Problem Set 2 Part 2
ECON 672
August 6, 2022

Question 3: We want to assess the impact of "Right-to-Work" (RTW) laws on unionization. Our research question is the following: do RTW laws reduce the unionization? Looking at aggregate data, we are unable to assess individual movements in and out of unionization, so we will use individual panels from the NBER CPS MORG (cps_morg_2009_2016.dta) to assess the research question. RTW laws eliminate union security agreements or the requirement to pay union dues or agency fees to the union that has a collective bargaining agreement with a firm. In February 2012 Indiana adopted a RTW law, while Michigan implemented a similar law in late 2013 and Wisconsin in March 2015. You need to assess the Average Treatment on the Treated (ATT) for the adoption of RTW laws on unionization.

Your outcome of interest is union membership, which is binary 0 or 1. You need to set up a canonical 2-by-2 Difference-in-Differences to assess the ATT of RTW on union status. $Y_{its} = \alpha + \gamma Post_t + \beta Treat + \delta(Post * Treat)_{st} + \epsilon_{its}$. You will be utilizing a linear probability model (LPM), since the outcome is binary. Your treatment variables will be the following for each individual 2-by-2 DD: INTREAT, MITREAT, and WITREAT. Your post variable will be the following: INPOST, MIPOST, and WIPOST. These variables are 0 for the first observation (before the law) and 1 in the second observation (after the law) is passed or implemented.

You will need two qualifiers for each 2-by-2 DD regression. First, each state has a set of comparison states. For example, you can see Indiana's comparison states by tabulating "in_borderstate" and stfips. Second, you will need to observe the time period of interest. These have been set up for you. For example, Indiana's observations before and after its law for the same individual can be found with "inob1". As a final note, these data have 1-year panels for each individual with "ID" being the unit variable and "year" as the time variable. Use do not need xtreg, but you will need areg and absorbe(ID) to account for individual fixed effects that will take care of the taste hypothesis. Please answer the following questions:

1) Assess the ATT by running separate 2-by-2 DD [9 points]
    a. What is the ATT for Indiana's law, use inob1 as the time period?
    b. What is the ATT for Michigan's law, use miob1 as the time period?
    c. What is the ATT for Wisconsin's law, use wiob1 time period?
2) Specification tests [10 points]
    a. Adding covariates to each 2-by-2 DD (consider a Mincer equation), what are the ATT estimates?
    b. Adding individual fixed effects (Hint areg y x, absorb(ID)) for each 2-by-2 DD, what are the ATT estimates ?
    c. Are the results relatively robust when adding covariates? Do the coefficients on the three ATTs radically change or are they stable?
3) Placebo tests with a triple difference-in-difference-in-differences [15 points]

   a. Use “management” for individuals in managerial occupations as a within-treatment-state comparison group for a Triple DDD. An RTW law should not affect managerial workers. (Hint: use “i.management”)
   b. What is the parameter of interest for the DDD for each DDD estimated? Are they statistically significant? If so, does this valid or invalidate our DDs?
   c. Rerun the Triple DDD for each states, but include a private sector covariate in your 2-by-2 DD called “private” (Hint: use “i.private”). Do your results change? Are you DDD parameters of interest statistically significant?
4) Placebo/Falsification Tests [9 points]
   a. Rerun the 2-by-2 DD for each state, but use Jan 2010 as the false cutoff, which are inob2 for Indiana, miob2 for Michigan, and wiob2 for Wisconsin.
   b. Do you find any statistical significant results? Does this corroborate or invalidate the original results robust?
5) Standard Errors [2 points]
   a. Even if you clustered standard errors at the treatment group level, what is a potential problem with standard errors?