

CLRS

*Industry Reserve and
Loss Ratio Trends*

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Agenda

I. Background

- 1. Overview of PwC analysis**
- 2. Background on FASB's short duration contract disclosures**
- 3. Observations from PwC review of FASB's short duration contract disclosures**

II. Industry reserve and loss ratio trends

- 1. Reserve variability trends**
- 2. Precision tables**
- 3. Persistency trends**
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Background

PwC analysis of reserve and loss ratio trends

Overview

- PwC analyzed reserve development and other trends using 2017 Statutory Schedule P filings (US Statutory) and the short duration contract disclosures in 2017 10-K filings (US GAAP)
- The analyses performed using US Statutory and US GAAP filings are comprised of:
 - Cumulative reserve development measuring the change in ultimate claim values over time by line of business
 - Loss and defense and cost containment (DCC) ratios on a net of reinsurance basis, comparing initial accident year estimates to year-end 2017 estimates, by line of business
- The US Statutory analysis relies on Schedule P filings by line of business for substantially all US Statutory filers
- The US GAAP analysis uses the disaggregated triangles from the updated disclosures required by the FASB ASU 2015-09, *Disclosures about Short-Duration Contracts*, for 43 large public companies which are intended to be a reasonable representation of the larger P&C Industry

FASB ASU on Short-Duration Contracts

Overview

- The Financial Accounting Standards Board (FASB) changed the disclosure requirements for short-duration contracts in its May 2015 publication of Accounting Standards Update (ASU) 2015-09, *Disclosures about Short-Duration Contracts*.
- FASB's stated intent for the enhanced disclosures was to...
 - ***increase transparency*** of significant estimates made in measuring the liability for unpaid claims and claim adjustment expenses,
 - ***improve comparability*** by requiring consistent disclosure of information, and
 - ***provide financial statement users with information*** to facilitate analysis of the amount, timing, and uncertainty of cash flows arising from contracts issued by insurance entities and the development of loss reserve estimates.
- Effective for annual periods beginning after December 15, 2015 for public entities and annual periods beginning after December 15, 2016 for all other entities.

FASB ASU on Short-Duration Contracts

Example Disclosure

Incurred Claims and Allocated Claim Adjustment Expenses, Net of Reinsurance											As of December 31, 2017		
Accident Year	For the Years Ended December 31,										Total Incurred-but-Not-Reported Liabilities Plus Expected Development on Reported Claims	Cumulative Number of Reported Claims	
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017			
2008	\$ 1,000	\$ 1,050	\$ 1,100	\$ 1,120	\$ 1,150	\$ 1,180	\$ 1,200	\$ 1,240	\$ 1,250	\$ 1,250	\$	10	50
2009		1,050	1,030	1,040	1,030	1,020	980	950	920	900		10	36
2010			1,100	1,080	1,060	1,050	1,040	1,020	1,010	1,000		20	40
2011				1,150	1,160	1,140	1,120	1,100	1,080	1,100		30	44
2012					1,200	1,260	1,300	1,280	1,260	1,250		50	50
2013						1,250	1,300	1,330	1,340	1,350		70	54
2014							1,350	1,340	1,320	1,300		140	52
2015								1,300	1,280	1,250		260	50
2016									1,250	1,200		450	48
2017										1,400		860	56
										Total		<u>\$12,000</u>	

Cumulative Paid Claims and Allocated Claim Adjustment Expenses, Net of Reinsurance											
Accident Year	For the Years Ended December 31,										
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	
2008	\$ 220	\$ 590	\$ 830	\$ 1,010	\$ 1,110	\$ 1,140	\$ 1,170	\$ 1,190	\$ 1,200	\$ 1,210	
2009		160	430	600	730	800	820	840	850	860	
2010			180	480	670	810	880	910	930	950	
2011				190	520	730	890	970	1,000	1,030	
2012					220	590	830	1,010	1,110	1,140	
2013						240	640	900	1,090	1,190	
2014							230	620	870	1,050	
2015								220	590	830	
2016									210	570	
2017										250	
										Total	<u>\$ 9,080</u>
										All outstanding liabilities before 2008, net of reinsurance	150
										Liabilities for claims and claim adjustment expenses, net of reinsurance	<u>\$ 3,070</u>

Average Annual Percentage Payout of Incurred Claims by Age, Net of Reinsurance										
Years	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>
Percentage	18%	30%	19%	14%	8%	3%	2%	2%	1%	1%

FASB ASU on Short-Duration Contracts

Overview of Required Disclosures

1

Incurred and paid development triangles

- Net of reinsurance
- Include up to 10 accident years

2

Reconciliation of liability implied by the triangles to the total liability reported (include reinsurance recoverables)

3

Total IBNR by accident year with a description of reserving methodology

4

Reported claims (unless impracticable to include) and description of approach to determine frequency

5

The average annual percentage paid by age for the same number of years presented in the triangles

FASB ASU on Short-Duration Contracts

Size of Development Tables

Claims development tables should be provided for the **number of years for which claims incurred typically remain outstanding.**

No. of Years	Year-end 2017		Year-end 2016	
	No. of Claims Development Tables	% of Claims Development Tables	No. of Claims Development Tables	% of Claims Development Tables
10	175	68%	163	67%
9	2	1%	7	3%
8	4	2%	2	1%
7	5	2%	21	9%
6	35	14%	4	2%
5	27	11%	43	18%
4	2	1%	0	0%
3	5	2%	3	1%
2	1	0%	2	1%
Total	256	100%	245	100%

- Number of years need not exceed 10 years
- Approximately one-third of companies presenting fewer than 10 years of data in the claims development tables cite “impracticable” as their rationale; in most other cases the length of time reported represents the number of years for which claims typically remain outstanding
- Companies providing fewer than 10 years of data in 2016 who cited “impracticable” as their rationale generally included an additional year in their 2017 tables

No. of Companies 43 41

FASB ASU on Short-Duration Contracts

Size of Development Tables

No. of Years	No. of Claims Development Tables				
	P&C Combined	Commercial Lines Focus Large	Commercial Lines Focus Small	Personal Lines Focus	Offshore Insurance / Reins Focus
10	175	79	38	17	41
9	2	2	0	0	0
8	4	3	1	0	0
7	5	4	1	0	0
6	35	5	4	0	26
5	27	12	5	10	0
4	2	2	0	0	0
3	5	3	2	0	0
2	1	0	1	0	0
Total	256	110	52	27	67

No. of Companies	43	15	12	6	10
Avg. No. of Tables	6.0	7.3	4.3	4.5	6.7

FASB ASU on Short-Duration Contracts

Size of Development Tables

No. of Years	Year-end 2017		Long-Tailed Lines		Short-Tailed Lines	
	No. of Claims Development Tables	% of Claims Development Tables	No. of Claims Development Tables	% of Claims Development Tables	No. of Claims Development Tables	% of Claims Development Tables
10	175	68%	93	80%	81	59%
9	2	1%	1	1%	1	1%
8	4	2%	3	3%	1	1%
7	5	2%	4	3%	1	1%
6	35	14%	13	11%	20	15%
5	27	11%	1	1%	26	19%
4	2	1%	0	0%	2	1%
3	5	2%	1	1%	4	3%
2	1	0%	0	0%	1	1%
Total	256	100%	116	100%	137	100%

