

# Strategic Behavior in the Homeowners Insurance Market

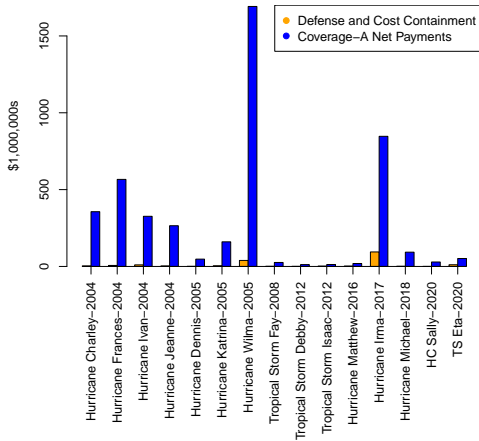
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FHFA Climate Summit

- Climate change is increasing the frequency and strength of extreme weather events throughout the United States
  - Hurricanes in the southeast
  - Wildfires in the west
  - Growing frequency and geographic occurrence of tornadoes
  - Hail throughout the US
- These weather events are putting additional stress on the market for homeowners insurance
- Asymmetric information has always played an important role in home insurance markets - new or exacerbated problems due to climate change?
  - Ex ante moral hazard - deferred maintenance
  - Ex post moral hazard - use storm for upgrades
  - Fraud by homeowner or third party

- In 2022, six Florida property insurers declared insolvency
  - Farmer's Insurance and AAA left in July of 2023
- Because of this, homeowner's insurance premiums have skyrocketed
  - Ill reported premiums in Florida increased 102% from 2021 to 2023
  - Florida accounts for 9% of all home insurance claims but approximately 80% of all lawsuits
  - Since 2012, Florida insurers paid \$51b (71% to attorneys)
- Evidence that similar problems are beginning in Louisiana, Alabama, California and even Iowa

# Catastrophe Payments and Litigation



# Moral Hazard?

- Deferred maintenance - in a world where extreme weather events are becoming more frequent and extreme, why engage in preventative maintenance? Why not wait for storm and file an insurance claim?
- Homeowners may have an incentive to attribute normal wear to storm in order to get needed upgrades for a reduced price
  - Specifically true as building standards improve to make homes more resistant to storms
  - Incentives may be greater if there are discounts given by insurers when certain standards are met

## Fraud due to Third Parties?

- 1 Roofers go door to door telling homeowners they have roof damage and that they can get them a new roof for free
- 2 Homeowners are then asked to sign an AOB so the roofer can manage, taking the homeowner completely out of the conversation
- 3 Roofer files an insurance claim on behalf of the homeowner
- 4 The insurance company sends out an adjuster and denies the claim or disputes the cost of the repair
- 5 The roofer completes the repairs, then teams up with an attorney to sue the insurance company for the amount of the repairs

- We examine the role of informational asymmetries and moral hazard on strategic behavior in the homeowners insurance market in Florida
- Data from Citizens Insurance, state-run insurer
- Starting in 2013, for all new policies, if the home is 30 years or older the home must have a four-point inspection
  - Existing policies may have an inspection if requested by the insurer
- Focus on original tile roofs which have a life expectancy of 30-50 years
- How does claiming behavior vary based on the age of the home and the four-point inspection policy?
  - What is driving differences in claiming behavior?

# Key Findings

- Find evidence of systematic differences in claiming behavior based on age of the home following Hurricane Irma - specifically properties aged 26 to 29
- Estimate this behavior costs Citizens approximately \$50 million for original tile roofs
- Results suggest that third parties contributing to the the results
- Tile roofs are not replaced systematically at age 30 in non-storm years
- No evidence of a change in building codes or methods driving findings



