The Hidden Inflation in Homeowners' Insurance

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Motivation and Questions

- Homeowner's insurance premiums have nearly doubled from $1200 to $2300 between 2013 and 2024 (Keys and Mulder, 2024)
  - **Affordability** → rising premiums increase monthly housing costs
  - Lower coverage → higher **exposure to expense shocks** (Fulford and Low, 2024)
  - Higher housing costs and lower coverage can impact credit risk
  - Not well-captured in inflation statistics (Tanzi, 2024; Jones et al., 2026)

- Expenditure growth ignores insurance quality and understates menu price growth

- **Research Questions:**
  - How have insurance menu prices changed over time (e.g., fixing contract terms)?
  - How do consumers adjust? What drives these adjustments?
  - What are the impacts on consumer credit risk?

This paper

1. Construct quality-adjusted insurance price index using novel data linking mortgages to insurance policies $\rightarrow$ menu price changes

2. Estimate insurance demand elasticity in response to menu price changes
   - Nominal coverage, coverage share, deductible, changing insurers

3. Inattention and information frictions related to insurance shopping
   - Elasticities at home purchase
   - Event study around refinance

4. Household finances after menu prices change
   - Credit card balances and consumer debt delinquency

Findings and Contributions

Document declining insurance quality and rising prices from 2014 to 2022

- Deductibles rise and coverage limits fall relative to house/construction prices
- Menu prices have grown 19 percent more than premium expenditure

Estimate household's elasticity of insurance choices

- Premium increase $\rightarrow$ increase deductibles, switch insurers, reduce coverage share
- Evidence for inattention and information frictions about structure value

Estimate impact of higher insurance prices on credit risk

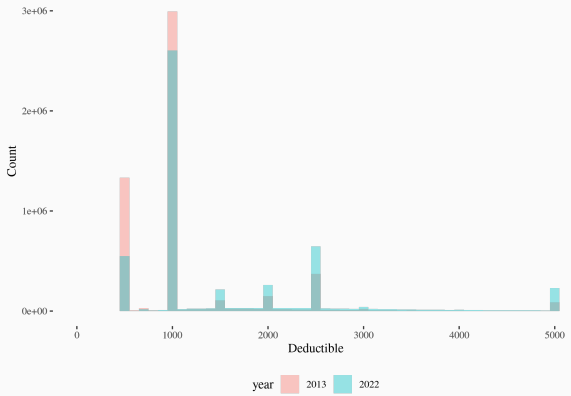
- Mortgage and credit card delinquencies increase for subprime borrowers
- Super-prime cards balances decrease, suggesting self-insurance

Data and Stylized Facts

Data

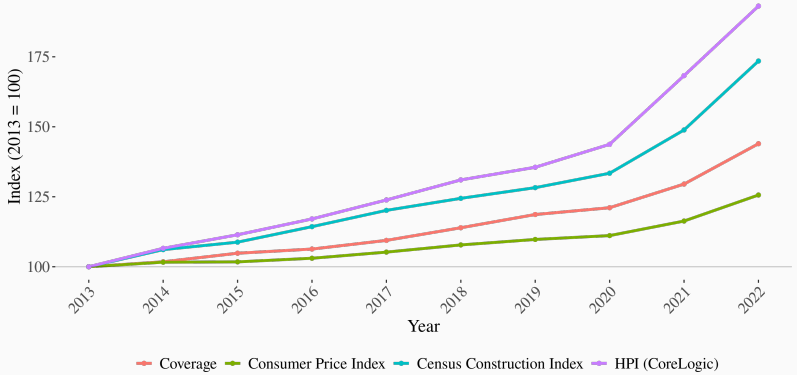
- ICE McDash: Insurance information for individual mortgage borrowers
  - Covers 2/3 of the mortgage market with insurance data for about 75% of mortgages
  - Insurance: premiums, coverage limits, deductibles, and insurers
  - Mortgages: appraisal, origination, refinance, and borrower credit characteristics
  - Restrict to non-condos with escrowed premiums
  - Panel: 54.1 million loan-year observations from 13.9 million loans (2013 - 2022)
- Supplemental data:
  - CRISM: links McDash to consumer's credit bureau records
  - All-Transaction House Price Index
  - Single family house construction price index (CPI)
  - Structure share of property (Davis et al., 2021)

