



Modeling Casualty Catastrophes

2019 CAS Spring Meeting
New Orleans, LA
May 20, 2019

WSJ Headlines – Bayer and glyphosate litigation

Bayer Hit by More Lawsuits Over Safety of Roundup Weedkiller

Lawsuits from 9,300 plaintiffs were pending at the end of October, up from 8,700 in August

Nov. 13, 2018 3:37 a.m. ET

Bayer to Cut 12,000 Jobs, Shed Coppertone and Dr. Scholl's Brands

German company plans to cut 10% of its workforce as it seeks to regain investors' favor

Updated Nov. 29, 2018 1:27 p.m. ET

Bayer Shares Fall After \$2 Billion Roundup Verdict

Chemical giant's shares are one of the worst performers in the Frankfurt stock exchange's blue-chip DAX index

May 14, 2019 6:35 a.m. ET

Bayer's Roundup Problem Sends Shares Spiraling Down

As the stock-market value of the German company plummets, investors and analysts say even radical change is unlikely to help

Updated May 19, 2019 6:11 p.m. ET

Bayer's market cap down more than 40% since Monsanto purchase

Bayer shares

The stock has lost some 35% of its value since Bayer's first major defeat in court in August.

Updated March 20, 2019 7:35 p.m. ET

€100



Source: SIX

WSJ Headlines – J&J and talc litigation

J&J Hit With \$4.7 Billion Jury Verdict in Baby Powder Suit

St. Louis jury awards compensatory damages of \$550 million, punitive damages of \$4.14 billion

Updated July 12, 2018 7:40 p.m. ET

J&J Slammed by Concern Over Baby Powder Safety

Stock's decline reflects new worries about the threat posed by lawsuits

Dec. 17, 2018 5:25 p.m. ET

Johnson & Johnson Talc Supplier Files for Bankruptcy

Imerys Talc America spent millions of dollars defending itself against lawsuits alleging its talcum powder causes ovarian cancer and mesothelioma

Updated Feb. 13, 2019 5:07 p.m. ET

Johnson & Johnson Is Subpoenaed for Talc Safety Information

Company says inquiries relate to news reports about product-liability litigation; safety of Baby Powder has been at issue

Feb. 20, 2019 7:37 p.m. ET

WSJ Headlines – Purdue Pharma, opioid crisis

Purdue Pharma Begins Resolution of Opioid Cases With \$270 Million Deal

Settlement is first to come of 1,600 lawsuits the maker of OxyContin faces over opioid marketing

Updated March 26, 2019 6:58 p.m. ET

Purdue Pharma Hit With Fresh Round of Opioid Lawsuits

Kansas, Iowa, Maryland, Pennsylvania, West Virginia and Wisconsin filed lawsuits against the maker of OxyContin in state courts this week

May 16, 2019 1:49 p.m. ET

What is a casualty catastrophe / latent liability?

A.M. Best defines a casualty catastrophe as "an event, activity, or product that results in a large number of lawsuits from multiple plaintiffs alleging damages that impact multiple insureds, coverages, and/or time periods." (A.M. Best SRQ)

Question	Property	Casualty
What?	Event (not man-made)	Event, activity, or product (man-made)
Who?	Multiple claimants (first party)	Multiple plaintiffs (third party)
How?	Multiple insureds and coverages	Multiple insureds, coverages and/or time periods Potential for cascading losses across industries
Also:	Fortuitous Loss	Fortuitous Loss ? ? ? ?

Fortuitous: happening or produced by chance

Poll question

What types of casualty related events most concern you?

- AI / Machine learning – algorithmic biases
- Asbestos
- Climate change
- E-cigarettes
- Marijuana
- Nanotechnology
- Obesity
- Opioid crisis
- Phthalates / BPA
- Sports related concussions
- Virtual currencies
- Other

Poll question

How does your company currently quantify its casualty cat exposure?

- Exposure aggregation techniques
- Deterministic scenarios
- Stochastic model
- We don't
- I don't know

Not a new discussion for actuaries...

EMERGING RISKS

 Tweet

Newly emerging liabilities (e.g., pollution, Y2K, internet liability) and contract structures (e.g., dual triggers such as a casualty events that must occur concurrently with financial misfortune, multi-year policies) have presented unique challenges for actuaries. On the one hand, difficulties in pricing and reserving for these unique exposures have made many insurers hesitant to write such risks. On the other hand, the high degree of uncertainty that surrounds such liabilities creates a natural demand for coverage from customers. The high customer demand and absence of a readily available market for such liabilities has created opportunities for the few willing to take such risks. The panel will discuss how actuaries approach the pricing of newly emerging liabilities and contract structures. Issues that will be addressed include:

How is the absence of historical insurance data handled?