- Impact of extreme weather events on real estate markets.
  - Importance of beliefs (Bakkensen and Barrage, 2022; Baldauf et al, 2020; Bernstein et al, 2020; Gibson and Mullins, 2020; Giglio et al, 2021; Keys and Mulder, 2020; Murfin and Spiegel, 2020)
  - Household debt (An et al, 2023; Billings et al, 2019; Biswas, 2023; Gallagher and Hartley, 2017; Kousky et al, 2020) and mortgage finance (LaCour-Little et al, 2024; Ouazad and Kahn, 2022; Sastry et al, 2024)
  - Flood insurance (Blickle and Santos, 2022; Collier et al, 2021; Gallagher, 2014, Kousky et al, 2018, 2020, 2021, Wagner, 2022)
  - Wildfires and fire insurance (An et al, 2023; Boomhower et al, 2023; Ge et al, 2022)
- Asymmetric information due to fraudulent claim filing
  - Impact of deductibles and full replacement cost (Dionne and Gagne, 2001, 2002)
  - Typhoon insurance (Pao et al, 2014)
  - Fraud tends to be counter-cyclical (Dionne and Wang, 2013)
  - Trust and market frictions (Dunn et al, 2024, Gennaioli et al, 2022)

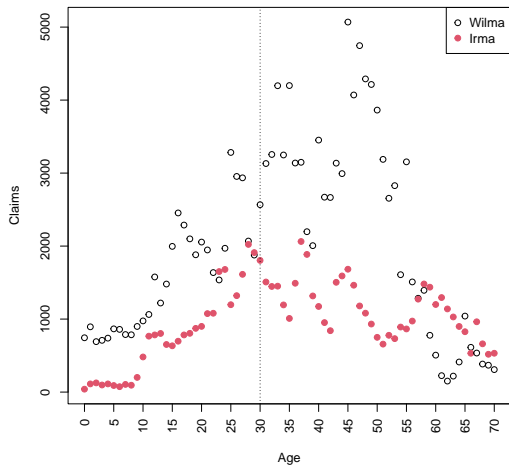
- Background Information on Florida
- Data
- Empirical Strategy
- Results - Probability of Filing a Claim After Hurricane Irma by Age
- Mechanisms - Moral Hazard (ex post) and/or Fraud?
  - FBC Equivalent
  - Four-point inspection or 30-year mark
  - Timing of claim filing
- Threats to Identification
  - Probability of New Roof
  - Building Characteristics
  - Sample Selection Concerns

# Background Information on Florida

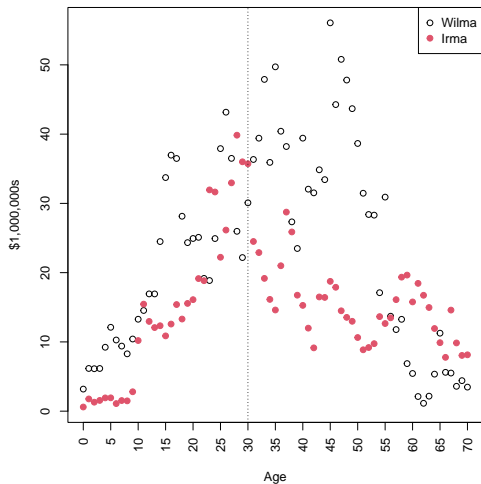
- Florida has a state-run insurance company - Citizens Insurance
  - Established after Hurricane Andrew
  - Citizens is intended to be “the insurer of last resort”
- Starting in 2013, Citizens Insurance required all new policies for homes that are 30 years or older to have a four-point inspection
- For currently insured policies over 30 years old, Citizens can request a four-point inspection
  - Extensive inspection on heating and cooling systems, plumbing, roof, and electrical systems
  - Documentation, including pictures, is required for this inspection
- When Irma hit in 2017, homes built in 1987 may have a four-point inspection, while those built in 1988 or more recently generally did not
- Policy created a difference in the likelihood that a given home *might have* a four-point inspection

