Who Bears Rising Commercial Property Insurance Costs?

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Introduction

Motivation

- U.S. billion-dollar disasters increased from 3.3/year (1980–2000) → 23/year (2020–2024)
- Home insurance premiums ↑ 63% (28% in real terms) from 2017–2024 (Keys and Mulder, 2025)
- Commercial property insurance costs also show steep increases, but existing research relies on aggregate data and lacks property-level granularity, so it remains understudied
- Commercial insurance market provides a useful laboratory: less rate regulation + CMBS standardized coverage requirements

This paper

1. Documents the scale and breadth of rising commercial insurance costs
2. Shows how the burden varies across locations through three supply-side mechanisms
3. Studies incidence between tenants and owners through rents, NOI, and asset values
4. Examines how owner scale and portfolio risk shape pricing and reallocation

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Preview of Results

Rise in Insurance Costs

- Time Series: Insurance costs rose $\geq$15% each year since 2019, hitting nearly 30% in 2023
- Cross Section: 37% of CBSAs saw 2x+ increases, spanning coastal and interior areas
- Comparison to HO: Commercial insurance rose $\geq 2\times$ as much as homeowners nearly everywhere

Burden Across Locations

- Increases largest where disaster risk, reinsurance exposure, and HO regulatory frictions are greatest

Burden Between Tenants and Property Owners

- Owners pass $\sim$49% of insurance cost $\uparrow$ to rents on average; pass-through has weakened over time
- Repricing capitalized: riskier properties $\Rightarrow \downarrow$ prices and $\uparrow$ yields post-2018

Burden Across Property Owners and Reallocation

- Size Advantage: Owner size $\uparrow \Rightarrow$ insurance costs $\downarrow$
- Portfolio Risk: Owners with $\downarrow$ avg portfolio risk $\Rightarrow$ insurance costs $\downarrow$
- Heterogeneity: Size effect and portfolio risk effect are $\uparrow$ in high-risk areas and have grown over time
- Reallocation: High-risk assets sold by smaller owners, purchased by larger, lower-portfolio-risk owners

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Related Literature

Insurance Supply and Pricing

- Regulation & cross-product subsidization (Oh, Sen, and Tenekedjieva, 2025; Ge, 2022; Sen, 2023); Reinsurance & capital constraints (Froot, 2001; Koijen and Yogo, 2015; Keys and Mulder, 2025); Information / catastrophe pricing (Boomhower et al., 2023; Eastman and Kim, 2024) (mostly homeowners)

⇒ This paper: commercial insurance: post-2018 local risk repricing, reinsurance, and HO spillovers

Climate Finance and Real Estate

- House prices, mortgages, bonds (Bernstein, Gustafson, and Lewis, 2019; Murfin and Spiegel, 2020; Sastry, 2026; Seltzer, Starks, and Zhu, 2026); CRE & CMBS (Holtermans, Kahn, and Kok, 2024; Buschbom et al., 2025; Fang et al., 2024)

⇒ This paper: insurance as a central channel: climate risk → rents, NOI, valuations, ownership

Incidence of Insurance Cost Increases

- House prices (Hino and Burke, 2021; Ge, Lam, and Lewis, 2024); Delinquency & relocation (Ge, Johnson, and Tzur-Ilan, 2026); HO coverage margin (Sastry, Scharlemann, Sen, and Tenekedjieva, 2026)

⇒ This paper: rental-market incidence: concave, declining pass-through; capitalization in prices and cap rates

Ownership Structure in Real Estate

- Long-term rentals & institutional landlords (Mills et al., 2019; Austin, 2022; Coven, 2023; Gorback, Qian, and Zhu, 2024); Buyer/seller identity (Koijen, Shah, and Van Nieuwerburgh, 2026)

⇒ This paper: owner scale + portfolio composition shape insurance pricing, with reallocation of high-risk assets toward larger owners

Data

Agency CMBS (Freddie Mac & Fannie Mae)

- Observe full operating statements, plus rich property-, loan-, and deal-level details
- 456k property-year observations across 103k multifamily properties (mostly 2014–present)
- Merge with RCA to identify property owners and their parent companies

Other Datasets

- FEMA: Disaster risk scores and expected losses at census tract-level
- RCA: Commercial property ownership and transactions (2000–present)
- Bloomberg: Non-agency multifamily and other property types (2000–present)
- SHELDUS: Disaster losses at county-year level
- NAIC: Losses, premiums written, reinsurance at insurance company-line-state-year level
- Federal Insurance Office (Treasury): Homeowners premiums at zipcode-year level

▸ Summary Statistics

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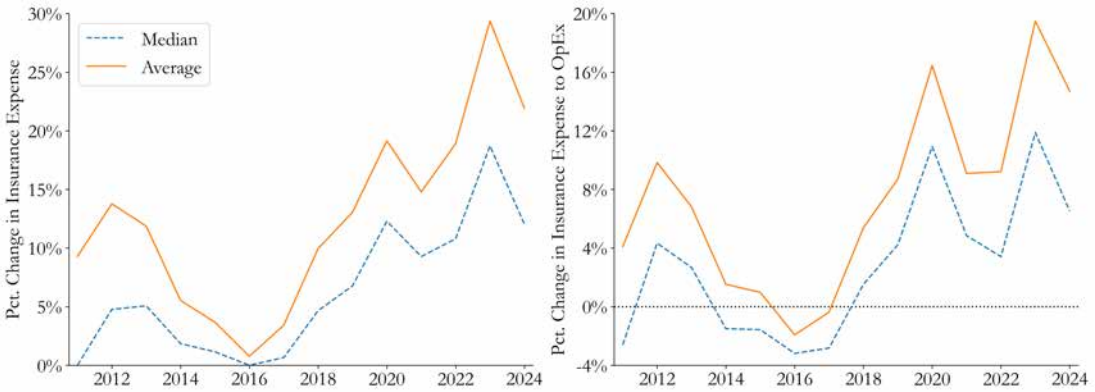
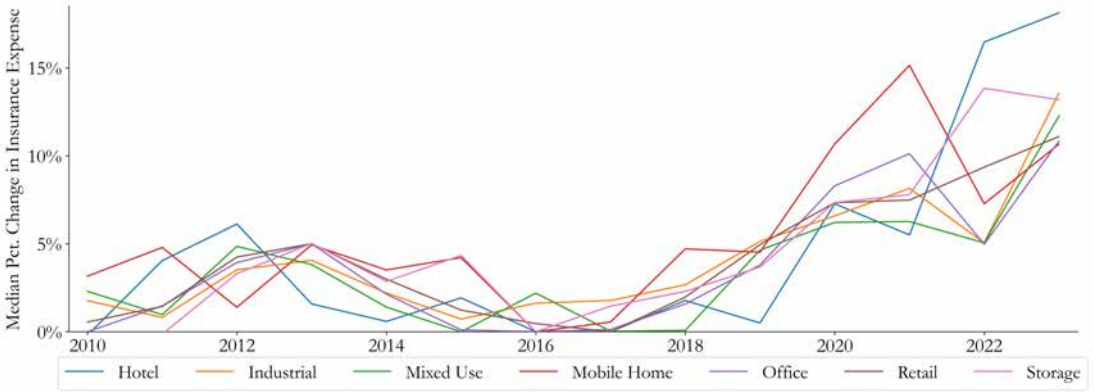
Multifamily: Annual Percentage Change in Insurance Costs



Average annual growth exceeded 15% every year since 2019, peaking near 30% in 2023

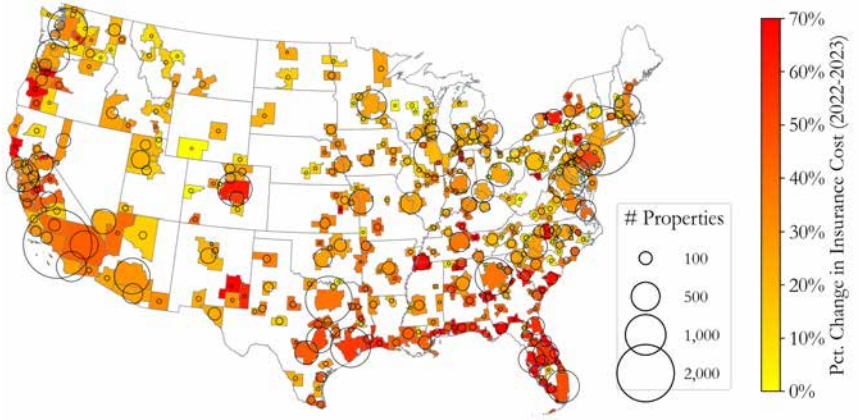
▸ Levels

Other Commercial Property Types: Annual Percentage Change



- Same pattern across property types ⇒ common commercial repricing
- Focus on multifamily: largest sample + standardized Agency CMBS coverage + non-multifamily → NNN leases (mechanical pass-through)

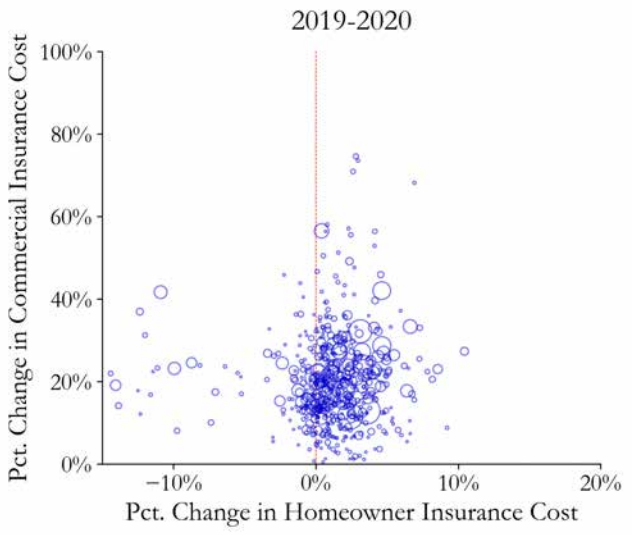
Cross-Section: Percentage Change in Insurance Costs, 2022–2023



- Largest increases on coasts (FL, TX, LA, CA) *and* interior (OK, CO, TN, IN)
- Only 12% of CBSAs (1% of properties) saw <10% increase

▸ Early vs. Late

Comparison to Rise in Homeowners Insurance



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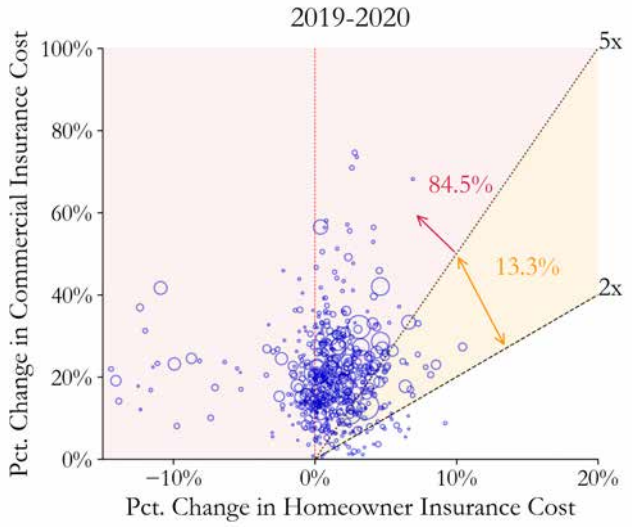
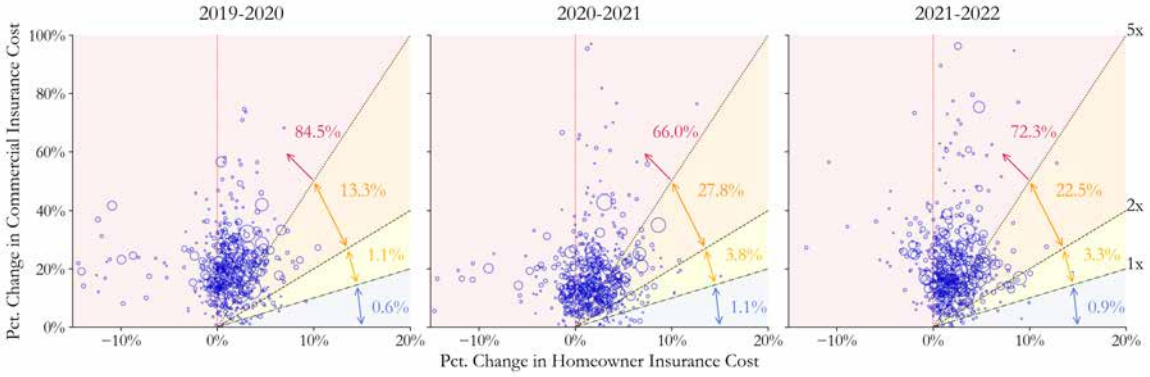


95% of population in counties where commercial insurance rose $\geq 2\times$ homeowners insurance

Commercial vs. Homeowners Insurance: All 3 Years



All 3 years show the same pattern: commercial rises much faster than homeowners insurance

