

The background of the cover is a dark blue and black gradient with various financial data visualizations. On the right side, there is a 3D bar chart with grey bars and a red line graph. Below it, a line graph with multiple colored lines (yellow, red, blue) is shown. In the lower right, there are green and yellow dots arranged in a grid pattern. The overall aesthetic is futuristic and data-driven.

THE Frontier Line

Thought leadership and insights from Frontier Advisors

Issue 170 October 2020

2020 ILS market update

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Frontier Advisors has been at the forefront of institutional investment advice in Australia for over two decades and provides advice over more than \$400B in assets across the superannuation, charity, public sector and higher education sectors.

Frontier's purpose is to enable our clients to generate superior investment and business outcomes through knowledge sharing, customisation, client empowering technology and an alignment and focus unconstrained by product or manager conflict.

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Donna Davis joined Frontier as an Associate in 2019. She works with the Alternatives and Derivatives team providing quantitative analytics support. She also assists with manager and investment research. Prior to joining Frontier, Donna worked for AustralianSuper in their Options Management Team. She also has 9 years banking experience with the Commonwealth Bank and ANZ in Corporate and Commercial Lending. Donna holds a Bachelor of Quantitative Finance from the University of South Australia and is currently completing the CFA program.

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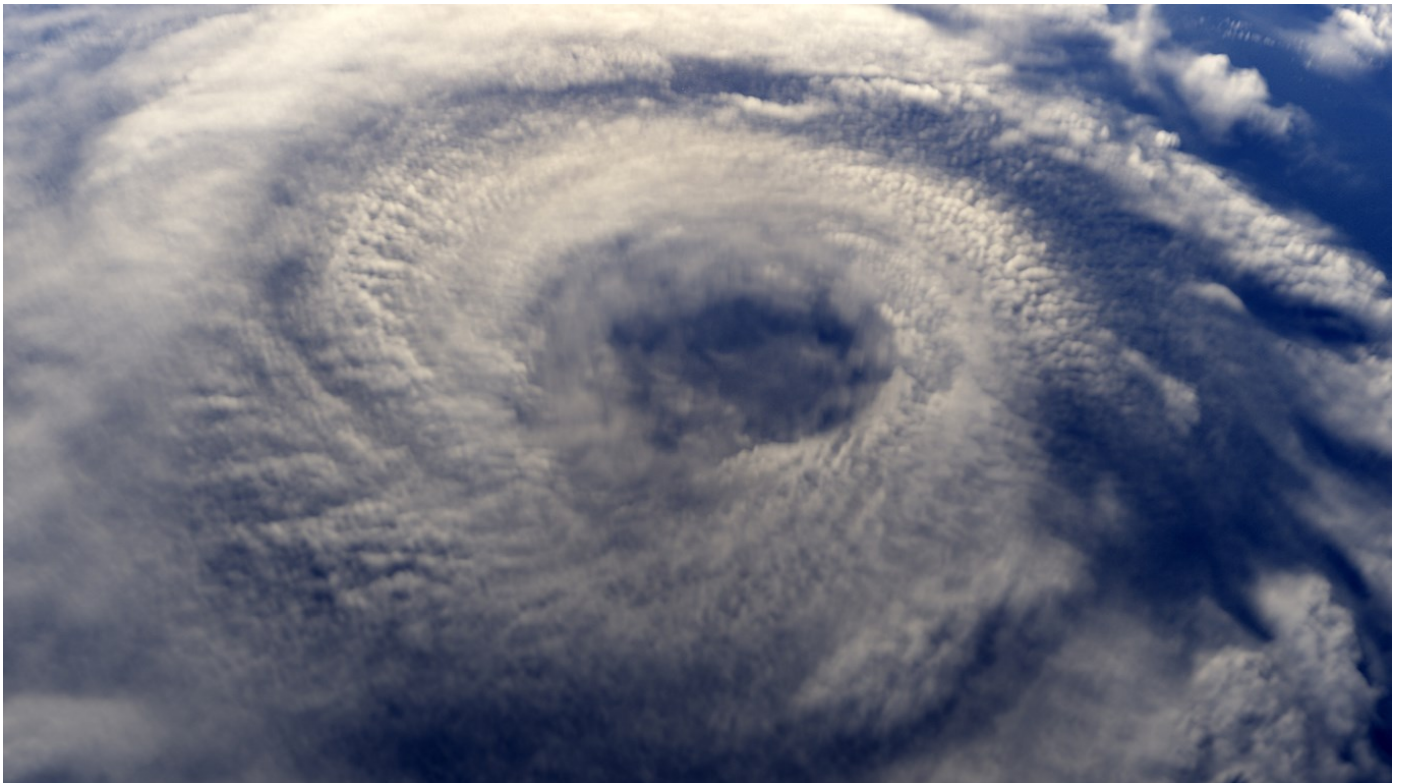
Joe joined frontier in 2020 as Senior Consultant. His responsibilities include derivatives, alternatives, and insurance linked strategies. Prior to joining Frontier Joe was at QIC in Brisbane for 9 years, working as a Senior Portfolio Manger for volatility and insurance linked strategies. Prior to this, Joe was a Portfolio Manager for the Tyndall/Suncorp Global Macro Fund for 5 years, specialising in commodity volatility strategies. Joe holds a PhD in Economics from the University of Queensland where he lectured Macroeconomics and Mathematical Economics, and a first class honours degree in Econometrics.

Introduction

Turbulent market conditions surrounding the COVID-19 pandemic and memories of recent losses have tested capacity in the Insurance Linked Securities (ILS) market. During the 2020 renewal seasons pricing reverted to the highs of 2012 levels and there is widespread expectation for further improvements in 2021. This means higher expected returns for ILS investors.

This paper reviews the ILS sector during 2019 and 2020 and provides an update on all key metrics including return, risk, portfolio composition, capital flow, and COVID-19 impacts.

If you are a new investor to the sector, we recommend you read this paper in conjunction with the recently released [Frontier Line 170: Private Insurance Linked Securities](#).



¹A cedant is an entity (either a primary insurer or reinsurer) who underwrites an insurance policy then contractually transfers (cedes) a portion of the risk to a reinsurer

Historic market performance

2019 year had significantly fewer natural catastrophe events than the previous two years (Table 1), resulting in relatively low global insured losses.

