

GEM Partnership Workshop

Domenico Pennucci
GC Analytics, Milan

Pavia
29/11/2017

Agenda

- 1 | LATEST TRENDS IN CAT RISK ANALYTICS AND INSURANCE MARKET NEEDS
- 2 | GUY CARPENTER STRATEGY
- 3 | INTEGRATION OF GEM PRODUCTS

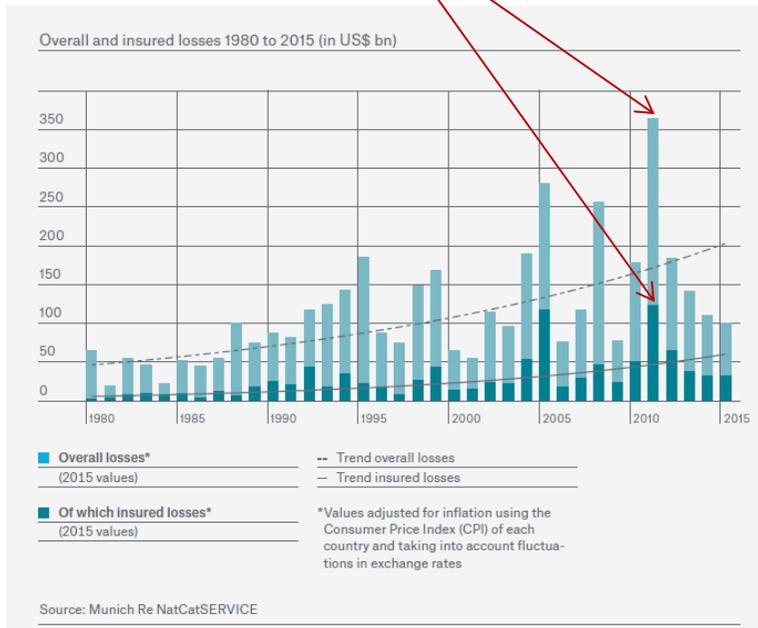
Latest Trends in Cat Risk Analytics & Insurance Market Needs



Attitude Change to Catastrophe Modelling

A Triple Hit in 2011 – Unmodelled losses, Model change, Regulatory pressures

Substantial economic and insured losses from international in 2011, many of which were unmodelled!

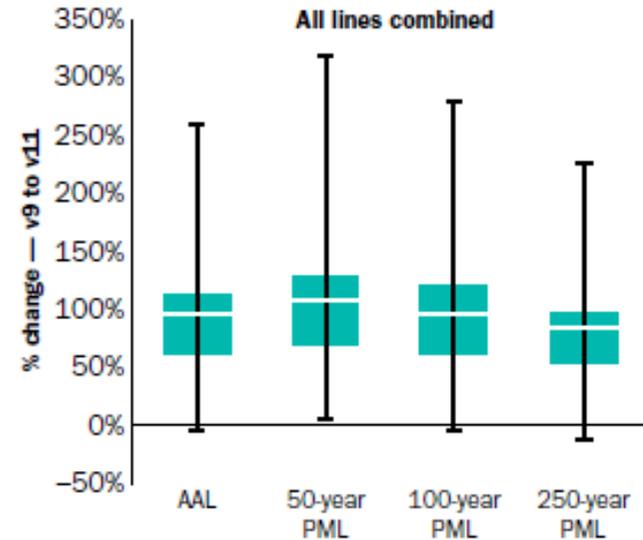


Attitude Change to Catastrophe Modelling

A Triple Hit in 2011 – Unmodelled losses, Model change, Regulatory pressures

And on top of that in 2011 RMS introduced major model change..

