Aon Benfield

Insurance-Linked Securities

Year-End 2017 Update

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Year-End 2017 Catastrophe Bond Transaction Review

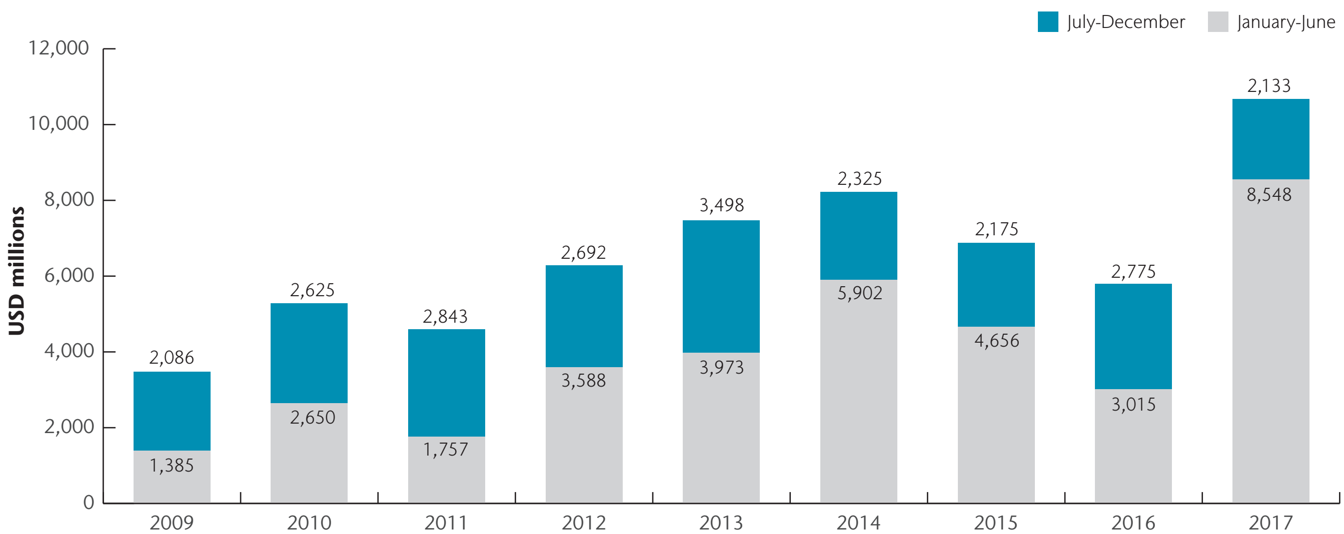
2017 was an exciting year for insurance-linked securities ("ILS"). Record levels of issuance in the catastrophe bond market resulted in the largest year ever and a new all-time high with respect to outstanding capital. Significant North America hurricane, earthquake and wildfire loss activity put many bonds at risk and provided sponsors with recoveries. ILS continues to be a well-used tool which supports both investor and sponsor interests and has momentum to expand upon this trend into the next calendar year and beyond.

2017: By the Numbers

- $10.7 billion of total 144A catastrophe bond issuance; $10.2 billion of which was property only (Record)
- $25.7 billion total 144A outstanding catastrophe bond capital at December 31, 2017 (Record)
- 35 144A issuances across 31 different sponsors

The strong first quarter of 2017 ($2.2 billion) and record-breaking second quarter ($6.3 billion) established 2017 as the largest annual issuance ever. Further strong levels of issuance in the second half of the year added to the new market high.

Catastrophe Bond Issuance by Half Year



Source: Aon Securities Inc.

Third and Fourth Quarter 2017 Transaction Review

In the normally quiet third quarter, three deals came to market. Two of these bonds were issued through the International Bank for Reconstruction and Development ("IBRD") Global Debt Issuance Facility, providing protection to the World Bank's Pandemic Emergency Financing Facility ("PEF") and Mexico's Fideicomiso Fondo de Desastres Naturales ("FONDEN"). Both bonds cover diversifying risks not typically seen in the catastrophe bond market.

