Lecture 3: Modelo Hedónico. Evidencia

Big Data and Machine Learning en el Mercado Inmobiliario
Educación Continua

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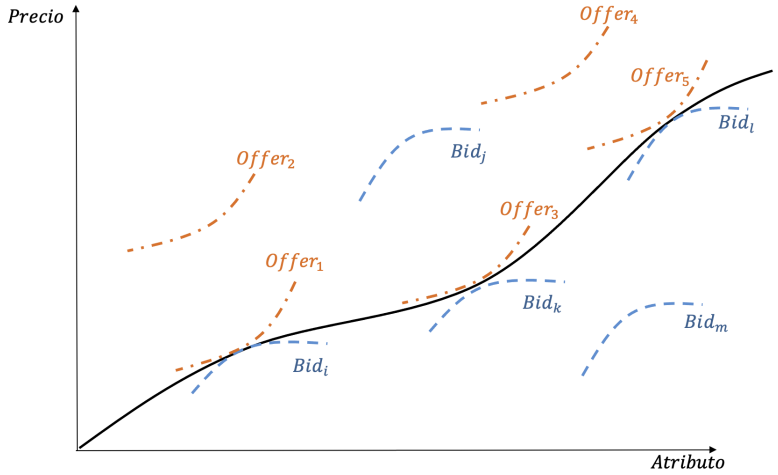
Agenda

1. Recap: Modelo Hedónico
2. Empleos, costos de transporte y gradientes de precios
3. Geografía y Regulaciones
4. Amenidades
5. Variables macro
6. Sobre la función hedónica
7. Para seguir leyendo
8. Break

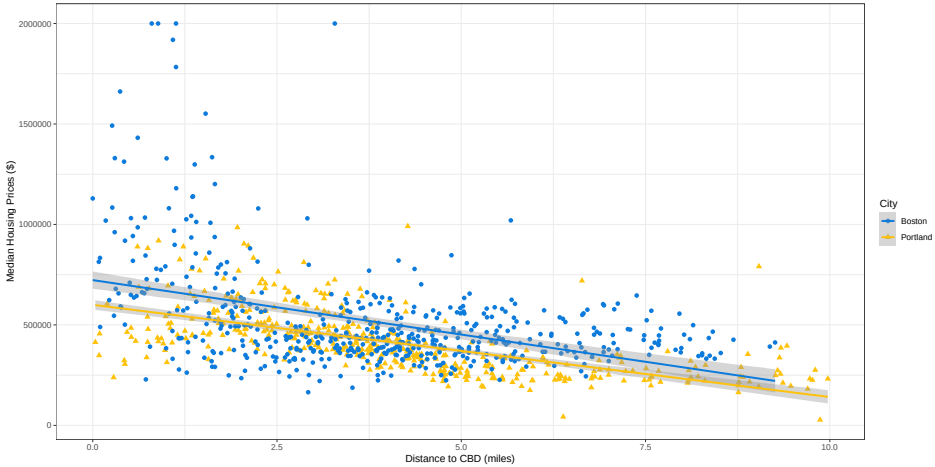
Modelo Hedónico: Intuición



Modelo Hedónico: Intuición

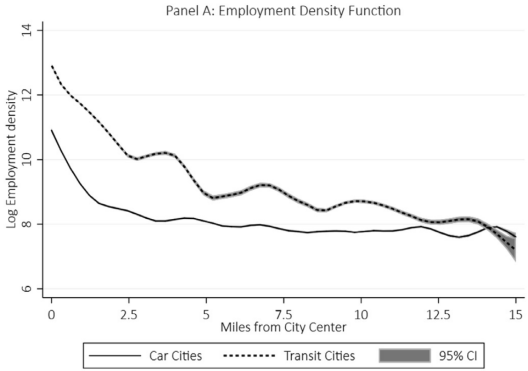
- El modelo prevé que los individuos eligen propiedades en función de
  - Los atributos de la propiedad (p. ej., espacio interior, dormitorios, baños)
  - Las caracteristicas de la ubicación (p. ej., proximidad a empleos, amenidades, etc.).
- En ausencia de fricciones en el mercado, se puede esperar que la variación espacial en las comodidades se capitalice en los precios.

