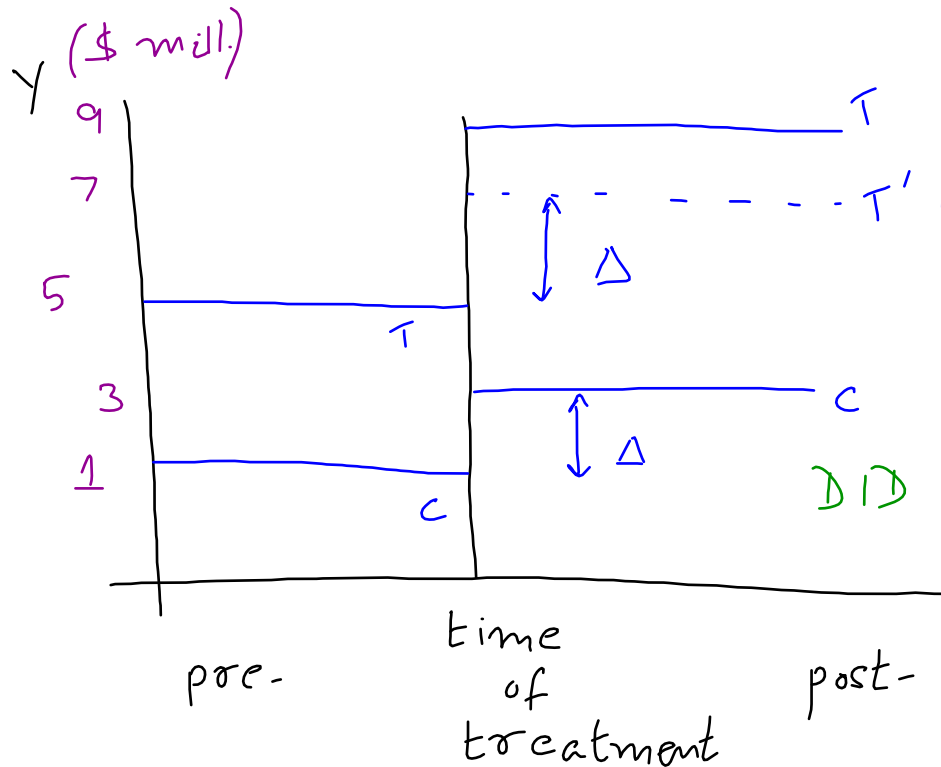


Difference in Differences (DID)

2 groups $\rightarrow$ treated (T) and control (C)

