Nat Cat reinsurance trends in CEE

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Reinsurance

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Overview

- Introduction to Sompo Canopius Re

- Nat Cat perils in CEE

- Our view on main Nat Cat reinsurance models in CEE

- How we see Nat Cat insurance and reinsurance prices in those markets

- Final considerations for Reinsurance trends

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Sompo Canopius Re

- A global multiline reinsurer with underwriting operations in key global markets (Bermuda, Singapore, Switzerland, UK, USA)
- A+ S&P rating
- Fast and profitably growing reinsurance company
- Strengthening profile in Continental Europe, offering clients accessibility and strong security
- Established in 2015, Sompo Canopius Re is the combination of the former Canopius and Sompo Japan Nipponkoa Insurance Inc. (SJNKI) reinsurance portfolios
- Unconditional parental guarantee from SJNKI
- SJNKI is one of the top three insurance companies in Japan, part of Sompo Holdings, a group that has been operating since 1880, with total assets of US$106 bn and a market cap of US$15.1 bn *
- Key figures:
  - Reinsurance CR 82% (2016)
  - WW Premium USD 0,5bln

As of 31 Mar 2017

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The team

- London:
  - Jamie Wakeling – Chief Underwriting Officer, Reinsurance
  - Toby Orrow – Head of International Treaty Reinsurance
  - Cat modelling team

- Zurich:
  - Thierry Pelgrin – Head of Continental Europe
  - Lucian Chiroiu – Senior Underwriter
  - Actuarial Dept

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2. Nat Cat perils in CEE

1. Main perils: EQ, flood, hail

    - Peril, Data Quality and Access to Information

        - Uneven Nat Cat penetration rate of main perils in CEE

2. Difference between modelled perils and non-modelled perils in CEE

- Earthquake is a major tail risk (Romania, Croatia, and, in a lesser extent, Slovenia, Bulgaria).

- The GFZ Research Centre site has some fairly useful generic information on relative risk in Eastern Europe: http://www.gfz-potsdam.de/en/section/seismic-hazard-and-stress-field/projects/previous-projects/probabilistic-seismic-hazard-assessments/gshap/

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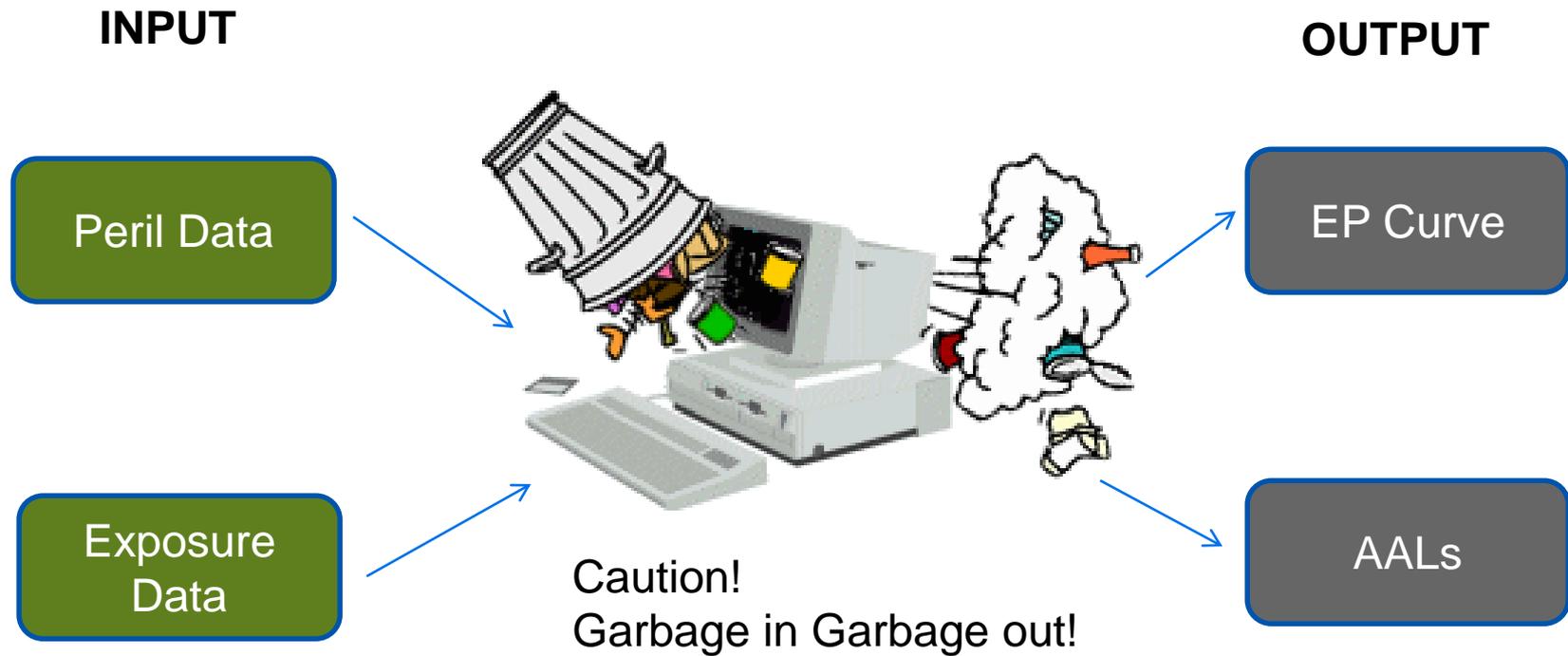
2. Nat Cat perils in CEE

