

BSM946 – Workshop 5: Panel Data

Panel Data Estimators

1) Load the dataset **bcuse jtrain**. You will be estimating the impact of a job training grant received by firm i in year t ($grant_{it}$) on hours of job training per employee ($hrsemp_{it}$) using the following model:

$$hrsemp_{it} = \beta_0 + \beta_1 d88 + \beta_2 d89 + \beta_3 grant_{it} + \beta_4 \log(employ_{it}) + \alpha_i + u_{it}$$

Check whether you have missing values for the variables you need in your estimation. You should drop these observations before you estimate your model. Details of the variables are included at the end of this document.

2) Run a pooled OLS regression for the above specification. What do the results suggest?

3) Transform the variable in the regression to their first differenced values. Estimate the above equation using a first differenced method by running an OLS regression on your transformed data. The following code should help:

```
xtset i-variable t-variable
```

```
gen fdhrsemp= d.hrsemp
```

4) Transform the variables in the regression to their demeaned values. Estimate the above equation using fixed effects by running an OLS regression on your transformed data. The following code should help:

```
by fcode: egen meanhrsemp=mean(hrsemp)
```

```
gen dmhrsemp=hrsemp-meanhrsemp
```

5) Run a fixed effects regression using STATA's inbult command. Do your results differ? This requires first telling STATA that you have panel data (Need to use **xtset**).

6) What is the coefficient on grant?

7) Do larger firms provide their employees with more or less training, on average? How big are the differences? (For example if a firm has 10% more employees, what is the change in average hours of training?)

8) Estimate the regression outlined about using OLS with firm specific dummies. Do you get the same results as the two fixed effects regressions you have run?

9) What if the grant takes longer than one year to take effect? Can we control for this in our estimation?

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1. year	1987, 1988, or 1989
2. fcode	firm code number
3. employ	# employees at plant
4. sales	annual sales, \$
5. avgsal	average employee salary
6. scrap	scrap rate (per 100
items)	
7. rework	rework rate (per 100
items)	
8. tothrs	total hours training
9. union	=1 if unionized
10. grant	=1 if received grant
11. d89	=1 if year = 1989
12. d88	=1 if year = 1988
13. totrain	total employees trained
14. hrsemp	tothrs/totrain
15. lscrap	log(scrap)
16. lemploy	log(employ)
17. lsales	log(sales)
18. lrework	log(rework)
19. lhrsemp	log(1 + hrsemp)
20. lscrap_1	lagged lscrap; missing
1987	
21. grant_1	lagged grant; assumed 0
in 1987	
22. clscrap	lscrap - lscrap_1; year
> 1987	
23. cgrant	grant - grant_1
24. cemploy	lemploy - lemploy[t-1]
25. clsales	lavgsal - lavgsal[t-1]
26. lavgsal	log(avgsal)
27. clavgsal	lavgsal - lavgsal[t-1]
28. cgrant_1	cgrant[t-1]
29. chrsemp	hrsemp - hrsemp[t-1]
30. clhrsemp	lhrsemp - lhrsemp[t-1]