



somewhat
different

Insurance-Linked Securities

Functioning & Recent Developments

Henning Ludolfs, Managing Director
Hannover Re, Retrocessions & Capital Markets

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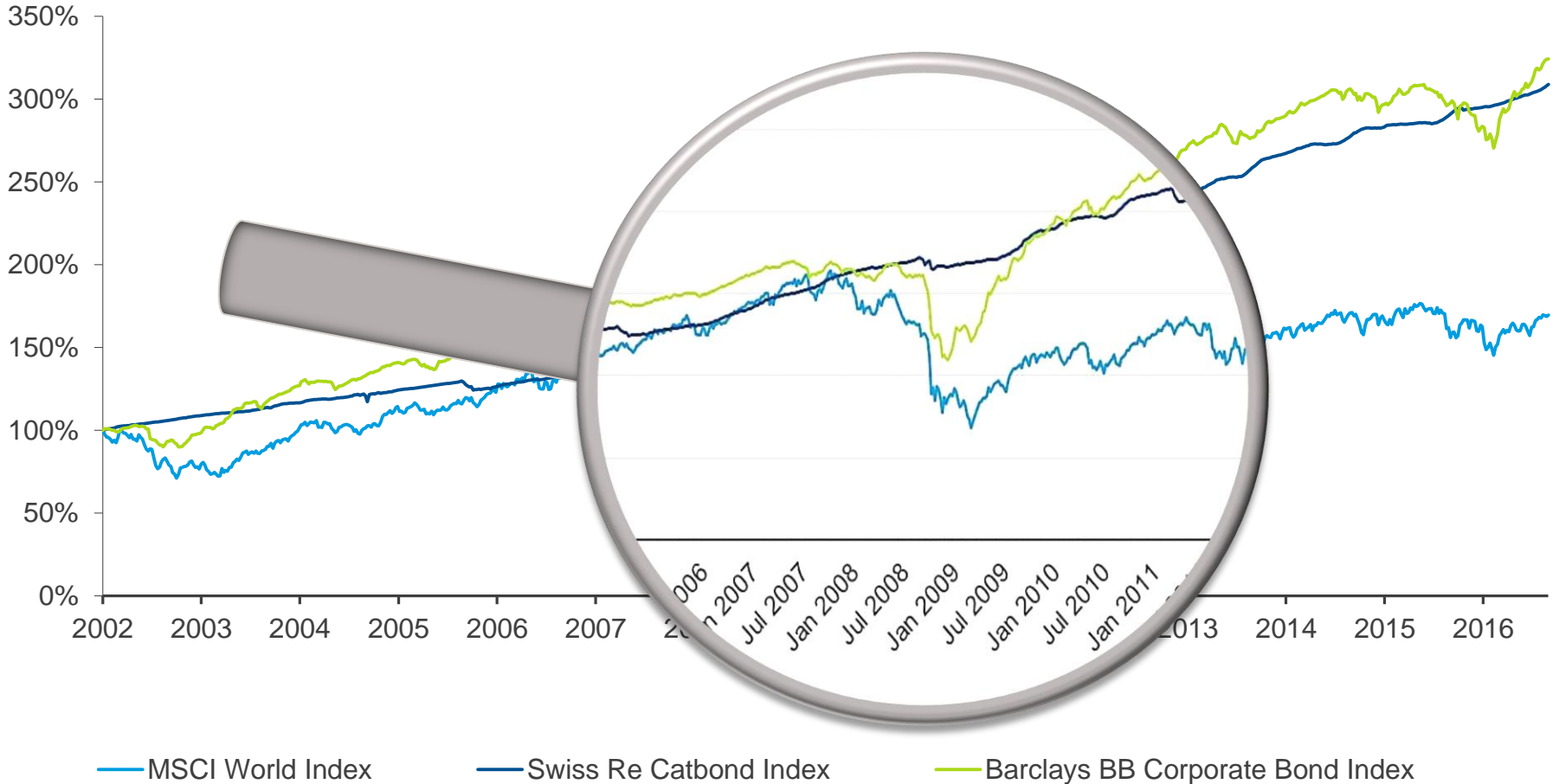
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Performance of different market segments

Cat bonds have historically shown a good performance with a low volatility

Relative Performance



Insurance-linked securities

What does this refer to?