Spreads and risk adjusted returns improved as investor preference shifted back towards more transparent, less risky instruments.

Concern centred on the industry's ability to assess losses in a timely manner and the dilutive impact of trapped collateral on expected returns.

Figure 1 details material loss events for 2017 – 2020. These losses cover insurance losses across all lines of business, for example property, marine, liability etc and in all layers of the insurance capital structure.

Table 1: Select natural catastrophes and global insured losses by year

Year	Californian wildfires		Atlantic hurricanes		Pacific typhoons		Global insured losses (US\$b)
	Acres burned	Structures destroyed	Total hurricanes	Major hurricanes	Total typhoons	Severe typhoons	
2020*	3,300,000	8,900	12	5	5	1	31 [#]
2019	260,000	732	6	3	16	4	50
2018	2,000,000	23,000	8	2	13	7	84
2017	1,500,000	11,000	10	6	11	2	144
10 year average	770,000		7	3	12	5	67

Source: Frontier, managers, Swiss Re Group, Insurance Information Institute. *data to September. # loss

Figure 1: Historic global insurance industry natural peril material event losses (USD)

- | | | | |
|-------------|---------------------------------|-------------|--|
| 2017 | • Hurricane Maria (\$26.5B) | 2019 | • California Wildfire (\$14.3B) |
| | • Hurricane Irma (\$26.6B) | | • Typhoon Faxai (\$7B) |
| | • Hurricane Harvey (\$19.4B) | | • Tropical Storm Imelda (\$0.7B) |
| | • California Wildfire (\$13.6B) | | • Kincaid Wildfire (\$0.6B) |
| 2018 | • California Wildfire (\$14.3B) | 2020 | • COVID-19 (\$50B-\$150B; current ~\$5B) |
| | • Typhoon Jebi (\$13.7B) | | • Hurricane Laura (\$9B-\$13B) |
| | • Hurricane Michael (11.8B) | | • Hurricane Sally (\$2B-3.5B) |
| | • Hurricane Florence (5B) | | • California Wildfire (\$5-8B) |

Source: PCS, Frontier. *Figures for 2020 are estimates only and are expected to change as actual losses develop.

2017

During 2017, out of a sample of 62 cat bonds, 27 experienced losses, with 52% fully defaulting. Of the bonds experiencing losses, almost 50% had exposure to Hurricane Irma, with around 80% average loss of principal. Cat bond losses were also linked to Hurricane Harvey (73% average loss), Hurricane Maria (80% average loss) and to the California wildfires (70% average loss), all as part of aggregate exposures.

Final claims for Hurricanes Irma, Harvey, and Maria were due by October 2020, as policy holders have up to three years to submit claims. As these losses were discovered to be higher than expected, they impacted returns in 2018-2020, a phenomenon known as “loss creep” now all too familiar to ILS investors.

2018

During 2018, out of a sample of 68 bonds, nine experienced losses and four have fully defaulted. Of the bonds in the sample covering US wind for Florence and Michael and Japanese Typhoon for Jebi, most have experienced full loss of principal. Bonds containing California wildfire exposure experienced around 20% loss of principal. This lower loss is partly due to insurers and bond holders recouping losses from utility companies deemed responsible. In particular, PG&E’s emergence from Chapter 11 bankruptcy led to payouts which have caused positive loss development in some ILS contracts.

Final losses from 2018 events are required to be submitted by policy holders by late 2021, with further loss creep possible.

2019

There were fewer events during 2019 and global insured losses were well below the ten-year average (see Table 1). Japanese typhoons Hagibis and Faxai drove up losses in the second half of 2019 along with the Australian bushfires.

For 2019, out of a sample of 65 bonds four have experienced losses, and only one of the impacted bonds has fully defaulted.

Most losses occurred in aggregate contracts¹ through slow erosion of deductibles² over the year. There has been a corresponding shift in investor preference toward single peril and per-occurrence contracts where losses are more easily understood and modelled, and aggregate spreads have widened.

¹Aggregate contracts group together multiple different exposure types – either by geography, peril, or both, over a defined risk period. Payouts are triggered when losses from the underlying contracts exceed a pre-defined amount

²Excess of loss insurance contracts pay losses above a certain level known as a “deductible”

2020

COVID-19 impact

Global insurance loss estimates from COVID-19 vary widely, with impacts expected to be felt in almost all insurance lines. The upper end of estimates is broadly accepted to be US\$100bn (although some firms are forecasting up to US\$150bn), although actual global insurance losses to June 2020 were around US\$5bn.

The primary exposure in ILS is from business interruption (BI) cover provided in commercial property policies. This cover compensates the insured for loss of income arising from the business not being able to operate from their insured property. Uncertainty over the extent of BI losses stems largely from uncertainties of the classification of the pandemic as a natural catastrophe, and the classification of the damage as a physical consequence of the pandemic (as would be clear in the case of a fire, storm, or earthquake). Pandemic exposure in existing BI policies falls into three categories:

1. **Clear pandemic exclusions:** the policy specifically excludes payment resulting from a pandemic and no loss reserving is required.
2. **Affirmative cover:** the policy specifically includes payment resulting from a pandemic, and this payment is normally up to a sub-limit. Here loss reserving is required and is generally calculated at the sub-limit level.
3. **Ambiguous policy wording:** these policies do not specifically include or exclude pandemic cover, raising an element of ambiguity. Several cases are currently being litigated. This is the most challenging loss to estimate and insurers and funds are currently erring on the side of caution with loss reserves.

Typical ILS managers have loss reserves between 1.5% and 2.0% for these business interruption claims. The 15% or so of funds with loss reserves in excess of 4% are mainly higher risk offerings with large quota share and retrocession allocations.

Other considerations

The presence of El Niño southern oscillation conditions combined with warmer-than-average ocean temperatures led to a forecast above average hurricane season. The season to date³ has been in line with these predictions – 25 named storms, 12 hurricanes and five major hurricanes making landfall. This makes 2020 one of the most active hurricane seasons on record.

The wildfire season has started earlier than usual on the west coast of the US. The fires have burnt 3.3m⁴ acres more than the ten-year average. Losses to date are lower than previous significant fire events due to the lower value of structures which have been destroyed. The peak of the season is typically October and November when there are increased chances of strong dry Foehn and Santa Ana winds.

