Aon Benfield

Reinsurance Market Outlook

Hurricane Harvey Highlights Protection Gap

September 2017

Empower Results®

Contents

Executive Summary: Hurricane Harvey Highlights Protection Gap

Hurricane Harvey came ashore in Texas on August 25, becoming the strongest hurricane to make landfall in the US since 2004. Catastrophic flooding across a broad section of eastern Texas and into southern Louisiana has caused significant property damage and disrupted industrial production and supply chains.

There is a very human dimension to this natural disaster, given the low proportion of homeowners in the affected areas that have insurance coverage for flood. Beyond the immediate financial distress, it is already clear that economic losses will far exceed insured losses. As a result, the burden will ultimately fall mainly on US taxpayers.

Sadly, this is just the latest manifestation of a global protection gap. Economic development and demographic trends are generating new concentrations of exposure, often in areas subject to natural catastrophes and at a time of increasing event frequency. Product delivery has lagged the changing needs of corporate buyers in developed markets and personal lines coverage of natural disaster risk remains patchy. In emerging markets, insurance penetration rates generally remain very low. On a global basis, emerging areas of risk such as cyber are presenting the insurance industry with new challenges.

And yet the insurance industry is widely held to be over-capitalized and new investors are actively seeking access to diversified insurance risk. In fact, the first half of 2017 was notable for a renewed surge of alternative capital, which impacted the mid-year reinsurance renewals and is now finding its way into the primary market.

Sustained growth in reinsurance demand is dependent upon increasing the relevance of insurance to the global economy. Although alternative capital is not expected to have a material impact on the protection gap in the short-term, it potentially presents an opportunity to grow what is insurable and create new products that can address some of the underlying issues.

In the meantime, reinsurance continues to prove its worth as a means of mitigating earnings volatility, controlling peak exposures, addressing reserving risk and providing capital relief. There is every reason to believe that it will have a growing role to play, as capital becomes better matched to risk.

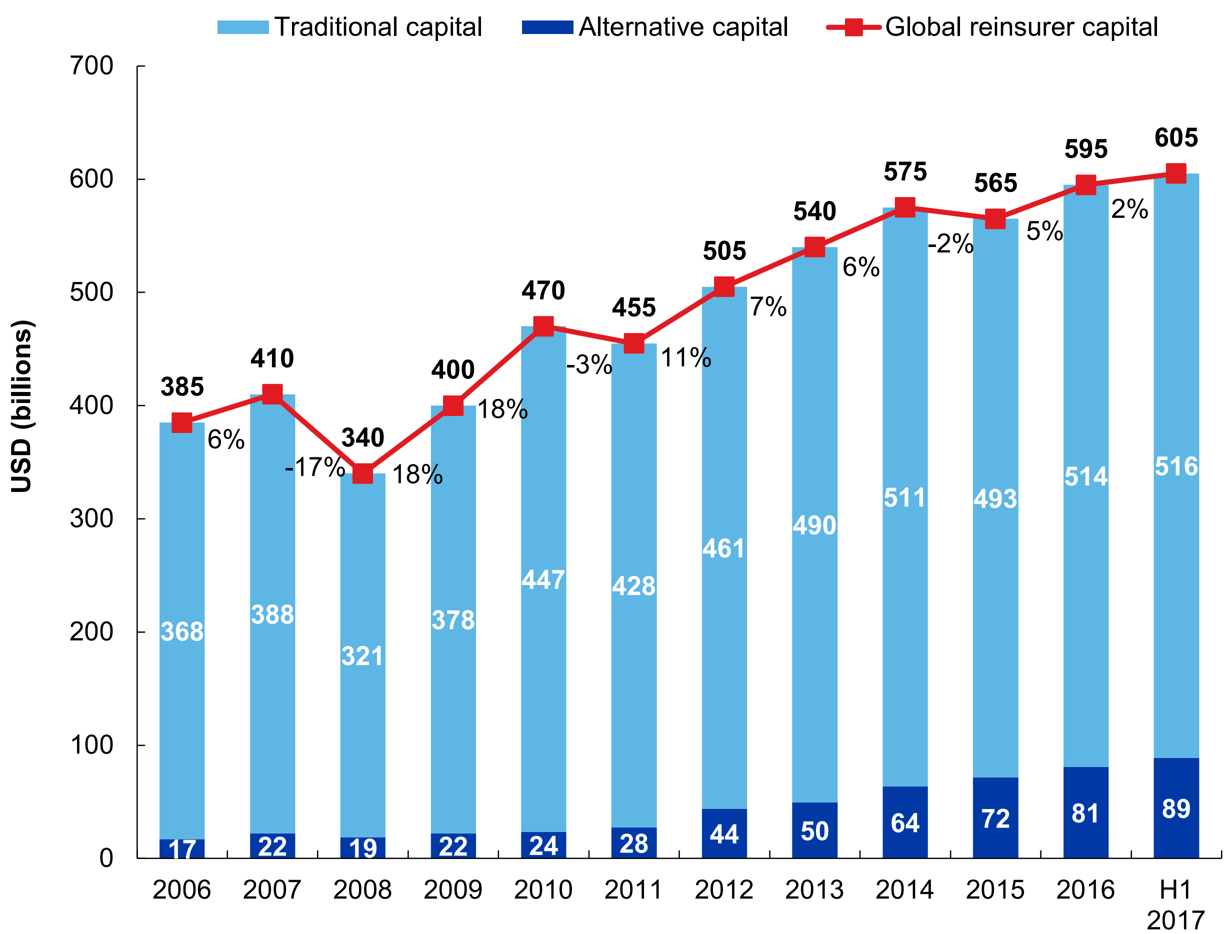
Reinsurance Supply

Global reinsurer capital

Aon Benfield estimates that global reinsurer capital stood at a peak level of USD605 billion at June 30, 2017, an increase of 2 percent relative to the end of 2016. This calculation is a broad measure of the capital available for insurers to trade risk with.

Traditional capital rose marginally to USD516 billion over the six months to June 30, 2017, solid earnings being offset by the payment of final dividends. Alternative capital rose by 10 percent to USD89 billion, reflecting renewed investor appetite for insurance risk.

