

CAT Bonds 101

ICM001

Speakers:

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Learning Objectives

At the end of this session, you will:

- **Learn about CAT Bonds**
 - What they are and how they are structured
- **Learn strategies for utilizing CAT Bonds**
 - How to quickly assess their suitability for your organization
- **Learn how and when to use Parametric Insurance**
 - As an alternative when CAT Bonds are not suitable for your organization

Agenda

- I. The Basics
- II. CAT Bond Structure
- III. The Market for Insurance-Linked Securities
- IV. CAT Bond Examples – MTA; Amtrak
- V. CAT Bond Alternative – Parametric Insurance

Insurance-linked Securities (ILS)

- Insurance-linked securities, or ILS, are financial instruments which are sold to investors whose value is affected by an insured loss event.
- The term insurance-linked security encompasses catastrophe bonds and other forms of risk-linked securitization.
- Insurance-linked securities are generally thought to have little to no correlation with the wider financial markets as their value is linked to non-financial risks such as natural disasters, longevity risk or life insurance mortality.
- As securities, insurance-linked securities can be and are traded among investors and on the secondary-market. They can enable corporations to offload risk and raise capital, they also allow life insurers to release the value in their policies by packaging them up and issuing them as asset-backed notes.

What is a CAT Bond?

- Catastrophe Bonds , also called CAT Bonds, are an example of an Insurance-Linked Security which transfer a specific set of risks (generally catastrophe and natural disaster risks) from an issuer or sponsor to investors.
- In this way investors take on the risks of a specified catastrophe or event occurring in return for attractive rates of investment.
- Should a qualifying catastrophe or event occur the investors will lose the principal they invested and the issuer (often insurance or reinsurance companies) will receive that money to cover their losses.

Key Elements of a CAT Bond

- One of the key elements of any catastrophe bond is the terms under which the securities begin to experience a loss. Catastrophe bonds utilize triggers with defined parameters which have to be met to start accumulating losses. Only when these specific conditions are met do investors begin to lose their investment.
- Triggers can be structured in many ways from a sliding scale of actual losses experienced by the issuer (indemnity) to a trigger which is activated when industry wide losses from an event hit a certain point (industry loss trigger) to an index of weather or disaster conditions which means actual catastrophe conditions above a certain severity trigger a loss (parametric index trigger).

Types of Coverage

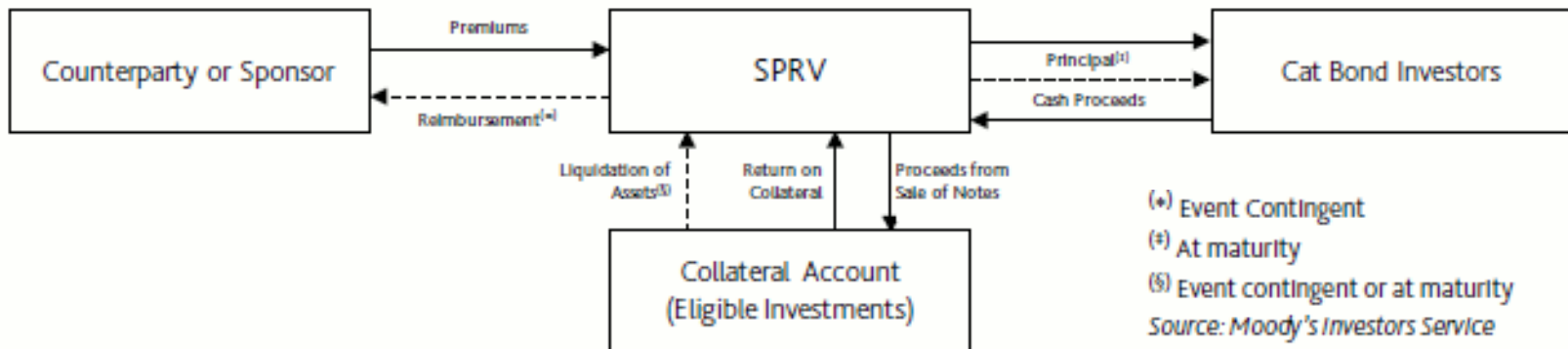
- **A catastrophe bond can be structured to provide**
 1. Per-occurrence cover;
 - exposure to a single major loss event
 2. Aggregate cover; or
 - exposure to multiple events over the course of each annual period
 3. On a multiple loss approach
 - triggered by second and subsequent events (ex. sponsors can issue a deal that will only be triggered by a second landfilling hurricane to hit a certain geographical location)

