LAM Sample Flashcards

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

J. Eddie Smith, IV, FSA
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List the 3 propositions related key rate duration

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Source: LAM-117: Key Rate Durations

Proposition 1: Effective duration = linear combination of KRDs ($D(i)$'s)

$$D = \sum_i D(i)$$

Proposition 2: The KRDs of a portfolio = weighted sum of each bond's KRD

$$D(i) = \sum_{j=1}^{m} w(j) D(j,i) \qquad w(j) = \frac{\text{Price of Bond } j}{\text{Total Portfolio Value}}$$

Proposition 3: A portfolio of zero-coupon bonds can be constructed to have the same value and interest rate risk exposure of the underlying bond or portfolio

$$w(i) = \text{“hedge ratios”} = \frac{D(i)}{T(i)} \qquad \sum_i w(i) = 1$$

Why is key rate duration superior to effective duration for non-parallel yield curve shifts?

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Source: LAM-117: Key Rate Durations

Effective duration predicts the change in price for a parallel yield curve shift

Problem: the yield curve rarely makes a parallel shift

KRDs allow measurement of:

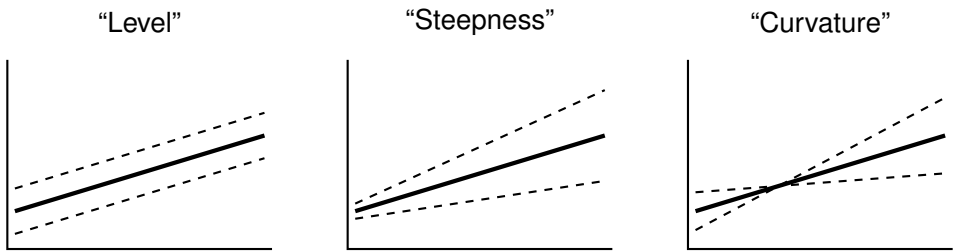
1. Changes in specific yields
2. Combinations of different yield shifts (changes in the shape of the yield curve)

Describe 3 classic yield curve shifts.

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Source: LAM-117: Key Rate Durations

1. “Level” – parallel shift up or down
2. “Steepness” – long-term rates move more than short-term rates (or vice versa)
3. “Curvature” – long- and short-term rates move more than medium-term rates



How does a call provision affect the key rate duration profile of a bond?

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Source: LAM-117: Key Rate Durations

- Call provision increases exposure to short-term interest rates
- Non-callable bonds have much more exposure to changes in longer term interest rates

What effect does the coupon level have on a callable bond's key rate duration profile?

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Source: LAM-117: Key Rate Durations

- Higher coupon = higher chance of being called
- Higher coupon = more exposure to short-term interest rates

What effect does a sinking fund have on a bond's key rate duration profile?

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Source: LAM-117: Key Rate Durations

Sinking fund retires principal faster $\Rightarrow$ lowers duration

Describe the differences in the interest rate sensitivity of European call vs. European put.

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Call is ITM on exercise date (T) if bond value $> K$ at year T

- Call = short position in T-yr zero + long position in underlying bond
- If T-yr rate rises, short position shrinks (increasing call value)
  - Results in negative KRD: rates ↑, value of security (the call) ↑
- If rates beyond year T fall, value of underlying increases (positive KRD)

Puts are the exact opposite of the above

- Positive KRD at exercise date
- Negative KRDs beyond exercise date

Compare the key rate duration profile of a European call vs. American call.

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Source: LAM-117: Key Rate Durations

American be exercised any time $\Rightarrow$ spreads exposure over more key rates

Describe the key rate duration profile of a mortgage pass-through.

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Source: LAM-117: Key Rate Durations

- Very low individual KRDs compared to bonds $\Rightarrow$ interest rate exposure is very spread out
- Prepayment option = call option $\Rightarrow$ similar to profile of callable bond with sinking fund

Compare the key rate duration profile of a principal- vs. interest-only strip.

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Source: LAM-117: Key Rate Durations

- PO is “call-like”: benefits from falling interest rates (increases prepayments)
- IO is more “put-like”: benefits from rising interest rates (extends coupon payments)
- Each benefit from opposite tilts of the yield curve

List the 3 propositions related key rate duration

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Effective duration predicts the change in price for a parallel yield curve shift

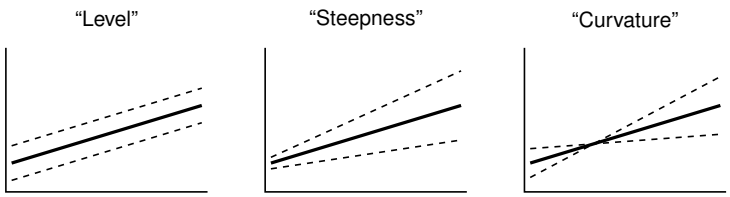
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