STANDARDS BOARD FOR ALTERNATIVE INVESTMENTS

SBai
Standards Board for Alternative Investments

Introduction to Investing in Insurance Funds

1. Introduction

Insurance plays a crucial role in the global economy, providing financial protection to individuals and organisations against unforeseen losses. By transferring risk from policyholders to insurers, the insurance industry enhances economic stability and resilience. However, the capital required to underwrite these risks is substantial, prompting insurers to seek alternative sources of capacity beyond traditional reinsurance.[1]

In institutional investing, insurance risk has emerged as a distinctive asset class, offering institutional investors an opportunity to gain exposure to a unique risk return profile without directly underwriting the insurance risk. Specifically, catastrophe Insurance Linked Strategies (ILS), including investing in tradeable catastrophe bonds (cat bonds), and natural catastrophe collateralised re-insurance, exhibit low correlation with broader financial markets - returns are primarily driven by the occurrence (or absence) of insured events, rather than macroeconomic factors. In addition, there is a structural arbitrage, given that catastrophe risks (cat risks) such as US wind and quake are priced higher than other insurance risks per unit of risk. This is due to the highly concentrated nature of these perils and the limited capacity on re-insurance balance sheets to bear these. These aspects make ILS an attractive, diversifying complement to traditional asset classes (equities, fixed income) in institutional portfolios.

But insurance investing involves some complexities and hurdles, notably an understanding of insurance risk, the vehicles through which investors can gain exposure to insurance risks, liquidity characteristics, as well as a terminology that differs from traditional asset classes such as equities and fixed income.

The purpose of this guide is to support institutional investors in developing a deeper understanding of insurance-linked strategies (ILS) to enable well-informed investment decisions and due diligence. **This guide focusses on investing in natural catastrophe Insurance Linked Strategies (ILS) through investment funds.**

Key Considerations and Takeaways

- **Diversification and return potential:** ILS can offer investors exposure to natural catastrophe risk with low correlation to traditional asset classes, enhancing portfolio diversification.
- **Investors access:** Investors can access the asset class via fiduciary relationships or direct investments, which can involve distinct fund structures, instruments, risk and liquidity profiles.
- **Educating the investment organisation:** Successful ILS adoption requires 'buy-in' amongst senior decision makers and concerted efforts to educate the organisation.
- **ILS specific due diligence:** Due diligence programs need to be adapted to include ILS specific characteristics, which are distinct from traditional asset classes (e.g. equities, fixed income), such as liquidity dynamics following loss events.[2]

[1] See Appendix A for an Overview: What is Insurance (including the insurance ecosystem)
[2] See SBAI memo on ILS Funds – Side Pocketing: https://www.sbai.org/resource/ils-funds-side-pocketing.html

2. Risk Transfer in ILS

Insurers are essentially in the business of managing and transferring risk, hence, risk management is central to the industry, including identification and quantification of risks, and the mitigation of potential losses, including through risk sharing and transfer to other parties such as syndicates[3] and re-insurers[4], capital markets and investment funds.

In addition to syndication and reinsurance, insurance companies can seek risk protection by repackaging risk exposures into public, tradeable instruments (e.g. securitised products such as Catastrophe (Cat) Bonds), or private, non-tradeable instruments (e.g. Sidecars, Collateralised Reinsurance and Industry Loss Warranties (ILWs)) [collectively referred to as **Insurance Linked Strategies (ILS)**].

The type of risk being transferred through ILS is predominantly natural catastrophe risk (such as hurricanes and earthquakes), however additional types of risk transfer such as specialty reinsurance (cyber, aviation, space, terror etc) are also available (often through markets such as Lloyds of London).

Cat risks, such as US wind and quake are also often referred to as peak risks / perils, due to the large potential losses they can cause and the concentrated nature by peril and region, compared to secondary perils (such as floods, wildfires) which are smaller scale, with higher frequency. Since traditional re-insurers are rated and fall under a prudential regulatory framework, which requires them to have well diversified portfolios, there is limited capacity for re-insurance balance sheets to absorb higher levels of such peak risks.

This is why Cat Bonds emerged in the mid-1990s because of costly events such as Hurricane Andrew (1992) and the Northridge Earthquake (1994), due to the limitations of re-insurance balance sheets and the need for more capacity to bear losses. The limited capacity of re-insurance balance sheets also causes higher prices per unit of risk for US wind and quake risk, compared to secondary perils, and this is why there is a structural arbitrage available in the market, making exposure to cat risk interesting to institutional investors through Cat Bonds or funds (with more concentrated portfolios), which are fully collateralised, and that are therefore not regulated by insurance regulators.

The Cat Bond market has evolved since, with subsequent innovations such as more secure counterparty structures post the Lehman collapse in 2008, replacing bank counterparties with money market funds/securities as collateral in the Cat Bond Special Purpose Vehicles (SPVs).

The market for private, non-tradeable instruments[5] has developed in parallel, also involving the use of SPVs to collateralise reinsurance contracts, providing a way for investors to access more bespoke insurance risk profiles. The risk profiles can differ by region, cat risk type, attachment point[6] as well risk transfer mechanism, such as excess loss (tail risk) reinsurance (that protects against large, infrequent losses) or quota shares (which involves proportional sharing of premiums, costs, and losses).

All these structures single out the exposure to actual events in the “natural world”, hence, ILS usually has low correlation with other asset classes such as bonds and stocks (which are exposed to economic risk factors such as growth, geopolitics, or company specific risks).

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[3] Syndication refers to a practice where multiple insurers or reinsurers collaborate to spread the risk of a large insurance policy or claim across several parties. This collaboration helps mitigate the financial exposure that any single insurer or reinsurer would otherwise face.

[4] Reinsurance allows primary insurers to protect themselves from unusually large losses. In the case of a major event causing significant claims, the reinsurance company would cover a portion of the claims. Retrocession (retro) refers to risk being transferred between reinsurance companies.

[5] ‘Appendix B: Overview of Insurance Investments’ provides a comprehensive overview of a range of non-tradeable instruments that can be accessed by investors such as sidecars, industry loss warranties and quota shares.

[6] Threshold amount of losses that a policyholder must incur before the insurance coverage kicks in and the insurer starts paying out claims

3. Gaining Exposure via ILS Funds

ILS funds provide access to a wide spectrum of public and private instruments. They are typically regulated in major fund management jurisdictions, such as the UK, EU, US, or Bermuda.

