Reinsurance: Revolution and Evolution

Stephen Mildenhall

July 13-15, 2011

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Section 1: Revolutionary Times

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Chile Earthquake Altered Earth Axis, Shortened Day

Earthquake sped Earth's spin, figure skater style.

Source: National Geographic

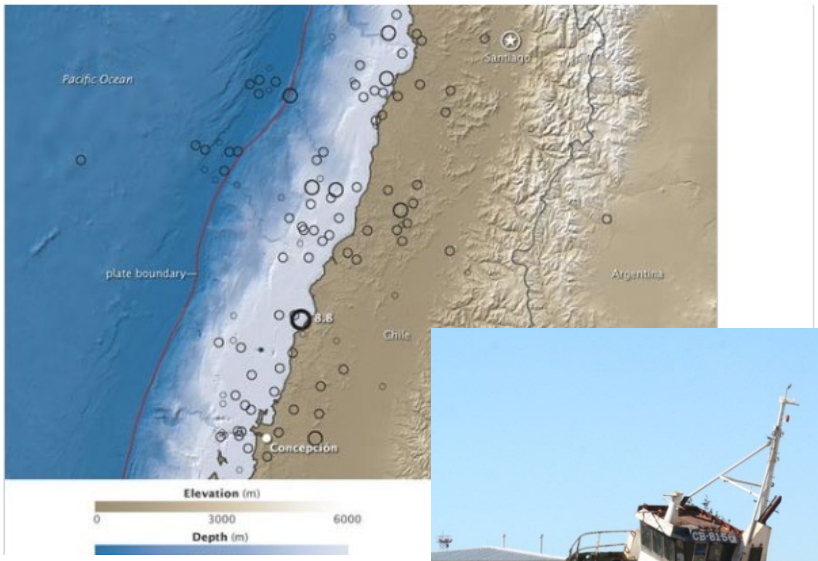
M 8.8 Chile Earthquake of Feb. 27, 2010
Event Expected – Tsunami Damage a Real Surprise

NATIONAL GEOGRAPHIC Daily News

Home Animals Ancient World Energy Environment Cultures Space/Tech Water Weird

Chile Earthquake Altered Earth Axis, Shortened Day

Earthquake sped Earth's spin, figure skater style.



- **Expected event**
  - Earthquake filled the 'gap' between prior historical events that ruptured regions to the North and South
- **562 fatalities & 12,000 injuries**
  - At least 370,000 houses, 4,013 schools, 79 hospitals and 4,200 boats damaged or destroyed by the earthquake and tsunami
- **Wide-spread contents and non-structural damage**
  - Attributable to duration of strongest phase of ground shaking (close to a minute of violent motion)

Source: National Geographic, Impact Forecasting

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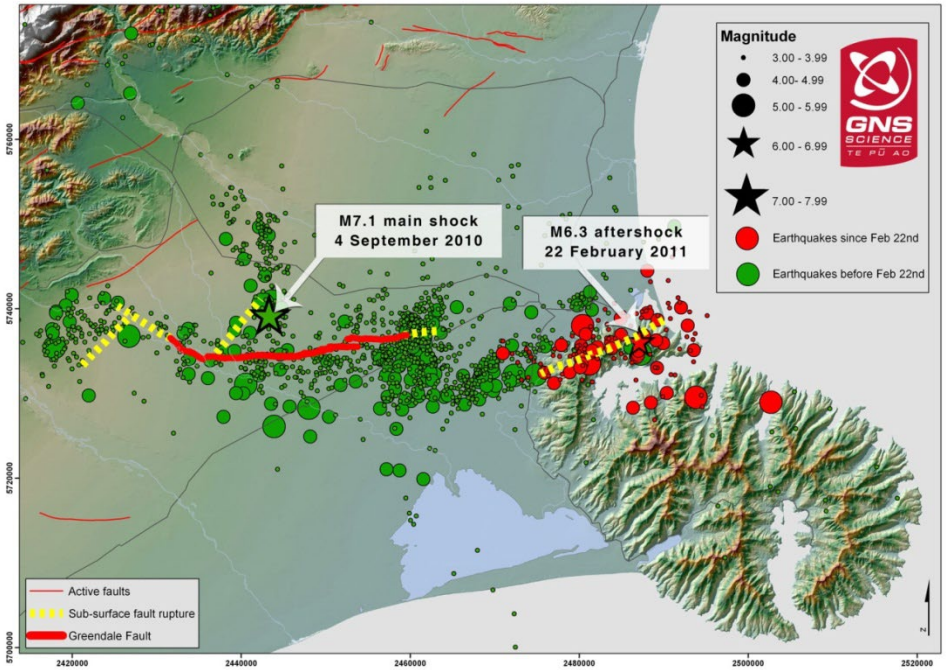
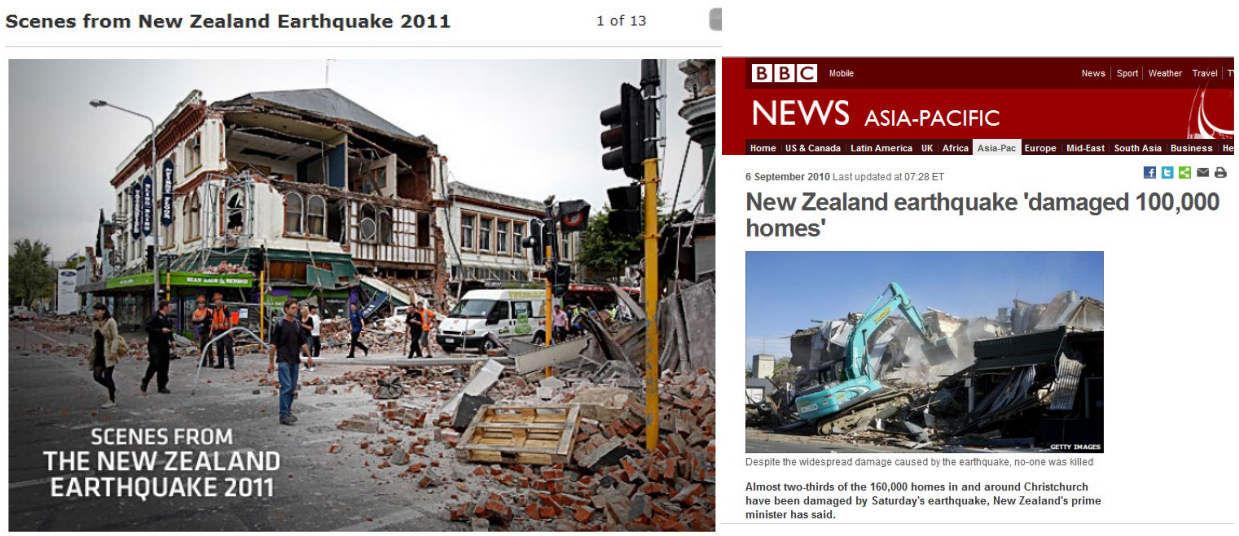
M 6.3 Christchurch Earthquake of Feb 22, 2011
Like Northridge, Christchurch Quake Occurred on an Unknown Fault





- **181 fatalities and 2,000 injuries**
  - The NZ EQC has recorded nearly 160,000 claims
- **Geotechnical event**
  - Widespread liquefaction, ground subsidence and ground failure main drivers of loss
- **Unexpected event**
  - Considered an aftershock of the M 7.1 Darfield earthquake of September 4, 2010. **Both faults were previously unknown**. Christchurch earthquake occurred on a fault with **no surface expression** (like **Northridge**)

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Source: BBC, New Zealand GNS

M 9 Tohoku, Japan Earthquake of March 11, 2011
Completely Unexpected Event in World's Most Geologically Studied Area

- **Unexpected event**
  - Tectonic potential exists, but no historical precedent for such a large magnitude event
- **15,382 fatalities, 5,364 injuries**
  - At least 540,000 homes and other structures damaged or destroyed by earthquake and tsunami
- **Tsunami key loss driver**
  - Shallow-sea tsunami barriers existed but proved inadequate
  - Tsunami, not ground shaking, responsible for incidents at nuclear power plants

Source: Impact Forecasting

US Severe Weather Spring, 2011

Very active first 6 months of 2011

- 589+ fatalities from severe weather = ten times higher than 56 YEARLY average
- 80 confirmed EF-3 or higher (136+ mph) tornadoes = nearly double 42 YEARLY average

Notable records

- Most fatalities from a tornado outbreak since 1950: 322, April 25-28, 2011
- Old record: 315, April 3-4, 1974

- 875 = most tornadoes in a month April 2011
- 542 = old record: May 2003

- $2+B insured: costliest natural disaster for Alabama = April 25-28 tornado outbreak
- $2B insured: old record = 2004 Hurricane Ivan

Event Date	Event Location	# of Deaths	# of Struct-ures/ Claims	Econ. Loss Estimate (Billions USD)	Insured Loss Estimate (Billions USD)
4/3-4/5	Midwest, Southeast, Plains	9	225,000	2.0	1.6
4/8-4/11	Midwest, Southeast, Plains	0	275,000	2.3	1.5
4/14-4/16	Plains, Southeast, Midwest	48	150,000	2.5	1.7
4/19-4/21	Plains, Southeast, Midwest	0	100,000	0.6	0.4
4/22-4/28	Southeast, Plains, Midwest	344	650,000	7.0	5.1
5/10-5/13	Midwest, Southeast	2	50,000	0.3	0.2
5/21-5/27	Plains, Midwest, Southeast	183	550,000	6.5	4.9
5/28-6/1	Plains, Midwest, Northeast	3	25,000	0.5	0.3
	Totals	**589**	**2,020,000**	**21.7**	**15.7**

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…Amongst Other Events

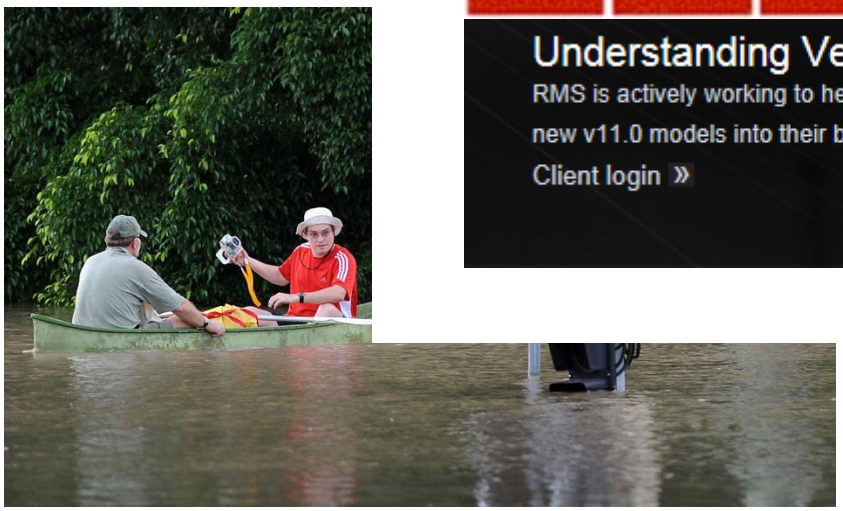
Progressing more slov

R M S

Understanding Version 11.0

RMS is actively working to help clients transition the new v11.0 models into their business.

