US Cyber Market Update

2020 US Cyber Insurance Profits and Performance

June 2021

Empower Results®

Introduction

The sixth edition of Aon's US Cyber Market Update covers the cyber insurance industry's 2020 performance based on data from the National Association of Insurance Commissioners (NAIC) statutory filing supplement. As with many things in 2020, cyber insurance had a wild ride. But this had little to do with COVID-19 and everything to do with ransomware.

The US industry loss ratio increased by 22.0 points overall, and 25.7 for standalone policies – largely eroding the industry's margin. These results confirm what Aon saw for many cyber insurers last fall, and if anything, understate the increases that many have seen across the industry. While some of our insurers performed significantly better than average, others did notably worse. We analyze these differences later in the report.

Our analysis is based on the NAIC statutory filing supplement, now in its sixth year. This data set has its limitations and data quality issues, but we aim to take its general lessons as representative of the US industry experience. See the "About the Data" section at the end of this paper for a full discussion of our approach to addressing these issues.

The NAIC data has an inherent lag, and if our report represents a specific point in time, that point in time is already 15 to 18 months ago. This lag has several contributing factors, but the largest is the way in which results are reported on a financial year basis. As a result, cyber insurers' loss experience during FY2020 reflects policies written in 2019 almost as much in 2020. While the sharp rise of loss ratios is bad news, there is some good news as well: insurers have already had considerable time to respond to the trends now coming through the NAIC data. This response has come in the form of both underwriting actions and rate increases. Indeed, rates increased significantly in the second half of 2020 and have accelerated further in early 2021. We know the industry is adapting to the new cyber environment, but it's still too early to evaluate how we are doing.

Last year, we wrote that: "We believe that the next several years may finally be the proving ground for the cyber insurance thesis – that by putting a price on risk, insurers will help improve cybersecurity hygiene and reduce the cost of cyberattacks." This remains true. Insurers are pursuing many interesting tactics to address the claims environment, even as we see new developments opening in the threat environment. It's a fascinating time in the industry. Stay tuned.

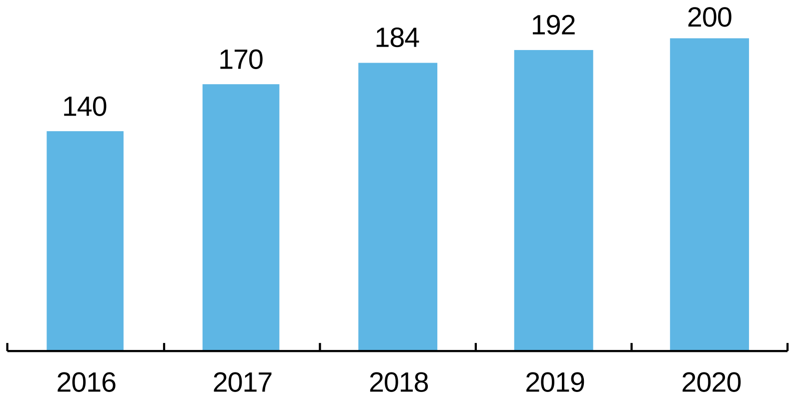
It's clear what cyber insurers need to be doing, and we will discover over the next 1-2 years how effectively insurers have responded to the challenges. **Our call to action is for the NAIC: make cyber its own line of business in the annual statement, including Schedule P.** Better yet, make it three lines – "Cyber Liability" for third party commercial, "Cyber Digital Damage" for first party commercial, plus cyber for personal lines. Concerns about cyber risk have never been higher. Cyber behaves differently than professional liability lines and deserves separate treatment. Thanks to actions from Lloyd's, cyber is quickly being unearthed and identified where it previously lay hidden in property portfolios. Our industry cannot adequately address what we cannot see.

