

Non-NatCat insurance-linked securities: Identifying market opportunities for diversifying perils

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Introduction

While natural catastrophe “peak perils” have always been the backbone of the non-life¹ insurance-linked securities (ILS) market, market innovators have long sought ways to deploy alternative capital across a much broader array of insurance risks. Recently, one of the most important market trends has been the rise in non-life ILS that transfer risks outside of the natural catastrophe space. Recently, the market has been increasingly successful at placing such “non-NatCat” deals, with each successful issuance representing another step forward in the ongoing maturation of the ILS market.²

However, to date, no particular type of non-NatCat deal has achieved the same widespread acceptance as NatCat deals. Why is that so? Will the slow take-up of non-NatCat ILS be a permanent feature of the market, or will it be overcome with time and additional innovation? Do alternative capital investors even have a robust, long-term interest in these types of risks?

We believe that these topics are key (in fact, existentially important) to the long-term success of the ILS market: While non-NatCat innovation could open up enormous avenues for market expansion, flawed transactions leading to losses could give investors reason to question the stability and growth potential of the market. These are complex issues, requiring creativity and coordination across the key participants on a non-NatCat transaction.

This paper is the first in a three-part series on non-NatCat ILS risk. After providing an overview of non-NatCat ILS in this paper, our following two papers will address what we believe are two of the most important actuarial issues facing non-NatCat ILS. Those are:

1. Considerations for *modeling* non-NatCat risks for an ILS transaction

1 Discussion of life ILS is excluded from the scope of this paper.

2 In this paper, we focus on publicly tradable securities, generally Rule 144(a) bonds. As a result, we will generally *exclude* discussion of other prominent alternative capital instruments, most notably quota shares and private collateralized reinsurance deals. The use of these instruments to transfer non-NatCat risk is mostly left for future papers.

2. Considerations for *valuing* and *ensuring liquidity* for non-NatCat ILS where loss outcomes are often not known until many years after the fact

We hope that our actuarial perspectives on these topics will help stimulate future discussions and collaboration aimed at exploring the potential of non-NatCat ILS.

Why not Non-NatCat ILS?

Non-NatCat ILS is “the topic that launched a thousand thought experiments.” The market potential is obvious: While peak peril catastrophe exposure is often one of the most prominent risk factors for a (re)insurer, it is far from the only one. For some entities, the underwriting performance of their liability, specialty, or health books of business may be the most important risk. For others, particular regulatory or rating agency requirements may incentivize the use of external capital. Finally, a range of entities may find themselves with various noninsurance tail risks that can be efficiently transferred to the broader financial markets via ILS.

On the other hand, there’s also a simple reason why only a handful of non-NatCat ILS have been completed to date: They are complex, costly, and challenging to execute in practice. As any ILS transaction must successfully bring two sets of parties to the table (the sponsor/cedent and the investors), there is a fairly broad set of criteria that an issuance must successfully meet.

Notably, a transaction must be a compelling risk-transfer option for the sponsor based on the following criteria:

- **Diversifying capacity:** ILS can expand a ceded or retrocessional reinsurance program beyond the traditional reinsurance market. In addition, ILS can provide capacity for risks where risk-taking appetite is limited among traditional reinsurers. In exchange, the sponsor must be comfortable with fully collateralized, arms-length participants on their risk transfer program.
- **Price competitiveness:** ILS must be reasonably cost-competitive with alternatives such as traditional reinsurance cover or retaining extra capital to self-insure the risk.

- **Scale:** The sponsor must generally be looking to transfer a reasonably large amount of risk (i.e., \$100 million or more of limit) in order to justify the time and structuring costs associated with an ILS transaction.³
- **Duration:** Most ILS provide multiple years of coverage to the sponsor as a means of spreading transaction costs and locking in current market rates for coverage.

