

# Reinsurance Market Outlook

Capacity Gap Narrows as Demand Picks Up

September 2016



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## Executive Summary: Capacity Gap Narrows as Demand Picks Up

The gap between reinsurance supply and demand has narrowed over the past year, driven by the improved economics of purchasing and reassessment of the core value of the product. However, ample capacity remains available to support current growth aspirations and risk transfer needs.

Reinsurance capital is currently at peak levels, as further declines in interest rates have built the stock of unrealized gains on bond portfolios and boosted the relative attractiveness of non-correlating insurance risk among institutional investors. At the same time, more reinsurance is being purchased. The cession ratio across the global property and casualty insurance industry showed a small uptick for the first time in several years in 2015 and a further increase is considered likely in 2016.

The lower pricing points delivered by alternative capital are clearly a factor, but the broader point is that reinsurance is growing in relevance as a proven mechanism for sharing risk, managing capital and controlling earnings volatility in the current environment. This is partly explained by the global trend towards risk-based regulatory regimes, which fully recognize the beneficial impact of reinsurance on cedents' capital positions.

Recent catalysts for increased demand include the emergence of poor underwriting results in certain casualty classes, out-sized losses from regional exposures and the introduction of Solvency II. The latter has prompted additional demand for solvency relief covers, including retrospective solutions dealing with reserving risk, and longevity risk transfers. A specific area of growth has been US mortgage credit, where Aon has assisted Freddie Mac in placing over USD5 billion of reinsurance coverage since 2013. At a time of heightened earnings sensitivity, reinsurers are increasingly utilizing cost-effective retrocession coverage to manage tail risk within their risk tolerances.

Reinsurance is undoubtedly a very valuable and multi-faceted product that is being used to support a whole range of critical management objectives. These include creating efficient corporate structures, maximizing business positions, developing new products, supporting target ratings, managing expenses, controlling aggregate exposures and optimizing solvency capital ratios.

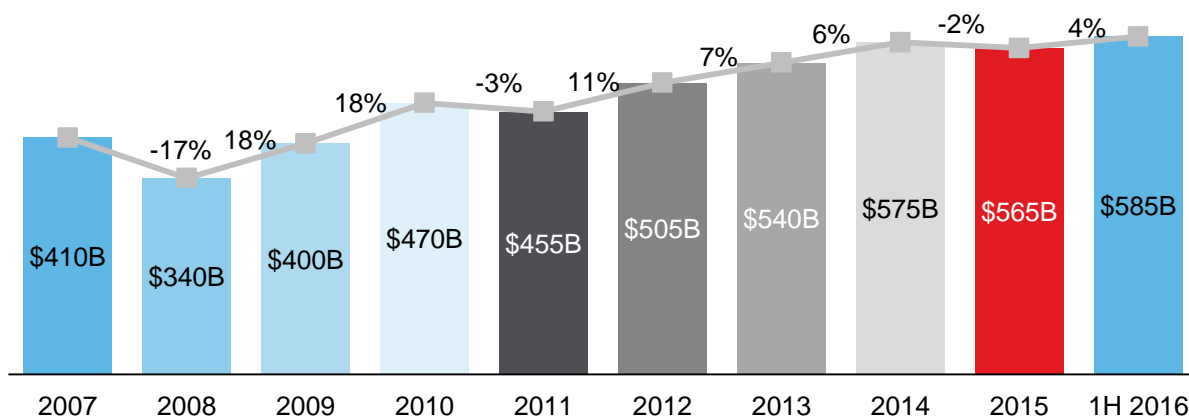
Rarely spoken about is the critical societal role of reinsurance in rebuilding communities in a post-loss environment. Aon Benfield remains committed to closing the 'protection gap' between economic and insured losses around the world. At a time of plentiful capital, it is sad to note that only a fraction of the losses from the recent earthquake in Italy will be recoverable, demonstrating that this is not just a feature of developing markets.

*Note: This reinsurance market outlook report should be read in conjunction with our firm's views on rate on line, capacity and retention changes for each cedent's market. Our professionals are prepared to discuss variations from our market sector outlook that apply to individual programs due to established trading relationships, capacity needs, loss experience, exposure management, data quality, model fitness, expiring margins and other factors that may cause variations from our reinsurance market outlook.*

## Reinsurance Supply Advances to New Peak

Aon Benfield estimates that global reinsurer capital rose by 4 percent to a new high of USD585 billion over the six months to June 30, 2016. This calculation is a broad measure of the capital available for insurers to trade risk with and includes both traditional and alternative forms of reinsurer capital. Overall reinsurer capital has increased by more than 70 percent since 2008.

**Exhibit 1: Change in global reinsurer capital**

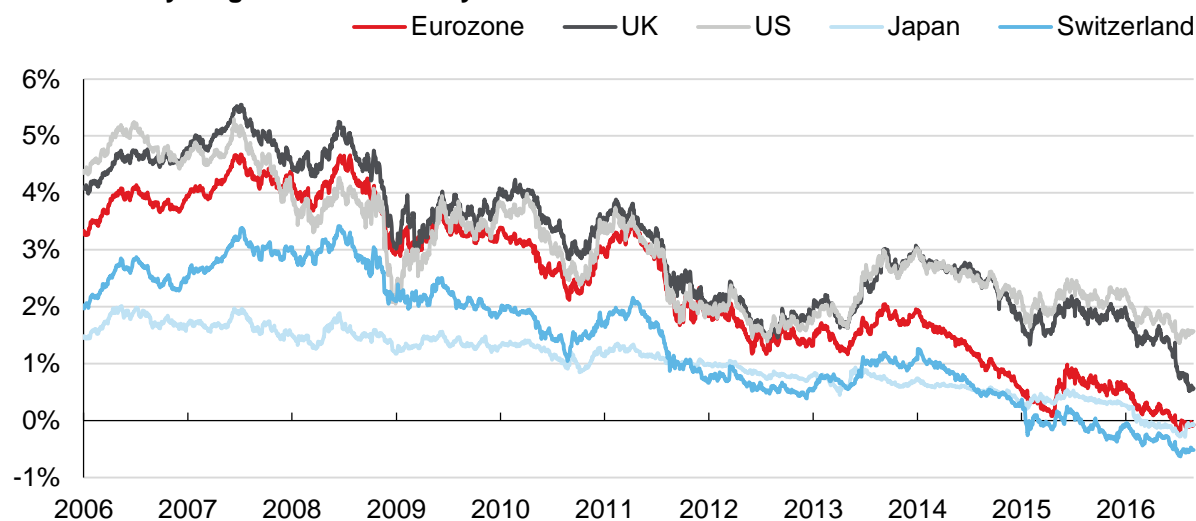


Source: Aon Benfield Analytics

### Macro factors drive traditional capital

Traditional capital rose by 3 percent to USD510 billion over the six months to June 30, 2016, driven mainly by unrealized gains on bond portfolios associated with declines in interest rates during the period. A secondary factor was modest weakening of the US Dollar relative to other currencies.

**Exhibit 2: 10 year government bond yields**



Source: Bloomberg

The low interest rate environment that has persisted in the developed world since the financial crisis is having a pervasive effect on traditional (re)insurance carriers that are mainly invested in cash and bonds, as well as significantly influencing market behavior. Some of the consequences are summarized below:

- Reported capital positions are inflated by unrealized gains.
- Ordinary investment yields have declined by around 40 percent.
- Asset risk has increased in the pursuit of better returns.
- Insurance risk is relatively more attractive as an asset class.
- New business models based on total return strategies have emerged.
- Debt is available on favourable terms.

