Catastrophe Bonds

Paolo Rainelli – Politecnico di Torino / AIDA Italia

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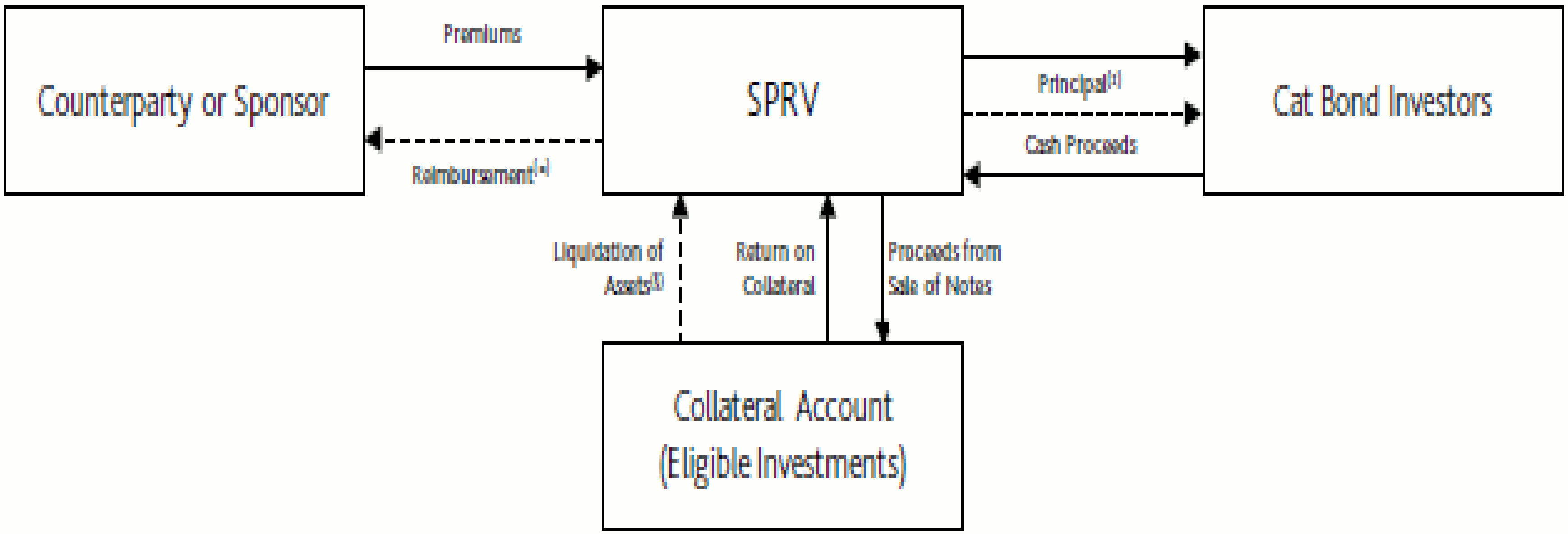
What They Are

Catastrophe bonds (aka **cat bonds**) are a form of insurance securitization to create risk-linked securities which transfer a specific set of risks (generally catastrophe and natural disaster risks) from an issuer or sponsor to investors

Cat Bond Structure



(*) Event Contingent
(‡) At maturity
(§) Event contingent or at maturity
Source: Moody's Investors Service

Legal Considerations

- Reimbursement of the principal amount to investors is subject to a condition precedent (*i.e.*, non-occurence of the trigger event)
- The SPV is subject to an alternative payment obligation (towards Sponsor or Investors)
- Coupon payment is certain and unconditioned