Fact 1: Deductibles have been rising



- The average deductible rose from $1173 in 2013 to $1800 in 2022.
- Higher deductible = lower quality; homeowner bears greater risk for small expenses

Fact 2: Coverage Limit Growth Lags House and Construction Price Growth



- Coverage limit: the highest amount of damages that an insurer will cover
- Lower coverage share = lower quality; homeowner bears greater tail risk

Quality-Adjusted Insurance Index

Premium expenditure growth understates price growth

- Deductibles have increased $\rightarrow$ downward pressure on premiums
- Coverage limits have lagged price growth $\rightarrow$ less exposure for insurers $\rightarrow$ downward pressure on premiums
- Despite downward pressure on premiums, premiums have continued increasing rapidly
- Quality-adjusted insurance premiums (menu prices) have increased even faster than premium expenditures

Raw price index for homeowner's insurance

Premium growth over time is equivalent to estimating the following regression:

$$\log(Premium_{it}) = \alpha + \lambda_t + \epsilon_{it}$$

- $Premium_{it}$: annual premium of mortgage i in year t
- λ_t : year fixed effect captures average annual changes in premium expenditures

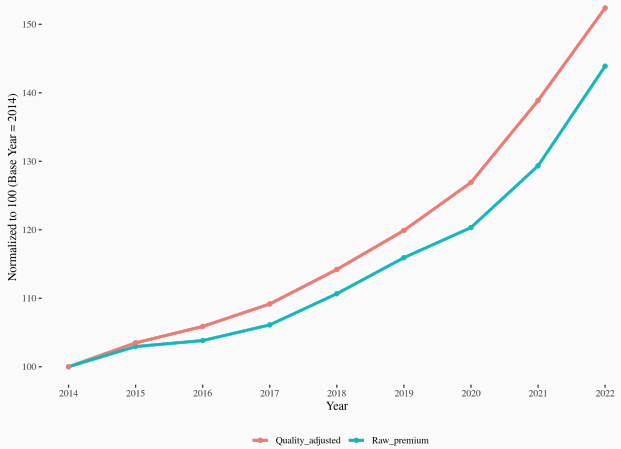
Quality-adjusted price index for homeowner's insurance

$$\log(Premium_{it}) = \alpha + \beta_1 \cdot Ded_{it} + \beta_2 \cdot CovShare_{it} + \lambda_t^{qa} + \delta_{z[it]} + \gamma_{k[it]} + \epsilon_{it}$$

- $Premium_{it}$: annual premium of mortgage i in year t
- Ded_{it}: deductible, discretized into \$500 bins
- $CovShare_{it} = CoverageLimit_{it}/StructureValue_{it}$
- $\delta_{z[it]}, \gamma_{k[it]}$: zip code and insurer fixed effect
- λ_t^{qa} : year fixed effect $\rightarrow$ **quality-adjusted insurance prices**

Interpretation: average market price increase for renewing the same policy from the same insurer

Quality-adjusted price index



Gap in price growth in 2022 is $52.4 - 43.9 = 8.5$pp (19% higher growth rate)

Exploring Drivers of Quality Changes

Drivers of Quality Changes

Two possible drivers of insurance policy changes

1. **Price Shocks:** homeowners adjust their policy or shop around when they receive a menu price shock
2. **Information Shocks:** if homeowners are inattentive, they adjust their policy or shop around only when they receive an information shock or nudge

Price-based policies become less effective if (1) is weaker than (2)

How Do Consumers Respond to Rising Premiums?

Question: Which quality dimensions do consumers adjust in response to price increases for a fixed insurance policy?

Our approach to estimate demand elasticities:

- Step 1: Isolate supply-driven price shifts, holding quality fixed (using a zipcode level index)
- Step 2: Estimate how consumers adjust qualities (elasticities)

Step 1: Construct Zipcode-Level Price Index

- Goal: Isolate price shift that is exogenous to individual quality choices.
- Method:

$$\log(\mathit{Premium}_{it}) = \alpha + \beta_1 \cdot \mathit{Ded}_{it} + \beta_2 \cdot \mathit{CovShare}_{it} + \lambda_{z,t}^{qa} + \gamma_{k[it]} + \epsilon_{it}$$

