

# A ROLE FOR ACTUARIES IN REINSURANCE AND CAPITAL MARKET CONVERGENCE

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# ILS Universe: Introduction

## ➤ What is Alternative Risk Transfer (“ART”)?

- Use of techniques other than traditional (re)insurance to protect risk-bearing entities from risk of loss
- ART market began in the 1990’s in effort to expand insurers’ ability to transfer peak insurance risks
- Objective: attract non-traditional capital willing & able to absorb insurance risk uncorrelated to existing portfolios while seeking favorable returns

## ➤ What is Insurance-Linked Securities (“ILS”)?

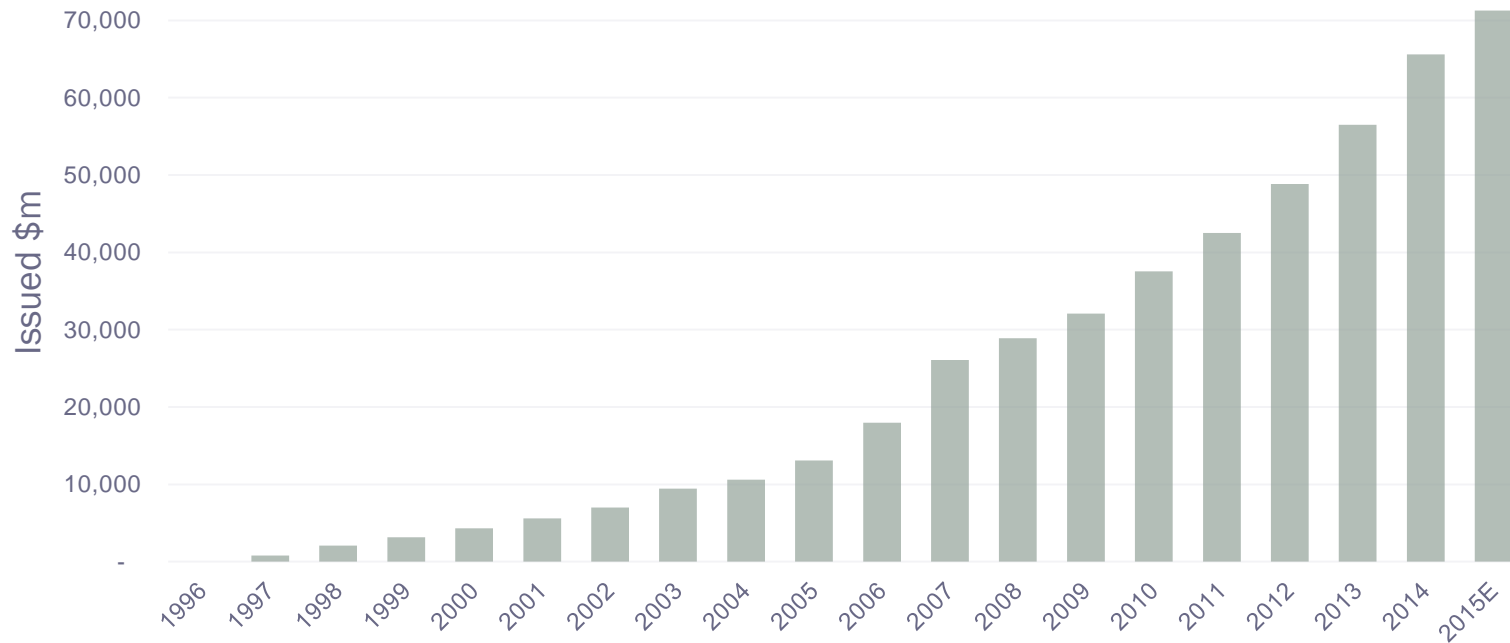
- Financial instruments whose values driven by insurance loss events
- Generic term referring to transactions in which insurance risks are transformed into transparent and tradable capital market products
- Also referred to as Alternative (Capital Market) Reinsurance



