ILA LFVC Model Solutions
Spring 2014

1. Learning Objectives:

5. The candidate will understand the Risk Based Capital (RBC) regulatory framework and the principles underlying the determination of Regulatory RBC and Economic Capital.

Learning Outcomes:

(5a) Explain and distinguish the roles of capital from the perspectives of regulators, investors, policyholders and insurance company management

(5b) Describe the U.S. Risk Based Capital (RBC) regulatory framework and the principles underlying the determination of Regulatory RBC, and be able to compute RBC for a U.S. life insurance company including:
- (i) Identification of significant risk components
- (ii) Identification of specialized product RBC requirements
- (iii) Interpreting results form a regulatory perspective
- (iv) Implementation under U.S. principle-based approach

(5c) Explain and describe the concept and roles of Economic Capital including:
- (i) Identification of the significant risk components
- (ii) Selecting calculation methods appropriate to stakeholder's perspectives
- (iii) Describing how a company would implement an Economic Capital Program

Sources:

Economic Capital Modeling: Practical considerations (same as ILA-C121-08)

Valuation of liabilities, 4th edition, Lombardi, ch.16 (excl. 16.6)

Economic Capital for Life Insurance Companies

Economic Capital Overview; Chad Runchey, August 2012

Commentary on Question:

Commentary listed underneath question component.

Solution:

(a) Calculate the Authorized Control Level Risk-Based Capital under the statutory basis.

1. Continued

Commentary on Question:
Candidates generally answered this question correctly. Credit was also granted to the candidates who used ½ ACL in their calculation. There was a typing error with the notation, where the term C_{1a} was used instead of $C_{1o;}$ this did not affect the calculation. The graders also made allowance for this typo by awarding appropriate points where there was indication of confusion caused by the incorrect notation.

Life Covariance Calculation = C0 + C4a + Square Root of [(C1a + C3a)2 + (C1cs + C3c) 2 + (C2) 2 + (C3b) 2 + (C4b) 2]

Also, candidates need to understand ACL is actually the diversified sum, like ACL Is a diversified capital level / amount

C0 = 100, C1a = 80, C2 = 1,800, C3a = 900
ACL = 100 + 0 + Sqr Root [(80 + 900) 2 + (1,800) 2] = 2,149.50

½ of ACL = 1,074.74 also accepted as correct answer

(b)

(i) Identify which basis produced a higher diversification.

(ii) Describe three factors which might drive the basis you identified above to produce higher diversification benefits.

Show your work.

Commentary on Question:
Candidates generally answered Part I correctly.

Candidates were more challenged with Part II. Some candidates only described the ACL formula without analyzing the correct factors that produce higher diversification benefits. Many candidates only listed the factor instead of describing as asked in the question. Few identified the correlation matrix approach as a factor. Candidates who properly identified three factors were able to correctly identify the differences in assumptions and the "one size fits all" approach. Partial credit was given for factors that were described that were not the main drivers but related to the solution.

(i) Statutory diversification benefit = 2,880 – 2,149.5 = 730.5
Economic diversification benefit = 1,638
Economic basis produces the higher diversification benefit

1. Continued

If ½ ACL was used in part A, Statutory Basis was accepted as a correct response

(ii) Factors that might contribute higher diversification benefits:

- Differences in underlying assumptions. Unlike with economic capital, the statutory basis uses assumptions prescribed by the local regulators.
- The statutory basis employed a one size fits all approach which might understate this company's diversification benefits; this common approach reflects an average industry view and may not apply to an individual company on a standalone basis. The economic basis reflects an approach that better reflects the business and underlying risks for a particular company.
- The statutory basis uses a modified correlation matrix approach to calculate the diversification benefits, which assumes correlation is symmetrical between the left and right tail. This might not reflect the true diversification for the industry or a particular company. Economic based calculations may employed copula or self-calibrated correlation matrix approach to better reflect the true diversification benefits between the risk categories.

2. Learning Objectives:

6. The candidate will be able to evaluate various forms of reinsurance, the financial impact of each form, and the circumstances that would make each type of reinsurance appropriate.

Learning Outcomes:

(6a) Describe the considerations and evaluate the appropriate form of reinsurance from the ceding and assuming company perspectives.

(6b) Explain the consequences and evaluate the effect on both ceding and assuming companies with respect to:
- (i) Risk transfer
- (ii) Cash flow
- (iii) Financial statements
- (iv) Reserve credit requirements

Sources:

Life, Health & Annuity Reinsurance, Tiller, 3rd Edition, Ch.6

Commentary on Question:

The goal of this question is to examine the candidate's ability to apply the concept of recapture to reinsurance on a YRT basis. First the candidate is expected to interpret recapture wording from a reinsurance treaty and determine the cash flow effect of a recapture fee. They will need to understand that the net impact of this recapture should be the increase in EV offset by the calculated recapture fee. Candidates will need these net results to evaluate whether to recapture the business or not. To receive full points, candidates will also need to note that EV analysis is only one way of evaluating this business case; there are many other ways such as looking at IRR, capital requirements etc. Candidates do not need to give full descriptions on these other consideration but will need to mentioned it in the answer in order to get full grading points.