- **Identification assumption:** Zipcode-year FEs capture **supply-cost driven price shifts,** not demand shocks.
- Identifying variation:
  - Changes to underlying risk profile of specific markets over time
  - Within-insurer changes to mark-up and administrative costs
  - Not across-insurer variation in mark-ups (e.g. spillovers from other markets)

Step 2: Estimate Elasticity of Quality Choices

$$y_{it} = \alpha + \beta \hat{\lambda}^{qa}_{z,t} + \mu_i + \gamma_t + \gamma_k + \epsilon_{it}$$

- Outcome (y_{it}) : log deductible, log coverage limits, log coverage share, and change to insurer of choice
- Key parameter: β, elasticity of quality choices
- μ is loan FE and γ are year and insurer FEs

Insurance demand elasticities

Y	log(Ded)	Switched Insurer	log($CovShare$)	log(Cov)	log($Premium$)
$\hat{\lambda}_{zt}^{qa}$	0.0458***	0.0683***	-0.5106***	0.0650***	0.7401***
	(0.0037)	(0.0031)	(0.0095)	(0.0029)	0.7401***
Loan FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Insurer FE	Yes	Yes	Yes	Yes	Yes
Observations	39,513,717	39,513,717	39,513,717	39,513,717	39,513,717
R2	0.92509	0.30121	0.94296	0.98380	0.9411
Adj. R2	0.90371	0.10180	0.92668	0.97918	0.92430
Mean(Y)	7.0568	0.07013	0.29679	12.566	7.0987

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors are clustered by zip code.

Elasticities in First Year of Mortgage Originations

Y	$\log(Ded)$	$\log(Cov)$	$\log(CovShare)$
$\hat{\lambda}_{zt}^{qa}$	0.0837***	-0.0621***	-0.2603***
	(0.0084)	(0.0075)	(0.0099)
Credit Score, DTI, LTV Bins	Yes	Yes	Yes
Zip FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Insurer FE	Yes	Yes	Yes
Observations	8,652,455	8,652,455	8,652,445
R2	0.35067	0.73696	0.40148
Adj. R2	0.35002	0.73670	0.40088
Mean(Y)	7.0741	12.472	0.33692

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors are clustered by zip code.

Inattention and Information Shock

Event study around refinance. The refi process:

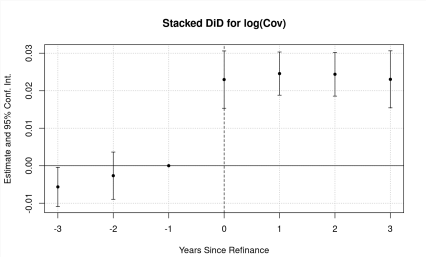
- Re-evaluate monthly costs $\rightarrow$ attention to insurance policy $\rightarrow$ attention shock / nudge to shop around
- New appraisal $\rightarrow$ information shock on home value $\rightarrow$ adjust insurance policy
- Does not require action beyond updating mortgagee line to new lender

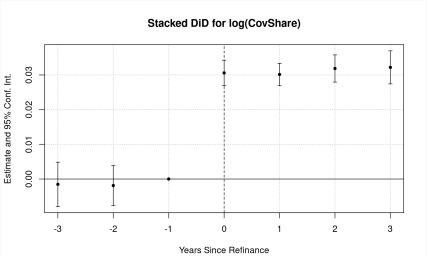
Stacked Event Study at Refinance

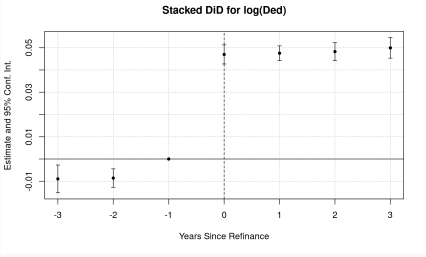
$$Y_{itd} = \alpha_{i \times d} + \gamma_{t \times d} + \sum_{k \neq -1} \beta_k (T_{id} \times 1\{t - d = k\}) + \epsilon_{it}^d$$

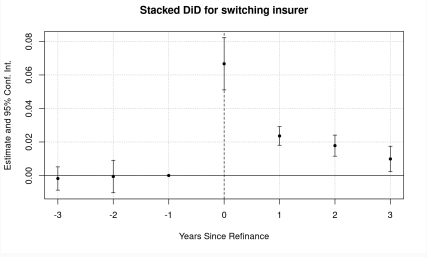
- $T_{id} = 1$ if loan refinances in period d
- 3 year pre and post windows, SE clustered by individual and year
- "Clean" controls: not-yet-treated loans that do not refinance in the window, but *do* refinance after the window
- Triple difference version: interacts T_{id} with size of appraisal shock (actual appraisal − predicted appraisal based on HPI)
- Only conventional refis (e.g. no FHA, VA, cash-out)

