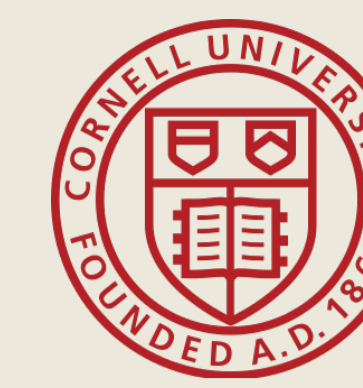# How Insurance Claim Delays Shift Mortgage Costs After Disasters?

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Research Questions

- Does the timing of insurance claim payments after natural disasters influence mortgage outcomes?
- When insurers delay payments, who ultimately bear(s) the resulting costs?

Motivation

- Natural disasters create immediate household **liquidity needs**. (Gallagher & Hartley (2017), Del Valle, Scharlemann & Shore (2024))

- **Friction:** the insurance payment share in the year of losses incurred is significantly lower than that in the following year.

Figure 1: Cumulative Claim Payment to Losses Incurred
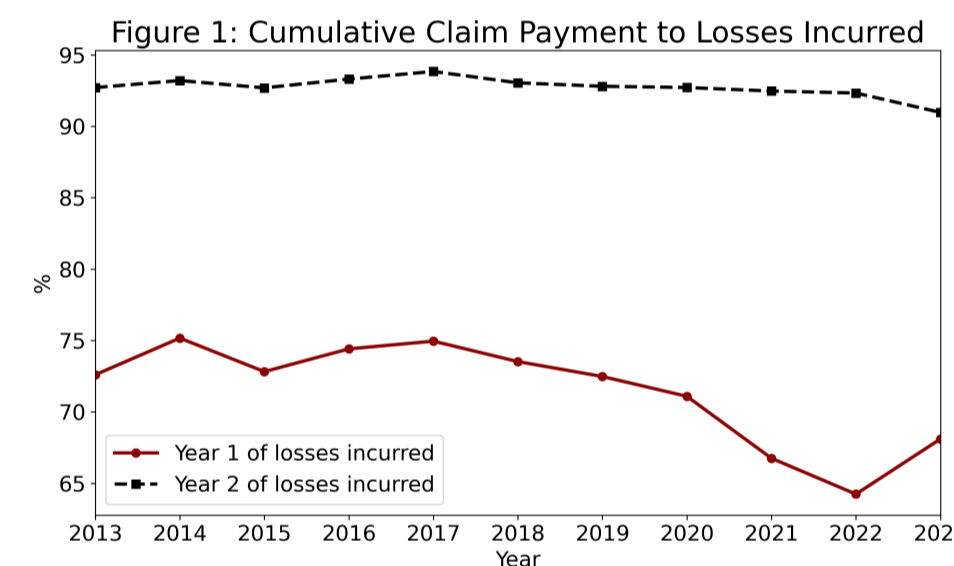
Stakeholders

Stakeholders	Impact by delinquency
Households	late fees
Freddie Mac	forbearance; modification
MBS investors	prepayment
CRT investors	credit events; mod. with lower interest rate or principal forbearance

Data

- NAIC schedule P: insurance claim payment progress by year.
- Capital IQ Pro: insurer financials.
- Freddie Mac single-family loans: origination and monthly performance since loan acquisition.
- FEMA: property damage after natural disasters.

Instrument on Insurance Payment in the Loss Year

- $IV_{z,0} = \sum_i s_{i,z,2016Q4} \Delta \text{PayShare}_{i,0}$.
- **The shifter**: $\Delta \text{PayShare}_{i,0}$, change in the share of losses paid in the loss-year from 2016 to 2017 for insurer i.
- **The share**: $s_{i,z,2016Q4}$, share of total premiums written by insurer i in ZIP-MSA z by 2016Q4.

Exogeneity:

- The path of Hurricane Irma is random.
- The shifter is exogenous to local shocks.