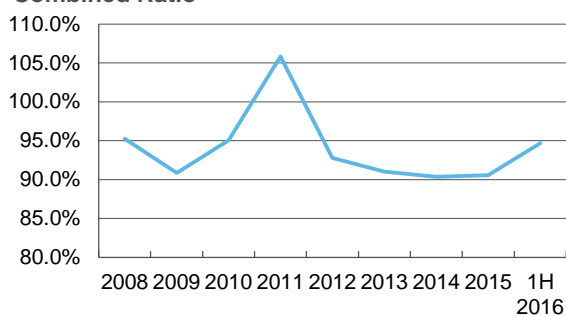
The real significance of the ‘Brexit’ vote in June 2016 was the resultant increase in central bank intervention in the capital markets in the UK, Europe and Japan and the delaying of further policy tightening by the US Federal Reserve. Some 40 percent of global sovereign bond yields are now negative and the return to a ‘normal’ interest rate environment appears to remain as elusive as ever.

## Reinsurer earnings

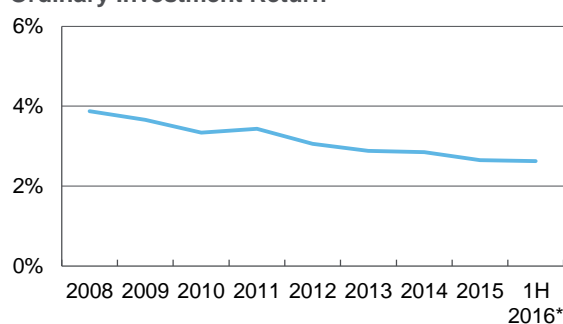
Retained earnings made a limited contribution to capital growth during the first half of 2016, due to the combined effects of lower investment income, higher insured catastrophe losses and more active capital management. Return on equity across the Aon Benfield Aggregate (ABA) dipped to 8.8 percent on an annualized basis, still an attractive return relative to risk-free rates.

### Exhibit 3: Reinsurance sector performance

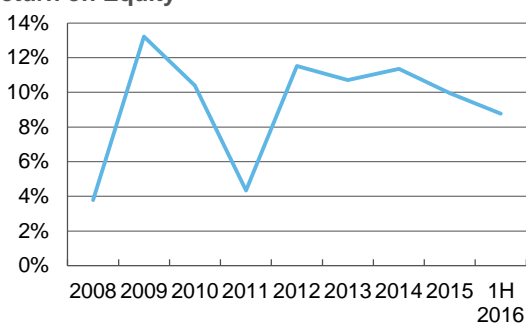
**Combined Ratio**



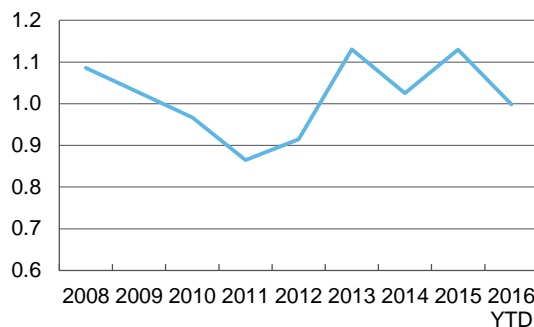
**Ordinary Investment Return**



**Return on Equity**



**Valuation - Price to Book**

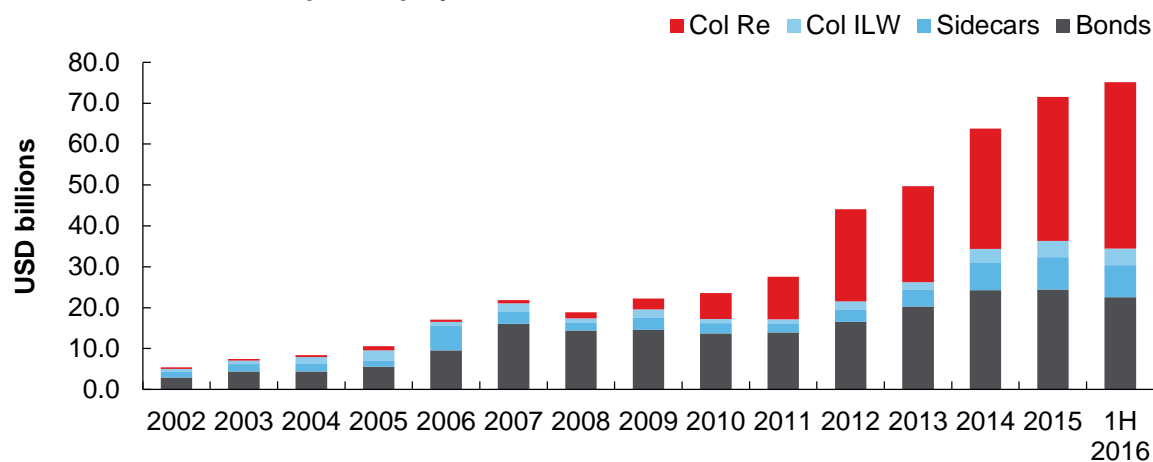


Source: Individual company records, Aon Benfield Analytics

## Insurance risk continues to attract capital markets investors

Alternative capital rose by 5 percent to USD75 billion over the six months to June 30, 2016, principally reflecting additional deployment into collateralized reinsurance structures. Catastrophe bond issuance slowed to USD3 billion in the period, despite a record first quarter.

### Exhibit 4: Alternative capital deployment



Source: Aon Securities (See *Insurance-Linked Securities – Alternative Markets Find Growth Through Innovation* for more details)

## Reinsurance capacity outlook

Ample capacity currently exists to meet expected reinsurance demand. However, price competition and weakening investment returns have eroded reinsurers' expected profitability and earnings have become increasingly sensitive to catastrophe loss experience. In the absence of major events, retained earnings are not expected to be a significant driver of traditional capital growth going forward, given the amount of capital now being returned to investors.

For alternative investment managers, the appeal of insurance risk has been enhanced by recent volatility in other asset classes and the weaker outlook for interest rates. Expected returns have declined, but they remain attractive relative to opportunities seen elsewhere, and further growth is therefore expected going forward. The lack of correlation with broader capital markets (except in the most extreme scenarios) remains a key consideration.

## Mergers and acquisitions

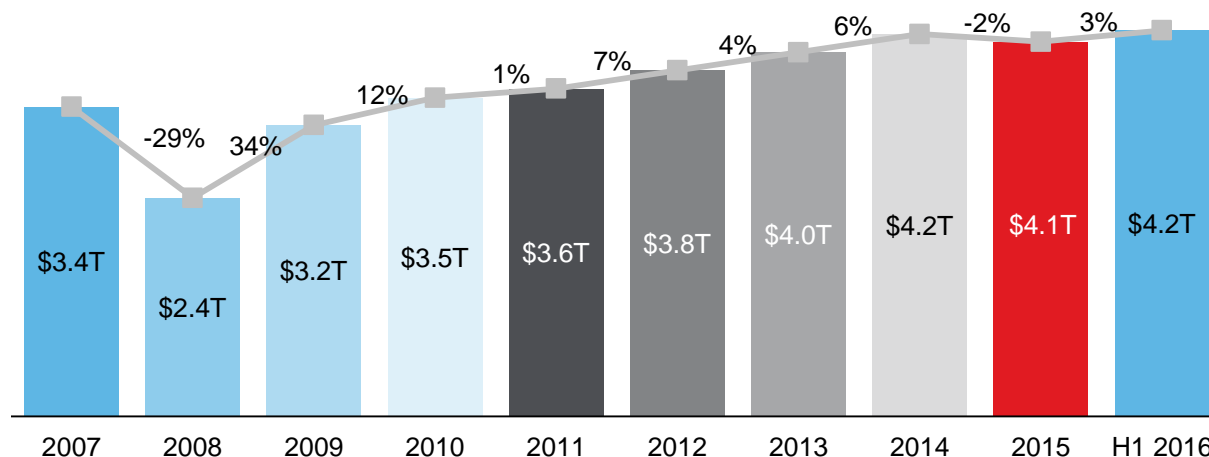
Further sector consolidation is considered likely, given that the market dynamics that gave rise to a flurry of major deals in 2015 have not changed. Several types of transaction are possible, including:

- Mergers within the industry, involving companies that are struggling to meet their return thresholds.
- Buy-outs from large regional (re)insurers in developing markets that are looking to establish global franchises.
- Acquisitions by investment holding companies, attracted by strong cash-flows and the potential for leveraging insurance "float".
- Synergistic deals aligning traditional reinsurers with ILS fund managers.

