H1 2018

TRADING Risk

ILS INVESTOR GUIDE

RECOVERING FROM 2017:

THE ILS MARKET REBOUNDS

Leadenhall
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Insurance Linked Investments

Non-Life and Life Strategies

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Published by Euromoney Trading Ltd,
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Subscriptions: +44 (0)20 7397 0619
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Annual subscription: £1295/$1945

AFTER THE STORMS

There is a whole generation of reinsurance market executives and investors – myself included – that had not experienced a loss year like 2017 in their careers before.

By the time our editorial team were reporting on the hurricane season's third major storm – Maria – there was a sense that nerves were running high in the industry. Few among our team had ever seen such a ruthless production line of storms head for the Caribbean and the US coastline.

It was a reminder that nature can't be controlled.

But risk can be. ILS managers are charged with constructing portfolios to suit the risk appetite of their investors, so that their losses from years such as 2017 come in within their tolerance.

But we believe that trade media such as *Trading Risk* also have a role to play in helping to create a framework for informed debate during years such as 2017 and – no less – 2018.

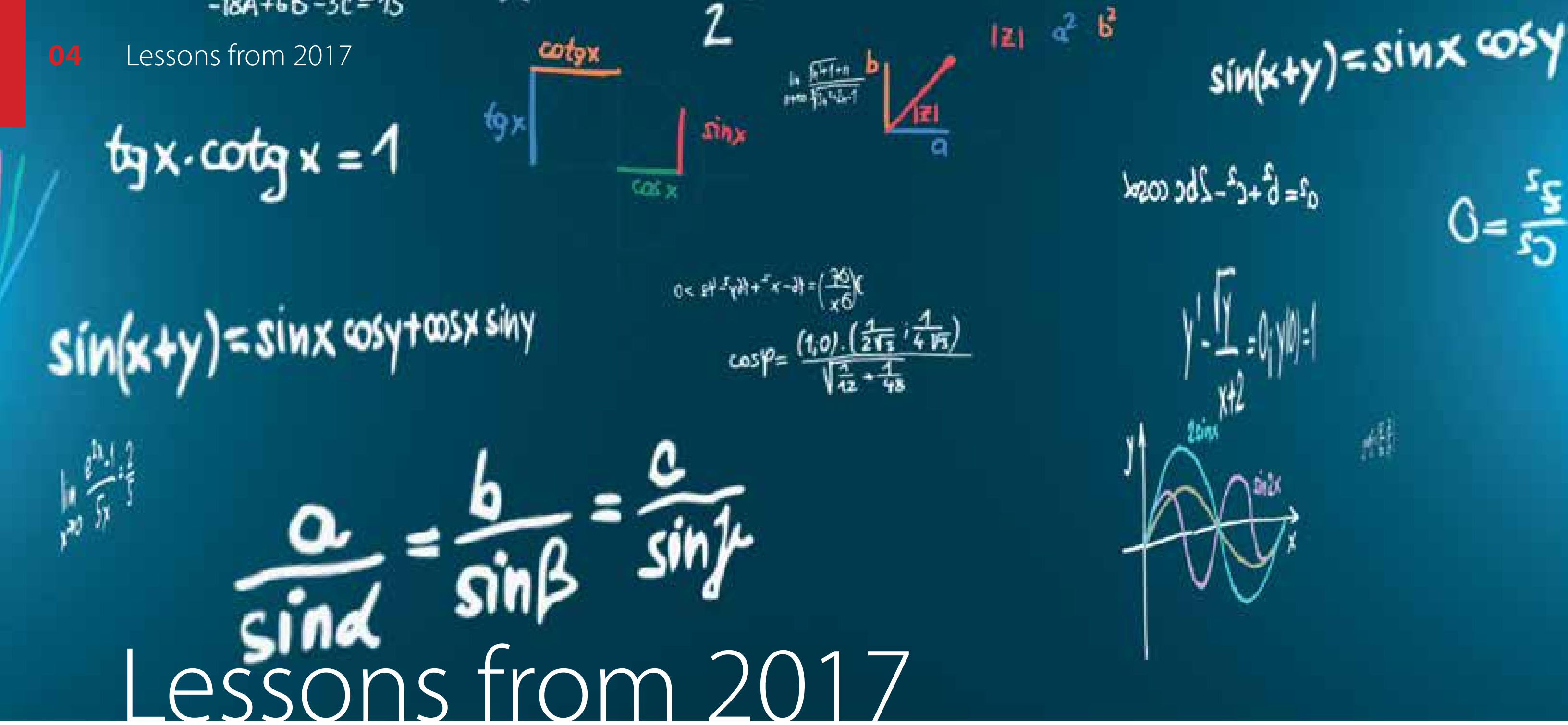
With memories of last year's hectic disaster activity already beginning to fade, the crucial question for ILS investors is whether the reaction to 2017's losses has been enough to lead them to want to increase their allocations to the asset class, or whether their chosen strategy in ILS has been the right fit for them at all. Ultimately, catastrophe volatility might seem like a unique challenge to take on.

But as I write this, stock markets have spent the past couple of weeks careening through valuation spikes no different from what might have been seen on ILS indices last year.

Meanwhile, the (re)insurance industry's focus is on rate adjustments to compensate for last year's losses, highlighting the rationale for diversifying into weather-driven risks. Indeed, I suspect that many investors would have kept a much cooler head during last year's hurricane season than some of us within the industry!

Fiona Robertson, *Trading Risk* editor

INSIDE



Lessons from 2017

If 2017 was the first major test of the ILS market since it came of age, it certainly won't be the last.

The US had enjoyed an unusually long stretch of good fortune in avoiding direct hurricane blows until last year, when Harvey, Irma and Maria (HIM) whipped through Texas, Florida and Puerto Rico, respectively.

As a result of these storms and other disasters such as the Californian wildfires, 2017 has now taken its place among the most expensive years on record for (re)insurers.

Its exact ranking alongside 2005 and 2011 varies between different sources, but despite these statistics, the first lesson for ILS investors to bear in mind from last year's catastrophe activity is simple.

It could have been far worse.

Harvey was largely a flood event, and thus much of its damages were uninsured. Likewise, Maria exacted a heavy toll in poorer, less-insured Caribbean islands than on the US mainland. And finally, Irma drifted off course from Miami to spare Florida a far more punishing scenario.

However, for one corner of the ILS market, the 2017 disasters came much closer to a worst-case scenario.

For many retrocession providers, a string of mid-sized loss events is far more challenging than a single major Florida storm.

Notably, this is the case for Markel Catco's pillared retro product, as well as for aggregate retro specialists such as Aeolus, AlphaCat or RenaissanceRe's Upsilon strategies.

Some of these managers benefited from hedging programmes they had in place to limit the ultimate impact of the disasters.

But brokers estimated that large swathes of retro market collateral would still be trapped, if not lost outright.

Aon Benfield president Andy Marcell said his firm had tracked around $20bn of impacted retro limit across traditional and alternative markets, with around $9bn of collateral affected either through loss or by being trapped.

This would make up the bulk of the ILS market's share of insured losses from last year's claims.

Overall, industry analysts have estimated that the ILS market could pick up as much as 15-25 percent of total insured claims from 2017 losses.

With last year's insured disaster toll estimated at $130bn-$135bn, including HIM losses of $80bn-$90bn, the ILS market could bear as much as $20bn-$33bn of claims – knocking about a quarter to a third off its capital base of $80bn-$90bn.

However, many of the year's losses were retained by primary insurers rather than being transferred to the reinsurance markets, so ILS losses are likely to be at the lower end of the scale and dominated by Irma, the Californian wildfires and aggregate or retro claims.

While many ILS managers are under no obligation to report their losses, the public information available to date certainly suggests a hit to the market well below this range. *Trading Risk* analysis suggests ILS market losses of less than $15bn (see table left).

One of the most public segments of the ILS market

ILS market segment loss projections

	Loss ($bn)	Estimated total size ($bn)	Assumptions
Indemnity retro	5.4	11	Assuming 49% loss based on Markel Catco's return (27% NAV loss on top of lost premium)
Collateralised reinsurance	5.3	35	Taking 15% loss as average based on 10-20% losses reported by some funds tracked by ILS Advisers index
Industry loss warranties	1.4	6	Based on 12% Micrix index loss, multiplied by two to account for higher US/aggregate exposure
Sidecars	0.8	8	Based on average loss from Stone Ridge/Pioneer sidecar investments
Cat bonds	0.7	25	Based on Lane Financial analysis of secondary market write-downs
Total	**13.6**	**85**	

Source: *Trading Risk*

is the cat bond sector, which will only pick up a minor share of the year's losses.

Trading valuations at year-end 2017 implied that about $706mn could be written off from the roughly $25bn volume of cat bond issuance, according to analysis from Lane Financial.

However, with only $170mn of recognised losses at year-end, some of these devalued bonds may yet regain value.

On another more commoditised side of the market, the Micrix industry loss warranty (ILW) index registered a 12 percent drop over September and October.

But the basket of ILWs tracked by the index does not include any aggregates and is more diversified than the underlying market. Doubling the recorded drop to compensate for this underweighting suggests a loss of about $1.4bn from the $5bn-$7bn ILW market.

The sidecar market is worth $8bn of limit, according to broker estimates. Regulatory filings from two of the biggest sidecar investors show that their fleet of investments lost 10.5 percent of capital on average between July and October – indicating around an $840mn loss.

Finally, the collateralised reinsurance market is the largest ILS sector component, with about $35bn of limit. However, given that many ILS funds include a blend of liquid cat bonds and private deals, it is harder to isolate the impact on this sector.

But a handful of results from various ILS strategies tracked by the ILS Advisers index showed losses of 10-20 percent in September, which points to a midpoint loss of $5bn.

This may be toward the higher end of the scale for these strategies, as a group of funds tracked by pension consultant Mercer showed average losses of 5 percent for the quarter ended September 2017. But lower quartile performers, which are likely to include funds with less allocated to low-risk cat bonds, ranged from 12-17 percent losses.

Retro markets could have picked up a similar level of losses at around $5.4bn, using Markel Catco's reports as a baseline view, with further uncertainty over trapped capital in this niche.

Plugging the loss gap

Meanwhile, some analysts have warned investors to watch for deterioration in loss reserves, as they highlighted a gap between aggregate loss disclosures from individual reinsurers and the projected level of industry claims.

This has led to concerns that losses could increase in 2018 as claims filter down the reporting chain – with one example of loss deterioration having already occurred after retro specialist Markel Catco significantly raised its reserves in its December month-end report.

On the other hand, initial industry loss forecasts appear to have been too pessimistic for Harvey and Irma, with claims for these storms trending down.

Every major catastrophe loss year is different in its own way. And 2017 also served as a reminder of just how challenging it is to put a figure on how often such a year might recur.

For example, Validus chairman and CEO Ed Noonan suggested that while the reinsurer saw the HIM storm season as an event that might recur every 32 years, analysis of disclosures from the firm's competitors suggested they viewed it as more than a 1-in-60-year event.

"Our peers seem to think this type of wind season will only happen once in their careers, while we see it as twice as likely," Noonan said.

But Fermat Capital co-founder John Seo argued that last year's losses – which were primarily a retro event – were modelling closer to a 1-in-10-year aggregate loss.

"If we put 2017 alongside 1992, 2005 and 2011, we would be seeing four similar or greater loss years across three decades," Seo said.

In recent months, the reinsurance industry has moved past the question of quantifying the 2017 losses to focus on the pricing reaction to the disasters.

1 January marked the first of several phases of annual renewals to come in 2018, and after years of relentless rate reductions, this time contract negotiations turned on the question of how far prices should move up.

But ultimately increases were subdued – which many took as proof that ILS market capital has permanently softened the reinsurance rating cycle.

Investors may take comfort in the fact that losses have helped the market find a pricing floor. But 2018 rate increases set the clock back only a year or so.

So it's clear that this year, just as much as 2017, will be one to stay close to your ILS manager.

2017 top 10 global insured loss events

Date	Event	Location	Death	Economic loss ($bn)	Insured loss ($bn)
25 Aug-2 Sep	Hurricane Harvey	US	90	100	30
18-22 Sep	Hurricane Maria	Caribbean Islands	Hundreds+	65	27
4-12 Sep	Hurricane Irma	US, Caribbean Islands	134	55	23
October	Wildfires	US	43	13	11
8-11 May	Severe weather	US	0	3.4	2.6
December	Wildfires	US	2	3.2	2.2
26-28 Mar	Severe weather	US	0	2.6	2
Spring & summer	Drought	US	0	2.5	1.9
6-10 Mar	Severe weather	US	0	2.2	1.6
11-Jun	Severe weather	US	0	2	1.6

Source: Aon Benfield

2017 was a 'game changer' for ILS: Securis

Within a week of Hurricane Irma tracking through Florida, following hard on the heels of Harvey and with Maria close behind it, Securis launched a post-event fund to take in new investment for 2018.

"We have been prepared for something like this," says Securis chief operating officer Vegard Nilsen. "This was a game changer."

Even though Hurricane Irma was not the big Miami event the industry initially feared, Securis co-founder Rob Procter says the firm believed the aggregation of losses would trigger a positive change in direction for catastrophe pricing.

The London-headquartered manager ultimately raised $1bn for its post-event strategy, the Securis Event Fund. It also raised an additional $500mn in a separate mandate as its overall assets under management reached $6.2bn for 2018.