- Obtained data from Citizen's Insurance for the entire state of Florida
- Extremely detailed data on policies including:
  - If an AOB was used
  - If a lawyer was involved
  - Amount paid on the claim
  - Type of damage (wind, water, fire, etc.)
- Also have extremely detailed information on the homes as it could relate to roof damage including:
  - Type of roof (gable)
  - Type of shingles (asphalt, composite, tile)
  - How the roof is connected to the structure (clips, single wrap, toe nail)

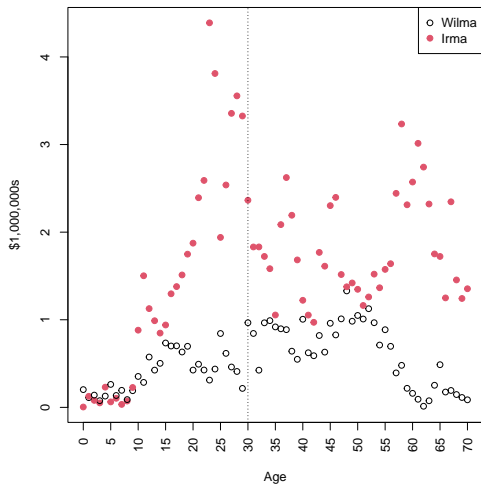
# Claims by Age - Wilma and Irma



# Net Coverage-A by Age - Wilma and Irma



# Defense and Cost Containment - Wilma and Irma



# Original Tile Roofs Only

- Limit analysis to original tile roofs that were covered by Citizens when Hurricane Irma hit
  - Cannot examine 2004 or 2005 Hurricane seasons (i.e. Wilma) for pre-period because no tile roofs were insured by Citizens until 2009
- No roof replacement on record
- Minimal back dating observed in the data
- Expected life of tile roof in Florida is 30-50 years, depending on tile material
  - Average life of asphalt roof is 20 years
  - Asphalt roofs have inspection at 25 year mark of shingles

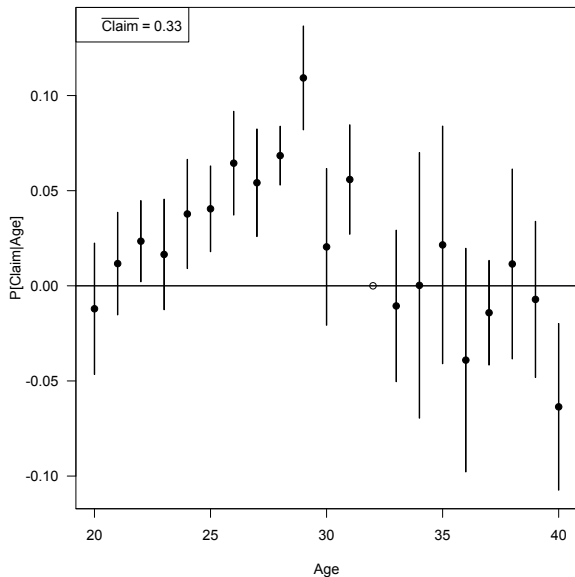


## Estimation Strategy: Probability of Filing a Claim

$$Claim_{n,t} = \sum_{t=0,1} \sum_{Age \in \mathcal{A}} I(Age(n) = Age) \times \delta_{Age,t} + \gamma X_{n,t} + \mu_{z(n),t} + u_{n,t}$$

- $Claim$  equals 1 if  $n$  filed a Hurricane Irma related claim
- $I(Age(n) = Age)$  equal to 1 if  $n$  is age  $Age$  at the start of the policy
- $\delta_{Age(n),t}$  is the age-specific effect on roof replacement at time  $t$
- $X_n$  are home specific control variables (roof attachment, gable, etc.)
- $\mu_{z(n)}$  are area fixed effects
- Excluded house age is 32

# Irma Related Claim - Tile



## How Big Is the Impact?

- Assume that homes over 30 years old are the “true” claim filing behavior
- Based on the attributes of the home, what is the impact of each attribute on the likelihood of filing a claim?
- Use the probabilities to estimate what claiming behavior should be for homes under 30 years