Exhibit 1: Change in global reinsurer capital

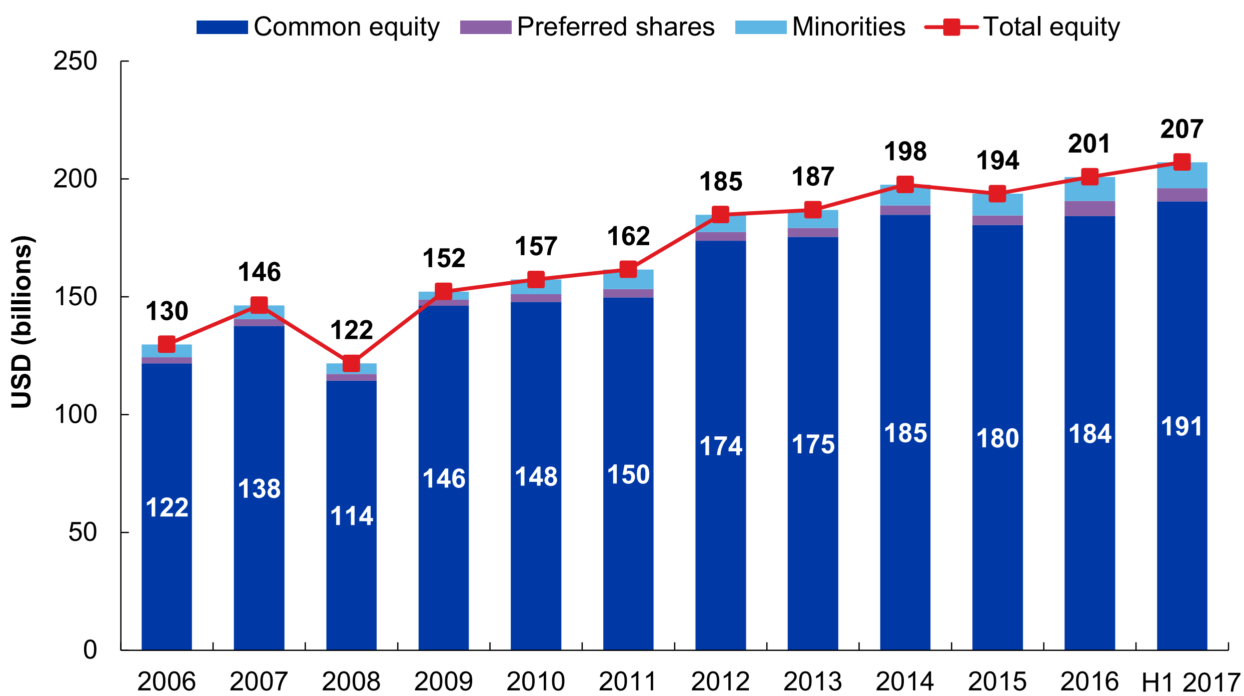


Source: Aon Benfield Analytics

Traditional capital

Recent years have seen a significant build-up of industry capital, as more stringent rating agency and regulatory requirements have coincided with low inflation and an absence of significant reinsured catastrophe losses in the US. Strong retained earnings, coupled with substantial unrealized gains on bond portfolios related to quantitative easing by central banks, have resulted in traditional equity capital growing by more than 40 percent over the past decade. The 21 major reinsurance groups forming the Aon Benfield Aggregate[1] (ABA) reported total equity growth of 59 percent (an increase of USD77 billion), additionally reflecting the impact of consolidation within the sector.

Exhibit 2: Change in ABA capital



Source: Aon Benfield Analytics

[1] The Aon Benfield Aggregate comprises 21 major reinsurers domiciled in developed markets that write approximately 50 percent of global property and casualty reinsurance premium on a combined basis.

Alternative capital

At the same time, the low interest rate environment has prompted investors to seek returns from alternative asset classes, particularly those that exhibit low correlation with the broader capital markets. This has resulted in new inflows of often lower-cost capital to the sector.

Capacity provided directly by capital markets investors has more than tripled since 2011. The bulk of this capital is being provided via dedicated ILS funds, the largest of which are shown below.

Exhibit 3: Leading ILS fund managers

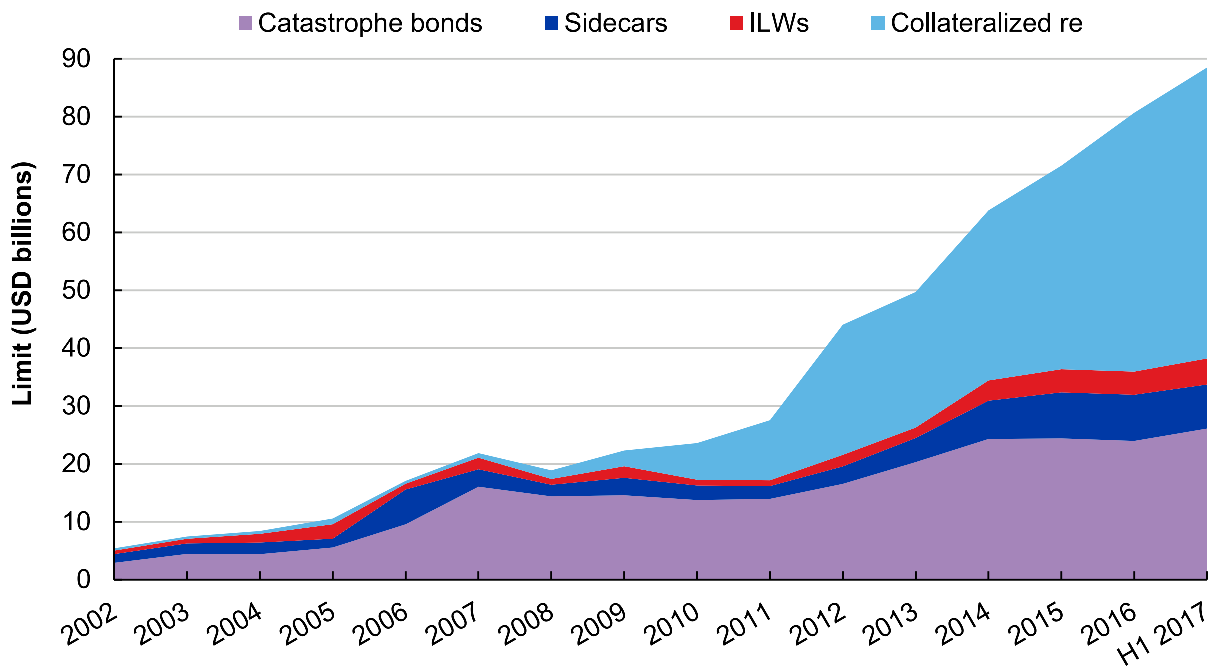
	Assets under management (USD billion)			
Manager	**January 2015**	**January 2016**	**January 2017**	**June 2017**
Nephila Capital	10.0	9.5	10.2	10.5
Credit Suisse ILS	6.5	6.5	7.5	8.6
LGT ILS Partners	4.1	5.2	6.5	7.0
Stone Ridge Asset Management	3.0	4.4	5.1	5.7
Fermat Capital Management	5.1	4.8	5.2	5.4
Securis Investment Partners	3.2	3.5	4.1	4.6
Markel CATCo	2.8	3.2	4.3	4.5
Leadenhall Capital Partners	1.8	2.4	3.5	4.2
Twelve Capital	3.5	3.5	3.5	4.0
Aeolus Capital Management	2.7	2.5	3.0	3.2
AlphaCat Managers	1.9	2.4	2.7	3.1
Elementum Advisors	1.9	2.5	2.9	3.0
Schroder Investment Management	1.4	1.7	1.9	2.5
RenaissanceRe Holdings	1.8	1.5	1.8	1.7
Pioneer Investments	1.0	1.4	1.7	1.7
Total	**50.7**	**55.0**	**63.9**	**69.7**

Source: Company data

Since the financial crisis, the investor profile has shifted away from investment banks and hedge funds seeking opportunistic returns, towards pension funds, sovereign wealth funds and high net worth individuals viewing insurance risk as a long-term, diversifying strategy. Meeting their broader needs has obliged ILS fund managers to invest in personnel with technical underwriting backgrounds and strong market relationships. As a result, the sector is showing increasing maturity and sophistication.

Alternative capital plays a significant role in the global retrocession market and its influence is growing in the global property catastrophe reinsurance market. Deployment is also being seen in specialty lines and the US commercial property insurance market, as larger ILS fund managers look to achieve cost savings and build a larger investible universe.