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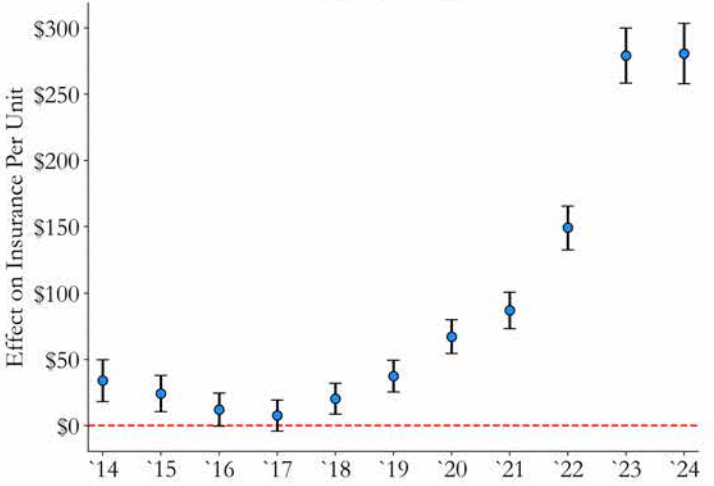
Local Risk Repricing: Post-2018 Break



Clear break in 2018: insurers reprice local climate risk much more aggressively

▸ NRI Split ▸ Table ▸ Year-by-Year (pct) ▸ Risk Map ▸ Damages Spike ▸ Horizons

Spillovers from Homeowners Insurance Frictions

- **OST (2025):** Homeowners ins. market frictions ⇒ insurers cross-state subsidization
- **Idea:** Cross-line subsidization: homeowners frictions ⇒ spillover to commercial pricing
  - Homeowner frictions ↑ & commercial frictions ↓ ⇒ commercial rates ↑ in the same state
- **Stacked DiD:** Compare post-disaster outcomes: high- vs low-friction border county



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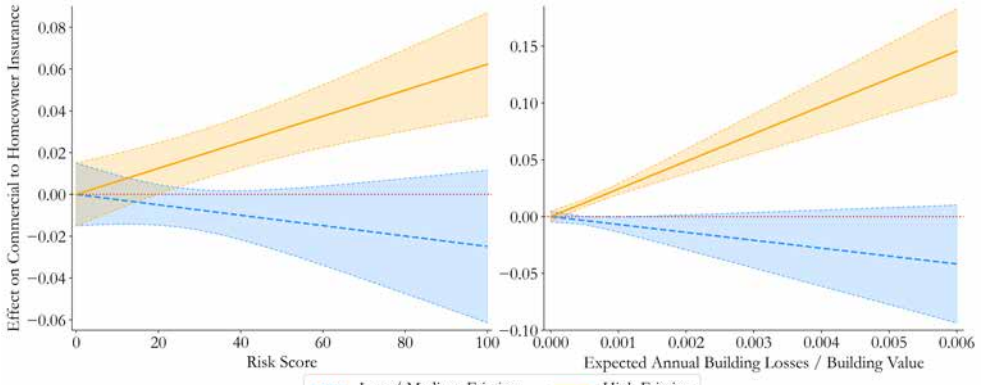

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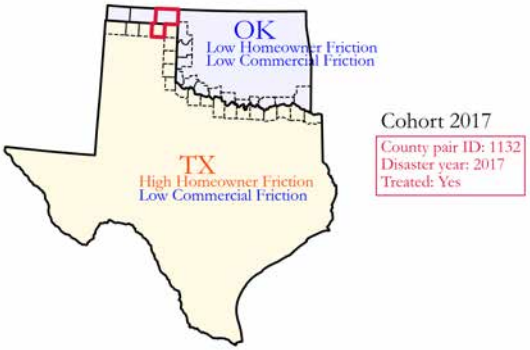

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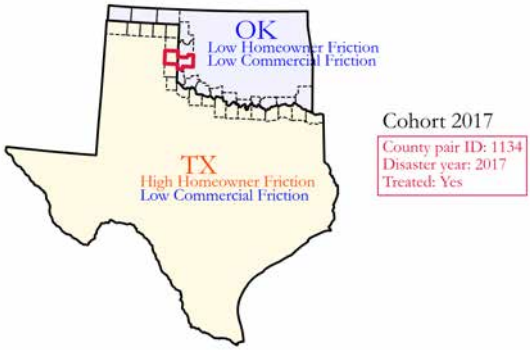

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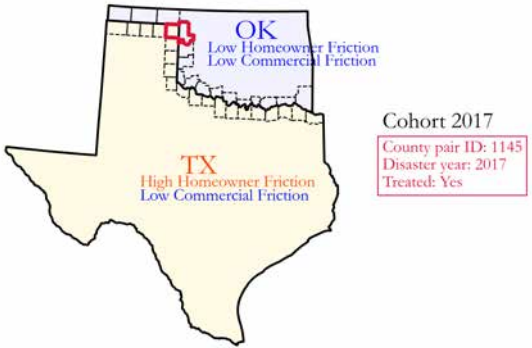

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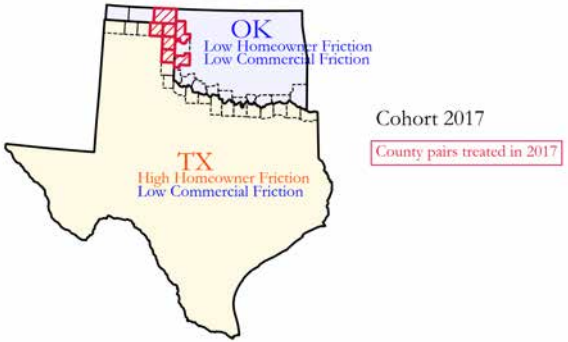

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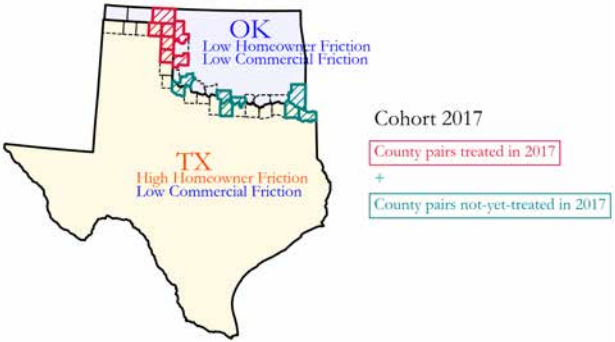

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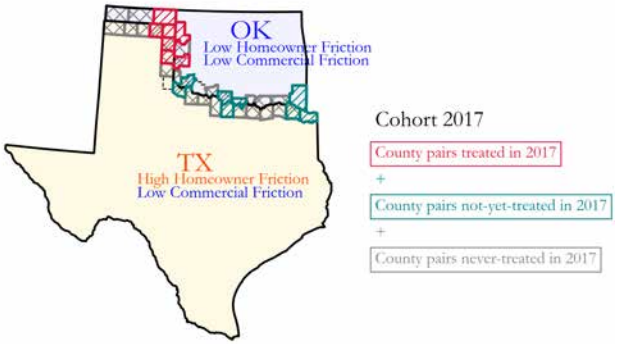

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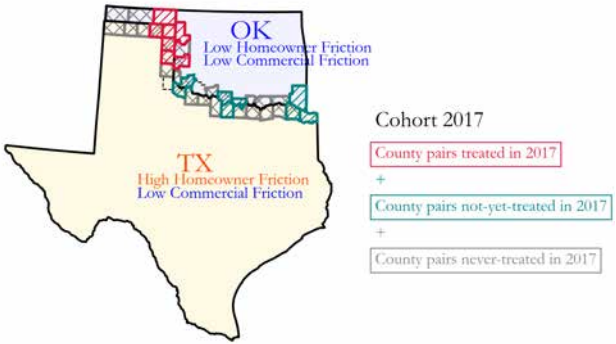
$$PctChgComIns_{ipstc} = \beta(HighHomeFric_s \times Post_{tc} \times Treat_{pc}) + \gamma_{stc} + \delta_{psc} + \zeta_{ptc} + \mu_i + \varepsilon_{ipstc}$$



Border-County Stacked DiD

$$PctChgComIns_{ipstc} = \beta(HighHomeFric_s \times Post_{tc} \times Treat_{pc}) + \gamma_{stc} + \delta_{psc} + \zeta_{ptc} + \mu_i + \varepsilon_{ipstc}$$

Dep. Variable:	Pct. Chg. in Commercial Insurance Cost	
	(1)	(2)
HighFriction × Post × Treated	0.193**	0.222***
	(2.79)	(9.51)
Cohort × State × Event-year FE	✓	✓
Cohort × State × County-pair FE	✓	✓
Cohort × Event-year × County-pair FE	✓	✓
Property FE		✓
Observations	49,707	49,624
Adjusted R^2	0.0912	0.234

After major disasters, commercial insurance costs rise 19–22 ppt more on the *high-friction* side.

Other Potential Factors Explored

✓ **Reinsurance Exposure** ▸ Index ▸ Map ▸ Marginal ▸ Border DiD

- Holding local risk fixed, higher reinsurance prices → larger increases in high-exposure states

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× **Property Location**

- Distance to Coast ▸ Binscatter
- Elevation ▸ Binscatter

× **Property Features**

- Property Size ▸ Binscatter
- Property Age ▸ Binscatter

× **Insurance Market Concentration**

- State-Level HHI ▸ Trends ▸ Binscatter
- County-Level HHI (California) ▸ Trends ▸ Binscatter

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Pass-through of Insurance Costs to Rents and NOI

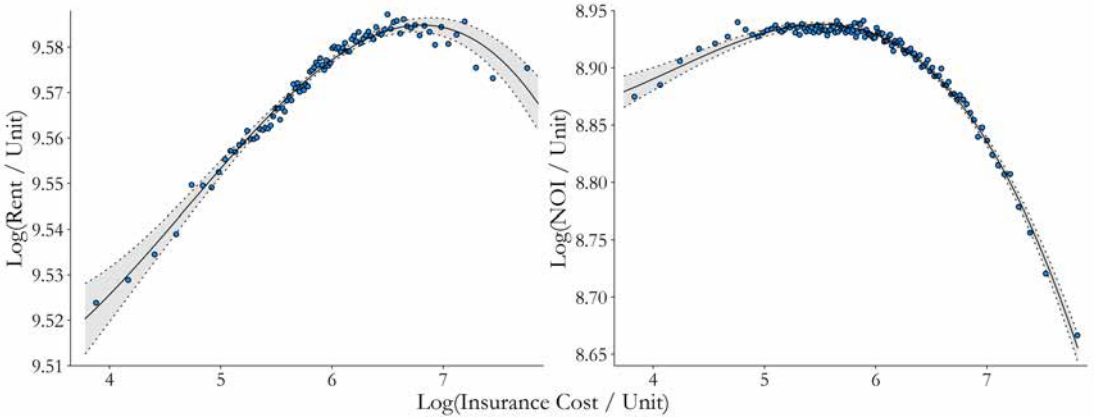
$$log(y)_{i,m,c,t} = \beta \times log(Insurance/Unit)_{i,m,t} + PropertyControls_{i,m,t} + PropertyFE_i + CBSAClassYearFE_{m,c,t} + \varepsilon_{i,m,c,t}$$

Dep. Variable:	log(Rent Per Unit)				log(NOI Per Unit)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
log(Insurance Cost Per Unit)	0.0223***	0.0164***	0.0127***	0.0122***	−0.0412***	−0.0461***	−0.0511***	−0.0462***
	(8.98)	(9.92)	(10.26)	(9.16)	(−10.78)	(−13.63)	(−14.66)	(−10.87)
Property FE	✓	✓	✓	✓	✓	✓	✓	✓
Year FE	✓				✓			
CBSA × Year FE		✓				✓		
CBSA × Class × Year FE			✓	✓			✓	✓
Additional Controls				✓				✓
Observations	411,951	411,951	407,134	170,246	411,951	411,951	407,134	170,246
Adjusted R^2	0.976	0.979	0.984	0.981	0.918	0.924	0.932	0.941

- Higher insurance costs are associated with higher rents but lower NOI
- Baseline estimate implies about 49% pass-through to rents; more demanding class-year controls imply 37–39%
- Remaining burden is borne by owners through lower profitability

Pass-through of Insurance Costs to Rents and NOI, Binscatters

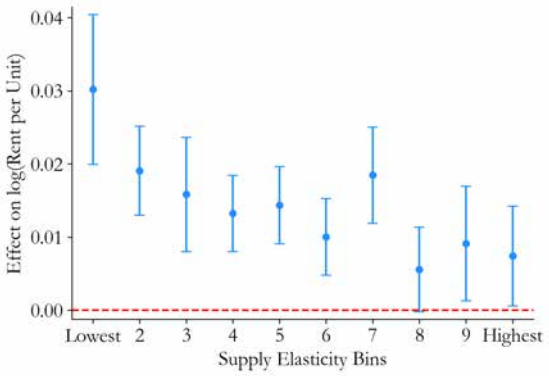
$$log(y)_{i,m,t} = \beta \times log(Insurance/Unit)_{i,m,t} + PropertyFE_i + CBSAYearFE_{m,t} + \varepsilon_{i,m,t}$$



- Rent response is nonlinear: strongest at moderate insurance-cost levels, then flattens
- NOI response steepens in the upper tail, where rent adjustment cannot offsets rising costs

Pass-through of Insurance Costs to Rents, Heterogeneity

$$log(Rent/Units)_{i,m,t} = \sum_d \beta_d \times \mathbb{1}(Decile_d) \times log(Insurance/Unit)_{i,m,t} + PropertyFE_i + CBSAYearFE_{m,t} + \varepsilon_{i,m,t}$$



- Pass-through to rent is strongest in markets with more inelastic supply
- Pass-through to rent is strongest among owners with greater local market share