▶ Insurance-Linked Securities

- are financial instruments whose values are primarily driven by insurance and/or reinsurance loss events

▶ In the narrow sense

- these are securities whose interest and principal payments are determined by the frequency and/or severity of insurance or reinsurance loss events
 - The main type of these securities are known as catastrophe bonds

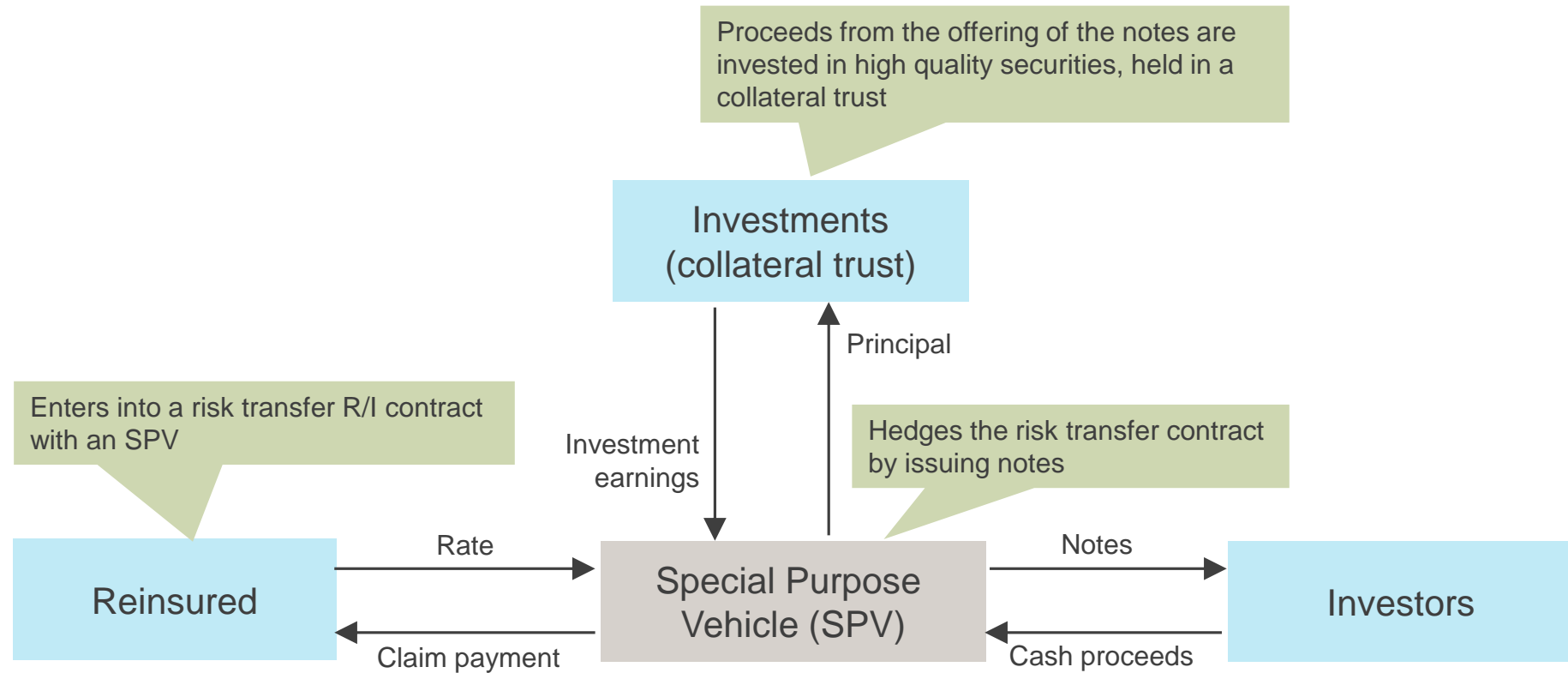
▶ In a wider sense

- ILS can be seen as transfer of all (re)insurance related risks to capital markets.
 - Examples: Catastrophe bonds, reinsurance sidecars, collateralised reinsurance and others

