

Env Econ 2 - Homework 8

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1.

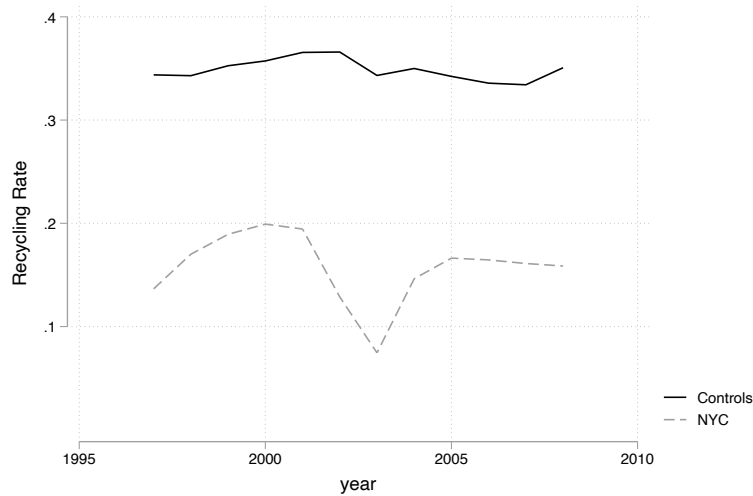


Figure 1: yearly plot of recycling rate for NYC and the controls.

Figure 1 shows the yearly average recycling rate for NYC and controls. In general, the rate does not change much in controls, but it plunges in NYC during 2002-2004.

2.

Restricting the dataset from 1997 to 2004, I did TWFE with a set of control variables. The result is in Table 1. The average effect is estimated as 6.6% decrease in recycling rate after the introduction of pause in 2002, with clustered standard errors of 0.013.

3.

Table 2 shows the result of the synthetic DID version of TWFE. I did both with and without control variables. With control variables, the estimate is a 6.5 % decrease in recycling with slightly larger clustered standard errors of 0.035. Figure 2 shows coefficient estimates for each year. We can see the estimates for the treated group decrease around 2001.

4.

Using reg command, I conducted an event history analysis with 2001 as a baseline (dotted lines). The result is in Figure 3. The coefficients slightly increase right before 2001, and plunge in 2002 when the pause began. After 2004, the coefficient becomes positive.

VARIABLES	(1) recyclingrate
tr*pause	0.0661*** (0.0128)
incomepercapita	4.77e-07 (2.45e-06)
collegedegree2000	12.51** (4.864)
nonwhite	-1.278** (0.589)
democratvoteshare2000	41.14** (18.03)
democratvoteshare2004	-37.52** (16.46)
Constant	-5.438** (2.291)
Observations	1,680
R-squared	0.731
Robust standard errors in parentheses	
*** p<0.01, ** p<0.05, * p<0.1	

Table 1: Results of regression estimate of TWFE using data from 1997-2004.

	(1)	(2)
	recyclingrate	recyclingrate
treated	-0.064 (0.053)	-0.065* (0.035)
<i>N</i>	1680	1680
Standard errors in parentheses		
* p 0.10, ** p 0.05, *** p 0.01		

Table 2: Results of regression synthetic DID version of the TWFE. The first column (1) is without any control variables and the second column (2) is with control variables.

5.

The four plots present results of synthetic DID.

(a)

Figure 4 presents raw outcomes for treated and control groups over time. The treated group, NYC is at the bottom of all groups in terms of recycling rate, indicating creating weights for the synthetic control group might not be skewed and not balanced.

(b)

Figure 5 presents raw outcomes for treated group and synthetic control group over time.

(c)

Figure 6 presents estimated synthetic control effects and placebo effects over time.

