

# **EFECTO CAUSAL DE IMPUESTOS TERRITORIALES SOBRE PRECIOS DE BIENES RAICES, EMPLEANDO REGRESIONES ESPACIALES DISCONTINUAS**



# Contenidos

I. Introducción

II. Metodología

III. Resultados

IV. Conclusiones

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# Introducción

¿Cómo afectan las contribuciones al precio de las viviendas?

¿ Por qué es importante?

- Único impuesto al patrimonio vigente
- Activa discusión sobre aumentarlos
- Poca claridad de cómo afectan-distorsionan al mercado respectivo

¿ Por qué esta es una pregunta difícil de contestar?

- Todas las propiedades pagan contribuciones
- Necesitamos poder identificar una variación exógena que nos permita ver causalidad

# Introducción: Qué hacemos?

Vamos a ocupar las zonas de iso-valor del SII (áreas homogéneas), en particular las fronteras.

- Logramos levantar los *shapefiles* del SII
- *Spatial RD design* (saltos en valor\_m2)

Contribuciones → Avalúo Fiscal

$$\text{avaluo\_fiscal} = \text{avaluo\_const} + \text{avaluo\_terr} \quad (1)$$

$$\text{avaluo\_terr} = \text{metraje\_terreno} \cdot \text{valor\_m}^2 \quad (2)$$

# Introducción: Qué hacemos?

- Zonas de isovalor
- Valor unitario representa el avalúo fiscal del  $m^2$
- Discretización del valor territorial de todo el país

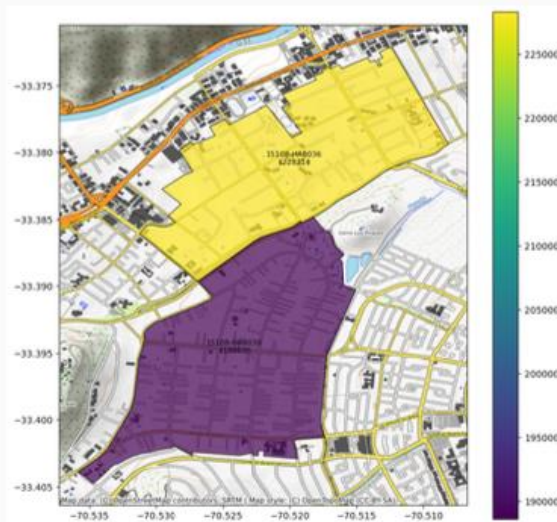
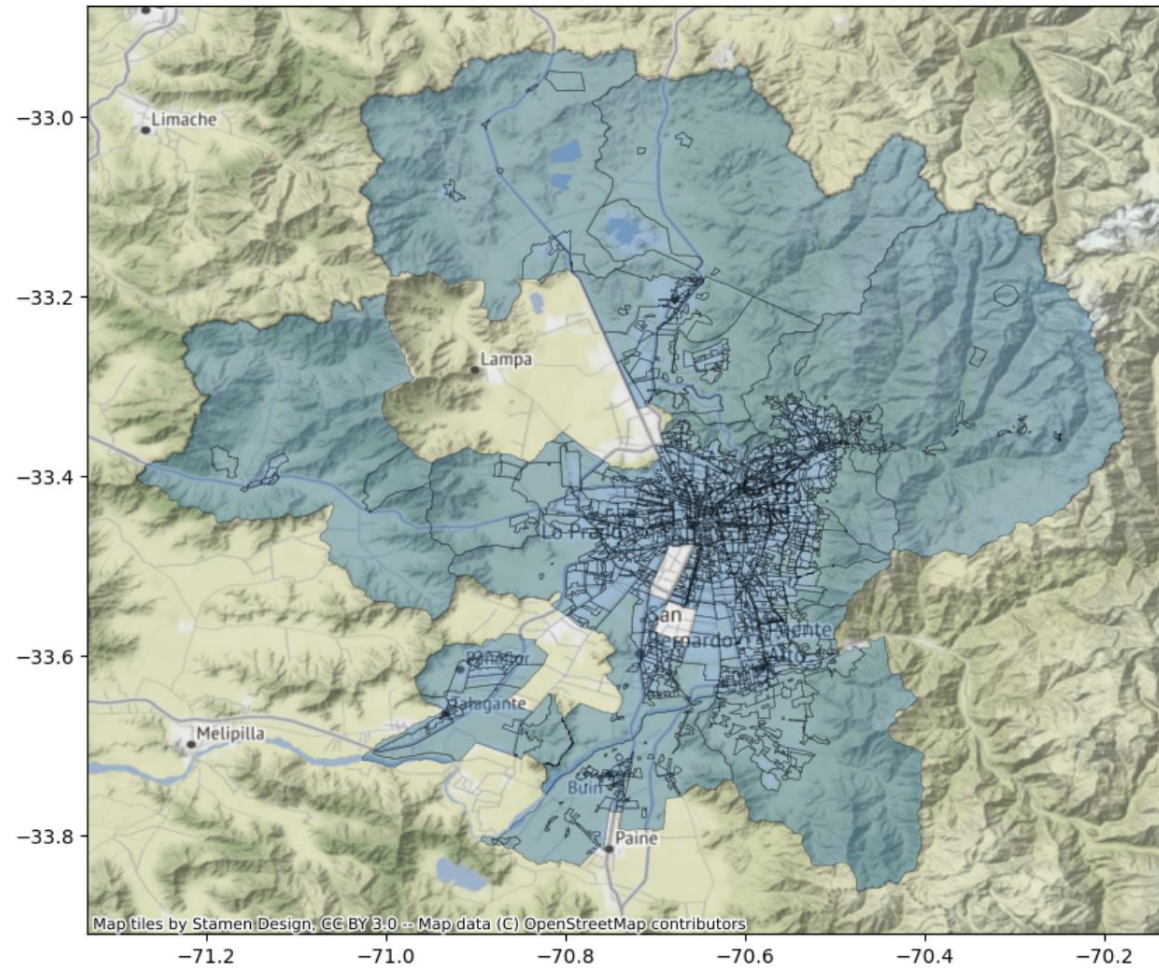


