

Aon Benfield Analytics

U.S. P&C Industry Statutory Reserve Study

Based on Schedule P data as of December 31, 2012

June 13, 2013

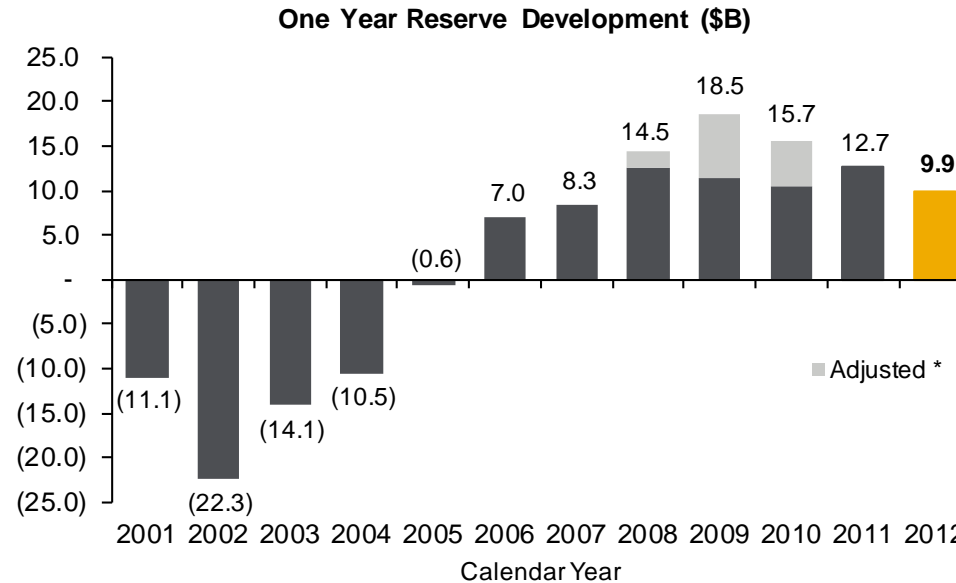
Disclaimer

- This study provides directional evidence about the aggregate adequacy of industry reserves and tries to capture the effects that may not be apparent or credible in any individual company's data
- This study is not intended, and should not be construed, as an actuarial reserve opinion
- This study was compiled from sources that Aon Benfield believes to be reliable. However, Aon Benfield makes no representation or warranty as to the accuracy, reliability of completeness of such information, and the information should not be relied upon in isolation in making business, investment or similar decisions

Industry Reserve Study Highlights

- Overall industry redundancy at year end 2012 of USD9.2B – equivalent to 1.6% of booked reserves
- Of the USD11.7B redundancy at year end 2011, USD9.9B was released in 2012
- Commercial lines moved to a deficient position of USD0.9B at year end 2012 and continues to release reserves in the first quarter of 2013
- Personal lines redundancy increased to USD10.1B at year end 2012 – 40% has been released during the first quarter of 2013

U.S. P&C Industry Reserve Development (2001 – 2012)



*Adjustments include Financial Lines development in 2008-2009 and AIG adverse development in 2010.

- 2012 development per P&C Industry data as compiled by SNL through May 21, 2013
- Total favorable development in 2012 of USD9.9B

U.S. Reserve Estimated Adequacy at YE 2012 (USD Billions)