# How Big Is the Impact?

Table 1: Observed and Predicted Values of Claiming Behavior

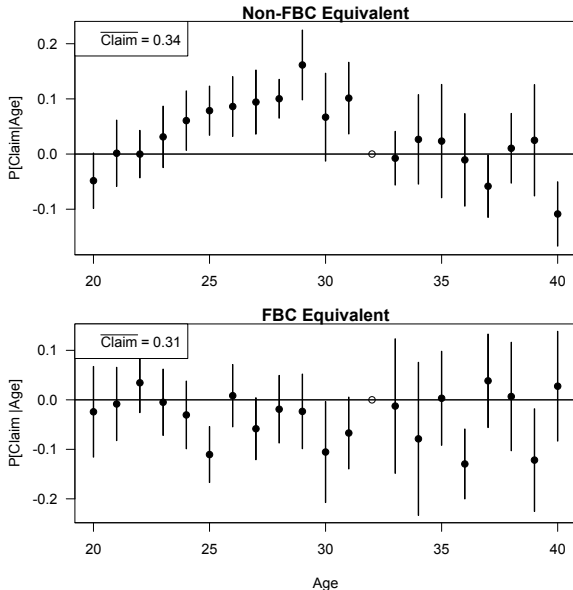
	Actual		Predicted
	Over 32	Below 29	below 29
Probability of a Claim	0.20	0.38	0.27
Net Coverage A	5,740.47	13,182.36	9,636.26
Net Coverage A, Policies with a Claim	28,733.35	34,621.29	12,288.61
DCC	478.91	1,709.05	826.93
DCC, Policies with a Claim	2,371.48	4,478.81	922.77
Net Coverage A + DCC	6,219.38	14,891.42	10,463.20
Net Coverage A + DCC, Policies with a Claim	31,104.83	39,100.10	13,211.38

Estimated cost for Citizens Insurance is approximately \$50 million for only original tile roofs

## Mechanisms: Ex Post Moral Hazard?

- Are individuals using the storm to replace a worn roof to avoid paying the full cost themselves in a few years? Or to pay for upgrades?
- Who is most likely to do this?
  - Households whose roof does not meet current FBC standards
  - Especially since many insurers give rates discounts based on if FBC standards are met
- Compare the likelihood of filing a claim based on age of the roof by whether or not roof meets FBC standards

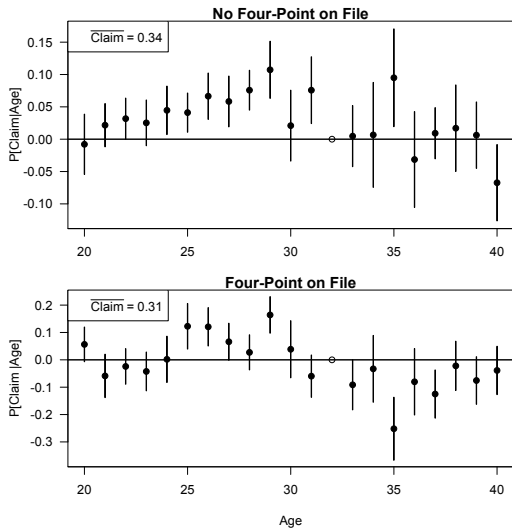
# FBC versus Non-FBC Equivalent Status



# What Information Matters?

- New policies for homes over 30 have a four-point inspection
  - Some existing policies for homes over 30 years have a four-point inspection
  - Few homes under 30 have a four-point inspection
- Homeowners have perfect information on if the house has a four-point inspection on file with Citizens insurance or not
- Third party individuals (i.e. roofers and lawyers) can easily tell via on-line search age of house but not four-point inspection status

