Property Catastrophe: "Own Your View of Risk"

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Outline

- How insurance/reinsurance practitioners use vendor models to quantify catastrophe risk
  - Prevailing practices
  - Challenges and issues
- Own your view of risk
  - Why it is important to establish your view of risk
  - Is this possible?
- Examples

Prevailing practices

- How insurance/reinsurance practitioners use vendor models today
  - Many companies use the “off-the-shelf” vendor model outputs for pricing and portfolio management
  - Some companies make *ad hoc* adjustments based on
    - Short record of client loss history
    - Qualitative arguments

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Owning your view of risk

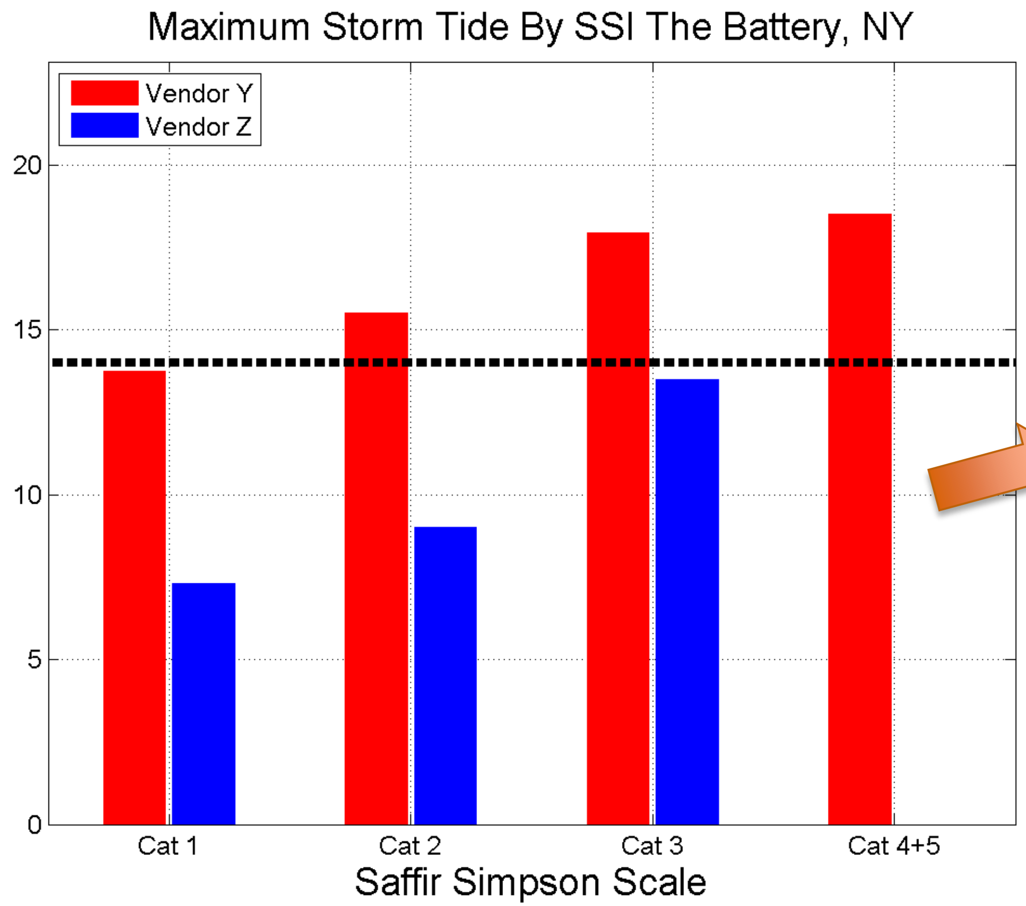
- Why this is important
  - Any bias or error in the vendor model will flow through to market pricing
  - Time lag in including the latest science from the large academic community and the best data collected from the industry
  - Vendors' priority of geographical and peril coverage does not necessarily align perfectly with every user

- Examples
  - Storm surge under-estimation
  - Substantial deviation from historical experiences
  - Vulnerability curve not calibrated based on latest claims data
  - Vendor model does not include all possible large events (Tohoku EQ and Christchurch EQ)