▸ NOI

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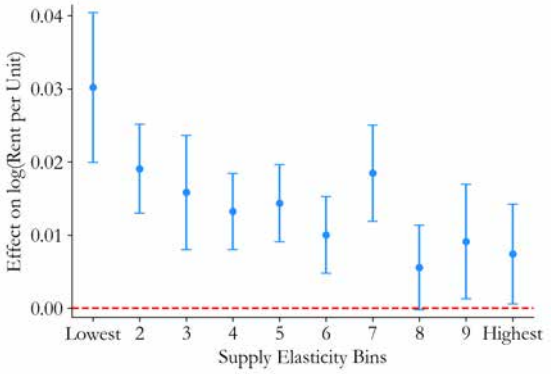

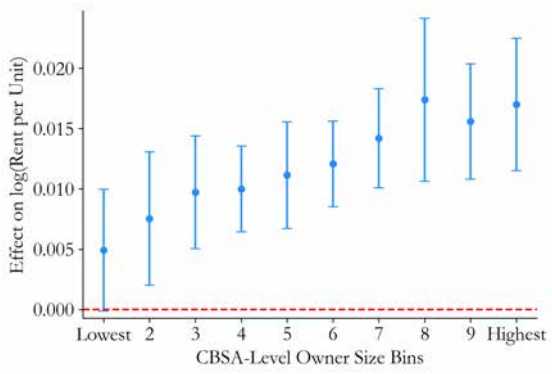

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Pass-through of Insurance Costs to Rents, Heterogeneity

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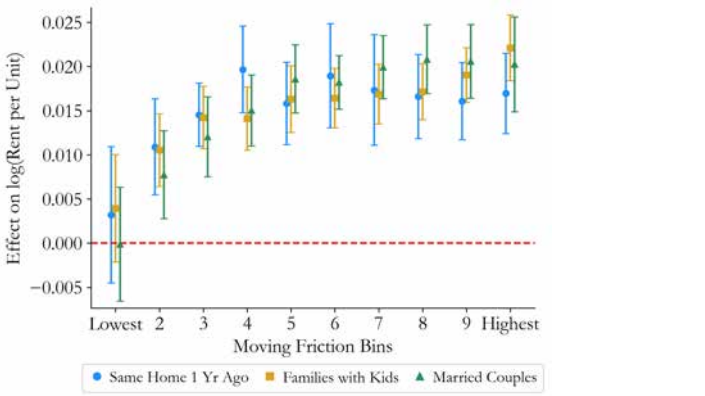

- Pass-through to rent is strongest in places with greater moving frictions
- Pass-through to rent is strongest where tenants have fewer outside options

▸ NOI

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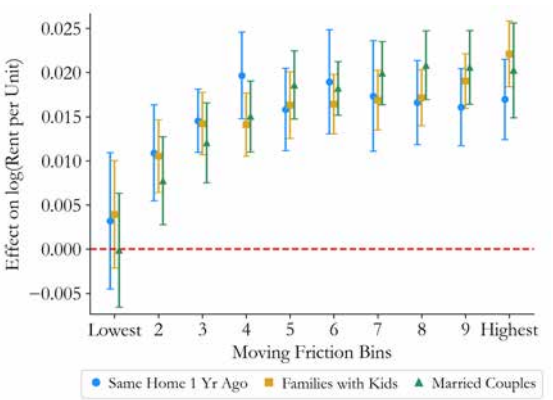

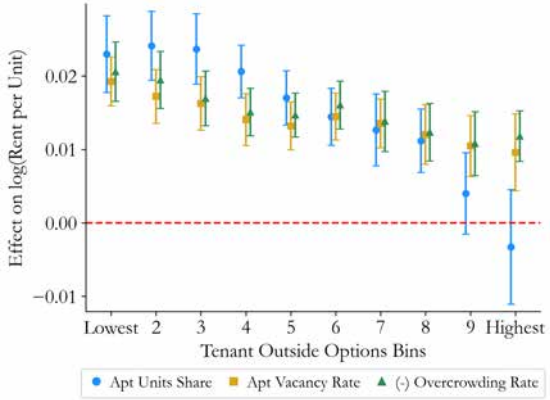

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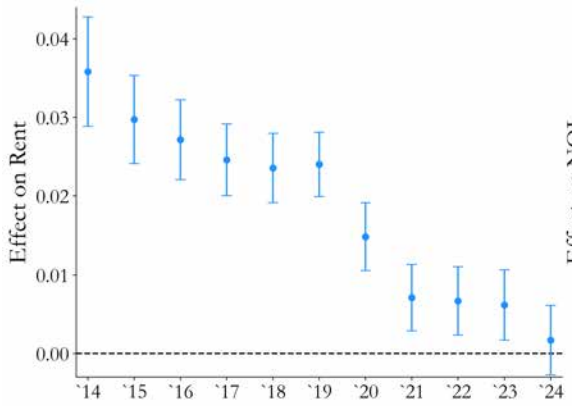
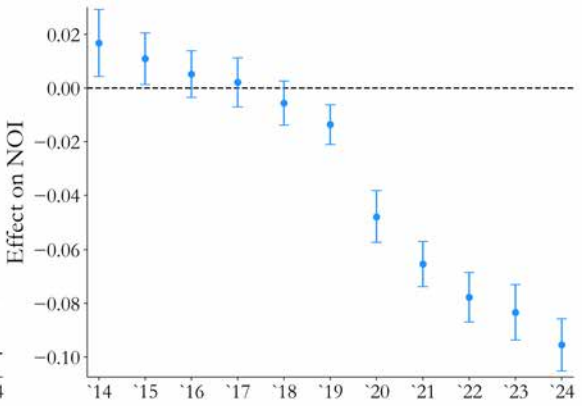
▸ NOI

Pass-through Over Time

$$log(y)_{i,m,t} = \sum_{\tau} \beta_{\tau} \times \mathbb{1}(Year{=}\tau) \times log(Insurance/Unit)_{i,m,t} + PropertyFE_i + CBSAYearFE_{m,t} + \varepsilon_{i,m,t}$$

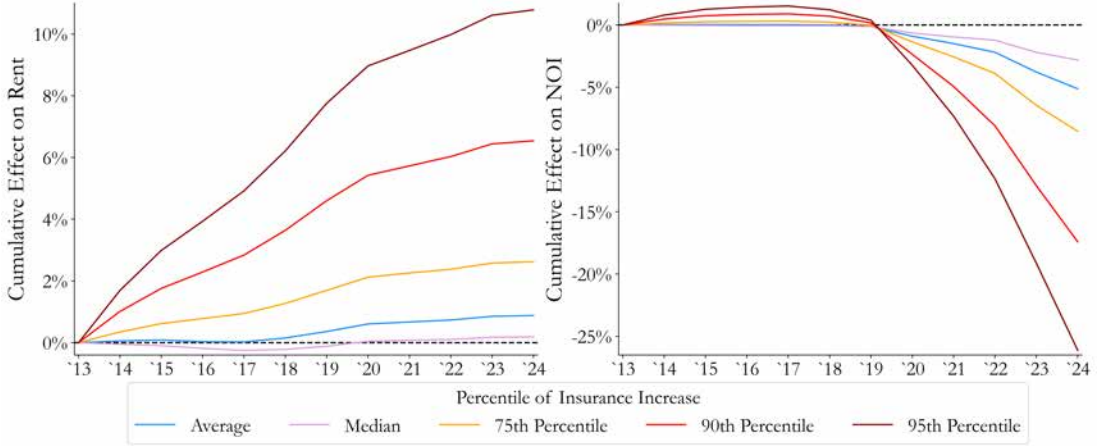




Larger shocks → harder to pass through ⇒ more burden on owners through lower profitability

▸ Table

Cumulative Implied Effect on Rents and NOI, 2014–2024



- Avg. implied cumulative effect: $+0.9\%$ rents, -5.1% NOI
- 95th percentile of insurance growth $\rightarrow$ tail effects sharply larger: $+11\%$ rents, -26% NOI

Climate Risk Capitalized in Transaction Prices and Cap Rates

	log(Trans. Price/Unit)		Cap Rate	
	(1)	(2)	(3)	(4)
$\mathbb{1}(2018+) \times$ Local Risk	-0.0747^{***}	-0.0653^{***}	0.000872^{***}	0.00118^{***}
	(-3.41)	(-7.00)	(3.15)	(3.58)
Local Risk	0.230^{***}		-0.00230^{***}	
	(5.43)		(-6.19)	
CBSA $\times$ Year FE	✓	✓	✓	✓
Property FE		✓		✓
Observations	102,294	49,955	38,551	10,535
Adjusted R^2	0.564	0.902	0.452	0.650

- Within-property: 1 log-pt ↑ in local risk ⇒ -6.5% price / $+11.8$ bps cap rate, post-2018
- NOI declines for riskier properties → capitalized into lower prices, higher required yields

Agenda

1. Introduction
2. Rise in Commercial Insurance Costs
3. Burden Across Locations
4. Burden Between Tenants and Property Owners
5. Burden Across Property Owners and Reallocation
6. Conclusion

Owner Heterogeneity: Size and Portfolio Risk

Dep. Variable:	Insurance Cost to Rent			
	(1)	(2)	(3)	(4)
log(Owner Size)	−0.00108***	−0.000406**		−0.00166***
	(−8.65)	(−2.36)		(−6.06)
log(Owner Size) × Property Risk		−0.00122***		
		(−4.02)		
Portfolio Risk Score			0.00364***	−0.00400
			(3.87)	(−1.25)
Portfolio Risk × log(Owner Size)				0.00108**
				(2.30)
CBSA × Year FE	✓	✓	✓	✓
Property FE	✓	✓	✓	✓
Observations	301,853	301,853	301,853	301,853
Adjusted R^2	0.767	0.767	0.767	0.767

▸ Size Fig ▸ Portfolio Fig ▸ Over Time ▸ Binscatter

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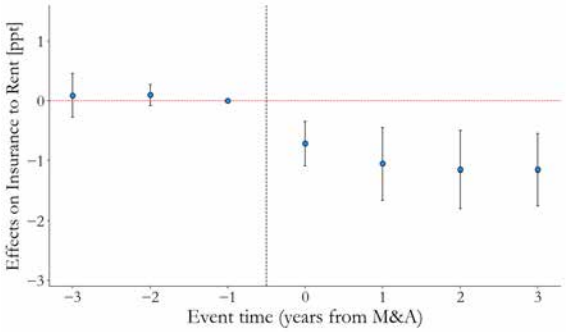
M&A Events: Stacked Difference-in-Differences

$$Insurance/Rent_{i,t,g} = \beta \times Post_{t,g} \times Treated_{i,g} + PropertyCohortFE_{i,g} + CBSAYearCohortFE_{c,t,g} + \varepsilon_{i,t,g}$$



- Insurance/Rent ↓ 1.02 ppt when properties acquired by larger owners (∼30% of mean)
- Decline larger when acquirer is much larger than target

▸ Table ▸ Within-Owner ▸ Renovation ▸ Alt DV

M&A Events: Stacked Difference-in-Differences

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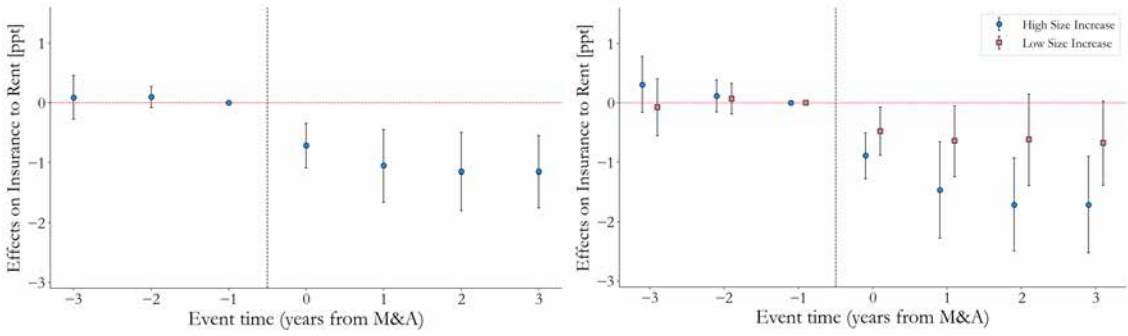

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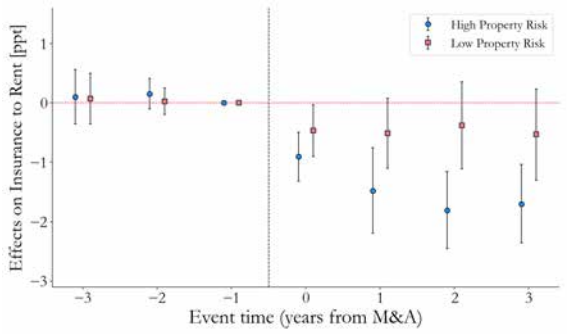
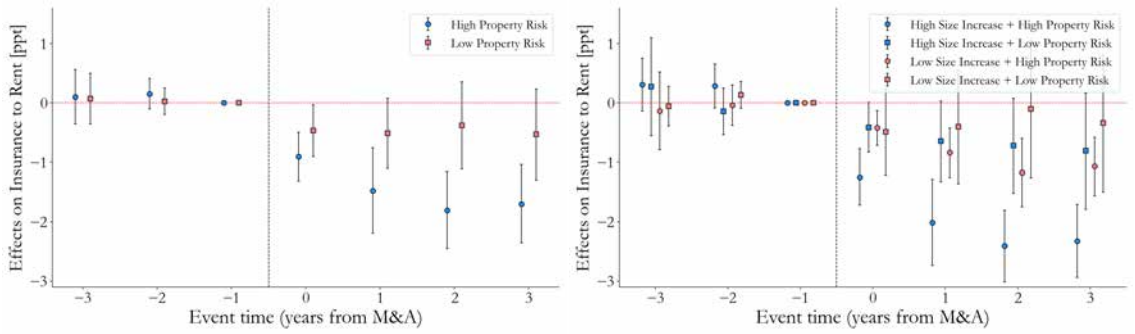
M&A Heterogeneity: By Property Risk