This growth leapfrogged it two places up the ranking of top 10 ILS managers into fourth spot, according to *Trading Risk* data.

After last year's losses, the opportunity set for investors this year is significantly improved, Nilsen adds. "It's resulted in an improved and hardened market, and although the rate increases may not be as positive as some had hoped, it's significantly improved. We have been very encouraged by the investor motivation to enter the space."

The manager estimates rates rose by approximately 20 percent in the retro market and around 10 percent on quota share covers, with cat bond yields up 20 percent.

As a significant retrocession writer, Securis was exposed to aggregate retro losses from last year's catastrophe activity, although chief underwriting officer Paul Larrett says the firm incurred few losses from the modest industry loss warranty (ILW) portfolio it had written last year.

Larrett says the firm's focus within the retro market has tended towards peak peril risk – where it believes risk-adjusted returns are highest.

"We have longstanding relationships and target business in all the major retrocession markets including London, Bermuda, the USA and continental Europe," he says, adding that the firm can also offer reinstatements on per-occurrence transactions with a sufficiently high premium rate.

Looking ahead, Securis plans to bolster its US catastrophe origination team this year as it plans to grow in this segment in 2018 and beyond.

The independent manager now has a mechanism in place that allows it to efficiently invest in reinstateable transactions – which typically require a credit rating to offer – and successfully deployed capacity via this route at 1 January, the firm's head of non-life origination Fergus Reynolds explains.

However, overall Securis is agnostic on the form and structures of deals it considers.

"Our structure and access to business allows us to be nimble and move to where we see the most attractive risk-adjusted returns," Reynolds explains.

"We are unique in that we access insurance risk across the spectrum, from insurance to retro in both tradeable and private form."

On the primary insurance side of its business, 2018 will mark the third year that Securis has been running a Lloyd's special purpose arrangement, Syndicate 6129.

This is now hosted by Axis after its takeover of Novae and is principally used to write catastrophe-exposed US property insurance business. This facility has since been complemented by a new partnership with StarStone, a US specialty insurer that will manage a portfolio of risk for the manager.

The primary portfolio comprises about $125mn of homeowners', small commercial and middle market shared and layered business, notes Securis non-life portfolio manager Herbie Lloyd.

Hurricanes Harvey and Irma were "impactful but not outsized" loss events for the primary portfolio, he adds.

"Syndicate 6129 also has the added protection of a dedicated cat reinsurance programme."

As with the reinsurance segment, the primary rating environment for 2018 is materially improved relative to 2017, especially in loss-affected areas such as Texas and Florida and in the commercial market, Lloyd says.

"We focus primarily on non-admitted business which allows immediate changes to price, terms and conditions post-loss," he adds.

Valuing the losses

The losses of 2017 were not only a test of ILS managers' ability to build quality portfolios, but also of their organisational response during a challenging half-year, Nilsen suggests.

"Turning around and raising $1.5bn in short order following one of the largest catastrophe loss years on record says a lot about how we are organised. Doing this simultaneously with facing valuation challenges, reserving, paying out claims and answering to investors are only a few of the key areas tested. This is where our team of approximately 50 professionals stands out."

Unlike many other ILS firms, Securis does not seek to set aside reserves through side pocketing to isolate the impact of loss events.

Instead, the firm believes that its valuation processes developed over the past 12 years are sufficiently robust to allow it to create a loss reserve that will hold up to scrutiny.

"In our experience our investors want to know their losses immediately. Our goal is to estimate the ultimate and total loss as soon as the event has happened," explains Nilsen.

"Nevertheless, there is obviously some valuation risk on a month to month basis, but our investors know they need to take a long-term view in this asset class," he continues. "Our investor base is sophisticated and professional, they understand this and we saw very few redemptions after the losses."

Indeed, the COO argues that major loss years such as 2017 are almost easier to manage than other more minor events.

"It was very clear-cut what had happened," Nilsen says. "The events were of such magnitude and size that there was little ambiguity as to whether a contract was affected or not, so that only very few positions carried any valuation risk in the aftermath – which also removes the need for side pockets."

> "2017 will be seen as the year when ILS proved its real value, , fully justifying its increasingly significant role in the global reinsurance market"

"There isn't a lot of uncertainty in it," Nilsen continues. "Besides, we have a dedicated team, managed by Stephen Lister, fully focused on loss reserving and valuation."

The firm's approach to evaluating its losses involves it first taking a broad-brush, top-down look at its exposure, setting aside any unexposed business, eliminating the covers that are expected to be a total loss and focusing its loss estimation on the final uncertain exposures that remain.

After setting the initial top-down loss pick, Securis then attacks this number using a ground-up approach – going through information at a contract level and seeking feedback from counterparties, brokers and cedants. "We were not sitting here waiting for PCS and other agencies to come out with a loss figure," says the COO.

Since setting its initial reserve, the firm has experienced a modest drift on its Harvey, Irma and Maria (HIM) reserves, Nilsen adds. "Our original estimate relating to HIM, now looking back, was very accurate."

Ultimately, Procter says that last year's losses have set the scene for a new phase of the ILS market's development.

"2017 will be seen as the year when ILS proved its real value, fully justifying its increasingly significant role in the global reinsurance market."

ILS managers reload after 2017 losses

ILS managers raised significant levels of capital in the second half of 2017, as they shrugged off catastrophe losses to replenish their capacity for 2018.

The industry's top 10 managers grew their assets under management (AuM) by 13 percent over the half year, figures from *Trading Risk's* latest biannual survey of ILS managers show.

This group controlled $64bn at January 2018, up from $57bn midway through last year.

Post-event fundraising led to some reshuffling of the leaderboard, as Securis leapfrogged Stone Ridge and Fermat to take fourth position with $6.2bn of assets.

Outside the top 10, AlphaCat's assets surged to $3.4bn from $2.9bn at the start of October. Axa Investment Managers' ILS funds topped $1bn for the first time.

ILS assets may be boosted later this year by trapped capital being released. In this survey, *Trading Risk* asked managers to provide AuM figures that reflected their current capacity, excluding side-pocketed assets that were not available to be deployed.

However, as some managers are still able to charge fees on side-pocketed assets, provided they are ultimately released, it is possible that the figures include some portions of locked capital.

Indeed, Markel Catco said its $6.1bn of assets included frozen capital. It raised more than $2.3bn last year and could have rolled forward another $1.6bn based on projections for its London-listed fund.

One ILS manager estimated that $15bn-$16bn of fresh capital had been raised by the industry after the Q3 losses, which would imply more stasis than growth given the level of losses projected at the end of 2017.

Top 10 ILS fund managers

	ILS AuM $bn				
	Jan-18	Jul-17	Jan-17	Jul-16	Jan-16
Nephila Capital	11.0	10.5	10.2	10	9.5
Credit Suisse Asset Management	8.8	8.6	7.5	7	6.5
LGT Insurance-Linked Partners	7.9	7.0	6.5	5.8	5.2
Securis Investment Partners	6.2	4.6	4.1	3.7	3.53
Stone Ridge Asset Management*	6.1	5.7	5.1	4.8	4.4
Markel Catco	6.1	4.5	4.3	3.7	3.2
Fermat Capital Management	5.7	5.4	5.2	4.8	4.8
Leadenhall Capital Partners	4.7	4.2	3.5	2.9	2.41
Aeolus	4.0+	3.2	~3.0	2.5+	2.5+
Elementum Advisors	3.4-3.7	2.8-3.1	2.7-3.0	2.6-2.9	2.25-2.75
Total	**64.1**	**56.7**	**52.3**	**48.0**	**44.5**
% change from prior half	**13.1%**	**8.4%**	**9.0%**	**7.7%**	**5.5%**

*Latest Stone Ridge AuM is based on most recent disclosure as of 31 October
Source: *Trading Risk*

2017 losses average 6%

2017 losses recorded by ILS funds averaged 6 percent net of fees, the Eurekahedge ILS Advisers Index shows. The index tracks the performance of a group of 34 ILS funds ranging from low-risk cat bond strategies to high-risk retrocession funds.

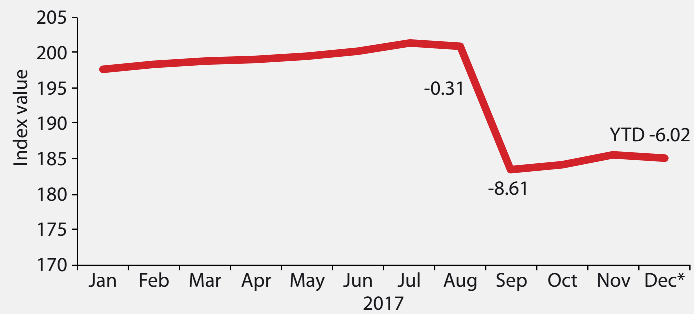
Last year's result was the worst on the ILS Advisers index since its inception, surpassing the 0.14 percent drop recorded in 2011.

The retro market was one of the main areas of the ILS market's exposure, with claims remaining below the level that would threaten typical cat bond covers.

But due to cat bond losses having an uneven impact on returns, there was more than a 7 percentage point spread in annual performance among a group of cat bond funds tracked by *Trading Risk*.

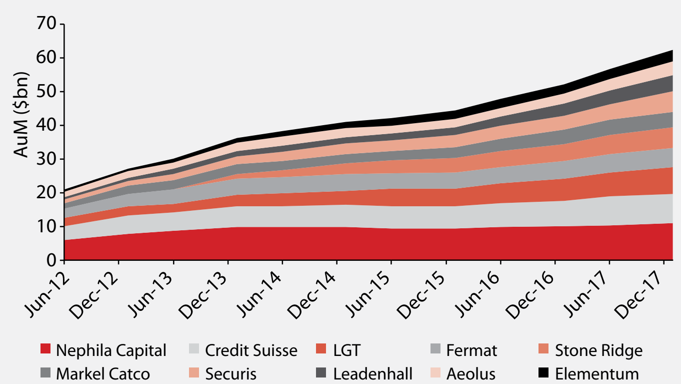
At the top end, Securis and LGT's cat bond funds even recorded annual gains of 1.64 percent, beating the 0.54 percent gain on the Swiss Re Cat Bond Performance Total Return Index.

ILS losses average 6% in 2017



*Based on 69.70% of funds which had reported December 2017 returns as at 24 January 2018
Source: Eurekahedge ILS Advisers index

Top 10 ILS managers' AuM



Source: *Trading Risk*

1.1 renewals: rates tick up after 2017 losses

Catastrophe reinsurance rates rose for the first time since 2012 in the annual January renewals, as the market reacted to a year of heavy disaster losses.

But the scope of rate increases was more modest than reinsurers had initially pushed for, as fears of capacity shortages did not come to pass.

Indeed, ILS managers were able to more than reload capital that was lost or trapped during the hurricane season, helping to smooth out the renewal process as overall ILS capital ended the year up 9 percent at $82bn, broker Guy Carpenter estimated.

The impact of losses was also manageable for traditional reinsurance capital, which remained flat at around $345bn, analysis from the broker and AM Best showed.

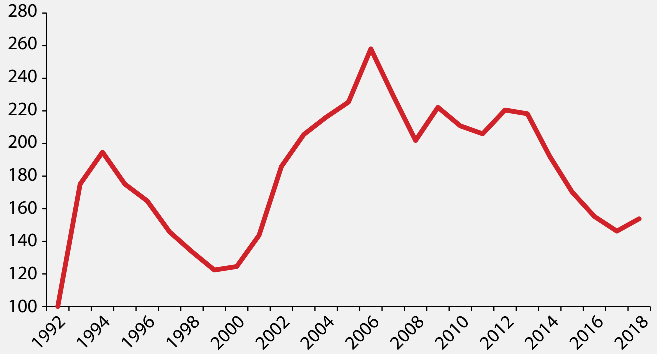
A large portion of the losses remained with US primary insurers, which was another factor that helped to frustrate reinsurer hopes of larger increases in the January renewals season.

But mid-year renewals will be a further test of the market's reaction to 2017 losses, as many large loss-affected programmes are yet to renew.

Brokers held back from giving a clear outlook on how the January renewals would set the course for mid-year rollovers. But Aon Benfield warned that surplus capital meant that any price increases seen at 1 January could quickly fade.

"Reinsurance pricing has moved up in lines and territories most affected by recent losses, but we expect this trend to be relatively short-lived, given the amount of new capital entering the sector," the intermediary said. "This may have long-term consequences for the structure of the reinsurance market," it added. Willis Re International chairman James Vickers said the outcome of the renewals showed that traditional thinking about the existence of a pricing cycle had been squashed, with reinsurers no longer able to live on "big bumps" post-loss.

JLT Re's risk-adjusted global property cat rate-on-line index



Source: JLT Re

Dialling back

Even after increases that averaged 4.8 percent on a risk-adjusted basis, catastrophe rates still lag below

2016 levels, broker JLT Re said (see chart).

JLT Re North America CEO Ed Hochberg said reinsurers had sought more substantial increases, although many conceded ground as the 1 January renewal date neared, particularly in loss-free areas.

"Even with these increases, the cost of property protection remains competitive with global property-catastrophe pricing approximately 30 percent below 2013 levels," he remarked.

Another measure of global catastrophe rates, Guy Carpenter's rate-on-line index, showed a slightly higher 6.1 percent increase year-on-year.

However, this figure was not risk-adjusted, as the firm said it was driven by reinsurers taking on more risk as well as obtaining higher rates.