▶ First catastrophe bond ever: KOVER, Hannover Re 1994

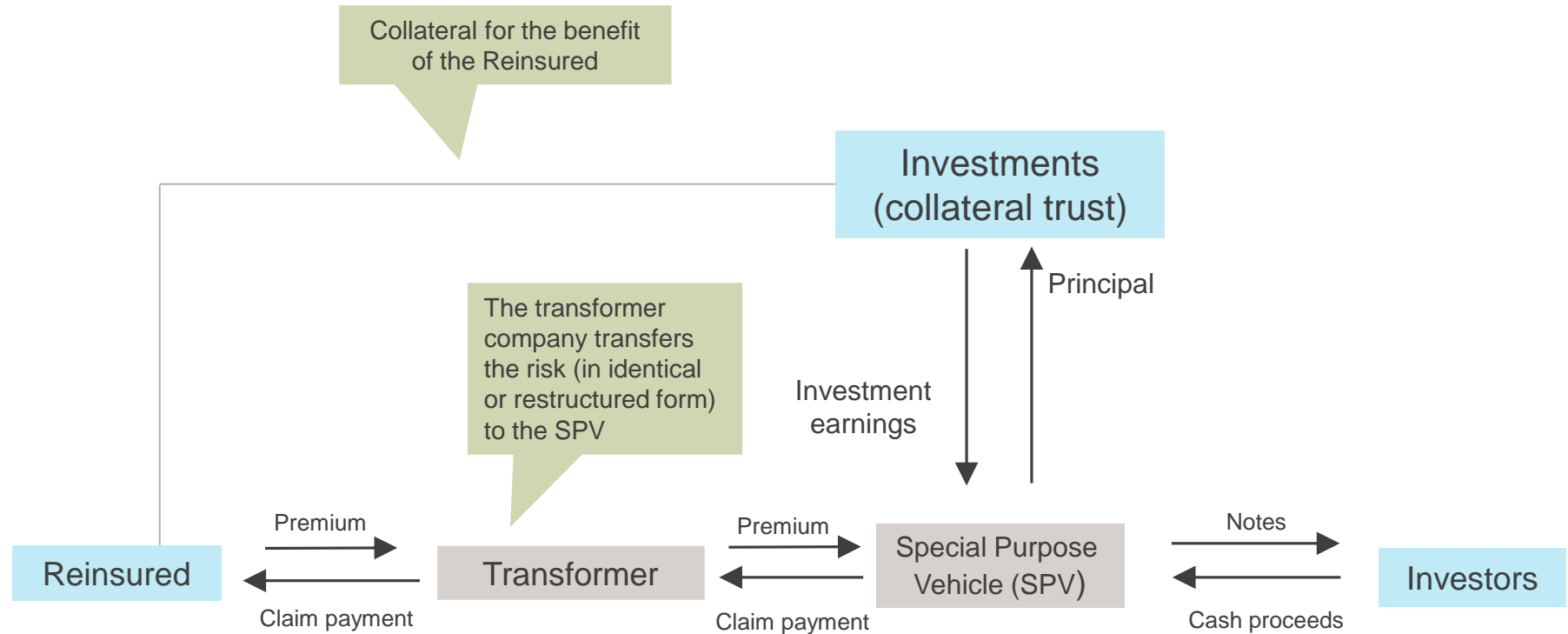
Functioning

The basic structure



Functioning (cont'd)

Sometimes with transformer



Variety of trigger mechanism

Some entail basis risk

- ▶ The attachment point is often defined as a synthetic trigger, in order to allow an easy and full understanding of the risks and a quick evaluation of the loss. The triggers can be categorised as follows:
 - **Parametric (geophysical index)**
 - Payment is determined by using geophysical parameters of the actual event (e.g. wind speed, location of hurricane, magnitude and location of EQ, etc.)
 - **Indemnity**
 - Payment is determined by the actual loss suffered by the sponsor
 - **Industry loss index**
 - Payment is determined by using an aggregate industry loss index (e.g. PCS or PERILS)
 - **Modelled loss**
 - Payment is determined by the application of a third-party model to the portfolio of exposures, fixed in advance, using parameters of the actual event

Basis risk generally reflects the possibility that a catastrophe bond with a synthetic trigger may not be partially or fully triggered (for covered perils) even when the sponsor of the catastrophe bond has suffered a loss, where he would have expected a recovery

Pros and cons of catastrophe bonds

Different perspectives of sponsors and investors

- ▶ Usual quantities: USD 100 m. - 300 m. per issuance

Originator's perspective

- ▶ **Sufficient capacity available**
(if price is right)
- ▶ **Very low counterparty credit risk**
- ▶ **Diversification of reinsurance capacity**
- ▶ Multi-year transactions



Investor's perspective

- ▶ Access to reinsurance market
- ▶ **Diversification**
- ▶ Currently some attraction compared to fixed income markets



- ▶ More complex
- ▶ More expensive – but not at this stage of the market
- ▶ Only one limit available over the term of the bond
- ▶ Structured release of collateral