- Post-M&A decline larger for high-risk properties (-1.44 ppt vs. -0.49 ppt)
- Insurance cost decrease largest for high-risk properties acquired by much larger owners

▸ Table

M&A Heterogeneity: By Property Risk



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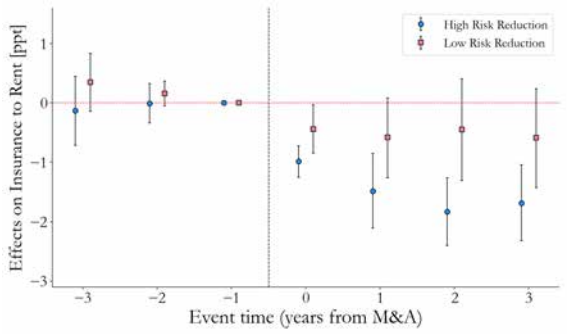
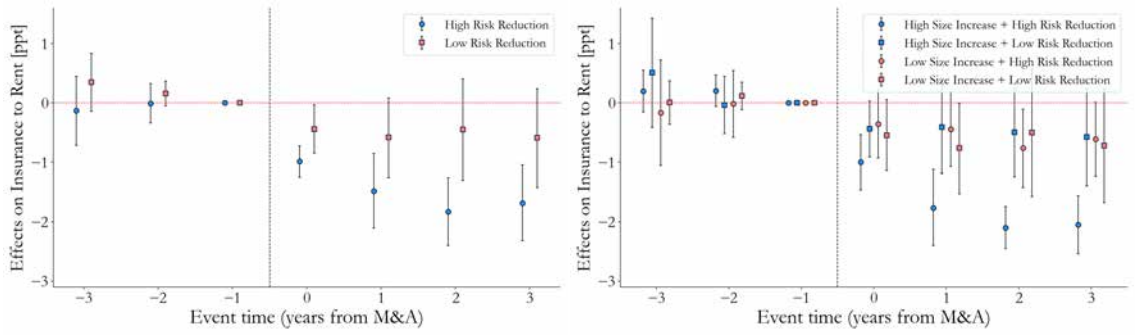
M&A Heterogeneity: By Portfolio-Risk Reduction



- Decline 2× larger with high portfolio-risk reduction (−1.38 ppt vs. −0.61 ppt)
- Insurance decrease largest when high portfolio-risk reduction meets much larger acquirer

Table

M&A Heterogeneity: By Portfolio-Risk Reduction



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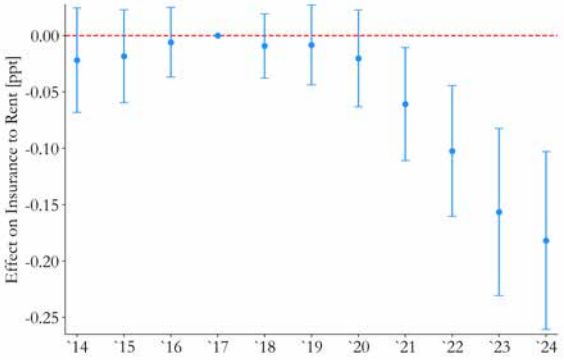
Owner Pricing Advantages Over Time

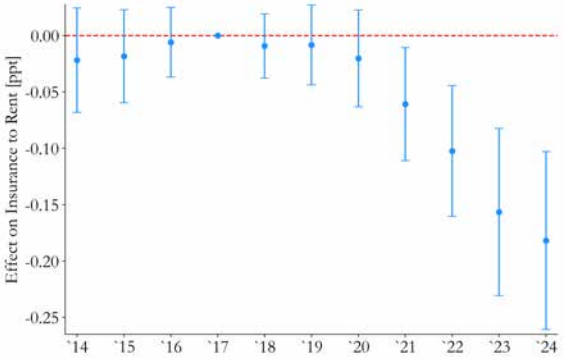
Size Advantage for Higher-Risk Properties



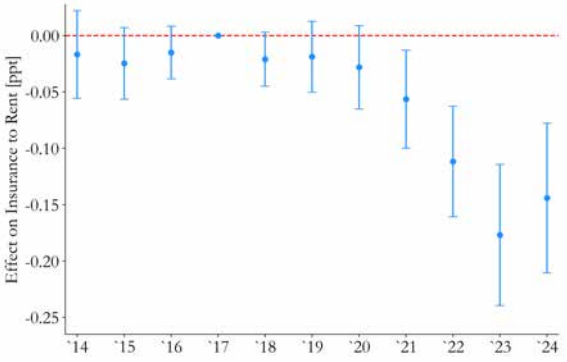
- The size advantage for higher-risk properties has widened sharply from 2021 onward
- Similarly, the portfolio-risk advantage has become substantially larger from 2021 onward

Owner Pricing Advantages Over Time

Size Advantage for Higher-Risk Properties



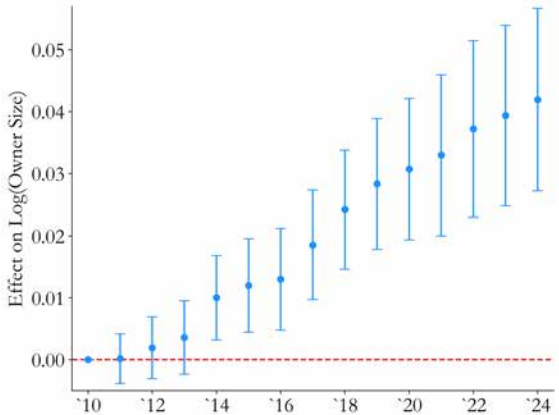
Owner Portfolio Risk Advantage

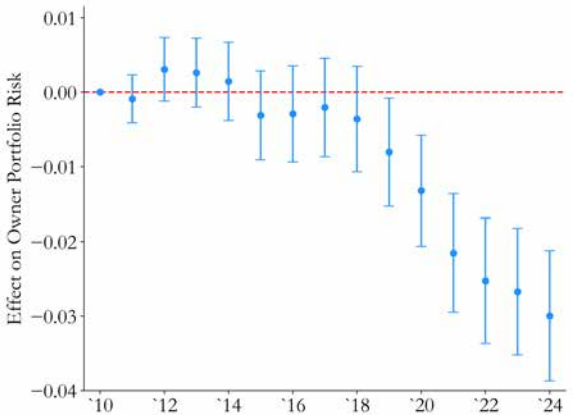


- The size advantage for higher-risk properties has widened sharply from 2021 onward
- Similarly, the portfolio-risk advantage has become substantially larger from 2021 onward

Reallocation: High-Risk Properties Shift to Larger, Lower-Risk Owners

$$Y_{i,o,t} = \sum_{t \neq 2010} \beta_t \times \mathbb{1}(Year{=}t) \times LocalRisk_i + PropertyFE_i + YearFE_t + \varepsilon_{i,o,t}$$



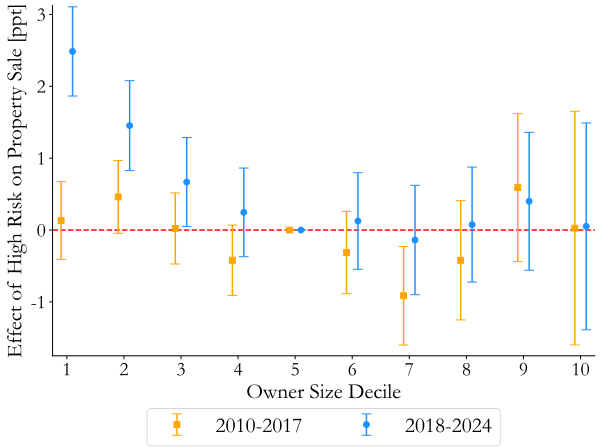


- High-risk properties shift to larger owners (left) & owners w/ lower-risk portfolios (right)
- Climate-risk repricing ⇒ risky assets move to better-positioned owners

▸ Table ▸ 2010 vs. 2024

Sale Margin: Small Owners of High-Risk Properties Sell After 2018

$$\mathbb{1}(Sale)_{i,c,t} = \sum_d \beta_d \times \mathbb{1}(Decile_d)_o \times \mathbb{1}(HighRisk)_i + CBSAYearFE_{c,t} + \varepsilon_{i,c,t}$$



- Pre-2018: no systematic relationship between risk and sale probability
- Post-2018: high-risk properties held by small owners most likely to transact

▸ Over Time

Reallocation of High-Risk Properties from Small Owners

$$\textit{log(NewOwnerSize)}_{i,c,t} = \beta \times \mathbb{1}(\textit{2018+}) \times \mathbb{1}(\textit{HighRisk})_i \times \mathbb{1}(\textit{SmallOwner})_o + \gamma_1 \times \mathbb{1}(\textit{HighRisk})_i \times \mathbb{1}(\textit{SmallOwner})_o + \gamma_2 \times \mathbb{1}(\textit{HighRisk})_i + \gamma_3 \times \mathbb{1}(\textit{SmallOwner})_o + \textit{CBSAYearFE}_{c,t} + \varepsilon_{i,c,t}$$

Dep. Variable:	log(New Owner Size)		
	(1)	(2)	(3)
$\mathbb{1}(2018+) \times \mathbb{1}$(High Risk) $\times \mathbb{1}$(Small Owner)	0.151**	0.161***	0.162***
	(2.39)	(2.67)	(2.70)
$\mathbb{1}$(High Risk) $\times \mathbb{1}$(Small Owner)	0.0510	0.0469	0.0479
	(0.20)	(0.18)	(0.19)
CBSA $\times$ Year FE	✓	✓	✓
Year $\times \mathbb{1}$(Small Owner)		✓	✓
Year $\times \mathbb{1}$(High Risk)			✓
Observations	100,583	100,583	100,583
Adjusted R^2	0.308	0.308	0.309

Conditional on sale, high-risk properties of small owners → buyers 16–18% larger after '18

Conclusion

Rise

- Commercial insurance rose at least 15% every year since 2019
- Broad across CBSAs (37% saw more than 2× increase) and property types
- Rose more than 2× faster than homeowners

Across Locations

- Increases largest where disaster risk, reinsurance exposure, and HO regulatory frictions are greatest

Between Tenants and Property Owners

- On average 49% of cost rise passes to rents ⇒ rent response weakens over time
- Capitalized into lower transaction prices and higher cap rates

Across Property Owners

- M&A validation: insurance costs fall upon acquisition by larger owners
- Effect stronger for high-risk properties and when acquirer's portfolio is less risky than target's

Reallocation

- Riskier-area properties increasingly held by larger, lower-portfolio-risk owners

Repricing shapes cash flows, asset values, and ownership

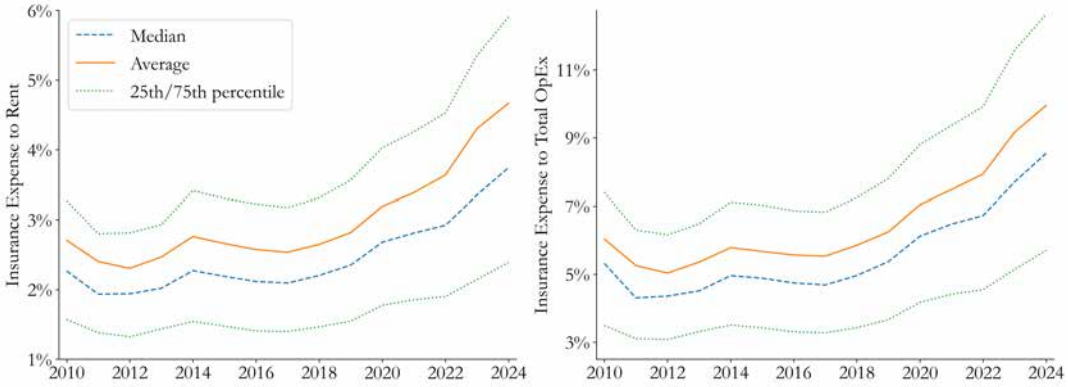
Appendix

Summary Statistics

	Mean	Std	Min	Quartiles 1st	Quartiles 2nd	Quartiles 3rd	Max
Pct. Change in Insurance Cost	0.1415	0.3451	-0.7984	-0.0012	0.0677	0.2166	2.6642
Log(Insurance Cost Per Unit)	5.8880	0.6868	3.2209	5.4653	5.8874	6.3367	7.9046
Log(Insurance to Operating Expense)	-2.8575	0.6035	-5.4747	-3.2420	-2.8532	-2.4564	-1.2007
Log(Rent Per Unit))	9.5532	0.4743	8.4396	9.2275	9.5303	9.8420	10.9848
Log(NOI Per Unit)	8.8923	0.6071	6.7883	8.4915	8.9048	9.3074	10.4077
Number of Units	159.452	181.2651	2	44	116	230	11,244
Property Age	42.2365	28.1258	1	21	39	53	231
Effective Age	23.3453	25.2343	-3	5	12	37	190
Min Distance to Coast (1000km)	0.0003	0.0004	0.0000	0.0000	0.0001	0.0004	0.0015
Elevation	0.2234	0.3519	-0.0545	0.0275	0.1246	0.2497	3.0939
Log(Damage Per Capita)	-0.6652	3.2011	-11.5129	-2.3888	-0.8328	1.1490	11.6379
Log(Expected Loss Per Capita)	4.8805	0.9789	2.0438	4.1705	4.7821	5.5702	12.2040
Risk Score	55.9163	28.1882	0.2664	32.3229	57.7641	81.1599	99.9988
State-level HHI	478.3773	202.5496	316	376	441	551	4,585
County-level HHI	920.2684	189.5710	585.1318	794.6330	893.2257	986.1418	3,283.958
Owner Size (Units)	3,303.165	6,689.341	5	100	636.5	3,214	86,266

◂ Back

Insurance Costs as Share of Rent and Operating Expenses



Insurance share of rent rose from <2.7% (pre-2019) to 4.7% (2024); share of OpEx rose from 5.7% to 9.9%. Dispersion widens post-2019 (25–75 pctile band).