For part b, the candidate is challenged to propose treaty wording to limit the risks of recapture from Rock's point of view.

Finally, the candidate is challenged to use their knowledge and explain why recapture is something that a reinsurer may not want to include without a cost.

Solution:

(a) Recommend whether Blue Jay should proceed with the proposed retention limit increase for new business only or on both new business and inforce. Justify your recommendation.

2. Continued

Commentary on Question:
Almost half of the candidates were able to answer this question by 1st calculating the recapture fee and calculate the net EV impact by considering the calculated recapture fee in it. Full points are given to the candidates who included the recapture consideration in the EV impacts and also stated other consideration in the "additional consideration" part of the model solution. Other candidates did not considered the recapture fee and just simply did an EV comparison pre and post increasing intention. Partial marks are given to these answers.

Recapture premium per 1000 Face Amount = 40*(16.5-13.5) + 30*(15-12.5) + 25*(13.5-11) + 18*(11-9) + 13*(73.5-60.5) = 462.5

Recapture premium payable to Rock Reinsurance is 462.5*1000 = 462,500

Change in EV for moving new business retention to 150000 per life is 1.2-1.4 = (0.2) million or a 200,000 decrease in EV

Increase in EV for increasing the inforce retention to 150000 per life is 6.2-5.1 = 1.1 million or 1,100,000 less the recapture premium of 462.500 = 637,500 total increase in EV for the inforce book.
For the total book of business, the increase in EV is 637,500 + (200,000) = 437,500

The increase in EV less the recapture payment is a positive amount, so moving to increased retention will improve the T10 block's profitability to Blue Jay Insurance.

Additional considerations:
Would prefer to leave reinsurance on the new business piece since it increases EV but need to increase retention on new business in order to increase retention on the inforce book.

EV is only one measure, should look at other information to make decision. Other information would include sensitivities, concentration of risk, reserve / capital levels, etc.

(b)

(i) Propose recapture clause conditions that Rock Reinsurance could include to limit the risks associated with Argo's recapture of their business.

2. Continued

(ii) Critique the pricing actuary's comments from Rock Reinsurance's point of view.

Commentary on Question:
(i) As long as candidates list any 4 of the following answers, he or she will receive full grading points. (ii) Candidates will need to mention all these points to get full grading points. Partial points will be awarded as long as candidates put down any points that are on the list. However, we also allocated partial points for candidates mentioning time to recoup initial expense from the reinsurance point of view.

(i)

- Argo may only recapture if Argo increases its maximum retention limits over those currently inforce and only at that time
- All business covered under the treaty must be recaptured, no picking and choosing individual cessions is permitted
- Once initiated, the recapture may not be stopped
- The business may not be recaptured and then ceded to another reinsurer for a period of "XX" years
- No recapture is allowed if Argo is increasing or getting stop-loss reinsurance as a justification for the increase in retention
- Argo must give Rock Re "XXX" days notice prior to its intention to recapture
- If portions of the reinsured policy have been ceded to more than one reinsurer, Argo must allocate the reduction in reinsurance so that the amount reinsured by each reinsurer after the reduction is proportionately the same as if the new maximum dollar retention limits had been in effect at the time of issue.
- Recapture is not available until the end of the "XXX"th policy year

(ii) Recapture is a one-way option; it allows Argo to transfer over the inforce policies according to the stipulations in the recapture clause. Argo could use this option to cap Rock's profit potential by recapturing the policies when the experience is emerging better than expected and realizing the full profits themselves while Argo is left with nothing more than the recapture fee. If experience is poor, Argo could choose not to recapture the policies, leaving Rock and Argo to deal with the higher than expected claims.

2. Continued

The timing of profit emergence as the PfAD's are released is important for recapture. Recapturing the policy before a major release of PfAD may result in the reinsurer not being able to meet their profit objectives if their recapture fee is not sufficient to compensate the foregone profits.

Since recapture is a one-way option that can cap the profits Rock earns, Rock has reason to charge higher YRT premiums for allowing it because it does have a cost if experience emerges more favorably than expected.

3. Learning Objectives:

3. The candidate will be able to understand and analyze the implications of emerging financial and valuation standards.

Learning Outcomes:

(3b) The candidate will be able to describe and assess the impact on reserves, capital, and/or income of emerging developments in International Finance Reporting Standards.

Sources:

Practical Guide to IFRS, PWC, (July 2013)

US: FASB exposure Draft (June 2013), pp. 24-64 (through to paragraph 834-10-50-37) plus Appendix A (pp. 376-39-405)

CAN: Insurance Contracts under IFRS – IASB (June 2013), pp. 13-64.