Exhibit 4: Deployment of alternative capital

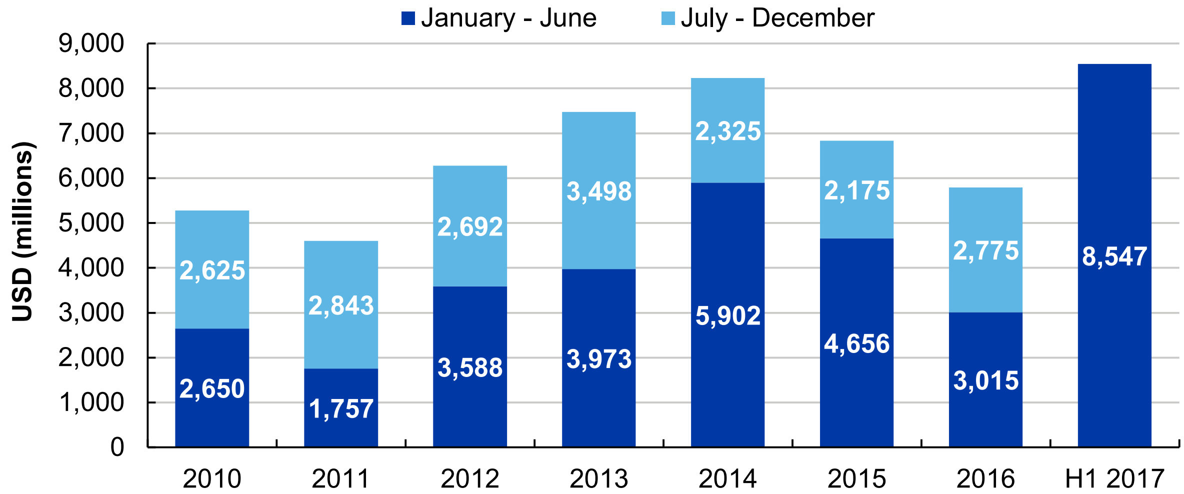


Source: Aon Securities Inc.

Catastrophe bonds

Rule 144A catastrophe bonds securing USD6.2 billion of limit matured in the first half of 2017. Strong investor appetite for new issuance drove returns on expected losses to near all-time lows, attracting three new sponsors and allowing new and renewing transactions to grow in size. As a result, more than USD8.5 billion of limit was placed, beating any prior full-year total, taking limit outstanding to a new high of USD26.1 billion at June 30, 2017. This growth has been supplemented by further expansion of private catastrophe bonds, as flexibility and cost savings attract new sponsors to this area of the market.

Exhibit 5: Catastrophe bond issuance



Source: Aon Securities Inc.

Peak zone exposure in the US continues to dominate. Almost two-thirds of the new issuance related to some type of aggregate structure and a similar proportion was placed on an indemnity basis. Six different public entities returned to the market, demonstrating alternative capital's continuing role in supporting the privatization of public risks. Evolution continues, with new perils and structures being tested, including for example European flood.

Collateralized reinsurance

Catastrophe bonds have gained all the recent headlines, but collateralized reinsurance has been the real area of growth over the past ten years. In various different forms, this product now supports more than USD50 billion of annual limit placed.

The expansion reflects investors' demand for broader risk exposure, coupled with cedents' desire for diversification of reinsurance arrangements beyond the 'promise to pay'. For buyers, these deals look and feel similar to traditional placements (particularly if fronted by a rated carrier) and tend to offer broader coverage than catastrophe bonds, at lower cost. The complication is that the actual risk-bearers tend to be non-rated, thinly-capitalized special purpose vehicles and that the availability of the supporting collateral is dependent on the language in a separate trust agreement.

Sidecars utilized by reinsurers to enhance their business positions and lower their overall cost of capital, currently engage around USD8 billion of alternative capital. A further USD4 billion is committed to supporting industry loss warranties (ILWs).

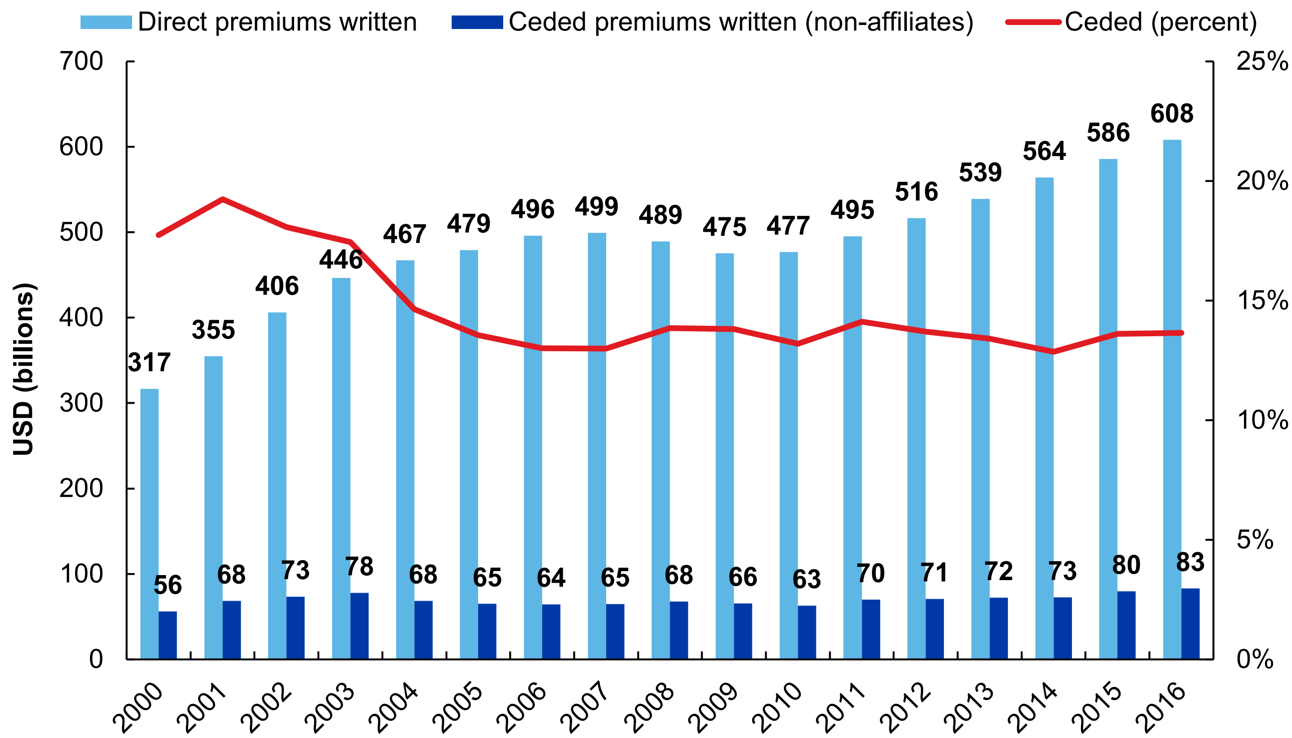
Reinsurance Demand

A modest upturn

Global demand has remained broadly flat over the last decade. Developed economies have seen limited underlying exposure growth and rationalized buying approaches among larger cedents have taken risk out of the market. However, the need for greater capacity in developing economies has provided an offset, driven by infrastructure spending and increasing insurance penetration.