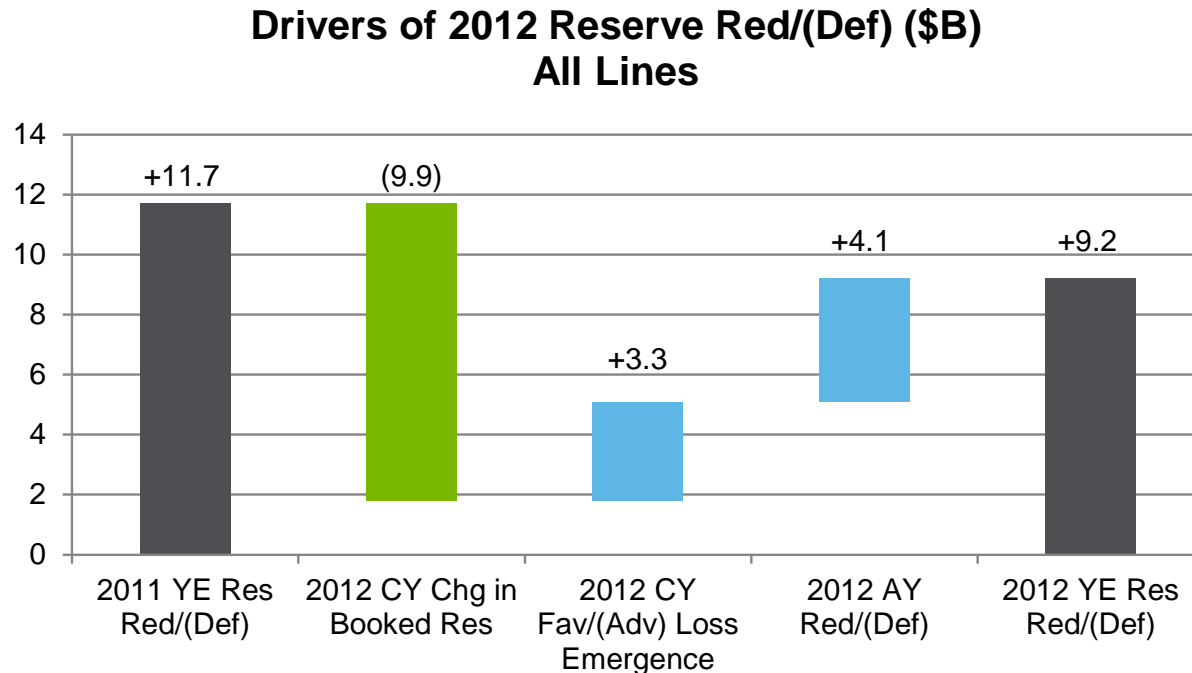
Reserve Development Summary (\$B)

Line	Estimated Reserves	Booked Reserves	Redundancy at YE 2012	Favorable / (Adverse) Development						Years at Run Rate
				2008	2009	2010	2011	2012	Average	
Personal Lines	129.6	139.7	10.1	5.4	5.8	6.7	7.6	7.1	6.5	1.6
Commercial Lines	437.8	436.9	(0.9)	(3.5)	12.8	3.9	5.1	2.8	4.2	N/A
Commercial Property	45.2	47.2	2.0	2.6	2.4	2.7	1.4	1.1	2.1	1.0
Commercial Liability	232.6	235.6	2.9	5.3	3.8	2.4	4.1	2.5	3.6	0.8
Workers Compensation	142.1	138.2	(3.9)	1.1	(0.5)	(1.6)	(0.0)	(0.1)	(0.2)	N/A
Financial Guaranty	17.8	15.9	(1.9)	(12.6)	7.0	0.4	(0.4)	(0.6)	(1.3)	N/A
Total	567.4	576.6	9.2	1.8	18.5	10.5	12.7	9.9	10.7	0.9

- P&C Industry undiscounted statutory reserves as of December 31, 2012 estimated to be USD9.2B redundant
- USD9.9B reserves released in calendar year 2012
- At the current average run rate, the redundancy could be eliminated within a year

Drivers of 2012 Reserve Redundancy/(Deficiency)