# ILS Universe: Market Size

- ILS market expected to reach 20% of global reinsurance capacity in 2015

Catastrophe bonds and ILS cumulative issuance by year

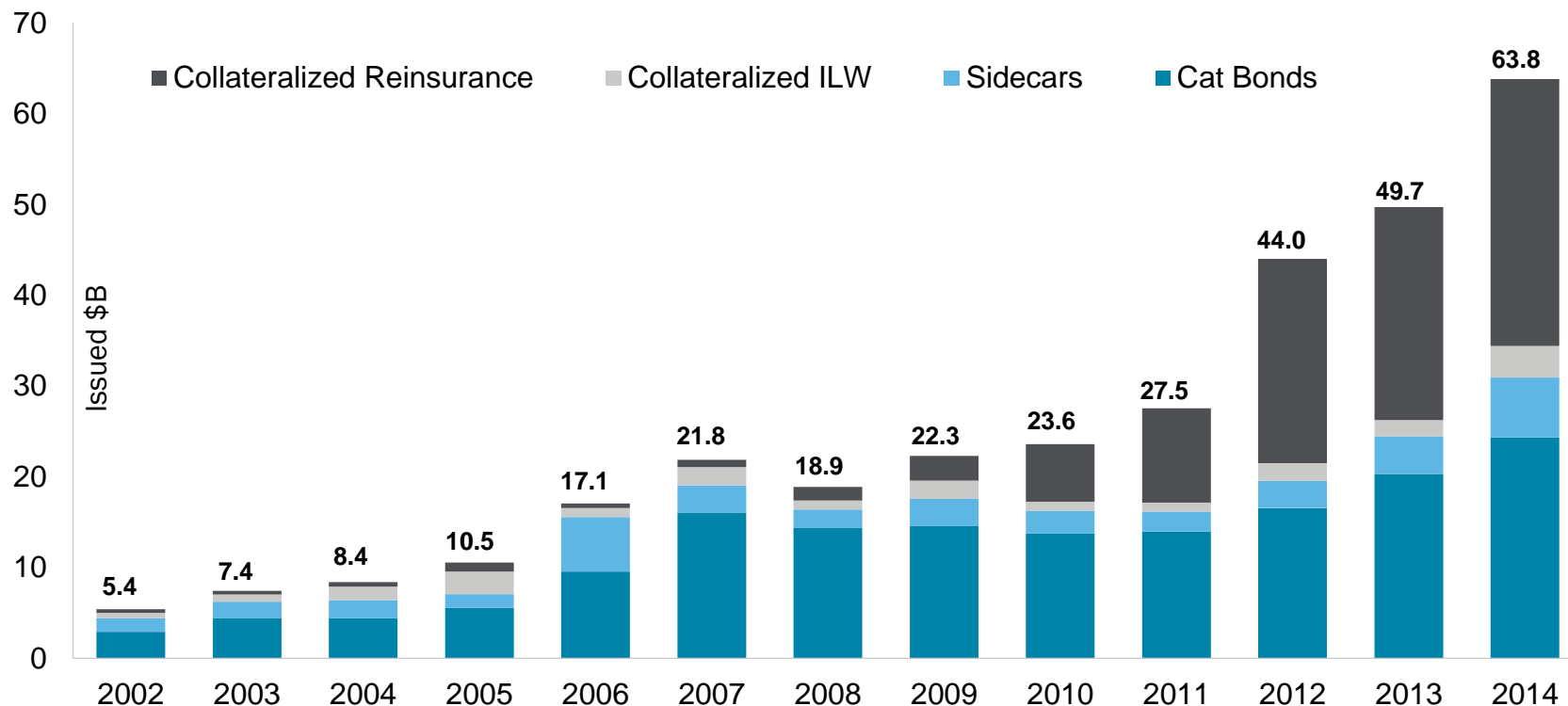


