# BSE · Econometric Tools for Policy Evaluation · 2021/22

Assignment 7 (due December 3rd)

## Instructions

This problem set covers the topic of instrumental variables and regression discontinuity. For each exercise you should provide estimates, report standard errors, and briefly interpret the results. Unless specified differently use pre-programmed Stata functions. Submit a PDF with your results and the do-file.

## 1 Instrumental Variables, Regression Discontinuity

In the following exercise you will replicate parts of the Oreopoulos (2006) that will be presented during the classes. This paper studies the impact of increasing the minimum school leaving age in United Kingdom from 14 to 15 in 1947. Such change gives a unique chance to estimate local average treatment effects (LATE) and returns to education using a regression discontinuity design rather than difference in differences. One of the major advantages of the study is that it allows to study average returns to high school from instrumental variables that affect almost half of the population.[1]

**Data.** The file `assignment7.dta` contains the data used by Oreopoulos (2006). It was constructed by combining 15 U.K. General Household Surveys (GHS) from 1983 to 1998 with 14 Northern Ireland Continuous Household Surveys from 1985 to 1998. The education is coded as the age at which individual completed full-time education. It contains information on 30,487 individuals who were aged 14 between 1935 and 1965, and 32 to 64 years old at the time of the survey. Besides education and basic demographic variables (gender, age, birth cohort and its polynomials), `assignment7.dta` contains information on earnings, employment and health status. For detailed description of see Appendix.

[1] Previous papers distinguished instruments for schooling such as: geographical proximity to college (Card, 1995), low tuition fee (Kane and Rouse, 1995) or more restrictive compulsory school laws (Acemoglu and Angrist, 2001), however those instruments affect usually less than 10 percent of the exposed population.

## Exercise

All referenced Tables and Figures in questions 1 through 3 can be found in the paper.

1. Replicate Figures 4 and 6 from the paper. Comment on the possible effect of increase of minimum school leaving age on earnings and age of leaving the full-time education.
2. Replicate Table 1 for Great Britain. Briefly comment your results
   [*Hint: use the person weight and cluster standard errors by birth cohort and region.*]
3. Estimate RD-IV as in Table 2 for Great Britain. Comment your results.

## Appendix

### IV, RD - Data

File `assignment7.dta` contains original data for UK used in *Oreopoulos* (2006). The list of variables is:

- `age` - age at time of survey
- `nireland` – 1 if in Northern Ireland, 0 if in Britain
- `yearat14` – year respondent was age 14
- `wght` – weighted cell size
- `lhinc` – log household income
- `learn` – log annual nominal labor earnings
- `linc` – log annual nominal income
- `lrearn` – log annual real (1998) earnings
- `yobirth` – year of birth
- `drop14` – 1 if dropout age faced when 14 is 14
- `drop15` – 1 if dropout age faced when 14 is 15
- `educb14` - 1 if left full-time school at age 14 or less
- `educb15` - 1 if left full-time school at age 15 or less
- `agelfted` – age left full time education