



Q3 2018 Catastrophe Bond & ILS Market Report

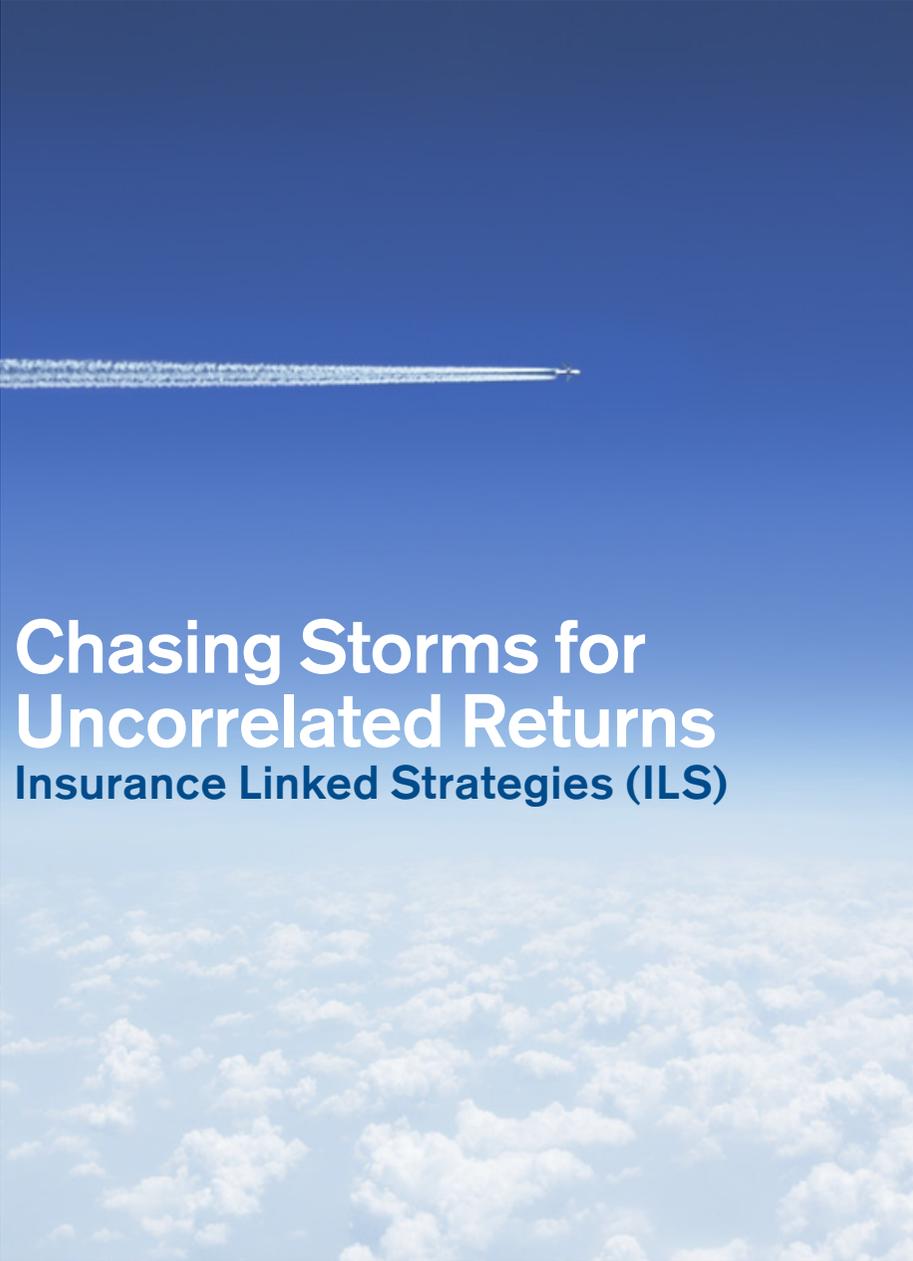
New perils help cat
bond market to record Q3

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INTRO

Artemis' third-quarter 2018 Catastrophe Bond and Insurance-Linked Securities (ILS) Market Report reviews new risk capital brought to market, as well as the composition of transactions completed during the period.

In total, nine transactions consisting of 15 tranches of notes came to market in Q3, taking issuance to a huge \$2.5 billion. This is the first time in the market's history that third-quarter issuance has surpassed \$2 billion, according to data from the Artemis Deal Directory.

The record-breaking \$2.5 billion of issuance is approximately \$1.5 billion higher than the ten-year average for the third-quarter, coming from a mix of private, repeat and new sponsors. Privately placed deals are now a common feature of any quarter, and contributed \$27.9 million to total risk capital issued in Q3.

First time sponsors FEMA /NFIP and PG&E Corporation brought \$700 million of new and diversifying risk capital to market, while \$1.77 billion of issuance came from repeat sponsors.

On the back of a record \$4.24 billion of issuance in Q1, combined with more than \$5.15 billion of issuance in Q2, catastrophe bond and ILS issuance at the end of the third-quarter of 2018 reached an impressive \$11.88 billion, taking the outstanding market size to a huge \$36.57 billion, as shown by the Artemis Deal Directory.