Source: [www.artemis.bm](http://www.artemis.bm) Deal Directory



# ILS Universe: Market Volume (Non-life)

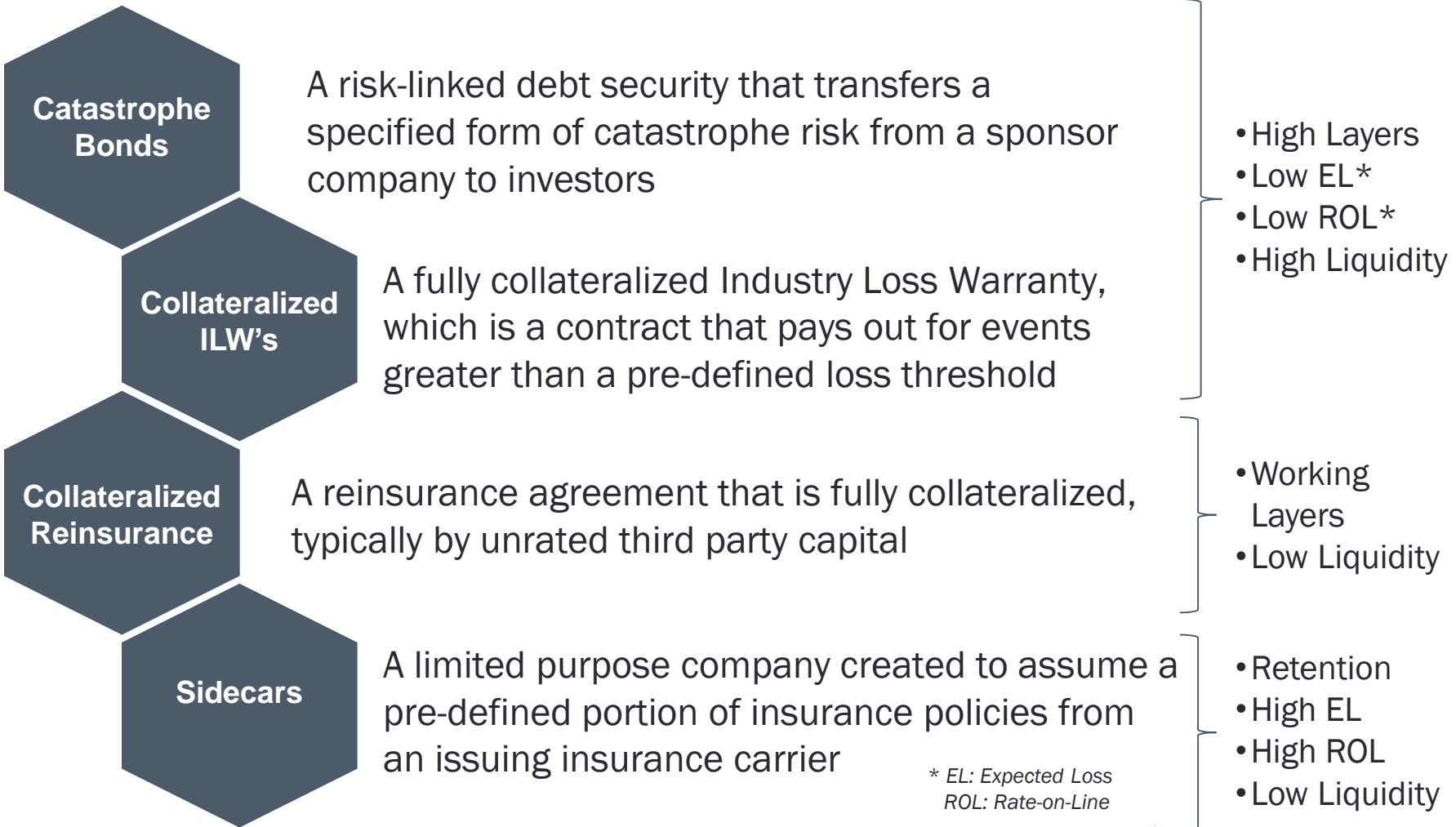
- Non-life alternative reinsurance has increased 28% since year-end 2013 to US\$63.8B



