GSERM 2021: "Analyzing Panel Data"

Homework Exercise
June 15, 2021

Introduction and Data

We'll examine a question that has been a perennial favorite of social scientists: The effectiveness of the death penalty in reducing violent crime, especially murder. For this exercise, we have data on 49 states in the U.S. (Nebraska is, inexplicably, omitted) over ten years (1985-1994) ($NT = 490$).

The main "dependent" variable, `MurderPer100K`, is the state's annual murder rate per 100,000 population. Our main predictor of interest, `DeathPenalty`, is coded 1 if the state had a death penalty statute during that year and 0 otherwise. In addition, I've included a range of other variables:

- `Population` is the state's population, in thousands of residents;
- `UrbanPct` is the percentage of that state's population that lives in urban areas;
- `AvgEducation` is the average number of years of formal education for adults living in that state;
- `SchoolSpendEq` is an index of equity in educational spending, where higher values indicate greater equity. A score of 100 indicates complete equity (that is, all local school districts spend exactly the same amount per pupil). This is a cross sectional variable, measured in 1997; i.e., it does not vary over time.[1]
- `CitizenIdeol`: A measure of mass-level political ideology. Specifically, this is Berry, Ringquist, Fording, and Hansson?s *citizen ideology* measure. It is measured on a 0-100 scale, with higher values representing higher levels of left/liberalism among the mass public.[2]
- `EliteIdeol`: A measure similar to `CitizenIdeol`, but measured on political elites. It is measured on a 0-100 scale, with higher values representing higher levels of left/liberalism among the state's political elites. The source is the same.
- `AvgIdeol` is the average of the two preceding ideology variables for that state/year.

The data were assembled from a variety of sources by Prof. Stephanie Lindquist. These are variables that have been chosen as potential influences on a state's likelihood of having the death penalty. The data are available on the course Github repository (in the folder labeled "Exercises"), and on the course's HSG CANVAS page.

[1] Source: Quality Counts: A Report Card on the Condition of Public Education in the 50 States. 1997. Washington, D.C.: Education Week/Pew Charitable Trusts.

[2] For information on how this variable was calculated, see: Berry, William D., Evan J. Ringquist, Richard C. Fording, and Russell L Hanson. 1998. "Measuring Citizen and Government Ideology in the American States, 1960-93." *American Journal of Political Science* 42:327-348.

Exercise

Your assignment is straightforward: examine the relationship between the death penalty and murder rates in the states, controlling for other confounding variables for which you have data, and using the tools that we have learned so far (that is unit-effects models). Write up your findings in a short (300-400 word) essay, and include any relevant tables and/or figures. You should *not* add any additional variables to the data; nor need you use every variable included in your analyses. Some suggestions:

1. Don't forget to discuss your findings in substantive terms.
2. Be sure to justify your modeling choices.
3. Consider implementing diagnostics and tests as part of #2.

Please submit your written homework exercise, along with any code you used to conduct your analyses, via email to zorn@psu.edu. This exercise is due by 11:59 p.m. CET on Thursday, June 17, 2021. It will be worth a total of 300 possible points (30 percent of the course evaluation total).