## Demand Trends Upward

Insurer capital was impacted by strengthening of the US Dollar during 2015, but has now returned to similar levels seen at the end of 2014. Earnings were impacted by a more typical level of insured catastrophe losses in the first half of 2016, but unrealized gains on bond portfolios stemming from recent declines in interest rates provided support.

**Exhibit 5: Insurer capital**

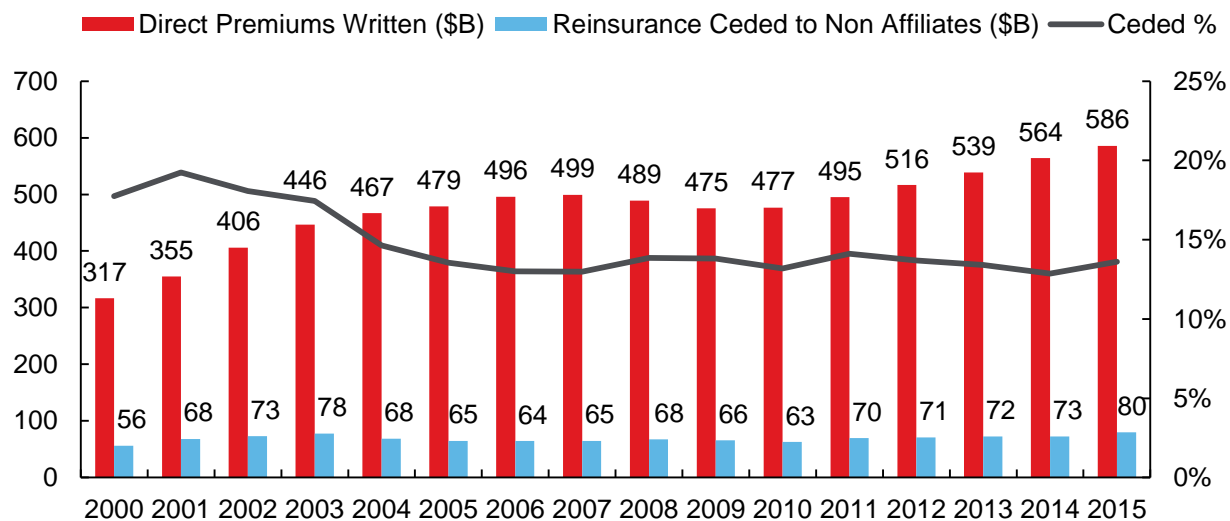


Source: Aon Benfield Analytics

## Increased purchasing in the United States

Industry data demonstrates that US insurers purchased proportionately more reinsurance in 2015, for the first time in several years. This trend has continued into 2016, driven by the improved economics and multiple uses of the coverage available in the current environment.

**Exhibit 6: Historical US non-affiliated reinsurance cession ratios**



Source: SNL

## Property catastrophe

Demand for property catastrophe protection is expected to remain relatively stable for January 2017 renewals, absent any material reinsured loss events. While certain regions affected by regulatory changes may look to secure additional capacity, overall demand change is expected to increase by approximately 5 percent across the market. That said, traditional placements continue to evolve, with more multi-year capacity in the market than ever before and continued movement towards cascading layers, increased reinstatement provisions at reduced costs and improved terms in many mature markets.

## Mortgage

The demand for (re)insurance of US mortgage default exposure continues to grow, driven by both new and existing cedents. Most of the (re)insurance purchased is driven by new regulatory capital requirements, most notably the PMIERS capital framework established by Fannie Mae and Freddie Mac to determine the mortgage insurance industry's capital adequacy, or FHFA's requirements that Fannie Mae and Freddie Mac continue to access private markets for credit risk transfer.

Notable recent developments include Arch's acquisition of United Guaranty to create the largest global mortgage insurer, National MI's announced purchase of a new mortgage insurance quota share program, and Fannie Mae and Freddie Mac's continued (re)insurance purchases, with nearly USD3 billion of limit purchased in the first six months of 2016.

## Cyber

Demand for cyber insurance coverage and product continues. With approximately USD1.7 billion in premium, nearly 90 percent of the market is based in the United States, with annual growth running at 30 to 50 percent. International growth will be driven by upcoming European Union regulations covering data protection that will become effective in 2018.

Demand for reinsurance continues to increase, driven by the evolving nature of the exposure, aggregate risk in certain industries and the potential for systematic exposure to certain large scale events. Additionally regulators and rating agencies are beginning to understand and evaluate exposure to cyber as a peril and product and continue to ask more detailed questions as portfolios grow.

Coverage for cyber has been secured through a broad spectrum of structures, including aggregate stop loss, proportional and per risk / event excess of loss. In addition, some insurers have elected to include coverage as a component of broader liability placements, as opposed to a standalone treaty.

## Crop

While a more mature market, crop insurance and reinsurance has returned to profitability in the US after a few difficult years. Growth in the line has mainly emanated from Asia with the Indian market seeing five times the insurance premiums for the 2016/2017 season compared to the year prior. Thailand has also seen positive growth, albeit not as significant.

Based on the growth and benefit seen from current plans, other Asian countries that do not currently have crop insurance schemes are looking to start up programs in the near future and these will also require international capacity.



## Major Rating Agency Criteria Drafts Released, More Changes Forthcoming; Impact = Slight Increase in Demand

Rating agencies continually fine-tune criteria to address industry trends and anticipate emerging issues, while improving their analytical approach and increasing transparency. In 2016, the significant criteria developments come from A.M. Best, with the draft criteria for a stochastic-based US P&C BCAR model and revised Best's Credit Rating Methodology (BCRM). Given that many companies use BCAR to set capital management strategies, the transition to the stochastic-based BCAR model will drive an increase in reinsurance demand to address potential shortfalls and align companies' capital management strategies with the new model. Somewhat tempering demand is the fact that many large companies are also rated by Standard & Poor's and have been managing to generally more conservative S&P capital requirements, including a 250-year net aggregate PML charge.

The following provides a brief overview of the draft criteria, attributes of companies most impacted, and expected timing of additional criteria and final implementation.

### A.M. Best Stochastic-based BCAR model

In March 2016, A.M. Best released draft criteria for the stochastic-based US P&C BCAR model and the revised BCRM. Rather than having one BCAR score, A.M. Best will calculate multiple BCAR scores at various confidence intervals. The output at the higher confidence levels will give A.M. Best insight into the point at which a company's surplus falls short of required capital. Initially, the five confidence intervals A.M. Best planned on publishing were 95 percent, 99 percent, 99.5 percent, 99.8 percent, and 99.9 percent. However, in a May update, A.M. Best noted concerns regarding use of extreme tail events, specifically 99.8 percent (500 year) and 99.9 percent (1,000 year) events with respect to measuring capital adequacy. They commented on the high level of model uncertainty at higher return periods and the lack of consistency across companies and geographies of capturing this level of tail risk, particularly in many developing markets.

Since the May briefing, A.M. Best has remarked that they plan to incorporate the probable maximum loss results at the 500 and 1,000 year return periods as a component of Enterprise Risk Management reviews. They will also introduce a 99.6 percent (250 year) confidence interval in the assessment of capital adequacy, which will be the new 'peak' capital requirement subject to a threshold score to meet the "Strongest" level of capital adequacy.

