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Special Topics in Applied Econometrics: Cross-Country Studies
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Hands-On Assignment 10:
Jackknife Incidental Parameters Bias Correction in Static FE Tobit Model

Please take out the following hands-on assignment in Matlab

1. Simulate data for the FE tobit model as given in Equation (18) in chapter two with
   - $\boldsymbol{\beta}=(5,-4)'$
   - $c_i \sim N(0,5)$
   - $\boldsymbol{x}_{it} \sim N(0,1)$
   - $\varepsilon_{it} \sim N(0,5)$
   - $N=100$

   and $T=3,6,9$
2. For each T, take out an MC simulation with S=100 replications to estimate the FE model [hint: you can use the estimation procedure implemented for the pooled tobit model and add as independent variable an individual dummy for each cross-section] and calculate the mean bias of the coefficients on $\boldsymbol{x}_{it}$ as well as the variance of the idiosyncratic error.
3. Which observation do you make on the mean bias as regards the three estimates?
4. Implement the bias correction by Hahn and Newey (2004)[1] as outlined in Equation (8) of chapter 4.
5. Integrate the bias correction into the MC simulation and correct the bias of the estimates of interest, that is, the coefficients of x_{it} and the variance parameter of the idiosyncratic errors.
6. Compare the bias corrected estimates with the biased estimates. What do you observe as regerads the quality of bias correction with increasing T?

[1] Hahn J. and W. Newey (2004): Jackknife and Analytical Bias Reduction for Nonlinear Panel Models, Econometrica 72(4), 1295-1319.