



Skin in the Game: Climate Risk and Real Asset Pricing

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Climate Events Are Happening Worldwide



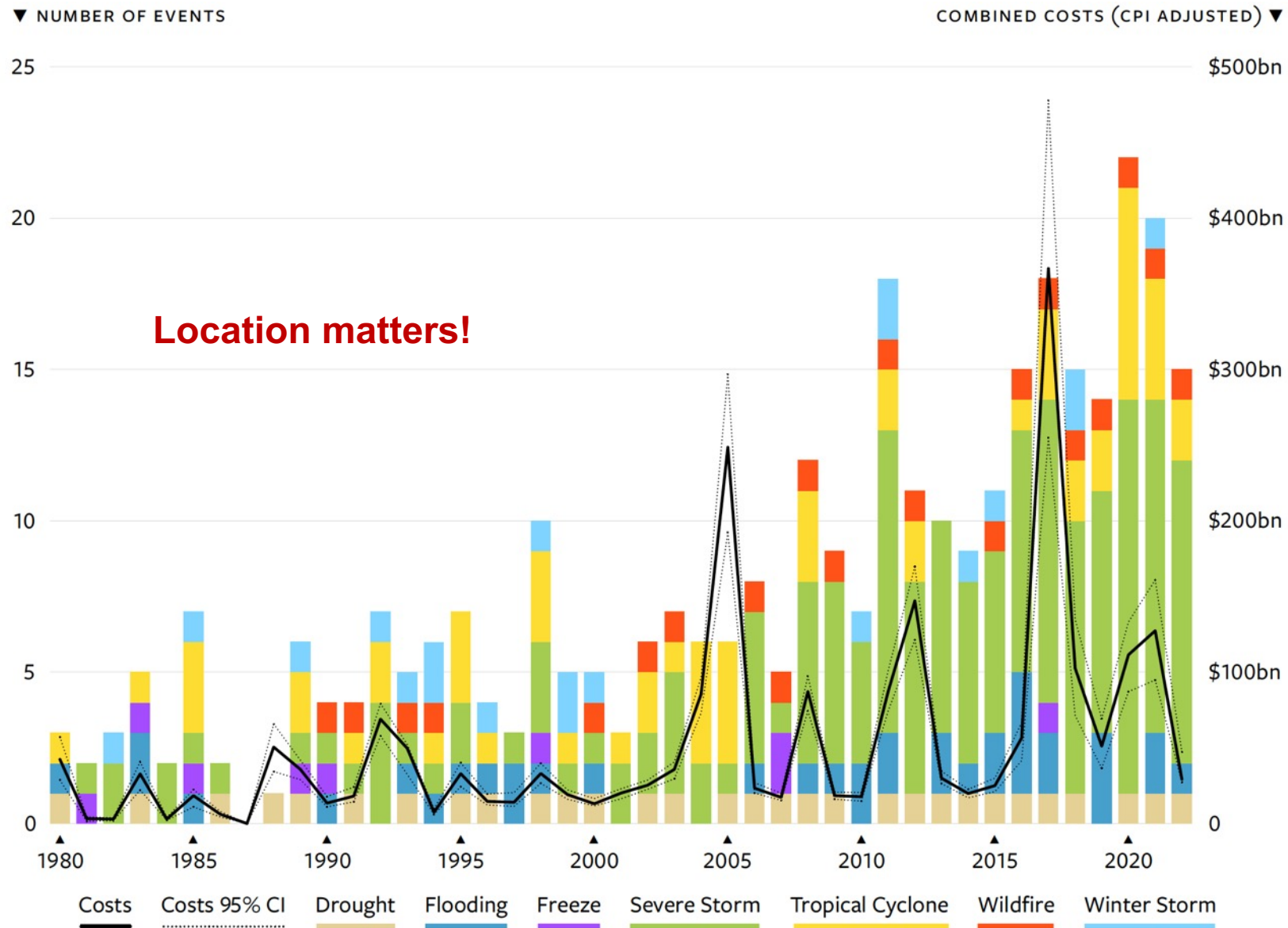
Wildfires in California...
Napa wine region

