An American Academy of Actuaries Webinar

Insurance-Linked Securities (ILS) and Catastrophe (Cat) Bonds

Presented by members of the Academy's P/C Extreme Events and Property Lines Committee

American Academy of Actuaries

August 2, 2022

About the Academy

The American Academy of Actuaries is a 19,500-member professional association whose mission is to serve the public and the U.S. actuarial profession. For more than 50 years, the Academy has assisted public policymakers on all levels by providing leadership, objective expertise, and actuarial advice on risk and financial security issues.

The Academy also sets qualification, practice, and professionalism standards for actuaries in the United States.

AMERICAN ACADEMY of ACTUARIES

Disclaimer

Please note: The presenters’ statements and opinions are their own and do not necessarily represent the official statements or opinions of the ABCD, ASB, any boards or committees of the American Academy of Actuaries, or any other actuarial organization, nor do they express the opinions of their employers.

AMERICAN ACADEMY of ACTUARIES

Presenters

- Rich Gibson
- Ralph Blanchard

Agenda

- Introduction
- History
- Cat Bond Basics
- Traditional Reinsurance vs. Cat Bonds
- Sponsor Perspective
- Investor Perspective

AMERICAN ACADEMY of ACTUARIES

Introduction

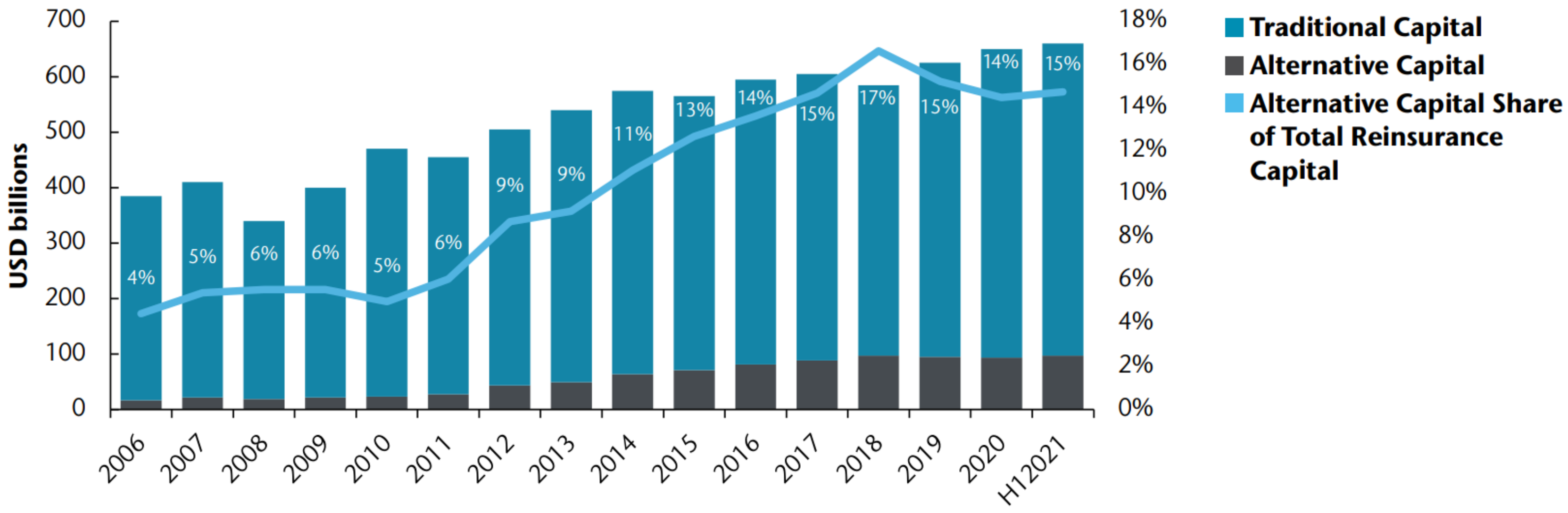
- Alternative risk transfer (or alternative capital) means alternative to the traditional form of reinsurance
- Capital is supplied by dedicated ILS fund managers, pension funds, mutual funds, hedge funds
- Can include:
  - Reinsurance Sidecars
  - Industry Loss Warranty (ILW)
  - Collateralized Reinsurance
  - **Insurance Linked Securities**
    - **Cat Bonds**

History – Setting the Stage

- 1987 – first commercial hurricane model – AIR
- Major hurricanes
  - 1989 Hugo (Charleston, S.C.)
  - 1992 Andrew (south of Miami, Fla.)
- 1989 – RMS founded (building California EQ models originally at Stanford University)
- Major earthquakes
  - 1989 Loma Prieta
  - 1994 Northridge
- Mid-1990s – first cat bonds