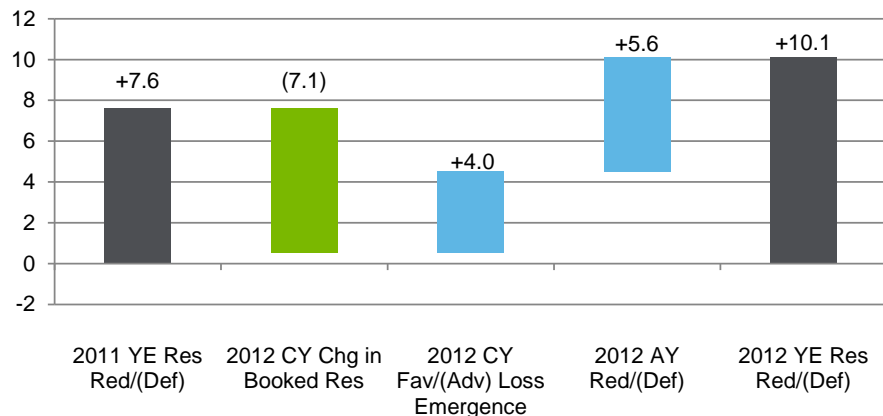
All Lines



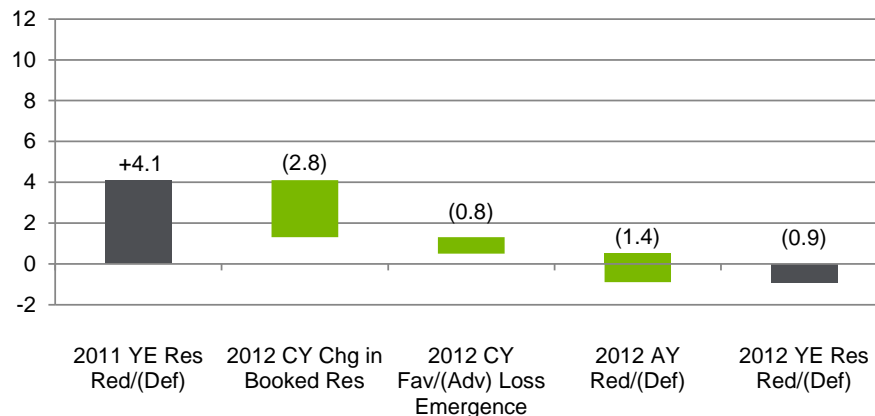
- About 85% of estimated total industry redundancy at year-end 2011 was released during 2012
- Year end 2012 reserve redundancy of USD9.2B driven by:
 - Favorable loss experience in accident years prior to 2012, primarily in personal lines
 - Conservatively booked 2012 accident year, primarily in personal lines

Drivers of 2012 Reserve Redundancy/(Deficiency) Personal & Commercial Lines

**Drivers of 2012 Reserve Red/(Def) (\$B)
Personal Lines**



**Drivers of 2012 Reserve Red/(Def) (\$B)
Commercial Lines**



- While most of the personal lines redundancy at year end 2011 was released in 2012, it was built back up due to:
 - Favorable loss experience in accident years prior to 2012
 - Conservatively booked 2012 accident year
- Commercial lines reserves were redundant at year end 2011 but have swung to a deficiency position at year end 2012
 - Significant portion of redundancy released during 2012
 - Deterioration in loss experience in accident years prior to 2012
 - 2012 accident year booked at a deficiency

Summary of Favorable / (Adverse) Reserve Development

Q1 2013 by Company Focus

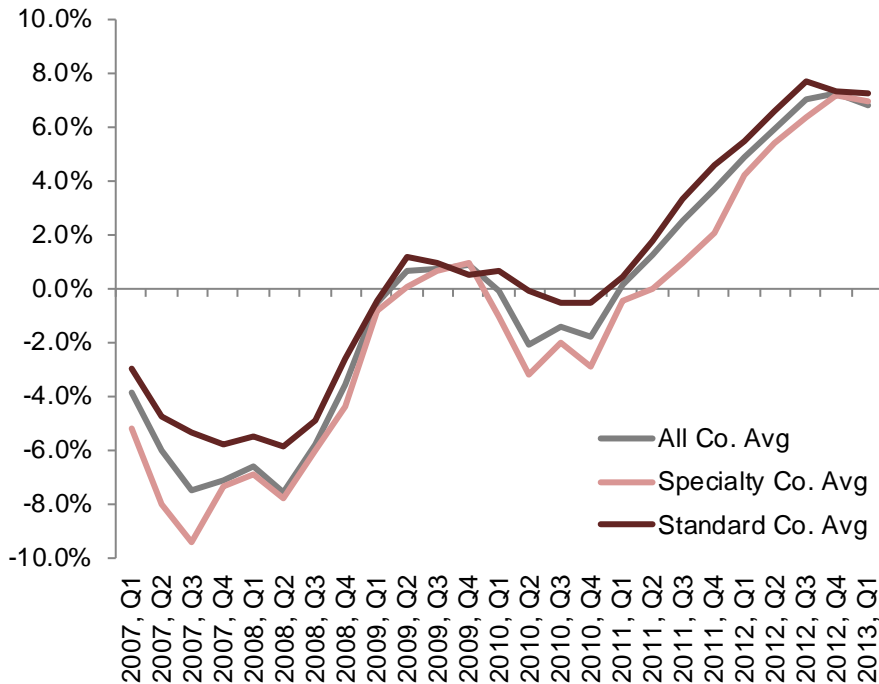
Company Focus	Favorable / (Adverse) Development (\$B)
Personal	3.8
Commercial	1.6
Other	0.1
Total	5.6