Credit: Jim Wilson/The New York Times



...and flooding closer to home
Historical city center of Dordrecht

With Increasing Frequency and Intensity



A Reminder of Climate Risk Close to Home

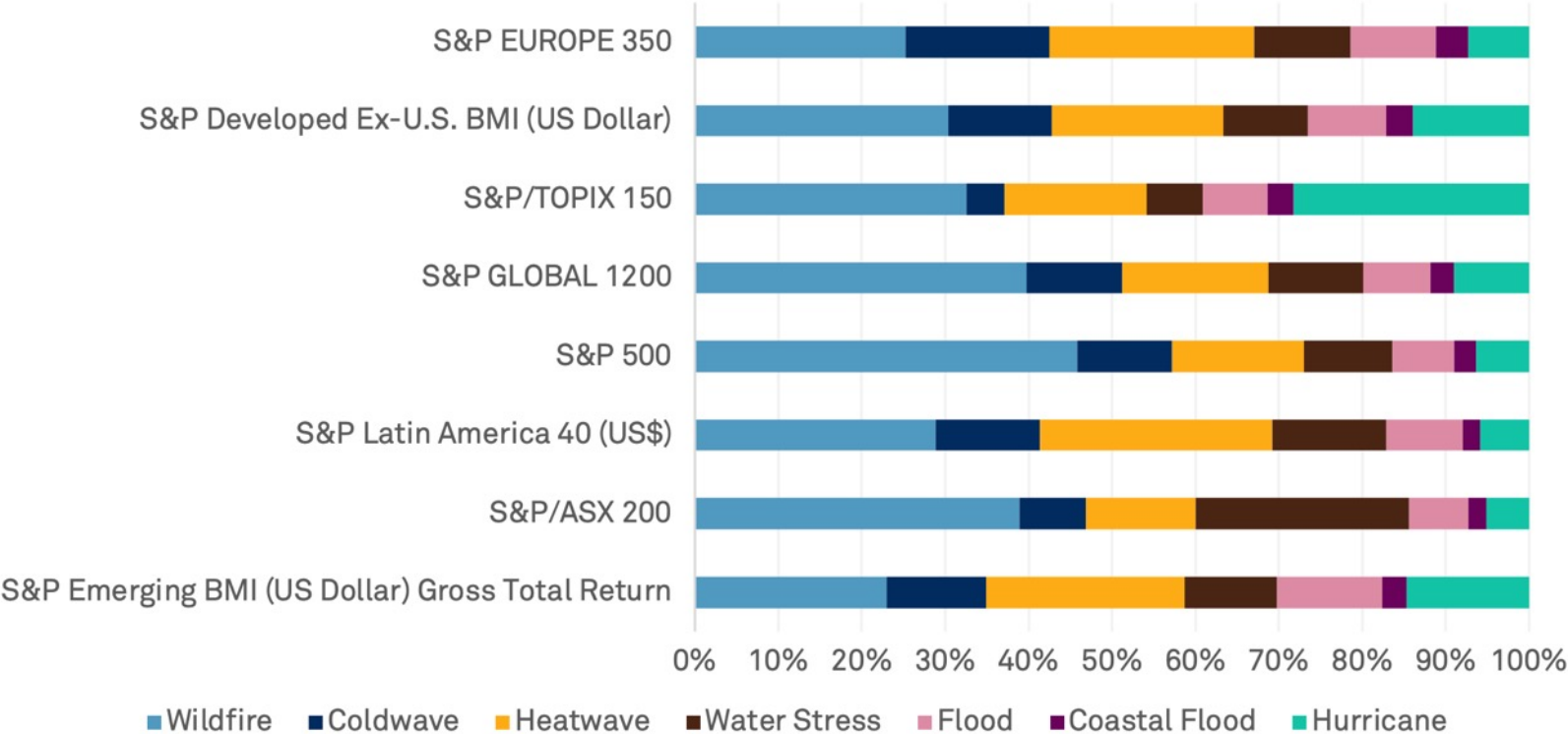


German and Dutch flooding in Summer 2021

Assets Exposed to Risk: More Than Expected

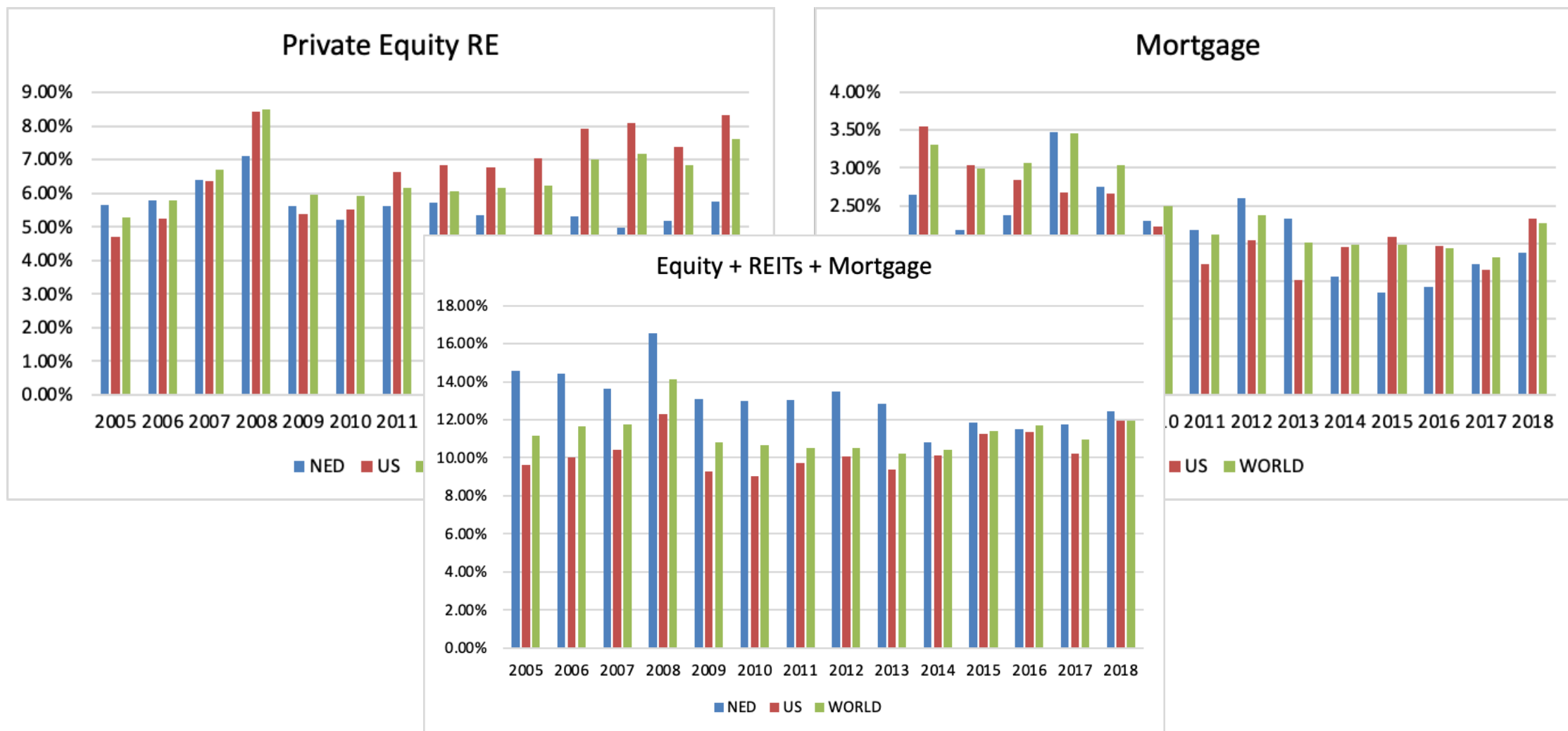
	Number of Companies with Assets at High Physical Risk on at Least One Indicator	Market Cap of Companies with Assets at High Risk \$US Trillion	Revenue of Companies with Assets at High Risk \$US Trillion
S&P/TOPIX 150	40 (27%)	\$1.3 (42%)	\$2.1 (55%)
S&P/ASX 200	88 (44%)	\$0.9 (89%)	\$0.4 (82%)
S&P GLOBAL 1200	521 (43%)	\$27.3 (66%)	\$16.6 (66%)
S&P EUROPE 350	101 (29%)		
S&P 500	297 (59%)		