Clients investing from the January 2021 renewal season will not typically be impacted by losses from prior events due to exposed contracts being segregated from new investors (these segregated share classes are often variously called “side-pockets”, “development classes”, “special investment classes”, or similar).

³To October 2020

⁴To October 2020

Performance update

There are currently no private ILS return indices covering natural perils. Frontier has developed its own indices to reflect the private natural catastrophe ILS market. We have separated these into two categories:

- Mid risk managers: risk / return metrics which broadly replicate BB rated bonds
- High risk managers: risk / return metrics which broadly replicate CCC rated bonds

These indices are compiled from a selection of 10 – 15 manager products each and cover both historic returns and forward-looking portfolio metrics. Table 2 provides comparison of how forward-looking metrics have evolved between 2019 – 2020.

Table 2: Expected risk and return metrics for high and mid risk ILS managers

		Return if no losses (A)	Expected losses (B)	Expected return (C = A + B)	95% tail loss ⁵	99% tail loss ⁶
High risk	July 2020	15%	-8%	7%	-17%	-41%
	July 2019	14%	-8%	6%	-15%	-35%
Mid risk	July 2020	8%	-4%	4%	-8%	-29%
	July 2019	7%	-3%	4%	-7%	-27%

Source: Frontier

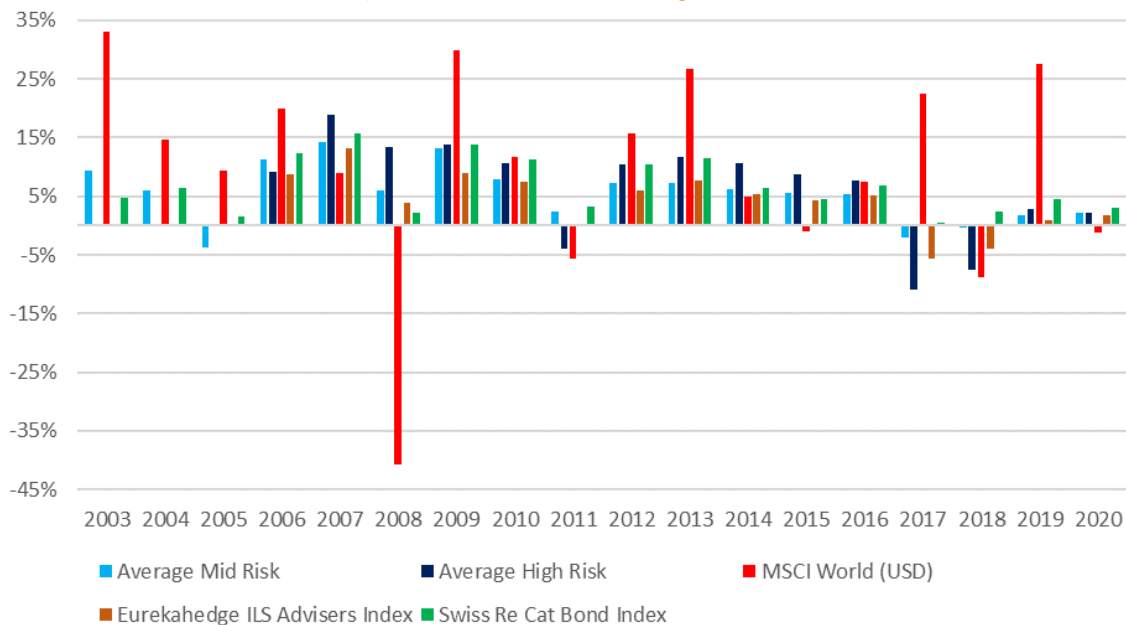
⁵Portfolio return is expected to be lower once in 20 years.

⁶Portfolio return is expected to be lower once in 100 years.

Returns for most ILS managers improved during 2020, aided by a reduction in loss events and capital constraints increasing spreads. Chart 1 and Chart 2 show historic returns based on the Frontier created mid and high risk private ILS indices.

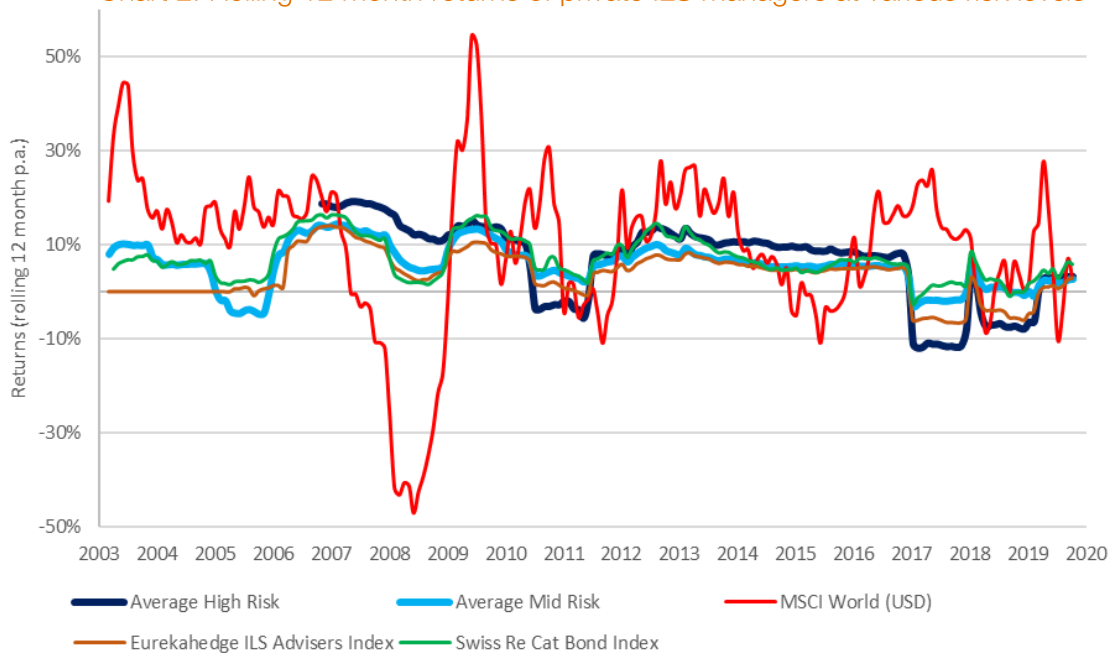
Most have recovered from losses experienced in 2017 and 2018, but some managers with larger exposure to Hurricane Irma or Japanese typhoons still reported losses.