ILS funds are managed by an investment manager and are therefore distinct from contractual based investments (Cat Bonds, Sidecars, Industry Loss Warranties (ILWs), etc.) which are contractual investment products and not regulated as an asset manager. The key distinctions are summarised in the table below:

Contractual Products (not the focus of this memo)	Managed Funds / Accounts, Syndicates (focus of this memo)
• Not regulated (as an asset manager), but "quasi" insurance contract • No fiduciary obligations are owed to the investor, only the contractual obligations (for example, for an insurance sidecar, fiduciary obligation is owed to the insurance parent) – more extensive due diligence of conflicts of interest/alignment required by investors to protect their interests • **Examples:** Catastrophe (Cat) Bonds (securities), Sidecars, Industry Loss Warranties (ILWs), etc.	• Principal – agent nature of asset management (including relevant regulatory protections through regulation of the investment manager) • Fund manager owes fiduciary responsibility to the fund / investors, giving investors enhanced protections • Fund manager has discretion in terms of structuring and managing the portfolio, subject to investment guidelines outlined in the offering materials.

There are many investment and operational due diligence considerations for investors to assess when gaining exposure to ILS funds, including risk profiles, structuring considerations and protections, such as fiduciary duties and accountability they receive through their investments.

The next section provides an overview of key the key steps to investing in ILS funds.

4. Steps to Investing in ILS Funds

ILS is a specialist asset class that many investment professional and investment committees are not necessarily familiar with, making it difficult for investment teams to propose ILS investments to the investment committee, and for investment committees to approve them. Hence, a project/study can help investors gain comfort with the asset class, including:

- The investment case for ILS, clarity about investment goals
- General familiarisation with insurance industry, insurance risk profiles and terminology
- Available instruments/asset types for gaining investment exposure (i.e. ILS Funds, Cat Bonds, etc., see previous section)
- Required capabilities (team level) to make an investment (Investment Due Diligence, Operational Due Diligence, ongoing monitoring), governance (required Board/investment committee education), and organisational implications

The table below summarises key considerations that such a project/study should cover.

Key considerations when allocating to ILS Funds

Focus area	Key Considerations
Internal considerations:	

Investment objectives and organisational set up for ILS investing	• Possible investment objectives, or combination thereof:
	  ○ Diversification/uncorrelated returns/portfolio defensiveness
	  ○ Yield enhancement, or
	  ○ ESG-related considerations (such as supporting disaster recovery)
	• Investment objectives can impact where ILS sits within the investment organisation, but will also be influenced by existing internal expertise (e.g., stand-alone asset class, part of hedge funds/absolute return, credit/fixed income, or dedicated CIO strategic portfolio)

Internal Buy-In and Stakeholder Alignment	• ILS is not an asset class that many investment professionals/board trustees are familiar with (opposed to equities, bonds), hence, extra effort is required to communicate and build the rationale for the asset class within the governance framework (e.g. investment committees and boards) • Case studies from peer organisations who have adopted the asset class (investment rationale, approach, key lessons, etc.) can support this effort • Undertake specialist training if required for investment personnel
Fund/Manager Due Diligence Considerations	

Risk-return and liquidity profile	• ILS yields versus riskiness of the asset class:
	  ○ Fat tails: Catastrophe risk (the bulk of ILS) often involves lower frequency events, which, when they occur, can result in significant drawdowns
	  ○ Implications for level of diversification across perils, geographical areas, etc. via individual or multiple funds (to reduce the impact of any singular catastrophe event)
	• Liquidity constraints:
	  ○ Liquidity varies across ILS funds, with redemption terms disclosed in the funds offering documents/prospectus
	  ○ Understanding differences in liquidity between cat bond funds and private reinsurance:
	  ▪ Cat bonds trade in secondary liquid markets, but liquidity for specific bonds can decline and bid-ask spreads widen following natural disasters (due to valuation uncertainty), making it costly to exit positions.
	  ▪ In private non-proportional (tail risk) collateralised re-insurance, capital can be retained (“trapped”) post-event due to uncertainty about the size of (re)insured losses7
	• Collateral capital:
	  ○ Understanding collateral capital arrangements
	  ○ Most tail risk ILS funds are fully collateralised (through a Special Purpose Vehicle that holds the collateral), with the collateral being invested in short-term treasuries or money market instruments

[7] See SBAI memo on side-pocketing, which refers to the method of separating assets affected by valuation uncertainty from the main fund.

Focus area	Key Considerations
	○ Quota shares require capital based on reinsurance regulatory and rating agency requirements, introducing leverage and limiting payment obligations to the provided capital. ○ Understanding how collateral is invested (duration, risk, etc), and the expected returns on these investments. • Market pricing dynamics following catastrophe events: ○ Pricing in insurance markets (and resulting investor returns) is driven by supply and demand for insurance risk capital ○ A "soft" market typically means lower premiums and less favourable conditions for investors, while a "hard" market typically means higher premiums and better return potential ○ Markets may "harden" after major catastrophes due to severe capacity imbalance[8] ○ When markets harden, this can provide investors with an opportunity to recoup prior losses, which raises practical questions about when (or whether) to top up portfolios after a loss event • Potential sources for counterparty risk, especially if derivatives or other complex financial instruments are utilised. → Implications for allocation sizing and fund selection, liquidity risk management, required longer term investment horizon
Investment Due Diligence, manager's capabilities in areas such as sourcing, risk management, etc.	• Understanding the investment risks (see section above) • Assessing the managers ability to source relevant risks from cedants/in the markets, role of parent company balance sheet [9] (where applicable), and assessment of potential conflicts of interest • Understanding Manager's capabilities and resources to assess risk (by peril, region, etc.), including cat risk modelling, internal and external data sources, and credibility of the providers • Assessing the manager's understanding of impact of evolving risks, such as climate change and extreme weather events, and integration of such risks into the risk modelling and pricing. • Depending on the breadth of the investment mandate, assessing the manager's ability to assess emerging areas of catastrophe reinsurance, such as flood or wildfire, or man-made risks (e.g. cyber, terrorism, casualty) • Assessing the manager's understanding of inclusions/exclusions of certain losses (Investors had been surprised by (re)insurance losses they assumed were excluded (e.g. COVID-19 losses being classified as natural catastrophe. Recent property catastrophe market hardening has reduced such surprises, some exposures like political violence or cyber outages remain. Fund managers should clearly communicate such risks and their underwriting approach)

[8] Market hardening is not guaranteed following a catastrophe event. The industry may retain sufficient capital to absorb the losses without a significant impact on pricing. For hardening to occur, capital must be destroyed or otherwise withdrawn, leading to insufficient market capacity relative to demand. This is most likely after a major catastrophe in a densely populated area but can also result from non-event-driven factors – such as rising interest rates causing mark-to-market losses for traditional reinsurers.