Source: S&P Global



Pension Fund Exposure to Climate Risks

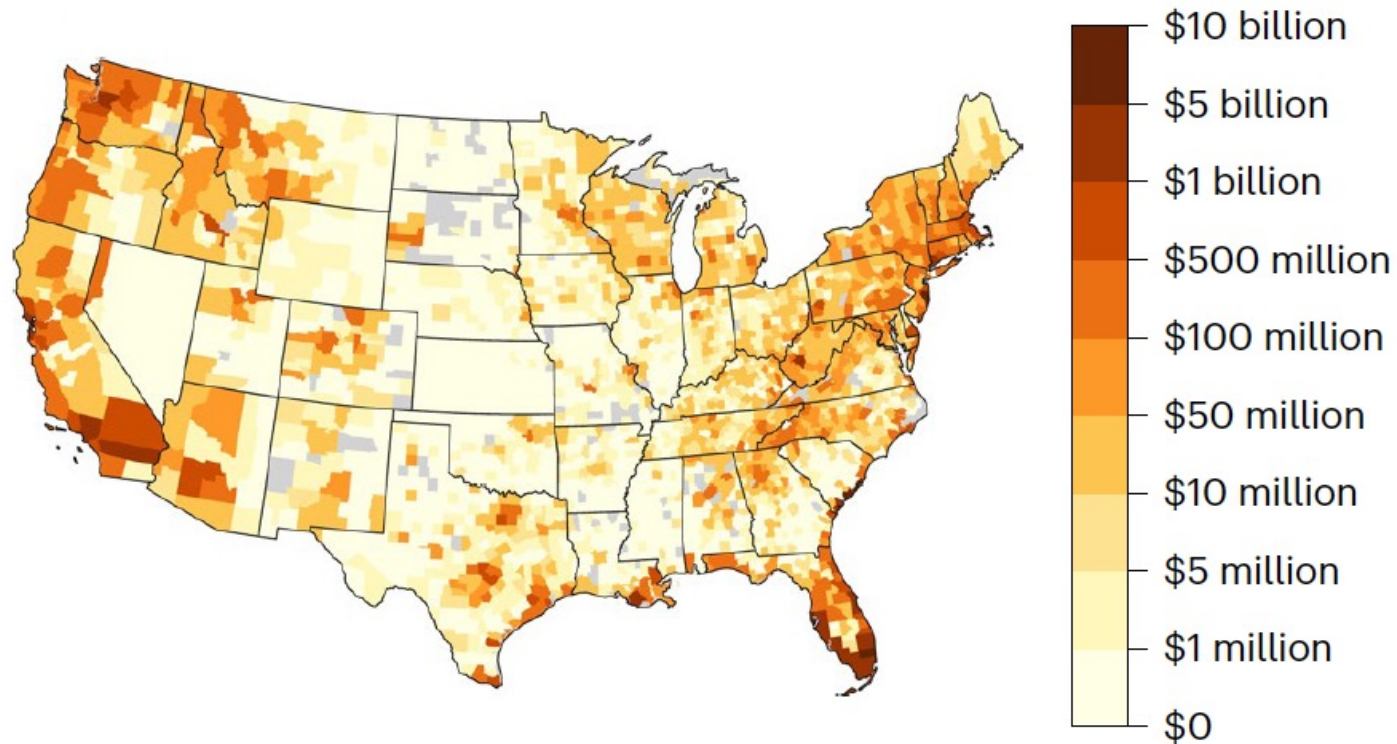
Pension fund investment weight in...



What Does “Exposure” Imply, Quantitatively?

Residential properties exposed to flood risk in the US are overvalued by...