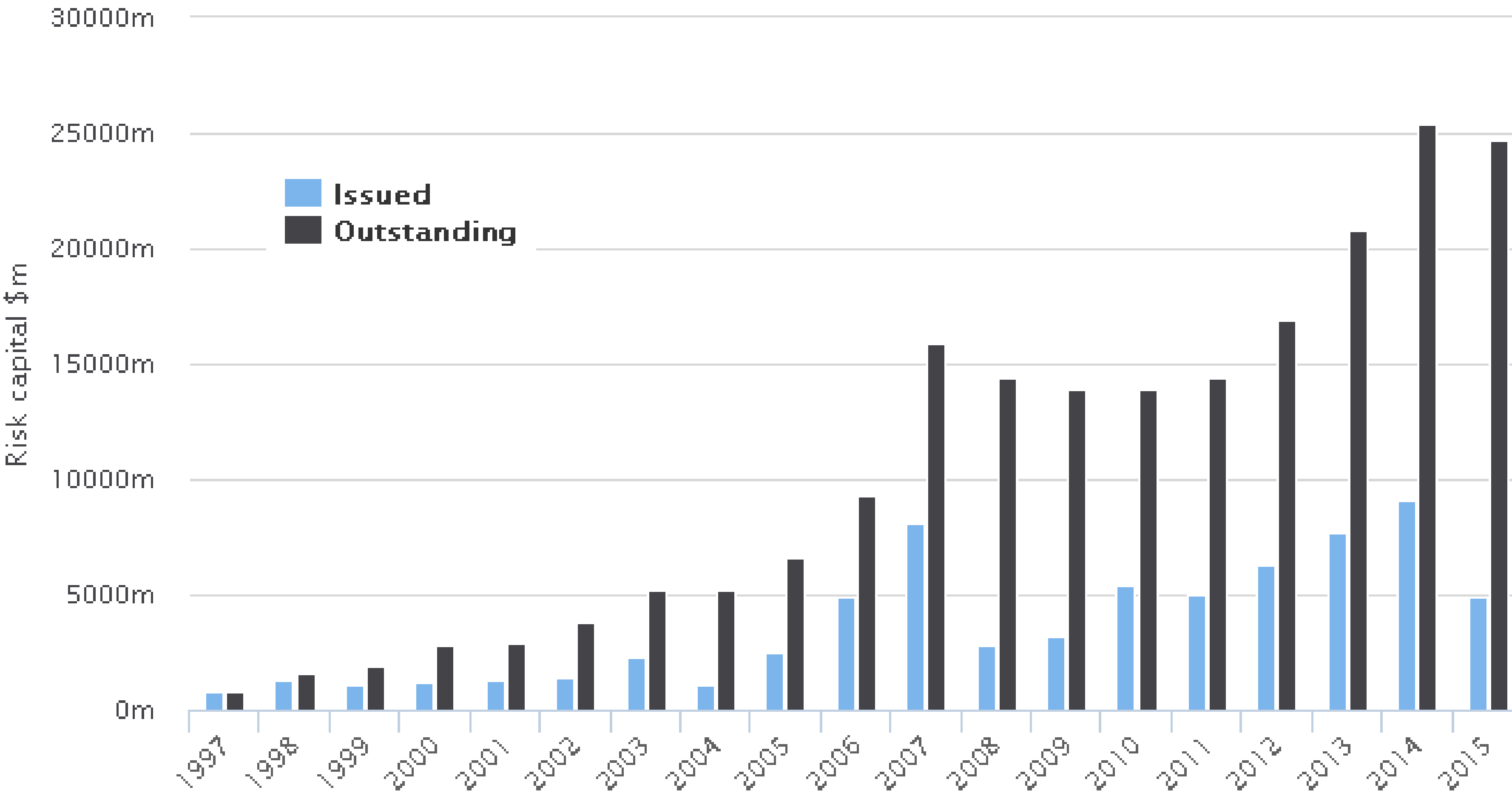
Origins (Mid 90's)

