Swiss Re

Wheels of Misfortune
CLRS 2018

Michael Rozema – Head of Actuarial and Reserving, Swiss Re America

Agenda

- Industry Booked Ultimate Loss Ratios - Development
- Industry Loss Ratio Summary
- Lengthening Development Patterns
- Claims Drivers/Trends
- Final Thoughts

Commercial Auto Liability

Schedule P Cumulative Reserve Development as of % of Initial Recorded Reserves

US Statutory: Cumulative reserve development as a % of initial recorded reserves
Accident year basis

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

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.

Source of Exhibit: PwC Actuarial Services – Key Market Insights. August 2018

Commercial Auto Liability

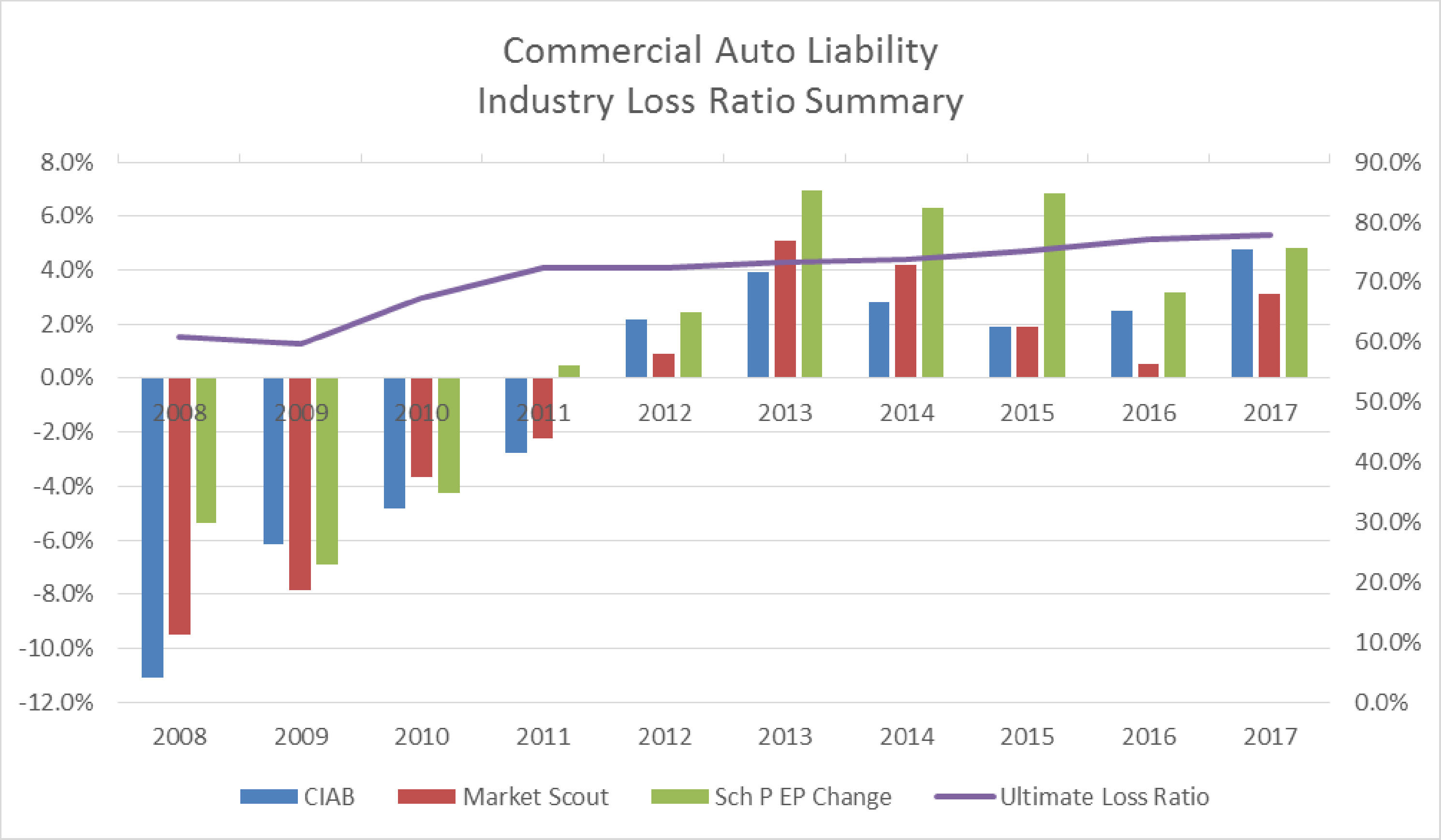
Schedule P Booked Ultimate Loss Ratios

Accident Year	Earned Premium (000s)	Schedule P Ultimate Loss Ratio Selections - Commercial Auto Liability As of 12	As of 24	As of 36	As of 48	As of 60	As of 72	As of 84	As of 96	As of 108	As of 120	(Adv)/Fav from 12 to Current
1996	12,038,793	76.7%	77.3%	79.1%	80.1%	80.6%	80.9%	80.9%	80.7%	80.8%	80.9%	-4.2%
1997	12,188,203	77.8%	78.3%	79.9%	81.8%	83.5%	83.9%	83.9%	83.7%	83.8%	83.7%	-5.9%
1998	12,093,751	77.0%	78.7%	81.8%	85.2%	86.4%	86.8%	86.5%	86.4%	86.1%	86.1%	-9.1%
1999	11,992,467	78.5%	83.7%	88.0%	91.3%	92.6%	92.5%	92.8%	92.6%	92.4%	92.4%	-13.9%
2000	12,870,674	77.3%	80.8%	84.2%	86.6%	88.0%	88.9%	88.6%	88.5%	88.5%	88.4%	-11.1%
2001	13,900,917	73.3%	73.2%	75.7%	77.6%	78.7%	78.2%	77.9%	77.9%	77.6%	77.5%	-4.2%
2002	15,724,627	66.6%	64.9%	66.4%	66.9%	66.9%	66.8%	66.4%	66.3%	66.1%	66.0%	0.6%
2003	17,429,980	63.6%	61.5%	61.1%	61.2%	60.8%	60.5%	60.2%	59.9%	59.8%	59.7%	3.9%