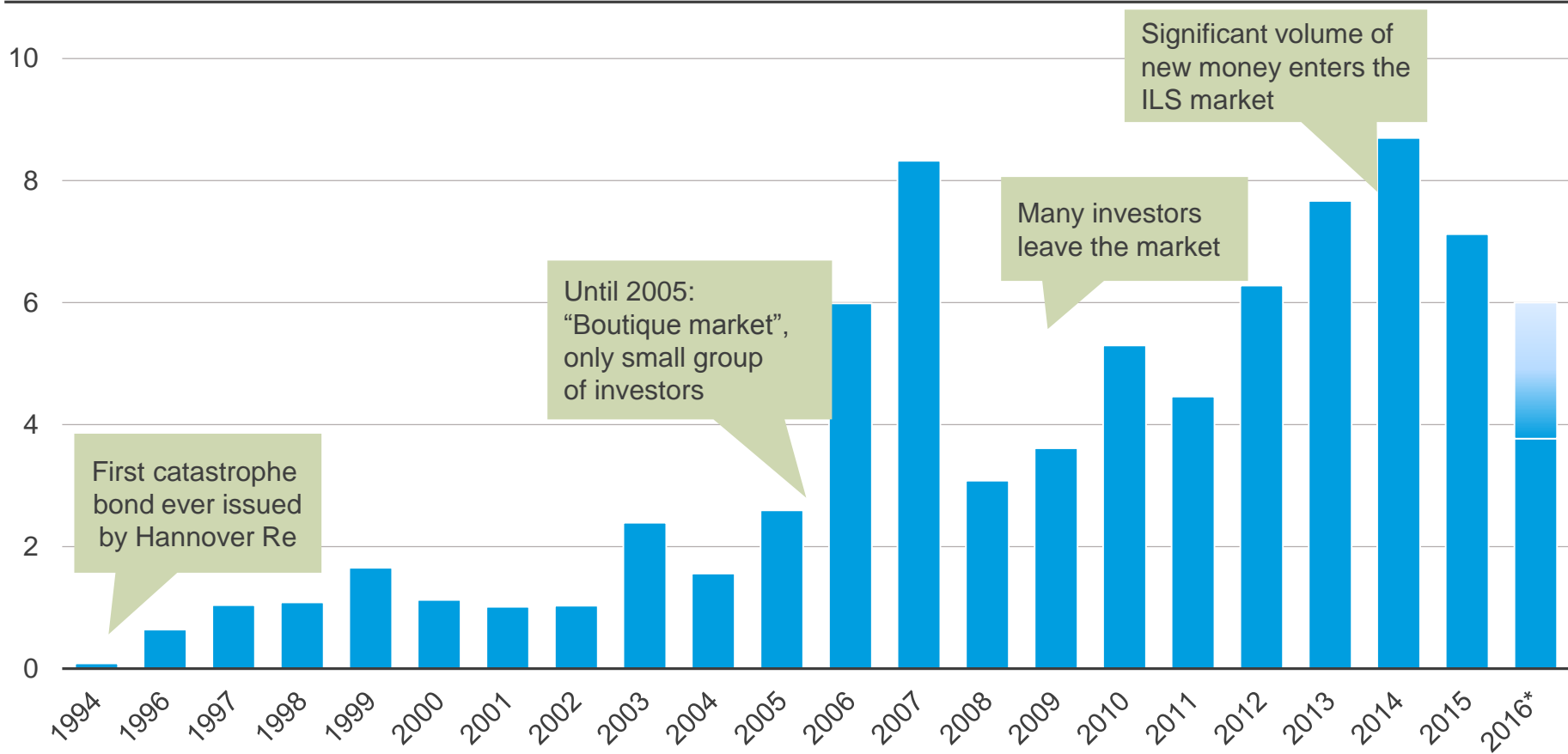
- ▶ Still relatively small market
- ▶ Higher cost of capital compared to traditional reinsurers
- ▶ Requires specific expertise

Catastrophe bonds: Strong impact from the financial crisis ...