Northridge Earthquake 1994 Hurricane Andrew 1992

Some Figures

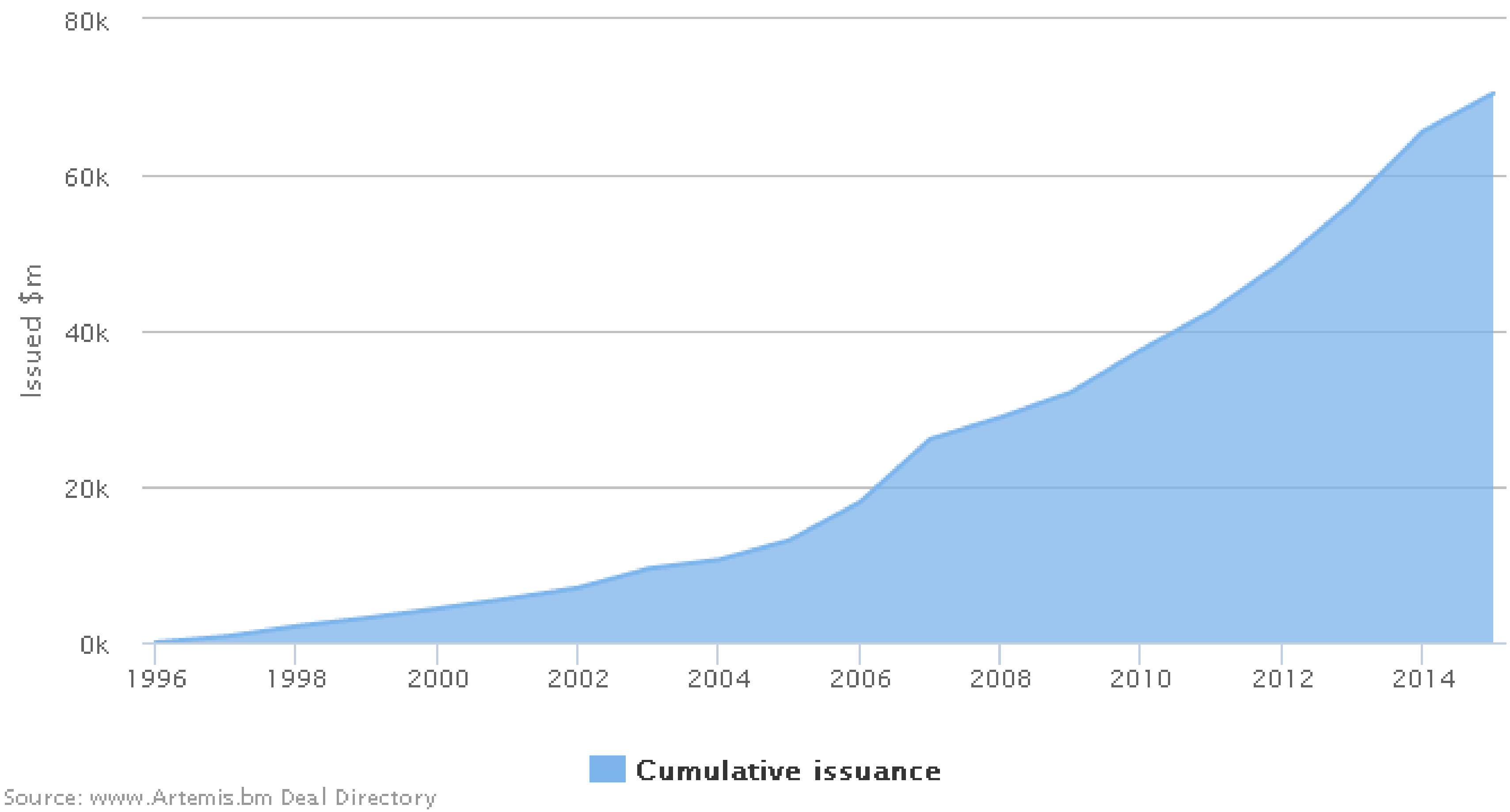
- In 10 years (between 1997 and 2007) issuance volumes increased more than sevenfold from less than USD 1 billion to over USD 7 billion
- Outstanding cat bonds' market is now over USD 24 billion
- In 2015 issuances have already reached USD 4.9 billion