Artemis is the leading, freely accessible source of timely, relevant and authoritative news, analysis, insight and data on the insurance-linked securities, catastrophe bond, alternative reinsurance capital and related risk transfer markets. The Artemis Deal Directory is the leading source of information, data and analysis on issued catastrophe bond and insurance-linked securitization transactions.

Transaction Recap

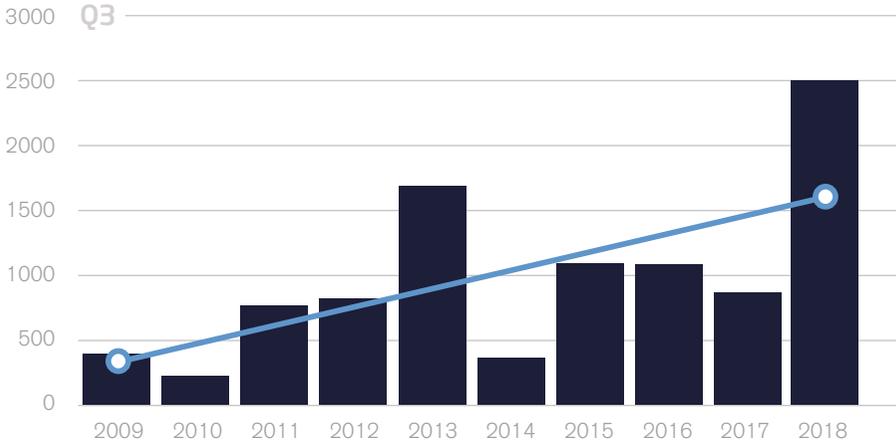
In terms of deal volume, more than a third, or \$918 million of Q3 issuance offered protection against mortgage insurance risks, coming from repeat sponsors Arch Capital Group and National Mortgage Insurance Corporation. The Artemis Deal Directory shows that this is a growing peril within the ILS and catastrophe bond space, with investors appearing happy to assume the risk.

The two new sponsors that entered the market in Q3 also provided additional diversification for investors with new perils. FEMA / NFIP issued the awaited FloodSmart Re deal, which is the first U.S. flood catastrophe bond, and which accounted for \$500 million of Q3 issuance. PG&E Corporation also entered the market in Q3, with its \$200 million Cal Phoenix Re deal, the first transaction to cover pure wildfire risks. Other returning and unknown sponsors that featured in Q3 brought further peril and region diversification to the marketplace, including Canada, California and U.S. earthquake, U.S. property catastrophe risks, U.S. and Puerto Rico named storms, and European windstorm risks.

ISSUER / TRANCHE	SPONSOR	PERILS	SIZE (\$M)	DATE
Ursa Re Ltd. (Series 2018-1)	California Earthquake Authority	California earthquake	250	Sep
Bellemeade Re 2018-2 Ltd. M-1A	Arch Capital Group Ltd.	Mortgage insurance risks	236.973	Aug
Bellemeade Re 2018-2 Ltd. M-1B	Arch Capital Group Ltd.	Mortgage insurance risks	224.164	Aug
Bellemeade Re 2018-2 Ltd. M-1C	Arch Capital Group Ltd.	Mortgage insurance risks	160.117	Aug
Bellemeade Re 2018-2 Ltd. B-1	Arch Capital Group Ltd.	Mortgage insurance risks	32.024	Aug
Dodeka XVII	Unknown	U.S. property catastrophe risks	18.322	Aug
Cal Phoenix Re Ltd. (Series 2018-1)	PG&E Corporation	California wildfire	200	Aug
FloodSmart Re Ltd. (Series 2018-1) Class A	FEMA / NFIP via Hannover Re	U.S. flood risk (from named storms)	325	Jul
FloodSmart Re Ltd. (Series 2018-1) Class B	FEMA / NFIP via Hannover Re	U.S. flood risk (from named storms)	175	Jul
Oaktown Re II Ltd. Class M-1	National Mortgage Insurance Corporation	Mortgage insurance risks	133.665	Jul
Oaktown Re II Ltd. Class M-2	National Mortgage Insurance Corporation	Mortgage insurance risks	116.957	Jul
Oaktown Re II Ltd. Class B-1	National Mortgage Insurance Corporation	Mortgage insurance risks	13.923	Jul
Acorn Re Ltd. (Series 2018-1)	Oak Tree Assurance, Ltd. via Hannover Re	U.S. earthquake	400	Jul
Dodeka XVI	Unknown	U.S. property catastrophe risks	9.603	Jul
Northshore Re II Ltd. (Series 2018-1)	AXIS Capital Holdings Ltd. subsidiaries	International multi-peril	200	Jul