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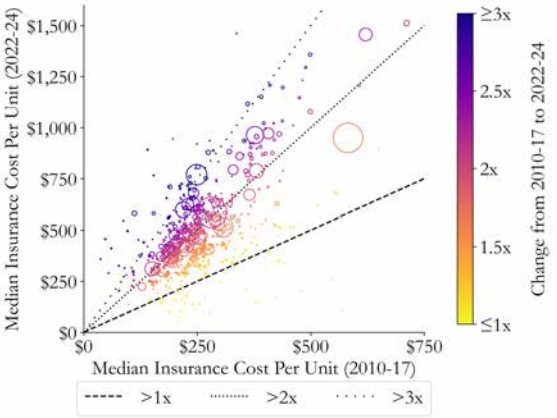
Insurance Cost Per Unit by CBSA, 2010–2017 vs. 2022–2024



Median CBSA insurance cost per unit rose by a factor of 1.94. 37% of CBSAs at least doubled. Increase is broad, not driven by initially high-cost markets.

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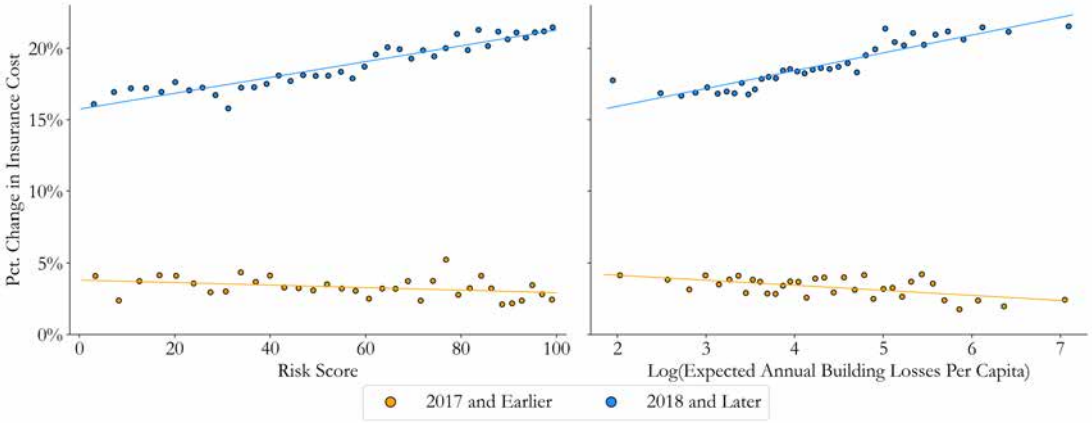
Risk Scores and Expected Annual Losses: Same Post-2018 Break



Forward-looking measures: both risk score (left) and expected annual losses (right) show flat pre-2018, strongly positive post-2018.

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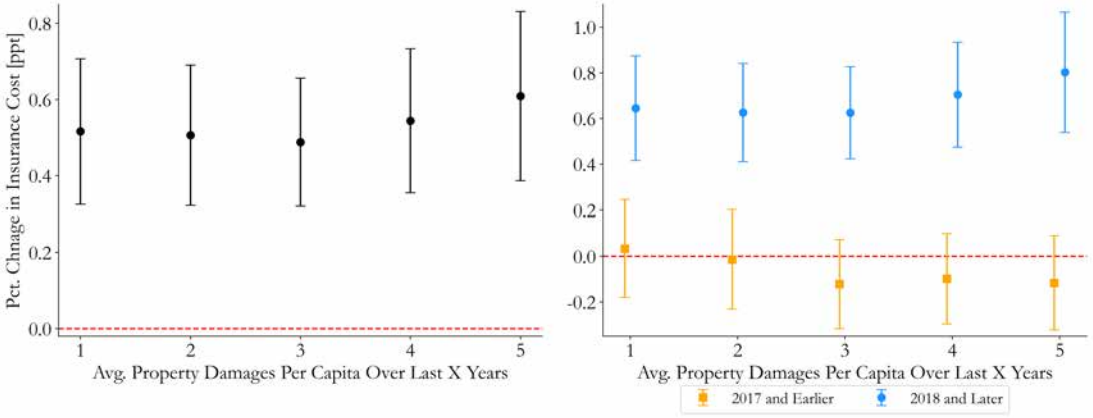
Past Property Damages: Multiple Horizons



Left: damages effect strengthens with horizon (1–5 yr); robust across measurement windows. Right: pre/post-2018 split.

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Damages–Risk Relationship Has Roughly Doubled After 2018

Dep. Variable: arcsinh(Property Damages Per Capita Over Last 5 Years)		
	(1)	(2)
$\mathbb{1}$(2017 and Before) × Risk Score	0.378***	
	(3.55)	
$\mathbb{1}$(2018 and After) × Risk Score	**0.709*** **	
	(5.24)	
$\mathbb{1}$(2017 and Before) × EAL Per Capita		0.462***
		(13.33)
$\mathbb{1}$(2018 and After) × EAL Per Capita		**0.782*** **
		(19.22)
Year FE	✓	✓
Observations	56,538	58,122

t stats in parentheses. *p<0.10, **p<0.05, ***p<0.01

Post-2018: ∼1.9× larger pass-through from risk to realized damages.

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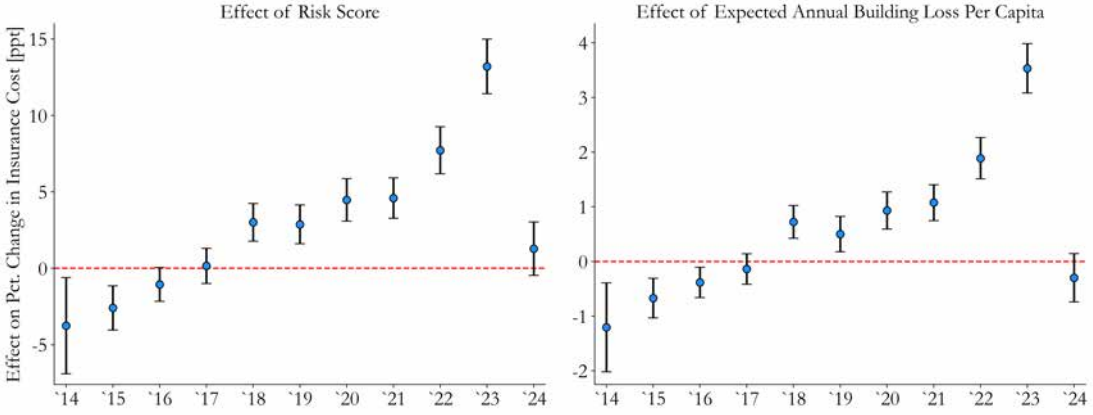
Effect of Local Risk on Insurance Growth, Year-by-Year



Year-by-year coefficients confirm post-2018 emergence of risk repricing.

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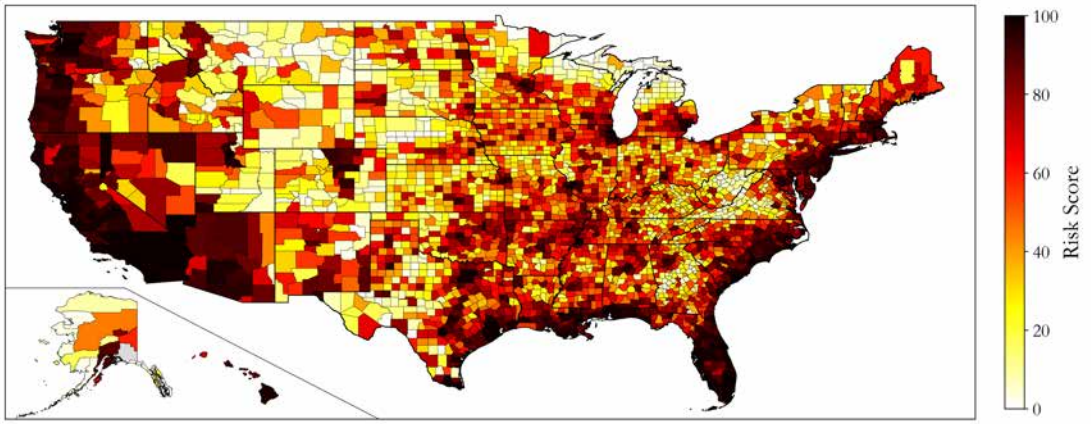
County-Level Disaster Risk Score (FEMA NRI)



County-aggregated FEMA risk scores. Coastal Gulf/Southeast + interior wildfire + tornado belts.

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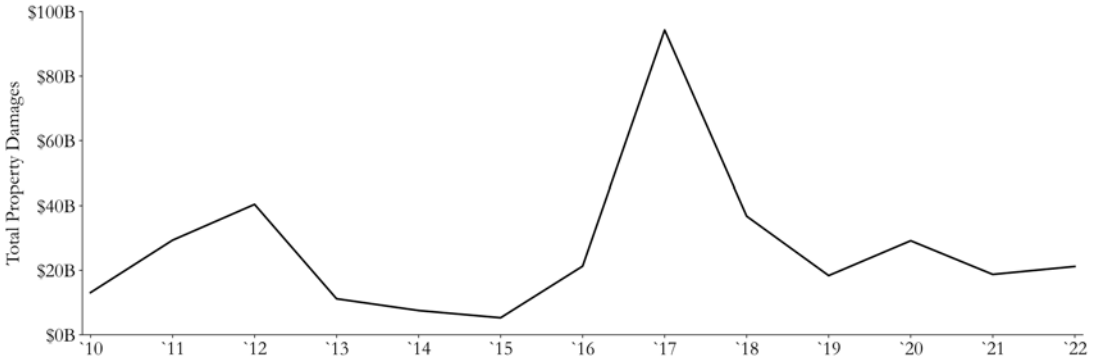
Property Damages Spike Around 2017–2018



Realized property damages step up sharply around 2017–2018, motivating the regime shift in insurer pricing models.

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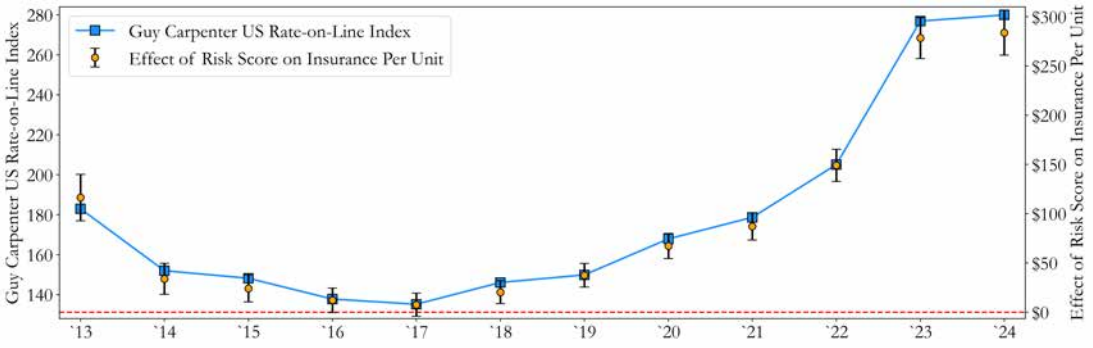
Reinsurance Cost Index and Local Risk Repricing



Local risk repricing tracks Guy Carpenter US Property Catastrophe Rate-On-Line Index.