American Academy of Actuaries

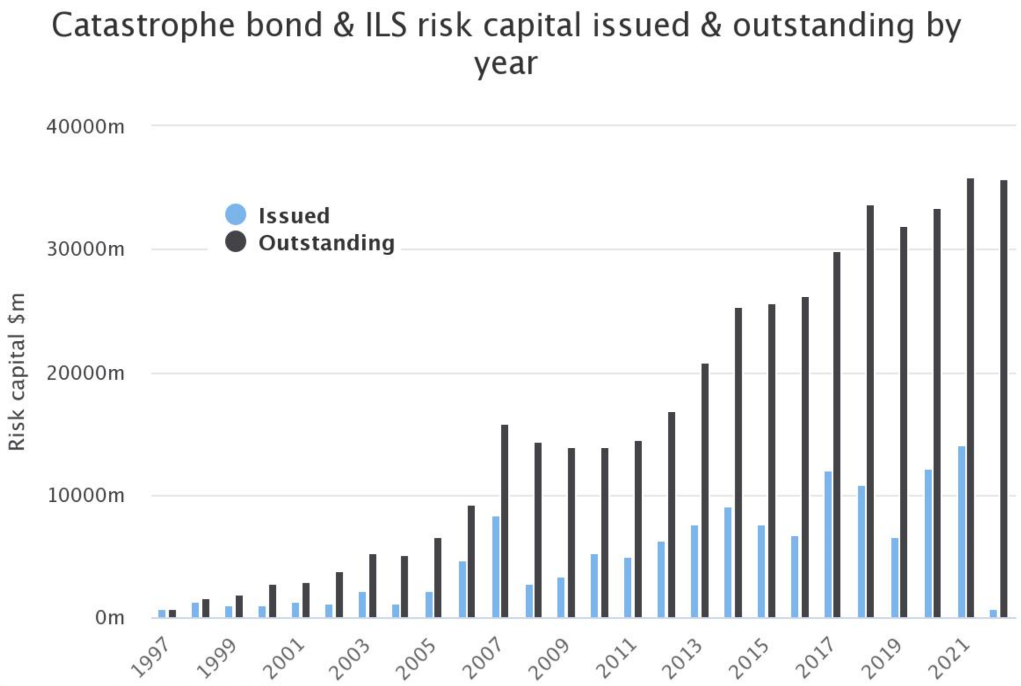
Alternative Capital Over the Years



Source: Individual Company Reports, Aon Reinsurance Solutions, Aon Securities LLC

AMERICAN ACADEMY of ACTUARIES

Growth of ILS and Cat Bonds



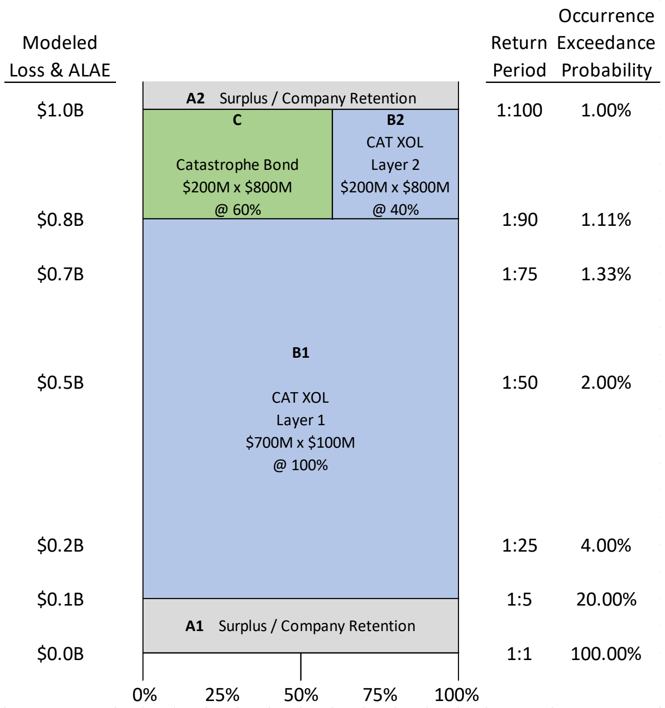
Source: www.Artemis.bm Deal Directory

- After 2004-2005 hurricanes, ILS market grew
- New issuance fell drastically in 2008 due to financial market crash
- Outstanding ILS capital has steadily grown from 2011 to 2021
- In 2021, of the $14 billion in ILS issued, $13.5 billion were property cat bonds

AMERICAN ACADEMY *of* ACTUARIES

Example of Risk Transfer Structure

Coastal Homeowners Insurance Company (CHIC)
2020-2021 Catastrophe Excess of Loss Reinsurance Tower

