Overview

ℂ 5m

As mentioned in the last section, ratemaking is the process of determining the premium or rate to charge so that the fundamental insurance equation is balanced.

$$Premium = Losses + LAE + UW Expenses + UW Profit$$

This process involves estimating each of the components above, generally by gathering, examining, and adjusting the relevant historical experience to what is expected during the period the premium will be in effect.

To start this section, we will introduce the principles and considerations that should guide the ratemaking process. Then, we'll begin looking at typical adjustments that can be made for each of the components of the fundamental insurance equation.

Ratemaking Principles and Considerations



Ratemaking Principles

According to the <u>Statement of Principles Regarding Property and Casualty Insurance</u> <u>Ratemaking</u> that has been adopted by the Board of Directors of the CAS, rates charged by insurance companies should be developed by following these four principles:

PRINCIPLE 1

A rate is an estimate of the expected value of future costs. Ratemaking is prospective since the insurance rate must be developed before the transfer of risk. However, future rates should not be developed to cover past losses. Historical data is only used to predict future experience when setting rates.

PRINCIPLE 2

A rate provides for all costs associated with the transfer of risk. This helps ensure that the insurance system is financially sound and that there is balance in the fundamental insurance equation at the aggregate level.

PRINCIPLE 3

A rate provides for the costs associated with an individual risk transfer. This helps ensure that there is balance in the fundamental insurance equation at the individual level. If the individual experience of a risk is not sufficient for estimating the future costs, then the combined experience of similar risks may be used to estimate the future costs for each individual in the group.

PRINCIPLE 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. Rates that are determined based on the first three principles above are considered actuarially sound.

There are various established ratemaking methodologies used by property & casualty actuaries. These methodologies should not necessarily be strictly followed, as it is beneficial to encourage experimentation and innovation in ratemaking. However, these methodologies can provide a foundation for developing actuarial procedures and standards of practice.

Ratemaking Considerations

Several important considerations should be taken into account when developing ratemaking methodologies. A few of these may sound familiar, as they were introduced in Section 1.

- **Exposure Unit**: An appropriate exposure unit or basis, i.e., one that varies with the hazard and is practical and verifiable, should be chosen.
- Data: Any data used should provide a basis for developing a reasonable indication of the future. Relevant data can include the insurer's historical premium, exposure, loss, and expense experience, as well as other external data, provided that the data can help determine the general direction of trends in claim costs, frequencies, expenses, and premiums.
- Organization of Data: Data can be organized in several different ways when
 performing a ratemaking analysis, including by calendar year, accident year,
 report year, and policy year. The choice can be affected by data availability,
 clarity, simplicity, and the nature of the insurance coverage.
- **Influences on Data**: Both internal and external influences on data should be considered in the ratemaking process.
- **Adjustments to Data**: Historical data should be adjusted to reflect any expected changes in costs between the historical period and the period that rates will be in effect.
- Homogeneity: Organizing experience into groups with similar characteristics can improve the accuracy of ratemaking, but this should be balanced with credibility.
- **Credibility**: Credibility measures the predictive value attached to a dataset. It can be increased by making groupings more homogeneous or by increasing group size. A group should be large enough to be statistically reliable, but it is important to balance the group size with the homogeneity of the groups.

- Classification Plans: A properly defined classification plan should be in place.
- Individual Risk Rating: When the experience for an individual risk is sufficiently credible, the premium for the risk should be modified to reflect the individual experience. The impact of individual risk rating plans on the overall experience should also be considered.
- Actuarial Judgment: Informed actuarial judgments can be used effectively throughout the ratemaking process. These should be documented and available for disclosure.

Influences on Data

The following possible influences on the data used in ratemaking should be considered.

- **Policy Provisions**: The effect of policy provisions that limit costs, such as salvage and subrogation, coinsurance, coverage limits, and deductibles, should be taken into account when determining future costs.
- **Mix of Business**: Distributional changes in deductibles, coverage limitations, or types of risks may affect the frequency or severity of claims.
- **Operational Changes**: Changes in the underwriting process, claim handling, claim reserving, and marketing practices could affect the continuity of the experience.
- Other Influences: External influences, such as the judicial environment and regulatory and legislative changes, may also impact the experience expected in the future.

Evaluating and Adjusting Ratemaking Data

When preparing ratemaking data, adjustments should account for influences discussed above as well as any other expected changes. These adjustments ensure the data reflects anticipated future costs accurately.

For this exam, common adjustments include:

1. **Shock losses**: Large, atypical losses, often from catastrophes, can distort the data. These are usually replaced with a long-term average to smooth out

- volatility and prevent overpricing. For the exam, you need to demonstrate proper handling of shock losses for ratemaking purposes.
- 2. **Reinsurance**: Premium and loss data may need to be adjusted for the effect of reinsurance arrangements, or the net effect may be included with expenses.
- 3. **Benefit and Rate Adjustments**: Adjustments should reflect any changes in policy benefits, rates, and coverage terms, including those mandated by law, to ensure premiums match the current or expected cost structure. For the exam, you need to calculate various adjustments to the premium and losses used for ratemaking.
- 4. **Development**: Premium and loss data are often immature, especially for recent periods. Develop these figures to ultimate levels to account for claims that are not yet fully settled.
- 5. **Trends**: Incorporate trends for historical and expected changes in claim costs, frequency, exposures, expenses, and premiums. Using appropriate trending techniques ensures that the ratemaking data reflects anticipated shifts in the insurance environment. For the exam, you need to calculate and apply trends using different approaches (e.g., exponential, and linear analyses).
- 6. **Expenses**: Separate expenses into fixed and variable components. Adjust for any anomalies to ensure expense data reflects typical operational costs over time, aligning expenses with anticipated costs in the ratemaking period.
- 7. **Profit and Contingency Provision**: Profit and contingency provisions should consider both random and systematic variations in costs. Include allowances for investment income and other revenues to establish a rate that balances financial stability with competitive pricing.

In the following sections, each of these common adjustments will be introduced in detail. We will conclude by integrating these adjustments to achieve an overall rate level indication that aligns with the fundamental insurance equation at an aggregate level.

Example 2.1.1.1 [CAS Exam 5 2010 Q21]

Identify four adjustments made to historical losses in projecting losses for a future policy period for ratemaking. Briefly describe the purpose of each.

Solution

1. **Large Losses**: Remove the impact of catastrophes by replacing them with a long-term average. This reduces volatility,

ensuring rates don't spike after catastrophes and drop in non-catastrophic years.

- 2. **Benefit Adjustments**: Adjust losses to reflect changes in benefits, such as updates to workers' compensation laws, ensuring losses are adjusted to the current benefit level.
- 3. **Development**: Adjust losses to their ultimate level, recognizing that early reported amounts (e.g., at 24 months) may not fully capture all claims.
- 4. **Trends**: Apply trending to account for changes in factors like inflation by adjusting historical losses to reflect future conditions at the midpoint of the projected policy period.

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