

ECON 340

Economic Research Methods

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Lecture 24
Differences-in-Differences & Event Study Designs

Answers to Causal Questions

- Lots of important questions in economics are of a causal nature.
- For example — what is the impact of immigration on labor markets? Or how do minimum wages impact employment?
- Experiments are the gold standard, but not always feasible.
- So we look for natural experiments.

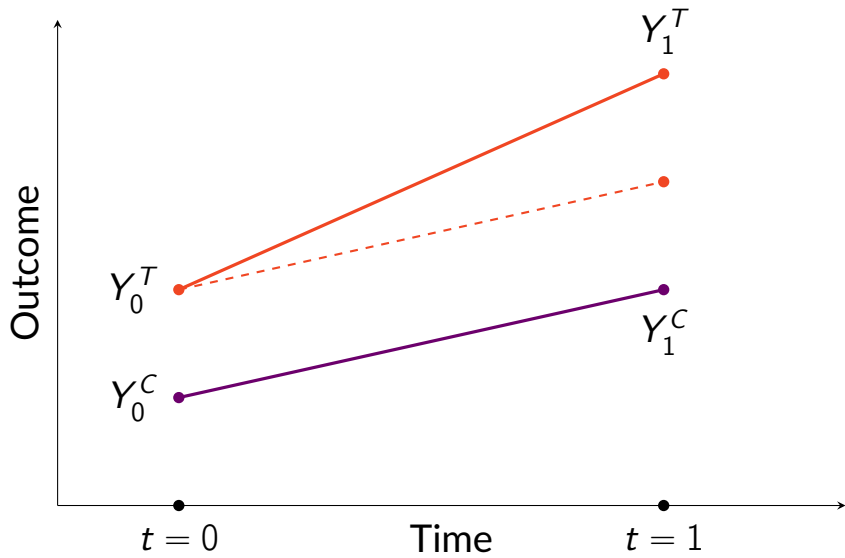
Differences-in-Differences Estimator

- Two groups: Treatment (T) and Control (C)
- Two time-periods: Pre ($t = 0$) and Post ($t = 1$)
- Differences-in-Differences (DID) estimator:

$$\begin{aligned}\beta_1^{DID} &= (\bar{Y}_1^T - \bar{Y}_0^T) - (\bar{Y}_1^C - \bar{Y}_0^C) \\ &= \Delta \bar{Y}^T - \Delta \bar{Y}^C\end{aligned}$$

where $\Delta \bar{Y}^T$ and $\Delta \bar{Y}^C$ is the average change in Y in the treatment and control group, respectively.

Differences-in-Differences

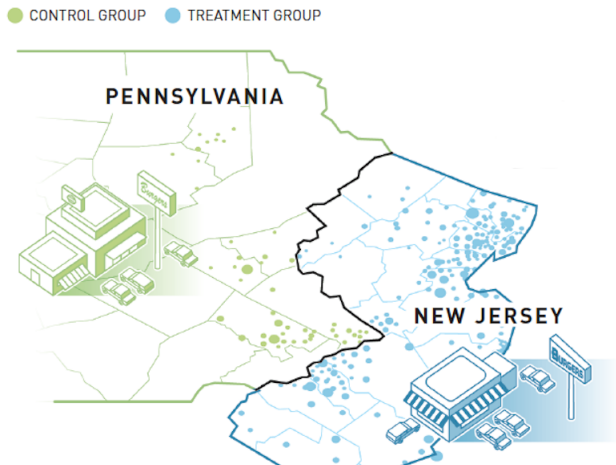


Maríel Boatlift

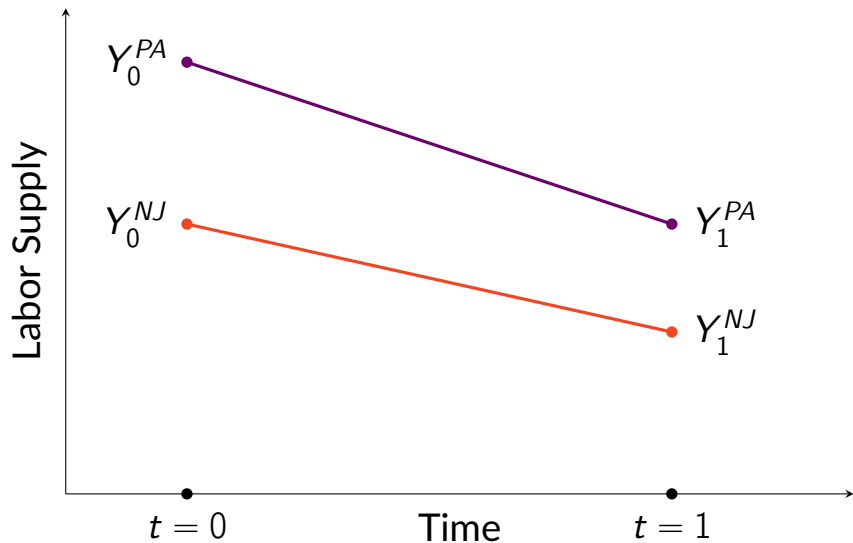
- In April 1980, Fidel Castro unexpectedly allowed all Cubans who wished to leave the country to do so from the port of Maríel.
- Around 50% of these immigrants settled in Miami.
- This led to a 7% increase in the labor force of Miami.
- Card (1990) studies the impact of the Boatlift on the Miami labor market by comparing wage and employment trends in Miami with those in four comparison cities.

