

Problem Set 2
Econometrics 717
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Due: Mon. March 19

Problem 1 Take the data set `jtrain1` from <http://www.stata.com/texts/eacsap/>. This has data on firms and the amount of job training they get.

a) Only use the data from 1987 and 1988. Construct the difference in differences estimator in two different ways:

i) Construct the 4 means (control,treatment \times before,after)

ii) Run the regression

$$hrsemp_{it} = \beta_0 + \beta_1 grant_{it} + \beta_2 1(year = 1988) + \beta_3 E_i + u_{it}$$

where E_i is a dummy variable for being a treatment (i.e. someone who would receive the grant in 1988).

iii) Run the fixed effect regression:

$$hrsemp_{it} = \theta_i + \beta_1 grant_{it} + \beta_2 1(year = 1988) + u_{it}$$

Do you get exactly the same answer, why or why not?

b) Now (using all the data rather than 2 years) include a firm specific time trend in the model in two different ways:

i) use the `xi` command (something like `xi: reg y x i.fcode*year`)

ii) For each firm, run a regression of x and y on an intercept and a time trend, take the residuals and run them on each other (there are different ways to do this, but you could use `egen` with `by`)

Problem 2. Now use the data set `regm.raw.gz` that you can get from the computer software part of my website.

You can read it into stata using the command: `infile coll merit male black asian year state chst using regm.raw`

Now run the difference in difference model 4 different ways

a) Standard regression using all data (construct standard errors 3 ways, robust, cluster by state year, cluster by state)

b) Standard regression using all data but weighted so that all states get the same weight

c) Now take the mean of all variable by $state \times year$ and run the diff in diff regression (robust se, and clustering by states)

d) Do the same as in c, but weight by state so it looks like the population

How does this all compare?

- e) Now use this data to do an event study looking at the effects of the merit aid program both before and after it was implemented. You will need to figure out when the merit aid program was passed for each state that had one. There are multiple ways you can implement this-you can choose yourself.

Problem 3. Construct a dummy data set as I did in class in the rd.do file (which is on my website). Modify the simulated model and the estimation method for a fuzzy design rather than a sharp design and show what you get.