- Major overhaul of the North American Hurricane model
 - PML increases of up to 100%
- And in the same year a major update of European windstorm model
 - With a significant change to losses for lower return periods
- Insurers and reinsurers faced with challenge of how to manage model change within the business



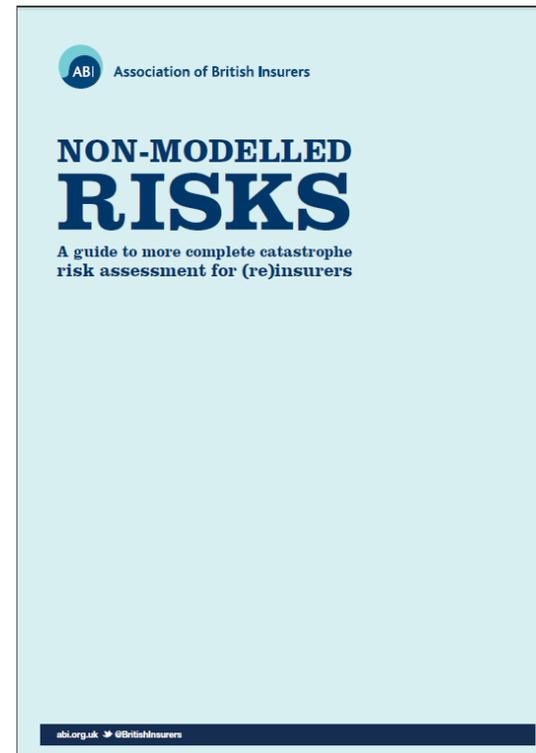
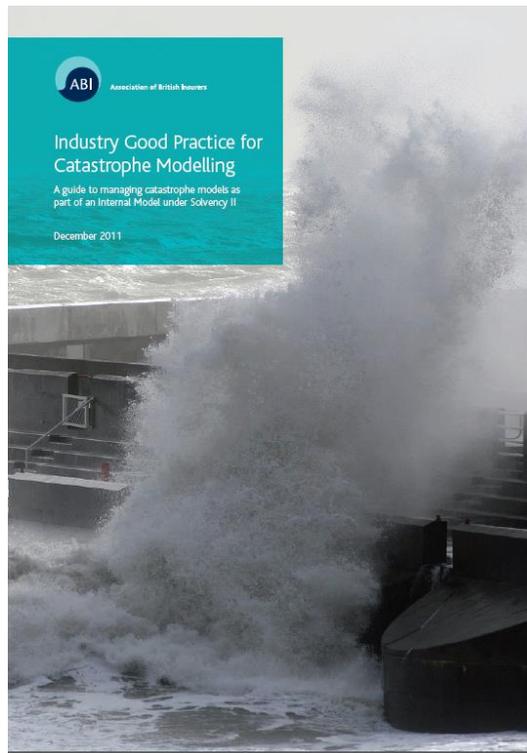
Further big changes expected in 2017/2018 as well, with the release of the first Oasis and RMS HD models, new severe convective storm models by RMS and AIR, etc..

Attitude Change to Catastrophe Modelling

A Triple Hit in 2011 – Unmodelled losses, Model change, Regulatory pressures

And then there were pressures from the regulatory environment..