Key Findings on 2020 US Cyber Insurance Performance

Premiums and market participation continue to grow

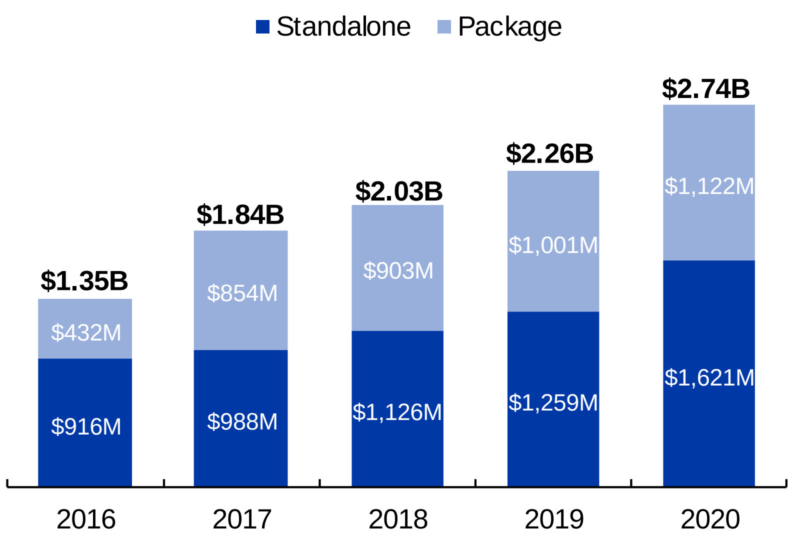
A total of 200 US insurers reported direct cyber written premium to the NAIC in 2020, up from 192 in 2019. The new market participants averaged USD1.17 million in premium each, which is considerably larger than recent years. Note that these numbers do not include MGAs, who do not file the NAIC supplement.

Exhibit 1: Number of US cyber insurers | 2016 – 2020



US cyber premiums grew to USD2.74 billion in 2020, a 21 percent increase from the prior year, with similar rates of growth observed for both package and standalone cyber products.[1]

Exhibit 2: US cyber direct written premiums | 2016 – 2020

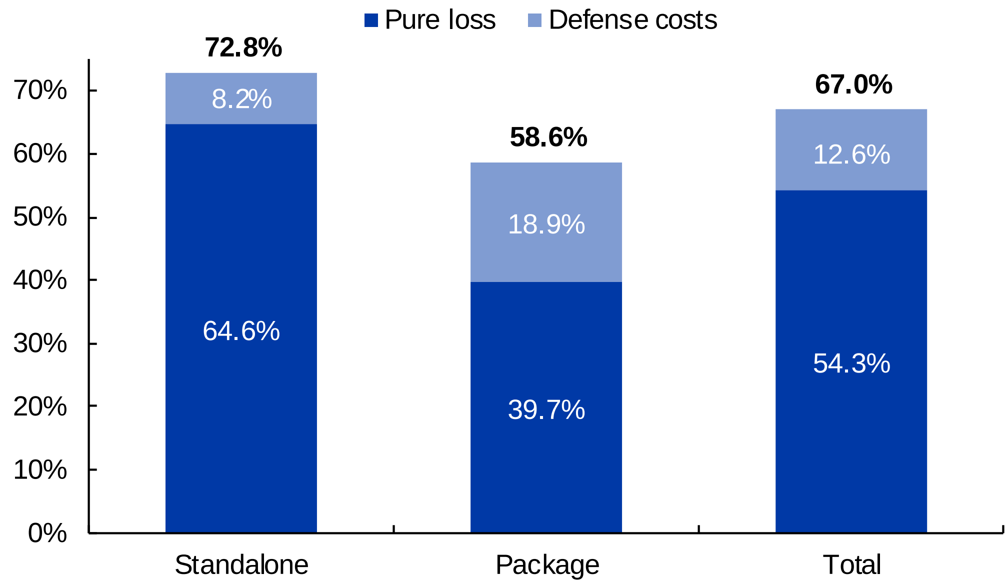


[1] See "About the Data" on page 11 for details on how "package" and "standalone" cyber are defined.

Loss ratios increased, driven by severity

Loss ratios increased in 2020 for both Standalone and Package. The direct incurred industry loss ratio was **67.0** percent across all policies, with standalone and package business reporting 72.8 percent and 58.6 percent respectively. This year, the average defense costs for Standalone insurers rose to 8.2 percent, with 12.6 percent average defense costs for the industry overall.