[9] Some ILS fund managers can use the financial strength of a parent company, its capital base and creditworthiness, to support more underwriting than they could independently. A strong balance sheet allows for the writing of more policies and better credit terms from counterparties. ILS managers who don't have their own insurance license often use licensed insurers (fronting providers) to issue policies. Sometimes, the fronting provider is a subsidiary of a large parent company, and its balance sheet is effectively backstopped by the parent.

Focus area	Key Considerations
Operational Due Diligence, including fund structuring, liquidity terms, legal review, and operational infrastructure	• Fund's liquidity terms (e.g. annual liquidity in line with insurance cycles) • Overall fund structure and the instruments being deployed • Role of related parties such as parent insurers and re-insurers, and management/mitigation of potential conflicts of interest. • Potential for side pocketing of collateral, limiting redemption availability until losses are determined (trapped collateral due to valuation uncertainty)[10] • Underlying risk parameters, such as coverage, pricing, and terms (standardised documentation and structures help investors assess and compare risk). • Legal, tax, contractual due diligence, understand regulatory and compliance issues (some jurisdictions may have more onerous requirements for managers, but may result in better investor protections), governance arrangements (e.g. in relation to conflicts of interest), structuring (SPVs, collateral trust accounts), trigger mechanisms for loss determination, potential fiduciary obligations in the context of investing via managed account structures • Fee structures and alignment – the SBAI has created several templates that aid transparency and disclosure efforts.11 • ESG integration, given the link to natural disasters and social impact (where applicable) • Manager sign up to industry Standards (such as SBAI) and provision of risk transparency (such as Open Protocol)
Ongoing Monitoring	• Determination of the appropriate benchmark for ILS • Reporting framework to board/investment committee (including ongoing education on industry trends, etc), including reporting mechanics following major cat events (where the impact on the fund might not be immediately available) • Integration into overall portfolio risk modelling (total portfolio level) • Competitive and pricing dynamics in the industry (consolidation, hard/soft markets, etc) • Impact of evolving regulatory and tax environment

The SBAI has undertaken several initiatives to enhance practices and to help current and prospective investors better understand the ILS sector:

- **Valuation Frameworks:** In May 2019, the SBAI released a memo titled "ILS Funds - Valuation," offering detailed guidance on establishing robust valuation policies for ILS funds. This framework emphasises governance, consistency, and transparency, addressing challenges such as varying loss estimates and the use of side pockets.

  Link: https://www.sbai.org/resource/ils-funds-valuation.html

- **Side-Pocketing Guidance:** In May 2021, the SBAI published "ILS Funds - Side Pocketing," discussing the objectives and considerations of side pockets in ILS funds, especially following loss events that introduce valuation uncertainties.

  Link: https://www.sbai.org/resource/ils-funds-side-pocketing.html

- **Responsible Investment (RI) Implementation**: Recognising the emerging stage of dedicated RI approaches within ILS, the SBAI released a memo in June 2022 titled "Implementation of RI in ILS

[10] See SBAI memo on ILS Funds – Side Pocketing: https://www.sbai.org/resource/ils-funds-side-pocketing.html
[11] See SBAI Reporting and Template initiatives https://www.sbai.org/toolbox-resources/reporting-templates.html

Strategies." This document explores the practical aspects of integrating responsible investment principles into ILS, considering data availability, asset selection, and ownership responsibilities.

Link: https://www.sbai.org/resource/implementation-of-ri-in-ils-strategies.html

- **Insurance Open Protocol (IOP):** To promote standardised risk reporting, the SBAI developed the Insurance Open Protocol Risk Reporting Template. This tool enables consistent and transparent communication of risk exposures to investors, enhancing comparability and understanding across the ILS sector.

  Link: https://www.sbai.org/toolbox-resources/open-protocol.html

In addition, our ILS Working Group brings together institutional investors and asset managers to discuss these issues and produce practical guidance on the topic.

Link: https://www.sbai.org/group/ils-working-group.html

These efforts reflect the SBAI's commitment to advancing best practices, transparency, and governance within the ILS industry.

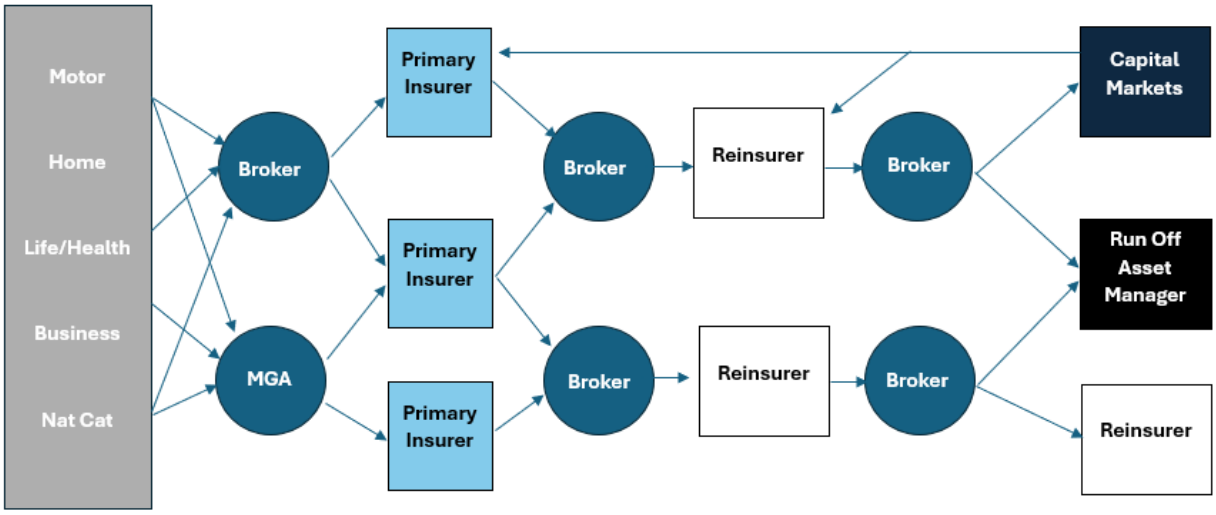
Appendix A: What is Insurance

Insurance is a financial agreement in which an individual or organisation (as policyholders or insureds) receives financial protection or reimbursement against losses from an insurance company. It enables policyholders to manage financial uncertainty and protect themselves from financial losses from pre-specified occurrences in return for a premium. Insurance companies pool the risks from many policy holders, manage the risks, and make claim payments to policyholders if covered events occur. The table below outlines a range of typical insurance coverages:

