



Milliman’s Claim Variability Benchmarks™ (CVB) provide benchmark statistics for comparison with your own data, drawn from statistical analysis of 5100 companies, over 30 years of activity, for 16 Schedule P Property & Casualty insurance lines of business.

The system provides comparative industry benchmark information that is directly applicable to your specific needs. You can get any of the following comparative data, for your chosen insurance line(s), your specific time period, and your selected size of company or data set:



**7 loss and claim count development patterns**



**11 claim frequency ratio patterns**



**6 claim severity ratios patterns**



**Unpaid distributions**



**Mack unpaid distributions**



**Statistics to ultimate**



**One-year time horizon**



**Correlation statistics for all pairs of Schedule P lines of business**

## Specific features and capabilities



### Benchmark loss development patterns

CVB provides loss development patterns, together with means and standard deviations, for all seven data sets from Schedule P (i.e., Paid, Incurred, Reported, Closed, CWP, CWOP, Incurred + IBNR). For each of these data options, individual years from 1989 to 2018 are included (where available), as well as all years combined.



### Benchmark frequency patterns

The system leverages Schedule P data to calculate frequency ratios for 10 x 11 arrays of all accident years for calendar years 1996 through 2018. The arrays include future projections since the volume-weighted average development factors for each triangle were used to square the triangles. The 11 frequency ratios are as follows:

- 1 Paid Losses / Incurred Losses
- 2 Closed Count / Reported Count
- 3 Closed with Payment Count / Closed Count
- 4 Closed with Payment Count / Reported Count
- 5 Closed without Payment Count / Closed Count
- 6 Closed Count / Ultimate Closed Count
- 7 Closed with Payment Count / Ultimate Closed Count
- 8 Closed without Payment Count / Ultimate Closed Count
- 9 Reported Count / Ultimate Reported Count
- 10 Closed Count / Prior Open Count
- 11 Closed Count / Prior Open + IBNR Count



### Benchmark severity patterns

CVB uses Schedule P data to calculate severity ratios for 10 x 11 arrays of all accident years for calendar years 1996 through 2018. The arrays include future projections since the volume-weighted average development factors for each triangle were used to square the triangles. The six severity ratios are as follows:

- 1 Paid Losses / Closed Count
- 2 Incurred Losses / Reported Count
- 3 Paid Losses / Closed with Payment Count
- 4 Case Loss Reserves / Open Claim Count
- 5 Paid Losses / Ultimate Closed Count
- 6 Incurred Losses / Ultimate Reported Count



### Benchmark unpaid distributions

This function provides benchmark distributions around a selected mean ultimate unpaid amount based on back-testing results for the ODP Bootstrap models applied to the Schedule P industry data. In addition to selecting the specific line of business, the algorithm allows you to adjust the benchmarks for Company Size, Development Pattern, Expected Unpaid, and other options. The output options include Accident Year Unpaid, Cash Flows, Unpaid Runoff, and Loss Ratio Benchmarks. These benchmarks include adjustments for model error based on the back-testing results.



### Benchmark unpaid distributions using Mack

CVB also provides similar benchmark unpaid distributions, based on the Mack and Merz-Wüthrich models instead of the ODP Bootstrap models. The output options include standard Mack, Mack Runoff, and Time Horizon Runoff benchmarks. These benchmarks do NOT include any adjustment for model error to make it easier to calibrate the benchmarks to non-U.S. data.



### Mack statistics

In addition to unpaid distributions, you can also get Mack-based means and standard deviations for any size development triangle. The options include a tail factor, tail standard deviation, exposures, outliers, N Year Average for ATA factors, displaying the entire runoff or an individual runoff year, displaying an alternative CVA, and displaying cash flow results instead of accident year results.



### One-year time horizon statistics

CVB can also be used to get Merz-Wüthrich model one-year time horizon means and standard deviations for any size development triangle. The options include a tail factor, tail standard deviation, exposures, outliers, N Year Average for ATA factors, displaying the entire runoff or an individual runoff year, excluding the Mack reconciliation from the runoff results, displaying an alternative CVA, and displaying cash flow results instead of accident year results.



### Benchmark correlation between lines of business

Once you have reviewed individual lines of business, CVB can provide benchmark correlation factors, including the means and standard deviations for correlation values from the Paid and Incurred data used to derive the benchmark loss development patterns. For all data options, individual years from 1989 to 2018 are included (where available), as well as all years combined.

## Learn more

Contact an expert at [actuarialsoftware@milliman.com](mailto:actuarialsoftware@milliman.com) or visit [actuarialsoftware.com](http://actuarialsoftware.com).

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