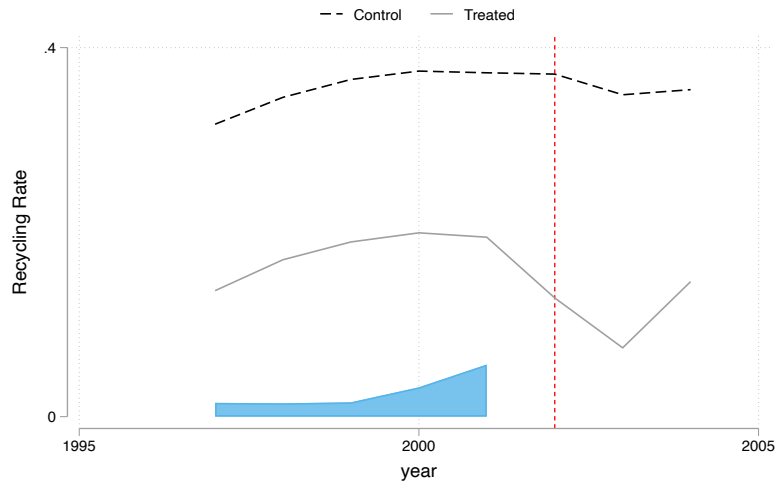


Figure 2: coefficient estimates of β_l of each year before and after the 2001.

(d)

Figure 7 presents final synthetic control estimates over time.

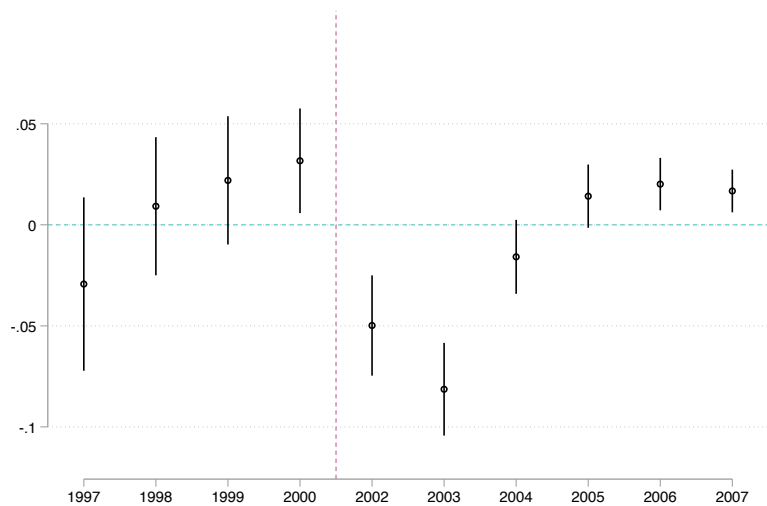


Figure 3: coefficient estimates of β_l of each year before and after the 2001.

