Insights from recent Severe Convective Storm (SCS) activity in Germany

Bastian Manz

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SCS Trends Europe/ Germany

SCS is dominant aggregate loss driver over last 20 years.
- SCS > ETC due to motor claims

Trend in storm losses is exposure driven.

Annual insured losses from SCS in Europe (USD bn, 2023 prices)

Source: Swiss Re

Germany, Property (Storm Coverage)

Source: GDV data

Annual Aggregate Industry Loss
Germany 2002-2022

Source: GDV data
SCS Trends – Accounting for Exposure

**Property (Storm Coverage): approx. 0% p.a.**

- **Loss Rate**
- **Loss Occ. Freq.**

**Motor: +5.5% p.a.**

- **Indexed Industry Loss**
- **Loss Freq.**

**Trend in SCS motor claims but not property**
- offsetting effects?
- Differing hail vulnerability?

**Claims records may not (will not?) reflect concurrent trend in hazard**

**Probability of hail based on ERA-interim 1990-2018 (Pucik et al. 2019)**

**Loss Rate**

- **Loss Occ. Freq.**

**Indexed Industry Loss (Mio. EUR)**

- **Year**

Source: GDV data
(In-) Consistency in hail climatologies?

- Freq. of severe hail potential, CPM model 1999-2019 (Kahraman et al. 2023)
- Average annual hail days (Source: ERA-interim 1979-2014, Verisk)
- Potential Hail Index 1951-2010 (Mohr et al. 2015)
- Summer hail days 2005-2018 (Source: Radar data KIT, Reklim)

Regional anomaly of motor hail loss freq. 1984-2022 (Avg. 6.5 %)

- Different data sources
- Different proxies/methodologies
- Different observational periods
- Different physical mechanisms for hail?
Near miss events: Klaus/Jörn, 2019

How useful are claims records?
SCS near-misses are commonplace!

→ Direct hit on Munich: ~3bn EUR?
→ 2nd largest historical SCS event!

Claims records may not reflect concurrent trend in hazard
- E.g. changes in summertime Omega-like weather pattern

Source: Wilhelm et al. 2021

Source: DWD

24h precipitation totals 11.06.2019

Source: Faszination Wetter
SCS events in central Europe can exhibit strong correlation in space/time, especially in near-stationary stable weather patterns.

**Example Event Definition/Wording:**

...all storm, rain, hurricane, tornado, typhoon, cyclone and hail losses arising from one and the same atmospheric disturbance during a period of 72/96 consecutive hours.

State-of-the-art catastrophe models allow us to explicitly model hours clauses!
SCS-FL Peril Correlation: Lambert, 2023

Max. RP 1-72 hrs rain & hail reports

Insurance Penetration Rate:
Flood Cover

Lambert Loss | Property (mn €) | Motor (mn €)
--- | --- | ---
Insured Loss | 250 (SCS) | 350
SCS (property) | 66% | 
Flood (property) | 34% | Source: GDV/DEVK

SCS vs FL peril separation is an insurance definition

Event-based correlation – accumulation risk

Cross-peril correlation reflected in (new) cat models

Modelling of flash flood risk, especially short-duration urban surface-water flooding remains a challenge!
Exposure: continued loss driver?

Changes in exposure dominate(d) hail loss trends

- Modelled exposure vs. object-level vulnerability

Green transformation of built environment changes vulnerability

| PV/ heat pumps: recent exponential rise set to continue (esp. residential sector) | PV growth correlates with most hail prone regions (southern GER) | PV Vulnerability (AUT):
  Hail resistance of new units
  58% ≤ 3 cm
  28% ≤ 4 cm
  14% ≤ 5 cm |

New PV Installations p.a.

Thank you!