Disaster Vultures or Recovery Machines? The Role of Investors in the Wake of Hurricanes

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22 October 2026

Disasters and the Cost of Climate Change

A motivating equation for the cost of climate change:

$$Consumption_t = Income(Climate_t) - Disasters(Climate_t)$$

- Climate change may decrease income and increase disasters over time
- Where does economics come in?
  1. Modeling adaptation responses: air conditioning, building in safer locations
  2. Extracting market expectations of climate change (land values)

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Is this even the right formula?

Disasters, **Insurance**, and the Cost of Climate Change

$$Consumption_t = Income(Climate_t) - \alpha \times Disasters(Climate_t)$$

- Perfect risk sharing: Welfare cost of disasters are expected losses
- Incomplete risk sharing increases the welfare costs above expected losses
  - Incomplete insurance take-up
  - Frictions in credit markets
  - **Capital costs**
- A growing literature argues $\alpha >> 1$, and this is the first paper to give us a credible measure of α

This Paper

- Introduces first time-varying measure of expected losses that can be compared apples-to-apples with premiums
- Validates measure: Directly used by insurers to set rates and aligns with other measures
- Estimates effect of change in beliefs of expected losses on premiums: 4X pass-through!
- Shows connection in markup to cost of reinsurance and inefficient risk exposure of small insurers

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- Takeaway: α is large!

A Novel Measurement of Dynamic Risk Perceptions

- The data work to construct measures of risk and premiums is really important
- This paper measures both how $E[Loss]$ is changing over time and the markup on $E[Loss]$ in pricing
- (1) Existing proxies of $E[Loss]$ are not dollar measures and (2) not time-varying
  - National Risk Index: Historical loss rates, but perils are not split out clearly or isolated to residential property
  - First Street or CoreLogic models: Housing model loss rate snapshots, but difficult to turn into a dollar measure comparable with premiums
- Useful as flexible controls or to identify mechanisms, but cannot accomplish the decomposition in this paper

This Paper's CAT Model Measure

Innovations:

1. Time-varying measure of relevant, clearly defined risk
2. Well defined $-value $E[Loss]$ on a constant housing type
3. Comparable premium measure defined on the same type of property for the same peril

Can credibly run the regression:

$$Premium = \alpha \times E[Loss]$$

My Comments

1. Role of the CAT models
2. Accounting for selection in pricing

(1) Does Insurer's Choice of CAT Model Matter?

Table 1: Florida Insurers in the Dataset

Insurer	Share 2024	(Share 2010)	Model vendor(s) 2024
Citizens	15%	(10%)	AIR, CL, RMS, FPM
State Farm	10%	(16%)	AIR, CL, RMS
Universal P&C	6%	(6%)	RMS
Tower Hill	6%	(-)	AIR
Slide	5%	(-)	AIR
First Protective	5%	(1%)	RMS
American Integrity	4%	(1%)	AIR
Florida Peninsula	3%	(2%)	AIR
ASI Preferred	3%	(1%)	AIR
Heritage	2%	(-)	AIR
Southern Oak	2%	(1%)	AIR
Truck Insurance	2%	(-)	RMS
American Strategic	2%	(2%)	AIR
Homeowners Choice	2%	(2%)	RMS
Castle Key Insurance	1%	(3%)	AIR
St. John's	-	(4%)	AIR
Total	68%	(49%)	

(1) Does Insurer's Choice of CAT Model Matter?

- Should we think of CAT model updates as "forcing" premium updates, or instead as measures of market beliefs about risk?

- Early on, reader might have a regulatory friction story in mind, or expect insurer's model vendor to be used for identification

- Ultimately, the authors convincingly show that these models should be used as measures of beliefs (average RMS and AIR)

1. I think this framing could be clarified earlier; a lot of focus on differences across models
2. Include "model used" interaction term in Table 7
3. Emphasize that models are much more than regulatory tools, respected and demanded globally

(2) Territories and Selection in Pricing

- Authors emphasize that costs and premiums are accounted at the territory and not ZIP level following Boomhower et al. (2024)
- $E[Loss]$ is measured by ZIP, but most insurers price at a more aggregate "territory" level
- Premiums will not vary for otherwise identical homes in the same territory
- Authors aggregate $E[Loss]$ by territory before running regressions
- This is a sensible way to measure the α insurers use, but raises a few questions of interpretation

Accounting for Selection

- Another point made by Boomhower et al. (2024) is that insurers will account for selection when setting prices
  - If I use very broad territories and my competitors use more granular territories, I will set my rates based on the adversely selected pool that I expect
- This could motivate $\alpha > 1$
- Not worried: Consistent evidence from rate filings and all insurers use (basically) the same models
- Could assume buyers will choose cheapest policy available to back out effective α that accounts for shopping effects

Other Thoughts

1. Why do insurers leave money on the table with broad territories?
2. How much cross-subsidization is created by aggregate territories?
3. How much reclassification risk is created by these model updates?

Thank you for sharing your interesting research!

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