The Price of Violence: The Impact of Social Unrest on Real Estate in Santiago, Chile

Ignacio Aravena-Gonzalez*

February 3, 2026

Click here for the latest version

Extended abstract

Episodes of civil unrest have become a recurring feature of urban life (Haig et al., 2020), yet we know comparatively little about their medium- and long-run effects on real estate markets relative to what is known about routine crime and conventional urban disamenities. This gap matters because property prices embed forward-looking beliefs about neighborhood quality and future urban trajectories. If unrest generates persistent discounts, this points to durable changes in perceived desirability rather than short-lived disruption.

This paper estimates the causal effect of the October 2019 social unrest in Santiago, Chile on residential and commercial real estate outcomes. What began on October 18 as protests against a marginal subway-fare increase escalated into a large episode of unrest, with arson, looting, and public disorder concentrated along commercial corridors, symbolic landmarks, and around metro infrastructure (Gonzalez and Morán, 2020; Avendaño, 2019; Sasse, 2019). I combine validated georeferenced incident hotspots from the national prosecutor's office between October 18, 2019 and March 31, 2020 and released an official report in October 2025 (Fiscalia Nacional, 2025).The report provides statistically significant hotspot polygons by incident category. I intersect these hotspot polygons with census-block polygons to assign exposure at the block level.

The main analysis uses administrative records of residential and commercial property transactions in the Santiago Metropolitan Region from January 2016 through December 2024 from the Servicio de Impuestos Internos. I complement transactions with apartment rental listings scraped from online portals and assigned to blocks. I also incorporate metro operational records identifying stations that were closed due to unrest-related damage and construct a baseline closure-proximity indicator using a 500-meter threshold (Metro de Santiago, 2020;

*London School of Economics and Political Science. i.a.aravena-gonzalez@lse.ac.uk

Agostini and Palmucci, 2008). Finally, I merge pre-treatment covariates from the 2017 Census and an area-level socioeconomic index (Araya, 2023), and I use police quadrant crime statistics to study heterogeneity.

Violence exposure is summarized by an index $V_b \in \{0, 1, 2, 3\}$ for block b, constructed by summing three indicators for intersection with hotspots for public disorder, arson, and looting during October 2019 through March 2020. Metro disruption is captured by M_b, an indicator equal to one if block b lies within 500 meters of a station that experienced closure due to damage.

The core finding is a large and persistent residential price discount in blocks with moderate to high violence exposure. In contrast, commercial price effects are imprecise, but commercial market participation declines sharply and persistently in more exposed locations, consistent with market thinning and selection among observed sales.

Empirical strategy

Identification is challenging because violence was not randomly assigned. Unrest clustered near metro stations and economically active locations that differ systematically from other areas of the city. The empirical strategy addresses this in two ways. First, baseline difference-in-differences and event-study models include block fixed effects, year-month fixed effects, and municipality-by-year fixed effects that absorb granular time-varying local shocks. Second, I exploit heterogeneity in metro station damage and closures, which provides a salient accessibility disruption that is spatially correlated with violence exposure but not perfectly overlapping. I implement a channel separation design and a triple-difference decomposition that separately identifies violence intensity, proximity to closed stations, and their interaction.

The baseline specification compares outcomes before and after October 2019 across blocks with different violence exposure:

$$\ln(P_{ibt}) = \beta \left(V_b \times \mathbb{1}\{t \geq \text{Oct 2019}\}\right) + X_{it}'\gamma + \alpha_b + \theta_t + \mu_{c(b),y(t)} + \varepsilon_{ibt}, \tag{1}$$

where P_{ibt} is the transaction price of property i in block b at month t, X_{it} includes standard property characteristics, α_b are block fixed effects, θ_t are year-month fixed effects, and $\mu_{c(b),y(t)}$ are municipality-by-year fixed effects. Standard errors are clustered at the block level.

To capture dynamics and isolate a post-normalization period, I pool months into three phases: Phase 1 from October 2019 through September 2020 when metro closures were most salient, Phase 2 from October 2020 through September 2022 covering the pandemic and transition, and Phase 3 from October 2022 onward when metro service was fully restored and major restrictions were no longer binding. Event-study models are estimated at the quarter level and pre-trends are assessed using both visual evidence and joint tests.