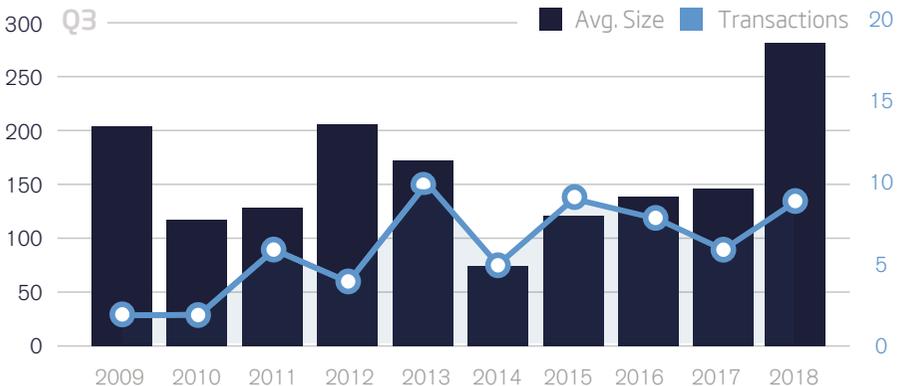
Q3 ILS issuance by year (\$M)

Catastrophe bond and ILS issuance surpassing \$2 billion would have been a record in Q3, so the fact it has reached \$2.5 billion is hugely impressive, and testament to the willingness, commitment and ability of the ILS community. The Artemis Deal Directory shows that Q3 2018 issuance was more than \$1.5 billion higher than the ten-year average for the quarter.



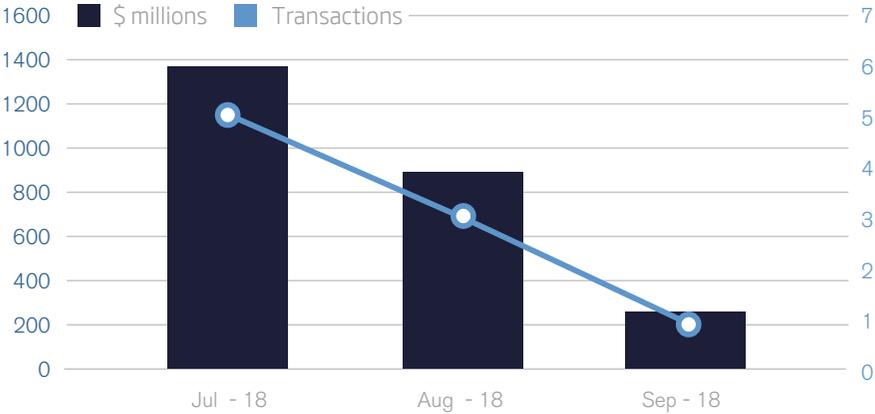
ILS average transaction size & number of transactions by year (\$M)

The average transaction size in the third-quarter of 2018 was \$277.3 million from nine transactions. This is above the ten-year average, in terms of transaction size, by \$120 million, and also above the ten-year average number of transactions for Q3, of six. At more than \$277 million, the average transaction size witnessed in Q3 is the highest ever recorded for the quarter, as shown by the Artemis Deal Directory.



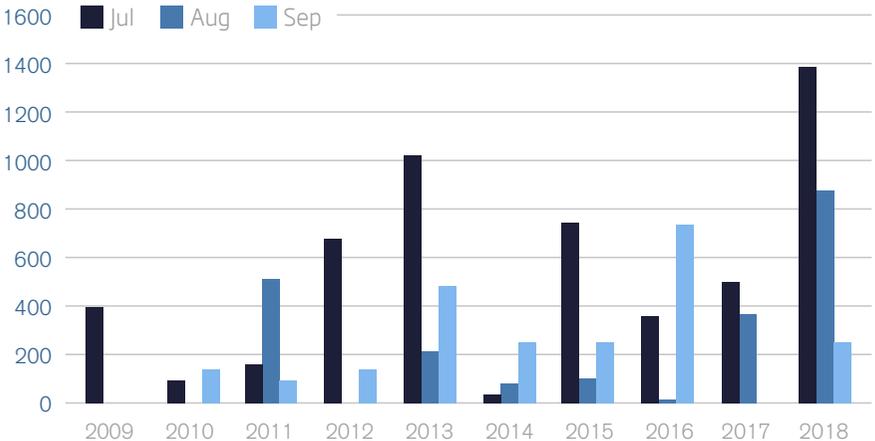
Number of transactions and volume issued by month (\$M)