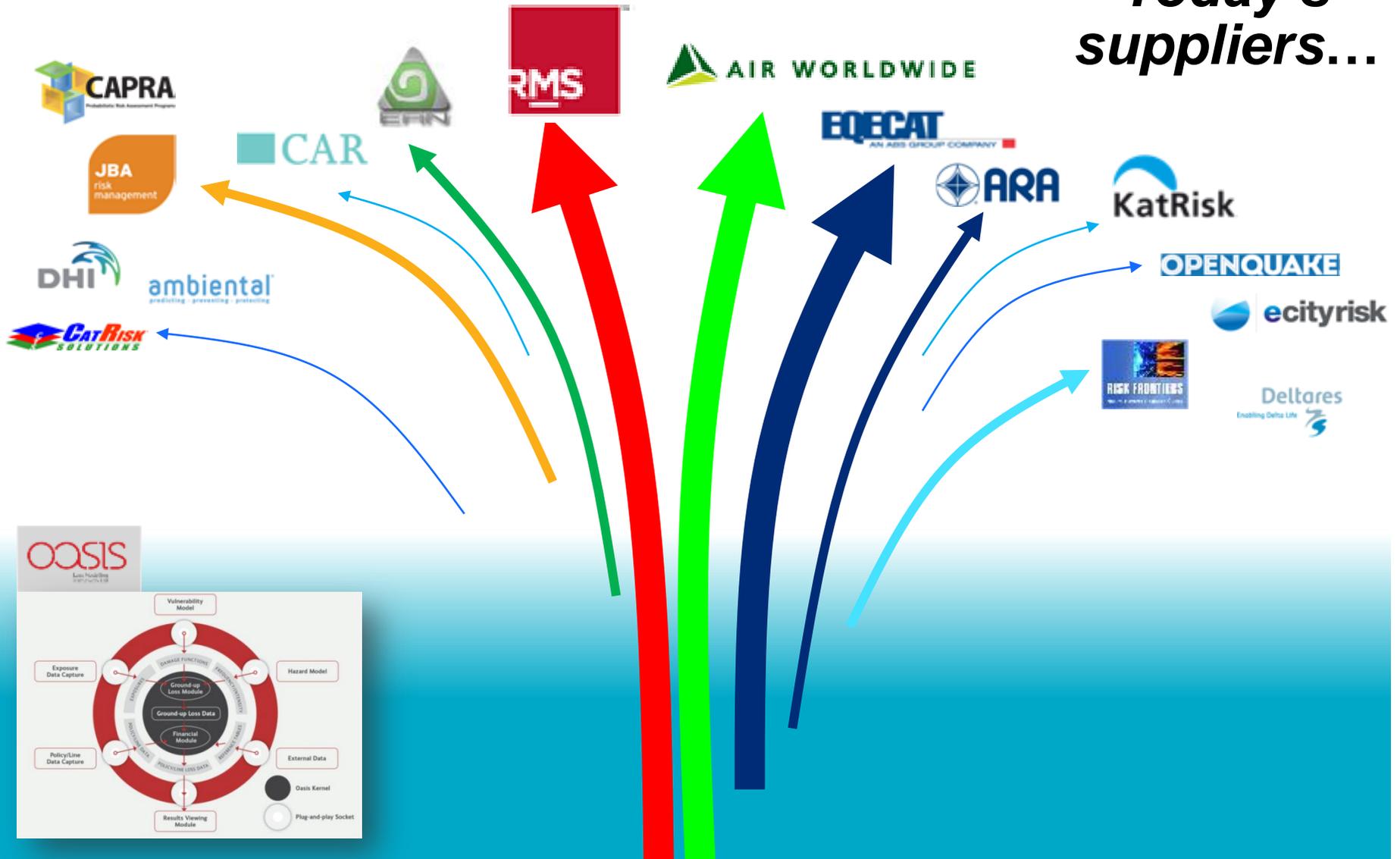
- Solvency II and other regimes insisted that companies demonstrate an understanding of their risk – and take responsibility for their view of risk



Attitude Change to Catastrophe Modelling

Evolution of Catastrophe Model Development Universe

Today's suppliers...



New Trends in Catastrophe Modelling

Emerging activities and new challenges

ADVANCED PTF MANAGEMENT

- More and more interacting functions require a more advanced management of portfolios
- Ever present internet access and modern GIS capabilities allow for an interactive management and mining of ptf's
- Improved availability of hazard maps and more reliable cat models result in more technical underwriting strategies.

NEW GENERATION CAT MODELS

- Unprecedented computation power allowed for the development of complex models (e.g. pan European flood models)
- New models moving to the cloud?

