Problem Set 1

MGMT 737

Spring 2024

1. Randomization. This analysis will use the Dehijia and Wahba sample from the Lalonde dataset of the NSW experiment. The dataset is `lalonde_nsw.csv`. The outcome variable is `re78` (real earnings in 1978). The treatment indicator is `treat`. The remaining variables are potential covariates. Assume for the purposes of this problem set that `treat` is completely randomly assigned.

   (a) Calculate the average treatment effect of the policy $E(\tau_i)$ using a simple difference in means.

   (b) Calculate the average treatment effect on the treated of the policy $E(\tau_i|\text{treat} = 1)$. How does it compare to part a?

   (c) Test the null of $\tau_i = 0$ for all i using a randomization test.
   N.B. Hold fixed the number of treated and control (e.g. assume the treatment count would be held fixed) and permute the labels randomly 1000 times – you do not need to fully do every permutation (there would be too many). Report the quantile that your estimate from the previous question falls.

   (d) Run a regression using robust standard errors (you may use canned software) of the outcome on the treatment dummy, and compare the p-values from this test to the previous answer.