No. of
Companies 43

Avg. No. of
Yrs per Table 9.3

Avg. No. of
Yrs per Table 8.1

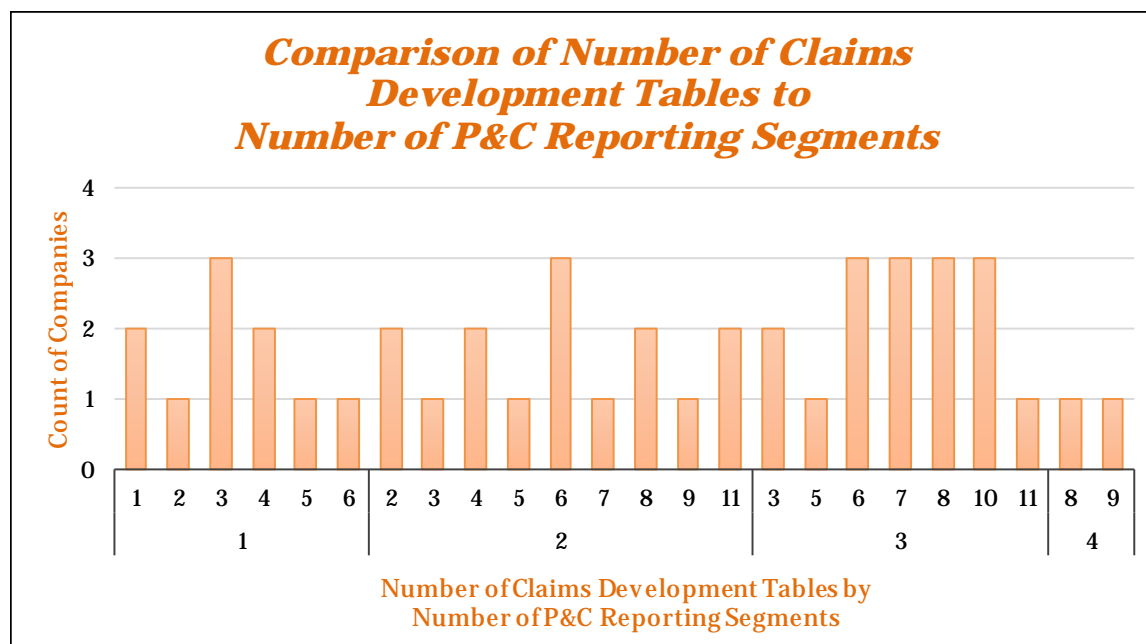
- Provide claims development tables for the number of years for which claims incurred typically remain outstanding
- Long-tailed lines tables generally include 10 years
- Short-tailed lines have more tables with fewer than 10 years

FASB ASU on Short-Duration Contracts

Level of Aggregation

Insurance entities should aggregate or disaggregate those disclosures so that useful information is **not obscured** by either the inclusion of **a large amount of insignificant detail** or the aggregation of items that **have significantly different characteristics**.

- Companies generally selected a more granular level of aggregation than is used for GAAP reporting
- Examples of levels of aggregation:
 - Product type
 - Geography
 - Duration of claims
 - Personal vs. Commercial



- We observed a slight increase in the level of disaggregation in 2017, with companies including on average 2.7 claims development tables per P&C Reporting Segment compared to 2.5 in 2016.

PwC analysis of reserve and loss ratio trends

Overview of findings

- In the aggregate, P&C insurers have released prior year-end reserves in each of the last 12 calendar years.
- Based on our analysis of ***US statutory filings***:
 - Medical Malpractice, Product Liability and Reinsurance have developed more favorably than other lines of business on an accident year basis.
 - Commercial Auto Liability has developed adversely relative to initial expectations over the last several accident years; Other Liability and Private Passenger Auto Liability have emerged adversely in recent accident years.
- Based on our analysis of ***US GAAP filings***:
 - Offshore insurance / reinsurance companies and smaller, commercial lines focused insurers have tended to develop more favorably relative to initial year-end balance sheet reserves than other industry groupings.
- As prior reserve balances mature and are re-evaluated, roughly one-fifth of US statutory companies' reserves have deviated by more than 25% from the amount initially recorded on the balance sheet.
- Loss and DCC ratios for accident year 2017, specifically Homeowners and Reinsurance, were driven by heavy natural catastrophe activity.

US P&C Industry: reserve variability by line

Calendar Year-end

This table shows how industry loss reserves have developed since the original year-end balance sheet date through year ending 2017. For example, aggregate industry reserves as of December 31, 2009 have since developed favorably by 10%. Note that the data for any given calendar year-end includes development from all prior accident years.

Cumulative Reserve Development as a % of Initial Recorded Reserves

Calendar Year End	All	Other Liab CM	Other Liab Occ	Med Mal CM	Med Mal Occ	CMP	WC	CAL	PPAL	HO	Prod Liab CM+Occ	Spec Liab	Reins
2008	-11%	-20%	-1%	-36%	-23%	-10%	-5%	-10%	-7%	-12%	29%	-20%	-12%
2009	-10%	-16%	-3%	-35%	-23%	-8%	-5%	-10%	-7%	-9%	27%	-23%	-12%
2010	-8%	-15%	-3%	-32%	-23%	-5%	-4%	-4%	-6%	-11%	25%	-23%	-11%
2011	-7%	-12%	-1%	-27%	-23%	-3%	-4%	2%	-4%	-14%	17%	-20%	-12%
2012	-6%	-10%	-1%	-22%	-22%	-2%	-4%	5%	-2%	-12%	16%	-17%	-12%
2013	-5%	-9%	1%	-14%	-19%	-1%	-5%	8%	-1%	-10%	8%	-16%	-11%
2014	-4%	-6%	2%	-14%	-13%	0%	-6%	11%	0%	-7%	5%	-8%	-8%
2015	-3%	-4%	2%	-9%	-8%	1%	-5%	9%	2%	-4%	1%	-6%	-6%
2016	-1%	-1%	1%	-4%	-5%	-1%	-3%	6%	1%	-1%	0%	-3%	-1%

Initial Recorded Reserves - CY 2016 (\$ in billions)

542	29	73	15	10	35	134	27	105	20	13	4	38
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Source: SNL, Individual Company Statutory Statements, 2017. Compiled by PwC.

AmTrust, Allianz, AIG, and Arch excluded from P&C Industry US Stat results due to distortions in their Schedule P development.

Note: Green highlighting denotes favorable emergence; red highlighting denotes adverse emergence.

US P&C Industry: reserve variability by line

Calendar Year-end, excluding prior accident years

This table shows how industry loss reserves have developed since the original year-end balance sheet date through year ending 2017, excluding accident years 2007 and prior.

Comparing the results in this table to the previous table highlights the impact of the prior accident years on the cumulative reserve development by line.