Client login »



Australian Floods, 2010-11

Euro Winter Storm Xynthia

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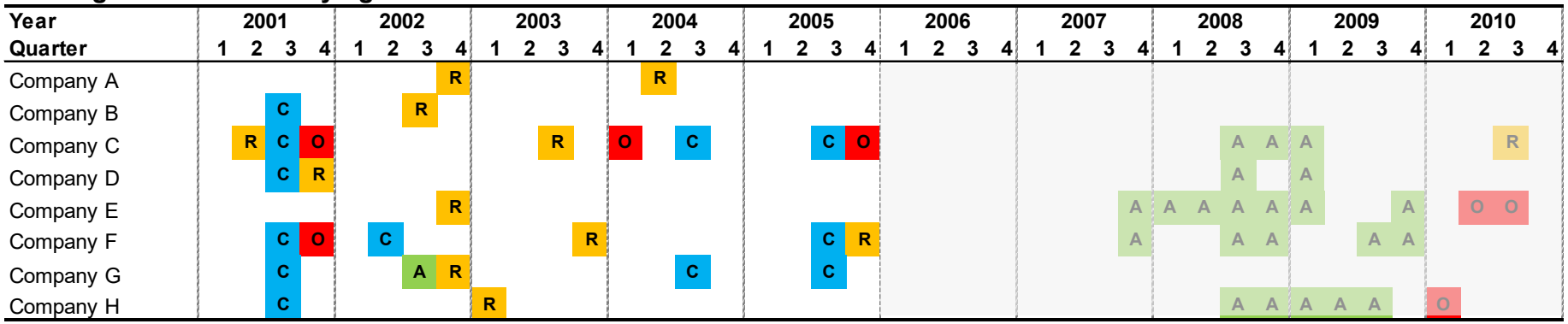
Resurgence of Loss Events after Five Calm Insurance Years

Earnings Hits and Underlying Causes



Key		Count	%
A	- Asset Related Earnings Hit	23	43%
R	- Reserve Related Earnings Hit	12	22%
C	- Catastrophe Related Earnings	12	22%
O	- All Other Earnings Hits	7	13%
	Total	54	100%

- Earnings hit defined as negative GAAP income in a quarter
- Over the last 40 quarters the peer group averaged 6.8 earning hits, ranging between 2 and 12 hits

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Revolution and Evolution

Revolution

- Sudden and unexpected change
- Insurance world is revolutionary

Evolution

- Gradual improvement in fitness and adaptation
- Reinsurance protects against the revolutionary
- Reinsurance continuously evolving in the face of a changing environment and emerging threats to enhance risk management
- Reinsurance evolution broker driven
  - Coverage
  - Risk transfer products
  - Sources of capital
  - Understanding risk
  - Risk modeling
  - Risk management

Section 2: US Insurance Environment

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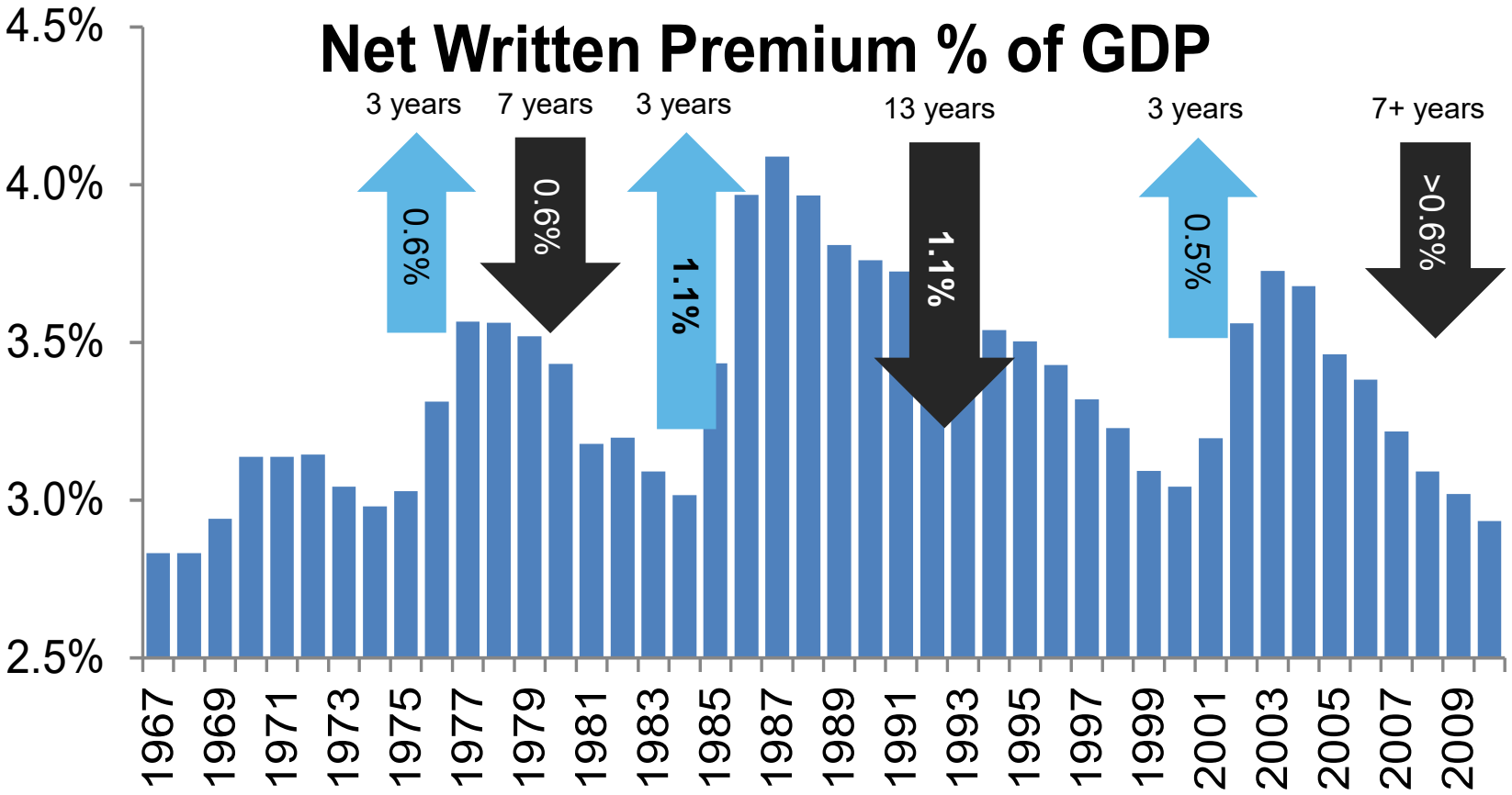
US Primary Insurance Market: Premium Adequacy



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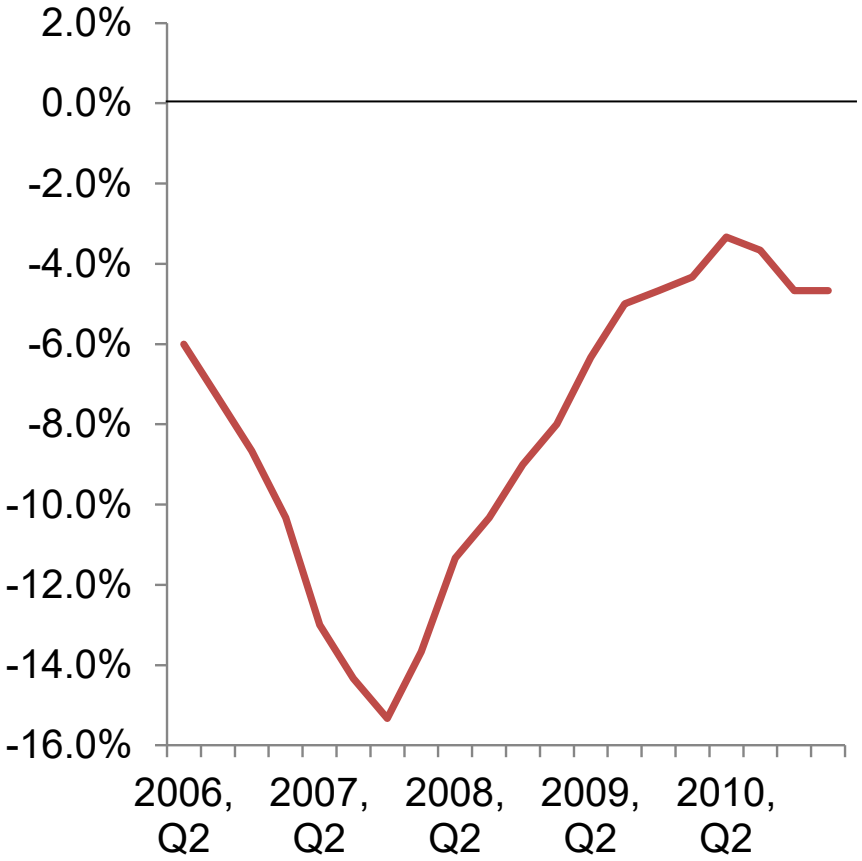
Commercial Lines Rate: History Consensus of Estimates