Event Study around Refinance



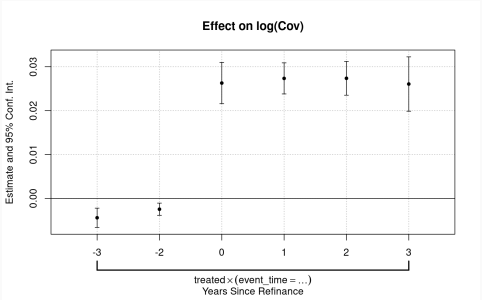


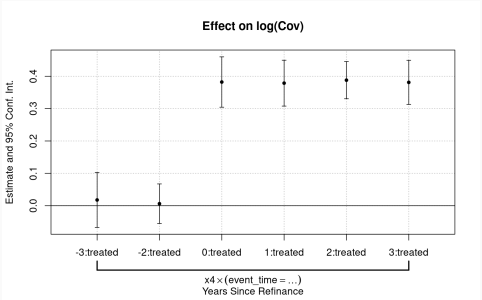




Triple Difference: Coverage Limit

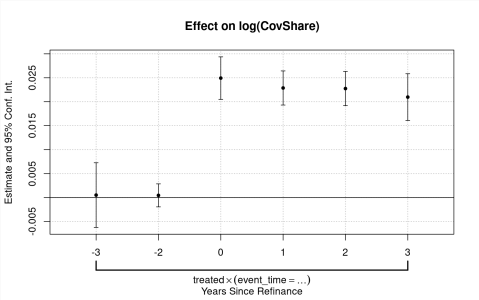
Appraisal shock = actual appraisal − predicted appraisal based on HPI

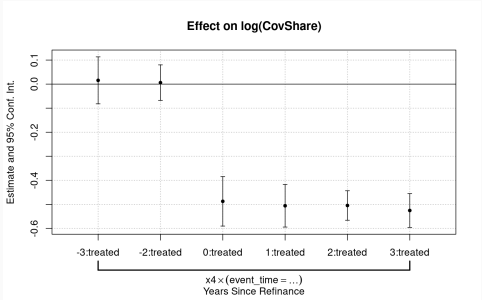




Triple Difference: Coverage Share

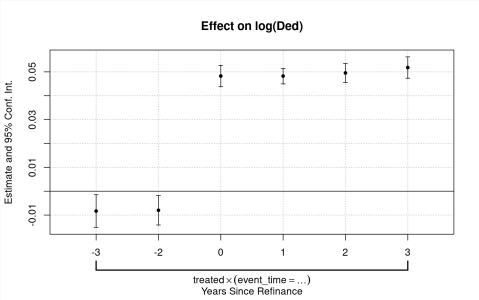
Appraisal shock = actual appraisal − predicted appraisal based on HPI

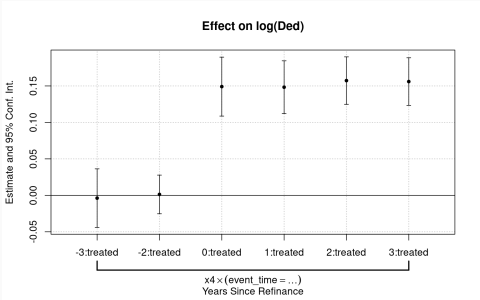




Triple Difference: Deductibles

Appraisal shock = actual appraisal − predicted appraisal based on HPI





Refinance results are not driven by household wealth or lender strictness

- Concern: household wealth and liquidity constraints change after refinance
  - Sample excludes cash-out refinances, which drive wealth changes
  - Premium expenditures are similar from before to after refinance
  - Results remain the same if we restrict to refinances where principal + interest payments change by less than 5%