The importance of owning your view of risk

- Example 1: Storm surge under-estimation

Observed Sandy storm tide



No loss-causing surge events for Vendor Z

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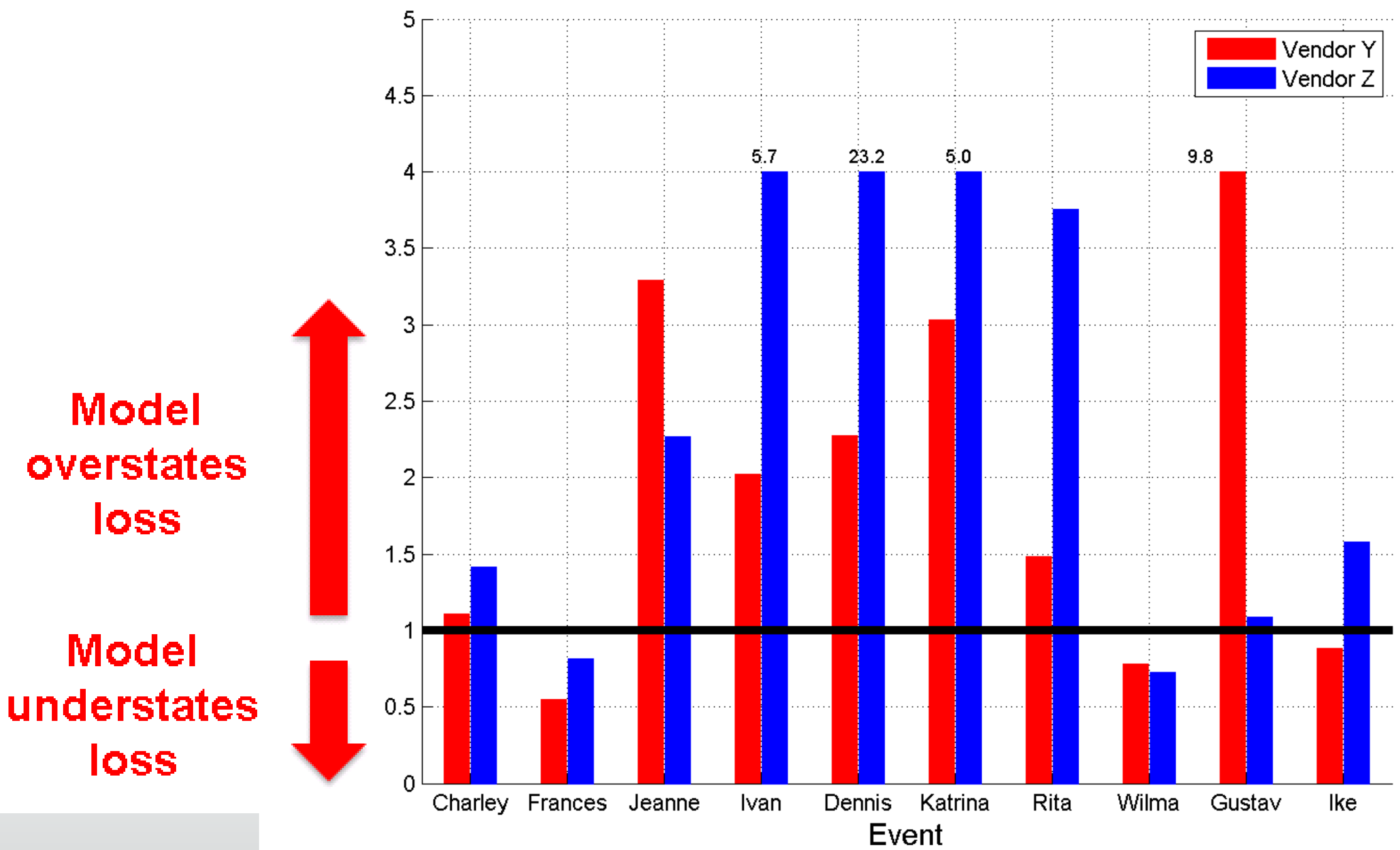
- Example 2: substantial deviations from historical experiences