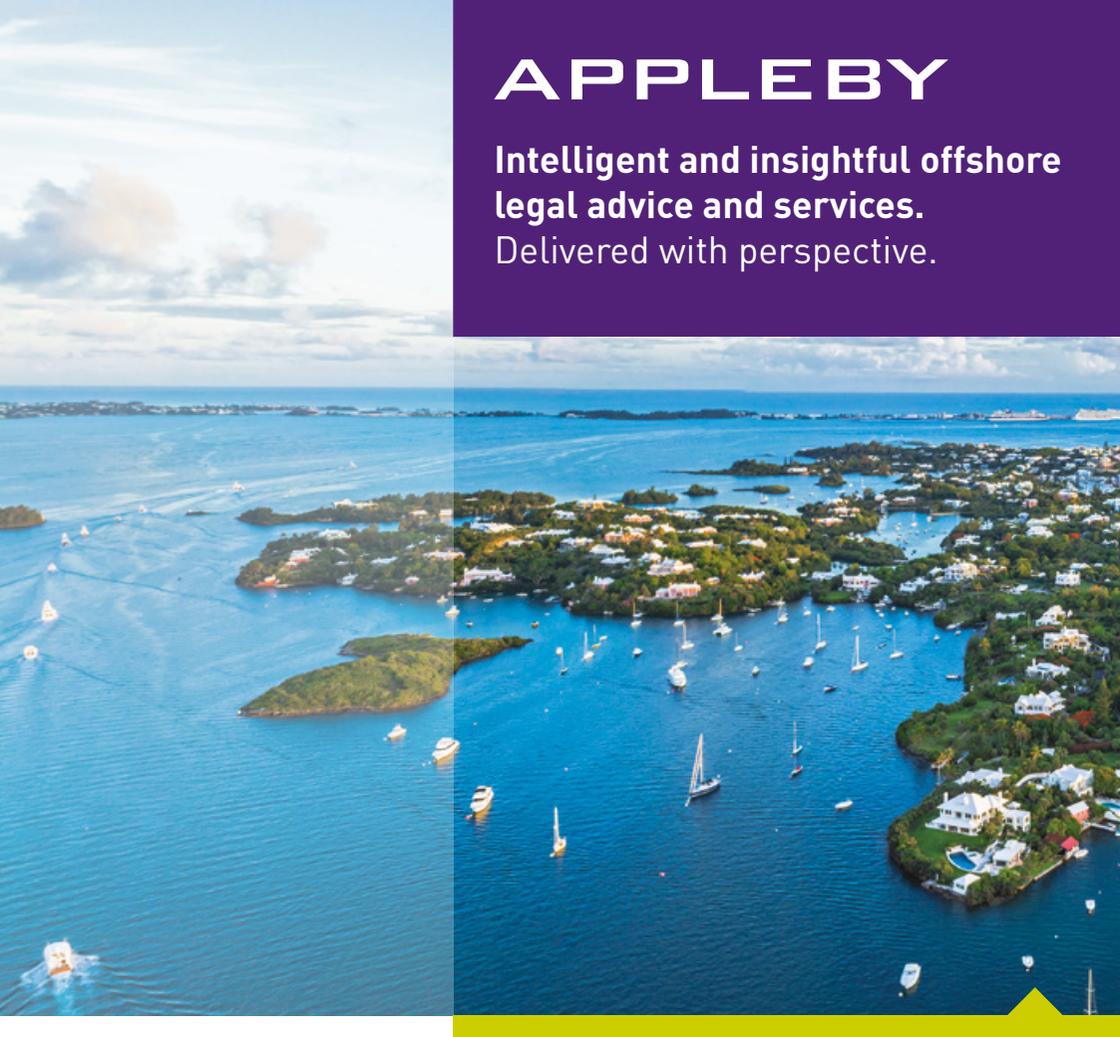
Typical of third-quarter issuance, the month of July was the busiest both in terms of the number of deals and the volume of new risk capital issued. A huge \$1.37 billion of new risk capital from five deals came to market in Q3, which is above the average volume of issuance for the month by \$839 million.



Q3 issuance by month & year (\$M)

While less active than July, issuance in both August and September, in terms of new risk capital issued, surpassed the ten-year averages by \$656 million and \$17 million, respectively. \$872 million of issuance from three deals is impressive for August. And while just one deal came to market in September, contributing \$250 million of total risk capital issued, this is a reversal from Q3 2017 when no deals were issued in the month.





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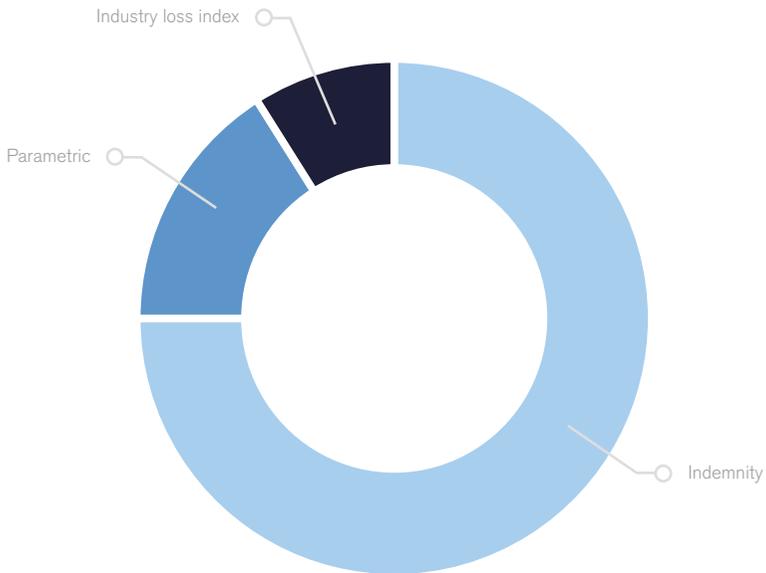
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Q3 2018 ILS issuance by trigger type