To what extent are models used?

How are they developed?

How are risk margins affected?

How is adverse economic or financial performance included in a rating analysis?

What are the accounting and jurisdictional issues involved with emerging risks?

Panelists: Dew, Edward

Moderators: Miller, Philip

Source: [2000 Ratemaking Seminar](#)

Not a new discussion for actuaries...

EMERGING RISKS-WHAT NOW?

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This session will discuss a variety of emerging liabilities and their ramifications for the property/casualty insurance industry. The largest category to date is asbestos, with current estimates of ultimate losses relating to U.S. exposure of at least \$200 billion, with \$55-\$70 billion expected to be provided by the U.S. insurance industry. While asbestos losses have been recognized as a significant issue for insurers since the 1980's, the litigation arena has changed dramatically in the last two years. We have seen a marked increase in the number of plaintiff claim filings, settlement awards to individuals who are unimpaired, numerous bankruptcies of corporate defendants, and a growing list of peripheral defendants drawn into the fray.

While asbestos losses have surged, pollution estimates have stabilized. However, other types of liabilities have also emerged-each with the question of "Is this the next asbestos?" Claims relating to breast implants, sexual misconduct, repetitive stress, HIV/AIDS, and Fen-Phen have been dealt with. Other exposures are developing, such as claims relating to lead, latex, tobacco, MTBE, managed care, guns, intellectual property, and mold. While water damage claims have been around for years, the new mold claims (involving a personal injury component) are receiving substantial attention, especially following some notable multimillion dollar awards.

Finally, as insurers and actuaries consider the unique challenges associated with these emerging liabilities (some that insurers arguably never intended to cover), yet another category has surfaced. Following the September 11 tragedy, the industry must grapple with how to deal with potential future terrorist acts.