Type	Description	Typical Coverage Scope
Annuities	Investment products sold by insurance companies that provide a steady income stream, typically for retirement.	Provides a guaranteed income stream, often during retirement.
Casualty Insurance	Protects individuals or organisations against liability for causing damage or injury to others. Examples include malpractice insurance, general liability, and workers compensation insurance.	Covers liability claims for injury, property damage, or legal responsibility.
Cyber Insurance	Covers policyholders against first- and third-party damages caused by data breaches, cyberattacks, hacking, and cloud outages.	Covers financial losses related to cyber threats, data breaches, and online attacks.
Disability Insurance	Offers income protection to individuals who become disabled and are unable to work.	Replaces lost income due to disability preventing the insured from working.
Health Insurance	Covers medical expenses, including hospitalisation, doctor visits, and medications.	Covers medical expenses, including doctor visits, hospitalisation, and medications.
Life Insurance	Covers death and sometimes also critical illnesses or disability. Pays a death benefit to beneficiaries upon the insured's death.	Pays a lump sum to beneficiaries upon death or in case of critical illness/disability.
Property Insurance	Protects against loss or damage to property. Examples include homeowner's insurance, auto insurance, and commercial property insurance.	Protects against financial loss from property damage due to accidents, disasters, or theft.
Travel Insurance	Covers risks associated with traveling, such as medical expenses, trip cancellation, lost luggage, and other losses.	Provides coverage for travel-related risks such as medical emergencies, cancellations, and lost belongings.

In a broader sense, the insurance industry functions as an ecosystem for pricing, managing, and transferring risk. It includes the policy holders, the primary insurers, brokers, re-insurers, asset managers, institutional investors, and many other service providers, who contribute to the functioning of the insurance market.

Overview of the Insurance Ecosystem[12]



1. Insured Risks - *Individuals & businesses purchase coverage for specific risks. E.g. Motor, Home, Life/Health, Business, Natural Catastrophe etc.*

2. Intermediaries (Risk Origination) - *Facilitating the issuance of insurance policies.*

Broker ↔ Managing General Agent (MGA)

- Facilitate insurance contracts
- Receive premiums from insured parties
- Pass risk and premiums to primary insurers

3. Primary Insurance - *Insurers underwrite and manage portfolios of risk.*

Primary Insurers

- Safeguard individuals and businesses
- Aggregate and manage risks
- Transfer part of risk portfolios to reinsurers through brokers

4. Reinsurance - *Insurers for insurers, providing additional risk cover.*

Reinsurers

- Diversify by geography and risk type
- Accept portfolios via brokers
- Further transfer risk through retrocession or capital markets

5. Retrocession / Capital Markets

Final layer of risk transfer, spreading risk into global capital markets. Investors absorb risk in return for yield. Instruments include securitized ILS and legacy asset portfolios.

Retrocession Options:

- Reinsurer (further backstopping)
- Run-off Asset Manager (optimizing legacy portfolios)
- Capital Markets (e.g., catastrophe bonds)

[12] Insurance Insights – An Industry Primer, Guy Spier (2022), access: https://www.guyspier.com/insurance-insights-an-industry-primer/

Appendix B: Overview of Insurance Investments

Product / Instrument	Diversification Features	Return Profiles	Liquidity Features
Publicly Listed Equity - Traditional Insurer and Reinsurance Entities - *Relationship with the company is governed by corporate law and securities regulations, not fiduciary principles*	Linked with broader equity markets but also influenced by catastrophic events and underwriting cycles. Offers a mix of financial market and insurance sector exposure.	Reflects a combination of underwriting results and broader financial market performance. Dividend yields can be attractive depending on the company's payout policy.	Generally liquid for large, publicly traded companies. Subject to market trading volumes and conditions.
Collateralised Reinsurance – *Direct participation in Reinsurance Agreements will not create a fiduciary obligation.* *Fiduciary duty will exist if investing through an ILS Fund or Managed Vehicle.*	Direct exposure to specific underwritten insurance risks. Low correlation with traditional financial markets.	Can offer returns higher than Cat Bonds, reflecting additional illiquidity and complexity premiums. Performance contingent on specific underwritten risks.	Illiquid with no standardised secondary market. Contracts are typically held to maturity and collateral can be locked for 3+ years after events occur.
Cat Bonds – *Direct participation in a Cat Bond will not create a fiduciary obligation.* *Fiduciary duty will exist if investing through an ILS Fund or Managed Vehicle.*	Primarily offers exposure to natural catastrophe risks. Low correlation with other traditional asset classes provides diversification benefits.	Typically, premium yields compared to traditional fixed income securities due to the "catastrophe risk premium." Payouts can be affected by pre-defined catastrophe events.	Reasonably liquid with an established but niche secondary market. However, not as liquid as traditional bonds.
ILS Funds – *Fiduciary duty will exist if investing through an ILS Fund or Managed Vehicle.*	Can provide diversification based on the fund's strategy, across different types of ILS, perils, geographies and triggers.	Aims for either consistent return or consistent risk over time depending on the ILS Fund strategy and assets selected by the Fund manager.	Liquidity varies significantly based on Fund terms, including whether funds are open- or closed-ended. Some Funds may offer monthly redemptions, while others can have lock-up periods over multiple years.
Sidecars – *Direct participation in a sidecar structure will not create a fiduciary obligation.* *Fiduciary duty will exist if investing through an ILS Fund or Managed Vehicle.*	Direct exposure to a slice of a sponsor's broader insurance or reinsurance portfolio, potentially offering diversification across risks.	Directly tied to the underwriting performance of sponsoring (re)insurer. Reflects the profit and loss of the shared portfolio.	Typically, illiquid structures with investments often locked for the duration of the underlying risk period plus a few additional years to allow claims to mature sufficiently.
Industry Loss Warranties (ILWs) - *ILWs operate on a contractual*	Provides exposure to broad industry-wide loss events. Mitigates	Payouts/returns are contingent on the non-occurrence of specified	Generally illiquid with a limited secondary market. Often held to contract

basis, not a fiduciary relationship	idiosyncratic risk linked to the underwriting and claims settlement practices of individual (re)insurers.	industry loss triggers. Can offer premium yields.	maturity with potential extension risk if events occur.
Quota Shares – *Direct investment into a pro-rated reinsurer's portfolio. Fiduciary duty will exist if investing through an ILS Fund or Managed Vehicle*	Structured across multiple risk tranches and geographies. Direct exposure to a sponsor's broader insurance or reinsurance portfolio, potentially offering diversification across risks	Directly tied to the underwriting performance of sponsoring (re)insurer. Reflects the profit and loss of the shared portfolio.	Typically, illiquid structures with investments often locked for the duration of the underlying risk period plus a few additional years to allow claims to mature sufficiently.