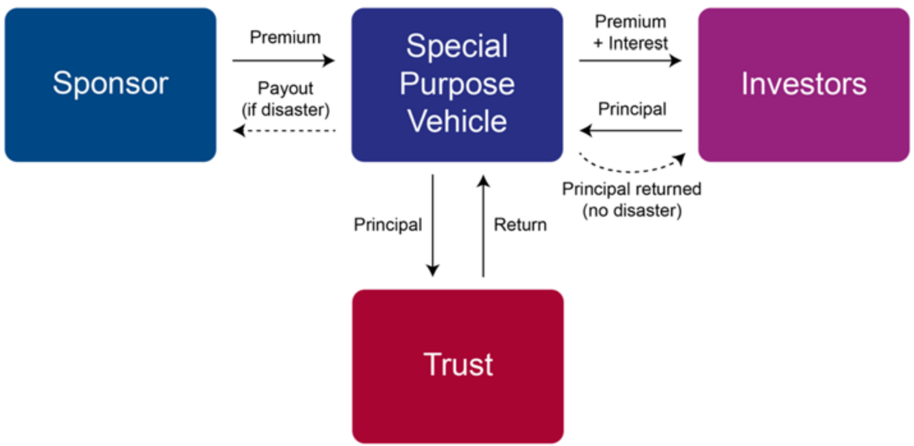


- Cat bonds are typically used in upper layers
- Cat bond attachment probability is the chance of payout or bond default
- In this example, cat bond pays out if an event loss exceeds $800m, with the maximum payout being 60% of $200m

American Academy of Actuaries

Catastrophe Bond Structure

FIGURE 1. TYPICAL STRUCTURE OF A CATASTROPHE BOND



Source: University of Pennsylvania Wharton Risk Management and Decision Process Center, [Primer: Catastrophe Bonds (upenn.edu)]

- Three parties
- Special Purpose Vehicle (SPV) is <u>reinsurer</u> to the sponsor and <u>bond issuer</u> to the investor
- Bonds are high yield, funded by trust investment income plus sponsor premium

American Academy of Actuaries

Special Purpose Vehicle

- The SPV acts as a (re)insurer to the sponsor, and the bond issuer to the investor.
- It takes the bond sale proceeds and invests in high quality assets/trust fund (the principal).
- It takes the investment income from the principal plus the premium from the sponsor to pay a higher yield to the bond holder.

Construction of Cat Bond

- Cat bond mimics the typical bond of a certain rating, usually BB rating
- Sets cat bond attachment at (say) BB default rates
- Required premium from the sponsor is the competitive BB spread over risk-free yield
- For example,
  - If BB default rate is 4%, then
  - Cat bond default (and reinsurance attachment) occurs at 96% value at risk (VaR) cat event.

Cat Bonds vs. Traditional Reinsurance

Cat Bonds	Traditional Reinsurance
Fully collateralized; No credit risk	Counterparty credit risk
Multi-year term (e.g., 3-year period)	Most commonly one year (can also be multi-year)
Single-shot (1 limit)	Offer 1 reinstatement (2 limits) in case of multiple events during the contract term
Commonly used in upper layers or at higher return periods (covering low frequency / high severity events)	Used across all return periods (e.g., covering events ranging from 1-in-10 year to 1-in-100 year return period)

Cat Bonds vs. Traditional Reinsurance

Cat Bonds	Traditional Reinsurance
High up-front cost (set up SPV, 3rd party service providers, documentation)	Brokerage fees netted from reinsurance premium, more familiar process
SPV commonly set up offshore (e.g., tax reasons)	
Various triggers: indemnity, index, parametric	Pays out based on sponsor's indemnity loss

American Academy of Actuaries

Sponsor Perspective

- Who uses cat bonds?
  - Insurers, reinsurers, government entities, large corporations
- Pricing vs. traditional reinsurance market
  - Stability (sensitivity to recent catastrophes)
  - Cat bond secondary market may give more frequent cat pricing info
- Capacity – both as to dollar amounts and region
- Up-front transaction cost can be barrier to entry
  - 3rd party service providers, documentation
- Trigger type – parametric, modeled loss, industry loss, indemnity

Triggers – Sponsor Perspective

- Indemnity vs. Parametric
  - Insurance sponsor
    - Wants reinsurance accounting
    - Reinsurance accounting requires indemnity trigger
    - Indemnity trigger avoids basis risk
  - Self-insured sponsor (government, corporate)
    - Doesn’t need reinsurance accounting
    - Parametric trigger – less work to support trigger
  - Parametric trigger – derivative accounting

Investor Perspective

- Who invests in cat bonds?
  - Dedicated ILS fund managers, hedge funds, pension funds, mutual funds, (re)insurers
- Source of diversification – lower correlation with financial market compared to other asset classes
- Evaluation of cat bonds similar to reinsurance underwriting
  - Assess sponsor's operations and exposure portfolios
  - Analyze cat model results and appropriate pricing for bond
  - Compare cat bond pricing with other fixed-income investments and with similar traditional reinsurance layers
- Cat bonds at times generate higher returns than similarly risky fixed-income assets

Triggers – Investor Perspective

- Transparency
  - Parametric trigger is more transparent
  - Faster determination, few disputes if parametric
  - Parametric not reliant on claim handling, coding of sponsor
  - If indemnity trigger, needs to get comfortable with controls
  - But ultimately, trigger set by sponsor & their needs

Questions?

Thank you for attending

Contact: Rob Fischer, Casualty Policy Analyst
(fischer@actuary.org)

AMERICAN ACADEMY of ACTUARIES