Catastrophe Bond Structure

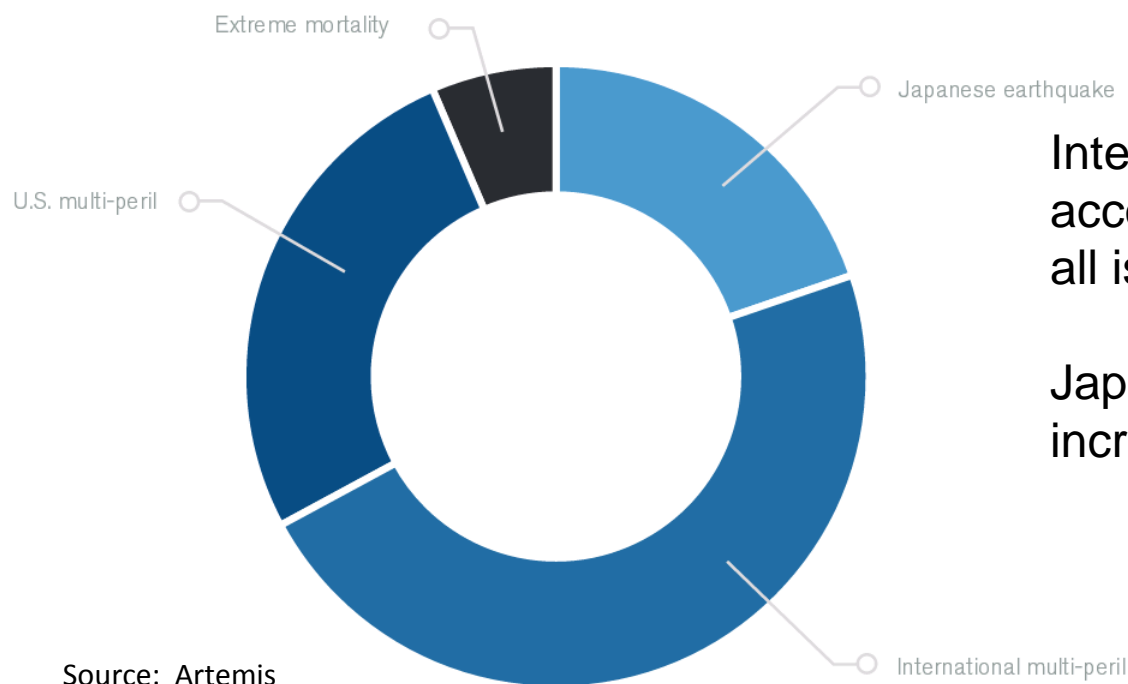
- The typical catastrophe bond structure sees a special purpose vehicle or insurer (SPV or SPI) enter into a reinsurance agreement with a sponsor (or counterparty), receiving premiums from the sponsor in exchange for providing the coverage via the issued securities. The SPV issues the securities to investors and receives principal amounts in return. The principal is then deposited into a collateral account, where they are typically invested in highly rated money market funds.
- The investors coupon, or interest payments, are made up of interest the SPV makes from the collateral and the premiums the sponsor pays.
- If a qualifying event occurs which meets the trigger conditions to activate a payout, the SPV will liquidate collateral required to make the payment and reimburse the counterparty according to the terms of the catastrophe bond transaction. If no trigger event occurs then the collateral is liquidated at the end of the cat bond term and investors are repaid.

Catastrophe Bond Structure

- Catastrophe bond structures have been used to hedge risks of hurricane, earthquake, typhoon, European windstorm, thunderstorm, hail and even life insurance related risks such as longevity and health insurance claims.
- Catastrophe modeling is vital to catastrophe bond transactions to provide analysis and measurement of events which could cause a loss as well as to define the exposed geographical region.
- The diagram below shows a typical catastrophe bond structure including where the capital flows from one party to another.



