Reserve development in Lloyd's syndicate data

Leveraging benchmark observations to better predict the adequacy of reserves given the uncertainties of social inflation

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The adequacy of claims reserves is an important matter for the property and casualty (P&C) insurance industry, as it affects the profitability, solvency and the reputation of insurers. Reserve estimates are subject to uncertainty, the level of which may change over time due to various factors, such as claim frequency and severity trends, legal environments, social attitudes, and economic conditions.

In the Lloyd's of London market, with syndicates underwriting P&C insurance and reinsurance contracts in more than 200 countries and territories worldwide,[1] management has identified social inflation in the United States as a key area of consideration for actuaries struggling to properly gauge reserve adequacy. Social inflation refers to the phenomenon of rising litigation costs, higher jury awards and broader contract interpretations that increase insurers' liabilities beyond their original expectations. Social inflation can have a significant impact on reserve adequacy, especially in lines of business, such as liability, that involve long-tail claims.

In collaboration with Mendes & Mount LLP, a recent Milliman publication[2] provided insight on notable reserve deterioration in the 2016 through 2019 accident years for US liability lines of business, and identified social inflation as a significant, non-exclusive driver of US cost increases prior to 2020.

Now Milliman's annual benchmarking of global data from Lloyd's expands these insights, revealing that these trends are similar for US liability lines of business that have been written by Lloyd's and that the pressure, post-2020, to reflect the transition to a hard market[3] with improved loss ratios may have been premature. We expect to see additional adverse developments (ADs) manifest in more recent years, which will lead to continued difficulties. As a result, syndicates will want to think critically about their reserve positions and potentially strengthen their estimates.

How can estimates be more accurately gauged given the impact of social inflation? In this paper, we demonstrate how Milliman's benchmark calibration applied to Lloyd's aggregate data (complementing the limited data available to individual syndicates) can provide valuable insight to overcome important challenges faced by reserving actuaries.[4]

What follows is a detailed analysis for use by our consultants, including development patterns based on premium and loss data evaluated as of year-end 2015 through 2023 for three specific supergroups from the United States: General Liability Occurrence US (risk code UA), General Liability Claims Made US (risk codes D6 and UC) and Automobile Liability US (risk codes MH and MI).[5]

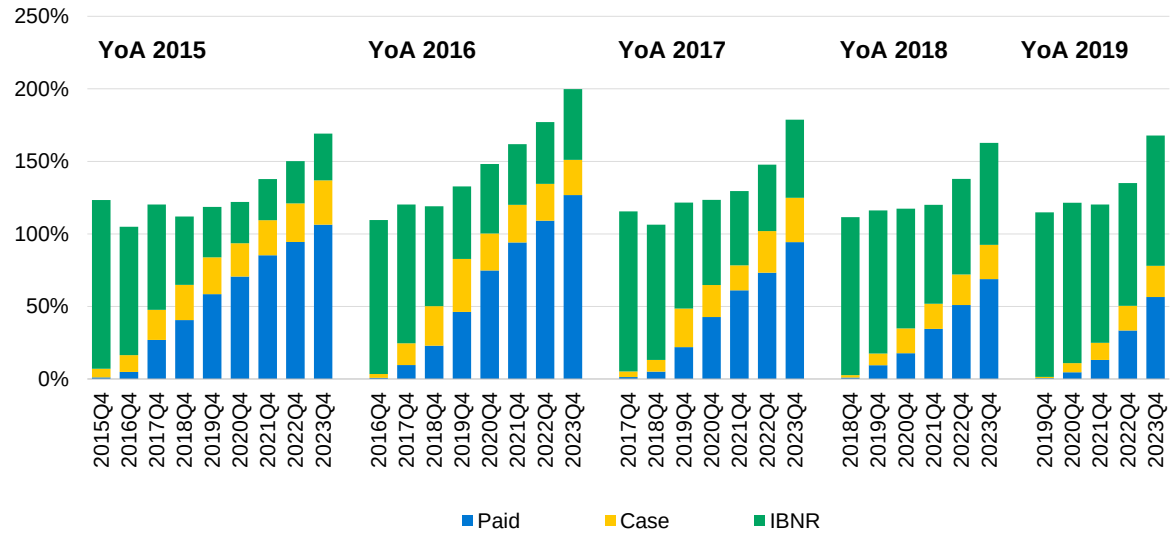
1. In 2023, gross premiums exceeded £52 billion per year; Lloyd's paid out roughly £22 billion in claims and had a total surplus of more than £45 billion.
2. Brown, B., Pipkorn, K., and Fredericks, C. (23 May 2024). Social inflation and reserve development. Milliman. Retrieved 17 March 2025 from https://www.milliman.com/en/insight/social-inflation-and-reserve-development.
3. The transition to a hard market involves a reduction in competition for business, leading to a higher likelihood of binding coverage at an adequate rate, which in turn leads to an expectation of better performance in the form of lower loss ratios.
4. Data compiled by Xchanging, the details of which (and how we use it) are described in the Appendices.
5. Milliman's annual benchmarking exercise of Lloyd's data shows that adverse reserve development is not limited to these three supergroups. Nevertheless, we have limited our discussion here to the lines discussed in the prior Milliman publication.