2 pds. $\rightarrow$ pre-treatment and post-treatment



effect on T $> 0 = 2$

e.g. Y $\rightarrow$ profit

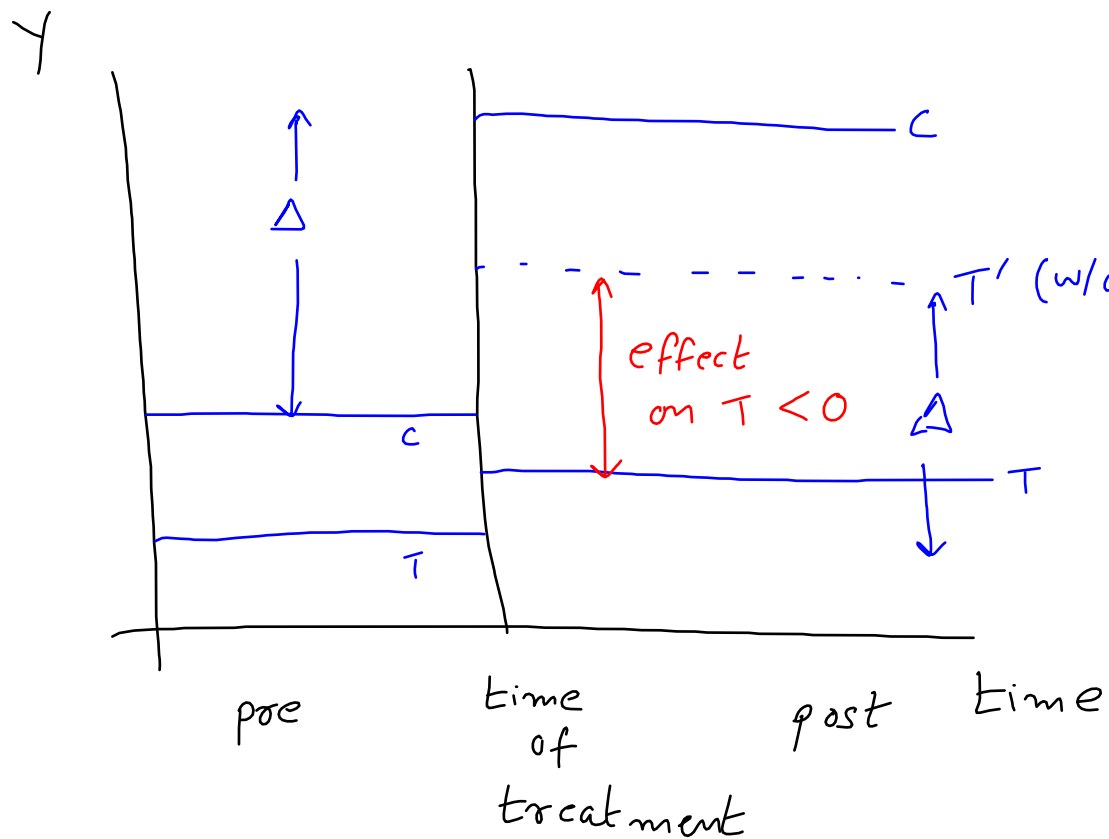
treated: firms w/
training

control: firms w/o
training

$$DID = \text{diff. in } T = (9 - 5)$$

$$- \text{diff. in } C = (3 - 1)$$

time



DID = diff. in T

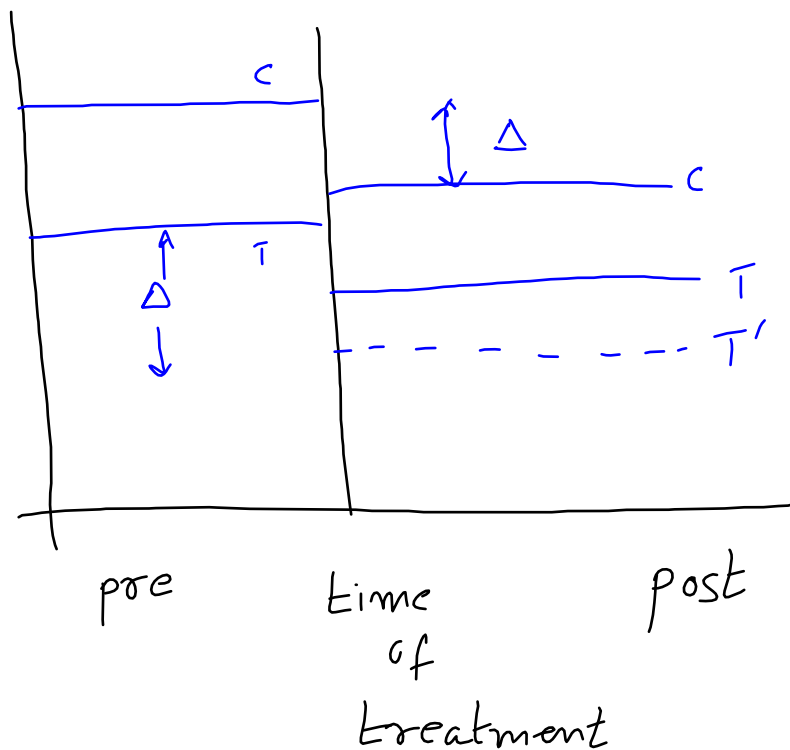
— diff. in C

e.g. Y $\rightarrow$ property value.

T : houses close to incinerator

C : houses away

Y



e.g. employment
(fast food)

↑ effect on $T > 0$
(w/o treatment)

T : min wage ↑ (NJ)

C : " same (PA)

time

DID = diff. in T

— diff. in C

DD estimates : often obtained from linear regression models

$$Y = \beta_0 + \delta_0 \text{ post} + \beta_1 \text{ treat} + \delta_1 \text{ post} \times \text{treat} + u$$

↓
dummy
post = 0 for pre-
= 1 for post-treat.

↓
dummy
treat = 0 for C
= 1 for T

	Pre	Post	Post - Pre
C	β_0	$\beta_0 + \delta_0$	δ_0
T	$\beta_0 + \beta_1$	$\beta_0 + \beta_1 + \delta_0 + \delta_1$	$\delta_0 + \delta_1$
T - C	β_1	$\beta_1 + \delta_1$	δ_1