

IZA European Summer School in Labor Economics 2005

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Course: Semiparametric Estimation of Micro Econometric Models

The focus of this course will be on the use of semi-parametric econometric methods which are potentially of use in the estimation of empirical models in labor economics.

Initially we will refer the parametric forms of these models before examining the use of non-parametric methods for density and conditional moment estimation. We will then introduce several semi-parametric procedures and their potential applications. Given the nature of the course there will be additional focus on my own research interests.

Topic 1: Review

- i) Discrete Choice Models
- ii) Multinomial Models
- iii) Censored Regression Models
- iv) Sample selection Models
- v) Models with Censored Endogenous Regressors

W.Greene, (2003), *Econometric Analysis*, 5th Edition, New York Macmillan

G.S.Maddala, (1983), *Limited Dependent and Qualitative Variables in Econometrics*, Cambridge University

Amemiya, T. (1984), "Tobit Models: A Survey", *Journal of Econometrics*, 24, 3-61.

Heckman, J.J. (1979), "Sample Selection Bias as a Specification Error", *Econometrica*, 47, 153-161.

Vella, F. (1998), "Estimating Models with Sample Selection Bias: A Survey", *Journal of Human Resources*, 33, 127-169.

Heckman, J.J. (1978), "Dummy Endogenous Variables in a Simultaneous Equations System", *Econometrica*, 46, 931-960.

Vella, F. (1993), "A Simple Estimator for Simultaneous Equations Models with Censored Endogenous Regressors", *International Economic Review*, 34, 441-457.

Rivers, D., and Vuong, Q. (1988), "Limited Information Estimators and Exogeneity Tests for Simultaneous Probit Models", *Journal of Econometrics*, 39, 347-366.

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

Topic 2: Non Parametric Density and Conditional Moment Estimation

Silverman, P. (1986), **Density Estimation**. New York, Chapman and Hall.

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

Topic 3: Some Useful Semi-Parametric Procedures

- i) Robinson Procedure
- ii) Semi-Parametric Least Squares
- iii) Klein/Spady Estimator
- iv) Ai Estimator

Ichimura, H. (1993), "Semiparametric least squares (SLS) and weighted SLS estimation of single index models" *Journal of Econometrics*, 58, 71-120.

Ichimura, H., and L.F.Lee (1991), "Semiparametric least squares (SLS) and weighted SLS estimation of multiple index models: Single equation estimation," in *Nonparametric and Semiparametric Methods in Econometrics and Statistics*, ed. W.Barnett, J.Powell and G.Tauchen, Cambridge University Press.

Klein, R. and R. Spady (1993), "An Efficient Semiparametric Estimator for the Binary Response Model", *Econometrica*, 61(2), 387-421.

Robinson, P. (1988), "Root N Consistent Semiparametric Regression", *Econometrica*, 56, 931-954.

Ai, C. (1997), "A Semiparametric Maximum Likelihood Estimator", *Econometrica*, 65, 933-963.

Topic 4: Application of Semi-Parametric Procedures

- i) Sample Selection Model
- ii) Models with Endogenous Treatments
- iii) Models with Non Additive Errors

Ahn, H. and J.L. Powell (1993), "Semiparametric Estimation of Censored Selection Models with a Nonparametric Selection Mechanism," *Journal of Econometrics*, 58, 1993, 3-29.

Newey, W.K. (1988), "Two step series estimation of Sample Selection Models," *MIT Department of Economics Working Paper*.

Powell, J. (1987), "Semiparametric Estimation of Bivariate Latent Variable Models", *working paper #8704*, Social Systems Research Institute, University of Wisconsin-Madison.

Powell, J, W.Newey and F.Vella "Nonparametric Estimation of Triangular Simultaneous Equation Models", *Econometric*, 1999, Vol 67 pp 565-603

Das, M, W. Newey and Vella (2003), "Non-parametric Estimation of Sample Selection Models", *Review of Economic Studies*, 2003, Vol 70, pp 33-58.

Imbens, G. and W.Newey (2003), "Identification and Estimation of Triangular Simultaneous Equations Models without Additivity", *MIT working paper*

Topic 5: Identification via Heteroskedasticity

Klein, R. and F.Vella (2004), "A Semiparametric Model for Binary Response and Continuous Outcomes Under Index Heteroscedasticity", *manuscript*

Klein, R, and F.Vella (2005), "Estimating a Class of the Triangular Simultaneous Equations Model Without Exclusion Restrictions", *manuscript*