Tips and Tricks for Checking Numbers

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Agenda

- Welcome – Basics and example questions 1 and 2– 15 mins
- 1st Breakout – questions 3-5 –10 mins
- Discuss answers – 10 mins
- 2nd Breakout – questions 6-8 - 12 mins
- Discuss answers and close – 10 mins

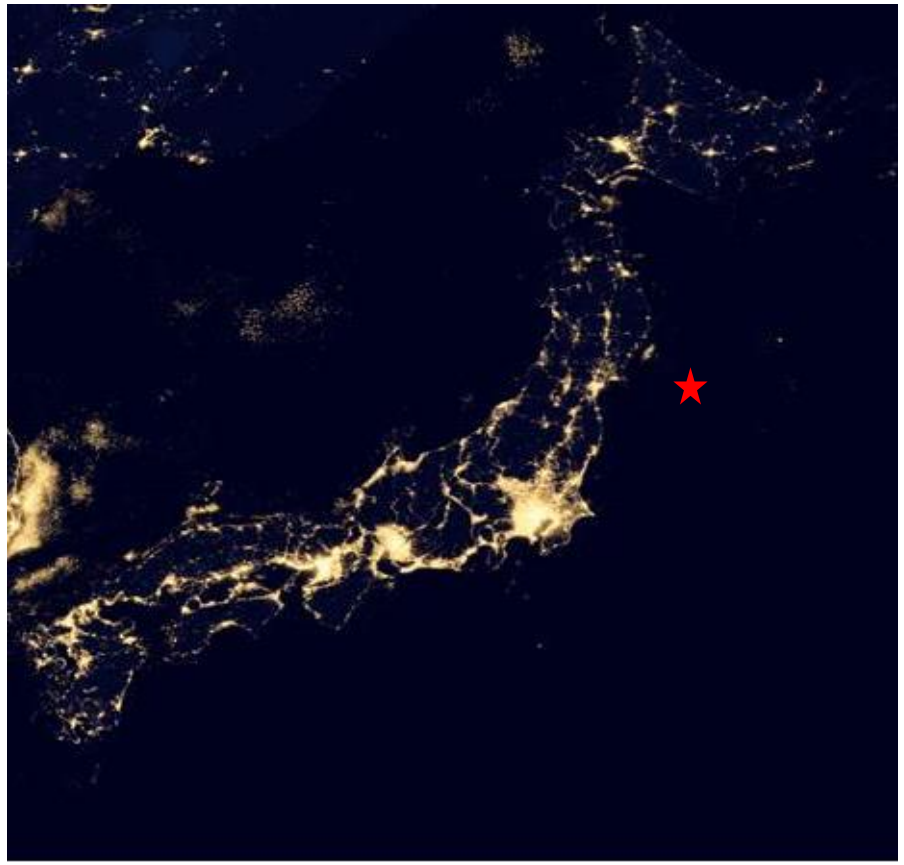
Basics

Ground up > Gross	loss currency
Aggregate >occurrence	Compare losses with previous year
sub portfolio AALs add to portfolio AAL	Compare industry losses with model doc/resource (AAL, 100 year loss)
loss units	Take industry AAL/TIV and 100 yr/TIV from model doc/database and compare with portfolio AAL/TIV and 100 yr/TIV (better match for well distributed portfolios)
Check SQL script results match UI	Check RP of industry event loss on industry EP curve is similar to that of company's event loss on its EP curve. If not, think why.
	Real time: Multiply company's market share by industry loss to benchmark expected company's loss vs Real time portfolio loss estimate

1) Materiality of sub-perils

Approximately what proportion of industry insured loss from the Tohoku earthquake (Mar 2011, Japan) was due to tsunami?