# Claiming Behavior for Hurricane Irma by Four-Point Inspection Status

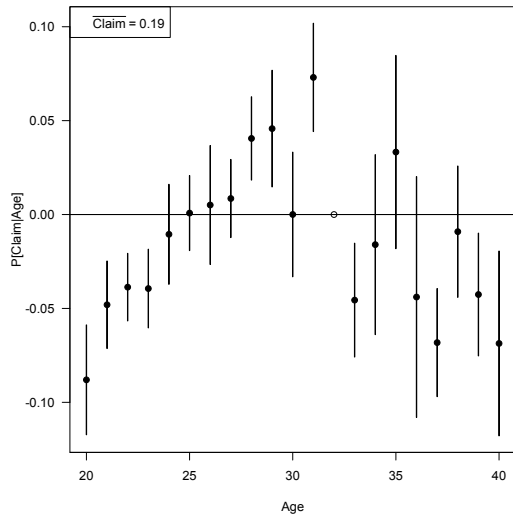




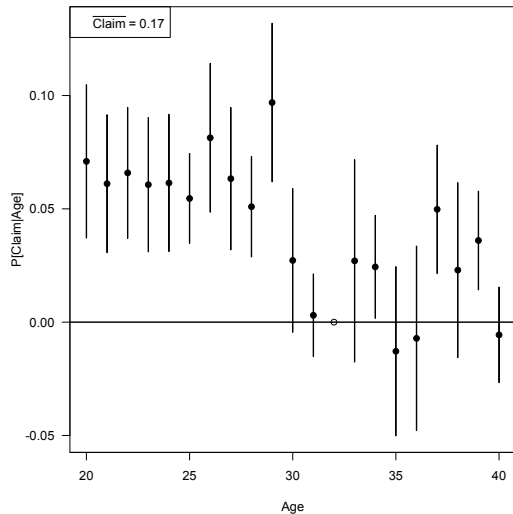
# When is the Claim Filed?

- If home is damaged by storm, most will recognize immediately
- Florida has a three year statute of limitation to file a claim since some damage may not be immediately obvious
- No strong a priori reason to think recognizing delayed damage is negatively correlated with the age of the home
- Roofers are busy immediately after the storm, expect that the schemes described earlier are more likely to be delayed versus immediate

# Claiming Behavior for Hurricane Irma in 2017



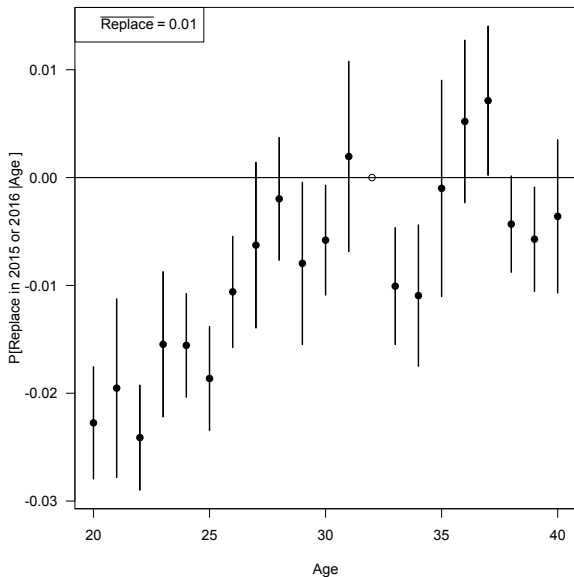
# Claiming Behavior for Hurricane Irma in 2018 or Later



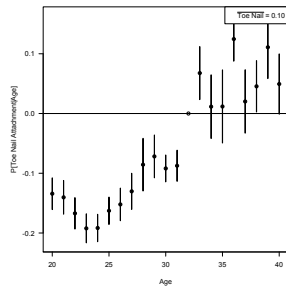
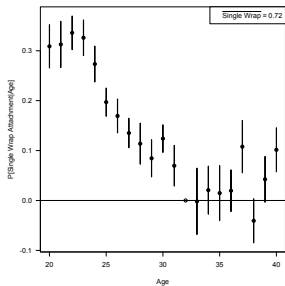
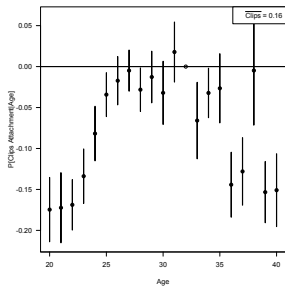
# Threats to Identification

