Applied Microeconometrics **Fall 2022**
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Problem set 3

Please send your answers to manuel.bagues@gmail.com by Sept. 17 at midnight, **including the log** for exercise A and indicating the name of the (up to) three group members.

A. Impact of minimum wages on teen employment

Prior to starting this exercise, please make sure you have installed the csdid Stata package by running the following command: ssc install csdid

If you are using R, install the did package with packages.install("did").

The exercises are conducted using `mpdta.dta`. The dataset consists of (logs of) teen employment in counties in the United States in 2003-2007. The dataset contains the following variables:

- year: Year of observation, 2003-2007.
- countyreal: County identifier.
- lpop: Log of the county population in 1000s.
- lemp: Log of county teen employment.
- first_treat: Year when the state where the county is located first raised it's minimum wage. 0 for states where minimum wage equals the federal minimum wage for the entire period.
- treat: Indicator for whether the county is treated.

1. Estimate the effect of increasing the minimum wage on teen employment using a standard two-way fixed-effects specification. Under which assumptions would this estimator provide a consistent estimate of the Average Effect of the Treatment on the Treated (ATT)? Discuss whether in this particular context (i.e. effect of minimum wage) we should expect these assumptions to hold.
   Note: please cluster errors at the county level, we will discuss later on whether this is the relevant level of clustering.

2. Let us now apply the method proposed by Callaway and Sant'Anna (2021), using `mpdta.dta` and the `csdid` package.

   (a) Controlling for county population, estimate the group-time average treatment effects, using never-treated units as the comparison group. Plot the estimates for 2004 and 2006 group. Estimate the average treatment effect on the treated (ATT).

   (b) Controlling for county population, estimate the group-time average treatment effects, using not-yet-treated units as the comparison group. Plot the estimates for 2004 and 2006 group. Estimate the average treatment effect on the treated (ATT).

   (c) Perform a test for whether all pre-treatment group-time average treatment effects were statistically equal to zero. Interpret the result.

   (d) Let us now discuss clustering. What would you say is the level at which standard errors should be clustered here? (i.e. county or state) Discuss why.

   The sample includes information from 25 states (although this variable is not in the dataset). Given this sample size, indicate how you would calculate the clustered standard errors and explain why.

B. The impact of gender quotas in electoral lists

Note: there is no need to read any of the papers mentioned in this exercise to answers these questions

To address the scarcity of women in politics, in recent years many countries have adopted gender quotas in candidate lists requiring the presence of a minimum share of female candidates. By construction, these quotas increase the share of female candidates. However, it remains an empirical question whether they also lead to an increase in the share of women getting elected or reaching top political positions. Let us focus in the case of local elections in Spain. Within a proportional representation electoral system with closed lists, a quota requiring the presence of at least 40% of candidates of each gender on the ballot was implemented in 2007 in municipalities with more than 5,000 inhabitants.

1. One could use a difference-in-differences (DID) strategy to analyze the impact of these quotas on the probability that a woman is elected as

mayor, using as treatment group municipalities with population between 5,000 and 10,000 inhabitants, and as control group smaller municipalities, and data for the 2003 and the 2007 local elections (e.g. Casas-Arce and Saiz (2015)). Explain briefly the potential threats to the validity of the DID strategy in this context and which robustness tests you might want conduct.

2. Let us consider now the possibility of using a regression discontinuity design (RDD) to estimate how quotas affect the probability that a woman becomes mayor (e.g. Bagues and Campa (2021)). Explain briefly what are the key requirements that would make the RDD strategy adequate in this particular context.

3. Let us now compare the RDD and the DID estimates. Discuss the potential advantages and disadvantages of these two approaches in this particular context, indicating potential differences in terms of (i) consistency, (ii) precision (iii) the locality of the estimates (i.e. ATT vs LATE).

4. Bonus question:
   It is possible to estimate an RDD that yields identical results as the above DID. Indicate what is the RDD estimation that would be equivalent to the above DID in terms of the (i) bandwidth (i.e. how large?), (ii) kernel (i.e. triangular vs uniform), (iii) order of the polynomial controlling for the running variable (i.e. 0, 1, 2...) and (iv) outcome variable (i.e. in levels vs. in differences).

References

Bagues, M. and P. Campa (2021). Can gender quotas in candidate lists empower women? evidence from a regression discontinuity design. *Journal of Public Economics 194*, 104315.

Callaway, B. and P. H. Sant'Anna (2021). Difference-in-differences with multiple time periods. *Journal of Econometrics 225*(2), 200–230.

Casas-Arce, P. and A. Saiz (2015). Women and power: unpopular, unwilling, or held back? *Journal of political Economy 123*(3), 641–669.