The IBRD CAR Series 111 and Series 112 issued to the benefit of the PEF covers worldwide health coverage on a parametric basis, while the IBRD CAR Series 113 covers Mexico Earthquake, and Series 114 and Series 115 cover Mexico named storm for FONDEN, also on a parametric basis.

Of note, the FONDEN 2017 transaction, IBRD CAR Series 113, already experienced a full loss of principal following the magnitude 8.1 earthquake that struck the coast of Chiapas, Mexico in September 2017. The location of the earthquake's epicenter fell within the parametric box causing a full recovery of the $150 million principal.

Further in the third quarter, AMTrust Financial Services secured $100 million of coverage through its issuance of Fortius Re notes. The transaction included dual trigger types of both Indemnity trigger and Modeled Loss trigger and covers U.S. named storms and U.S. and Canada earthquakes. The Modeled Loss component covers workers compensation coverage from earthquakes in the U.S. and Canada.

In the fourth quarter, five deals came to market totaling approximately $1.4 billion. Historically, the fourth quarter is one of the largest quarters year-over-year in terms of new catastrophe bond issuances. Hurricanes Harvey, Irma, and Maria (collectively known as "HIM") wreaked devastation across the U.S. and Caribbean, leaving some uncertainty of the capital markets' response in terms of rate movements and secondary pricing.

The first sponsor to issue post-HIM was XL Insurance (Bermuda) Ltd, which returned to the market for the second time in 2017 with the issuance of Galileo Re Ltd. Following a similar structure to its prior Galilei Re Ltd. issuance, the reinsurer secured industry index coverage for U.S., Europe and Australia risks, which is expanded coverage from previous transactions. The transaction successfully closed after it received broad investor interest, demonstrating the resiliency of the capital markets post-event. The transaction coverage and covered area also expanded over previous Galilei Re Ltd. and Galileo Re Ltd. issuances to include index coverage for severe thunderstorm in the U.S. and priced within the initial pricing guidance for both classes of notes.

Following the success of Galileo Re Ltd. Series 2017-1, veteran sponsor USAA also came to market with $295 million of its Residential Re program across three classes of notes. The Residential Re notes cover a broad range of U.S. perils including hurricane, earthquake, severe thunderstorm and wildfire, and the risk profiles ranged from low to very high risk program layers, demonstrating USAA's utility of catastrophe bond capacity throughout its risk transfer program.

The CEA issued $400 million of notes via its well-established Ursa Re program across two classes of notes. Ursa Re 2017-2 covers earthquake risk in California and was well received by the market.

First time sponsor Covéa Group issued its Europe wind-exposed notes via Hexagon Re. The covered area includes France, Andorra, and Monaco. These notes ended up pricing at the bottom of already reduced guidance, which implies a continued appetite for diversifying risks being incorporated in investor portfolios.

To close out the year, Validus Holdings issued its first 144A catastrophe bond via a newly formed special purpose insurer in Bermuda, Tailwind Re Ltd. The notes cover North America (including Puerto Rico and U.S. Virgin Islands) named storm and earthquake risk. The notes were broadly syndicated, upsized from $300 million to $400 million, and each class of notes priced below initial guidance.