Cumulative Reserve Development as a % of Initial Recorded Reserves Excluding Accident Years 2007 & Prior

Calendar Year End	All	Other Liab CM	Other Liab Occ	Med Mal CM	Med Mal Occ	CMP	WC	CAL	PPAL	HO	Prod Liab CM+Occ	Spec Liab	Reins
2008	-11%	-6%	-18%	-31%	-21%	-11%	-1%	-6%	-6%	-8%	-4%	-13%	-24%
2009	-12%	-6%	-18%	-29%	-22%	-9%	-3%	-7%	-7%	-8%	-4%	-24%	-23%
2010	-10%	-8%	-16%	-28%	-21%	-6%	-1%	-1%	-6%	-11%	-4%	-24%	-19%
2011	-9%	-8%	-11%	-25%	-21%	-4%	-1%	5%	-5%	-14%	-4%	-21%	-18%
2012	-8%	-8%	-7%	-20%	-20%	-4%	-4%	7%	-2%	-12%	-5%	-18%	-19%
2013	-6%	-7%	-4%	-14%	-17%	-2%	-6%	10%	-1%	-10%	-11%	-17%	-17%
2014	-5%	-5%	-2%	-14%	-12%	-2%	-7%	12%	0%	-7%	-9%	-9%	-14%
2015	-3%	-4%	0%	-8%	-7%	0%	-6%	10%	2%	-4%	-10%	-6%	-10%
2016	-2%	-1%	0%	-4%	-4%	-2%	-4%	6%	1%	-1%	-5%	-3%	-1%

Initial Recorded Reserves - CY 2016 (\$ in billions)

443	27	55	15	9	32	89	26	102	20	6	4	23
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Source: SNL, Individual Company Statutory Statements, 2017. Compiled by PwC.

AmTrust, Allianz, AIG, and Arch excluded from P&C Industry US Stat results due to distortions in their Schedule P development.

Note: Green highlighting denotes favorable emergence; red highlighting denotes adverse emergence.

US GAAP: reserve variability by industry group

Calendar Year-end, excluding prior accident years

This table shows how reserves have developed since the original year-end balance sheet date through year ending 2017. Note that the data for any given calendar year-end includes development from all prior accident years excluding accident years 2007 and prior.

Cumulative Reserve Development as a % of Initial Recorded Reserves

Calendar Year End	P&C Combined	Industry Grouping				Line Grouping			
		Commercial Lines Large Insurer	Commercial Lines Small Insurer	Personal Lines Focus Insurer	Offshore Insurance/ Reinsurance Focus	Short-tail Lines	Long-tail Lines	Insurance Lines	Reinsurance Lines
2008	-8%	-6%	-17%		-12%	-13%	-5%	-5%	-16%
2009	-8%	-7%	-18%		-11%	-17%	-5%	-6%	-15%
2010	-7%	-6%	-14%		-11%	-14%	-5%	-5%	-15%
2011	-6%	-5%	-13%		-10%	-12%	-4%	-4%	-14%
2012	-7%	-5%	-12%		-12%	-13%	-4%	-4%	-15%
2013	-6%	-4%	-9%	-3%	-11%	-10%	-4%	-4%	-14%
2014	-5%	-3%	-8%	-4%	-9%	-8%	-3%	-2%	-12%
2015	-2%	-1%	-6%	-2%	-6%	-5%	-1%	0%	-9%
2016	-1%	0%	-3%	-3%	-2%	-2%	-1%	-1%	-3%

Initial Recorded Reserves - CY 2016 (\$ in billions)

353	231	9	24	89	122	231	272	81
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Source: 43 GAAP 10K Annual Statements, 2017. Compiled by PwC. Excludes accident years 2007 and prior.

Note that several disaggregated claims development tables included in our analysis included both short and long tailed exposure. Since we could not separate the short and long tailed components, we did not assign these claims development tables to either grouping. As such, the sum of short tailed lines and long tailed lines does not equal the P&C Combined total.

Note: Green highlighting denotes favorable emergence; red highlighting denotes adverse emergence.

US P&C Industry: reserve variability by line

Accident Year

This table shows how accident year loss reserves have developed since the initial year-end balance through year ending 2017.

For example, aggregate industry reserves for accident year 2009 as of December 31, 2009 have since developed favorably by 9%.

Accident years will continue to develop as they mature. More recent accident years have had fewer subsequent calendar years to mature and are therefore subject to greater estimation uncertainty.

Cumulative Reserve Development as a % of Initial Recorded Reserves

Accident Year	All	Other Liab CM	Other Liab Occ	Med Mal CM	Med Mal Occ	CMP	WC	CAL	PPAL	HO	Prod Liab CM+Occ	Spec Liab	Reins
2008	-11%	-6%	-18%	-31%	-21%	-11%	-1%	-6%	-6%	-8%	-4%	-13%	-24%
2009	-9%	0%	-20%	-28%	-22%	-4%	-2%	-8%	-6%	-5%	-6%	-26%	-22%
2010	-5%	-6%	-11%	-24%	-21%	-4%	2%	4%	-5%	-8%	-5%	-19%	-17%
2011	-6%	-2%	-4%	-16%	-23%	-3%	-1%	13%	-4%	-13%	-5%	-11%	-16%
2012	-6%	1%	-1%	-12%	-17%	-1%	-7%	11%	-2%	-10%	-17%	-11%	-16%
2013	-5%	-4%	0%	-4%	-11%	-1%	-8%	14%	0%	-8%	-21%	-11%	-16%
2014	-3%	-1%	-1%	-4%	-6%	-1%	-9%	14%	1%	-4%	-19%	1%	-10%
2015	-1%	-1%	0%	-1%	-3%	0%	-7%	11%	5%	0%	-14%	0%	-7%
2016	-1%	3%	0%	0%	-2%	-2%	-4%	5%	1%	3%	-2%	0%	6%

Initial Recorded Reserves - AY 2016 (\$ in billions)

167	7	15	4	2	12	23	11	53	13	1	2	6
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Source: SNL, Individual Company Statutory Statements, 2017. Compiled by PwC.

AmTrust, Allianz, AIG, and Arch excluded from P&C Industry US Stat results due to distortions in their Schedule P development.

Note: Green highlighting denotes favorable emergence; red highlighting denotes adverse emergence.

US GAAP: reserve variability by industry group

Accident Year

This table shows how accident year loss reserves have developed since the initial year-end balance through year ending 2017. Accident years will continue to develop as they mature. More recent accident years, which have had fewer subsequent calendar years to mature, are therefore subject to greater estimation uncertainty.

Cumulative Reserve Development as a % of Initial Recorded Reserves

Accident Year	P&C Combined	Industry Grouping				Line Grouping			
		Commercial Lines Focus Large Insurer	Commercial Lines Focus Small Insurer	Personal Lines Focus Insurer	Offshore Insurance/ Reinsurance Focus	Short-tail Lines	Long-tail Lines	Insurance Lines	Reinsurance Lines
2008	-8%	-6%	-17%		-12%	-13%	-5%	-5%	-16%
2009	-7%	-5%	-14%		-10%	-16%	-3%	-5%	-12%
2010	-3%	-2%	-6%		-8%	-7%	-1%	-1%	-10%
2011	-3%	-1%	-9%		-8%	-8%	1%	0%	-10%
2012	-5%	-2%	-10%		-12%	-12%	-1%	-2%	-14%
2013	-5%	-3%	-5%	-3%	-11%	-8%	-2%	-3%	-13%
2014	-3%	-1%	-10%	-3%	-7%	-6%	0%	-1%	-9%
2015	0%	2%	-6%	-1%	-2%	-3%	4%	2%	-6%
2016	2%	3%	-3%	-2%	0%	1%	2%	1%	2%

Initial Recorded Reserves - AY 2016 (\$ in billions)

119	71	4	14	31	63	56	92	27
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Source: 43 GAAP 10K Annual Statements, 2017. Compiled by PwC. Excludes accident years 2007 and prior.

Note that several disaggregated claims development tables included in our analysis included both short and long tailed exposure. Since we could not separate the short and long tailed components, we did not assign these claims development tables to either grouping. As such, the sum of short tailed lines and long tailed lines does not equal the P&C Combined total.