Chart 1: Calendar year returns of ILS managers at various risk levels



Source: Managers, Frontier. Returns in 2020 are to July, in USD and inclusive of USD cash

Chart 2: Rolling 12 month returns of private ILS managers at various risk levels



Source: Managers, Frontier. Rolling 12-month returns are to July 2020, in USD and inclusive of USD cash

Pricing update

Pricing in ILS is often quoted as Rate on Line (RoL) which is the ratio of premium to maximum loss. RoL continued to increase in 2020 for the third consecutive year as markets incorporated price loading for losses experienced in 2017-2019, climate change, model uncertainty, and the impact of trapped collateral.

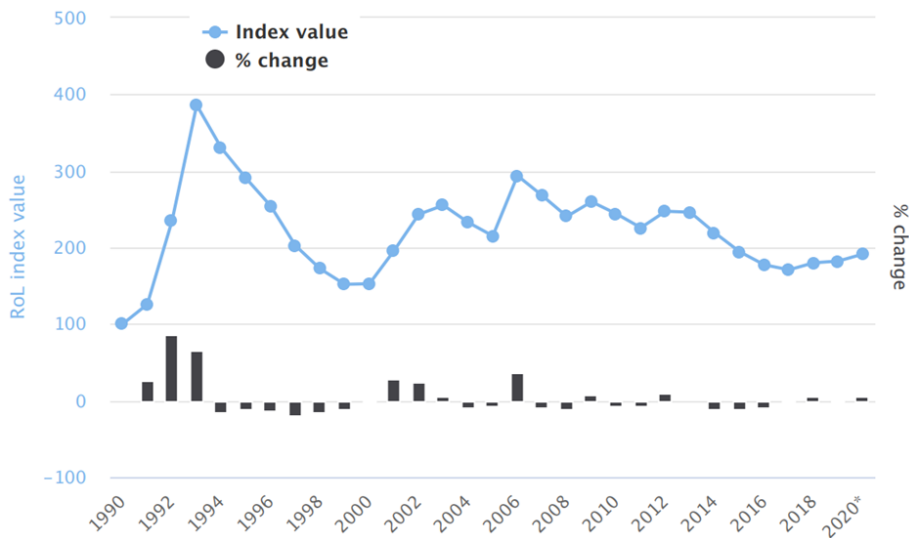
Chart 3 and Chart 4 show the evolution in RoL for global and US contracts. Chart 5 and Chart 6 (p. 8) show the evolution of pricing via a different metric – spread over expected loss (“spread”), for different contract types (collateralised

reinsurance vs retrocessional), regions (US vs worldwide or WW) and risk layer (low, moderate, or high risk).

Global and US pricing has continued to increase from lows in 2017, though changes differ at the regional, contract, and peril levels.

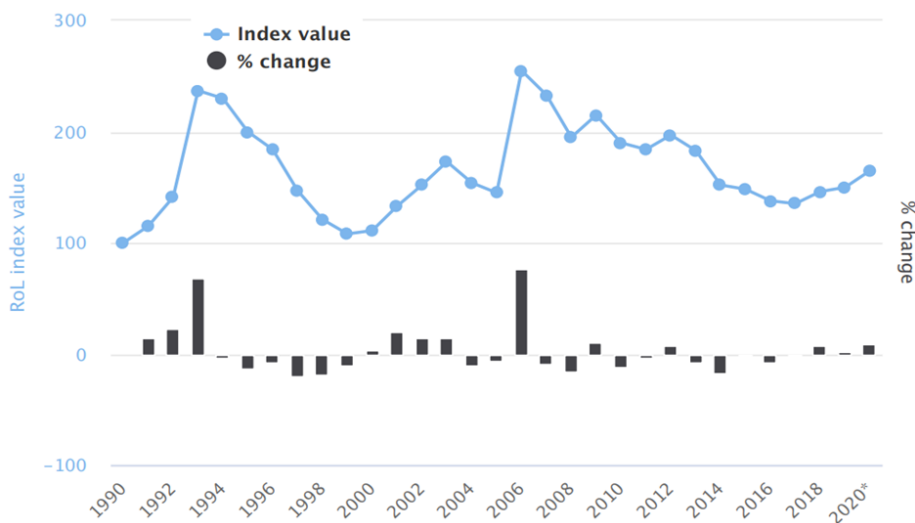
Higher pricing, either quoted as RoL or spread reflects a combination of increased risk and reduced availability of capital. The market consensus is that rates have increased more than risk, meaning higher expected returns for investors.