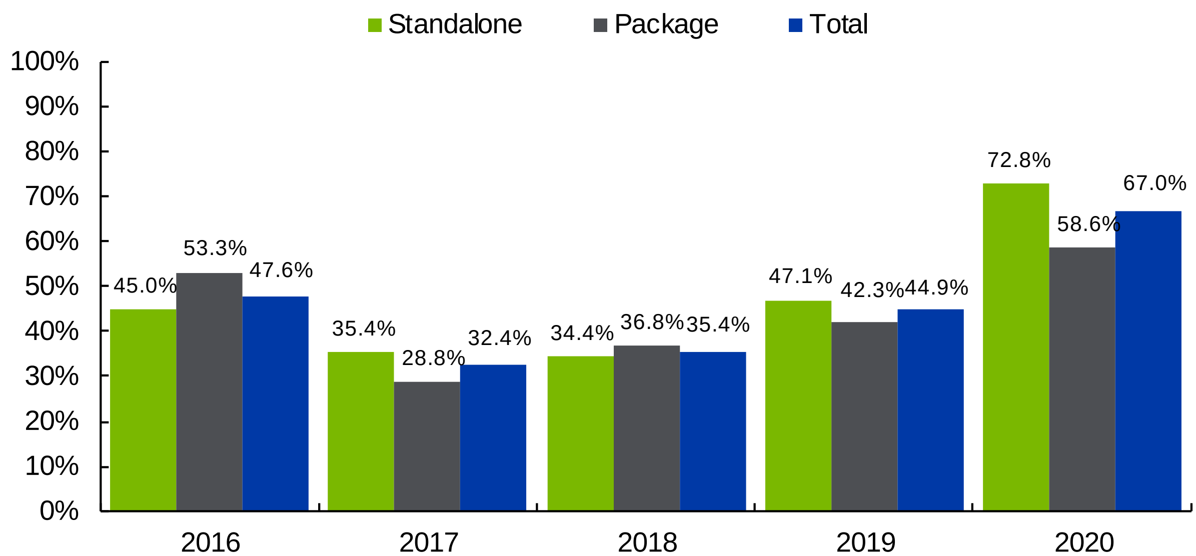
Exhibit 3: US cyber loss ratios | Standalone vs. package



Loss ratios increased for both Standalone and Package segments, with both segments seeing their highest loss ratios since the NAIC began collecting data in 2015.[2] The loss ratio increase was particularly stark for Standalone cyber policies, where a 25.7-point increase was observed, on top of a notable increase in 2019. The increase for Package was 16.4 points, and the total industry loss ratio increased 22.0 points.

[2] Note that in 2015 and 2016, the NAIC also included "adjusting and other" expenses in loss ratios, whereas they have not since 2017. Adjusting and other costs averaged 1.7 loss ratio points in 2015 and 2016 – a minor component of the loss ratio but one worth noting.

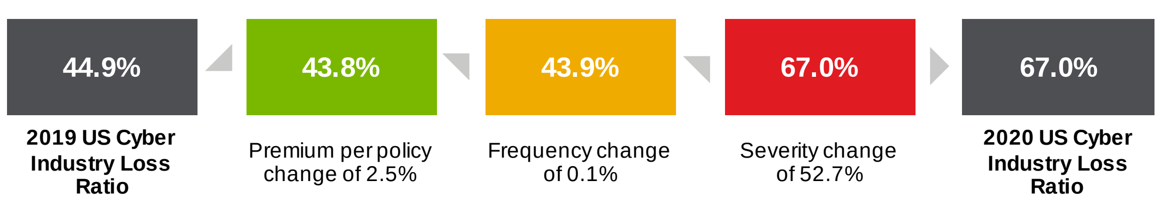
Exhibit 4: US cyber loss ratio | 2016 – 2020



The 2020 loss ratio increase appears to be primarily due to an increase in claim severity; the average claim size rose more than 50% from USD48,709 in 2019 to USD74,354 in 2020. We observed this trend among our clients in 2020, with ransomware claims seeing heightened incident response costs as well as extortion demands. Meanwhile, frequency reported as quite flat according to the NAIC data, with the average 2020 claim frequency across all companies being 5.62 claims per 1000 policies versus 5.61 in 2019. In terms of our clients, the frequency trend has been varied, with some seeing sharp rises in ransomware claims while others saw a peak in 2019 followed by subsequent reductions.

Overall, insurers saw a modest rate increase during 2020, averaging 2.5% greater than 2019. Standalone policies drove this trend with 3.8% gains, while Package policies still saw a 4.4% decrease. As we mentioned earlier, we expect to see significantly more rate come through in next year's numbers based on insurers' actions late in 2020 and the first half of 2021. Rates in 2019 were flat, and slightly negative in 2018, so compared with recent history this is a dramatic upward shift.

Exhibit 5: Components of loss ratio change, 2019 to 2020



We also compared loss ratios a different way to see how widespread the year-on-year deterioration appeared to be. Here, we segmented insurers based on the magnitude of their loss ratio change from 2019 to 2020, looking only at writers with at least USD5 million in direct written premium to avoid potential skewing from small premium bases. A change of at least 5 loss ratio points was selected to indicate a material change. The results appear in Exhibit 6.