Note: Green highlighting denotes favorable emergence; red highlighting denotes adverse emergence.

Reserve Variability – precision tables

Percentage of companies within X%

Percentage of Companies with Cumulative Reserve Development Through 12/31/17 Within X% of Initial Recorded Reserves

(companies with initial recorded reserves > \$500M)

<i>Calendar Year End</i>	<i>Within +/- 5%</i>	<i>Within +/-10%</i>	<i>Within +/- 25%</i>
2008	24%	43%	79%
2009	25%	40%	77%
2010	26%	49%	80%
2011	27%	51%	82%
2012	31%	51%	84%
2013	33%	58%	88%
2014	45%	69%	94%
2015	53%	74%	95%
2016	74%	92%	98%

Source: SNL, Individual Company Statutory Statements, 2017.

Compiled by PwC.

AmTrust, Allianz, AIG, and Arch excluded from P&C Industry US Stat results due to distortions in their Schedule P development.

This table shows the percentage of companies whose year-end reserves, when re-evaluated as of December 31, 2017, have developed within a certain percentage of the amount initially recorded.

For example, when reserves as of year-end 2009 are re-evaluated as of December 31, 2017, 40% of companies are within 10% of their initial recorded reserves.

For more fully developed years, roughly one-quarter of companies have hindsight reserves within 5% of initial reserves, while roughly one-fifth of companies deviate by more than 25%.

Reserve Variability – precision tables

Percentage of companies within 10%

Percentage of Companies with Cumulative Reserve Development Through 12/31/17 Within 10% of Initial Recorded Reserves

(companies with initial recorded reserves > \$250M)

<i>Calendar Year End</i>	<i>All</i>	<i>Other Liab CM</i>	<i>Other Liab Occ</i>	<i>Med Mal CM*</i>	<i>Med Mal Occ*</i>	<i>CMP</i>	<i>WC</i>	<i>CAL</i>	<i>PPAL</i>	<i>HO*</i>	<i>Prod Liab CM+Occ*</i>	<i>Spec Liab*</i>	<i>Reins</i>
2008	42%	41%	28%	13%	8%	28%	46%	35%	59%	22%	21%	21%	17%
2009	39%	42%	18%	13%	4%	40%	51%	55%	65%	48%	13%	40%	12%
2010	48%	43%	26%	14%	15%	44%	64%	65%	67%	38%	13%	47%	20%
2011	48%	41%	30%	7%	12%	53%	67%	59%	71%	22%	16%	40%	21%
2012	52%	53%	29%	17%	19%	58%	71%	39%	79%	41%	28%	21%	27%
2013	56%	60%	37%	7%	0%	63%	67%	48%	81%	58%	36%	31%	21%
2014	66%	56%	51%	12%	17%	77%	68%	44%	81%	65%	26%	54%	55%
2015	72%	76%	68%	22%	41%	77%	74%	50%	89%	78%	33%	33%	64%
2016	90%	85%	82%	78%	67%	88%	86%	83%	98%	89%	62%	82%	100%

Source: SNL, Individual Company Statutory Statements, 2017. Compiled by PwC.

* Med Mal CM, HO, Prod Liab CM+Occ, and Spec Liab present companies with initial recorded reserves > \$150M to increase sample size.

* Med Mal Occ presents companies with initial recorded reserves > \$50M to increase sample size.

AmTrust, Allianz, AIG, and Arch excluded from P&C Industry US Stat results due to distortions in their Schedule P development.

Reserve Variability – persistency trends

US Statutory – all lines combined

Development of Accident Year Reserves P&C Industry US Stat - All Lines Combined (in \$millions)

Evaluation Date (in months)

Accident Year	Initial Reserve	Evaluation Date (in months)									Hindsight Reserve at 2017	Cumulative Reserve Development
	12	24	36	48	60	72	84	96	108	120		
2008	160,271	(1,376)	(3,485)	(3,808)	(4,780)	(2,678)	(999)	(72)	(580)	(234)	142,257	-11%
2009	146,162	(4,131)	(3,596)	(675)	(1,840)	(1,003)	(535)	(709)	(503)		133,171	-9%
2010	144,232	(1,577)	(1,190)	(780)	(1,154)	(807)	(734)	(627)			137,364	-5%
2011	151,992	(4,371)	(1,550)	(812)	(1,045)	(1,172)	(638)				142,403	-6%
2012	151,263	(5,179)	(1,651)	(1,228)	(997)	(626)					141,581	-6%
2013	148,452	(3,658)	(1,225)	(900)	(898)						141,771	-5%
2014	150,645	(3,462)	(924)	(780)							145,479	-3%
2015	157,528	(1,620)	(491)								155,417	-1%
2016	166,827	(2,077)									164,750	-1%
2017	186,562										186,562	

Source: SNL, Individual Company Statutory Statements, 2017. Compiled by PwC.

AmTrust, Allianz, AIG, and Arch excluded from P&C Industry US Stat results due to distortions in their Schedule P development.

This heat map shows the incremental subsequent development of losses by accident year from initial year-end balance through year ending 2017 and is useful to understand underlying changes in reserve redundancy / deficiency.

Once an accident year begins to develop downward, the favorable trend generally persists.

We have observed similar trends of ongoing adverse development in some older accident years (e.g. accident years 1997 through 2002) in prior analyses.

Reserve Variability – persistency trends

US Statutory – by line of business

P&C Industry US Stat - Workers' Compensation

Evaluation Date (in months)

Accident Year	Initial Reserve	Evaluation Date (in months)										Hindsight Reserve at 2017	Cumulative Reserve Development
	12	24	36	48	60	72	84	96	108	120			
2008	20,204	192	(131)	(94)	(28)	69	(123)	(23)	(92)	(73)	19,901	-1%	
2009	18,646	(99)	(105)	125	(25)	(55)	(54)	(94)	(98)		18,241	-2%	
2010	18,298	524	147	76	(41)	(95)	(71)	(139)			18,700	2%	
2011	19,402	142	86	(43)	(66)	(99)	(204)				19,219	-1%	
2012	21,042	(320)	(300)	(316)	(237)	(246)					19,623	-7%	
2013	21,687	(468)	(531)	(339)	(475)						19,874	-8%	
2014	22,383	(672)	(601)	(699)							20,411	-9%	
2015	22,765	(766)	(857)								21,142	-7%	
2016	22,857	(956)									21,901	-4%	
2017	22,860										22,860		

P&C Industry US Stat - Other Liability Occurrence

Evaluation Date (in months)

Accident Year	Initial Reserve	Evaluation Date (in months)										Hindsight Reserve at 2017	Cumulative Reserve Development
	12	24	36	48	60	72	84	96	108	120			
2008	12,200	(509)	(394)	(451)	(166)	(281)	(252)	(94)	(39)	(31)	9,982	-18%	
2009	11,732	(367)	(555)	(480)	(276)	(275)	(227)	(75)	(75)		9,402	-20%	
2010	11,323	(336)	(197)	(110)	(193)	(190)	(116)	(84)			10,097	-11%	
2011	11,239	(301)	3	(46)	(97)	31	(81)				10,748	-4%	
2012	11,765	(45)	(121)	(104)	(47)	191					11,639	-1%	
2013	12,692	(157)	42	49	112						12,738	0%	
2014	13,549	(177)	129	(73)							13,428	-1%	
2015	14,531	(101)	69								14,499	0%	
2016	15,084	(68)									15,016	0%	
2017	15,774										15,774		

