Simulation Study of the Sensitivity of Nonexperimental Methods to Matching and Alternative Assumptions

Extract

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Econ 312, Spring 2023

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1. A Model of Earnings and Program Participation (Heckman, 1977; Heckman and Robb, 1985)

- Individual i's earnings are determined by the following equation, error term combines an AR(1) process, and an individual-specific fixed effect,

$$Y_{it} = \beta + \alpha_i D_i + \theta_i + U_{it} \tag{1}$$

$$U_{it} = \rho U_{i,t-1} + \varepsilon_{it} \tag{2}$$

- Training takes place in period k.

- $E(\varepsilon_{it}) = 0$.
- ε_{it} is independent and identically distributed.
- θ_i, ε_i, and α_i are mutually independent.

$$Y_{it} = D_i Y_{1it} + (1 - D_i) Y_{0it} \tag{3}$$

$$Y_{1it} - Y_{0it} = \alpha_i \tag{4}$$

- Mean effect of training in the population, $E(\alpha_i)$, mean effect of training on those who actually receive training, $E(\alpha_i \mid D_i = 1)$.

- Decision to participate in training depends on individuals' discounted lifetime gain from training, α_i/r, their opportunity costs or foregone earnings in period k, Y_{ik}, and their tuition costs or subsidy, c_i.

$$D_i \begin{cases} 1 \text{ iff } \alpha_i/r - Y_{ik} - c_i > 0 & \text{and } t > k \\ 0 & \text{otherwise} \end{cases} \tag{5}$$

  consistent with Ashenfelter's dip in earnings.
- Instruments as determinants of program costs write $c_i = Z_i'\phi + V_i$, Z_i is an observe characteristic that affects the cost of training V_i is a mean zero random disturbance.