

Example 1: Estimations of the panel logit models explaining female labor participation using a fictitious dataset

The definitions of variables are inherited from those in the manuals “dfelrtna.pdf” and “dfelrtnb.pdf”.

Dataset

fls_{it} : fls1986 - fls1993 (female labor supply: 1=supply; 0=no supply, from 1986 to 1993)

$hdbt_{it}$: hdbt1986 - hdbt1993 (log of husband's debt, from 1986 to 1993)

$hinc_{it}$: hinc1986 - hinc1993 (log of husband's income, from 1986 to 1993)

(Number of individuals $N = 15000$)

The model when using the program “dfelrtna.tsp” described later is appropriate for this dataset. True values of parameters generating this dataset are

$$\gamma = \gamma_{fls(-1)} = 0.5$$

$$\beta_{(1)} = \beta_{hdbt} = 0.5$$

$$\beta_{(2)} = \beta_{hinc} = -0.5$$

$$TD_{1986} = 0.5$$

$$TD_{1987} = 1.0$$

$$TD_{1988} = -0.5$$

$$TD_{1989} = 0.0$$

$$TD_{1990} = -0.5$$

$$TD_{1991} = 0.5$$

$$TD_{1992} = 0.0$$

$$TD_{1993} = -1.0$$

and accordingly,

$$\Delta TD_{1988} = -1.5$$

$$\Delta TD_{1989} = 0.5$$

$$\Delta TD_{1990} = -0.5$$

$$\Delta TD_{1991} = 1.0 .$$

Model, Moment conditions, and parameters to be estimated when using the program “dfelrtna.tsp”

Model

$$y_{it} = \frac{\exp(\eta_i + TD_t + \gamma y_{i,t-1} + \beta_{(1)}x_{(1)it} + \beta_{(2)}x_{(2)it})}{1 + \exp(\eta_i + TD_t + \gamma y_{i,t-1} + \beta_{(1)}x_{(1)it} + \beta_{(2)}x_{(2)it})} + v_{it}, \quad \text{for } t = 1987, \dots, 1991.$$

$$y_{it} = fls_{it}$$

$$x_{(1)it} = hdbt_{it}$$

$$x_{(2)it} = hinc_{it}$$

Moment conditions

Used moment conditions based on g-form

$$E[\hbar U_{it}^+(\gamma, \beta_{(1)}, \beta_{(2)}, \Delta TD_t, \Delta TD_{t+1})] = 0, \quad \text{for } t = 1988, \dots, 1990,$$

$$E[y_{is} \hbar U_{it}^+(\gamma, \beta_{(1)}, \beta_{(2)}, \Delta TD_t, \Delta TD_{t+1})] = 0, \quad \text{for } s = 1986, \dots, t-2; t = 1988, \dots, 1990,$$

$$E[\Delta x_{(1)is} \hbar U_{it}^+(\gamma, \beta_{(1)}, \beta_{(2)}, \Delta TD_t, \Delta TD_{t+1})] = 0, \quad \text{for } s = t-1, t, t+1; t = 1988, \dots, 1990,$$

$$E[\Delta x_{(2)is} \hbar U_{it}^+(\gamma, \beta_{(1)}, \beta_{(2)}, \Delta TD_t, \Delta TD_{t+1})] = 0, \quad \text{for } s = t-1, t, t+1; t = 1988, \dots, 1990.$$

Used moment conditions based on h-form

$$E[\hbar Y_{it}^+(\gamma, \beta_{(1)}, \beta_{(2)}, \Delta TD_t, \Delta TD_{t+1})] = 0, \quad \text{for } t = 1988, \dots, 1990,$$

$$E[y_{is} \hbar Y_{it}^+(\gamma, \beta_{(1)}, \beta_{(2)}, \Delta TD_t, \Delta TD_{t+1})] = 0, \quad \text{for } s = 1986, \dots, t-2; t = 1988, \dots, 1990,$$

$$E[\Delta x_{(1)is} \hbar Y_{it}^+(\gamma, \beta_{(1)}, \beta_{(2)}, \Delta TD_t, \Delta TD_{t+1})] = 0, \quad \text{for } s = t-1, t, t+1; t = 1988, \dots, 1990,$$

$$E[\Delta x_{(2)is} \hbar Y_{it}^+(\gamma, \beta_{(1)}, \beta_{(2)}, \Delta TD_t, \Delta TD_{t+1})] = 0, \quad \text{for } s = t-1, t, t+1; t = 1988, \dots, 1990.$$

Parameters to be estimated

$$\gamma = \gamma_{fls(-1)} : g_fls_lag1$$

$$\beta_{(1)} = \beta_{hdbt} : b_hdbt$$

$$\beta_{(2)} = \beta_{hinc} : b_hinc$$

$$\Delta TD_{1988} : dtd1988$$

$$\Delta TD_{1989} : dtd1989$$

$$\Delta TD_{1990} : dtd1990$$

$$\Delta TD_{1991} : dtd1991$$

Model, Moment conditions, and parameters to be estimated when using the program “dfelrtnb.tsp”

Model

$$y_{it} = \frac{\exp(\eta_i + TD_t + \gamma y_{i,t-1})}{1 + \exp(\eta_i + TD_t + \gamma y_{i,t-1})} + v_{it}, \quad \text{for } t = 1987, \dots, 1991.$$

$$y_{it} = fls_{it}$$

Moment conditions

Used moment conditions based on g-form

$$\begin{aligned} E[\hbar U_{it}^-(\gamma, \Delta TD_t, \Delta TD_{t+1})] &= 0, \quad \text{for } t = 1988, \dots, 1990, \\ E[y_{is} \hbar U_{it}^-(\gamma, \Delta TD_t, \Delta TD_{t+1})] &= 0, \quad \text{for } s = 1986, \dots, t-2; \quad t = 1988, \dots, 1990. \end{aligned}$$

Used moment conditions based on h-form

$$\begin{aligned} E[\hbar Y_{it}^-(\gamma, \Delta TD_t, \Delta TD_{t+1})] &= 0, \quad \text{for } t = 1988, \dots, 1990, \\ E[y_{is} \hbar Y_{it}^-(\gamma, \Delta TD_t, \Delta TD_{t+1})] &= 0, \quad \text{for } s = 1986, \dots, t-2; \quad t = 1988, \dots, 1990. \end{aligned}$$

Parameters to be estimated

$$\gamma = \gamma_{fls(-1)} : g_fls_lag1$$

$$\Delta TD_{1988} : dtd1988$$

$$\Delta TD_{1989} : dtd1989$$

$$\Delta TD_{1990} : dtd1990$$

$$\Delta TD_{1991} : dtd1991$$