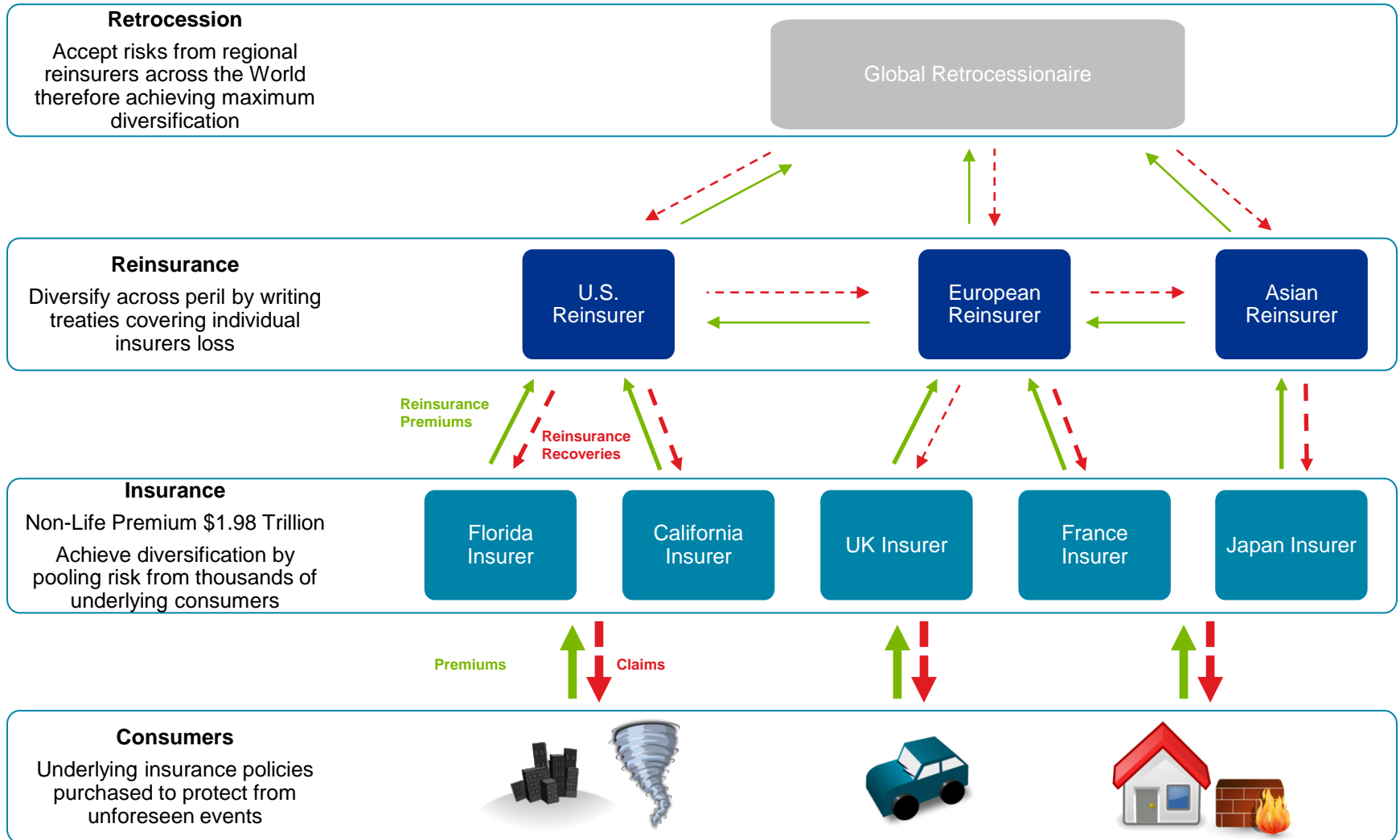


Catastrophe Reinsurance Traditional vs Collateralized vs Cat Bonds

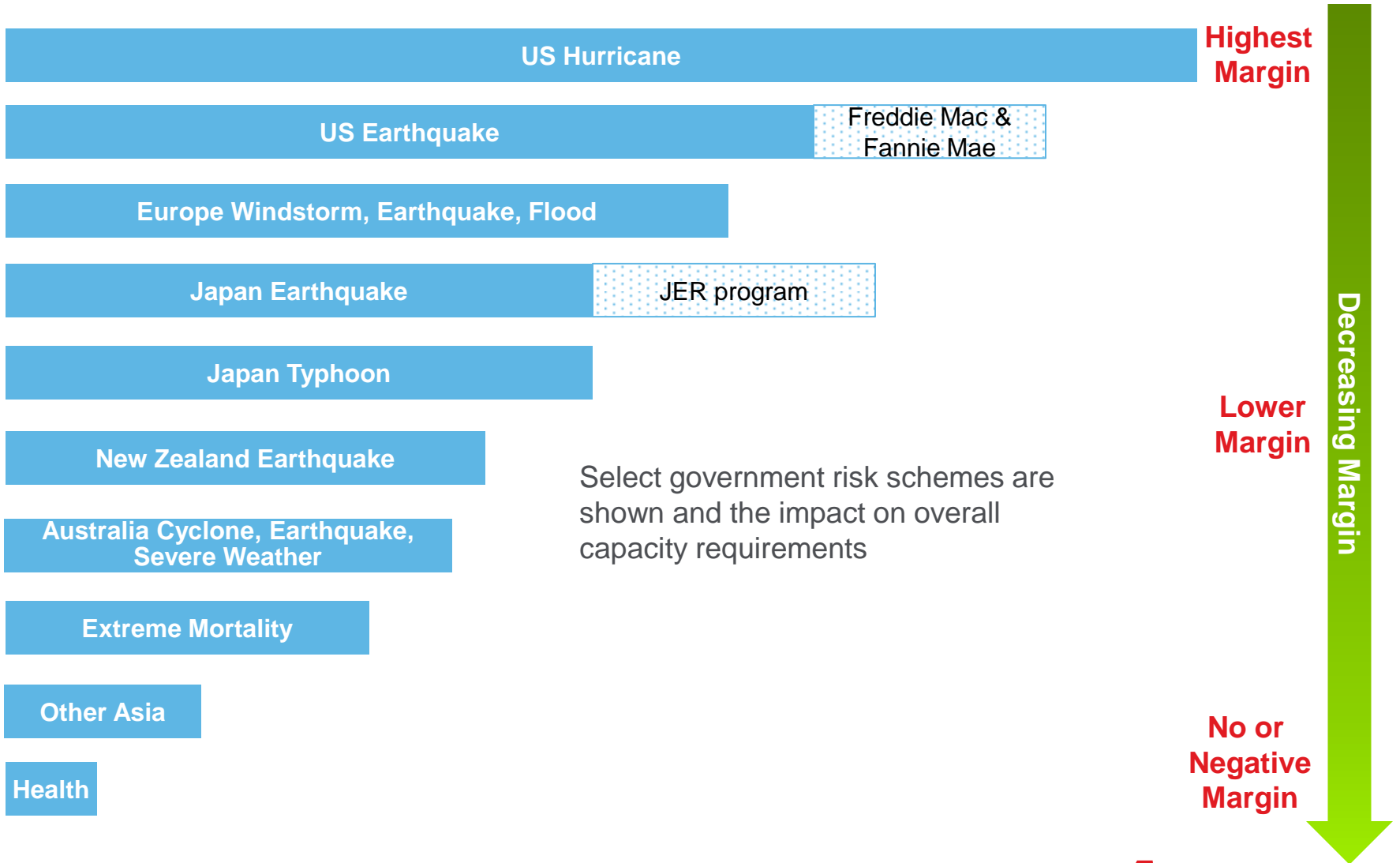
Erin Lakshmanan, Aon Benfield Securities
CAS Annual Meeting, November 4th 2013



