ECON 42230 Advanced Econometrics exercise 1

Kevin Denny 10th April 2017

A. Tobit 1 models

Use the **laborsub** dataset which is available online and on BB.

Examine the distribution of wife's hours of work graphically and numerically.

- What do you notice?

1. Regress wife's hours of work on the number of children <6, number of children between 6 & 18, wife's age, wife's educational attainment
2. Estimate the model using Tobit assuming left censoring at 0
3. Use OLS truncating the sample at y>0 i.e. use positive values of the dependent variable only
4. Use truncated regression on the truncated sample

- Comparing the results, what do you notice about coefficients & standard errors?
- Compare the four sets of marginal effects [my **Notes on… with Stata 1** has code] for model 2
- Are the results in models 1, 2 consistent with Goldberger's result about OLS & Tobit?

- For the Tobit model use the **bctobit** download to test for specification error (note this only works when there is left censoring at 0).

B. Heckman/Tobit 2 models

Use the **womenwk** dataset which is available online and on BB.

1. Estimate a an OLS model of wages on education and age
2. Use the Heckman selection model using married & children (also) in the selection equation
3. Repeat this model but using the twostep model
4. Use the Heckman model but without exclusion restrictions by ML and by twostep

- What do you notice? Test for sample selection bias.

My "**Notes on … with Stata 1**" shows you how to calculate the different marginal effects for the Heckman model.

C. Bootstrapping

Use the **womenwk** dataset

1. Run a probit of married on children, wages and a quadratic in age.
2. Bootstrap using 50 and 500 replications.
3. Run the model using the robust standard errors option.

Generate, if you can, a nice table with the four models, show the standard error (instead of t ratios) suppress the significance "stars" (***, etc) and include the number of obs and the pseudo r-squared at the end.

- Comparing the results, what do you notice about coefficients & standard errors?

D. Heteroscedasticity & probit

Use the **womenwk** dataset

1. Run a probit of married on children, age, wages and education
2. Now run the model but allowing the variance to depend on age
3. Estimate the model but using the bootstrap instead.
4. Estimate the model using robust standard errors.

- What do you conclude?