Seminar on Reinsurance

June 5-6, 2023

Westin Philadelphia

Philadelphia, PA

C-24: Wheels – 7-year, No Warranties

June 6, 2023

Moderator: John Buchanan, FCAS, Managing Principal, Verisk Underwriting Solutions

Speakers:
Marni Novack, FCAS, Actuarial Manager, Verisk Underwriting Solutions
Rebecca Bredehoeft, FCAS, SVP, North America Motor Portfolio Owner, Swiss Re
Jennifer Stevens, SVP, Head of Regional Casualty Treaty Underwriting and North America Liability Portfolio Owner, Swiss Re

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C-24 – Wheels – 7-year, No Warranties - Agenda

- **Introduction**
- **Commercial and personal auto update**
  - Overall industry results through 12/31/2022 – Covid/Heightened Inflation
  - Review trends, LDFs, loss ratios, segments, ground-up vs excess, competitive underwriting cycle, rate changes, emergence lags, ILF pressures
  - Covid and heightened inflation – considerations into 2023 and beyond
- **Motor Portfolio Management perspective**
  - State of the market for commercial and personal auto
  - Current and Future auto trends, supply chain disruption, severity etc…
  - Impact on portfolio loss ratios & reserving
- **Liability/ Umbrella Portfolio Management perspective**
  - Economic uncertainty
  - Large losses looming, social inflation remains
  - Navigating the challenging risk landscape
- **Q&A**

Benchmark Assessment Matrix

Estimating Confidences – Pre and Post Pandemic - Illustrative

As part of an annual or quarterly Best Practices framework, after gathering all relevant internal and external information, it is useful to assess all actuarial benchmarking components. And how confident you are in each.

Some for example like LDFs and rate changes may feel quite confident, if no major disruptions. While others like ILFs may feel less confident in times of high and unknown social inflation and litigation financing impacts.

	1	2	3	4	5	6	7	8
	Trends							State/ Hazard/ Subline
	Ground Up			Excess		Loss Dev't Factors		
	Severity	Frequency	Exposure	Severity	Frequency	Ground Up	Excess	
Property	●	◉	●	◉	⊙	●	●	◉
Casualty	●	◉	○	◉	⊙	●	●	◉
Commercial Auto	●	◉	○	◉	⊙	●	●	⊙
Personal Auto	◉	⊙	○	⊙	⊙	◉	◉	⊙

	9	10	11	12	13	14	15	16
	Rate Changes		Loss Costs		External Forces	Loss Ratios		Where In the Cycle?
	Primary	Reinsurance	Ground-up	ILFs		Primary	Reinsurance	
Property	●	●	●	●	○	●	●	●
Casualty	●	●	●	●	○	●	●	◉
Commercial Auto	◉	⊙	◉	◉	○	●	⊙	◉
Personal Auto	⊙	⊙	⊙	⊙	○	◉	⊙	⊙

Confidence: Good ● Medium ◉ Some ⊙ Minimal ○

Source: Adapted from IT2 Intermediate / Advanced - CARe May 2014 (JBuchanan)

Update of Commercial Auto

View at 2020

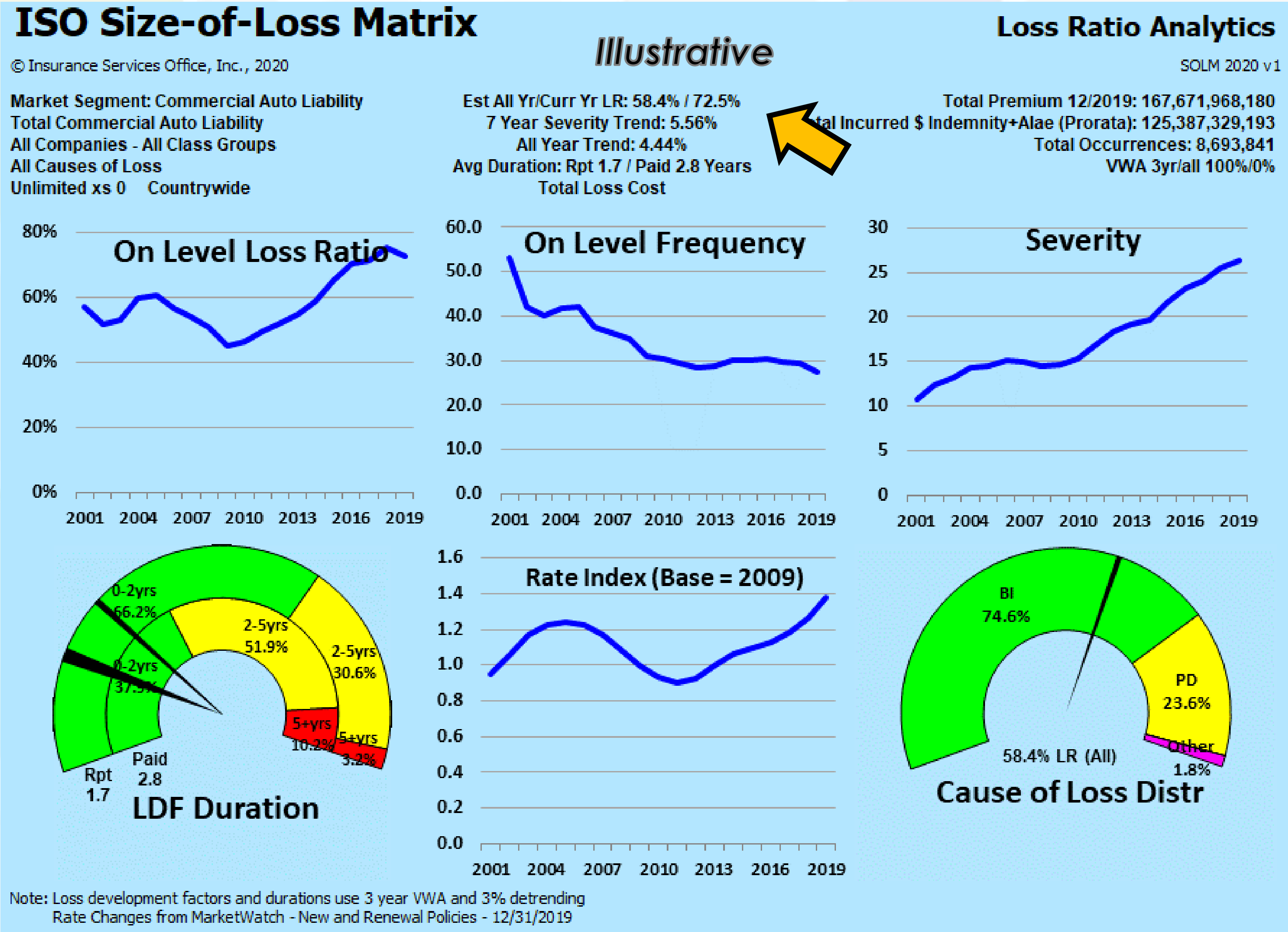
Commercial Auto – View at 2020

There has been a steady decline in on-level results since 2009.

Overall loss ratios fell slightly for the first time in 2019 due to slightly reduced severity trend and slightly increased reduction in frequency.

Since 2009, there has been higher average severity trends (7-year trend 5.6%), lengthening tail and continued adverse actual vs. expected losses. The recent improvement in rates may be starting to reverse the higher loss levels.

The current loss ratio of 72.5%, is 14.1 points worse than longer term on-level average of 58.4%.



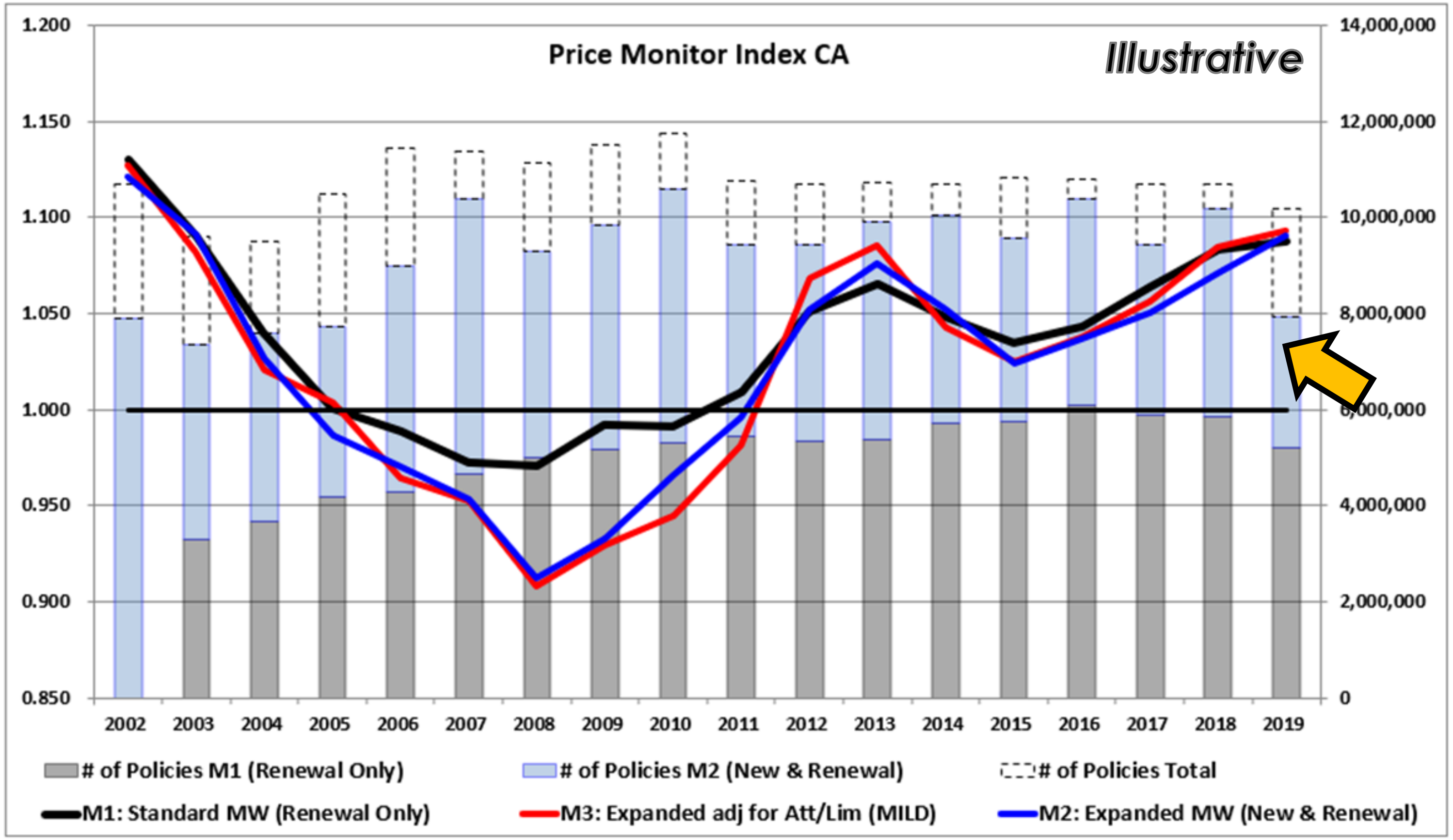
Source: SOLM 2020v1 (using expanded MarketWatch method 3-new and renewal including impacts from ILFs)

Commercial Auto – View at 2020

Sample Price Monitors - Commercial Auto Liability – New and Renewal Policies

Renewal vs. New and Renewal rate changes show different patterns throughout the underwriting cycle.

For example, renewal policies show a reduction of about 2% in 2009 and 2010, while new and renewal (adjusted for different average attachment and limits offered), shows a reduction of closer to 7% and 5% (-8% in 2008).



Note: **Renewal Policies (Standard MarketWatch)** - the # of policies underlying this policy level method is shown by the height of the grey bar. The black line represents the incremental rate changes. This method analyzes policy level data, only including policies with a common footprint from year to year for limit, attachment, capping, etc.

New and Renewal Policies (Expanded MW) - the # of policies underlying this company level method is shown by the total height of the grey and blue bars. The blue line represents the incremental rate changes. This method analyzes company level data from year to year, excluding companies for a particular year that have significant changes. This method does not include impacts due to the average number or type of exposures underlying the policy counts.

Limit/Attachment Adjusted - includes adjustments for aggregated limit and attachment differences using MILD for casualty lines (no adjustment for property).

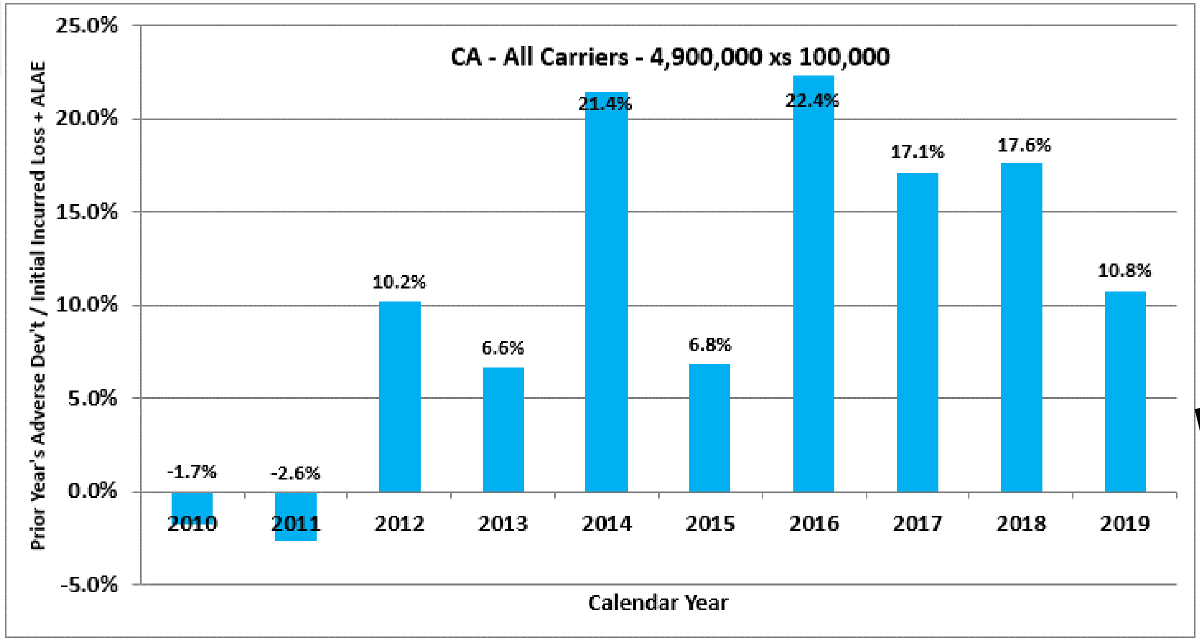
The total # of policies issued by line of business is the total height of all 3 bars (the bar height is the current year policy counts, rather than the prior year).
The largest reported exposure bases (by policy count) for this line are: Car Months 89%, Employee Months 7%, Cost of Hire 1%

Commercial Auto – View at 2020

All CAu – Reserve Run-off Test @12/31/2019 – 4.9M xs 100k

Illustrative

Comparing to initial selected excess loss ultimates at 12 months using a mechanical 7-year average, produces adverse development all calendar years since 2012.



ISO SOLM 2020 v1 - Development Triangle and Analysis

Ex-ante Reserving Analysis Runoff Tests (through 12/31/2019)

Market Analysis: CA - All Class Groups - All Carriers

Assumptions: Incurred $ Indemnity+Alae (Prorata); 4,900,000 xs 100,000; 7 yr VWA (100% wt); 3.0% detrended threshold

Select Metric here:

% Adverse (Favorable) Development	Ultimate Est. INCURRED @12 mos	Adverse (Fav) Devt	AY	CY2019 1	CY2018 2	CY2017 3	CY2016 4	CY2015 5	CY2014 6	CY2013 7	CY2012 8	CY2011 9
4.2%	1,127,046,093	47,476,388	2000	(12,547)	(149,760)	(15,852)	(161,035)	(267,938)	390,362	748,972	(1,032,814)	(505,188)
8.0%	2,500,551,667	199,145,650	2001	2,455,819	242,100	(2,000,655)	(48,578)	665,059	248,715	(3,235,863)	5,977	(528,202)
4.6%	2,504,229,408	113,984,001	2002	1,465,432	612,680	(251,771)	542,465	549,941	4,653,329	423,934	(935,314)	6,697,939
1.4%	2,596,503,520	37,494,803	2003	313,924	(291,888)	1,141,926	(20,446)	(1,574,931)	(1,905,818)	(510,559)	1,830,455	11,665,307
-1.9%	2,982,485,486	(56,885,274)	2004	(750,906)	2,669,709	1,559,839	938,233	(1,564,344)	931,127	(3,075,597)	2,761,655	9,367,274
0.1%	2,927,291,177	2,747,009	2005	(630,464)	9,844,095	337,374	(662,982)	(1,032,716)	(373,217)	(6,032,520)	305,191	13,346,052
-2.2%	3,041,009,165	(66,376,821)	2006	(1,798,531)	397,175	1,771,054	6,190,687	(3,539,459)	4,021,497	4,374,383	(154,746)	708,599
-1.9%	3,057,810,770	(59,116,310)	2007	357,877	(110,842)	1,122,844	(3,306,540)	6,779,331	6,316,040	(6,429,017)	16,015,972	(21,883,627)
-4.0%	2,674,414,621	(106,544,639)	2008	5,002,159	3,445,731	2,385,856	4,520,052	155,293	6,199,162	97,349	7,648,026	(81,265,670)
3.3%	2,147,733,606	71,462,745	2009	(2,280,516)	173,797	(71,484)	5,758,127	(9,238,324)	17,525,939	17,886,956	56,340,017	(56,393,670)
12.1%	2,089,570,653	251,905,645	2010	1,301,158	1,096,449	9,447,220	15,407,425	3,397,948	78,232,099	19,198,439	75,857,400	47,967,506
13.7%	2,215,739,451	302,799,093	2011	277,595	1,650,398	7,382,891	36,014,524	46,541,968	98,349,018	44,094,807	68,487,891	
14.7%	2,365,026,561	348,751,436	2012	(11,270,148)	11,838,602	5,883,343	70,383,873	49,382,418	144,219,511	78,313,837		
20.8%	2,317,328,024	482,647,102	2013	14,648,550	14,773,629	61,079,228	157,189,388	105,781,916	129,174,393			
12.4%	2,719,477,388	335,913,384	2014	18,325,126	70,464,148	138,338,555	153,110,341	(44,324,787)				
16.3%	2,925,812,692	477,851,180	2015	28,389,917	163,977,871	166,835,860	118,647,532					
9.4%	3,370,133,595	317,013,076	2016	66,841,291	166,605,222	83,566,563						
5.2%	3,517,115,960	181,210,142	2017	88,119,785	93,090,357							
4.2%	3,714,761,128	157,569,101	2018	157,569,101								

AY	CY2010 10	CY2009 11	CY2008 12	CY2007 13	CY2006 14	CY2005 15	CY2004 16	CY2003 17	CY2002 18	CY2001 19
2000	(269,262)	(148,841)	(2,952,111)	2,566,046	(13,637,592)	(19,657,081)	(4,689,317)	7,230,225	47,497,065	32,543,055
2001	1,469,044	(1,324,413)	1,748,742	15,479,017	(20,502,536)	(35,208,913)	29,598,306	71,071,307	139,010,723	
2002	1,673,711	(4,931,143)	(132,323)	30,611,956	(8,791,521)	(62,101,621)	40,033,542	103,862,766		
2003	(11,097,807)	(12,676,130)	(9,604,316)	9,084,536	48,890,159	(32,237,060)	34,487,451			
2004	(9,068,260)	1,723,583	(4,410,257)	(5,058,702)	(60,762,367)	7,853,737				
2005	(15,573,584)	(5,136,133)	(2,385,326)	(18,555,000)	29,296,237					
2006	(12,019,361)	(44,039,848)	(39,956,858)	17,668,586						
2007	(49,199,573)	(1,258,693)	(7,520,082)							
2008	(13,410,124)	(41,322,474)								
2009	41,761,905									

Minimum	Maximum	Actual vs Expected Development: AY x CY	
-3.0%	-1.3%	10	Favorable development
-1.3%	-0.5%	8	Somewhat favorable
-0.5%	0.5%	118	Within +-0.5% of original estimate
0.5%	2.6%	29	Somewhat adverse
2.6%	6.8%	25	Adverse development

Sources: Using SOLM 2020 v1 – mechanical selections of VWA (100% 7-year)

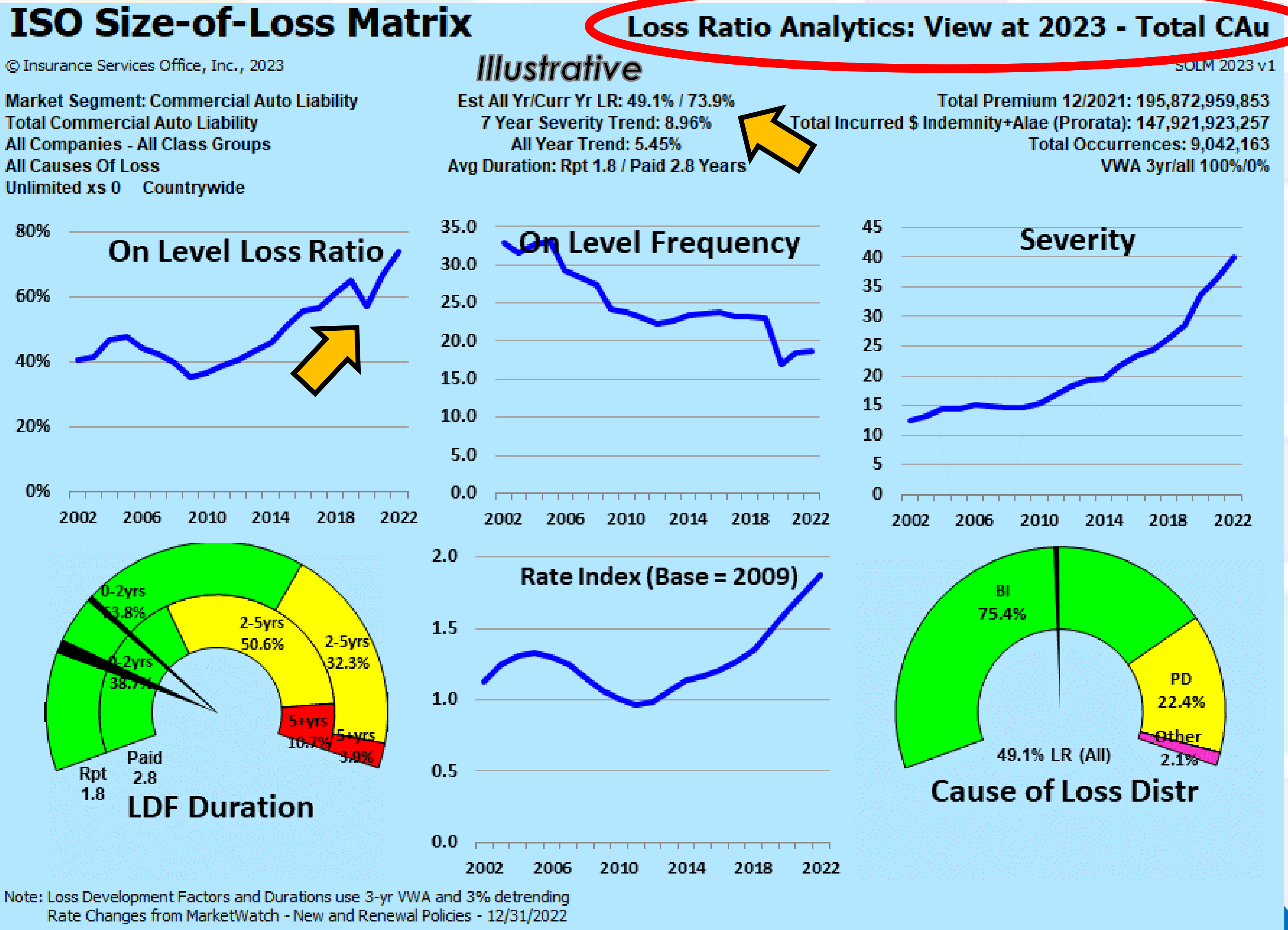
Commercial Auto

View at 2021 - 2023

Commercial Auto – View at 2023

After the steady increase in loss ratio since 2009, loss ratios fell sharply in 2020. This was due to the significant drop in frequency that was observed in 2020 as a result of the pandemic. Fewer people were driving as people were staying home and most businesses were not open. Loss ratios rebounded in 2021 and 2022 to higher than pre-pandemic levels, due to increasing severity and small rebound in frequency. Severity has continued to climb from 2020-2023 (9% 7-year trend).