Figure 1: Dos AH vecinas con diferencia de un 21% en valor unitario

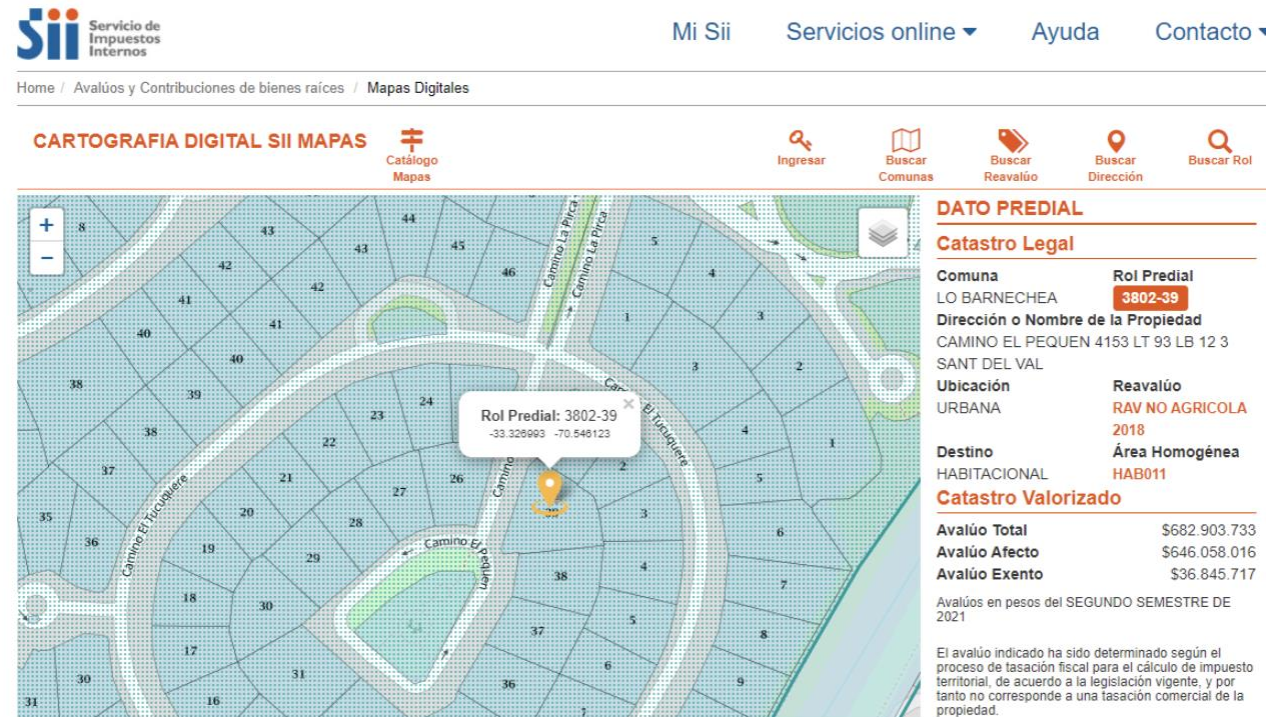
# Introducción: Qué hacemos?

