

# Not All Disasters are Alike: Extreme Weather Events and Stock Performance

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Summary

Asset Pricing

Contributions

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Comments

# This Paper

## How do extreme weather events affect U.S. stock returns?

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### ① General impact across all disasters:

- Prolonged **positive** drift in CAR, stronger pre-hurricane Sandy (1980-2012)
- Absent post-Hurricane Sandy → improved market pricing

### ② Short-run heterogeneous impact by disaster type

- **Tropical Cyclones**: Significantly **negative** and monotonically decreasing CARs
- **Winter Storms**: Significantly **positive** and monotonically increasing CARs
- Droughts, flooding, freeze, wildfire: No significant effects.

# Asset Pricing Perspective

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- **Physical climate risks** can affect future cash flows through asset destruction, supply chain disruption, or demand shifts.
- Investors require a **risk premium** for these **non-diversifiable** risks.
- This paper: Markets may **underreact** to slow-moving or complex risks → gradual price adjustment → predictable return drift.

# Contributions

## ① Pricing physical climate risk

- Acharya, Engle, and Lyons (2022): Heat risk priced in stocks and bonds;
- Hong, Li, and Xu (2019): Underreaction to drought in food stocks;
- Griffin, Kruger, and Maturana (2019); Seetharam (2017): Negative returns after weather extremes;
- Goldsmith-Pinkham, Kotchen, and Pfeiffer (2023): SLR risk priced in municipal bonds post-2013; etc.

## ② Comprehensive comparison across disaster types

- Lanfear, Burke, and Phillips (2017): Hurricanes across industry portfolios;
- Griffin, Kruger, and Maturana (2019): Temperature extremes with some heterogeneity;
- Malik, Shah, and Shahid (2023): CSR firm performance across disaster contexts; etc.

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# Comment I

## How Different Physical Climate Risks Affect CARs Differently

### ① Cash-flow shock vs. demand surge

- **Hurricanes:** Destroy assets, halt operations, disrupt supply chains → lower expected cash flows → sustained price declines as damages are revealed.
- **Winter storms:** Rarely damage infrastructure, but cause demand spikes for energy, food, and repairs → higher expected revenues → upward price drift as sales data arrive.

### ② Sector composition of exposed firms

- **Hurricanes:** Affected firms are often insurers, refiners, tourism, and small-cap manufacturers, directly exposed and financially vulnerable.
- **Winter storms:** Impacted firms such as utilities, energy distributors, and home-improvement retailers likely benefit from demand surges and cost pass-throughs.

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# Comment I

## Sector composition and style of affected firms

- Lanfear, Burke, and Phillips (2017) and Griffin, Kruger, and Maturana (2019): Manufacturing, consumer, small-cap, and high-momentum stocks are hit hardest by hurricanes or extreme heat, whereas gold and defensive sectors (e.g., utilities, healthcare) may benefit.
- **Suggestion:** Re-estimate CARs and re-plot Figure 1 to identify whether average underreaction is concentrated in vulnerable groups.
  - ▶ **Industry type:** Cyclical vs. defensive
  - ▶ **Style:** Small vs. large cap, low vs. high momentum.

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# Comment II

## Economic Significance

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- The peak long-window CAR is only **0.60%** for the full sample.
- **Suggestion:**
  - ▶ Convert CARs to annualized abnormal returns for better comparison.
  - ▶ Benchmark against known effects (e.g., post-earnings-announcement drift approx. 2 – 4%).

# Comment III

## Time-Varying Climate Risks

- Evidence suggests pricing begins to emerge around **2013–2015**, aligning with:
  - ▶ Rising scientific consensus and media coverage of climate risks
  - ▶ Regulatory focus (e.g., TCFD discussions, Paris Agreement)
  - ▶ Increased institutional investor awareness and ESG integration.
- **Suggestion:**
  - ▶ Use rolling-window CARs or include year-specific interaction terms.
  - ▶ Consider using a Bai–Perron multiple break test to identify the timing endogenously.

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# Other Comments I

- Positioning of the paper in the literature more rigorously.
- Using headquarter or incorporation state to link firms to disaster zones may misclassify some firms, e.g., multinationals.
- Discussion of overlapping macro shocks: Some of the largest disaster clusters (e.g., 2020 hurricane season) coincide with major macro events (COVID-19). How to disentangle weather effects?
- Adding summary statistics of firm matching and characteristics of matched firms by disaster types.
- The choice of event day can materially affect CARs, especially for long-duration events like droughts. A discussion on optimal event timing per disaster type would be useful.

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## Other Comments II

- Terms such as “mild” vs. “severe” hurricanes are defined via economic loss, but this could be misread as meteorological intensity. A clearer label such as “low-cost” vs. “high-cost” may improve clarity.
- Table 1 Panel D missing 1987.
- Consistency in decimal places: Some CAR numbers are reported with two decimals, others with three.
- Redundant Paragraph 2 on Page 8.
- Typo “Sanday” in several figure captions and panel headings (e.g., Figure 5 B1, B2; Figure 6 B; Figure 7 B).

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