- Market Scout: small and middle market wholesale business

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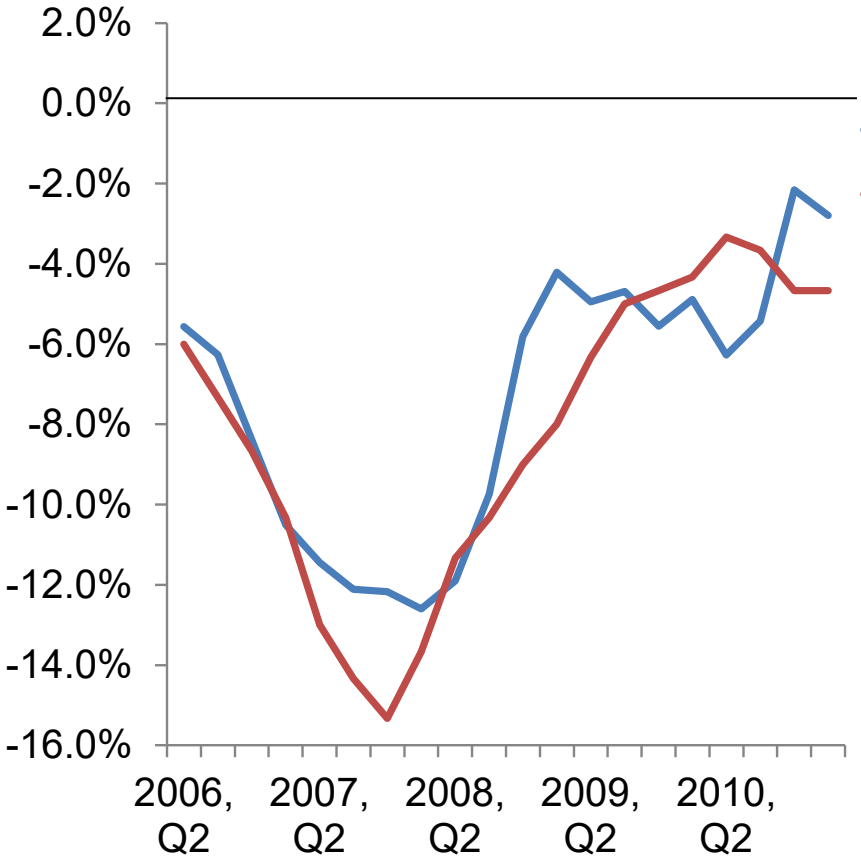

- Market Scout: small and middle market wholesale business
- CIAB: agent and broker consensus

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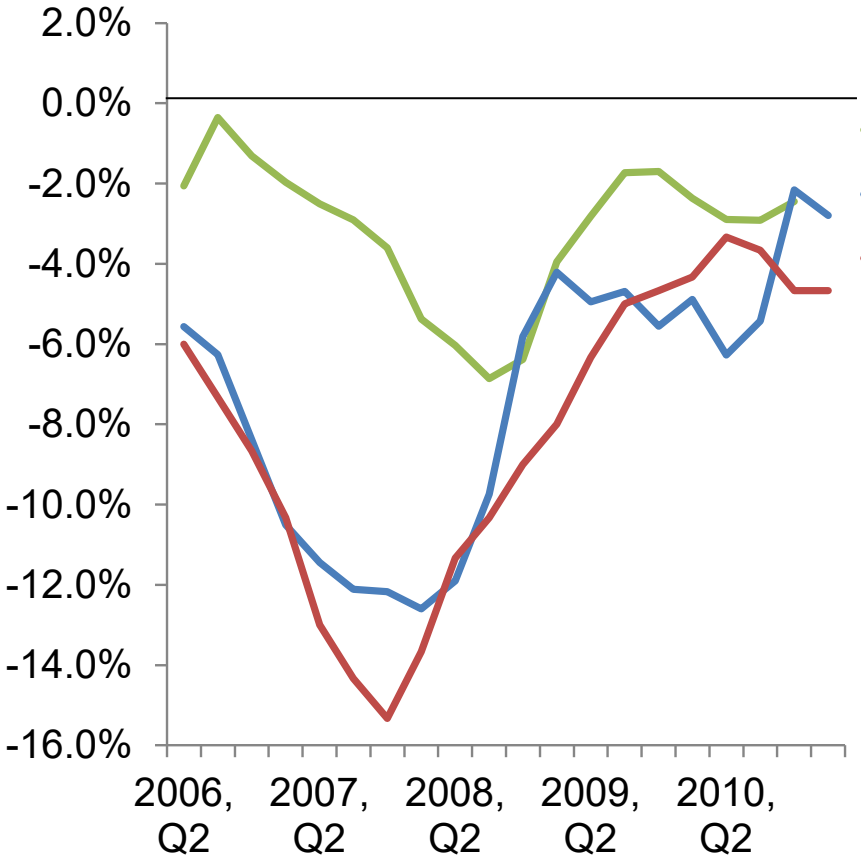

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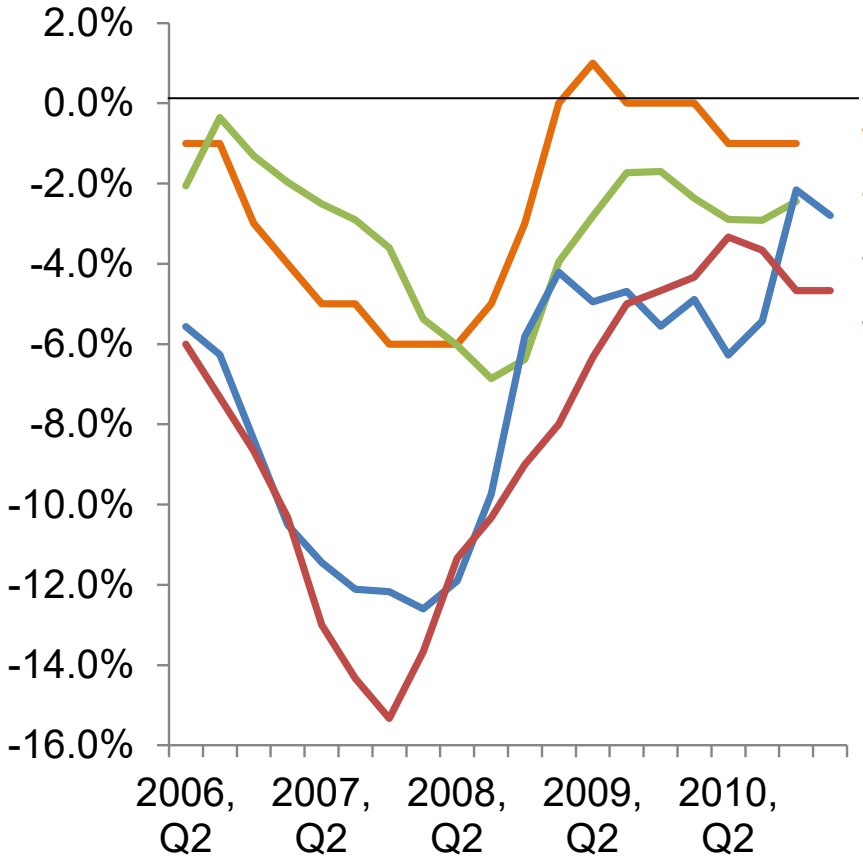

- Market Scout: small and middle market wholesale business
- CIAB: agent and broker consensus
- Advisen: large risk management accounts
- CLIPS: data reported by subscribing companies

** Respondents in the CIAB GL survey had an unusually high proportion (23%) of non responses in Q1 2011*

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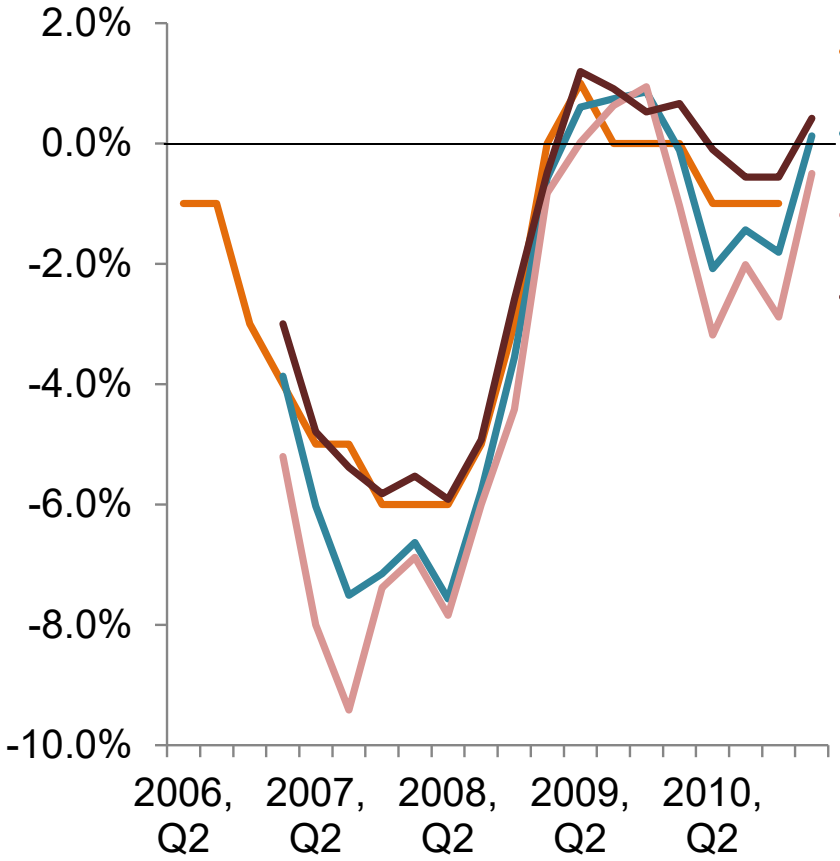
Commercial Lines Rate: Aon Benfield History Consensus of Estimates