The current year loss ratio is back to being higher than the all-year loss ratio (49.1% all year vs. 73.9% in 2022).



Source: SOLM 2023v1 (Pre-Release) (using expanded MarketWatch method 3-new and renewal including impacts from ILFs)

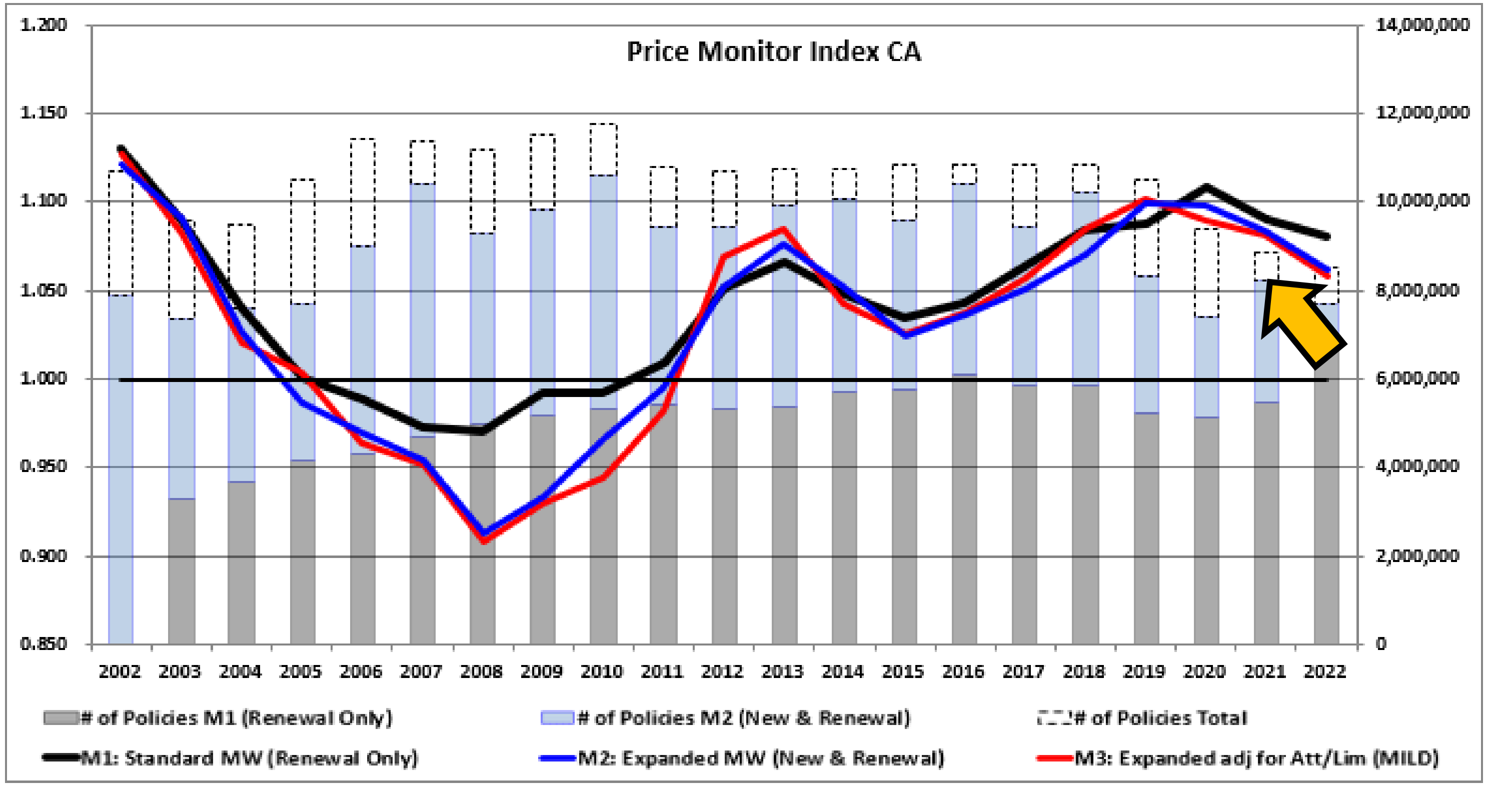
Commercial Auto – View at 2023

Sample Price Monitors - Commercial Auto Liability – New and Renewal Policies

Illustrative

After years of increasing rate increases since 2015, rates, while still in the high single digits, have started to see lesser increases, more so for new and renewal policies than renewal only policies.

The number of policies in 2020-2022 is also down from what was observed previously, indicating that there may have been some loss of policies during the pandemic, perhaps from businesses going out of business.



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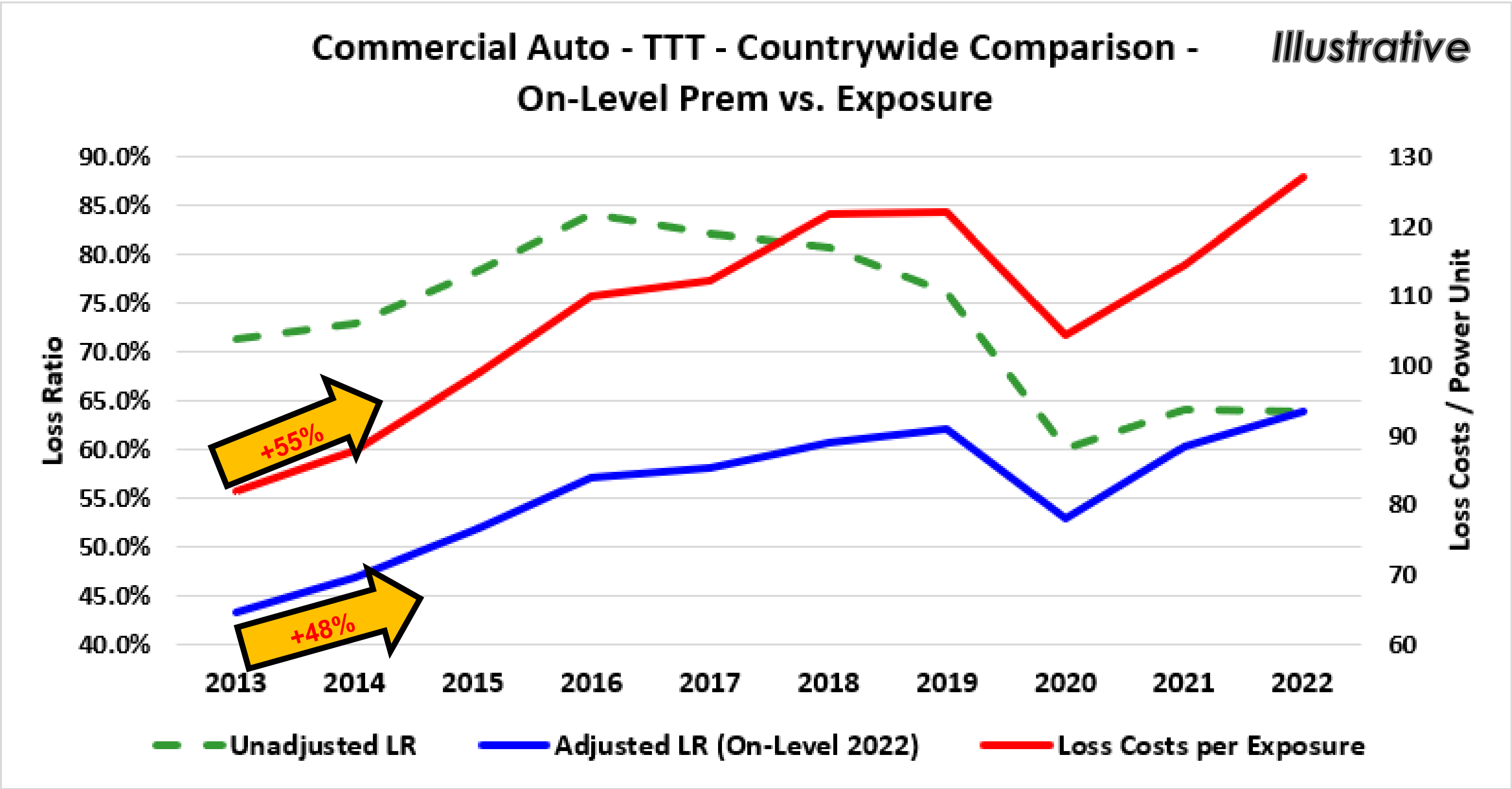
The largest reported exposure bases (by policy count) for this line are: Car Months 77%, Employee Months 20%, Named Insured Months 1%, Cost of Hire 1%

Commercial Auto – View at 2023

Comparison of Results using On-level premium vs. Power Units - TTT

Overall increase in loss cost up by 55% per power unit, and up by 48% per on-level premium since 2013.

Both methods show a significant drop-off in 2020 (~15%) due to the significant frequency reduction due to Covid. Both methods then show an increase/rebound (~20%) after covid to levels higher than pre-pandemic.

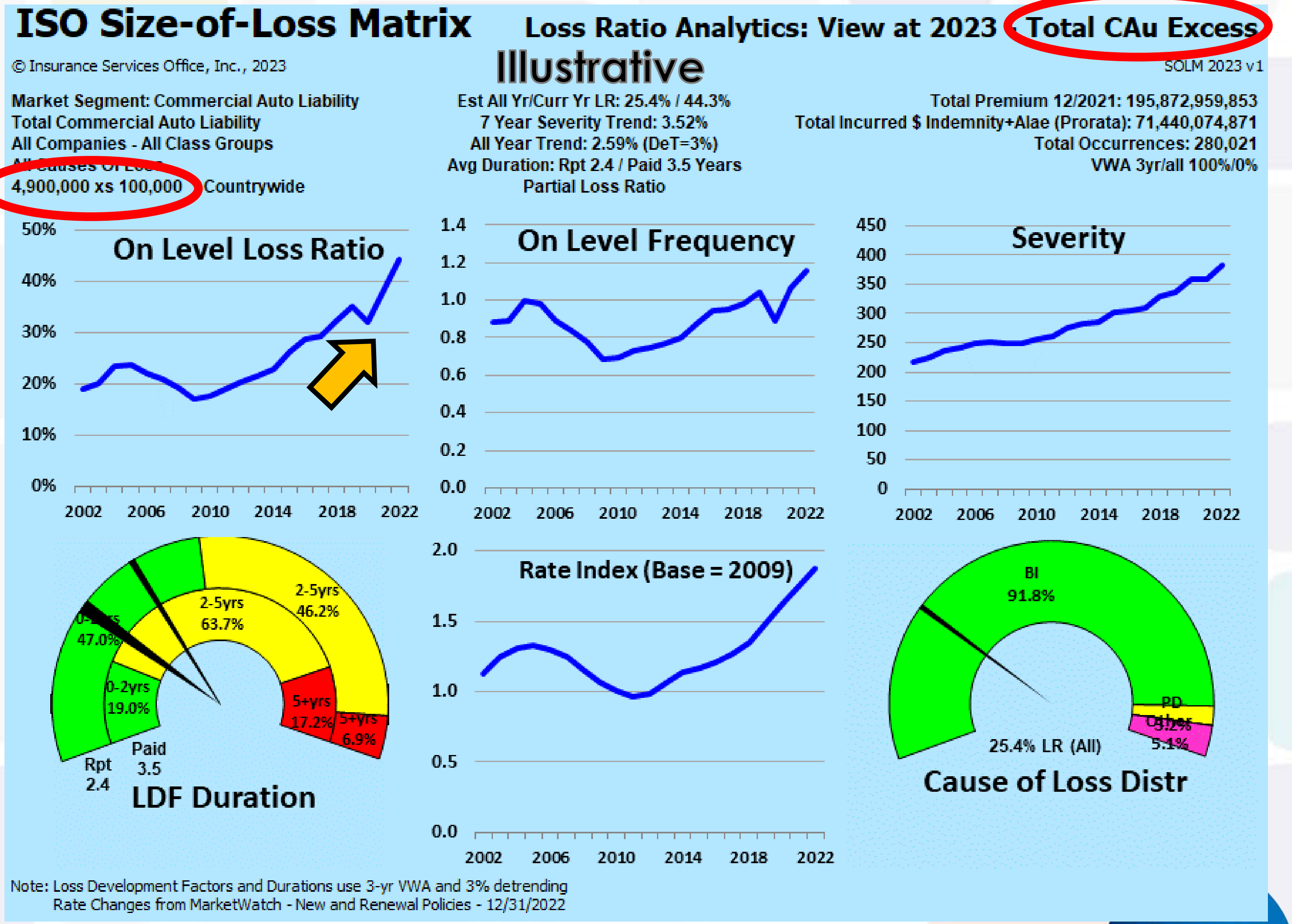


Source: SOLM 2023v1 (Pre-Release); losses developed using 3-yr VWA; uses ISO MarketWatch 12/31/2022 rate changes – CA-TTT Liability; power units in months

Commercial Auto – View at 2023

Larger claim sizes, had a more significant rebound in frequency than smaller claims, while the severity was not as impacted. This increase in frequency, along with stable increasing severity, has led to an increase in loss ratio to above pre-pandemic levels.

During the pandemic, fewer smaller claims were observed compared to prior years, potentially due to their being fewer cars on the road, so fewer smaller accidents (fender benders).



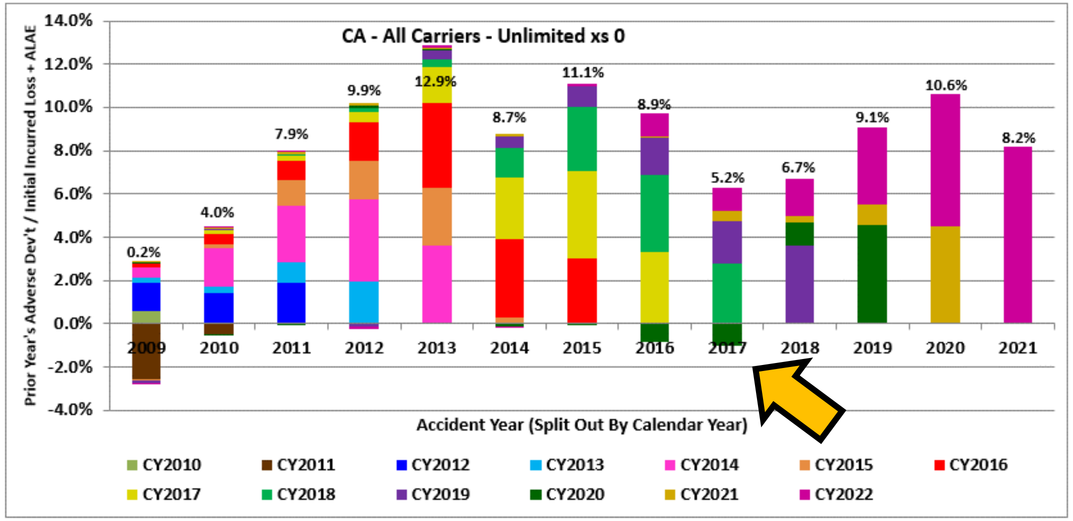
Source: SOLM 2023v1 (Pre-Release) (using expanded MarketWatch method 3-new and renewal including impacts from ILFs)

Commercial Auto – View at 2023

Total CAu Liability – Reserve Run-off Test @12/31/2022 – GU

Illustrative

For all Calendar Years since 2012, we have seen adverse development. 2020 was the only year that we saw significantly lower adverse development, and the first year since CY 2011 that we see favorable development for any accident years (2016 and 2017). CY 2022 has significant adverse development.



ISO SOLM 2023 v1 - Development Triangle and Analysis

Ex-ante Reserving Analysis Runoff Tests (through 12/31/2022)

Market Analysis: CA - All Class Groups - All Carriers

Assumptions: Incurred $ Indemnity+Alae (Prorata); Unlimited xs 0; 7 yr VWA (100% wt); 3.0% detrended threshold

Select Metric here:

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3.8%	5,505,406,803	210,017,340	2002	23,468	10,184	(1,265,086)	2,042,423	1,157,997	(85,798)	1,276,156	233,764	4,913,864	(607,830)	(1,658,036)	7,411,847	2,879,304	(4,403,231)	(1,054,260)	62,319,025	21,891,142	(83,308,489)	65,971,452	132,269,443
2.1%	5,411,595,343	114,034,075	2003	368,751	(198,042)	(496,826)	599,426	(1,910)	1,363,621	16,608	(1,811,496)	(2,241,724)	(626,104)	2,395,690	13,097,342	(6,416,344)	(13,729,044)	(1,813,485)	39,338,743	64,273,470	(33,208,773)	53,124,172	
1.1%	5,780,555,299	64,493,542	2004	(1,307,531)	1,065,922	346,653	(7,050,377)	2,703,060	1,535,949	(50,864)	(858,410)	1,046,261	(4,115,577)	4,057,302	9,110,936	(8,771,082)	15,653,208	21,677,374	22,450,870	(27,139,966)	34,139,815		
1.4%	5,903,302,481	82,273,492	2005	(760,404)	94,913	774,568	248,463	10,309,525	978,236	(809,558)	(1,013,391)	(1,400,991)	(5,475,830)	476,116	17,139,274	(16,920,082)	11,890,116	21,067,048	(1,046,698)	46,722,187			
-0.4%	6,054,870,521	(22,180,238)	2006	446,970	2,552,224	732,870	(1,150,642)	1,061,268	1,479,869	11,701,079	(4,548,077)	5,349,851	3,360,893	1,859,089	(449,879)	(8,598,828)	(28,337,257)	(20,749,711)	13,110,045				
-0.5%	6,107,484,408	(31,268,708)	2007	2,427,057	13,833	(3,016,207)	557,812	1,054,311	444,503	(3,807,303)	9,536,802	5,891,103	(7,269,694)	21,135,903	(26,291,225)	(60,183,642)	15,716,229	12,521,811					
-1.7%	5,372,846,742	(91,510,964)	2008	766,984	(2,094,296)	1,053,975	4,949,989	10,270,142	2,372,564	5,935,745	846,400	10,554,124	(5,593,431)	27,196,769	(107,390,122)	(41,570,724)	1,190,917						
0.2%	4,730,171,364	7,472,191	2009	(648,544)	2,758,219	1,576,390	(4,006,470)	693,472	(269,747)	7,185,755	(4,308,530)	22,698,300	12,152,944	63,071,794	(119,956,447)	26,525,055							
4.0%	4,851,815,702	192,635,952	2010	12,829	2,983,107	(1,184,337)	1,931,773	1,672,744	8,694,588	24,027,065	7,801,945	85,073,441	14,125,897	69,838,358	(22,341,458)								
7.9%	4,985,390,233	395,152,986	2011	1,061,353	5,256,920	(1,816,920)	1,006,849	2,230,123	10,625,128	45,651,236	59,401,533	129,854,422	47,773,404	94,108,936									
9.9%	5,209,527,521	517,303,858	2012	(7,936,075)	4,979,296	8,498,668	(5,874,113)	7,807,495	25,343,434	90,647,824	92,897,732	199,720,975	101,218,623										
12.9%	5,340,508,747	686,360,077	2013	3,726,992	3,287,200	5,581,097	22,388,044	17,193,547	89,102,753	209,144,573	144,009,398	191,926,473											
8.7%	5,946,349,112	515,110,505	2014	(875,392)	5,991,713	(6,162,424)	34,250,182	80,336,432	169,342,304	215,483,268	16,744,422												
11.1%	6,534,743,143	724,788,815	2015	10,015,414	1,370,435	(1,905,510)	61,083,523	192,250,618	263,469,380	198,504,954													
8.9%	7,202,561,312	638,747,706	2016	74,448,705	5,879,535	(59,907,871)	122,868,548	258,303,972	237,154,816														
5.2%	7,462,394,005	391,759,660	2017	78,732,759	36,277,541	(76,269,314)	147,160,398	205,858,276															
6.7%	7,914,382,024	531,569,807	2018	138,241,469	22,514,845	83,827,060	286,986,433																
9.1%	8,234,414,852	749,236,664	2019	294,540,878	77,677,620	377,018,166																	
10.6%	6,427,803,264	684,099,604	2020	395,160,074	288,939,530																		
8.2%	7,335,244,189	598,417,774	2021	598,417,774																			