- Main issues often encountered by reinsurers in practice:
  - Is natural hazard properly incorporated in the basic policy pricing?
  - Collecting information about the risk
  - Construction quality and comparison with Western Europe
  - Data quality is key

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2. Nat Cat perils in CEE

- Historical losses in CEE :

Summary of losses	Loss in EUR
1997 Jul flood (CZ, PL, SK)	445,708,276
2002 Aug flood (CZ, SK)	1,015,094,676
2007 Jan Kyrill storm (CZ, PL, SK)	145,077,867
2009 Jun flood (CZ, PL, SK, HU)	139,944,208
2010 May-Jun flood (CZ, PL, SK, HU)	517,942,295
2010 Aug flood (CZ, PL, SK)	141,315,734
2013 Jun flood (CZ, PL, HU, SK)	268,670,061
2014 Sofia hail (BG)	100,221,372

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Importance of data

INPUT

OUTPUT

Peril Data

Exposure Data

EP Curve

AALs

Caution!
Garbage in Garbage out!

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Defining a vulnerability function

Exposure Data

Geocoding

Occupancy

Construction

Building Height

Year of Construction

Secondary Modifiers

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2. Nat Cat perils in CEE

- Other aspects (modelled / non-modelled perils):
  - Perils other than flood and EQ have produced significant losses to both insurers and reinsurers, e.g. hail , weight of snow or even flash floods
  - These perils remain unmodelled, however the risk has to be accounted for in order to avoid surprises

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3. Our view on main Nat Cat reinsurance models in CEE:
  - General model features
  - Models in CEE

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Cat model components

- Event Set
  - Series of hypothetical events which could occur for a given peril

- Hazard Model
  - Footprint of each event e.g. geographical distribution of wind speeds

- Vulnerability Model
  - Describes relationship between hazard (wind speeds, ground motion) and damage

- Financial Model
  - Applies insurance terms to the ground up loss and calculates key metrics

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Cat model components

Event Set	→	Hazard Module	→	Vulnerability Module	→	Financial Module
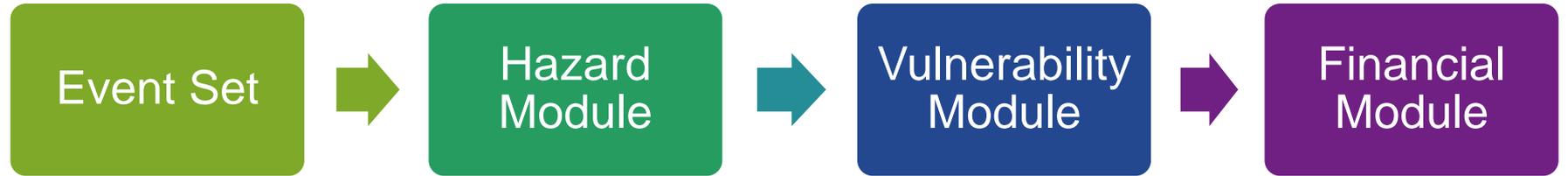
Event 1

Miami destroyed
1 in 100,000 years

Shockwave overpressure of 50 psi + over 200km radius

100% damage

100% X $500m = $500m

Event 2

Small asteroid shower
1 in 400 years

Shockwave overpressure of 2 psi over 5km radius

Wood frame = 10% damage

Concrete = 2% damage

(10% X $10m) + (2% X $3m) = $1.06m

Average Annual Loss =
($500m * 0.00001) +
($1.06m * 0.025)
= $7,650

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Components: Vulnerability model

