

LECTURES ON PANEL DATA ECONOMETRICS
NCER, QUT, Brisbane, 9-10 July 2007
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Organization

The lectures outlined below will provide a survey of state-of-the-art methods for panel data analysis and review selected applications. There will be an emphasis in recent advances on discrete choice and other nonlinear models of interest in microeconometrics. Fixed and random effects perspectives will be examined, as well as the choice of population framework and its implications for identification and estimation. The material will be presented according to the following schedule:

9 July

09.00 – 10.30 Session 1: Incidental parameters and parameters of interest.

11.00 – 12.30 Session 2: Fixed effects: static models.

14.00 – 15.30 Session 3: Random effects: static models.

10 July

09.00 – 10.30 Session 4: Random effects: dynamic models.

11.00 – 12.30 Session 5: Fixed effects: dynamic models.

14.00 – 15.30 Session 6: Bounds and bias reduction.

Outline

Lecture 1

1. Models, parameters of interest, and incidental parameters
 - 1.1 Review of some nonlinear models
 - a) Discrete choice
 - b) Censoring and selection
 - c) Count data
 - d) Conditional variance
 - 1.2 Policy parameters
 - 1.3 The incidental parameter problem

Lecture 2

2. Static models
 - 2.1 Fixed effects
 - a) Conditional MLE
 - b) Maximum score
 - c) Fixed T identifiability
 - 2.2 Random effects
 - a) Simulation based estimation
 - b) Semiparametric approaches
 - 2.3 Bias reduction

Lecture 3

3. Dynamic models
 - 3.1 The initial conditions problem
 - 3.2 Dynamic discrete choice and duration
 - 3.3 Random effects
 - 3.4 Fixed effects
 - 3.5 Large T and N
 - 3.6 Fixed T Bounds

Readings on nonlinear panel data models

General

Arellano, M. (2003): “Discrete Choices with Panel Data”, *Investigaciones Economicas* 27, 423-458.

Arellano, M. and B. Honoré (2001): “Panel Data Models. Some Recent Developments”, in J. Heckman and E. Leamer (eds.), *Handbook of Econometrics*, Vol. 5, Ch. 53.

Chamberlain, G. (1980): “Analysis of Covariance with Qualitative Data”, *Review of Economic Studies* 47, 225-238.

Chamberlain, G. (1984): “Panel Data”, in Z. Griliches and M. D. Intriligator (eds.), *Handbook of Econometrics*, Vol. 2, Elsevier Science.

Honoré, B. (2002): “Nonlinear Models with Panel Data”, *Portuguese Economic Journal*, 1, 163-179.

Wooldridge, J. (2002): *Econometric Analysis of Cross Section and Panel Data*, MIT Press, Chapters 15, 16, 17 and 19.

Static models: Fixed effects

Hausman, J.A., B. Hall, and Z. Griliches (1984): “Econometric Models for Count Data with an Application to the Patents-R&D Relationship”, *Econometrica*, 52, 909-938.

Honoré, B. (1992): “Trimmed LAD and Least Squares Estimation of Truncated and Censored Regression Models with Fixed Effects”, *Econometrica*, 60, 533-565.

Manski, C. (1987): “Semiparametric Analysis of Random Effects Linear Models from Binary Panel Data”, *Econometrica*, 55, 357-362.

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

Static models: Random effects

Altonji, J. G. and R. L. Matzkin (2005): “Cross Section and Panel Data Estimators for Nonseparable Models with Endogenous Regressors”, *Econometrica*, 73, 1053-1102.

Butler, I. S. and R. Moffitt (1982): “A Computationally Efficient Quadrature Procedure for the One-Factor Multinomial Probit Model”, *Econometrica*, 50, 761-764.

Gourieroux, C. and A. Monfort (1993): “Simulation-based inference: A Survey with Special Reference to Panel Data Models”, *Journal of Econometrics*, 59, 5-33.