Deterioration of years of account 2015 through 2019

Lloyd's syndicates report premium and loss data by year of account (YoA),[6] risk code and currency to a single source. Looking at YoAs 2015 through 2019, let's consider how a reserving actuary would adequately allow for the impact of harder market conditions on open YoAs when persistent deteriorations on prior years are present. We can quantify an amount of *missing information*[7] (on average) in initial loss ratio expectations based on the amount of adverse development observed since the initial estimates were prepared.[8]

Figures 1 through 3 show aggregated Lloyd's data for 2015 through 2019 for the three supergroups, respectively. Estimated ultimate loss ratios for 2015 through 2019 have developed adversely nearly every calendar year since the end of the third development year. (Note that generally Lloyd's waits three years to calculate a profit or loss, represented by the third bar at 36 months of development in Figures 1 to 3.)

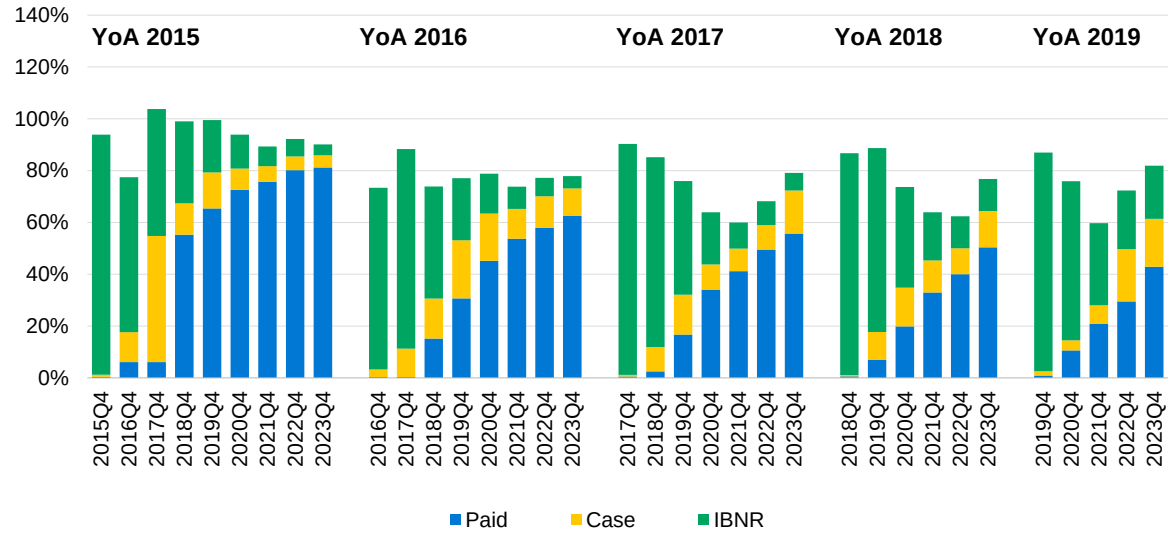
FIGURE 1: AGGREGATED DATA FOR YOAS 2015 THROUGH 2019 ASSOCIATED WITH GENERAL LIABILITY OCCURRENCE US RISK CODES, VALUED AT 2015 THROUGH 2023 YEAR-END



Depending on the year, the ultimate loss ratios for the General Liability Occurrence US supergroup have increased 40 to 80 loss ratio points between the estimate after 36 months of development and the most recent estimate at year-end 2023.