A) <20%, B) 20-40% C) 40-100%



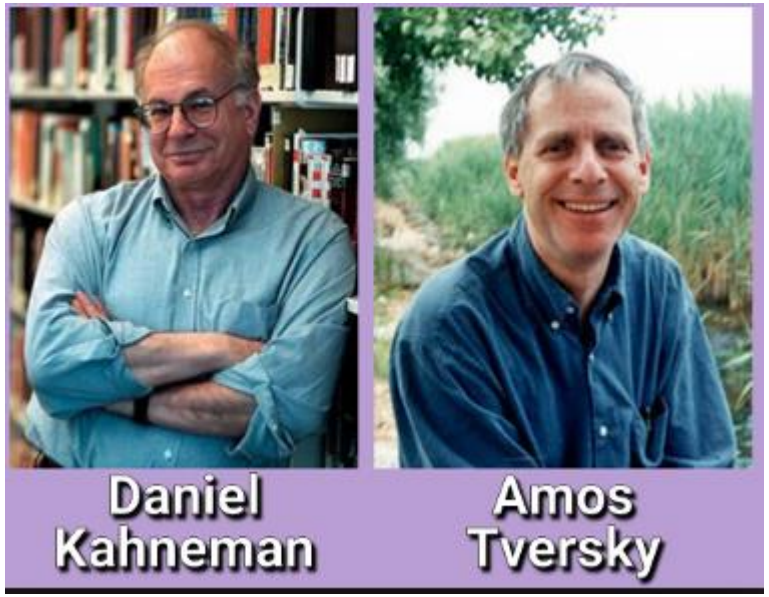
Counterintuitives

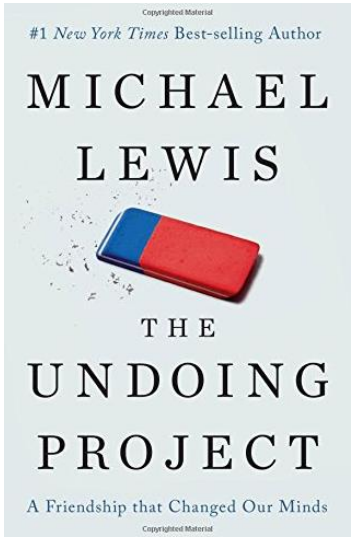
Adjective: contrary to intuition or to common-sense expectation.

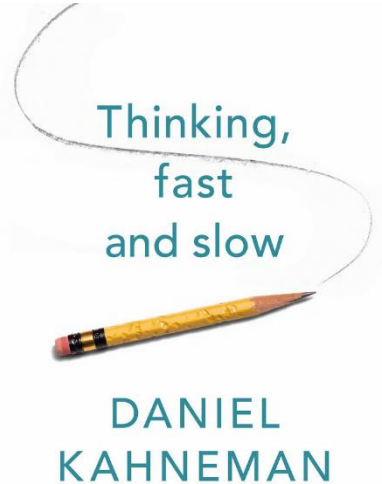
Kahneman and Tversky's Availability Heuristic

The availability heuristic operates on the notion that if something can be recalled, it must be important, or at least more important than alternative solutions which are not as readily recalled.[1] … **the easier it is to recall the consequences of something the greater those consequences are often perceived to be.**

- Many people think that the likelihood of dying from shark attacks is greater than that of dying from being hit by falling airplane parts, when more people actually die from falling airplane parts.





