

1 Overview

This folder contains Matlab files and data set for empirical illustration of the transformed likelihood approach proposed by Hsiao, Pesaran and Tahmiscioglu (2002, *Journal of Econometrics*) and Hayakawa and Pesaran (2015, *Journal of Econometrics*) "Robust Standard Errors in Transformed Likelihood Estimation of Dynamic Panel Data Models with Cross-Sectional Heteroskedasticity".

2 Model and data

We estimate models of earning dynamics by using the same data set as Meghir and Pistaferri (2004 *Econometrica*). Specifically, the following model is estimated:

$$y_{it} = \alpha_i + \gamma y_{i,t-1} + \beta_1 x_{1it} + \beta_2 x_{2it} + \beta_3 x_{3it} + u_{it} \quad (1)$$

where $y_{it} = \log(\text{earning}_{it}/\text{price}_t)$, $x_{1it} = \text{age}_{it}$, $x_{2it} = \text{age}_{it}^2$, $x_{3it} = \text{fsize}_{it}$. (Note: *fsize* denotes family size). Data are provided in "sample_data.csv". The estimation period is $t = 1978 - 1992$ ($T = 15$) with cross-sectional sample size $N = 507$.

The main file is "main_sample_code.m". To implement this file, optimization toolbox for Matlab is required. If you run "main_sample_code.m", then you will obtain the following results:

```
*****
starting value : random variable
time effects   : not included
```

		non robust	robust
variable	coef	std. err	std. err
y(-1)	0.4279	0.0125	0.0364
x1	0.0176	0.0056	0.0073
x2	-0.0130	0.0072	0.0094
x3	0.0110	0.0035	0.0045

```
*****
starting value : minimum distance estimator
time effects   : not included
```

		non robust	robust
variable	coef	std. err	std. err
y(-1)	0.4274	0.0125	0.0364
x1	0.0177	0.0056	0.0073
x2	-0.0132	0.0072	0.0094
x3	0.0110	0.0035	0.0045

```
*****
starting value : random variable
time effects   : included
```

		non robust	robust
variable	coef	std. err	std. err

y(-1)	0.4271	0.0125	0.0365
x1	0.0021	0.0110	0.0132
x2	-0.0120	0.0079	0.0100
x3	0.0110	0.0035	0.0044

starting value : minimum distance estimator
time effects : included

variable	coef	non robust std. err	robust std. err
y(-1)	0.4270	0.0125	0.0365
x1	0.0012	0.0110	0.0132
x2	-0.0113	0.0079	0.0100
x3	0.0111	0.0035	0.0044