Third and Fourth Quarter 2017 Catastrophe Bond Issuance

	Transaction	Beneficiary	Perils	Trigger	Size (million)	Expected Loss (1)	Interest Spread
Q3	IBRD CAR A	Pandemic Emergency Financing Facility	Select Worldwide Pandemics	Parametric	$225.0	3.57%	6.90%
	IBRD CAR B				$95.0	7.74%	11.50%
	Fortius Re II Ltd. 2017-1	AMTrust Financial Services	US NS, EQ; CAN EQ	Multiple	$100.0	1.19%	3.75%
	CAR 113 A	The Fund for Natural Disasters	MEX EQ	Parametric	$150.0	3.43%	4.50%
	CAR 114 B		MEX EQ		$100.0	5.77%	9.30%
	CAR 115 C		MEX EQ		$110.0	3.96%	5.90%
Q4	Galileo Re Ltd. 2017-1 A	XL Bermuda Ltd.	US NS, EQ, ST, EU Wind, AU TC, EQ, (includes PR & USVI)	Industry Index	$75.0	3.68%	7.50%
	Galileo Re Ltd. 2017-1 B				$75.0	10.66%	17.50%
	Residential Re 2017-II 1	United Services Automobile Associates	US NS, EQ, ST, WS, WF, VE, MI, OP	Indemnity	$55.0	17.35%	21.00%
	Residential Re 2017-II 2				$110.0	8.35%	12.50%
	Residential Re 2017-II 3				$130.0	3.24%	5.50%
	Ursa Re 2017-2 C	California Earthquake Authority	CAL EQ	Indemnity	$200.0	1.32%	4.00%
	Ursa Re 2017-2 D				$200.0	2.79%	5.25%
	Hexagon Reinsurance DAC 2017-1 A	Covea Group	EU WS	Indemnity	€45.0	6.75%	8.00%
	Hexagon Reinsurance DAC 2017-1 B				€45.0	5.52%	6.50%
	Tailwind Re Ltd. 2017-1 A	Validus Holdings	US NS, EQ; CA HU, EQ (includes PR & USVI)	Index	$150.0	3.79%	7.25%
	Tailwind Re Ltd. 2017-1 B				$150.0	4.94%	9.00%
	Tailwind Re Ltd. 2017-1 C				$100.0	6.29%	11.00%

EU - Europe
EQ - Earthquake
FL - Florida
NS - Named Storm
US - United States
MI - Meteorite Impact
CAL - California
OP - Other PCS-reported perils
AU - Australia
ST - Severe Thunderstorm
PR - Puerto Rico
VE - Volcanic Eruption
VI - Virgin Islands
WF - Wildfire
MEX - Mexico
TC - Tropical Cyclone

(1) Where applicable sensitivity (i.e. WSST) measures are shown

Aon ILS Indices

The Aon ILS Indices are calculated by Bloomberg using month-end price data and index membership provided by Aon Securities Inc., the administrator of the indices.

Aon ILS Indices returned positive results during the 12 months ending December 31, 2017 despite significant natural catastrophe activity, with the Aon All Bond and U.S. Hurricane indices producing gains of 1.40 percent and 3.43 percent respectively. The Aon All Bond Index underperformed relative to comparable fixed income benchmarks, but was higher than the return on the 3-5 year U.S. Treasury Note index. The strongest benchmark index performance came from equities as the S&P 500 Index returned an impressive 19.42 percent during the period under review.

On a quarterly basis, the All Bond and U.S. Hurricane indices posted strong Q4 returns of 4.28 percent and 6.51 percent respectively. This was due to losses coming in at lower levels than the market had anticipated at the beginning of the quarter. Despite the occurrence of three major hurricanes, the U.S. Hurricane index outperformed the All Bond index in the quarter, as losses manifested in multi-peril aggregate transactions which cover hurricane events in addition to picking up losses from the recent California wildfires and other smaller events that occurred throughout the year.

Given the magnitude of catastrophe losses in 2017, the annual returns for all Aon ILS Indices underperformed the prior year's annual returns. The 10-year average annual return of the Aon All Bond index of 6.69 percent relatively similar to benchmarks despite having a low correlation to broader fixed income and equity markets.