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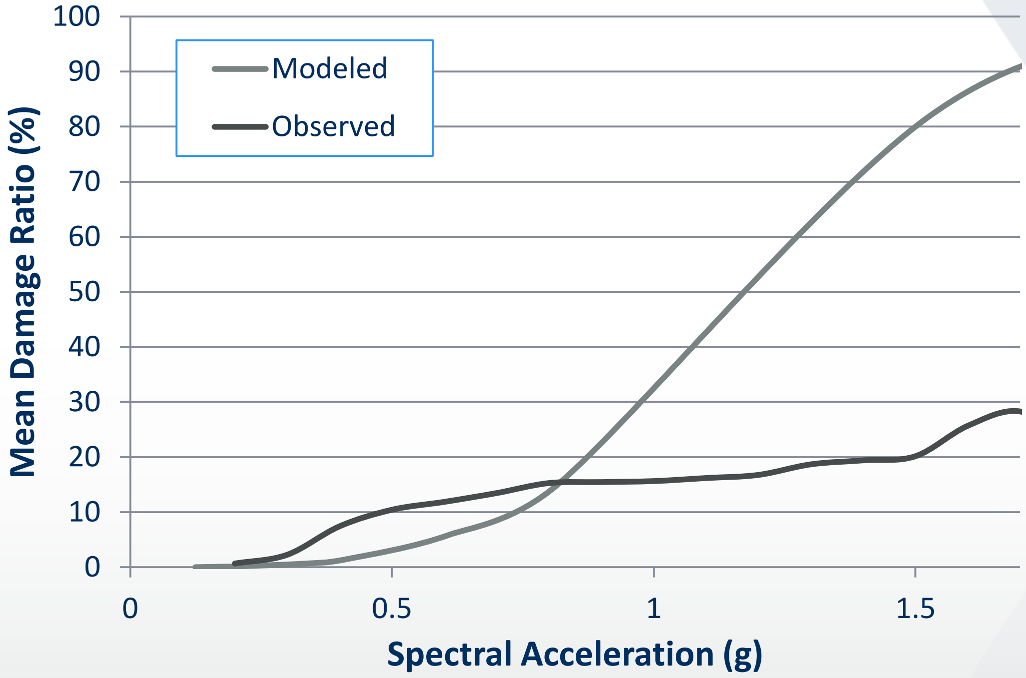
- Example 3: Vulnerability curve not calibrated based on latest claims data



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Feasibility of owning your view of Risk

- Is it possible for an insurer/reinsurer to own its view of risk, given the substantial investments made by vendors in science and data?
- From a science perspective
  - Fundamental theories are mostly in the public domain and are equally accessible by both the vendors and insurers/reinsurers
  - Proprietary information: specific partnership can be used to obtain necessary private information
  - Internal research: an insurer/reinsurer can choose to focus resources on specific perils that are most important to its business
- From a data perspective
  - Claim data: major insurers have the best data to calibrate the model
  - Industry data: large reinsurers have best access
- Different business models
  - Vendors must serve their entire clientele; this requires extreme caution when making changes
  - An insurer/reinsurer can focus on its own business needs and make decisions more efficiently