Additionally, a transaction must be able to satisfy a largely different set of criteria for investors:

- **Potential returns:** An offering must include a potential rate of return to investors that is appealing within the context of their overall investment strategies and fund objectives. Often, investors will look for an absolute minimum level of returns even on bonds with very low risk, simply for getting involved in the transaction.
- **Diversification:** There are two aspects of diversification. First, funds will take different views on *intra-market diversification*, or how much accumulated ILS exposure they are willing to take to certain perils or geographies. To the extent that non-NatCat ILS become more prominent, it will offer additional ways for these funds to achieve diversification within the ILS space.

Secondly, the underlying value proposition of ILS is that it provides *inter-market diversification* when considered in the context of a broader financial market portfolio. That is, returns on ILS are expected to be largely uncorrelated with returns from most major financial asset classes. This is a topic of particular importance for non-NatCat ILS, as some types of insurance (e.g., liability coverages) are potentially more affected by economic variables than property coverages.

- **Transparency:** Investors must understand the risk, the structure, and what outcomes could cause them to lose some or all of their investment. This is often a major hurdle for risks that are new to the ILS market as investors lack the level of familiarity that they have with NatCat deals. The type of trigger (e.g., parametric versus indemnity) can often play a major role in determining the transparency of a deal.
- **Modelability:** In addition to being understandable, the risk must be quantifiable. One of the major historical reasons for the success of NatCat ILS is the industry standard of providing potential investors with independently modeled risk metrics for each transaction. Investors are far more likely to add a new risk to their portfolios if it can be measured using a familiar “language of risk” and incorporated into the existing metrics used to construct their portfolios.

³ More recently, “cat bond lite” structures have aimed to streamline the structuring process and lower minimum required transaction sizes. Often private in nature, these transactions are basically excluded from the scope of this paper, although many of the same considerations may apply.

- **Liquidity:** Investors look to realize fair value when trading out of their positions, ideally by transacting on a secondary market with ample liquidity. However, a key concern for non-NatCat ILS is that many risks entail a great deal of *valuation uncertainty*, requiring a number of years to pass before the ultimate losses can be estimated with precision. Constructing a well-functioning, liquid secondary market under these circumstances can be a major challenge.

Reviewing the potential types of Non-NatCat transactions

A wide variety of non-NatCat ILS have been proposed—some have even been tested in the market. Which ones are most likely to become regular components of the ILS markets several years from now?

We can start by identifying several groupings of non-NatCat ILS with similar characteristics. By identifying the particular criteria that are most likely to pose a challenge, we can then identify what future market innovations would best serve to unlock the potential of that type of non-NatCat ILS.

1. LOWER-LAYER PROPERTY AND SPECIALTY ILS

Description: These transactions cover property and specialty risks where losses are driven by smaller, “medium-tail” events as opposed to “far-tail” events. Currently, these risks are covered predominately by the traditional reinsurance markets.

Examples: This category consists of a wide range of transactions, including:

- Working-layer property deals subject to regional weather events (e.g., a U.S. hailstorm)
- Property per-risk coverages that cover non-NatCat losses (e.g., a factory fire)
- Specialty deals covering risks such as marine, engineering, crop, satellite, etc.

Key benefits: While they are not “peak perils,” medium-tail events are often an important focus of ceded reinsurance programs. ILS can be an important source of *diversifying capacity* for sponsors, expanding their traditional panels of reinsurers covering these risks.

For investors, going further “down the program” may give them access to higher-yielding risks that could improve their *potential returns* as well as an important source of *diversification* from peak perils such as a U.S. hurricane.

Key challenges: Many cedents may not have the *scale* of risk on such “minor perils” required to sponsor ILS. In particular, the risk transfer needs for most insurers’ specialty books of business (particularly when further subdivided into marine, energy, etc.) are likely to fall far short of the average transaction size of today’s

ILS. In addition, the *price competitiveness* of ILS may be weaker than it is on NatCat ILS, given the relatively lower capital charges that traditional reinsurers face on working-layer business.