- Standard companies includes ACE, AIG, HIG, TRV, XL, WRB, CNA and CB
- Specialty companies includes ACGL, AWH, AXS, MKL, ORI, RLI, WRB, CNA and CB

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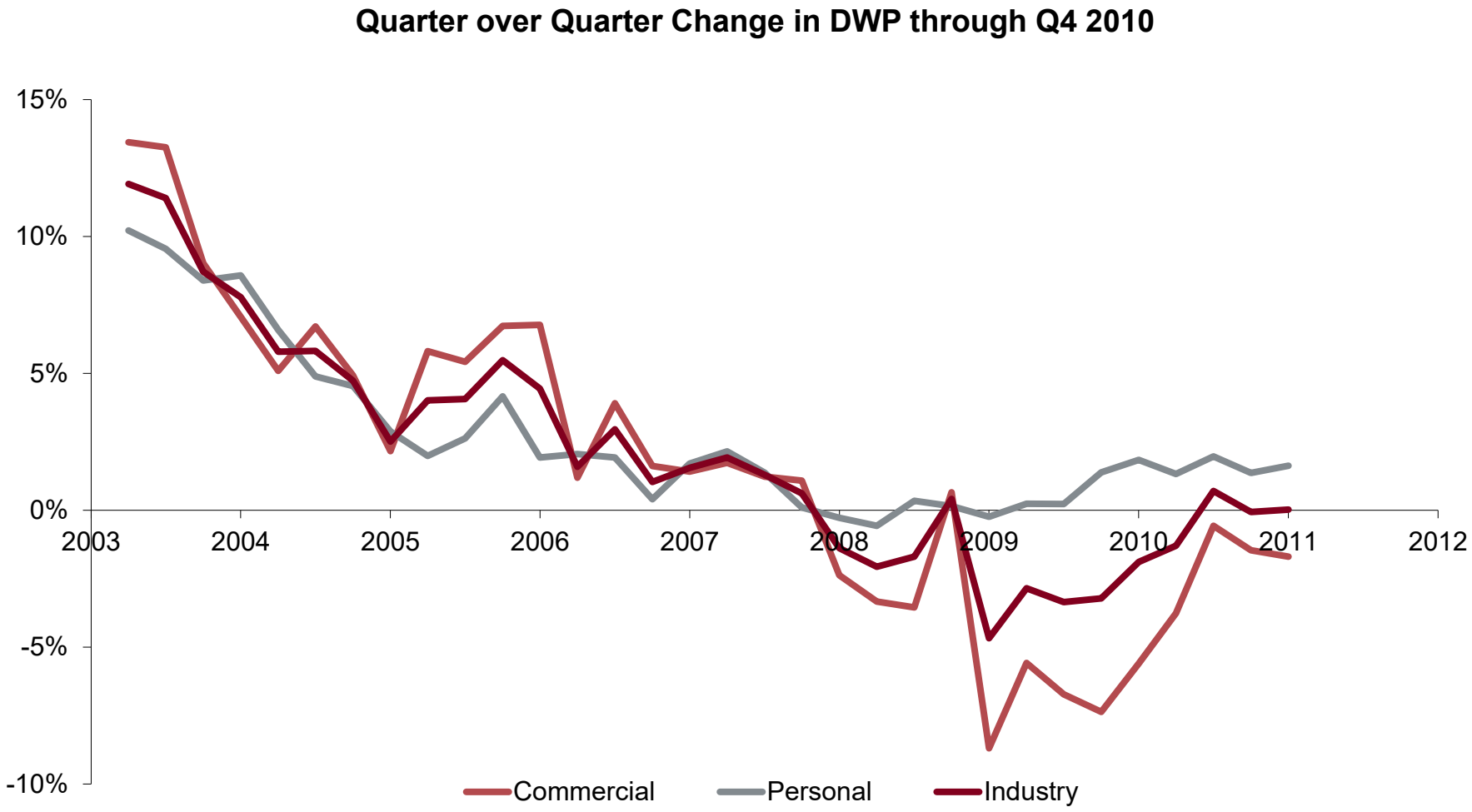
Macro Premium Trends

Change in DWP through Q4 2010 Personal vs. Commercial



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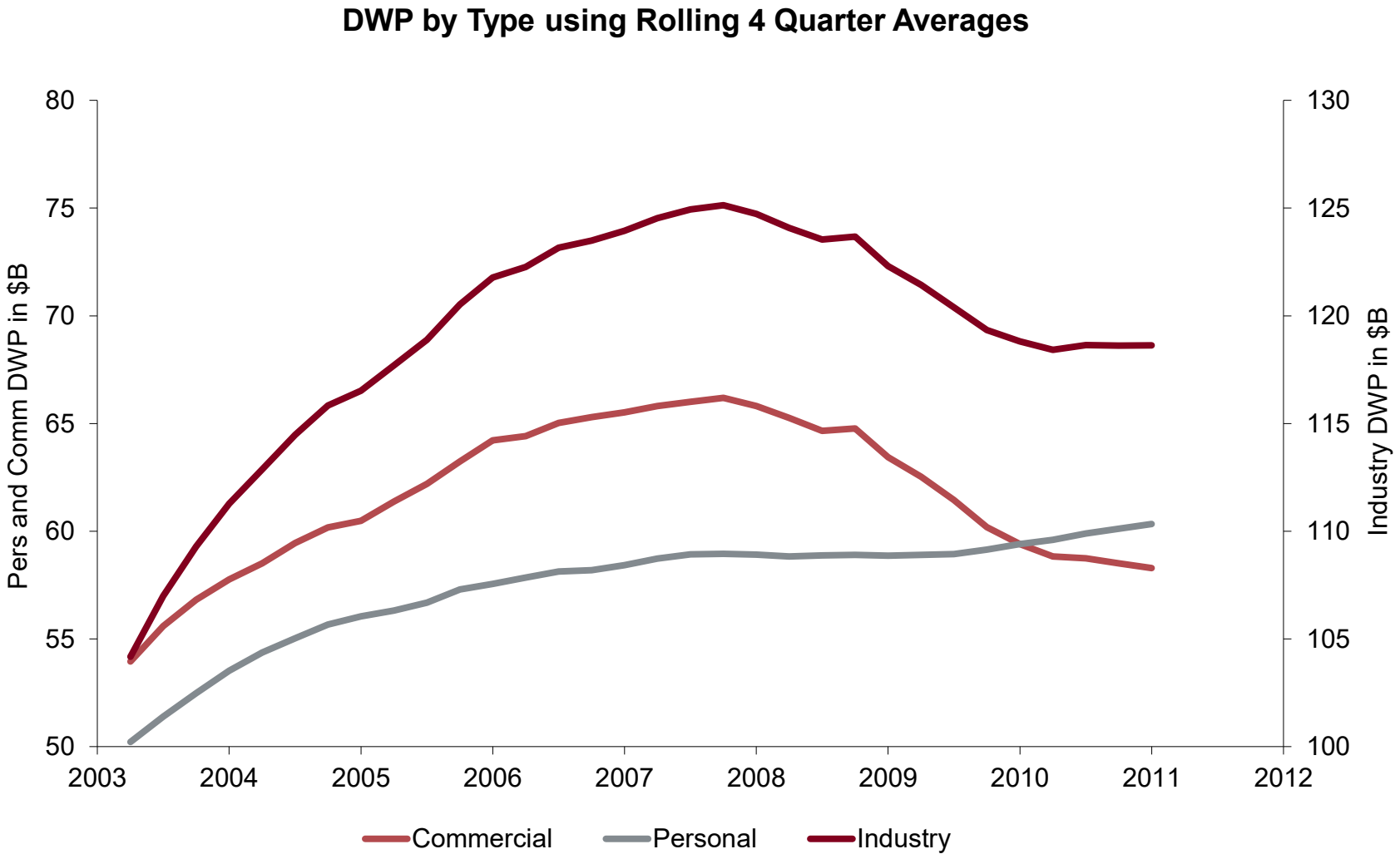