To separate violence from accessibility disruptions, I use two complementary designs. First, I classify blocks into mutually exclusive channels based on (V_b, M_b), namely Control, Violence Only, Metro Only, and Both, and estimate phase-specific effects by channel. Second, I estimate a triple-difference decomposition that includes V_b, M_b, and $V_b \times M_b$ interacted with phase indicators, which tests whether the violence effect differs systematically in locations exposed to closures.

Main results

Table 1 reports pre-period differences by violence intensity. Exposed blocks are more central and have higher baseline commercial presence and higher socioeconomic status, highlighting the non-random geography of unrest. These level differences motivate a design that relies on differential changes over time, conditional on granular fixed effects, rather than balance in levels.

Table 2 summarizes the main difference-in-differences results. In the preferred specification with municipality-by-year fixed effects, residential prices fall by about 5 to 6 percent in moderately and highly exposed areas in the post-normalization phase. The pooled post-shock estimate masks dynamics. Phase-specific estimates show near-zero effects during the metro-closure and pandemic phases and sizeable effects in Phase 3. This timing is difficult to reconcile with a purely accessibility-driven mechanism, which would predict the largest price response during closures.

Commercial price estimates are imprecise, but market activity responds strongly. Table 5 shows that residential transaction volumes do not differentially decline once municipality-by-year shocks are absorbed, whereas the probability of any commercial transaction declines in more exposed areas across phases. This pattern supports an interpretation in which commercial adjustment operates primarily on the participation margin, consistent with market thinning and potential selection among observed sales.

Violence versus accessibility

Table 3 addresses the concern that violence exposure proxies for metro-accessibility disruptions. The Violence Only channel exhibits a negative and statistically significant Phase 3 effect for residential prices and rents, while Metro Only estimates are close to zero for residential prices. Table 4 reports the triple-difference decomposition and shows that violence intensity remains negative and precisely estimated in Phase 3, whereas proximity to a closed station is small and statistically insignificant for residential prices. Taken together, these results support interpreting the residential discounts as primarily driven by violence exposure rather than by temporary accessibility losses.

Heterogeneity and interpretation

Heterogeneity patterns are consistent with a perceived-safety channel. Effects are larger near the city center and in medium- and high-socioeconomic-status areas. Table 6 shows that residential sales effects concentrate in medium and high GSE, while low GSE shows no discernible response. For rents, the largest declines occur in high GSE. These patterns are consistent with higher-income households being more responsive to perceived safety risks and having greater residential mobility. At the same time, heterogeneity is not designed to separately identify mechanisms and may reflect correlated centrality and amenity gradients.

Robustness summary

The main Phase 3 residential estimate is robust to a battery of checks summarized in the paper. These include flexible time shocks that vary by distance-to-CBD and commercial-density bins, local sample restrictions near the violence boundary, placebo timing exercises, donut tests around protest epicenters, repeat-sales specifications with property fixed effects, Conley standard errors, and alternative thresholds for defining proximity to closed stations. Across these exercises, the post-normalization estimate remains negative and is typically statistically significant.

Contribution

This paper contributes to three literatures. First, it provides causal evidence on unrest and real estate from a major Latin American city using high-coverage administrative microdata and validated georeferenced exposure, complementing evidence on riots and conflict in other settings (Collins and Margo, 207; Besley and Mueller, 2012; Kourtis et al., 2020). Second, it contributes methodologically by showing how channel classification and a triple-difference decomposition can help separate correlated mechanisms when violence exposure overlaps with accessibility shocks, building on recent difference-in-differences advances (de Chaisemartin and D'Haultfœuille, 2020; Callaway and Sant'Anna, 2021). Third, the persistence and growth of effects over time speak to broader questions of durable urban change after acute shocks (Davis and Weinstein, 2002; Collins and Margo, 207).

Keywords Urban violence, real estate, disamenities
JEL codes R21, R23, D12, O18

References

Agostini, Claudio A. and Gaston Palmucci, "Capitalización Heterogénea de un Bien Semipúblico: El Metro de Santiago," *Cuadernos de economía*, 2008, *45* (131), 105–128.

Araya, Martín Rosas, "Calculating Socio Material Territorial Index [R package ismtchile version 2.1.5]," *CRAN: Contributed Packages*, 7 2023.

