Insurance-linked securities (ILS) glossary

We have compiled a comprehensive list of the most commonly used ILS terms. We hope this resource helps you navigate this complex landscape.

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Attachment probability

The attachment probability is the likelihood an insurance-linked security will suffer some losses of principal over the course of a set period (usually one year).

Basis risk

Basis risk is the difference between the expected recovery from a risk transfer mechanism and the actual recovery of the cedant.

Cat-in-a-box

A cat-in-a-box trigger is a simple parametric trigger mechanism that depends on the physical parameters of the event. In the case of earthquake risk, three criteria are usually set as a trigger: the location of the epicenter within a specific geographic zone (box), its magnitude and the depth of the actual fault rupture. If these three criteria are met, the transaction triggers, resulting in a claims payment. This structure is very transparent to investors as these parameters are publicly reported by national and international agencies. It also has the advantage of providing prompt claims payment following the event. On the other hand, it may create substantial basis risk for the sponsor. As such it is only suitable for sophisticated sponsors well informed about basis risk.

Collateralized reinsurance

This is a reinsurance contract where the reinsurer puts collateral in a collateral account at inception to secure its obligation to pay the ceding company. Typically, a cat bond or a single ILS investor investing in private ILS is the source of the collateral. Collateralized reinsurance, has also come to refer to situations where a ceding company faces a fronting reinsurer and then the front in turn enters into collateralized risk transfer with an ILS investor. In this second situation notwithstanding the common usage, the name is technically incorrect as no collateral is posted for the direct benefit of the ceding company. Any of an insurer, a reinsurer or a captive insurer for a corporation can act as the ceding company for collateralized reinsurance.

No fronting

The ceding company cedes reinsurance to a cell company authorized to engage in collateralized reinsurance in the cell company’s domicile. The cell company could be an unrated reinsurer owned by an investor fund or a rented cell in a third-party unrated reinsurer. The collateral is explicitly linked to each deal: The investors invest in the cell to collateralize the obligation of that cell company.

Fronting

The ceding company cedes reinsurance to an authorized reinsurer and the investors enter into a financial contract with the reinsurer either directly or indirectly through a cell company. The collateral is dealt with behind the scenes: The investors post collateral either directly to the fronting company or behind the cell company.

Exchange-traded contracts

Parties may also trade (re)insurance event risk (e.g., natural catastrophe risk, longevity risk) using index triggers on recognized financial exchanges (e.g., the Chicago Board of Trade) using standardized exchange-traded contracts such as futures contracts. To date, none of the exchange-traded contracts have reached sufficient scale to achieve meaningful liquidity and substantial commercial success.

Expected loss

The expected loss of a cat bond is the average loss that investors can expect to incur over the course of a period (usually one year) divided by the principal amount invested (which typically equals the reinsurance limit). The expected loss for cat bonds is usually estimated by a third-party modeling agent, such as AIR, RMS and CoreLogic.

Extension period

A sponsor may cause the special purpose reinsurance vehicle (SPRV) to extend a bond past the scheduled maturity to calculate reinsurance recoveries for events that took place during the risk period. This period from the scheduled maturity to the final maturity is called the extension period. Only events happening during the risk period rather than the extension period can give rise to claims.

Extension spread

During the extension period, the sponsor continues to pay a premium but at a reduced rate in comparison with the risk premium corresponding to the risk spread. This spread is known as the extension spread.

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Insurance-linked securities

Insurance-linked securities (ILS) are securities sold to provide collateral to support collateralized (re)insurance usually protecting against low-frequency/high-severity events, such as natural catastrophe and life/mortality disasters, and transferring such risks to investors.

Catastrophe bonds

Catastrophe bonds or “cat bonds” are a liquid form of ILS linked to nonproportional reinsurance contracts. Sometimes people refer to both the liquid ILS and linked reinsurance contract as a cat bond when in fact they are actually two separate contracts.

Bond size and term

Cat bonds typically have a two-to-five-year term, three years being most common. They usually have a size of $100 million to $300 million, although the market will sometimes support deals as large as $1 billion to $2 billion.

ILS structure

In the classic structure, a special purpose reinsurer vehicle (SPR) is set up solely to issue the bond. The SPR is typically set up in Bermuda or Ireland (Figure 1).

After issuing the bond, the SPR will hold the proceeds in a collateral account to collateralize the reinsurance agreement. The proceeds will be deposited in the collateral account and invested in highly rated stable value assets. Investors receive the investment income on the collateral, plus an amount equal to the premium payments from the sponsor. In the event of a reinsurance claim, the SPR will liquidate the collateral to pay the claim to the sponsor.

Industry loss warranties

Often referred to as ILWs, they can be purchased in reinsurance or derivative form. ILWs are protection contracts based in part (or in their entirety if a derivative) on the total loss arising from an event or events to the entire insurance industry rather than the ceding company’s own ultimate net loss (UNL). Losses are reported by index providers (e.g., PERILS and Property Claim Services).