Exhibit 6a: US cyber loss ratios, 2019 vs. 2020 | Standalone policies
For insurers with standalone cyber direct written premium greater than USD5 million

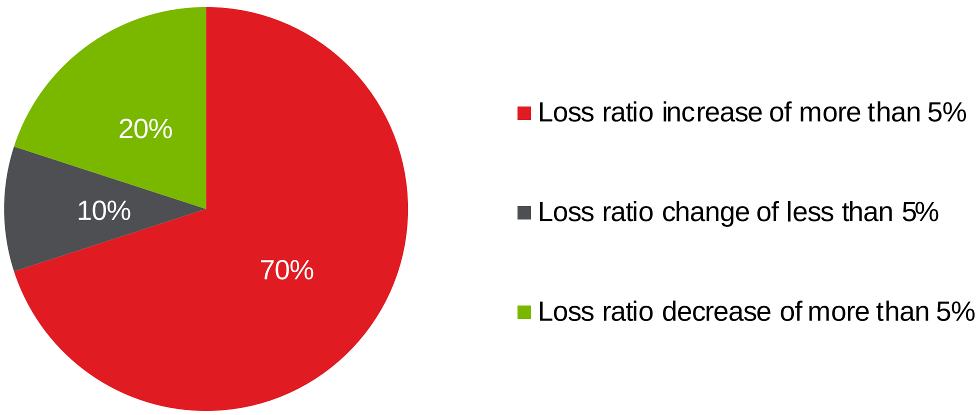
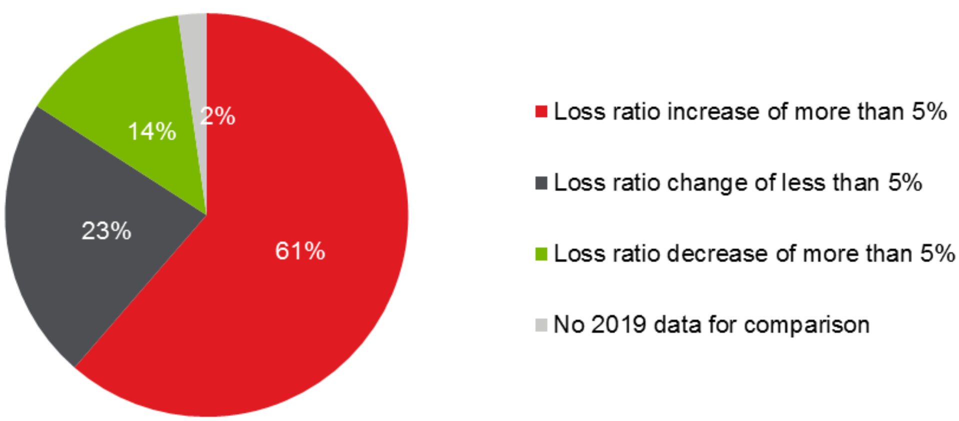


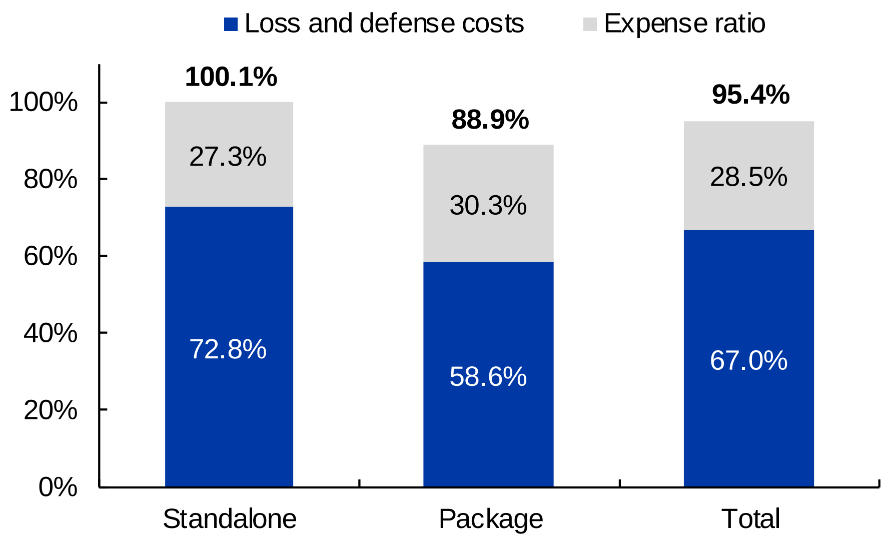
Exhibit 6b: US cyber loss ratios, 2019 vs. 2020 | All policies
For insurers with total cyber direct written premium greater than USD5 million



These charts tell a story consistent with the earlier analysis. Overall, significantly more insurers saw increases in loss ratios than decreases in loss ratios of similar magnitude when looking at all policies, 61 percent versus 14 percent. For standalone policies (Exhibit 6a), the differential is even more extreme, with 70% of insurers showing increases versus 20% showing decreases. Indeed, 50 percent of Standalone insurers saw an increase of more than 20 loss ratio points.