Reserve Variability – persistency trends

US Statutory – by line of business

P&C Industry US Stat - Private Passenger Auto Liability

Evaluation Date (in months)

Accident Year	Initial Reserve	Evaluation Date (in months)										Hindsight Reserve at 2017	Cumulative Reserve Development
	12	24	36	48	60	72	84	96	108	120			
2008	37,505	(605)	(692)	(490)	(292)	(88)	(29)	11	(48)	15	35,288	-6%	
2009	39,902	(922)	(717)	(453)	(258)	56	34	(66)	(22)		37,555	-6%	
2010	41,237	(923)	(789)	(92)	(135)	10	(68)	(41)			39,199	-5%	
2011	41,425	(1,267)	(35)	(69)	(95)	(95)	24				39,889	-4%	
2012	41,767	(664)	(124)	(84)	(77)	(70)					40,747	-2%	
2013	42,672	(108)	114	9	(203)						42,484	0%	
2014	44,559	411	253	(4)							45,219	1%	
2015	47,824	1,937	551								50,313	5%	
2016	53,348	784									54,132	1%	
2017	56,662										56,662		

P&C Industry US Stat - Commercial Auto Liability

Evaluation Date (in months)

Accident Year	Initial Reserve	Evaluation Date (in months)										Hindsight Reserve at 2017	Cumulative Reserve Development
	12	24	36	48	60	72	84	96	108	120			
2008	8,158	(204)	(87)	(62)	(27)	(30)	(28)	(32)	(6)	(6)	7,676	-6%	
2009	7,808	(395)	(57)	(56)	(30)	(16)	(24)	(22)	3		7,211	-8%	
2010	7,572	10	111	93	88	13	(33)	(13)			7,840	4%	
2011	7,556	418	221	152	161	36	3				8,546	13%	
2012	7,908	290	196	255	134	23					8,806	11%	
2013	8,432	246	466	293	138						9,576	14%	
2014	8,912	441	454	318							10,125	14%	
2015	9,730	547	568								10,845	11%	
2016	10,745	527									11,272	5%	
2017	11,857										11,857		

Reserve Variability – persistency trends

US GAAP – all industry groups combined

Development of Accident Year Reserves P&C Industry US GAAP - All Industry Groups Combined (in \$millions)

Evaluation Date (in months)

<i>Accident Year</i>	<i>Initial Reserve</i>										<i>Hindsight Reserve at 2017</i>	<i>Cumulative Reserve Development</i>
	<i>12</i>	<i>24</i>	<i>36</i>	<i>48</i>	<i>60</i>	<i>72</i>	<i>84</i>	<i>96</i>	<i>108</i>	<i>120</i>		
2008	77,367	(251)	(803)	(1,536)	(730)	(1,022)	(653)	(417)	(251)	(226)	71,478	-8%
2009	68,807	94	(922)	(816)	(684)	(991)	(644)	(152)	(410)		64,283	-7%
2010	68,345	1,129	(473)	(610)	(859)	(529)	(244)	(611)			66,148	-3%
2011	77,937	562	(545)	(675)	(240)	(560)	(504)				75,974	-3%
2012	86,666	(668)	(1,845)	(762)	(551)	(548)					82,293	-5%
2013	102,089	(1,268)	(1,750)	(912)	(1,229)						96,929	-5%
2014	106,922	(1,312)	(555)	(1,157)							103,899	-3%
2015	112,980	1,212	(807)								113,384	0%
2016	118,929	1,798									120,727	2%
2017	139,277										139,277	

Source: 43 GAAP 10K Annual Statements, 2017. Compiled by PwC.

Reserve Variability – persistency trends

US GAAP – by industry group

P&C Industry US GAAP - Commercial Lines Focus Large Insurer

Evaluation Date (in months)

Accident Year	Initial Reserve	Evaluation Date (in months)										Hindsight Reserve at 2017	Cumulative Reserve Development
	12	24	36	48	60	72	84	96	108	120			
2008	55,117	301	(337)	(1,199)	(332)	(712)	(528)	(223)	(108)	(76)	51,902	-6%	
2009	49,938	145	(293)	(531)	(448)	(810)	(387)	44	(295)		47,364	-5%	
2010	49,359	1,169	64	(447)	(706)	(358)	(253)	(333)			48,495	-2%	
2011	54,335	498	68	(138)	(135)	(287)	(316)				54,023	-1%	
2012	56,725	445	(630)	(249)	(50)	(394)					55,846	-2%	
2013	62,424	(566)	(693)	(17)	(527)						60,621	-3%	
2014	66,319	(446)	391	(511)							65,753	-1%	
2015	68,786	1,781	(467)								70,100	2%	
2016	71,082	2,232									73,313	3%	
2017	81,242										81,242		

P&C Industry US GAAP - Commercial Lines Focus Small Insurer

Evaluation Date (in months)

Accident Year	Initial Reserve	Evaluation Date (in months)										Hindsight Reserve at 2017	Cumulative Reserve Development
	12	24	36	48	60	72	84	96	108	120			
2008	2,083	(8)	(67)	(88)	(84)	(51)	(26)	(17)	(9)	(2)	1,731	-17%	
2009	1,909	(20)	(55)	(53)	(39)	(40)	(23)	(22)	(8)		1,649	-14%	
2010	1,828	34	(29)	(12)	(50)	0	(27)	(17)			1,727	-6%	
2011	2,023	(29)	(22)	(31)	(32)	(30)	(34)				1,844	-9%	
2012	2,312	(72)	(104)	(33)	(11)	(11)					2,081	-10%	
2013	3,067	(108)	(20)	(18)	5						2,926	-5%	
2014	3,284	(190)	(98)	(36)							2,958	-10%	
2015	3,421	(144)	(47)								3,230	-6%	
2016	3,614	(124)									3,490	-3%	
2017	3,878										3,878		

Reserve Variability – persistency trends

US GAAP – by industry group

P&C Industry US GAAP - Personal Lines Focus Insurer

Accident Year	Evaluation Date (in months)											Hindsight Reserve at 2017	Cumulative Reserve Development
	Initial Reserve 12	24	36	48	60	72	84	96	108	120			
2008													
2009													
2010													
2011													
2012													
2013	10,712	(50)	(43)	(57)	(193)							10,367	-3%
2014	11,169	(152)	(61)	(88)								10,867	-3%
2015	12,441	(12)	(108)									12,322	-1%
2016	13,611	(317)										13,294	-2%
2017	14,442											14,442	

