Additional Empirical Exercise 10.1

Traffic crashes are the leading cause of death for Americans between the ages of 5 and 32. Through various spending policies, the federal government has encouraged states to institute mandatory seat belt laws to reduce the number of fatalities and serious injuries. In this exercise you will investigate how effective these laws are in increasing seat belt use and reducing fatalities. The data file **Seatbelts** contains a panel of data from 50 U.S. states plus the District of Columbia for the years 1983 through 1997.[1] A detailed description is given in **Seatbelts_Description**.

a. Estimate the effect of seat belt use on fatalities by regressing *FatalityRate* on *sb_useage, speed65*, *speed70, ba08, drinkage21*, ln(*income*), and *age*. Does the estimated regression suggest that increased seat belt use reduces fatalities?

b. Do the results change when you add state fixed effects? Provide an intuitive explanation for why the results changed.

c. Do the results change when you add time fixed effects plus state fixed effects?

d. Which regression specification—(a), (b), or (c)—is most reliable? Explain why.

e. Using the results in (c), discuss the size of the coefficient on *sb_useage*. Is it large? Small? How many lives would be saved if seat belt use increased from 52% to 90%?

f. There are two ways that mandatory seat belt laws are enforced: "Primary" enforcement means that a police officer can stop a car and ticket the driver if the officer observes an occupant not wearing a seat belt; "secondary" enforcement means that a police officer can write a ticket if an occupant is not wearing a seat belt, but must have another reason to stop the car. In the data set, *primary* is a binary variable for primary enforcement and *secondary* is a binary variable for secondary enforcement. Run a regression of *sb_useage* on *primary*, *secondary*, *speed65*, *speed70, ba08, drinkage21*, ln(*income*), and *age*, including fixed state and time effects in the regression. Does primary enforcement lead to more seat belt use? What about secondary enforcement?

g. In 2000, New Jersey changed from secondary enforcement to primary enforcement. Estimate the number of lives saved per year by making this change.

---

[1] These data were provided by Professor Liran Einav of Stanford University and were used in his paper with Alma Cohen, "The Effects of Mandatory Seat Belt Laws on Driving Behavior and Traffic Fatalities," *The Review of Economics and Statistics*, 2003, 85(4): 828–843.