Growth of the Cat Bond Market



Source: www.Artemis.bm Deal Directory

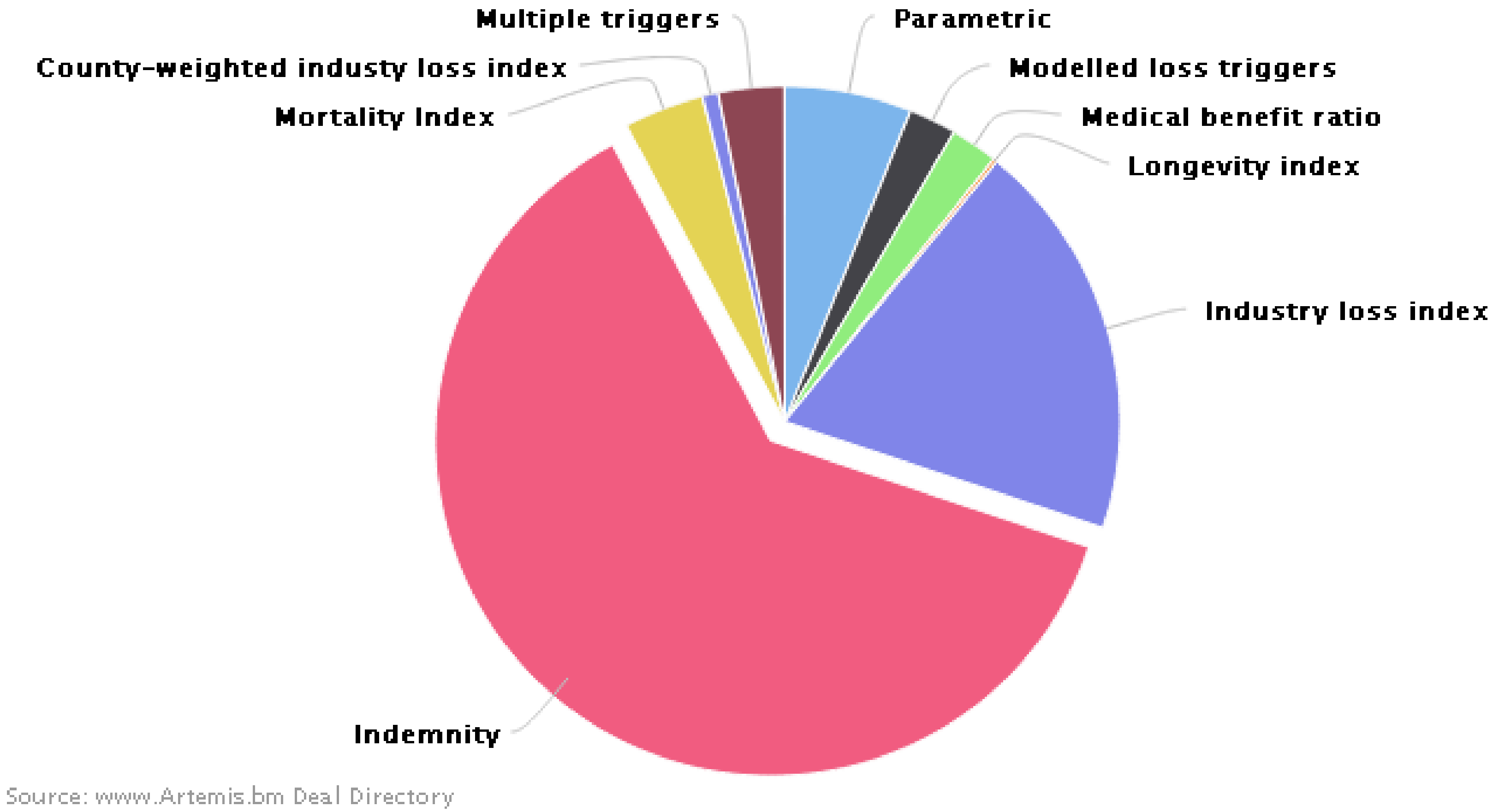
Cat Bonds Cumulative Issuance



Trigger Events

- Indemnity (actual losses experienced by the issuer)
- Industry loss trigger (cumulative)
- Parametric index trigger (index of weather or other disaster conditions)