Empleos, costos de transporte y gradientes de precios



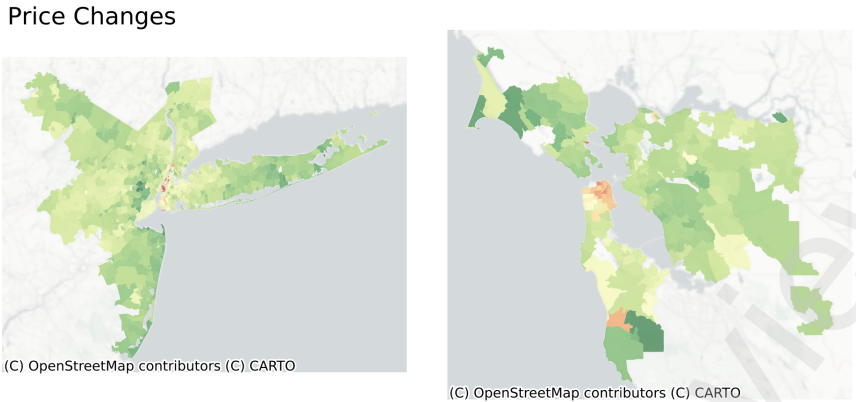
Fuente: Elab. propia en base a datos de la ACS 2018.

Empleos, costos de transporte y gradientes de precios



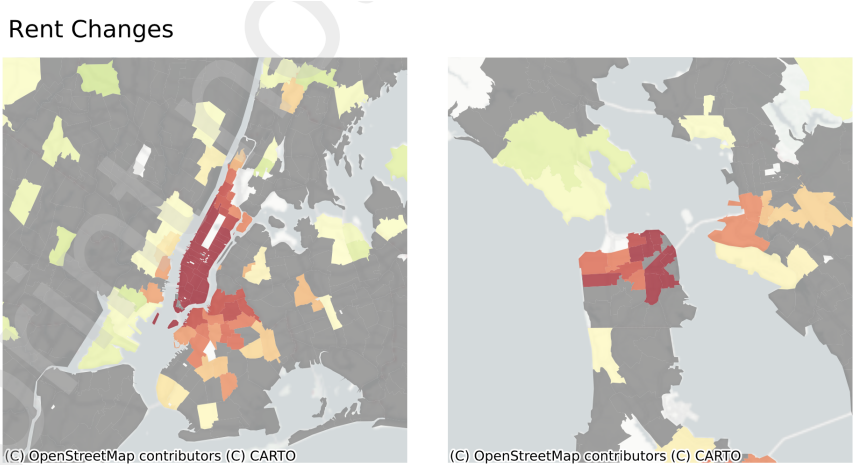
Fuente: Rosenthal et al (2022)

Empleos, costos de transporte y gradientes de precios



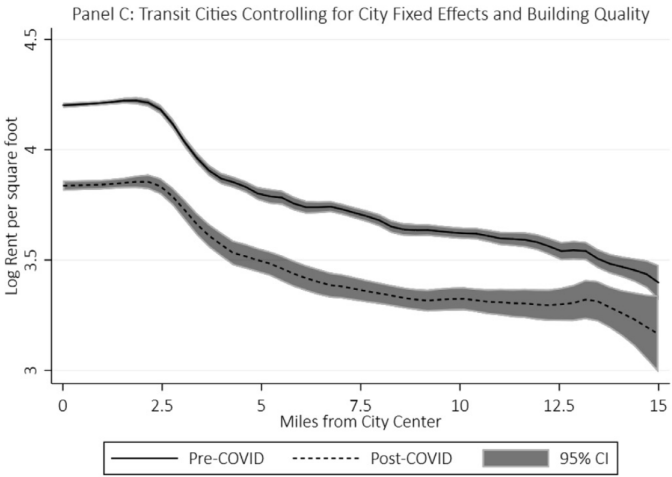
Fuente: Gupta, A., Mittal, V., Peeters, J., & Van Nieuwerburgh, S. (2022)