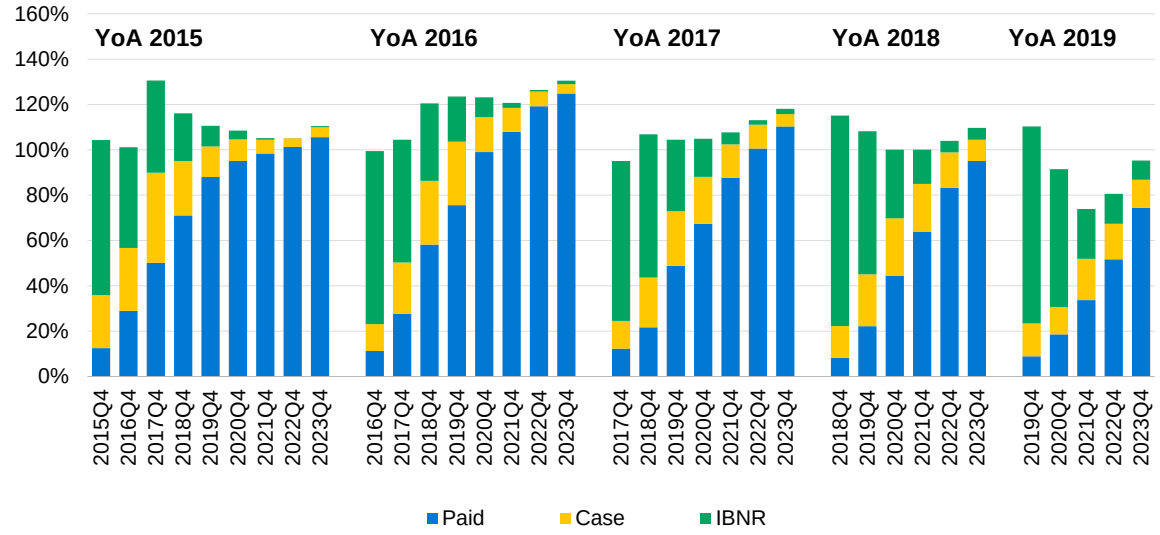
6. All dates in this study refer to YoA unless otherwise noted. A brief description of YoA, which is the year in which a contract that is underwritten by a syndicate and different from the accident year reporting basis more commonly used in the United States, has been provided in Appendix A.
7. "Missing information" here and throughout refers to the knowledge gain since initial loss ratio expectations were set, which includes but is not limited to the observed adverse development.
8. An estimate of the missing information would in practice be offset by any adjustments made to date by syndicate reserving teams to recalibrate loss ratio expectations for YoAs 2020 through 2023.

FIGURE 2: AGGREGATED DATA FOR YOAS 2015 THROUGH 2019 ASSOCIATED WITH GENERAL LIABILITY CLAIMS MADE US RISK CODES, VALUED AT 2015 THROUGH 2023 YEAR-END



The General Liability Occurrence US supergroup is not alone in experiencing development from 2015 through 2019. In the past two years, General Liability Claims Made US has seen sizeable adverse development in 2017 through 2019. For each year, unlike General Liability Occurrence US, the ultimate loss ratio deterioration was delayed, following a few years of seemingly benign or sometimes favourable development.

FIGURE 3: AGGREGATED DATA FOR YOAS 2015 THROUGH 2019 ASSOCIATED WITH AUTOMOBILE LIABILITY US RISK CODES, VALUED AT 2015 THROUGH 2023 YEAR-END



While less pronounced than the General Liability Occurrence US supergroup, ultimate loss ratios for the Automobile Liability US supergroup from 2015 through 2019 have seen strengthening of 10% to 20% over the past two years.

Social inflation: The driver of adverse development

The recent adverse development of reserve estimates for older YoAs stems, at least partially, from components of social inflation such as juror sentiments, nuclear verdicts, and third-party litigation funding.

