EXERCISE SHEET 12: HORNUNG (2015): RAILROADS AND GROWTH IN PRUSSIA

Main learning goals: 1. More on propensity score matching (PSM)

2. Implement and understand logistic regressions
3. Interpretations of marginal effects
4. Estimating treatment effects with matching estimators
5. More on panel regressions

Hand-in: As usual: do-file and the corresponding log-file (saved in .log-format) containing the following steps (numbered in the do-file).

1. Open the dataset `hornung-rail-cross-section_new.dta` and copy the definition of the global macros for controls and ex ante controls from last week's do-file.
2. Briefly take a detour to discuss the logit model as example for non-linear models (since we have not seen them in the course so far) in comparison to the usual linear probability model. To do so, estimate the probability of receiving a railroad access based on the ex ante controls from table 3. Use the `margins` command to estimate the marginal effect of population growth at the means for both models (LPM and logit) and briefly discuss.
3. Use `psmatch2` to implement the propensity score matching with a kernel to replicate panel B of table 7. Make sure that you impose the right constraints. What is the role of the common support? Use `psgraph` to plot it.
4. Compute the weighted averages for panel B of table 7 and check how to compute the differences. What is the relation between matching and unobserved heterogeneity?
5. Combine the PSM approach with the IV to re-estimate columns (1) and (2) of table 8, panel B. To do so, use the weights obtained from the propensity score matching to weight the IV regression.
6. Use the dataset `hornung-rail-panel-city.dta` to estimate equation (3) of the paper. Generate new variables if necessary. Replicate columns (1) and (2) of table 9, i.e. the POLS and the FE estimates. Which problem does the panel estimation with fixed effects solve? What might still be a concern?
7. Estimate the IV in the panel setting with `xtivreg2` to replicate columns (11) and (12) of table 9. Briefly discuss your findings.

Further comments: Submit 3 files (.do, .log, .pdf(with graphs)) to Ilias. Usual procedures apply.