"Reinsurers' focus on flat risk-adjusted pricing led to higher premiums for increased exposure," Guy Carpenter added.

Zoning in on rate change

In terms of geography, the US recorded the biggest rate increases after a punishing hurricane season.

Pricing was flat to up 5 percent for loss-free accounts and 10-20 percent higher on loss-affected contracts, JLT Re said.

Lloyd's and global direct and facultative business, also hard hit by 2017 losses, took increases of 15 to 25 percent or more.

The broker's peer Willis Re said loss-free US nationwide property cat accounts were flat to up 7.5 percent, with loss-hit deals registering rate rises of between 5 and 10 percent.

Some west coast insurers were subject to higher rate hikes following the California wildfires, the broker said in its 1st View report.

Property catastrophe rates at 1 January 2018 – Willis Re

US loss free	US loss affected	UK loss free	UK loss affected	Germany loss free	Germany loss affected	Australia/NZ loss free	Australia/NZ loss affected	Retro loss free	Retro loss affected
0-7.5%	5-10%	0-5%	N/A	0-3%	5-10%	0-2.5%	Varies	5-15%	10-30%

Source: Willis Re

Amid benign loss activity in Europe and Asia, rates were flat to moderately up for international property cat business, the firm said.

In Europe, largely flat renewals halted a decade of continuous reductions, Willis Re added.

Pricing momentum in the retro market also tapered off at the end of last year, sources said, as a lack of new demand and a smooth reload of lost capital meant increases fell short of expectations.

Ahead of the renewal, the retro market was being circled by new players looking to take advantage of rate increases, but one broker said the newer players had found it more difficult to deploy capital.

In terms of rate changes, Willis Re put rate increases on non-marine cat loss-hit retro business at 10-30 percent, with 5-15 percent hikes on loss-free cat-exposed business.

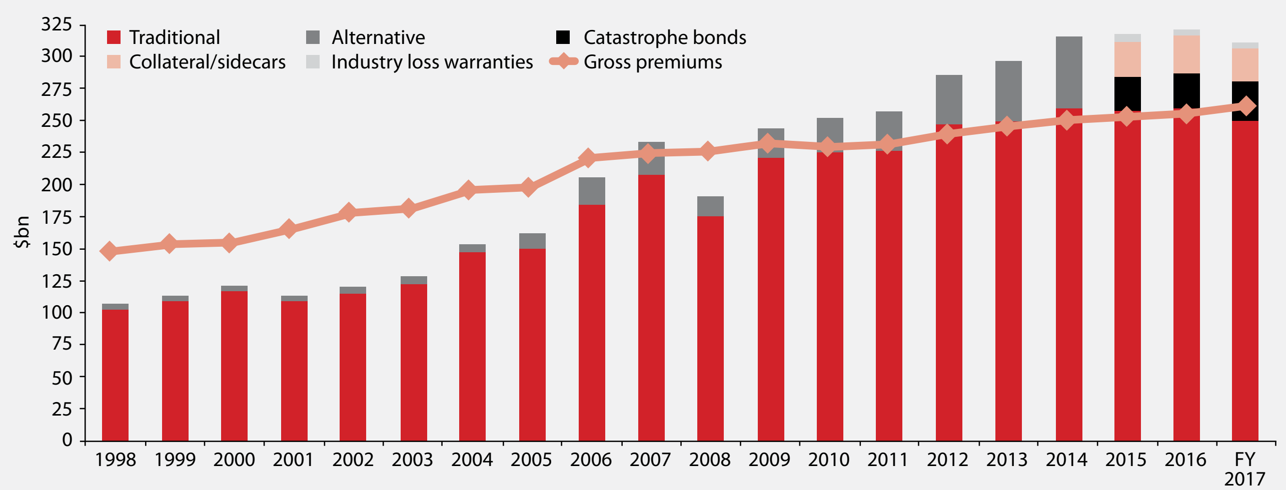
This is on the lower side of the 25 percent rate increases that underwriters had been projecting earlier in the fourth quarter of 2017.

Its peer JLT Re put retro increases at an even more modest 10-20 percent.

Moreover, Willis Re highlighted a mismatch between underlying reinsurance and retrocession pricing, as reinsurance rate rises fell short of the increases charged for retro cover.

The firm said the question of how long this mismatch could continue and which side of the market would "break first" remained a key issue for 2018.

Dedicated reinsurance sector capital and GWP



Source: JLT Re

Building a hedge against disaster

Buying hedges may have paid off for some ILS managers in 2017, but Leadenhall Capital Partners CEO Luca Albertini argues that there are cheaper ways for investors to shield themselves against hurricane losses.

"We try to minimise the need for hedging by shaping the construction of our portfolio, rather than hedging and paying margin to another company," he explains.

Picking and choosing risk at different levels and across multiple geographies effectively provides a source of natural tail protection, reducing an ILS manager's potential worst-case losses.

While some industry loss warranty (ILW) or other hedges may have been activated by last year's catastrophes, such covers can be an expensive outlay for multiple years before the purchase pays off.

"If you want to maximise rate while minimising risk, hedging needs to be an opportunistic move, not a core part of the portfolio," Albertini argues.

Indeed, ILS managers have typically retained the bulk of the risk they write on a net basis, and many only began buying ILW cover in greater volumes in recent years as prices fell. This generally reflects a philosophy that their investors are expecting to take catastrophe risk – so the cards dealt by Mother Nature during the hurricane season should lie where they fall.

Ultimately the losses of 2017, coming after an unprecedented run of good luck for US coastal states in avoiding hurricanes strikes, have reminded investors that what they are investing in is "true risk", the Leadenhall CEO says.

"2017 was not a year you want to see repeated – but it shouldn't be repeated very often."

However, while 2017 may have cost ILS investors money, there could be an upside for the industry after having faced the tests of hurricanes Harvey, Irma and Maria.

Generally losses drive more purchasing of catastrophe cover and while it is early days for evidence of this trend, industry media have reported that the US National Flood Insurance Program lifted its protection for 2018, Albertini notes.

"We hope the coverage gap is reducing."

Moreover, many are hoping that ILS managers will have room to lift their share of the catastrophe reinsurance market after having smoothly managed the process of quickly raising fresh capital to meet claims and renew their portfolios in 2018.

"Some of the sceptics may be less concerned about the reliability of ILS capital now," believes Albertini.

But he also cautions against the industry pushing too quickly for growth in the wake of last year's losses.

Speaking several weeks after the January 2018 renewal season had concluded, the Leadenhall CEO suggested that the turnover of contract renewals highlighted examples of aggressive behaviour, with some underwriters looking to undercut broader rate increases to deploy larger volumes.

"We have lost \$50mn-\$60mn of renewal opportunities where we held out on pricing – mostly on large retrocession programmes," he explains.

"We're left with extra capacity to redeploy but we believe it was the right thing to do."

Building relationships with protection buyers should enable risk takers to gain some "payback" via higher premiums if they have sustained major losses, he argues.

"What we were talking about was relatively modest increases," he says.

Moreover, this undercutting could leave investors disappointed if they were promised certain increases in yields by managers that have not really attempted to deliver on those targets, he fears.

The issue highlights the complexity of the task facing ILS managers that were out fundraising in the last quarter of 2017 – they had to attempt to gauge what rate increases might be available to them at a time when there was uncertainty not only over the extent of losses, but also over how much capital their peers would raise.

This means that the process of fundraising must be an interactive one so that investors can provide a gauge of their minimal requirements, Albertini believes.

"We need to demonstrate the industry has robust pricing behaviour."

Fronting up

The ILS market may have proved its durability following last year's losses, but Albertini believes the industry can further develop its use of fronting relationships and rated facilities to help improve comfort levels over credit risk.

This could be crucial in years such as this, when ILS investors face the prospect of significant volumes of capital being locked up – not because they are expected to be lost, but because claims might be hovering near the threshold that would trigger a loss.

Leadenhall has access to fronting facilities via its parent company, MS Amlin, and it also gained a Standard & Poor's (S&P) rating last year on cat bond type instruments put in place to reinsure structures used by its funds.

This source of credit meant Leadenhall was able to roll forward capital which could otherwise have been locked to allocate against 2018 risks fronted for it by MS Amlin.

The ILS manager may have to provide more capital to MS Amlin if loss estimates deteriorate, but the S&P rating demonstrates to the reinsurer that the credit risk it is taking on across a large portfolio of assets is truly remote.

Similar use of credit ratings and risk analysis could help the ILS industry to measure the risks of catastrophe losses deteriorating to minimise trapped collateral.

It would not be about gaining leverage, Albertini says, but improving the understanding of the true counterparty risk of an ILS fund.

"If you look at our exceedance probability curve – a 1-in-10,000-year risk of exhausting capital is more than AAA level."

Another way that Leadenhall sought to minimise the level of illiquid, trapped capital was by waiting a couple of months after last year's major hurricanes before it set up side pockets for locked collateral.

The manager did not look to raise new capital into its commingled funds in September or October, which meant it could take that extra time while still ensuring level treatment for investors.

At the end of November, it established a side pocket for locked capital that was recorded in its October month-end result. Any changes to the valuation of this side pocket will be recorded in updates to the October headline result.

London bound

Harvey, Irma and Maria might have grabbed most of the ILS market's attention in 2017, but there was another topic that hit the headlines as well: the UK government's move to introduce a local regulatory framework to attract ILS business.

Albertini pored over draft documents for the new regime while it was under construction and says the firm will be looking to engage further with the regulator now that it is up and running.

"When you buy domestic you eliminate a level of complexity involved in cross-border transactions," he says. "All things being equal it facilitates business being simpler."

While it's not yet clear if the local framework will be suited to life ILS transactions, this is another area that Leadenhall has been expanding over the past year through the launch of a new closed-ended fund.

Life portfolios now make up $2bn of the firm's $4.7bn assets under management.

Across the industry, investors are coming in to life ILS funds with more long-term money and this is likely to give new energy to the life securitisation markets, Albertini believes.

"It may help to wake up more liquidity in the market."

In the life ILS market, where bilateral trades are much more frequent than in non-life catastrophe risks, the ability to execute and source risks is a crucial test of a manager's ability.

> "Hedging needs to be an opportunistic move"

But Albertini also suggests that this is true in the non-life reinsurance sector, given how much smaller the market is compared to broader financial industries.

Hence, while the reinsurance industry as a whole is currently focused on cutting costs from a historically high operating cost base, the Leadenhall CEO cautions investors that ILS funds are already operating at a low cost base, and further sharpening could come at the expense of underwriting rigour.

ILS managers are already much leaner than their reinsurance carrier peers, but Leadenhall is able to draw on MS Amlin's resources as well as its own analytics, he says.

This means the firm is able to reach counterparties who might have just five or six reinsurance writers on their core panel of providers. "There are hundreds of clients out there like that, but you need resources to reach out to them."

While the industry has to minimise costs at a time of pressure on returns, the ILS industry must make sure that any costs taken out are truly valueless, he argues.

"What we won't do is reduce underwriting expertise."

Cat bond market rebounds as another busy year forecast

Catastrophe bond investors are expected to benefit from another year of high volumes in 2018, after new issuances hit a peak of more than $11bn last year.

This made 2017 the most active year since 2014, when $8.9bn of deals were issued. Broker-dealers surveyed by *Trading Risk* say they expect this year's volumes will also surpass $10bn.

The tradeable cat bond segment remains the smaller part of the overall ILS market, accounting for $25bn of an estimated $82bn-$89bn, but it has grown its share after transactions hit a new peak in 2017.

Despite taking a severe hit in early September, when it was feared Hurricane Irma would hit Miami as a Category 5 storm, the market emerged relatively unscathed and clawed back most of its write-downs by year-end.

The Swiss Re index of global cat bond returns showed a 0.54 percent gain over full-year 2017, compared to a 6.64 percent increase in 2016.

This generally benign experience reflects the cat bond market's role in providing low-risk reinsurance cover that typically only triggers in the most extreme catastrophe scenarios. The fact that few cat bonds offer coverage for Puerto Rican or wildfire risks also helped to minimise losses.

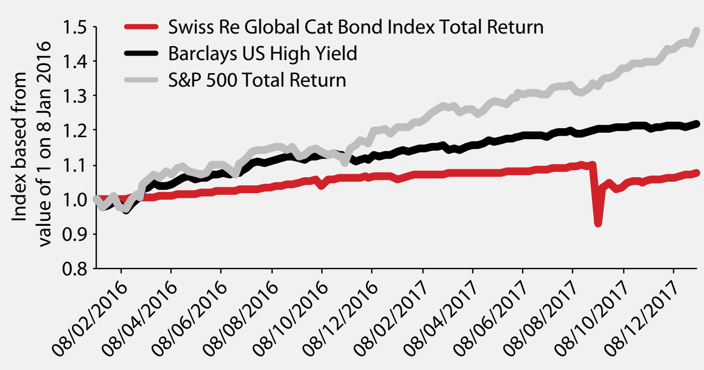
By year-end 2017, just two bonds worth $170mn were considered to be a full loss, although further claims were pending.

The largest loss was triggered by the Mexican earthquake on 7 September and marks the second payout to the country's disaster insurance scheme in recent years.

Other deals that were on the hook included some small, high-risk bonds protecting Floridian insurers, as well as deals that provided annual aggregate cover across the full year.

Across a group of impaired cat bonds facing partial payouts, losses could reach $536mn, ILS analyst Lane Financial calculated. This was based on secondary market valuations at year-end for bonds valued below 80 percent of par value.