Previous Milliman research describes the eroding of people's trust in corporations after the 2007–2008 global financial crisis. This has led to growing public sentiment to hold big corporations accountable for their actions, which in turn has led to higher-severity claims, especially in lines of business where lawsuits can be framed as a corporation versus an individual. Nearly two-thirds of the nuclear verdicts[9] in personal injury and wrongful death cases studied by the US Chamber of Commerce Institute for Legal Reform over a 10-year period came from product liability (23.6%), auto accident (22.8%) and medical liability (20.6%) cases[10]. This rise of nuclear verdicts is contributing to rising social inflation. As an example (impacting Automobile Liability US): A landmark $1 billion wrongful death verdict was reached during 2021 against two trucking companies found to be negligent.[11] As the frequency of nuclear verdicts has increased and award amounts have been amplified by the media, larger verdicts are made to feel more mainstream to potential jurors.

In addition to jury sentiment as a factor in the increase in nuclear verdicts; third-party litigation funding also continues to drive up claim severities. Third-party litigation funding refers to an external party investing capital in the litigation process in exchange for a portion of the settlement amount. As plaintiffs are able to pursue cases for longer periods of time with stronger funding, third-party litigation funding has created larger verdicts. Prior Milliman research shows that the third-party litigation market grew by 44% in the United States between accident years 2019 and 2022[12], with no signs of slowing down, compounding the upward pressure on liability severities. While a number of US states currently have pending legislation aimed at both requiring disclosure of third-party litigation funding to juries and adding consumer protections, it may be quite some time before any legislation of this kind softens the impact of third-party litigation on claim severity.

This trend is not limited to the United States; we have also seen the third-party litigation funding market grow rapidly in recent years in the UK and EU. Following an important UK supreme court decision[13] and government-backed consultation, public discussion about the third-party litigation funding industry and the extent to which it facilitates access to justice has been renewed, and enhanced regulation is expected to follow. Meanwhile, the European Parliament has recently urged the EU to impose more extensive regulation of third-party litigation funding across all EU member states.

What can we learn from this?

The observed adverse development trends in these US liability lines provokes the question as to whether we should expect similar deterioration in more recent YoAs. We know that the driver of adverse development is not limited to 2015 through 2019. We also know that the market hardened in and around 2020 for many classes, leading to higher premiums for coverage and, potentially, better loss ratio performance.

In terms of process, initial loss ratio expectations associated with a syndicate's YoA are linked to the syndicate business forecast (SBF) submitted to Lloyd's during the summer prior to that YoA. For reserving an immature YoA, the SBF is an important input, as very little information can be gleaned from the actual paid and incurred claim data.

Since roughly 2020, actuaries have been walking a tightrope with respect to reserving decisions on YoAs perceived to be hard market years, having to balance two contradictory pressures:

1. Pressure to decrease loss ratios from underwriters, executives and third-party capital providers to reflect the rating improvements inherent in the harder market
2. Pressure to increase loss ratios, based on the further observed deterioration of the 2015 through 2019 YoAs, which had not previously been considered

9. Consistent with previous Milliman research, nuclear verdicts are understood to be those with a settlement larger than $10 million.

10. Silverman, C. & Appel, C.E. (September 22, 2022). Nuclear Verdicts: Trends, Causes, and Solutions. Retrieved May 1, 2024, from https://instituteforlegalreform.com/research/nuclear-verdicts-trends-causes-and-solutions/.

11. It is worth noting that much less than $1 billion was ultimately paid, as one of the trucking companies went out of business.

12 Holzheu, T. & Finucane, J. U.S. Liability Claims: The Shadow of Social Inflation Still Looms.

13. R (PACCAR Inc.) v. Competition Appeal Tribunal, UKSC 28 (2023) https://www.supremecourt.uk/cases/uksc-2021-0078.

The COVID-19 lockdowns and subsequent heightened inflationary environment has added to this challenge.

Each year of further adverse development increases the actuarial weight given to item 2. It can be instructive to consider the amount of adverse development which has been experienced in the wider market since prior year-ends. Observations of market-level adverse development (i.e., a benchmark analysis) can supplement observations of a syndicate's experience, which would typically be more volatile.

