

Lab 10 for ECO R002 – Matrix, Figures and Experiments.

Note: if it is beginning to take significantly longer than 180minutes, I recommend to cut off.

Optional Bonus Warmup:

- 1.) Starting from file Lab_09.RScript, try to run yourself what you saw in "Matrix_03" the primer session.

Conceptual stuff:

- 2.) Let's do a thought experiment: Using the slide-deck UEA_ecoR2PhD CoreLect_06 ATENT_Match_Stk and dt.wages, let's pretend, for a moment "south," is a randomly assigned treatment in an experiment.:
 - a. Compute a difference-in-means estimator when treatment is "south," and the outcome is wage.
 - b. Now focus on race and gender as control variables (in "x") and run a regression estimation of treatment effects
 - c. Now try to estimate the regression and account for potentially heterogeneous treatment effects.
 - i. Note if you get lost, forget about south, and do it only for race.
 - d. Next, try to implement a 2-step fitted regression.
 - e. Next, consider that you also want to control for experience.
 - i. Can you do a regression estimation of treatment effects?
 - ii. Can you account for heterogeneous treatment effects w.r.t. experience?
 1. For both, discuss whether this is possible and how you would do it (or do it). Explain, which of the 3 approaches above you would use, and why.
- 3.) Lastly, let's worry that "south" is potentially not a great randomly assigned treatment.
 - a. Provide up to 3 reasons, why south is not a good "treatment."
 - b. Provide up to 3 reasons, why it might be justified to consider south "randomly assigned." (sketch bullets, don't get philosophical)
 - c. Now, let's check the balance in the covariates:
 - i. Provide summary statistics for both groups (south=0, south =1) separately. Are the covariates well-balanced (i.e. does it look like south and non-south are drawn from the same distribution?) Discuss how to evaluate this formally (keyword two-sample testing).
 - d. Describe verbally how would you set up a matching strategy? Which factors (variables) do you think will be most important to consider in the matching?
 - i. Do you think your matching strategy would work?
 - ii. Bonus: feel free to try implementing your suggested strategy.

R-Materials for stuff that you covered last week. [150-180 more minutes. Do it if care to repeat in R]

- 4.) Do Lab 11b for a DiD Exercise. (90 min)
- 5.) Do Lab 11a for a tutorial on panel estimation in R – this will help you get a clear intuition to better follow through with the theoretical material. (60-90 min)