More recently, a modest upturn in global demand has been noted, influenced to some extent by the improved economics of reinsurance-purchasing. This can be seen in the development of non-affiliated reinsurance cession ratios in the US market, as shown below.

Exhibit 6: US cessions to non-affiliated reinsurers



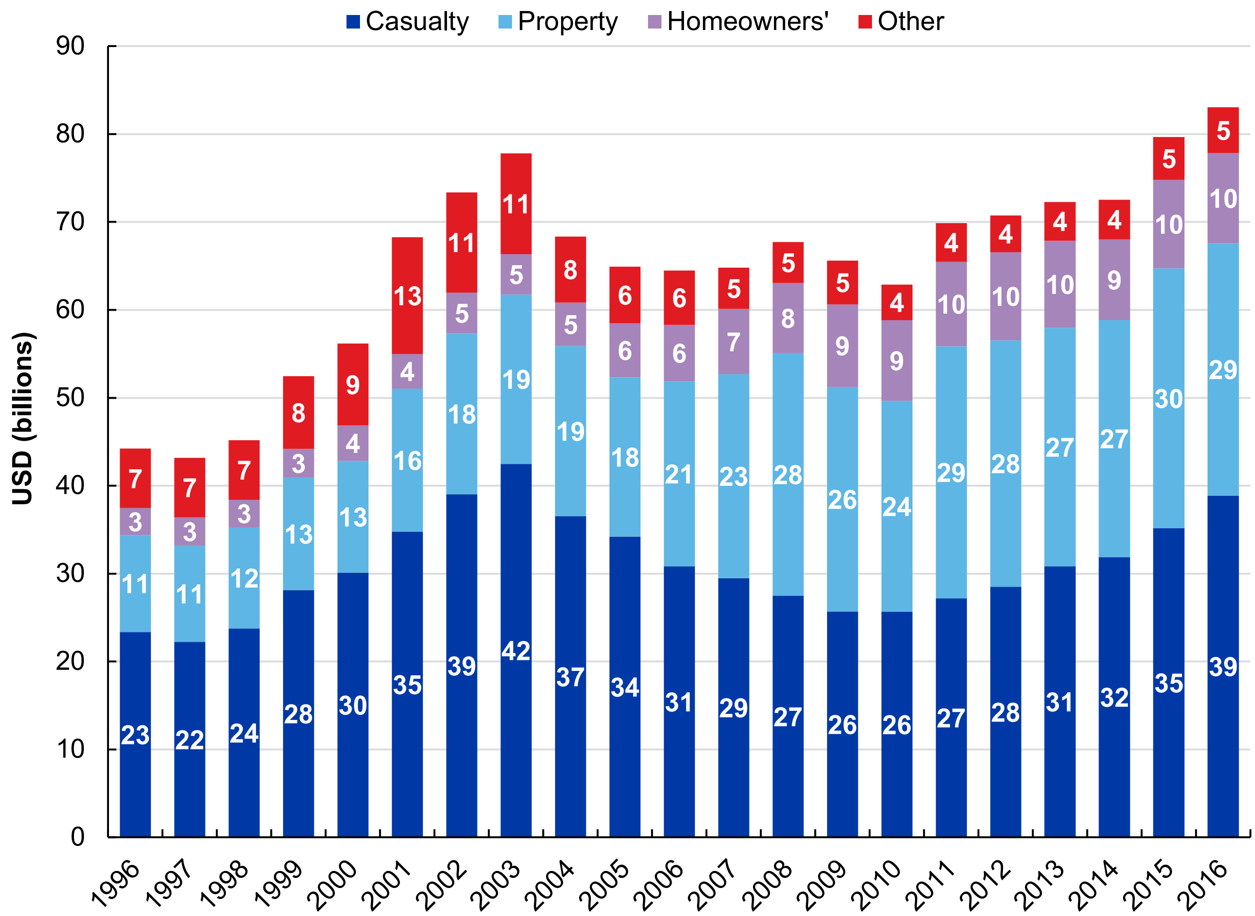
Source: S&P Global Market Intelligence

A principal driver has been the introduction of Solvency II and other risk-based capital regimes, which fully recognize the beneficial impact of reinsurance on cedents' capital positions. As well as bringing a more strategic approach to reinsurance-buying, this has sharply increased demand for retroactive solutions that mitigate charges for reserving risk, in both the life and non-life markets.

Another factor has been new and emerging areas of risk transfer. Aon Benfield continues to play a leading role in generating reinsurance capacity to support mortgage credit and cyber business. Most ceded cyber premiums currently relate to US-domiciled risks, but regulatory pressure and heightened risk awareness are now expected to drive significant primary growth in Europe and Asia. Other areas of expansion include agriculture (particularly in India), flood and annuity reinsurance.

Recent demand growth in the US market has been focused in casualty lines, as shown below.

Exhibit 7: US non-affiliated cessions by class of business



Source: S&P Global Market Intelligence

Two additional factors are expected to stimulate additional demand for property reinsurance going forward. The first is A.M. Best's transition to a new methodology and stochastic-based BCAR model by the end of 2017. Companies most likely to be affected include those with low current BCAR scores relative to their rating level, higher-rated companies whose current catastrophe reinsurance program exhausts near the 100-year return period, companies with aggressive investment strategies or high asset leverage, thinly-capitalized health companies and annuity writers.

The second factor is the inclusion of a specific catastrophe charge in the US Risk Based Capital model, which will apply from 2017 full-year reporting. This will lower RBC for most catastrophe-exposed companies, but is expected to have a meaningful impact in only a limited number of cases.

Growing the market

Fundamentally, significant growth in reinsurance demand is dependent on increasing the relevance of insurance to the global economy. Huge swathes of uninsured risk in both developed and developing markets present a tantalizing opportunity for the industry to fully deploy its capital and risk management know-how, over the longer-term.

Uninsured populations exposed to natural disasters and severe weather events are growing, increasing the post-event refinancing burden for hard-pressed national governments. At the same time, commercial insurers are adjusting to a world in which corporate buyers are just as worried about supply chains, intellectual property and reputational risk as they are about tangible assets.

Awareness of the economic damage resulting from natural disasters is growing. The private sector has had some recent success in assisting individual governments and supra-national agencies with the creation of schemes that expand insurance coverage and provide risk transfer. Potential opportunities for further involvement are summarized below.

- In the US, the federally-backed National Flood Insurance Program is due to expire at the end of September. The already heavily indebted scheme will be heavily impacted by Hurricane Harvey.

- In August, the Monetary Authority of Singapore reported that member states of the Association of Southeast Asian Nations aim to substantially liberalize access to catastrophe reinsurance by 2019. Less than 5 percent of economic losses in developing Asia were said to be insured.

- Also in August, it was disclosed that a new catastrophe risk insurance program was being launched by the Government of the Philippines, supported by the World Bank and the UK Department for International Development.

- In July 2017, it was announced that the World Bank was working with the UK and German Governments to set up the London Centre for Global Disaster Protection, with a view to fostering insurance solutions and risk management for developing countries. This coincides with the introduction of a new regulatory framework governing London-based ILS business.

- In June 2017, the Chinese authorities called for improved catastrophe risk management in China, underpinned by both traditional and alternative risk transfer. The government subsequently disclosed that natural disasters in July alone had cost USD20 billion.