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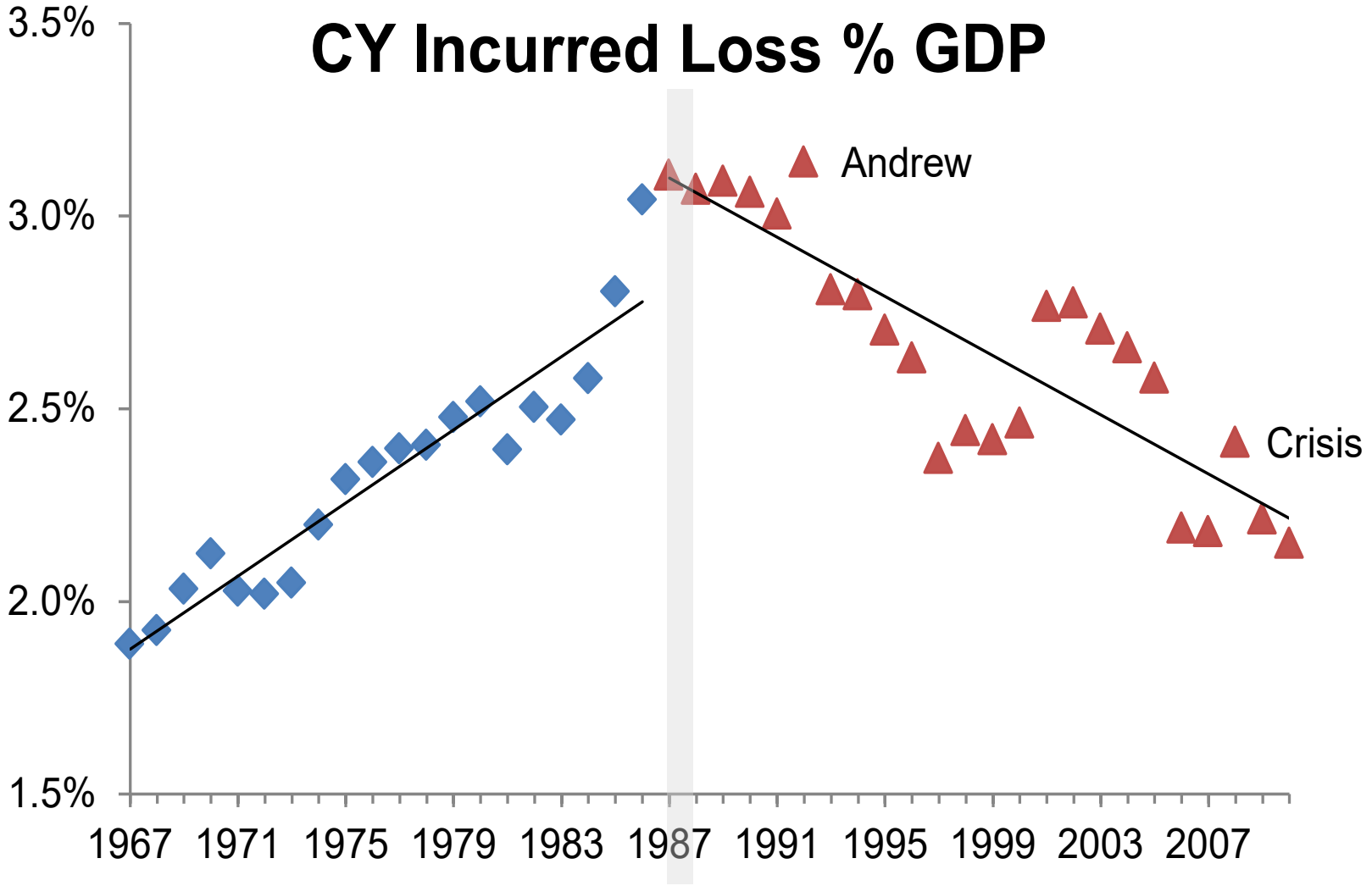
Loss History: A Crisis of Innovation?



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Primary Insurance Reserves: Where are the Losses?

LOB Detail from Aon Benfield US Statutory Industry Reserve Study

Reserve Summary ($B)

Line	Estimated Reserves	Booked Reserves	Remaining Redundancy	Favorable / (Adverse) Development 2007	2008	2009	2010	Average	Years at Run Rate
Personal Lines	127.1	133.6	6.5	5.9	5.4	5.8	6.7	5.9	1.1
Commercial Property	40.5	41.9	1.5	1.7	2.6	2.4	2.7	2.3	0.6
Commercial Liability	227.0	236.8	9.9	1.0	5.2	3.8	2.4	3.1	3.2
Workers Compensation	111.2	117.7	6.5	1.0	1.1	(0.5)	(1.6)	0.0	N/A
WC AIG Only					0.0	(1.1)	(1.8)	(0.8)	
WC xAIG					1.1	0.6	0.2	0.8	
Total Excl. Financial Guaranty	505.7	530.1	24.4	9.5	14.4	11.5	10.1	11.4	2.1
Financial Guaranty	32.6	30.2	(2.4)	(1.2)	(12.6)	7.0	0.4	(1.6)	N/A
Total	538.3	560.2	22.0	8.3	1.7	18.6	10.5	9.8	2.2

- P&C Industry undiscounted statutory reserves as of December 31, 2010 estimated to be USD22.0 Billion redundant
- USD10.5 Billion reserves released in calendar year 2010
- At the current average run rate, the redundancy will be eliminated in 2.2 years

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Loss Ratio Summary By Accident Year

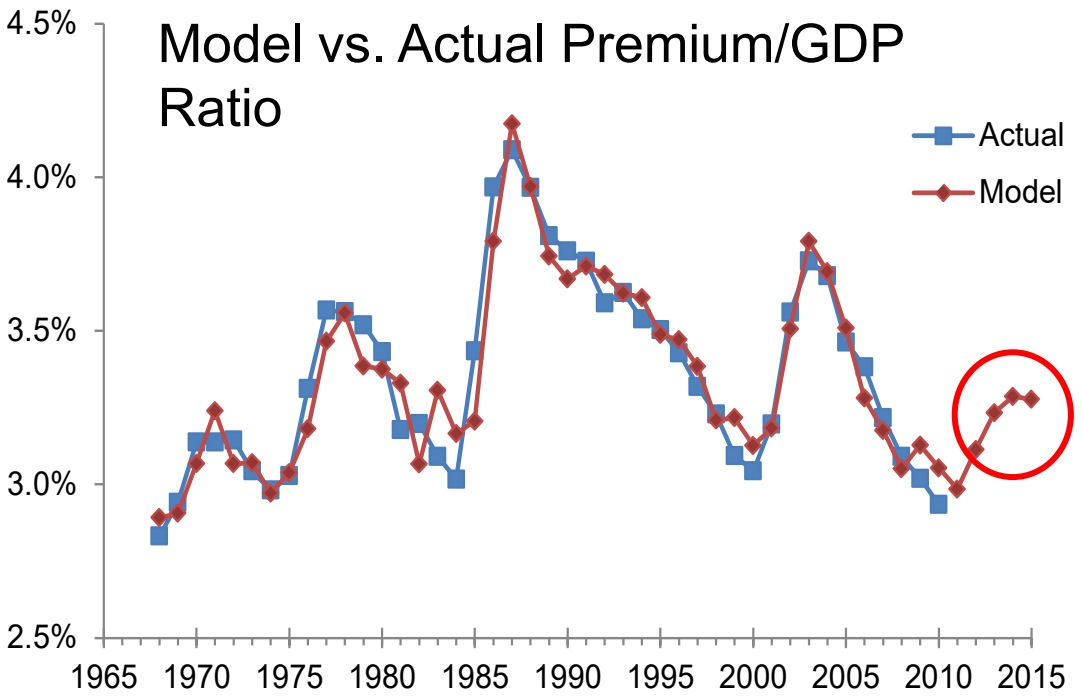
Ultimate Loss Ratio Summary by AY ($B)

AY	Earned Premium	Booked Ultimate Loss	Estimated Ultimate Loss	Redundancy/ (Deficiency)	Booked Ult. Loss Ratio	Estimated Ult. Loss Ratio
Prior				(6.9)		
2001	295.4	236.4	236.4	-	80.0%	80.0%
2002	328.7	222.8	222.8	(0.0)	67.8%	67.8%
2003	364.7	217.8	217.7	0.1	59.7%	59.7%
2004	389.9	221.8	221.1	0.7	56.9%	56.7%
2005	393.5	241.5	241.0	0.5	61.4%	61.2%
2006	413.1	231.5	228.2	3.3	56.0%	55.2%
2007	416.9	259.2	254.2	5.0	62.2%	61.0%
2008	416.0	304.0	295.8	8.2	73.1%	71.1%
2009	403.9	279.6	273.8	5.8	69.2%	67.8%
2010	403.4	287.5	282.3	5.2	71.3%	70.0%
Total	3,825.6	2,502.2	2,473.4	22.0	65.4%	64.7%

- Study indicated redundancy in 2011 driven by 2009 and prior differences
- Increase in loss ratio YoY 2.2 points vs. 2.1 points booked

Primary Insurance Cycle: Waiting for the Losses

- Premium to GDP based on prior and second prior year premium/GDP and loss/GDP
- Model R^2 very strong, 91%
- Predicts slight bottoming of market but no convincing hardening
- Model predicts that convincing hardening will be ***loss driven***
- Broad hardening casualty driven



Cycle Model Statistics

	Parameter	Std. Error	p Value
Constant	0.010	0.0017	7.9E-07
Prior Loss/GDP	0.426	0.0798	4.4E-06
Prior Premium/GDP	1.053	0.1149	1.2E-08
Second Prior Premium/GDP	-0.673	0.0936	2.8E-11
Regression R^2	90.9%		

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Section 3: International Reinsurance Market

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Reinsurance Market Outlook, January 1, 2011

2010 Property Catastrophe Renewals Recap

We are pleased to report that our efforts for U.S. catastrophe reinsurance clients at the January 1, 2011 renewal were at the top end of the reductions we projected for the light year estimates we published in September. Several factors for this outperformance have been mentioned in this report but a brief recap is (a) the light season scenario contemplated more ceded U.S. catastrophe losses than actually occurred—a lighter than light season, (b) reinsurer capital grew at a 17 percent rate for the year and we had anticipated a 12 percent growth rate net of share repurchases—more capital meant more competition than we anticipated, and (c) we anticipated that the catastrophe model increases that occurred and are still anticipated for U.S. hurricane would have made it tougher for reinsurers to accept lower prices than proved to be the case.