Reinsurance Example



Global Distribution of Catastrophe Business

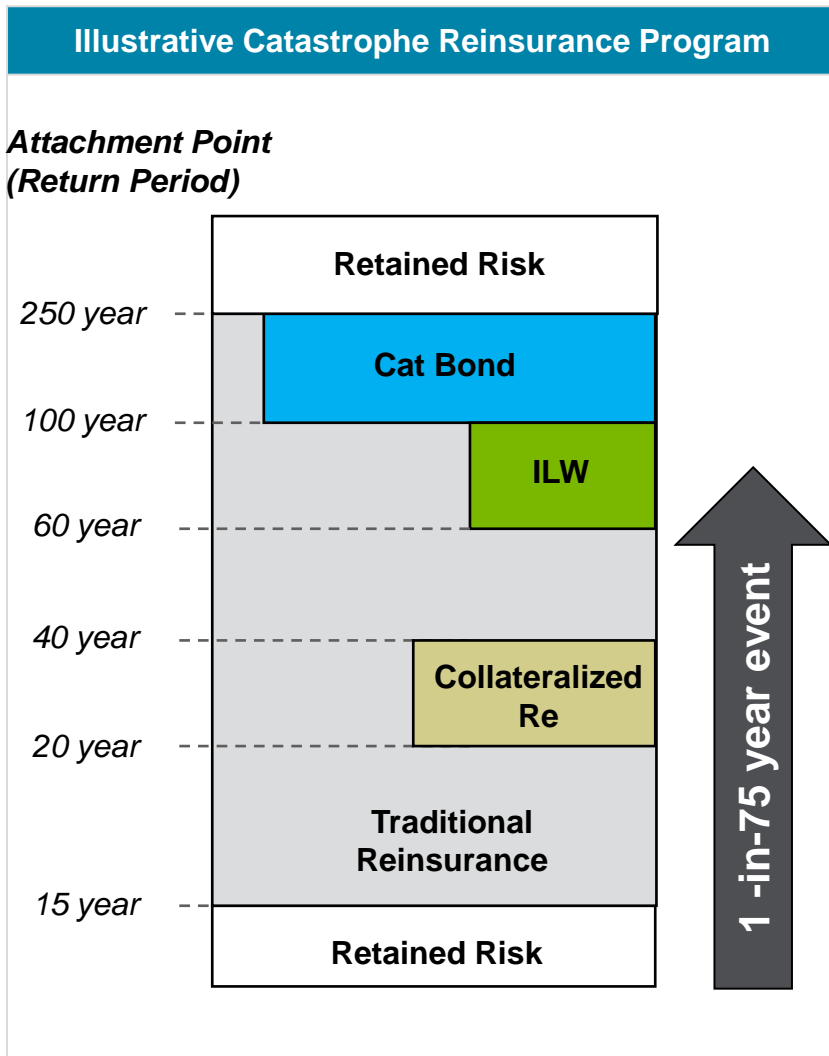


Excess of Loss Risk Transfer Options

Products	Description	When to Utilize
Traditional Reinsurance	<ul style="list-style-type: none"> Reinsurance contracts are renewed annually Multiple reinsurers typically participate in excess of loss contracts Reinstatements of limit are common 	<ul style="list-style-type: none"> Insurance companies purchase reinsurance to reduce exposure to losses from catastrophic events Less severe losses are absorbed in a retention layer
Catastrophe Bonds*	<ul style="list-style-type: none"> Typically cover defined risks on an excess of loss basis Investors provide coverage to insurers above an agreed trigger level 	<ul style="list-style-type: none"> Similar to traditional reinsurance Collateralized limit advantage for extreme events Market size currently ~\$17bn
Industry Loss Warranty (ILW)*	<ul style="list-style-type: none"> Binary reinsurance contract or derivative instrument that cover losses from events where the industry-wide insured loss exceeds some pre-agreed threshold 	<ul style="list-style-type: none"> Designed to protect insurers and reinsurers more comfortable with index-based risk from severe losses due to extreme industry events
Collateralized Reinsurance*	<ul style="list-style-type: none"> Coverage identical to traditional reinsurance with limits fully collateralised Mainly single event risks 	<ul style="list-style-type: none"> Used primarily for lower layers of coverage and for treaties without reinstatable limits, including aggregate covers and reinstatement premium protection (RPPs)

* ILS (Insurance-Linked Securities)

ILS Products Supplement Traditional Reinsurance



- Purpose of Reinsurance Cover**
- Purchased to cover losses arising from catastrophic events, e.g. hurricanes, earthquakes
 - Typically purchased in multiple layers with small losses being retained by the cedant
 - Catastrophe losses must exceed attachment point in order to cause impairment

Comparison of Risk Transfer Products

	Traditional Reinsurance	Collateralized Reinsurance	Catastrophe Bond
Security	Reinsurers “Paper”	Collateral posted for limit minus premium	Fully collateralized
Premium payments	Normally quarterly in advance	Normally quarterly in advance	Typically quarterly in arrears
Reinstatement	One reinstatement; reinstatement premium offset against loss	Mostly single shot	Single shot
Premium Adjustment	Premium adjustment based on exposure changes (e.g. premium, TIV or expected loss)	Similar to traditional reinsurance	Not applicable unless option reset mechanics built in
Fees and Expenses	Percentage of premium	Similar to traditional	Higher upfront fees associated with set up of vehicle
Documentation	Similar documentation used year-on-year	Similar to traditional, but more extensive because of collateral	Heavier documentation requirements (multiple transaction documents)
Risk Analysis	Dedicated expertise to assess the probability of loss	Similar to traditional reinsurance	Provided by independent modeling firm
Tradability	Not tradable	Typically not tradable	Freely tradable to qualified buyers