Cat bond returns still lag pre-Irma levels



DISCLAIMER: Swiss Re Cat Bond Index Total Return ("Index"), calculated by Swiss Re Capital Markets ("SRCM"), is a market value-weighted basket of natural catastrophe bonds tracked by SRCM, calculated on a weekly basis; past performance is no guarantee of future results. For full disclaimer details please see Bloomberg.

Last year's losses made 2017 the ILS market's second worst year for claims after 2005, Lane Financial said.

Q4 repricing

Hurricane-exposed cat bond yields showed some increases in the first few deals issued after the third quarter storms, but rate adjustments this year were expected to remain moderate.

This low-key reaction is expected to draw in sponsors of new deals as they look to manage post-loss volatility in their (re)insurance premiums.

In terms of potential increases, broker-dealer GC Securities forecast rate rises of up to 3 percent relative to pricing before Q3/Q4 2017 on low-risk US-exposed cat bonds.

For riskier layers, the firm said rates could increase by up to 15 percent relative to pre-event levels.

However, surplus capital could quickly undo any rate increases that might be seen, according to Aon Securities CEO Paul Schultz.

"Over time we believe that the supply and availability of capital will again lead to declines in rates," he said.

Yields averaged 5.4 percent across the past year's cat bond issuance, against expected losses of 2.8 percent, according to data compiled by Willis Towers Watson.

This was up from 5.0 percent and 2.5 percent respectively in mid-2017.

In the pipeline

Reinsurance buyers now face a competitive disadvantage if they are not using ILS capacity, which could draw more sponsors to the market, according to Willis Towers Watson's head of ILS Bill Dubinsky.

"ILS capacity is rapidly moving from a 'nice to have' to a 'must have,'" he added.

In terms of perils covered, Schultz expects that this year will bring some much sought-after diversification to the market.

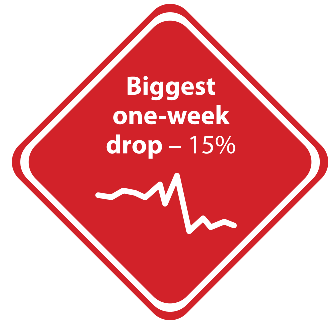
"We are likely to see a larger contribution from non-US risks, as well as an expansion of scope and perils covered," he said.

The speed of ILS payouts could be one of the incentives that bring new sponsors to the market, said Judith Klugman from Swiss Re Capital Markets.

Indeed, the $150mn payout to the Mexican government's catastrophe insurance scheme occurred within a couple of months of the earthquake that triggered the deal.

And while relatively few other claims might ultimately be made following such a disastrous year, the cat bond market's offer of multi-year, diversifying capacity is expected to keep attracting demand from protection buyers and investors.

Cat bond market milestones set in 2017:

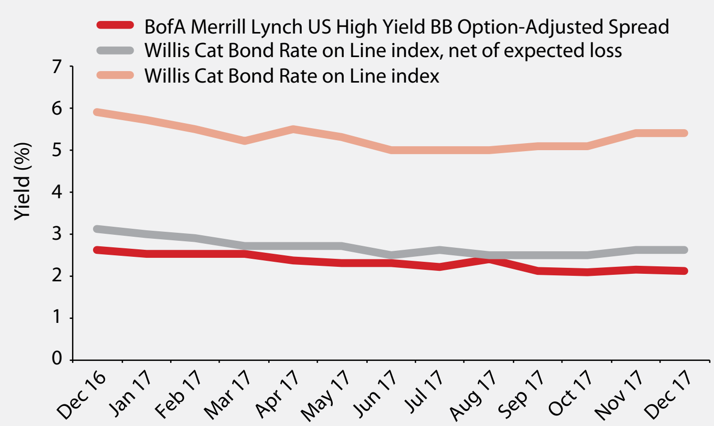


2017 hits to the cat bond market

Bond	Total size ($mn)	Triggering loss	Trigger	Sponsor	Anticipated loss ($mn)
Confirmed payouts					
IBRD MultiCat Mexico class A	150	Chiapas, Mexican earthquake	Parametric	World Bank/Mexican Fonden fund	150
Manatee Re 2016-1 C	20	Irma	Indemnity	Florida insurer Safepoint	20.0
Total:	**170**				**170.0**
Potential payouts					
High-risk per-event bonds					
Residential Re 2013-2 class 1	80	California wildfires	Indemnity multi-peril	US nationwide insurer USAA	60.0
Citrus Re 2016-1 E-50 (4)	100	Irma	Indemnity	US regional insurer Heritage	20.0
Casablanca C	6.75	Irma	Indemnity	Florida insurer Avatar	2.0
Total:	**186.75**				
Aggregates					
Caelus Re V 2017-1 class D	75	Harvey, Irma, wildfires	Indemnity multi-peril	Nationwide Mutual	75.0
Loma Re 2013-1 C	65	Harvey, Irma, Maria	Industry loss; includes Puerto Rico	(Re)insurer Argo	65.0
Residential Re 2014-1 10	80	Harvey, Irma, wildfires	Indemnity multi-peril	US nationwide insurer USAA	64.0
Residential Re 2017-1 10	50	Harvey, Irma, wildfires	Indemnity multi-peril	US nationwide insurer USAA	48.0
Caelus Re V 2017-1 class C	75	Harvey, Irma, wildfires	Indemnity multi-peril	Nationwide Mutual	45.0
Residential Re 2016-1 10	65	Harvey, Irma, wildfires	Indemnity multi-peril	US nationwide insurer USAA	39.0
Atlas Re IX 2015-1 A	150	Harvey, Irma, Maria	Industry loss; includes Puerto Rico	Global reinsurer Scor	38.0
Blue Halo Re 2016-1 B(4)	55	Harvey, Irma	Industry loss (multi-year aggregate)	Allianz Risk Transfer (Nephila)	33.0
Residential Re 2015-1 10	50	Harvey, Irma, wildfires	Indemnity multi-peril	US nationwide insurer USAA	25.0
Total:	**665**				**432.0**

Source: *Trading Risk*, Lane Financial. Anticipated loss based on 31/12/17 secondary market price

ILS vs corporate BB bond yields



Source: Bank of America Merrill Lynch, Willis

ILS market proves its staying power

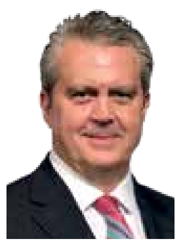
For more than a decade there has been a steady growth in alternative capital in the (re)insurance marketplace, which has resulted in a greater volume of ILS being issued, and therefore an increase in opportunities available to investors.

To illustrate this trend, in 2006 Aon Securities estimated that alternative capacity represented $17bn of an overall $385bn of global reinsurance capital. By 2017 this had risen to an estimated $89bn of an overall $605bn. When compared to the amount of property catastrophe limit purchased by (re)insurers, alternative capital – which focuses almost entirely on property catastrophe exposures – has an even greater significance.

Commentators have long questioned whether this growing participation would be sustained in the event of a loss. In this regard 2017 was an important year, as a series of natural catastrophes – including hurricanes Harvey, Irma and Maria (HIM), as well as earthquake and wildfire losses – provided both the ILS and the broader (re)insurance markets with an indication of capital markets' ongoing appetite for (re)insurance risk.

Given the ILS market's size, number of sponsors and scope of coverage across perils and geographies, secondary market pricing volatility during this period was greater than at any time in recent memory as investors sought to interpret the implications of the catastrophe events. As the hurricane losses began to stabilise, and wildfire activity continued to develop in California, there was heightened focus on which specific bonds could be impacted by losses.

As can be seen in the graphic, high levels of pricing volatility were seen across the 37 classes of notes that were deeply impaired by the catastrophe events (i.e. experienced greater than a 25 percent reduction from par at some point post-event), highlighting the significant uncertainty in market sentiment beginning in September following Harvey and Irma, then continuing through to the end of the year.



Author:
Paul Schultz,
CEO, Aon Securities

But despite this initial volatility, investors continued to see the benefits of ILS as an asset class, allocating $1.4bn of capital to catastrophe bonds soon after the HIM hurricanes, and sending a message that alternative capital was willing to reload for 2018.

The result was that the most testing year in the history of the ILS market was also its most successful, with 2017 becoming the largest year ever both in terms of catastrophe bonds issued and on-risk. The strong first quarter of 2017 ($2.2bn) and record-breaking second quarter ($6.3bn) established the annual issuance record, with further strong levels of issuance in the second half of the year adding to the new market high.

Historically, one of the big challenges for ILS has been the perception that it is an untested source of capacity when compared to traditional (re)insurance. In the wake of the largest loss-causing year ever, ILS rose to the occasion and continued to prove to be an efficient source of capital, further demonstrating its value to the (re)insurance market. This momentum, we believe, will continue through 2018 and will be a "tide that rises and lifts all ships" across all forms of ILS.

As a result, Aon Securities forecasts that catastrophe bond issuance for 2018 will be approximately $8bn-$9bn, thereby providing a wealth of continued opportunities for ILS investors.

Cat bond devaluations

Notional amount of catastrophe bonds with a 25% price drop from 25 August

	Sep-01	Sep-08	Sep-15	Sep-22	Oct-06	Oct-20	Oct-31	Dec-01	Dec-08	Dec-15	Dec-22	Dec-29
Florida-only deals	$0.0mn	$1,224.3mn	$814.3mn	$566.8mn	$231.8mn	$159.8mn	$159.8mn	$156.8mn	$156.8mn	$26.8mn	$26.8mn	$26.8mn
Aggregate index deals	$0.0mn	$1,260.0mn	$710.0mn	$1,435.0mn	$1,435.0mn	$1,135.0mn	$1,135.0mn	$335.0mn	$205.0mn	$205.0mn	$205.0mn	$205.0mn
Aggregate indemnity deals	$0.0mn	$195.0mn	$195.0mn	$195.0mn	$260.0mn	$65.0mn	$410.0mn	$460.0mn	$535.0mn	$535.0mn	$535.0mn	$535.0mn
Other deals	$0.0mn	$150.0mn	$150.0mn	$150.0mn	$150.0mn	$150.0mn	$150.0mn	$150.0mn	$230.0mn	$230.0mn	$230.0mn	$230.0mn
Total	$0.0mn	$2,829.3mn	$1,869.3mn	$2,346.8mn	$2,076.8mn	$1,509.8mn	$1,854.8mn	$1,101.8mn	$1,126.8mn	$996.8mn	$996.8mn	$996.8mn
Key events	Post Harvey	Pre Irma	Post Irma	Post Maria	Post Harvey and Irma PCS est.	Post Maria PCS est.	Post Atlas fire (California)	Post Harvey and Irma PCS resurvey	Post Thomas fire (California)			

Source: Aon Securities

TERO PURSIAINEN

It will take time to realise the full impact of 2017 losses, says AIM Capital senior associate

Q: How long have you been investing in ILS?
AIM Capital began doing research on the ILS universe in 2010. Our first ILS fund investment was made in April 2011. In January 2012, we launched a dedicated fund of funds vehicle.

Q: Have your ILS investments performed in line with your expectations?
Well, yes and no. I think our expectations since those early days have evolved in line with the market's development and as our understanding of the reinsurance market has deepened. The overall performance has been in line with how we see things today.

The extent of rate softening and its impact on the market's evolution were something of a surprise. We really began to see the effects around 2014. I think the "quality" of the underlying risk has increased in importance massively since then because the pricing on average has probably become close to breakeven.

Q: What was the biggest challenge for you in dealing with the ILS sector?
Understanding the nature of the returns and realising how little information historical performance figures and exceedance probability curves provide. Casual inspection of the modelled return profile could lead you to think that losses materialise immediately after the event, and that you are able to roll the investment to the following year.

In reality, you have mark-to-market, reserve changes, side pocketing and run-off investments, and all of these features have an impact on the return stream and the portfolio management process. And you can't really compare one fund's exceedance probability curve to another's. Manager selection relies heavily on qualitative factors.

Q: What advice would you give to investor considering their first allocation to ILS?
Be realistic about your expectations. ILS can be a wonderful addition to your portfolio but the occasional loss year will come. Timing the market will probably get you nowhere. Another thing to consider is that a 1-in-100 year is not the same type of year for everyone. The underlying portfolios differ. This means that any particular year can make a great ILS manager look bad as well as a bad manager look great, just by pure luck.

Q: Were there any surprises in the results from the 2017 losses?
We invest mainly in traditional or collateralised reinsurance and the fact is that we don't know the final 2017 results yet. If the current estimates turn out to be accurate, they will be well within our expectations. The 2017 events will continue to have an impact on this year's returns both through collateral lock-ups and potential revaluations of the loss reserves. Then there is of course the improved pricing for 2018. The impact on compounded returns could be significant over multiple years and there you certainly have potential for surprises.

Q: Did you lift your ILS allocation this year?
We did not. For us it depends both on the market opportunity and the willingness of our investors to increase their allocations. We did not view 2018 as the potential opportunity of a lifetime. But for anyone looking to allocate to ILS, January 2018 probably offered a good entry point.

