

Property Insurance and Disaster Risk: New
Evidence From Mortgage Escrow Data
by Keys and Mulder

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Summary

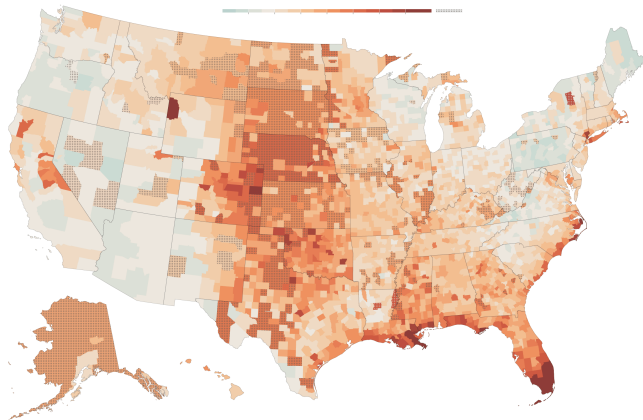
- ▶ New: comprehensive database of local insurance premiums
- ▶ Backed out from CoreLogic monthly loan-level data:

$$PMT = Principal + Interest + Taxes + Insurance$$

- ▶ Risk measures:
 - ▶ disaster risk index based on FEMA & FSF
- ▶ Property insurance premia have increased: how and why?
- ▶ Potential drivers:
 - ▶ climate change shocks
 - ▶ material and labor costs, home values
 - ▶ regulation
 - ▶ reinsurance costs

Findings: distribution of insurance premia over time

- ▶ Time series: premiums up by 13% (real) b/w 20-23
- ▶ Geographic dispersion of annual average insurance premiums
gray-blue $\approx \leq \$1000$ vs dark red $\approx \geq \$4000$



Findings: distribution of insurance premia over time

- ▶ Most risk exposed properties largest increase in premia

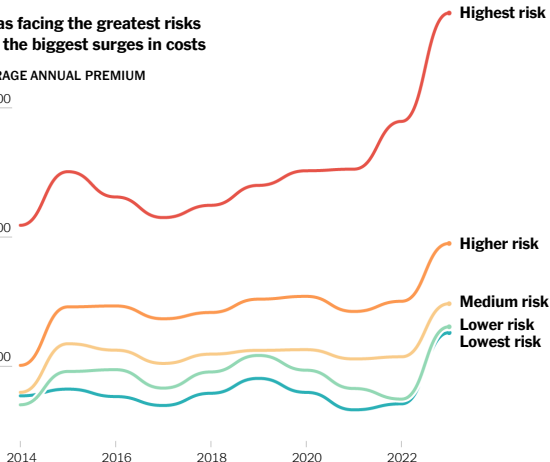
**Areas facing the greatest risks
saw the biggest surges in costs**

AVERAGE ANNUAL PREMIUM

\$3,000

\$2,500

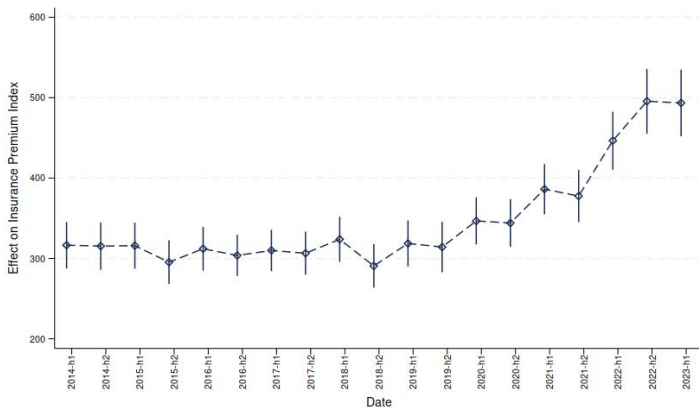
\$2,000



Source: Keys and Mulder, National Bureau of Economic Research (2024) • Note: Inflation-adjusted. Each line depicts the median of all loan observations within a risk group.

Findings: increased pass-through "Beta" of disaster risk

- ▶ Regress IPI_{zst} on *zip-time* disaster risks, controls for zip-cd & state-time fe, zip-income, home values
- ▶ Disaster risk β stable at \$300 pre-2020, then increase to \$500



Findings: reinsurance costs key driver of rise in premia

- ▶ Since 2020 reinsurance premia up by 80%
- ▶ Compare ins-prem_{zct} with different reinsurance "shock" exposure
- ▶ Focus on *within zip-code* variation, controlling for zip fe & time fe, structure value, disaster risk

earlier version: state-time fe to rule out alt explanations varying at state-time *inflation, production shortages, state regulation ...*

- ▶ Measure level of reinsurance intensity $ReExp_{zcs} = CAT_z \times Corr_{cs}$
 CAT_z is indicator for top 20% of wildfire + hurricane expected losses
- ▶ Finding:
property insurance premia $\uparrow$ more in high-reinsurance "shock" zip-codes
- ▶ Consistent with higher reinsurance costs being passed on to homeowners

Why have reinsurance costs risen so much since 2019/20

► Scenario 1:

- insurers typically seek reinsurance for high-risk areas
- reinsurers exposed to some exg. cost shifter (regulation?)
- lack of competition, cost shifter is (unfairly?) passed on?

► Scenario 2:

- high-risk areas have become costlier (e.g., 2023 insured natural cat claims were up 23% above US 10-year average)
 - $\Rightarrow$ insurers demand more reinsurance $\Rightarrow$ reinsurance face more risk & premia $\uparrow \Rightarrow$ reinsurer shock $\approx$ risk shock
 - *driver of cost increase* is high-risk areas have become *riskier*
- But have we not controlled for disaster risk?

Why have reinsurance costs risen so much since 2019/20

- ▶ What variation unrelated to zip-code risk could $Corr_{cs}$ be picking up?
- ▶ Did quantity of disaster risk-index change over time / geography?
- ▶ $\Rightarrow$ risk measurement key else potential errors-in-variable issue that plagued cash-flow investment literature
- ▶ What were the dynamics of the reinsurance market?
 - ▶ increased demand for reinsurance?
 - ▶ have reinsurance mark-ups increased/profit share shifts b/w reinsurers and insurers?
 - ▶ regulatory developments? E.g., the move to IFRS 17 accounting standards prompted increase in premia
- ▶ Additional evidence for independent reinsurance channel would help drive the rise in reinsurance cost point home

What is the role of regulation?

- ▶ Oh-Sen-Tenekedijieva-2025 show state-regulation limiting premia leads to cross-subsidization
- ▶ Disaster risk in tightly regulated states passed on to homeowners in lightly regulated states
- ▶ Table 5 (reinsurance cost effect) controls for state-regulatory frictions (within-state-time)
- ▶ Interesting to back out a state-level effect of regulations on premium increases – currently absorbed by state-time fe
- ▶ Could compute *local state-regulation effects on premia*, e.g., exploiting regulatory shifts in state premium-caps

Dynamics of regulatory cross-subsidization of climate risk input for a quantitative model of insurance market regulation

Conclusion

Very interesting paper

Sheds much-needed light on dynamics in the property insurance market