Collateralized Reinsurance

- Traditional UNL (ultimate net loss) policy with un-rated carriers
 - Full policy limit collateralized at inception
 - Collateral provided through
 - Trust account
 - Letter of credit (LOC)
 - Fronting arrangement

- Cedent motivations for product
 - Substantially reduce counterparty credit risk
 - Expand reinsurer panel
 - Attract capital interested in reinsurance risk as an asset class

Industry Loss Warranties (ILWs)

- Important source of capital markets capacity on an industry index basis
 - Macro hedge
- Two primary forms
 - Derivative contract: Pays full limit based solely on industry loss trigger
 - Reinsurance contract: Pays full limit based on industry loss trigger, up to company's net retained losses
- Limited perils and regions
- Advantages for cedent
 - Ease of execution
 - Minimal disclosure
- Important considerations
 - Basis risk
 - Collateral
 - Tail development

	Trigger	US	Florida
Hurricane	USD 25bn	23.00%	14.00%
	USD 40bn	13.00%	9.00%
	USD 50bn	10.50%	7.50%
	USD 60bn	8.50%	6.00%
	Trigger	US	California
Quake	USD 20bn	6.50%	5.00%
	USD 30bn	5.00%	4.00%
	USD 40bn	4.00%	3.50%
	Trigger	US	
All Perils	USD 20bn	30.00%	
	USD 30bn	22.00%	
	USD 40bn	16.00%	
	USD 50bn	13.50%	

Source: Aon Benfield Securities' RLS Price Sheet dated October 18, 2013

Catastrophe Bonds

- Debt security
- Single limit (no reinstatement)
- Fully collateralized
- Multi-year capacity at a fixed price
- Diversified source of capital
- Excess of loss coverage
 - Per occurrence
 - Aggregate
 - Subsequent event
- Availability and quality of exposure data for catastrophe modeling analysis
- Commonly covered perils include
 - US hurricane, earthquake, severe convective storm, winter storm
 - Europe windstorm
 - Japan typhoon, earthquake

Selected Sponsors	Number of Deals
ACE	3
AIG	5
Allianz	8
Amlin	2
Argo	2
Assurant	4
Catlin	1
Chubb Group	5
Factory Mutual	2
Flagstone	3
Hartford Fire	5
Liberty Mutual	5
Nationwide Mutual	4
Platinum	1
SCOR	9
State Farm	5
Travelers	4
USAA	19
Zurich	6