Figure 2: Total homogeneous areas coverage



# Introducción: Qué hacemos?

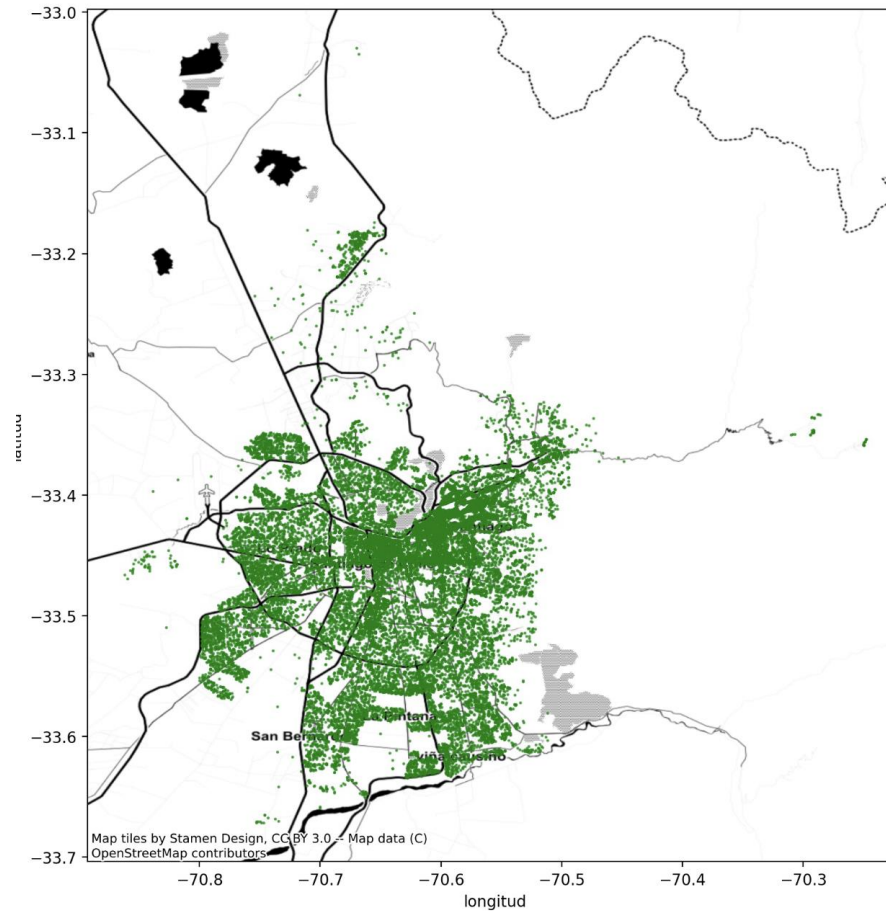
Figure 3: SII web platform



**Notes:** This figure illustrates the web platform of the SII from which with a *web scraping* procedure, it is possible to extract the geographical coordinates of the real estate properties, as well as their corresponding homogeneous areas and their unitary prices.

# Introducción: Qué hacemos?

Figure 4: Sample of georeferenced properties



**Notes:** This figure illustrates a sample of 30.000 properties that have been georeferenced making use of the web scraping procedure.