In the best case, there is a two-year lag of information. For example, historical data as at year-end 2018 would have been available for the YoA 2020's original SBF calibration. To the extent that the original SBFs still contribute to the updated 2020 ultimate loss ratio estimates,[14] actuaries can quantify the amount of *missing information* that still needs to be accounted for with respect to both the benchmark and syndicate indications.

Figures 4 through 6 quantify the average adverse development since the original SBF based on the benchmark indication using averages across two, three, and four YoAs.

FIGURE 4: ADVERSE DEVELOPMENT IN ESTIMATED ULTIMATE LOSS RATIOS ASSOCIATED WITH GENERAL LIABILITY OCCURRENCE US RISK CODES

		(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*	*(11)*	*(12)*
		General Liability - Occurrence - US										Average AD since SBF	
		Year of Account									SBF for	using metric based on	
		2015	2016	2017	2018	2019	2020	2021	2022	2023	YoA	2 YoAs	3 YoAs	4 YoAs
(a)=(k)-(f)	AD since 2018	57%	81%	73%	51%						2020	62%	68%	66%
(b)=(k)-(g)	AD since 2019	50%	67%	57%	47%	53%					2021	50%	52%	56%
(c)=(k)-(h)	AD since 2020	47%	52%	55%	46%	46%	19%				2022	33%	37%	42%
(d)=(k)-(i)	AD since 2021	31%	38%	49%	43%	48%	13%	28%			2023	21%	30%	33%
(e)=(k)-(j)	AD since 2022	19%	23%	31%	25%	33%	13%	16%	18%					
(f)	2018 year-end	112%	119%	106%	112%									
(g)	2019 year-end	119%	133%	122%	116%	115%								
(h)	2020 year-end	122%	148%	124%	117%	122%	129%							
(i)	2021 year-end	138%	162%	130%	120%	120%	135%	141%						
(j)	2022 year-end	150%	177%	148%	138%	135%	135%	153%	156%					
(k)	2023 year-end	169%	200%	179%	163%	168%	148%	169%	174%	182%				

Note that the average adverse development (abbreviated as "AD" in chart) since the calibration of the SBF for a YoA depends on the number of prior YoAs in the calculation. As an example (using Figure 4): The average adverse development since the calibration of the SBF for 2020 based on two YoAs (62%) would account for adverse development in 2017 and 2018 since year-end 2018 (73% and 51%, respectively, which represent adverse development since 2018 or 179% less 106% and 163% less 112%, respectively), while the average adverse development since the calibration of the SBF for 2020 based on three YoAs (68%) would account for adverse development in 2016, 2017 and 2018 since year-end 2018 (81%, 73% and 51%, respectively). The grey shading indicates the first opportunity to estimate the ultimate loss ratio for a YoA, after 12 months since inception.

The *missing information* for the General Liability Occurrence US supergroup impacts every YoA from 2020 through 2023. More than 60% of loss ratio adverse development has occurred since the 2020 SBF was submitted (based on information available at year-end 2018). The estimated ultimate loss ratios based on information available at each year-end have since deteriorated as follows.[15]

- For year-end 2021: Deterioration by between 21% (based on two YoAs) and 33% (based on four YoAs) was recognized by year-end 2023; see columns (10) through (12).
- For year-end 2020: Deterioration by between 33% (based on two YoAs) and 42% (based on four YoAs) was recognized by year-end 2023; see columns (10) through (12).
- For year-end 2019: Deterioration by between 50% (based on two YoAs) and 56% (based on four YoAs) was recognized by year-end 2023; see columns (10) through (12).

14. Potentially adjusted for the internal view regarding applicability of the observed adverse development for a syndicate's portfolio.