Q4 ILS issuance by peril

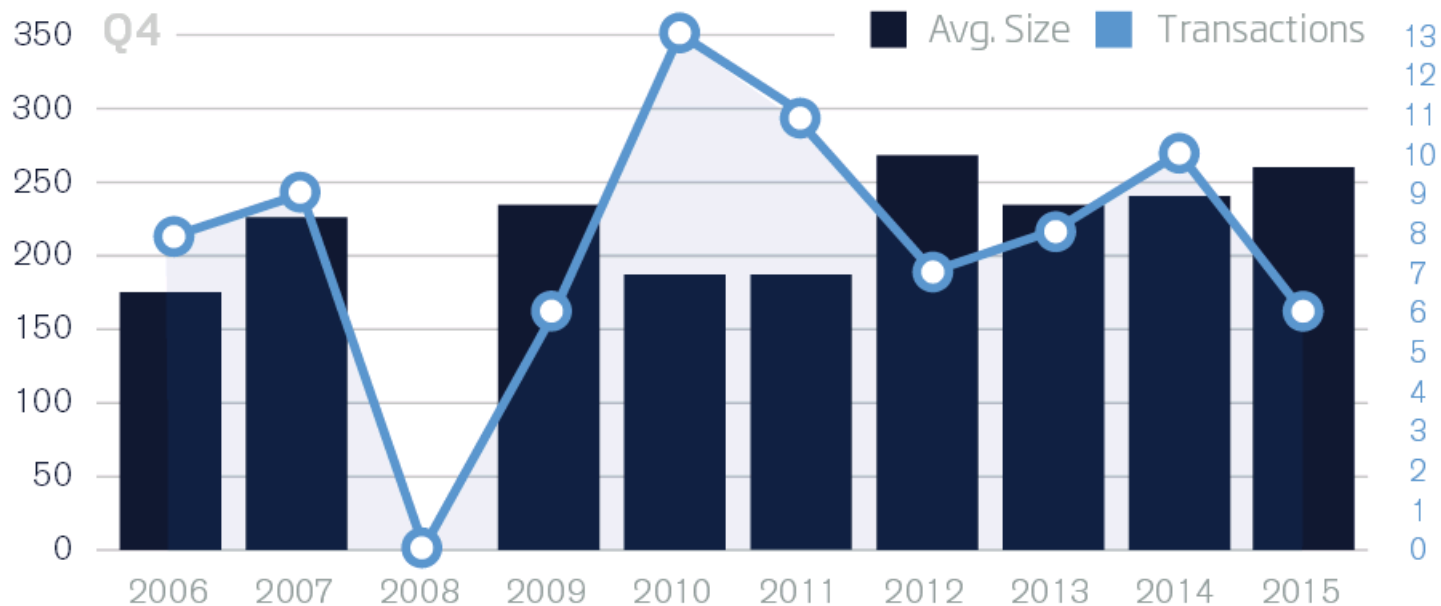


International multi-peril deals accounted for almost half of all issuance

Japanese earthquake increased substantially

Source: Artemis

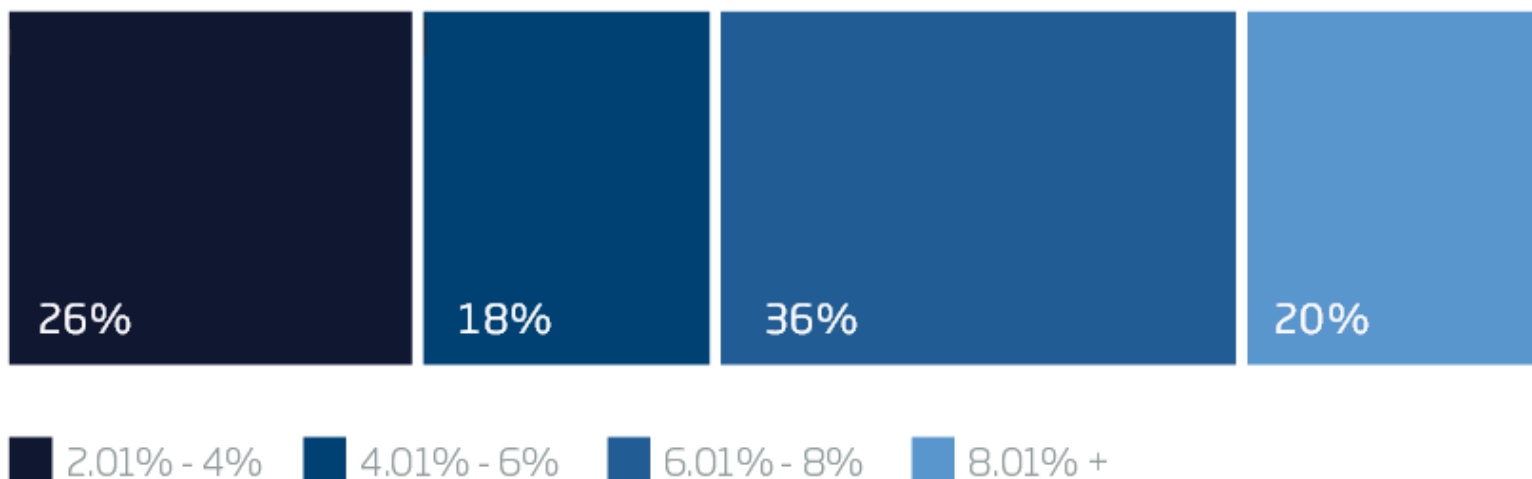
ILS Average Transaction Size Q4



- The average transaction size of \$254 million was above average.
- The number of recorded transactions at 6 was below average.

Source: Artemis

Q4 ILS issuance by coupon pricing

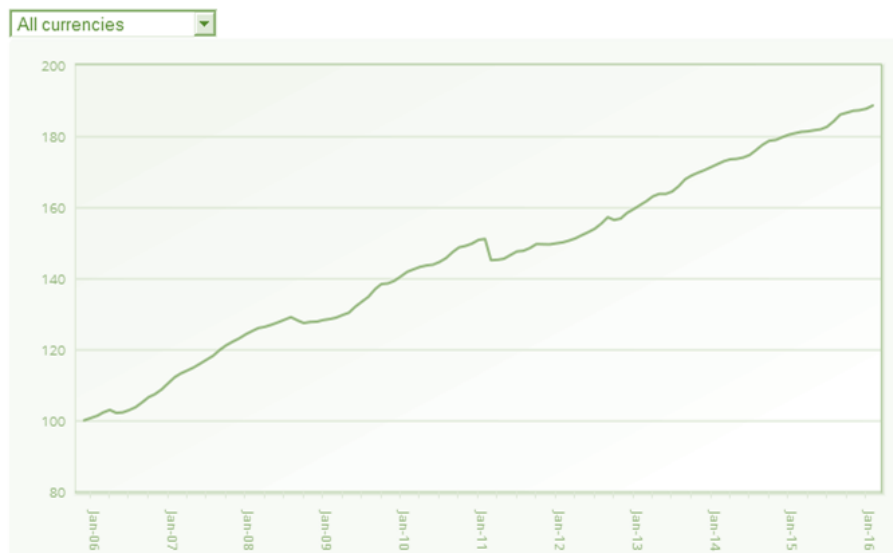


Source: Artemis

- 26% of risk capital issued pays investors a coupon of below 4%.
- 56% of risk capital issued pays investors a coupon of above 6%

ILS Historical Returns

Eurekahedge ILS Advisers Index



The Eurekahedge ILS Advisers Index is ILS Advisers and Eurekahedge's collaborative equally weighted index of 31 constituent funds. The index is designed to provide a broad measure of the performance of underlying hedge fund managers who explicitly allocate to insurance linked investments and have at least 70% of their portfolio invested in non-life risk. The index is base weighted at 100 at December 2005, does not contain duplicate funds and is denominated in local currencies.