Overall commentary: If NatCat ILS represent alternative capital's involvement in the “big ticket coverages” of reinsurance, then expansion to localized events would represent a logical next stage for a maturing market. Investors with capital to deploy would certainly appreciate the presence of new sponsors and risks with a long history of data, modeling, and successful reinsurance transactions.

That said, the relatively limited size of potential transactions in this space provides a disincentive for sponsors to choose the ILS route at least until further standardization of issuances lowers the fixed costs. It is illustrative that alternative capital investors have shown a great appetite for this type of risk already, but through private vehicles and collateralized reinsurance. While these transactions do not provide investors liquidity, investors seem to have largely accepted this trade-off in order to obtain access without the need for cedents to issue publicly traded ILS.

Thus, collateralized reinsurance seems likely to be the preferred vehicle for this type of risk for the near-term.⁴

2. EMERGING RISK ILS

Description: These transactions cover “emerging risks” that are new to the private reinsurance markets or are in a rapid stage of development. These emerging risks are generally event-driven and pose the potential for a major financial loss to the sponsor—even if not directly insurance-related.

Examples: This category includes:

- Perils that are new in nature and growing in importance (e.g., cyber and terrorism)
- Perils that are long-existing but new to the private reinsurance markets (e.g., mortgage insurance and U.S. flood)
- Noninsurance risks that pose some kind of financial risk to the sponsor (e.g., operational risk, lottery jackpot risk)

Key benefits: For emerging risks, private market solutions and capital have historically been in short supply. Thus, ILS provides significant *diversifying capacity* as an alternative risk financing solution as well as scale beyond what many traditional reinsurers can offer. Finally, the multiple-year *durations* of ILS can provide sponsors with coverage certainty in inherently uncertain markets.

From the investor side, the uncertainty surrounding these risks may generate risk premiums that result in attractive *potential returns*. This benefit may be particularly important given the decrease in returns available on traditional ILS perils over the past several years.

⁴ It is worth noting that the ongoing London market ILS initiative, depending on its success, could conceivably open more pathways for specialty risk to enter the ILS market.

Key challenges: There are two major obstacles to these transactions, both faced by investors. The most important one is a lack of *modelability*. To model a risk, one must first have access to a robust data source. For mortgage and flood, a large amount of data already exists in the hands of the government (Fannie Mae/Freddie Mac and the Federal Emergency Management Agency [FEMA], respectively), and is increasingly being shared with the private market. For cyber and terrorism, data collection is trickier. Not only is there a lack of historical loss data, but also the loss and exposure data that does exist can be closely guarded by businesses and the government for privacy or security reasons.

To make matters even more difficult, both cyber and terrorism losses are human-driven events: While modeling NatCat risk requires *scientific* models, modeling these risks instead requires *behavioral* models that investors must get comfortable with.

The other major obstacle, a potential lack of *diversification*, is intrinsic to certain emerging perils. The ILS market is largely based around the principle that ILS are uncorrelated with assets such as stocks and bonds. At this point, it is unclear whether a large operational risk event or major cyber or terrorism attack would have the same uncorrelated nature with financial markets, but reasonably evident that mortgage insurance transactions would exhibit some correlation.

Overall commentary: Emerging risks offer perhaps the most compelling avenue for non-NatCat ILS growth. Each risk bears potentially catastrophic risks that need to be transferred, paired with an immature but rapidly growing private reinsurance market. In the case of mortgage insurance and flood insurance, the government agencies that have traditionally warehoused much of the economic risk are now actively seeking to translate portions of that risk to the private market. We have already seen several mortgage insurance-related ILS transactions reach the market in the past several years, and the National Flood Insurance Program completed its first major reinsurance placement for 2017, transferring over \$1 billion in limit.

However, overcoming the current modeling challenges will be quite difficult in some cases. For cyber and terrorism, it will likely require interdisciplinary model development initiatives analogous to the creation of the original hurricane and earthquake catastrophe models. We will explore this topic in greater detail in the second part of this paper series.