Chart 3: Global reinsurance Rate on Line index 1990 to 2020



Source: Guy Carpenter, JLT Re, Artemis

Chart 4: US reinsurance Rate on Line index 1990-2020

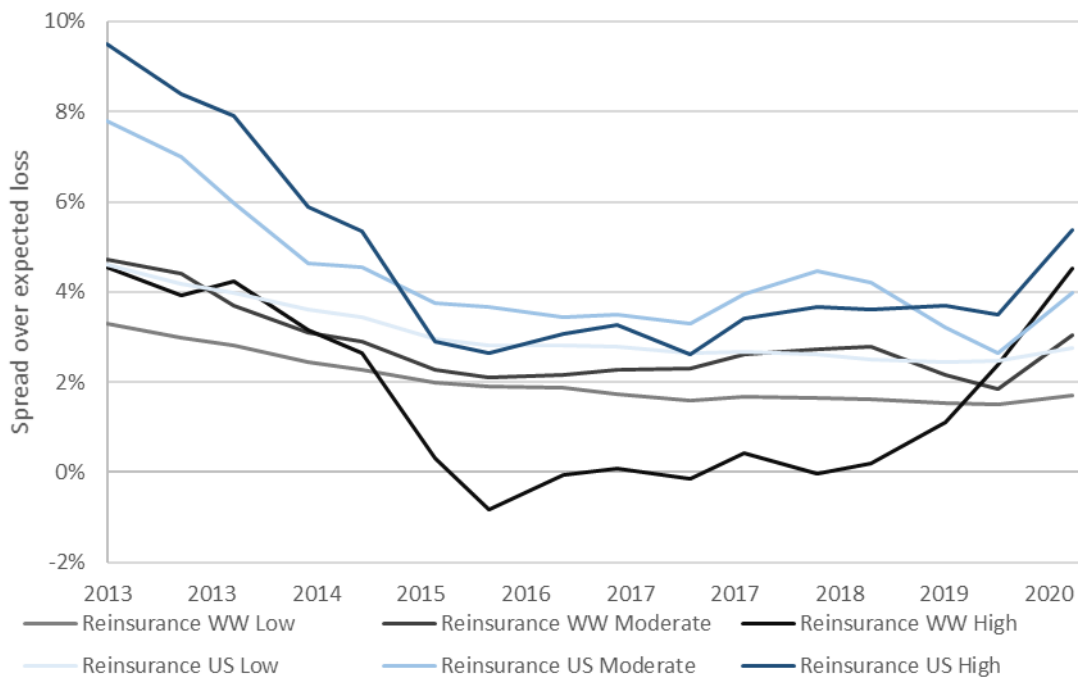


Source: Guy Carpenter

In reinsurance, worldwide high-risk spreads improved the most while US mid risk spreads have continued to decline.

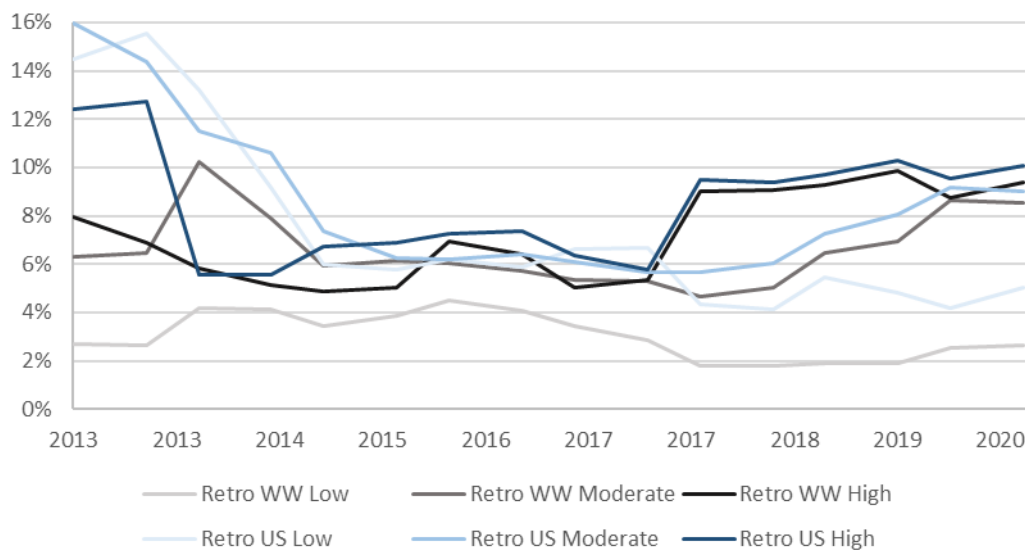
In retrocession contracts, moderate risk spreads continue to improve but high-risk spreads have declined.

Chart 5: Spreads over expected loss for collateralised reinsurance contracts



Source: Manager, Frontier. WW refers to contracts covering worldwide (ex-US) perils (e.g. Japanese earthquake)

Chart 6: Spreads over expected loss for retrocession contracts



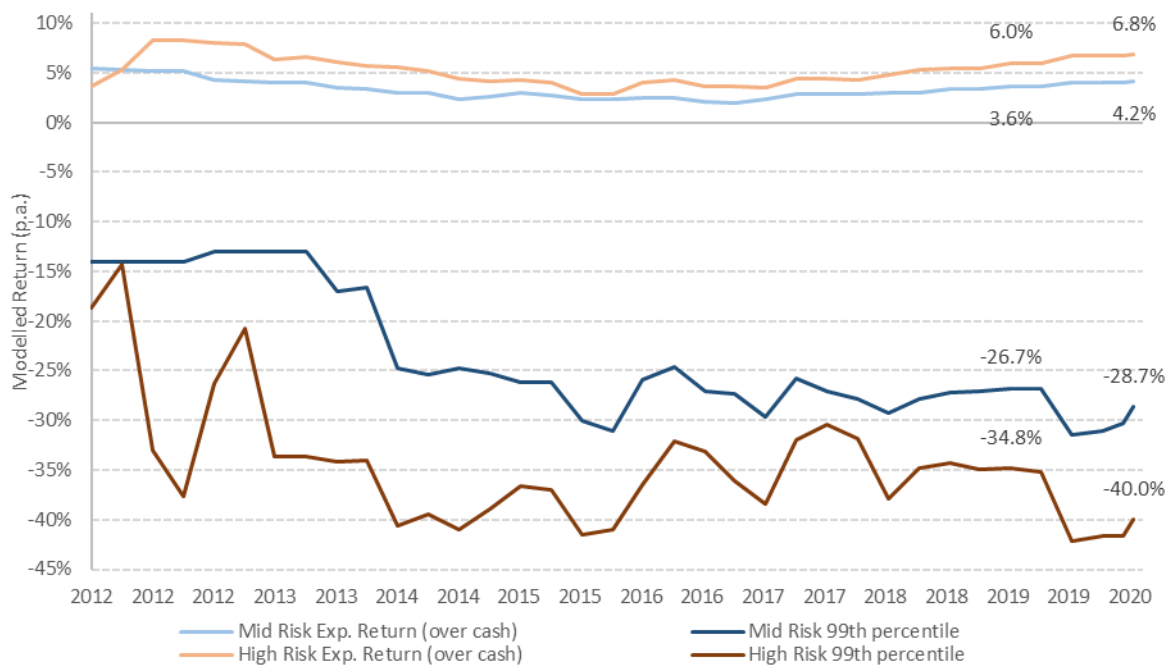
Source: Manager, Frontier. WW refers to contracts covering worldwide (ex-US) perils (e.g. Japanese earthquake)

Risk/return update

Risk adjusted returns improved in 2019 in several ILS sectors. Average no-loss yields for high risk managers increased 15% for the July 2020 renewal period on the same period in 2019 (refer Chart 7). Expected losses have decreased 1% and tail losses have increased year on year but have decreased since the January renewal period.