The table below provides a snapshot comparison of the current BCAR and new stochastic BCAR model differences. See our *Evolving Criteria Bulletin – Update on US P&C Stochastic BCAR Model* for a more detailed comparison.

	Current model	Stochastic-based model
<b>Capital adequacy ratio</b>	<p><u>Adjusted surplus</u> Net required capital</p> <p>BCAR minimum scores vary by rating level</p>	<p><u>Adjusted surplus – Net required capital</u> Adjusted surplus</p> <p>Redundant capital if score &gt; 0%</p>
<b>Confidence intervals</b>	---	95    99    99.5    99.6
<b>Catastrophe charge</b>	<p>250yr EQ or 100yr Wind</p> <ul style="list-style-type: none"> <li>By peril</li> <li>Reduction to adjusted surplus</li> <li>Net post-cat, VaR occurrence</li> </ul>	<p>20yr    100yr    200yr    250yr</p> <ul style="list-style-type: none"> <li>All perils</li> <li>Addition to net required capital, no covariance benefit</li> <li>Net post-cat, VaR occurrence</li> </ul>

Currently, A.M. Best deducts from surplus the greater of a 1 in 100 wind event or a 1 in 250 earthquake event on an occurrence basis. The new model will use an occurrence, all-perils view of catastrophe risk and the return period will vary by confidence interval (CI). The catastrophe risk measure will be added to net required capital as opposed to the current practice of subtracting it from surplus. While there are various moving parts to the rating framework, companies rated 'A-' or above would likely need to hold adequate capital to at least the 99.5 CI. As such, most companies will need to manage their catastrophe exposure at least to the 1 in 200 year return period.

The table below illustrates what a company's BCAR score means at the various confidence intervals. For example, a BCAR score of 20 points at the 99.5 CI and -5 points at the 99.6 CI would represent a "Strong" BCAR indicator. Aon Benfield believes that an appropriate minimum score requirement at the 99.6 CI to achieve "Very Strong" and "Strongest" BCAR is 10 (X) points and 30 (Y) points, respectively. Please note, A.M. Best has not released target scores for any rating level at this time.

Description	Amended proposed BCAR	ICR**	FSR**
Strongest	>Y* at 99.6	a+ / a	A
Very strong	>X* at 99.6	a / a-	A / A-
Strong	>0 at 99.5	a- / bbb+	A- / B++
Adequate	>0 at 99	bbb+ / bbb / bbb-	B++ / B+
Weak	>0 at 95	bb+ / bb / bb-	B / B-
Very weak	<0 at 95	b+ and below	C++ and below

\* A.M. Best indicated a certain amount of cushion would be required to achieve "Very Strong" or "Strongest" BCAR; this cushion has yet to be determined

\*\* Above mapping is companies with country risk tier assessments of '1' or '2'; Different mapping applies for CRTs '3', '4' and '5'

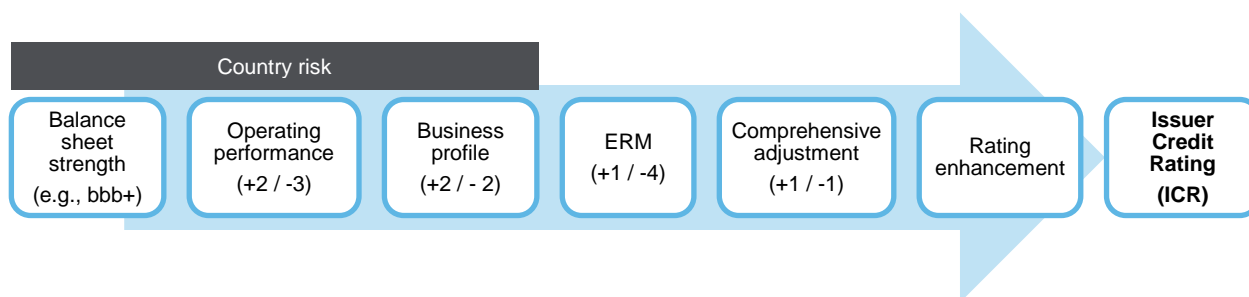
## Best's Credit Rating Methodology (BCRM)

The BCRM applies globally to all rated insurers. It is intended to increase transparency and provide insights on how companies are rated. This was open for an industry comment period through June 30, 2016 and will be re-opened later this year with the release of the Universal BCAR and Life & Health BCAR models.

A.M. Best assigns each rating unit an Issuer Credit Rating (ICR), which is then mapped to a Financial Strength Rating (FSR) based on the table below. Both the FSR and ICR are published, but the industry is generally more familiar with the FSR. Some FSR levels translate to multiple ICR's, therefore a company could be at the higher or lower end of the scale for that FSR rating level.

ICR	FSR
aaa / aa+	A++
aa / aa-	A+
a+ / a	A
a-	A-
bbb+ / bbb	B++
bbb-	B+
bb+ / bb	B

The BCRM report focuses on the determination of the ICR rating. First, a baseline ICR is selected after an assessment of balance sheet strength (including BCAR results). Next, that ICR can be adjusted either upward or downward by degrees of notches shown in the graph below for a company's operating performance, business profile, ERM, comprehensive adjustment and rating enhancement. For example, if a company started with a baseline ICR of 'bbb+' and the operating performance and business profile each yielded a +1, the ICR would move two notches to 'a'. If the ERM, comprehensive adjustment and rating enhancements were neutral, that company would have an 'a' ICR which translates to an 'A' FSR.



Source: Best's Credit Rating Methodology (BCRM): Global Life and Non-Life Insurance Edition – March 10, 2016

See our *Evolving Criteria Bulletin – Update on Best's Credit Rating Methodology* for more details.

## Impact of new criteria on ratings

A.M. Best has indicated they do not expect many rating upgrades or downgrades from the new criteria changes. However, some companies may be adversely affected by the change in the new BCAR model and/or new BCRM. Common attributes we see from companies most impacted include:

- Companies with low current BCAR scores relative to the rating level; they have less room to absorb the impact of more conservative factors under the new BCAR model, especially at higher confidence intervals
- Higher rated companies (A- or above) whose current catastrophe reinsurance program exhausts near the 100-year return period; they will likely see a material drop in capital adequacy at higher confidence intervals, which will influence A.M. Best's view of their balance sheet strength
- Companies with aggressive investment strategies or high asset leverage; the risk charges for common stocks and bonds are multiples of the current BCAR model

While BCAR remains only one component of the overall rating assessment, it is a key measure for balance sheet strength. Many companies use BCAR to set capital management strategies. As such, we believe the transition to the new stochastic-based BCAR model will drive an increase in reinsurance demand to address potential shortfalls and align their capital management strategy with new the model.

## Timeline—what comes next?

A.M. Best expects to release the Universal BCAR (non-US model) and the Life & Health BCAR model in October. This will include re-releases of the BCRM and US P&C BCAR model draft criteria. Additionally, A.M. Best will be updating all of their other criteria papers in the next year to conform to the new updates. This will include criteria for rating new company formations, terrorism, holding companies, surety, title, etc. A.M. Best anticipates a full adoption of all models and criteria in the second half of 2017.

## Regulatory Developments on the Horizon; Impact = Slight Increase in Demand

Regulatory developments remain an important topic for all companies. Many companies faced new regulatory requirements in 2016 such as Solvency II, C-ROSS and US Own Risk Solvency Assessment (ORSA) to name a few. Across all regions, regulators continue to increase the capital requirements by raising minimum capital standards, refining capital models, reevaluating catastrophe risk exposure, and expanding their reviews to assess risk management processes. The impact of these actions is closing the gap between rating agency and regulatory capital requirements. As such, we see pockets of the market where increasing regulatory requirements will push up demand for reinsurance in the near future.