Gaining Insurance Exposure - Specific Product Details

Publicly Listed Insurance Companies

These refer to stocks of companies active in the insurance and reinsurance business. Returns are influenced by both the broader equity market and company-specific underwriting cycles. This option provides investors with a liquid and transparent way of gaining insurance exposure but also means that investors need to consider correlation to wider equity indices and sectors which may create volatility. Often you can also buy the bonds of publicly listed insurance companies, however the link to returns from "insurance" would be much weaker than for the equity.

Catastrophe Bonds (Cat Bonds)

Cat bonds are sponsored by insurers, reinsurers, corporates or supranational organisations to transfer specific risks, such as natural catastrophes (hurricanes, earthquakes, etc.), man-made catastrophes (terrorism, cyber, etc.) or pandemic risks, to capital market investors. If the specified event occurs within the bond's duration and meets predefined criteria, the principal paid by investors can be reduced or exhausted, as funds are then used to cover the bond sponsor's losses from the event. In return for taking on this risk, investors receive periodic coupon payments.

Cat Bond Structure

Issuance - The SPV issues Cat bonds to investors. The money raised (the principal) is typically deposited into a bankruptcy-remote trust and is invested in low-risk, highly liquid assets, often U.S. government bonds or money market funds.

Premium Payment - The sponsor enters into a reinsurance agreement with the SPV through which it transfers specified reinsurance risks and for which it pays a reinsurance premium. This premium is then passed through to Cat bond investors through coupon payments and compensates investors for taking on these specified risks.

Triggering Event – The determination of whether a specific event qualifies for coverage under a Cat bond rests on measurement of specific triggers. These include industry index, pure parametric, parametric index, modelled loss and indemnity.

- Industry index: Recovery is some percentage of total insurance industry losses in excess of a minimum loss and subject to a maximum loss.
- Pure parametric: Recovery depends on the location and observable physical data (e.g. magnitude, wind speed) of a specific event.

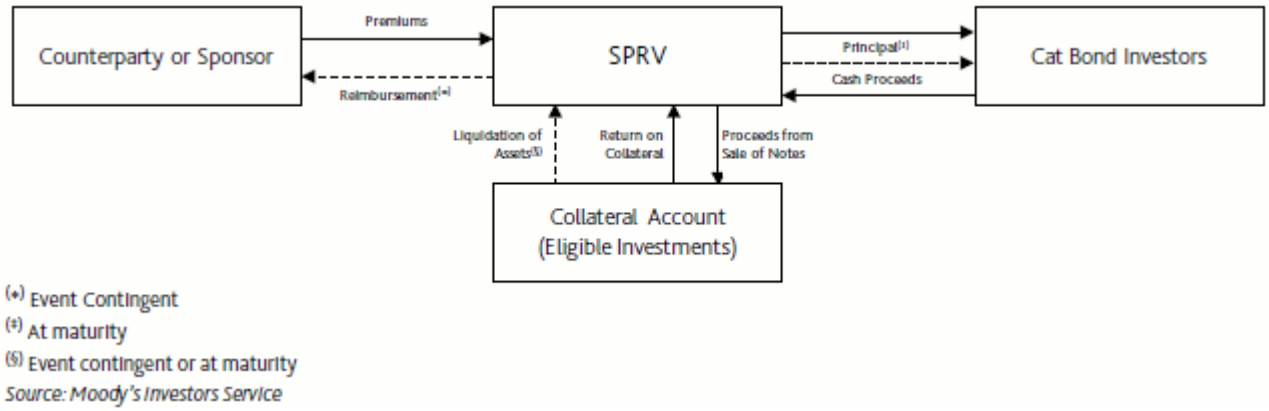
- Parametric index: Like a pure parametric trigger but applicable to multiple locations as recovery depends on physical data of the event across each location.
- Modelled loss: Recovery is based on expected losses modelled in a third-party vendor catastrophe model using physical data from the catastrophe rather than actual loss to the insurer.
- Indemnity: Recovery is based on the insurer experiencing a minimum loss beyond which actual losses are covered subject to a maximum loss.

Payout - If a triggering event occurs:

- The SPV uses the principal (or a portion of it) to pay the sponsor's claim.
- Investors lose their principal (or part of it) but have earned coupons and interest on the principal until the loss.

If no trigger event occurs by bond maturity:

- Investors receive their principal back, along with accumulated interests.



Source: https://www.artemis.bm/library/what-is-a-catastrophe-bond/

Cash Flows

From Sponsor to SPV - Regular reinsurance premium payments.

From SPV to Investors - Coupon payments, derived from the reinsurance premium and interest payments from the returns on the invested principal.

From SPV to Sponsor (if a covered event occurs) - Payment to cover the sponsor's losses, either partially or in full, generated from the invested principal.

Industry Loss Warranties (ILWs)

ILWs are financial contracts that provide payouts based on industry-wide loss metrics, rather than individual company losses. They're triggered when industry losses from an event (like a hurricane) in a specific area exceed a predefined threshold. ILWs are relatively straightforward and offer a way for insurers, reinsurers, and other parties to manage their risk exposures quickly, although leaving these parties exposed to the basis risk between ILW payouts and the financial losses they have actually incurred from the event

Contract Establishment: The protection buyer and seller enter an ILW contract, which specifies the trigger amount (a predefined industry loss amount), the coverage area and covered perils, the coverage limit, and the premium.

ILWs Structure

Triggering Event - If a significant event (e.g. a hurricane or earthquake) occurs, the industry loss index provider will calculate the overall losses incurred by the insurance industry by main classes of business (e.g. personal lines, commercial lines, automobile) and by geographical areas (e.g. by US States).

Payout - If the calculated industry-wide loss surpasses the predefined trigger amount in the ILW contract:

- The protection seller pays the protection buyer, up to the coverage limit.
- The exact payout mechanism can vary – it could be binary (full payout if the trigger is breached, regardless of the amount by which it's exceeded) or proportional (payout progressively ramps up based on how much the trigger is exceeded, subject to a full payout when a maximum industry loss is reached).