This has resulted in marginal divergence in expected return between mid and high-risk managers (see Chart 7). Despite the continued divergence in return, the difference in tail risk has remained reasonably consistent since 2017 with high risk managers on average 15% riskier.

Chart 7: Mid and high risk portfolio return and tail



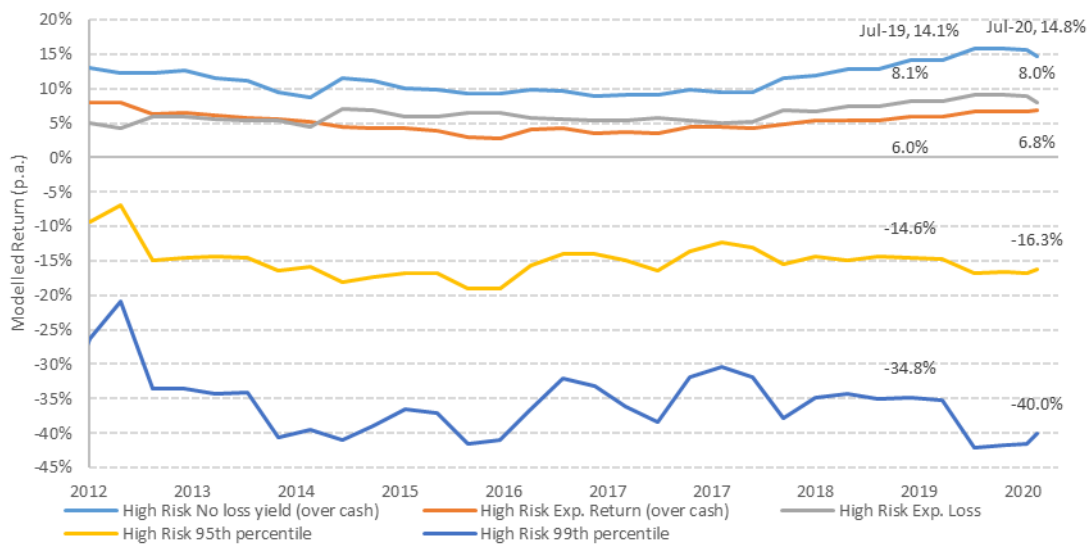
Source: Managers, Frontier. 12 ILS managers used to create High Risk grouping, 10 used to create the Mid Risk grouping

Chart 8 and Chart 9 highlight how risk/return has evolved for mid and high risk managers over time. This data indicates a level of seasonality, especially in tail risk. This is due to the timing of contract renewals: January incorporates the global reinsurance and retrocession contract renewals, April incorporates Japanese renewals, and June and July are US contract renewals. A manager with exposure to Japanese and US contracts could find portfolio weights have diverged from target, skewing the risk/return profile of the portfolio following renewal in January, especially if the portfolio is re-weighted.

Material price increases were evident in April Japanese renewals following losses from typhoons in 2018/2019. Losses are also still developing from hurricanes Irma and Michael with milder price increases in US contracts.

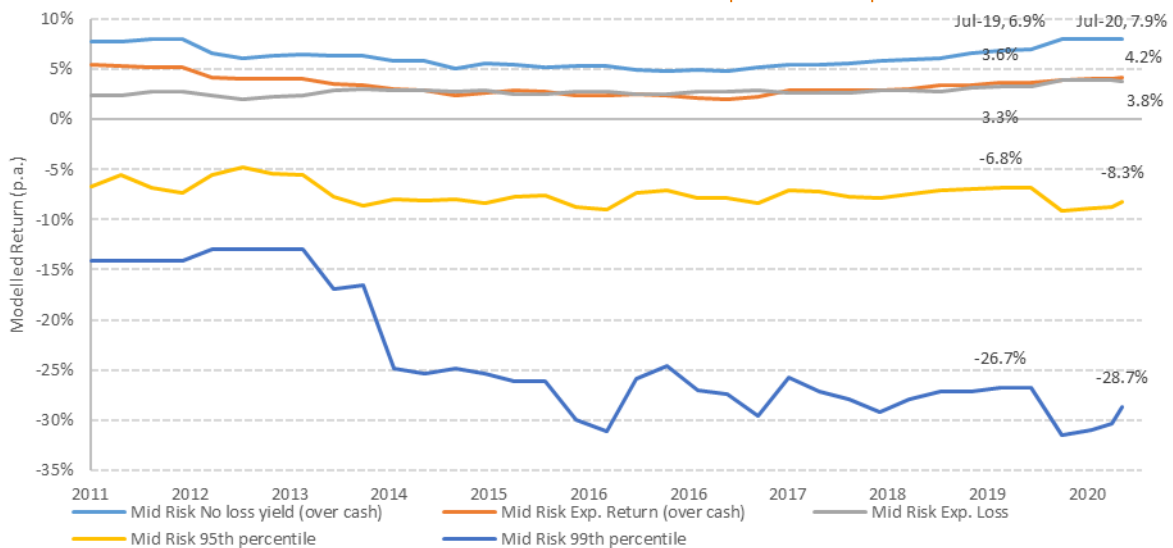
There is a general consensus that the industry is now in a hard market, with less capital available and higher premiums. There was already evidence of firming market conditions going into 2020, and the impacts of COVID-19 has further reduced capital availability as insurers have increased loss reserves. These conditions are likely to continue into the 2021 renewal periods. This is positive for investors, with higher yields and portfolio returns expected.