Large T and N bias reduction

Arellano, M and J. Hahn (2007): “Understanding Bias in Nonlinear Panel Models: Some Recent Developments.” In: R. Blundell, W. Newey, and T. Persson (eds.): *Advances in Economics and Econometrics, Ninth World Congress*, Cambridge University Press, forthcoming.

Hahn, J. and W.K. Newey (2004): “Jackknife and Analytical Bias Reduction for Nonlinear Panel Models”, *Econometrica*, 72, 1295-1319.

Lancaster, T. (2002): “Orthogonal Parameters and Panel Data”, *Review of Economic Studies*, 69, 647-666.

Dynamic models

• Random effects

Arellano, M., O. Bover and J.M. Labeaga (1999): “Autoregressive Models with Sample Selectivity for Panel Data”, in C. Hsiao et al. (eds.): *Analysis of Panels and Limited Dependent Variable Models*, Cambridge University Press.

Arellano, M. and R. Carrasco (2003): “Binary Choice Panel Data Models with Predetermined Variables”, *Journal of Econometrics*, 115, 125-157.

Heckman, J. J. (1981): “Statistical Models for Discrete Panel Data”, in C. F. Manski and D. McFadden (eds.): *Structural Analysis of Discrete Data with Econometric Applications*, MIT Press.

Wooldridge, J. (2005): “Simple Solutions to the Initial Conditions Problem in Dynamic, Nonlinear Panel Data Models with Unobserved Heterogeneity”, *Journal of Applied Econometrics* 20, 39-54.

• Fixed effects

Chamberlain, G. (1985): “Heterogeneity, Omitted Variable Bias, and Duration Dependence”, in J. J. Heckman and B. Singer (eds.), *Longitudinal Analysis of Labor Market Data*, Cambridge University Press.

Chamberlain, G. (1992): “Comment: Sequential Moment Restrictions in Panel Data”, *Journal of Business & Economic Statistics*, 10, 20-26.

Honoré, B. E. and E. Kyriazidou (2000): “Panel Data Discrete Choice Models with Lagged Dependent Variables”, *Econometrica*, 68, 839-874.

Kyriazidou, E. (2001): “Estimation of Dynamic Panel Data Sample Selection Models”, *Review of Economic Studies*, 68, 543-572.

Wooldridge, J. M. (1997): “Multiplicative Panel Data Models without the Strict Exogeneity Assumption”, *Econometric Theory*, 13, 667-678.

• Bounds

Honoré, B. E. and E. Tamer (2006): “Bounds on Parameters in Dynamic Discrete Choice Models”, *Econometrica*, 74, 611-629.

Applications

Alessie, R., S. Hochguertel, and A. van Soest (2004): “Ownership of Stocks and Mutual Funds : A Panel Data Analysis”, *Review of Economics and Statistics*, 86, 783-796.

Alvarez, J., M. Browning, and M. Ejrnaes (2002): “Modelling Income Processes with Lots of Heterogeneity”, unpublished.

Card, D. and D. R. Hyslop (2005): “Estimating the Effects of a Time-Limited Earnings Subsidy for Welfare-Leavers”, *Econometrica*, 73, 1723-1770.

Carrasco, R. (2001): “Binary Choice with Binary Endogenous Regressors in Panel Data: Estimating the Effect of Fertility on Female Labor Participation”, *Journal of Business & Economic Statistics*, 19, 385-394.

Hyslop, D. (1999): “State Dependence, Serial Correlation and Heterogeneity in Intertemporal Labor Force Participation of Married Women”, *Econometrica*, 67, 1255-1294.

Hu, L. (2003): “Dynamic Panel Data Models with Censoring: An Application to Earnings Dynamics”, unpublished.

Labeaga, J. M. (1999): “A Double-Hurdle Rational Addiction Model with Heterogeneity: Estimating the Demand for Tobacco”, *Journal of Econometrics*, 93, 49-72.

Vissing-Jorgensen, A. (2002): “Towards an Explanation of Household Portfolio Choice Heterogeneity: Nonfinancial Income and Participation Cost Structures”, NBER Working Paper 8884.