Commentary on Question:

This question is testing knowledge of IFRS insurance contract liability and its application to a sample insurance contract. Many candidates were able to list the components of IFRS insurance contract and two approaches to determining the discount rate under IFRS. On the application and calculation, only a few candidates were able to get the correct answer.

Solution:

(a)

(i) Describe the three components of an IFRS insurance contract liability.

(ii) You are given the following for a whole life portfolio:

Acquisition Costs (successful efforts)	150
Acquisition Costs (unsuccessful efforts)	200
Expected Present Value of Premiums	5,500
Expected Present Value of Claims	5,000
Assumed Value of Indifferent Fixed Cash Flows (excluding Acquisition Costs)	600

Calculate the components described in (i). Show all work.

(iii) Describe how these components are treated differently under FASB.

3. Continued

(i) Present value of fulfillment cash flows
- Explicit, unbiased and probability weighted estimate of future cash outflows less future cash inflows
- Determined by range of scenario that reflects the full range of possible outcomes

Risk Adjustment
- Measure compensation for uncertainty about amount and timing of cash flows

Contractual service margin
- Unearned profit amortized over coverage period

(ii) Present value of fulfillment cash flows
- = PV Claims + Acquisition Costs (successful and unsuccessful efforts) – PV Premiums
- = 5000 + 150 + 200 – 5500
- = -150

Risk Adjustment
- = 600 – (5500 – 5000)
- = 100

Contractual service margin
- = -PVCF – risk adjustment
- = -(-150) – 100
- = 50

(iii) Present value of fulfillment cash flows
- Unbiased and probability weighted estimate of future cash outflows less future cash inflows
- Determine the mean that considers all relevant information, need not quantify all possible scenarios

Margin
- Expected unearned profit
- Exclude acquisition costs with unsuccessful efforts

(b)

(i) Compare the two approaches to determine the discount rate under IFRS.

(ii) Calculate the IFRS discount rate based on each of the two approaches. Show your work.

3. Continued

Commentary on Question:
Almost all candidates listed and compared the two approaches to determine the discount rate under IFRS. The calculations part was more challenging for candidates. Only a few could apply the concept correctly on the calculation.

(i) Bottom up approach:
- Differences in liquidity characteristics from assets traded
- Adjustment to risk free rate for illiquid nature

Top down approach:
- Identify a discount rate on replicating portfolio
- Deduct elements not included in liability
- Eliminate expected credit losses and market risk premium for credit

(ii) Bottom up approach:
- = 2% + 1.5%
- = 3.5%

Top down approach:
- = 5.9% - 1.2% - 0.7%
- = 4%

(c) For contracts that require the mirroring approach under IFRS:

(i) (*1 point*) Describe the criteria that would qualify contracts for this approach.

(ii) (*2 points*) Explain the measurement and decomposition of cash flows that is required.

Commentary on Question:
Generally, only a few candidates were able to identify the criteria (passing the risk of return to the policyholder) for qualifying contracts for the mirroring approach. Even fewer candidates were able to decompose fulfilment cash flows into three components. Many candidates mistakenly answered the question in terms of the mirroring approach for reinsurance.

(i) Variable cash flows depend on underlying items where entity required to hold underlying items.
Entity does not bear the risk of the return on underlying items.

(ii) Decompose cash flows into three components:
- Variable cash flows: measure by reference to carrying value of underlying items

3. Continued

- Indirectly varying cash flows: measurement according to building block approach
- Fixed cash flows: measurement according to building block approach

4. Learning Objectives:

1. The candidate will understand financial statements and reports of Canadian life insurance companies and be able to analyze the data in them.

7. The candidate will understand the professional standards addressing financial reporting and valuation

Learning Outcomes:

(1e) Describe, use and recommend methods for performing reviews of reserves.

(7d) Explain the actuary's professional responsibilities to stakeholders including obligations under Sarbanes-Oxley.

Sources:

LFV-102-09: Actuarial Review of Reserves and Other Annual Statement Liabilities

Actuarial Aspects of SOX 404, Financial Reporter, December 2004

Commentary on Question:

This question tests the candidate's understanding of SOX 404 and the actuarial review process. Most candidates did well on parts (a) and (b), but not so well on part (c).

Solution:

(a)

(i) Describe Burch's management responsibilities under SOX 404.

(ii) Describe the key steps to implementing an effective financial reporting evaluation process within the COSO framework.

Commentary on Question:

Candidates generally did well on this part.

(i) Burch's management responsibilities under SOX 404 are:

- Accept responsibility for effectiveness of ICFR
- Evaluate effectiveness of ICFR using suitable criteria
- Support evaluation with sufficient evidence, including documentation
- Present written assessment of effectiveness of ICFR as of end of most current year

(ii) The key steps to implementing an effective financial reporting evaluation process within the COSO framework are:

- Plan implementation
  - Determine scope and approach
  - Identify timeline and resources
- Document design of controls
- Evaluate and document effectiveness of controls

4. Continued

- Communicate and correct any deficiencies discovered during evaluation
- Prepare management's written assertion about effectiveness of controls
- Prepare information needed by independent auditor to audit controls

(b) Critique Ben's advice.

