

EC 771B Spring 2000 Problem Set 3

Christopher F. Baum

March 22, 2000

Due at classtime, Tuesday 4 April 2000

Set up a Stata program (do-file) to provide the empirical results requested. Hand in a copy of the program, annotated with your comments as warranted. The comments may be handwritten on the printout if they are clearly legible.

Use the Wooldridge PRISON dataset, available from within Stata via the command
use <http://fmwww.bc.edu/ec-p/data/wooldridge/PRISON>

This dataset contains 714 observations, longitudinal data on the following variables:

1. state	alphabetical; DC = 9
2. year	80 to 93
3. govelec	=1 if gubernatorial election
4. black	proportion black
5. metro	proportion in metro. areas
6. unem	proportion unemployed
7. criv	violent crimes per 100,000
8. cript	property crimes per 100,000
9. lcriv	log(criv)
10. lcript	log(cript)
11. gcriv	lcriv - lcriv_1
12. gcript	lcript - lcript_1
13. y81	=1 if year == 81
14. y82	
15. y83	
16. y84	
17. y85	
18. y86	
19. y87	
20. y88	
21. y89	
22. y90	
23. y91	
24. y92	
25. y93	
26. ag0_14	prop. pop. 0 to 14 yrs
27. ag15_17	prop. pop. 15 to 17 yrs
28. ag18_24	prop. pop. 18 to 24 yrs
29. ag25_34	prop. pop. 25 to 34 yrs

30. incpc	per capita income, nominal
31. polpc	police per 100,000 residents
32. gincpc	$\log(\text{incpc}) - \log(\text{incpc}_1)$
33. gpolpc	$\text{lpolpc} - \text{lpolpc}_1$
34. cag0_14	change in ag0_14
35. cag15_17	change in ag15_17
36. cag18_24	change in ag18_24
37. cag25_34	change in ag25_34
38. cunem	change in unem
39. cblack	change in black
40. cmetro	change in metro
41. pris	prison pop. per 100,000
42. lpris	$\log(\text{pris})$
43. gpris	$\text{lpris} - \text{lpris}[t-1]$
44. final1	=1 if fnl dec on litig, curr yr
45. final2	=1 if dec on litig, prev 2 yrs

Fit and evaluate the following models. You will want to use 'iis' and 'tis' to convince Stata that these are panel data.

1. a. Log of violent crime rate = $f(\text{black}, \text{metro}, \text{polpc})$, with year dummies, via fixed effects (see xtreg). Discuss expected signs and findings.
 - b. Same model, via GLS random effects.
 - c. Perform the Hausman test and evaluate the results.
2. a. Log of property crime rate = $f(\text{black}, \text{metro}, \text{polpc})$, with year dummies, via fixed effects.
 - b. Same model, via GLS random effects.
 - c. Perform the Hausman test and evaluate the results.
3. Repeat #1 and #2 adding lpris (log of prison population per 100,000) to the fixed effects and random effects formulation. Do your judgments from the Hausman test results change? Why or why not?
4. Generate lagged values of gcriv and gcrip, the changes in the log crime rate variables. (Careful: this must be done for each state; see 'by'). Test OLS regression models in which $\text{gcriv} = f(\text{cag15_17}, \text{gpris}, \text{lgcriv})$ and $\text{gcrip} = f(\text{cag15_17}, \text{gpris}, \text{lgcrip})$. Comment on expected signs. What is being implied by the lagged variables' placement in these equations? Comment on their estimated coefficients. What does the constant term in these equations imply?
5. Reestimate the two OLS equations above using Zellner SURE (see sureg) with the corr and isure options. Comment on the SURE results versus the OLS results.