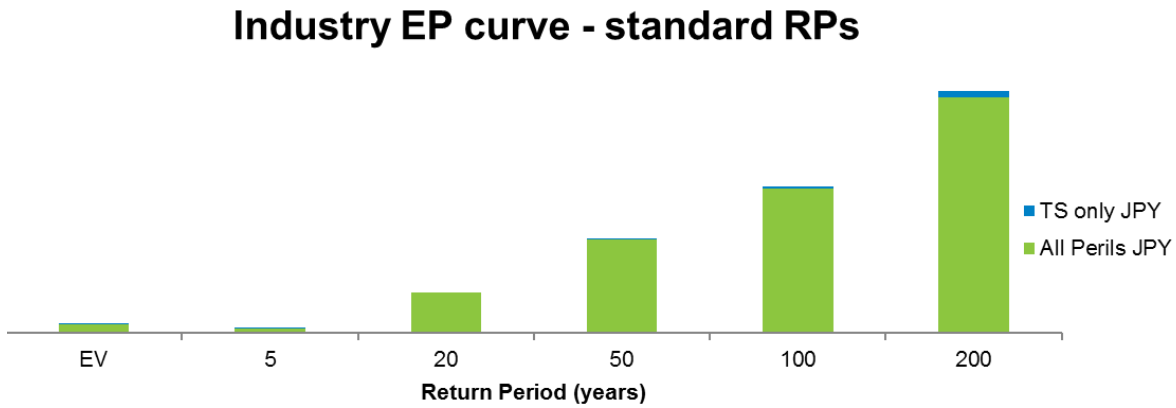


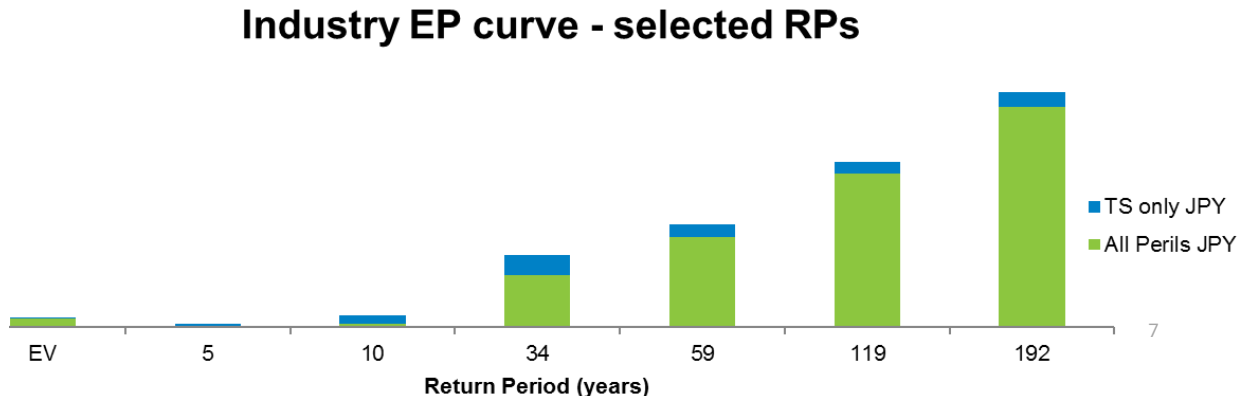
1) Materiality of sub-perils

Approximately what proportion of the loss from Tohoku earthquake (Mar 2011, Japan) was due to tsunami?

A) <20%, B) 20-40% C) 40-100%

If I run a portfolio without tsunami and then run with tsunami, approximately how much should my AAL change by, e.g. 0.1%, 1%, 10%, 50%?





2) Return period reasonability

What is the return period of a Hurricane Katrina sized loss (say $90b today) on the industry insured US hurricane EP curve?

A) 20 years, B) 50 years, C) 100 years, D) 200 years

	Gulf Hurricane	U.S. Hurricane
$P_{Loss} > \$90B$	~1%	~5%

1st Breakout

- ISCM leads moderate groups
- Keep screenshot of 3 questions on hand to discuss
- Group nominates individual, other than ISCM lead to give response if called

3) AAL reasonability

UK extratropical cyclone (winter storm) portfolio

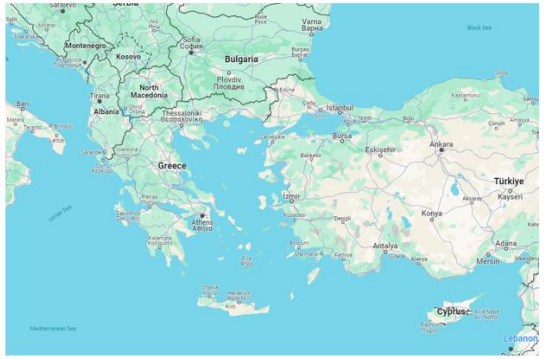
AAL = 300k
TIV = 3m

Is this reasonable?