Source: Aon Benfield Securities, Inc.  
As of December 31, 2014



# ILS Universe: Types of Transaction

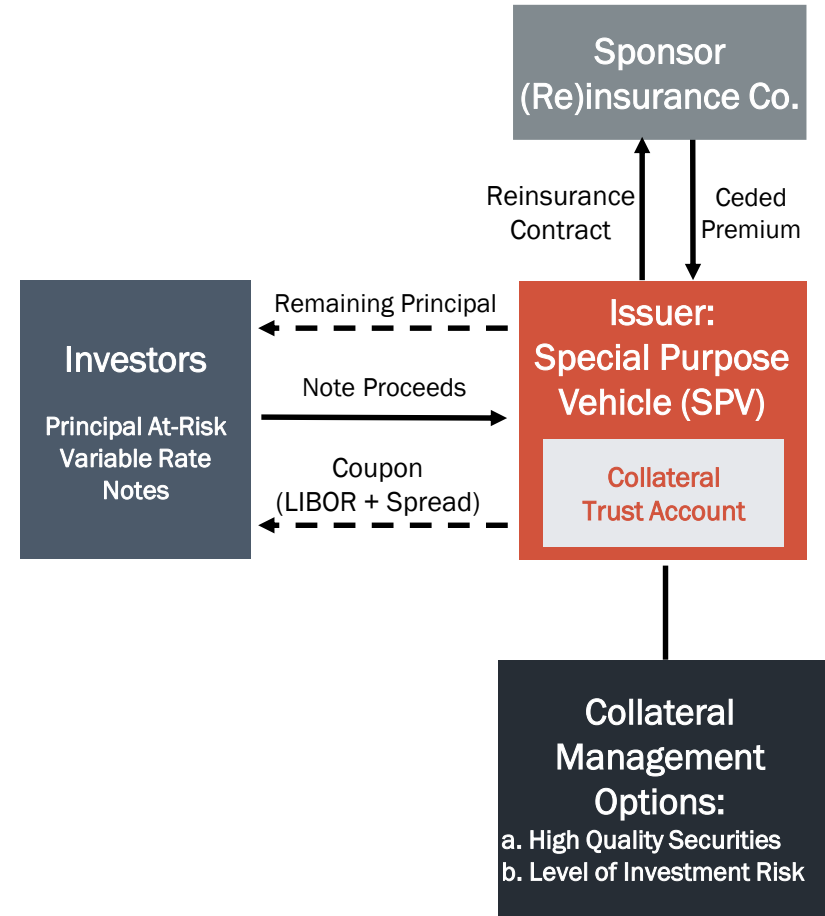


\* EL: Expected Loss  
ROL: Rate-on-Line



# ILS Universe: Catastrophe Bond Structure

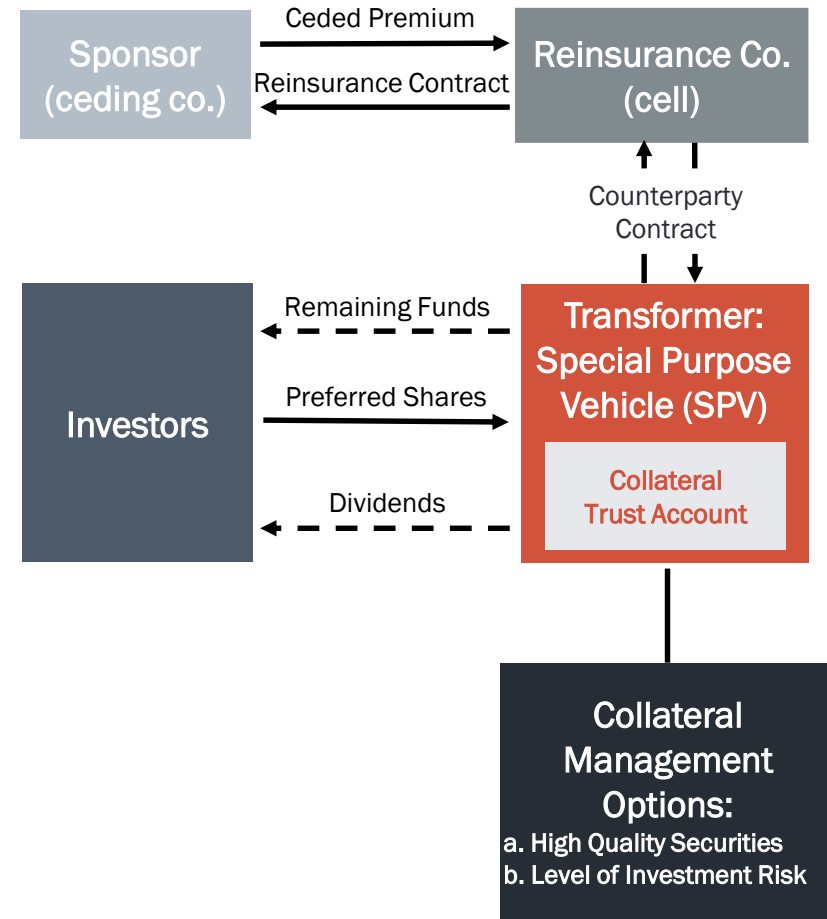
- Special Purpose Vehicle (“SPV”) established to write a reinsurance agreement
  - Entity exists solely to write the specific transaction
- Investors purchase bonds issued by the SPV
  - Investors receive interest income on the invested funds plus a premium (interest spread) for the risk assumed
  - Funds raised collateralize the reinsurance agreement (i.e. limited credit risk)
- No Loss Events
  - Principal repaid to investors with interest
- Loss Events
  - Insured (sponsor) has transferred catastrophe risk and receives loss payment from the SPV
  - Insufficient funds in the SPV to fully repay investors (i.e. full or partial default)