...and some recent volume reduction

New issuance volume per year

in bn. USD



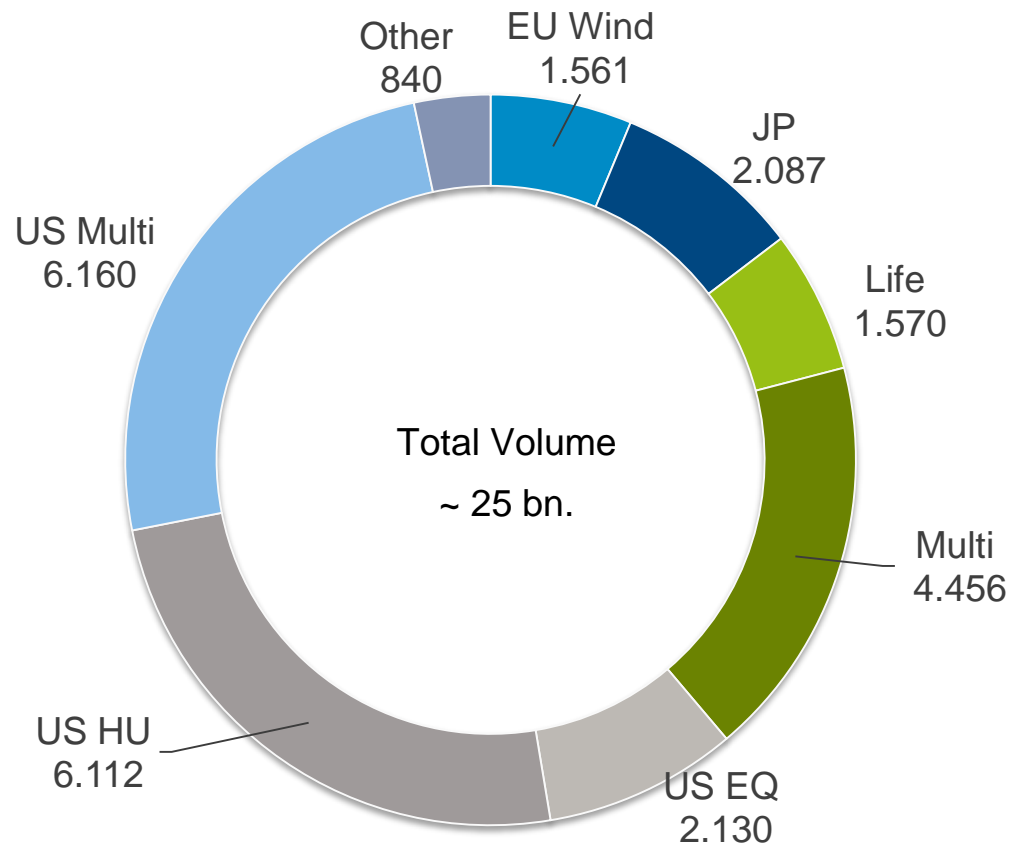
*) As at October 2016

Type of catastrophe risks

US dominates

Catastrophe bonds outstanding as of December 2015

in million USD

