



Casualty Catastrophe Modeling
Rachel Abramovitz
CAS Spring Meeting
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Agenda

- § The ideal Casualty Cat model
- § Casualty Cat models currently in the market
- § Willis Re's proprietary Casualty Cat model: eNTAIL

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Ideal Casualty Cat Model

Must have

Usable	Do you have the data? Is it in the right format?
Comprehensive	Are you excluding any major sources of risk (Systemic event risk vs Single event risk, Physical event risk vs Professional event risk)
Able to capture risk accumulations	Can you recognize risk across business units and regions? Are you informed about where new policies increase risk and where they diversify?
Unbiased	Are parameters created by the underwriters writing the business?
Exposure Based	Does the model scale with limits exposed?
Understandable	Can you explain the model and results to senior management, the board, and business unit underwriters?
Stakeholder buy-in	Do underwriters think the model presents a fair view of risk? Does senior management think the model is reliable? Does the board have confidence in the model?

Model must be trusted and used by the company

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Ideal Casualty Cat Model

Good to have

Scientific parameters	Not based on physical science like Property cat models, but we can still look at research / past Casualty cats for guidance. Delphi method is legitimate estimation methodology in the absence of robust scientific data.
Stochastic / probabilistic	Allows calculation of things like 100 year VaR – more informative value than deterministic Realistic Disaster Scenarios (RDS)
Tied in to current capital model	Ultimate goal of ERM: seamless results, nothing falls in the cracks
Considers how Casualty Cats manifest across AYs and CYs	How would the cat loss actually hit your books?
Transparent	Difficult to evaluate and get universal buy-in to a black box
Easy to update	Keep pace with the dynamic Casualty risk environment, easily make improvements, tailor industry model to your company view
Proven	Industry buy-in
Cool name	Google vs Ask.com

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Casualty Cat Models currently available

Praedicat Oortfolio

- § Quantifies potential risks to Products exposure
- § Based on text mining of scientific journals
- § Requires identifiable unique policy names

Guy Carpenter ForCas

- § The current component addresses losses resulting from sudden disasters (Single Events)
- § Based on data from Advisen

RMS & AIR Cyber Cat models

- § In early stages of development
- § Published data standard

Arium Casualty Analytics Platform

- § Model defines how exposures connect in the global supply chain & users design static RDS
- § Requires identifiable unique policy names

Towers Watson Casualty Cat Model

- § Projected cat loss distribution is fit to historical losses adjusted for inflation, population growth and regulatory developments
- § Based on proprietary database of historical events over the past 100 years

Willis Re eNTAIL

- § Quantifies complete loss distribution from all major sources of Casualty Cat
- § Usable and proven: adopted by multiple industry leading global insurance companies
- § Based on proprietary research of cat events

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Willis Re eNTAIL Casualty Cat Model