Actual vs Expected Development: AY x CY

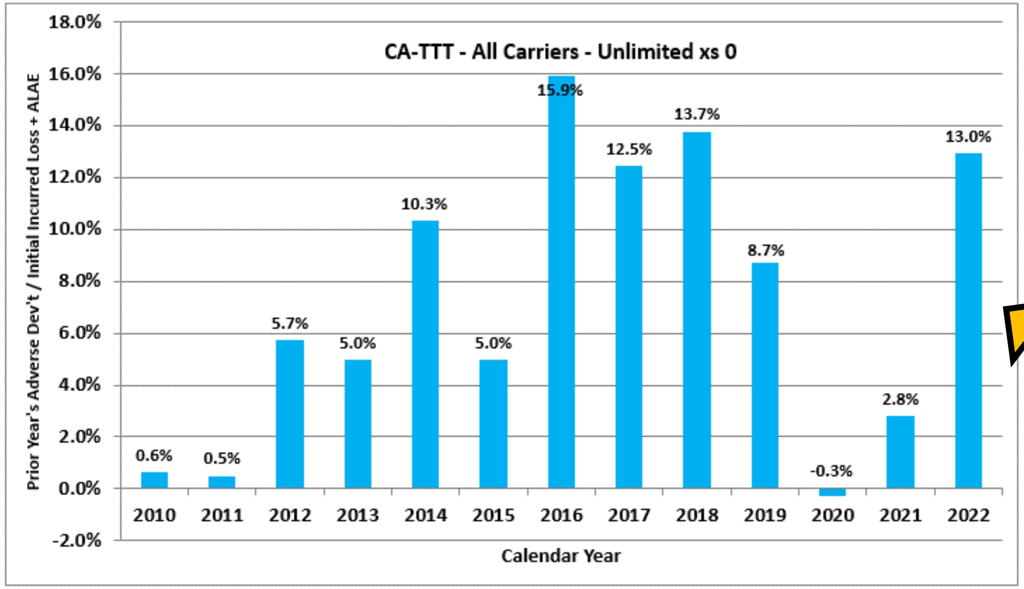
Minimum	Maximum	Count	
-2.5%	-1.2%	3	Favorable development
-1.2%	-0.5%	5	Somewhat favorable
-0.5%	0.5%	152	Within +-0.5% of original estimate
0.5%	3.1%	37	Somewhat adverse
3.1%	8.2%	13	Adverse development

Source: SOLM 2023v1 (Pre-Release - mechanical selections of VWA (100% 7-year)

Commercial Auto – View at 2023
TTT – Reserve Run-off Test @12/31/2022 – GU

Illustrative

All Accident years since 2009 show adverse development, but CY 2020 showed slight favorable development, the only year to do so. CY2022 shows adverse development at levels back to CY2016-CY2019.



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Select Metric here:

% Adverse (Favorable) Development	Ultimate Est. INCURRED @12 mos	Adverse (Fav) Devt	AY	CY2022 1	CY2021 2	CY2020 3	CY2019 4	CY2018 5	CY2017 6	CY2016 7	CY2015 8	CY2014 9	CY2013 10	CY2012 11	CY2011 12	CY2010 13	CY2009 14	CY2008 15	CY2007 16	CY2006 17	CY2005 18	CY2004 19	CY2003 20
-5.3%	2,581,849,754	(137,856,124)	2002	224,191	227,930	(742,723)	1,693,331	141,029	41,813	608,824	445,381	946,609	833,289	185,456	(1,184,278)	(43,526)	(2,105,427)	(3,749,028)	14,276,275	(24,490,665)	(68,035,365)	(19,934,534)	(37,194,707)
-2.8%	2,561,465,111	(71,227,595)	2003	79,964	682,383	(408,567)	284,856	2,973	369,024	(298,768)	(1,009,489)	(931,427)	(979,252)	679,703	2,914,030	(4,368,587)	(4,436,181)	1,526,222	(3,936,009)	(753,791)	(50,890,314)	(9,754,365)	
-3.7%	2,701,645,399	(98,891,788)	2004	(208,702)	(64,230)	(1,097,513)	1,193,016	470,536	732,222	281,201	100,725	(1,833,358)	(600,003)	1,594,173	1,134,101	(3,949,433)	892,164	2,972,727	(44,992,018)	(40,680,152)	(14,837,244)		
-4.0%	2,749,592,018	(111,140,742)	2005	(213,530)	22,569	(404,863)	1,216,876	(377,028)	16,733	(887,904)	274,808	433,270	(352,990)	366,065	4,907,634	4,857,439	(2,960,824)	(25,473,078)	(65,427,988)	(27,137,933)			
-3.3%	2,717,320,343	(89,199,889)	2006	138,088	(58,746)	(424,033)	278,552	(635,768)	229,915	1,145,343	(1,942,498)	2,135,335	(507,251)	1,448,373	(2,060,424)	8,645,105	(34,311,428)	(27,847,978)	(35,432,474)				
-2.4%	2,736,177,053	(66,238,989)	2007	407,138	(35,629)	(864,730)	228,826	(961,477)	266,486	1,934,804	3,024,434	(2,216,113)	2,734,907	5,899,791	5,373,453	(17,097,033)	(32,399,292)	(32,534,555)					
-0.9%	2,418,562,053	(20,739,344)	2008	137,876	(54,863)	(143,867)	850,262	(952,098)	3,553,738	50,668	2,377,437	7,081,311	(2,162,133)	7,716,431	(11,490,175)	(21,237,324)	(6,466,607)						
4.3%	2,070,606,747	89,711,571	2009	5,482	514,206	368,548	(857,323)	1,952,377	2,441,739	8,910,076	(99,451)	4,229,291	9,730,733	28,249,223	(6,346,993)	40,613,663							
4.8%	2,242,349,293	106,648,714	2010	(291,953)	(363,532)	819,248	(76,856)	(39,737)	7,531,664	11,151,643	6,023,892	29,447,646	7,229,483	25,676,039	19,541,177								
7.3%	2,430,675,715	178,451,330	2011	2,588,732	404,765	(2,482,637)	1,068,022	(5,562,144)	8,557,890	15,696,181	21,981,834	46,165,800	29,158,722	60,874,167									
8.2%	2,472,956,454	201,892,087	2012	(1,092,936)	(1,237,887)	(2,496,708)	(1,689,547)	(1,183,301)	(867,853)	42,763,407	23,943,191	68,868,713	74,885,007										
10.9%	2,629,719,978	287,142,661	2013	143,765	329,637	(4,835,713)	5,583,281	8,011,477	39,326,333	91,655,599	44,783,749	102,144,533											
9.5%	2,904,991,888	276,054,725	2014	(2,488,433)	(1,502,609)	(3,642,896)	(4,099,729)	41,637,291	81,067,710	135,757,276	29,326,114												
11.3%	3,167,138,826	357,442,205	2015	9,261,531	2,517,405	680,006	18,076,415	106,603,655	82,641,793	137,661,399													
11.3%	3,531,658,591	398,487,162	2016	31,674,438	11,682,113	(36,104,984)	64,111,454	165,525,430	161,598,710														
7.5%	3,678,271,934	276,155,579	2017	45,244,030	5,619,718	(51,719,093)	121,481,325	155,529,600															
4.1%	3,960,014,702	164,140,130	2018	50,524,127	(15,122,546)	18,463,447	110,275,102																
5.2%	4,085,822,187	210,769,710	2019	94,351,473	24,395,806	92,022,432																	
4.4%	3,269,270,576	144,262,525	2020	77,410,694	66,851,831																		
4.6%	3,564,370,960	163,588,795	2021	163,588,795																			

Minimum	Maximum	Actual vs Expected Development: AY x CY	
-2.6%	-1.2%	9	Favorable development
-1.2%	-0.5%	11	Somewhat favorable
-0.5%	0.5%	148	Within +-0.5% of original estimate
0.5%	1.9%	20	Somewhat adverse
1.9%	4.7%	22	Adverse development

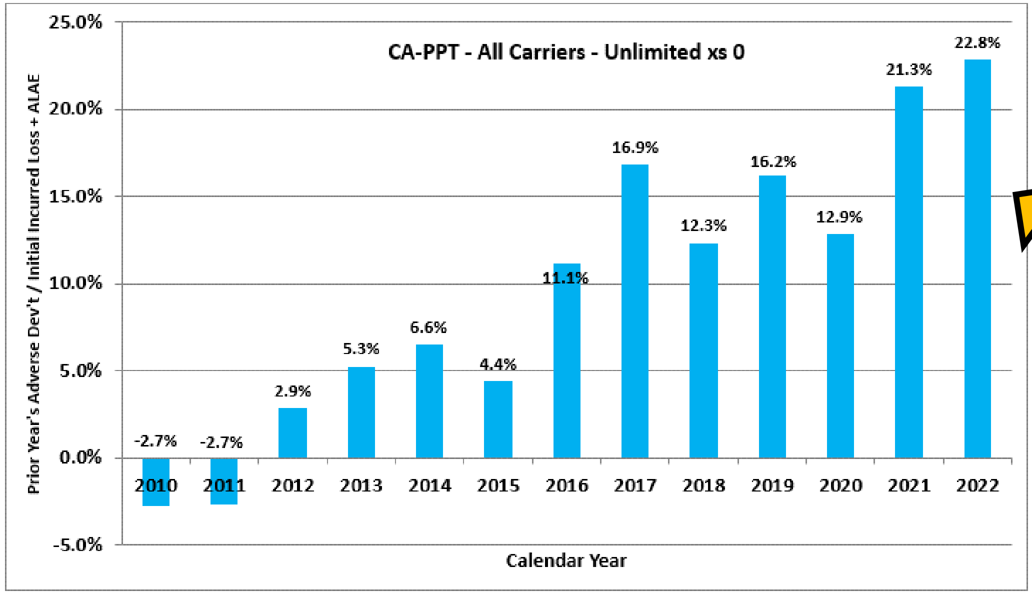
Source: SOLM 2023v1 (Pre-Release) - mechanical selections of VWA (100% 7-year)

Commercial Auto – View at 2023

PPT – Reserve Run-off Test @12/31/2022 – GU

Illustrative

PPT did not see the favorable development in 2020 that TTT saw and continues to see high adverse development in all accident and calendar years.



ISO SOLM 2023 v1 - Development Triangle and Analysis

Ex-ante Reserving Analysis Runoff Tests (through 12/31/2022)

Market Analysis: CA-PPT - All Class Groups - All Carriers

Assumptions: Incurred $ Indemnity+Alae (Prorata); Unlimited xs 0; 7 yr VWA (100% wt); 3.0% detrended threshold

Select Metric here:

% Adverse (Favorable) Development	Ultimate Est. INCURRED @12 mos	Adverse (Fav) Devt	AY	CY2022 1	CY2021 2	CY2020 3	CY2019 4	CY2018 5	CY2017 6	CY2016 7	CY2015 8	CY2014 9	CY2013 10
-4.1%	489,628,633	(20,295,705)	2002	3,137	48,363	(15,522)	159,070	(4,992)	(19,521)	18,125	(164,195)	485,458	(130,427)
-5.8%	465,902,459	(27,006,166)	2003	36,347	(38,672)	(46,389)	(40,093)	997	(7,205)	5,857	149,242	129,427	(97,186)
-8.3%	470,359,386	(39,141,904)	2004	240,661	(14,335)	(50,162)	8,794	(3,724)	(22,550)	(226,030)	92,671	445,089	(348,261)
-6.1%	486,078,184	(29,830,929)	2005	(21,225)	(45,908)	(1,582)	(45,080)	(5,081)	181,007	(248,264)	104,025	96,386	256,312
-1.2%	453,445,331	(5,450,165)	2006	(36,786)	(10,142)	(20,443)	10,503	195,579	278,290	252,704	(81,840)	139,055	425,841
-1.6%	468,019,249	(7,266,740)	2007	11,058	13,657	(10,466)	186,928	48,503	(201,770)	135,216	956,226	482,117	1,849,191
-1.3%	429,335,448	(5,379,413)	2008	626,922	82,077	190,573	134,876	538,054	(282,122)	1,855,261	(441,202)	(285,022)	3,069,950
1.3%	399,685,495	5,334,411	2009	27,440	11,792	68,685	134,877	(592,802)	163,733	(367,772)	(1,355,315)	3,099,294	6,150,967
2.9%	424,319,318	12,177,585	2010	(130,042)	386,554	(55,227)	(282,533)	(949,544)	815,085	(1,450,830)	767,121	7,177,373	7,517,042
4.9%	445,584,693	21,753,159	2011	(23,235)	(788,048)	392,834	479,488	(1,113,814)	2,649,532	4,168,870	2,657,969	(266,741)	6,255,468
3.9%	451,772,657	17,395,267	2012	145,572	127,599	(621,398)	(222,021)	(76,447)	1,960,869	6,195,586	1,809,923	10,749,712	(2,674,127)
7.8%	464,845,723	36,300,356	2013	501,843	(649,608)	614,520	432,571	2,227,276	4,087,872	18,402,172	3,903,441	6,780,268	
11.3%	431,598,551	48,798,614	2014	(16,958)	90,569	4,227,575	(2,991,567)	6,121,031	18,125,308	11,914,180	11,328,475		
13.5%	477,464,140	64,490,385	2015	1,539,991	(26,523)	800,782	11,813,027	11,452,632	28,736,226	10,174,251			
15.1%	519,526,527	78,506,407	2016	3,219,431	3,997,776	(2,208,596)	22,893,943	27,066,939	23,536,915				
10.8%	503,677,584	54,355,431	2017	3,646,026	2,542,952	10,359,914	21,505,884	16,300,655					
11.5%	593,388,075	68,088,204	2018	3,750,691	13,727,870	17,665,876	32,943,768						
20.7%	712,176,384	147,416,661	2019	28,951,974	68,305,665	50,159,022							
14.4%	485,353,484	69,758,453	2020	29,481,743	40,276,710								
10.1%	578,566,109	58,440,400	2021	58,440,400									

AY	CY2012 11	CY2011 12	CY2010 13	CY2009 14	CY2008 15	CY2007 16	CY2006 17	CY2005 18	CY2004 19	CY2003 20
2002	(1,292,123)	519,984	(991,517)	358,840	1,433,062	(4,013,470)	(1,042,419)	(15,255,113)	(6,315,193)	5,922,747
2003	(53,092)	237,766	(115,106)	(145,238)	514,227	(3,981,282)	(8,134,225)	(16,677,012)	1,255,471	
2004	909,240	1,241,391	(4,200,234)	39,789	(879,275)	(9,912,132)	(12,259,916)	(14,202,920)		
2005	(798,662)	466,001	(2,314,906)	763,523	(3,543,748)	(20,630,198)	(4,043,530)			
2006	1,110,577	3,332,985	(351,062)	(5,321,833)	(3,944,408)	(1,429,186)				
2007	2,699,405	(5,761,762)	(1,848,421)	(11,963,680)	6,137,057					
2008	(3,689,279)	(3,776,103)	(507,183)	(2,896,215)						
2009	3,593,025	(3,380,008)	(2,219,505)							
2010	2,577,924	(4,195,337)								
2011	7,340,835									

Actual vs Expected Development: AY x CY

Minimum	Maximum	Count	
-4.2%	-1.7%	7	Favorable development
-1.7%	-0.5%	18	Somewhat favorable
-0.5%	0.5%	134	Within +-0.5% of original estimate
0.5%	3.7%	37	Somewhat adverse
3.7%	10.1%	14	Adverse development

Source: SOLM 2023v1 (Pre-Release) - mechanical selections of VWA (100% 7-year)

Commercial Auto Liability – Loss Development Factors – GU Indemnity

Illustrative

Since 2020Q2, development factors are noticeably higher than previously. This could be due to the shutdown of the court system or pipeline issues during the pandemic, as well as continuing backlog from the pandemic with potentially fewer resources

Loss Year	Loss Month	3	6	9	12	15	18	21	24	27	30	33	36	39
2017	3	472,132,595	778,637,845	894,243,838	991,138,646	1,079,595,467	1,163,440,348	1,238,324,525	1,319,258,847	1,381,655,014	1,438,154,509	1,491,050,933	1,540,521,133	1,589,811,819
2017	6	517,736,559	858,838,355	1,006,886,841	1,109,410,084	1,226,969,079	1,309,540,449	1,397,814,932	1,476,158,707	1,555,373,869	1,618,757,071	1,674,417,295	1,719,149,404	1,745,447,239
2017	9	530,088,063	872,539,134	1,013,367,703	1,148,327,488	1,249,979,213	1,343,536,916	1,438,706,550	1,527,142,923	1,605,859,499	1,663,743,501	1,731,043,796	1,763,447,730	1,801,345,280
2017	12	547,862,906	859,826,948	1,008,592,449	1,122,716,317	1,228,022,452	1,340,803,954	1,419,968,621	1,497,544,631	1,577,801,052	1,651,407,576	1,691,944,451	1,729,530,755	1,768,653,874
2018	3	460,475,923	774,794,447	910,967,964	1,026,810,080	1,145,051,523	1,228,017,999	1,310,012,205	1,402,646,258	1,479,466,135	1,520,111,804	1,568,574,949	1,606,251,262	1,633,295,372
2018	6	514,861,332	863,949,940	1,001,876,281	1,123,985,940	1,227,221,509	1,340,761,731	1,430,753,626	1,554,747,503	1,640,361,002	1,682,410,642	1,726,423,932	1,763,727,566	1,806,806,979
2018	9	527,773,013	912,045,623	1,073,696,585	1,196,309,634	1,323,708,702	1,419,420,494	1,514,042,143	1,619,548,322	1,694,656,760	1,752,932,761	1,801,099,196	1,865,761,642	1,923,612,656
2018	12	542,678,671	863,339,178	1,011,657,596	1,146,680,397	1,258,032,795	1,388,391,098	1,475,340,022	1,552,773,567	1,634,036,425	1,691,671,638	1,761,072,315	1,823,086,969	1,877,389,704
2019	3	469,418,043	786,530,945	931,894,730	1,037,108,688	1,161,518,522	1,271,427,520	1,350,563,778	1,452,402,226	1,509,294,342	1,568,431,986	1,629,960,179	1,692,708,685	1,731,962,873
2019	6	505,201,156	877,561,756	1,029,975,964	1,159,637,828	1,291,115,265	1,392,101,352	1,479,225,722	1,551,328,754	1,628,511,255	1,684,183,930	1,754,737,106	1,804,129,385	1,866,948,853
2019	9	534,051,418	933,827,021	1,105,281,065	1,253,310,292	1,375,421,070	1,495,566,828	1,592,949,615	1,691,951,846	1,773,315,965	1,849,954,550	1,915,584,186	1,994,297,268	2,065,811,554
2019	12	518,816,331	872,391,277	1,043,030,307	1,197,790,721	1,310,709,893	1,410,142,593	1,513,395,454	1,609,920,669	1,715,100,088	1,804,807,062	1,884,555,856	1,956,290,460	2,049,455,180
2020	3	413,226,073	665,590,803	791,615,061	887,860,637	987,388,178	1,076,682,187	1,154,190,677	1,234,701,502	1,296,034,431	1,366,674,658	1,432,815,782	1,502,908,808	
2020	6	274,332,232	523,777,413	632,671,394	720,442,271	794,381,369	848,637,346	929,703,762	983,629,965	1,068,261,415	1,123,938,305	1,183,471,003		
2020	9	392,529,236	698,399,994	824,353,887	934,499,963	1,031,540,828	1,143,812,545	1,222,329,027	1,323,656,528	1,424,540,149	1,518,711,558			
2020	12	414,843,632	695,983,725	826,330,221	944,836,996	1,064,205,756	1,174,755,169	1,289,833,192	1,380,969,927	1,511,027,370				
2021	3	340,672,402	632,378,131	753,197,079	865,826,297	952,042,075	1,049,882,846	1,137,177,228	1,241,355,248					
2021	6	399,497,447	733,463,444	879,732,392	991,612,078	1,128,374,109	1,243,476,201	1,364,038,377						
2021	9	445,698,189	800,142,412	980,505,649	1,118,904,005	1,256,275,218	1,383,552,141							
2021	12	455,920,756	786,657,577	984,799,362	1,130,738,611	1,289,082,613								
2022	3	385,389,343	719,177,271	896,260,687	1,046,875,693									
2022	6	422,709,129	800,488,187	1,006,344,420										
2022	9	484,125,655	899,570,355											
2022	12	476,616,762												