\$121-237 billion

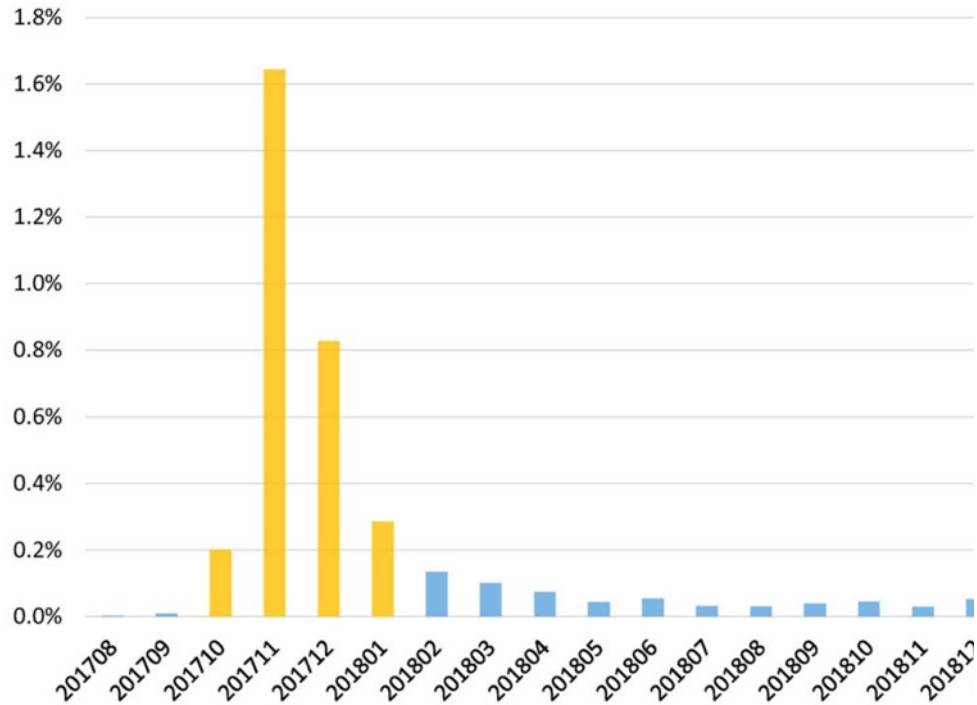


Climate Shocks Also Affect Mortgages

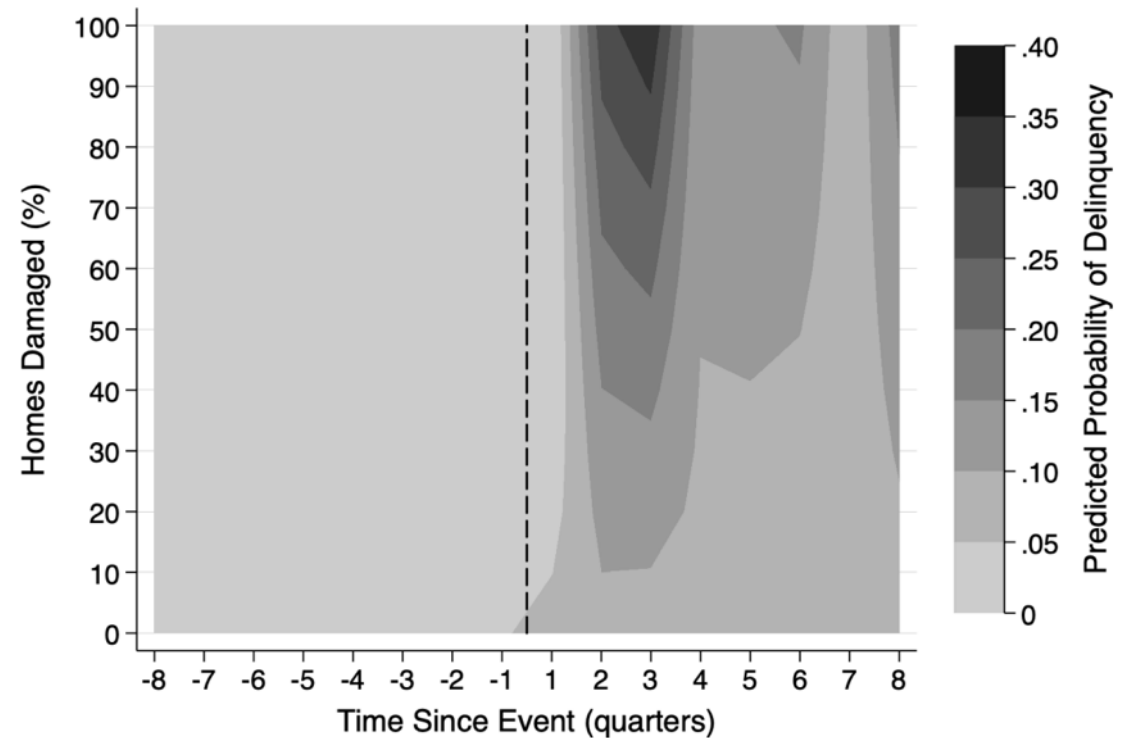
Rate of loans entering delinquency after Harvey in damaged areas:

50 times higher than typical rate level (residential)

28% higher probability than before (commercial)



Source: Kousky et al. (2020)