Select pension funds invested in ILS, stakes of $250mn+

Pension fund	ILS allocation ($mn)	Total funds ($bn)	% ILS allocation	Managers employed	Date of initial allocation
PGGM	4,776	245	1.95%	Fermat, LGT, Nephila, Elementum, AlphaCat, New Ocean, Munich Re	2006
RBS	1,400*	64	2.20%	Nephila, Leadenhall; *total also includes unspecified stake in insurance litigation fund	2012
Pensionskassernes Administration (PKA)	1,370	39	3.51%	Twelve Capital, Nephila, Markel Catco	
Pennsylvania Public School Employees	650	49	1.33%	Nephila, Aeolus, RenaissanceRe	2011
AP2	640	40	1.60%	Fermat, Elementum, Credit Suisse	2012
New Zealand Super Fund	235*	26	1.76%	Elementum, Leadenhall; *also includes life settlements with Apollo	2010
MLC	392	78	0.50%	AlphaCat Managers	2007
Coca-Cola Pension	~379	7.6	~5%	Securis and another	
AP3	325	40	0.81%	In-house and external allocations	
MassPRIM	250	69.4	0.36%	Aeolus, Catco	2017

Source: *Trading Risk*; some information as of 2017 reports

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Evaluating the valuations

Reserving for losses is such a fundamental part of the reinsurance market's role that there are whole subsets of industry jargon devoted to the exercise.

The "kitchen-sinking" approach to setting reserves implies that a risk taker has been overly conservative in estimating their exposure to losses – throwing in "everything and the kitchen sink" at a time when investors may forgive the high claims burden.

Any extra capital set aside now could be released later to smooth over future difficulties.

Equally, no investor wants to find that reserves have been "under-cooked" and that further capital has been lost months after an event.

But as there are inherent uncertainties and judgement calls involved in reserving for catastrophe losses, what are some of the questions that ILS investors should be asking to ensure that they are getting apples-to-apples loss estimates?

Firstly, investors could ask what industry loss assumptions an ILS manager or reinsurer has taken into account in deriving their own individual loss estimates.

This is a yardstick that can be compared across managers and will provide a gauge of how conservative or optimistic they may have been on exposures in general.

Next, investors could ask what external sources of information their manager has used in calculating their estimates. Have managers used loss advice notices from cedants and brokers as well as industry loss estimates? Would they be willing to seek out independent valuation estimates before accepting new subscriptions or redemptions?

These external sources of advice are critical because ILS managers can't wait for loss notifications to come through their door, Hiscox Re ILS COO Richard Lowther says.

"One of our concerns is that we believe there could be managers out there who will only recognise a write-down of a position when they get a piece of paper from a cedant saying that there is a loss and that could be many weeks or months down the road," Lowther explains.

"You need to have the in-house tools, including modelling and claims expertise, to quickly ascertain and allocate an industry loss estimate across the portfolio. Any assessment of the fair-value impact of a loss should include a loading for non- or poorly-modelled perils, but ultimately you need to be prepared to actively pick up the phone to get information from brokers, underwriters and other industry participants."

Timing of loss recognition is key because if an investor is let out of a fund before losses are taken, then those remaining or coming into the fund could be at a disadvantage.

ILS managers typically use side pockets to manage these situations, setting aside assets that may or may not be ultimately subject to a claim, so that investors take their fair share of losses or gains on loss-exposed business.

Investors may also want to question whether side-pocketed assets have been trapped by counterparties with a claim to the collateral, or whether they have been segregated on an ILS manager's choice.

If side pocketing has taken place, fee practices applicable to segregated assets vary, so investors should be aware of how their charges could be impacted.

If the side pocket has been hedged against loss deterioration, they need to determine how much that has cost them.

History may also provide a guide of an ILS manager's reserving abilities.

Solomon Nevins, a senior investment manager at Architas, recommends looking at the previous loss experience of a fund.

"Look at how quickly they mark a book, how initial losses measure up against the final losses," he says.

Ultimately, while 2017 may have been a costly year for ILS investors, it has provided a chance for them to measure up how their managers perform under testing situations.

Key post-loss questions to ask an ILS manager

- What industry insured losses have you assumed in valuing your portfolio?
- If using modelled inputs, do you account for the impact of non- or poorly-modelled perils?
- What is your valuation process and does it include any independent reviewing?
- How many counterparties have given you loss advice?
- How much capital has been side pocketed or trapped by cedants?
- Have you included benefits from any hedges in the net asset valuations, is there any basis risk involved and what was the cost in terms of impact on the no-loss return?

ANDRE PEREZ

Loss years highlight the need for independent valuations, the Horseshoe Group CEO tells us

Q: How did the ILS market handle the challenge of valuing last year's catastrophe losses?

As with every catastrophe loss, it takes a while for all the details to emerge and therefore to have a better sense of where claims will end up.

The loss valuation process is not dramatically different for the ILS and traditional markets. The issue with ILS structures is the trapping of collateral, which is a function of the loss quantum as well as the relative percentage losses bear to contract limits. Fortunately 1 January contracts do not have as heavy exposure to Florida and the Caribbean as 1 June and 1 July contracts. While there was still a fair bit of collateral trapped, it wasn't as much of an issue at 1 January as originally anticipated. Significant capital raising by existing ILS funds alleviated the need for collateral to be freed up.

After Harvey, Irma and Maria (HIM), we saw existing ILS funds increase assets under management (AuM) on average between 15 and 20 percent from pre-hurricane levels. This additional capacity allowed ILS funds to participate in January renewals without much difficulty despite the uncertainty of loss valuation at that time.

Q: Did the 2017 loss experience highlight any areas of concern or room for improvement in reporting practices?

Undoubtedly the biggest area where the ILS sector needs to improve is centred on valuation. There is still a wide divergence of valuation methodologies and timing of loss recognition among ILS fund managers. Furthermore, the lack of widespread of independent valuation makes matters worse. We have seen ILS funds materially change their ultimate loss figures above and beyond what one would have expected to see if prudent loss reserving practices had been applied.

This lack of consistent valuation methodology is especially problematic during a fundraising exercise. Fortunately the great majority of ILS funds have side pocketed HIM losses, which insulates new investors from future loss deterioration.

For those ILS funds which have not side pocketed HIM losses, investors need to be extremely comfortable with the amount of losses the fund carries for those events at the time of their investment.

Q: Did the ILS market's losses ultimately fall within expectations? How much of a share of industry claims did fund managers bear?

It is difficult to know with certainty especially since the ILS sector lacks sufficient disclosure to ascertain the percentage of HIM losses attributable to the market.

Based on our internal data, we estimate ILS funds have lost roughly 12 percent of their July 2017 AuM due to HIM. This would imply that the ILS sector's share of HIM losses is well below its 20-30 percent share of worldwide property catastrophe capacity. This comes as a bit of a surprise, but then again, several ILS transactions are further up the risk spectrum than traditional reinsurance.

Despite the fact the overall ILS share of losses is below our original expectations, the percentage loss of AuM varies greatly among ILS funds, with some as low as 2 percent and others as high as 60 percent.

Q: A number of reinsurers set up new sidecar vehicles for 2018. How will this market evolve?

While some new sidecars were formed, their number is well below post-2005. The majority of the new sidecars appear to be more of a replacement for retro capacity rather than an expansion of underwriting capacity in lieu of capital raising, the latter being emblematic of post-Katrina sidecars.

Sidecars are effective structures but our view is that there is no significant shortage of reinsurance capacity so we would not expect a large number of new sidecars in the near future.

Q: Now that the UK's ILS framework is up and running, how do you think the London insurance market will approach this new regime?

We at Horseshoe are pretty bullish about ILS in the UK. We have recently set up an office in London to manage future UK-based ILS transactions and have transferred one of our senior colleagues there with a view to growing that office as transactions get done. We are in the process of setting up our own protected cell company, similar to our Bermuda-based Horseshoe Re. The timing of it will depend on how receptive the Prudential Regulation Authority will be in accommodating the realities of the ILS market while preserving the soundness of its regulatory regime.

Rate relief for D&F market after losses

Property direct and facultative (D&F) insurance markets picked up a sizeable portion of last year's catastrophe losses, which led to notable rate increases for the class of business.

But what precisely does this corner of the market entail?

As well as generating billions of dollars in insurance premiums every year, D&F risk is also one of the largest sources of catastrophe risk for the primary insurance market.

The product is designed to insure against damage to the most complex and specialist property developments, ranging from luxury hotels and breweries to sewerage facilities and chicken farms. This means the insured assets of the class of business are hugely varied in nature.

Figures for the size of the global property D&F market are elusive, however the International Underwriting Association estimated the volume of property D&F premiums written by the London market at around £10bn in 2016.

As the name suggests, property D&F is written either directly – when the business is placed directly with an insurer or insurers – or facultatively, when the cover is initially placed with a fronting insurer and then up to 100 percent reinsured by other carriers.

Cover is typically written on an all-risk basis, although in some cases insurance can be written to cover a specific peril, such as wind risk, flood or fire.

London and Bermuda are both big property D&F hubs, however the class also incorporates elements of the US commercial property market, especially for assets such as hotels and large-scale housing developments.

Major writers of the business include AIG, Chubb, XL Catlin and various Lloyd's insurers, however carriers can also specialise by geography.

Current ILS involvement in the property D&F market is limited, although there have been a couple of recent developments which could point toward increasing interest.

Lloyd's carrier Neon raised $72mn of third-party capital in late 2017 for its reinsurance sidecar NCM Re. The sidecar supports its catastrophe treaty reinsurance and D&F (re)insurance portfolios via a quota share arrangement.

The inclusion of property D&F risk in the vehicle is not commonly seen in the sidecar market.

Meanwhile, Credit Suisse's ILS funds now have access to US property D&F risk via Barbican's recently established Bermudian underwriting platform, which focuses on the class of business and writes on behalf of Barbican Syndicate 1955.

Credit Suisse-backed Arcus Syndicate 1856 takes a whole-account quota share of the Barbican syndicate.

Meanwhile, ILS providers are also involved in the "cat on D&F" reinsurance covers typically bought by Lloyd's carriers to protect both their D&F and cat treaty accounts.

At the moment, cat on D&F reinsurance is largely written by retro providers, such as Aeolus, and other Lloyd's syndicates.

The D&F market has seen double-digit rate increases in the aftermath of the major catastrophes in the second half of 2017, particularly on loss-affected business.

At 1 January, the consensus from the D&F market was that loss-free cat-exposed business renewed up in the range of 10 to 15 percent.

Rate increases on loss-affected business varied greatly, from hikes of 20-40 percent in the US to 100 percent or more on Caribbean placements.

The cat on D&F line of business attracted some of biggest rises across the market at 1 January, at 25-30 percent, with some business up 40 percent or even 50 percent on severely loss-affected accounts.

It is hoped this rating momentum will continue into 1 April and 1 June, when the largest D&F accounts come up for renewal.

The increase in D&F pricing has been welcomed by underwriters, who have endured a number of years of rate softening due to excess capacity and intense market competition. As a result, D&F books were making the slimmest of profits before the string of catastrophes in 2017.

At the halfway point in 2017, the Lloyd's property market as a whole was running at an underwriting loss, with an accident year combined ratio of 100.9 percent, including major claims.

UK ILS framework offers sidecar options

Sidecars have now become a permanent feature of the reinsurance markets, with multiple new vehicles emerging in the January 2018 renewals.

A key tension in sidecar structuring has been to allow investors the ability to redeploy capital while providing full security to cedants and meeting regulatory requirements.

From the vehicle's and the cedant's perspective, collateral must be held back for estimated losses, on top of which a "buffer" margin is typically imposed to allow for potential adverse development.

The UK's new Risk Transformation Regulations 2017 may allow for other ways to resolve these tensions.

In order to be considered fully funded, assets in a UK insurance special purpose vehicle (ISPV) must at all times be valued at least equal to the aggregate maximum risk exposure (AMRE), and the vehicle must be able to pay its liabilities as they fall due.

The UK regulations note that where there are contractual features (e.g. a rollover agreement) that could result in the AMRE decreasing, the conditions governing return of capital to investors (e.g. a clawback) should be such that the fully funded requirement is maintained. The Prudential Regulation Authority has also implied an element of flexibility and judgement as it relates to the fully funded requirement for UK ISPVs that may allow off-balance sheet support arrangements to be taken into account.

Joseph Ferraro is a partner in London at Willkie Farr & Gallagher (UK) LLP

Many collateralised sidecars have replicated liquidity features that are more like funds, such as giving investors in multi-year vehicles the right to opt in or out of renewing risk exposures.

These elections are given with enough notice to allow the sponsor and cedant to plan the amount of capital available at the upcoming renewal period.

Sponsors in some sidecars pre-agree with investors the provisions on rollover and collateral hold-back depending on investor preference and liquidity needs. In the event of a potential shortfall due to late-developing losses, the parties can agree a procedure for clawback of funds or new investments.

Overcoming the flood model barriers

Wind models have a proven track record, but attempting to quantify the risk from flood events such as Hurricane Harvey is far more challenging.

Inland flood models have only been launched in the last few years and their reliability is still debatable.

Insurers are mainly concerned with two types of flooding – coastal storm surge from tropical cyclones and inland flooding resulting from excessive rain, snow melt and other causes.

For example, the Superstorm Sandy flood losses were driven by storm surge while Hurricane Harvey's flood losses were caused by excessive rain over a short period of time.

Inland flood is a more challenging peril to model for a number of reasons, according to Karen Clark, CEO of modelling company Karen Clark & Co (KCC).

Hurricanes are well-defined events – there is a clear beginning and end and they typically dissipate within days of landfall, with measurable intensity.

Inland floods, on the other hand, are more amorphous and can happen anywhere, explains Clark.