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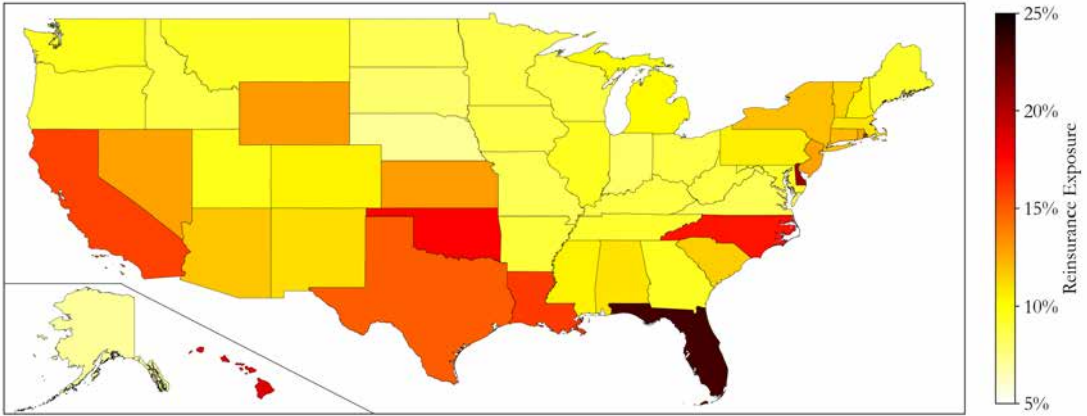
Reinsurance Exposure by State

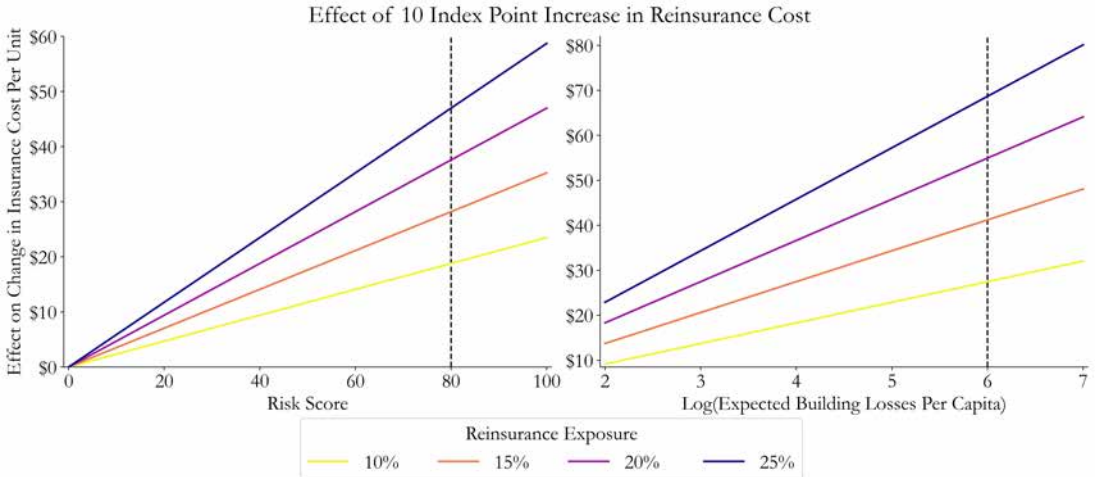
$$ReinsuranceExposure_s = \frac{\sum_{i \in I} DirectPremiumsWritten_{i,s} \times PctCeded_i}{\sum_{i \in I} DirectPremiumsWritten_{i,s}}$$



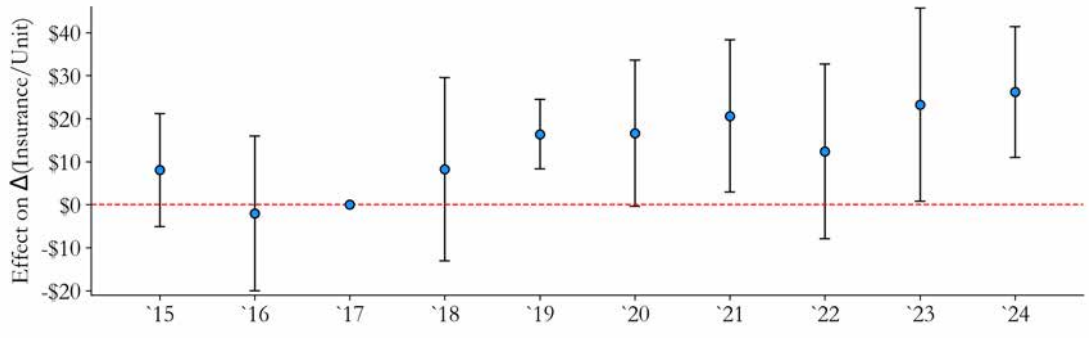
Gulf/Southeast states (FL, LA, TX) most exposed; Midwest/Northeast least.

Reinsurance Exposure: Marginal Effects

$$\Delta(\textit{Insurance/Unit})_{i,s,t} = \beta \times \Delta(\textit{ReinsuranceCost})_t \times \textit{ReinsuranceExposure}_s \times \textit{RiskScore}_i + \delta_t \times \textit{ReinsuranceExposure}_s + \zeta_t \times \textit{RiskScore}_i + \textit{PropertyFE}_i + \textit{YearFE}_t + \varepsilon_{i,s,t}$$



Reinsurance: Border-County-Pair DiD



Properties on high-reinsurance-exposure side of state border experience larger increases after reinsurance markets harden, especially post-2018.

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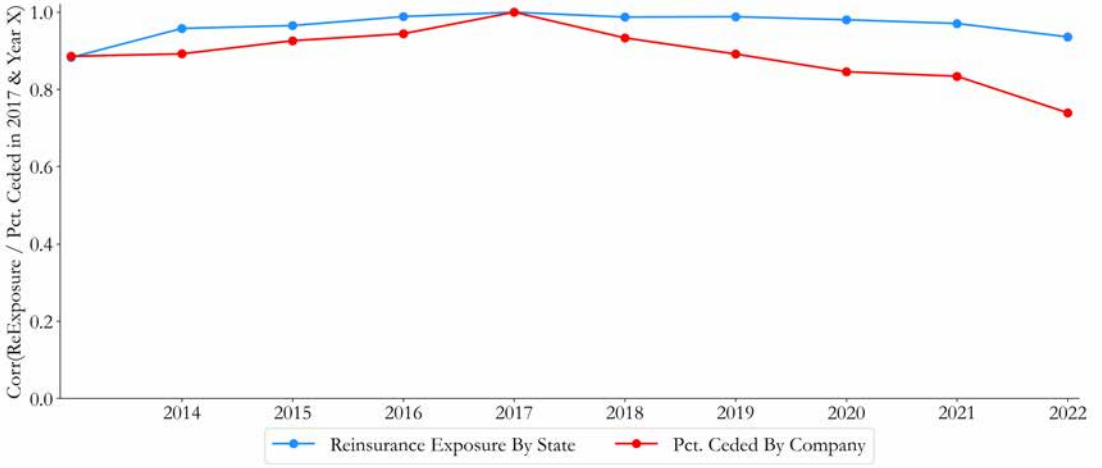
Reinsurance Exposure: Stability Over Time



State-level reinsurance exposure is stable over time (constructed from 2017 data); not endogenous to recent shocks.

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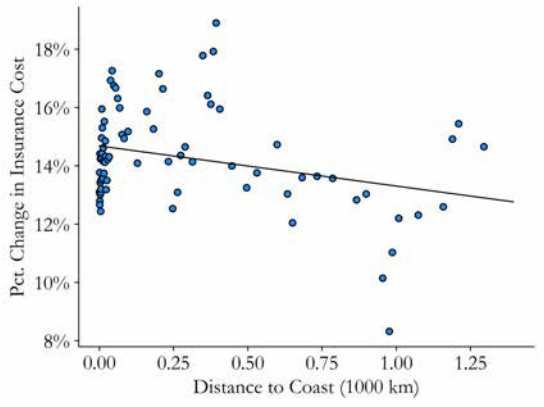
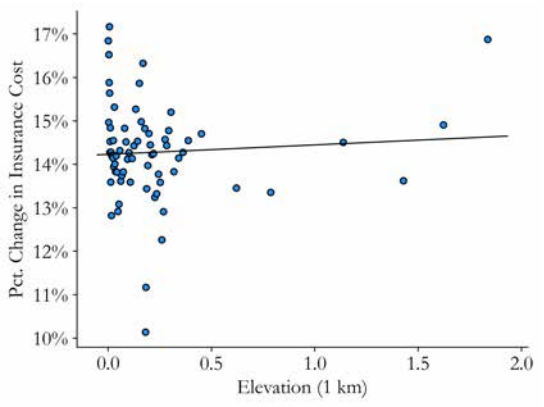
Property Location





Distance to coast: weak/negative; elevation: essentially flat ⇒ neither explains the broad national increase.

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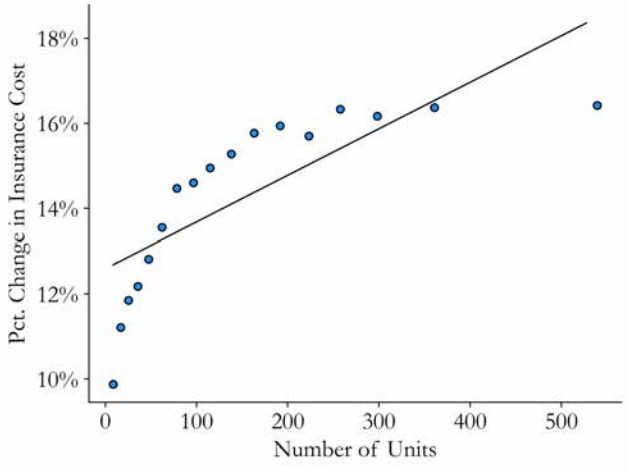
Property Features: Size



Larger properties face somewhat larger increases ⇒ inconsistent with simple property-feature story.

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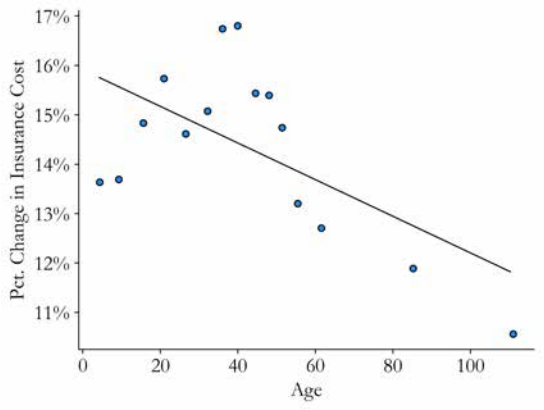
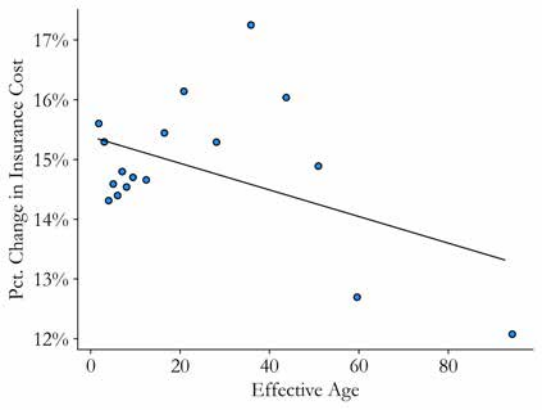
Property Features: Age





Older properties, if anything, face *smaller* increases ⇒ inconsistent with building age / depreciation story.

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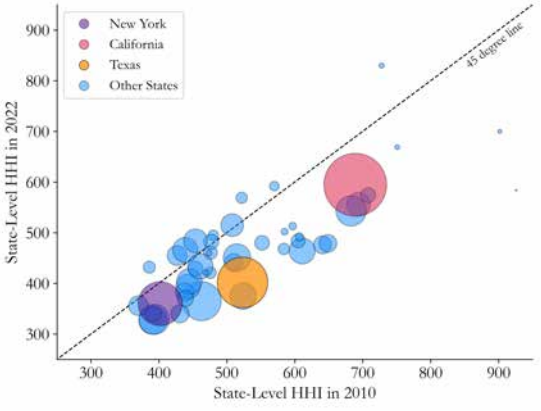
Insurance Market: State-Level HHI





State-level HHI declined over sample; cross-sectional relation between lagged HHI and insurance cost growth is weak and negative.

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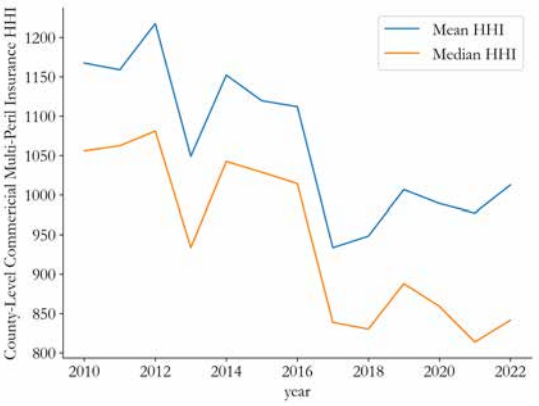
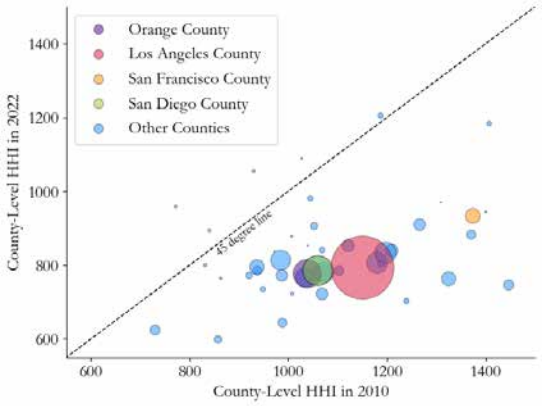
Insurance Market: County-Level HHI (California)





Same pattern at county level (California): no support for a market-power explanation.

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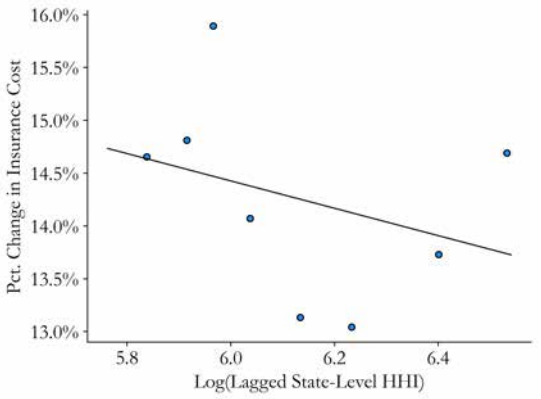
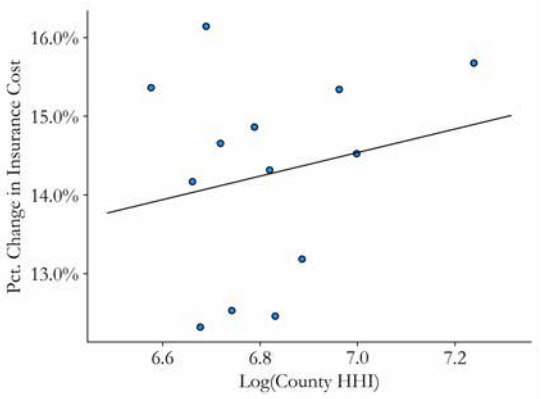
Effect of Insurance Market Concentration





Lagged HHI vs. insurance cost growth: weak and negative at both state and county level.