Empleos, costos de transporte y gradientes de precios



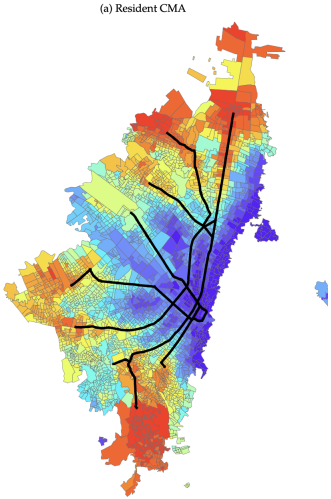
Fuente: Gupta, A., Mittal, V., Peeters, J., & Van Nieuwerburgh, S. (2022)

Empleos, costos de transporte y gradientes de precios



Fuente: Rosenthal et al (2022)

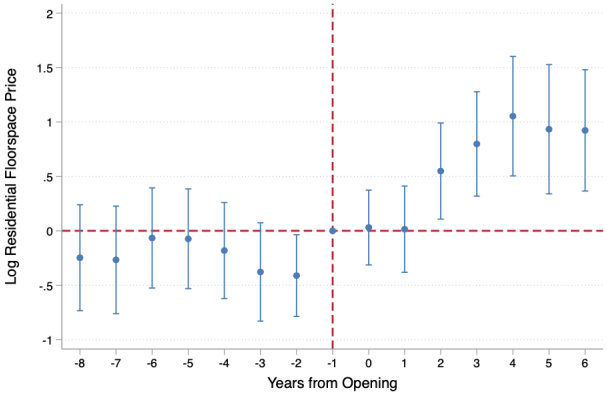
Empleos, costos de transporte y gradientes de precios



Fuente: Tsivanidis, N. (Forthcoming).

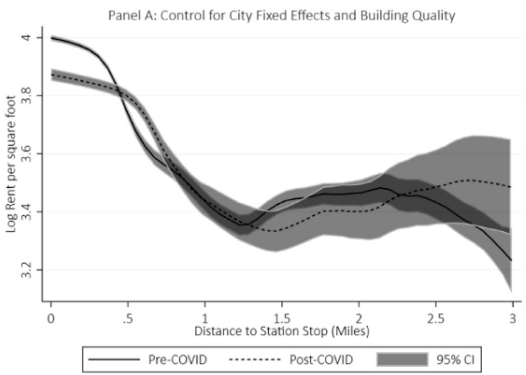
Empleos, costos de transporte y gradientes de precios

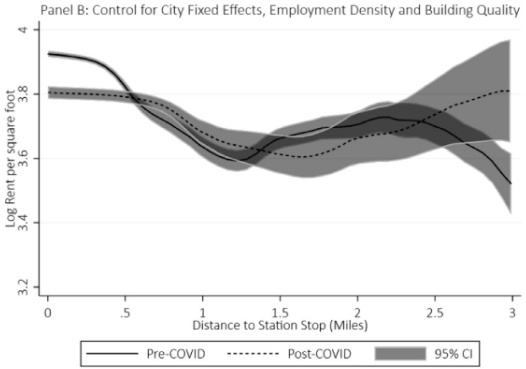
Figure 3: Residential Floorspace Price Event Study



Fuente: Tsivanidis, N. (Forthcoming).

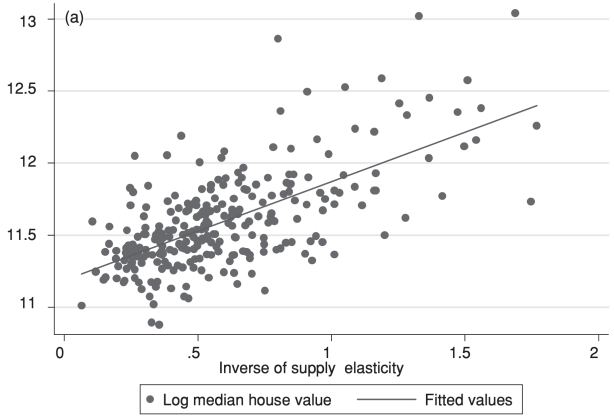
Empleos, costos de transporte y gradientes de precios