15. YoA SBFs are assumed to have been calibrated on year-end data from two years prior.

FIGURE 5: ADVERSE DEVELOPMENT IN ESTIMATED ULTIMATE LOSS RATIOS ASSOCIATED WITH GENERAL LIABILITY CLAIMS MADE US RISK CODES

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)		(10)	(11)	(12)
		General Liability - Claims Made - US												
		Year of Account									SBF for	Average AD since SBF using metric based on		
		2015	2016	2017	2018	2019	2020	2021	2022	2023	YoA	2 YoAs	3 YoAs	4 YoAs
(a)=(k)-(f)	AD since 2018	-9%	4%	-6%	-10%						2020	-8%	-4%	-5%
(b)=(k)-(g)	AD since 2019	-10%	1%	3%	-12%	-5%					2021	-9%	-5%	-3%
(c)=(k)-(h)	AD since 2020	-4%	-1%	15%	3%	6%	-24%				2022	-9%	-5%	0%
(d)=(k)-(i)	AD since 2021	1%	4%	19%	13%	22%	-7%	-7%			2023	-7%	3%	5%
(e)=(k)-(j)	AD since 2022	-2%	1%	11%	15%	10%	-2%	-2%	15%					
(f)	2018 year-end	99%	74%	85%	87%									
(g)	2019 year-end	100%	77%	76%	89%	87%								
(h)	2020 year-end	94%	79%	64%	74%	76%	76%							
(i)	2021 year-end	89%	74%	60%	64%	60%	59%	65%						
(j)	2022 year-end	92%	77%	68%	62%	72%	54%	60%	66%					
(k)	2023 year-end	90%	78%	79%	77%	82%	52%	58%	81%	79%				

On the other hand, while the road has been bumpy, the *missing information* for the General Liability Claims Made US supergroup appears to be limited.

FIGURE 6: ADVERSE DEVELOPMENT IN ESTIMATED ULTIMATE LOSS RATIOS ASSOCIATED WITH AUTOMOBILE LIABILITY US RISK CODES

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)		(10)	(11)	(12)
		Automobile Liability - US												
		Year of Account									SBF for	Average AD since SBF using metric based on		
		2015	2016	2017	2018	2019	2020	2021	2022	2023	YoA	2 YoAs	3 YoAs	4 YoAs
(a)=(k)-(f)	AD since 2018	-5%	10%	11%	-5%						2020	3%	5%	3%
(b)=(k)-(g)	AD since 2019	0%	7%	13%	2%	-15%					2021	-7%	0%	2%
(c)=(k)-(h)	AD since 2020	2%	8%	13%	10%	3%	-2%				2022	0%	4%	6%
(d)=(k)-(i)	AD since 2021	6%	10%	10%	10%	21%	13%	11%			2023	12%	15%	14%
(e)=(k)-(j)	AD since 2022	6%	5%	5%	6%	14%	16%	13%	15%					
(f)	2018 year-end	116%	121%	107%	115%									
(g)	2019 year-end	111%	124%	105%	108%	110%								
(h)	2020 year-end	109%	123%	105%	100%	92%	101%							
(i)	2021 year-end	105%	121%	108%	100%	74%	86%	89%						
(j)	2022 year-end	105%	126%	113%	104%	81%	83%	87%	87%					
(k)	2023 year-end	111%	131%	118%	110%	95%	99%	100%	102%	101%				

The *missing information* for the Automobile Liability US supergroup impacts the 2023 YoA projection.

- Estimated ultimate loss ratios based on information available at year-end 2021, on which we assume the 2023 YoA SBF to have been calibrated, have since deteriorated by between 12% (based on two YoAs) and 15% (based on three YoAs).

If adverse development for this supergroup continues, impacting reserving as at year-end 2024, this will put additional pressure on the recently submitted SBFs for 2024 and 2025.

The most recent observations for the least mature YoAs

Generally, Lloyd's waits three years to calculate a profit or loss. Nevertheless, the development experience during the last annual year for the least mature YoAs has been adverse.

Figure 7 shows the adverse development in the last 12 months as at year-end 2023 for the three supergroups, based on Milliman's annual benchmarking exercise of Lloyd's data.

FIGURE 7: DEVELOPMENT OF GROSS ULTIMATE LOSS RATIOS FOR LESS MATURE YOAS

	(1)	*(2)*	*(3)* = *(2)-(1)*	*(4)*	*(5)*	*(6)* = *(5)-(4)*	*(7)*	*(8)*	*(9)* = *(8)-(7)*
	General Liability - Occurrence - US			General Liability - Claims Made - US			Automobile Liability - US		
Year of Account	31 Dec 2022	31 Dec 2023	One-year Development	31 Dec 2022	31 Dec 2023	One-year Development	31 Dec 2022	31 Dec 2023	One-year Development
2020	135%	148%	13%	54%	52%	-2%	83%	99%	16%
2021	153%	169%	16%	60%	58%	-2%	87%	100%	13%
2022	156%	174%	18%	66%	81%	15%	87%	102%	15%
2023		182%			79%			101%	

During 2023, the 2020 YoA for General Liability Occurrence US and Automobile Liability US have seen adverse development of 13% and 16%, respectively. An exercise to compare the level of *missing information* with the strengthening of the 2020 YoA could lead to some conclusions as to whether 2020 will continue to experience adverse development.