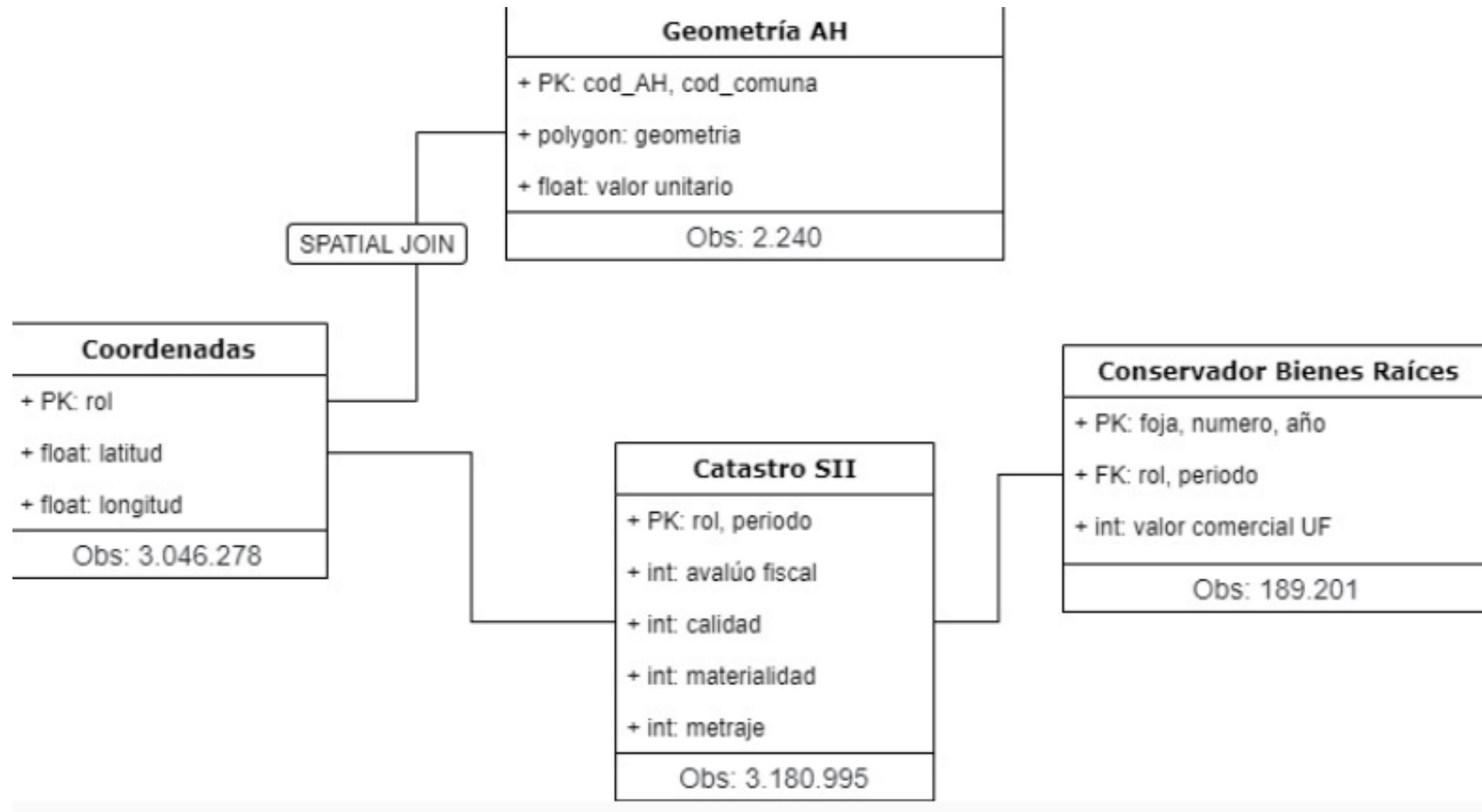
# Introducción: Qué hacemos?

Table 1: Descriptive statistics for cartographic data

municipality	N°AH	N°AH (H)	unitary price AVG	N° coords
SANTIAGO	69	8	1006915	6318
SANTIAGO OESTE	34	7	178500	12359
SANTIAGO SUR	23	5	189501	14985
RECOLETA	52	22	91017	28723
INDEPENDENCIA	55	27	130600	13518
QUINTA NORMAL	34	16	84149	21854
MAIPU	92	60	114836	135897
PUDAHUEL	72	31	93424	49824
RENCA	23	12	73083	30604
CONCHALI	23	15	67081	26875
LO PRADO	18	12	70760	16396
CERRO NAVIA	18	9	52828	26991
ESTACION CENTRAL	72	23	133267	25525
HUECHURABA	45	21	84573	16610
CERRILLOS	38	13	74883	16776
COLINA	98	63	36718	31464
PROVIDENCIA	94	21	466684	13284
NUNOA	104	61	228092	22826
LAS CONDES	200	104	355322	33670
LA FLORIDA	138	83	101645	80901
LA REINA	93	34	170325	19179
MACUL	45	21	90487	20681
PENALOLEN	118	65	85426	45432
VITACURA	95	44	394883	14079
LO BARNECHEA	167	99	217313	15547
SAN MIGUEL	63	27	111825	14624
LA CISTERNA	48	26	78684	18311
LA GRANJA	27	19	66490	25084
SAN RAMON	21	7	41524	17367
LA PINTANA	33	18	42383	41317
SAN JOAQUIN	49	21	79225	20923
PUENTE ALTO	176	84	97174	144147
SAN BERNARDO	125	68	83902	68190
	2363	1146		1090282

