PA 9950 Quantitative Methods

Problem Set #5

For this homework write-up and present your results in “journal” format. To do this present a hypothesis (variable of interest) and interpret your results. Standard reporting technique is to discuss your variable(s) of interest at length and only discuss “control” variables that are interesting or present some unexpected result.

Your results must be presented in tables. To facilitate this use the outreg2 command. You will have to download this routine from the STATA website. At the STATA command line type: findit outreg2 the rest will be obvious. ***All assignments must be typed. Use the equation editor (in MS – Word) for any equations you present.***

Questions:

Part I – Panel Data Estimators

For this exercise, we use JTRAIN to determine the effect of the job training grant on hours of training per employee. The basic model for the three years is

1. Estimate the equation using first differencing. How many firms are used in the estimation? How many total observations would be used if each firm had all variables (in particular, *hrsemp*) for all three time periods?
2. Interpret the coefficient on *grant* and comment on its significance.
3. Is it surprising that *grant-1* is insignificant? Explain.
4. Do larger firms train their employees more or less, on average? How big are the differences in training?

For this exercise, we use JTRAIN to determine the effect of the job training grant on hours of training per employee. The basic model for the three years is

1. Estimate the equation using fixed effects. How many firms are used in the FE estimation? How many total observations would be used if each firm had all variables (in particular, *hrsemp*) for all three time periods?
2. Interpret the coefficient on *grant* and comment on its significance.
3. Is it surprising that *grant-1* is insignificant? Explain.
4. Do larger firms train their employees more or less, on average? How big are the differences in training? (For example, if a firm has 10% more employees, what is the change in the average hours of training?)

Part II – Instrumental Variables

The data in FERTIL2 include, for women in Botswana during 1988, information on the number of children, years of education, age, and religious and economic status variables

1. Estimate the model

by OLS and interpret the results. In particular, holding *age* fixed, what is the estimated effect of another year of education on fertility? If 100 women received another year of education, how many fewer children are they expected to have?

1. The variable *frsthalf* is a dummy variable equal to one if the woman was form during the six months of the year. Assuming that *frsthalf* is uncorrelated with the error term from 1., show that *frsthalf* is a reasonable IV candidate for *educ*. (Hint: you need to do a regression)
2. Estimate the model from 1. by using *frsthalf* as an IV for *educ*. Compare the estimated effect of education with the OLS estimate from 1.
3. Add the binary variables *electric, tv,* and *bicycle* to the model and assume they are exogenous. Estimate the equation by OLS and 2SLS and compare the estimated coefficients on *educ*. Interpret the coefficient on *tv* and explain why television ownership has a negative effect on fertility.