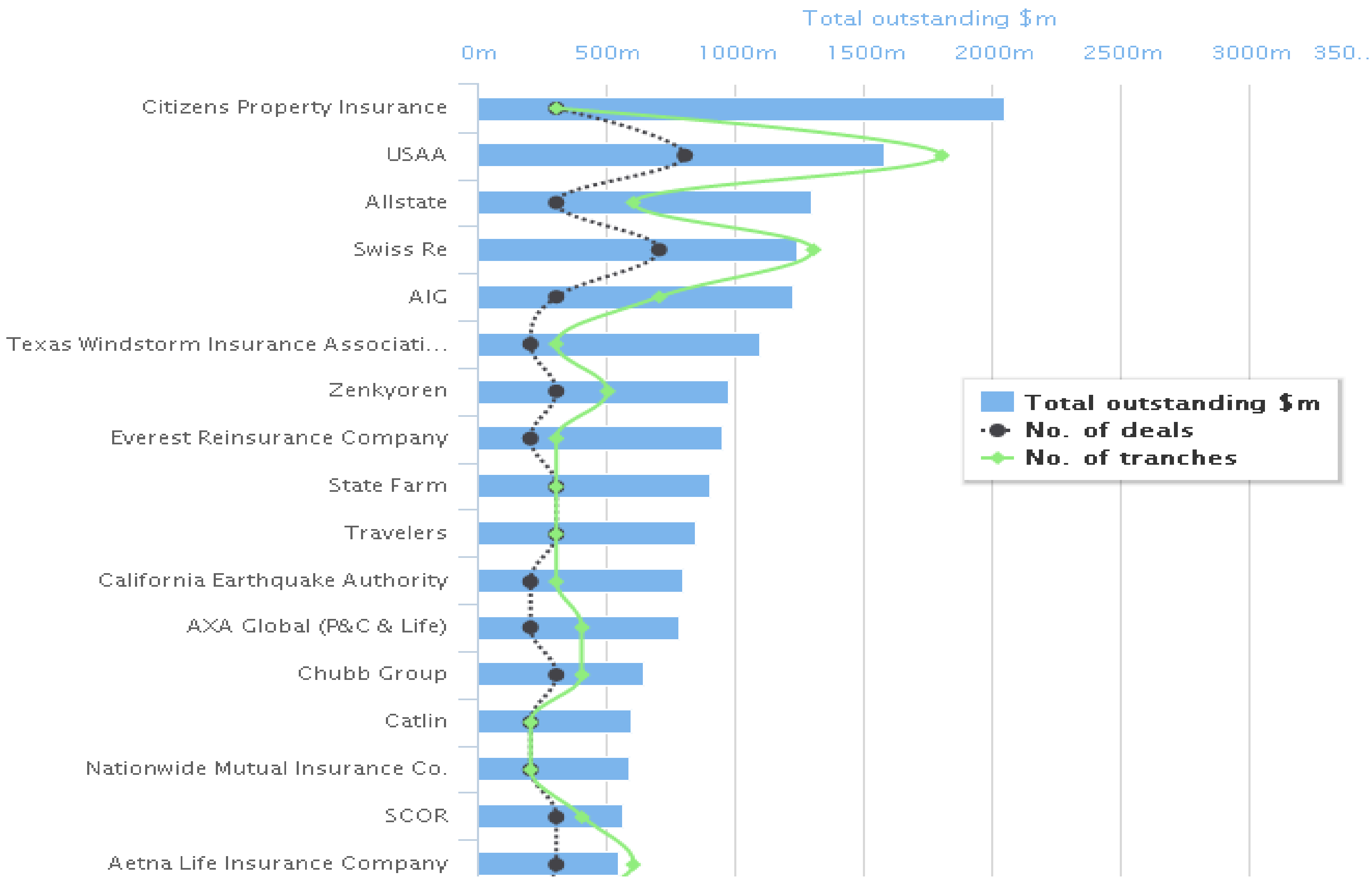
Cat Bonds by Trigger Event



Indemnity

- Per-occurrence cover
- Aggregate cover (multiple events over the course of each annual risk-period)
- Multiple loss approach (only triggered by second and subsequent events)

