



LRM Sample Flashcards

You have downloaded a sample of our LRM flashcards. The flashcards are designed to help you memorize key material for the SOA's LRM exam.

The flashcards are in a "Q&A" format that is well-suited for reviewing the material at a high level after you complete section of the online seminar. The cards are sequenced in exactly the same order as the rest of the online seminar. Practicing your ability to recall the material in the form of an answer to a question is a great way to get ready for the actual exam.

Flashcard Formats Available

The same cards are in each format below. Only the format of the cards differs, as explained below.

1. **"Singles"**. This version contains alternating front/back sides of each card in sequence. This format is well suited for PDF viewers on your computer, tablet, or phone. Simply flip through the pages.
2. **"FrontBack"**. This version has 3 cards per page. If you print this PDF double-sided on U.S. Letter (8.5" x 11") paper, the front and back of each card will be aligned. This format also works well on Avery 5388 3x5" index cards, which can be [purchased on Amazon](#). Printing instructions are included with the full flashcard set available in the online seminar.
3. **Mobile version**. TIA's free Flashcards app for [iPhone](#), [Android](#), and the web (see Flashcards tab in online seminar) lets you study, filter, and shuffle your flashcards wherever you are. All cards are fully integrated with the online seminar, and your progress syncs across all apps. No printing or manual effort on your part to load the cards. Simply sign in, and get started.

Samples of the PDF formats are included in this PDF. You can see samples of the mobile flashcards by simply downloading the app for free.

If you have any questions, email me anytime.

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Define modeling and give examples of its uses.

A **model** is a simplified version
of reality

Modeling means deciding *which*
simplifications to make

Examples

- Financial reporting
 - US GAAP
 - Canadian accounting
- Asset adequacy analysis (CFT)
- ALM
- Internal management reporting
- Pricing
- Budgeting
- Appraisals
- Surplus analysis

What are the benefits of modeling?

Model simplifications save time

1. Lowers model run time

- **Reduces data volume (in and out)**
- Yes computers are faster now, BUT:
 - Workloads ↑
 - Number of runs ↑ (stochastic)
 - Software sophistication ↑

2. Lowers people time (effort)

What are the costs of modeling?

Known error – Revealed by validating against available data

1. **Static validation** (balance sheet)
 - Starting model to actual values should be ≈ 1
2. **Dynamic validation** (income statement)
 - Compare projected values to historical trends

Unknown error – Cannot be revealed since data doesn't exist

- Will arise in the future as experience emerges
- Authors estimated by comparing a base case to various models
- **Metrics used to quantify unknown error**
 1. PV future profits at hurdle rate
 2. Gross premium reserve = PVFB + PVFE – PVGP at earned rate
 3. Value-based reserve = Stat Res – PV(Stat Profit) at hurdle rate

Describe issue age modeling, including its benefits and costs.

1. Group issue ages into bands (e.g. quinquennial)
2. Select one age within each band to represent all policies in the band

Benefits

- Dramatically reduces time and effort
- Can significantly reduce run time and data processed

Costs and Conclusions

- Wider issue age bands generally increase forecast error
- Fit is more important than width
- Carefully consider and tailor to the specific situation

Describe premium modeling, including its benefits and costs.

Use the weighted average premium for each model cell (e.g. issue age band)

Benefits

- Reduces known error (better static validation results)

Costs and Conclusions

- May significantly increase unknown error (forecast error)
- Usually inappropriate—better to select a new model
- Use with extreme caution

Describe policy size modeling, including its benefits and costs.

Source: LRM-116: Life Insurance Forecasting and Liability Models

Use the average policy size for each model cell rather than actual size for the chosen model policy

Benefits

- Allows the use of per unit assumptions in the model (good for expenses)
- Reduces data volume
- Reduces model run time

Costs and Conclusions

- If policy size is not uniform, unknown error ↑
- Not appropriate when expenses should be modeled per policy (term, size-banded products, small policies)
- Age-level results may not be accurate (not good for pricing)

Describe forms of issue date modeling, including their benefits and costs.

- **Issue month modeling** – e.g. map actual month to a quarterly month
- **Issue day modeling** – e.g. assume 15th of every month
- **Issue year modeling** – e.g. map actual year to the mid-point of every 5th year

Benefits

- Issue month and day modeling
 - Very common and easy to implement
 - Significantly reduces data and run time
 - Minimum error introduced since duration doesn't change
- Issue year modeling – same as above *if used in moderation or special situations*

Costs and Conclusions

- Issue year modeling can result in high error since duration changes
- Should correlate with forecast start date

What are the benefits and costs of combining modeling assumptions?

Benefits

- Dramatic reduction in data and run time
- Authors' study saw a 99% reduction in data!

Costs and Conclusions

- Does not necessarily compound forecast error
- Very common to combine plan, issue age, issue date, and policy size modeling

Provide some general modeling conclusions and recommendations.

Source: LRM-116: Life Insurance Forecasting and Liability Models

1. Reduces data processed, run time, and manpower
2. Modeling decisions can introduce significant error (make them carefully)
3. Arbitrarily changing modeled items can introduce significant error
4. Static and dynamic validations indicate model accuracy (do both if possible)
5. Known and unknown errors may or may not be correlated
6. Consider unusual product features and age of the business
7. Do not analyze results in more detail than the modeling used

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