DA Final Assignment - Smoke Free Laws and Lung Cancer

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A technical note: the code and data can also be found in this Github repo.

1. Data

2. Binary Intervention

A. Simple OLS

Model 1 is for 20 years before intervention. Treatment group interventions between 2010 and 14. Control Group base year was chosen as 2012. **Model 2** is for year of intervention. Same groups. **Model 3** is for 6 years after intervention. Same groups.

In the annex same calculation with interventions betwen 2010 and 2016, very similar result.

Table 1: Simple Cross Sectional Regression

	(1)	(2)	(3)
Untreated	20.4***	24.6***	27.7***
	(2.09)	(2.57)	(2.71)
Treated	-7.04*	-7.33	-7.51
	(3.13)	(4.05)	(4.40)
Observations	138	138	138
R2	0.020	0.014	0.013

B. Diff-in-diff

The difference between treated and untreated countries in their differences 6 years prior and 6 years after the interventions.

Table and regression show same result.

group	before	after	group_diff
untreated	23.2	27.72	-4.53
treated	15.9	20.21	-4.32
total	7.3	7.51	-0.21

Table 2: Diff-in-diff

	(1)
Untreated	4.53***
	(0.618)
Treated	-0.210
	(1.00)
Observations	138
R2	0.0002

C. Long differenc model

First difference between the avg. of yearly changes in the 6 years prior to the intervention compared to the change seen 6 years after the intervention.

	(1)
Untreated	-0.157 *
	(0.067)
Treated	0.146
	(0.194)
N	138
R2	0.006

*** p < 0.001; ** p < 0.01; * p < 0.05.

3. Quantitative Causal Variable

A. Simple OLS

Model 1 shows association between number of places with banned indoor smoking and lung cancer rate of country in 2008. **Model 2** is same for 2016. **Model 3** is same for 2020.

Table 3: Simple Cross Sectional Regression

	(1)	(2)	(3)
Intercept	21.1***	23.7***	24.6***
	(2.48)	(3.13)	(3.76)
Number of banned places 2008	-0.094		
	(0.608)		
Number of banned places 2016		-0.299	
		(0.523)	
Number of banned places 2020			0.023
			(0.576)
Observations	174	174	174
R2	0.0001	0.002	8.18e-6

B. Fixed Effect

	(1)
Number of places	-0.002
	(0.070)
Year	0.392 ***
	(0.044)
N	2262
R2	0.987

*** p < 0.001; ** p < 0.01; * p < 0.05.

C. First diffrenc, with 2 and 6 year lags.

	(1)	(2)	(3)
Intercept	0.316 ***	0.331 ***	0.404 ***
	(0.045)	(0.053)	(0.071)
Cont Diff of number of bans	0.026	0.043	0.109
	(0.050)	(0.075)	(0.149)
1st Lag of Diff number of bans		-0.025	-0.027
		(0.019)	(0.027)
2nd Lag of Diff number of bans		0.012	0.052
		(0.023)	(0.053)
3rd Lag of Diff number of bans			-0.115
			(0.088)
4th Lag of Diff number of bans			0.034
			(0.037)
5th Lag of Diff number of bans			-0.035
			(0.021)
N	2088	1740	1218
R2	0.000	0.001	0.004

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

D. Controls

	(1)
Intercept	-3.349 ***
	(0.577)
Cont Diff of number of bans	0.188
	(0.112)
1st Lag of Diff number of bans	-0.058 **
	(0.021)
2nd Lag of Diff number of bans	0.011
	(0.055)
3rd Lag of Diff number of bans	-0.062 ***
	(0.018)
4th Lag of Diff number of bans	0.007
	(0.038)
5th Lag of Diff number of bans	-0.058 ***
	(0.017)
GDP Per capita	-0.000
	(0.000)
Health Expenditure of government	-0.000
	(0.000)
Life Expectancy	0.058 ***
	(0.009)
N	1003
R2	0.036

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

Annex

1. Four year intervention period OLS

Table 4: Simple Cross Sectional Regression

	(1)	(2)	(3)
Untreated	21.0***	24.8***	27.7***
	(2.16)	(2.58)	(2.71)
Treated	-6.75*	-6.26	-7.65
	(3.11)	(3.98)	(4.22)
Observations	146	146	146
R2	0.020	0.012	0.016

Diff-in-diff

group	before	after	group_diff
untreated	23.63	27.72	-4.09
treated	17.45	20.07	-2.62
total	6.18	7.65	-1.47

Table 5: Diff-in-diff

	(1)
Untreated	4.09***
	(0.570)
Treated	-1.47
	(0.744)
Observations	146
R2	0.014

Long diff

	(1)
Untreated	-0.187 **
	(0.063)
Treated	0.480
	(0.346)
N	146
R2	0.030

*** p < 0.001; ** p < 0.01; * p < 0.05.