

COPLFR Reserve Variability Issue Brief

A slide with a dark background and a photograph of two men in a modern office with large windows overlooking a city and water. The text is overlaid in white. At the bottom, there is a white bar with the seminar details and the Milliman logo.

COPLFR Issue Brief on Reserve Variability

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Casualty Loss Reserve Seminar
September 18 – 19, 2008

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Overview

- Introductions
- What is a “Reserve Range”?
- Summary of COPLFR Issue Brief

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What is a “Reserve Range”?

- A “range” is generally considered to be either a subset of the possible outcomes or a subset of central estimates.
- A “possible outcome” will generally include random movements in the incremental values (e.g., calendar period payments within each accident period).
- For a “central estimate” the incremental values will essentially have the random movements “averaged” or “smoothed” out.

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What is a “Reserve Range”?

- A “distribution” generally describes “all” possible outcomes.
- A purely statistical distribution will include all possible outcomes as defined by that distribution.
- The estimation of unpaid claims involves significant uncertainties that cannot be completely estimated, so “all” should be thought of as a reasonable estimate of the distribution to the extent that it can be estimated using historical data.

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What is a “Reserve Range”?

- If point estimates are used to determine the “range” then the statistical meaning of the points cannot readily be determined – e.g., we do not know if they represent a mean, median or mode estimate.*
- A “distribution” does have statistical meaning – e.g., the mean, median, mode, percentiles, confidence intervals, etc. can be determined.

* See ASOP 43, Appendix 3.

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What is a “Reserve Range”?

- A “range of *reasonable* estimates” of the unpaid claims is:
- an aid to management in determining management’s best estimate.
- used in determining whether or not the reported reserves make a reasonable provision for the value of the unpaid claims.
- a statement about the reliability of current earnings, i.e., how much of current earnings are a function of judgments or assumptions.

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What is a “Reserve Range”?

- A “range of *reasonable* estimates” of the unpaid claims is:
- based on different views or opinions as to what might be considered reasonable assumptions and/or methods.
- intended to represent only those opinions or assumptions that are considered reasonable with respect to a central estimate.
- not readily usable for ERM.

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What is a “Reserve Range”?

- A “range of *possible* estimates” of the unpaid claims:
- is intended to provide “high” and “low” estimates in addition to a central estimate.
- can be estimated by scenario testing, in which different assumptions create a range of possibilities using deterministic methods.
- is generally intended to be wider than a “range of *reasonable* estimates,” although both are subjective.
- is still not readily usable for ERM.

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What is a “Reserve Range”?

- An aggregate range:
- can be determined by adding the LOB ranges if the reasonable estimates are intended to reflect a “mean” value, as this does not imply any particular correlation assumption.
- is more problematic for possible estimates as a correlation assumption would generally be required.

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What is a “Reserve Range”?

- A “distribution of *statistical* outcomes” is:
- estimated using statistical distributions to essentially extend a deterministic central estimate.
- generally based on statistical properties estimated from the data, but some properties are simply assumed (e.g., the central estimate is assumed to be the mean).

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What is a “Reserve Range”?

- A “distribution of *possible* outcomes” is:
- an expression of the “full” breadth of the possibilities of the future payouts.
- estimated using a probabilistic model which simulates a large number of possible outcomes, with the outcomes providing the ability to measure statistical properties such as the mean, mode, percentiles, etc.
- estimated using either individual claims, semi-aggregated or aggregated claim data

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What is a “Reserve Range”?

- A “distribution of *possible* outcomes”:
- is not intended to only be derived from a single probabilistic model – every model has strengths and weaknesses.
- can become a “best estimate” by weighting multiple distributions.
- can also be used to define subsets or ranges which are analogous to deterministic ranges.

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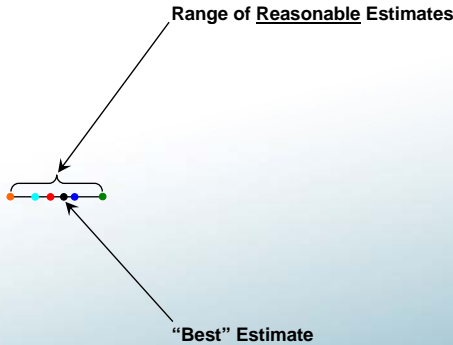
What is a “Reserve Range”?

- An aggregate distribution:
- can be determined by correlating the variances of the *statistical* LOB distributions.
- can be determined by correlating the outcomes of the *probabilistic* LOB distributions.
- can be used for Enterprise Risk Management.

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What is a “Reserve Range”?