They can last days, weeks, or even months.

"The Great Mississippi Flood of 1993 lasted from April to October," she adds.

Last year's Hurricane Harvey, which flooded the Houston metropolitan area, was a good opportunity for flood modellers to learn lessons.

"What came as a surprise to a lot of people was that there was significant inland flood damage even very far away from the nearest river," said Pete Dailey, who heads flood model management at modelling firm RMS.

The vast volume of rainfall produced by Harvey had to go somewhere, but it did not always flow into the nearest river, instead pooling into low-lying areas, especially in urban environments in and around Houston.

Harvey showed that urban areas can be highly exposed to flood risk even far from a river.

"Some insurers were unaware of the significance of pluvial [surface flood] risks," says Dailey.

Harvey also highlighted the need to include in models the impact of human responses, such as dam releases, on downstream flooding.

"The impact of water release from dam failure is captured in our model but controlled releases are only implicitly captured in our model," says Kent David, senior leader of analytics consulting at CoreLogic.

Modelling firm KatRisk estimates average annual losses from inland flood in the US at $19bn, with a further $6bn from storm surge, based on a US total exposure of about $78tn.

"Currently only a fraction of the $78tn is insured," says the firm's co-founder Dag Lohmann.

Almost all US flood risk at present is covered by the government through its National Flood Insurance Program.

But as insurers and reinsurers become more confident in modelling capabilities, the flood market is likely to expand – where and when the pricing makes sense – says Rick Miller, co-head of ILS at JLT.

"JLT is seeing increasing demand for flood quota shares from various (re)insurers. It will only be a matter of time until these products become more viable," he adds.

Flood risk is an ideal candidate for ILS as it has the potential to be associated with not only very large hurricanes but also with other catastrophes, says Willis Towers Watson Securities' head of ILS Bill Dubinsky.

For example, an earthquake can cause a dam or sea wall failure and because of its association with other peak perils, flood risk can place significant capital strain on the industry.

"If the US market bundled flood risk with other perils rather than ceding it on a standalone basis, it would make the cost of hedging with ILS significantly cheaper and the resulting insurance protection more available and affordable," he adds.

What would it cost: US east coast flood

Before Hurricane Harvey struck last year, Superstorm Sandy in 2012 was the most recent US storm to highlight the destructive power of cyclone-driven flooding.

New York's financial district is home to the world's largest stock exchange, as well as global banks and institutions, while further down the coastline, New Jersey's Atlantic City is a bustling tourist hub.

Trading Risk asked AIR Worldwide to estimate insured industry losses from catastrophic flooding in each zone.

AIR analysed two storm events generating storm surge and inland flood losses that aligned with the 1-in-100-year and 1-in-250-year scenarios across each hub.

While inland flood could cause significant losses, storm surge (flood driven by cyclone winds) is the peril that produces most of the largest loss events, according to AIR senior risk consultant Harry White.

However, the firm does not model precipitation-induced flooding as a result of tropical cyclones.

As the results highlighted, lack of flood insurance coverage potentially makes such scenarios far less costly than wind-driven damage.

However, lack of information on take-up makes determining the precise cost of such events difficult, and AIR's loss figures vary drastically compared to other modelled storm surge projections.

Local losses

A 1-in-100-year disaster, based on a scenario of a Category 2 hurricane making landfall south of Atlantic City, could produce property losses of $1.8bn within this region, the modelling firm calculated.

This figure represents "insurable" losses – properties that could be insured, but which may not have flood cover.

This event would produce storm surge depths in Atlantic City of up to 11.5ft, with $1.2bn of the event's surge losses coming from commercial and auto lines of business.

If wind losses are included, the total Atlantic City insurable loss for this event would be $2.4bn.

Further along the coast, a 1-in-250-year flood loss could produce $3.0bn of insurable losses from a storm that makes landfall in Nassau, New York, with Category 2 strength winds producing storm surge depths in New York City's financial district of up to 8.8ft.

Again, the bulk of these losses – some $2.6bn – would come from commercial and auto business, as take-up of flood cover for these lines is much higher than for residential properties.

If wind losses are also included, the total insurable loss for this event would be $3.4bn within the New York financial district and Atlantic City specifically.

Cat bond losses

Despite the relatively low level of insurable loss damages from these scenarios, each would result in losses for the cat bond market.

The 1-in-100-year event would cause a 0.5 percent loss, while the 1-in-250-year event produces a 37.9 percent loss across all outstanding deals (reflecting the wind impact across a broad swathe of the US east coast).

Just two catastrophe bonds have been issued to date covering storm surge risk specifically – both by east coast rail operators, one covering New York's Metropolitan Transport Authority (MTA) and one for Amtrak.

The MTA was initially drawn to the ILS market after 2012's Superstorm Sandy, which caused its insurance premiums to spike after it took extensive losses.

Insurable losses within the New York financial district and Atlantic City from a storm similar to Sandy could be about $3.6bn today.

It would cause a 2.1 percent loss to the catastrophe bond market, impacting both Amtrak's PennUnion Re and the MTA's Metrocat Re transactions.

Vulnerable cities

Figures from Karen Clark & Co (KCC) suggest New York is the third most vulnerable city in the US to flooding. It ranked the city behind Tampa and New Orleans in a 2015 report on storm surge.

KCC said that New York could take flood losses of $100bn, both insured and uninsured, from a 1-in-100-year storm. These figures would cover a broader region than AIR's financial district estimate.

KCC noted that 1-in-100-year wind events may be quite different from the equivalent flood disaster, as weaker, larger storms can produce more damaging surge than stronger, smaller storms that have lesser impact on water levels.

ILS market primer: from disaster frontline to pension portfolio

What is the insurance-linked securities (ILS) market? As the name suggests, it consists of financial instruments that provide insurance cover – some of which might be tradeable securities, while other instruments are less liquid.

The ILS market first emerged in the mid-1990s but it wasn't until after the 2008 financial crisis that it began to take off.

That's largely due to its major selling point as a source of diversifying, or non-correlating risk. The industry is predominantly exposed to natural catastrophe events such as hurricanes or earthquakes – acts of God that won't be triggered by financial market turmoil.

Despite its name, the ILS market has largely made its home within the reinsurance sector – a wholesale industry that provides insurance to insurers to help them bear claims when disasters produce a spike in losses.

The ILS sector has also been labelled the "alternative reinsurance" market, and contrasted with the so-called "traditional" reinsurance market, which refers to rated, often listed companies such as Swiss Re or Munich Re, to cite two of the longest-standing industry brands.

That's because instead of simply buying reinsurance equities, the emergence of ILS market asset managers has given investors an alternative entry route into reinsurance risk, and one that carries several key advantages.

An ILS portfolio provides a theoretically purer source of diversification, because a reinsurer's shares are subject to the swings of market fortunes while their sizeable – albeit typically conservative – investment portfolios add a degree of asset risk.

In contrast, investing via an asset manager isolates underwriting risk. Without a rated equity base, ILS managers have to pledge cash-equivalent collateral against their reinsurance liabilities. Alternately, they can pay a fee to a rated company to essentially borrow their rating.

This structure also cushions investors against inflation risk, because their returns are derived from fixed-rate insurance premiums on top of floating investment rates earned from their collateral, which is typically held in short-term US Treasuries.

In addition, ILS managers have focused traditionally on the catastrophe market, compared to the broader sweep of reinsurance risks that might be covered by traditional companies – some of which may involve more correlation to financial market fortunes.

However, since its early days, this simplistic distinction between the two segments has eroded as the ILS segment has broadened and melded into the wider reinsurance markets.

For one, many traditional reinsurers have set up asset management platforms to compete with ILS managers, while a number of ILS managers have set up or are closely tied to rated reinsurance vehicles that give them more freedom to take on a broader range of underwriting risks.

In recent years, the ILS market has expanded into segments such as marine and energy or aviation reinsurance. Meanwhile, for a select group of ILS managers, life (re)insurance risk is a major part of their business.

Despite blurring the boundary with the broader reinsurance industry, ILS still offers investors a distinct route into taking reinsurance risk while skirting the equities market.

Why catastrophe risk?

There are various reasons why the ILS market is

ILS Primer: Market timeline

1996 George Town Re, widely cited as the market's first cat bond, is launched by St Paul Re, followed a year later by the first Residential Re deal from USAA and a Swiss Re deal

1997 Nephila Capital, which is now the industry's largest asset manager, is founded

2005 The hurricane season of Katrina, Rita and Wilma sets off a spike in reinsurance rates and a spate of new start-ups

2008 Lehman Brothers collapses – it had managed collateral for four cat bonds that defaulted – cat bond structures shift to invest collateral largely in Treasury money market funds

2011 The cat bond market records three full defaults in one year due to the Tohoku earthquake in Japan and US tornado claims

2017 Hurricanes Harvey, Irma and Maria along with US wildfires make 2017 the ILS market's biggest loss year to date

predominantly exposed to property catastrophe risks, besides the non-correlation benefits.

The segment's well-developed risk models help to provide a strong statistical analysis of the risk levels being taken, although there is a relatively limited range of well-modelled perils.

The reinsurance market's top risks are US hurricane or wind, US earthquake, Japanese earthquake and European wind. Australian storm and earthquake, often bundled with New Zealand earthquake, follows these four peak perils.

All of these risks also feature on the ILS market, although its risk profile is even more highly skewed towards the peak peril of US hurricane events.

However, underwriters might also provide cover for "all natural perils", which will include exposure for any catastrophe event, modelled or otherwise.

Historically, unmodelled catastrophe perils that have caused surprise losses for the reinsurance market include the Canadian wildfires that burned through Fort McMurray in 2016 or the Thailand floods that hit in late 2011.

Beyond the models, however, there was a more financial rationale that led the ILS market to colonise catastrophe risk. US hurricane offered higher rates than other types of risk, as it was the reinsurance industry's biggest source of exposure and required companies to set aside more capital to write than if they were providing a small amount of Colombian earthquake cover, for example.

This offered a chance for ILS managers to target the market's prime source of income, since for their pension fund capital providers, hurricane risk was a minor source of diversifying income to their own peak peril of equity market risk.

As ILS managers grabbed more market share in the property catastrophe market, the ensuing competition has over the past few years eroded some of the premium previously attached to hurricane risk.

However, it remains the market's peak exposure with a corresponding price advantage compared to the types of catastrophe business that diversify a reinsurer's portfolio – such as the smaller market for European wind or Australian cat risk, for example.

Continental European catastrophe margins are often said to be little better than break-even, which is one of the reasons why ILS market participation in this sector is relatively limited – cash collateralising limit for such margins would be highly inefficient.

Imagine the mathematics of it as a kind of gambling game where reinsurers have piled their catastrophe chips onto the "US hurricane" slot on their roulette wheel.

Hence, the ratings agencies that supervise their gaming to ensure they're good to meet any payouts insist on reinsurers holding more collateral against every dollar gambled on this risk. Conversely, the stakes on a Colombian quake loss are so much lower, that they can add this bet into their game at a much lower regulatory cost.

Sizing up the market

Brokers estimate that total reinsurance capacity is about $320bn-$420bn, with the alternative reinsurance segment providing about $82bn-$88bn of this sum.

Within this segment, there are several distinct product types, including the catastrophe bonds that kicked off the market's development (confusingly, the term ILS can sometimes be used to refer to these tradeable securities specifically, as well as the broader segment overall).

But although the market began with cat bonds, at about $25bn in size they are no longer the dominant force in the industry. Instead, so-called "collateralised reinsurance" has driven growth over the past few years to stand at roughly $35bn-$40bn. These are effectively just traditional reinsurance contracts. However, while traditional reinsurers with a credit rating from Standard & Poor's or AM Best can use that stamp of creditworthiness to guarantee any reinsurance obligations they take on, ILS asset managers typically have no such security to offer reinsurance buyers.

Instead, they either pledge cash-equivalent collateral against any reinsurance cover that they provide, or pay a reinsurer a fee to stand in their stead and cede on the risk – a practice known in the industry as "fronting".

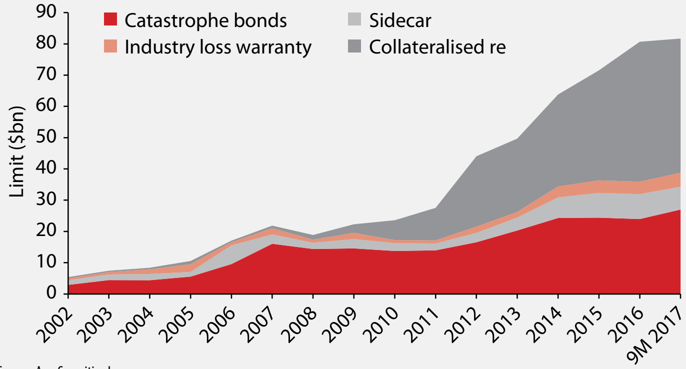
Industry loss warranties, or ILWs, are a niche market segment that provide reinsurance cover based not on a buyer's actual losses but on the insurance industry's overall loss from a specified disaster or disasters – for example, a $50bn US hurricane ILW or a $5bn Florida hurricane ILW.

The "sidecar" market refers to vehicles run by reinsurers, which sit alongside their balance sheets to provide them with additional capacity. Sidecars typically involve a reinsurer ceding a share of their underwriting portfolio to external investors under reinsurance agreements known as "quota shares" (because they involve the counterparty taking a set percentage, or quota, of losses and income from the portfolio).