4) Risk Relative to Exposure Diversification

All else equal (similar exposure distribution, similar EQ risk, vulnerability) – which should be higher, 200-year loss/TIV for Greece or for Cyprus?

Which types of countries (size/region/peril) would you expect the largest 200-year loss/TIV ratios for a *portfolio* of risks in that country?



5) Percentage Changes

My cat model version n+1 losses have decreased a lot compared to my cat model version n losses. Loss decrease is -150% comparing version n+1 to version n.

Is this reasonable?

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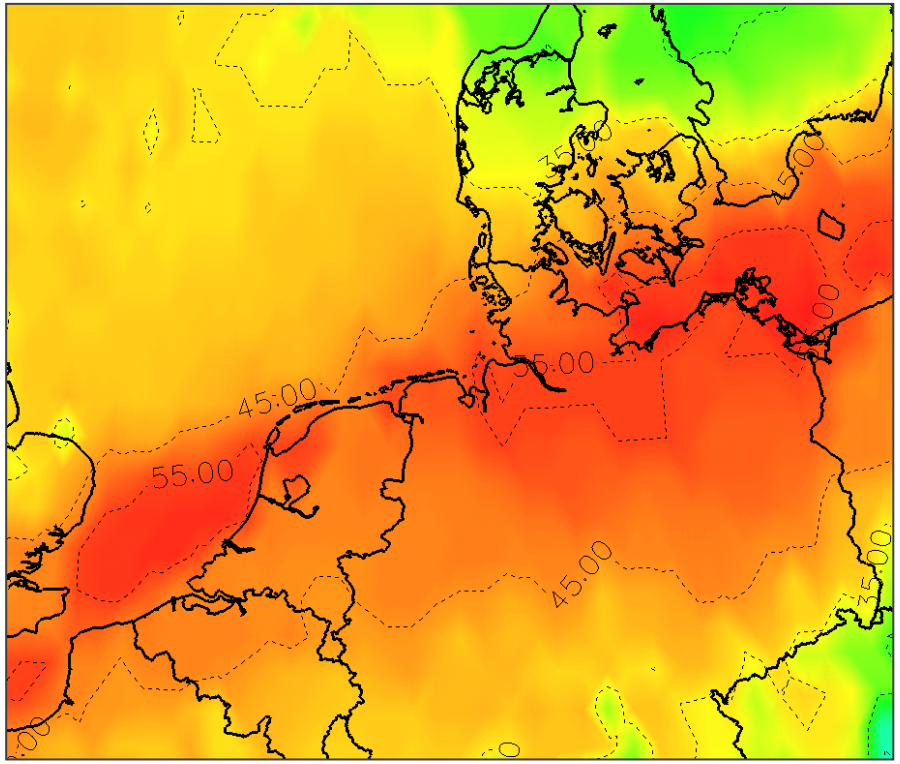
European Windstorm



