariate Regression Models for Panel Data." *Journal of Econometrics* 18: 5-45.

Chamberlain, Gary (1984). "Panel Data," in Griliches and Intriligator (eds.), *Handbook of Econometrics*, Volume 2. Amsterdam: North-Holland.

Heckman, J. (1976). "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*, 5, 475-492.

Honore, B. (1992). "Trimmed LAD and Least Squares Estimation of Truncated and Censored Regression Models with Fixed E ects," *Econometrica*, 60, 533-565.

Mundlak, Y. (1978). "On the Pooling of Time Series and Cross Section Data", *Econometrica*, Vol. 46, pp. 69-85.

Powell, J. (1984). "Least Absolute Deviations Estimation for the Censored Regression Model," *Journal of Econometrics* 25, 303-325.

Powell, J. (1986). "Censored Regression Quantiles," Journal of Econometrics, 32, 143-155.

Powell, J. (1986). "Symmetrically Trimmed Least Squares Estimators for Tobit Models," *Econometrica*, 54, 1435-1460.

Smith and Blundell (1986). "An Exogeneity Test for a Simultaneous Equation Tobit Model with an Application to Labor Supply," *Econometrica* 54, 679-685.

Wooldridge, J. (1995). "Selection Corrections for Panel Data Models Under Conditional Mean Independence Assumptions," *Journal of Econometrics* 68, 115-132.

# **Journal Articles: Sample Selection Models**

Amemiya. T. (1985). Advanced Econometrics, Cambridge, Harvard University Press.

Heckman, J. (1979). "Sample selection bias as a specification error," *Econometrica*, 47, 153-161.

Heckman, J. (1990). "Varieties of Sample Selection", *American Economic Review*, 80, 313-318.

Kyriazidou, E. (1997). "Estimation of a Panel Data Sample Selection Model," *Econometrica*, 65(6), 1335-1364.

Manski, C. (1989). "Anatomy of the Selection Problem", *Journal of Human Resources*, 24, 343-360.

Newey, W., J. Powell, and J. Walker (1990). "Semiparametric Estimation of Selection Models," *American Economic Review*, 80, 313-318