6SSMN961 Applied Econometrics 2019-20

Problem Set 4. Instrumental Variables - Immigration

1. On the course page you can find the Stata dataset **immigration.dta**, which is adapted from the data used in Sá (2015). The file **readme_immigration.doc** provides a description of the variables in the data file.

   (a) Calculate the average house price index and the average ratio of immigrants to population (in %) across all local authorities (LAs) for each year.

   (b) In a diagram, plot the evolution over time of average house prices and average immigrant share (the two variables calculated in part (a). What is the correlation between the two series?

   (c) Estimate the following model by OLS:

$$\Delta \ln P_{it} = \beta \frac{\Delta FB_{it}}{Pop_{it-1}} + \phi_t + \rho_i + \varepsilon_{it}$$

   where i denotes local authority and t denotes year. The dependent variable is the change in log of house prices, $\frac{\Delta FB_{it}}{Pop_{it-1}}$ is the share of new immigrants to initial local population, and ϕ_t and ρ_i are year and LA fixed effects.

      1. Why would you include year and LA fixed effects in the model?
      2. What type of standard errors are you using? Why?
      3. Interpret the OLS results. Do they measure the causal effect of immigration on house prices? Explain.

   (d) What instrument could you use to estimate the causal effect of immigration on house prices? What conditions does this instrument need to satisfy in order to achieve identification?

   (e) Now estimate the model by IV using the instrument provided.

      1. Report and comment on the first-stage results.
      2. Create a table with the OLS and IV coefficients and standard errors on the immigration variable.
      3. Compare $\hat{\beta}_{IV}$ with $\hat{\beta}_{OLS}$. What is the direction of the bias in the OLS estimate? What may explain this bias?

   (f) What model would you estimate to test whether there is native displacement, i.e., whether natives leave a LA in response to an inflow of immigrants? Write down the estimated equation.

(g) Estimate the model you suggested in part (f) by OLS and IV. Create a table with the OLS and IV coefficients and standard errors on the immigration variable and interpret the results.

Reference: Sá, F. (2015), "Immigration and House Prices in the UK", *Economic Journal*, Vol.125(587), pp.1393-1424