Comparative Indices and Benchmarking

Index Title	Return for Quarterly Period Ended December 31		Return for Annual Period Ended December 31	
Aon ILS Indices	2017	2016	2017	2016
All Bond Bloomberg Ticker (AONCILS)	4.28%	0.73%	1.40%	7.03%
U.S. Hurricane Bond (AONCUSHU)	6.51%	1.59%	3.43%	7.05%
Benchmarks				
3-5 Year U.S. Treasury Notes (BEUSG2)	-0.58%	-2.05%	0.98%	1.26%
3-5 Year BB U.S. High Yield (J2A1)	-0.08%	1.03%	4.70%	11.66%
S&P 500 (SPX)	6.12%	3.25%	19.42%	9.54%
ABS 3-5 Year, Fixed Rate (R2A0)	0.18%	-1.38%	3.45%	2.85%
CMBS 3-5 Year, Fixed Rate (CMB2)	-0.08%	-1.36%	2.16%	3.04%

Source: Aon Securities Inc. and Bloomberg

[3] The 3-5 Year U.S. Treasury Note index is calculated by Bloomberg and simulates the performance of U.S. Treasury notes with maturities ranging from three to five years.

The 3-5 Year BB U.S. High Yield index is calculated by ICE Data Indices, LLC (IDI), and tracks the performance of U.S. dollar denominated corporate bonds with a remaining term to final maturity ranging from three to five years and are rated BB1 through BB3. Qualifying securities must have a rating of BB1 through BB3, a remaining term to final maturity ranging from three to five years, fixed coupon schedule and a minimum amount outstanding of $100 million. Fixed-to-floating rate securities are included provided they are callable within the fixed rate period and are at least one year from the last call prior to the date the bond transactions from a fixed to a floating rate security.

The S&P 500 is Standard & Poor's broad-based equity index representing the performance of a broad sample of 500 leading companies in leading industries. The S&P 500 Index represents price performance only, and does not include dividend reinvestments or advisory and trading costs. The ABS 3-5 Year, Fixed Rate index is calculated by BAML and tracks the performance of U.S. dollar denominated investment grade fixed rate asset backed securities publicly issued in the U.S. domestic market with terms ranging from three to five years. Qualifying securities must have an investment grade rating, a fixed rate coupon, at least one year remaining term to final stated maturity, a fixed coupon schedule and an original deal size for the collateral group of at least $250 million.

The ABS 3-5 Year, Fixed Rate Index is calculated by IDI and tracks the performance of U.S. dollar denominated investment grade fixed rate asset backed securities publicly issued in the U.S. domestic market with terms ranging from three to five years. Qualifying securities must have an investment grade rating, a fixed rate coupon, at least one year remaining term to final stated maturity, a fixed coupon schedule, and an original deal size for the collateral group of at least $250 million.

The CMBS 3-5 Year, Fixed Rate index is calculated by IDI and tracks the performance of U.S. dollar denominated investment grade fixed rate commercial mortgage backed securities publicly issued in the U.S. domestic market with terms ranging from three to five years. Qualifying securities must have an investment grade rating, at least one year remaining term to final maturity, a fixed coupon schedule and an original deal size for the collateral group of at least $250 million.

The performance of an index will vary based on the characteristics of, and risks inherent in, each of the various securities that comprise the index. As such, the relative performance of an index is likely to vary, often substantially, over time. Investors cannot invest directly in indices.

End of Year Activity

The second half of 2017 was stimulated by the end of year catastrophes, and the year-end response from the capital markets was extremely informative for both the ILS and the broader reinsurance markets in terms of capital markets' appetite for insurance risk. There was a sustained focus on i) 'trapped collateral', ii) the ability of collateralized managers to underwrite treaties for January 1, 2018 inception, and iii) the dynamic pricing environment.

Given that in 2006 we estimated alternative capacity was $17 billion of an overall $385 billion of global reinsurance capital, and in 2017 we estimate the same comparison to be $89 billion of an overall $605 billion, alternative capacity has become an increasingly more meaningful part of the reinsurance sector. At year end there was a focus on the ability for ILS markets to 'reload' for 2018. In the end, alternative capital seized the opportunity to demonstrate its value to the broader reinsurance market. Not only was alternative capital able to roll over renewing contracts at January 1, 2018 but we note additional capital investments were made into the asset class via managers that participate in collateralized reinsurance, sidecars, and catastrophe bond allocations.