Commentary on Question:
Most candidates were able to draw the right conclusions on whether Ben's advice is appropriate or not, though some candidates did not write down enough information to support their conclusions.

Tom should reference the prior review. The prior review serves as a guide to planning the current review. It identifies where errors were made in the past and where certain components of the current review should be focused. It also serves as a guide to structuring the current report.

Tom should not reach out directly to individuals from different departments. Burch should choose one counterpart through whom all questions and answers funnel. One counterpart helps assure all information provided to Tom is consistent.

Tom should make sure all issues are documented and resolved. Immateriality can be a form of resolution. Materiality threshold should be decided in advance of review. Tom should also verify that the aggregate amount of immaterial items does not result in an inappropriate bias.

(c)

(i) Compare and contrast simple random sampling with stratified random sampling.

(ii) Determine whether or not you agree with Ben's suggestion by calculating and comparing the standard deviation of the sample mean under both approaches. Show all work.

Commentary on Question:
Candidates generally did very well on the first part. On the second part, most candidates struggled with the required statistical calculations and did poorly as a result.

(i) In simple random sampling, each element of the population has the same probability of being chosen.

4. Continued

In stratified random sampling, the population is divided into smaller groups (known as strata), and a simple random sample is taken from each stratum in proportion to the stratum's size compared to the population. Stratified random sampling improves the accuracy of a statistical estimate if the characteristic being estimated and the characteristic(s) used to define the strata are not statistically independent.

(ii) Standard deviation of sample mean using simple random sample (STDSM Simple)
STDSM Simple = (Var(X) / n)^(0.5) = ((E(X^2) - (EX)^2) / n)^(0.5)
Group A: E(X^2) = 20^2 + 80^2 = 6,800
Group B: E(X^2) = 37^2 + 175^2 = 31,994
Group C: E(X^2) = 24^2 + 96^2 = 9,792
E(X^2) = (0.2 x 6,800) + (0.3 x 31,994) + (0.5 x 9,792) = 15,854.20
E(X) = (0.2 x 80) + (0.3 x 175) + (0.5 x 96) = 116.5
STDSM Simple = ((15,854.20 - (116.5)^2) / 100)^(0.5) = 4.78

Standard deviation of sample mean using stratified random sample (STDSM Stratified)

STDSM Stratified = ((Weighted-average variance of the strata) /n)^(0.5)
= (((0.2 x (20)^2) + (0.3 x (37)^2) + (0.5 x (24)^2)) /100)^(0.5) = 2.79

STDSM Stratified is less than STDSM Simple, so Ben is correct.

5. Learning Objectives:

2. The candidate will be able to understand and apply valuation principles of individual life insurance and annuity products issued by Canadian life insurance companies.

Learning Outcomes:

(2b) Recommend appropriate valuation assumptions.

Sources:

LFV-634-13: CIA Consolidated Standards of Practice – Section 2100, 2300, 2500

CIA Educational Note: Expected Mortality: Fully Underwritten Canadian Individual Life Insurance Policies: July 2002

Final communication of a promulgation of prescribed mortality improvement rates, July 2011

CIA Educational Note: Approximations to the Canadian Asset Liability Method (CALM): November2006

CIA Use of Actuarial Judgment in Setting Assumptions and Margins for Adverse Deviations, November 2006

Commentary on Question:

Commentary listed underneath question component.

Solution:

(a) List the principles that should be considered when setting best estimate assumptions and margins for adverse deviations (MfAD) for the purpose of valuation.

Commentary on Question:

Candidate's performance is not as good as expected and many of them do not show good understanding of the principles which should be considered when setting best estimate assumptions and margins for adverse deviations for the purpose of valuation.

In setting best estimate assumptions and margins for adverse deviations the following principles would be considered:

- While assumptions and margins for adverse deviations are often based on historical data the appropriateness of these are justified on a prospective basis.
- Maintaining an assumption or a margin for adverse deviations is subject to the same level of scrutiny as implementing a change.
- The change in policy liabilities would not reflect a change in past experience that the actuary has sufficient reason to believe is temporary.

5. Continued

- The change in expected assumption would be supported with evidence that indicates a need for change.
- The change in the margin for adverse deviations would be supported by a change in the assessment of the level of risk.
- The change in assumption would not be manipulative. Methods to determine assumptions are predetermined and are not subject to irregular or inconsistent application over time.

(b) Assess the appropriateness of each assumption giving consideration to the CIA Standards of Practice. Recommend changes where applicable.

