

Microeconometrics

Ethan Kaplan

Homework #1

Note : Please use STATA and hand in your a printed copy of your .do file in addition to your output.

Generate 10,000 data points with:

$$\epsilon_1 \sim N(0, 9), \epsilon_2 \sim N(7, 4), \epsilon_3 \sim N(3, 12), \mu \sim N(0, 5)$$

Generate:

$$X = \epsilon_1 + \epsilon_2, W = \epsilon_1 + \epsilon_3$$

Model A: Generate $Y1 = 5 + 10X^* - 12W + \mu$

Model B: Generate $Y2 = (4X^* - 5W)^2 + \mu$

Generate $X^* = 1$ is $X > 0$ and $X^* = 0$ otherwise

1. Run OLS for models A and B. Report your results.
2. Estimate the average treatment effect for X^* using propensity score bins for both model A and model B. Break up the propensity scores into quintiles and then deciles. Report your results. Non-parametrically bootstrap your standard errors with 500 replications.
3. Estimate the average treatment effect for X^* using propensity score nearest neighbor matching with replacement for both models. Report your results. Non-parametrically bootstrap your standard errors with 500 replications.
4. Discuss your results.

Generate 10,000 data points with:

$$\epsilon_4 \sim N(0, 5), \epsilon_5 \sim N(0, 5)$$

Generate Z :

$$Z_1 = 4\epsilon_1 + \epsilon_4, Z_2 = 0.05\epsilon_1 + \epsilon_5$$

1. Estimate two stage least squares using Z_1 as an excluded instrument for X and W as an included instrument. Report your results. Non-parametrically bootstrap your standard errors with 500 replications. Report the first stage F-statistic.
2. Plot the second stage residuals.
3. Redo steps (1.) and (2.) using Z_2 as your excluded instrument instead of Z_1 .
4. Discuss your results.