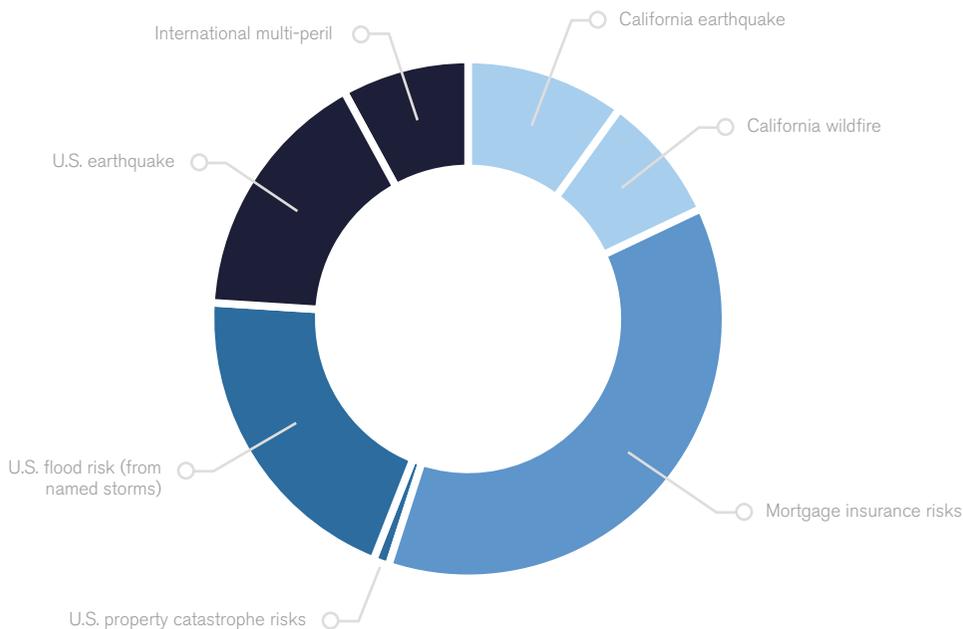
Unlike the third-quarter of last year, indemnity protection dominated issuance in the third-quarter of 2018, amounting to \$1.87 billion, or 75% of total risk capital issued.



Parametric triggers have become a common feature of third-quarter catastrophe bond and ILS issuance, and the trigger structure featured again in Q3 2018, providing investors with \$400 million of trigger diversification, accounting for 16% of total issuance. The remaining \$228 million of Q3 issuance featured an industry loss index trigger, contributing 9% of new risk capital issued in the period.

