Distributional treatment effects

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Description of the course

Applied econometrics is mainly concerned with mean effects. In many contexts, however, the effect of a treatment on the entire distribution of outcomes is of interest. The distribution of the dependent variable may change in many ways that are not revealed or are only incompletely revealed by an examination of averages. For example, the wage distribution can become more compressed or the upper-tail inequality may increase while the lower-tail inequality decreases. This short course provides econometric tools to estimate and make inference about distributional treatment effects. Several identification strategies are discussed: selection on observables, instrumental variables, regression discontinuity design and difference-in-differences. Computer codes are available for most of the estimators.

Tentative course outline

1 Conditional distributional treatment effects
- 1.1 Conditional quantile and distribution functions
- 1.2 Quantile regression
- 1.3 Distribution regression
- 1.4 Uniform inference

2 Unconditional distributional treatment effects
- 2.1 Counterfactual distributions
- 2.2 Regression methods
- 2.3 Inference
- 2.4 Re-weighting methods

3 Instrumental variables
- 3.1 Identification based on rank similarity
- 3.2 Identification based on monotonicity
- 3.3 Regression discontitnuity design

4 Extensions (if time permits and depending on interest of the class)
- 4.1 Difference-in-differences
- 4.2 Sample selection
- 4.3 Censored data
- 4.4 Duration data
- 4.5 Panel data

References (send me an email if you cannot access some of this material)

Abadie, A. 2003. "Semiparametric instrumental variable estimation of treatment response models," Journal of Econometrics, 113, 231–263.

Abadie, A., J. Angrist, and G. Imbens (2002): "Instrumental variables estimates of the effect of subsidized training on the quantiles of trainee earnings," Econometrica, 70, 91–117.

Angrist, J., V. Chernozhukov, and I. Fernandez-Val (2006): "Quantile Regression Under Misspecification,With an Application to the U.S.Wage Structure," Econometrica, 74, 539–563.

Athey, S., and G. Imbens (2006): "Identification and Inference in Nonlinear Difference-in-Difference Models," Econometrica, 74, 431.497.

Chernozhukov, V., and I. Fernandez-Val (2005): “Subsampling Inference on Quantile Regression Processes,” Sankhya, 67, 253–276.

Chernozhukov, V., I. Fernandez-Val and A. Galichon (2010): “Quantile and Probability Curves without Crossing,” Econometrica 78, 1093–1125.

Chernozhukov V., I. Fernandez-Val and B. Melly (2013): “Inference on counterfactual distributions,” Econometrica, 81, 2205-2268.

Chernozhukov, V., and C. Hansen (2005): “An IV Model of Quantile Treatment Effects,” Econometrica, 73, 245-261.

Chernozhukov, V., and C. Hansen (2006): “Instrumental Quantile Regression Inference for Structural and Treatment Effect Models,” Journal of Econometrics, 132, 491–525.

DiNardo, J., Fortin, N., and T. Lemieux (1996): “Labor Market Institutions and the Distribution of Wages, 1973-1992: A Semiparametric Approach,” Econometrica, 64, 1001-1044.

Firpo, S. (2007): “Efficient semiparametric estimation of quantile treatment effects,” Econometrica, 75, 259-276.

Foresi, S., and F. Peracchi (1995): “The Conditional Distribution of Excess Returns: an Empirical Analysis,” Journal of the American Statistical Association, 90, 451-466.

Fortin, N., Lemieux, T., and S. Firpo (2011): “Decomposition Methods in Economics,” in: O. Ashenfelter and D. Card (ed.), Handbook of Labor Economics, volume 4A, chapter 1, Elsevier.

Frandsen, B.R., M. Frölich and B. Melly (2012) “Quantile treatment effects in the regression discontinuity design,” Journal of Econometrics, 168, 383-395.

Frölich M. and B. Melly (2013): “Unconditional quantile treatment effects under endogeneity,” Journal of Business and Economic Statistics, 31, 346-357.

Frölich M. and B. Melly (2010): “Estimation of quantile treatment effects with Stata”, Stata Journal, 10, 423-457.

Heckman, J. J., Smith, J., and N. Clements (1997): “Making the Most Out of Programme Evaluations and Social Experiments: Accounting for Heterogeneity in Programme Impacts,” The Review of Economic Studies, 64, 487-535.

Kato, K., A.F. Galvao, and G.V. Montes-Rojas (2012): “Asymptotics for panel quantile regression models with individual effects,” Journal of Econometrics, 170, 76-91.

Koenker, R. (2005): “Quantile Regression,” Econometric Society Monograph, Cambridge University Press, Cambridge.

Koenker, R. and Bassett, G. (1978): “Regression Quantiles,” *Econometrica*, 46, 33–50.

Koenker R., and Y. Bilias (2001): “Quantile regression for duration data: a reappraisal of the Pennsylvania reemployment bonus experiments,” Empirical Economics, 26, 199-220.

Koenker, R. and K.F. Hallock (2001): “Quantile Regression,” Journal of Economic Perspectives, vol. 15(4), 143-156.

Koenker, R., and Z. Xiao (2002): “Inference on the Quantile Regression Process,” Econometrica, 70, 1583-1612.

Powell, J. L. (1986): “Censored Regression Quantiles,” Journal of Econometrics, 32, 143-155.