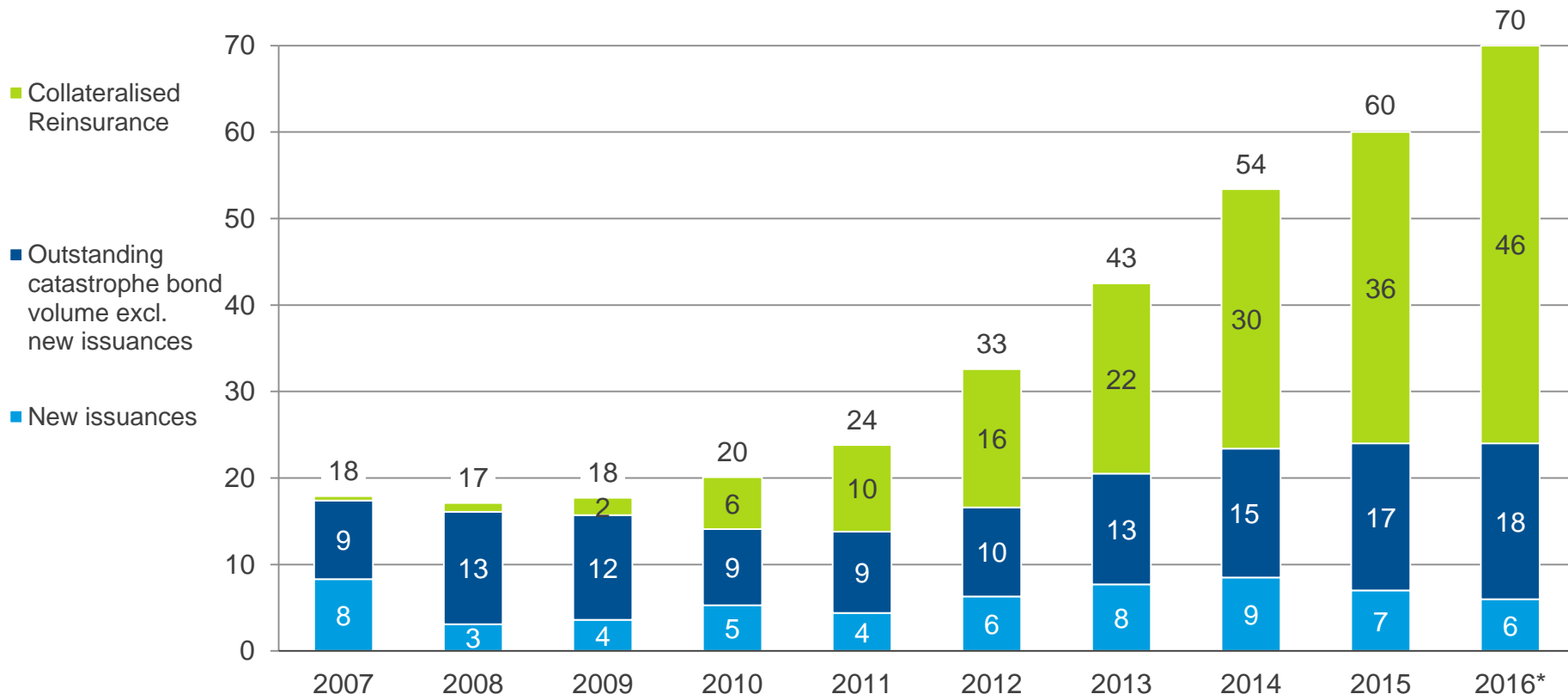


ILS Market: More than catastrophe bonds

Strong growth of Collateralised Reinsurance

ILS market volume

in bn. USD

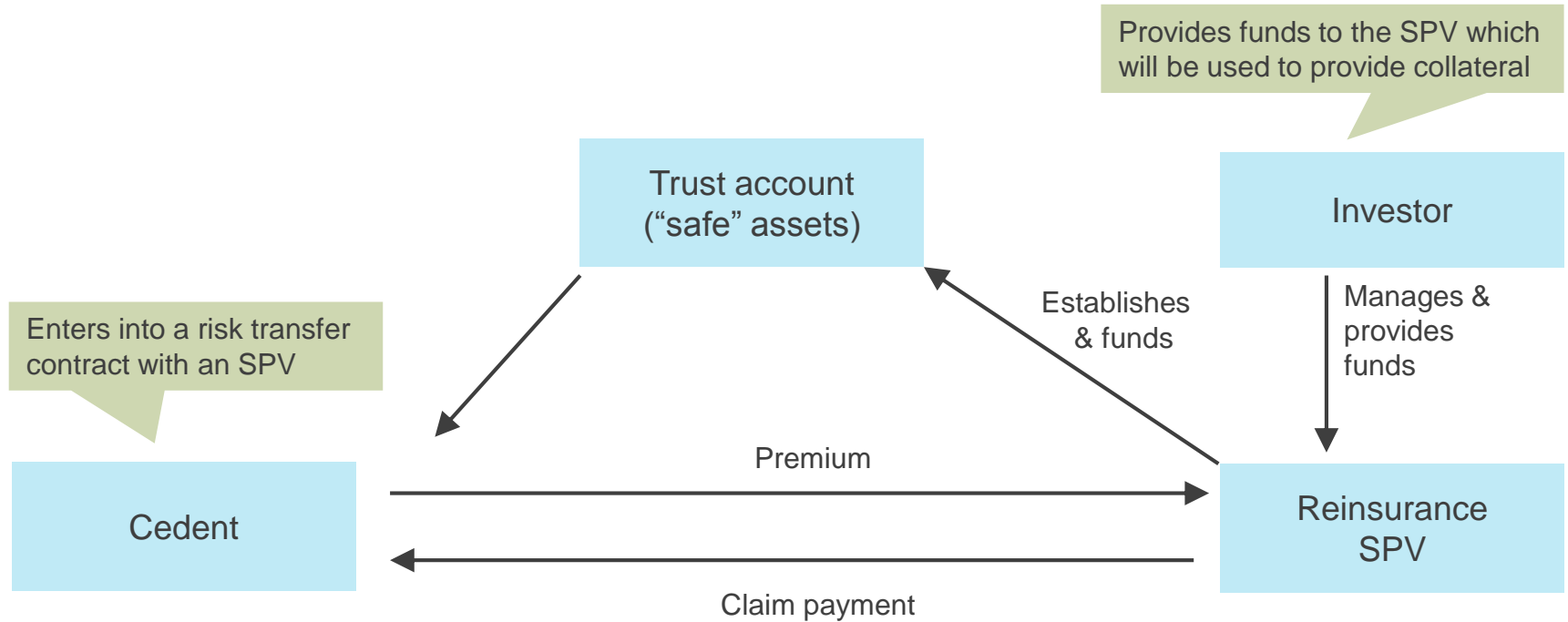


► We assume that in addition investors will invest in ILWs of 3 - 5 bn. USD p.a.

