Economics of Property Insurance

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Motivation

- **Climate risk is rising**
  - 2024 US insured nat-cat losses: $117B, 52% above 10-year average (Jones, 2025)
- Insurers pass thru **higher costs** and are **exiting** some markets
  - Reinsurance costs doubled 2018-2024, raising premiums ~$425 (Keys Mulder, 2024)
  - Private carriers retreating from FL, CA, LA: California FAIR Plan exposure $724B, +230% since 2022 (CDI, 2026)
- **This market may become increasingly difficult to sustain!**
  - There's an active policy debate on how to best incentivize provision of property insurance

Paper Overview

- **This paper:** structural estimation of property insurance supply model
  - **Model:** tractable Holmstrom (1979) style model (hidden effort) of property insurance
  - **Data:** ~8 million contracts from 2021 of mortgage borrowers with escrowed accounts

- **Findings:**
  - Risk aversion and WTP for property insurance is very low (abs. risk aversion = **79 x 1e-6**)
  - Small costs of ex ante moral hazard (e.g., property maintenance) to insurers **0.7% of RP ($7)**
  - Mandating full coverage (incl. $0 deductibles) ➔ **46%** of homeowners losing access to insurance

- **Discussion:** identification and policy implications

Key Identifying Assumptions

- Identification comes from model assumptions and equilibrium properties (not orthogonality/exogeneity conditions)

- Key assumptions and properties:
  - **Perfect info:** insurer knows damage dist. $f_1(x)$, risk aversion (ρ), and cost of effort (ϕ)
  - **Individualized contracts:** premium (p_i), deductible (D_i), and max coverage (C_i)
  - Insurer makes a **TIOLI** offer → insurer extracts **100% of consumer's surplus**
  - **Outside option = uninsured**
  - CARA, no liquidity constraints → **WTP is independent of wealth** (liquid or otherwise)

Identification:
Risk Aversion

Identifying Moment for Risk Aversion (1/2)

- Absolute risk aversion (ρ) is identified from the participation constraint binding:

$$E[u(\text{contract}, x)|\text{effort}, \text{insured}] = E[u(x)|\text{effort}, \text{uninsured}]$$

(where x is the damage shock)

- Binding ⟷ policyholder is indifferent between having insurance or not

- Thus, contract extracts **100%** policyholders' surplus (relative to outside option)

Identifying Moment for Risk Aversion (2/2)

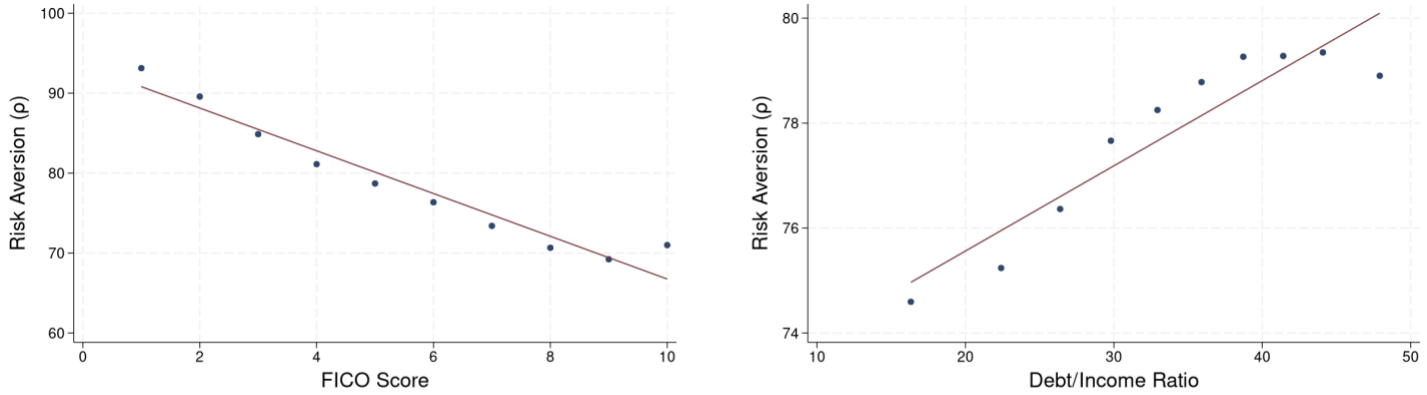
- Then, **under CARA**, you can solve for absolute **risk aversion ρ** by finding its value such that the certainty equivalents (CE) with and without insurance are equal

$$CE\left(\text{insured};\ \underbrace{p, D, C}_{\text{contract}},\ \underbrace{f_1(\cdot)}_{\text{risk}},\ \rho\right) = CE\left(\text{uninsured};\ \underbrace{f_1(\cdot)}_{\text{risk}},\ \rho\right)$$

- In the model, contract parameters and risk are sufficient to identify ρ
- Under CARA, ρ is independent of wealth
  - **Implication:** if preferences deviate from CARA, ρ will conflate risk aversion and wealth

Credit Constraints

- Fig 7: low-FICO and high-DTI policyholders have high measured risk aversion



(a) FICO Score **(b)** DTI Ratio

  - Not obvious we'd expect the above if ρ reflects risk aversion—risk averse households would prefer to save and tend to be less likely to end up with bad credit scores and high DTIs
  - Additionally, Sastry et al. show credit constraints **causally** affect coverage adoption