Fuente: Rosenthal et al (2022)

Geografía y Regulaciones



Fuente: Saiz, A. (2010)

Geografía y Regulaciones

	MSA	Elasticity	Unavailable Land	Regulation Index
1	Miami, FL	0.60	77%	0.94
2	Los Angeles, CA	0.63	52%	0.49
3	Ft. Lauderdale, FL	0.65	76%	0.72
4	San Francisco, CA	0.66	73%	0.72
5	San Diego, CA	0.67	63%	0.46
265	Terra Haute, IN	6.51	5%	-1.39
266	Alexandria, LA	7.15	19%	-1.68
267	Columbia, MO	7.84	6%	-1.53
268	St. Joseph, MO	7.94	6%	-1.51
269	Pine Bluff, AR	12.15	18%	-1.76

Fuente: Saiz, A. (2010)

Amenidades

Crimen es un fenómeno local

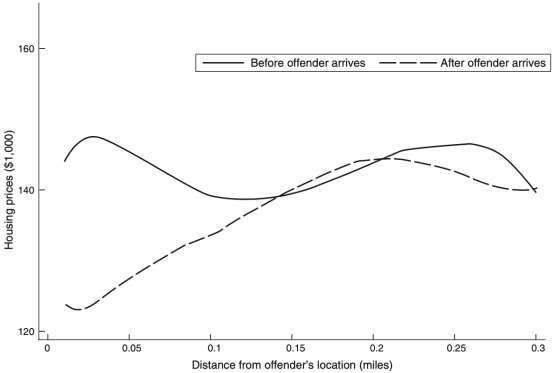


FIGURE 2B. PRICE GRADIENT OF DISTANCE FROM OFFENDER
(Sales during year before and after arrival)

Fuente: Linden, L., & Rockoff, J. E. (2008)

Ejemplo: Unlocking amenities JPUBE

Un cuento de dos parques

Humboldt Park

207 acres

Homicides nearby in
2001-3: 6; 2013-5: 2

House prices near park:
$\leq 1/8mi$: \$247K; $1 - 3/8mi$: \$218K

Diff. = \$29K (levels)

Garfield Park

185 acres

Homicides nearby in
2001-3: 10; 2013-5: 8

House prices near park:
$\leq 1/8mi$: \$86K; $1 - 3/8mi$: \$118K

Diff. = -\$32K (levels)

Ejemplo: Unlocking amenities JPUBE

Interacciones entre las Amenidades

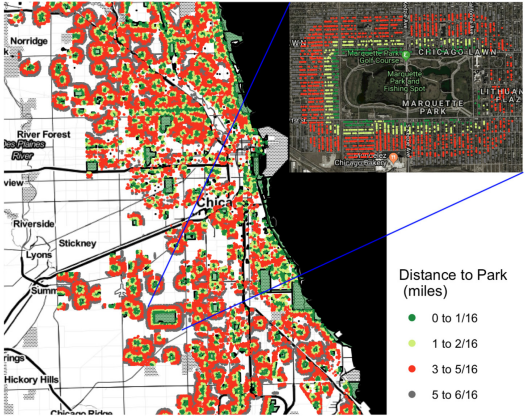


Fig. 1. Housing transactions around parks: neighborhood distance intervals. Notes: The following figure shows transactions within 3/8 miles of the nearest park in Chicago. The zoom in figure represents the 'neighborhood' around Marquette Park. It contains all of the transactions (4623) within three-eights of a mile that are not closer to another a park. Colors correspond to different distance intervals or 'bands' around the park. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