		6/3	9/6	12/9	15/12	18/15	21/18	24/21	27/24	30/27	33/30	36/33	39/36	42/39
2017	3	1.649	1.148	1.108	1.089	1.078	1.064	1.065	1.047	1.041	1.037	1.033	1.032	1.011
2017	6	1.659	1.172	1.102	1.106	1.067	1.067	1.056	1.054	1.041	1.034	1.027	1.015	1.015
2017	9	1.646	1.161	1.133	1.089	1.075	1.071	1.061	1.052	1.036	1.040	1.019	1.021	1.016
2017	12	1.569	1.173	1.113	1.094	1.092	1.059	1.055	1.054	1.047	1.025	1.022	1.023	1.022
2018	3	1.683	1.176	1.127	1.115	1.072	1.067	1.071	1.055	1.027	1.032	1.024	1.017	1.022
2018	6	1.678	1.160	1.122	1.092	1.093	1.067	1.087	1.055	1.026	1.026	1.022	1.024	1.015
2018	9	1.728	1.177	1.114	1.106	1.072	1.067	1.070	1.046	1.034	1.027	1.036	1.031	1.022
2018	12	1.591	1.172	1.133	1.097	1.104	1.063	1.052	1.052	1.035	1.041	1.035	1.030	1.018
2019	3	1.676	1.185	1.113	1.120	1.095	1.062	1.075	1.039	1.039	1.039	1.038	1.023	1.030
2019	6	1.737	1.174	1.126	1.113	1.078	1.063	1.049	1.050	1.034	1.042	1.028	1.035	1.028
2019	9	1.749	1.184	1.134	1.097	1.087	1.065	1.062	1.048	1.043	1.035	1.041	1.036	1.036
2019	12	1.682	1.196	1.148	1.094	1.076	1.073	1.064	1.065	1.052	1.044	1.038	1.048	
2020	3	1.611	1.189	1.122	1.112	1.090	1.072	1.070	1.050	1.055	1.048	1.049		
2020	6	1.909	1.208	1.139	1.103	1.068	1.096	1.058	1.086	1.052	1.053			
2020	9	1.779	1.180	1.134	1.104	1.109	1.069	1.083	1.076	1.066				
2020	12	1.678	1.187	1.143	1.126	1.104	1.098	1.071	1.094					
2021	3	1.856	1.191	1.150	1.100	1.103	1.083	1.092						
2021	6	1.836	1.199	1.127	1.138	1.102	1.097							
2021	9	1.795	1.225	1.141	1.123	1.101								
2021	12	1.725	1.252	1.148	1.140									
2022	3	1.866	1.246	1.168										
2022		1.894	1.257											
2022		1.858												

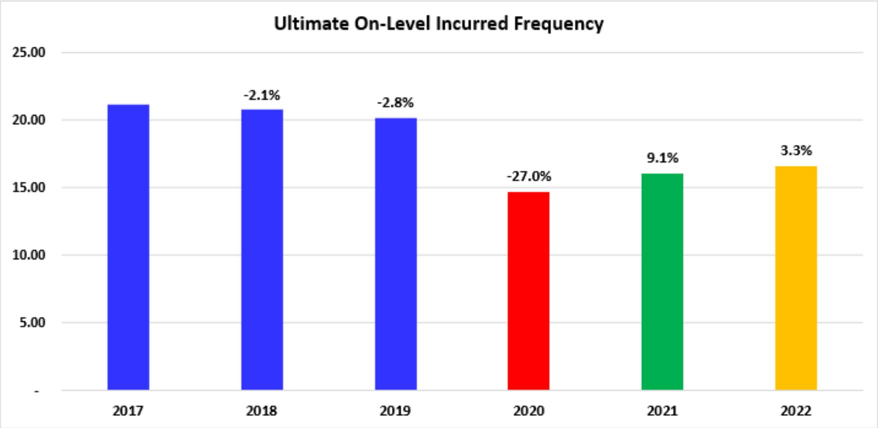
		3 - 6	6 - 9	9 - 12	12 - 15	15 - 18	18 - 21	21 - 24	24 - 27	27 - 30	30 - 33	33 - 36	36 - 39	39 - 42
ATA	2017-2020Q1	1.666	1.174	1.123	1.102	1.083	1.066	1.064	1.051	1.039	1.036	1.032	1.028	1.022
ATA	2020Q2-2022	1.815	1.218	1.144	1.121	1.099	1.088	1.077	1.086	1.060	1.053	1.032	1.028	1.022
ATA	Last 7 Qu	1.831	1.224	1.145	1.121	1.098	1.083	1.071	1.066	1.048	1.043	1.038	1.033	1.024
ATU		5.145	2.810	2.295	2.006	1.790	1.630	1.504	1.405	1.319	1.258	1.207	1.163	1.126
Ultimate		2,452,254,794	2,527,943,406	2,310,022,988	2,099,619,428	2,307,089,091	2,255,271,416	2,052,189,724	1,743,988,288	1,992,297,262	1,910,413,270	1,427,866,554	1,747,369,112	2,307,337,875

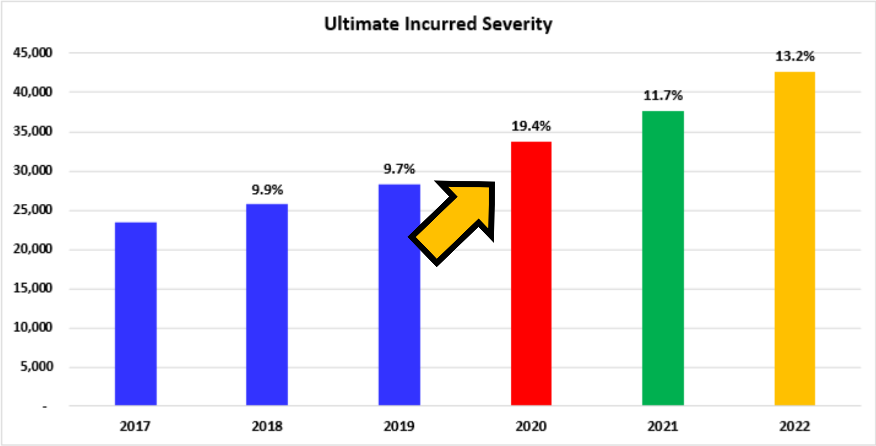
Source: CAu SOLM-Qtr at 12/31/2022; Indemnity Only

SOLM Qtr – Total CAu Liability

Illustrative

As observed previously, in 2020 there was a significant frequency reduction driving a significant loss ratio reduction. For severity, we see YTY changes significantly higher than in the past with increases above 10% in 2020 - 2022. This large increase in severity, paired with a partial rebound in frequency led to an increase in loss ratio in 2021 and 2022 to higher than pre-pandemic levels.

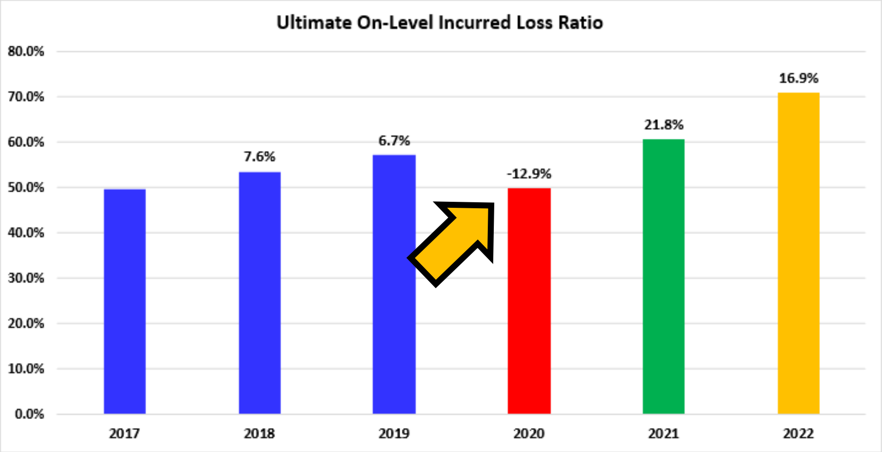




SOLM Qtr CAu 2022 Q4

For SOLM / E&R+ Clients Only

Class Group	Liability
Region	Midwest | North | South | West
Cause of Loss	All Causes of Loss
Claim Size	1 - <10k | 10k - <25k | >=25k



CvIF

	Frequency	Severity	Loss Ratio
2020	0.711	1.307	0.931
2021	0.776	1.459	1.134
2022	0.801	1.651	1.325

# of Claims (6 years) 1,574,141

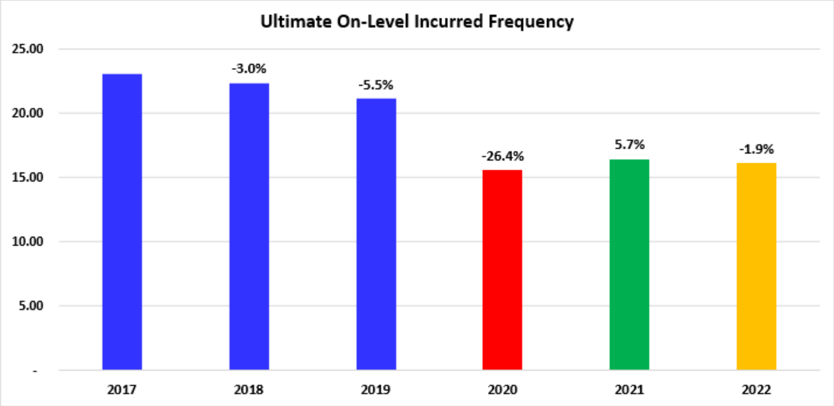
NB: mechanical selection for LDFs of last 7 qtr VWA used in projections from CAu SOLM-Qtr at 12/31/2022. No tail beyond 2017 supplied. Indemnity Only

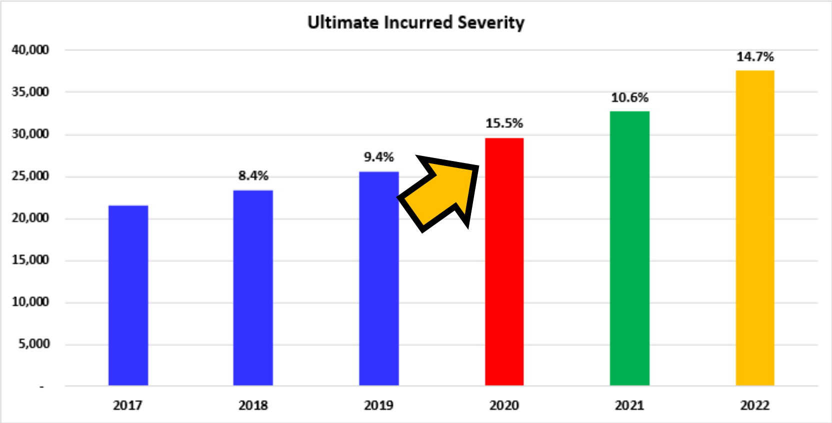
uses ISO MarketWatch 6/30/2022 rate changes

SOLM Qtr – TTT

Illustrative

TTT data shows a very similar story to Total Commercial Auto Liability. In 2020 there was a significant frequency reduction driving a significant loss ratio reduction. For severity, we see YTY changes significantly higher than in the past with increases above 10% in 2020 - 2022. This large increase in severity with slight rebound in frequency led to a rise loss ratio in 2021 and 2022 to above pre-pandemic levels.





ISO SOLM QTR

SOLM Qtr CAu 2022 Q4
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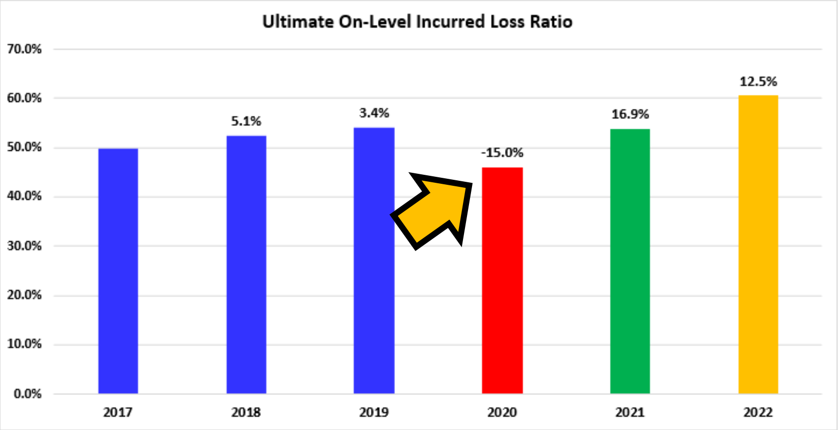
Class Group	Trucks, Tractors and Trailers
Region	Midwest | North | South | West
Cause of Loss	All Causes of Loss
Claim Size	1 - <10k | 10k - <25k | >=25k



CvIF

	Frequency	Severity	Loss Ratio
2020	0.701	1.257	0.883
2021	0.741	1.391	1.033
2022	0.727	1.596	1.162

# of Claims (6 years) 830,627

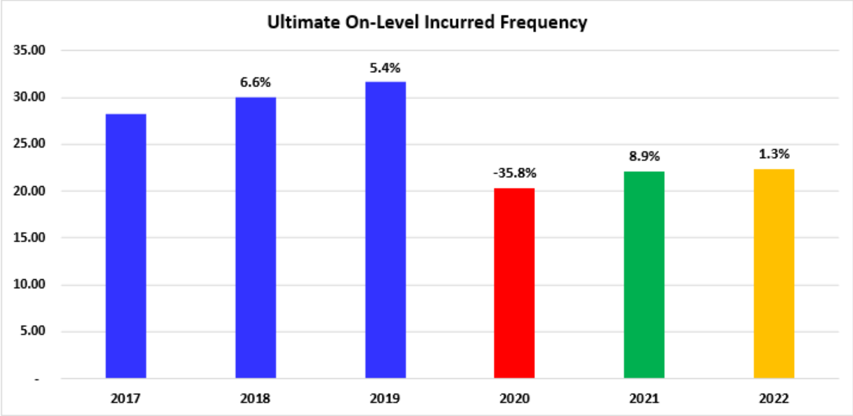
NB: mechanical selection for LDFs of last 7 qtr VWA used in projections from CAu SOLM-Qtr at 12/31/2022. No tail beyond 2017 supplied. Indemnity Only

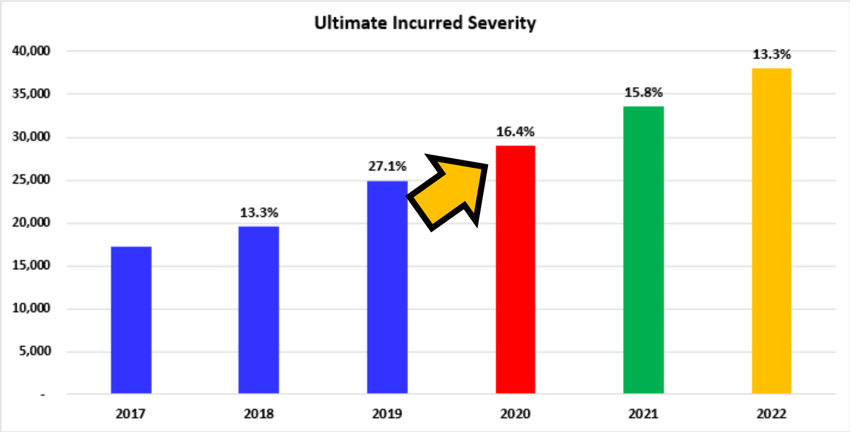
uses ISO MarketWatch 6/30/2022 rate changes

SOLM Qtr – PPT

Illustrative

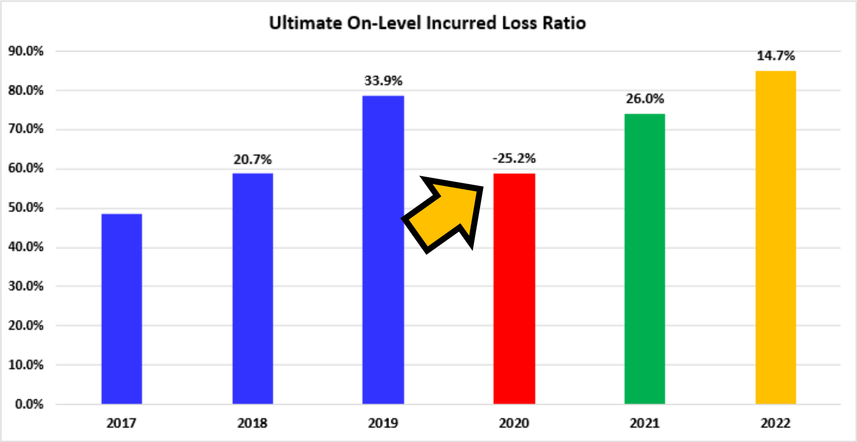
PPT shows the same overall pattern as TTT, but shows a more extreme drop in frequency in 2020. We see high severity changes in 2020 - 2022, but not as high as what was observed in 2019 of over a 20% increase. The beginning of a rebound in frequency in 2021 coupled with the large severity increases in recent years led to a recovery in loss ratio in 2021 and 2022 to slightly higher than pre-pandemic levels.





SOLM Qtr CAu 2022 Q4

Class Group	Private Passenger Types
Region	Midwest | North | South | West
Cause of Loss	All Causes of Loss
Claim Size	1 - <10k | 10k - <25k | >=25k



CvIF

	Frequency	Severity	Loss Ratio
2020	0.678	1.408	0.948
2021	0.738	1.630	1.195
2022	0.748	1.846	1.371

# of Claims (6 years) 156,105

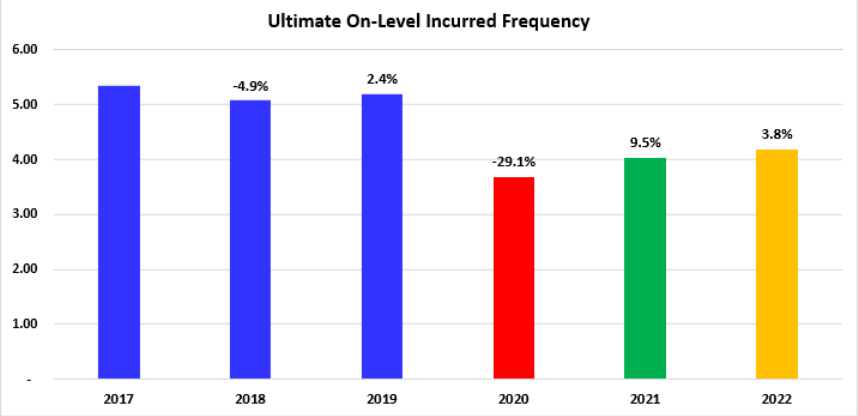
NB: mechanical selection for LDFs of last 7 qtr VWA used in projections from CAu SOLM-Qtr at 12/31/2022. No tail beyond 2017 supplied. Indemnity Only

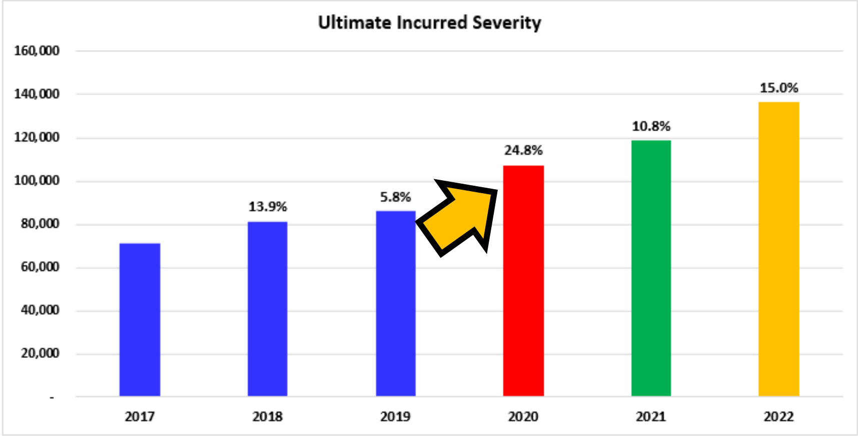
uses ISO MarketWatch 6/30/2022 rate changes

SOLM Qtr – Total CAu Liability BI

Illustrative

When looking at Total Commercial Auto Liability BI, we see the same trends as for All Causes of Loss. Frequency dropped significantly in 2020 followed by increases in 2021 and 2022. Severity shows large increases of close over 10% or higher in both 2020 - 2022. These frequency and severity changes led to a large decline in loss ratio in 2020 and an increase in 2021 and 2022 to higher than pre-pandemic levels.

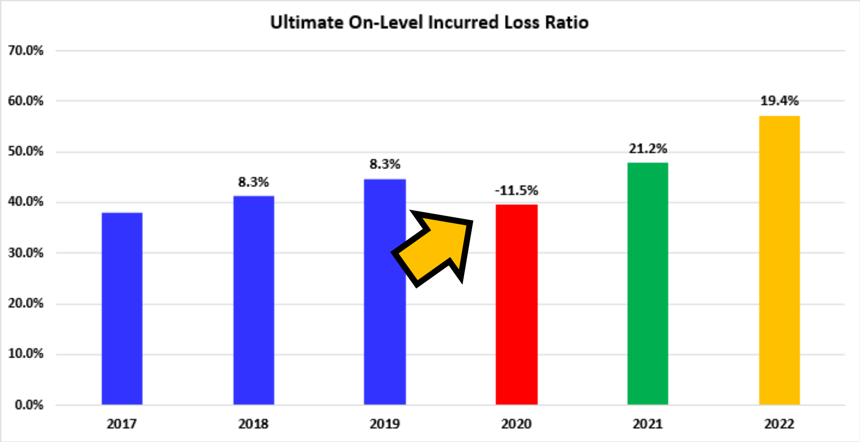




ISO SOLM QTR

SOLM Qtr CAu 2022 Q4

Class Group	Liability
Region	Midwest | North | South | West
Cause of Loss	BI
Claim Size	1 - <10k | 10k - <25k | >=25k



CvIF

	Frequency	Severity	Loss Ratio
2020	0.708	1.348	0.956
2021	0.775	1.494	1.159
2022	0.805	1.717	1.383

# of Claims (6 years) **394,608**

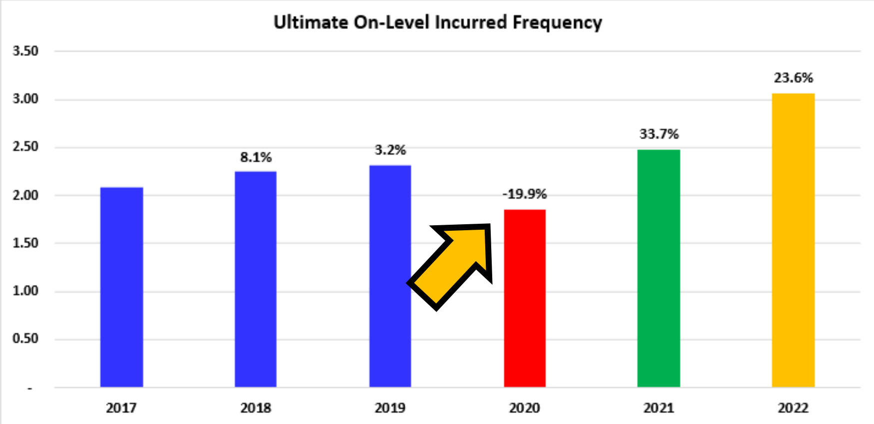
NB: mechanical selection for LDFs of last 7 qtr VWA used in projections from CAu SOLM-Qtr at 12/31/2022. No tail beyond 2017 supplied. Indemnity Only

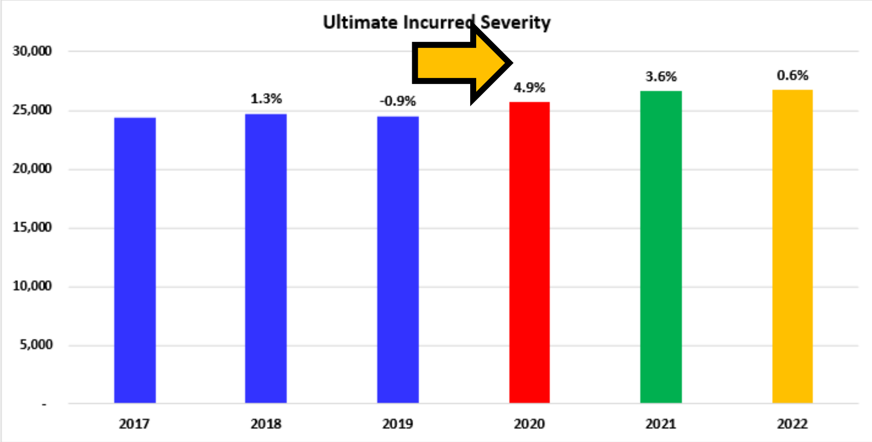
uses ISO MarketWatch 6/30/2022 rate changes

SOLM Infographic – Total CAu Liability PD >10k

Illustrative

Not all segments are seeing the large increase in severity. Property Damage claims >10k are a good example. In 2020, we still saw the large drop in frequency, but there was not much of an impact to severity, leading to a drop in loss ratio. 2021 and 2022 saw large increases in frequency leading to an increase in loss ratio above pre-pandemic levels.