Commentary on Question:
Most candidates show a fairly good understanding of the Lapse and Mortality assumptions. However, they are not able to demonstrate a complete understanding for some of the valuation assumptions such as Term of Liabilities and Future Mortality Improvements.

Term of Liabilities
The term of a policy's liabilities is not necessarily the same as the contractual term of the policy.
The term of the liabilities of any other insurance contract ends at the earlier of

- the first renewal or adjustment date at or after the balance sheet date at which there is no constraint, and
- the renewal or adjustment date after the balance sheet date that maximizes the insurance contract liabilities.

The adjustment is contractually constrained as the premiums are guaranteed at renewal.

KJO life should calculate the reserves assuming that the term of its liabilities ends at each renewal and if the reserves are lower after the renewal, that renewal should not be included in the term.
KJO life should regularly review the term assumption as a change in the outlook such as mortality or lapse may provoke a change in the term assumption.

The term assumption of KJO life includes the first renewal but not renewals after the second which seems not intuitive. It is possible that the renewal premiums are high enough that with future mortality improvements even considering anti-selective lapse, that the reserve taking the first renewal into account is higher than the reserve taking the second renewal into account. In this case, this term assumption is appropriate.

5. Continued

Mortality
For the details of what the mortality assumption depends on, candidate may refer to LFV-634-13: CIA Consolidated Standards of Practice – Section 2350.05.

To show an adequate understanding of the appropriateness of the mortality assumption of KJO life, we would expect candidate to cover:

CIA Table varies by issue age, duration (select & ultimate table), smoker status and it is appropriate for KJO life to use the most recent CIA tables. It is also appropriate to adjust the table to reflect underwriting and for standard vs. preferred non-smokers.

KJO life should ensure that the table is also adjusted for policy size and anti-selective lapses. Anti-selective lapse is a tendency of policies on healthy insured lives to lapse and unhealthy insured lives not to lapse, resulting in deterioration in the insurer's mortality experience. It is not clear, but the premium likely increases at renewal leaving healthy lives to go search for cheaper insurance elsewhere. The renewal commissions end at year 5 which may result in encouraging this practice.

Data which emerges from both industry and company experience studies is often several years old at the valuation date. KJO life should adjust the study results to reflect trends in mortality (i.e., mortality improvement or deterioration) as appropriate.

Future Mortality Improvement
It is appropriate for KJO life to apply an assumption for FMI.
The Best Estimate Future Mortality Improvements promulgated by CIA is as follows:
Annual base mortality improvement rates should vary by attained age as follows: 2% from age 0 to 40, decreasing linearly from 2% to 1% from age 40 to 60, 1% from age 60 to 90, and decreasing linearly from 1% to 0% from age 90 to 100. The annual base mortality improvement rates are the same for both females and males, and for both smokers and non-smokers.

Lapse
For the details of what lapse assumption depends on, candidate may refer to LFV-634-13: CIA Consolidated Standards of Practice – Section 2350.19.

To show an adequate understanding of the appropriateness of the lapse assumption of KJO life, we would expect candidate to cover:

5. Continued

It is correct for KJO life to vary lapses by duration. Patterns of decreasing lapses right before renewal followed by higher lapses at / just after renewal also makes sense and hints at possible anti-selective lapses.

The insurer's withdrawal experience would be pertinent and usually credible. Lapse assumption should be based on own company's actual experience (ie. lapse study) unless it is not available for new products.

Interest
This description looks close to describing the Canadian Asset Liability Method (CALM) Best Estimate Interest Rate scenario. However, KJO life should change the interest rate assumption by using CALM. The actuary would solve for a non-level equivalent interest rate vector that discounts the liability cash flows to the CALM GAAP policy liabilities (determined from the selected adverse scenario). The best estimate valuation interest rate assumption would be one that equates the present value of the liabilities to the CALM best estimate scenario reserve.

Expenses and commissions
The actuary would select a best estimate assumption that provides for the expense of the relevant policies and their supporting assets, including overhead.
The insurer's other expense is irrelevant to the valuation of insurance contract liabilities, which would include

- expense related to policies that, for the relevant policies, was incurred before the balance sheet date, such as marketing and other acquisition expense, and
- expense not related to the relevant policies and their supporting assets, such as investment expense for the assets that support capital.

First year commissions and assumption for acquisition expenses are irrelevant to the valuation of insurance contract liabilities because they were incurred before the balance sheet date.

It is appropriate to set the assumption of expense per policy based on expense study completed annually.

Expense assumption would provide for future expense inflation consistent with that in the interest rate scenario. However, it is not clear the inflation rate of 2.7% per year is consistent with that in the interest rate scenario.

Taxes
The margin for adverse deviations would be zero.

The 33% income tax assumption is likely the continuation of the current regime. It appears as if there is an expectation of decreasing tax rates in the future which should not be included unless a virtually definitive decision from the government to change the tax regime.

5. Continued

The 2.25% premium tax rate is likely developed as a weighted average tax rates and therefore should be appropriate.