The catastrophe bond market saw approximately $1.4 billion of initial issuance activity since HIM. Additionally, secondary market pricing volatility was greater than at any time in recent memory as investors worked to interpret catastrophe event implications. Given the current ILS market size, number of sponsors, peril and geographic scope of coverage, the amount of secondary market price volatility was unprecedented. As HIM losses began to stabilize, 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 table below, there was a great deal of pricing volatility across the 37 classes of notes that were deeply impaired (i.e. experienced greater than a 25 percent reduction from par at some point post-event). The catastrophe bond market offers the greatest visibility into market sentiment at any given time. The figure below clearly demonstrates the significant uncertainty in market sentiment beginning in September following Hurricanes Harvey and Irma, then continuing through to the end of the year.

Post Event Trading Activity

Key Events

Notional Amount of Catastrophe Bonds with a 25% Price Drop From August 25

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)			
	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	$0.0M	$1,224.3M	$814.3M	$566.8M	$231.8M	$159.8M	$159.8M	$156.8M	$156.8M	$26.8M	$26.8M	$26.8M
Aggregate Index Deals	$0.0M	$1,260.0M	$710.0M	$1,435.0M	$1,435.0M	$1,135.0M	$1,135.0M	$335.0M	$205.0M	$205.0M	$205.0M	$205.0M
Aggregate Indemnity Deals	$0.0M	$195.0M	$195.0M	$195.0M	$260.0M	$65.0M	$410.0M	$460.0M	$535.0M	$535.0M	$535.0M	$535.0M
Other Deals	$0.0M	$150.0M	$150.0M	$150.0M	$150.0M	$150.0M	$150.0M	$150.0M	$230.0M	$230.0M	$230.0M	$230.0M
Total	$0.0M	$2,829.3M	$1,869.3M	$2,346.8M	$2,076.8M	$1,509.8M	$1,854.8M	$1,101.8M	$1,126.8M	$996.8M	$996.8M	$996.8M

We've categorized the impacted catastrophe bonds into Florida-exposed, aggregate industry index trigger, aggregate indemnity trigger, and Other transactions (transactions covering Mexico earthquake and occurrence transactions with significant exposure to California wildfire). Florida-only deals were dramatically discounted in early September in the secondary market as investors anticipated large losses from Hurricane Irma prior to its landfall. Since then the market reversed and we can see a correction to those prices due to changes in the storm track. We've seen similar trends in the aggregate index structured transactions. Aggregate indemnity bond valuations continued to deteriorate particularly as the notes which cover U.S. nationwide exposures continued to experience loss development from HIM as well as the California wildfires.

Outlook

2017 was and extraordinary year in terms of catastrophe losses and ILS issuance, and as we move into 2018 there is a great deal of momentum for ILS. Historically, one of the big issues for ILS is being characterized as an untested source of capacity when compared to traditional reinsurance. 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 reinsurance market.

This ILS momentum, we believe, will continue through 2018 and will be a 'tide that rises and lifts all ships' (i.e. all forms of ILS). Aon Securities forecasts catastrophe bond issuance for 2018 will be approximately $8-$9 billion.

Contact

Paul Schultz
Chief Executive Officer, Aon Securities Inc.
+1.312.381.5256
paul.schultz@aonbenfield.com

About Aon Securities

Aon Securities Inc. and Aon Securities Limited (collectively, "Aon Securities") provide insurance and reinsurance clients with a full suite of insurance-linked securities products, including catastrophe bonds, contingent capital, sidecars, collateralized reinsurance, industry loss warranties, and derivative products.

As one of the most experienced investment banking firms in this market, Aon Securities offers expert underwriting and placement of new debt and equity issues, financial and strategic advisory services, as well as a leading secondary trading desk. Aon Securities' integration with Aon Benfield's reinsurance operation expands its capability to provide distinctive analytics, modeling, rating agency, and other consultative services.

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