Cash Flows

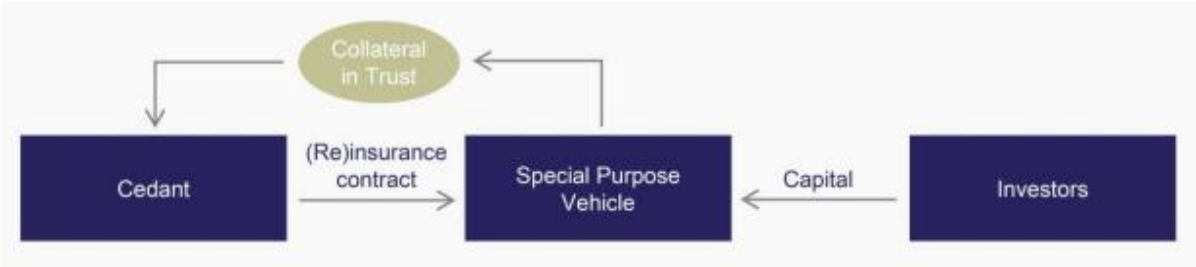
From Protection Buyer to Protection Seller - Premium for the ILW coverage.

From Protection Seller to Protection Buyer (post-event) - Payout if the predefined industry loss trigger is exceeded.

Collateralised (Re)insurance

Collateralised (re)insurance facilitates the transfer of (re)insurance risk (and return streams) into capital markets (i.e. institutional and retail investor portfolios). The underlying (re)insurance contract is between the cedant and a special purpose (re)insurance vehicle ("SPV"), and the key differentiating feature from traditional (re)insurance is that the obligations of the SPV to the cedant are collateralised by assets held in a trust. These assets are typically invested in near risk-free assets (e.g. government bonds, providing money market returns), and the collateral at any time during the exposure period of the contract is equal to the (remaining) contract limit.

Illustration: Structure of a collateralised (re)insurance transaction



The assets in the trust come from a combination of the premiums paid to the SPV by the cedant (the protection buyer) and capital provided to the SPV by the ILS investor. In a catastrophe bond structure, the SPV issues bonds to investor in return for cash that is deposited into the trust. In certain collateralised (re)insurance structures, the SPV may instead issue short-term preference shares in exchange for cash, or even be provided with the necessary cash under a swap agreement with the investor. If no (re)insurance losses occur, the collateral in the trust is returned to the fund or investor (who may also receive coupons over time in the case of a multi-year contract). If a (re)insurance event occurs that results in a loss to the underlying contract, part or all the collateral will be transferred to the cedant. At maturity (or a later point in time, as losses are finalised), there is a return to the investor of remaining assets in the trust.

Sidecars/Collateralised Quota Shares

Sidecars and collateralised quota shares are sponsored by (re)insurers and reinsurers and allow investors to take on a portion of a (re)insurer's portfolio on a pro rata basis. Sidecars enable sponsoring (re)insurers to increase their underwriting capacity. Investors generally participate through the purchase of preferred shares or notes issued by a special purpose vehicle (the SPV). The sponsoring (re)insurer cedes a portion of its portfolio's premiums and risks to the SPV.

Sidecar Structure

Capitalisation - Investors provide capital to the sidecar through the purchase of securities issued by SPV, which is then used to underwrite a specific set of insurance or reinsurance policies. Investors liability is limited to the capital provided to the SPV, beyond which additional losses fall back to the sponsoring (re)insurer.

Risk Sharing - The sponsor cedes a pro rata portion of its policies, and thus its premiums and risks, to the SPV. The specific set of policies ceded is clearly defined at the outset.

Claims and Payouts - In the event of claims related to the ceded policies:

- The sidecar will cover its share of the claims using the premiums received and the capital provided by the investors.
- If claims exceed the premiums and capital in the sidecar, the reinsurer might be responsible for the excess, depending on the terms set out at inception.

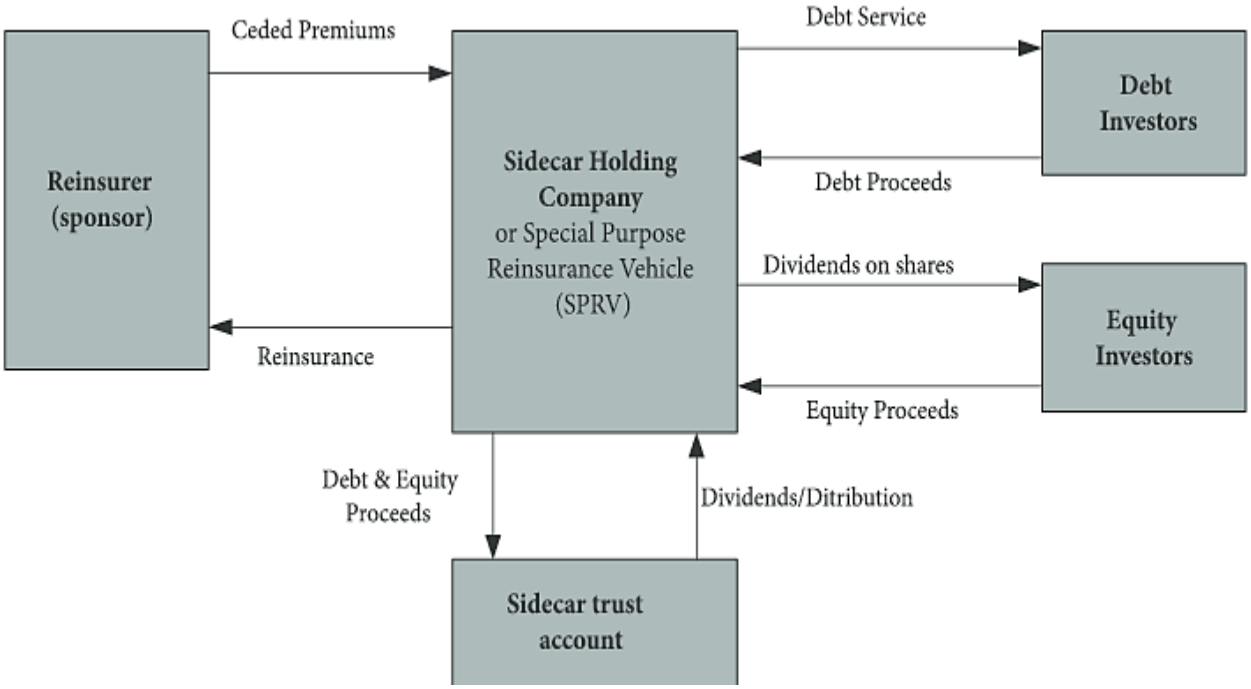
Expiry - After the end of the defined risk period (often one year), any remaining capital and profits (after covering claims and expenses) are returned to the investors.

Cash Flows

From Sponsor to SPV - Premiums associated with the ceded risks, net of all acquisition costs.

