Additional Assessment 2 Review Questions

Part 1: Political Movements

The following example is based on Madestam et al. (QJE, 2013).

The authors are interested in the effects of political protests on subsequent strength of political movements. They study whether attendance at Tea Party movement rallies on Tax Day in 2009 affected subsequent strength of the movement.

The authors have data on the following county-level measures:

- Rainfall on Tax Day
- Tea Party rally attendance
- Local movement strength following the rally, public support for Tea Party positions, Republican votes in midterm elections

$$\text{Strength}_i = \beta_0 + \beta_1 \text{Attendance}_i + u_i$$

1. Consider the regression above. If you estimated that regression via OLS would $\hat{\beta}_1$ give an unbiased estimate of the effect of attendance on subsequent movement strength? Why or why not?
2. The authors instrument for rainfall to estimate the effect of rally attendance on subsequent movement strength. What do the relevance, exogeneity, and monotonicity assumptions of IV mean in this context?
3. Suppose Tax Day 2009 was a beautiful rainless day in Cambridge, Massachusetts, and yet no one showed for the Tea Party rally. How would this affect the LATE? Assume the IV assumptions all hold.
4. What regressions could you run to estimate the effect of rally attendance on movement strength using rainfall as an instrumental variable?

Part 2: Difference in Differences

You are studying the effect of local policy on the careers of young musicians in Massachusetts. Suppose Cambridge institutes a noise ordinance that bans music over a certain volume after 8pm in all but a few select venues. You obtain data from Cambridge and Somerville Public Schools on 12th graders before and after the ordinance went into effect. You estimate the following regression:

$$\text{Berklee}_{it} = \beta_0 + \beta_1 \text{Cambridge}_i + \beta_2 \text{Post}_t + \beta_3 \text{Cambridge}_i \times \text{Post}_t + u_{it}$$

- $Berklee_{it}$ equals 1 if student i who graduated from high school in year t attended Berklee College of Music and 0 otherwise.
- $Cambridge_i$ equals 1 if i lived in Cambridge and 0 otherwise.
- $Post_t$ equals 1 if graduation year t is after the ordinance and 0 otherwise.

1. Interpret each coefficient.
2. What assumption is necessary for a causal interpretation of β_3?
3. Suppose that prior to the ordinance Somerville music students frequently use facilities in Cambridge that are affected by the ordinance. Does this affect the internal validity of difference-in-differences?
4. Suppose that the aliens from "A Quiet Place" touch down on Earth shortly after the noise ordinance goes into place. These murderous invaders have sharp hearing that they use to detect and hunt humans (like Jim from the Office). Does their arrival affect the internal validity of difference-in-differences?