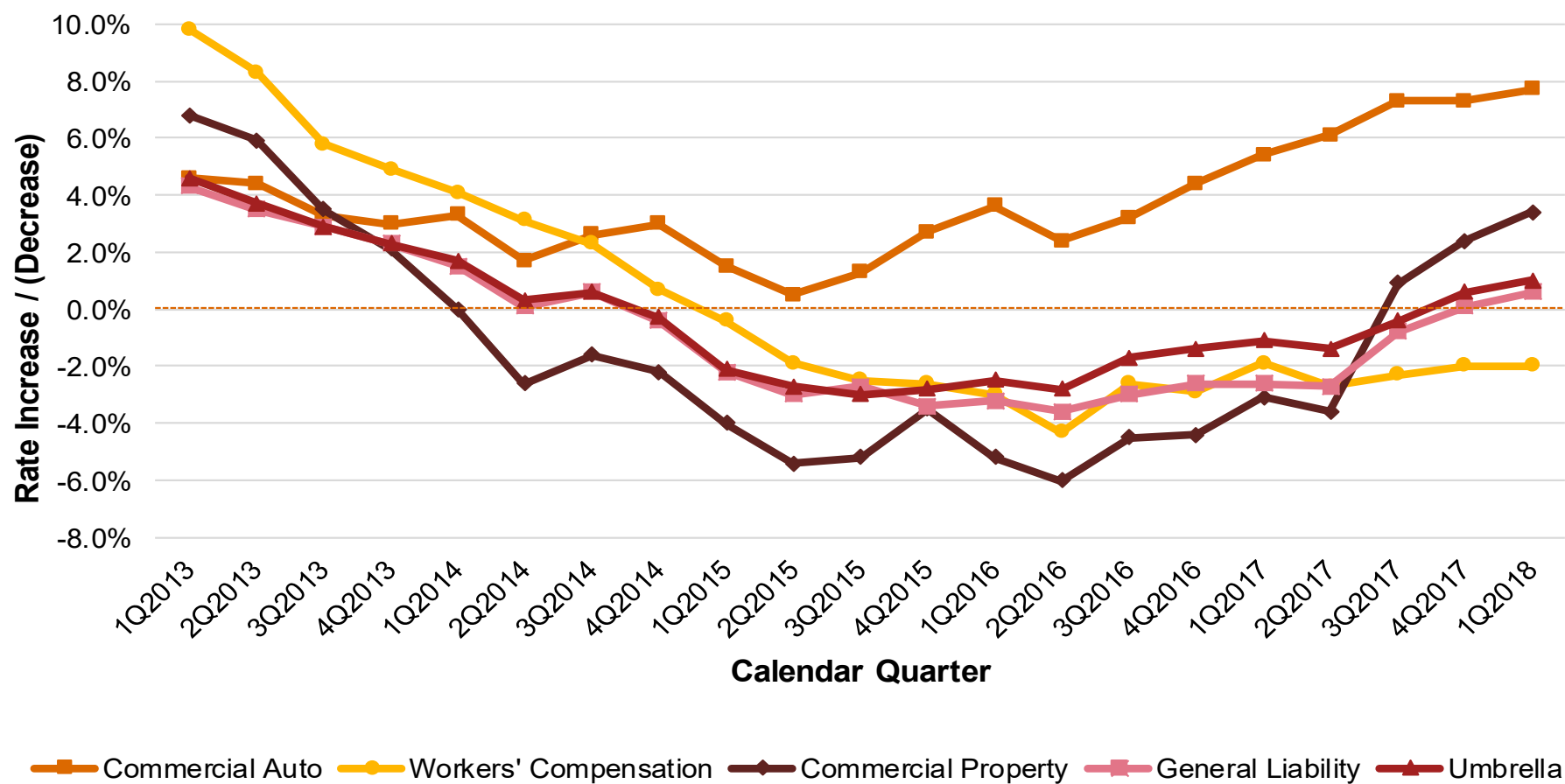
P&C Industry US GAAP - Offshore Insurance / Reinsurance Focus

Accident Year	Evaluation Date (in months)											Hindsight Reserve at 2017	Cumulative Reserve Development
	Initial Reserve 12	24	36	48	60	72	84	96	108	120			
2008	19,124	(454)	(371)	(252)	(311)	(258)	(98)	(177)	(132)	(148)		16,923	-12%
2009	15,998	26	(578)	(228)	(195)	(145)	(233)	(174)	(108)			14,363	-10%
2010	16,159	(68)	(514)	(156)	(101)	(171)	36	(262)				14,922	-8%
2011	20,607	31	(607)	(507)	(75)	(241)	(159)					19,047	-8%
2012	26,529	(1,029)	(1,113)	(479)	(494)	(145)						23,268	-12%
2013	25,887	(544)	(994)	(820)	(514)							23,014	-11%
2014	26,150	(524)	(786)	(521)								24,320	-7%
2015	28,331	(413)	(186)									27,732	-2%
2016	30,622	7										30,630	0%
2017	39,715											39,715	

Pricing environment

Many factors, including pricing, will continue to impact the reserve environment in the near and the long term. In 2017, the US P&C insurance industry overall experienced flat or negative rate level changes for most commercial lines. Through the first quarter of 2018, most commercial lines experienced rate increases.

CIAB earned annual rate level change by calendar quarter



Source: Council of Insurance Agents and Brokers, PwC Analysis.

Loss and DCC Ratios by line

This table presents incurred net loss and DCC ratios as of year-end 2017 overall and by line of business. Accident years will continue to develop as they mature.

Incurred Net Loss and DCC Ratios Estimate as of Year End 2017

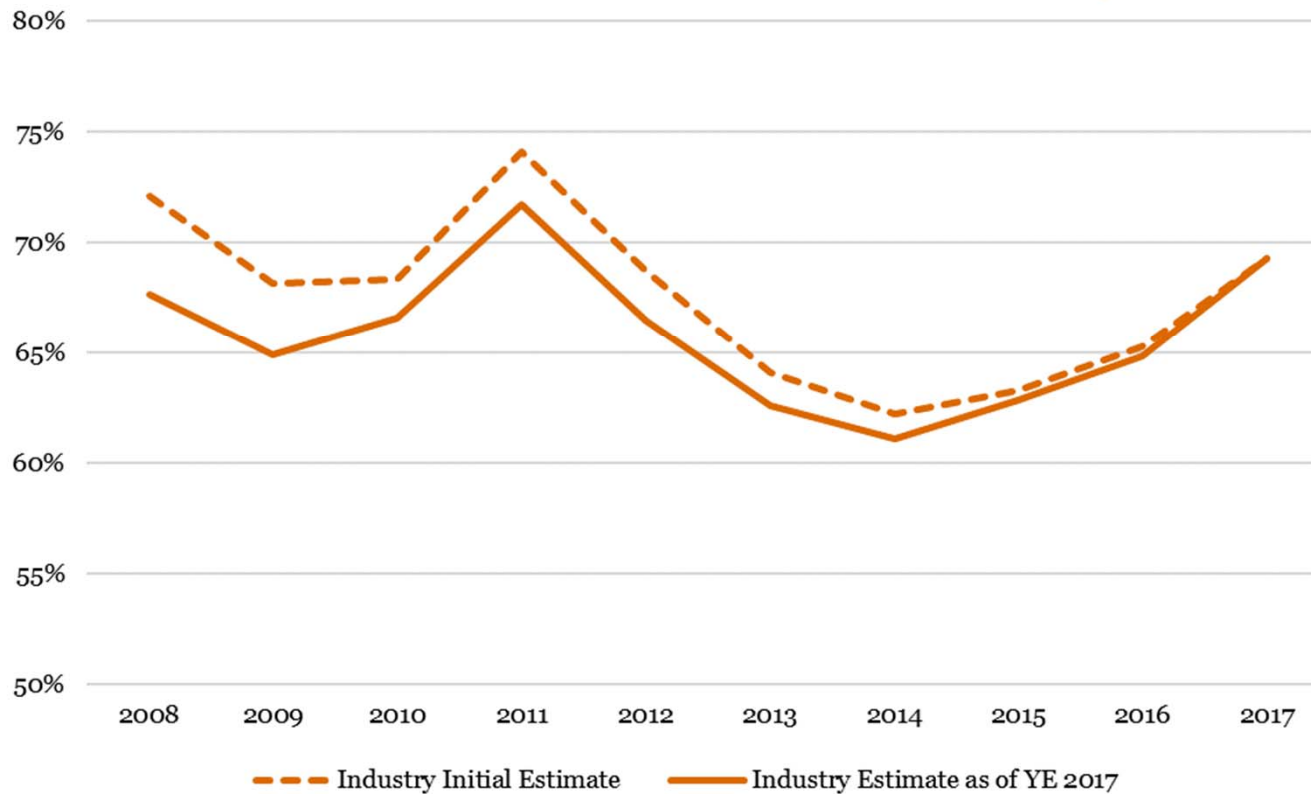
Accident Year	All	Other	Other	Med	Med	CMP	WC	CAL	PPAL	HO	Prod	Spec	Reins
		Liab	Liab	Mal	Mal						Liab		
		CM	Occ	CM	Occ						CM+Occ	Liab	
2008	68%	66%	54%	51%	71%	65%	71%	60%	67%	76%	58%	60%	56%
2009	65%	69%	54%	55%	72%	59%	74%	59%	70%	68%	60%	45%	48%
2010	67%	64%	59%	59%	70%	62%	79%	67%	71%	68%	66%	48%	54%
2011	72%	68%	62%	65%	70%	73%	76%	72%	70%	82%	65%	54%	78%
2012	66%	68%	62%	69%	75%	66%	71%	72%	70%	65%	56%	58%	55%
2013	63%	61%	61%	73%	79%	57%	66%	72%	72%	54%	51%	47%	48%
2014	61%	62%	60%	76%	83%	59%	63%	71%	66%	56%	51%	50%	49%
2015	63%	61%	61%	80%	82%	54%	63%	71%	75%	55%	54%	51%	54%
2016	65%	62%	61%	79%	83%	57%	62%	71%	76%	57%	57%	55%	68%
2017	69%	62%	62%	80%	87%	65%	64%	69%	72%	69%	59%	61%	99%