From SPV to Investors - Distributions, often comprising both a return of capital and a profit share, after the coverage period ends and all claims are settled. The exact nature of these distributions is defined in the terms set at the outset.

From SPV to Claimants (post-event) - Payments related to claims arising from the ceded policies.



Appendix C: Specific Valuation Issues for ILS Funds

Large catastrophic events are often complex, and the ultimate insurance related losses may not be known for a considerable period after such an event, potentially resulting in material valuation uncertainty over an extended period. The valuation required is a single number, but this number is often the summary of a wide range of potential outcomes.

As there is no secondary market in most ILS assets, Fund managers are required to derive their own valuations (increasingly involving third-party valuation firms in the valuation process). One exception is the Cat bond market, for which a secondary market does exist, and third-party pricing indications are available at most times from a variety of brokers (although in times of stress the bid/ask spread may be very wide).

In the absence of losses to a (re)insurance contract, many Fund managers will price the contract by recognising the contract premium over the risk period of the contract commensurate with the dissipation of the underlying catastrophe event risk. In situations where a loss event has occurred, valuations by the Fund manager will generally involve estimating the total potential losses to the contracts exposed to that event. This is likely to require qualitative and quantitative inputs which may vary by event, by cedent[13] and over time, including:

- Mark-to-model (based on characteristics of the event)
- Industry loss estimates disseminated by modelling companies or other sources
- Analysis of the cedent's exposure data
- Market share analysis
- Claims and loss reserve reporting by the cedent, and
- Ultimate loss estimates provided by cedents

While it is clearly desirable to have "accurate" valuations quickly after a loss event, actual loss information will materialise over time as insurance claims are reported, adjusted and settled. The illustration below shows generally what information is available during the different stages before and following an event (before the final determination of the ultimate loss).

Illustration: Stages of valuation (pre-ultimate loss determination)

Source: Milliman

[13] A cedant is a party that buys insurance cover from and pays a premium to a Fund or (re)insurer.

Valuation of ILS instrument types by liquidity

Type of instrument/structure	Pricing approaches
Tradable instruments: Cat Bonds	• Pricing sheets from brokers (not necessarily based on observable trades) • Secondary market prices/past transactions (as markets not particularly deep, usually not enough price data points to use as firm basis for valuation) • Broker quotes
Private Contracts: ILWs, private Cat bonds, Collateralised Insurance, Reinsurance, Retrocession, and Quota Shares	• Broker quotes (for ILWs and private Cat bonds) • Manager-estimated pricing.; more often this is based on mark-to-model, allocation of insurance industry loss estimates by market share analysis, broker estimates, counterparty exposure data, and, ultimately, counterparty loss and loss reserve advice, which albeit themselves are based on actuarial inputs and the manager's analysis thereof, or internal modelling

Appendix D: Important Insurance Markets

Bermuda

Bermuda is widely regarded as the world's leading ILS market. Its regulator, the Bermuda Monetary Authority (BMA), has been proactive in developing and maintaining a conducive environment for ILS structures, particularly Special Purpose Insurers (SPIs).

Key Products: Catastrophe bonds (cat bonds), collateralised reinsurance, ILS Funds and other ILS structures.

Cayman Islands

Known for its financial services and the world's largest insurance captives' domicile, the Cayman Islands also offers a regulatory framework for the issuance of catastrophe bonds and other ILS structures.

Key Products: Various ILS structures, with an emphasis on cat bonds.

Singapore

Singapore has been positioning itself as an ILS hub for Asia in recent years. Supported by the Monetary Authority of Singapore, the region has made regulatory changes to encourage ILS issuance and investment.

Key Products: catastrophe bonds, with a handful of ILS Funds managers with local presence.

Switzerland

Switzerland is home to some of the world's largest reinsurers and several prominent ILS Fund managers. Zurich is a notable hub for ILS activity.

Key Products: Swiss entities often manage ILS Funds, which invest in a diverse array of insurance-linked products.

United Kingdom

London has historically been a global hub for insurance and reinsurance. While slower to adopt ILS than Bermuda, regulatory changes in recent years have made it easier to set up ILS vehicles in the UK.

Key Products: A wide range of ILS products can be found, although it might be on a smaller scale than in Bermuda or the U.S. Of note, Lloyd's has established the London Bridge PCC structure to facilitate access for institutional investors to individual Lloyd's syndicates.

United States

The U.S., with its vast insurance industry and frequent exposure to natural catastrophes like hurricanes, earthquakes, and wildfires, has been a significant originator of risks that get transferred to the capital markets via ILS.

Key Products: Cat bonds, especially those covering U.S. hurricane or earthquake risks, are prevalent. The U.S. also hosts various ILS Fund managers, although the majority operate offshore.

Appendix E: Key Regulatory Frameworks

ILS are a specialised form of investment and are subject to specific regulatory frameworks that differ by jurisdiction.

Bermuda

Insurance Act 1978 and related regulations: Bermuda's regulatory framework, particularly as managed by the Bermuda Monetary Authority (BMA), has specific provisions for Special Purpose Insurers (SPIs), which are vehicles often used in ILS transactions.

Cayman Islands

Insurance Law and related regulations: The Cayman Islands Monetary Authority (CIMA) oversees the issuance and operation of catastrophe bonds and other ILS vehicles under this framework.

European Union

Solvency II Directive: While it's a broader regulatory framework for insurance and reinsurance in the EU, Solvency II has implications for ILS, particularly regarding capital requirements and risk management.

European Insurance and Occupational Pensions Authority (EIOPA): Mandated to protect the public interest by contributing to the stability and effectiveness of the EU financial system. EIOPA is also an ILS stakeholder given retail investors can access catastrophe bonds through UCITS-eligible Funds.

Singapore

Monetary Authority of Singapore (MAS): Given Singapore's intent to become an Asian ILS hub, MAS has provided specific regulations and incentives for ILS structures, particularly through their Insurance (Special Purpose Reinsurance Vehicles) Regulations.

Switzerland

Swiss Financial Market Supervisory Authority (FINMA): This is the main regulatory body overseeing ILS transactions, ensuring that they align with Switzerland's broader insurance and securities regulatory framework.

United Kingdom

Risk Transformation Regulations 2017: Provides the framework for Insurance Special Purpose Vehicles (ISPVs) in the UK, facilitating the issuance of ILS.

Prudential Regulation Authority (PRA) and Financial Conduct Authority (FCA): These two regulatory bodies provide oversight and further guidance for ILS structures.

United States

Securities Act of 1933 and Securities Exchange Act of 1934: Catastrophe bonds and other securitised insurance products are treated as securities and thus are regulated under these acts.