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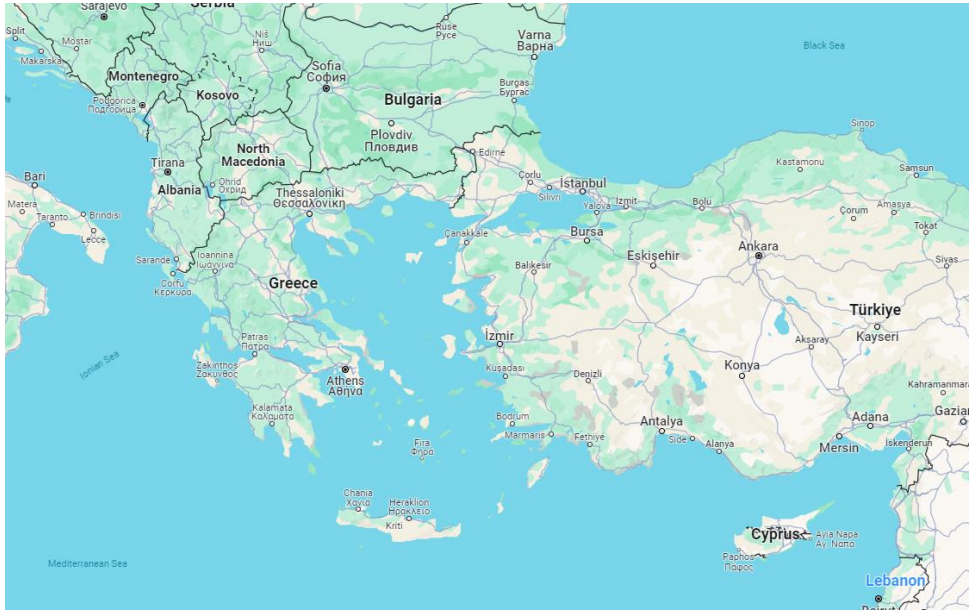

https://en.wikipedia.org/wiki/Hurricane_Irma

St Martin, Irma - “As many as 95% of the buildings there were damaged to some degree; 60% of those were totally uninhabitable”

https://en.wikipedia.org/wiki/Hurricane_Maria#Dominica

Dominica, Maria - “Overall, the hurricane damaged the roofs of as much as 98% of the island's buildings, including those serving as shelters; half of the houses had their frames destroyed.”

5) Percentage Changes

My cat model version n+1 losses have decreased a lot compared to my cat model version n losses. Loss decrease is -150% comparing version n+1 to version n.

Is this reasonable?

Percentage change = new/old - 1

2nd Breakout

- ISCM leads moderate groups
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6) Return Period and PML (probable maximum loss) Reasonability

200 year RP loss on occ basis for a portfolio= 1bn

TIV = 5bn

Is this reasonable?

If this is for 1 location, is it reasonable?

7) Return period for single countries within a domain vs domain wide

I've run the European earthquake model and EP for each country shows they start having a loss around 20-50 year return period.

However, when I look at the EU-wide EP curve there is a loss at much lower RPs, even 2 year. Have I done something wrong?

8) Validation reasonability – return period and market share

I've run the real time/historical loss for a company. The company's market share is 15%. Industry loss is reported at 1b. The cat model is giving a loss to the company for that event of 300m. What factors can lead to the market share vs real time/historical difference?

Which perils are more likely to see this behaviour? Could you see the opposite behaviour (model<observed)? Why?

The return period of the event on the industry is 100 year, but on the company EP curve it's 1,000 years. What should I investigate to understand this further? Are the results wrong?

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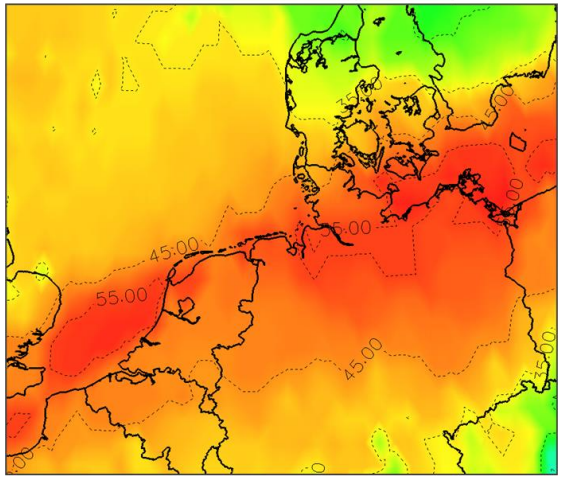
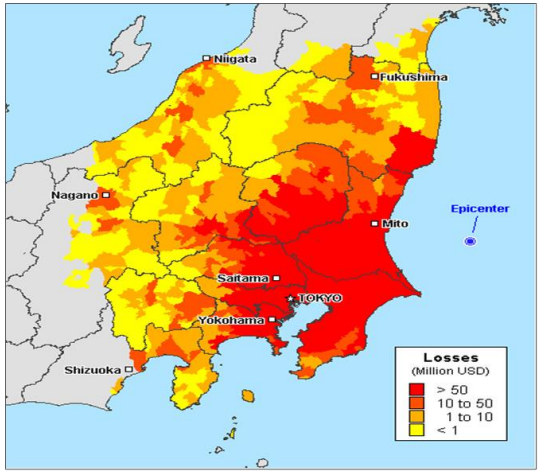