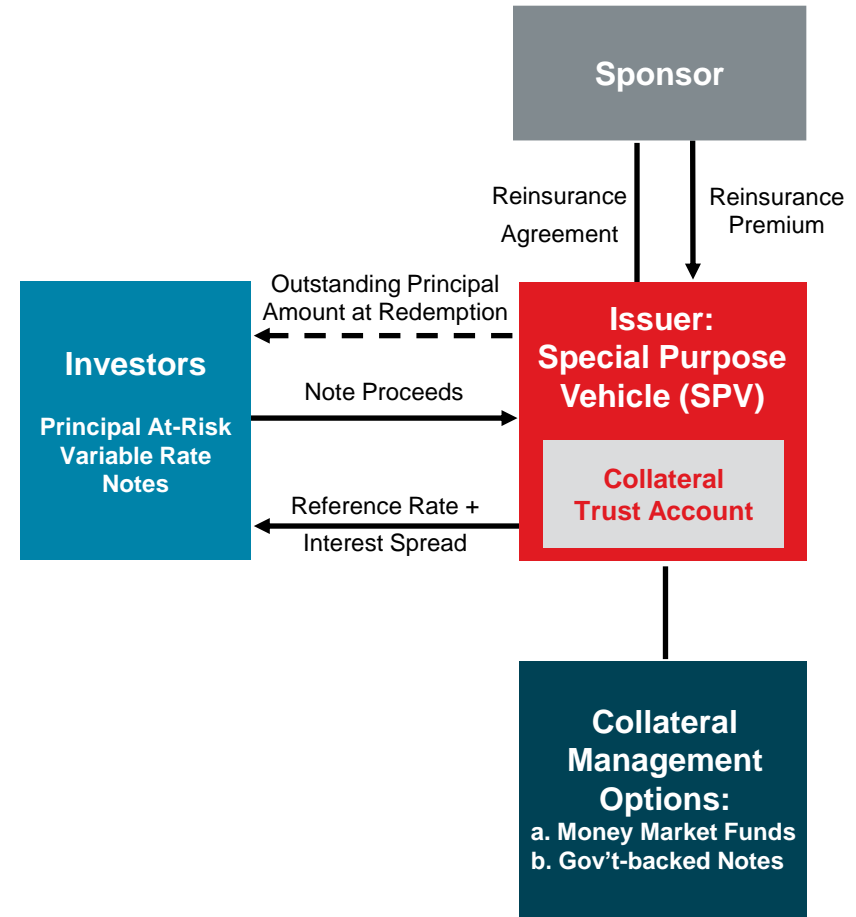
Cat Bond Buyers

- Investors in ILS are all Qualified Institutional Buyers (“QIB”) including

Institutional Funds (including Pension Funds)	<ul style="list-style-type: none">Credit SuisseLGTOntario Teachers Pension Plan
Dedicated ILS Funds	<ul style="list-style-type: none">ElementumFermatNephila
Hedge Funds	<ul style="list-style-type: none">BracebridgeD.E. ShawFarallon
Life Companies	<ul style="list-style-type: none">GenworthPacific LifeSwiss Life
Mutual funds	<ul style="list-style-type: none">OppenheimerPioneerStone Ridge
Reinsurer-Sponsored Funds	<ul style="list-style-type: none">Partner ReRenaissance ReTokio Millennium Re