Source: SNL Financial

- Companies continued to release reserves in the first quarter of 2013
 - About 40% of the year end 2012 personal lines redundancy
 - Increased pressure on commercial lines as more releases despite deficiency at year end 2012

Aon Benfield Commercial Casualty Rate Indices

Aon Benfield Indices



- For the ninth consecutive quarter, commercial casualty rates increased
 - All 14 groups included in the study achieved rate increases
 - However, the size of the rate increase declined for the first time since the second quarter of 2012
- Several groups stated that the largest rate increases were achieved in workers compensation
- Rates in professional lines show continuing improvements
- Most companies reported that rate adequacy was better on new business than on renewal business

Notes: Aon Benfield rate information compiled from Earnings Calls, Press Releases and other filings (10K's, 10Qs) from the following companies:

Standard: ACE Limited, American International Group, Inc., Hartford Financial Services Group, Inc., Travelers Companies Inc., XL Group plc, W.R. Berkley Corporation, CNA Financial Corporation and Chubb Corporation

Specialty: ACE Limited, Arch Capital Group Ltd, Allied World Assurance Company Holdings, AG, AXIS Capital Holdings Limited, Markel Corporation, Old Republic International Corporation, RLI Corp., W.R. Berkley Corporation, CNA Financial Corporation and Chubb Corporation; Some groups report a Commercial Line rate change which includes both property and casualty

Data Sources

- Schedule P parts 1 – 5 were used to obtain the following:
 - Earned Premiums
 - Paid Loss Triangle
 - Case Incurred Loss Triangle
 - Incurred (Ultimate) Loss Triangle

- P&C Industry 2012 data based on aggregation of NAIC Annual Statement data via SNL Financial
 - Data as of May 6, 2013 is based on majority of industry, but may change as additional annual statements are filed and aggregated

Reserve Methods Applied

- Determine reserve levels indicated by mechanical application of actuarial techniques
 - Three and five year weighted average link ratios applied to paid loss triangles
 - Three and five year weighted average link ratios applied to case incurred loss triangles
 - Hierarchical Growth Curve model applied to most lines
 - Tail factors based on current booked tail factor (Booked Ultimate Loss for AY 2003 divided by most recent Case-Incurred or Paid Loss for AY 2003)

- Accident Years Prior to 2003
 - Prior year reserves estimated based on observed decay rate of prior year paid losses
 - Methodology makes no explicit provision for Asbestos & Environmental (A&E) reserves

- Reserve data are subject to considerable uncertainty and actual reserve emergence could vary materially from the amounts indicated by these methods

- For workers' compensation, the analysis is based on nominal data
 - Other industry studies on workers' compensation reserves may include tabular and/or non-tabular discounts as part of the industry's reserve adequacy (i.e., discounts reduce the industry's reserve adequacy)
 - This study does not include discounts as a reduction in reserve adequacy