Event Study around Hurricane Irma in Sept. 2017

$$Y_{l,z,c,t} = (100 - \widehat{S_z}) \times Post + X'_{l,z,c,t}\gamma + \mu_z + \theta_c + \tau_t + \varepsilon_{l,z,c,t}$$

- $Y_{l,z,c,t}$: mortgage outcome dummy of loan l in zip3-msa z, observed in month t, acquired in quarter c.
- $\widehat{S_z}$: the instrumented share of insurance payment in the year of losses.
- $X_{l,z,c,t}$:
  - The damage from Hurricane Irma $\times$ Post.
  - Loans' origination and monthly characteristics.
  - FICO-LTV-month FEs; DTI-month FEs.
  - Assignment-of-benefits-month FEs.
  - Servicer-month FEs.
- μ_z, θ_c, τ_t are ZIP-MSA, acquisition cohort and month FEs.

Key Findings

- Insurance matters for post-disaster mortgage delinquency by how fast they pay after the disaster (e.g. in the loss-year).

- Insurer-induced delinquencies create losses for households and Freddie Mac, but not for MBS or CRT investors.

- Households and Freddie Mac suffer higher losses than insurers' savings from delaying, creating deadweight losses.

Post-Irma Loan Status
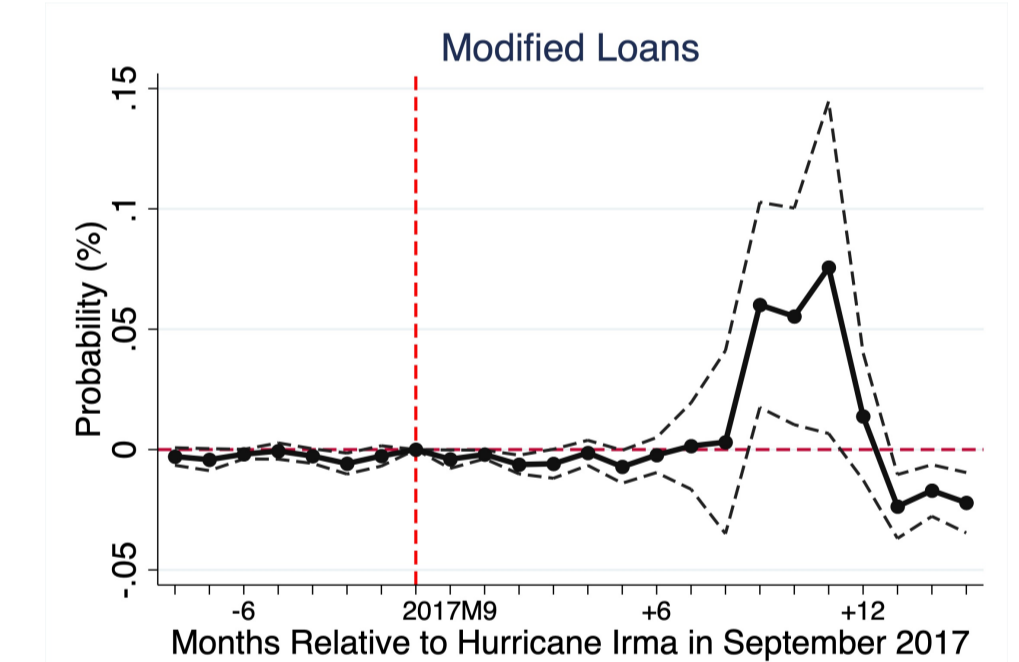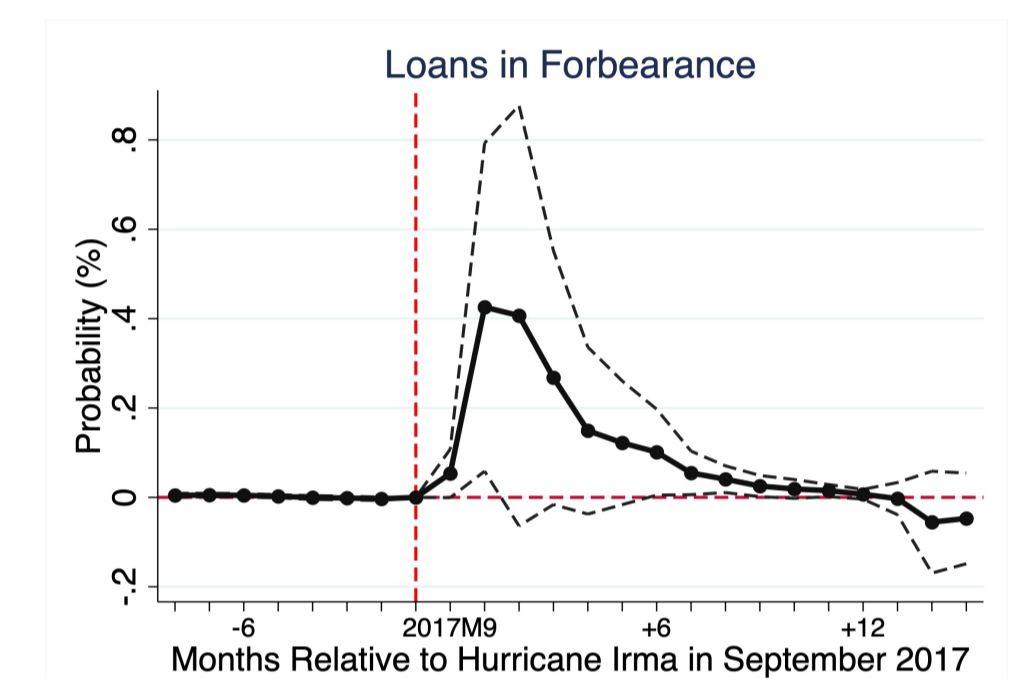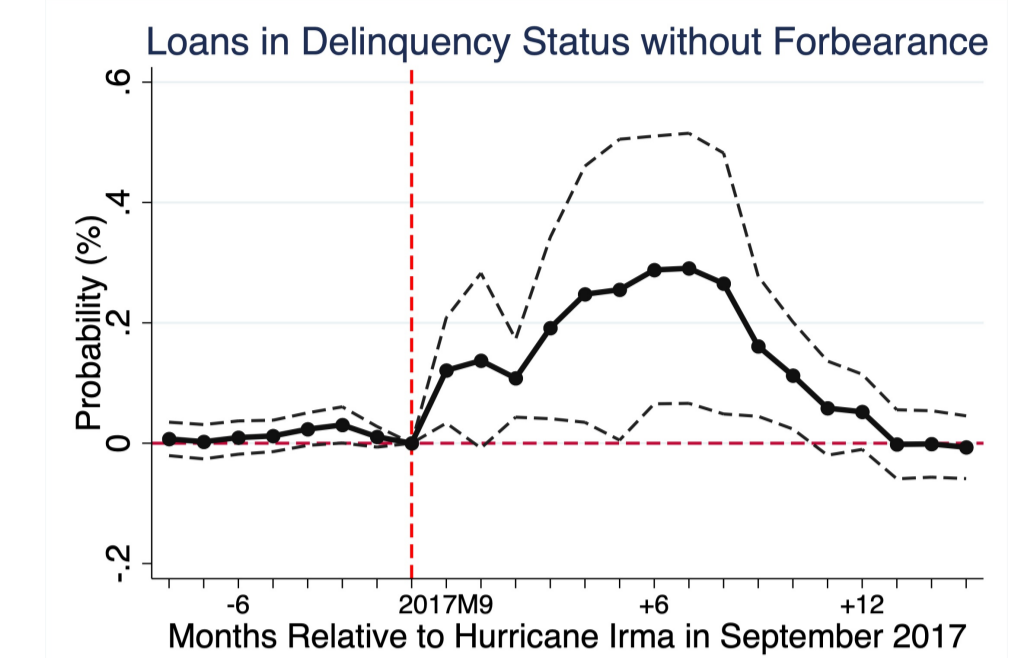
- Standard errors are clustered at zip-msa level.
- Confidence intervals are reported at 90%.

Back-of-the-Envelope Cost Estimates

Consider a 1% change in loss-year claim payment across all insurers for the 222000 loans in Florida:

Stakeholders	Cost calculation	
	conservative	aggressive
HHs: delinquency wo forb.	249084 USD	
Freddie: forb.	2.4 mil. USD	14.5 mil. USD
Freddie: mod.	6.7 mil. USD	15 mil. USD
Insurers costs	2.2 million	
Net cost:	7.1 mil	27.5 mil