

- ii. Does adding the control variables in regression (2) change the estimated effect of a shall-carry law in regression (1) as measured by statistical significance? As measured by the “real-world” significance of the estimated coefficient?
 - iii. Suggest a variable that varies across states but plausibly varies little—or not at all—over time and that could cause omitted variable bias in regression (2).
- b. Do the results change when you add fixed state effects? If so, which set of regression results is more credible, and why?
 - c. Do the results change when you add fixed time effects? If so, which set of regression results is more credible, and why?
 - d. Repeat the analysis using $\ln(\text{rob})$ and $\ln(\text{mur})$ in place of $\ln(\text{vio})$.
 - e. In your view, what are the most important remaining threats to the internal validity of this regression analysis?
 - f. Based on your analysis, what conclusions would you draw about the effects of concealed weapons laws on these crime rates?

E10.2 Do citizens demand more democracy and political freedom as their incomes grow? That is, is democracy a normal good? On the textbook website, www.pearsonglobaleditions.com/Stock_Watson, you will find the data file **Income_Democracy**, which contains a panel data set from 195 countries for the years 1960, 1965, . . . , 2000. A detailed description is given in **Income_Democracy_Description**, available on the website.⁴ The data set contains an index of political freedom/democracy for each country in each year, together with data on the country’s income and various demographic controls. (The income and demographic controls are lagged five years relative to the democracy index to allow time for democracy to adjust to changes in these variables.)

- a. Is the data set a balanced panel? Explain.
- b. The index of political freedom/democracy is labeled *Dem_ind*.
 - i. What are the minimum and maximum values of *Dem_ind* in the data set? What are the mean and standard deviation of *Dem_ind*

⁴These data were provided by Daron Acemoglu of M.I.T. and were used in his paper with Simon Johnson, James Robinson, and Pierre Yared, “Income and Democracy,” *American Economic Review*, 2008, 98:3, 808–842.

- in the data set? What are the 10th, 25th, 50th, 75th, and 90th percentiles of its distribution?
- ii. What is the value of *Dem_ind* for the United States in 2000? Averaged over all years in the data set?
 - iii. What is the value of *Dem_ind* for Libya in 2000? Averaged over all years in the data set?
 - iv. List five countries with an average value of *Dem_ind* greater than 0.95; less than 0.10; and between 0.3 and 0.7.
- c. The logarithm of per capita income is labeled *Log_GDPPC*. Regress *Dem_ind* on *Log_GDPPC*. Use standard errors that are clustered by country.
- i. How large is the estimated coefficient on *Log_GDPPC*? Is the coefficient statistically significant?
 - ii. If per capita income in a country increases by 20%, by how much is *Dem_ind* predicted to increase? What is a 95% confidence interval for the prediction? Is the predicted increase in *Dem_ind* large or small? (Explain what you mean by large or small.)
 - iii. Why is it important to use clustered standard errors for the regression? Do the results change if you do not use clustered standard errors?
- d.
- i. Suggest a variable that varies across countries but plausibly varies little—or not at all—over time and that could cause omitted variable bias in the regression in (c).
 - ii. Estimate the regression in (c), allowing for country fixed effects. How do your answers to (c)(i) and (c)(ii) change?
 - iii. Exclude the data for Azerbaijan and rerun the regression. Do the results change? Why or why not?
 - iv. Suggest a variable that varies over time but plausibly varies little—or not at all—across countries and that could cause omitted variable bias in the regression in (c).
 - v. Estimate the regression in (c), allowing for time and country fixed effects. How do your answers to (c)(i) and (c)(ii) change?
 - vi. There are additional demographic controls in the data set. Should these variables be included in the regression? If so, how do the results change when they are included?
- e. Based on your analysis, what conclusions do you draw about the effects of income on democracy?