2004	18,711,968	61.5%	58.6%	58.2%	57.9%	57.3%	57.4%	56.9%	56.8%	56.7%	56.7%	4.9%
2005	19,121,586	60.8%	59.1%	58.3%	58.2%	57.8%	57.5%	57.1%	57.0%	56.8%	56.7%	4.1%
2006	19,041,946	61.6%	59.8%	59.2%	58.9%	58.3%	57.8%	57.8%	57.7%	57.5%	57.5%	4.1%
2007	18,899,073	61.9%	61.1%	60.9%	60.7%	60.1%	60.2%	60.0%	59.9%	59.8%	59.7%	2.2%
2008	17,940,916	62.6%	61.7%	61.6%	61.3%	61.3%	61.2%	61.2%	61.1%	61.1%	60.7%	1.9%
2009	16,703,890	62.9%	60.7%	60.6%	60.4%	60.4%	60.2%	60.2%	59.9%	59.7%		3.2%
2010	15,990,876	64.9%	65.1%	66.2%	67.0%	67.9%	68.0%	67.8%	67.4%			-2.6%
2011	16,064,787	65.8%	68.5%	70.3%	71.4%	72.7%	72.8%	72.5%				-6.7%
2012	16,456,734	66.4%	68.5%	70.1%	72.1%	73.0%	72.8%					-6.4%
2013	17,614,360	65.8%	67.5%	70.9%	73.2%	73.7%						-7.9%
2014	18,752,466	65.5%	68.7%	71.9%	73.5%							-8.0%
2015	20,078,284	66.3%	70.2%	72.9%								-6.6%
2016	20,763,883	69.5%	72.4%									-2.9%
2017	21,825,073	70.6%										

Δ vs 12	< -8.0%	< -6.0%	< -4.0%	< -2.0%		> 2.0%	> 4.0%	> 6.0%	> 8.0%

- Direction of movement from initial booked loss ratio rarely reverses
- Clear indication of future adverse development as early as Year-End 2013
- Simple Chain Ladder indicates continued deterioration in 2015-2017

Commercial Auto Liability
Industry Loss Ratio Summary



Ultimate Loss Ratio is estimated based on Schedule P paid and reported chain ladder methods

- 13 point loss ratio deterioration between 2009 to 2011 is explained by loss trend and price decreases.
- Slight loss ratio deterioration from 2011 to 2017 due to numerous frequency and severity trend drivers.
- Industry premium changes generally exceed industry rate changes 2011 through 2016, probably explained by improving economic conditions → More insured vehicles.