Ejemplo: Unlocking amenities JPUBE

Interacciones entre las Amenidades

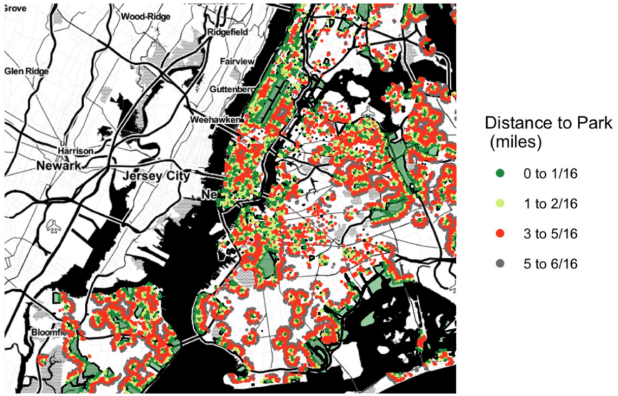
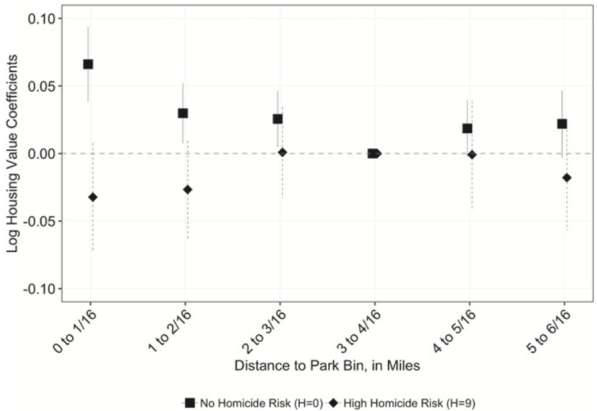


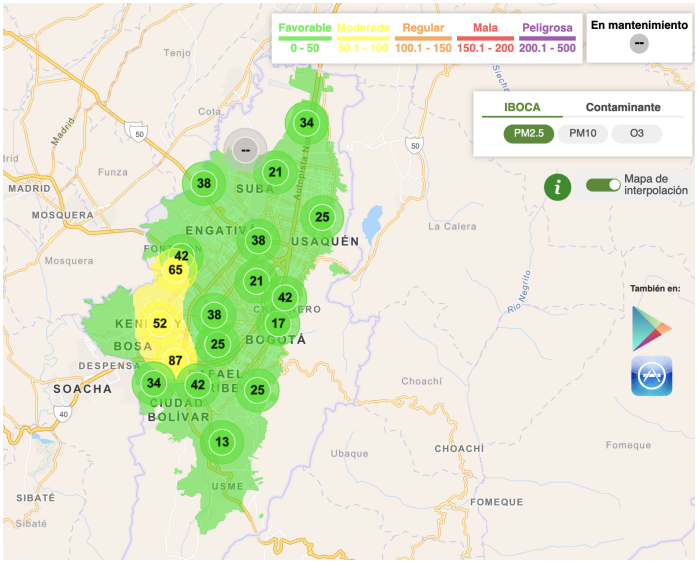
Fig. A1. Housing transactions within 3/8 miles of the nearest park, New York. Notes: Points represent transactions within 3/8 miles of the nearest park. Different shades denote proximity to the park.

Ejemplo: Unlocking amenities JPUBE

Interacciones entre las Amenidades



Contaminación



Contaminación: Currie et al (2015) AER

TABLE 2—THE EFFECT OF TOXIC PLANTS ON LOCAL HOUSING VALUES

	0–0.5 Miles		0.5–1 Miles		0–1 Miles		0–1 Miles (+/– 2 years)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel C. First difference: Estimated effect of plant openings and closings								
1(Plant Opening)	−0.096***	−0.107***	−0.007	−0.008	−0.020	−0.022	−0.030	−0.038
× Near	(0.036)	(0.034)	(0.023)	(0.020)	(0.022)	(0.019)	(0.028)	(0.025)
1(Plant Closing)	0.017	0.010	0.008	0.003	0.010*	0.005	0.005	0.001
× Near	(0.011)	(0.009)	(0.005)	(0.004)	(0.006)	(0.005)	(0.007)	(0.005)
H_0: Opening = −Closing (p-value)	0.051	0.013	0.968	0.827	0.688	0.438	0.402	0.164
Observations	1,114,248	1,114,248	1,305,780	1,305,780	1,375,751	1,375,751	1,196,000	1,196,000
State × year fixed FE	X		X		X		X	
County × year FE		X		X		X		X