Outlook for January Renewals

Alternative capital competing strongly

Growing investor engagement allowed the alternative capital sector to compete strongly at the mid-year renewals. Against a backdrop of record catastrophe bond issuance, ILS fund managers offered increased collateralized capacity at decreased pricing margins and expanded coverage relative to prior years, with pressure exerted internationally, as well as in the US. At the same time, there were few signs of withdrawal in the traditional market. Absent further extreme events, and based on the capital position of the industry and results in the first half of 2017, most cedents are likely to find the marketplace accommodating at the January 1 renewals.

What could change the dynamics?

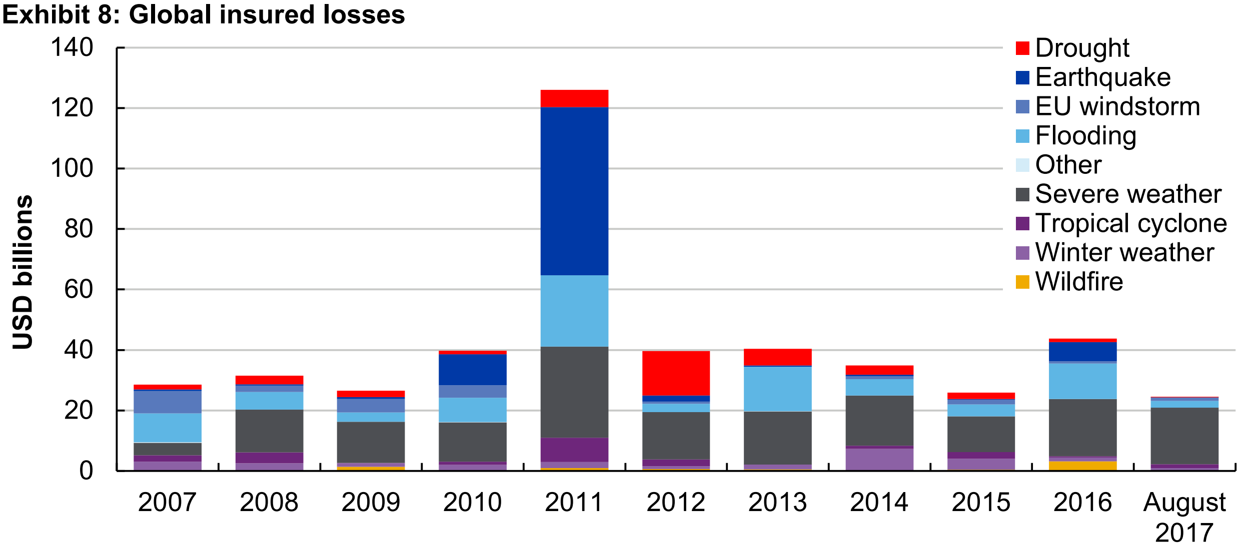
Only a fundamental shift in the balance of supply and demand will drive higher reinsurance pricing on a sustainable basis. Given that the expected increase in demand is expected to take time to materialize, this will only happen if a significant amount of capacity is forced to leave the market. There are three main ways in which this can happen: substantial losses, rapid movement in interest rates, or changes in market structure that cause constraints in supply.

Insured losses

Balance sheet impairment can result either from adverse prior year reserve development, or from very large catastrophe events. Low inflation and generally benign loss trends have allowed most major reinsurers to establish long-term track records of favorable reserve development over the past decade. The level of release is now dwindling, but there is little sign of near-term stress from this direction.

Based on preliminary figures pre-Hurricane Harvey, insured losses during the first eight months of 2017 totaled USD24.5 billion, representing only 56 percent of the prior 10 year average for this period. Severe weather continued to generate the largest share of losses at USD18.7 billion, of which nearly 90 percent occurred in the US. Typically relating to smaller events, this loss activity tends to be more heavily contained within insurer retentions, resulting in lower loss levels ceded to reinsurers.

Exhibit 8: Global insured losses



Source: Impact Forecasting

While the last 10 years have resulted in below average tropical cyclone insured losses, August and September remain the peak periods for this activity. The three leading commentators recently revised their forecasts and now expect this year's Atlantic hurricane season to see above-average levels of activity, as shown below.

Exhibit 9: Atlantic hurricane predictions

	Named storms	Hurricanes	Major hurricanes
TSR (May 2017)			
1950-2016 average	11	6	3
2017	17 (+3)	6 (same)	3 (same)
CSU (June 2017)			
1981-2010 median	12.0	6.5	2.0
2017	16 (+2)	8 (+2)	3 (+1)
NOAA (May 2017)			
1981-2010 average	12	6	3
2017	14-19 (+3-2)	5-9 (same)	2-5 (+0-1)

Note: Values in parentheticals indicate the change since the predictions included in our July Reinsurance Market Outlook
Sources: Tropical Storm Risk (TSR), Colorado State University (CSU), National Oceanic and Atmospheric Administration (NOAA)

The industry has proved itself to be very resilient over the last decade, a period that includes a major global financial crisis and the all-time record year for insured catastrophe losses (2011). Reinsurers are actively managing their catastrophe exposures and most of the larger players currently trade with extremely strong capital adequacy. It will therefore require an extraordinary loss event, or combination of events, for capacity to be materially impaired.

For context, Standard & Poor's (S&P) recently estimated that, across companies they rate, the 1-in-250-year modelled annual aggregate net loss had declined to an average of 30.0 percent of total equity in 2017, from 31.5 percent in 2016. Higher reliance on retrocession has contributed to this trend, with around 40 percent of exposure being retroceded, on average, at this return period. S&P's stress tests indicate that such a loss could reduce the capital adequacy of the reinsurance industry to a level commensurate with a rating in the 'A' category, from its currently extremely strong ('AAA') position.

The pricing impact of any major loss is determined largely by its timing and the extent to which it was previously contemplated. Losses that challenge modelling assumptions and/or tie-up material amounts of collateral have the potential to create the most disruption. Material capital waiting on the side-lines is likely to be deployed quickly should such an opportunity present itself.

Interest rates

The capital markets appear calm, but uncertainty is widespread, geo-political risk has increased and central bank policy is beginning to diverge.

The International Monetary Fund (IMF) continues to expect a pick-up in global growth, from 3.2 percent in 2016, to 3.5 percent in 2017 and 3.6 percent in 2018. Growth projections for the US and the UK have declined since April, while those for the euro area, Japan and China have been revised upwards. Excluding the effects of Brexit-related devaluation in the UK, inflation in advanced economies remains subdued and generally below target.

The US Federal Reserve has implemented two rate rises so far in 2017. A third is expected before the year-end and initial moves towards a normalization of monetary policy are possible within the same timeframe. On July 11, JPMorgan Chase CEO Jamie Dimon warned that the unwinding of quantitative easing had never been attempted on this scale (the Federal Reserve's balance sheet has ballooned by USD3.3 trillion since late 2008) and could be more disruptive than envisioned. Market volatility is likely to increase and interest rates may rise more quickly than expected.

In July 2017, the European Central Bank (ECB) left its key policy rates unchanged and signaled that they would remain at present levels for an extended period of time. The commitment to maintain net asset purchases at EUR60 billion per month until at least the end of 2017 was also reaffirmed. This additional liquidity will keep prices high and yields low, particularly in the case of short-term bonds.

Market structure

The principal driver of changes in reinsurance market structure in recent years has been merger and acquisition (M&A) activity. However, consolidation has not materially reduced industry capital, as many transactions are motivated by a desire to achieve scale and remain relevant.

