

## 高计 2 作业 2

截至日期：2023 年 3 月 24 日，中午 12 点

**Total mark: 7.5**

In this exercise you will begin by reading the data from the National Supported Work Demonstration (NSW) from **LaLonde (1986)** and the Population Survey of Income Dynamics (PSID) and the Current Population Survey (CPS) from **Dehejia and Wabha (1999, 2002)**. You will be asked to estimate the ATT using the experimental data and, then, to use non-experimental controls from PSID and CPS together with matching methods to estimate the treatment effect of training.

This exercise contains five questions.

1. Read the experimental data in `nsw.dta`. Get the descriptive statistics by treatment status. Test the equality of each of the variables between the treatment and control groups. **(1 point)**
2. Estimate the regression-unadjusted and the regression-adjusted ATT using `nsw.dta`, where the outcome variable is `RE78` and including the following regressors in the adjusted-regression: `age`, `age squared`, `education`, `education squared`, `Black`, `Hispanic`, `married`, `RE75`, `RE75 squared`,. We will refer to these results as the experimental ATTs. **(1 point)**
3. Merge `psid_controls.dta` and `cps_controls.dta` to `nsw.dta`. Redo step 2 using the merged sample. Explain how the results differ from experimental ATTs. **(2 point)**  
Use **propensity score matching (PSM)** to estimate ATT in the merged sample. I recommend `psmatch2` from Stata, but you are free to choose any statistical software and use any command. Show clearly the following
  1. estimation results for propensity score;
  2. test of covariates balance (you are required to select your own covariates, and explain your selection);
  3. test common support (show tail-trimming if any).
4. Use the non-experimental sample (merged sample) to estimate the ATT with nearest neighbor (with or without replacement and caliper), radius matching, and kernel matching. Experiment with different specifications of matching methods and then present the ATTs using these methods. Choose your most preferred setting and explain. **(2.5 point)**
5. Contrast the estimated ATT of your most preferred PSM matching method with the

experimental ATT. Note the final ATT should not be too far away from the experimental ATT. Explain the difference. **(1 point)**

Please prepare a word document to briefly present your methods, and results required above. This word file will be the document for the marking process. In this file, include all the necessary tables and figures together with your explanations.

This word file **should not exceed 10 pages.**

If you use English, please use the **Times New Roman font, size 12, 1.5 line spacing.**

如果用中文答题和展示结果，请使用**楷体，12号字体，1.5倍行距。**

Name this word document as **yourname homework2.doc/docx.** Submit the word file to course.pku before the deadline. **Any late submission will be subject to a 20% penalty on the final mark.**