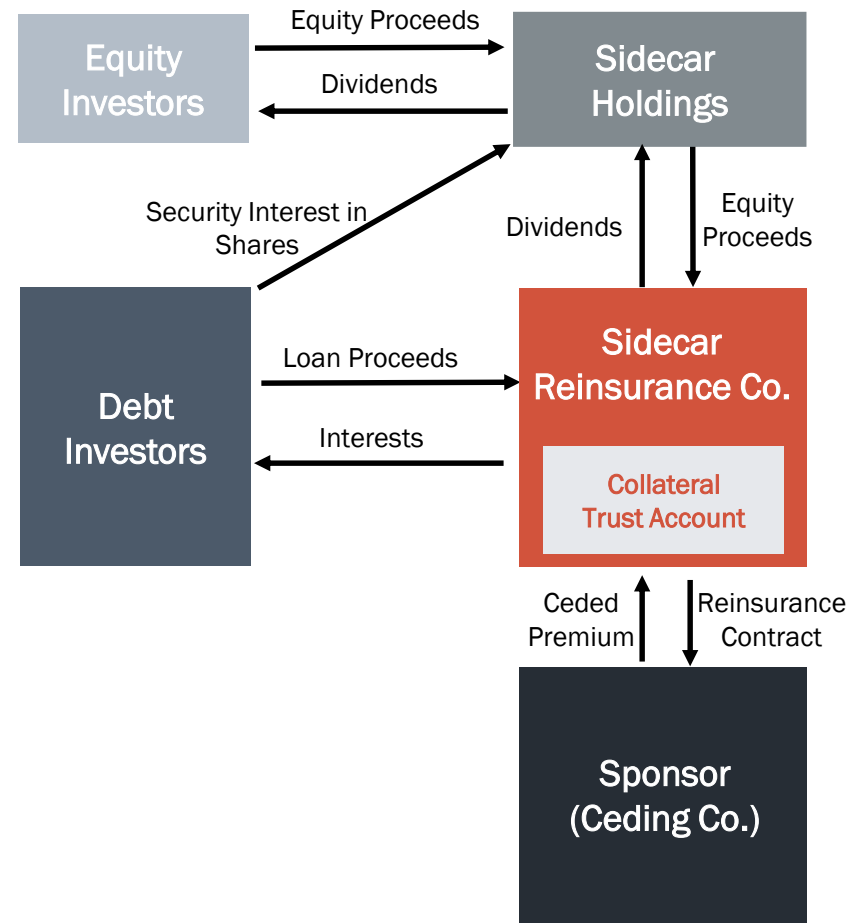
# ILS Universe: Collateralized Re Structure

- Special Purpose Vehicle (“SPV”) established to transform insurance risks into capital market products
  - Typically licensed reinsurance company with segregated account (“cell”) structure
- Some advantages of cell structure:
  - Less expensive than separate reinsurance
  - Investors are non-voting shareholders
  - Easier to unwind than stand-alone company
- Investors purchase non-voting preferred shares in the SPV
  - Funds raised collateralize the reinsurance agreement (i.e. no credit risk)
  - Investors receive dividends and remaining funds
  - Allow direct investment into (re)insurance



