

## Workshop – Unit of Account and Calculation Sequence

**2017 Insurance IFRS Seminar**

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Session 15

# Illustration Example (non-participating)

Consider a traditional whole life portfolio that covers a 12 month issue period

- **Assuming that pricing cannot be used to form groups**
- Contract level calculation then becomes necessary in order to form groups;
- Three groups are formed based on contract level CSM information:
  - profit-making, loss-making and potential onerous
- Questions:
  1. What is the reported CSM for this portfolio?
  2. If three groups are independent of each another (for simplicity. In reality, they'd be most likely positively correlated as they are in the same portfolio), and the risk adjustment has been calculated at the group level, how might you quantify the risk adjustment reported at the portfolio level?
  3. In amortizing the CSM, what is a reasonable proxy for coverage units to reflect the service provided?
  4. Would it be possible the reasonable proxy, which determines the pattern of service, differs by group?

| Beginning of Year                                 | PV FCFs    | RA        | CSM      |
|---------------------------------------------------|------------|-----------|----------|
| Profit-making group                               | 100        | 10        | 20       |
| Potential onerous group                           | 100        | 15        | 5        |
| Loss-making group                                 | 100        | 20        | -10      |
| Total Portfolio                                   | <b>300</b> | <b>45</b> | <b>?</b> |
| Total Portfolio reflecting diversification effect | 300        | ?         | ?        |



# Illustration Example (non-participating) – AnswerKey

Consider a traditional whole life portfolio that covers a 12 month issue period

- Assuming that pricing cannot be used to form groups

- Contract level calculation then becomes necessary in order to form groups;

- Three groups are formed based on contract level CSM information:

- profit-making, loss-making and potential onerous

- Considerations:

- CSM is floored at zero for reporting, but it is still necessary to track for the loss-making group as it could reverse to a profit situation;
- The portfolio RA =  $\sqrt{10^2+15^2+20^2} = 27$  under independent assumptions. If the risk adjustment is calculated at the group level, when aggregating the groups, the effect of diversification will need to be considered. In fact, the risk adjustment could be reported at a level even higher than portfolio, so further aggregation may be necessary;
- For this portfolio, inforce face amount could be chosen as a reasonable proxy to determine the coverage units for the three groups. It is conceivable to use different proxies for profit-making vs. loss-making groups but may introduce undue complexity.

| Beginning of Year                                        | PV FCFs    | RA        | CSM       |
|----------------------------------------------------------|------------|-----------|-----------|
| Profit-making group                                      | 100        | 10        | 20        |
| Potential onerous group                                  | 100        | 15        | 5         |
| Loss-making group                                        | 100        | 20        | -10*      |
| <b>Total Portfolio</b>                                   | <b>300</b> | <b>45</b> | <b>25</b> |
| <b>Total Portfolio reflecting diversification effect</b> | <b>300</b> | <b>27</b> | <b>25</b> |

Note\*: negative CSM reported as zero

# Illustration Example (non-participating)

## Unlocking the CSM at the Group Level

- Consider the profit-making group from previous slide. Assume its BOY inforce face amount is 500, and EOY face amount is 450.
- Locked-in discount rate is 4% for the CSM;
- Future cash flow discount rate changed from 4% to 5%, and future lapse assumptions were updated during the year;
- Results under different runs are shown to the right for PV of FCFs and RA;
- Experience adjustments are ignored in this example.
- Questions:
  - What is the amount of interest accretion during the year?
  - What are the amounts of changes in PV of FCFs and RA that are recognised in the CSM?
  - What is the amortized portion of the CSM for this period?
  - What is the EOY CSM?

|                   | PV of FCFs | RA   |
|-------------------|------------|------|
| BOY@4%            | 100.0      | 10.0 |
| EOY@4%/old lapses | 90.0       | 9.0  |
| EOY@4%/new lapses | 98.0       | 9.8  |
| EOY@5%/new lapses | 92.0       | 9.2  |

|                      | BOY CSM        | 20.0     |
|----------------------|----------------|----------|
| + Interest Accretion |                | ?        |
| - Chg of PV of FCFs  |                | ?        |
| - Chg of RA          |                | ?        |
| - Amortization       |                | ?        |
|                      | <b>EOY CSM</b> | <b>?</b> |

# Illustration Example (non-participating) – AnswerKey

## Unlocking the CSM at the Group Level

- Consider the profit-making group from previous slide. Assume its BOY inforce face amount is 500, and EOY face amount is 450.

