

‘Dynamic Treatment Effects of Job Training’: Empirical Implementation

Jorge Rodríguez, Fernando Saltiel and Sergio Urzúa

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In this document, we illustrate the empirical strategy behind the model introduced in *Dynamic Treatment Effects of Job Training* by Rodríguez, Saltiel and Urzúa. The exact parameterization is laid out below (Section 1). Its features the building blocks of the main model: a two-sector one-factor Roy model. Its extension to the setting used in the main text is direct. Those interested in the Bayesian algorithm used for estimation see our paper’s Appendix D and the codes provided as part of our replication package.

1 Simulated data

Consider the following Roy model:

$$\begin{aligned} I &= 0.5Z + 0.5\theta + U_V, \\ Y_1 &= 2 + 2X + 2\theta + U_1, \\ Y_0 &= 1.5 + X + \theta + U_0. \\ D &= 1[I > 0] \end{aligned}$$

where θ is the latent factor which follows a mixture of normals, such that: $\theta \sim 0.3 \times N(1, 1) + 0.7 \times N(-0.428, 0.387)$, and the idiosyncratic components are distributed according to:

$$\begin{aligned} U_1 &\sim N(0, \sigma_{U_1}^2), \\ U_0 &\sim N(0, \sigma_{U_0}^2), \\ U_V &\sim N(0, \sigma_{U_V}^2). \end{aligned}$$

As a measurement system, consider the following three test scores:

$$\begin{aligned} T_1 &= 0.1 + 0.1Q + 1.1\theta + U_{T_1}, \\ T_2 &= 0.5 + 0.1Q + 1.4\theta + U_{T_2}, \\ T_3 &= 0.4 + 0.3Q + \theta + U_{T_3}. \end{aligned}$$

where $U_{T_1} \sim N(0, \sigma_{U_{T_1}}^2)$, $U_{T_2} \sim N(0, \sigma_{U_{T_2}}^2)$, and $U_{T_3} \sim N(0, \sigma_{U_{T_3}}^2)$. For the sake of illustration, we let $\sigma_{U_1}^2, \sigma_{U_0}^2, \sigma_{U_V}^2, \sigma_{U_{T_1}}^2, \sigma_{U_{T_2}}^2, \sigma_{U_{T_3}}^2 = 1$. Below, we show convergence of the factor loadings after generating 1,000 draws from the estimated posterior distribution. Similar figures can be obtained from the outputs associated with the other parameters of the model.

Figure 1: Factor Loadings for Test Scores

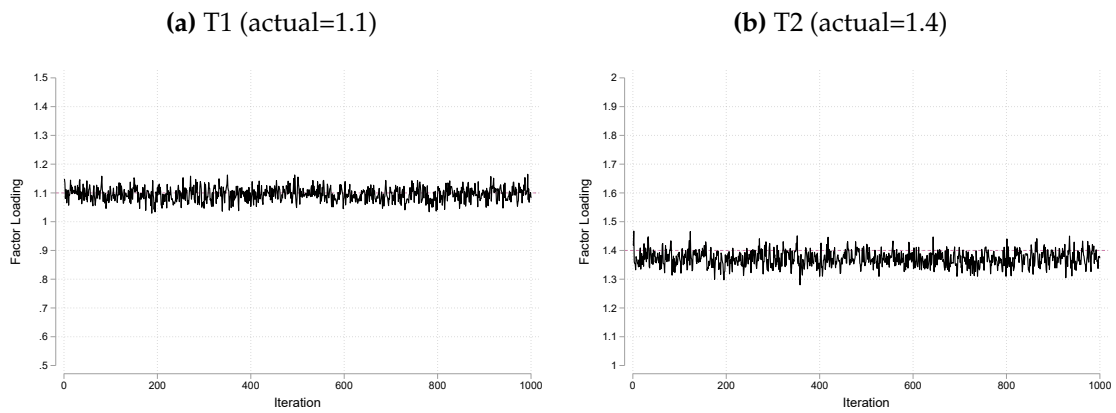


Figure 2: Factor Loadings for Decision (actual=0.5)

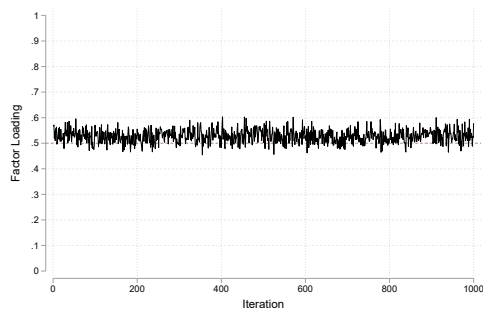


Figure 3: Factor Loadings for Outcomes