Finally, we estimated the industry's cyber combined ratio for 2020, using expense ratio estimates from the Insurance Expense Exhibit, as seen below in Exhibit 7.[3]

Exhibit 7: Estimated 2020 US cyber combined ratios



These results suggest that the margin for US cyber insurance was largely eroded in 2020. Two additional points are also worth keeping in mind when considering these numbers:

- Cyber insurance is a catastrophe-exposed line of business. The SolarWinds Orion hack was just coming to light in December 2020, and while we do not expect a significant volume of claims from the event, any losses to cyber insurers would likely be incurred during the 2021 financial year. Aon has spent considerable time working with clients and models to set appropriate catastrophe loads and risk tolerances for cyber business.

- The expense ratios shown above are estimates since Cyber is not a line in the annual statement.[3] Our experience with many insurers suggests that cyber expense ratios may be higher than for other professional lines. This is also not reflected in the NAIC data and is another reason why Cyber being an annual statement line would yield valuable information.

[3] 2020 Insurance Expense Exhibit. Based on a premium-weighted average of the other liability-claims made expenses (for standalone cyber premiums) and commercial multi-peril liability expenses (for package premiums).

Loss ratio volatility increased across all segments

Individual insurers saw loss ratio results both higher and lower than the average of 67.0 percent – some notably so. Among underwriters with at least USD5 million in direct written premium, loss ratios ranged from 0.0 percent at the low end to 803.5 percent at the high end.

The coefficient of variation (CV) of insurer loss ratios – defined as the standard deviation divided by the mean – increased in 2020 for insurers with at least USD5 million of direct written premium. The CV also increased among the subset of large cyber insurers with at USD50 million of premium, again suggesting that the heightened loss activity seen in 2020 was not confined to any one segment.

Exhibit 8: Coefficient of variation of direct loss ratio by year

Calendar Year	Insurers with > USD 5M	Insurers with > USD 50M
2019	116.1%	28.7%
2020	169.5%	40.4%
2015 - 2020	150.0%	56.6%

For the first time, we are also publishing CV estimates for all years the NAIC has collected data, 2015-2020. This is an attempt to bring cyber insurance volatility estimates in line with Aon's annual Insurance Risk Study parameterizations for Schedule P lines. For this purpose, the 56.6% CV for insurers with over USD50 million in premium is the number to focus on. Cyber insurers with over USD50 million generally have a diversified book of business whose results will not be overly skewed by one or two large losses. While this 56.6% number may decline as additional years of data are added, it's worth noting that this number suggests that cyber insurance is a more volatile US line than most lines other than non-proportional reinsurance. This should be no surprise given the rapid changes we have witnessed over the last two years.

We also look at the percentile distribution of loss ratios for insurers. The tables below show the range among insurers with premiums more than USD5 million as well as those with more than USD50 million.

Exhibit 9a: Cyber insurance loss ratio percentiles by year | insurers with > USD 5M

Calendar Year	5th Pctl	25th Pctl	Median	75th Pctl	95th Pctl
2019	2.1%	12.5%	31.8%	55.5%	123.7%
2020	8.4%	24.9%	41.5%	76.7%	137.8%

Exhibit 9b: Cyber insurance loss ratio percentiles by year | insurers with > USD 50M

Calendar Year	5th Pctl	25th Pctl	Median	75th Pctl	95th Pctl
2019	29.7%	32.6%	47.1%	55.5%	61.6%
2020	34.4%	47.9%	59.1%	98.2%	109.1%