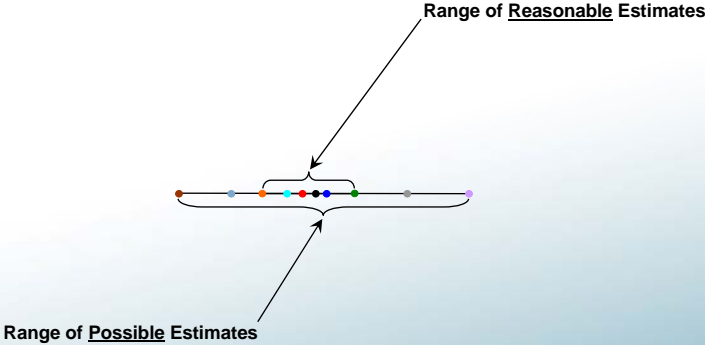


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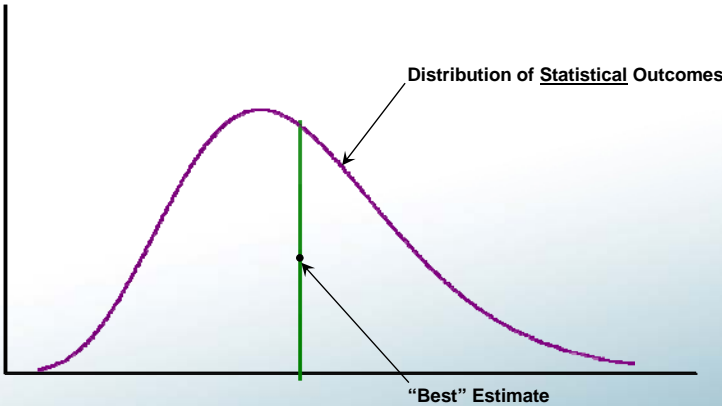
What is a “Reserve Range”?



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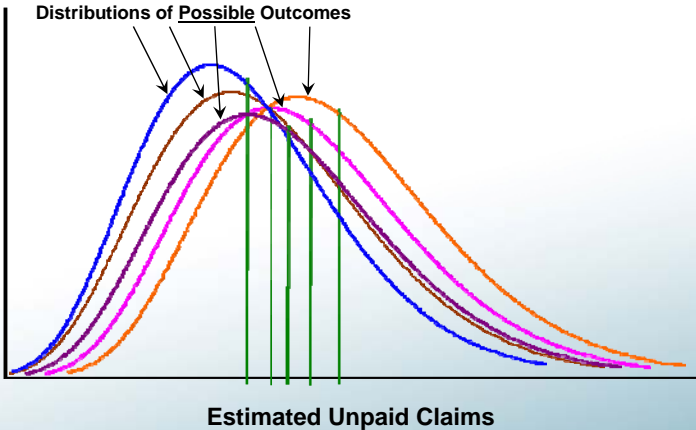


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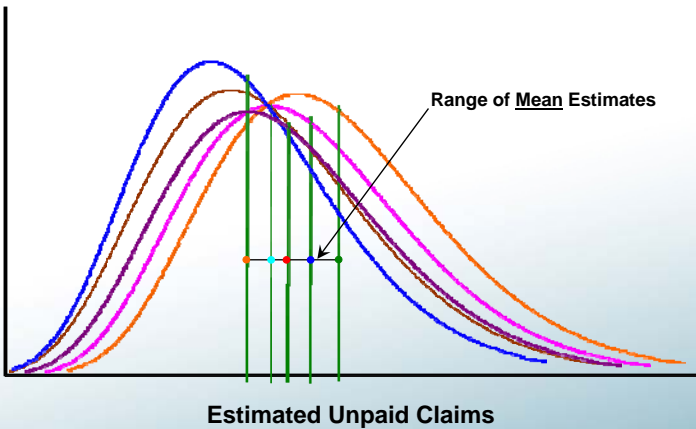
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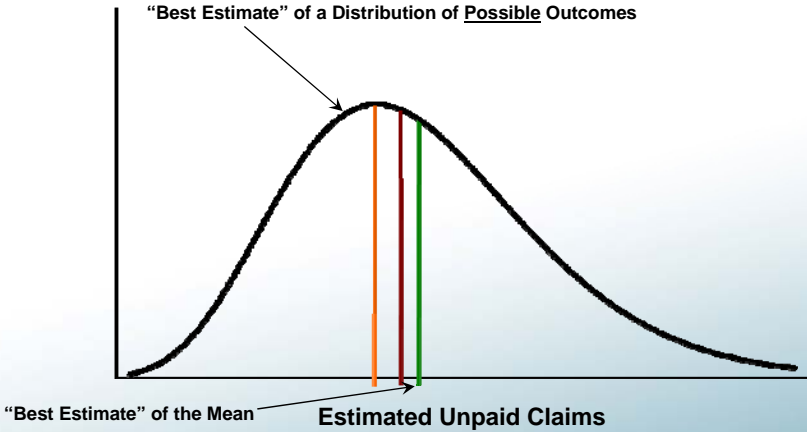


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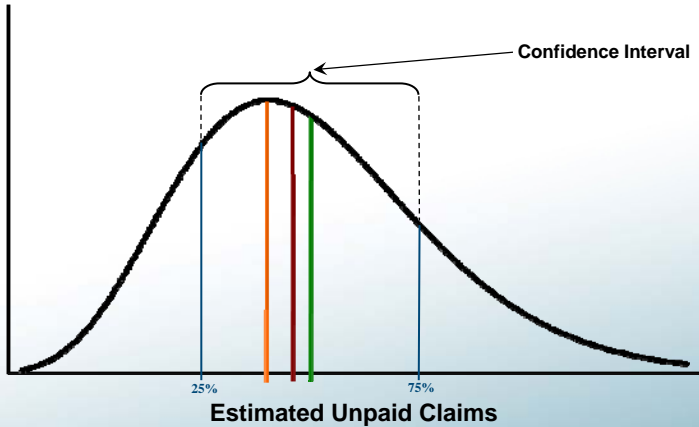
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What is a “Reserve Range”?



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Any Questions on Reserve Ranges?

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