Panelists: Yezzi, Domenick ; Lehmann, Steven

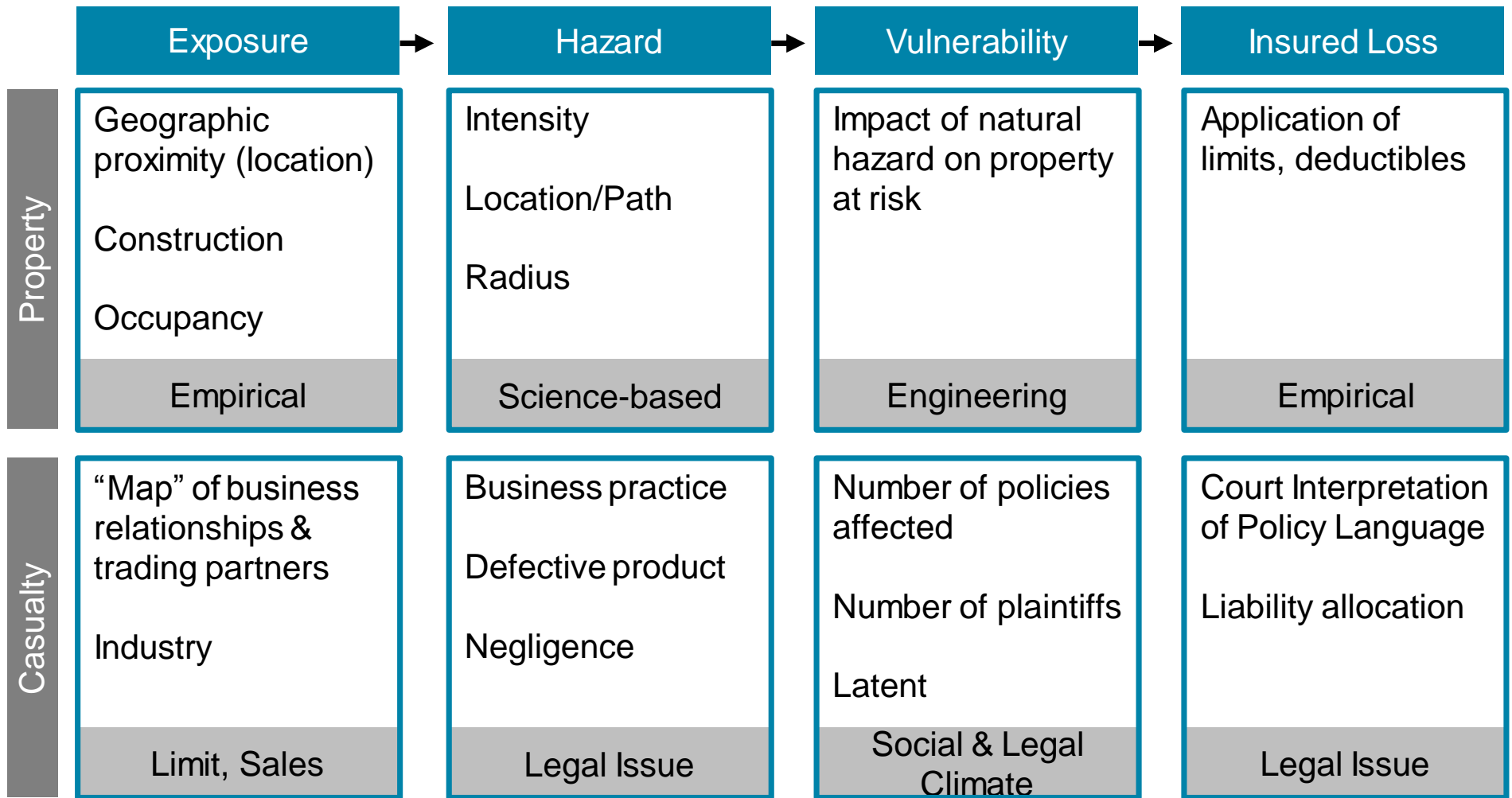
Moderators: Biggs, Jennifer

Source: 2002 Ratemaking Seminar

Breast implants
Sexual misconduct
Repetitive stress
HIV/AIDS
Fen-Phen

Lead
Latex
Tobacco
Model

Property catastrophes vs. Casualty catastrophes



Challenges in modeling casualty catastrophes