Observations from less mature YoAs should be treated with caution. However, the 2021 and 2022 YoAs for General Liability Occurrence US and Automobile Liability US have also experienced sizeable adverse development since their estimated ultimate loss ratios after 12 months.[16] On the other hand, estimated loss ratios for General Liability Claims Made US, especially for 2020 and 2021, appear to be holding steady.

Takeaways

Social inflation's influence has been pervasive in the General Liability Occurrence US, General Liability Claims Made US and Automobile Liability US risk codes. In recent years, these supergroups have experienced a deterioration in estimated ultimate loss ratios for the 2015 through 2019 YoAs. The unpredictability of this stressor greatly impacts reserves, making estimations difficult, and we expect social inflation and its associated adverse development to continue.

However, tracking the total adverse development experienced in the market since the calibration of the initial SBF for each YoA can unlock valuable information regarding both the relevant year and every subsequent year that relied on its earlier valuations. When Milliman's benchmark analysis is applied to Lloyd's aggregate data, the 2020 and subsequent, less mature YoAs show signs of a similar emerging pattern. Although outcomes are uncertain, we anticipate that these years may also continue to deteriorate under the pressure of social inflation.

Therefore, observations of market-level adverse development, through benchmark analysis, can supplement the typically more volatile syndicate experience. The additional information can be combined with known adjustments to the relevant YoA's expected loss ratio over time to keep loss ratios for all years consistent with the latest adverse development observed. This approach will allow reserving actuaries in syndicates affected by social inflation to create more accurate projections, thereby meeting the challenge of determining an appropriate level of reserves.

16. Expected to be largely correlated to the YoA's low aggregate SBF.

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Appendix A: About the data

Underwriters categorize Lloyd's data into roughly 260 risk codes that represent mutually exclusive business classifications based on the line of business, type of contract and/or country of risk.

The Lloyd's data is grouped by YoA—that is, the year in which an insurance or reinsurance contract that is underwritten by a syndicate is allocated for accounting purposes, and into which all premiums and claims arising in respect of that contract are payable. Insurance or reinsurance contracts are generally allocated to YoAs according to the calendar year of their inception date, so a contract that commences in 2015 will normally be allocated to the 2015 YoA.

The premium data available is a signed premium on a gross net basis (gross of reinsurance, net of brokerage and commissions). A signed premium is equivalent to a cash basis (i.e., not written premium or earned premium).

Lloyd's business is written in various currencies, but we relied upon data that was converted and then summed into a single currency using exchange rates that vary by year. We believe that the effect of currency conversion on our selected factors is minimal.

ALAE/DCC is included in the Lloyd's data; the selected factors develop loss and ALAE combined. All data is gross of reinsurance (both cost and recoveries) and net of brokerage.

Appendix B: About the benchmark methodology

As with any dataset, we have employed expert judgement to estimate ultimate loss ratios. Individual/catastrophe losses can skew results for both the loss ratios and development patterns. This is particularly prevalent in Lloyd's due to the nature of the business.

For several supergroups, we have fit curves (inverse power or Weibull) to estimate tail factors and older development factors due to insufficient historical data on which to base the full pattern.

We have computed incurred loss ratios (paid loss ratios) as incurred loss (paid loss) divided by premium. We also calculated ultimate loss ratios by YoA. Ultimate loss ratios are computed from incurred losses and premium as at the most recent valuation date, developed to ultimate using our selected factors. For the immature years, we calculate the loss ratio via the incurred Bornhuetter-Ferguson method, using an average of prior loss ratios as an *a priori* expected loss ratio (IELR). A limitation of the resulting benchmark is that the IELRs have not been adjusted for rate changes.