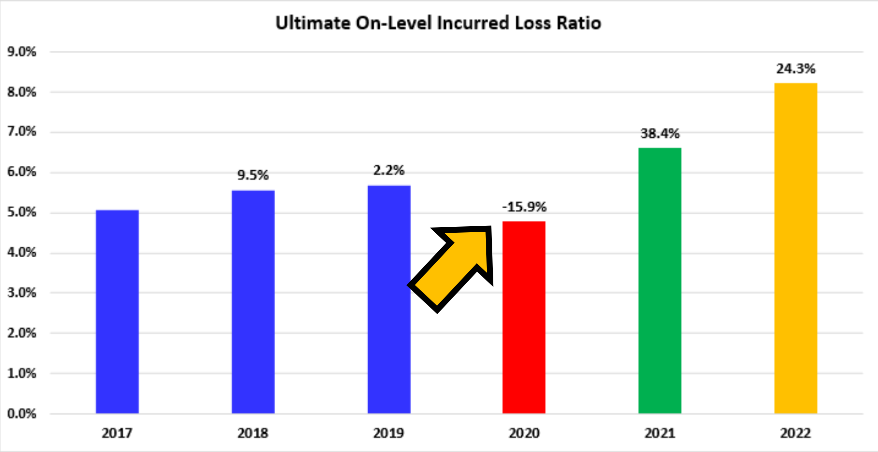




ISO SOLM QCR

SOLM Qtr CAu 2022 Q4

Class Group	Liability
Region	Midwest | North | South | West
Cause of Loss	PD
Claim Size	10k - <25k | >=25k



CvIF

	Frequency	Severity	Loss Ratio
2020	0.839	1.047	0.879
2021	1.121	1.085	1.216
2022	1.386	1.091	1.512

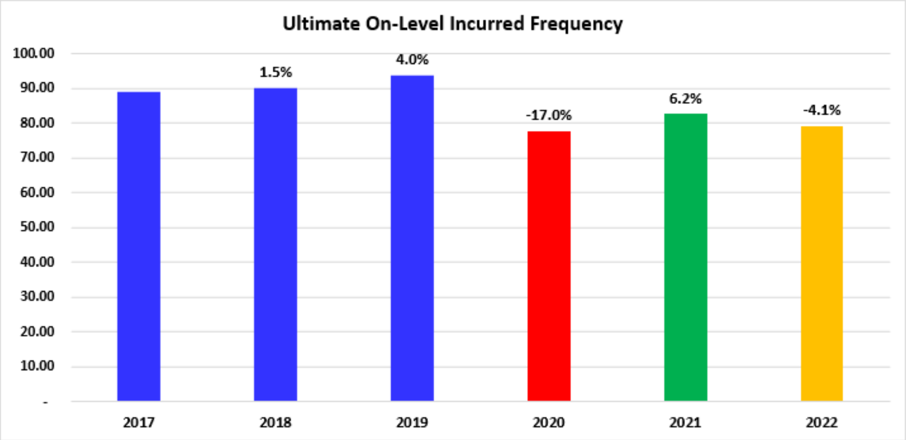
# of Claims (6 years) **191,356**

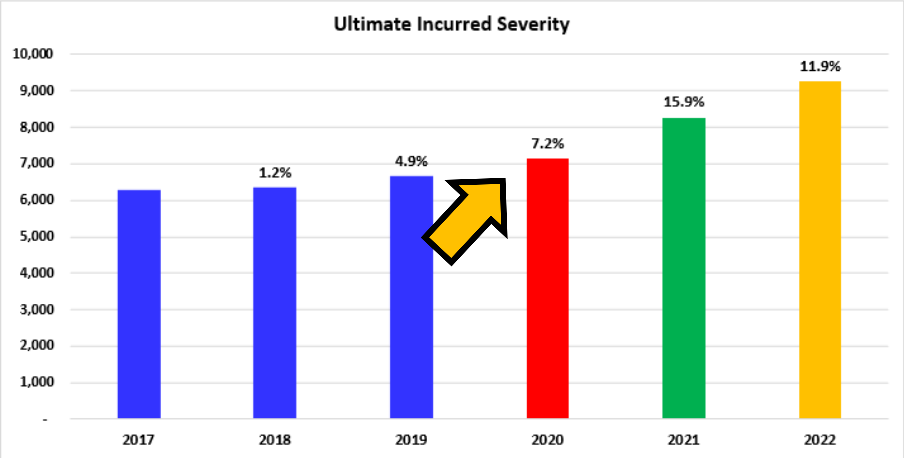
NB: mechanical selection for LDFs of last 7 qtr VWA used in projections from CAu SOLM-Qtr at 12/31/2022. No tail beyond 2017 supplied. Indemnity Only
uses ISO MarketWatch 6/30/2022 rate changes

SOLM Infographic – Total CAu Physical Damage

Illustrative

Commercial Auto Physical Damage shows a very similar story to Commercial Auto Liability. While still showing a significant frequency decrease in 2020 and increasing severity in 2020 - 2022, these impacts are not as significant as for liability.





ISO SOLM QTR

SOLM Qtr CAu 2022 Q4
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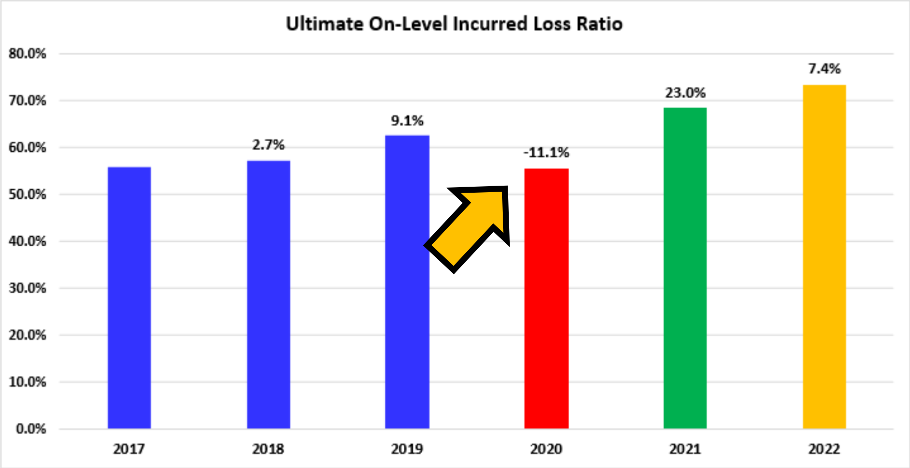
Class Group	Liability
Region	Midwest | North | South | West
Cause of Loss	All Causes of Loss
Claim Size	1 - <10k | >=10k



CvIF

	Frequency	Severity	Loss Ratio
2020	0.856	1.111	0.950
2021	0.909	1.287	1.169
2022	0.872	1.441	1.255

# of Claims (6 years) **1,711,755**

NB: mechanical selection for LDFs of last 7 qtr VWA used in projections from CAu SOLM-Qtr at 12/31/2022. No tail beyond 2017 supplied. Indemnity Only
uses ISO MarketWatch 6/30/2022 rate changes

SOLM Qtr – Total CAu Liability – Closure Rates

Illustrative

Looking at the ratio of closed claims to incurred claims, the closure rate in accident quarters since 2021Q2 and calendar years since the start of COVID, has slowed down from what it had been previously for Commercial Auto Liability

Cumulative Closed		= Closed Claims/ Incurred Claims									
		3	6	9	12	15	18	21	24	27	30
2017	3	44.5%	70.1%	79.8%	84.8%	88.0%	90.2%	91.5%	92.6%	93.8%	94.6%
2017	6	43.8%	69.3%	79.2%	84.5%	87.6%	89.7%	91.3%	92.5%	93.8%	94.6%
2017	9	42.9%	69.1%	79.2%	84.6%	87.7%	89.8%	91.3%	92.5%	93.7%	94.6%
2017	12	41.5%	68.4%	79.0%	84.0%	87.3%	89.4%	90.9%	92.2%	93.6%	94.4%
2018	3	44.6%	70.3%	79.7%	84.7%	87.7%	89.8%	91.2%	92.5%	93.6%	94.7%
2018	6	43.0%	68.5%	78.8%	83.8%	87.2%	89.1%	90.9%	92.0%	93.3%	94.2%
2018	9	42.3%	68.5%	78.3%	83.6%	86.8%	89.2%	90.7%	92.2%	93.3%	94.1%
2018	12	41.4%	67.8%	78.1%	83.4%	87.0%	89.1%	91.0%	92.2%	93.2%	94.4%
2019	3	43.7%	69.0%	78.4%	84.1%	87.1%	89.6%	91.0%	92.2%	93.7%	94.4%
2019	6	42.9%	67.2%	78.4%	83.6%	87.4%	89.5%	91.0%	92.4%	93.4%	94.2%
2019	9	42.6%	67.6%	77.4%	83.4%	86.6%	88.7%	90.5%	91.7%	92.8%	93.6%
2019	12	41.5%	67.0%	78.2%	83.6%	86.5%	88.7%	90.2%	91.4%	92.5%	93.4%
2020	3	46.6%	68.9%	78.6%	83.7%	86.8%	88.8%	90.4%	91.6%	92.7%	93.7%
2020	6	44.2%	67.3%	78.0%	83.1%	86.1%	88.2%	89.7%	91.0%	92.2%	93.1%
2020	9	44.5%	66.0%	76.7%	82.2%	85.1%	87.3%	89.2%	90.7%	92.1%	93.2%
2020	12	42.0%	65.0%	75.9%	81.5%	84.9%	87.4%	89.2%	90.7%	92.2%	
2021	3	44.7%	65.6%	76.7%	82.1%	85.7%	88.1%	89.8%	91.2%		
2021	6	39.6%	63.6%	75.1%	81.0%	85.1%	87.5%	89.2%			
2021	9	38.1%	61.8%	73.9%	80.7%	84.7%	87.4%				
2021	12	33.4%	59.5%	73.1%	80.0%	84.2%					
2022	3	37.3%	62.0%	74.8%	81.4%						
2022	6	34.4%	60.6%	74.1%							
2022	9	34.4%	59.3%								
2022	12	31.7%									

Source: CAu SOLM-Qtr at 12/31/2022

SOLM Qtr – Total CAu Liability – Incremental to Ultimate

Illustrative

When comparing incremental closed claims and paid indemnity to ultimate values, in the 8 quarters following the start of the pandemic, closure and payment rates fell from what they had been pre-pandemic. After those initial 8 quarters, closure rates began to increase again in many cases to higher than pre-pandemic levels. Closure rates remain low in the 3 month evaluation perhaps indicating a push to close older claims first.

Closed Claims

		Ultimate	Total	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	63	66	69	72
2017	3	77,643	99.5%	36.0%	31.8%	10.1%	5.0%	3.6%	2.4%	1.7%	1.4%	1.4%	1.0%	0.8%	0.8%	0.7%	0.5%	0.4%	0.3%	0.4%	0.4%	0.2%	0.2%	0.2%	0.1%	0.1%	0.1%
2017	6	83,406	99.5%	35.6%	31.5%	9.9%	5.6%	3.6%	2.5%	1.9%	1.4%	1.5%	1.0%	0.8%	0.7%	0.7%	0.5%	0.4%	0.4%	0.4%	0.2%	0.2%	0.2%	0.1%	0.1%	0.1%	
2017	9	82,803	99.4%	34.7%	31.8%	10.3%	6.1%	3.7%	2.3%	1.6%	1.6%	1.5%	1.0%	0.7%	0.7%	0.7%	0.5%	0.5%	0.5%	0.4%	0.3%	0.2%	0.2%	0.2%	0.2%		
2017	12	79,460	99.2%	34.0%	32.0%	11.0%	5.6%	3.6%	2.3%	1.8%	1.4%	1.6%	0.9%	0.8%	0.7%	0.6%	0.6%	0.6%	0.3%	0.4%	0.3%	0.3%	0.2%	0.2%			
2018	3	74,931	99.1%	36.2%	31.4%	10.2%	5.4%	3.3%	2.4%	1.7%	1.5%	1.4%	1.0%	0.7%	0.6%	0.7%	0.7%	0.4%	0.4%	0.3%	0.3%	0.2%	0.2%				
2018	6	79,843	98.9%	34.7%	31.6%	10.5%	5.5%	3.8%	2.3%	1.9%	1.5%	1.6%	0.9%	0.8%	0.8%	0.7%	0.4%	0.5%	0.4%	0.4%	0.3%	0.3%					
2018	9	81,085	98.6%	33.7%	31.8%	10.7%	5.7%	3.8%	2.5%	1.8%	1.7%	1.5%	0.9%	0.9%	0.8%	0.6%	0.5%	0.4%	0.4%	0.4%	0.4%						
2018	12	79,047	98.2%	33.0%	31.5%	11.3%	5.9%	3.8%	2.5%	2.1%	1.5%	1.3%	1.1%	0.9%	0.6%	0.7%	0.6%	0.5%	0.4%	0.5%							
2019	3	74,730	97.8%	34.4%	31.5%	10.5%	5.8%	3.7%	2.8%	1.7%	1.4%	1.5%	1.0%	0.7%	0.6%	0.7%	0.5%	0.4%	0.5%								
2019	6	78,980	97.4%	33.0%	31.1%	11.3%	6.1%	4.3%	2.5%	1.8%	1.5%	1.5%	0.9%	0.8%	0.7%	0.6%	0.5%	0.6%									
2019	9	80,229	96.6%	32.8%	31.0%	11.3%	6.3%	3.7%	2.5%	1.9%	1.7%	1.5%	1.0%	0.9%	0.8%	0.7%	0.7%										
2019	12	75,430	95.8%	31.7%	32.0%	12.0%	5.9%	3.6%	2.4%	1.9%	1.4%	1.6%	1.0%	0.8%	0.7%	0.8%											
2020	3	60,269	95.3%	36.9%	28.7%	10.5%	5.7%	3.5%	2.5%	1.8%	1.5%	1.5%	1.1%	0.8%	0.9%												
2020	6	41,654	94.2%	31.9%	32.1%	11.8%	5.4%	3.6%	2.4%	1.8%	1.5%	1.5%	1.1%	1.0%													
2020	9	54,191	93.3%	33.0%	30.1%	11.5%	5.9%	3.3%	2.6%	2.1%	1.9%	1.6%	1.2%														
2020	12	52,948	92.1%	31.1%	30.5%	12.3%	5.9%	3.8%	2.8%	2.1%	1.8%	1.8%															
2021	3	49,889	90.8%	32.4%	30.0%	11.7%	6.0%	4.0%	2.9%	1.9%	1.8%																
2021	6	55,777	88.6%	28.7%	31.2%	12.5%	6.5%	4.6%	3.0%	2.1%																	
2021	9	58,453	86.8%	27.5%	30.1%	13.5%	7.7%	4.7%	3.2%																		
2021	12	55,972	83.3%	24.6%	30.7%	15.4%	7.8%	4.9%																			
2022	3	52,640	80.0%	26.8%	31.9%	14.0%	7.2%																				
2022	6	54,669	72.5%	25.2%	32.9%	14.4%																					
2022	9	54,310	58.2%	26.3%	32.0%																						
2022	12	46,680	26.5%	26.5%																							

Calendar Year	Calendar Quarter	Straight Average until 27 months	Ranks Straight Average until 27 months
2019	3	10.8%	9
2019	6	10.7%	12
2019	9	10.6%	10
2019	12	10.6%	11
2020	3	11.5%	15
2020	6	10.5%	15
2020	9	10.9%	11
2020	12	10.6%	8
2021	3	10.8%	9
2021	6	10.3%	7
2021	9	10.2%	6
2021	12	10.0%	6
2022	3	10.6%	11
2022	6	10.5%	14
2022	9	10.8%	14
2022	12	10.5%	16

Paid Indemnity

		Ultimate	Total	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	63	66	69	72
2017	3	1,645,119,060	100.0%	8.1%	9.7%	5.9%	5.2%	5.3%	6.1%	5.3%	5.7%	6.4%	4.5%	5.2%	5.5%	4.6%	3.5%	2.7%	2.9%	2.1%	2.2%	2.0%	1.9%	1.3%	1.6%	1.6%	0.8%
2017	6	1,824,735,762	99.2%	7.7%	9.1%	6.4%	5.4%	6.0%	5.5%	5.9%	6.3%	6.1%	5.4%	4.5%	4.9%	4.4%	2.8%	3.1%	1.7%	2.7%	2.2%	2.0%	2.1%	1.7%	1.8%	1.6%	
2017	9	1,934,441,851	97.6%	7.3%	8.8%	5.7%	6.1%	5.9%	5.6%	5.7%	6.0%	5.7%	4.9%	4.3%	3.8%	4.1%	2.9%	2.6%	3.3%	4.3%	3.0%	2.1%	2.0%	1.8%	1.5%		
2017	12	1,892,180,120	96.0%	7.1%	9.0%	6.2%	5.8%	6.1%	5.3%	5.2%	5.9%	7.0%	4.9%	3.9%	4.0%	3.6%	3.3%	3.6%	3.0%	3.2%	2.7%	2.4%	2.1%	1.7%			
2018	3	1,760,867,776	94.3%	7.6%	9.2%	5.3%	5.7%	5.9%	6.8%	4.6%	6.2%	7.3%	3.8%	4.1%	3.8%	3.7%	3.8%	2.8%	3.3%	2.9%	2.9%	2.7%	2.1%				
2018	6	1,930,030,929	92.3%	7.3%	8.7%	6.5%	5.5%	5.7%	4.6%	5.7%	6.5%	5.8%	4.0%	4.4%	3.3%	3.4%	3.3%	3.7%	3.9%	3.3%	3.3%	3.2%					
2018	9	2,064,244,369	89.8%	6.9%	9.0%	5.8%	5.3%	5.5%	6.8%	6.2%	6.1%	5.4%	3.8%	3.4%	3.9%	4.2%	5.0%	3.2%	3.9%	3.3%	2.2%						
2018	12	2,047,190,265	87.2%	6.8%	8.7%	5.7%	4.9%	5.8%	5.2%	5.1%	4.7%	5.9%	4.7%	4.3%	4.3%	5.8%	3.8%	3.8%	4.1%	3.6%							
2019	3	1,905,099,377	83.9%	7.1%	8.4%	5.3%	5.5%	5.8%	5.3%	4.6%	5.5%	6.4%	4.1%	4.0%	5.1%	4.4%	4.1%	4.4%	3.9%								
2019	6	2,015,976,705	80.2%	6.8%	8.8%	6.5%	5.4%	5.8%	5.2%	4.7%	4.9%	5.3%	4.1%	5.8%	4.4%	4.4%	4.1%	3.9%									
2019	9	2,234,717,265	76.6%	6.5%	8.5%	5.6%	5.5%	5.5%	5.2%	5.1%	5.3%	5.4%	4.6%	4.2%	4.6%	5.5%	5.1%										
2019	12	2,155,356,861	72.3%	6.2%	9.1%	5.9%	5.5%	5.2%	4.7%	4.9%	4.7%	6.0%	5.1%	4.4%	5.0%	5.7%											
2020	3	1,628,580,608	67.5%	7.4%	8.9%	5.1%	5.4%	4.9%	5.1%	4.8%	5.4%	5.9%	5.3%	4.5%	5.0%												
2020	6	1,304,697,429	62.9%	5.5%	8.2%	5.8%	4.4%	5.3%	4.0%	6.1%	5.5%	6.2%	6.5%	5.4%													
2020	9	1,753,394,145	58.2%	5.8%	7.6%	5.9%	4.7%	5.0%	5.9%	4.8%	6.0%	6.8%	5.7%														
2020	12	1,855,452,560	53.2%	5.4%	7.1%	5.3%	5.2%	5.2%	5.0%	6.1%	6.1%	7.8%															
2021	3	1,603,230,673	47.0%	5.8%	8.1%	5.3%	5.2%	5.3%	5.4%	5.6%	6.2%																
2021	6	1,897,721,886	41.3%	5.4%	7.9%	5.7%	4.6%	6.4%	5.7%	5.7%																	
2021	9	2,117,312,087	35.8%	4.9%	7.5%	6.0%	5.7%	6.5%	5.3%																		
2021	12	2,115,647,789	30.5%	4.6%	7.6%	6.4%	5.7%	6.2%																			
2022	3	2,041,681,694	24.5%	4.7%	8.0%	6.3%	5.5%																				
2022	6	2,058,718,304	19.1%	4.8%	8.4%	6.0%																					
2022	9	2,185,694,047	13.1%	4.9%	8.3%																						
2022	12	1,892,618,414	5.0%	5.0%																							