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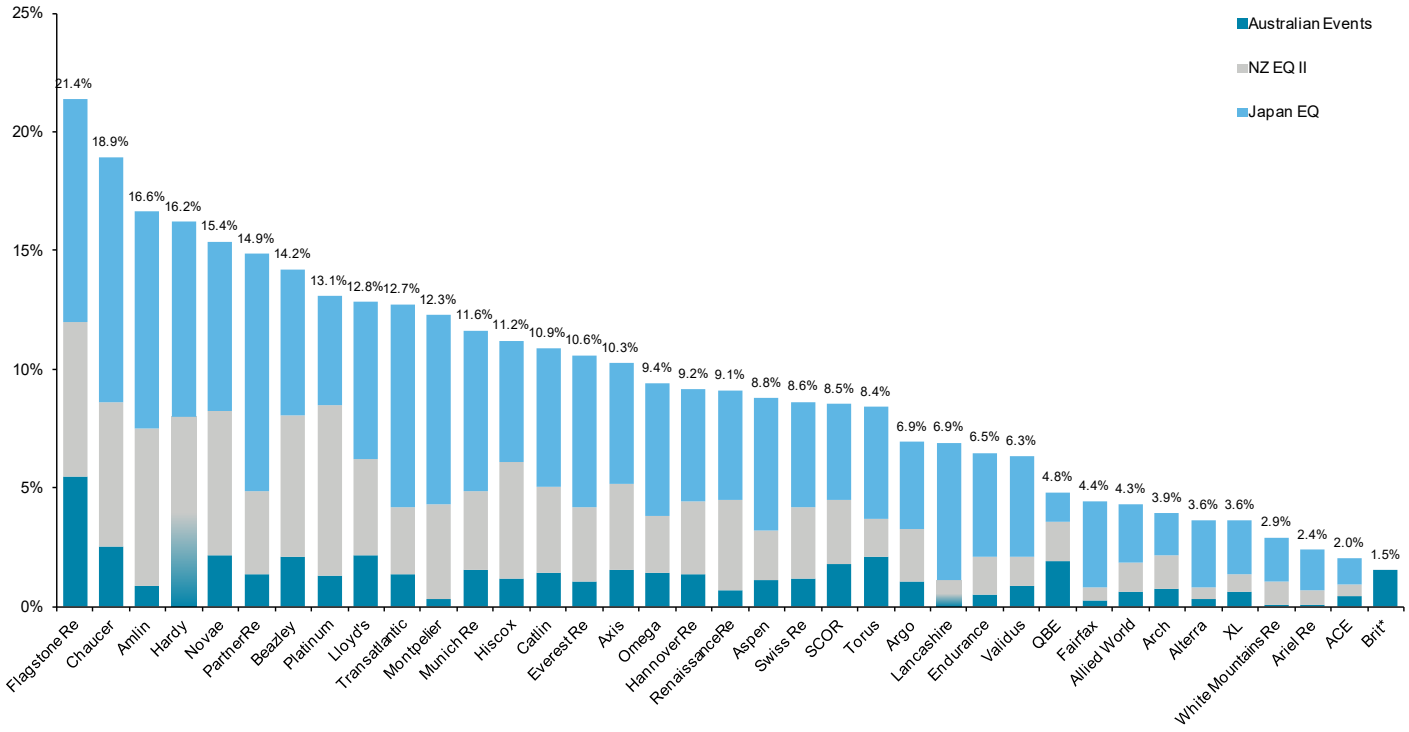
Reinsurance Market Outlook, April 1, 2011
Aggregate Cats Still Just a Material Earnings Event

- Multiple significant insurance events have **stirred thoughts of a global market hardening**
- **Meaningful regional price adjustments** have occurred, but as yet no global effect
- 2011 events still at level of an **earnings event** – less or equal to than expected full year income, after tax for most reinsurers – not a capital event
- Existing **capital remains adequate** to satisfy insurer demand; no supply driven turn
- **US property cat renewals saw -5 to -10% reductions** with no capacity shortage
- RMS v. 11 model change, largely in line with historical model miss, but some surprises on individual portfolios anticipated to slow rate of decrease for June and July renewals

Reported Loss Percent of Shareholder Funds



*Brit has not yet disclosed a Japan estimate

Reinsurance Market Outlook

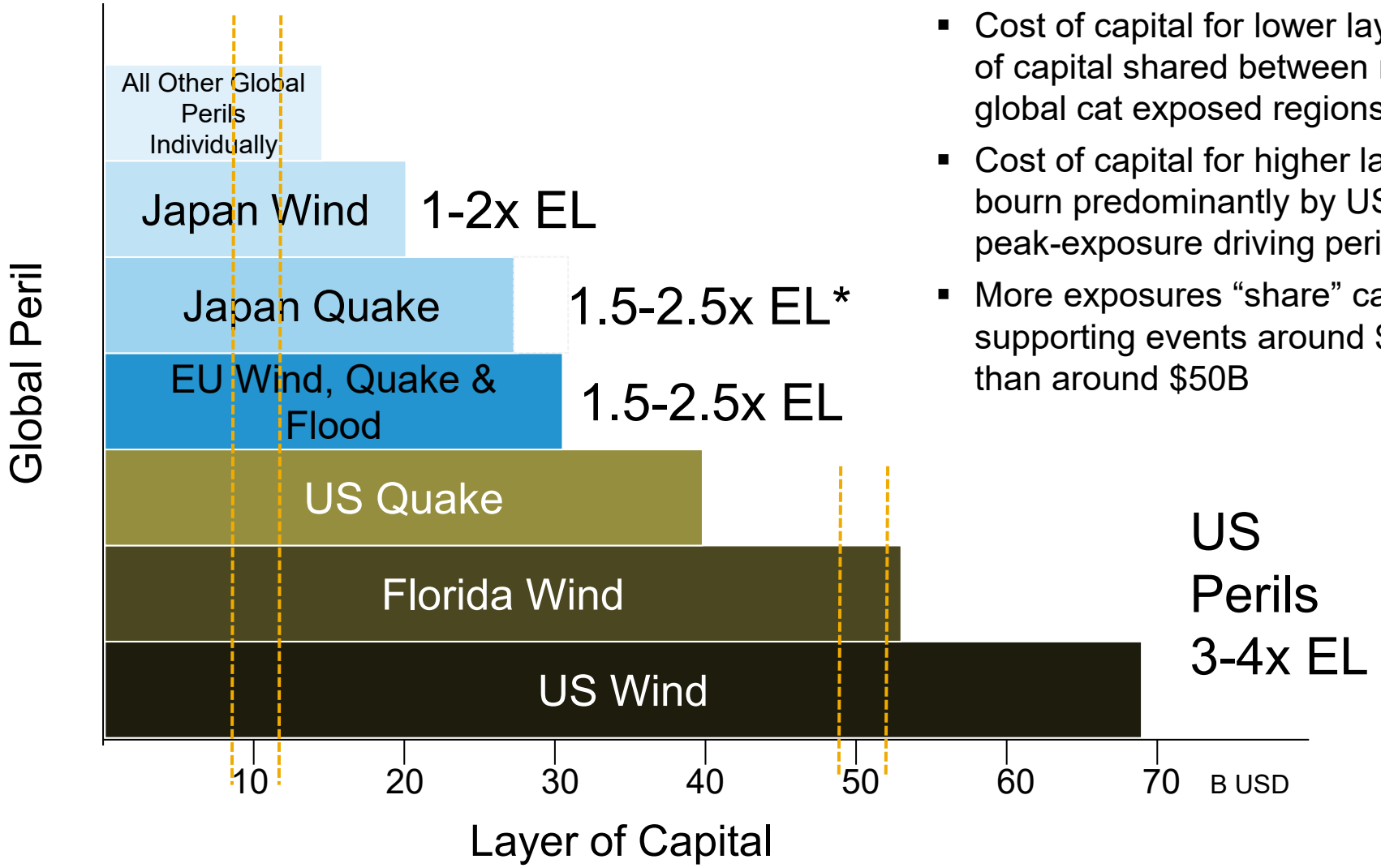
June and July 2011 Update

Executive Summary – In testing times, Aon Benfield achieves renewals guidance on behalf of clients

June and July brought meaningful rate changes to regions affected by the significant catastrophe events of the first quarter and a real debate about whether western European and U.S. insurers should pay more for their catastrophe capacity following such loss activity – we believed they should not and we were the sole minority voice advocating this position on behalf of our clients. We have looked at all times to challenge the perceived wisdom of what "should" be available.

- Rational arguments around US technical pricing and adequate capital prevailed over market emotions
- US pricing differentiated from results in loss-driven Asia Pacific and Australian regions
- Model updates being digested
- Analysis based on by far largest June/July 1st renewal book

Global Cost of Catastrophe Reinsurance Capacity



- Cost of capital for lower layers of capital shared between more global cat exposed regions
- Cost of capital for higher layers bourn predominantly by US peak-exposure driving perils
- More exposures "share" capital supporting events around $10B than around $50B

* Pre-3/11 Event

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Section 4: Reinsurance Evolution