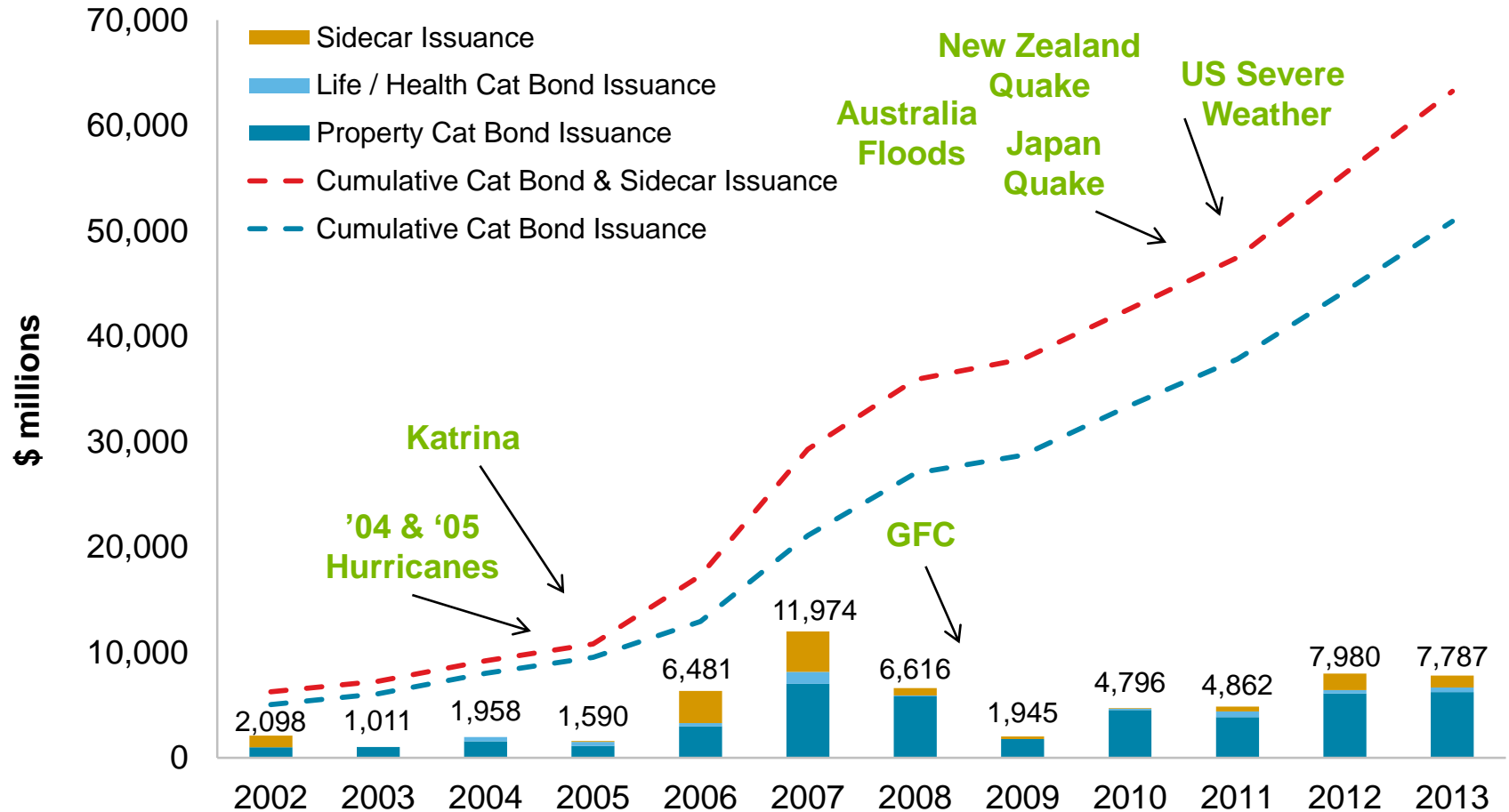
Overview of Catastrophe Bond Structure

- Special Purpose Vehicle (“SPV”) established to write a reinsurance/retrocession 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/retrocession agreement
- No Loss Events