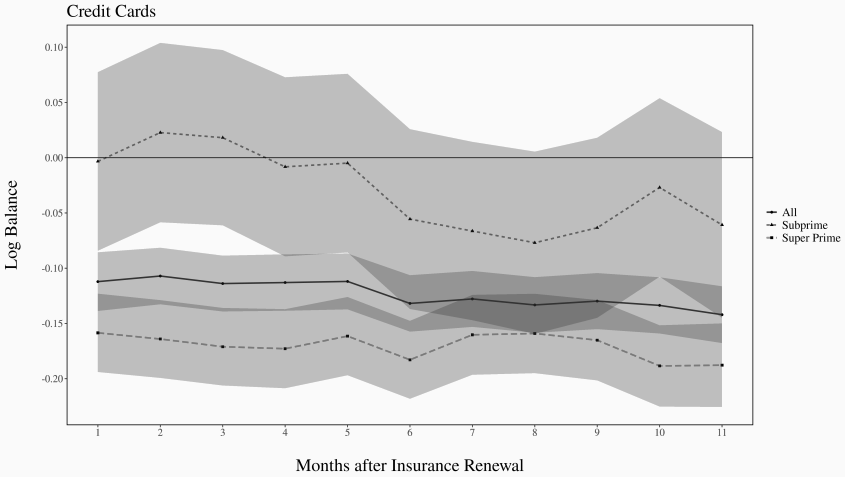
- Concern: refinance across different lenders may change lender scrutiny or strictness about insurance
  - Same results if we restrict to refinances where both loans are securitized by GSEs
  - GSE standardized rules about insurance should not change even if the lender changes

Credit Outcomes

Insurance market prices and credit outcomes

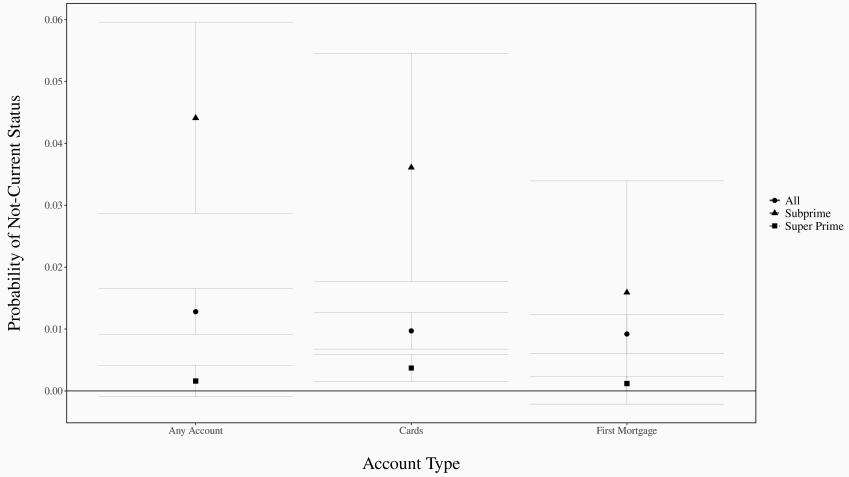
- Index captures average menu price changes for keeping the same policy from same insurer
- Household insurance premium expenditures go up by \$0.74 per \$1 of menu price
- Higher deductibles and lower coverage share $\rightarrow$ household exposure to expense shocks go up
- Estimate reduce form impact of higher prices (from premiums and expense shocks) on:
  - Credit card balances in 11 months after policy start
  - Credit delinquency: probability of accounts not being current in following year

Cards Balances



$$\log(\text{Credit Card Balance})_{itm} = \alpha_m + \beta_m \hat{\lambda}^{qa}_{z,t} + \mu_i + \gamma_{tm} + \gamma_k + \epsilon_{it}, \quad m \in \{1, \ldots, 11\}$$

Credit Delinquency, by Credit Score



$$P(\text{Not Current}_{it}) = \alpha + \beta \hat{\lambda}_{z,t}^{qa} + \mu_i + \gamma_t + \gamma_k + \epsilon_{it}$$

Conclusion

- Insurance quality has declined over time, adding another margin that increases homeowners' cost burden.
- Homeowners are increasingly exposed to tail risks
  - Higher deductibles $\rightarrow$ more exposure to small expense shocks
  - Lagging coverage $\rightarrow$ more exposure to catastrophic tail shocks
- Significant inattention to insurance coverage suggests that behavioral nudges may be more effective than price-based policies at closing coverage gaps
- Subprime borrowers face financial distress but super-prime borrowers may self insure

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