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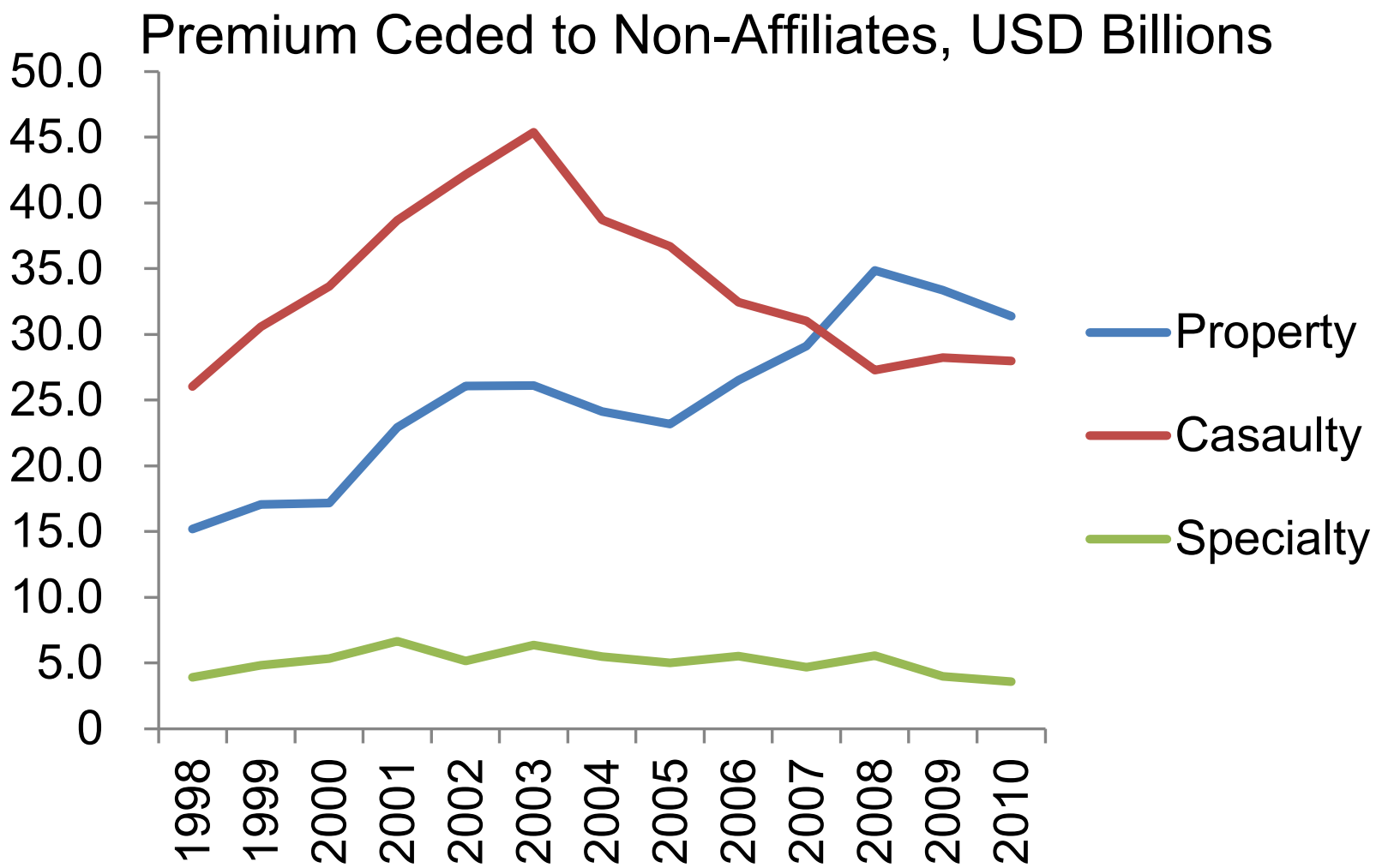
Property vs. Casualty Reinsurance Split



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Regulatory and Rating Agency "Environmental Drivers"

A. M. Best Catastrophe Stress Test

- 100 year wind or 250 year earthquake net loss direct charges to capital
- Stress test requires trading through two events

Standard and Poor's

- 250 year all perils aggregate net loss

Solvency II

- 200 year return period
- Exposure based or model based PML estimates

Swiss Solvency Test

- 200 year return period

UK ICA

- 200 year return period

- Unclear blending of solvency (tail) management with going-concern viability
- Valuation considerations ignored

Dominance of Tail Risk Covers

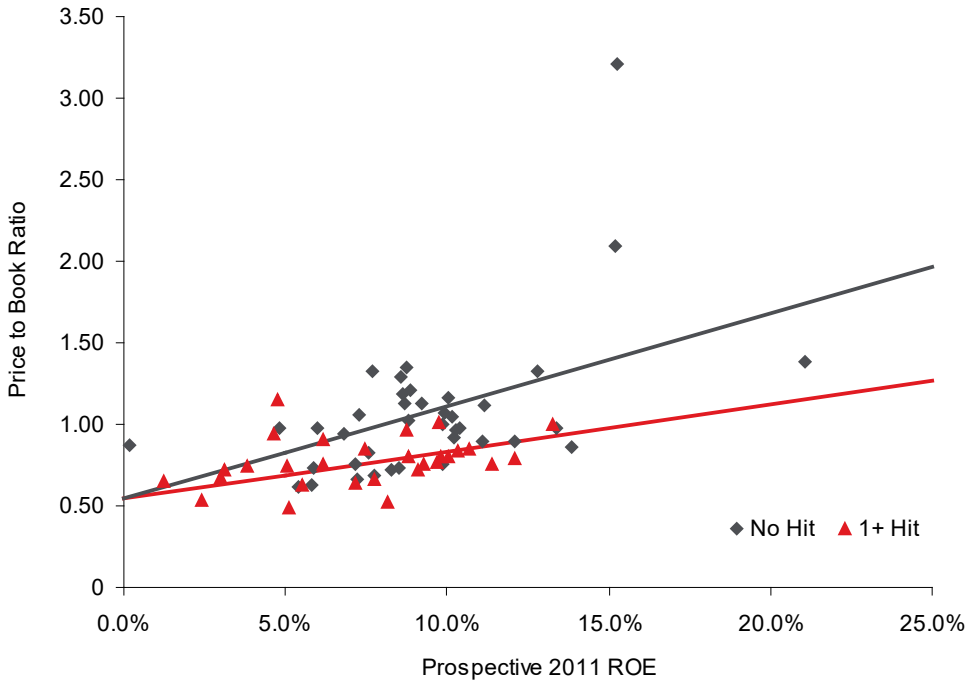
- Per occurrence reinsurance tail protection highly accretive
  - Cheaper to lay-off tail risk to reinsurers who gain economic efficiency through global risk aggregation and diversification
  - Certainty provided around trade through “currency” provided by cat models
  - Supply certainty: acceptance of cat model currency in capital markets
  - Demand certainty: acceptance of cat model currency by rating agencies

- Purchasing subject to budget imposed by primary pricing
  - Top down approach increases retentions often leaving severe weather (non-named storm tornado hail events) net
  - Lack of perceived value for casualty covers also increases retentions, as seen in ceded premium mix

- Rating agencies, regulators and recent ERM and Economic Capital Modeling paradigms stress importance of tail covers but can result in higher net retentions that leave management with outsized, valuation-destroying net loss volatility

Return, Volatility and Valuation – US Listed Company Experience

Aon Benfield Hit/No Hit Price to Book Regression Study



Price to Book, Prospective ROE Link

Prospective ROE	Price to Book Assuming 1+ Hits	Price to Book Assuming No Hits	Delta
7.5%	0.76	0.97	27.3%
10.0%	0.83	1.11	33.2%
12.5%	0.91	1.25	38.2%
15.0%	0.98	1.39	42.5%
20.0%	1.12	1.68	49.3%

- **No earnings hits >150% of average quarterly operating income**: 1 point increase in prospective ROE increases P:B by **5.7 points**
- 1 or more earnings hits: 1 point increase in prospective ROE increases P:B by only **2.9 points**
- Valuation differential has persisted through time

Price to Book Regression History

	Valuation Differentials										
	Dec '10	May '10	Feb '10	Nov '09	Aug '09	Apr '09	Nov '08	Mar '08	Dec '07	May '07	Nov '06
At a 10% ROE	33.2%	28.5%	17.2%	15.4%	24.0%	33.6%	42.0%	31.1%	12.1%	11.0%	12.5%
At a 15% ROE	42.5%	54.3%	32.4%	36.0%	31.8%	48.4%	40.7%	48.8%	30.3%	44.5%	26.8%

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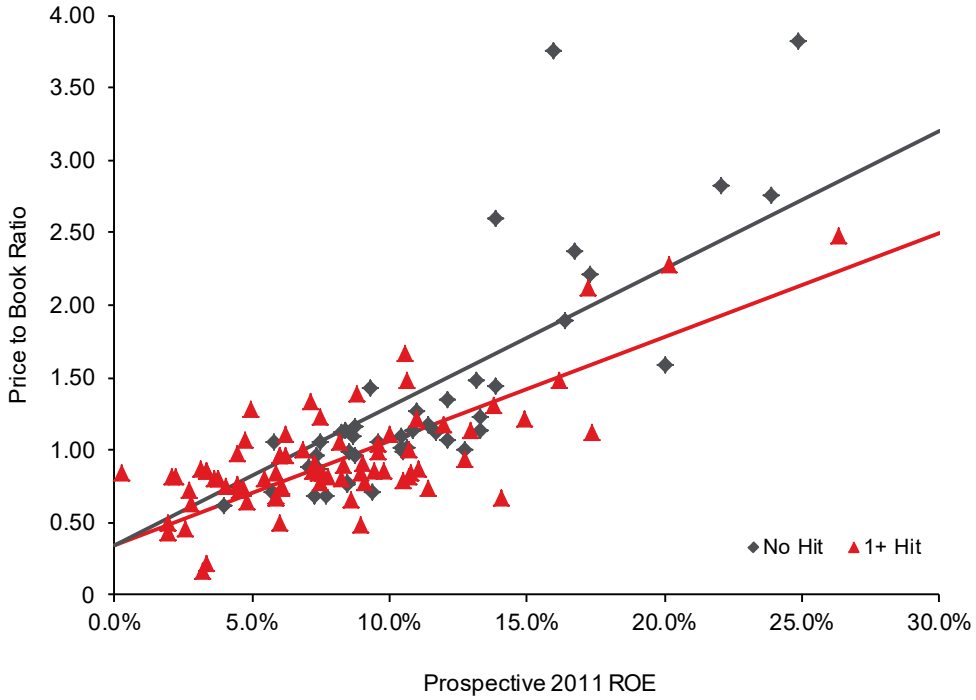
Return, Volatility and Valuation

Global Price to Book Study Q4 2010 Update



Price to Book, Prospective ROE Link

Prospective ROE	Price to Book Assuming 1+ Hits	Price to Book Assuming No Hits	Delta
7.5%	0.88	1.06	20.6%
10.0%	1.06	1.30	22.2%
12.5%	1.24	1.54	23.8%
15.0%	1.42	1.78	24.9%
20.0%	1.78	2.25	26.5%