- Calculates damage to a location given wind speed / ground motion etc
- Damage is expressed in terms of a mean damage ratio (repair cost / replacement value)
- Mean is based in claims data from multiple events (where available)
- Model is typically more robust for residential than commercial due to larger availability of claims data
- Also less uncertainty in Florida versus Northeast
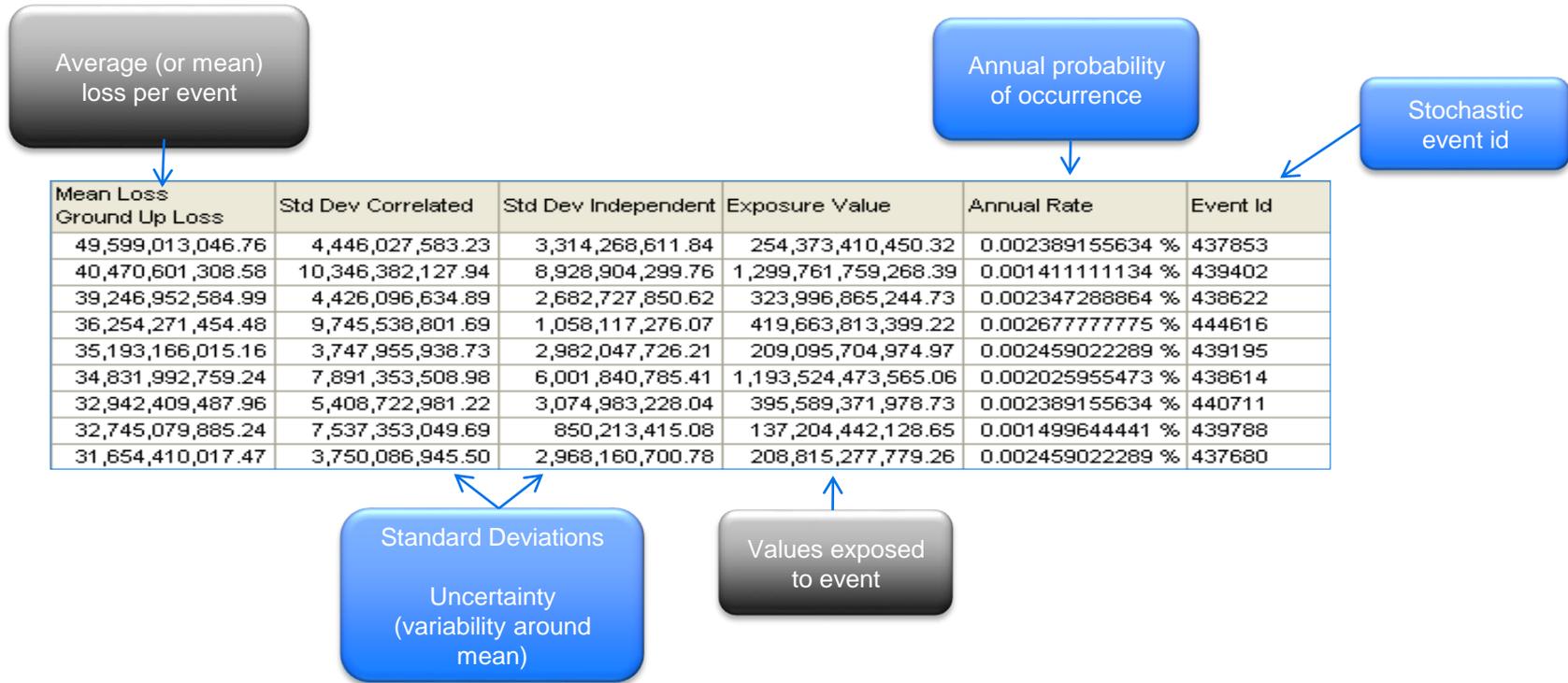- For EQ there is much greater uncertainty and some degree of reliance on engineering approach