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Incidence of Insurance Cost Increases on Rents and NOI

Dep. Variable:	log(Rent Per Unit)			log(NOI Per Unit)		
	(1)	(2)	(3)	(4)	(5)	(6)
log(Insurance/Unit)	0.0223***	**0.0164*** **	0.0158***	−0.0410***	**−0.0460*** **	−0.0391***
	(8.99)	**(9.95)**	(9.76)	(−10.74)	**(−13.55)**	(−8.63)
Property FE	✓	✓	✓	✓	✓	✓
Year FE	✓			✓		
CBSA × Year FE		✓	✓		✓	✓
Add'l Controls			✓			✓
Observations	411,669	411,669	173,388	411,669	411,669	173,388
Adj. R^2	0.976	0.979	0.977	0.918	0.924	0.929

t stats in parens (CBSA-clustered). *p<0.10, **p<0.05, ***p<0.01

Mean Insurance/Rent share ≈ 3.3% ⇒ implied avg. pass-through ≈ 49% (= 0.0164 / 3.3%).

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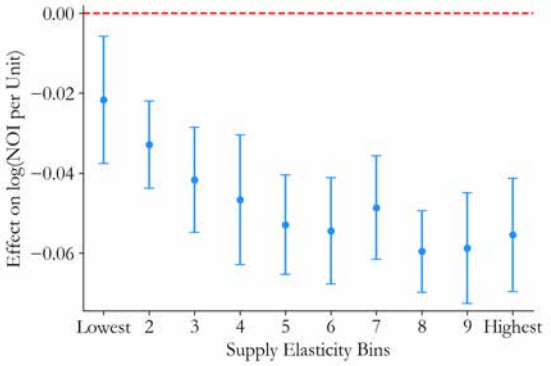
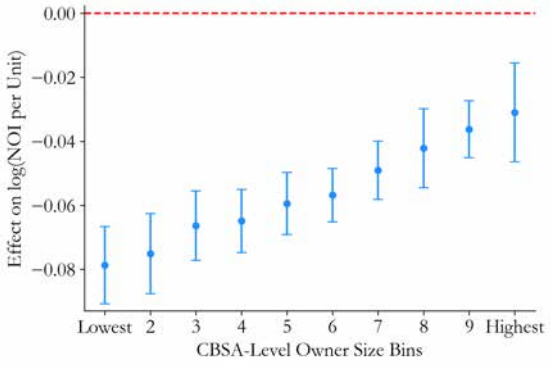
Pass-through of Insurance Costs to NOI, Heterogeneity





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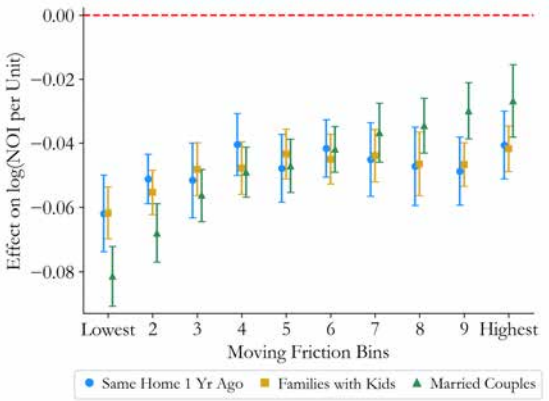
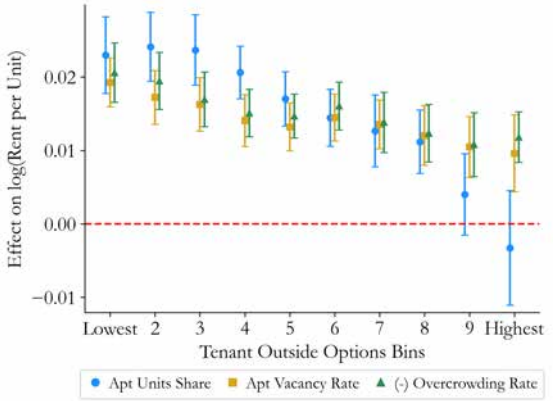
Pass-through of Insurance Costs to NOI, Heterogeneity





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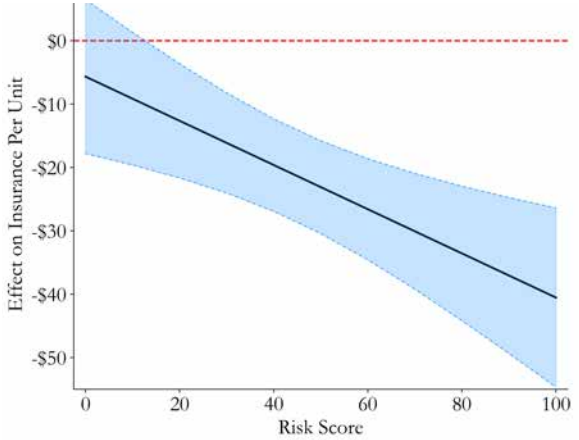
Owner Size Advantage by Property Risk (Figure)

$$\textit{Insurance/Rent}_{i,o,c,t} = \beta \times \textit{RiskScore}_i \times \textit{log(OwnerSize)}_{o,t} + \delta \times \textit{log(OwnerSize)}_{o,t} + \textit{PropertyFE}_i + \textit{CBSAYearFE}_{c,t} + \varepsilon_{i,o,c,t}$$

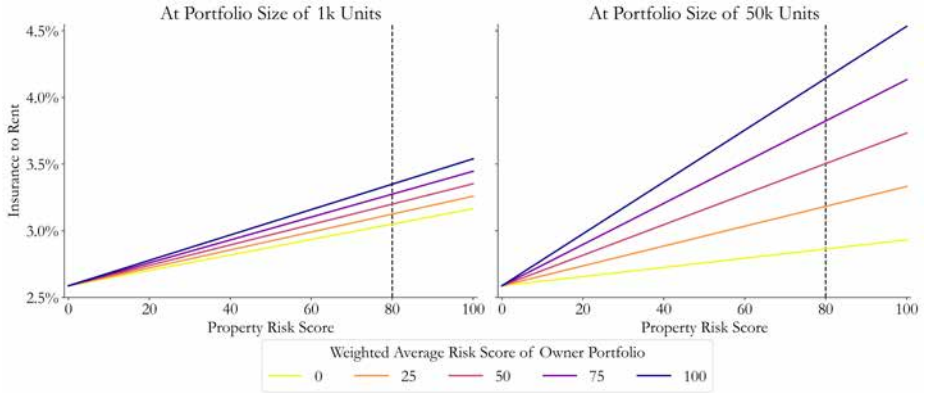


1-SD ↑ owner size ⇒ much larger reduction in Insurance/Rent for high-risk properties.

▸ Table

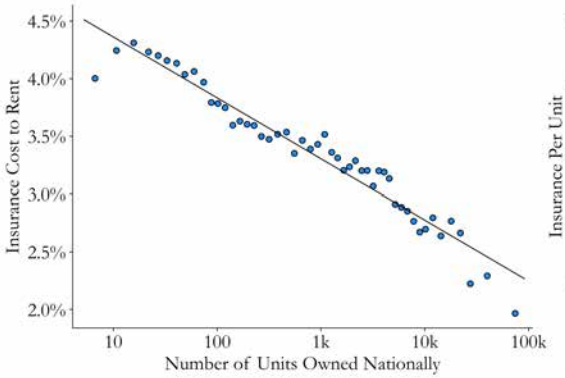
Portfolio Risk Effect by Owner Size

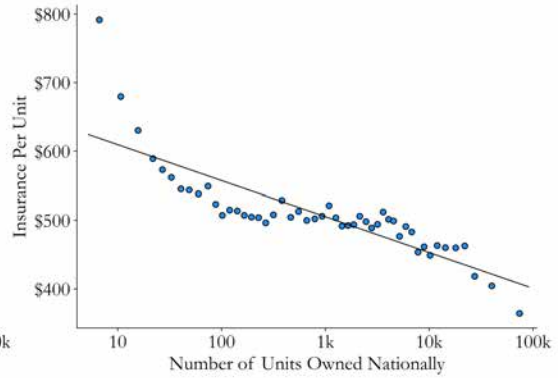
$$\begin{aligned} \textit{Insurance/Rent}_{i,o,c,t} = {} & \beta \times \textit{OwnerPortfolioRisk}_{o,t} \times \textit{RiskScore}_i \times \textit{log(OwnerSize)}_{o,t} \\ & + \gamma \times \textit{OwnerPortfolioRisk}_{o,t} \times \textit{RiskScore}_i + \delta \times \textit{RiskScore}_i \times \textit{log(OwnerSize)}_{o,t} \\ & + \eta \times \textit{RiskScore}_i + \textit{OwnerYearFE}_{o,t} + \varepsilon_{i,o,c,t} \end{aligned}$$



Small owners (1k, left): portfolio risk barely matters; large owners (50k, right): lower portfolio risk ⇒ materially lower Insurance/Rent for high-risk properties

Insurance Costs Decline with Owner Size





Larger owners pay lower insurance costs per unit and as a % of rent (incl. CBSA-year FE).

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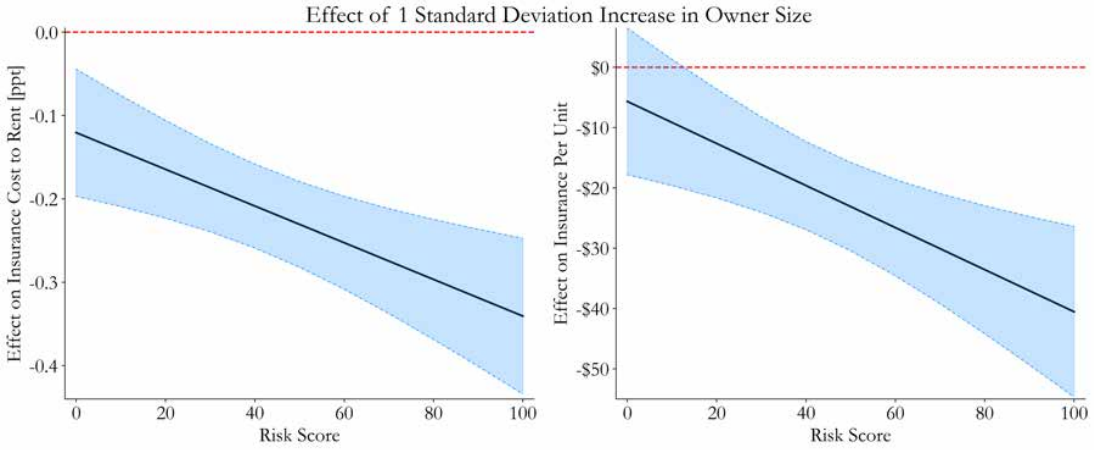
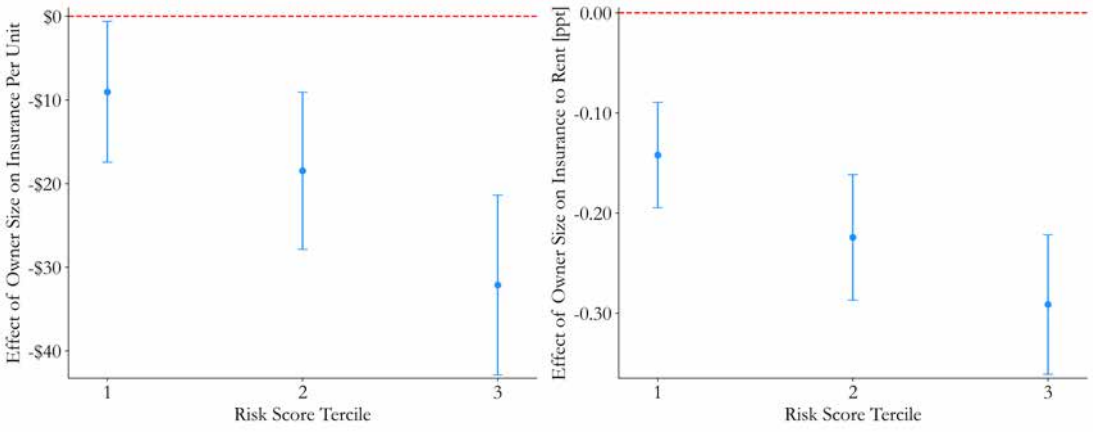
Owner Size Advantage: Per Unit & Per Rent (Full)



Left: insurance cost per unit. Right: insurance/rent. Same pattern across both outcomes. Terciles Back

Size Advantage by Risk Score Terciles (Non-parametric)



Same pattern non-parametrically: advantage grows monotonically across risk terciles.