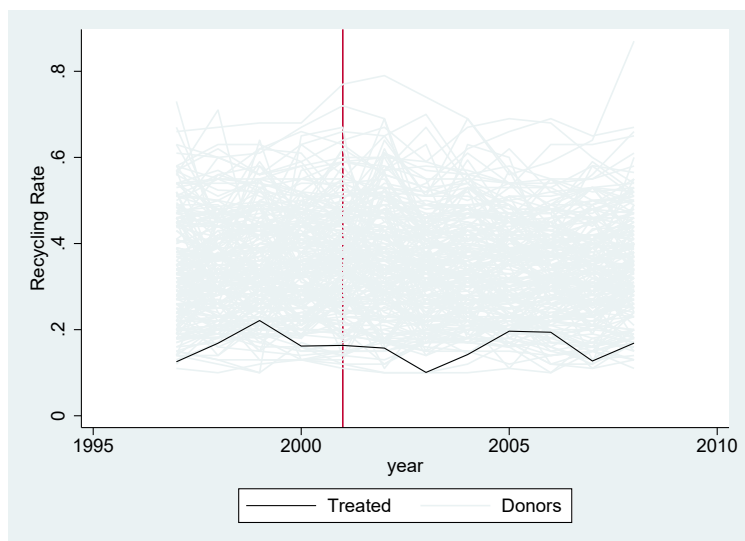


Figure 4: raw outcomes for treated and control groups over time

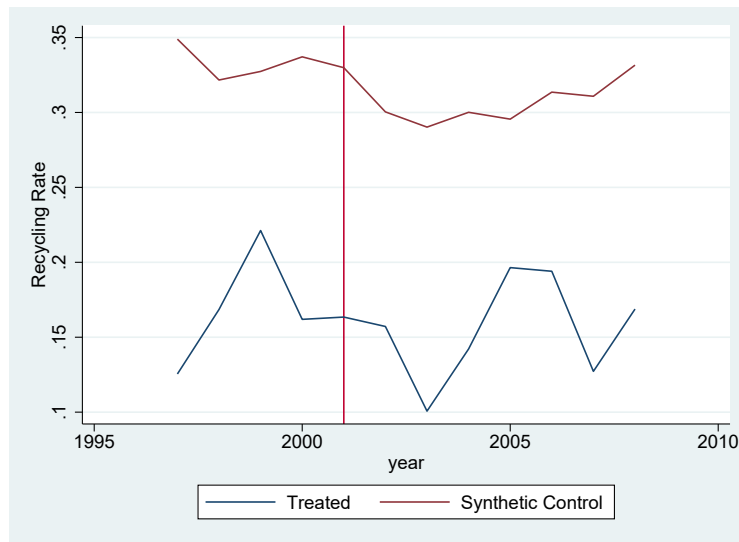


Figure 5: raw outcomes for treated group and synthetic control group over time

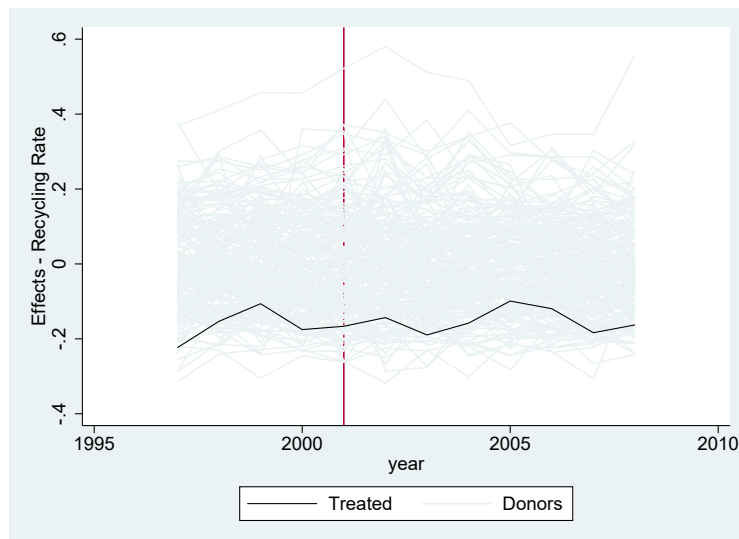


Figure 6: estimated synthetic control effects and placebo effects over time.

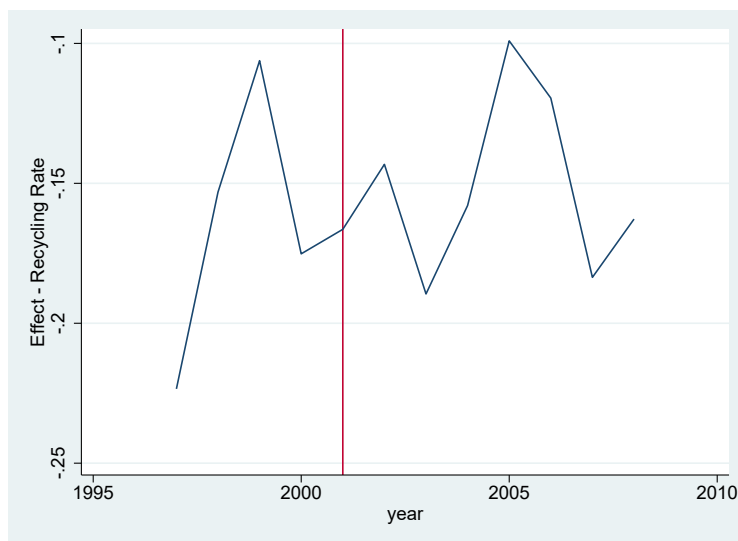


Figure 7: final synthetic control estimates over time