Hurricane Vulnerability Function
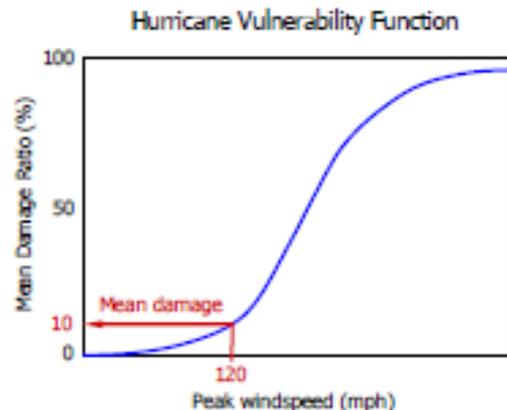
A building's vulnerability at a given hazard intensity is measured by its mean damage ratio

$$MDR = \frac{average\ loss}{replacement\ value}$$
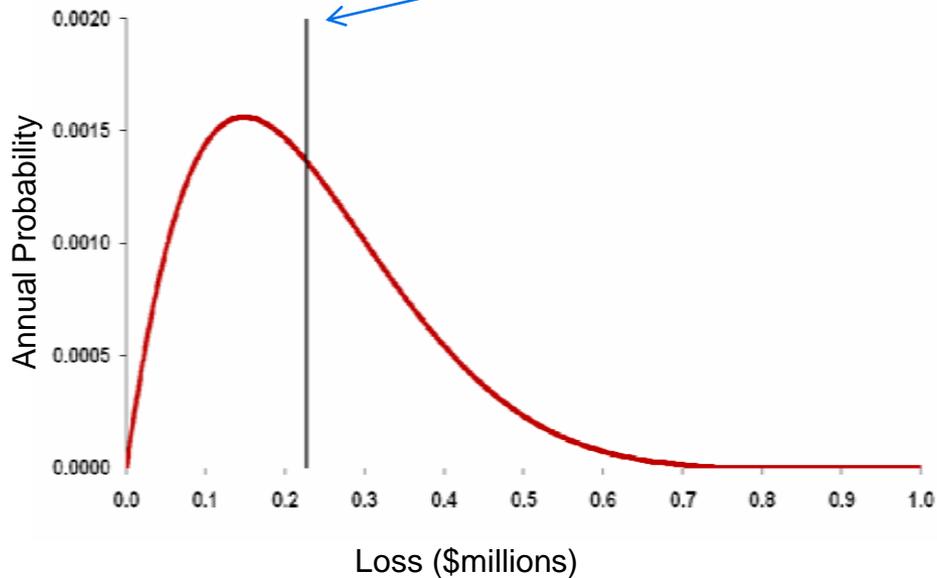
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Components: Financial model

- Applies calculated damage ratio to insured values to give ground up financial losses
- Applies insurance terms such as lines, limits, deductibles and reinsurance
- Expresses financial losses as key metrics
  - Event Loss Table (ELT)
  - Pure Premium or Average Annual Loss (AAL)
  - Exceedance Probability Curve (EP Curve)

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Event Loss Table (ELT)

Average (or mean) loss per event

Annual probability of occurrence

Stochastic event id

Mean Loss Ground Up Loss	Std Dev Correlated	Std Dev Independent	Exposure Value	Annual Rate	Event Id
49,599,013,046.76	4,446,027,583.23	3,314,268,611.84	254,373,410,450.32	0.002389155634 %	437853
40,470,601,308.58	10,346,382,127.94	8,928,904,299.76	1,299,761,759,268.39	0.001411111134 %	439402
39,246,952,584.99	4,426,096,634.89	2,682,727,850.62	323,996,865,244.73	0.002347288864 %	438622
36,254,271,454.48	9,745,538,801.69	1,058,117,276.07	419,663,813,399.22	0.002677777775 %	444616
35,193,166,015.16	3,747,955,938.73	2,982,047,726.21	209,095,704,974.97	0.002459022289 %	439195
34,831,992,759.24	7,891,353,508.98	6,001,840,785.41	1,193,524,473,565.06	0.002025955473 %	438614
32,942,409,487.96	5,408,722,981.22	3,074,983,228.04	395,589,371,978.73	0.002389155634 %	440711
32,745,079,885.24	7,537,353,049.69	850,213,415.08	137,204,442,128.65	0.001499644441 %	439788
31,654,410,017.47	3,750,086,945.50	2,968,160,700.78	208,815,277,779.26	0.002459022289 %	437680

Standard Deviations

Uncertainty (variability around mean)

Values exposed to event

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ELT components – Mean and SD

