Summary

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This section provides guidelines for setting fair and adequate insurance rates.

Ratemaking Principles

Rates should estimate future costs, covering all expenses related to risk transfer. They must be fair, not excessive or inadequate.

Shock Losses

Shock losses are large, rare claims. They can be managed by excluding or capping them. A shock loss provision is calculated by applying a loading factor to historical non-shock losses.

Catastrophe Data

Catastrophe provisions address severe events. Regular, non-modeled events use historical data, while rare, high-severity events use modeling. Both are combined for a total catastrophe provision.

Reinsurance

Reinsurance shares risk with another insurer.

- Proportional: Premiums and losses are shared equally, no adjustment needed.
- Non-proportional: Only certain losses are shared and require
 adjustments to account for reinsurance costs and expected recoveries.

Ratemaking Principles

- 1. A rate is an estimate of the expected value of future costs.
- 2. A rate provides for all costs associated with the transfer of risk.
- 3. A rate provides for the costs associated with an individual risk transfer.
- 4. A rate is reasonable and not excessive, inadequate, or unfairly discriminatory if it is an actuarially sound estimate of the expected value of all future costs associated with an individual risk transfer.

Shock Losses

Individual losses that occur infrequently and that are excessively large.

Ways to adjust for shock losses:

- Excluding shock losses entirely
- Capping losses at the basic limit
- Capping losses at a different large loss threshold, e.g., a percentile of the loss distribution or a percent of the insured value

To determine a shock loss provision,

- 1. Separate all losses into excess losses and non-excess losses.
- 2. Sum the excess losses.
- 3. Sum the non-excess losses.
- 4. Calculate the ratio of excess losses to non-excess losses.
- 5. Calculate the excess loss loading factor as 1 plus the ratio found above.

Multiply the historical non-excess losses by the factor above to account for the long-term average expected shock loss.

Catastrophe Data

Losses from unusually severe disasters, both natural and man-made, that result in a large number of claims.

- Non-modeled catastrophe analysis is used for events that occur somewhat regularly over a period of many years
- Modeled catastrophe analysis is used for events that occur very infrequently but that result in high-severity claims

To determine a non-modeled cat loss provision,

- 1. follow the same process used for the shock loss provision, or
- 2. develop a pure premium or loss ratio for the non-modeled cat exposure.

Modeled cat losses can be estimated using a stochastic model and then added to the non-modeled cat loss provision to get a total cat loss provision.

Reinsurance

Reinsurance is insurance purchased by a primary insurance company to transfer some of its financial risk.

There are two main types:

- 1. Proportional: the same proportion of premium and losses are ceded to the reinsurer.
- 2. Non-proportional: the primary insurer cedes a portion of premium to the reinsurer, and the reinsurer assumes some predefined portion of the losses.

Proportional reinsurance doesn't need to be explicitly included in a ratemaking analysis, but non-proportional reinsurance should be. To adjust for non-proportional reinsurance,

- 1. reduce projected losses for any expected recoveries and reduce total premium by cost of reinsurance, or
- 2. include the cost of reinsurance minus the expected recoveries as an expense item.