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Philipp Eisenhauer

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Monte Carlo Exploration

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Introduction

The Econometrics of Policy Evaluation

- ▶ is important
- ▶ is complicated
- ▶ is multifaceted

Fundamental Problems

- ▶ Evaluation Problem
- ▶ Selection problem
 - ▶ Essential Heterogeneity

Objects of Interest

- ▶ Conventional Average Treatment Effects
- ▶ Policy-Relevant Average Treatment Effects
- ▶ Local Average Treatment Effect
- ▶ Marginal Effect of Treatment
- ▶ Distribution of Effects
- ▶ Effects on Distribution

Identification Strategies

- ▶ Random Assignment
- ▶ Matching
- ▶ Control Functions and Extensions
- ▶ Instrumental Variables

Generalized Roy Model

Potential Outcomes

$$Y_1 = \beta_1 X + U_1$$

$$Y_0 = \beta_0 X + U_0$$

Cost

$$C = \gamma Z + U_C$$

Observed Outcomes

$$Y = DY_1 + (1 - D)Y_0$$

Choice

$$S = Y_1 - Y_0 - C$$

$$D = I[S > 0]$$

Monte Carlo Exploration

We will touch on all these issues in a Monte Carlo exercise using the **grmpy** package. The notebook is available on the course website.

Appendix

References

- Carneiro, P., Heckman, J. J., & Vytlacil, E. J. (2011). Estimating marginal returns to education. *American Economic Review*, 101(6), 2754–2781.
- Heckman, J. J. (1990). Selection bias and self-selection. In J. Eatwell, M. Milgate, & P. Newman (Eds.), *Econometrics* (pp. 201–224). London: Palgrave Macmillan.
- Heckman, J. J., & Taber, C. (2010). Roy model. In L. E. Blume & S. N. Durlauf (Eds.), *Microeconometrics* (pp. 221–228). London: Palgrave Macmillan.