Avendaño, Octavio, "ESTALLIDO SOCIAL EN CHILE: LOS DILEMAS POLÍTICOS DESDE OCTUBRE DEL 2019," *Política. Revista de Ciencia Política*, 12 2019, *57* (2), 105–119.

Besley, Timothy and Hannes Mueller, "Estimating the Peace Dividend: The Impact of Violence on House Prices in Northern Ireland," *American Economic Review*, 2012, *102* (2), 810–33.

Callaway, Brantly and Pedro H.C. Sant'Anna, "Difference-in-Differences with multiple time periods," *Journal of Econometrics*, 12 2021, *225* (2), 200–230.

Collins, William J and Robert A Margo, "The Economic Aftermath of the 1960s Riots in American Cities: Evidence from Property Values," *Journal of Economic History*, 12 207, (67), 849–883.

Davis, Donald R. and David E. Weinstein, "Bones, Bombs, and Break Points: The Geography of Economic Activity," *American Economic Review*, 12 2002, *92* (5), 1269–1289.

de Chaisemartin, Clément and Xavier D'Haultfœuille, "Two-Way Fixed Effects Estimators with Heterogeneous Treatment Effects," *American Economic Review*, 9 2020, *110* (9), 2964–96.

Fiscalia Nacional, "Informe Estallido Social," Technical Report, Ministerio Publico 2025.

Gonzalez, Ricardo and Carmen Le Foulon Morán, "The 2019–2020 Chilean protests: A first look at their causes and participants," *International Journal of Sociology*, 5 2020, *50* (3), 227–235.

Haig, Christian Stirling, Katherine Schmidt, and Samuel Brannen, "The Age of Mass Protests: Understanding an Escalating Global Trend," 2020.

Kourtis, Eleftherios, Panayiotis Curtis, and Michael Kourtis, "Spatial Differentiation of Urban Property Prices as a Repercussion in the Aftermath of a Civil Disorder Incident: The 2011 London Case," *International Journal of Finance, Insurance and Risk Management*, 2020, *10* (4), 3–24.

Metro de Santiago, "Memoria Anual," 2020.

Sasse, Lea, "Chile Despertó-The Reasons for the Mass Protests in Chile Contact," 2019.

Table 1: Summary Statistics by Violence Exposure in the Pre-Period

	V=0 (Control)	V=1 (Low)	V=2 (Medium)	V=3 (High)
Panel A. Residential transactions				
Price (UF/m^2)	44.6 (26.5)	49.5 (24.9)	53.9 (27.9)	58.4 (26.9)
Construction area (m^2)	65.3 (38.8)	65.1 (30.3)	65.7 (32.7)	63.5 (30.8)
Year built	2003.1 (19.3)	2000.4 (20.0)	1998.2 (19.6)	1997.4 (24.8)
Apartment (=1)	0.64	0.68	0.67	0.80
Observations	129,161	32,261	9,709	9,308
Panel B. Commercial transactions				
Price (UF/m^2)	67.4 (41.0)	61.1 (42.4)	66.4 (35.6)	64.2 (33.2)
Construction area (m^2)	156.1 (774.1)	279.2 (1453.6)	157.5 (261.0)	164.2 (438.6)
Year built	1998.8 (26.5)	1986.9 (30.4)	1991.7 (27.0)	1987.7 (30.6)
Office (=1)	0.62	0.56	0.60	0.73
Observations	5,339	1,144	833	1,698
Panel C. Block characteristics				
Distance to metro (m)	4,194	1,609	1,764	696
Commercial stock	1.32	1.84	4.08	13.83
GSE level	1.57	1.72	1.81	1.92
Population 2017	135	145	129	147
Blocks	34,060 (76.2%)	7,031 (15.7%)	2,263 (5.1%)	1,345 (3.0%)
Panel D. Rental listings				
Rent (UF/m^2)	0.32 (0.10)	0.30 (0.09)	0.31 (0.08)	0.33 (0.09)
Rent (UF)	29.1 (15.6)	22.8 (12.3)	23.9 (9.0)	19.3 (5.6)
Size (m^2)	96.6 (50.4)	79.5 (37.8)	81.5 (36.4)	63.2 (26.7)
Bedrooms	2.36 (0.91)	2.16 (0.82)	2.14 (0.89)	1.77 (0.84)
Bathrooms	2.08 (0.85)	1.86 (0.66)	1.91 (0.70)	1.53 (0.58)
Observations	3,858	1,318	595	657

Notes. Standard deviations in parentheses. Pre-period is October 2017 through September 2019. Violence intensity $V \in \{0, 1, 2, 3\}$ is based on whether the block polygon intersects hotspots for public disorder, arson, and looting during October 2019 through March 2020.