6. Learning Objectives:

5. The candidate will understand the Risk Based Capital (RBC) regulatory framework and the principles underlying the determination of Regulatory RBC and Economic Capital.

Learning Outcomes:

(5a) Describe the MCCSR/RBC regulatory framework and the principles underlying the determination of Regulatory RBC.

(5b) Compute MCCSR for a life insurance company, including:
- (v) Identification of significant risk components
- (vi) Identification of specialized product MCCSR requirements
- (vii) Interpreting results form a regulatory perspective

Sources:

LFV-606-13: OSFI: Guideline Minimum Continuing Capital and surplus Requirements for Life Insurance Companies 1-5, 8 (2012)

LFV-636-13: OSFI Guideline A-4 internal target capital ratio for ins companies

Commentary on Question:

Candidates did relatively well on part c). For part a), most candidates were not able to identify C-3 risk was missing and elaborate on it. For part b), most candidates were able to list the criteria but not further comment on why the product does not qualify as a qualifying participating product. For part d), most candidates failed to fully "critique" the plan as required by the question.

Solution:

(a) Evaluate the above approach to the determination of capital.

Commentary on Question:

Most candidates were able to demonstrate their understanding of mortality and lapse risk, and mentioned companies may not "cherry pick" the credit rating assessments. Very few candidates identified C-3 risk was missing and even fewer candidates elaborated on the absence of this risk.

Asset Default (C-1) Risk

- companies may not "cherry pick" the assessments provided by different rating agencies
- for the most part, the on-balance sheet assets must be valued at their balance sheet carrying amounts
- some exceptions for loans & debt securities carried at fair value (amortized cost)

6. Continued

Mortality Risk

- this is no longer the correct method for determining capital for mortality risk.
- mortality risk is the sum of components for volatility and catastrophe risk
- full points are given if the formula for volatility and catastrophe is described with reasonable accuracy

Lapse Risk

- do take difference in policy liabilities at different lapse mfads
- lapse mfad is increased 6.5 percentage points if qualifying participating, and 13 percentage points if not
- for example, if the lapse mfad on the par policy is 5% then it is increased to 11.5%

Changes in Interest Rate Environment (C-3) Risk was omitted

- this is the risk from asset depreciation from shifts in interest rate
- factor based on guaranteed period remaining on premiums or credited interest multiplied by policy liabilities
- if there are no CSV's in the next 5 years then the factor would be halved

Minimum Capital Requirement

- correct that the minimum capital requirement is 120% of the sum of capital requirements
- there is a supervisory target capital ratio of 150% intended to cover risks in the minimum capital requirement plus provide a margin for risks not included in the calculation such as strategic and reputational risk

(b) Determine whether this product is a "qualifying participating product" based on the criteria outlined in the MCCSR guidelines. Justify your answer.

Commentary on Question:
Most candidates were able to identify the criteria for qualifying participating product, and determined this product does not qualify. Where some candidates went wrong was they were not able to further comment on why the product does not qualify. For example, some candidates were not able to identify the interest and expense dividends as not meaningful, and the dividend policy should not be only available upon request.

Criteria #1: The policy must pay meaningful dividends

- the experience with respect to the risk component should be explicitly incorporated in the dividend
- for this product, the mortality and lapse dividends are meaningful, but the interest and expense dividends are not => does not fully meet the criteria

6. Continued

Criteria #2: The company's participating dividend policy must be publicly disclosed

- in this case the dividend policy is only available upon request to advisors and policyholders => does not fully meet the criteria

Criteria #3: The company must review the policyholder dividend scale at least once a year

- in this case the dividend scale is reviewed every three years => does not meet the criteria

(c) Identify which of the following statements pertain to each level:

(i) The level of capital, based on a company's own risk and capital adequacy assessment process, is necessary to cover the risks in the capital tests as well as all other risks of the insurer.

(ii) If the insurer's capital ratio were to approach or fall below this level, OSFI would be concerned about the ongoing viability of the insurer.

(iii) Target capital ratio is 150% of the calculated capital.

(iv) Level of capital which would provide adequate time for management to resolve financial concerns that arise while minimizing the need for OSFI intervention.

(v) Level of capital necessary to cover the risks specified in the capital test.

(vi) Insurers are expected to operate above this level of capital.

Commentary on Question:
Candidates did relatively well on this part, demonstrating a good understanding of the different capital levels.

(i) Internal
(ii) Minimum
(iii) Supervisory
(iv) Internal
(v) Minimum
(vi) Internal

(d) You are given the following plan for reviewing and revising ABC's Internal Target Capital Ratio:

6. Continued

- Review the capital plan and associated stress testing.
- Verify that scenarios include extreme events that could adversely affect the company.
- Determine the probability of falling below the internal target capital.
- The internal target should be set so that the company has the ability to access capital (through capital markets) to address financial requirements as they emerge.
- Write a report to the board describing the determination and review of the internal target.
- Notify OSFI if there is a change in the Internal Target Capital Ratio.