DATA AUGMENTATION / 3D MODELLING

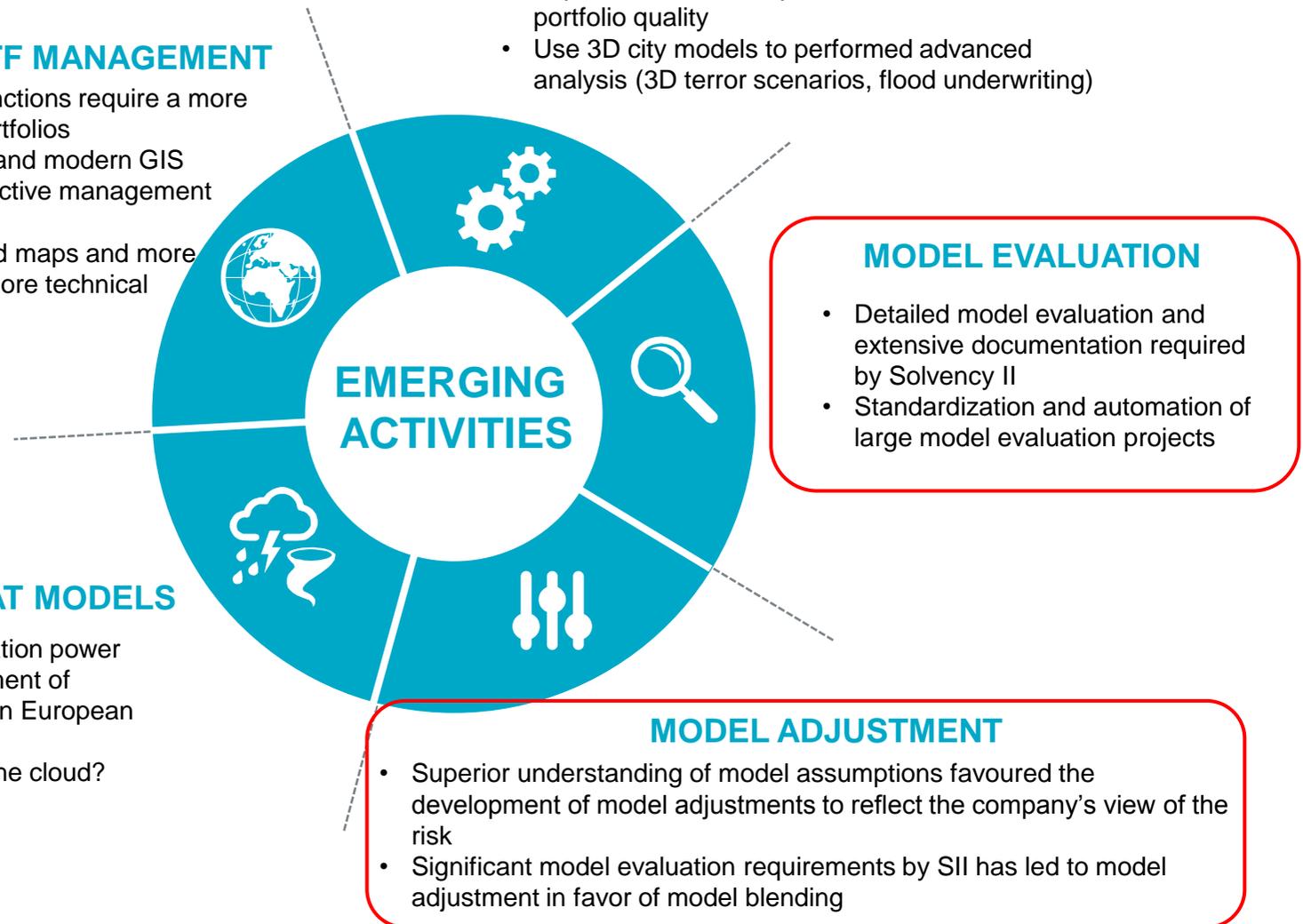
- Exploit satellite and open source data to enhance portfolio quality
- Use 3D city models to performed advanced analysis (3D terror scenarios, flood underwriting)

MODEL EVALUATION

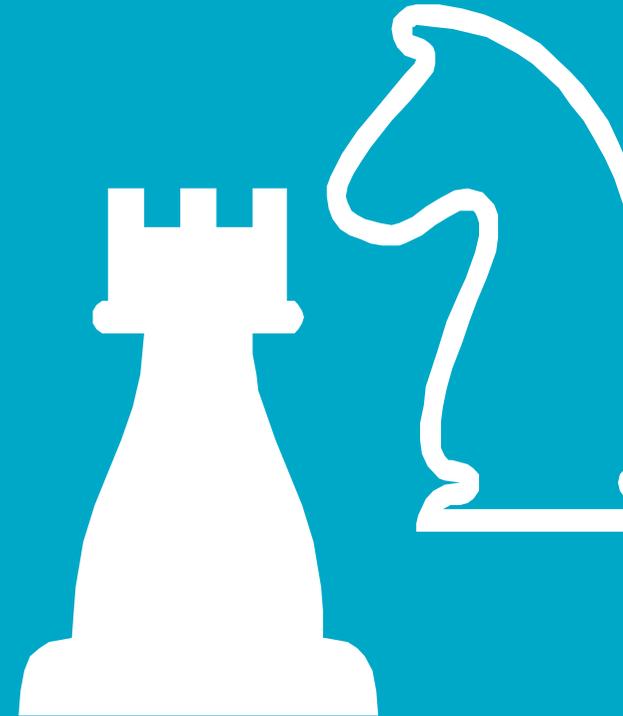
- Detailed model evaluation and extensive documentation required by Solvency II
- Standardization and automation of large model evaluation projects