- No quarterly net income losses: 1 point increase in prospective ROE increases P:B by 9.5 points
- 1 or more quarterly net income loss: 1 point increase in prospective ROE increases P:B by only 7.2 points
- Q3 and Q4 2008 omitted from study, similar results produced looking at operating income for US companies

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Summary of Price to Book Study

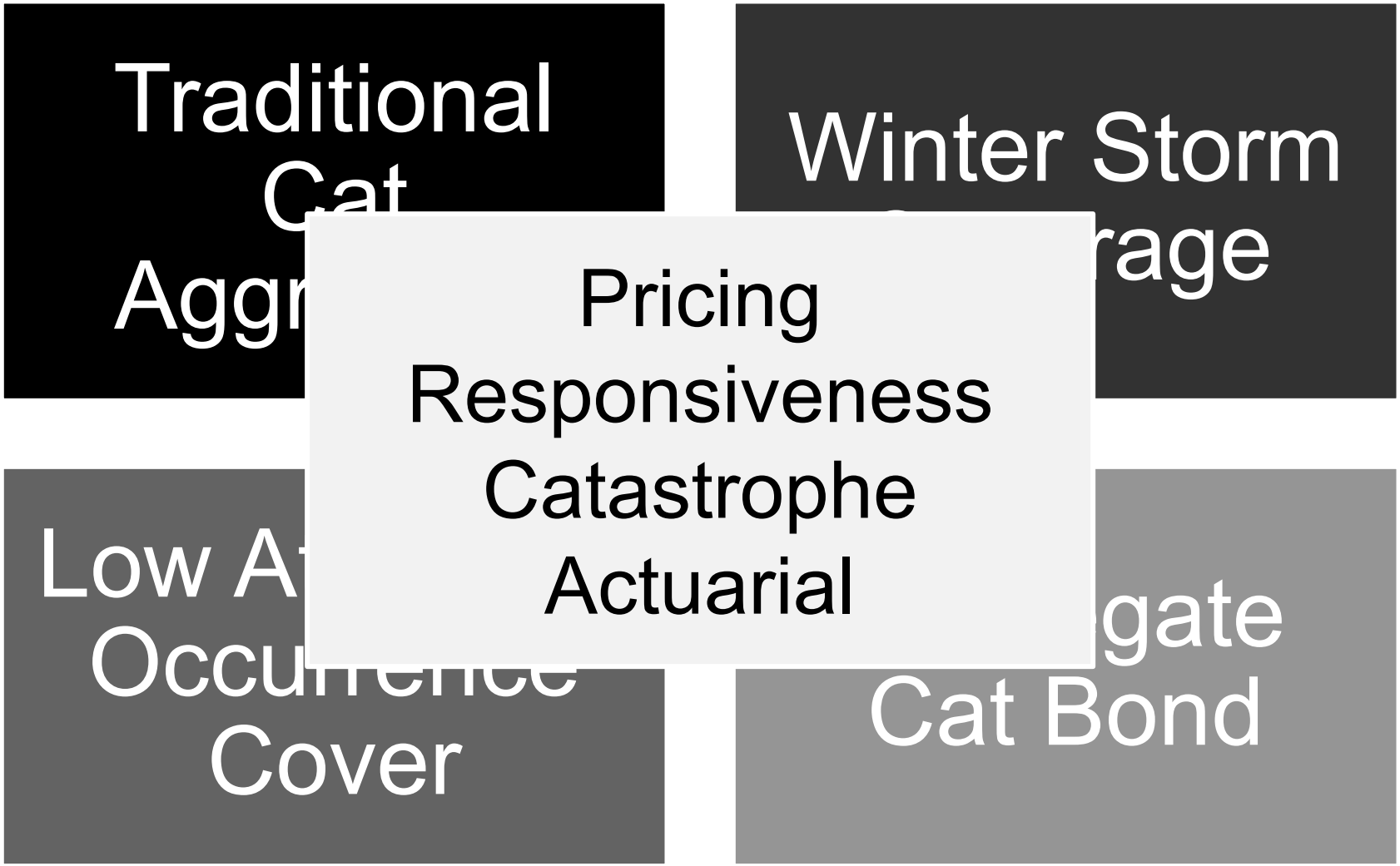
Hit Threshold Net Income Loss (Excluding 2008 2H) as of 2010 Q4

Summary of Global Price to Book Summary

	Global	US	Europe	APAC
Valuation Differential				
At 10% ROE	**22%**	**17%**	**16%**	**54%**
At 15% ROE	**25%**	**20%**	**15%**	**66%**
Number of Companies in Regression	124	66	40	18
Percentage of Companies with a Hit	65%	67%	65%	56%
Avg Hit Frequency	6%	8%	5%	7%
Average Values for Companies with Hits				
ROE	7.6%	5.9%	10.9%	7.2%
Price to Book Ratio	93%	88%	101%	100%
Average Values for Companies with No Hits				
ROE	11.5%	10.5%	11.2%	14.7%
Price to Book Ratio	136%	123%	118%	207%
Regression R^2	63%	42%	80%	84%

- Post financial crisis, tightening of risk tolerances
- Regression statistically significant at net income loss per quarter threshold
  - Vs. loss of 150% of expected quarterly income in original study from Nov 2006

Evolving Volatility Reinsurance Solutions



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Evolving Volatility Insurance Solutions

Impact on Demand

Impact Forecasting (IF)

Cat Score

Pricing for Portfolio Optimization

New Challenges: Hedging Model Risk

Multi-Model

Transparency

IF Custom Damage Functions

IF Near-Term / Long-Term Research

New Challenges: Hedging Pricing Risk

Strong Client Advocate

Multi-Year Covers

Insurance Linked Securities

Catastrophe Actuarial

Reinsurance Led Innovation

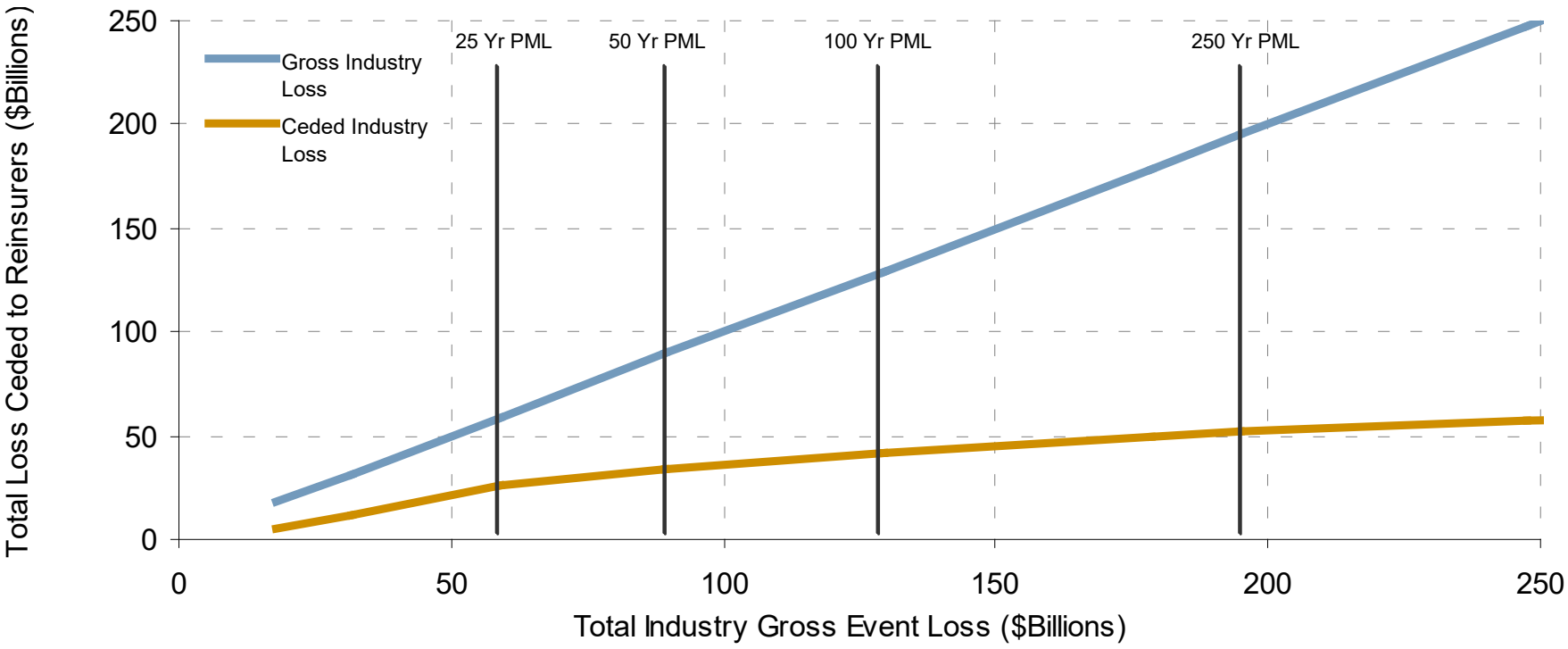
NFIP Privatization

HazMor / Quake Mortgage

Coverage Extensions

Coverage Enhancements

Reinsurance: A Solid Promise



- Insurer purchases reinsurance covers to 100 to 250 year PML
- As the size of the industry catastrophe event increases, the proportion of loss ceded to reinsurers decreases as more company specific covers reach the top of their reinsurance program
- Reinsurer cover limits limit exposure to potential model miss

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Reinsurance: Evolving to Solve Your Problems in Revolutionary Times

- Reinsurance evolution
  - Risk transfer structures and capital providers
  - Tail-centric risk transfer augmented with volatility / valuation management solutions
  - Broker guidance to navigate market…evaluate options…and advocate on your behalf
  - Broker analytic solutions for underwriting, pricing and risk & capital management

- Reinsurance market functioned successfully through financial crisis
  - Unlikely to impacted by “systemically risky” regulation from banking
  - Providing solid promise and warranted view of risk

- Enjoy a productive conference

Contact

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