Critique the above plan.

Commentary on Question:
Most candidates were able to make general comments or list criteria for a good plan so only minimum credit would be given. Most candidates failed to fully "critique" the plan as required by the question.

Bullet point #1
- good point=> should also review capital plan, also review business planning, DCAT, and other reverse-engineered scenarios

Bullet point #2
- good point => should include scenarios that are exceptional but plausible events
- should consider all possible events or changes in market conditions that could adversely impact the insurer

Bullet point #3
- should determine the probability of falling below each of the three levels of capital requirements , not just the internal target capital level

Bullet point #4
- correct to operate at a level of capital that provides it with the continued ability to access capital (through capital markets) to address financial requirements as they emerge

Bullet point #5
- good since the board is responsible for setting the internal target
- report should enable the board to make an assessment of the overall result & appropriateness of the internal target

Bullet point #6
- appropriate

7. Learning Objectives:

6. The candidate will be able to evaluate various forms of reinsurance, the financial impact of each form, and the circumstances that would make each type of reinsurance appropriate.

Learning Outcomes:

(6a) Describe the considerations and evaluate the appropriate reinsurance form from the ceding and assuming company perspectives.

(6b) Explain the consequences and calculate the effect on both ceding and assuming companies with respect to:

- (iv) Risk transfer
- (v) Cash flow
- (vi) Financial statements
- (vii) Reserve credit requirements
- (v) Tax

Sources:

LFV-632-12: OSFI Guideline B-3: Sound Reinsurance Practices and Procedures

Report of the CIA Task Force on the Appropriate Treatment of Reinsurance

Accounting for Reinsurance Contracts under International Financial Reporting Standards

Commentary on Question:

This is a tough question which combines several different topics related to reinsurance. Students in general did poorly on this question.

Solution:

(a) Gamma is evaluating a prospective reinsurance contract to cede the entire segregated fund block to Delta Re. Your broker has already performed a detailed analysis on the financial strength of Delta Re. To evaluate this reinsurance contract the Valuation Actuary relies entirely on the Broker's report as well as an external rating agency's assessment. Critique this approach.

Commentary on Question:

Students did well on this sub-question and got the idea of not entirely relying on the third party. However, to get the full credit, they also need to emphasize that the FRI retain the ultimate accountability for the outsources.

Disagree.

In accordance with Guideline B-3, in the evaluation of its current and prospective reinsurance counterparties, a FRI should generally not rely solely on third parties, including rating agency assessments or broker analysis and recommendations.

7. Continued

Prudent practice dictates that the FRI should, to an extent proportional to the importance of such counterparty, conduct its own due diligence on the financial strength and capabilities of all reinsurance counterparties.

FRI can outsource business activities (due diligence function); However, any significant outsourcing of this due diligence function to a third party must be in accordance with OSFI's Guideline B-10: Outsourcing of Business Activities, Functions and Processes. The FRI retain ultimate accountability for all outsourced activities

(b)

(i) Describe the mirror reserving approach.

(ii) In the US, a few states require mirror reserving for statutory reserves. Explain why mirror reserving is not appropriate for life insurance in Canada

Commentary on Question:
Students had trouble understanding the concept of mirror reserving and explaining the reason of inappropriateness in Canada. The main point is that the US uses a factor based method but Canada uses a principle based method.

(i) The mirroring concept is based on the premise that both the cedant and the reinsurer would have exactly the same view of both the risk(s) being transferred and the value of those risk(s).

Conceptually speaking, ceded reinsurance liabilities determined by the cedant would be substantially similar to assumed reinsurance liabilities determined by the reinsurer for the same contract.

(ii) For Life reinsurance in Canada, in particular individual business, mirroring is likely to be inappropriate.

Each actuary is responsible for setting assumptions for all contingencies and for all cash flow payments based on his or her own best estimate assumptions.

These best estimate assumptions are based at least, in some part, on each company's experience and the actuary's view of future experience. Differences can, and would, certainly occur for mortality, morbidity, lapse, expense and investment income assumptions.

7. Continued

Expenses incurred and investment income earned by the cedant and the reinsurer will be different resulting in different valuation assumptions being used by each actuary.

What may not be obvious is there are differences in mortality, morbidity and lapse assumptions as well.

In the cedant's case, experience is based on its own observed mortality, morbidity and lapses, each of which is influenced by its underwriters, sales force, and product characteristics.

The reinsurer's experience, however, will be based on the concept of pooling of risks across companies. The pooled experience that contributes to the assumptions of the reinsurer can, and likely will, be different from that of the cedant.