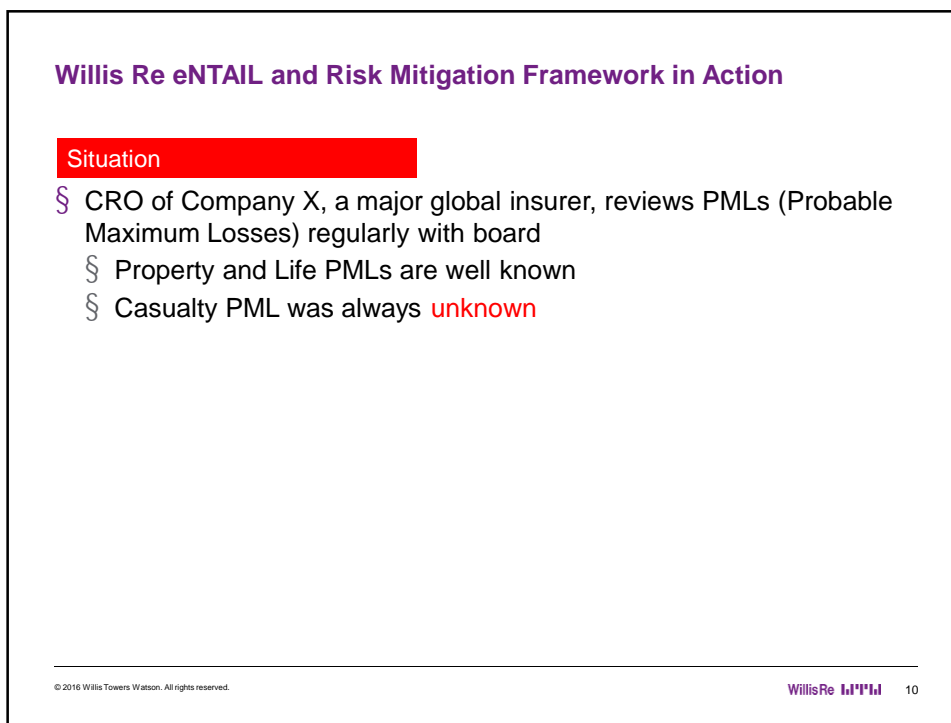
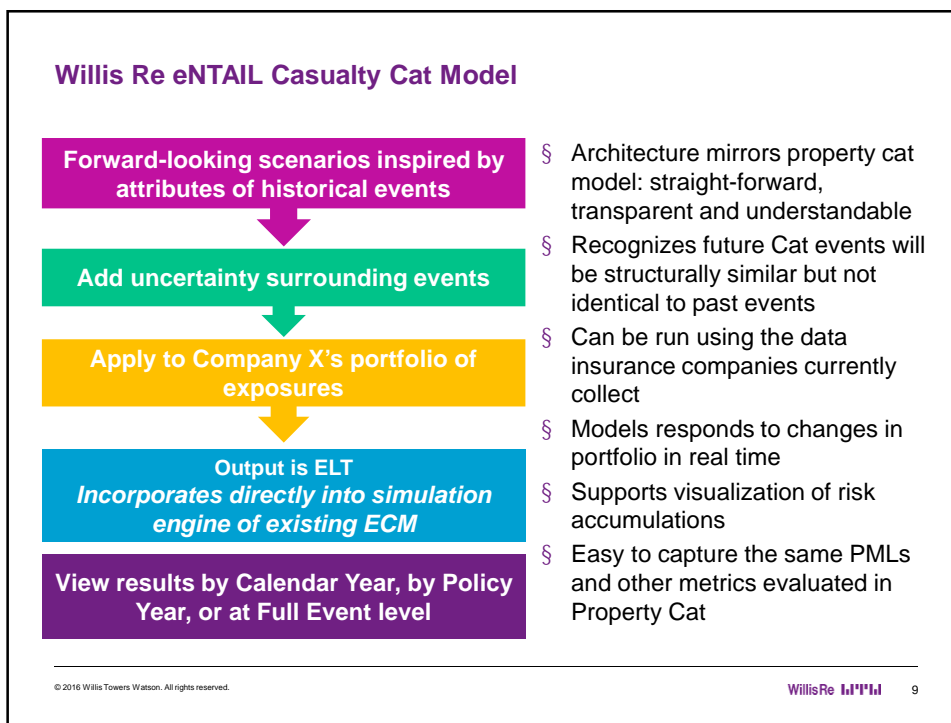
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Willis Re eNTAIL Casualty Cat Model

- ☐ Usable
- ☐ Comprehensive
- ☐ Able to capture risk accumulations
- ☐ Unbiased
- ☐ Exposure Based
- ☐ Understandable
- ☐ Stakeholder buy-in
- ☐ Scientific parameters
- ☐ Stochastic / probabilistic
- ☐ Tied in to current capital model
- ☐ Considers how Casualty Cats manifest across AYs and CYs
- ☐ Transparent
- ☐ Easy to update
- ☐ Proven
- ☐ Cool name

Willis Re eNTAIL Model has been validated and is used by multiple industry-leading global insurance carriers

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Willis Re eNTAIL and Risk Mitigation Framework in Action

Solution

- § Willis Re helped Company X scrub data, and quantify downside metrics via eNTAIL
- § Model validation and back testing on company-specific historical event experience and RDS
- § Willis Re and CRO held workshops with key company stakeholders to discuss model and ensure buy-in at all levels

Willis Re eNTAIL and Risk Mitigation Framework in Action

Outcome

- Ü CRO was able to report Casualty PMLs and risk aggregation statistics to board
- Ü Underwriter buy-in to model means less disagreements about capital allocation to business units
- Ü Actuaries can focus traditional analysis on more predictable non-cat losses, Capital modelers have an easy (ELT) input into their model

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