 - Principal repaid to investors with interest, as planned
- 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)



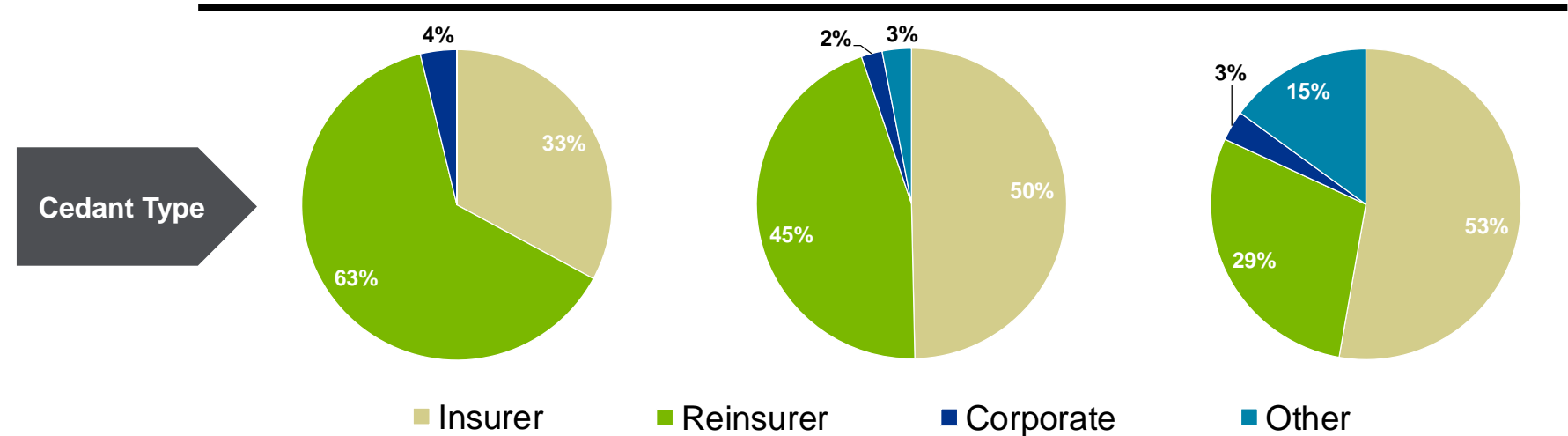
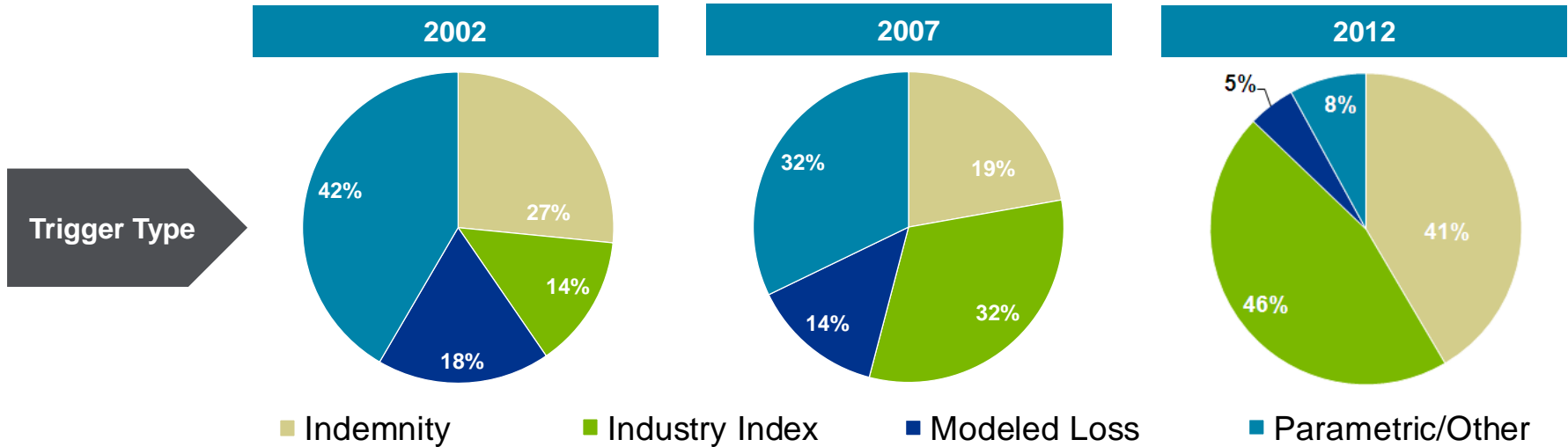
Historical Cat Bond Issuance and Market Events