- Inspection is systematically catching and requiring the replacement of roofs at age 30
- Change to building codes
  - If building codes changed in 1987, this could impact how much damage is experienced by these homes and the likelihood of a claim
  - In 1994, in response to Hurricane Andrew (1992), building codes were changed
- Building preferences changed
- Sample Selection

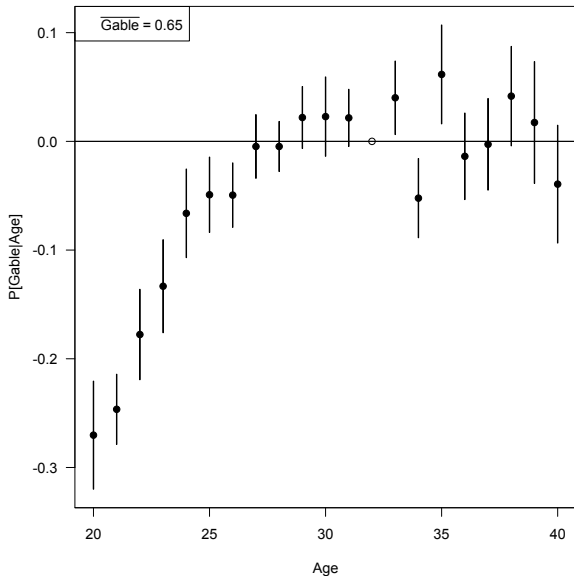
# Probability of New Tile Roof in Non-Storm Years



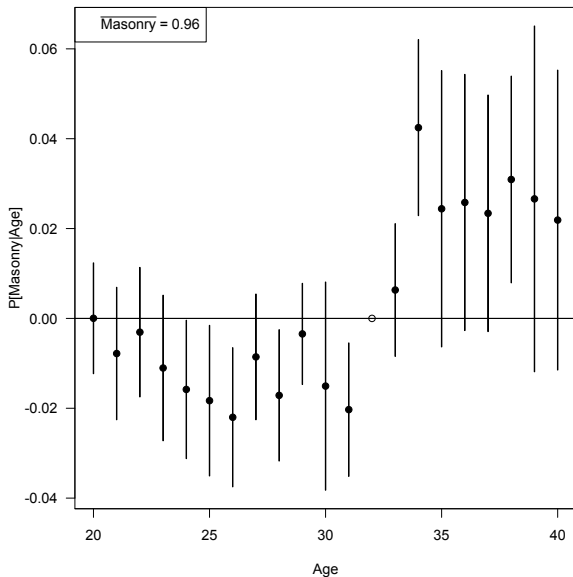
# Attachment Type



# Shape Type



# Construction Type





# Sample Selection Concerns

- Are lower quality homes selecting into Citizens Insurance?
- For this to explain our results, this selection must be correlated with the age of the house
- Variety of checks to see if present:
  - No difference in likelihood of assumption based on age
  - No difference in the sale price at the time of purchase between Citizens insured properties and privately insured (or not insured) properties
  - Within Miami-Dade county, do not find evidence of concentration geographically using the Duranton-Overman measure

# Conclusion

- Examine the role of information and information asymmetries on strategic behavior in the homeowners insurance market in Florida
- Find likelihood of filing an Irma related claim is significantly more likely if the home is under 30 years old
- Estimate this costs Citizens approximately \$50 million for just the original tile roofs
- Results suggest that this is driven by third party involvement
  - Age pattern exists when focus on only non-FBC Equivalent roofs
  - Four-point inspection not systematically lowering likelihood of filing a claim
  - Delay in pattern of filing a claim