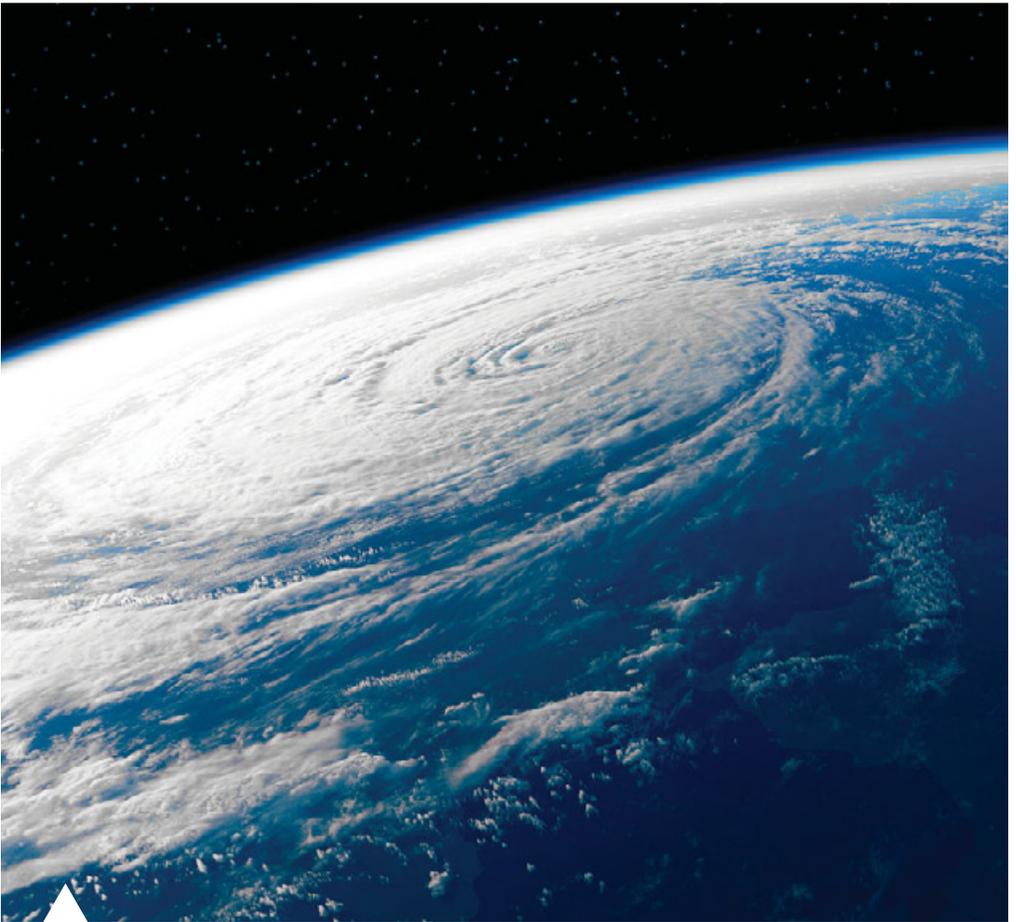
Q3 2018 ILS issuance by peril

For the first time since the inception of the cat bond market, U.S. flood risks and pure wildfire risks featured in Q3 2018. FEMA's first entry into the market for reinsurance protection for the NFIP, of which Hannover Re is a beneficiary, contributed \$500 million, or 20% of issuance. PG&E Corporation, another new sponsor, provided investors with \$200 million of California wildfire risk, accounting for 8% of issuance.



Over a third, or \$918 million of Q3 2018 issuance offered protection against mortgage insurance risks, from two separate deals by repeat sponsors Arch Capital Group, and National Mortgage Insurance Corporation.

Oak Tree Assurance brought \$400 million of U.S. earthquake risk to market in Q3, of which Hannover Re is a beneficiary, and which accounted for 16% of issuance. The California Earthquake Authority returned with \$250 million of California earthquake risk, which contributed 10% of issuance. 8%, or \$200 million of issuance covered multiple international perils, including U.S. and Puerto Rico named storms, U.S. & Canada earthquake, and European windstorm risks. Just 1%, or \$28 million of Q3 issuance covered U.S. property catastrophe risks.



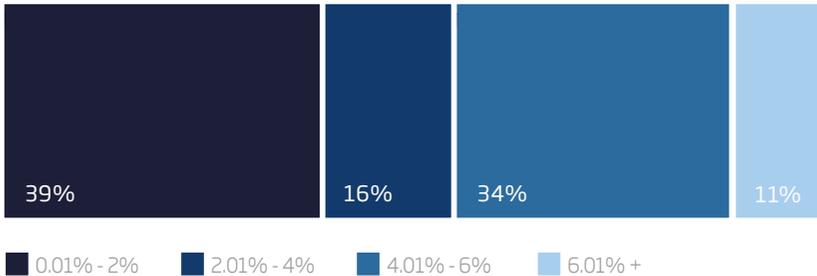
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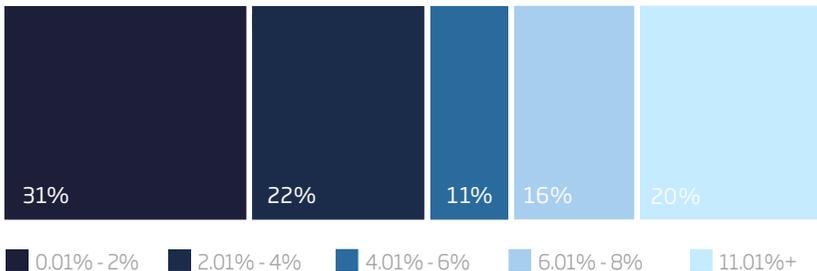
Q3 2018 ILS issuance by expected loss

For the \$1.55 billion of risk capital issued that we have expected loss data for, 39%, or \$600 million had an expected loss of less than 2%. \$525 million, or 34% of Q3 issuance had an expected loss of between 4.01% and 6%. Just 16%, or \$250 million of issuance offered investors an expected loss of between 2.01% and 4%, while 11%, or \$175 million had an expected loss above 6%. The Class B tranche of FloodSmart Re notes were the riskiest of the quarter, with an expected loss of 6.32%. While Acorn Re's U.S. earthquake deal had the lowest expected loss, of 0.81%.