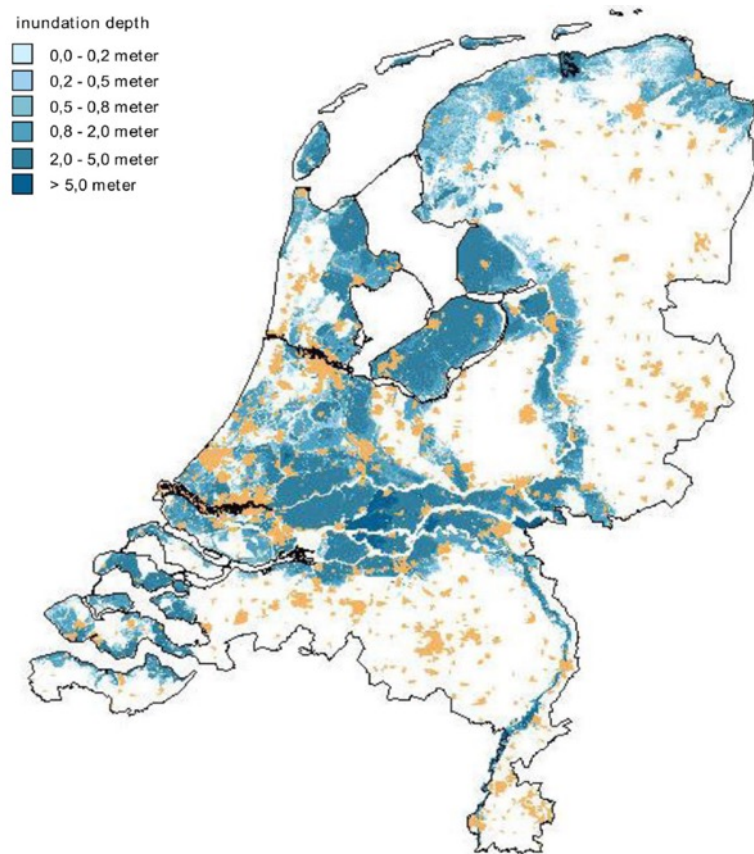


Source: Holtermans et al. (2022)

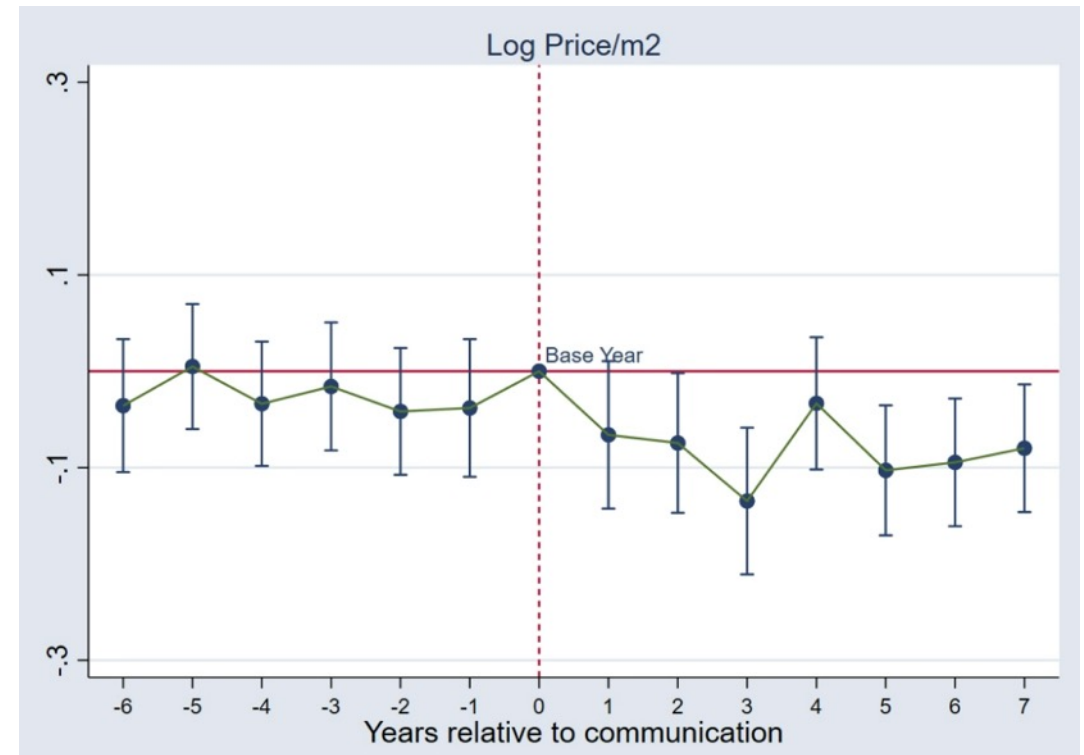
It's Not Just the U.S., But Also in Holland

