Difference-in-Differences

Mixtape Session

Roadmap

Basic suggestions going forward

- Differential timing with heterogeneity – Bacon, Callaway and Sant'anna, etc.
- Covariates – Abadie, Sant'Anna and Zhao
- Fuzzy - de Chaisemartin and D'Haultfoeuille

Concluding remarks on DD

- You're probably going to write a paper using DiD at least once in your life, but probably more
- Even if you don't, you're going to read a lot of papers using DiD, referee them, or advise students using them
- It's in your best interest to make the fixed cost investment in the new econometrics of DiD because the old methods are mostly harmful
- Good news is we are at the conclusion of this wave of papers, software is now widely available, solutions tend to have common features, and overall presentations (static and dynamic) aren't all that different

Concluding remarks

- Simple 2x2 has its own problems when estimated using TWFE *if you include covariates*
- Stronger assumptions needed to include covariates, and bias can be large
- Don’t control for covariates that could be affected by the outcome (e.g., COLLIDER BIAS!! DAG!! BOOGIEMAN!)
- Why pay more for the same car?

Concluding remarks

- Main problem in differential timing is heterogeneity and the use of already-treated units as controls
- Honestly, I'll just put my neck out there – if you have any reason to believe homogenous treatment effects hold from theory, fine. Use TWFE
- But with differential timing and not a priori theory, you *cannot* use TWFE. It is biased, and it does not obey a "no sign flip" property, weights can be negative, etc etc.
- CS has additional benefits like examining heterogenous responses by timing – this is part of the value of defining target parameters as weighted averages

Concluding remarks

- Causal claims depends on valid assumptions, high quality and appropriate data, and appropriate estimators
- Use this opportunity to remember how much fun econometrics is
- Don't sweat whether you learned everything in this seminar – check out my substack "Causal Inference: the Remix" for simple explainers, go back to the papers, talk to the authors (they are all very smart, but also extremely kind people)
- Have fun! Remember that applied work is exciting, so don't sweat it. Don't forget how great it is to learn something new
- Don't forget that season 2 of Ted Lasso came out yesterday. It felt the same, but different (metaphor)