The human element

Disparate and unknown causes of loss

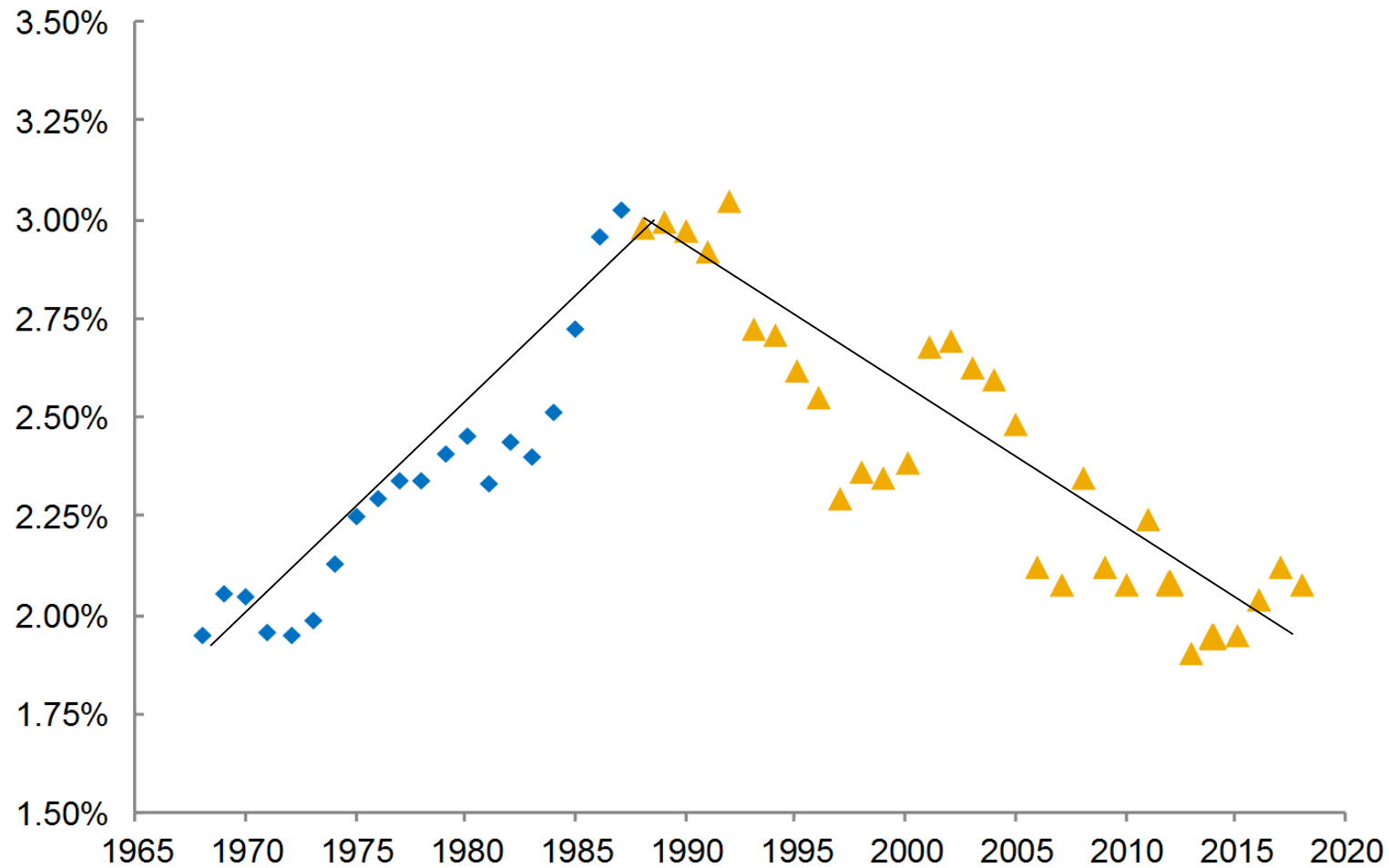
Aggregation across policy years

Clash across multiple industries, insurance lines of business, and geographies

Availability of historical data

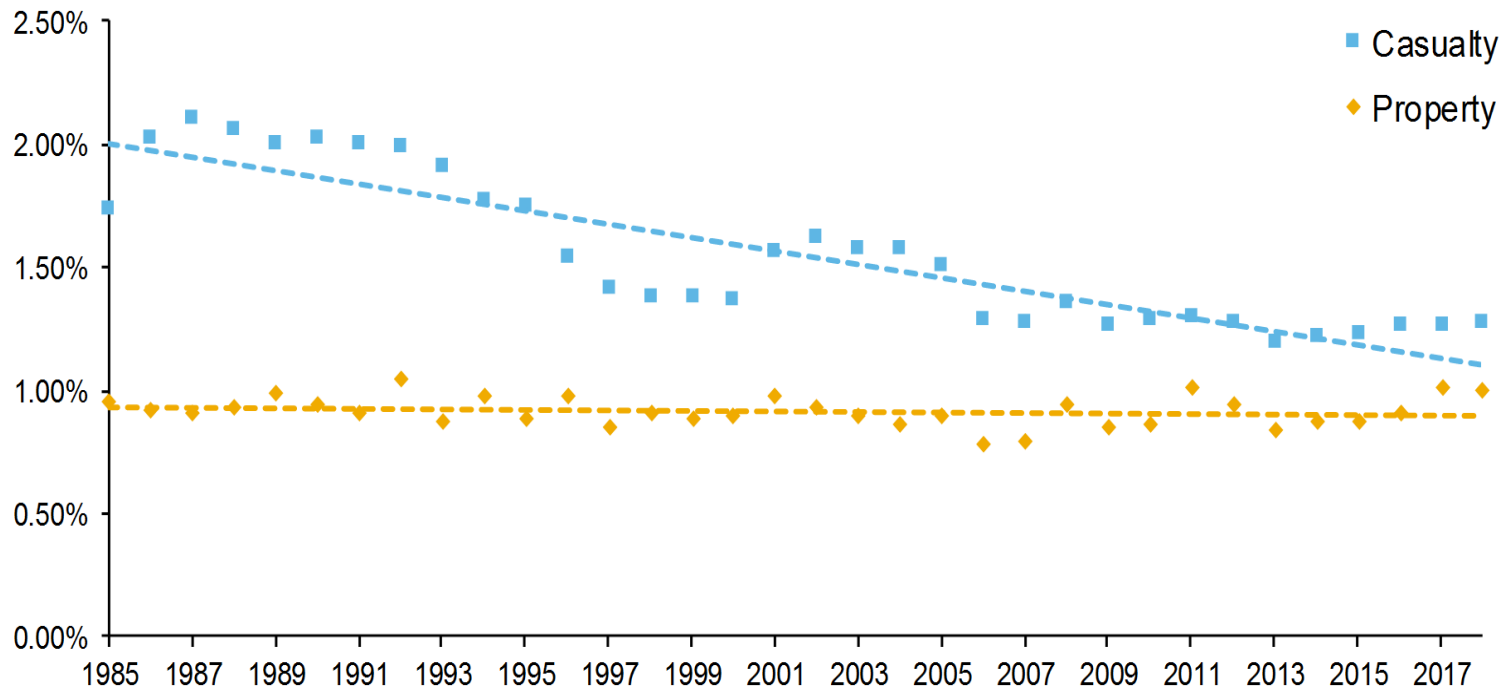
This is an opportunity for the insurance industry...