Years ending June 30



Source: Aon Benfield Securities, Inc.

Trigger Types, 2002 – 2012



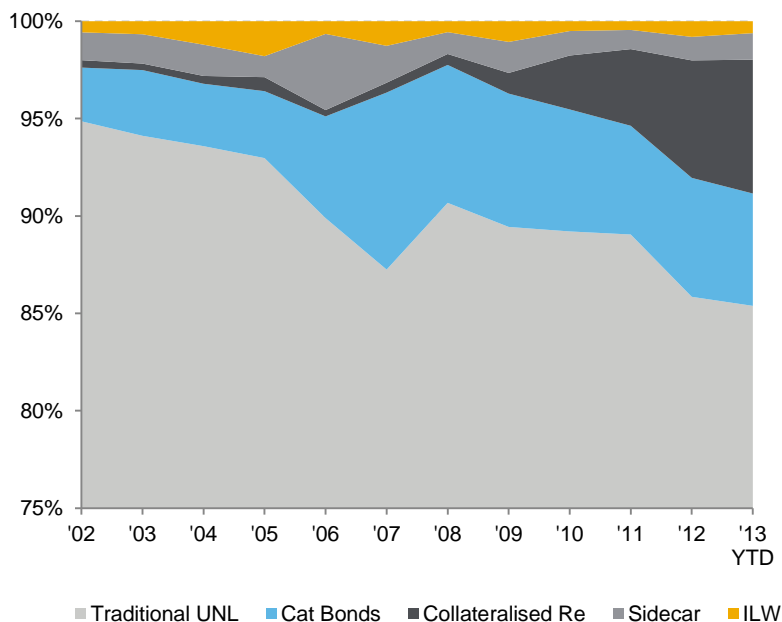
Note: Includes only cat bonds outstanding

Source: Aon Benfield Securities, Inc.