Calendar Year	Calendar Quarter	Straight Average until 27 months	Ranks Straight Average until 27 months
2019	3	7.2%	15
2019	6	7.0%	12
2019	9	6.6%	7
2019	12	7.1%	13
2020	3	7.4%	15
2020	6	6.8%	10
2020	9	6.4%	6
2020	12	6.4%	6
2021	3	6.4%	6
2021	6	6.2%	4
2021	9	6.0%	3
2021	12	6.4%	9
2022	3	6.4%	7
2022	6	6.8%	13
2022	9	6.8%	15
2022	12	6.8%	13

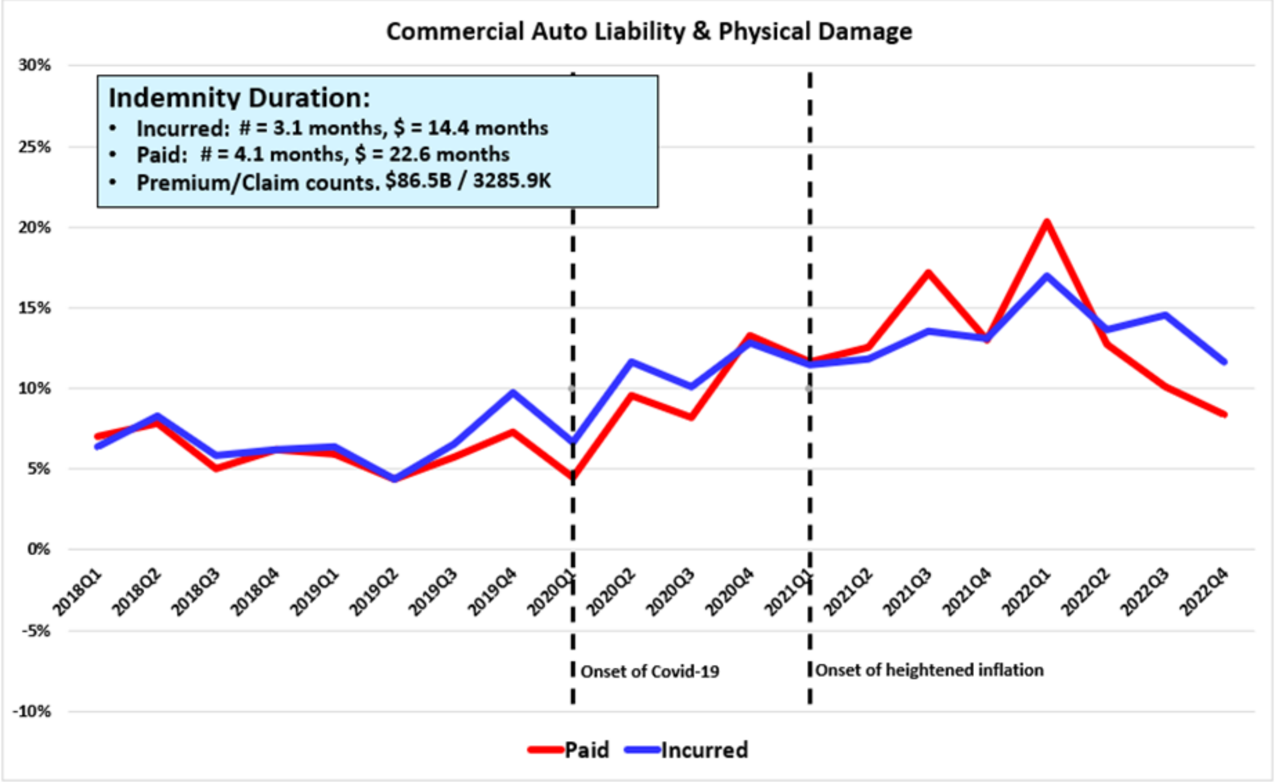
NB: mechanical selection for LDFs of last 7 qtr VWA used in projections from CAu SOLM-Qtr at 12/31/2022. No tail beyond 2017 supplied. Indemnity Only

Closure Ratios through 12/31/2022
Impact of Delayed Closures and Inflation on Paid Indemnity - Countrywide

This figure shows the dampening impact of the pandemic on settling claims starting in calendar quarter 2020Q2, affecting almost all the accident quarters. The delayed settlements continues to significantly affect the average settlements.

Average Severities have been increasing YOY on every quarter since the start of the pandemic at a higher rate than pre-pandemic average of around 6%.

Adverse (Favorable) Development		
Loss Quarter	Calendar Quarter	Accident Quarter
2017Q3	-0.3%	-9.6%
2017Q4	6.4%	10.7%
2018Q1	1.6%	5.3%
2018Q2	2.4%	-1.2%
2018Q3	-1.9%	4.4%
2018Q4	5.6%	8.0%
2019Q1	4.5%	8.0%
2019Q2	-0.7%	1.2%
2019Q3	-16.4%	0.6%
2019Q4	5.7%	5.8%
2020Q1	3.6%	3.9%
2020Q2	-10.6%	-4.9%
2020Q3	-10.5%	0.8%
2020Q4	-4.5%	3.3%
2021Q1	-7.3%	5.0%
2021Q2	3.6%	0.3%
2021Q3	4.4%	4.7%
2021Q4	21.3%	8.5%
2022Q1	12.5%	8.9%
2022Q2	17.9%	3.6%
2022Q3	21.0%	3.7%
2022Q4	14.7%	2.2%



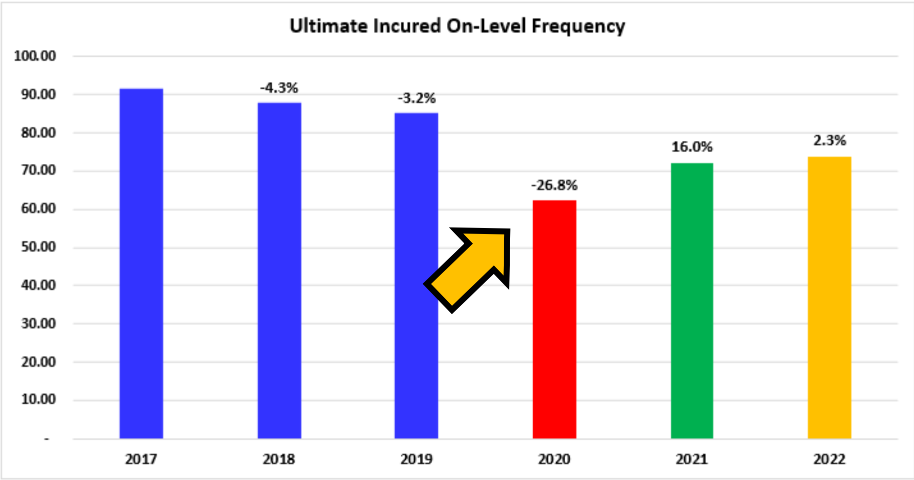
Personal Auto

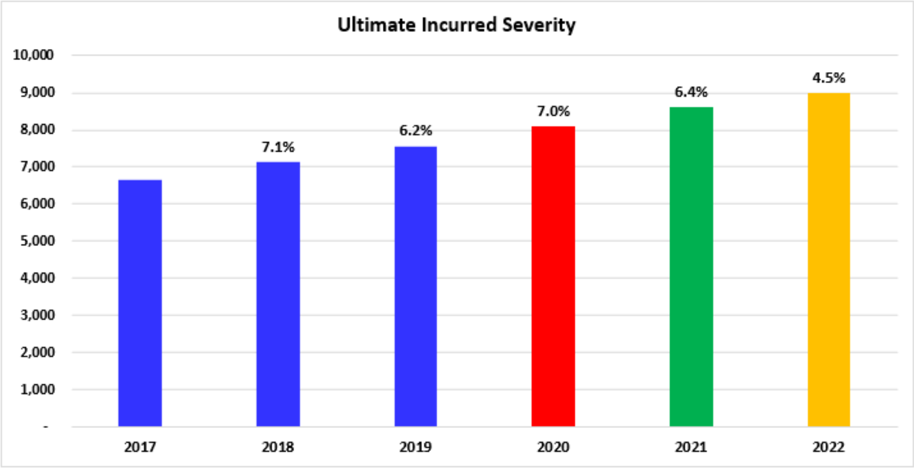
View at 2021 - 2023

SOLM Qtr – Total PAu Liability

Illustrative

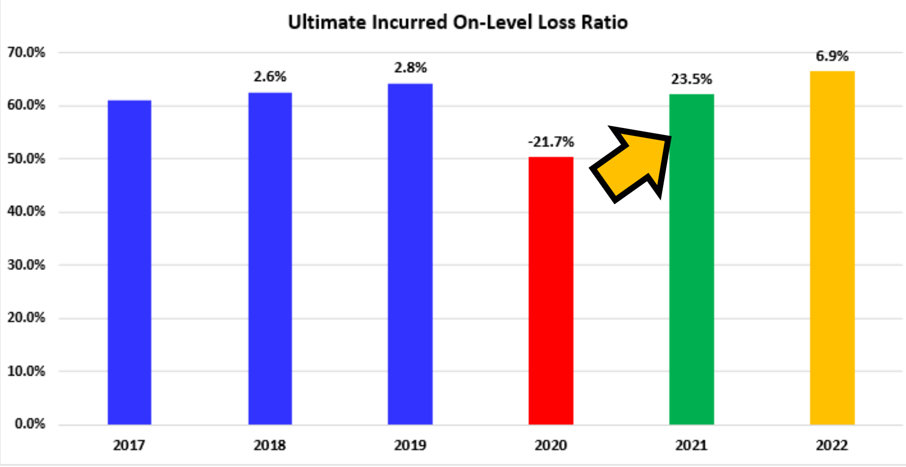
For Personal Auto Liability, we see the large decline in frequency in 2020 that we see generally across most lines of business. In 2021, there is a bigger recovery in frequency than what was seen for Commercial Auto. This recovery continued into 2022 through Q3. Severity increases in 2020-2022Q3 are not very different (even lower in some cases) than what was observed since 2017. The changes in frequency drove the loss ratio to fall in 2020 and then recover back to pre-pandemic levels in 2021 and 2022 through Q3.





ISO SOLM QTR

Class Group	PAu Liability
Region	Midwest | North | South | West
Cause of Loss	All Causes of Loss
Claim Size	>=25k | 1 - <10k | 10k - <25k



CvIF

	Frequency	Severity	Loss Ratio
2020	0.705	1.138	0.804
2021	0.819	1.211	0.993
2022	0.752	1.285	0.969

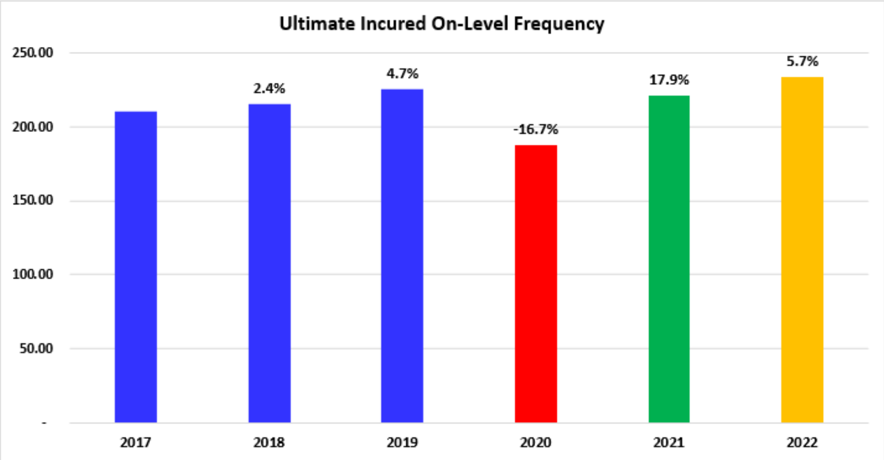
# of Claims (6 years) **9,615,430**

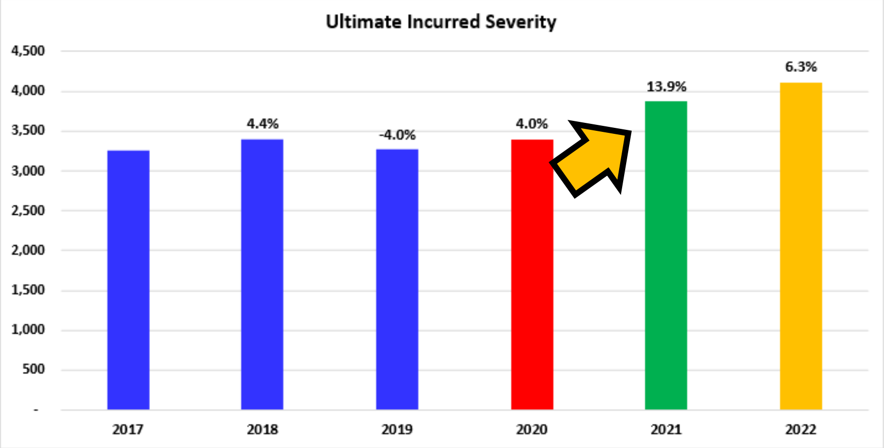
NB: mechanical selection for LDFs of last 7 qtr VWA used in projections from PAu SOLM-Qtr at 9/30/2022. No tail beyond 2017 supplied. Indemnity Only uses ISO MarketWatch 6/30/2022 rate changes

SOLM Qtr – Total PAu Physical Damage

Illustrative

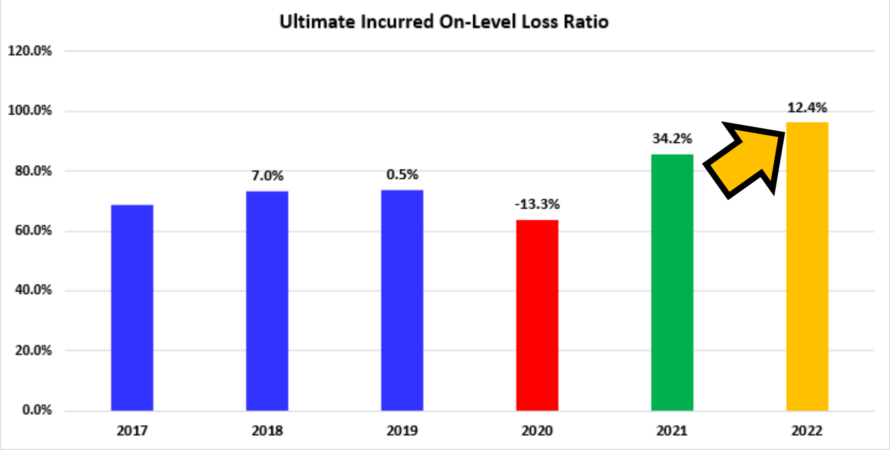
For Personal Auto Physical Damage, like with liability, we see the large decline in frequency in 2020 and the start of the recovery in 2021 and continuing into 2022 through Q3. Severity in 2021 also jumped significantly from what had been observed in the past. Severity was up again in 2022 through Q3, less so than in 2021, but higher than pre-pandemic levels. This led to a large increases in loss ratio in 2021 and 2022 through Q3 to higher than pre-pandemic levels.





SOLM Qtr PAu 2022 Q3

Class Group	PAu Physical Damage
Region	Midwest | North | South | West
Cause of Loss	All Causes of Loss
Claim Size	>=25k | 1 - <10k | 10k - <25k



CvIF

	Frequency	Severity	Loss Ratio
2020	0.866	1.027	0.889
2021	1.020	1.169	1.193
2022	0.916	1.290	1.181

# of Claims (6 years) 23,288,229

NB: mechanical selection for LDFs of last 7 qtr VWA used in projections from PAu SOLM-Qtr at 9/30/2022. No tail beyond 2017 supplied. Indemnity Only uses ISO MarketWatch 6/30/2022 rate changes

SOLM Qtr – Total PAu Liability – Closure Rates

Illustrative

Looking at the ratio of closed claims to incurred claims, the closure rate in accident quarters since 2021Q2 and calendar years since the start of COVID, has slowed down from what it had been previously for Personal Auto Liability.

Cumulative Closed = Closed Claims / Incurred Claims

		3	6	9	12	15	18	21	24	27	30
2017	3	48.7%	78.8%	87.1%	91.2%	93.5%	95.1%	96.1%	96.9%	97.7%	98.1%
2017	6	48.4%	78.1%	86.7%	91.0%	93.5%	95.0%	96.1%	96.9%	97.7%	98.1%
2017	9	47.5%	77.7%	86.5%	90.9%	93.4%	94.9%	96.0%	96.9%	97.6%	98.1%
2017	12	45.3%	77.2%	86.6%	90.9%	93.4%	94.9%	96.1%	96.9%	97.7%	98.1%
2018	3	48.2%	78.5%	87.0%	91.3%	93.6%	95.2%	96.1%	96.9%	97.7%	98.2%
2018	6	47.9%	78.2%	86.9%	91.1%	93.6%	95.0%	96.1%	96.9%	97.7%	98.0%
2018	9	45.4%	76.8%	86.1%	90.7%	93.2%	94.8%	95.9%	96.8%	97.5%	97.9%
2018	12	41.2%	75.3%	85.6%	90.3%	93.0%	94.7%	95.9%	96.7%	97.4%	97.9%
2019	3	43.3%	76.3%	85.9%	90.5%	93.2%	94.9%	95.9%	96.7%	97.4%	97.9%
2019	6	44.2%	76.7%	86.0%	90.6%	93.4%	94.8%	95.8%	96.5%	97.3%	97.8%
2019	9	45.7%	77.5%	86.8%	91.3%	93.5%	94.9%	95.9%	96.6%	97.5%	98.0%
2019	12	41.5%	76.5%	86.6%	90.7%	93.0%	94.5%	95.5%	96.5%	97.3%	97.7%
2020	3	49.1%	79.0%	87.3%	91.1%	93.3%	94.6%	95.9%	96.7%	97.3%	97.8%
2020	6	43.0%	77.6%	86.6%	90.5%	92.5%	94.7%	95.8%	96.4%	97.3%	97.8%
2020	9	45.1%	77.3%	85.9%	90.6%	92.9%	94.5%	95.3%	96.2%	97.1%	
2020	12	43.4%	75.9%	86.7%	90.8%	93.2%	94.4%	95.6%	96.4%		
2021	3	42.8%	79.0%	87.5%	91.2%	93.2%	94.7%	95.8%			
2021	6	39.7%	74.2%	84.8%	88.9%	91.9%	93.7%				
2021	9	37.1%	72.4%	83.6%	88.9%	91.8%					
2021	12	33.3%	71.4%	84.0%	89.1%						
2022	3	38.9%	73.4%	84.3%							
2022	6	38.4%	70.9%								
2022	9	37.7%									

Source: PAu SOLM-Qtr at 9/30/2022

SOLM Qtr – Total PAu Liability – Incremental to Ultimate

Illustrative

When comparing incremental closed claims and paid indemnity to ultimate values, in the 4 quarters following the start of the pandemic, closure and payment rates fell from what they had been pre-pandemic. After those initial 4 quarters, closure rates began to increase again in many cases to higher than pre-pandemic levels. Closure rates remain low in the 3 month evaluation perhaps indicating a push to close older claims first.