Risk/Return (as of February 2016)

Annualized Return (%)	6.44
2016 Return (%)	0.70
2015 Return (%)	4.24
Last 3 Months (%)	0.78
Return Since Inception (%)	88.58
Best Monthly Return (%)	1.60
Worst Monthly Return (%)	-3.94

ILS Historical Monthly Performance

Eurekahedge ILS Advisers Index

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD
2015	0.39	0.24	0.21	0.08	0.16	0.15	0.40	0.84	1.03	0.27	0.31	.08	4.24
2014	0.50	0.50	0.45	0.32	0.08	0.21	0.41	0.81	0.86	0.60	0.14	-0.10	4.87
2013	0.67	0.74	0.64	0.85	0.44	0.00	0.40	0.92	1.20	0.61	0.48	0.42	7.61
2012	0.18	0.19	0.32	0.43	0.58	0.57	0.61	0.94	1.18	-0.51	0.27	1.01	5.93
2011	0.70	0.18	-3.94	0.06	0.21	0.72	0.68	0.13	0.54	0.74	-0.03	-0.04	-0.14
2010	0.92	0.94	0.45	0.49	0.28	0.16	0.51	0.75	1.16	0.90	0.29	0.42	7.52
2009	0.36	0.22	0.28	0.59	0.51	1.33	1.03	1.03	1.58	1.06	0.14	0.52	8.99
2008	0.93	0.75	0.67	0.27	0.46	0.53	0.56	0.59	-0.71	-0.59	0.25	0.06	3.83
2007	1.60	1.56	0.92	0.75	0.74	0.95	0.95	0.96	1.37	1.09	0.85	0.74	13.22
2006	0.65	0.63	0.93	0.70	-0.82	0.15	0.62	0.81	1.32	1.37	0.84	1.18	8.68

Recent CAT Bond Transactions

<u>Issuer</u>	<u>Cedent</u>	<u>Risks / Perils covered</u>	<u>Size</u>	<u>Date</u>
Operational Re Ltd.	Zurich Insurance Co. Ltd.	Operational Risks	630m	Mar 2016
Aozora Re Ltd.	Sompo Japan	Japan Typhoon	\$220m	Mar 2016
Akibare Re Ltd.	Misui Sumitomo	Japan Typhoon	\$200m	Mar 2016
Espada Reinsurance	USAA	US tropical cyclones, earthquakes, severe thunderstorm, winter storm, wildfire, volcanic eruption, meteorite impact, other perils	\$50m	Mar 2016
Caelus Re IV Ltd.	Nationwide Mutual Insurance	US tropical cyclones, earthquakes, severe thunderstorm, winter storm, wildfire, volcanic eruption, meteorite impact, other perils	\$300m	Feb 2016
Galileo Re Ltd.	XL Insurance (Bermuda) Ltd.	US named storms, US earthquake, Canada earthquake, European windstorm	\$300m	Jan 2016
PennUnion Re Ltd.	Amtrak	US storm surge and wind from named storm, US earthquake	\$275,	Oct 2015

CAT Bond for the NY MTA

- The MetroCat Re Ltd. (Series 2013-1) catastrophe bond was the first cat bond in the markets history to bring storm surge risk alone in a transaction to ILS investors.
- The successful completion of the cat bond gives First Mutual Transportation Assurance Co. (FMTAC), a New York State-licensed captive insurer and subsidiary of the New York Metropolitan Transportation Authority (MTA), a fully-collateralized source of multi-year reinsurance protection for storm surge risks.
- The per-occurrence reinsurance protection that MetroCat Re provides for storm surge risks is based on a parametric trigger, with trigger events linked to actual surge heights during named storms as measured by tidal gauges in key locations around New York and Manhattan.
- The transaction was well-received by investors in the ILS market; the cat bond upsized by 60% up from \$125 Million to offer the MTA \$200 Million of coverage. At the same time the pricing on the deal dropped as investors accepted the risk for less than it was originally marketed at, typically a sign of strong investor demand, with the coupon dropping from the initial price guidance of 5% to 5.5% above the return of the collateral assets to finish with a coupon of 4.5%.