Properties exposed to flood risk in the Netherlands are sold at a discount by

1~3% in transaction values (€10k per house)



Source: Bosker et al. (2019)



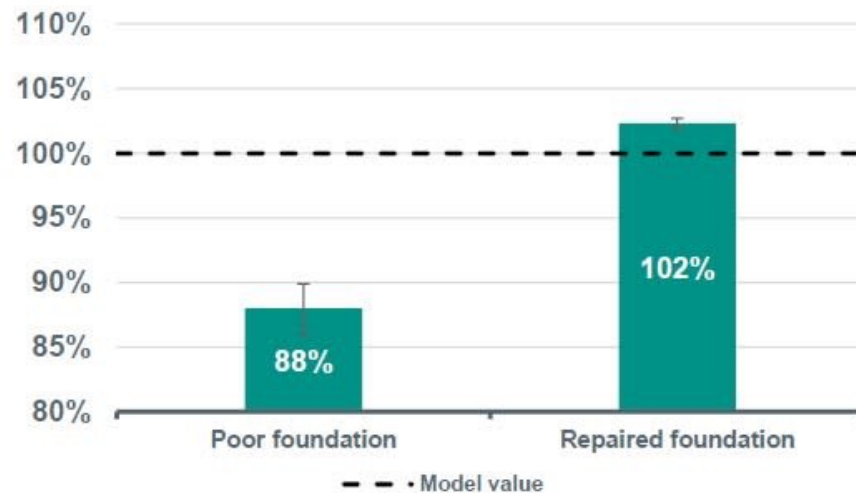
Source: Niu et al. (2023)

And...More Than Just Flood Risk!

25% of properties built before 1970 exposed to foundation problems

Realised sales price by reported foundation quality

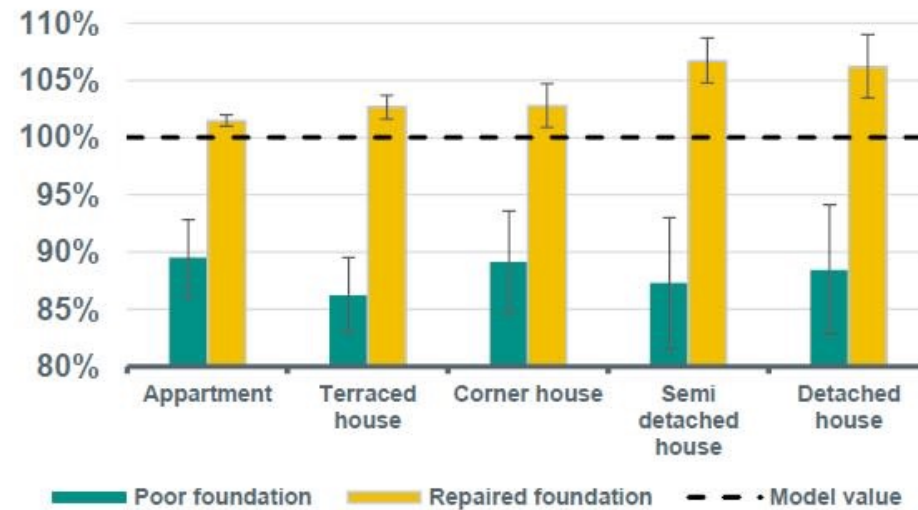
As percentage of model valuation



Source: Brainbay, ABN AMRO

Realised sales price by reported foundation quality

As percentage of model valuation



Source: Brainbay, ABN AMRO

12% lower transaction values (€47k per house)
€60 million damage by 2050

How to Tackle the Problem?

Information provision

- Risk assessment
- Transparency
- How to interpret the information (individuals and institutions)

Financial Institutions

- Insurance industry (affordability and equity)
- Banks and underwriters (different risks, different rates?)

Households

- Climate awareness
- Climate justice

Investors

- Asset selection and portfolio allocation
- Location, location, location

Risks, Yes...But Also Opportunities!

Unrelated investment?

-
-
-

Location-based risky assets?

Think about reinsurance !



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