Chart 8: Risk/return metrics for high risk private ILS products



Source: Managers, Frontier. 12 ILS managers used to create High Risk grouping

Chart 9: Risk/return metrics for mid risk private ILS products



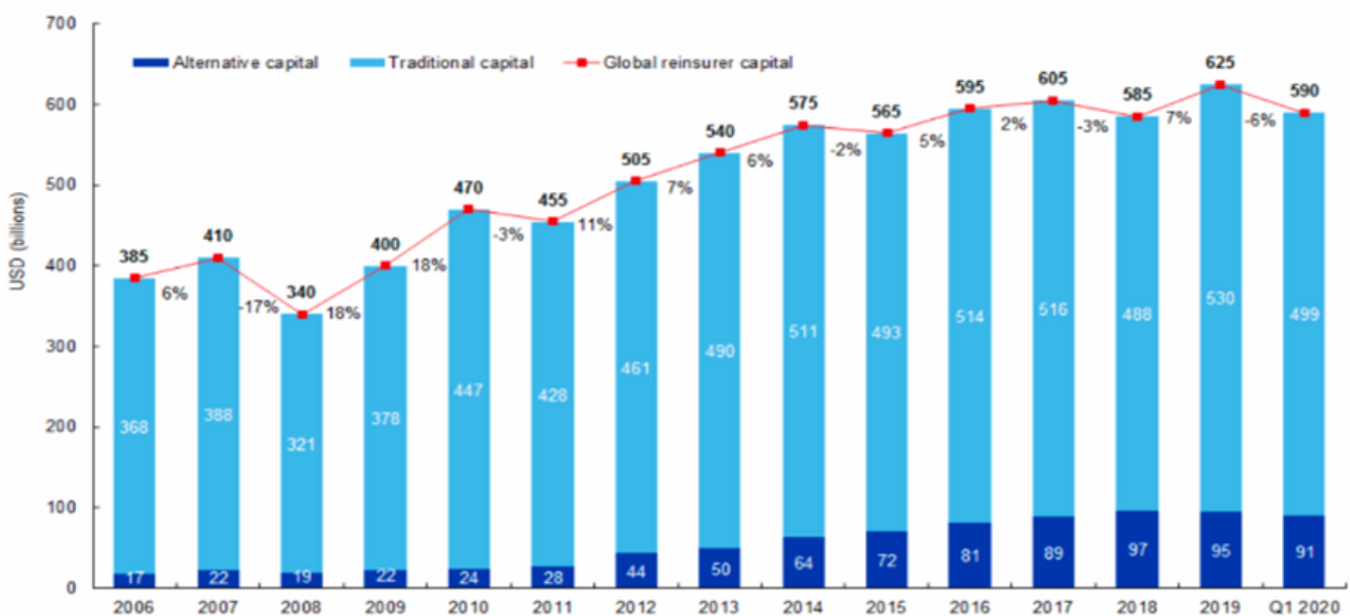
Source: Managers, Frontier. Ten ILS managers used to create Mid Risk grouping

Capital flow

There was a net inflow of capital into global reinsurance in 2019 (Chart 10), including an increase in traditional reinsurance capital⁷ of 9% offset by a smaller decrease in non-traditional reinsurance capital⁸ of 2%. This resulted in a net overall increase of 7% into the sector.

In 2020, capital availability has contracted around 6% further embedding the “hard market” conditions. This reduction of capital has resulted in increased yields and expected returns.

Chart 10: Dedicated reinsurance sector capital (2006 to 2020)



Source: Aon Business Intelligence / Aon Securities Inc.

⁷Traditional reinsurance capital is sourced from the reinsurance firm’s own balance sheet – backed by its own equity and debt capital

⁸Non-traditional reinsurance capital is where a reinsurance firm sources capital from third parties such as pension funds in exchange for a fee

ILS risks

Complexity

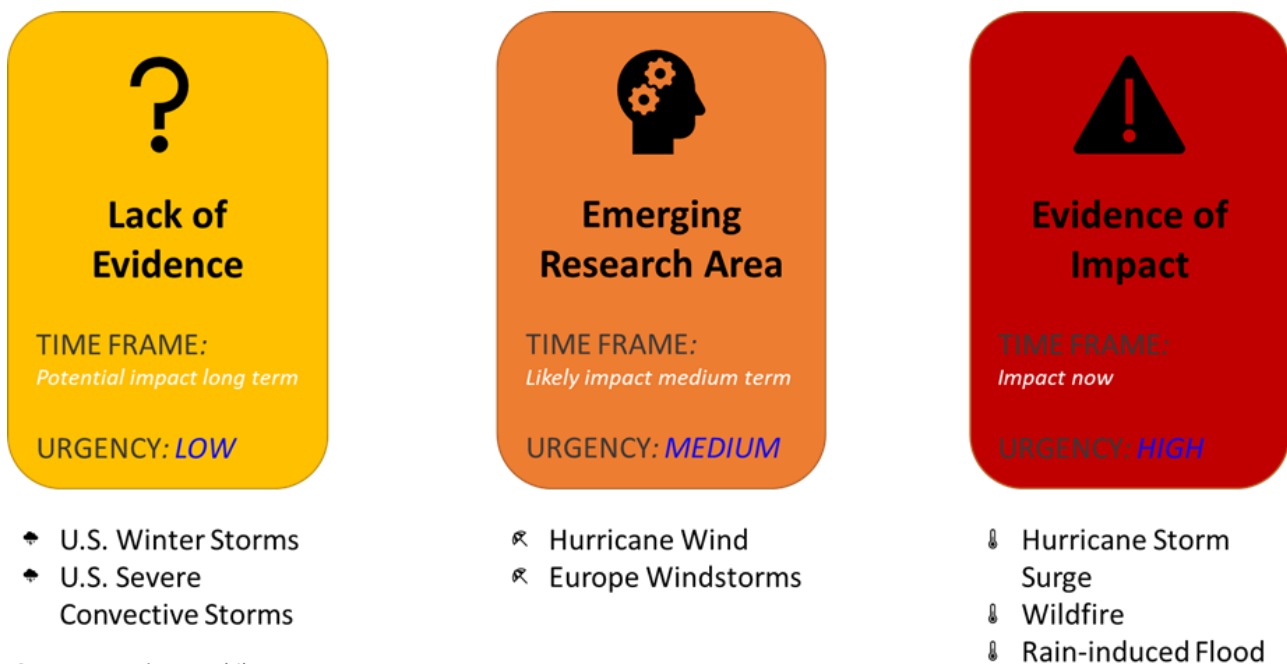
Fund managers and investors need to understand the reinsurance contracts and perils covered at a very granular level. This has been highlighted during the COVID-19 market dislocation, with unclear pandemic cover leading to uncertainty over losses. Pandemic cover is not the only “grey area”. Some other similarly uncertain areas are exposures to terrorism, cyber-attacks, solar flares, and the consequences of civil unrest. Understanding how perils are defined within contracts and to what extent rare but costly events are included, excluded, or otherwise not referenced is needed to understand the true tail risk potential.