Source: SNL, Individual Company Statutory Statements, 2017. Compiled by PwC.

AmTrust, Allianz, AIG, and Arch excluded from P&C Industry US Stat results due to distortions in their Schedule P development.

US P&C Industry incurred loss and DCC ratios

**P&C Industry Ultimate Loss Ratios
By Accident Year
Initial Estimate and Estimate as of YE2017**



This graph compares the incurred net loss and DCC ratios as of the initial evaluation to the re-evaluation as of year-end 2017 for the US P&C Statutory Industry.

The accident year 2011 ultimate loss ratio is impacted by catastrophes, including Japan and New Zealand earthquakes and Thailand flooding.

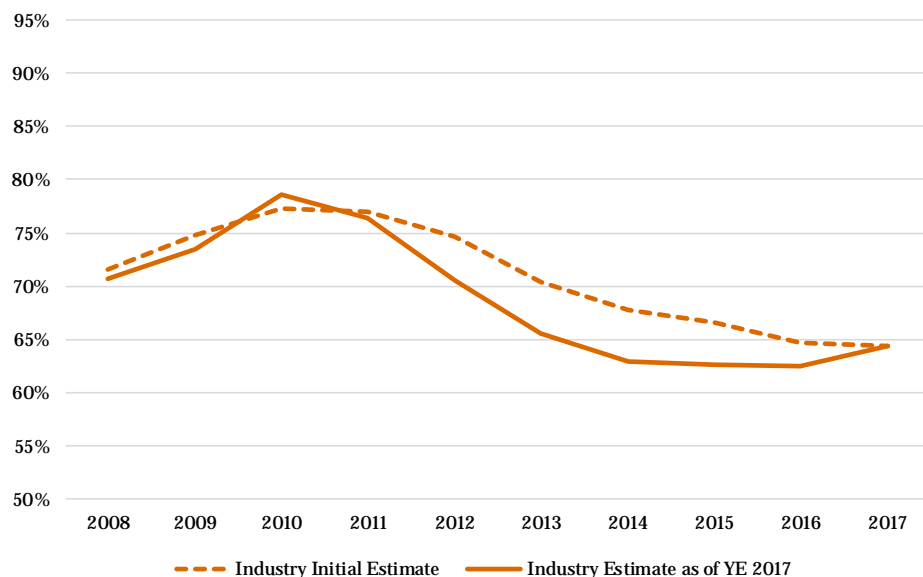
The accident year 2017 ultimate loss ratio is impacted by a high frequency of catastrophes, including hurricanes Harvey, Irma, and Maria.

Source: SNL, Individual Company Statutory Statements, 2017. Compiled by PwC.
AmTrust, Allianz, AIG, and Arch excluded from P&C Industry US Stat results due to distortions in their Schedule P development.

Reserve Variability – incurred loss and DCC ratios

US Statutory – by line of business

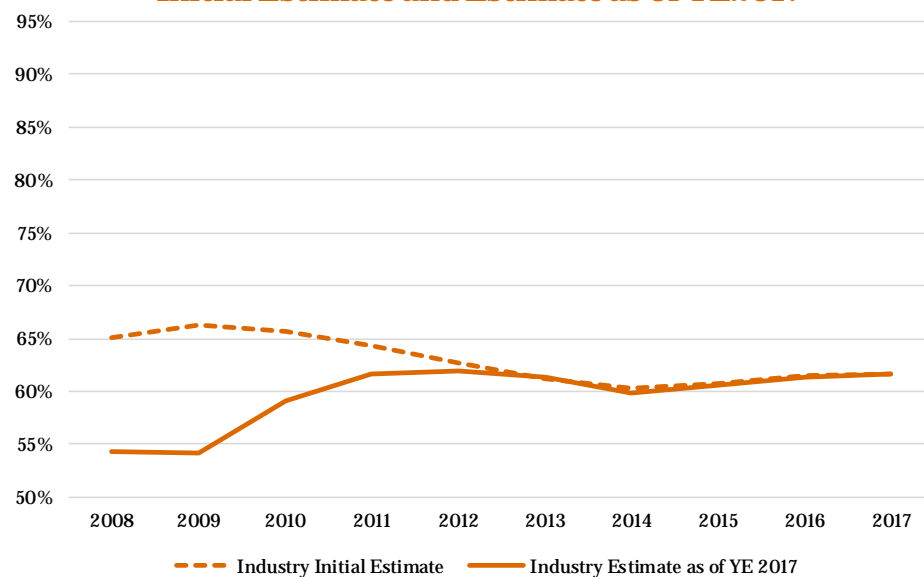
**P&C Industry Ultimate Loss Ratios
Workers' Compensation
Initial Estimate and Estimate as of YE2017**



Incurred Net Loss & DCC Ratios

Accident Year	Initial Estimate	YE2017 Estimate	Change
2008	72%	71%	-1%
2009	75%	74%	-1%
2010	77%	79%	1%
2011	77%	76%	-1%
2012	75%	71%	-4%
2013	70%	66%	-5%
2014	68%	63%	-5%
2015	67%	63%	-4%
2016	65%	62%	-2%
2017	64%	64%	0%