Recent Investment in (Re)insurance / ILS

Structural Shifts in Reinsurance

Estimated Market Share

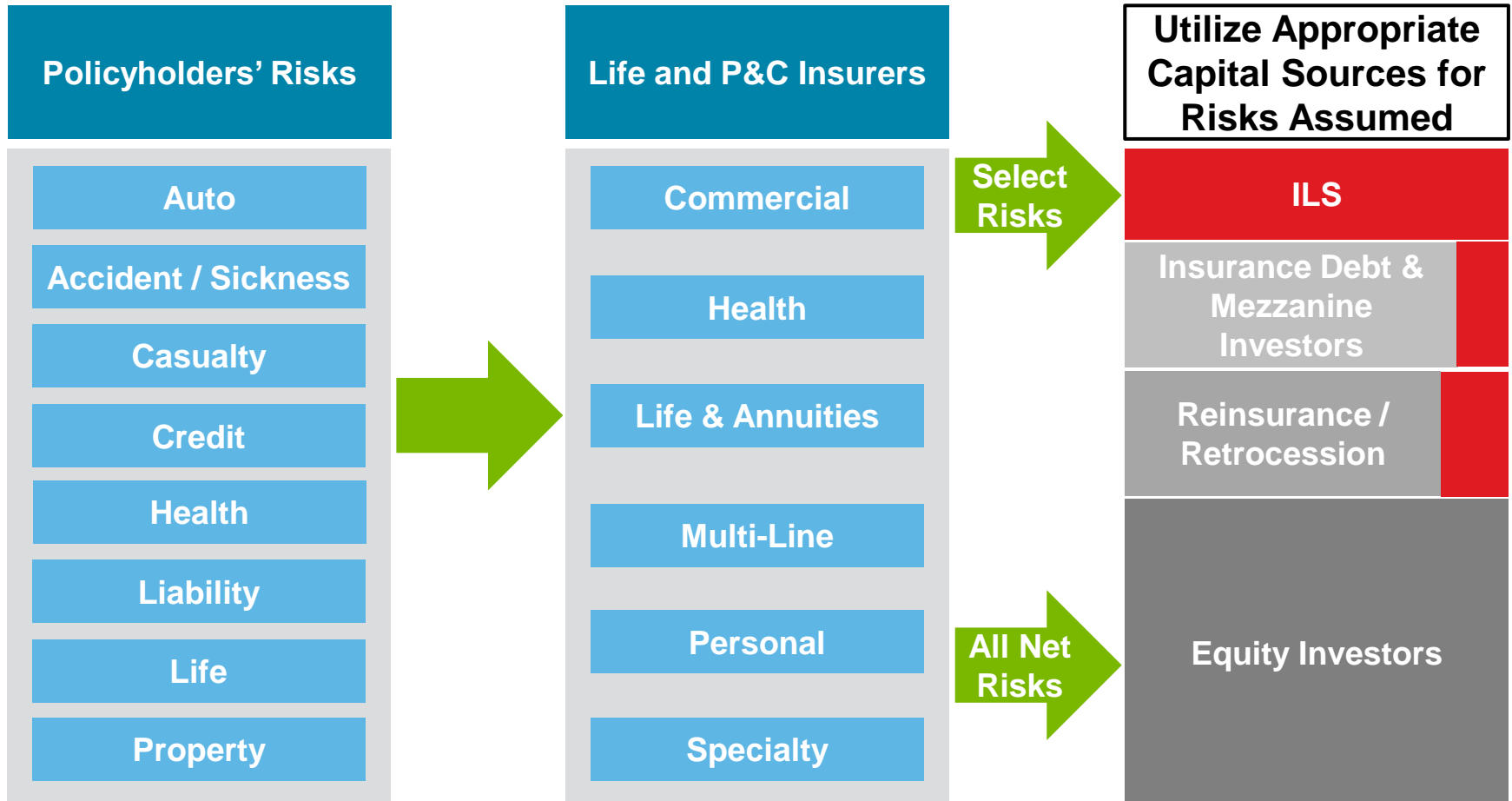


Source: Aon Benfield Securities

- Structural shifts within the industry indicating a trend to attracting and managing third-party capital
- Exemplified by ILS funds combined raising more than double the volume of capital as traditional reinsurance companies over the past year
- Third-party vehicles operate similar to traditional asset managers with performance and management fees
- Two prominent recent transactions highlighting investor appetite:
 - Goldman Sachs currently selling 75% of their reinsurance operations to private investors
 - KKR acquiring 24.9% of Nephila to broaden the Private Equity firms offering of liquid alternative investment strategies

Broad Opportunities for Growth Exist

- Total reinsurance capital ~USD 505 billion
- Total ILS market ~ USD 44 billion



Potential Next Areas for Growth and Challenges

- Expansion of life & non-property market
 - Longevity – global costs of ageing could increase by tens of trillions US dollars if individuals live 3 years longer than expected¹
 - Extreme mortality and health
 - Short-tail casualty
- New regions and perils
- Broadening coverage for non-modeled risks
- Modeling challenges
 - Data quality
 - Third-party model availability and frequency of updates
- Regulatory challenges, including Dodd-Frank and Solvency II
- How much do investors need and value diversification?

¹ Source: IMF