The University of Texas at Austin
ECO 348K (Advanced Econometrics)
Prof. Sukjin Han

Assignment 3

Due: Oct. 4th 11:00am

- In answering questions, if any math derivations are involved, state them explicitly.

1. Lee (2008) (uploaded on Canvas) is arguably the most famous paper in the RD literature that has popularized the method in the economics profession. Carefully read Sections 3.1–3.4 of the paper, and answer the following question:

   (a) What is the research question? State in one sentence.

   (b) What is the challenge in answering this research question? That is, what would be a naive comparison and what would be the selection bias when making this comparison?

   (c) Explain (in a few sentences) how the RD method can overcome this challenge in this particular example.

   (d) What is the running variable? What is the treatment variable?

   (e) Argue that the running variable affects the treatment variable in this example.

   (f) Based on (e), conclude whether the setup is the sharp RD or the fuzzy RD.

   (g) Consider Figure 2. Panel (a) illustrates the RD estimate when the dependent variable is the probility of winning the election at $t+1$. Using the logit fit curves of the figure, visually determine the value of the estimated causal effect (a rough range is fine).

   (h) In the same figure, explain the role of Panel (b); why do we need this figure (or this exercise)?

   (i) In Table 1, the author compares winners and losers (i.e., individuals on each side of the cutoff). The first two columns compare all individuals; the next four columns compare individuals within specific windows around the cutoff. The last two columns compare a hypothetical individual's potential outcomes at the cutoff, via extrapolation using a model similar to (4.4) in MM, but with a fourth-order polynomial instead of a quadratic polynomial. In this table, find the RD estimate for the causal effect on the probability of winning. In doing so, find the most compelling RD estimate, in the sense that it passes the balance check. Explain your decision.