Closed Claims

		Ultimate	Total	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	63	66	69
2017	3	478,301	99.9%	41.8%	34.1%	9.4%	4.7%	2.7%	1.7%	1.2%	0.9%	0.9%	0.5%	0.4%	0.3%	0.3%	0.2%	0.1%	0.1%	0.1%	0.2%	0.1%	0.1%	0.1%	0.0%	0.0%
2017	6	512,723	99.9%	41.7%	33.6%	9.5%	4.8%	2.9%	1.8%	1.2%	0.9%	0.9%	0.5%	0.4%	0.3%	0.3%	0.2%	0.1%	0.1%	0.3%	0.1%	0.1%	0.1%	0.1%	0.0%	
2017	9	498,185	99.8%	40.4%	34.4%	9.8%	5.0%	2.9%	1.7%	1.2%	1.0%	0.9%	0.5%	0.4%	0.3%	0.3%	0.2%	0.1%	0.3%	0.1%	0.1%	0.1%	0.1%	0.0%		
2017	12	516,348	99.8%	38.2%	35.9%	10.3%	5.2%	2.8%	1.7%	1.2%	0.9%	0.9%	0.5%	0.4%	0.3%	0.3%	0.2%	0.4%	0.2%	0.2%	0.1%	0.1%	0.1%			
2018	3	462,068	99.7%	41.1%	34.1%	9.8%	4.8%	2.7%	1.7%	1.1%	0.9%	0.9%	0.5%	0.3%	0.3%	0.3%	0.5%	0.2%	0.2%	0.2%	0.1%	0.1%				
2018	6	482,718	99.6%	41.1%	34.2%	9.6%	4.8%	2.9%	1.7%	1.1%	0.9%	0.9%	0.5%	0.3%	0.3%	0.5%	0.2%	0.2%	0.2%	0.2%	0.1%					
2018	9	471,229	99.5%	39.4%	34.4%	10.1%	5.0%	2.8%	1.8%	1.3%	1.0%	0.9%	0.5%	0.4%	0.8%	0.4%	0.2%	0.2%	0.2%	0.1%						
2018	12	489,107	99.4%	36.8%	35.5%	10.8%	5.2%	3.0%	1.9%	1.4%	0.9%	0.9%	0.5%	0.9%	0.4%	0.4%	0.3%	0.2%	0.2%							
2019	3	434,767	99.2%	38.4%	34.4%	10.3%	5.1%	3.1%	2.0%	1.2%	0.9%	0.9%	1.2%	0.5%	0.4%	0.4%	0.3%	0.2%								
2019	6	449,939	99.0%	38.7%	34.1%	10.0%	5.2%	3.2%	1.7%	1.1%	0.9%	1.8%	0.6%	0.5%	0.5%	0.4%	0.3%									
2019	9	474,614	98.8%	39.0%	34.2%	10.1%	5.3%	2.6%	1.5%	1.1%	2.1%	1.1%	0.6%	0.5%	0.4%	0.4%										
2019	12	468,743	98.4%	35.7%	35.6%	11.3%	4.8%	2.6%	1.7%	2.7%	1.2%	1.1%	0.8%	0.5%	0.5%											
2020	3	368,236	98.1%	43.3%	30.2%	9.3%	4.3%	2.6%	3.5%	1.5%	1.1%	1.2%	0.6%	0.5%												
2020	6	243,204	97.6%	36.3%	35.2%	9.4%	4.6%	5.6%	2.2%	1.4%	1.3%	1.1%	0.6%													
2020	9	337,420	96.9%	38.1%	31.9%	9.8%	8.1%	3.2%	2.0%	1.6%	1.2%	1.1%														
2020	12	358,746	95.8%	34.4%	32.5%	15.9%	5.3%	3.0%	2.3%	1.4%	1.1%															
2021	3	346,771	94.6%	33.2%	41.3%	9.3%	4.2%	3.4%	1.9%	1.3%																
2021	6	369,221	92.7%	34.3%	35.2%	10.8%	6.6%	3.7%	2.2%																	
2021	9	388,496	90.6%	31.4%	34.5%	14.6%	6.6%	3.6%																		
2021	12	427,690	87.3%	26.7%	40.5%	14.1%	6.0%																			
2022	3	367,551	81.7%	34.0%	36.4%	11.3%																				
2022	6	366,148	69.7%	35.6%	34.1%																					
2022	9	368,631	35.4%	35.4%																						

Calendar Year	Calendar Quarter	Straight Average until 27 months	Ranks Straight Average until 27 months
2019	3	10.7%	8
2019	6	10.7%	10
2019	9	10.7%	9
2019	12	10.3%	8
2020	3	11.3%	12
2020	6	10.2%	11
2020	9	10.5%	7
2020	12	9.7%	2
2021	3	9.7%	4
2021	6	12.8%	17
2021	9	10.0%	11
2021	12	9.4%	10
2022	3	11.7%	16
2022	6	11.3%	15
2022	9	10.7%	13

Paid Indemnity

		Ultimate	Total	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	63	66	69
2017	3	3,076,268,857	100.0%	21.3%	20.1%	11.0%	8.7%	6.8%	5.4%	4.0%	3.9%	3.9%	2.5%	2.0%	1.9%	2.0%	1.2%	1.0%	0.9%	0.7%	0.6%	0.5%	0.5%	0.3%	0.4%	0.3%
2017	6	3,314,660,191	99.7%	21.1%	19.8%	11.4%	8.8%	7.0%	5.2%	4.2%	3.6%	4.0%	2.4%	2.3%	1.9%	1.5%	1.1%	0.9%	0.8%	0.8%	0.7%	0.6%	0.5%	0.5%	0.3%	
2017	9	3,311,273,893	99.4%	20.0%	19.9%	11.5%	9.1%	6.8%	5.4%	4.3%	3.9%	4.0%	2.5%	2.0%	1.9%	1.4%	1.3%	1.1%	0.9%	1.0%	0.8%	0.6%	0.6%	0.4%		
2017	12	3,512,466,430	99.0%	19.2%	21.2%	11.8%	8.7%	6.9%	5.0%	4.4%	3.9%	4.0%	2.4%	1.9%	1.7%	1.8%	1.1%	1.1%	1.0%	1.1%	0.9%	0.7%	0.5%			
2018	3	3,110,309,092	98.5%	20.7%	20.4%	11.3%	8.8%	6.3%	5.2%	4.2%	3.9%	3.9%	2.4%	1.7%	1.6%	1.8%	1.3%	1.4%	1.2%	1.0%	0.9%	0.5%				
2018	6	3,281,478,775	97.9%	20.6%	20.1%	11.7%	8.7%	6.9%	5.2%	4.2%	3.7%	3.6%	2.4%	2.0%	1.6%	1.7%	1.4%	1.3%	0.9%	1.1%	0.7%					
2018	9	3,392,709,416	97.1%	19.2%	20.5%	11.2%	8.9%	6.8%	5.4%	4.5%	3.9%	3.6%	2.2%	1.8%	1.9%	2.1%	1.6%	1.3%	1.3%	1.0%						
2018	12	3,646,398,241	96.1%	18.6%	21.2%	11.6%	8.9%	7.0%	5.1%	4.2%	3.5%	3.8%	2.2%	2.1%	1.9%	2.1%	1.5%	1.3%	1.0%							
2019	3	3,200,671,301	95.1%	20.1%	20.1%	11.5%	8.8%	6.8%	5.3%	3.9%	3.5%	3.6%	2.5%	2.0%	2.1%	2.2%	1.3%	1.4%								
2019	6	3,364,236,607	93.9%	19.5%	20.4%	11.3%	8.9%	7.1%	5.0%	4.1%	3.6%	3.9%	2.4%	2.3%	2.0%	1.9%	1.5%									
2019	9	3,463,040,151	92.5%	19.0%	19.8%	11.6%	9.3%	6.4%	4.9%	4.2%	4.2%	4.1%	2.7%	2.2%	1.9%	2.1%										
2019	12	3,658,426,516	90.5%	18.0%	21.1%	12.4%	8.1%	6.5%	4.8%	4.4%	4.0%	4.1%	2.7%	2.3%	2.1%											
2020	3	2,819,513,763	88.5%	22.3%	19.3%	10.9%	7.9%	6.2%	5.2%	4.4%	3.8%	3.8%	2.6%	2.2%												
2020	6	1,941,161,067	86.4%	17.4%	20.8%	11.1%	8.5%	7.3%	5.3%	4.9%	4.2%	4.3%	2.5%													
2020	9	2,780,117,263	83.9%	18.7%	19.4%	11.5%	9.0%	7.1%	5.7%	4.5%	4.1%	3.9%														
2020	12	2,963,138,014	79.9%	17.9%	20.5%	11.5%	8.8%	7.1%	5.4%	4.6%	4.1%															
2021	3	2,636,898,551	75.9%	18.8%	20.3%	11.5%	8.8%	6.9%	5.2%	4.4%																
2021	6	3,288,050,352	71.5%	17.3%	20.9%	12.0%	8.8%	7.2%	5.4%																	
2021	9	3,524,756,286	66.2%	16.4%	20.7%	12.5%	9.4%	7.2%																		
2021	12	3,865,077,305	59.1%	14.8%	21.4%	13.1%	9.9%																			
2022	3	3,379,886,236	50.0%	15.9%	21.0%	13.1%																				
2022	6	3,631,703,322	37.7%	16.0%	21.8%																					
2022	9	3,577,559,979	16.7%	16.7%																						

Calendar Year	Calendar Quarter	Straight Average until 27 months	Ranks Straight Average until 27 months
2019	3	9.4%	8
2019	6	9.4%	11
2019	9	9.3%	10
2019	12	9.2%	9
2020	3	9.8%	12
2020	6	9.2%	9
2020	9	9.0%	4
2020	12	8.8%	3
2021	3	9.1%	6
2021	6	9.2%	12
2021	9	9.2%	11
2021	12	9.1%	13
2022	3	9.3%	12
2022	6	9.4%	14
2022	9	9.6%	15

NB: mechanical selection for LDFs of last 7 qtr VWA used in projections from PAu SOLM-Qtr at 9/30/2022. No tail beyond 2017 supplied. Indemnity Only http://www.verisk.com/iso/excess-reinsurance

State of the Auto Market

Motor Trends

Litigation Funding

Supply Chain Issues

Microchip Shortage

Worker Shortages

Wage Inflation

Increasing Attorney Rep. rate

Elevated Used car values

Increased severity

General and widespread inflation for materials

Medical inflation

Frequency returning to pre-pandemic levels

Higher baseline for Gas

Social unrest

Ukraine-Russia conflict / Global instability

General Observations Commercial Auto

- Elevated loss & combined ratios due to social inflation and adverse development
- Rising rates; high single/ double digit but unfortunately, rates still inadequate
- Litigation funding becoming the norm
- Slow uptake of technology – telematics haven't produced the loss ratio lift expected
- Cameras gaining use, but a double-edged sword
- TNC business has not performed well and continues to struggle with rate, product and regulations

General Observations Personal Auto

- Brief COVID benefit in 2020 on the frequency side has proven to be a significant anomaly
- Severity increased dramatically through the pandemic and has continued to grow through 2023
- Continuing supply chain and inflationary issues are creating increased loss costs, especially for APD exposures
- Worker shortages, social inflation and lit funding are further eroding personal motor results
- Amount of rate needed to return to profitability has been slow to come and will continue to lag emerging trends – California

In uncertain times for the Personal Auto business…

Personal Auto insurers' margins are under the pressure of higher loss costs and limited rate increases approved by regulators. Rate increases are projected to catch up with loss inflation by end of 2024, depending on state mix

Loss severity on the rise

While loss frequency is back to pre-pandemic levels, physical damage loss severity has increased dramatically driven by higher costs for repairs, car parts, and the price of used vehicles.
Social inflation trends are also impacting the severity of liability losses, in particular third party litigation funding.

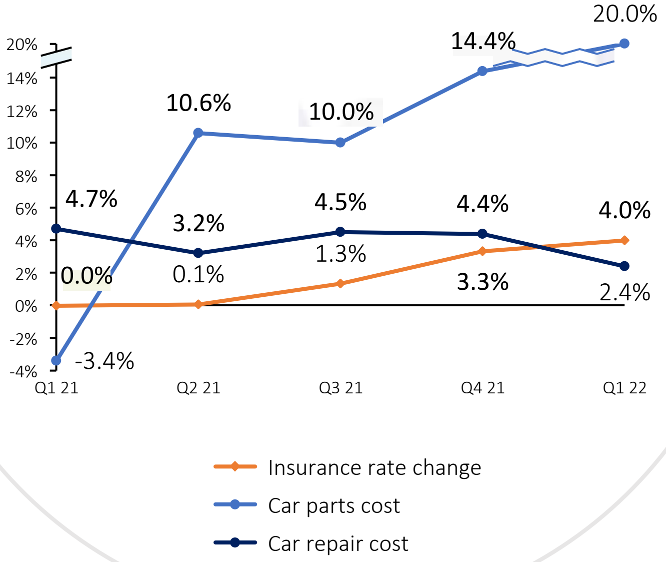
Rate increases still to catch up

Rate activity picked up in the second half of 2021 and continues in 2023, though regulatory backlog is slowing the rate approval process in some heavily impacted states. Projection is that rate will catch up by the end of 2024, depending on state mix. Margins will remain under pressure until the new rate has earned through.

Impact of geopolitical situation on loss inflation

Ukraine-Russia conflict impacting production and distribution of key materials (e.g. neon and palladium) fueling continued market shortages and more supply chain disruptions for automakers. Microchip shortage still exists, but manufacturers are starting to get some relief. Higher energy costs have not had a material impact on vehicle miles travelled.

Personal Auto rate increases* vs loss severity components



*Industry average of approved rate filings for all Personal Auto products, across all states
Source: S&P Capital IQ, statutory filings, US Bureau of Labor Statistics

MANHEIM USED VEHICLE VALUE INDEX

April 2023

Cox Automotive™ Manheim

Current Auto Trends

Overall Impact

Supply Chain - Continued supply chain issues creating increased loss costs, longer wait times for parts and increased cost of those parts. Rental cars are needed longer while repair work is being done

Microchip Shortages - Micro-chip production, and many of the key components needed to build them, has been hit hard in the recent past but the industry is getting relief and production facilities planned in the US by 2028

Gas Prices - Gas price has risen to historical levels but appears to have stabilized somewhat. Reduced miles driven does not appear to have materialized to any significant degree while gas prices were at their highest. Hybrid work/remote work has dampened work travel and changed busy periods on major roads, but overall miles driven have not dropped in any material way.

Inflation – **Wage, Medical, & Social.** Number of medical procedures increasing, and they are being ordered faster. Worker shortages driving wage inflation, trucking hit especially hard. Social inflation continues to create adverse development, even in the personal lines space

Advanced Technology - ADAS features should continue to help with frequency and severity on the liability side, but for first party covers, these features make cars more expensive to fix, increasing comprehensive loss costs. Adoption will be slower than projected due to car shortages. Average age of vehicles continues to go up which slows adoption of ADAS features overall.

Rate Changes - Commercial lines carriers have achieved a lot of rate over the last decade, but nuclear verdicts continue to erode any gains. Many personal lines carriers issued refunds during the pandemic, but loss costs started to heat up in Q2 2021 and have continued to climb. Some reacted with rate increases in late 2022 and early 2023, but DOI's have been slow to approve rate increases. CA especially problematic as they are just now approving filings from 2019. More rate needed across the board.

Severity - Severity started to increase during the pandemic and continuing to rise. Less traffic causing less congestion and higher rates of speed. Fatality rate higher than it's been in 40 years. Alcohol related accidents up. Unclear how marijuana will impact severity long term. Litigation funding coming into the personal lines space quickly.

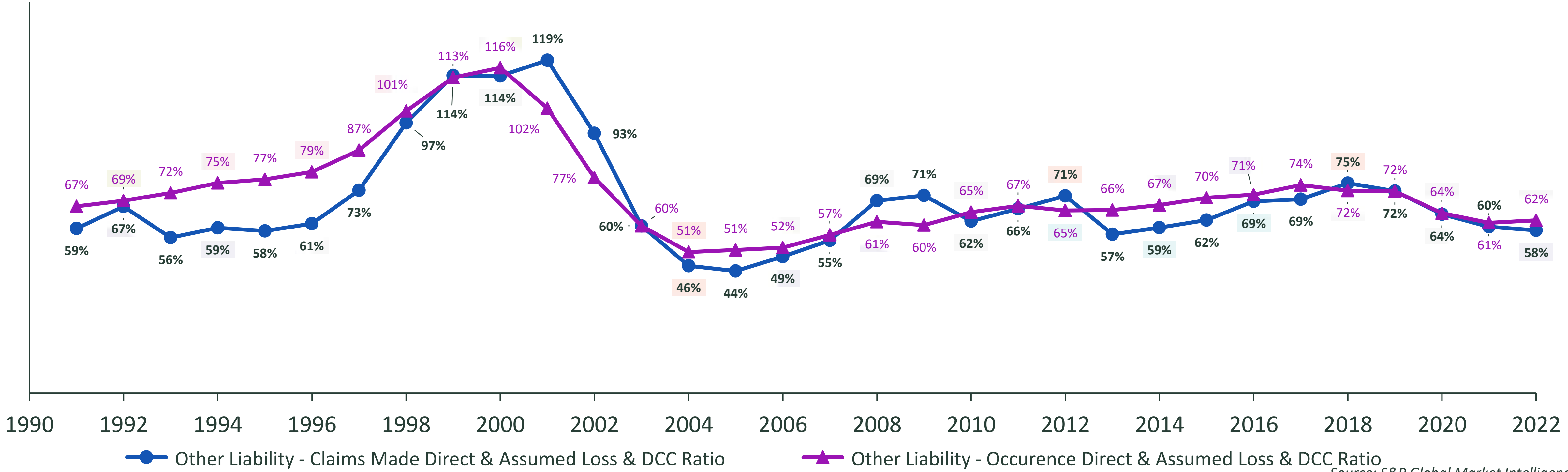

The Road Ahead

Future Auto Trends

	Overall Impact
Plaintiff Attorney focus on motor and nuclear verdicts. Plaintiff's bar focus on traditional bodily injury and motor, de-sensitized and anti-corporate juries, and complexity are driving increase in large losses.	⬇
Distracted Driving. Distracted Driving is expected to continue. However, smartphone penetration has little room to increase and vehicle cockpit innovations continue to be prevalent.	➡
Soaring Repair Costs. Supply chain issues, worker shortages and tech advances in vehicles will continue to drive up costs.	⬇
Telematics and Usage Based Insurance. Telematics and UBI uptake continues, and should improve loss costs. Telematics heavily used in commercial motor, but hasn't produced the magnitude of savings expected. Telematics continues to grow in personal as cars become more connected. UBI became more popular during the pandemic, but insurtech's continue to struggle with profitability.	➡
Ride Share & Micromobility. Ride share is the norm, but profitability has been elusive. Micro-mobility gaining popularity (scooters) but understanding the exposures and properly underwriting them has proven to be difficult.	?
Safety Innovation & Autonomous Vehicles. Highly autonomous vehicles expected in the next decade with full automation much further out. Average age of a vehicle increasing since the 1990's has risen steadily. AV will trickle into the population, more slowly now than ever, delaying full benefits. Fully Autonomous vehicles, 'bot' vehicles, being piloted for delivery services for small radius trips.	⬆
Medical Inflation. Innovation and enhanced protocols are driving higher utilization of medical services, treatment costs and life expectancy, increasing severity. Plaintiffs bar also driving up medical costs.	⬇
Marijuana. Legalization for recreational use is expected to continue in more states. Results on loss costs unclear but will need long term studies to fully understand.	↘
Cyber. Cyber is not expected to be a covered motor exposure, but in the case of a mass hack creating an aggregate event, Motor will be expected to respond initially with ultimate liability being sorted out in the courts over many years.	➡


What about Umbrella?

Liability (Claims Made and Occurrence) Industry Schedule P Booked Loss Ratios
Improved performance 2020-2022



Source: S&P Global Market Intelligence

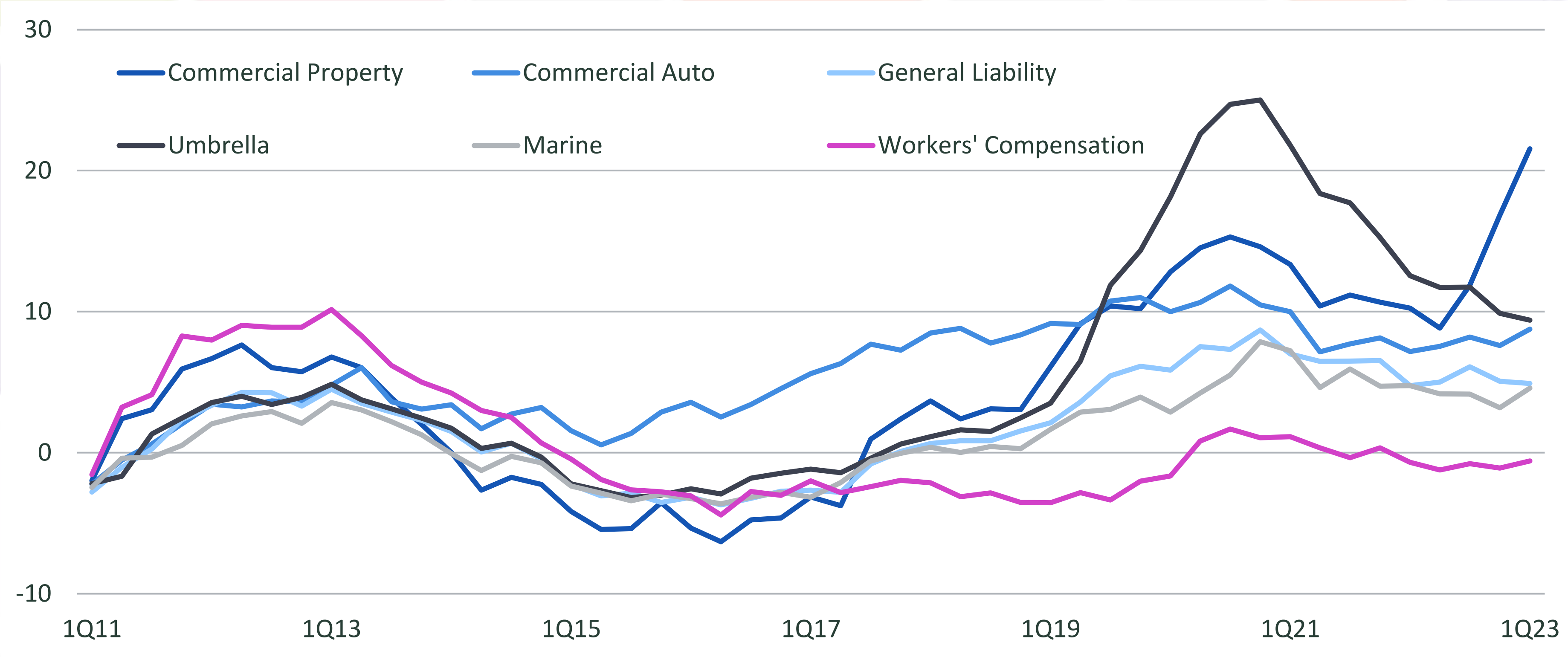
Key Points:

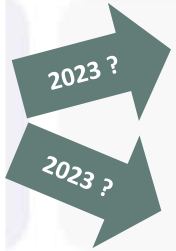
- The market has hardened since 2019; original rate increases and frequency reductions during the pandemic have benefited liability
- Caution around over-exuberance due to strong rates, the post-Covid environment is uncertain
- 2020-22 looking profitable, but rate increases slowed in 2022 and 2023
- The risk and competitive landscape + economic conditions will continue to challenge the industry

Commercial rate outlook
Property increases surge, casualty short-changed (again!)