### North America—ORSA development

Comparing to last year, five additional states joined the list of states with Own Risk Solvency Assessment (ORSA) legislations. As of the publication release date, 40 states adopted the ORSA requirements, while one additional state has pending legislations for adoption. The US National Association of Insurance Commissioners (NAIC) is anticipating all states will adopt the model act into law by end of next year. Approximately 200 reports were filed during 2015 and it is estimated 300 reports will be filed on an annual basis once the model act is adopted by all states.

For companies that filed their reports during 2015, state regulators are in process of providing feedback prior to the 2016 submissions. Among the key comments provided on 2015 reports, quantifying critical risk exposures and stress testing were highlighted. Companies were asked to articulate rationales for selecting particular stress event and demonstrate there is sufficient capital in stress scenarios.

#### **States adopted ORSA Model**

AL, AK, AR, AZ, CA, CO, CT, DE, FL, GA, HI, IA, IL, IN, KS, KY, LA, ME, MI, MN, MO, MT, ND, NE, NH, NJ, NY, NV, OH, OK, OR, PA, RI, TN, TX, VA, VT, WA, WI, WY

#### **States with actions pending**

MA

### US Risk Based Capital (RBC)—catastrophe risk charge

The NAIC is fairly close on adopting the final implementation date for the RBC catastrophe risk charge. The targeted effective timeframe is year-end 2017 reporting year, which will be filed in March 2018. Thus far, key approaches for calculating the RBC risk charge agreed upon by the NAIC include:

- Separate charge applied to 1-in-100 year modeled hurricane and earthquake loss net of reinsurance
- CAT charges subject to the covariance adjustment
- Contingent credit risk charge applied at 4.8 percent on reinsurance recoverable
- Allow companies to report both Aggregate Exceedance Probability (AEP) and Occurrence Exceedance Probability (OEP) modeled results

Prior to the catastrophe risk charge being officially included in the RBC formula, a few more aspects need to be finalized:

- Finalize models (internal and external) that can be used for filing purposes
- If additional perils (other than hurricane and earthquake) should be in the catastrophe risk charge
- Whether to add a factor to artificially increase OEP results to approximate AEP results

While the inclusion of a catastrophe charge lowers RBC results across the board, we estimate this only has a meaningful impact on approximately 1 percent of US companies. However, many Florida Homeowners companies will experience a material drop in RBC once the catastrophe risk charge is adopted and may likely consider increased of reinsurance to manage regulatory capital requirements.

## Europe—Solvency II

The Solvency II Directive (S2) came into effect across the European Union (EU) on January 1, 2016. It introduced a comprehensive program of regulatory requirements for (re)insurers, structured into three pillars – quantitative requirements, qualitative requirements and disclosure. These formally place the onus on EU (re)insurers to proactively manage their own risk and solvency position.

Under Pillar 1, required capital is calculated to a 99.5 percent confidence level over a one-year period, based on a dynamic approach valuing all assets and liabilities according to market-consistent principles. The solvency capital requirement (SCR) is therefore equivalent to the expected negative impact of a 1 in 200 year event. As well as insurance risk, the SCR covers market risk, credit risk and operational risk. It takes full account of any risk mitigation techniques applied by the (re)insurer and may be calculated using either a Standard Formula or an internal model validated by the supervisory authorities.

Pillar 2 relates to governance and supervision. As part of their risk management system, all (re)insurers must have a regular practice of assessing their overall solvency needs based on their specific risk profile, known as 'Own Risk and Solvency Assessment' (ORSA). Pillar 3 relates to disclosure and transparency. The new rules will require (re)insurers to disclose certain information publicly to a far greater extent than currently is the case.

After a long time in development, the introduction of the new solvency regime has proceeded relatively smoothly, albeit with the aid of certain 'transitional measures', designed mainly to help life insurers address the challenges of the low interest rate environment. The change was easiest for larger, more sophisticated (re)insurers that were already managing their businesses in accordance with S2 principles and with regard to the significantly higher capital thresholds required by the rating agencies. Many have achieved internal model approval, allowing them to benefit from diversification benefits in their SCR calculations. Smaller companies have found converting to the new regime more difficult. The pressure is greatest on unrated mutuals, monoline insurers and captives that lack diversification and do not have easy access to new funds.

The introduction of S2 has potentially important impacts on reinsurance supply and demand across the EU, as outlined below:

- S2 has been a catalyst for improved risk management across the EU (re)insurance industry, driven by the requirement for all firms to conduct an ORSA
- The mark-to-market nature of the regime has increased the volatility of capital positions
- EU firms underwriting capital-intensive products will increasingly use hedging strategies to mitigate their exposures
- High levels of uncertainty within legacy reserves drive higher regulatory capital requirements
- Capital loadings will discourage EU (re)insurers from buying cover from reinsurers based in a territory which is neither subject to S2 nor deemed S2 equivalent
- Currently only Bermuda, Japan, and Switzerland are deemed equivalent (negotiations between the EU and the US are in progress)
- EU cedents will need to carefully consider the extent to which any collateral posted by the reinsurer will enable it to take credit for the reinsurance
- Reinsurance will need to demonstrate genuine risk transfer, limiting some forms of financial reinsurance that have been used in the past
- S2 will recognize securitisation and derivatives as effective risk mitigation techniques, which could help to stimulate further interest from EU sponsors
- S2 formalises the advantages of large diversified groups, which may act as a catalyst for M&A

## Asia Pacific

The China Risk Oriented Solvency System (C-ROSS) was formally implemented effective January 1, 2016 and applies to all three pillars of C-ROSS: quantitative capital requirements, qualitative supervisory requirements, and market discipline mechanisms. Under C-ROSS, domestic reinsurers and off-shore reinsurers are treated differently for the cedent's credit risk capital calculation. The Reinsurance Registration System requires all reinsurers (and reinsurance brokers) who write inward business from China to register on a platform built and maintained by the China Insurance Regulatory Commission (CIRC). Cedents must select reinsurance counterparties only from those valid in the registration system. Treaty reinsurers must have secure ratings ('A-' minimum for leaders and 'BBB' minimum for followers). Certain exemptions may apply. In May 2016, CIRC and the Ministry of Finance published the plan to set up residential earthquake insurance scheme which provides households protection from loss caused by earthquakes and other secondary catastrophes initiated by tremors. Additionally, the CIRC began a nationwide commercial automobile de-tariff experiment in July 2016.

In June 2016, the Japan Financial Service Agency (JFSA) decided to conduct field tests covering all insurance companies, with the aim of considering the economic value-based evaluation and supervisory method. This is the third field test following prior tests conducted in June 2010 and June 2012. JFSA contemplates to implement the regime that is most suitable to the Japanese insurance market. A summary of the tests is expected to be published in March 2017.

Moving toward or enhancing RBC models is prevalent in many countries. In Hong Kong, the insurance industry is moving towards a RBC system with the original consultation paper issued by the Insurance Authority (IA) in September 2014 and the following Consultation Conclusions were made public in September 2015. Implementation dates have not been determined. The Insurance Regulatory and Development Authority of India (IRDA) set up a committee in June 2016 to study the approach to move towards RBC and liability valuation. In July 2016, the Monetary Authority of Singapore (MAS) issued the third RBC 2 consultation paper on proposed revisions to the RBC framework for insurers, taking into account feedbacks from the industry.

Evidence of increased protectionism is being seen in certain markets. For example, in Indonesia, new regulations require Indonesian insurers to place all reinsurance of motor, health, personal accident, credit, life and surety business with domestic reinsurers. In Vietnam, the Ministry of Finance (MOF) proposed in April 2016 a limitation on the amount of reinsurance placed overseas by stipulating a compulsory minimum retention level. Further to this proposal in July, the MOF issued a decree limiting foreign insurers placing reinsurance overseas.