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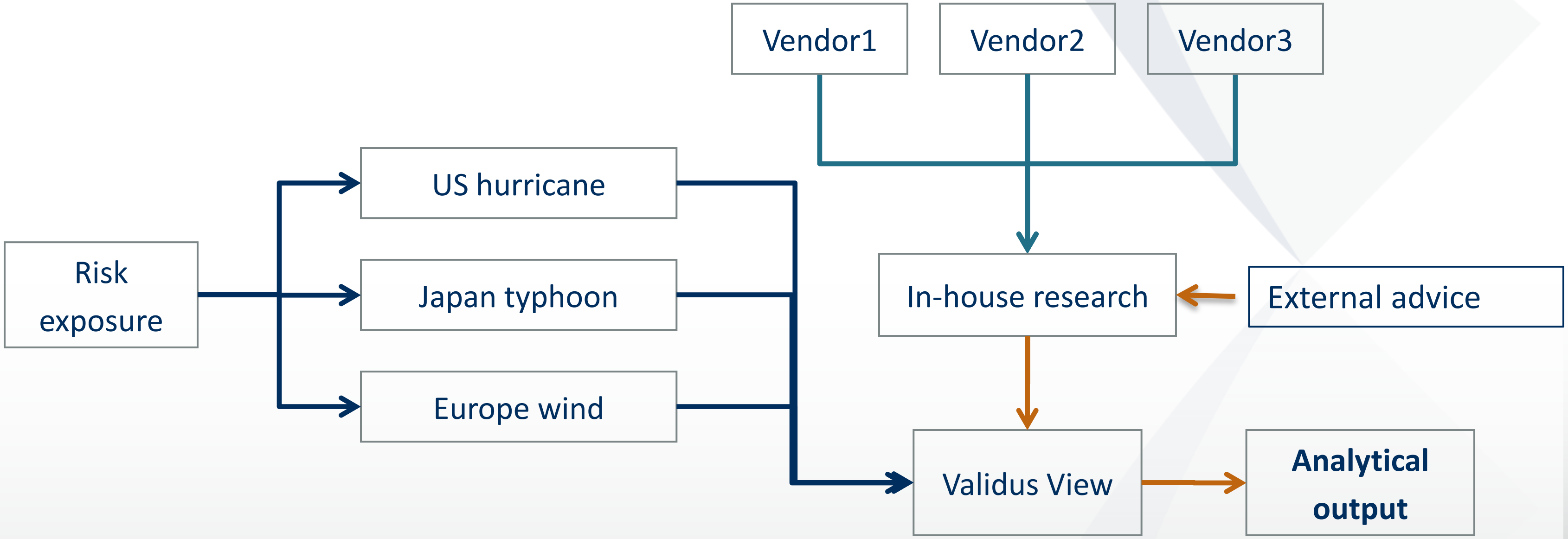
Owning our view of risk – the Validus approach

- Vendor models are the best starting point
  - Vendor models are an important part of our framework and process of cat risk quantification, and they also provide the platform for us to develop our own view of risk
- With each catastrophe model we license
  - Understand the drivers behind the model differences
  - Identify issues and biases of each model
  - With the support of high-quality data and latest theory, adjust the vendor views to form our own view of risk

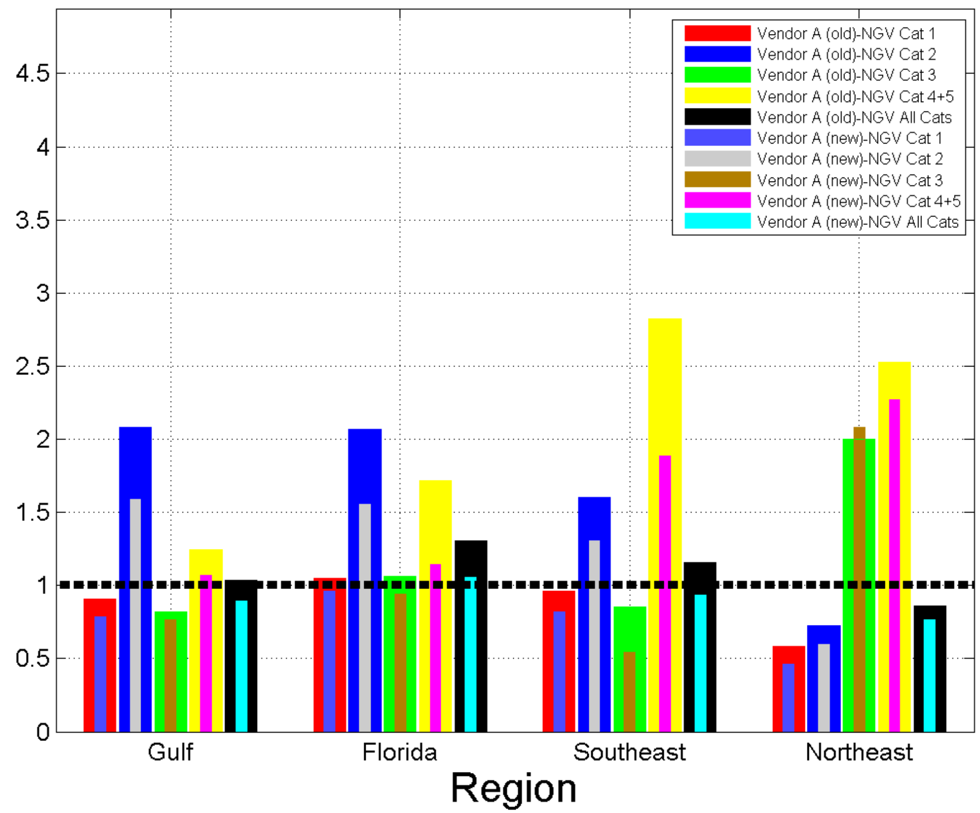
Owning our view of risk – the Validus approach