Cat Bonds Outstanding by Sponsor

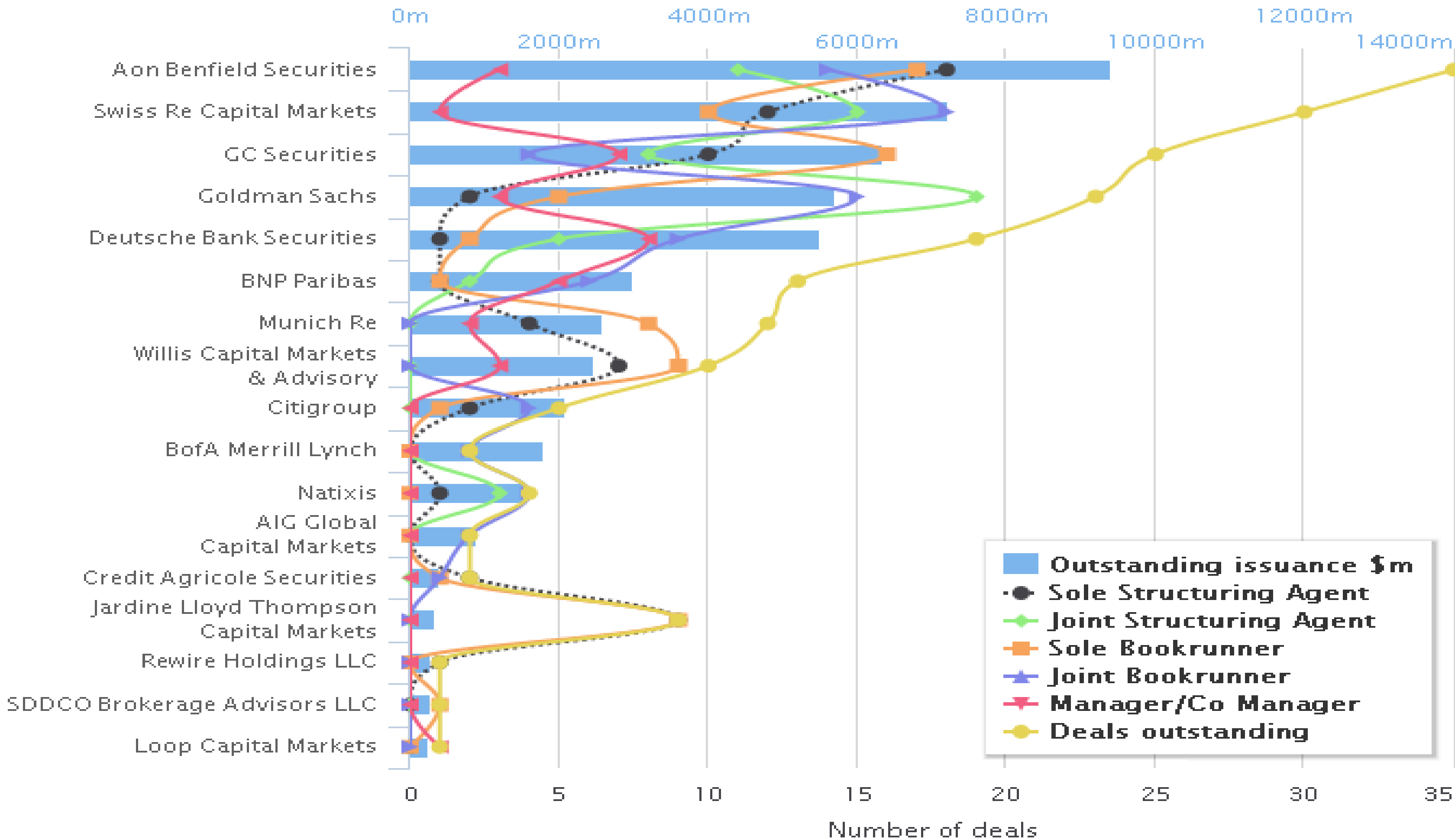


Italian Market

Lion I Re Limited
European windstorm
EUR 190 million (April 2014)

Azzurro Re I Limited
Earthquakes (mainly Italy)
EUR 150 million (June 2015)

Cat Bonds' Leading Banks, Brokers and Intermediaries



Source: www.Artemis.bm Deal Directory

Investors’ Base

- In 1999 primary insurers and reinsurers together purchased 55% of the cat bond issued volume. The remaining demand came from money managers (30%), hedge funds, banks and dedicated funds (5% each).
- In 2010 dedicated funds (46%), money managers (23%), and hedge funds (14%) were by far the largest purchasers with insurers and reinsurers falling to a mere 8%.

A radical change of the investors’ base

Investment drivers

Pros

- Little or no correlation with traditional asset classes (diversification)
- Attractive returns
- Knowledge of the market to use cat bonds in the future
- Better than the conventional reinsurance market
- Liquidity (only for selected series)

Cons

- They do not fit with asset and liability management
- Regulatory constraints
- Missing know-how