**Notes:** This table present a statistics summary of the cartographic data for the municipalities of Santiago. It includes the the total count of homogeneous areas  $N^{\circ}AH$ , the count of homogeneous areas with residential predominant use  $N^{\circ}AH (H)$ , the average of the unitary price for the residential homogeneous areas and the count of properties that have been georeferenced within these homogeneous areas.

# Introducción: Datos



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Table 2: Descriptive statistics of property characteristics

<b>Panel A: Statistics Summary 2018 - 2019</b>			
	count	mean	std
construction surface	8630	157,52	152,45
terrain surface	8630	487,91	681,89
material quality	8630	3,37	0,81
construction year	8630	1983,19	20,14
price	8630	7418,87	11765,15

<b>Panel B: Statistics Summary 2011 - 2012</b>			
	count	mean	std
construction surface	5212	128,36	134,04
terrain surface	5212	360,47	496,98
material quality	5212	3,52	0,72
construction year	5212	1980,71	16,12
price	5212	3248,08	5720,31

**Notes:** This table presents a statistics summary of the characteristics associated with the real estate properties. Panel *A* includes statistics for all properties that have been sold in the years 2018 and 2019. Panel *B* includes statistics for all properties that have been sold in the years 2011 and 2012.

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# Metodología: Regresión discontinua espacial

- Running Variable: Distancia euclidiana a frontera AH
- Outcome Variable: Valor de mercado normalizado
- Treatment: AH con mayor valor unitario

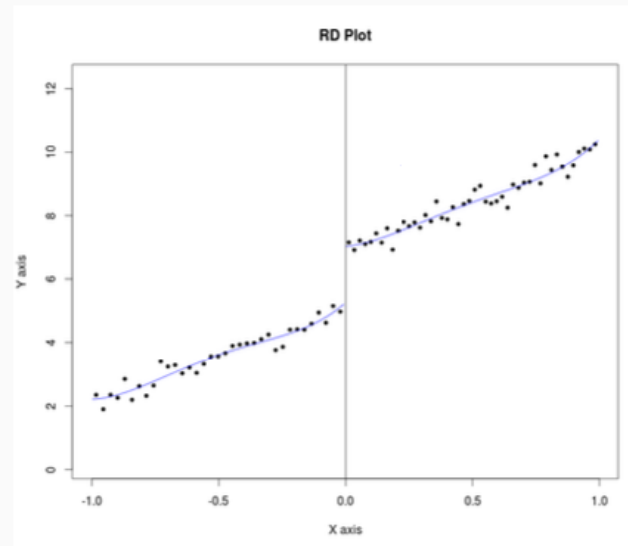
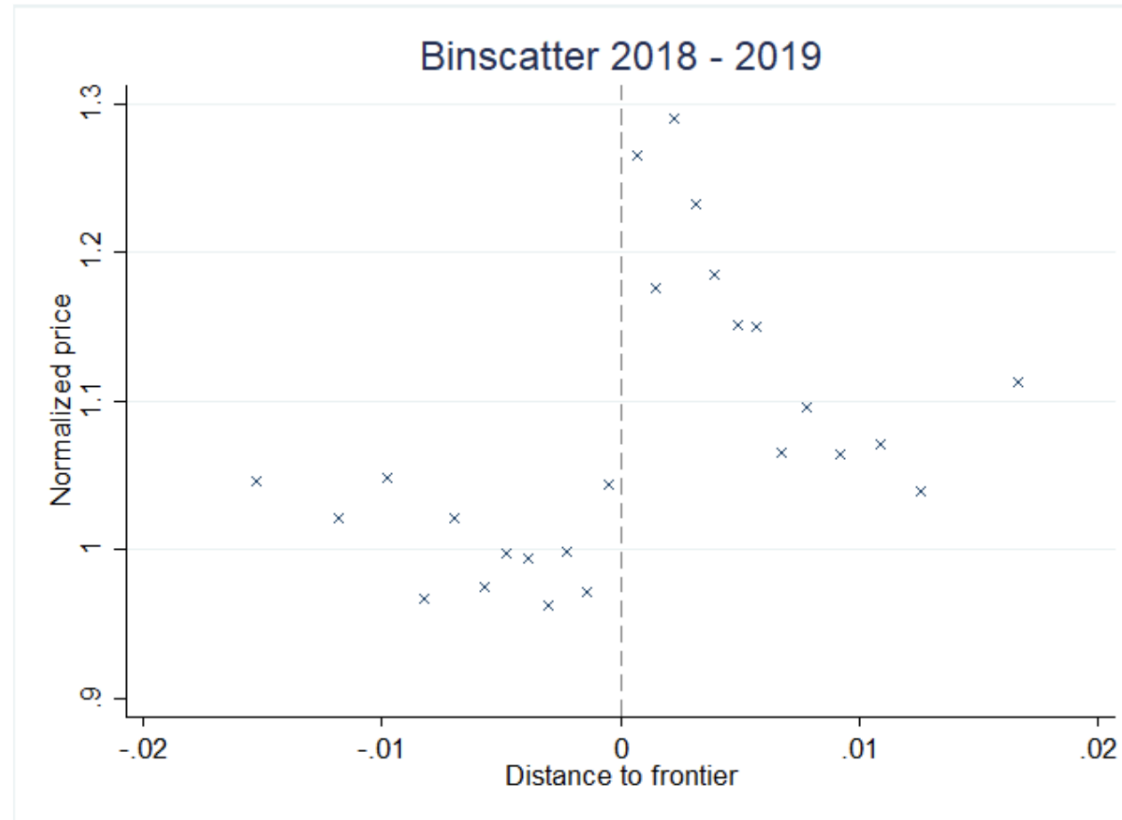