- **Property rates drove a re-acceleration of overall commercial lines price increases**, rising over 20% in 1Q23
- Overall rates increased 8.8% in 1Q23, up from 8.0% in 4Q22
- However, Umbrella and GL rate increases continue to moderate, reinforcing concern that loss trends exceed rate levels

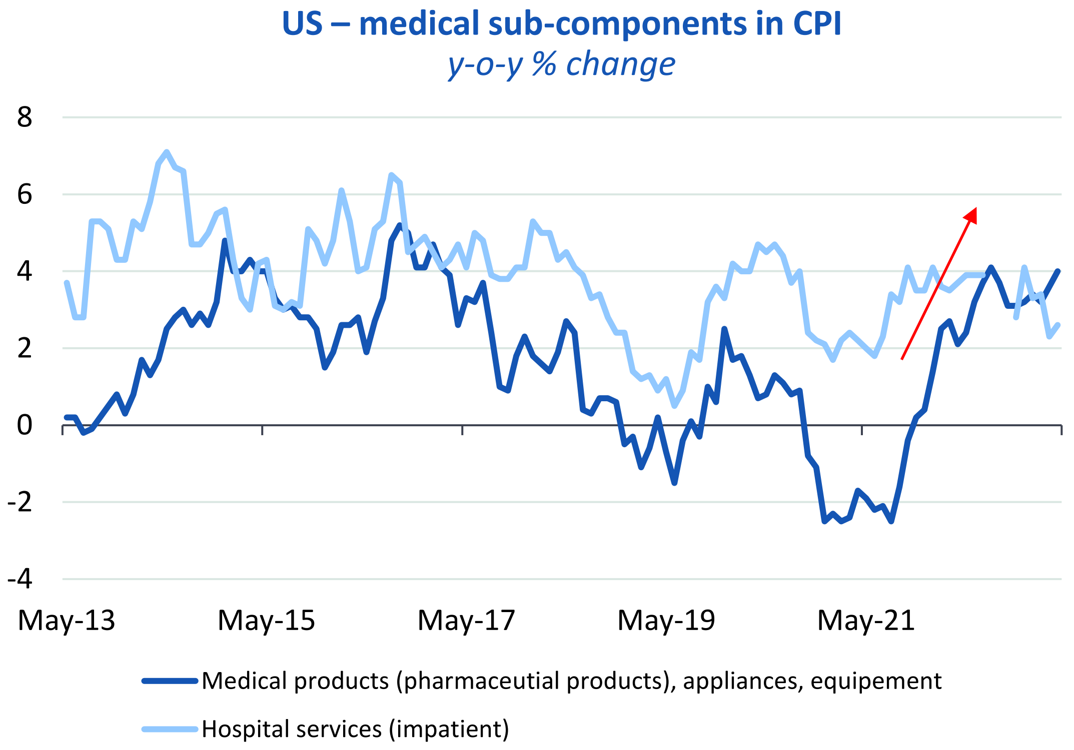
US commercial insurance rate changes



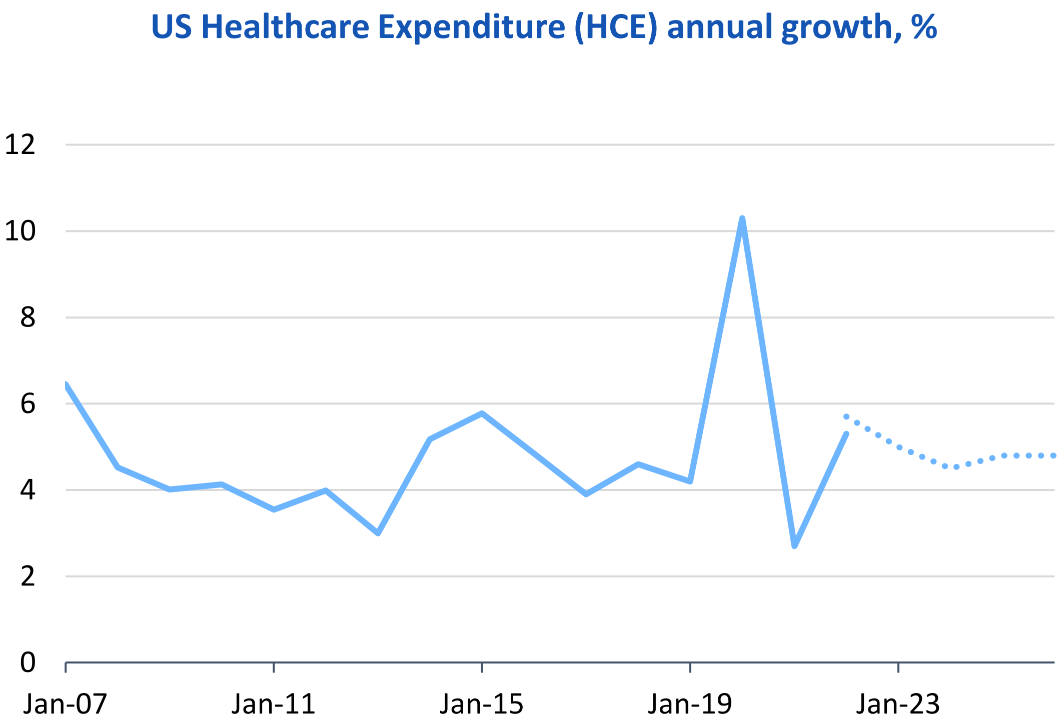


Sources: CIAB, Swiss Re Institute

Medical Inflation rising and expected to persist above pre-Covid Average
The medical sub-components in CPI show an incomplete picture (wage effect)



Source: Bloomberg, Swiss Re Institute



Source: US BEA, Swiss Re Institute

Source: Bloomberg, Swiss Re Institute

Claims inflation drivers
Social Inflation

Expanding Liability Theories

- Expanding liability theories like public nuisance applied to casualty losses; bounty laws
- Assignment of benefits

Social Sentiment

- Low confidence in big business
- Erosion of trust in US institutions, especially by millennials
- Rising inequality

Litigation Funding

- Provision of capital by a third party in exchange for a share in the proceeds
- Amplifies some of the other drivers of social inflation

Plaintiff's Bar

- Highly coordinated
- Apply psychological tactics (reptile theory)
- Attorney advertising
- Systematic use of data and analytics

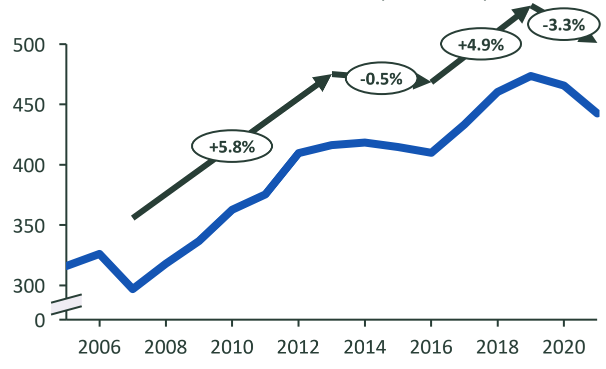
Juries

- Emotions and beliefs impact jurors' decisions
- Trend towards more plaintiff-friendly attitudes
- Generational shift
- Social media influence

High severity claims are stuck in the Post-Covid court backlog
Expect more nuclear verdicts to follow as social inflation picks up again

Only minor drop in tort filings

Filed tort cases in State Courts (in 1,000)



Source: Thomas Reuters Westlaw, Swiss Re Institute

Civil case filings in state courts dropped 28% during the pandemic.

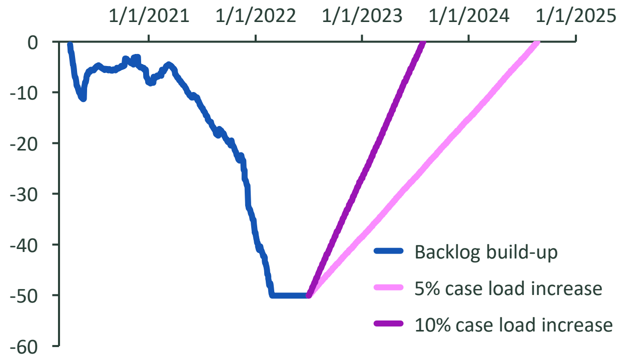
However, casing filings for insurance relevant **tort cases only dropped 6.5%.**

Filing dynamics differ significantly by state

Impact: Tort case filings dropped far less than what would be expected from the impact of the pandemic. Expect those cases to work their way through the court system over the next years.

Significant court case backlog

Backlog build-up and dig-out (in 1,000 cases)



Source: Thomas Reuters Westlaw, Swiss Re

Court closures during the pandemic lead to the build-up of a significant case backlog.

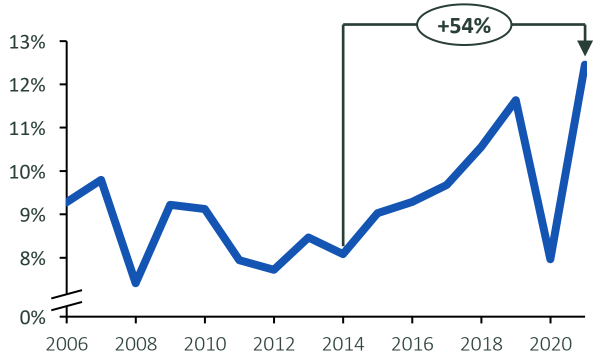
We expect the **backlog** to have grown by approx. **50k cases** during the pandemic and will take **1.5 to 3 years to clear**.

Nuclear verdicts have **significantly decreased** during the pandemic.

Impact: While settlement conditions were favorable for small/mid-size claims, **high severity claims remain stuck in the court system.** Claims duration has increased.

Social inflation trends pick up again

Share of GL verdicts >5m



Source: Thomas Reuters Westlaw, Swiss Re Institute

The reprieve on social inflation trends from the shutdown appears to be over.

The **proportion of large verdicts is escalating** again, following pre-pandemic trends.

The drivers underlying social inflation have not abated, propensity to sue is increasing and our **outlook remains negative**.

Impact: Expect **continued pressure from social inflation** on the high severity case backlog flowing through the court system.

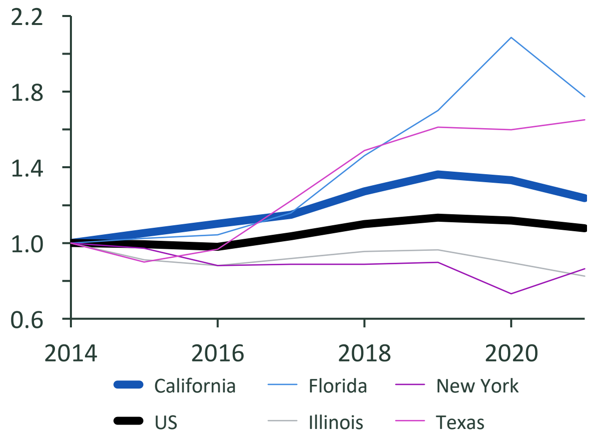
Actions

- Prudent portfolio steering considering current UW uncertainty
- Costing parameters must adequately reflect social inflation trends
- Lags should be adjusted to reflect longer claim duration
- Experience costing should consider that pandemic years probably appear better than they are

California: Large case clearance rate at all-time low, Court backlogs persist

Only minor drop in tort filings

Zoom in: Filed tort cases in CA vs the US (indexed: 2014=1)



Source: Thomas Reuters Westlaw, Swiss Re Institute

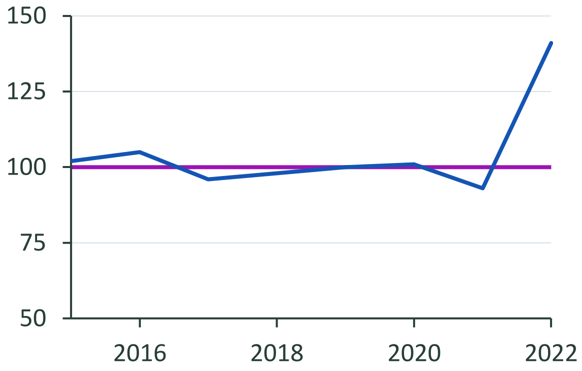
Filing dynamics differ significantly by state, dropping by 6.5% countrywide vs. 8.8% in California during Covid

Further variation exists by size of case. All sizes decreased; small by 151%, medium by 17%, and large by 3%

Impact: Even the pandemic didn't dampen litigation for large claims in CA

CA small cases clearance rate

Clearance rate for cases less than $10K in value (%)



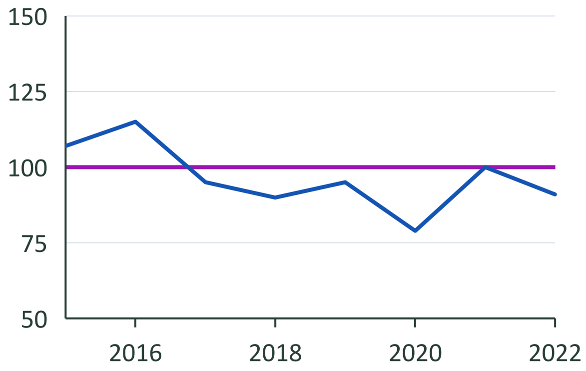
Disposition rates fell slightly during the pandemic leading to a small increase to the backlog of open cases.

Once courts reopened, clearance rates increased to 143%.

Impact: 99% of small cases are settled before reaching trial

CA medium cases clearance rate

Clearance rate for cases between $10K and $25K in value (%)



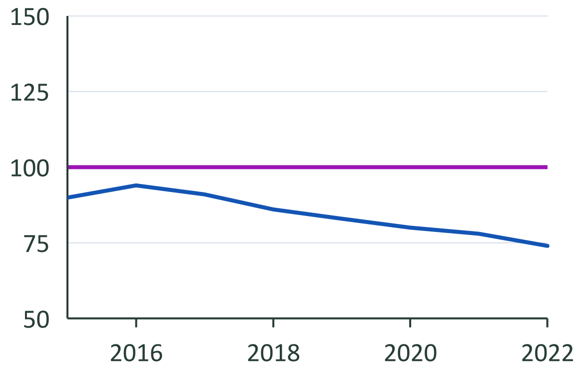
Disposition rates for medium claims fell to a greater degree than small claims. The clearance rate for medium claims has not exceeded 100% since 2016 and was 91% in 2022.

Dispositions declined by 60% between 2019 and 2022.

Impact: Medium claims taking longer to progress through litigation leading to higher claims values.

CA large cases clearance rate

Clearance rate for cases greater than $25K in value (%)



Source: State of California Court System, Court Statistics Project

Disposition rates for "Unlimited" cases (damages greater than $25K) have fallen the most.

The current clearance rate is just 74%.

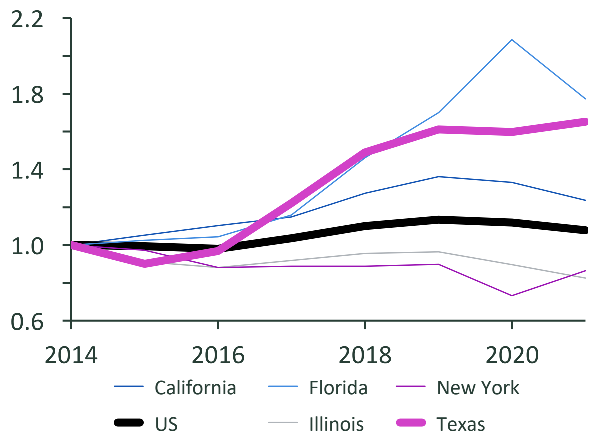
Impact: Low clearance rates combined with minimal reduction to case filings in this category = longer tail, masked severity and greater uncertainty.

Note: clearance rate = total dispositions/total filings

Texas: Larger cases progressing, court backlogs reducing, severity increasing

Increasing tort filings

Zoom in: Filed tort cases in TX vs the US (indexed: 2014=1)



Source: Thomas Reuters Westlaw, Swiss Re Institute

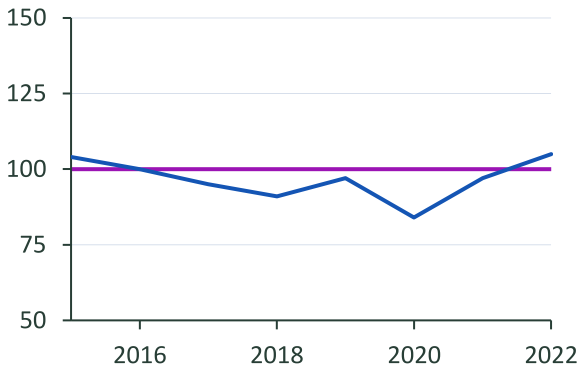
Filing dynamics differ significantly by state, dropping by 6.5% countrywide, while Texas tort filings ***increased*** by 2.4% (!)

Filings for small/medium cases remained stable, while filings for large cases increased by 5%

Impact: Even the pandemic didn't dampen litigation for large claims in TX

TX small/medium cases clearance rate

Clearance rate for cases less than $25K in value (%)



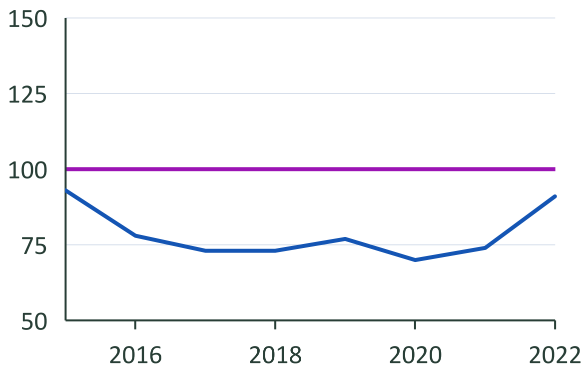
During the pandemic small/medium cases saw a small decrease in clearance rates.These cases comprise approximately 75% of total tort case filings since 2015.

Once TX courts adjusted, smaller cases were cleared from the docket very quickly.

Impact: Sm/Med cases are adjudicated in roughly 12-18 months after filing. Large cases can take an *additional 24 months* to adjudicate.

TX large cases clearance rate

Clearance rate for cases greater than $25K in value (%)



Large case clearance rates were stable to slightly increasing towards the end of 2021.

Clearance rates start from a low level of only 75% from 2016-2020 with the overall clearance never exceeding 100% since prior to 2015.

Impact: Clearance rates have accelerated by 21% to 91% @ YE 2022 suggesting increased severity as larger claims are resolved

Other notable state developments

- Note: FL and NY tort cases are not stratified by damage amounts. All torts are lumped together
- The clearance rate in FL courts for all tort cases dropped 153% during the pandemic, while filings dropped by only 8%
- Data for New York is only through YE 2021. Clearance rates fell by 45% through the pandemic while filings only decreased by 3%
- Other states reported varying clearance rates from 2019-2021, ranging from 145% (HI) to just 2% (SC)
- These numbers are just a snapshot of the nuances in the US state court system, making accurate lag selections very challenging

Dashboard: Other Liability - Occurrence

Incremental Reported Loss Ratio

Accident Years	12 Months	24 Months	36 Months	48 Months	60 Months	72 Months	84 Months	96 Months	108 Months	120 Months
2005	16.8%	9.7%	6.7%	5.8%	3.7%	1.4%	1.7%	1.7%	1.1%	1.0%
2006	15.4%	9.5%	7.8%	5.4%	3.1%	2.3%	2.1%	0.8%	0.6%	1.1%
2007	16.0%	10.9%	8.2%	5.5%	4.3%	3.6%	1.7%	1.1%	1.1%	0.7%
2008	15.1%	11.5%	8.8%	6.4%	5.4%	2.6%	2.2%	1.1%	1.3%	1.2%
2009	16.6%	11.9%	8.4%	7.5%	4.7%	2.9%	1.8%	1.8%	1.6%	0.8%
2010	16.2%	12.4%	11.0%	7.4%	5.1%	2.9%	3.0%	2.1%	1.2%	0.1%
2011	16.1%	13.1%	10.8%	8.6%	5.5%	4.0%	3.1%	1.9%	0.6%	0.8%
2012	14.3%	12.2%	10.7%	8.8%	4.3%	5.4%	2.2%	1.0%	0.6%	0.8%
2013	13.5%	12.0%	11.1%	7.9%	7.0%	3.8%	2.3%	0.8%	0.5%	1.1%
2014	14.3%	12.3%	10.2%	9.6%	5.9%	3.5%	1.5%	1.2%	1.3%	
2015	14.2%	12.7%	12.5%	9.9%	6.4%	2.8%	2.0%	1.9%		
2016	14.3%	13.0%	11.3%	9.8%	5.3%	3.5%	3.8%			
2017	13.7%	14.7%	12.3%	7.6%	6.3%	6.0%				
2018	14.6%	13.6%	10.8%	8.6%	8.2%					
2019	15.3%	12.9%	10.6%	10.9%						
2020	12.9%	10.8%	10.4%							
2021	11.6%	12.6%								
2022	12.1%									

	A/R ULR	Industry ULR	Diff
2013	65.0%	63.6%	-1.4%
2014	66.1%	64.4%	-1.7%
2015	69.9%	68.4%	-1.5%
2016	69.2%	69.6%	0.4%
2017	71.1%	70.5%	-0.7%
2018	70.5%	70.0%	-0.5%
2019	72.4%	70.2%	-2.2%
2020	64.8%	65.8%	1.0%
2021	64.9%	62.8%	-2.1%
2022	66.3%	63.1%	-3.2%
Redundancy/(Deficiency) $Mil			$ (4,691.9)

Adverse development from this line during CY2022 came mainly from the problematic 2016-2019 accident years where social inflation is biting and liability policy limits were still substantial. Our work suggests that there could be more adverse development from 2019 (our L/R is 2.2 points above the booked figure). But more problematic are two observations: 1) The diagonal is consistently red; a sign to us that inflation for wage, labor, and medical costs (the stuff of liability claims) is outstripping the provisions embedded in development factors. And 2) We think the ultimate L/Rs for AY21 and 22 are 2-3 points higher than booked. Our provision for accelerated inflation is $5.7 bil, which accounts for most of this L/R difference.

Source: ©2023 S&P Global Market Intelligence, Assured Research

Navigating an Uncertain Casualty Landscape

SIGNAL	CHALLENGE	ACTION
Claims duration	Prolonged duration for medium-large claims	Lengthen loss development patterns
Nuclear verdicts	Possible wave of large verdicts	Reserving and Costing parameters need to reflect the new reality
Uncertainty	Explosive mix of economic and social inflation	Higher trend factors and a priori loss ratios
Claims filings	Propensity to litigate is up, driven by aggressive advertising of the plaintiff's bar	Reflect in forward looking trend parameters
"Green diagonal"	Recent years may look better than they are due to court backlogs	Cautious approach in releasing reserves due to favorable experience

Legal notice

Questions?

Thank you!

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