Tutorial 6
Difference-in-Difference - Due on 28.06.2022 20:00

Empirical Banking and Finance
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This exercise is based on [Jayaratne and Strahan, 1996] who study the effects of intra-state bank branching deregulation on GDP growth. The dataset contains the year of when bank branching deregulation was allowed in a given US state and state-level GDP data from the Bureau of Economic Analysis Regional Data. The dataset contains, among others, the following variables:

- *ind_dereg* A dummy variable that equals 1 once a state has lifted bank branching regulation
- *ind_deregYear* A dummy variable that equals 1 only in the year of the bank branching deregulation
- *deregulationInfo* A string variable containing the information about the deregulation timing in that state based on Table 1, column 1 "Year M&A branch restrictions lifted" of the paper

1. Preliminary Questions
    a) What do we need to assume to give the a difference in difference coefficient a causal interpretation? Illustrate the assumption(s) with one concrete example using a relevant economic variable.
    b) How do the variables *ind_dereg* and *ind_deregYear* encode the information of the variable *deregulationInfo*?
    c) How are the years of deregulation distributed over time?
    d) What could be an important confounding event?
    e) Briefly explain the mechanism of how this event could affect the estimation below.
2. Regression 1
    a) Replicate regression 5. in Table II of the paper. Note that you should exlude the deregulation years from the estimation.
    b) Compare the sign, size and significance of the coefficient on *ind_dereg* to the one in the paper.
    c) What does the size of the coefficient on *ind_dereg* mean precisely?
    d) An important assumption for diff-in-diff can be, among other possibilities, tested using a regression. Please run this regression.

3. Regression 2

    a) Provide a different specification of the regression in 2 a) which controls for potential additional omitted variables.

    b) Run the regression and provide a brief comment.

4. Decomposition

    a) Briefly explain the potential problem of using TWFE with staggered treatement.

    b) Please install the command BACONDECOMP using *ssc install bacondecomp* and run the decomposition. *bacondecomp GDPgr ind_dereg if ind_deregYear==0, stub(Bacon_) robust*

    c) Which type of 2x2 diff-in-diff is driving the overall result? Hint: look at the table, not the graph

    d) Compute average GDP growth for each group in the variable *Bacon_gp*. Provide pretrend graphs for the three 2x2 estimates with the highest weight in the overall regression. Hint: the weight is stored as *Bacon_S*

    e) Provide a comment of your results found in d).

References

[Jayaratne and Strahan, 1996] Jayaratne, J. and Strahan, P. E. (1996). The finance-growth nexus: Evidence from bank branch deregulation. *The Quarterly Journal of Economics*, 111(3):639–670.