CAT Bond for Amtrak

- The PennUnion Re Ltd. (Series 2015-1) catastrophe bond was sponsored by Passenger Railroad Insurance, Ltd., a Bermuda insurer owned by Amtrak's parent the National Railroad Passenger Corporation. By selling the notes, PennUnion Re will be able to fully-collateralize a reinsurance agreement between itself and Passenger Railroad Insurance, which will in turn provide insurance protection to Amtrak.
- The coverage is on a per-occurrence basis, across just over a three-year period, providing protection against the perils of storm surge, wind from named storms, and earthquakes across CT, DE, MD, MA, NJ, NY, PA and RI.
- All three perils feature parametric triggers, commonly used in corporate catastrophe bonds such as this where the beneficiary wants a source of insurance protection that pays out rapidly. The payout mechanics are designed to provide a sliding scale of payment for all three perils, with increasing payouts for increasingly severe events.
- The surge parametric trigger is based on calculation points at tidal stations, such as New York City's The Battery and in Delaware City. The named storm wind parametric trigger uses the Weatherflow hurricane network recording stations as calculation points, which are located around the U.S. coastline. The earthquake peril's trigger is based on shake data and information reported by the USGS.

CAT Bond for Amtrak (con't)

- This cat bond transaction provides a source of responsive insurance coverage for Amtrak, paying out in the event of a catastrophe above certain parameters of intensity impacting the region where the rail company operates and has the highest concentration of assets and infrastructure. The sliding scale mechanism ensures that payouts are linked to intensity of catastrophe events and the likely ensuing damage and interruption to Amtrak's infrastructure and business. We expect to see more of these corporate sponsored parametric cat bond transactions, as they make perfect sense as a source of risk finance and transfer.
- In terms of historical events, superstorm Sandy would have caused a 100% loss to the cat bond notes. With the cat bonds exposure heavily weighted towards storm surge events, it's clear that for Amtrak the key type of event it wants protection from is a repeat of such a storm and the resulting surge.
- The transaction was well-received by investors in the ILS market; the cat bond upsized by 37.5% up from \$200 Million to offer Amtrak \$275 Million of coverage. At the same time the pricing settled at 4.50%, the lowest end of guidance which was set at 4.50% to 5.25%. Also noteworthy is that the issuance of this cat bond was delayed by hurricane Joaquin which threatened an east coast U.S. landfall, causing the cat bond to be held back by one week.

CAT Bond Alternative

Like CAT Bonds, Parametric Insurance products provides ready access to capital in the event of an earthquake or windstorm without the complexity associated with CAT Bond offerings and other Insurance-Linked Securities.

- **Transaction Size**

- A good rule of thumb is \$100 Million or less
- More capacity is available, but CAT Bonds are often cheaper

- **Timing**

- CAT Bonds can take a long time to structure, 90+ days

- **Simplicity**

- Management does not have to explain CAT Bonds to their Board or Shareholders

- **Special Purpose**

- Deductible in-fill; Multiple triggers; Supply chain

Parametric Insurance

1. Parametric Insurance can be structured on an annual or multi-year basis (typically 3-year policies with annual installments).

- The insurance can be custom designed to provide coverage for an entire property portfolio or sub-segments as needed.
- No underwriting data is required. The insured does not need to disclose any information to underwriters regarding their property portfolio.

2. Parametric Insurance provides contract certainty if a triggering event occurs.

- Coverage is typically based on a magnitude trigger and radius, and can be structured for both earthquakes and windstorms.
- If the triggering event occurs, payment is made. Adjusters are not needed as there is nothing to calculate.

Parametric Insurance

3. Parametric Insurance provides ready access to capital after a triggering event.

- Claim is paid in full in as few as 10 business days of the triggering event.
- Funds can be utilized, as needed, for any purpose.

4. Parametric Insurance can be pro-actively disclosed to both regulators and to shareholders to address CAT risk concerns.

- Regulators will consider the insurance as support for capital adequacy models.
- Shareholders can be reassured that there is insurance in place in the event of a major CAT event.

5. Parametric Insurance is consistent with and supports most corporation's enterprise risk management practices.

- Independent CAT modeling companies such as RMS and AIR are typically used to model the exposure at various triggers.
- The insurance can be optimally structured at the trigger which is most suitable for the corporation.

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Questions & Answers