

Example 4: Estimations of the panel logit models explaining women's labor supply using a fictitious dataset

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

Dataset

wls_{it} : wls1986 - wls1993 (woman's labor supply: 1=supply; 0=no supply, from 1986 to 1993)

(Number of individuals $N = 100000$)

We can estimate the same model, using both programs “dfelrtna.tsp” and “dfelrtnb.tsp” described later. Accordingly, the results obtained using both programs will be identical. This model is appropriate for this dataset. True values of parameters generating this dataset are

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

$$TD_{1986} = 0.5$$

$$TD_{1987} = 1.0$$

$$TD_{1988} = -0.5$$

$$TD_{1989} = 0.0$$

$$TD_{1990} = -0.5$$

$$TD_{1991} = 0.5$$

$$TD_{1992} = 0.0$$

$$TD_{1993} = -1.0$$

and accordingly,

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

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

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

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

Specifying the following commands in the file “prma.tsp” to run the file “dfelrtna.tsp”, we can obtain the same estimation result as that obtained from running the file “dfelrtnb.tsp”:

```
list exv wls ;  
list lead_wls 0 ; list ctmp_wls 0 ; list lag_wls 0 ;  
and  
set d_wls_sg = -99 ; set d_wls_eg = -99 ;
```

where with the last commands, all wls_{it} variables are relegated from the instruments.

Since $N=100000$, we must read the “csv” files instead of “xls” files to carry out the estimations using the files “dfelrtna.tsp” and “dfelrtnb.tsp”. Therefore, we must write the statements in the files “datra.tsp” and “datrb.tsp”.

For the purpose of reading the big dataset with $N=100000$, we must increase the allocated memory size, by writing the statement such as “memory = 512” in the file “login.tsp”.

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

Model

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

$$y_{it} = wls_{it}$$

Moment conditions

Used moment conditions based on g-form

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

Used moment conditions based on h-form

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

Parameters to be estimated

$$\gamma = \gamma_{wls(-1)} : \text{g_wls_lag1}$$

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

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

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

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

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

Model

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

$$y_{it} = wls_{it}$$

Moment conditions

Used moment conditions based on g-form

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

Used moment conditions based on h-form

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

Parameters to be estimated

$$\gamma = \gamma_{wls(-1)} : \text{g_wls_lag1}$$

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

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

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

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