Insurance M&A activity has declined in 2017, due to uncertainty created by Brexit and temporary monetary controls imposed in China. High valuations are also acting as a constraint, partly due to the embedded takeover premium in smaller companies' stocks.

The principal deals since the beginning of 2015 are summarized on the next page.

Exhibit 10: Reinsurance-related M&A activity

Announced	Completed	Buyer	Target	Target GPW (USD billions)	Value (USD billions)	Price to book (x)
Nov-14	Mar-15	RenRe	Platinum	0.5	1.9	1.13
Jan-15	May-15	XL	Catlin	6.0	4.1	1.21
Feb-15	Jul-15	Fairfax	Brit	1.9	1.9	1.63
Mar-15	Jul-15	Endurance	Montpelier Re	0.7	1.8	1.21
May-15	Nov-15	Fosun	Ironshore	2.2	2.3	1.12
Jun-15	Oct-15	Tokio Marine	HCC	3.0	7.5	1.90
Jul-15	Jan-16	ACE	Chubb	13.6	28.3	1.70
Jul-15	Apr-16	China Minsheng	Sirius	1.1	2.6	1.43
Aug-15	Mar-16	EXOR	PartnerRe	5.5	6.9	1.11
Sep-15	Feb-16	Mitsui Sumitomo	Amlin	3.8	5.3	1.93
Apr-16	Nov-16	AmTrust	ANV	0.7	0.2	
Aug-16	Jan-17	Arch	United Guaranty	1.0	3.4	1.01
Sep-16	Dec-16	Canada Pension Plan	Ascot	1.1	1.1	
Oct-16	Mar-17	Sompo	Endurance	2.0	6.3	1.36
Oct-16	Apr-17	PartnerRe	Aurigen	0.1	0.3	
Oct-16		Shenzhen Qianhai	Asia Capital Re	0.8	1.0	1.25
Nov-16	Feb-17	Argo	Ariel Re	0.4	0.2	1.45
Dec-16	May-17	Liberty Mutual	Ironshore	2.2	3.0	1.43
Dec-16	Jul-17	Fairfax	Allied World	3.0	4.9	1.35
Mar-17	Jul-17	Hannover Re	Argenta	0.4	0.1	
Jul-17		AXIS	Novae	1.2	0.6	1.53
Jul-17		Markel	State National	1.3	0.9	2.90
Aug-17		Centerbridge	Sompo Canopius	1.4	1.0	

Source: Aon Benfield Analytics

Scale has advantages, but can result in the loss of the agility and underwriting focus necessary to respond to changing market needs. This has provided an opportunity for growth and innovation in the managing general agency (MGA) sector. MGAs are typically streamlined operations with preferential access to business, on either a geographic or relationship basis. The attraction for capacity providers is that they can offer cost and capital efficient access to new markets.

Regulation can have a significant impact on market structures and the way in which reinsurance capacity is supplied. In recent times, the industry's ability to deliver risk transfer on a cross-border basis has been threatened by a growing tendency towards protectionism. This may alter risk-reward dynamics and the extent of foreign interest in local markets, limiting the diffusion of knowledge, pricing know-how and risk diversification – key ingredients for stable long-term market expansion.

The authorities in the US and the European Union finalized a 'covered agreement' in the last days of the Obama administration, the intent being to create a level playing field between the regulatory regimes in the two markets. Both sides recently confirmed that this agreement would be implemented.

Brexit is adding cost to the industry, but is not expected to have a material impact on the way in which reinsurance capacity is supplied. US tax reform could potentially have more of an effect, depending on how it impacts the relative attractiveness of the US and Bermudian markets.

A final area to consider is the exponential advance of technology, which is ultimately expected to have a profound impact on business models, the efficiency of the industry and service delivery to clients.

Reinsurer Results

A decade of strong performance

The Aon Benfield Aggregate (ABA) reported an average combined ratio of 93.7 percent and an average return on equity of 9.9 percent over the decade to the end of 2016, representing attractive performance relative to many other sectors. Reinsurers have adapted to the changed operating environment by diversifying their underwriting portfolios, seeking operating efficiencies and leveraging third party capital to expand their business positions, earn fee income and lower their cost of capital. To some extent, this process has been accelerated through consolidation.

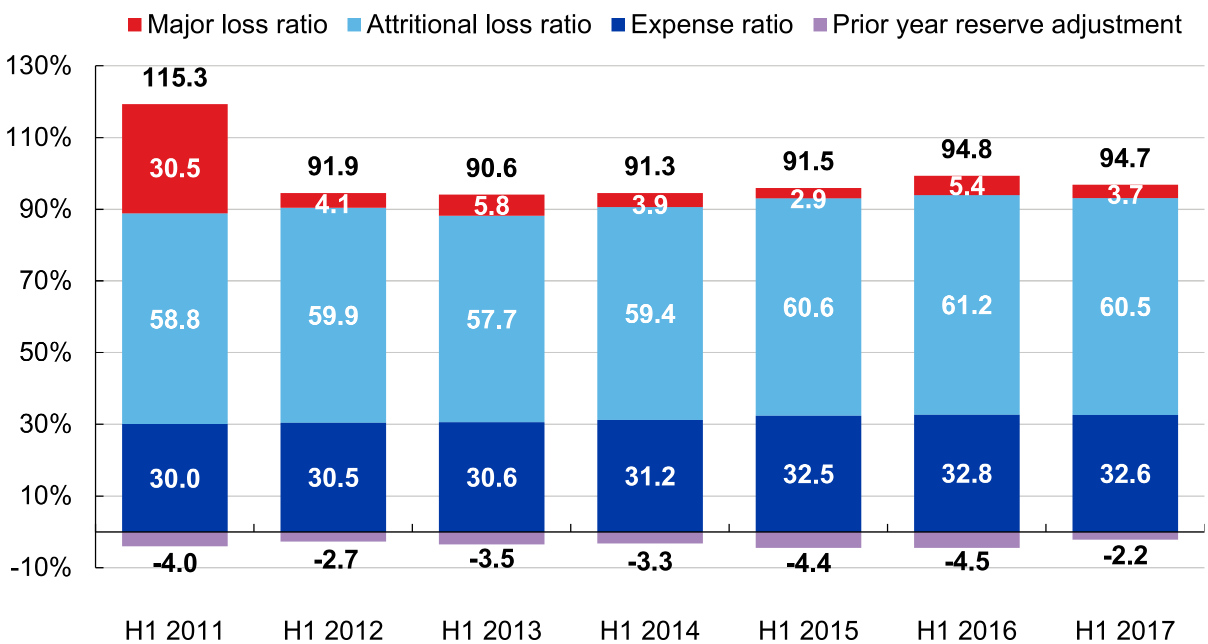
First half 2017 results

Major reinsurers continued to produce solid results in the first half of 2017, despite the impact of the unexpectedly harsh Ogden discount rate cut, driven by a relatively benign loss environment and stabilized investment returns. Impact Forecasting estimates global economic and insured losses in the period at USD53 billion and USD22 billion, representing 44 and 65 percent of the 10-year averages. The reinsured proportion of these losses was relatively low, as the major cause was severe convective storms in the US.

