Chapter 2 Review: Tools of Positive Analysis: John

Readings: Rosen: Chapter 2 all

Outline

I. Controlled Experiments: The ultimate test of a theory
   Can this be done in Economics?
   How does economics attempt to do controlled experiments?

II. Case Studies: a third bests

III. The Second Best: Econometrics (statistical testing/analysis)
   A. Simple Statistics
   B. Linear regression: what is it?
   C. Problems with linear regression

Discussion Questions (p 30)
#’s 1 – 4

Practice Problems

1. What is one method by which economists have attempted to conduct controlled experiments? Give an example of such an experiment. What are the drawbacks or difficulties with this method?

2. Bo and Luke Duke, two economists, are submitting a paper to the prestigious journal Reflections on Economics, Harleys, And Bars (REHAB). You are an editor (or referee) for REHAB. In it their article the Dukes argue that increasing political participation lead to higher unemployment. They theorize that political participation results in people using inefficient government to get what they want instead of working to produce it. They estimate (i.e. regress) the following equation using an econometric software package. The voter turnout is the percentage of eligible voters voting in the last election. To hold as much constant as possible, Bo and Luke only examined the top 32 nations in the world in terms of GDP/capita.

   \[ U_{rate} = \alpha_0 + \alpha_2 \cdot (\text{Voter turnout in \%}) + \varepsilon \]

Their results are shown below. Measures of dispersion (i.e. goodness of fit measures such as R^2, t-stats, etc.) indicate that the data fits the equation really well. i.e. The data strongly indicates that there is some relationship between the unemployment rate and voter turnout.
\[ U_{\text{rate}} = 0.5\% + 0.2 \cdot (\text{Voter turnout in } \%) + e^1 \]

Holy cow! The equation says that increasing voter turnout by, say 10\%, increase the unemployment rate (0.2 \cdot 10\% =) 2\%. Those Duke boys conclude that political participation is bad for economic growth.

- Draw a graph illustrating the equation the Dukes estimated. Include the relevant numbers, etc.
- Critique the Dukes’ technique for testing their theory. In particular, point out any flaws they may have made. Would you publish the results? Why or why not?

3. Daisy Duke\(^2\) is attempting to explain voting on Indian policy in the 1830s. She hopes to publish in the *Journal of Kool Economics* (JOKE). She is trying to explain senators’ votes (Yeah = 1, Nay = 0) on a bill to relocate Indians from the Southeast U.S. to Oklahoma. i.e. She is trying to explain voting patterns on the “Trail of Tears” vote. Land in the southeast was considered more fertile and closer to markets than land in Oklahoma. Daisy’s argument is that senators representing rural constituencies have a greater desire for taking Indian lands

\[ \text{Vote} = \alpha_0 + \alpha_2 \cdot \text{(rural)} + \varepsilon \]

*Rural* is the proportion of a state’s citizens (0 to 1) living in rural areas. Their results are shown below. Vote is a 0 if the senator voted against the bill and a 1 if they voted for it.

\[ \text{Vote} = -25 + 1.49 \cdot \text{(rural)} + \varepsilon \]

Graphically illustrate the equation Daisy estimated. Critique the equation Daisy illustrated based on what was discussed in this class. Namely, is linear regression appropriate for voting data and other 1 or 0 data?

4. Jesse Duke, not wanting to be left out, wants to submit an article to the journal *Review of American Social History* (RASH). He is hoping to explain family size based on the economic characteristics of the parents. He has good data, survey data from 4,000 households scattered across the U.S. This data is very detailed containing information such as; the age of the male head of household, age of female head of household, combined income of household, the number of siblings each head of household has, etc. Jesse’s problem is that he cannot narrow it down to just one variable. Jesse states; “I have at least six likely determinants of family size. However, When I graph the relationship, I only can put one explanatory variable on the horizontal axis.”

Explain to Jesse how econometrics can help him with this dilemma. Hint: The answer is probably simpler than most people think at first.

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1 Don’t worry about the difference between \( \varepsilon \) and \( e \) in this class. They both mean the unexplained part or the error. One, \( \varepsilon \), simply refers to the true value of the error and the other, \( e \), is the value of the error from the estimation results.

2 Yes, the rumors are true. Daisy and John were once involved in a romantic relationship. However, their love of each other and their shared interest in voting studies was not enough to hold them together. Daisy left John for a man named Kooter. After years of heartbreak, John met Julie and found reason to live again.