- Locked-in discount rate is 4% for the CSM;
- Future cash flow discount rate changed from 4% to 5%, and future lapse assumptions were updated during the year;
- Results under different runs are shown to the right for PV of FCFs and RA;
- Experience adjustments are ignored in this example.

### Roll-forward of the CSM:

- Interest accretion is based on 4%;
- Changes in PV of FCFs and RA due to lapse update are recognised in the CSM;
- Coverage units = 500 at BOY, and CSM allocated to each unit at the end of the period (before recognising any in P&L to reflect the services provided in the period) is  $(20 + 0.8 - 8.0 - 0.8) / 500 = 0.024$ ;
- Thus the amortized portion of the CSM is  $0.024 * (500 - 450) = 1.2$ ;
- EOY CSM is 10.8, and its corresponding allocation per coverage unit remains at  $0.024 = 10.8 / 450$ .

|                   | PV of FCFs | RA   |
|-------------------|------------|------|
| BOY@4%            | 100.0      | 10.0 |
| EOY@4%/old lapses | 90.0       | 9.0  |
| EOY@4%/new lapses | 98.0       | 9.8  |
| EOY@5%/new lapses | 92.0       | 9.2  |

|  |                      |             |
|--|----------------------|-------------|
|  | BOY CSM              | 20.0        |
|  | + Interest Accretion | 0.8         |
|  | - Chg of PV of FCFs  | -8.0        |
|  | - Chg of RA          | -0.8        |
|  | - Amortization       | -1.2        |
|  | <b>EOY CSM</b>       | <b>10.8</b> |



# Illustration Example (VFA)

## Unlocking the CSM at the Group Level

- Consider the profit-making group from previous slide. Assume its BOY inforce face amount is 500, and EOY face amount is 450.
- Future cash flow discount rate changed from 4% to 5%, and future lapse assumptions were updated during the year;
- Results under different runs are shown to the right for PV of FCFs and RA;
- Experience adjustments are ignored in this example.
- Question:
  - Under the VFA approach, how would the calculations on the previous slide change?

|                   | PV of FCFs | RA   |
|-------------------|------------|------|
| BOY@4%            | 100.0      | 10.0 |
| EOY@4%/old lapses | 90.0       | 9.0  |
| EOY@4%/new lapses | 98.0       | 9.8  |
| EOY@5%/new lapses | 92.0       | 9.2  |

|                      | BOY CSM        | 20.0     |
|----------------------|----------------|----------|
| + Interest Accretion |                | ?        |
| - Chg of PV of FCFs  |                | ?        |
| - Chg of RA          |                | ?        |
| - Amortization       |                | ?        |
|                      | <b>EOY CSM</b> | <b>?</b> |

# Illustration Example (VFA) - AnswerKey

## Unlocking the CSM at the Group Level

- Consider the profit-making group from previous slide. Assume its BOY inforce face amount is 500, and EOY face amount is 450.

- Discount rate changed from 4% to 5%, and future lapse assumptions were updated during the year;
- Results under different runs are shown to the right for PV of FCFs and RA;
- Experience adjustments are ignored in this example.

- Roll-forward of the CSM:
  - Interest accretion is based on current rate of 5%;
  - Changes in PV of FCFs and RA due to lapse and discount rate updates are recognised in the CSM;
  - Coverage units = 500 at BOY, and CSM allocated to each unit at the end of the period (before recognising any in P&L to reflect the services provided in the period) is  $(20+1.0-2.0-0.2)/500 = 0.0376$ ;
  - Thus the amortized portion of the CSM is  $0.0376 * (500-450) = 1.9$ ;
  - EOY CSM is 16.9, and its corresponding allocation per coverage unit remains at  $0.0376 = 16.9 / 450$ .

|                   | PV of FCFs | RA   |
|-------------------|------------|------|
| BOY@4%            | 100.0      | 10.0 |
| EOY@4%/old lapses | 90.0       | 9.0  |
| EOY@4%/new lapses | 98.0       | 9.8  |
| EOY@5%/new lapses | 92.0       | 9.2  |

|  |                      |             |
|--|----------------------|-------------|
|  | BOY CSM              | 20.0        |
|  | + Interest Accretion | 1.0         |
|  | - Chg of PV of FCFs  | -2.0        |
|  | - Chg of RA          | -0.2        |
|  | - Amortization       | -1.9        |
|  | <b>EOY CSM</b>       | <b>16.9</b> |

**Thank You**



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