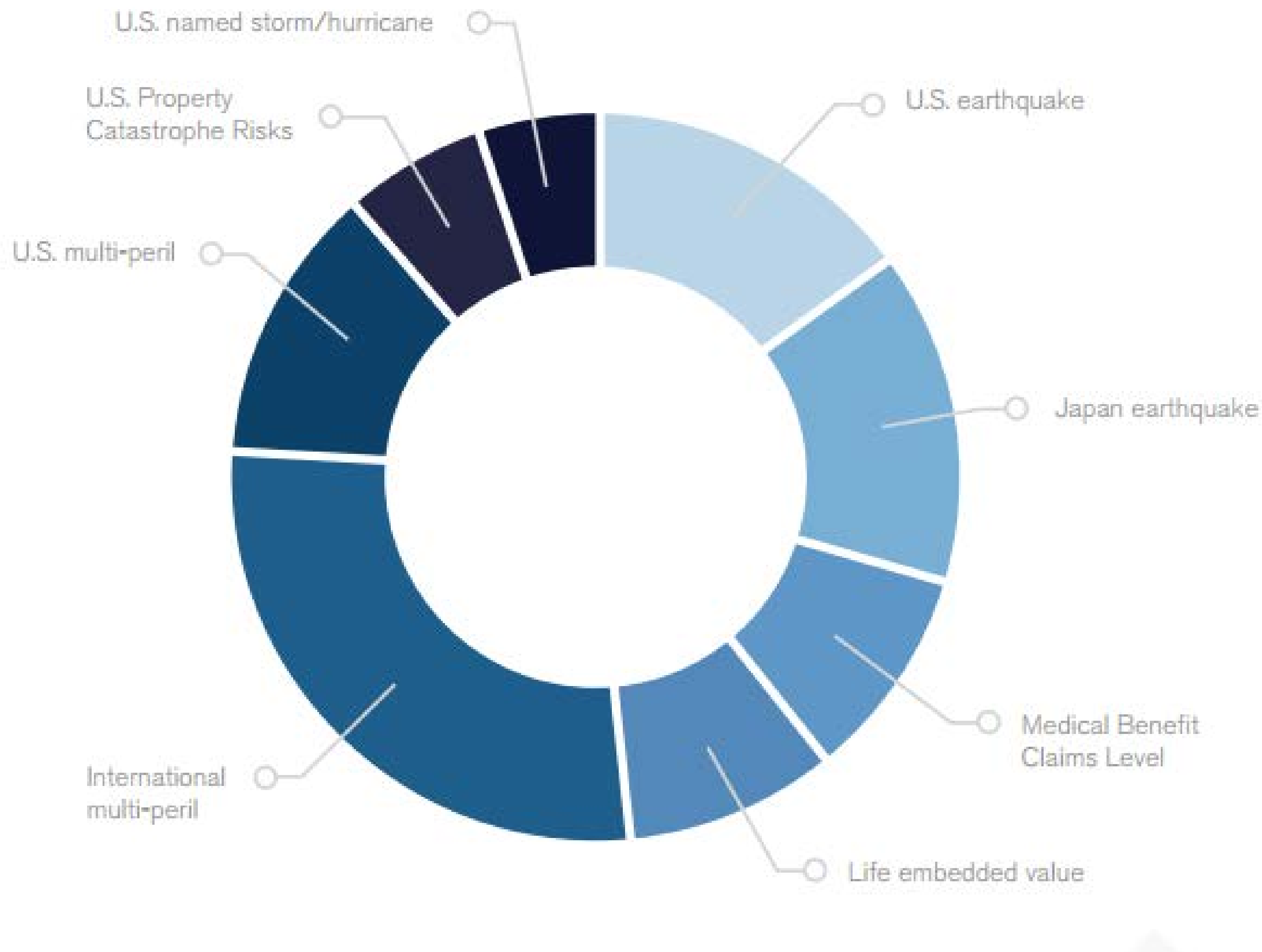
Types of Securitized Risks

Currently Hurricanes, Earthquake, Typhoons, Windstorms, Thunderstorms, Floods, Hails

<u>but</u>

There is room to adapt the model to typical life risks such as longevity and health insurance claims

Trend of 2015 Issuances by Risk Type



Selected Issues and Areas of Research

- Regulatory constraints, tax and choice of law
- Unenforceability issues in purely speculative environments (*i.e.*, gambling *exceptio*)
- Pricing models (*e.g.*, market based and actuarial)
- Catastrophes' data and impact of climate change
- Regulation…

«In the Beginning it is the Market, In the End it is the Law»

References

- www.artemis.bm (a database with almost 300 cat bond deals, market data and updated reports)
- LEWIS, *In Nature's Casino*, New York Times (August 26, 2007)
- BRAUN-MÜLLER-SCHMEISER, What drives insurers' demand for cat bond investments? Evidence from a Pan-European survey (2012)

A lot of work ahead of us…

Thank you

paolo.rainelli@polito.it