However, there are several "market-facing" sidecars – so called because reinsurers use these pools of capital to write specific portfolios on behalf of the sidecar vehicles, in a similar structure to a managed fund.

Finally, the retrocession segment is a subset of the reinsurance market that has a relatively high share of capital market participation – it is believed to make up around half the $20bn or so of capacity available.

Alternative capital deployment



Source: Aon Securities Inc

What is a cat bond?

A catastrophe bond transaction involves a sponsoring insurer paying investors a premium for reinsurance cover against defined catastrophe losses. If a cat bond triggers, investors' capital is used to reimburse a sponsor's losses. There is no requirement for insurers to later repay such sums to investors. However, if no qualifying event occurs, then investors recoup their capital at the end of the transaction (typically three to four years).

Retrocession is simply reinsurance cover written for a reinsurance portfolio, which may include quota shares or ILW instruments.

Weighing up returns

So far during its short history the ILS market has delivered strong returns for investors. Before last year, its most difficult years had been 2011 and 2005, as a result of the Tohoku earthquake in Japan and Hurricane Katrina, respectively. These were both testing, but by no means worst-case, catastrophe scenarios for the largely Florida-exposed market. Even 2017, with its trio of hurricanes, could have been much worse had Irma taken a less favourable track over Florida.

There are a couple of benchmarks of returns that are often cited within the industry, although neither is without its quirks and limitations.

The Eurekahedge ILS Advisers index has returned annualised gains of 5.36 percent and a Sharpe ratio of 1.03 since 2006. The index tracks the performance of 34 ILS funds all equally weighted, which cover a wide range of strategies from high risk-return retro vehicles down to low-risk cat bond-only funds. Its worst year to date was 2017, when it finished 5.57 percent down.

Meanwhile, the Swiss Re Cat Bond Total Return index – which solely tracks performance of the cat bond segment – returned 0.57 percent last year. It delivered annualised returns of 6.64 percent over the prior year. However, the Swiss Re index will typically deliver stronger gains than ILS managers as they often attempt to build more diversified cat bond portfolios for investors than the US-centric market index.

It is also important to note that competition over the past few years has eroded the kind of returns that were available to ILS investors in the market's early years before spreads began falling in 2013.

How do the reinsurance and ILS industries measure rate adequacy and changes?

Traditional reinsurance premiums are quoted in terms of rate-on-line, whereby premium income is expressed as a percentage of the amount of limit available to meet losses. In other words, if a buyer pays a \$4mn premium on a \$100mn contract, they are paying a 4 percent rate-on-line.

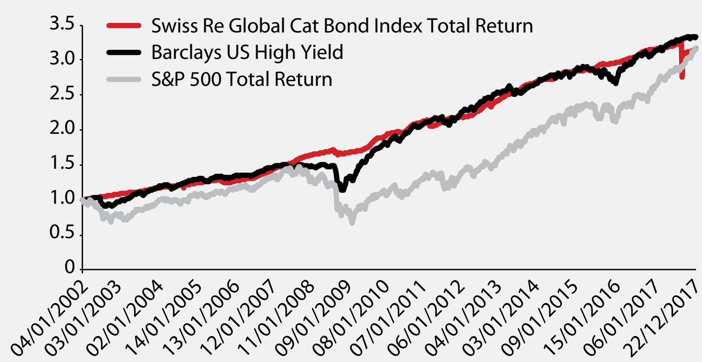
The major reinsurance brokers release rate-on-line indices to show how rates are moving over time.

In the cat bond market, investors receive a fixed coupon above a floating rate. The floating portion is linked to the investment return from the bond collateral – typically held in short-term US Treasury money market funds – with the fixed coupon or spread above the floating rate being the insurance premium due to investors.

Cat bond investors are also typically given the "expected loss" of a deal, a figure that expresses the likelihood of capital loss in any given year. For example, a 1 percent expected loss means investors could lose that amount of their principal in any year – or looked at another way, is roughly similar to the prospect that a 1-in-100-year disaster would wipe out all their capital.

Cat bond spreads are often cited as a multiple of the deal's expected loss, which is an easy way of referencing the margin of premium earned in relation to potential losses. Typically, cat bonds in the 1-2 percent expected loss range now offer investors around a 2-3x multiple (or spreads of 4 percent), depending on the risk profile.

Cat bond performance 2002-17: HIM losses tip ILS below high-yield



DISCLAIMER: Swiss Re Cat Bond Index Total Return ("Index"), calculated by Swiss Re Capital Markets ("SRCM"), is a market value-weighted basket of natural catastrophe bonds tracked by SRCM, calculated on a weekly basis; past performance is no guarantee of future results. For full disclaimer details please see Bloomberg.

How does reinsurance work?

Typically, a broker will put together a "reinsurance programme" for their insurer client by obtaining capital commitments from numerous different underwriting companies. This is known as "subscription market" business, although some larger insurers might also buy bilateral private deals.

Reinsurance programmes are often stratified into several different "layers" of cover, with all parties on each layer generally receiving the same premium. However, some reinsurance buyers may offer to pay higher premiums to the counterparties that are setting terms for the deal – also known as "lead underwriters" – who will play the main role in settling any claims that arise on behalf of the companies that are putting up smaller amounts of "following" capacity.

Two of the major types of reinsurance cover are "excess of loss" reinsurance, where an underwriter simply picks up any losses within a set band above a fixed threshold (or deductible); and "quota share" or "proportional" cover, which entitles them to a set share of premiums and losses, in effect taking a slice of the portfolio's results. Both are "indemnity" covers where underwriters commit to reinsuring a company's actual incurred losses.

Investor list

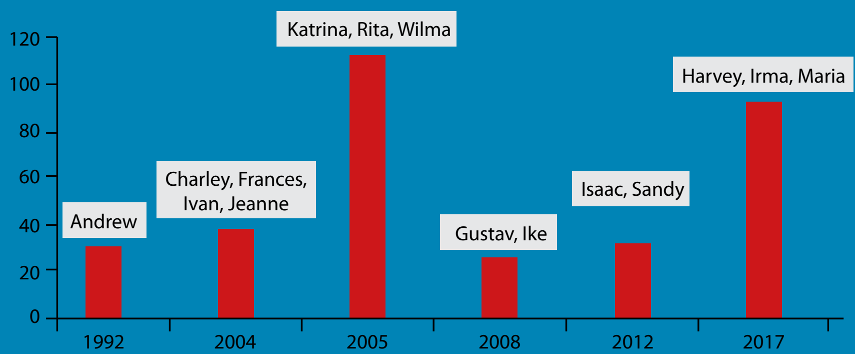
Manager by type	Total AuM in ILS $mn (estimated)	AuM within UCITS funds if applicable	AuM within '40 Act funds if applicable	Type	Notes	ILS strategies	Established in ILS	Base
Specialist ILS manager								
Nephila Capital	11,000	0	0	Specialist ILS manager	Part-owned by KKR and Man Group	Various multi-instrument funds and single-investor mandates, also invests in weather	1998	Bermuda
Credit Suisse Asset Management	8,800	0	0	Specialist ILS manager	Bank's asset management arm offers Iris suite of ILS funds	Various funds with different risk levels	2003	Switzerland
LGT Insurance-Linked Partners	7,900	600		Specialist ILS manager	Former Clariden Leu ILS team moved to Swiss alternatives manager in 2012. Team of 50 (20 portfolio managers; 30 support staff).	Various funds and bespoke mandates	2005	Switzerland
Securis Investment Partners	6,177	63.8		Specialist ILS manager	Northill Capital owns majority stake	Life, non-life and mixed strategy funds	2005	UK
Stone Ridge Asset Management	6,115		6,115	Mutual fund manager	Net assets of end October 2017 (most recent disclosure)	Cat bond and sidecar funds	2013	US
Markel Catco	6,100			Specialist ILS manager	AuM includes trapped capital	Retrocession writer	2011	Bermuda
Fermat Capital Management	5,700			Specialist ILS manager	Pioneering dedicated manager	Cat bond focus	2001	US
Leadenhall Capital Partners	4,700	200	N	Specialist ILS manager	Now majority-owned by Amlin after buy-up in late 2014	Non-life and mortality funds, life/non-life mandates	2008	UK
Aeolus Capital Management	4,000+			Specialist ILS manager	Began as private reinsurer; transformed into fund manager in 2011	Retro and collateralised re focus	2006	Bermuda
Elementum Advisors	3,400-3,700	0	0	Specialist ILS manager	Managing ILS funds since 2002; team investing since 1995	Multi-instrument funds	2009	US
AlphaCat Managers	3,400	0	0	Reinsurer-backed manager	Validus subsidiary. AuM from 30 June filing	$1,393mn lower-risk ILS fund, $750mn higher-risk fund, $144mn BetaCat fund, $546mn direct mandates, $26mn sidecars. $168mn Validus capital	2008	Bermuda
Schroders (Secquaero Advisors) *Nov AuM	2,636	1,260	0	Specialist ILS manager	Schroders owns 50.1% of Secquaero, which advises it on ILS management	Five funds: two cat bond; three multi-instrument of which two include life risk. Four segregated mandates	2008	Switzerland
Renaissance Underwriting Managers	2,225			Reinsurer-backed manager	Runs two rated sidecars (DaVinci Re ~$1.3bn incl 22% RenRe share), Top Layer Re $4bn, not included in AUM as capital is largely stop-loss reinsurance	$221mn third-party capital in Medici cat bond fund with RenRe holding 32% stake (hence $325mn total); $600mn Upsilon funds including ~16% RenRe share	1993	Bermuda
Twelve Capital	1,664	530		Specialist ILS manager	Spun out from Horizon21; team in ILS since 2007	Cat bond and multi-instrument ILS funds (insurance debt fund not tracked)	2010	Switzerland
Pioneer Investments	1,650			Mutual fund manager	Diversified high income trust mutual fund strategy includes ILS	Direct investor in diversified ILS, sidecars	2007	US
Hiscox Insurance-Linked Strategies	1,350	N	N	Reinsurer-backed manager	Hiscox-owned asset manager; Hiscox capital $55mn	Two co-mingled diversified funds; single-investor funds; one insurance sidecar	2014	Bermuda
Axis Ventures	92			Reinsurer-backed manager	Crop and nat-cat facilities – some capital from Stone Ridge		2014	Bermuda
Axa Investment Managers	1,045	159	N	Specialist ILS manager	Affiliate of insurer; invests third-party funds only	Various funds and mandates, new UCITS fund added 2017	2007	France
Mt Logan (Everest Re sidecar)	1,028			Reinsurer-backed manager	Includes some Everest Re capital	Quota share of Everest Re book		
Scor Investment Partners	945			Reinsurer-backed manager	Asset management affiliate of reinsurer established 2011	Multi-instrument	2011	France
Cartesian Re	>750	0	0	Specialist ILS manager	Backed by private equity firm Cartesian Capital	Focus on index strategies via ILWs, cat bonds & other ILS. Investment vehicles include: open-ended funds in Cayman Is and Delaware, Luxembourg SICAV, Bermuda-listed shares of segregated account and managed accounts	2009	Bermuda
Coriolis Capital	700	25		Specialist ILS manager	Team operating since 1999; est. after MBO from Societe Generale	Multi-instrument including weather	2003	UK
Aspen Capital Markets	550	0	0	Reinsurer-backed manager	Runs $130mn Silverton Re sidecar (including $20mn Aspen capital)	Declined to comment on other strategies		
Hudson Structured Capital Management	550	N	N	Specialist ILS manager	Start-up led by Michael Millette; backing from Blackstone	Reinsurance AuM listed; transport fund not included. Invests across natural catastrophe, life/health, casualty, property, financial & distribution risks and various instruments	2016	US/Bermuda
Arch Underwriters	500			(Re)insurer	Underwrites for rated $1.13bn casualty-focused Watford Re, not tracked here	Also manages $500mn third-party capital	2014	Bermuda
Kinesis Capital Management	500			Reinsurer-backed manager	Lancashire subsidiary established mid-2013	Kinesis Re I vehicle writes multi-class reinsurance and retro. Wrote $340mn limit	2013	Bermuda
Tokio Marine Asset Management	500			(Re)insurer	Third-party assets; has expanded significantly in past couple of years	Largely ILS, some collateralised covers		Japan
TransRe Capital Markets	500			(Re)insurer	Pangaea Re and other sidecars			
PartnerRe	480	N	N	(Re)insurer	Collateralised quota share / sidecars $370mm; $110mn cat bonds			US
PG3	450			Family office	Family office; invests in QS sidecars, ILWs and ILS across wide range of reinsurance – nat-cat, non-nat-cat, life and health, legacy	Largely family office funds, may take third-party capital		Switzerland