Gross property and casualty (P&C) premiums written by the ABA companies totaled USD90 billion in the first half of 2017, up 1 percent relative to the prior year period. The reinsurance cession ratio increased to 17.7 percent, from 15.6 percent previously, partly reflecting greater utilization of retrocession and third party capital. Net premium earned rose by 2 percent to USD69 billion.

The combined ratio was flat at 94.7 percent and underwriting profit rose by 5 percent to USD3.6 billion. The contribution from favorable prior year reserve development halved to USD1.5 billion, mainly reflecting the impact Ogden on UK liability reserves. Disclosed major losses fell by 30 percent to USD2.5 billion.

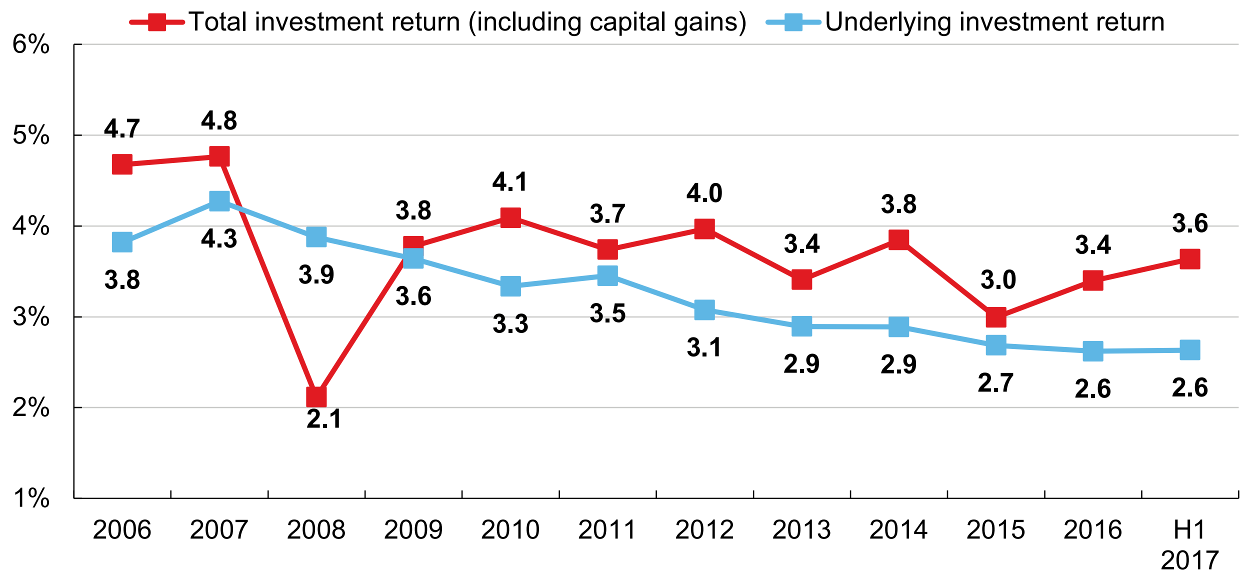
Exhibit 11: ABA combined ratio composition



Source: Company results, Aon Benfield Analytics

The total investment return reported by the ABA companies stood at USD14.0 billion in the first half of 2017, representing an annualized return of 3.6 percent on average cash and investments of USD789 billion. Excluding realized and unrealized gains, the underlying yield held steady at 2.6 percent.

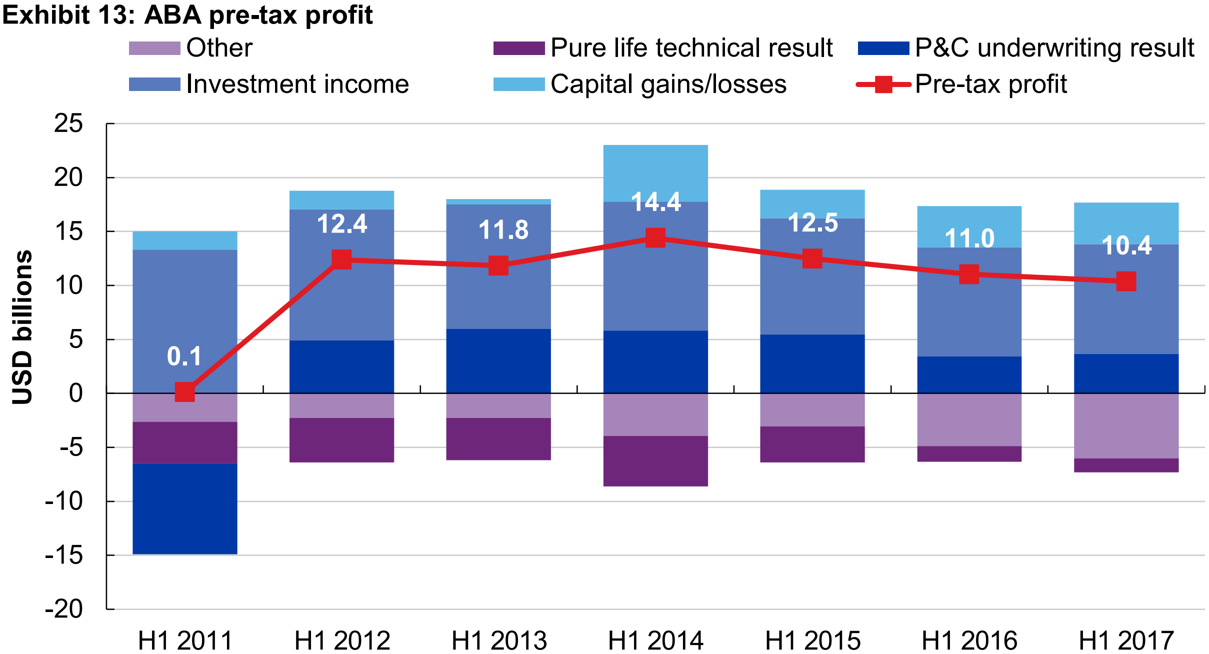
Exhibit 12: ABA investment yield



Source: Company results, Aon Benfield Analytics

Other expenses increased by USD1 billion in the first half of 2017, partly due to foreign exchange losses, and as a result overall pre-tax profit fell by 6 percent to USD10.4 billion.