Calendar Year Incurred Loss % of GDP



...especially for casualty lines

Calendar Year Incurred Loss % of GDP

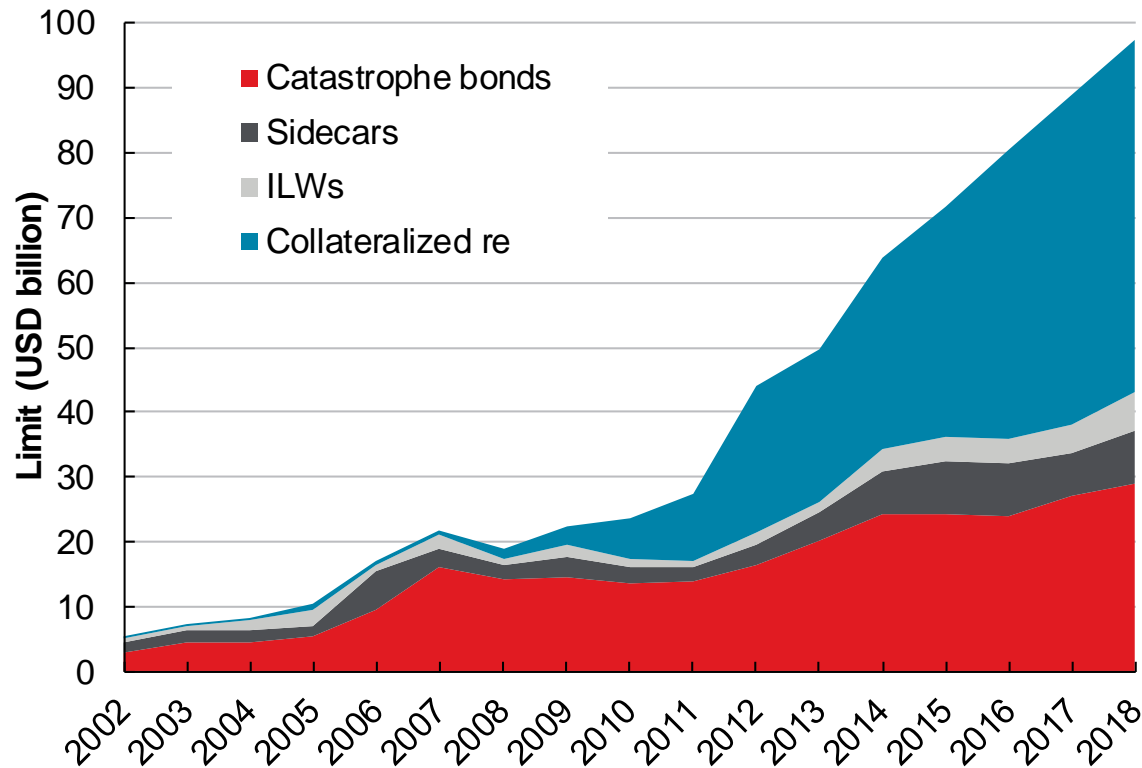


We need to provide coverage for difficult exposures, not just exclude it

We need models to help us better understand, price, and manage the risk

Casualty Insurance-Linked Securities?

Alternative Capital in Property Cat Reinsurance



Source: Aon Securities Inc.

Securitization Characteristics

Characteristics	Traditional Cat
Natural Demand	✓
Loss Modeling	✓
Loss Triggers	✓
Rating Agency Capital	✓
Bond-like Default Profile	✓
No Equity Tranche	✓
Uncorrelated Returns	✓
Quick Emergence	✓
Quick Loss Settlement	✓

Poll question

Do you think it is possible to stochastically model casualty catastrophes?

- Yes
- No
- I don't know

In your opinion, what is the top barrier to modeling casualty catastrophes?

- Insufficient historical data to build models
- Appropriate exposure data not captured
- Lack of adequate modeling techniques
- It is an impossible task

If a perfect casualty cat model did exist, what would be your top use case?

- New product development / pricing
- Portfolio management / capital allocation
- Reinsurance buying
- Reserving
- Other



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