Japan Earthquake - 8.0 Magnitude



	Gulf Hurricane	U.S. Hurricane	U.S. All Perils	Global All Perils
P_{Loss} > $90B	~1%	~5%	~7%	~15%

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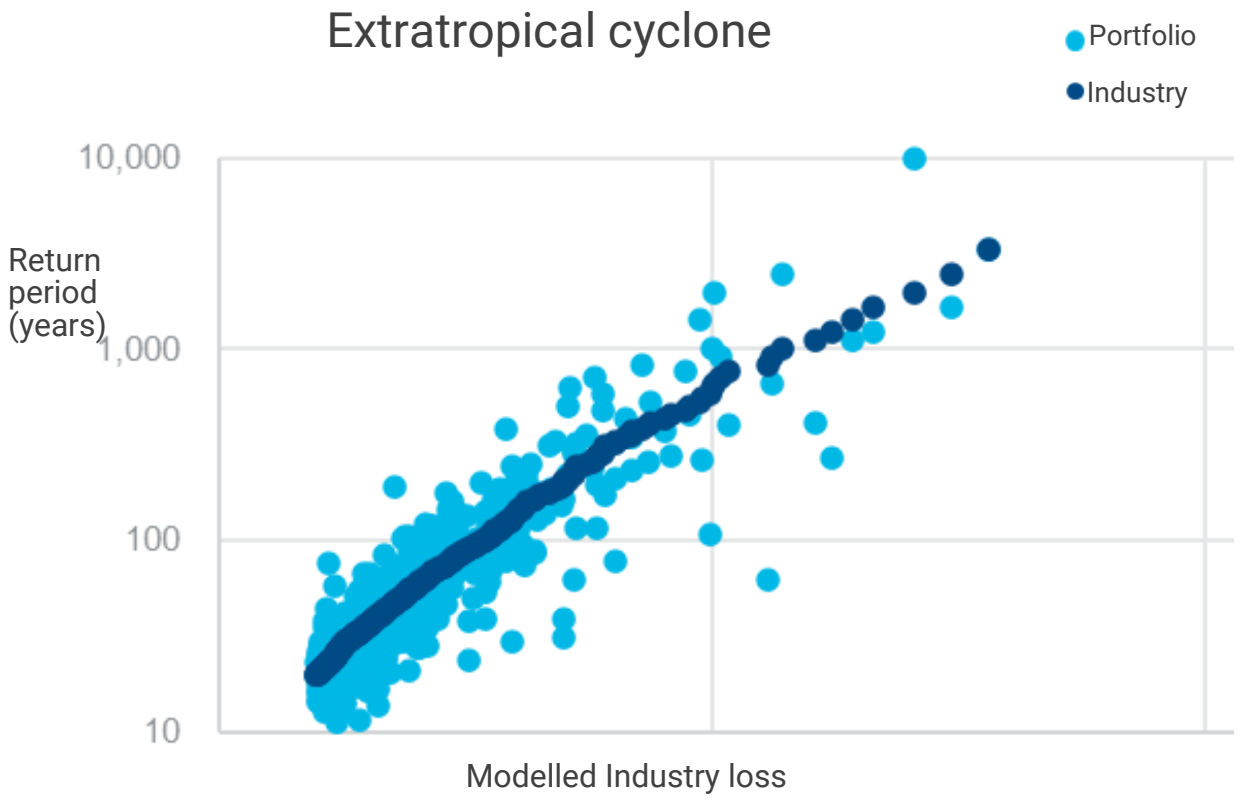
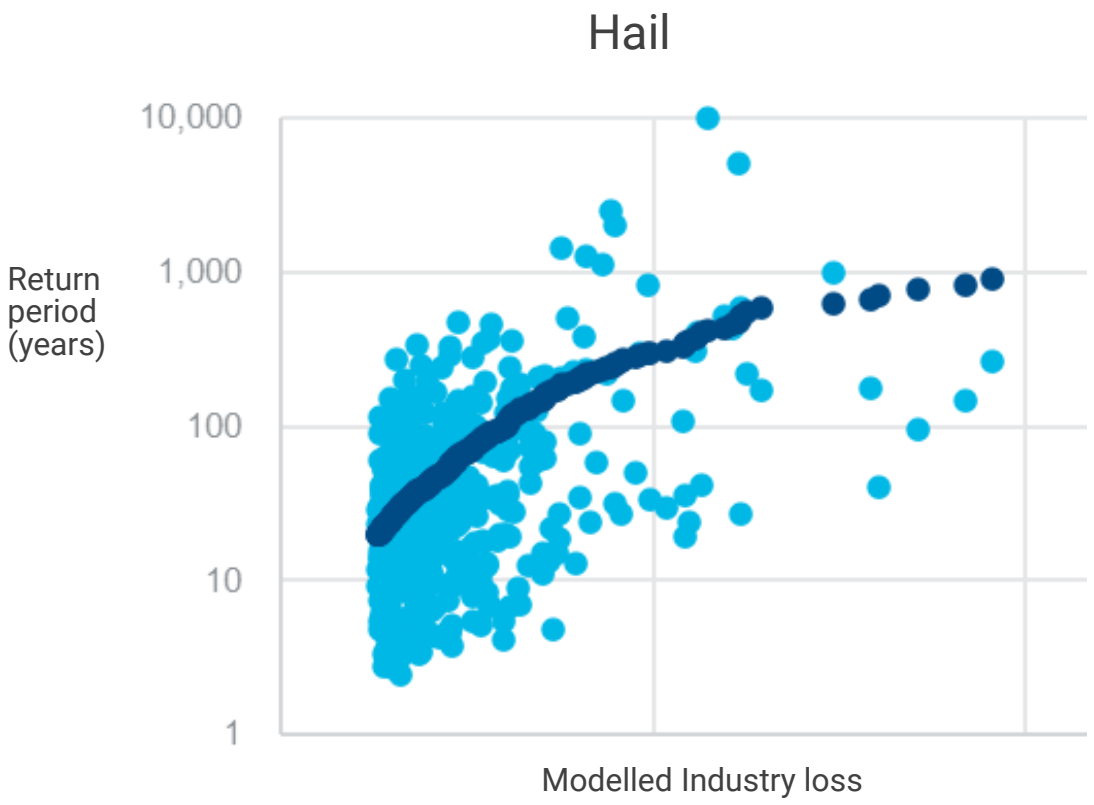
Do Industry and Company Portfolios Always Have Similar Return Periods of Loss? How Does this Vary by Peril?

For highly localised perils like hail, very similar industry losses can have very different implied return periods (similar observation with concentrated exposure). This difference reduces for broad brush perils like extratropical cyclone.





Thank You

Bonus Question: On industry insurable exposure, what is the ratio of the French extratropical cyclone AAL compared to Martinique and Guadeloupe tropical cyclone AAL?

A) About the same (i.e. 1), B) 10 times, C) 50 times