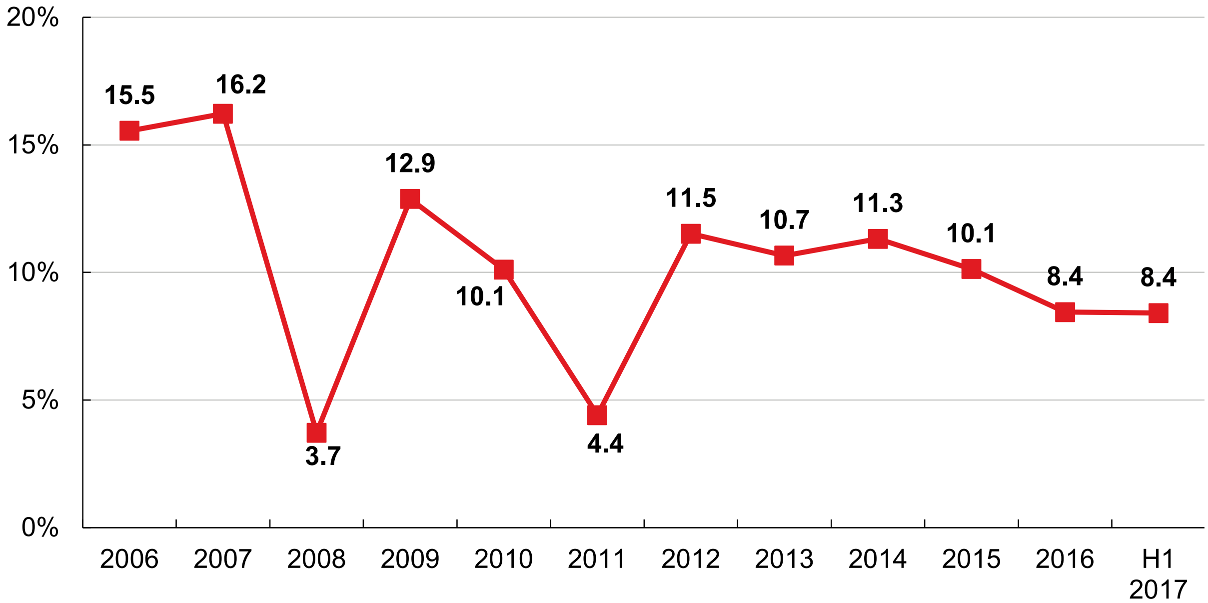
Exhibit 13: ABA pre-tax profit



Source: Company results, Aon Benfield Analytics

Total net income reported by the ABA companies fell by 3 percent to USD8.6 billion in the first half of 2017. Net income attributable to common shareholders fell by 2 percent to USD7.9 billion, representing an annualized return on average common equity of 8.4 percent. This represented a reduction from 8.7 percent in the first half of 2016, but was in line with the outcome for the full year.

Exhibit 14: ABA return on equity



Source: Company results, Aon Benfield Analytics

As always, results for the full year are heavily dependent on the outcome of the Atlantic hurricane season. Increased utilization of retrocession and third party capital has allowed reinsurers to contained modelled exposures relative to capital, but current earnings provide less of a cushion that has been the case in the past and future results are likely to be more volatile as a consequence.

The timing is uncertain, but the UK government appears committed to reforming the methodology for setting the discount rate used in large bodily injury claims settlements (Ogden). If the new discount rate is higher than the current -0.75 percent, it may result in a reversal of newly-constituted reserves.

Appendix

Exhibit 15: Largest global reinsurers – total reinsurance gross premiums written (USD millions)

No.	Reinsurer	2015	2016
1	Swiss Re	27,958	31,032
2	Munich Re[1]	30,559	29,473
3	Hannover Re	18,957	18,102
4	SCOR	14,079	14,555
5	Lloyd's	13,137	12,758
6	Berkshire	12,236	12,709
7	RGA	9,249	10,107
8	Great-West Lifeco	4,710	8,517
9	China Re	8,819	8,407
10	Korean Re	5,580	5,691
11	PartnerRe	5,548	5,357
12	GIC Re	2,878	4,994
13	Alleghany	3,662	4,330
14	Everest Re	4,359	4,247
15	XL Catlin	2,273	3,975
16	Mapfre	3,619	3,873
17	Fairfax[2]	2,915	3,562
18	Maiden Re	2,663	2,831
19	AXIS	2,021	2,250
20	Sompo[3]	295	2,202
21	Tokio Marine	2,156	2,176
22	Mitsui Sumitomo	2,317	2,162
23	RenRe	1,846	2,125
24	Toa Re	1,845	2,063
25	R+V	1,706	1,942
26	Validus	1,762	1,821
27	Pacific Life	1,453	1,570
28	Arch	1,419	1,494
29	CCR	1,429	1,456
30	IRB Brasil Re	1,324	1,421
31	Aspen	1,249	1,413
32	Liberty Mutual[4]	1,687	2,075
33	Deutsche Ruck	1,197	1,301
34	Qatar Insurance	1,218	1,300
35	Taiping Re	1,033	1,184
36	Markel	965	1,041
37	QBE	954	1,026
38	Sirius	867	900
39	W.R. Berkley	837	896
40	Allianz	1,064	887
41	American Agriculture	805	856
42	Chubb	883	739
43	Peak Re	583	698
44	Hiscox	586	671
45	African Re	689	642
46	Third Point Re	702	617
47	Nacional Re	569	589
48	Asia Capital Re	734	588
49	Hanover Insurance	633	571
50	Greenlight Re	502	536

Source: Company reports, Aon Benfield Analytics

[1] Excluding Risk Solutions
[2] Pro forma for Allied World in 2016
[3] Pro forma for Endurance in 2016
[4] Pro forma for Ironshore in 2016

Exhibit 16: Largest property & casualty reinsurers – gross premiums written (USD millions)

No.	Reinsurer	2015	2016
1	Swiss Re	16,656	18,822
2	Munich Re[1]	14,082	14,418
3	Lloyd's	13,137	12,758
4	Hannover Re	10,371	10,189
5	Berkshire	7,049	8,037
6	SCOR	5,530	5,492
7	Korean Re	4,705	4,762
8	GIC Re	2,507	4,645
9	Alleghany/TransRe	3,662	4,330
10	Everest Re	4,359	4,247
11	PartnerRe	4,277	4,189
12	XL Catlin	2,273	3,975
13	China Re	5,128	3,683
14	Fairfax[2]	2,915	3,562
15	Mapfre	2,952	3,156
16	Maiden Re	2,663	2,831
17	AXIS	2,021	2,250
18	Sompo Japan[3]	295	2,202
19	Tokio Marine	2,156	2,176
20	Mitsui Sumitomo	2,317	2,162
21	RenRe	1,846	2,125
22	Liberty Mutual[4]	1,687	2,075
23	R+V	1,706	1,942
24	Validus	1,762	1,821
25	Arch	1,419	1,494
26	Aspen	1,249	1,413
27	Toa Re	1,331	1,409
28	IRB Brasil Re	1,260	1,325
29	CCR	1,326	1,317
30	Qatar Insurance	1,218	1,300
31	Deutsche Ruck	1,151	1,249
32	Markel	965	1,041
33	QBE	954	1,026
34	Sirius	867	900
35	W.R. Berkley	837	896
36	Allianz	1,064	887
37	American Agriculture	805	856
38	Chubb	883	739
39	Peak Re	583	698
40	Hiscox	586	671
41	African Re	689	642
42	Taiping Re	594	639
43	Third Point Re	702	617
44	Asia Capital Re	734	588
45	Hanover Insurance	633	571
46	Greenlight Re	502	536

Source: Company reports, Aon Benfield Analytics

[1] Excluding Risk Solutions
[2] Pro forma for Allied World in 2016
[3] Pro forma for Endurance in 2016
[4] Pro forma for Ironshore in 2016

Exhibit 17: Largest life & health reinsurers – gross premiums written (USD millions)

No.	Reinsurer	2015	2016
1	Munich Re	16,477	15,055
2	Swiss Re	11,302	12,210
3	RGA	9,249	10,107
4	SCOR	8,549	9,062
5	Great-West Lifeco	4,710	8,517
6	Hannover Re	8,586	7,913
7	China Re	3,691	4,724
8	Berkshire	5,187	4,672
9	Pacific Life	1,453	1,570
10	PartnerRe	1,271	1,168
11	Korean Re	875	929
12	Mapfre	667	717
13	Toa Re	514	654
14	Taiping Re	439	545
15	GIC Re	371	349

Source: Company reports, Aon Benfield Analytics

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