PhD Econometrics (ECON50580)
Replication and Practice Exercise

This exercise has two goals. One is to bring you one step closer to conducting independent empirical research. Here you can pick a paper and work on some well-defined tasks, but you have considerable discretion over how you approach these tasks. Some techniques will be familiar from the lecture or from previous courses, while others are completely new. In your own projects, you will face many similar challenges: cleaning the data, choosing which analysis to run, interpreting the results, etc. Another important goal of this exercise is to familiarize you with the latest refinements of important methods such as Diff-in-Diff, IV, or fixed effect estimation.

Ground Rules

This assignment has three parts:

1. Replication of the main result of a published paper
2. Application of a new methodology to the data and context the published paper
3. A presentation of your findings in the last two weeks of the course

Deliverables:

1. A written report of the replication exercise, explaining how you go about the analysis, discussing differences between your findings and those in the original paper, and discussing limitations of the analysis in the original paper. Code should be attached. Approximate length: 10 pages.
2. A memo about the new methodology, which includes: 1) an intuitive explanation of how the methodology works, 2) a simple example based on simulations, 3) the application of the method to the dataset of the original paper. Approximate length: 5 pages. Code should be attached.

How it works

- Teams of 3 students were randomly assigned (see below). Each team will receive joint grades for the written work and presentation.
- You have to pick a paper from an approved list of journals (see below for a list) that uses the basic method indicated below. If you want to replicate a paper that is not from the list of approved journals, please contact me first.
- Criteria for picking the paper: 1) it has to use a given method, 2) you have to be able to get the data to replicate the paper, 3) the paper has not been used as an example to demonstrate the new methodology (most papers showcase their method based on an existing study; DO NOT use that study).
- Replicate the main findings of the paper. Check that your summary statistics match with those in the paper (or if they don't, report and discuss it). Similarly, you may not be able to replicate the results. If that's the case, don't worry, this is very common. Just explain what you did and why, and discuss why you think there is a difference between the authors' results and yours. You do not have to replicate all findings in a paper. One main finding plus descriptive stats (and potentially one or two graphs) are fine.
- Apply the new methodology to the original paper. Write up the memo as described under "Deliverables"
- You will not be assessed based on the correctness of the results but rather on your ability to i) solve problems, ii) critically discuss econometric methods and iii) apply methods to a new context.
- With your consent, we will make the memos available to the entire class.

Deadline for Submission through Brightspace: April 11. The same submission guidelines as for the problem sets apply to this assignment (i.e. one pdf, show evidence of using version control and soft coding, attach the code, etc).

Groups and Topics

Group 1:

- Basic method: Difference-in-Differences
- New method to apply: Sant'Anna & Zhao (2020)
- Members: Jinging, Ioannis, Manuel
- Presentation date: April 14

Group 2:

- Basic method: Difference-in-Differences
- New method to apply: Abraham & Sun (forthcoming) link here.
- Members: Tatiana, Min, Yishan
- Presentation date: April 14

Group 3:

- Basic method: Instrumental variables (using a shift-share instrument)
- New method to apply: Borusyak *et al.* (2018) link here.
- Members: Yuting, Himani, Killian
- Presentation date: April 14

Group 4:

- Basic method: Synthetic Controls
- New method to apply: Ben-Michael *et al.* (2020)
- Members: Jai, Luke, Sinian
- Presentation date: April 21

Group 5:

- Basic method: Treatment Effects (diagnostic checks)
- New method to apply: Słoczyński (2020)
- Members: Beatriz, Dimitris, Matthew
- Presentation date: April 21

Approved Journals

Quarterly Journal of Economics, American Economic Review, Journal of Political Economy, Review of Economic Studies, AEJ:Applied, AEJ:Policy, Journal of the European Economic Association, Economic Journal, Review of Economics & Statistics, Journal of Labor Economics, Journal of Human Resources, Journal of Development Economics. Journal of Public Economics.

References

Abraham, Sarah, & Sun, Liyang. forthcoming. Estimating Dynamic Treatment Effects in Event Studies With Heterogeneous Treatment Effects. *Journal of Econometrics*.

Ben-Michael, Eli, Feller, Avi, & Rothstein, Jesse. 2020. *The Augmented Synthetic Control Method*.

Borusyak, Kirill, Hull, Peter, & Jaravel, Xavier. 2018 (September). *Quasi-Experimental Shift-Share Research Designs*. Working Paper 24997. National Bureau of Economic Research.

Sant'Anna, Pedro H.C., & Zhao, Jun. 2020. Doubly robust difference-in-differences estimators. *Journal of Econometrics*, **219**(1), 101 – 122.

Słoczyński, Tymon. 2020. Interpreting OLS Estimands When Treatment Effects Are Heterogeneous: Smaller Groups Get Larger Weights. *The Review of Economics and Statistics*, **0**(ja), 1–27.