MODEL ADJUSTMENT

- Superior understanding of model assumptions favoured the development of model adjustments to reflect the company's view of the risk
- Significant model evaluation requirements by SII has led to model adjustment in favor of model blending



Guy Carpenter Strategy & Integration of GEM Products



GC Cat Risk Strategy

Leverage research, development and market reach of commercial vendors

- We pay vendors for their scale
- Common or reference trading currency
- Useful for benchmarking

Support and actively evaluate new entrants

- Licence models and data from JBA, KatRisk, ERN etc
- Founding member of PERILS and OASIS

Fill in material gaps with robust and credible models

- Ranging from scenarios through to full probabilistic (simple to leading-edge)
- Always open and transparent
- Building on best available data and research
- Validated and documented for regulatory use

We do not compete head on with vendors

- Maintain a strong relationship as a client rather than competitor
- Open dialogue

GC Strategy – Model Evaluation

Don't just go and build another model for an already widely covered peril



Instead we aim to understand models and what drives differences

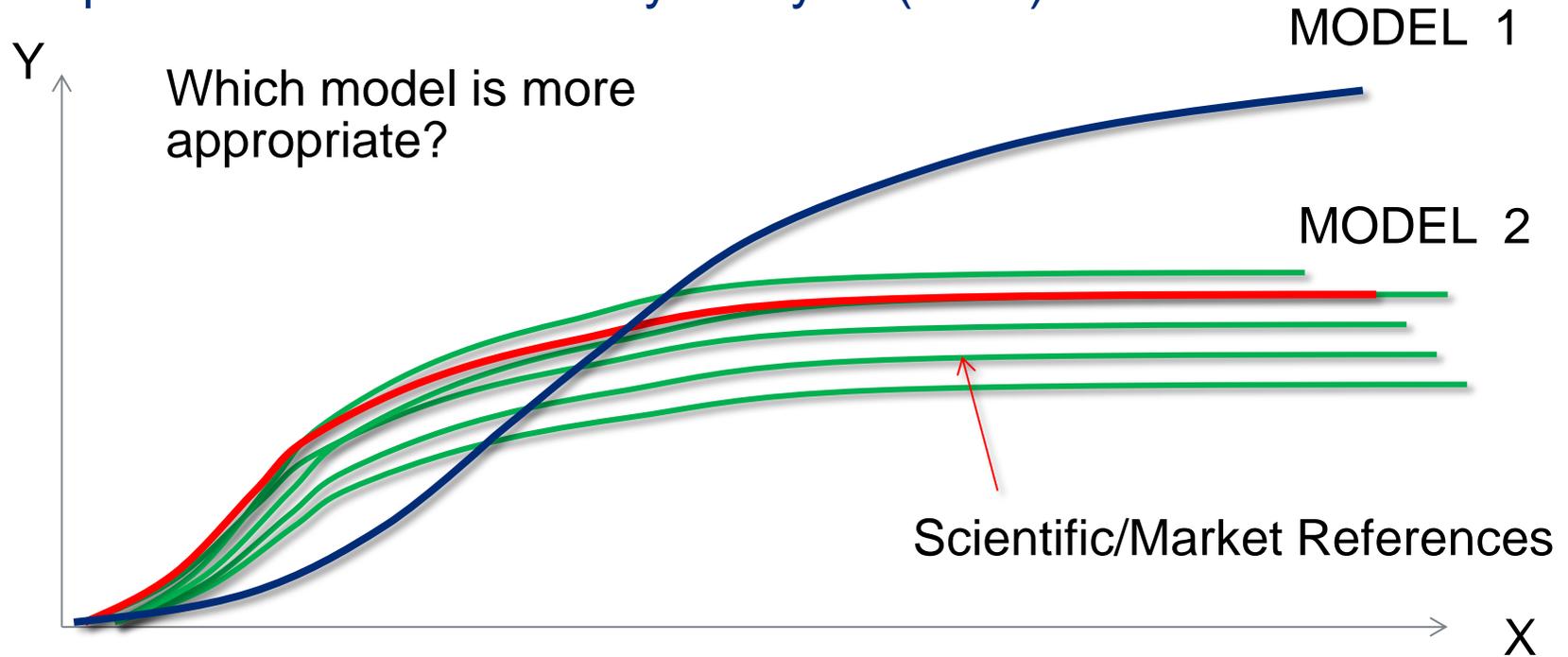
Ensure we make best use of models

- Sensitivity of exposure data attributes
- Sensitivity of modelling assumptions
- Support clients with data cleaning and data enhancement (e.g. 3-D)

Use a consistent and open approach to evaluate existing models

- Independent and unbiased – reference to credible scientific research and data
- Transparent
- Leverage our own expertise
- Make adjustments where supported by the analysis

Guy Carpenter's Model Suitability Analysis (MSA)[®]



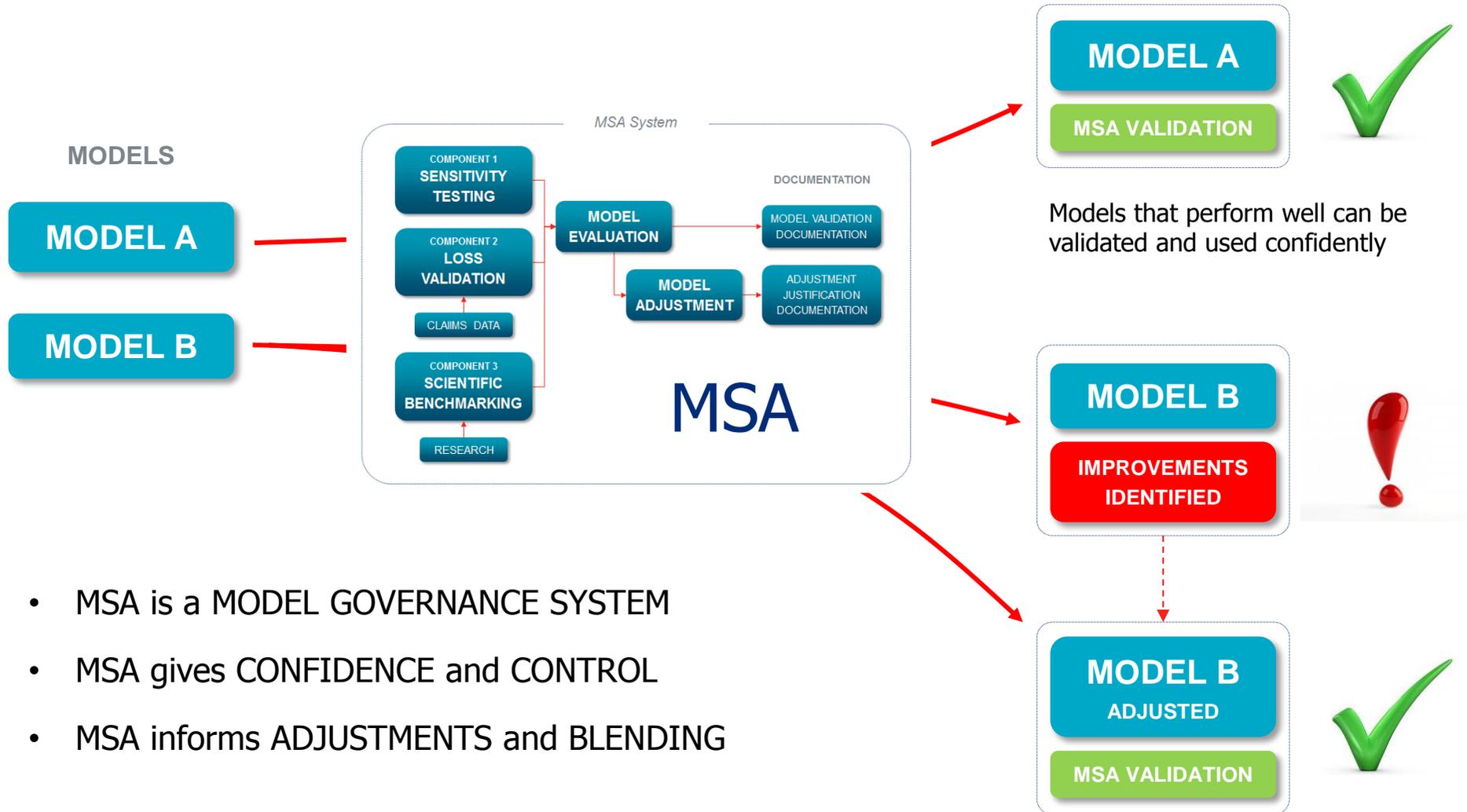
MSA Validation is:

- Independent
- Unbiased
- Transparent
- Standardized

Supported by more than 20 research collaborations:



Guy Carpenter's Model Suitability Analysis (MSA)[®]



- MSA is a MODEL GOVERNANCE SYSTEM
- MSA gives CONFIDENCE and CONTROL
- MSA informs ADJUSTMENTS and BLENDING

How can GEM activities fit in all this

- GEM represents an unmatched central repository of cutting edge knowledge in the field of earthquake hazard/risk
- Uniformity of output and approaches enables direct streamlining of research data into business
- Full transparency of assumptions and data implementation (eg. availability of openquake input files) is very valuable
- Ease of replicability and customization of important international research studies (eg. SHARE, EMME, etc.) via OpenQuake allows for an even greater flexibility and deeper understanding, never available before.

How can GEM activities fit in all this

- New challenges ahead for the vulnerability/fragility field, which presents specific difficulties and complications compared to hazard evaluation
- GEM contribution in the field of vulnerability can be even greater, potentially filling the gaps and providing an ordered structure to a rather chaotic domain
- Historically, cat model development/evaluation/documentation has been focused on hazard much more than vulnerability..
- ..GEM work on vulnerability can help stimulate the discussion on next gen vulnerability evaluation/development, ultimately resulting in more transparent and more reliable EQ risk models.



Guy Carpenter ® Disclaimer

The data and analysis provided by Guy Carpenter herein or in connection herewith are provided "as is", without warranty of any kind whether express or implied. The analysis is based upon data provided by the client or obtained from external sources, the accuracy of which has not been independently verified by Guy Carpenter. Neither Guy Carpenter, its affiliates nor their officers, directors, agents, modelers, or subcontractors (collectively, "Providers") guarantee or warrant the correctness, completeness, currentness, merchantability, or fitness for a particular purpose of such data and analysis.

The data and analysis is intended to be used solely for the purpose of Client internal evaluation and client shall not disclose the analysis to any third party, except its reinsurers, auditors, rating agencies and regulators, without Guy Carpenter's prior written consent. In the event that client discloses the data and analysis or any portion thereof, to any permissible third party, client shall adopt the data and analysis as its own. In no event will any Provider be liable for loss of profits or any other indirect, special, incidental and/or consequential damage of any kind howsoever incurred or designated, arising from any use of the data and analysis provided herein or in connection herewith.



Guy Carpenter & Company, LLC provides this report for general information only. The information and data contained herein is based on sources we believe reliable, but we do not guarantee its accuracy, and it should be understood to be general insurance/reinsurance information only. Guy Carpenter & Company, LLC makes no representations or warranties, express or implied. The information is not intended to be taken as advice with respect to any individual situation and cannot be relied upon as such. Please consult your insurance/reinsurance advisors with respect to individual coverage issues. Readers are cautioned not to place undue reliance on any calculation or forward-looking statements. Guy Carpenter & Company, LLC undertakes no obligation to update or revise publicly any data, or current or forward-looking statements, whether as a result of new information, research, future events or otherwise. Statements concerning tax, accounting, regulatory or legal matters should be understood to be general observations based solely on our experience as reinsurance brokers and risk consultants and may not be relied upon as tax, accounting, regulatory or legal advice, which we are not authorized to provide. All such matters should be reviewed with your own qualified advisors in these areas. This document or any portion of the information it contains may not be copied or reproduced in any form without the permission of Guy Carpenter & Company, LLC, except that clients of Guy Carpenter & Company, LLC need not obtain such permission when using this report for their internal purposes. The trademarks and service marks contained herein are the property of their respective owners.