Card and Krueger (1994)

April 1, 1992: Hourly minimum wage in New Jersey increased from \$4.25 to \$5.05



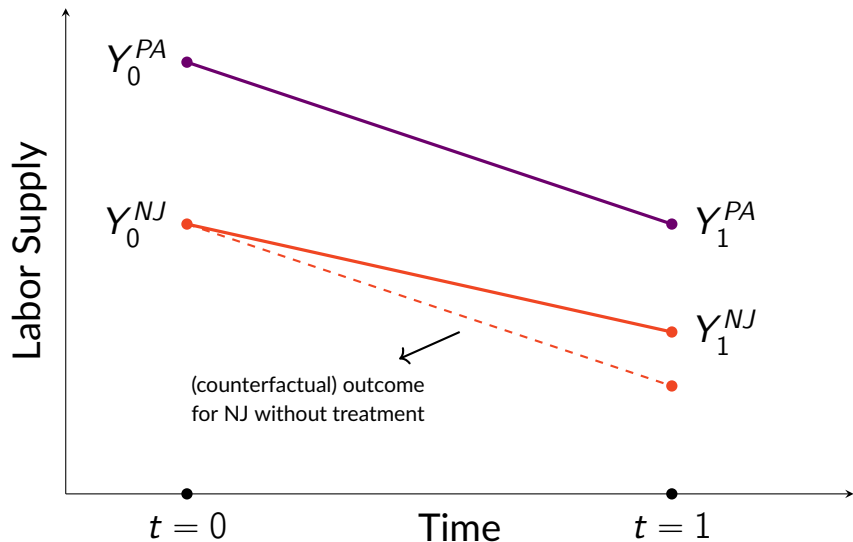
Observed Outcomes



Differences-in-Difference Design

- Say, labor supply declined in both states over this period due to seasonality or aggregate trends in the economy
- We might be tempted to attribute the decline in labor supply over this period in NJ to increased minimum wages (unintuitive!)
- Differences-in-Difference design: look at how labor supply evolved in NJ relative to the control group (PA)