3. LIABILITY CAT ILS

Description: These transactions cover “liability catastrophes” materially affecting a sponsor's portfolio, typically in the form of either a large single loss event or an exposure-based risk factor.

Examples: This category includes:

- Transactions covering the accumulation of one or more liability loss events (e.g., the 2005 Oil Casualty Limited bond)
- Transactions designed to cover an accumulation of losses from a catastrophic liability source (e.g., “the next asbestos”)

Key benefits: Liability portfolios of business are often subject to enormous underwriting variability. Sometimes they are subject to the occurrence of individual major losses, such as explosions. Historically, however, the most significant drivers of far-tail liability losses are systemic causes—a change in tort law, a new theory of liability, or the discovery of a new systemic risk factor such as asbestos.

There are very few tools for insurers to mitigate these types of losses through risk transfer, so a properly structured ILS could potentially provide a number of key benefits (including *capacity*, *scale*, and *duration* of protection) to an interested cedent. For investors, the *potential returns* to take on a risk that would be systemic across the insurance industry could be great, and liability risk would certainly provide *diversification* to a market that is still predominantly cat-focused.

Key challenges: *Transparency* is the first concern that investors face when considering liability risk. Before the “next asbestos” can be covered, ILS documentation must exist that clearly defines what does or does not qualify as the next asbestos. The onset of a major liability crisis is usually gradual and progressive (unlike NatCat losses, which typically have a clearly defined start and end date). Finding a definition of loss that is acceptable to both sponsor and investor is likely to be difficult, particularly given the public and arms-length nature of major ILS transactions (e.g., the sponsor may not be able to rely on a close relationship with its counterparties when it comes time for them to accept or contest a potential cause of loss).

Assuming the peril can be appropriately defined, *modelability* is another major concern. There has been significant investment in the past several years in “liability catastrophe models” that draw analogies to NatCat models. These models use modern scientific literature to attempt to identify and quantify potential future causes of liability loss. For single large liability claims with a precedent in a company’s loss history, a combination of actuarial and economic models may also be of use. Both approaches are likely to face incredibly close scrutiny from investors until they are further validated and used in a few successful transactions.

Even if the challenges above can be met, perhaps the largest obstacle to a major liability catastrophe transaction is investors’ desire for *liquidity*. Liability events require many years for the losses to emerge and be paid out. Along the way, there is an enormous amount of uncertainty associated with reserving for the ultimate loss outcome. This, in turn, makes it incredibly difficult to determine a fair secondary trading value for instruments. In such an environment, the likely outcomes are enormous market spreads and drastically limited liquidity.

In addition, these challenges do not only arise during the life of the bond. Most existing ILS have a relatively short extension period (perhaps three years). At the end of this period, it is

assumed that the event is mature enough that the parties can reasonably agree on a final settlement or commutation value. Liability ILS will not have this luxury. Instead, they will either need to feature an appreciably longer extension period or have a robust commutation procedure around what is likely to be a highly contested settlement value.

Overall commentary: The past examples of asbestos, environmental liability, and other mass torts show the potential for catastrophic liability coverage. Ultimately, the viability of liability cat ILS will hinge on the market’s ability to develop structures that can avoid or mitigate the challenges associated with the reporting tail. Without solutions that go beyond the existing structures in the ILS market, viable liability cat ILS is hard to envision. We will explore this topic in greater detail in the third paper in this series.

4. AGGREGATE AND STOP-LOSS ILS

Description: These transactions cover accumulations of losses, often with an element of attritional (or small) losses being combined with larger events. These can cover property or casualty/liability portfolios of risk.

Examples: This category includes:

- Property excess-of-loss covers with an attritional component or low threshold (“franchise”) deductible
- “Top and drop” covers where a high excess limit reverts to a much lower limit after several smaller events
- Stop-loss covers for an entire portfolio of risk
- Transfers of run-off portfolios of (re)insurance liabilities

Key benefits: Aggregate contracts are common in the private reinsurance market, and we have already seen some sponsors eager to use the *diversifying capacity* of alternative capital on aggregate risk (albeit primarily in the form of collateralized reinsurance to this point). *Duration* may also be a selling point: above all else, stop-loss covers provide certainty to a cedent—their downsides to loss will be capped at a certain point. A cedent seeking such certainty may accordingly prefer to lock it in for a multiple-year period.