Commercial and Industrial Rents

$$RENT_t = \alpha_0 + \Sigma\alpha_{1i} GDP_{t-i} + \Sigma\alpha_{2i} EMP_{t-i} + \Sigma\alpha_{3i} SUPPLY_{t-i} + \Sigma\alpha_{4i} LAND_{t-i} + \varepsilon_t \quad (1)$$

for $i = 0, ..., N$.

Fuente: Thompson y Tsolacos (2020)

Commercial and Industrial Rents

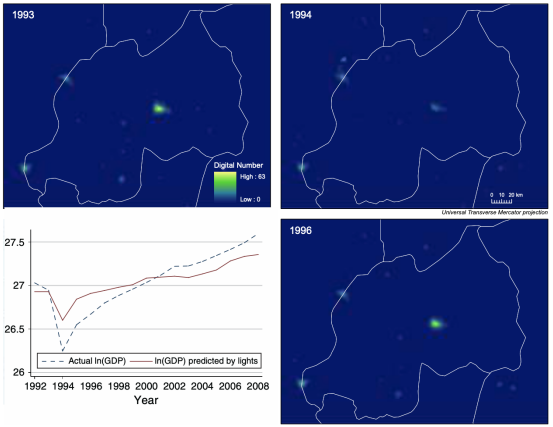
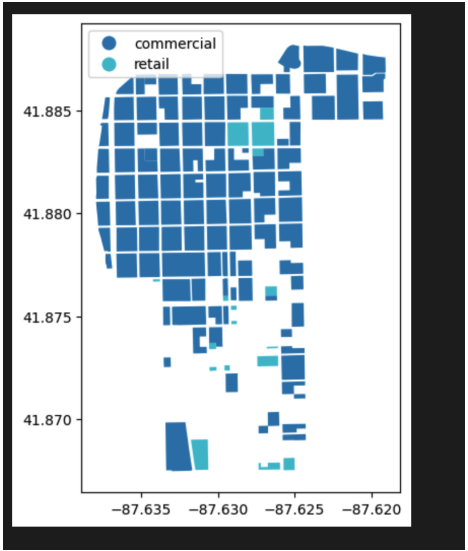


FIGURE 4. GENOCIDE EVENT: RWANDA

Fuente: Henderson et al. (2012)

Commercial and Industrial Rents



Función Hedónica

- La evidencia teórica y de simulaciones sugiere que se debe suponer que la función de precios hedónicos no es lineal. (Ekeland, Heckman y Nesheim, 2004; Cropper, Deck y McConnell (1988)
- Cropper, Deck y McConnell (1988) muestran que las especificaciones relativamente flexibles para la función de precios, como las transformaciones de Box-Cox, brindan estimaciones más precisas que las especificaciones lineales y logarítmicas.
- El Aprendizaje de Máquinas es particularmente util para *aprender* estas formas funcionales.

Para seguir leyendo

- Albouy, D., Christensen, P., & Sarmiento-Barbieri, I. (2020). Unlocking amenities: Estimating public good complementarity. Journal of Public Economics, 182, 104110.
- Gupta, A., Mittal, V., Peeters, J., & Van Nieuwerburgh, S. (2022). Flattening the curve: pandemic-induced revaluation of urban real estate. Journal of Financial Economics, 146(2), 594-636.
- Linden, L., & Rockoff, J. E. (2008). Estimates of the impact of crime risk on property values from Megan's laws. American Economic Review, 98(3), 1103-27.
- Saiz, A. (2010). The geographic determinants of housing supply. The Quarterly Journal of Economics, 125(3), 1253-1296.
- Tsivanidis, N. (Forthcoming). Evaluating the impact of urban transit infrastructure: Evidence from bogota's transmilenio. AER

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