Distribution for a single event

Mean = average loss for the event
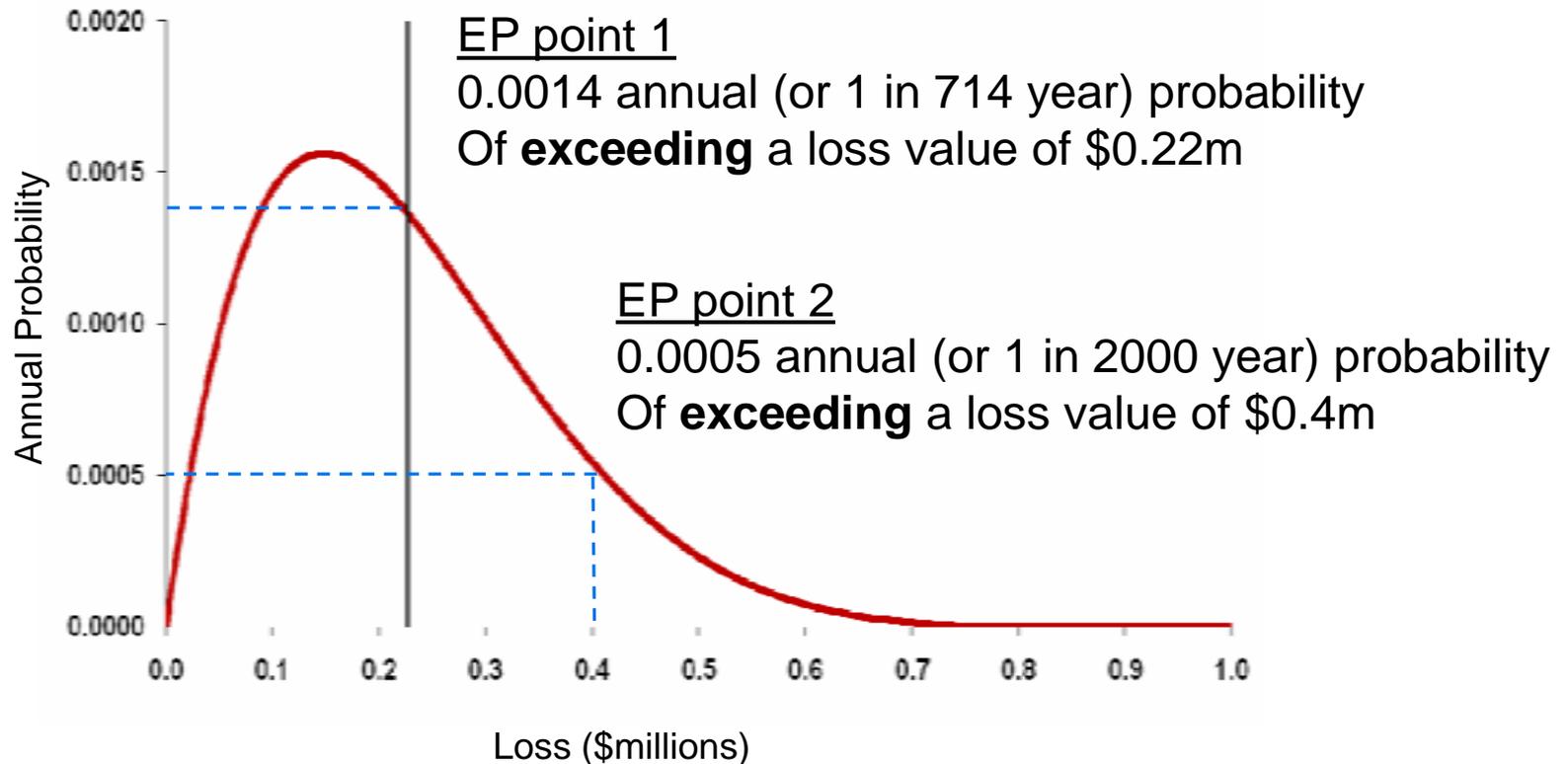

Loss ($millions)

Standard Deviation (SD) = a measure of how tightly the values in a set of data are clustered around the mean.

The greater the SD the greater the uncertainty/variation surrounding the mean value.