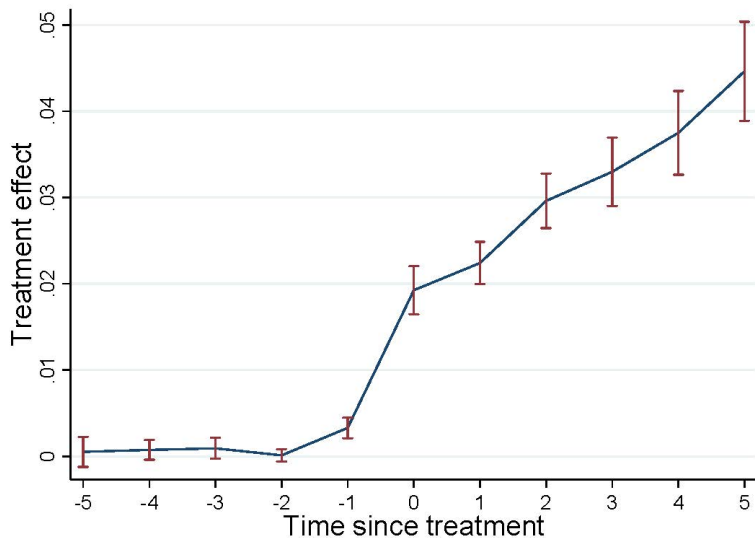
Differences-in-Difference Estimator



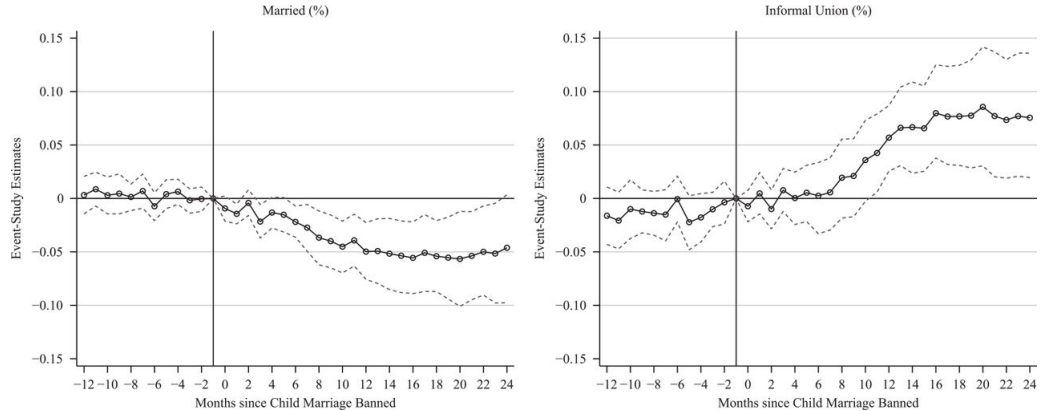
Differences-in-Difference Design

- Underlying assumption: parallel trends for treatment and control groups in the absence of treatment
- We are not saying outcomes are similar for NJ and PA, but just that they move similarly over time
- In practice, one can often test this assumption by looking at pre-trends
- Event-study designs: examine the difference in outcomes for two groups over a longer pre-period

Event Study Design

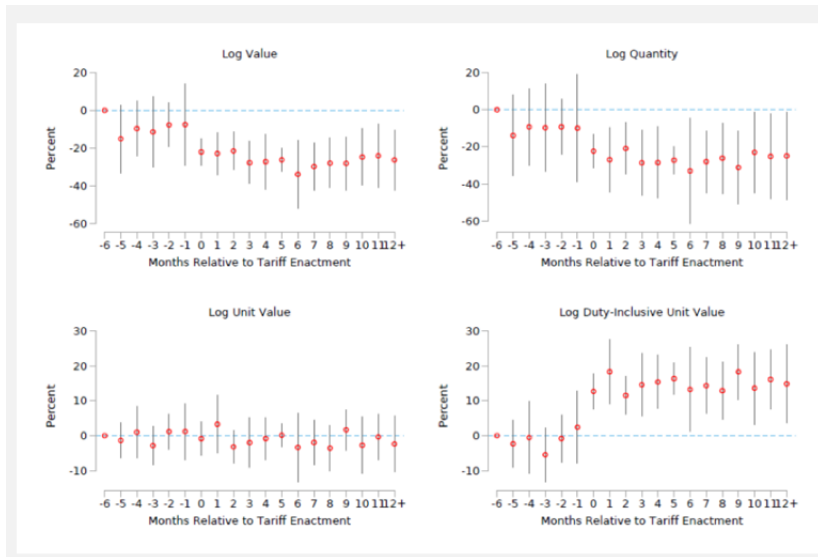


Child Marriage in Mexico

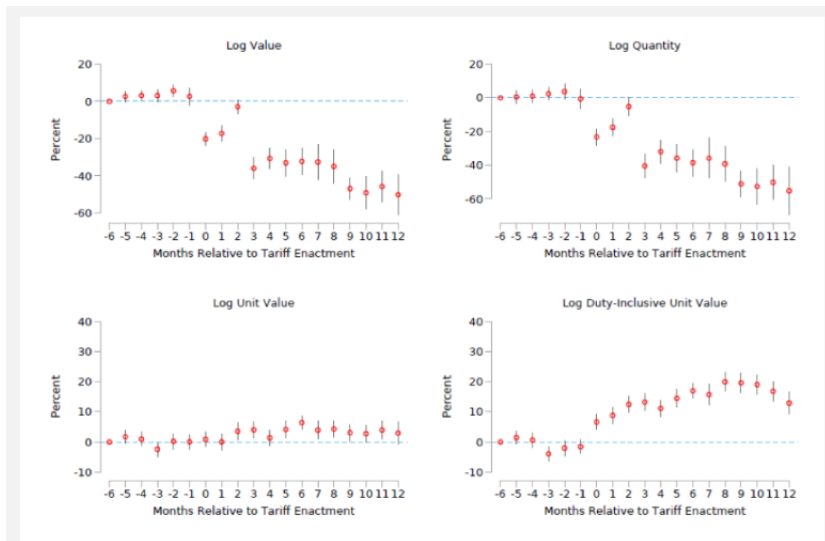


Source: Belles-Obrero and Lombardi (2023)

Trade War



Trade War



Taking Stock

- Link for reading: <https://microeconomicinsights.org/the-return-to-protectionism/>
- Research paper due next week Tues
- Talk about Big Data & Machine Learning on Tues
- Review class for the midterm on Thurs
- Please fill the SOQs :)