Manager by type	Total AuM in ILS $mn (estimated)	AuM within UCITS funds if applicable	AuM within '40 Act funds if applicable	Type	Notes	ILS strategies	Established in ILS	Base
New Ocean Capital Management	450			Reinsurer-backed manager	XL and Stone Point seeded; Mitsui & Co bought 15% share in 2016	Three funds: Diversified (QS of XL Re property cat book); Market Value (super-remote risk); Focus (directly written short-tail reinsurance). Also individual accounts	2014	Bermuda
Blue Capital Management	400			Reinsurer-backed manager	Sompo International subsidiary; runs two listed funds; open-ended fund and private sidecars. AuM as of Q4 17	Collateralised reinsurance (regional focus)	2012	Bermuda
Pillar Capital Management	375			Specialist ILS manager	Previously Juniperus; Transatlantic owns 50%	Collateralised re focus, runs two funds and mandates	2008	Bermuda
Oppenheimer Funds	366		332	Institutional investor	Includes capital from retail mutual and institutional funds	OFI Global Cat Bond Strategy open to external investors	1997	US
ILS Capital Management	350			Specialist ILS manager	Don Kramer-backed manager	Specialty focus	2014	Bermuda
Swiss Re	335			(Re)insurer	Internal ILS portfolio, invests in cat bonds, ILWs and swaps			
Eskatos Capital Management	260			Specialist ILS manager	Azimut Group subsidiaries Eskatos and Katarsis Capital Advisors manage and advise the ILS fund respectively	One fund: Eskatos AZ Multistrategy ILS fund; small longevity exposure	2008	Luxembourg
Plenum Investments	255	1		Specialist ILS manager		Cat bond focus, long only strategies	2010	Switzerland
Lombard Odier	~180	140		Specialist ILS manager	Swiss private bank launched ILS fund in 2016	Cat bond funds	2016	Switzerland
Leine Investments	150			Reinsurer-backed manager	Anchor investor Hannover Re which has committed up to $150mn	Cat bonds and collateralised re		
Sumitomo Mitsui Asset Management (Tokyo)	85			Reinsurer-backed manager	ILS fund launched July 2014; advised by Mitsui Sumitomo Insurance	Diversified, low-risk portfolio – JPY denominated	2014	Japan
Tenax Capital	58			Generalist manager	Launched Ucits ILS fund in May 2017 with EUR50mn capital	Cat bond funds	2017	London
Eastpoint Asset Management	50			Specialist ILS manager	Backed by Japanese manager Asuka Asset Management	Cat bond focus	2012	Bermuda
Mercury Capital	45			Specialist ILS manager	Seed funding from Lloyd's syndicate Ark	ILW tracker fund	2013	Bermuda
Entropics Asset Management	25			Specialist ILS manager	Newly operational fund; still raising capital	ILS	2015	Sweden
IBI ILS Partners	Not disclosed	NA		Specialist ILS manager	Joint venture between Roman Muraviev & IBI Investment House		2017	Israel
Solidum Partners	Not disclosed			Specialist ILS manager		Cat bond and multi-instrument funds	2004	Switzerland
Munich Re	Not disclosed			(Re)insurer	Internal ILS fund of up to $1bn; also manages Eden Re sidecar		2006	Germany
Lutece	New			Specialist ILS manager	Seed capital from BTG Pactual among others; launched by former reinsurance broker Erik Manning and ex Ariel CFO Angus Ayliffe	Initially a focus on retrocession	2018	Bermuda
Tangency Capital	New			Specialist ILS manager	Launched by trio of reinsurance execs	Quota share retrocession portfolio	2018	Germany/ London
Total	**87,198**							
Multi-strategy fund managers active in ILS								
Baillie Gifford	500				Scotland-based asset manager; one multi-asset fund invests in ILS – much less active in ILS through 2015 than 2014	Buys ILS directly. Also holds stake in listed ILS funds Catco/DCG Iris		UK
Quantedge	340				Hedge fund with $1700mn overall AuM; ILS	Invests in cat bonds, sidecars, ILWs	2013	US
Aberdeen Asset Management	33				6% of £379mn Diversified Growth fund at end 2017; reinvested $33mn in Catco post-loss; also had Blue Capital stake			UK
Blackstone Alternative Asset Mgmt	0				$266bn asset manager; allocates to Nephila Capital through mutual fund	Blackstone Alternative Multi-Manager Fund		US
BlueMountain Capital	Not disclosed				$21bn alternatives asset manager; employed Al Selius to manage ILS portfolio		2017	US
DE Shaw	Not disclosed			Hedge fund	Has $40bn+ total AUM; ILS holdings not disclosed	Writes collateralised re/retro	2007	US
Guggenheim Capital	Not disclosed			Institutional investor	Broker-dealer with portfolio management arm			US
Tiaa-cref	Not disclosed			Institutional investor	Manages $800bn overall AuM	Buys cat bonds directly		US
Total	**600**							
ILS Fund of funds								
K2 Advisors	587				Hedge fund of funds manager; $10.3bn AUM	Invests with multiple ILS funds; buys cat bonds directly	2003	US
GT ILS fund	230				Texas-based advisory firm offering ILS fund of funds solution	Securis and others	2016	US
ILS Advisers	178				Index tracker fund tracking ILS Advisers index	Fund of funds	2014	Bermuda
City National Rochdale	23				City National Rochdale Select Strategies fund – allocates to Iris Re		2017	US
AIM Capital	20	N	N		Finnish fund of funds manager	AIM Insurance Strategies fund	2011	Finland
Total	**1,038**							

2017: Ranking the losses

Last year ranks somewhere in the top three years for insured disaster losses, alongside 2005 and 2011. But overall costs highlighted a gap in insurance coverage in the Caribbean and from Harvey's flooding. In contrast, the Californian wildfires were highly insured

Insured losses from selected North American hurricane seasons, in $bn at 2017 prices

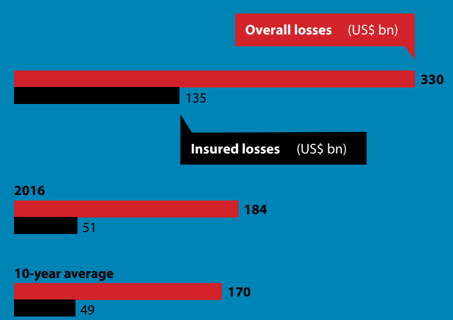


Source: Swiss Re Insitute

Insured losses from Hurricanes Harvey, Irma and Maria reached $93bn, according to Swiss Re estimates, which failed to topple the record set by the 2005 season. Some estimates put the trio of storms closer to $80bn. It's also important to note that damage from historical loss years such as 1992 could be more costly if they recurred today, as these figures are only inflation-adjusted and do not account for changing property values.

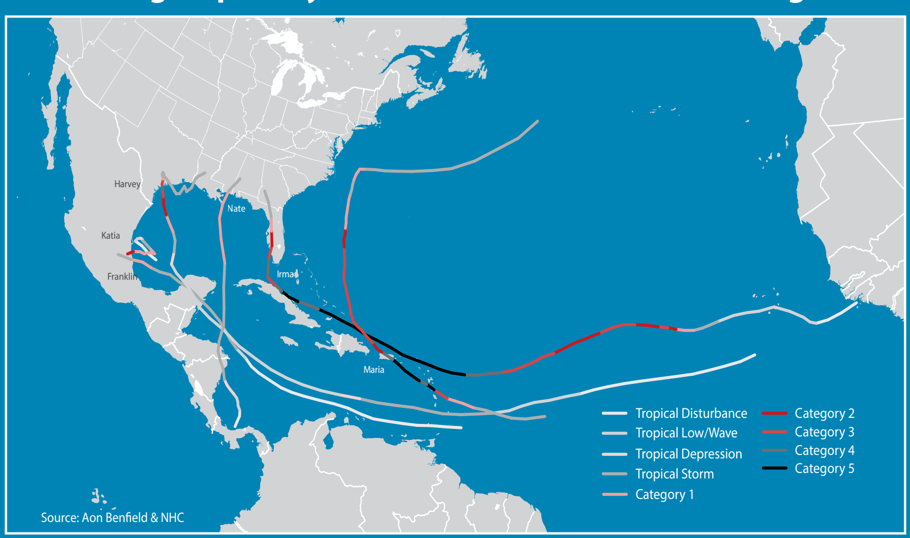
Natural catastrophes

2017



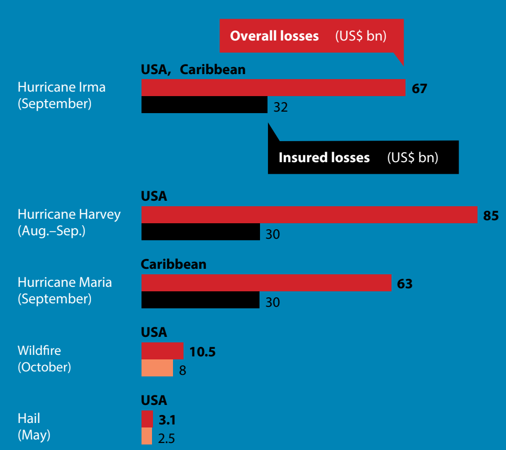
Source: Munich Re NatCatSERVICE

Landfalling tropical cyclones in the Atlantic Basin during 2017



The largest insured natural catastrophes

2017



Source: Munich Re NatCatSERVICE

GLOSSARY OF TERMS

KEY PHRASE	DEFINITION
Aggregate exceedance probability (AEP)	Probability of total annual losses of a particular amount or greater
Alternative risk transfer	Transferring risk through methods other than traditional insurance or reinsurance, for example utilising capital markets capacity through the issuance of insurance-linked securities
Attachment point	The point at which excess insurance or reinsurance protection becomes operative; the retention under an excess reinsurance contract
Attachment probability	Likelihood of losses exceeding the attachment point over the course of a one-year term
Administrator	Assumes all operating and reporting protocols for a special purpose insurer/entity
Basis risk	Risk that losses in a non-indemnity trigger differ from indemnity losses
Capacity	The largest amount accepted on a given risk or, sometimes, the maximum volume of business a company is prepared to accept
Catastrophe bond	Securities that transfer catastrophe risks from sponsors to investors
Cedant	Party to an insurance or reinsurance contract that passes financial obligation for potential losses to another party
Collateralised reinsurance	Reinsurance contract that is fully collateralised to the limit
Earned premium	The portion of premium (paid and receivable) that has been allocated to the (re)insurance company's loss experience, expenses and revenue
Excess of loss	System whereby a (re)insured pays the amount of each claim for each risk up to a limit determined in advance, while the (re)insurer pays the amount of the claim above that limit up to a specified sum
Exhaustion probability	Likelihood of losses exceeding the exhaustion point, causing a full loss on a reinsurance layer
Expected loss	The expected loss is the modelled loss within the layer divided by the layer size
Extension period	Time period after the scheduled maturity used to calculate losses for events which took place during the risk period
Extension spread	Spread paid during the extension period (typically a reduced rate from the initial risk spread)
Gross premiums	Premium before subtracting direct costs
Indemnity trigger	Type of trigger that most closely resembles the traditional market ultimate net loss cover, and offers ceding insurers (a.k.a. sponsors) the ability to recover based on actual losses
Industry loss index trigger	Type of trigger where payouts are determined by a third party estimate of industry losses
Industry loss warranty (ILW)	Form of reinsurance or derivative contract that covers losses arising from the entire insurance industry rather than a company's own losses from a specified event
Incurred losses	The total amount of paid claims and loss reserves associated with events from a particular time period
Insurance-linked security (ILS)	Financial instruments whose value is affected by an insured loss event
Limit	The maximum amount of (re)insurance coverage available under a contract

KEY PHRASE	DEFINITION
Loss ratio	Incurred losses divided by earned premiums (earned premiums include reinstatement premiums)
Modelled loss trigger	Type of trigger where payouts are determined by inputting event parameters into a predetermined and fixed catastrophe model to calculate losses
Net premiums	Premium less direct costs
Quota share	Reinsurance where the cedant transfers a given percentage of every risk within a defined category of business
Occurrence exceedance probability (OEP)	Probability that any single event within a defined period will be of a particular loss size or greater
Parametric trigger	Type of trigger where recoveries are triggered by a formula that uses measured or calculated parameters of an actual catastrophe event (e.g. wind speed, magnitude of an earthquake)
Peril	A specific risk or cause of loss covered by an insurance policy
Probable maximum loss (PML)	The anticipated maximum loss expected on a policy
Profit commission	A provision that provides the cedant a share of the profit from business ceded
Proportional reinsurance	System whereby the reinsurer shares losses in the same proportion as it shares premium and limit
Rate on line	Reinsurance premium divided by reinsurance limit
Reinsurance	A transaction whereby the reinsurer, for a consideration, agrees to indemnify the ceding insurer against all or part of the loss which the insurer may sustain under a policy or policies that it has issued
Reinsurer	Company that provides financial protection to an insurance company
Reset	Adjusting a layer of a multi-year catastrophe bond to maintain a bond's probability of loss at the level defined at issuance
Retention	The net amount of risk the ceding company keeps for its own account
Retrocession	A transaction whereby a reinsurer cedes to another reinsurer all or part of the reinsurance it has previously assumed
Risk period	Time period for which a reinsurance agreement covers events taking place
Sidecar	A structure to allow investors to share in the profits and losses of an insurance or reinsurance book of business
Special purpose insurer/entity (SPI/SPE)	A company created by (but not owned by) a (re)insurer for the purpose of raising capital for a specified programme
Treaty	An agreement between a cedant and a reinsurer stating the types or classes of businesses that the reinsurer will accept from the cedant
Underwriting profit	Earned premium minus incurred losses and incurred commissions (earned premiums include reinstatement premiums)
Variable reset	Adjusting a layer of a multi-year catastrophe bond up or down within a pre-defined range of probability of loss, with a corresponding update in risk spread
Vendor models	Software that estimates expected loss and probability of occurrence for specified exposure sets and predefined peril scenarios. The three largest vendors by market share are AIR Worldwide, Risk Management Services and Eqecat
Written premiums	Premium registered on the books of an insurer or a reinsurer at the time a policy is issued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