Several countries are expanding regulation for catastrophe risk management. In Indonesia, new rules require that insurers must have an automatic reinsurance support including for catastrophic risk, although an insurer may be exempted if it has already established a catastrophe reserve. For this purpose, the minimum own retention must be under the assumption that the disaster risk event repeats every 250 years. In New Zealand, the Probable Maximum Loss ("PML") arising from earthquake catastrophes used in RBC calculation will be calibrated at 1 in 1000 years effective September 2016 (currently 1 in 750 years). In the Philippines, the Insurance Commission (IC) plans to lobby for mandatory insurance covering natural catastrophes as part of a disaster risk financing strategy.

## Latin America

In Argentina, a new administration in the Superintendencia de Seguros has led to increasing the minimum capital requirements for insurers and local reinsurers. Additionally, the local reinsurance market will likely return to a partial or totally open reinsurance market, as it was in the past. These will lead to an increase in both reinsurance demand and supply to the market.

In Brazil, 2017 sees the introduction of resolution CSN 322/2015, which increases the intragroup limitation from 20 percent to 30 percent and reduces the obligatory local reinsurer cession from 40 percent to 30 percent. This is just the start of progressive changes that will continue until 2020. Separately, A.M. Best recently lowered Brazil's country risk tier assessment from '3' to '4'. While this is not expected to affect any ratings, it will lead to higher asset capital charges for local companies.

Chile is about to release new regulations making it mandatory for all insurers to have a written reinsurance policy, which is properly supervised and approved by their boards. The adequacy of earthquake catastrophe reserve requirements based upon CRESTA zone exposures is also being reviewed. Any change in approach could impact reinsurance demand going forward.

There were no large changes for the Mexican market during 2016. Reinsurance continues being governed under LISF (Insurance and Surety Law) and the Unified Insurance and Surety Regulations (CUSF) established in April 2015 which incorporated Solvency II.

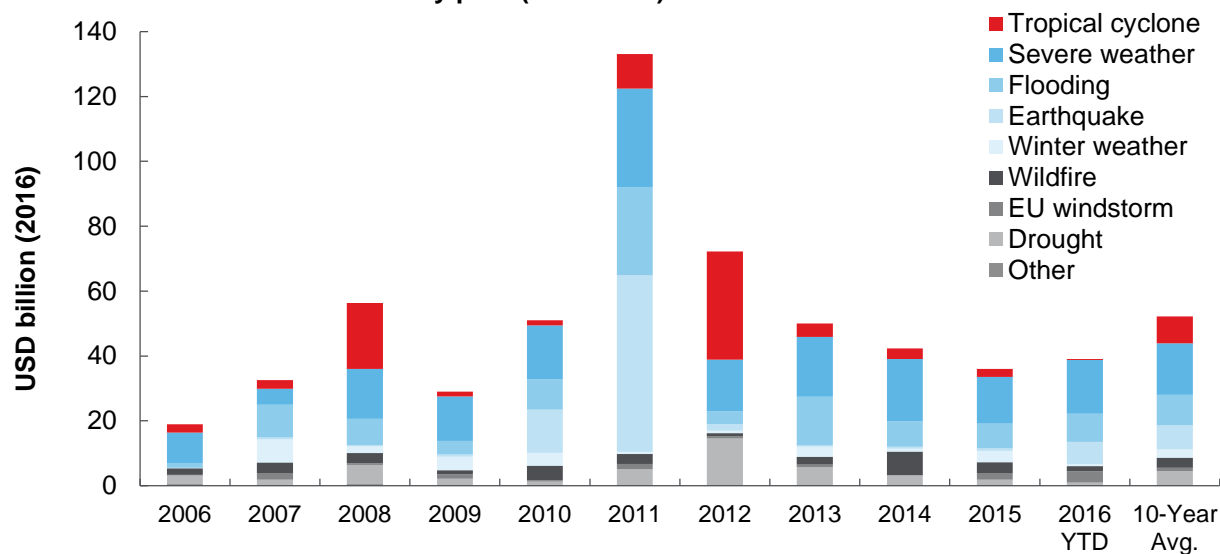


## Active Year Continues for Natural Disasters; Insured Losses Higher than 2015

As of September 1, insurable losses from global catastrophes remained at an elevated pace in 2016. Due to a series of major natural disasters this year, the public and private insurance industry has now sustained losses of USD39 billion. This is already more than the USD36 billion recorded in all of 2015. The preliminary USD39 billion tally, equals 75 percent of the annual average since 2006 (USD52 billion) and 78 percent of the average since 2000 (USD50 billion). The total is also 16 percent below the 10-year median (USD46 billion), but is equal to the median since 2000 (USD39 billion). Through the first eight months of 2016, the severe convective storm peril (USD17 billion) remains the costliest globally, with most of those losses occurring in the United States following an extremely active spring and summer season of thunderstorms. The majority of the thunderstorm-related losses resulted from hail.

Through the middle of Q3 2016, the costliest insured events included: April earthquakes in Kumamoto, Japan; late May and early June storms Elvira and Friederike in Europe; an early April US severe convective storm outbreak; and the May wildfire in Fort McMurray, Canada.

**Exhibit 7: Global insured losses by peril (2006-2016)**



Source: Aon Benfield Analytics

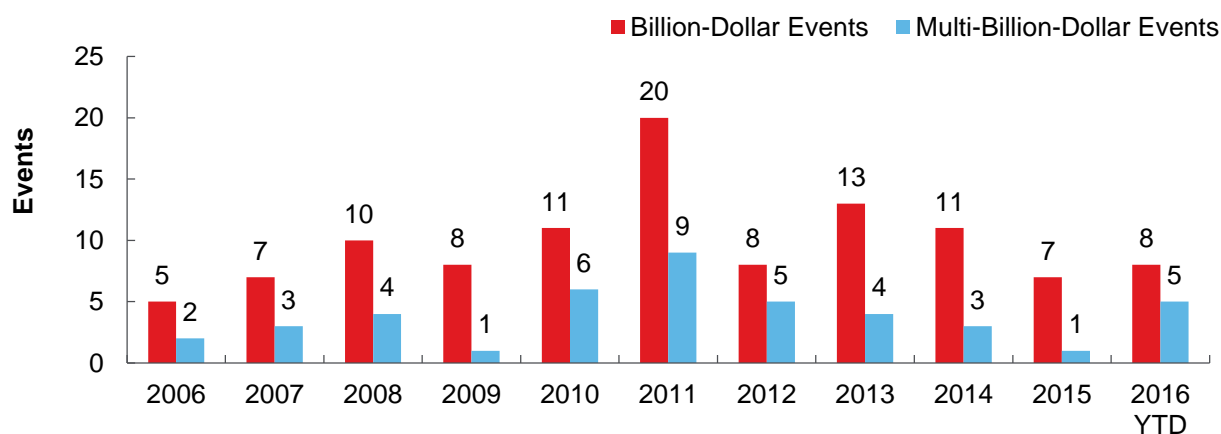
With four months left in the year, insurance-related catastrophe losses in 2016 are trending higher than the last few years. By comparison, based on what we published in our report at the same period in 2015 showed USD16 billion of losses. This year could put an end to a four-year downward trend in annual losses. With the peak of the Atlantic Hurricane Season and Western Pacific Typhoon Season upcoming, it would take just one catastrophic event to even further accelerate natural disaster losses this year.

One recent event that will add to the 2016 loss total is the magnitude-6.2 earthquake that struck central Italy's Umbria region in late August. Preliminary data indicates that this event will end up costing insurers hundreds of millions (USD), though it will be a mere fraction of the overall multi-billion-dollar economic cost. Homeowners insurance in this part of Italy does not typically cover earthquake damage, and the majority of residents do not own separate insurance policies.