*) Per October 2016 estimation for 2016

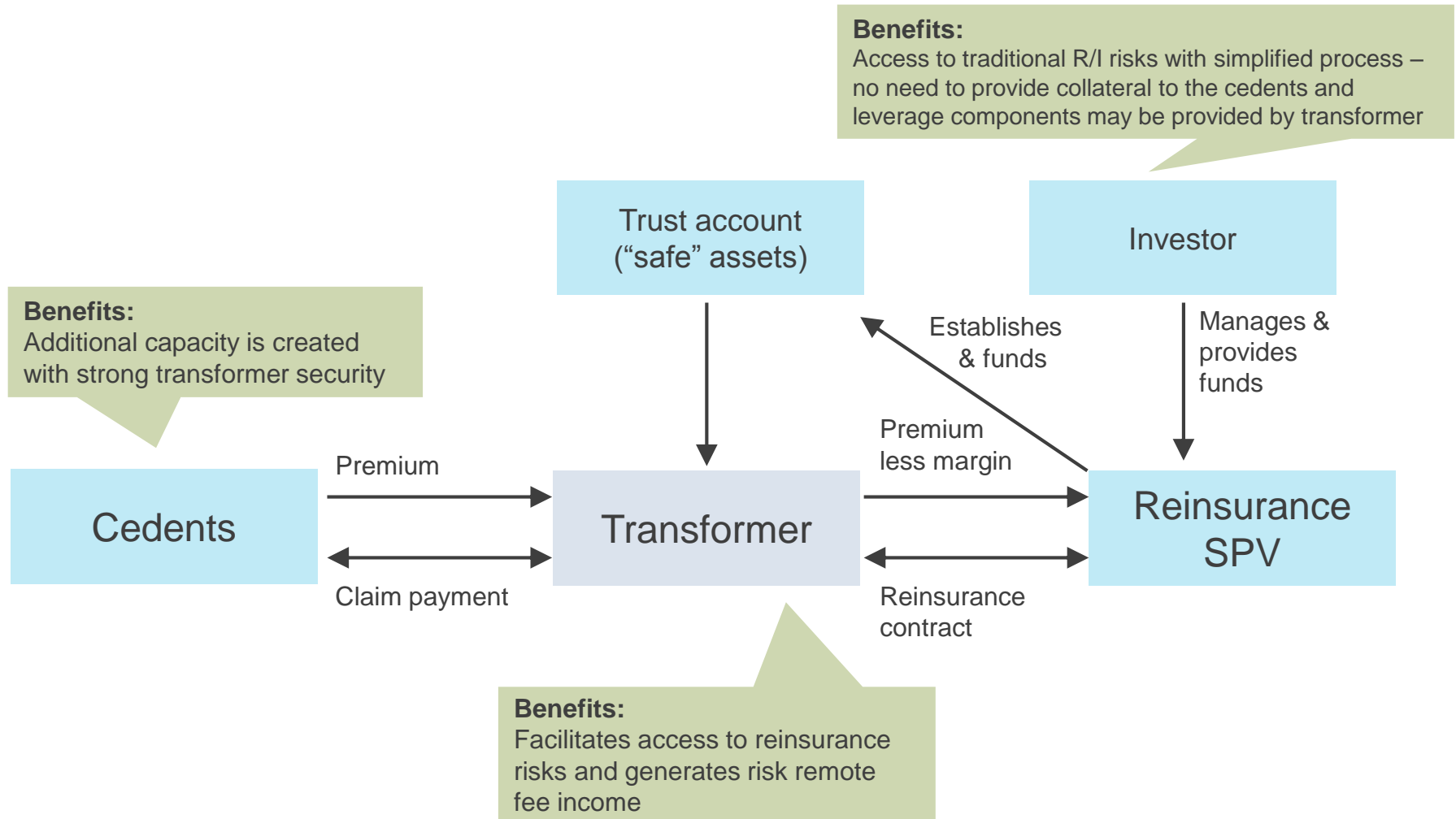
Transfer of risks to capital markets by way of reinsurance

Like reinsurance but collateralised



Transfer of risks to capital markets by way of reinsurance

Sometimes with transformer



Collateralised R/I - the new class of "Bermudian" reinsurers?

Behind the scenes - but strong increase

- Range of risks transferred to capital markets is larger than in catastrophe bond space
- Usual quantities: ~ USD 2 m. - 5 m., but could go up to USD 100 m. in some cases

Originator's perspective

- ▶ **(Almost) same as traditional reinsurance**
- ▶ Additional capacity
- ▶ **Investor provides collateral**

- ▶ Trust account or LOC negotiations
- ▶ Collateral release needs to be agreed on

Investor's perspective

- ▶ **Another route to insurance-based risks**
- ▶ Covers wider non-life reinsurance spectrum

- ▶ Not tradable
- ▶ Suitable only for short-tail risks



Disaster finance

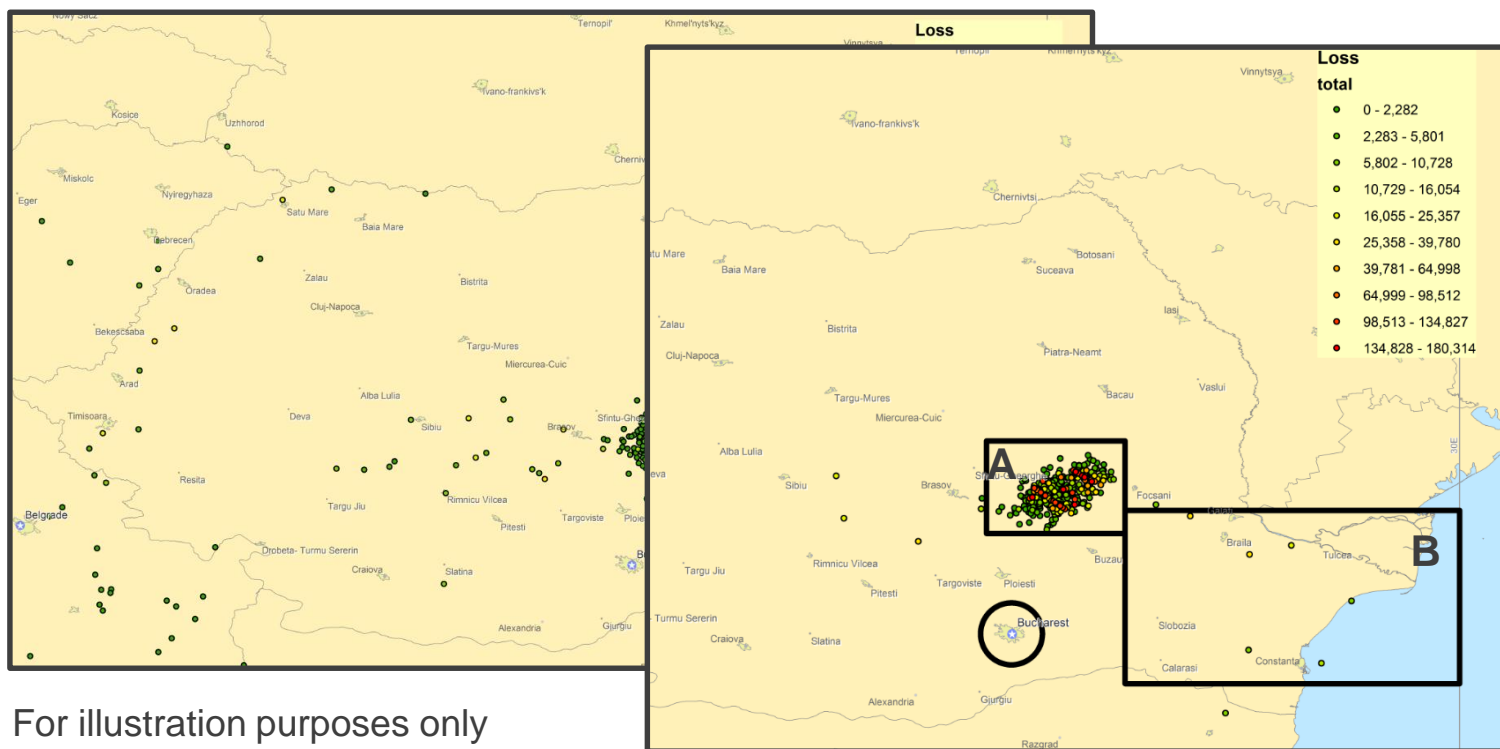
A state risk management concept for governments