For investors, the primary motivation is likely to be *diversification*, although care needs to be taken if the attritional portfolio is subject to underlying economic trends that correlate with the financial markets. In addition, the *potential returns* on offer may attract some investors as stop-loss covers that insure a broad range of a sponsor’s loss distribution can in theory be tranching to meet a wide range of risk tolerances and return targets.

Key challenges: *Transparency* is an important factor to consider in aggregate and stop-loss covers, particularly to ensure an alignment of interest between the sponsor and investor. ILS with a wider set of potential triggers must clearly define “what counts” in terms of causing loss to the deal. Aggregate deals

have no shortage of potential complications that the investor should fully understand before committing capital to a deal, including but not limited to:

- Attritional losses
- Event definitions and franchise deductibles
- Claims handling expenses
- Other unallocated insurers expenses
- Inuring reinsurances
- Intra-group pooling structures

Modelability is another key concern. To successfully write aggregate covers, investors must be comfortable with the assumptions, methodologies, and sensitivities inherent in the attritional (and usually actuarial) loss estimates. In some cases (e.g., stop-loss arrangements), the impact of catastrophes on the deal may be largely removed through inuring cover or sublimits, and the actuarial model may be the only independent modeling provided to investors. In other cases, aggregate modeling may require the effective *integration* of attritional (actuarial) loss models with catastrophe model results. This is something that reinsurers are intimately familiar with, but which is less common in ILS issuances.

Finally, the presence of attritional losses complicates the valuation process, potentially leading to less *liquidity*. For pure catastrophe contracts, it is usually easy to identify when there has not been a loss on the contract. By contrast, aggregate deals often see an accumulation of attritional losses in every scenario, regardless of whether or not they eventually breach the attachment point. Modeling the development of this loss can be a complex task requiring significant actuarial input, potentially leading to wider spreads, fewer trades, and disagreement in the market over fair value.

Overall commentary: Aggregate deals offer an interesting opportunity for ILS investors to broaden the scope of their portfolios—however, it is worth noting that, all else being equal, the ILS market has historically avoided taking on attritional risk. The rationale is simple: attritional risk has much lower required capital costs and can usually sit comfortably on a rated balance sheet, particularly when compared to catastrophe risk. As such, it might make sense for investors to focus on aggregate ILS that either **1)** focus on an accumulation of medium-sized catastrophes as opposed to truly attritional losses or **2)** provide protection on an attritional portfolio against some potentially catastrophic underlying factor such as economic trends (although this poses correlation-related challenges).

The triggers of an aggregate contract are also often highly tailored and complicated. In many cases, however, this specificity is crucial to the sponsor’s interest in transferring risk, which significantly reduces the level of potential standardization across aggregate ILS transactions. In a market where standardization brings significant cost benefits, it might be challenging for ILS to compete with private deals on bespoke aggregate contracts.

What’s next for ILS?

The ILS market has a number of interesting avenues to explore in the upcoming years. It is simply a matter of building the vehicles to get it there. While there are a number of moving parts needed to bring a new transaction to market, from the actuarial standpoint there are two key recurring challenges that frequently serve as impediments to development:

1. An inability to *model* the risk to the high standards of the investor community or investors’ lack of comfort with existing models
2. A lack of structures and methodologies to handle valuation complexities—particularly on “longer-tail” lines of business such as liability—leading to unacceptably low market *liquidity* and uncertain settlement procedures

With the right investment of time and effort, these should not be insurmountable barriers. The next two papers in this series will focus on clearly defining these issues, identifying what we believe are best practices from an actuarial perspective, and sketching an outline of potential solutions to bring new sets of risks to the ILS market.

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