Risk Retention Act: Impacts the structure of certain collateralised reinsurance transactions.

State-based Insurance Regulation: The U.S. insurance industry is regulated on a state-by-state basis, so specific regulations may vary depending on the state.

Appendix F: Influential Industry Representative Bodies

Several global representative bodies and associations play an essential role in the ILS and the broader reinsurance space. These organisations provide industry standards, best practices, advocacy, research, and forums for discussions and networking. Some of the key bodies include:

Association of Bermuda Insurers & Reinsurers (ABIR):

ABIR represents the public policy interests of Bermuda (re)insurers and includes members active in the collateralised reinsurance sector.

ILS Bermuda: Given Bermuda's prominence in the ILS space, ILS Bermuda is an important organisation representing ILS market participants in the region.

International Underwriting Association (IUA): Represents the interests of non-Lloyd's insurers and reinsurers in London and other international markets.

Reinsurance Association of America (RAA): Represents reinsurance companies in the U.S. It is involved in industry advocacy, research, and education.

International Association of Insurance Supervisors (IAIS): A global standard-setting body that promotes effective and globally consistent supervision of the (re)insurance industry.

Global Federation of Insurance Associations (GFIA): Represents insurance associations from around the world and engages on various international insurance issues.

Glasgow Financial Alliance for Net-Zero (GFANZ): GFANZ promotes cross-sector best practices and technical collaboration to accelerate the development and implementation of net-zero transition plans. Most of the world's largest (re)insurers participate to GFANZ through its the Net-Zero Asset Owner Alliance working group.

Appendix G: Glossary of key Insurance Terms[14]

Act of God Bond - A bond where redemption value is related to the occurrence of catastrophes.

Aggregate Retention - Retention of risk by the policyholder calculated by reference to the total of claims to be retained.

Alternative Risk Transfer (ART) - Generic phrase used to denote various non-traditional forms of re/insurance and techniques where risk is transferred to the capital markets.

Annual Aggregate Limit - Retention of risk by the policyholder, calculated on the basis of retention of claims in total over a year.

Attachment Probability - The likelihood that a catastrophe bond will experience some losses during a year.

Average Basis - A way of quantifying basis risk. Used to describe average difference between losses from portfolios and gains from hedges.

Basis Risk - A method of measuring performance of hedges: the lower the basis risk the better the hedges performance.

Blended Cover - Mixture of insurance/reinsurance and other risk management techniques on a single policy.

Capacity - Amount of reinsurance that can be underwritten by an entity or market.

Captive - A company that is wholly owned and controlled by another company, designed to insure the risks of the parent.

Cat-in-a-Box - A Cat-in-a-Box trigger is a parametric trigger that pays out a pre-defined amount based on specific parameters of an event.

Cedant - An insurance company buying reinsurance cover.

Commutation - Agreement to swap future insurer claims liabilities into a cash payment to the buyer.

Cost of Risk Formula - Formula to measure the insurable risk of a company.

Deductible - First part of loss borne by policyholder.

Event Risk - The insurable risk from an occurrence such as a catastrophe (e.g. earthquake, hurricane).

Excess of Loss Reinsurance - Reinsurance which pays on the basis of the excess of claims over and above a pre-determined retention limit.

Expected Loss - The expected loss is the average loss cat bond investors can expect to transpire over a certain period, divided by the capital sum invested.

Experience Account - Reserve fund set up to hold the premiums for finite reinsurance from a single insured.

Extension Period - The sponsor of a cat bond might wish to extend the deals maturity date to assess and calculate all claims, especially if an event has taken place close to the end of the bond's risk period, this is called the extension period.

[14] ART Glossary, access here: https://www.artemis.bm/library/glossary/

Extension Spread - A reduced premium paid by the sponsor of a cat bond during the extension period.

Finite Risk - Re/Insurance policy with an ultimate limit of indemnity often with direct link between premium and claim amounts.

Fronting (in insurance, reinsurance and ILS) - Fronting is when the ceding company (insurer) underwrites a policy and transfers the entire risk to a reinsurer.

Insurance Guarantee Funds - Funds set up to meet in full or part the cost of claims from insolvent insurance companies.

Long Tail Liability - Insurance of liability risks where notification and payment of claims are intrinsically delayed.

Loss Creep - Loss creep refers to increasing loss estimates and reported losses from previous loss events.

Loss Portfolio Transfer - Transfer of an insurance portfolio where amount transferred reflects the total expected cost of unpaid losses.

Non-proportional Reinsurance - Non-proportional reinsurance is based on loss retention.

Outstanding Loss - Loss whose cost has not been fully determined and paid.

Payment Account - Opposite to an experience account. Money is moved from the experience account to the payment account to be specifically paid out in losses.

Per Loss Retention - Retention of risk of fixed amounts for each individual loss.

Primary Insurer - Insurer who takes the first element of the risk.

Probability of Exhaustion - The probability of exhaustion is the likelihood that a cat bond, or transaction will suffer a complete loss.

Proportional Reinsurance - When the primary insurer and the reinsurer share liabilities in a distinctly defined proportion as explained within the underlying treaty.

Proportional Treaty - Reinsurance contract which takes a defined pro rata share of all risks within treaty limits.

Rate on line or ROL (reinsurance) - Rate on line (ROL) is the ratio of reinsurance premium paid to loss recoverable in a contract, reflecting how much money an insurer or ceding company must pay to obtain reinsurance coverage. A high rate on line (ROL) implies that more must be paid for coverage, while a lower ROL implies lower cost.

Redeemable Preference Shares - Give priority in payment of interest in shares of capital, redeemable shares can be bought back by the insurer.

Reinsurance Pool - Pooling of reinsurance risks within fixed limits of a group of reinsurers.

Resets (for catastrophe bonds and ILS) - Multi-year deals, whether catastrophe bonds or collateralised reinsurance agreements, that don't use a parametric trigger (indemnity/industry loss trigger) could expose investors to greater risks than they are being compensated for, over time.

Retrospective Funding - Insurance where the premium is adjustable after the claims to reflect the cost of loss.

Risk Based Capital - System of calculating insurance capital needed with reference to different elements of risk.

Risk Purchasing Groups (RPG) - Collective insurance buying.

Risk Retention Groups (RRG) - Collective insurance companies i.e. underwriter of risk.

Run-Off - The process of settling claims for an account that has stopped accepting new risks.

Stop Loss Reinsurance - Reinsurance which covers the total cost of claims within fixed limits.

Timing Risk - Risk that claims may become payable earlier than expected.

Zero-Beta Asset - An investment which doesn't correlate with an index or market results.