Reserve Methods Applied to Industry by Line of Business

Summary of Reserve Methodology by LOB

LOB	LDF Selection	Tail Factor	Ultimate Loss Selection		
			Methods Used	Average of Methods	Max of Methods
Homeowners	3 Wtd and 5 Wtd	Current Booked	Avg Pd & Inc LDF, Pd & Inc HLR	AY 2003 - 2010	AY 2011 - 2012
Private Passenger Auto	3 Wtd and 5 Wtd	Current Booked	Avg Pd & Inc LDF, Pd & Inc HLR	AY 2003 - 2012	
Commercial Auto	3 Wtd and 5 Wtd	Current Booked	Avg Pd & Inc LDF, Pd & Inc HLR	AY 2003 - 2010	AY 2011 - 2012
Workers Compensation	3 Wtd and 5 Wtd	2 Yr Avg Booked	Avg Pd & Inc LDF, Pd & Inc HLR	AY 2003 - 2007	AY 2008 - 2012
Commercial Multi Peril	3 Wtd and 5 Wtd	Current Booked	Avg Pd & Inc LDF, Pd & Inc HLR	AY 2003 - 2010	AY 2011 - 2012
Medical PL - Occ	3 Wtd and 5 Wtd	Current Booked	Avg Pd & Inc LDF, Pd & Inc HLR	AY 2003 - 2007	AY 2008 - 2012
Medical PL - CM	3 Wtd and 5 Wtd	Current Booked	Avg Pd & Inc LDF, Pd & Inc HLR	AY 2003 - 2010	AY 2011 - 2012
Special Liability	3 Wtd and 5 Wtd	Current Booked	Avg Pd & Inc LDF, Pd & Inc HLR	AY 2003 - 2010	AY 2011 - 2012
Other Liability - Occ	3 Wtd and 5 Wtd	2 Yr Avg Booked	Avg Pd & Inc LDF, Pd & Inc HLR	AY 2003 - 2007	AY 2008 - 2012
Other Liability - CM	3 Wtd and 5 Wtd	Current Booked	Avg Pd & Inc LDF, Pd & Inc HLR	AY 2003 - 2009	AY 2010 - 2012
International	3 Wtd and 5 Wtd	Current Booked	Avg Pd & Inc LDF, Pd & Inc HLR	AY 2003 - 2010	AY 2011 - 2012
Reinsurance - Property	3 Wtd and 5 Wtd	Current Booked	Avg Pd & Inc LDF, Pd & Inc HLR	AY 2003 - 2010	AY 2011 - 2012
Reinsurance - Liability	3 Wtd and 5 Wtd	Current Booked	Avg Pd & Inc LDF, Pd & Inc HLR	AY 2003 - 2012	
Reinsurance - Financial	3 Wtd and 5 Wtd	Current Booked	Avg Pd & Inc LDF, Pd & Inc HLR	AY 2003 - 2010	AY 2011 - 2012
Products Liability - Occ	3 Wtd and 5 Wtd	Current Booked	Avg Pd & Inc LDF, Pd & Inc HLR	AY 2003 - 2010	AY 2011 - 2012
Products Liability - CM	3 Wtd and 5 Wtd	Current Booked	Avg Pd & Inc LDF, Pd & Inc HLR	AY 2003 - 2010	AY 2011 - 2012
All Other 2 Year Lines	3 Wtd and 5 Wtd	Current Booked	Avg Pd & Inc LDF	AY 2003 - 2010	AY 2011 - 2012
Financial Guaranty	Manual Selection	Manual Selection	Avg Pd & Inc LDF	AY 2003 - 2010	AY 2011 - 2012

- Methodology above applied to P&C Industry data, with limited deviations where appropriate

Hierarchical Growth Curve Loss Reserving Model (HLR)

- Based on Clark (2003) and Guszczka (2008), model loss development using a non-linear hierarchical model
 - More parsimonious than standard loss reserving methods
 - Assumptions can be easily tested
 - Statistical framework results in a more ‘automated’ exposure based indication
 - Integrates Buhlmann Credibility theory into (G)LM modeling – both actuarial staples
- Use growth curve (Loglogistic or Weibull) to model the loss development process
- Cape Cod method
 - Cumulative loss (CL) by accident year and development period is equal to premium times expected loss ratio times one minus growth curve (G) at that development period
- Use hierarchical modeling to allow the expected loss ratio to vary by accident year
- Clark, D. R., “LDF Curve Fitting and Stochastic Loss Reserving: A Maximum Likelihood Approach,” *Casualty Actuarial Society Forum*, Fall 2003, 41-91
- Guszczka J. (2008). Hierarchical Growth Curve Models for Loss Reserving. *Casualty Actuarial Society Forum*. Available at <http://www.casact.org/pubs/forum/08orum/7Guszczka.pdf>

About Aon Benfield

Aon Benfield, a division of Aon plc (NYSE: AON), is the world's leading reinsurance intermediary and full-service capital advisor. We empower our clients to better understand, manage and transfer risk through innovative solutions and personalized access to all forms of global reinsurance capital across treaty, facultative and capital markets. As a trusted advocate, we deliver local reach to the world's markets, an unparalleled investment in innovative analytics, including catastrophe management, actuarial and rating agency advisory. Through our professionals' expertise and experience, we advise clients in making optimal capital choices that will empower results and improve operational effectiveness for their business. With more than 80 offices in 50 countries, our worldwide client base has access to the broadest portfolio of integrated capital solutions and services. To learn how Aon Benfield helps empower results, please visit aonbenfield.com.

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