# ILS Universe: Sidecars

- Holding company own 100% of the sidecar
  - Capital structure typically include Equity and Debt
- Sponsor buy reinsurance coverage
  - Common for property and marine catastrophe risks
  - Usually via a quota share reinsurance agreement
  - Receives commissions and fees (override and profit commission)
  - transaction typically has a limited lifespan



# Impact on Reinsurance: Disruptive Innovation

- Traditional reinsurance employs leverage
  - Reinsurers write policies whose losses are multiples of capital in balance sheets (“levered” balance sheets)
  - Leverage is accepted as part of business plan through diversification, risk management and credit rating
- Securitization eliminates leverage via full collateralization
  - Securitized risk hold cash and liquid securities equal to full limit of coverage
  - Thus reduces credit risk and makes liquid trading possible
- At simplest insurance securitization is change in capital structure:
  - From levered to unlevered (collateralized) balance sheet
  - From managing to hedging the risks



# Impact on Reinsurance: Evolving Business Models

| Evolving Business Models   | Key Risk Strategies | Main Attributes  |
|--|---------------------|--|
| Superior scale: globally big and knowledgeable   | Underwriting        | Capital and pricing efficiency   |
| Nimble innovator: uses analytics and expertise   | Underwriting        | Platform flexibility and superior customer understanding                               |
| Llyod's: combines depth and breadth with expertise                                     | Underwriting        | Creativity and innovation within small structure & global licenses                     |
| Hedge-fund Re: accumulates (large) stable funds to deliver superior investment returns | Asset               | Careful targeted risk selection with low volatility                                    |
| Risk transformer: specialist capital market funds                                      | Fee income          | Channel investments into reinsurance while providing capital efficiency & transparency |
| Direct: partners with client to provide targeted capital market protection             | Underwriting        | Provides cost-efficient capital market protection against discrete risks               |

Source: PwC Reinsurance 2020 & personal experience



# Actuarial Involvement in ILS

## ➤ Factors influencing actuarial involvement in ILS:

- Transparency: Net Asset Value (“NAV”) published on monthly basis
- Independence: Investors’ demand for independent third-party review
- Credit rating agencies (“CRA”) and regulators prospective:
  - Assessors of creditworthiness and policyholders security
  - CRA used in structured finance to rate but also advise on structure
  - Actuarial work products is KEY rating factors (e.g. ratemaking and reserving)

## ➤ NAV is an assessment of fund’s Fair Value (“FV”)

- $$FV(t) \approx \underbrace{[Collateral + Premium]}_{FV(Assets)} - \underbrace{P(t)}_{FV(Liabilities)}$$
- $P(t)$  is premium that rational risk taker charge at  $t$  to assume all risks
  - $P(t) \approx Loading(t) * E[X|L(t)]$  with  $P(0) = Premium$
  - $L(t) = Ultimate\ loss\ on\ earned\ exposure$



# Actuarial Involvement in ILS (cont.)

- Summary of current actuarial involvement in ILS
  - Actuarial risk analysis and pricing at inception
  - Revenue recognition according to seasonal earning of premium
  - Actuarial loss reserving related to estimating  $L(t)$
  - Actuarial pricing related to estimating  $P(t)$
  - Portfolio risk management (e.g. track UW guidelines or risk metrics)
  - Collateral release and commutation (e.g. procedure for establishment and run-off of reserves)
  - Service provider (e.g. loss reserve specialist, calculation agent, peril modeler, etc.)
  - Third party valuation review
  - Education (...)



# Actuarial Involvement in ILS (cont.)

- Summary of current actuarial involvement in ILS
  - Financial analysis & reporting
  - Traditional actuarial loss reserving
  - Traditional actuarial pricing & modeling
- Some actuarial consideration in ILS valuations
  - Premium Estimate
    - Modeled vs. Un-modeled
    - Seasonality earnings
    - Remodeling after loss occurs & consideration for aggregate XOL contracts
  - Claims Estimate
    - Timing of recognition (expected, actual or modeled)
    - Attritional vs. Catastrophe
    - Reserving process and governance issues



# QUESTIONS?

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