Table 2: Summary of Difference-in-Differences Estimates

	(1) TWFE	(2) + mun. × Year	(3) By Phase	(4) By Phase and V_b
Panel A. Residential sales (N=467,034)				
Post × Viol. index	-0.020***	-0.010*		
Viol. index × Phase 1			-0.006	
Viol. index × Phase 2			-0.007	
Viol. index × Phase 3			-0.020***	
Phase 1 × $V = 1$				-0.014
Phase 1 × $V = 2$				-0.034**
Phase 1 × $V = 3$				-0.005
Phase 2 × $V = 1$				-0.013
Phase 2 × $V = 2$				-0.030
Phase 2 × $V = 3$				-0.010
Phase 3 × $V = 1$				-0.009
Phase 3 × $V = 2$				-0.051***
Phase 3 × $V = 3$				-0.059***
Panel B. Commercial sales (N=22,417)				
Post × Viol. index	-0.016	0.010		
Viol. index × Phase 1			0.012	
Viol. index × Phase 2			0.025	
Viol. index × Phase 3			-0.014	
Phase 1 × $V = 1$				-0.044
Phase 1 × $V = 2$				0.053
Phase 1 × $V = 3$				0.034
Phase 2 × $V = 1$				0.075
Phase 2 × $V = 2$				0.011
Phase 2 × $V = 3$				0.075
Phase 3 × $V = 1$				0.015
Phase 3 × $V = 2$				-0.039
Phase 3 × $V = 3$				-0.048
Panel C. Apartment listings (N=27,554)				
Post × Viol. index	-0.018***	-0.018***		
Viol. index × Phase 1			-0.015**	
Viol. index × Phase 2			-0.018***	
Viol. index × Phase 3			-0.028***	
Phase 1 × $V = 1$				-0.023
Phase 1 × $V = 2$				-0.022
Phase 1 × $V = 3$				-0.042**
Phase 2 × $V = 1$				-0.017
Phase 2 × $V = 2$				-0.015
Phase 2 × $V = 3$				-0.057***
Phase 3 × $V = 1$				-0.009
Phase 3 × $V = 2$				-0.040**
Phase 3 × $V = 3$				-0.088***
Block FE	Yes	Yes	Yes	Yes
Year-month FE	Yes	Yes	Yes	Yes
mun. × Year FE	No	Yes	Yes	Yes

Notes. Phase 1 is October 2019 through September 2020. Phase 2 is October 2020 through September 2022. Phase 3 is October 2022 onward.
Significance. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table 3: Price Effects by Treatment Channel

	Residential	Commercial	Rents
Violence Only			
Phase 1	−0.0065	0.0082	−0.0154**
	(0.0052)	(0.0199)	(0.0065)
Phase 2	−0.0045	0.0266	−0.0176***
	(0.0064)	(0.0229)	(0.0065)
Phase 3	−0.0181***	−0.0170	−0.0274***
	(0.0061)	(0.0219)	(0.0079)
Metro Only			
Phase 1	−0.0053	0.2868**	0.0262
	(0.0187)	(0.1447)	(0.0212)
Phase 2	0.0074	−0.1467	0.0267
	(0.0194)	(0.1521)	(0.0225)
Phase 3	0.0011	−0.1788	0.0255
	(0.0221)	(0.1427)	(0.0241)
Both			
Phase 1	−0.0028	0.0579	−0.0065
	(0.0087)	(0.0382)	(0.0110)
Phase 2	−0.0202**	0.0164	−0.0165
	(0.0101)	(0.0352)	(0.0101)
Phase 3	−0.0278***	−0.0005	−0.0260***
	(0.0102)	(0.0375)	(0.0101)
Block FE	Yes	Yes	Yes
Year-month FE	Yes	Yes	Yes
municipality×Year FE	No	Yes	Yes
Observations	467,034	22,417	27,554

Notes. Dependent variable is log price for Residential and Commercial, and $\ln(\text{UF}/m^2)$ for Rents. Violence Only and Both coefficients are per unit of violence intensity. Metro Only is binary. Standard errors are clustered at the block level for Residential and Commercial and at the manzana level for Rents.