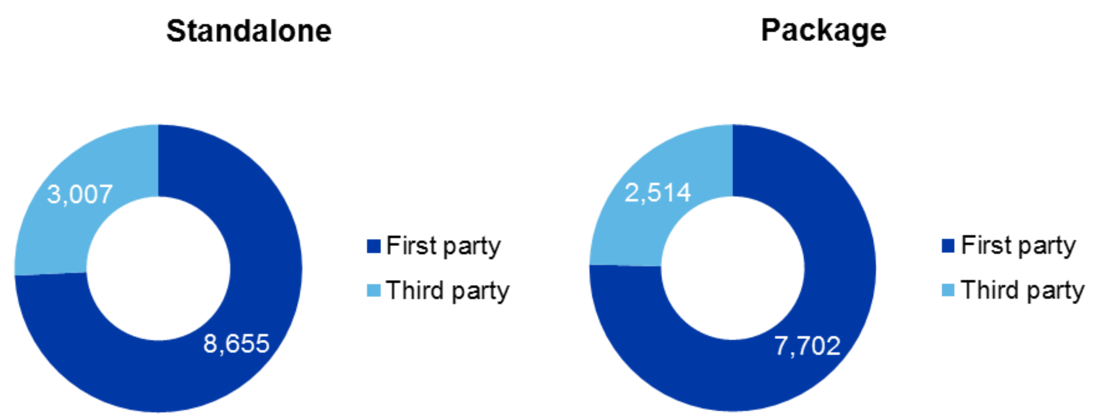
We see the median loss ratio increased for insurers of all sizes, consistent with the earlier findings. Moreover, each percentile shown has increased in 2020, with particularly large changes at the 75th and 95th percentiles.

First party claims predominate

In 2020, claims against first party coverage outnumbered third party claims, accounting for 75 percent of all claims. For standalone policies, first party claims made up 74 percent of the total, while for package policies, first party was 75 percent of the total. The claims results are summarized below.

Exhibit 10: US 2020 cyber claims

Total Claims: 21,878
Total First Party Claims: 16,357 | Total Third Party Claims: 5,521



This has been a consistent story since the first year the NAIC has collected data: despite still commonly being labeled "cyber liability," cyber insurance is mainly a first party product.

Claims rates were significantly higher for standalone business. Cyber claims occur at a rate of 59.5 per 1000 standalone policies, versus a rate of 2.8 per 1000 package policies. Note, 'package' business may vary in meaning for different insurers, ranging from cyber endorsements on small commercial or BOP policies to large cyber / technology E&O blended policies.

Premiums are growing and the field has expanded slightly

In 2020, US cyber premiums grew approximately 21 percent year-on-year to USD2.74 billion. In total, 200 insurers reported writing some cyber premiums in 2020. 91 insurers wrote more than USD1 million and 44 wrote more than USD5 million.

Overall, the market became slightly more competitive in 2020. Eight new insurers reported direct cyber premiums. The top 10 cyber insurers accounted for 68 percent of direct written premiums, down from 69 percent last year. In comparison, the top 10 writers of other liability claims made insurance account for 56 percent of premium and the top 10 in commercial multi-peril account for 46 percent of premium.[4] The US cyber market is still quite concentrated.

[4] Source: NAIC 2020 statutory filings, as captured in S&P Global Market Intelligence as of May 12, 2021.

As a reminder, the NAIC data does not include MGAs. This is unfortunate, as recent years have seen MGAs adding both to the number of market participants as well as the perceived level of competition. So, the cyber market is not quite as concentrated as the data suggest.

The charts below illustrate the distribution of cyber premium.

Exhibit 11: US 2020 cyber direct written premium distribution by insurer size | 2016 – 2020