Q3 2018 ILS issuance by coupon pricing

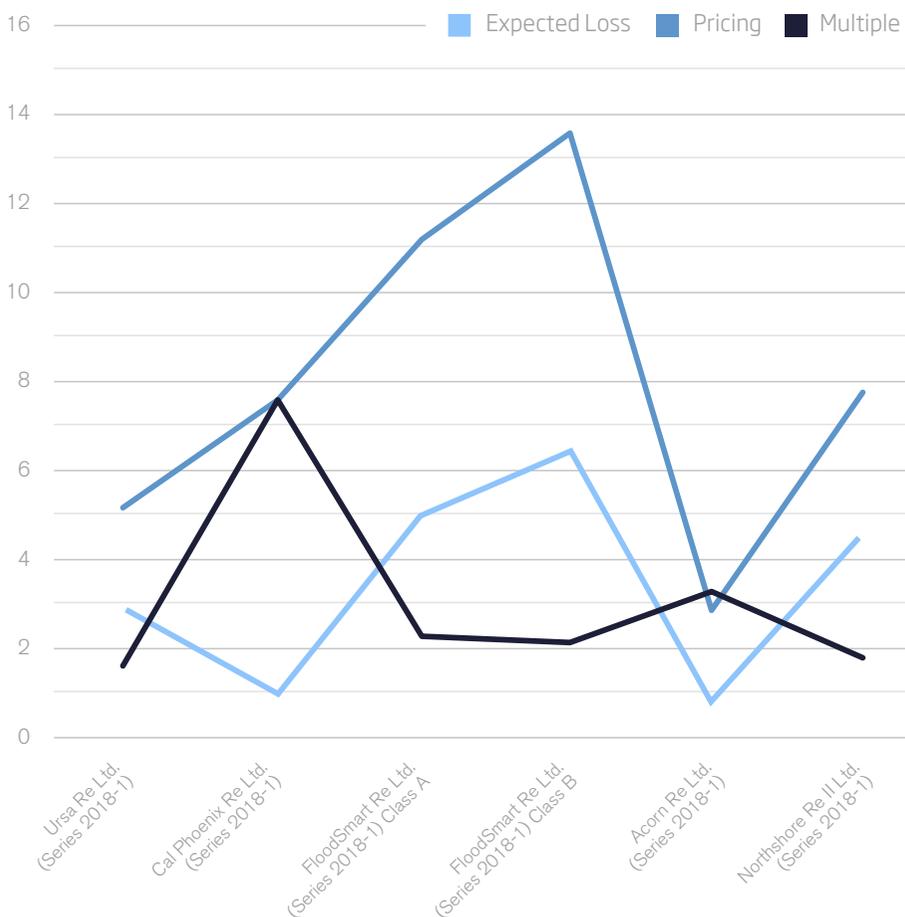
For third-quarter issuance where we have pricing data (this amounts to \$2.47 billion of total risk capital issued), 53%, or \$1.3 billion offered investors a coupon of below 4%. Just 11%, or \$264 million of issuance offered a coupon of between 4.01% and 6%. Over a third, or \$900 million of issuance had a coupon of more than 6.01%, with \$500 million of this offering a coupon higher than 11%. The riskiest tranche issued in Q3, FloodSmart Re's Class B notes, offered the highest coupon, of 13.5%. While the lowest coupon came from the Class M-1A tranche of Bellemeade Re 2018-2 notes, at 0.95%.



Pricing multiples of Q3 2018 issuance

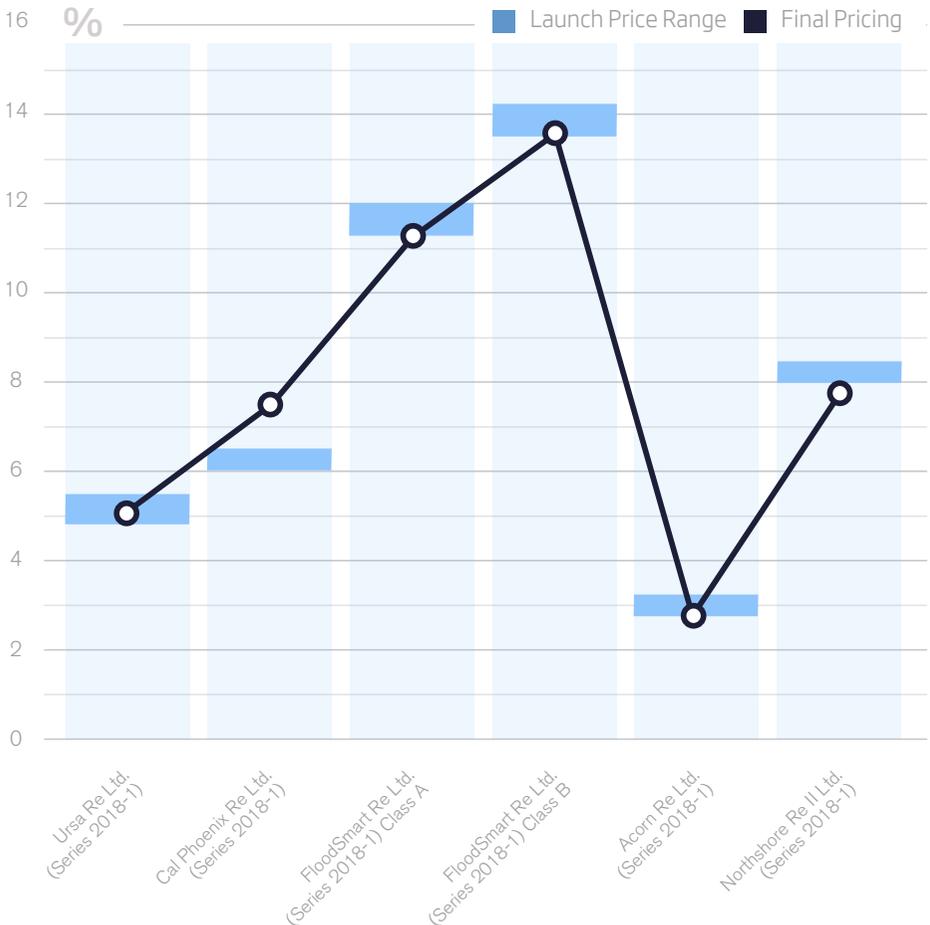
For deals that we have both expected loss and pricing data for (this amounts to \$1.55 billion of total risk capital issued), the average multiple (price coupon divided by expected loss) during Q3 2018 was 2.34. Throughout 2017 the average multiple had been declining, but bounced back in Q1 2018 to 2.01. After falling again in Q2 2018, the average multiple in the third-quarter is 0.69 higher than in Q3 2017.