ILWs are used extensively as a form of retrocessional reinsurance (i.e., reinsurance of reinsurers) not only for natural catastrophe risk but also in other lines of reinsurance, such as marine and energy, aviation, terrorism and satellite. Where an appropriate and market-recognized index supports a class of business, then ILW capacity can be sourced. ILS investors have become significant buyers and sellers of ILW protection; however, traditional (re)insurers continue to participate in this market too. Note that technically an ILW is a form of reinsurance, but market practice is to refer to an industry index derivative (where no actual ceding company losses [UNL] are required if the industry trigger is met) also as an ILW.

Figure 1. Basic reinsurance to ILS transformation structure

Protection buyer

Collateralized reinsurance agreement*

Premium [X %]

Transforming reinsurer*

Stable value asset yield + [X%]

$[Y] million proceeds

Collateral account: stable value investments such as U.S. Treasurys

Typically the cell of a cell company or a special purpose reinsurer (SPR)

$[Y] million securities (sold to institutional investors)

*Note: Sometimes other risk transfer alternatives are used and the transformer is not technically a reinsurer.

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**Institutional investor**

Only institutional investors may invest in cat bonds and sidecars. An institutional investor is a professional investor with access to specialized knowledge to evaluate complex investments. The most common institutional investors are mutual funds, pension funds, endowment funds, insurance companies, commercial banks and hedge funds.

Institutional investors are exempt from many security regulations designed to protect smaller investors, as they are considered resourceful and knowledgeable enough to protect themselves. Many cat bonds and sidecars are restricted to Qualified Institutional Buyers, or QIBs, a category of institutional investor specifically defined under the U.S. securities laws.

**Risk perils**

Cat bonds may provide collateral to support coverage for a single peril such as hurricanes within a specific region or for multiple perils such as hurricanes and earthquakes across multiple territories. U.S. hurricane risk dominates the market, but other peak perils include U.S. earthquake, European windstorm, and Japanese earthquake and typhoon. The market has been accessed for non-peak perils, such as Australian cyclone, Mediterranean earthquake and Mexican earthquake. Cat bonds have also transferred life, accident and health risks among others.

**Risk period**

The reinsurance agreement and the related ILS only cover events taking place during the risk period. The risk period typically commences the day following the issuance of the ILS (but it is possible to indicate a risk period start date at a later point in time) and terminates a few days before the scheduled maturity (e.g., the risk period might end on December 31 for a bond scheduled to mature on January 8). Usually the risk period lasts between three and five years.

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**Private ILS**

Private ILS structures are typically used for transactions smaller than the efficient scale for a Rule 144A cat bond. The product has a high level of flexibility and can be tailor-made depending on investor and sponsor needs. In a private ILS, investors might not receive either third-party modeling or a bond rating to help evaluate the deal. A private ILS uses simplified documentation usually resulting in lower fixed issuance costs. As a result, the investor universe shrinks. Additionally, private ILS deals typically have significant securities law-based transfer restrictions. These factors make private ILS deals less liquid than an underwritten Rule 144A cat bond.

**Reset**

For multiyear ILS with an indemnity/UNL trigger or an industry loss trigger, changes in a sponsor’s book of business could expose investors to a changed risk profile. These cat bond deals usually address this by adjusting the trigger (usually on an annual basis) to hold the risk to investors constant (or in variable reset deals to keep the risk/return relationship relatively constant). Resets are also used in other types of cat bonds for various reasons, including to mitigate basis risk (e.g., the index weightings for a parametric index deal may need to shift to reflect changes in risk exposures).

**Rule 144A ILS**

Rule 144A refers to the type of placement. Rule 144A cat bonds represent the vast majority of the cat bonds publicly known in the market. In an underwritten Rule 144A placement, a securities underwriter will act as the initial purchaser of the bonds from the SPRV and immediately resell them only to large institutional investors, often only those who qualify as QIBs. These placements are not subject to the SEC’s registration and disclosure requirements for public offerings, although there is typically an offering document and the bonds are usually made eligible for some electronic clearing systems. An underwritten Rule 144A deal (as opposed to private ILS) is currently the most liquid type of ILS offering and therefore tends to have tighter spreads than private ILS.
**Secondary market price/secondary trade**

The reselling of bonds among investors constitutes a secondary trade. Securities broker-dealers facilitate this secondary trading activity and sometimes may also hold inventory. The money paid for bonds in the secondary market (less a trading margin) goes to the selling party, not to fund the SPRV collateral account, which remains unaffected.

The price at which the bond is being sold on the secondary market is the secondary market price. The secondary market price will vary depending on investors’ appetite for the bond and in particular their assessment of the risk transferred. As a result, secondary market prices often differ from the new issue price.