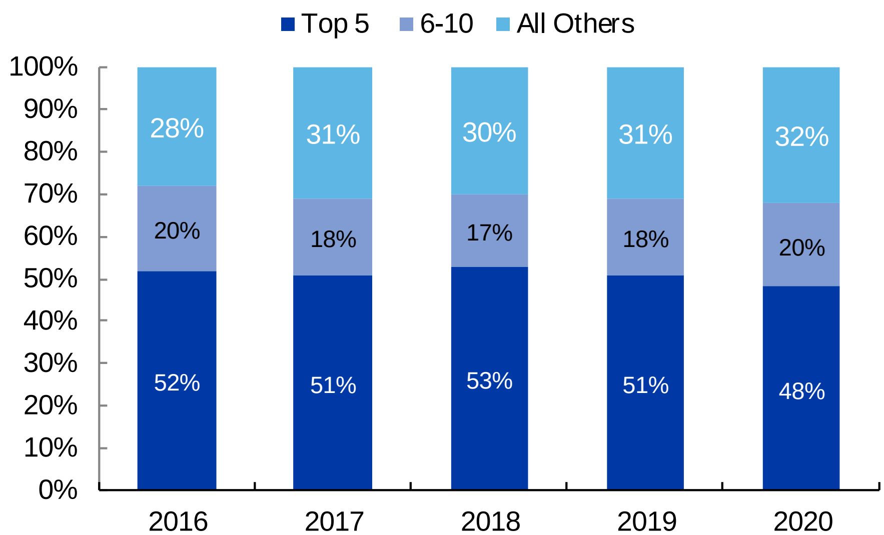
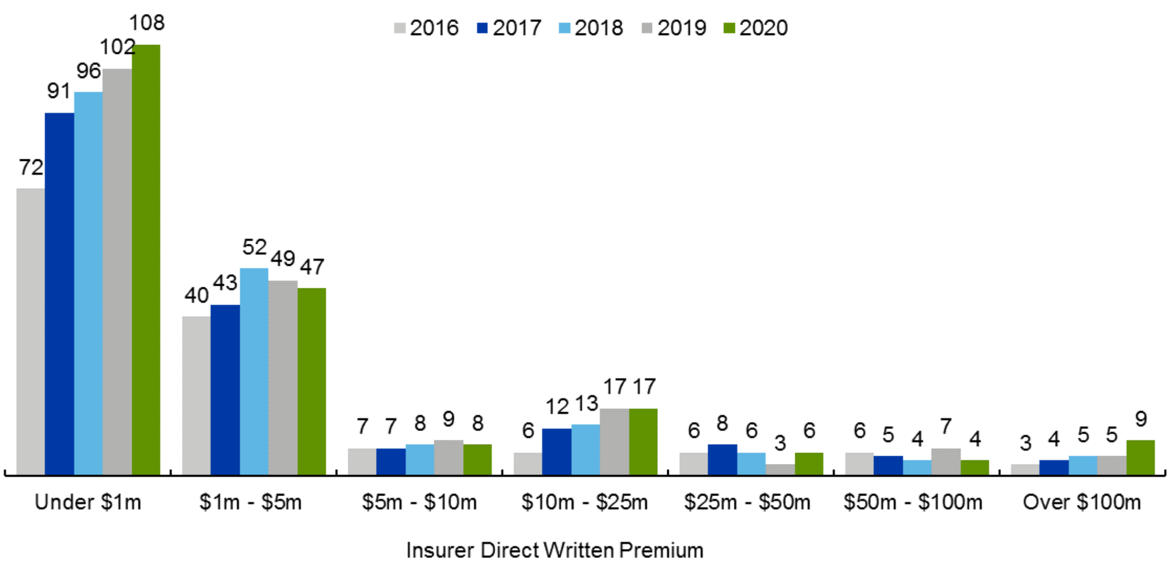


Exhibit 12: Number of US cyber insurers by direct written premium

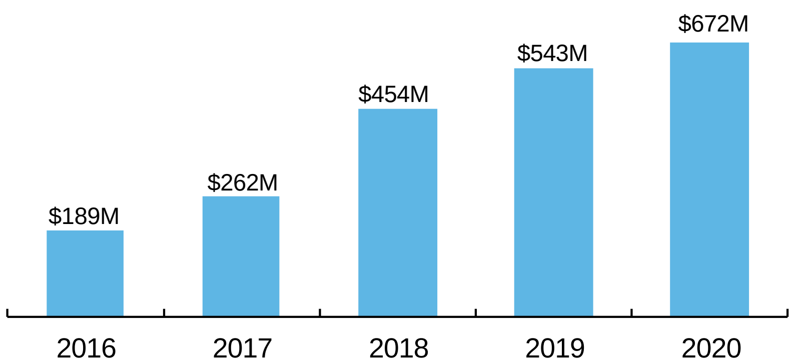


Small commercial cyber still slightly outperforms the industry

Finally, in 2020 saw continued development of the small commercial cyber segment, where the growth rates have exceeded the rest of the industry. Loss ratios have outperformed the industry as well, and although many have remarked on the impact of ransomware attacks on small businesses in 2020, the segment still ran at a lower loss ratio than the industry as a whole.

The NAIC data does not neatly allow segmentation by company size. To estimate the small commercial cyber market, we have focused on a group of insurers that we believe are primarily focused on small commercial accounts and aggregated that group's results. The results can be seen below.

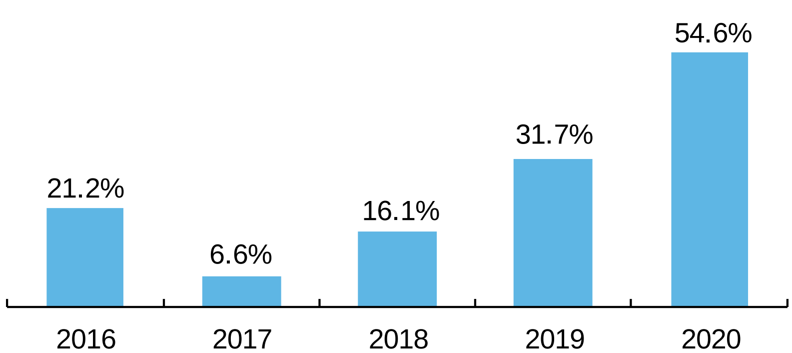
Exhibit 13: US cyber direct written premiums | small commercial writers | 2016 – 2020



Based on this cohort of companies, small commercial cyber premiums grew by nearly 24 percent in 2020 and by 20 percent in 2019. The industry overall grew 21 percent and 11 percent, respectively.