Throughout 2017, the softness of reinsurance pricing appeared to result in investors taking on more risk at a lower return. But despite this, the market broke records in 2017. On the back of the significant industry losses driven by 2017 catastrophes, the average multiple has stayed above 2 for the majority of 2018, reaching a new high at the end of the third-quarter.



Cat bond and ILS price changes during Q3 2018 issuance

For the \$1.55 billion of total risk capital issued that we have full pricing data for, the average price change during the third-quarter was -0.21%. Cal Phoenix Re was the only deal issued in the quarter that priced above the mid-point of initial price guidance, increasing by 20% while marketing. The most dramatic price decrease in the third-quarter of 2018 came from Acorn Re, which, as shown by the Artemis Deal Directory, declined by 8.33% while marketing.

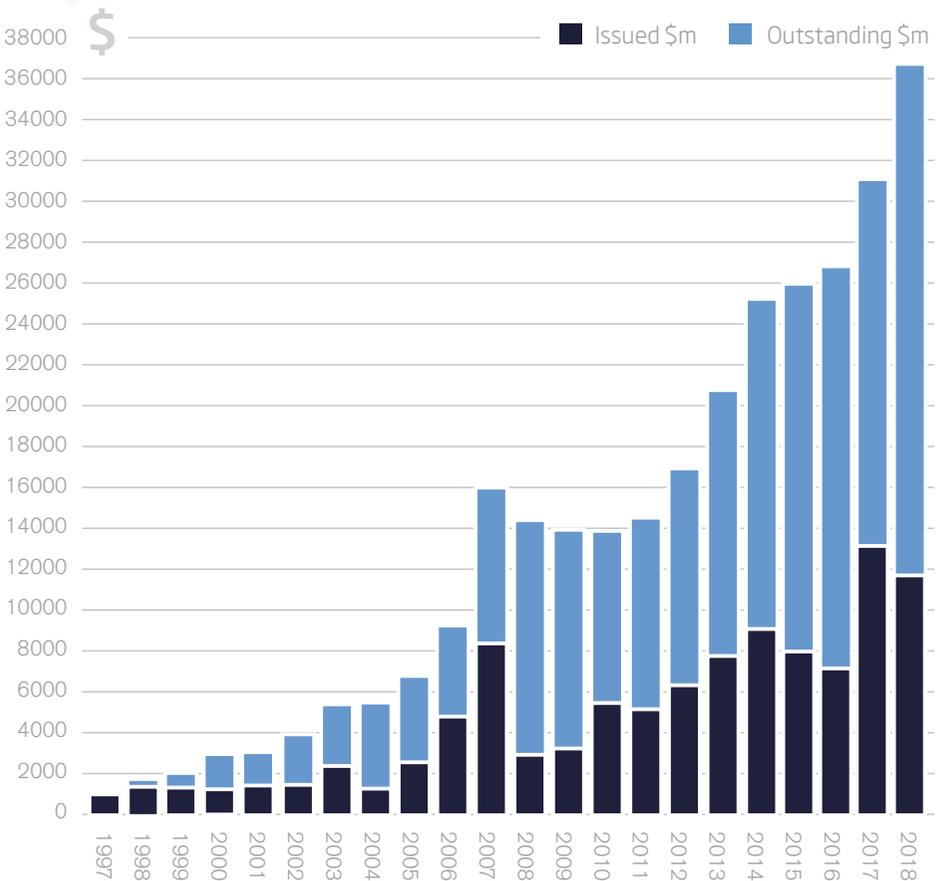


Issued / Outstanding

On the back of a record-breaking first-quarter and more than \$5.1 billion of issuance in Q2, catastrophe bond and ILS issuance in the third-quarter of 2018 has been extremely impressive. At \$2.5 billion, Q3 issuance in 2018 is the strongest in the market's history, taking the outstanding catastrophe bond and ILS market size at the end of September to a huge \$36.57 billion, a new end of quarter record.

As a result of the strong and continued appetite amongst both the investor and sponsor base, catastrophe bond and ILS issuance in 2018, as at the end of Q3, has reached \$11.88 billion, which is just \$676 million below 2017's full-year issuance record.

Year-on-year, the outstanding catastrophe bond and ILS market has grown by \$6.7 billion, or 22%, as shown by data from the Artemis Deal Directory. Just \$467 million worth of deals are scheduled to mature in the final three months of the year. This, combined with the huge level of issuance already recorded in 2018, and the fact average Q4 issuance of the last ten-years has been just shy of \$2 billion, suggests the market will achieve outright growth once again in 2018, again breaking issuance records.



If you want to see full details of every catastrophe bond and ILS transaction included in the data in this report, please visit www.artemis.bm/deal_directory/

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