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Exceedance probability (EP) curve

Distribution for a single event

EP point 1
0.0014 annual (or 1 in 714 year) probability
Of **exceeding** a loss value of $0.22m

EP point 2
0.0005 annual (or 1 in 2000 year) probability
Of **exceeding** a loss value of $0.4m

Return Period = 1/Annual Probability

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Models in CEE

- Cat models were developed for CEE in early 2000s , alongside with Romania EQ and Czech Rep Flood models
- Since then, most of the territories are covered for the key perils by both broker (Aon, Willis, GC) and commercial models (EQE, RMS, AIR)
- Data vintage and limited coverage of models
- Despite the modeling offer, there is - fortunately - little data to validate the models
- There is a lot of uncertainty around the modeling, especially at large return period. Features such as impact of flood protections or the depth of the earthquake are very difficult to quantify and incorporate with a high degree of reliability in a model
- For lower return periods, the lack of small events in the recent years is also challenging the models, as the burning cost / experience is usually well under the modeling results.
- Every model is based on assumptions, and does not provide an exact answer. It only gives a technical indication, and the risk managers / underwriters should understand this in their decision process

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Models in CEE – how confident can we be?

- They are new (in a global sense)
- They deal with the three 'difficult to model' perils, for example:
  - Earthquake modelling in New Zealand where the Christchurch fault line was not specifically modelled
  - Japan where the event catalogue did not include a magnitude 9 on the Richter scale nor tsunami peril
  - Motor losses are affected by the day of the week and time of the day and also the colour of the car !
- There is limited historical data on which to calibrate the output (eg because of previous low/lower insurance take up rates and low frequency of events)
- How do they deal with associated risks such as demand surge/post-loss amplification and, for earthquake, fire-following and liquefaction? .
- However, the models are undeniably a invaluable tool in risk assessment, pricing and capital allocation.

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"With the potential scenarios numerous, diverse and constantly changing, there is no single model or approach that could contemplate all of them. Furthermore, the various disaster scenarios with which carriers are being increasingly confronted needs to be prioritized and synthesized within their enterprise risk management framework. By their very definition, there may be limited data on hand on which to base any modelling. As a result, much of the industry continues to rely on multiple models and actuarial approaches that encompass model applications, probable maximum loss (PML) estimates, realistic disaster scenarios, experience and exposure ratings to create a broad set of scenarios and deterministic views", a recent Guy Carpenter article pointed out.

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4. Our view

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How we see Nat Cat insurance and reinsurance prices

- Economic growth and insurance / reinsurance premium growth opportunities

- Central and East European (CEE) economies saw, in general, a good 2015 and 2016, with an ongoing average regional increase in GWP supported by a solid domestic demand.

- As the economic growth patterns are quite different from country to country in CEE, the extent to which they have resulted in an increased purchasing power of the population and of the local businesses is also different and thus, the growth opportunities offered to insurers and reinsurers are uneven across the region.

- Factors influencing demand:
    - Reinsurance needs the underlying insurance product to exist in the first place
    - Low take up rates, question of affordability and/or knowledge of insurance products
    - Government intervention - increased use of private market to transfer risks previously/currently considered a social issue (residential/agriculture/municipal risks particularly)
    - Reinsurance - solvency II

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How we see Nat Cat insurance and reinsurance prices (con't)

- Most actors in CEE tend to consider that one viable solution would be the establishment of some sort of mandatory insurance scheme for the nat cat risks coverage.

- A mandatory insurance scheme seems to be the most realistic solution for at least increasing awareness, if not significantly reducing the property insurance gap.

- Yet, for the time being no relevant steps were taken in this direction and the political fear of increased tax has discouraged attempts.

- With some exceptions, the CEE insurance markets have seen, at least in GWP terms, positive results in 2016 (also in 2015). Property insurance lines performed well in most CEE countries. Calm years ?

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Final considerations for reinsurance trends

- Potential for insurance (low Cat insurance penetration rate even if growing) and for reinsurance in CEE

- Insurance and reinsurance prices especially remain at bottom level; how long is this sustainable for our industry?

- Capacities :

  - Most of the reinsurance ceded premium in CEE comes from Cat exposure / reinsurance

  - Our days most of the capacities purchased are integrated in the regional group covers, and not purchased on one territory basis

  - PAID Romania is by far the largest capacity bought locally, and of the biggest cat capacities in Europe (approx top 20 in Europe). Further growth feasible for reinsurers?

- Moving forward beyond traditional well-known obstacles in CEE

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- Within the regional group covers, correlation between different countries is also an important topic
- Another challenge for models is to properly consider correlations, between different countries on the same river basin for instance (Czech , Poland etc) or where an EQ can have an impact (Romania and Bulgaria for instance)
- Final thoughts:
  - Demand for larger capacities is ongoing (see Romanian EQ pool e.g.) also driven by S2
  - Type of cover: local cover / regional cover / pool / group cover is very diversified and calls for
    - * different reinsurance purchasing attitude
    - * different market response (expected): selected programs or all?

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Thank you!
Any questions?

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