**P&C Industry Ultimate Loss Ratios
Other Liability Occurrence
Initial Estimate and Estimate as of YE2017**



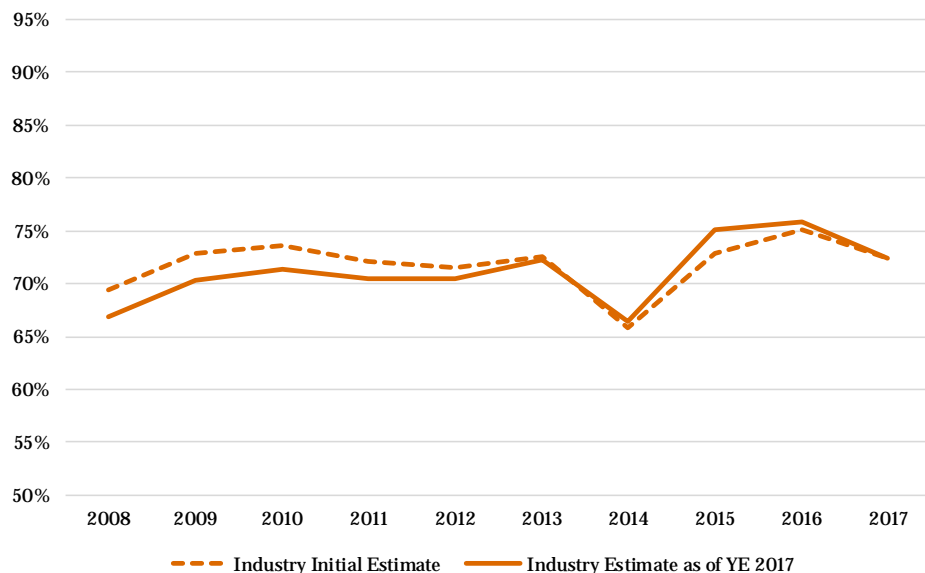
Incurred Net Loss & DCC Ratios

Accident Year	Initial Estimate	YE2017 Estimate	Change
2008	65%	54%	-11%
2009	66%	54%	-12%
2010	66%	59%	-7%
2011	64%	62%	-3%
2012	63%	62%	-1%
2013	61%	61%	0%
2014	60%	60%	0%
2015	61%	61%	0%
2016	62%	61%	0%
2017	62%	62%	0%

Reserve Variability – incurred loss and DCC ratios

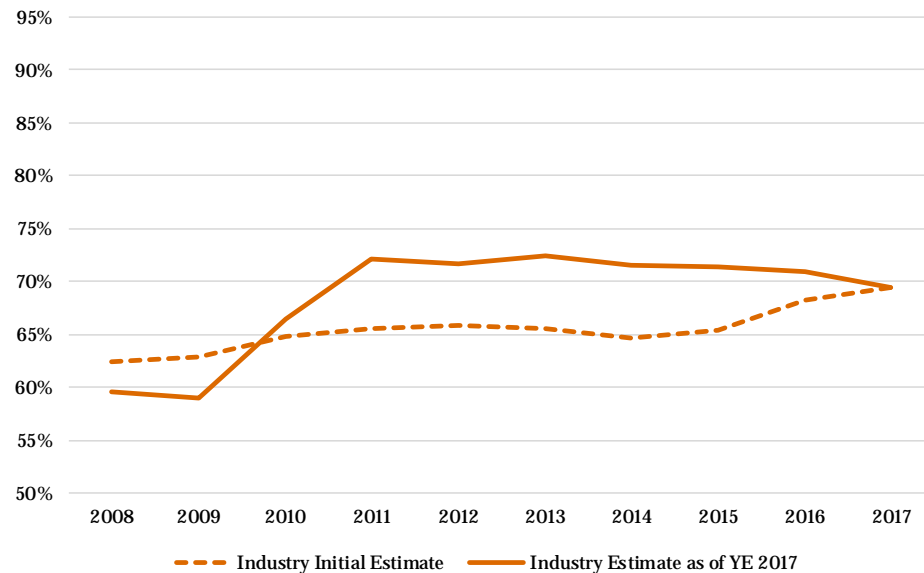
US Statutory – by line of business

**P&C Industry Ultimate Loss Ratios
Private Passenger Auto Liability
Initial Estimate and Estimate as of YE2017**



<i>Incurred Net Loss & DCC Ratios</i>			
<i>Accident Year</i>	<i>Initial Estimate</i>	<i>YE2017 Estimate</i>	<i>Change</i>
2008	69%	67%	-2%
2009	73%	70%	-3%
2010	74%	71%	-2%
2011	72%	70%	-2%
2012	71%	70%	-1%
2013	73%	72%	0%
2014	66%	66%	1%
2015	73%	75%	2%
2016	75%	76%	1%
2017	72%	72%	

**P&C Industry Ultimate Loss Ratios
Commercial Auto Liability
Initial Estimate and Estimate as of YE2017**



<i>Incurred Net Loss & DCC Ratios</i>			
<i>Accident Year</i>	<i>Initial Estimate</i>	<i>YE2017 Estimate</i>	<i>Change</i>
2008	62%	60%	-3%
2009	63%	59%	-4%
2010	65%	67%	2%
2011	65%	72%	7%
2012	66%	72%	6%
2013	66%	72%	7%
2014	65%	71%	7%
2015	65%	71%	6%
2016	68%	71%	3%
2017	69%	69%	

Looking ahead

Changes in taxes, inflation and the overall economy may begin to impact reserve development in the upcoming years.

- ***Tax Cuts and Jobs Act (TCJA).*** While industry experts expect the tax bill to benefit most insurers, it poses many long-term strategic questions
- ***Inflation.*** Low inflation, as observed in the past several years, likely will increase at some point, potentially impacting claim costs adversely. General and medical inflation also will continue to exert pressure on reserve adequacy.
- ***Economic outlook.*** An acceleration in the economy could impact the frequency and severity of claims for future accident periods.

Several years of reserve releases combined with a prolonged soft market, changes in the US tax code, continued inflationary pressures, and the risk of adverse trends that could result if the economic recovery accelerates will likely exert pressure on the reserve adequacy of the P&C insurance industry.

Companies by industry grouping

<i>Commercial Lines Focus Large Insurer*</i>	<i>Commercial Lines Focus Small Insurer</i>	<i>Personal Lines Focus</i>	<i>Offshore Insurance / Reinsurance Focus</i>
AIG	Amerisafe, Inc.	Donegal Group	Alleghany Corporation
American Financial Group, Inc.	Assurant	Infinity Property & Casualty	Arch Capital Group
Amtrust Financial Services, Inc.	Baldwin & Lyons, Inc.	Mercury General Corporation	Aspen Insurance Holdings Limited
Berkshire Hathaway	EMC Insurance Group	Safety Insurance Group, Inc	AXIS Capital Holdings Limited
Chubb Limited	Employers Holdings, Inc	The Allstate Corporation	Everest Re
Cincinnati Financial Corp	Global Indemnity	The Progressive Corporation	PartnerRe Ltd
CNA Financial Corp	Hallmark Financial Services, Inc.		RenaissanceRe Holdings Ltd
The Hanover Insurance Group, Inc	The Navigators Group, Inc		Swiss Re
The Hartford Financial Services Group, Inc	ProAssurance Corporation		Validus Holdings
Liberty Mutual	RLI Corp		XL Group
Markel Corporation	State Auto Financial Corporation		
Old Republic International Corporation	United Fire Group, Inc		
Selective Insurance Group, Inc			
The Travelers Companies, Inc.			
W R Berkley Corporation			

** Categorization based primarily on the magnitude of reserves in excess of \$2 billion.*

Thank you!

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