- ▶ Receive immediate cash for first aid programmes
- ▶ Funding to help the uninsured
- ▶ Funding to rebuild destroyed government assets and infrastructure
- ▶ Compensation to help offset loss of future tax revenues
- ▶ Funding to minimize state budget reallocations and avoid the redirection of funding for important development projects
- ▶ Protect the sovereign rating

Disaster finance (cont'd)

Example Romania: Determine protection level and qualifying events

- ▶ Distribution of epicentres of simulated earthquake events with magnitude 6.5 and greater
- ▶ Based on the modelled events, zones are created to protect the areas affected by potential earthquakes (magnitudes ≥ 7.0)



- ▶ For illustration purposes only

Disaster finance (cont'd)

Example Romania: Determine protection level and qualifying events (cont'd)

- ▶ A payout scale is created to protect the key zones

Magnitude	A	B	Bucharest
<6.5	0%	0%	0%
≥6.5	0%	0%	50%
≥7.0	50%	75%	75%
≥7.5	100%	75%	100%
≥8.0	100%	100%	100%

- ▶ Trigger parameters*

- Attachment probability: 3.36%
- Expected loss: 2.24%
- Exhaustion probability: 1.09%

- ▶ Location of earthquakes and magnitude factors are combined to determine payout



Example: 7.6 magnitude EQ

- in Box A leads to 100% payout
- in Box B leads to 75% payout
- less than 30km away from Bucharest leads to 100% payout

- ▶ For illustration purposes only

*) Numbers based on models provided by AIR Worldwide

ILS Market

Current trends and observations

- ▶ The ILS market is still growing but at a much lesser pace than in the past:
 - Significant amounts come from pension funds which invest through dedicated ILS funds
 - Still more money is sitting on the side ready to be allocated to ILS
- ▶ Substantial increase in collateralised fronting business, also driven by the fact that investors' appetite is much larger than available cat bond volumes
- ▶ Reinsurance price levels have decreased significantly due to lack of major loss events, still good earnings of (re)insurers and growing ILS capacity
- ▶ Investors' supply does not seem to find corresponding demand from reinsurers' buyer perspective
- ▶ Catastrophe bond light – a less complex (usually private) transaction for smaller quantities

Will ILS grow forever?

Not that easy to answer

- ▶ Yes
 - Many regions have low insurance take-up rates (e.g. earthquake California) and a change in particular for peak-zones would increase demand for (traditional and) ILS capacity
 - New territories, new risks, new (index-) structures: More to think of
 - Investors' interest is still strong driven by
 - Diversification, and
 - Still relative attractive returns combined with lack of other investment opportunities
- ▶ No
 - The (re)insurance model ('write several risks against capital') has advantages over ILS ('collateralise all limits'), for example
 - Provides more limits/reinstatements
 - More flexibility in renegotiating contracts/ex-gratia payments
 - Covers non-modellable risks or side perils
 - No basis risk and no reset issues
 - Can manage long-term risks (liability)

My conclusion:

**ILS market will grow further
but
reinsurance remains a strong business model**

Thank you

Thank you very much for your attention!