Difference in Difference

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Recap

The basics:

- The ceteris Paribus

- Selection Bias

- OVB

- Quasi-experimental design: DID

    - Why do we need it?

Difference in Difference

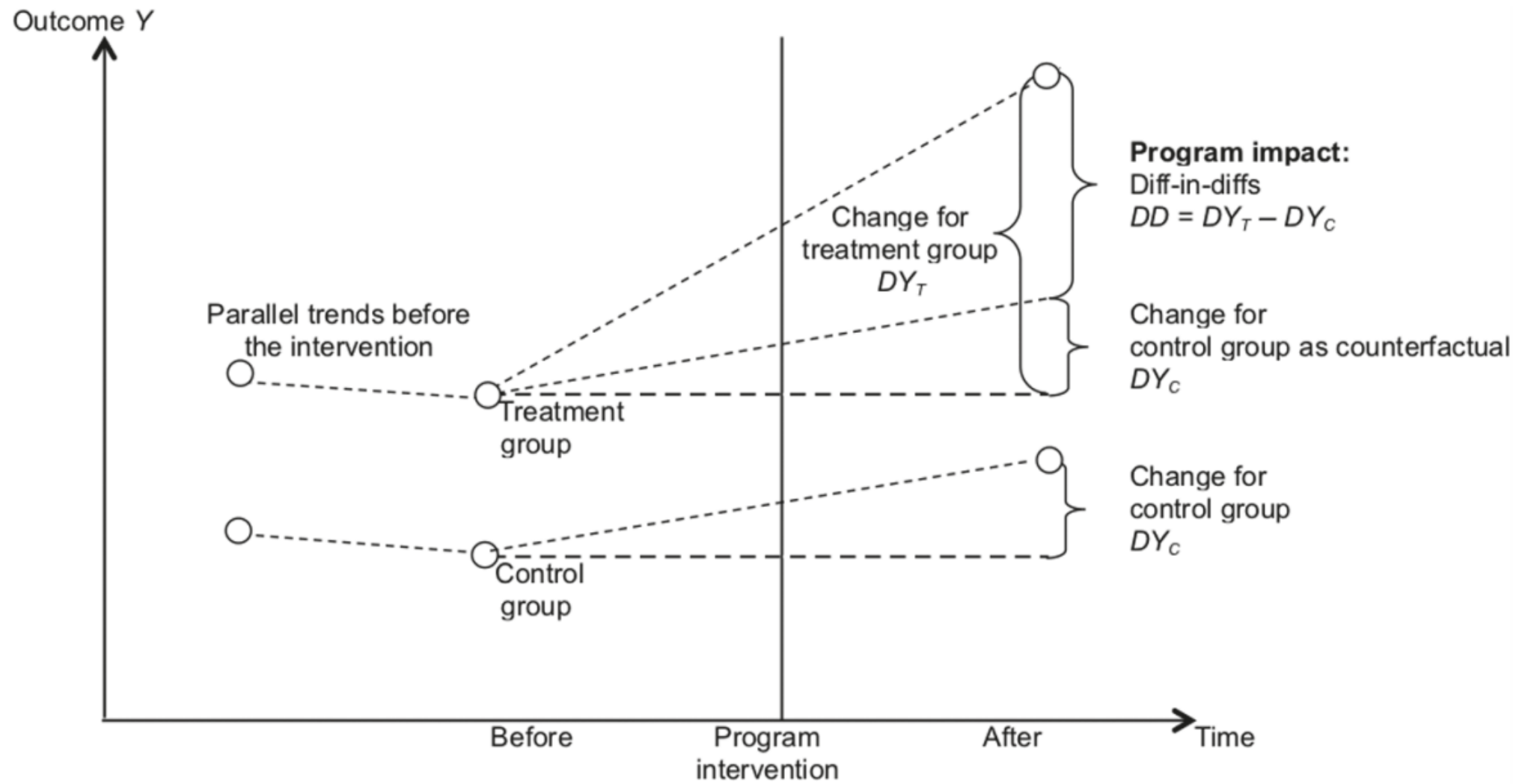JUSTUS-LIEBIG-
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DID

Figure 4.3 Difference-in-differences method

Assumptions

1. Parallel trends

2. Linear Additive Effect

3. All GM assumption of the linear regression

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Learn more about DID:

Watch: Introduction to Differences-in-Differences

https://youtu.be/eiffOVbYvNc

Read:

1. (Angrist & Pischke, 2014, Chapter 5)

2. (Angrist & Pischke, 2009, also Chapter 5)

3. (de Janvry & Sadoulet, 2021, Chapter 4)

4. (Card & Krueger, 1994)

Example 1. Otrachshenko, Popova, & Tavares (2016)

Reproducing:

- Otrachshenko, V., Popova, O., & Tavares, J. (2016). Psychological costs of currency transition: evidence from the euro adoption. European Journal of Political Economy, 45, 89-100.

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Example 2. Card & Krueger (1994)

The Minimal Wage debate. See Economist's short "The minimum wage: does it hurt workers?" (https://youtu.be/8H4yp8Fbi-Y)

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Research question and the setting

Causal effect of the minimum wage policy on employmnet is not negative.

- Two states: New Jersey (NJ) and Pennsylvanian (PA)

- Two time periods: Before and after

- Treatment: Minimal Wage in one state (New Jersey) only

Geography

Empirical problem

$$Y_{jt} = \beta_0 + \beta_1 \mathrm{NJ}_j + \beta_2 \mathrm{Time}_t + \beta_3 \left(\mathrm{NJ}_j \times \mathrm{Time}_t \right) + \beta_4 X_{jt} + \epsilon_{jt}$$

Where:

- Outcome: Y_{jt} - Employment level at the key fast food chains, Full Time Equivalent persons.

- Treatment: Minimal wage policy in NJ NJ_j indicator variable where 1 = NJ, and 0 = PA.

- Time: Time_t indicator variable where 0 = before, and 1 = after.

- What are we expecting to find?

- What are the expected values of the coefficients?
  - If the minimal wage policy reduces employmnet.
  - If the minimal wage policy increases employmnet.

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Practical exercise in R

Let us estimate β_3 now using R and corresponding data.

References

References

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