Figure 3: Ejemplo de diseño de regresiones discontinuas

# Resultados

Figure 6: Binscatter 2018 - 2019



**Notes:** This figure represents the relationship between the distance of a real estate property to the homogeneous area boundaries with the normalized price of the property for the years 2018 & 2019.

# Resultados

Table 3: Regression discontinuity results

	(1)	(2)	(3)	(4)	(5)	(6)
	LRD bw/2	LRD bw	LRD 2bw	QRD bw/2	QRD bw	QRD 2bw
<b>Panel A: RDD results periods (2018 - 2019)</b>						
$\mathbb{1}(d > 0)$	0.285*** (0.0901)	0.301*** (0.0599)	0.285*** (0.0435)	0.330** (0.155)	0.272*** (0.0986)	0.324*** (0.0656)
$N$	1204	2303	3525	1204	2303	3525
$R^2$	0.032	0.023	0.019	0.032	0.023	0.019
<b>Panel B: RDD results periods (2018 - 2019) covariants</b>						
$\mathbb{1}(d > 0)$	0.361*** (0.0903)	0.373*** (0.0624)	0.329*** (0.0459)	0.452*** (0.149)	0.341*** (0.0975)	0.376*** (0.0656)
$N$	1140	2195	3382	1140	2195	3382
$R^2$	0.151	0.134	0.168	0.152	0.134	0.169
<b>Panel C: RDD results periods (2011 - 2012)</b>						
$\mathbb{1}(d > 0)$	-0.0780 (0.0725)	-0.0865 (0.0529)	-0.0125 (0.0370)	0.0536 (0.112)	-0.0696 (0.0776)	-0.0840 (0.0577)
$N$	679	1326	2110	679	1326	2110
$R^2$	0.002	0.004	0.001	0.007	0.005	0.003
<b>Panel D: RDD results periods (2011 - 2012) covariants</b>						
$\mathbb{1}(d > 0)$	-0.0257 (0.0666)	-0.0136 (0.0466)	0.0386 (0.0331)	0.0824 (0.114)	0.00594 (0.0745)	-0.0119 (0.0520)
$N$	679	1326	2110	679	1326	2110
$R^2$	0.206	0.167	0.146	0.210	0.167	0.147

Standard errors in parentheses

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

# Conclusiones

- Encontramos un efecto robusto, que podemos interpretar de manera causal
- Cambio exógeno en el impuesto permanente de un 1 \$, implica una caída en el precio de 0.33 \$



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