Table 4: Triple-Difference Decomposition by Phase

	Residential	Commercial	Rents
Violence index interacted with phase			
Phase 1	−0.0066	0.0063	−0.0169***
	(0.0052)	(0.0199)	(0.0064)
Phase 2	−0.0045	0.0229	−0.0188***
	(0.0064)	(0.0230)	(0.0064)
Phase 3	−0.0180***	−0.0202	−0.0287***
	(0.0061)	(0.0220)	(0.0078)
Near closed metro interacted with phase			
Phase 1	−0.0086	0.0882	0.0107
	(0.0191)	(0.1308)	(0.0166)
Phase 2	0.0028	−0.2351*	0.0238
	(0.0180)	(0.1220)	(0.0193)
Phase 3	0.0025	−0.2257*	0.0132
	(0.0208)	(0.1225)	(0.0169)
Violence interacted with near metro and phase			
Phase 1	0.0074	0.0171	0.0145
	(0.0098)	(0.0634)	(0.0111)
Phase 2	−0.0170	0.0707	0.0014
	(0.0119)	(0.0559)	(0.0118)
Phase 3	−0.0107	0.0933	0.0045
	(0.0118)	(0.0572)	(0.0118)
Block FE	Yes	Yes	Yes
Year-month FE	Yes	Yes	Yes
municipality×Year FE	No	Yes	Yes
Observations	467,034	22,417	27,554

Notes. Violence index ranges 0 to 3. Near closed metro equals one if within 500m of a closed station. Dependent variable is log price for Residential and Commercial, and $\ln(\text{UF}/m^2)$ for Rents. Standard errors are clustered at the block level for Residential and Commercial and at the manzana level for Rents.

Table 5: Difference-in-Differences Estimates for Market Activity

	(1) TWFE	(2) + mun. × Year	(3) By Phase
Panel A. Residential transaction volumes			
A.1 OLS			
Post × Viol. index	-0.0082***	-0.0017	
Viol. index × Phase 1			-0.0027
Viol. index × Phase 2			-0.0017
Viol. index × Phase 3			-0.0012
A.2 PPML			
Post × Viol. index	0.0626**	0.0149	
Viol. index × Phase 1			0.0398
Viol. index × Phase 2			-0.0069
Viol. index × Phase 3			0.0199
Panel B. Commercial transaction volumes			
B.1 OLS extensive margin			
Post × Viol. index	-0.0047***	-0.0037***	
Viol. index × Phase 1			-0.0054***
Viol. index × Phase 2			-0.0025*
Viol. index × Phase 3			-0.0035***
B.2 PPML intensive margin			
Post × Viol. index	0.0742	0.0643	
Viol. index × Phase 1			0.0781
Viol. index × Phase 2			0.0202
Viol. index × Phase 3			0.0927
Manzana FE	Yes	Yes	Yes
Event-quarter FE	Yes	Yes	Yes
mun. × Year FE	No	Yes	Yes

Notes. Phase 1 is October 2019 through September 2020. Phase 2 is October 2020 through September 2022. Phase 3 is October 2022 onward.

Table 6: Violence Effects by Socioeconomic Status in the Post-normalization Period

	Residential (Sales)	Commercial (Sales)	Residential (Rents)
Low GSE	0.0014	0.0257	0.0005
	(0.0105)	(0.0804)	(0.0231)
Medium GSE	−0.0298***	0.0389	0.0030
	(0.0091)	(0.0419)	(0.0109)
High GSE	−0.0209**	−0.0217	−0.0333***
	(0.0089)	(0.0254)	(0.0086)
FE (block, year-month, municipality×year)	Yes	Yes	Yes
Observations	443,593	20,947	27,440

Notes. Coefficients are per unit of violence intensity in Phase 3. Standard errors are clustered at the block level.