Climate change

While all managers Frontier has met agree on the broad outline of climate change impacts on temperatures, there are diverging views on the impacts on specific perils. The frequency and severity of natural catastrophes and the subsequent insured loss impacts as broadly agreed by managers Frontier has interviewed is summarised in Figure 2. Conflicting views remain on the impact of ocean temperatures on the frequency and severity of hurricanes, and on temperatures in general on the prevalence and intensity of wildfires, with research continuing to evolve on both subjects.

There is some consensus that perils such as wildfire appear to be increasing in severity, plausibly as a result of climate change, but also as a result of increasing urban sprawl and reduced wildfire prevention measures. These are the views expressed by fund managers in general. Insured losses for Californian wildfires in 2017 and 2018 were unprecedented, and this looks likely to continue through 2020. The 2019/2020 Australian bushfire season was one of the worst on record, though in the Australian case there were relatively low insured losses (~US\$1.3B⁹). Several managers believe that the industry has not been appropriately modelling the loss-potential from wildfires and so is under-pricing the premiums (which may expose investors to lower returns for this particular risk). This view, as well as substantial realised losses, has increased premiums on California wildfire contracts and we expect a similar response in pricing to recent Australian bushfires.

Figure 2: Climate change impacts on catastrophe risk



Source: Frontier, Nephila.

⁹Source: Insurance Journal

Modelling risks

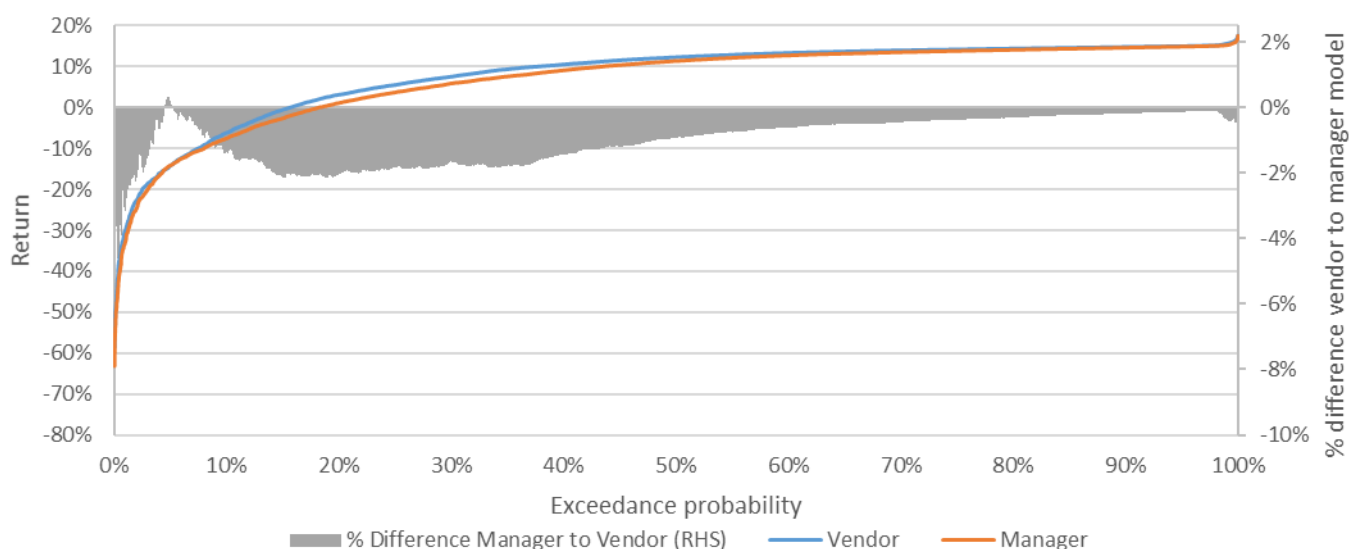
As evidenced by losses during 2017 and 2018, accurate modelling of natural perils is key to understanding tail risk. Frontier has witnessed continued evolution in sophistication and quality of modelling undertaken within the sector, especially by top managers. A key element of this conservatism is in model assumptions.

Chart 11 demonstrates this conservatism for one manager, highlighting increased loss-potential relative to the vendor model (this is shown by the shaded great area being negative which means the manager's likely loss for different confidence levels is larger than the loss from the vendor model).

Frontier introduces its own conservatism to stress the loss potential of the portfolio. We do this to allow for a margin in model uncertainty and in order to determine a scaled, and more conservative, potential loss should the modelling not properly account for some risks (e.g. climate change, wildfires).

Our approach is to increase rare and large losses (~1 in 100-year event) by 30% and less rare losses (~1 in 10 years) by 20%. More commonly occurring losses (~1 in 5 years) are increased by 10%. This stress test reduces the annual expected return by 1.5% and increases the tail loss potential (Table 3).

Chart 11: Change in loss distribution relative to industry standard



Source: Manager, Frontier. Data based on 1/07/2020 period data

Table 3: Impact on distribution statistics from scaling losses

Statistic	Manager	Frontier adjusted scaled assessment	Difference
Expected return	7.0%	5.5%	-1.5%
90% VaR	-7.5%	-9.8%	-2.3%
95% VaR	-14.1%	-18.4%	-4.2%
99% VaR	-32.4%	-42.2%	-9.8%
Skew	-2.1	-2.5	-0.3
Standard deviation	10%	12%	1.4%

Source: Manager, Frontier. Statistics measured over a forward-looking 12-month time horizon. Data based on 1/07/2020 data

The final word..

ILS pricing improved over 2019/2020, with fewer natural catastrophe events and capacity constraints in some markets assisting to improve spreads. Investors shifted marginally away from private reinsurance to cat bonds, seeking greater transparency and liquidity amidst concerns about the reinsurance industry's ability to assess losses in a timely manner and the resulting impact of trapped collateral on expected returns.

These concerns have improved premiums and expected returns for remaining investors.

If this is a sector you are interested in, please contact Frontier to discuss how this opportunity fits with your specific investment requirements.



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