Problem set 12: week 16

This problem set is to be completed prior to your Stata class. The data sets used, bwght.dta and card.dta, are available on the EC203 website, please copy them on to a memory stick or your H: drive.

1. Open a do file in Stata. All the commands we use in this problem set will be copied into here. This is so you can recall what we have done, and the analysis can be repeated. It will also be useful for you to annotate the do file as you go along.

2. Load bwght.dta into Stata. Run the following regression using OLS: $ln(bwght_i) = \alpha + \beta_1 packs_i + \epsilon_i$. Interpret the coefficients.

3. Do you think packs is an exogenous variable?

4. Instead of using OLS to estimate the model, you decide to use IV (2SLS) estimation. As an instrument you decide to use cigarette price. Before carrying out the estimation, explain why price may act as a good IV, in terms of **instrument relevance** and **instrument exogeneity**. (It is not because it is the only other variable in the data set.)

5. To check the relevance of your instrument, you run a reduced form regression for packs, that is: $packs_i = \pi_0 + \pi_1 price_i + \eta_i$. What do you conclude?

6. You decide to proceed with the IV estimation. Use the **ivregress 2sls** command to do so. Explain the resulting regression.

7. Load card.dta into Stata. Using OLS regress $ln(wage)$ against all variables in the data set, except for $near4$. Interpret the coefficient on education.

8. Motivate using $near4$ as a IV for education. As part of this motivation test for instrument relevance.

9. Again using the **ivregress 2sls** command run an IV (2SLS) estimation of part 7, using $near4$ as an instrument. Compare the IV and OLS estimates.

10. Now manually carry out the 2SLS. That is, in the first stage manually run the reduced form regression for education to obtain the fitted values, $\hat{educ}$. Then use these predicted values in the second stage. Verify that the coefficients are identical to those attained in part 9.

11. Annotate and close your do file.