- **Suggestion:** relax CARA and incorporate liquidity constraints so that $\hat{\rho}$ doesn't absorb wealth differences nor shadow costs of liquidity constraints

Forced Insurance

- Using a sample of escrowed accounts means everyone is **required by their mortgage lender** to carry insurance
  - True outside option: mortgage lender will make you buy insurance (force-placed)
  - Sastry et al. (2024) find **lender rules explain 67% of coverage** choice variation

- **Implication:** $\hat{\rho}$ is biased upwards (conflates high WTP w/ force-placed outside option)

- **Suggestion:** redefine the outside option as force-placed insurance (typically more expensive and worse coverage), not "uninsured owner"

TIOLI & Market Power

- Insurer makes a TIOLI offer, extracting 100% of the policyholder's surplus
  - This is an **extreme degree of market power**! Implies observed price = reservation price
  - Plausibility: making TIOLI offers requires precise knowledge and tailoring of contracts

- **Implication:** biases $\hat{\rho}$ downward
  - If observed price < reservation price, markup is overstated, WTP understated

- **Suggestion:** incorporate a plausible degree of market power

Magnitude Comparison & Other Omitted Vars

- Sydnor (2010): a rational, frictionless model requires **implausibly large risk aversion** (CRRA $\gg$ 100) to explain property insurance choices
  - Jung and Jung (2026) find estimates about 100x smaller than Sydnor(2010)

- Sydnor(2010) highlights other plausible distortions to explain estimates:
  - Biased expectations
  - Reference dependent preferences
  - Steering by lenders/brokers
  - Aversion to extreme choices on menus

Panel Data Could Help Provide Validation

- Most data sources span multiple years, but NSI (replacement cost data) is only available for 2021 (limiting sample)

- Expanding the sample would not only boost power…

- …but you could re-estimate ρ within the **same policyholder** over time!
  - If estimation is recovering a stable preference primitive, you'd expect high persistence within policyholders even when premiums or risk vary

Adverse Selection

Adverse Selection on Risk

- **Model:** assumes damage risk $f_1(\cdot)$ is common knowledge
- **Reality:** policyholders may have **private info about risk** (structure quality, etc.)
  - Rational insurers would use menus to screen on private info
- **Evidence:** Sydnor (2010) finds higher claims rates on low-deductible contracts
  - Table 8 findings of lower moral hazard cost where states restrict use of claims and credit history is arguably more consistent with adverse selection that moral hazard

- **Implications:**
  1. The 0.7% moral hazard cost is the true moral hazard cost plus the DWL from screening
  2. Counterfactual's "46% lose access" can be **biased** (sign depends on competing forces)

     (down from adverse selection unraveling; up from misattributing dispersion in types to negligence)

Adverse Selection on Claims Behavior

- **Model:** it's optimal for households to file claims for all damages

- **Reality:** it's not always optimal to file a claim!
  - If you face a $1,600 expense and $1,000 deductible and have no history claims, it can be preferable to pay it out of pocket and protect your history (keep your premiums low)
  - Liquidity constrained (or low financial sophistication) policyholders may prefer to claim

- In line with this, Blonz et al. (2026) find **low-FICO people pay 24% more for *identical* coverage**, driven by a higher rate of claims conditional on damages

- **Implication:** biases $\hat{\rho}$ upwards; likely understate lost access in counterfactual

Adverse Selection: Suggestions

- Incorporate adverse selection on private types and screening with menus

- Consider incorporating endogenous claims behavior
  - A dynamic, strategic model of claims behavior would be realistic (and interesting!)
  - Blonz et al. (2026) and Sydnor (2010) estimates could help discipline this component

100% Coverage Policy Counterfactual

Private Benefits to Effort

- Find mandating 100% coverage would cause **46% to lose insurance**
- **Model:** no private benefits to effort; only risk exposure incentivizes effort
  - Thus, under **full insurance**, there's no reason to exert effort
  - In the counterfactual: premiums rise sharply because (1) covered % rises and **(2) effort stops**
- **Reality:** effort improves quality of housing services consumed
  - Owners prefer when roof doesn't leak, HVAC works, no mold, etc.
  - Private benefits of effort could motivate effort under full coverage
- **Implication:** counterfactual may overstate coverage decline

GE Effects Are Likely Important

- Model is PE; holding constant housing decisions and prices

- **Could get less exit:** when insurers hike premiums, expensive-to-insure properties should trade at a discount ➔ attenuating exit
  - Keys and Mulder (2025) find significant capitalization of premiums into prices

- **Could get more exit:** generous insurance creates moral hazard at the property selection margin ➔ buy and build riskier homes ➔ amplifying exit

Which Policies to Study?

- Mandating 100% coverage may be a relatively extreme policy
- Other policies receiving attention:
  - **Mandated insurer participation** (e.g., CA's Sustainable Insurance Strategy)
  - **Residual markets** for insurer-of-last-resort pools (FAIR Plans, Citizens), which expand the policyholders' outside options
  - Collier Keys Mulder (2026) propose a **federal reinsurance backstop**; Sen. Schiff proposed a 2025 bill for a federal catastrophic reinsurance program
  - **Rate-setting and screening** rules (e.g., FL inspection rules, WA screening restrictions)

In conclusion...

Conclusion

- Very interesting paper!
- Rich contract-level data
- Sharpening model and estimation would tighten interpretation
- Scope to shed light on importance policy questions re: regulation of insurance