With the uptick in insured catastrophe losses in 2016, it is worth putting the year into better perspective given the last several years of reduced losses since the peak year in 2011. The two exhibits below help explain where this year currently stands in comparison. While the number of billion-dollar insured loss events has primarily stayed consistent (after inflation-adjustment using the US Consumer Price Index) – despite the outlier year in 2011 – there has been greater fluctuations in the number of multi-billion-dollar events. At present, there have been five such events in 2016. This is the most since 2012.

After seeing a decline in both the global mean and median of disaster events since 2013, the losses thus far in 2016 are again elevated. The mean is currently USD409 million and the median is USD125 million. These statistics are based on insured events with losses minimally of USD25 million.

#### Exhibit 8: Global billion-dollar insured loss events



Source: Aon Benfield Analytics

#### Exhibit 9: Insured loss analysis (2006-2016)

Year	Costliest event	Costliest event insured loss	Global mean insured loss <sup>1</sup>	Global median Insured loss <sup>2</sup>
2006	US Drought	2.8 billion	345 million	139 million
2007	WS Kyrill	7.2 billion	595 million	229 million
2008	HU Ike	16.6 billion	802 million	250 million
2009	WS Klaus	3.8 billion	507 million	257 million
2010	Chile EQ	9.4 billion	550 million	164 million
2011	Japan EQ	37.4 billion	1.9 billion	375 million
2012	HU Sandy	31.2 billion	1.2 billion	156 million
2013	Central Europe Flood	5.4 billion	541 million	205 million
2014	Japan Snow Storm	3.9 billion	344 million	114 million
2015	US Winter Storm	2.1 billion	271 million	101 million
2016 YTD	Japan EQ	5.5 billion	409 million	125 million

For the most up-to-date global catastrophe loss data for 2016, and other historical loss information, please visit Aon Benfield's Catastrophe Insight website: [www.aonbenfield.com/catastropheinsight](http://www.aonbenfield.com/catastropheinsight)

<sup>1</sup> Based on events solely with insurable losses ≥USD25 million

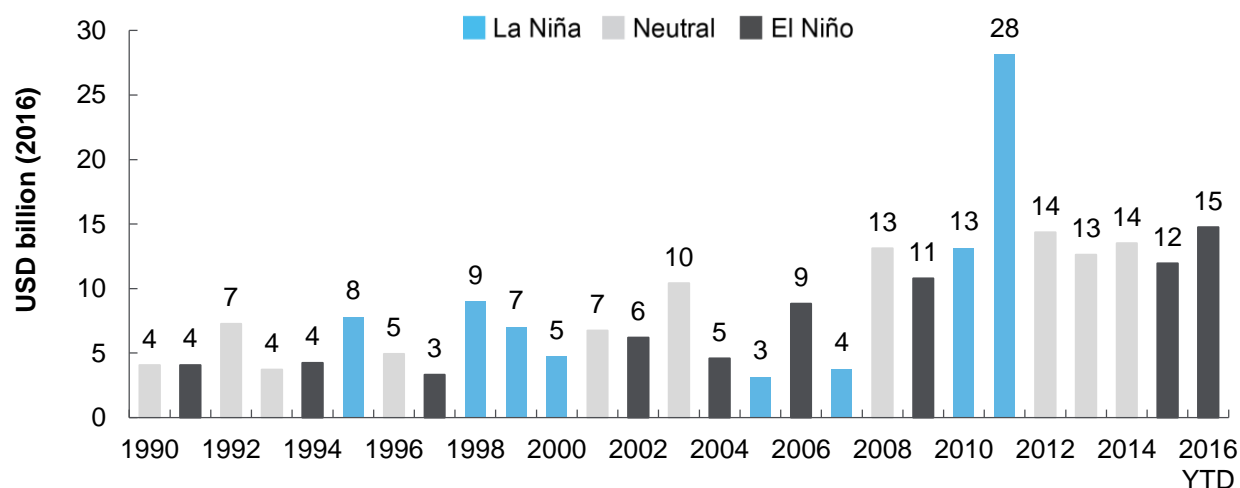
<sup>2</sup> Based on events solely with insurable losses ≥USD25 million

## How might the next La Niña impact SCS losses for US insurers?

While the United States has gone through a record stretch without a major hurricane landfall (Category 3+)—nearly 11 years—it has not necessarily meant that the insurance industry has seen a decline in catastrophe losses. In fact, losses incurred by the private sector and public insurance entities such as the US Department of Agriculture’s Risk Management Agency (RMA) crop insurance program have continued to dominate the majority of insurable global natural disaster losses throughout the past decade. Much of the loss during this time has occurred due to the severe convective storm (SCS) peril.

Following a record year in 2011 that saw more than USD28 billion in insurable losses in the United States due to catastrophic tornadoes, large hail and damaging straight-line wind events, the industry has continued to face greater costs. The annual rate of growth for the peril has been 5.2 percent since 1990; and since 2006, the rate of growth has been an accelerated 7.2 percent above the rate of inflation.

**Exhibit 10: US severe convective storm insured losses by year**



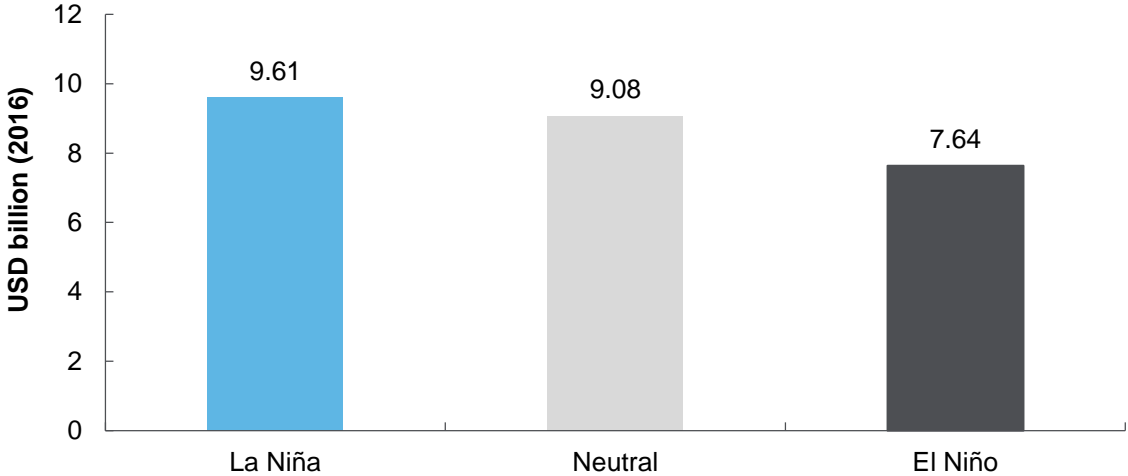
Source: Aon Benfield Analytics

Despite largely static growth in the overall frequency of local storm reports cited by the Storm Prediction Center (SPC) during the past decade, Exhibit 10 shows the positive annual growth trend in SCS losses. In fact, the US has now recorded more than USD10 billion in insurable losses from the SCS peril since 2008. Prior to 2008, the country had only reached that total once (2003). Partial explanations for this increase can partially be attributed to greater intensity of SCS events as well as increased population, continued urbanization, and more widespread exposure. When all of these factors are combined, it can often lead to greater loss per event.

With all of these ideas in mind, it is worth diving deeper into the data to better understand any common trends. One popular question often asked by the insurance industry is: What does the arrival of an El Niño or La Niña mean for the United States and severe weather loss risk? With the globe exiting one of the strongest El Niño phases on record and currently in the midst of slowing transitioning to an expected La Niña by the end of 2016 into early 2017, this is a pertinent question to ask. A study of historical SPC storm report data dating to the early 1950s indicates that there is no statistically significant difference in the overall number of storm reports when broken down by ENSO type. However, there are differences in the regional location of where the expected frequency of severe weather (tornadoes, hail, straight-line winds) may be more prevalent.