Loss ratios in the small commercial cohort have also performed better than the industry overall, averaging 54.6 percent in 2020. We found that the frequency for these insurers was 25 percent lower than industry averages, and severity was 26 percent lower as well. Understandably, insurers have found small businesses to be an attractive segment. The 2020 loss ratio was up sharply from 2019, to about the same degree as the industry overall. As observed on page 7, the CV for smaller cyber insurers was significantly greater than for larger insurers – meaning that while the class overall performed better than the industry, many individual insurers performed notably worse.

Exhibit 14: US cyber loss ratio | small commercial writers | 2016 – 2020



About the Data

The NAIC supplement requests insurers to report on several kinds of coverage:

- Standalone cyber insurance policies
- Cyber insurance that is part of a package policy
- Standalone identity theft insurance policies
- Identity theft insurance that is part of a package policy

For our analysis, we have focused on the cyber insurance coverages, both standalone and package.

For this year's study, the data was extracted on May 12, 2021.

We looked to extract as many insights from the supplement data as possible but have some concerns about the completeness and quality of the reported information. We suggest reading this briefing not as commentary about the US cyber industry per se, but rather as commentary about *this particular data set*. We have commented on anomalies in the data where we are able to identify and adjust for them. We discuss a few specific data issues below.

Premium completeness

The data reported to the NAIC is only a partial picture of the US cyber insurance market. Non-US insurers garner premiums for US risks that are not reflected in this data – most notably, this includes the Lloyd's syndicates. The NAIC data represent a sizable portion of the US market but are not comprehensive. Additionally, the NAIC data do not reflect the entirety of the performance of US insurers that write internationally. Finally, premium written by MGAs may be *assumed* by US insurers but is not *directly* written by US insurers, and as a result is reflected in this data set.

Issues with package policies

The treatment of cyber package policies creates several issues worth noting, particularly when comparing results against standalone policies:

- Premiums for the 'cyber' portion of package policies can be difficult to break out. About 11 percent of the total package cyber premiums reported are from insurers that were unable to quantify the amounts exactly and instead used estimation techniques, up from the eight percent estimated in 2019. However, it's worth noting that this is down from the 23 percent estimated when the NAIC started collecting data in 2015.

- Losses reported for package policies do not include IBNR. The NAIC requested payments and case reserves for package policies, whereas it requested payments and total incurred amounts for standalone policies. It remains unclear whether insurers interpreted the standalone 'incurred' losses to include IBNR. But the results for package business clearly do not.

- Insurers were left to interpret the meaning of 'package' business for themselves. 'Package' in cyber can be interpreted extremely widely, ranging from an endorsement on a small commercial or BOP policy to a large cyber / technology E&O blended policy. We see this in the policy counts for package insurers: a number have more than 100,000 policies issued, while others with fewer than 1,000 are collecting more premium. Thus, the results for package business are far less homogeneous than the results for standalone cyber.

Claims data quality

Not all insurers reported cyber claims counts, and of those that did, the number of claims varied considerably. The mix between first and third party claims also varied significantly between some insurers. We would advise caution if analyzing the data on a per-claim basis.

Contact Information

Authors

Jon Laux, FCAS, MAAA
Head of Cyber Analytics
+1 708 908 0807
jonathan.laux@aon.com

Craig Kerman, FCAS
Managing Director, Cyber Practice Group
+1 212 441 1568
craig.kerman@aon.com

Sammie Coakley-Hellman
Analyst, Cyber Practice Group
+1 212 441 1270
sammie.coakley@aon.com

Katie O'Donnell
Analyst, Cyber Practice Group
+1 212 441 2582
katie.odonnell@aon.com

Aon's Reinsurance Cyber Leadership

Catherine Mulligan
Global Head of Cyber
+1 212 441 1018
catherine.mulligan@aon.com

Luke Foord-Kelcey
International Head of Cyber
+44 (0)20 7086 2067
luke.foord-kelcey@aon.com

About Aon

Aon plc (NYSE:AON) is a leading global professional services firm providing a broad range of risk, retirement and health solutions. Our 50,000 colleagues in 120 countries empower results for clients by using proprietary data and analytics to deliver insights that reduce volatility and improve performance.