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Owner Size and Insurance Costs: Regression Evidence

Dep. Variable:	Insurance Cost to Rent		
	(1)	(2)	(3)
log(Owner Size)	-0.00108^{***}	-0.000406^{**}	-0.000691^{***}
	(-8.65)	(-2.36)	(-3.68)
log(Owner Size) × Risk Score		$\mathbf{-0.00122}^{***}$	-0.000882^{***}
		$\mathbf{(-4.02)}$	(-2.66)
$\mathbb{1}(2018+)$ × log(Owner Size)			0.000366^{***}
			(3.24)
$\mathbb{1}(2018+)$ × Risk Score			0.00307^{**}
			(2.37)
$\mathbb{1}(2018+)$ × log(Owner Size) × Risk Score			$\mathbf{-0.000436}^{***}$
			$\mathbf{(-2.65)}$
CBSA × Year FE	✓	✓	✓
Property FE	✓	✓	✓
Observations	301,853	301,853	301,853

t stats in parens (tract-clustered). *p<0.10, **p<0.05, ***p<0.01

Size advantage strongest for high-risk properties, and intensifies post-2018 (triple interaction sig. at 1%).

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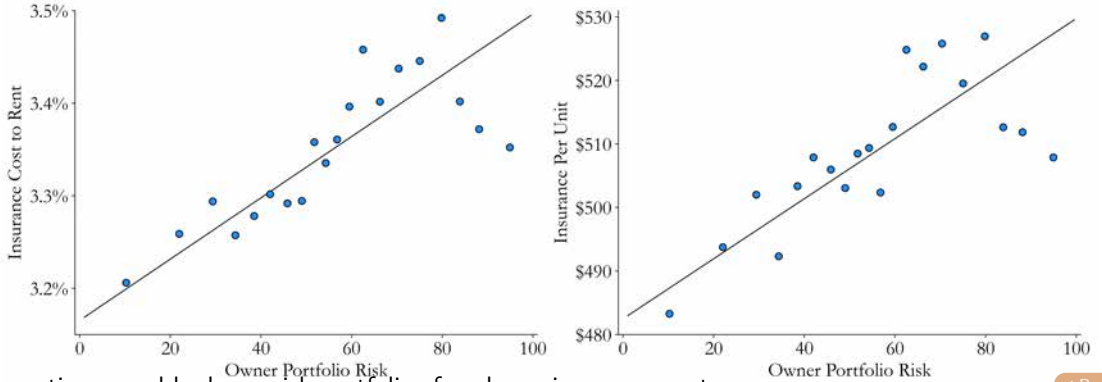
Owner Portfolio Risk: Binscatter

$$Insurance/Rent_{i,o,c,t} = \beta \times OwnerPortfolioRisk_{o,t} + \delta \times log(OwnerSize)_{o,t} + PropertyFE_i + CBSAYearFE_{c,t} + \varepsilon_{i,o,c,t}$$



Properties owned by lower-risk portfolios face lower insurance costs.

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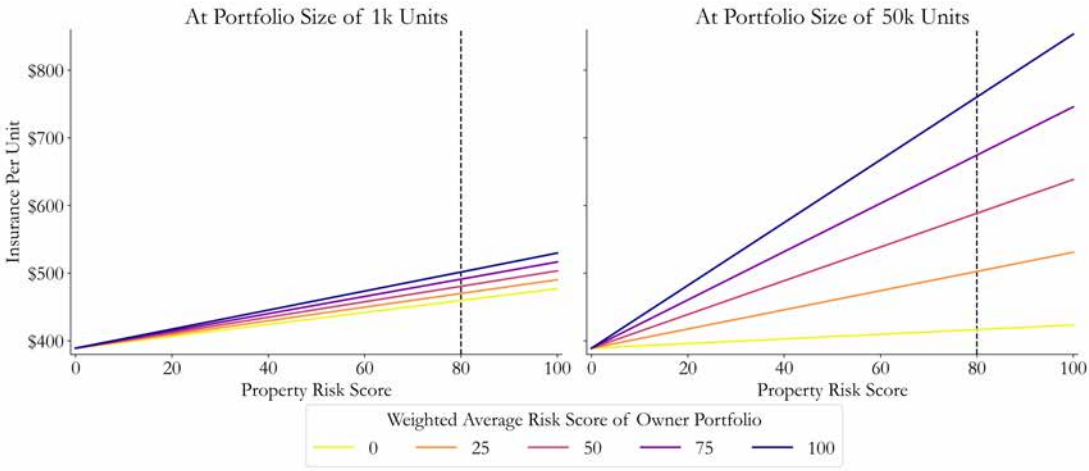
Portfolio Risk Effect: Per Unit



Same pattern using log(Insurance Cost per Unit).

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Portfolio Risk and Insurance Costs: Regression Evidence

Dep. Variable:	Insurance Cost to Rent			
	(1)	(2)	(3)	(4)
Portfolio Risk Score	0.00364***	−0.00155	0.00196*	−0.00581***
	(3.87)	(−1.00)	(1.93)	(−3.36)
Portfolio Risk × Property Risk		**0.00969*** **		0.0135***
		(3.45)		(4.62)
𝟙(2018+) × Portfolio Risk			0.00257***	0.00614***
			(3.53)	(5.37)
𝟙(2018+) × Portfolio Risk × Property Risk				**−0.00533*** **
				(−2.77)
CBSA × Year FE; Property FE	✓	✓	✓	✓
Observations	301,853	301,853	301,853	301,853

t stats in parens (tract-clustered). *p<0.10, **p<0.05, ***p<0.01

Portfolio risk matters more for higher-risk properties; effect intensifies post-2018.

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Validation: Within Continuing Ownership Relationships

Test: Restrict to property-years whose owner is unchanged from 3 years earlier.

Dep. Var.: Δ_{3y}(Insurance/Rent)	(1)	(2)	(3)	(4)
Δlog(Owner Size)	-0.00200^{***}	-0.000783^{*}		
	(-6.71)	(-1.65)		
Δlog(Owner Size) $\times$ Property Risk		$\mathbf{-0.00218}^{***}$		
		$\mathbf{(-2.67)}$		
ΔPortfolio Risk Score			0.00364^{**}	-0.00453
			(2.12)	(-1.63)
ΔPortfolio Risk $\times$ Property Risk				$\mathbf{0.0150}^{***}$
				$\mathbf{(3.04)}$
Year FE; Year $\times$ Property Risk	✓	✓	✓	✓
Observations	132,958	132,958	132,958	132,958

t stats in parens. *p<0.10, **p<0.05, ***p<0.01

Same patterns appear within stable owner-property relationships ⇒ rules out owner-property match selection alone

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M&A Baseline Estimates (Table)

Dep. Variable:	Insurance/Rent	Insurance/OpEx	log(Insurance/Unit)
$\mathbb{1}(\text{Treated}) \times \mathbb{1}(\text{Post})$	-0.0102^{***}	-0.0163^{***}	-0.1371^{**}
	(-3.84)	(-2.59)	(-2.31)
Property × Cohort FE	✓	✓	✓
CBSA × Year × Cohort FE	✓	✓	✓
Observations	550,872	550,872	550,797

t-stats in parens (owner-clustered). *p<0.10, **p<0.05, ***p<0.01

Insurance/Rent falls 1.02 ppt; Insurance/OpEx falls 1.63 ppt; log(Insurance/Unit) falls 13.7%.

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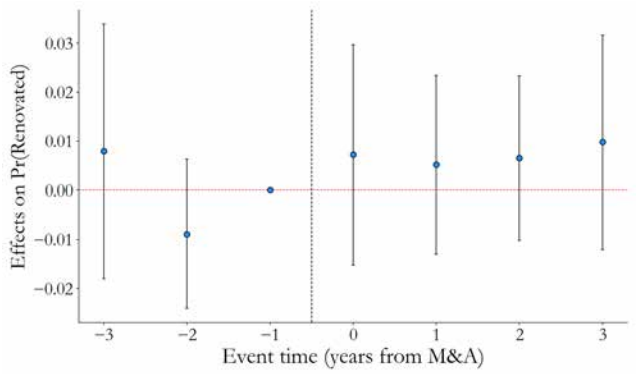
M&A Renovation Check: Renovations Do Not Spike Post-Acquisition



Probability of renovation does not change discontinuously around M&A events ⇒ insurance-cost declines are not driven by contemporaneous physical upgrades.

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M&A Heterogeneity by Property Risk (Table)

Dep. Variable:	Insurance Cost to Rent					
	(1)	(2)	(3)	(4)	(5)	(6)
Owner-Size Gap:	Unconditional		High		Low	
Property Risk:	High	Low	High	Low	High	Low
$\mathbb{1}$(Treated) $\times$ $\mathbb{1}$(Post)	-0.0144^{***}	-0.0049^{*}	-0.0199^{***}	-0.0058^{**}	-0.0080^{***}	-0.0039
	(-4.69)	(-1.77)	(-8.15)	(-2.18)	(-3.92)	(-0.81)
Property $\times$ Cohort FE	✓	✓	✓	✓	✓	✓
CBSA $\times$ Year $\times$ Cohort FE	✓	✓	✓	✓	✓	✓
Observations	279,249	266,648	266,928	277,050	282,406	262,053
Wald t-stat (p-value)	-2.29 (0.022)		**-3.90 (0.000)**		-0.78 (0.436)	

t-stats in parens (owner-clustered). *p<0.10, **p<0.05, ***p<0.01

M&A effect concentrated in high-risk properties acquired in high-owner-size-gap deals: -1.99 ppt vs. -0.39 ppt.

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M&A Heterogeneity by Portfolio-Risk Reduction (Table)

Dep. Variable:	Insurance Cost to Rent					
	(1)	(2)	(3)	(4)	(5)	(6)
Owner-Size Gap:	Unconditional		High		Low	
Portfolio-Risk Reduction:	High	Low	High	Low	High	Low
$\mathbb{1}$(Treated) $\times$ $\mathbb{1}$(Post)	-0.0138^{***}	-0.0061^{**}	-0.0172^{***}	-0.0056^{***}	-0.0047^{**}	-0.0067^{*}
	(-4.40)	(-1.96)	(-7.55)	(-1.99)	(-2.84)	(-1.77)
Property $\times$ Cohort FE	✓	✓	✓	✓	✓	✓
CBSA $\times$ Year $\times$ Cohort FE	✓	✓	✓	✓	✓	✓
Observations	549,311	549,104	548,373	548,132	548,476	548,517
Wald t-stat (p-value)	-1.76 (0.079)		**-3.22 (0.001)**		0.50 (0.618)	

t-stats in parens (owner-clustered). *p<0.10, **p<0.05, ***p<0.01

Strongest effect: -1.72 ppt for high portfolio-risk reduction $\times$ high owner-size gap. Effect insignificant when owner-size gap is low.

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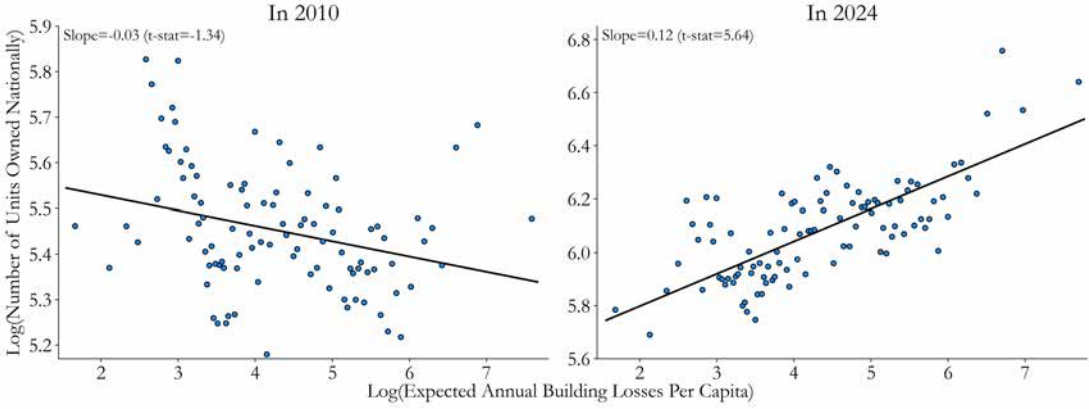
Property Risk and Owner Size: 2010 vs. 2024



In 2010: owner size essentially unrelated to local risk. By 2024: positive and significant relationship.

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Local Risk and Owner Characteristics: Reallocation Evidence

Panel A: Local Risk and Owner Characteristics

Dep. Variable:	log(Owner Size)		Owner Portfolio Risk	
	(1)	(2)	(3)	(4)
$\mathbb{1}(2018+) \times$ log(EAL)	0.0237^{***}		-0.0173^{***}	
	(4.66)		(−6.29)	
$\mathbb{1}(2018+) \times$ Risk Score		0.104^{***}		-0.0178^{***}
		(5.36)		(−6.86)
Property FE; Year FE	✓	✓	✓	✓
Observations	1.93M	1.93M	1.18M	1.18M

t stats in parens (clustered by owner). *p<0.10, **p<0.05, ***p<0.01

Within-property, post-2018: property in higher-risk area increasingly held by a larger owner (1–2) and an owner with a lower-risk portfolio (3–4).

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Reinsurance Amplification: Using Expected Annual Losses

Dep. Variable:	ΔInsurance Cost Per Unit			
	(1)	(2)	(3)	(4)
ΔReins. Cost × Reins. Exp. × log(EAL)	**531.7*****	**551.5*****	**455.5*****	**457.8*****
	(5.99)	**(4.06)**	**(3.22)**	**(3.23)**
Year FE; State FE	✓	✓		
Year FE; Property FE			✓	✓
Year × EAL; Year × Reins. Exp.				✓
Observations	325,705	325,705	312,920	312,920

t-stats in parens (state-year clustered).

Triple-interaction with EAL gives same conclusion as with risk score: reinsurance pass-through concentrated in high-EAL areas of high-exposure states.

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