For La Niña conditions during the winter months – when ENSO conditions are typically at their strongest – there has historically been a greater risk of enhanced severe convective storms in an area extending from the Gulf Coast to the Great Lakes. A 2007 study written by co-authors at the Storm Prediction Center determined that while there is typically no large increase in the number of tornado counts, there is a statistically significant trend for stronger and longer-track tornadoes to occur. This is also true during ENSO-neutral winters. La Niña additionally tends to lead to more hailstorms in parts of the Plains, including states such as Oklahoma, Texas and Kansas. During El Niño phases, these higher frequent impact regions often endure more suppressing atmospheric conditions that limit thunderstorm genesis.

**Exhibit 11: Average annual US SCS insured losses by ENSO phase (1990-2016)**



Source: Aon Benfield Analytics

When analyzing the breakout of insured SCS losses by ENSO type, it is found that La Niña years have annually averaged nearly USD2.0 billion more per year than El Niño. As a reminder, the record year in 2011 was a La Niña year. However, it is interesting to note that of the 10 costliest years since 1990, five of those years were marked by ENSO-neutral conditions. The other five included three during El Niño and just two during La Niña.

Perhaps the most important takeaway is that if the right atmospheric conditions are present, significant severe convective storm episodes can happen regardless of what time of year or ENSO phase. When it comes to the accumulation of storm losses and financial impacts to the insurance industry, the event location is the greatest concern.

## Forecasters: Slightly More Tropical Cyclones Expected in the Atlantic Ocean

The three main hurricane season prognosticators (National Oceanic and Atmospheric Administration (NOAA), Colorado State University (CSU) and Tropical Storm Risk (TSR)) have released updated Atlantic Hurricane Season forecasts, and each agency continues to predict near-normal or slightly above-normal hurricane activity. Each agency cites uncertainties surrounding the timing from a transition from ENSO-neutral conditions to the arrival of a weak La Niña in the Central and Eastern Pacific Ocean by the end of the year. This should lead to more favorable atmospheric and oceanic conditions in the main development region of the Atlantic Ocean for cyclogenesis.

### Exhibit 12: Atlantic Hurricane season forecast

	Named storms	Hurricanes	Major hurricanes
<b>TSR (August 2016)</b>			
1950-2015 average	11	6	3
2016	15	7	3
<b>CSU (August 2016)</b>			
1981-2010 median	12.0	6.5	2.0
2016	16	6	2
<b>NOAA (August 2016)</b>			
1981-2010 average	12	6	3
2016	12-17	5-8	2-4

Source: Tropical Storm Risk (TSR), Colorado State University (CSU), NOAA

## Case Study: China Flood Events

The first eight months of 2016 have already seen the worst flood event in China since 1998. The most prolific flood event occurred across the Yangtze River Basin Region from May through July that left many areas enduring catastrophic inundation. This year's flood event left at least 475 people dead in 11 provinces and more than 500,000 homes damaged or destroyed. The floods were triggered by particularly heavy seasonal 'Mei-Yu' rainfall that was enhanced by lingering impacts from El Niño. These torrential rains led to extensive river flooding in parts of Anhui, Zhejiang, Fujian, Jiangxi, Hubei, Hunan, Guangxi, Chongqing, Sichuan, Guizhou, and Yunnan. Combined economic losses reached USD28 billion across the 11 affected provinces.

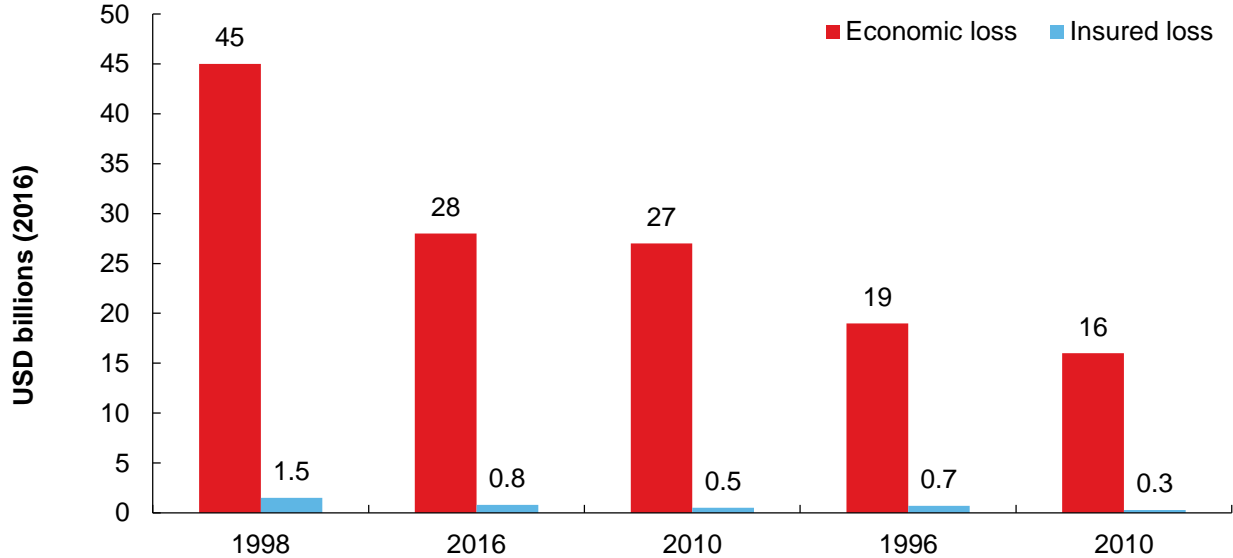
To date, the 2016 Yangtze River Basin floods are the second costliest flood event on record in China, only behind the devastating floods of 1998. The third costliest flood event to affect the basin occurred during the summer months of 2010. It is interesting to note that all three of these events were preceded by moderate to very strong El Niño events while the 1998 and 2010 floods were followed by moderate La Niña events. At this time, the forecast models continue to indicate the possibility of a La Niña event developing by the end of 2016 or early in 2017. Intriguingly, the correlation between ENSO-phase (i.e. El Niño and La Niña) and summer precipitation over China is weak and has been shown by climate scientists to not be statistically significant.

Despite the exceptional overall economic cost from the 2016 Yangtze River Basin flood, only a small fraction of the damage will end up being covered by insurance given very low penetration levels in China. In two of the hardest-hit provincial regions this year – Hubei and Anhui – total combined losses were nearly USD10 billion. Latest data from the China Insurance Regulatory Commission (CIRC) indicated that more than 52,000 claims were filed in the two provinces with total payouts at roughly USD150 million. This suggests that slightly less than two percent of all losses were covered by insurance, and the bulk of those claims were related to agricultural losses.

The large disparity between economic and insured losses in China highlights a common theme across many Asian countries: the lack of insurance penetration. As populations and urbanization continues to increase in these regions, there is also rapid growth of exposures. With insurance penetration levels remaining very low, this leaves many areas of the continent highly exposed to losses when large natural disasters strike.

China is an emerging market for the insurance industry and as of 2014 insurance penetration in China was just 3.2 percent. (Life insurance accounted for 64 percent of the market while non-life insurance accounted for the remaining 36 percent). This was significantly lower than the global average of 6.2 percent but slightly higher than the average rate throughout the emerging Asian markets (3.1 percent). From 2009 to 2014, in terms of gross written premiums, China's insurance sector showed a compound annual growth rate of 12.5 percent. Past large flood events in Asia have had large impacts on the insurance markets in the affected territory. For example, following the historic flooding in Thailand in 2011, the growth in treaty and facultative premiums ceded the following year (2012) was 35 percent.

Exhibit 13: China top 5 economic flood loss events



Source: Aon Benfield Analytics





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