Owning your view of risk– a success story

Vendor A: Old vs. New versions

Ratio < 1 → Vendor rate less than Validus View and vice versa



→ In general, convergence towards the Validus View of landfall rates (i.e. closer to 1) outside of the Northeast

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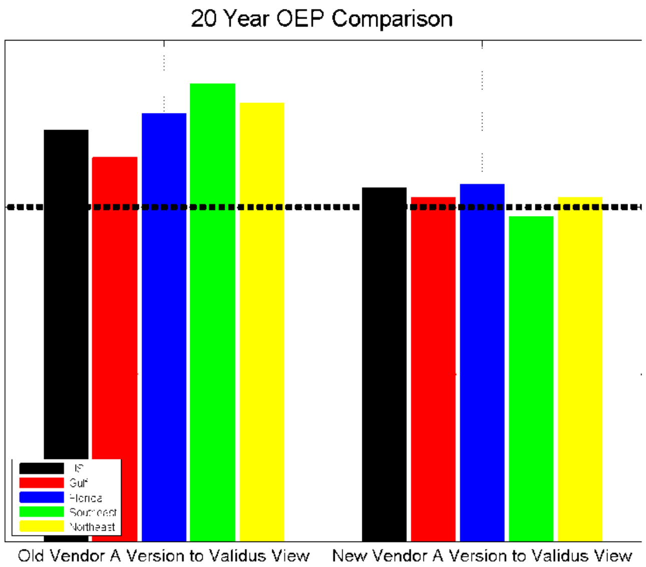
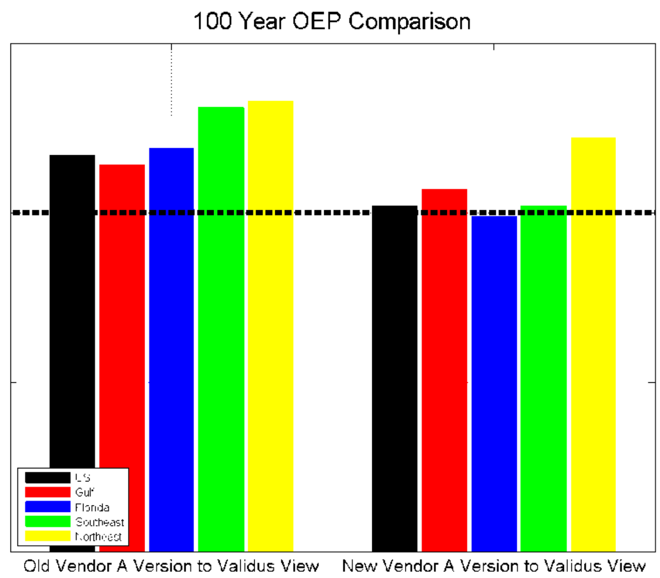
Owning your view of risk– a success story

- Our view for US hurricane:
  - Largely insulates us from vendor model change
  - Allows for consistent technical pricing
  - Reaffirms the validity of our internal research





Ratio > 1 → Vendor A greater than Validus view and vice versa

Conclusions

- The “plug-and-play” approach to using cat models is adopted by many practitioners. This approach can lead to systemic mispricing of cat risk
- Ad hoc adjustments without solid supporting theory and/or data do not solve this problem. Moreover, it can even reduce the “signal-to-noise ratio” in model outputs
- A rigorous approach to identify and correct biases in cat models can add a tremendous amount of value to pricing and risk management. It enables an insurer/reinsurer to outperform competition in all market cycles. This is possible only with substantial in-house investment in research