Commercial Auto Liability
Schedule P Loss Development

Paid Loss and DCC ($Millions)

Acc Yr	12	24	36	48	60	72	84
2008	2,459	5,061	7,243	8,887	9,875	10,364	10,589
2009	2,170	4,508	6,487	8,029	8,974	9,447	9,654
2010	2,285	4,858	7,044	8,678	9,716	10,209	10,463
2011	2,426	5,170	7,448	9,251	10,432	11,031	11,286
2012	2,429	5,238	7,618	9,521	10,732	11,271	
2013	2,532	5,499	8,059	10,255	11,588		
2014	2,636	5,736	8,691	10,968			
2015	2,770	6,303	9,385				
2016	2,880	6,583					
2017	3,004						

	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96
2008	2.058	1.431	1.227	1.111	1.050	1.022	1.010
2009	2.078	1.439	1.238	1.118	1.053	1.022	1.012
2010	2.127	1.450	1.232	1.120	1.051	1.025	1.011
2011	2.131	1.441	1.242	1.128	1.057	1.023	
2012	2.157	1.454	1.250	1.127	1.050		
2013	2.171	1.466	1.273	1.130			
2014	2.176	1.515	1.262				
2015	2.276	1.489					
2016	2.286						

Reported Loss and DCC ($Millions)

Acc Yr	12	24	36	48	60	72	84
2008	6,347	8,504	9,616	10,232	10,575	10,680	10,757
2009	5,696	7,637	8,665	9,333	9,637	9,792	9,834
2010	5,919	8,041	9,314	10,033	10,434	10,574	10,631
2011	6,152	8,613	9,983	10,793	11,228	11,405	11,479
2012	6,251	8,741	10,178	11,059	11,510	11,676	
2013	6,559	9,255	10,902	11,979	12,468		
2014	6,908	9,778	11,673	12,847			
2015	7,464	10,793	12,773				
2016	8,010	11,406					
2017	8,364						

	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96
2008	1.340	1.131	1.064	1.034	1.010	1.007	1.003
2009	1.341	1.135	1.077	1.033	1.016	1.004	1.002
2010	1.358	1.158	1.077	1.040	1.013	1.005	1.003
2011	1.400	1.159	1.081	1.040	1.016	1.006	
2012	1.398	1.164	1.086	1.041	1.014		
2013	1.411	1.178	1.099	1.041			
2014	1.415	1.194	1.101				
2015	1.446	1.183					
2016	1.424						

- *Source: Industry Schedule P Part 4 compiled from SNL Financial Database*

Lengthening Paid and Reported LDFs has likely exacerbated slow recognition of adverse results

Commercial Auto Trends

Driver shortages are affecting the driver pool with more young/inexperienced drivers operating trucks.

Vehicle utilization levels increased due to an improved economy and lower gas prices.

Increase in vehicle miles travelled

Technology - Increased cost of vehicle repairs and distracted driving

Increased plaintiff use of safety data in litigation

Increase in traumatic brain injury (TBI) cases.

Low Impact Traumatic Brain Injury (TBI) Claims

- TBI cases are becoming more dangerous in front of juries
  - Plaintiff attorneys are becoming skilled at presenting claims for big dollars even where the impact was minor
  - Neuropsychologists are frequently used. Defense experts are needed to counter neuropsychologist testimony
  - Juries are more open to TBI claims, likely due to recent publicity surrounding sports concussions.
- TBI claims tend to be longer tailed
  - Filed later than most bodily injury claims. Latent onset of head/brain symptoms can be linked to prior accidents
  - Expert intensive litigation takes longer than typical injury.

Final Thoughts
What did we miss? What did I miss?

- 8 accident years of adverse development provides an obvious learning opportunity for the industry, but more importantly for individual actuaries and other professionals
  - Data Science capabilities are better now than they were in 8 years ago. How could Data Science have improved Commercial Auto Liability results (industry and company)?
  - Did we see early evidence of adverse development using traditional approaches and what did we do about it?

- In retrospect, could we have been
  - More forward looking?
  - Faster to recognize development and adjust accordingly?
  - More effective in communication?

Legal notice