Cat bonds are one of the only products transferring (re)insurance risk in liquid form (with exchange-traded contracts being another). This is a significant advantage for investors over other forms of reinsurance risk taking as they can eliminate their obligation by selling their bond without having to enter into a cumbersome novation process. Another advantage of the secondary market is the ability for intermediaries and their clients to follow pricing trends and monitor changing investor appetite and perceptions of risk.

**Sidecar**

A sidecar refers to an ILS investment linked to a proportional or quota share reinsurance arrangement. Technically, the sidecar is just the transforming reinsurer, but in fact people use the term to refer to the reinsurance contract and ILS investment in the sidecar together. The sidecar recovery amount is capped by the size of the sidecar, so there is an exit point, usually set at the maximum of capital requirements of the cedant. In traditional reinsurance terms, this is a capped quota share. Typically the sidecar’s ability to pay claims comes from both the net ceded premiums and the invested capital.

Sidecars are very flexible in terms of business mix, size and modeling requirements. In terms of business mix, sidecars allow the transfer of worldwide exposures. Non-property cat lines of business (LOBs) and retro indemnity are possible. Long-tail LOBs where full development is required are not very suitable due to the cost of holding capital (i.e., the collateral) over a long period.

The size of sidecars can change over time as price and terms are typically renegotiated every year. A sidecar can take multiple forms: Figure 2 shows only one iteration.

The SPRV is formed solely to issue the shares/notes and hold proceeds in a collateral account to collateralize a quota share reinsurance agreement. At issuance of the shares/notes, proceeds are deposited in the collateral account and invested in highly rated assets. Although there have been some Rule 144A sidecars, the sidecar securities are more often issued in a traditional private placement to institutional investors and are not eligible for any electronic clearing systems and therefore less liquid.

Throughout the year, the portion of the premium allocated to the quota share reinsurance agreement netted of the ceding commission is paid to the SPRV. The sponsor keeps the ceding commission and, in addition, a profit commission can also be included to further incentivize the sponsor to generate excess returns. In addition to any surplus, investors receive the investment income on the collateral.

### Figure 2. Sidecar

<table>
<thead>
<tr>
<th></th>
<th>Sponsor</th>
<th>Q/S reinsurance agreement</th>
<th>Special purpose reinsurance vehicle (SPRV)</th>
<th>Shares/Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Premium</td>
<td>Loss payments</td>
<td>Stable value asset yield + surplus</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$[Y] million proceeds</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Stable value asset yield</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Collateral account: stable value asset</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

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**Tranches**

The ILS placement process often splits large deals into multiple pieces called tranches with different risk/return profiles (similar to different layers in a reinsurance program). Tranching broadens appeal by providing risk-return choices to investors and therefore can improve the economics for the sponsor.

In Figure 3, different bond tranches provide collateral for different excess of loss reinsurance layers.

<table>
<thead>
<tr>
<th>Layer size</th>
<th>Expected loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1,000m</td>
<td></td>
</tr>
<tr>
<td>Reinsurance 50% of layer 5 $200m xs $800m</td>
<td>Cat bond Class A notes 50% of $200m xs $800m</td>
</tr>
<tr>
<td>$800m</td>
<td>0.25%</td>
</tr>
<tr>
<td>Reinsurance 33% of layer 4 $200m xs $600m</td>
<td>Cat bond Class B notes 67% of $200m xs $600m</td>
</tr>
<tr>
<td>$600m</td>
<td>0.50%</td>
</tr>
<tr>
<td>Reinsurance Layer 3 $150m xs $450m</td>
<td>Cat bond Class C notes 50% of $200m xs $250m</td>
</tr>
<tr>
<td>$450m</td>
<td>2.00%</td>
</tr>
<tr>
<td>Reinsurance 50% of layer 2 $200m xs $250m</td>
<td>Cat bond Class C notes 50% of $200m xs $250m</td>
</tr>
<tr>
<td>$250m</td>
<td>4.00%</td>
</tr>
<tr>
<td>Reinsurance Layer 1 $150m xs $100m</td>
<td>Cat bond Class C notes 50% of $200m xs $250m</td>
</tr>
<tr>
<td>$100m</td>
<td>Retention</td>
</tr>
</tbody>
</table>

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**Trigger**

Many cat bonds provide protection on an indemnity (or ultimate net loss) basis similar to traditional reinsurance. Alternative index-based triggers have developed to help investors assess and price cat bonds more efficiently for sponsors with more opaque and often volatile portfolios.

Triggers for cat bonds include the following:

- **Indemnity**: base recovery on the actual losses of the sponsor (ultimate net loss)
- **Parametric and parametric index**: use actual reported parameters (e.g., wind speed, earthquake magnitude or location, reported deaths by age and gender cohort by jurisdiction) to determine loss
- **Industry loss index**: use estimated insured industry losses (e.g., PCS and PERILS) to determine loss
- **Modeled loss**: determine payout by inputting actual physical parameters into a predetermined cat model and running the model for an escrowed portfolio to produce an event loss
- **Hybrid**: use combined approaches (e.g., mixing modeled loss and industry index into one trigger)
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