As a result, legitimate differences do occur between the ceded and assumed reserves due strictly to assumption differences. Even if by coincidence the best estimate assumptions and margins for adverse deviations are similar enough that the initial ceded and assumed liabilities are close enough where it is perceived that mirroring is occurring, differences can, and likely will, emerge over time as assumptions or margins are revised to reflect the most recent experience.

(c) Calculate the impact of prudence in financial statements under IFRS4. Show your work.

Commentary on Question:
Most students had difficulty with this part of the question and the performance was poor. They did not realize that the 800 net insurance liabilities here mean padded liabilities. In addition, students were expected to show the margin of prudence and also the surplus through "impact of prudence".

There are two ways to answer this question.

Method 1:
Asset = 1000
Gross liabilities (best estimate) = 800 / (1 +10%) = 727
Margin for prudence = 800 - 727 = 73
Total Ceded liabilities = 800 * 70% = 560
Ceded liabilities (best estimate) = 560 / (1 +10%) = 509
Ceded Margin for prudence = 560 - 509 = 51
Total liabilities = 800 - 560 = 240
Surplus = 1000-240=760

7. Continued

Method 2:
Financial Reporting under IFRS 4 should be on gross basis
Total Asset = 1000 + 509 = 1509
Gross liabilities (best estimate) = 800 / (1 +10%) = 727
Margin for prudence = 73 + (-51) = 22
Total Ceded liabilities = 727 + 22 = 749
Ceded reinsurance reported in Asset (best estimate) = 509
Total liabilities = Total Ceded liabilities = 749
Surplus = 1509-749=760

8. Learning Objectives:

2. The candidate will be able to understand and apply valuation principles of individual life insurance and annuity products issued by Canadian life insurance companies.

Learning Outcomes:

(2a) Describe valuation methods

(2c) Calculate liabilities for life and annuity products and their associated riders

Sources:

CIA Educational Note: Future Income and Alternative Taxes excluding Appendix D (December 2012)

Commentary on Question:

This question tests candidates' understanding of future income and alternative taxes, including the ability to demonstrate knowledge of the concept through a simplified calculation.

Solution:

(a)

(i) Explain the purpose of setting up future tax liabilities.

(ii) Define the two classifications for differences in projected GAAP and Taxable income. Give three examples of each.

Commentary on Question:

Candidates did well on this part: most of them were able to explain the purpose of future tax liabilities and provide correct examples for permanent/temporary difference

(i)

- Prior to adoption of IFRS in Canada, AcG-9 addressed that insurance liabilities would be adjusted for the effect of both tax timing differences and permanent differences on cash flows available to satisfy policy obligations
- AcG-9 was later replaced by IFRS4 which requires the continuation of Canadian GAAP accounting until the completion of IASB's second phase of the development of standards specific to insurance contracts
- Projected tax cash flows and GAAP cash flows may be different, which can be recognized by setting up future tax liabilities

(ii) A temporary difference (i.e., timing difference) is one for which there are period-to-period differences between tax and GAAP income which are fully offset (i.e., reversed) over the lifetime of the item giving rise to the difference. Examples of temporary differences are:

8. Continued

- Differences between GAAP insurance contract liabilities and the corresponding tax liabilities;
- Real estate—valued at depreciated cost for tax purposes, market value or amortized cost for GAAP purposes;
- Derivative instruments, e.g., forward starting swaps—valued at cost for tax purposes and at market for GAAP purposes;
- Accident and sickness unpaid claim reserves;
- Incurred but not reported (IBNR) reserves for both individual and group life and accident and sickness business;
- Run-off of pre-2007 deferred realized gains and losses from specified debt obligations (SDO);
- Policy loans; and
- Deferred acquisition cost (DAC) amortizations.

For business written in non-Canadian jurisdictions, there may be other differences between GAAP and taxable income.

A permanent difference is one where differences in income in reporting periods between tax versus GAAP are not fully offset (i.e., reversed) over the lifetime of the item giving rise to the difference. Examples of permanent differences are:

- Dividends from Canadian stocks (which are not taxable in the hands of the insurer);
- Net capital gains on real estate (only a percentage of which is included in taxable income);
- Income from Canadian subsidiaries;
- Non-deductibility of investment income tax (IIT) in Québec;
- Some expenses non-deductible in taxable income; and
- Non-taxable investment income on assets outside of a Canadian investment fund.

(b) You are the actuary for a Canadian Life Insurance company where the tax reserves being reported are lower than the Maximum Tax Actuarial Reserve (MTAR). Describe two acceptable approaches for treating this difference for the purposes of calculating future tax liabilities as per the Educational Note.

Commentary on Question:
Part (b) appeared to be challenging, as most candidates either left it blank or described CALM method which wasn't what this question was about. The candidates who got some credit apparently read the particular section in the paper, but weren't able to give enough details for full credit

8. Continued

The following approaches are in use:

- Projected taxes associated with the reversal of underclaims and the amortization of LCFs are not insurance contract-related.
  - This approach is consistent with the view that if MTARs were equal to GAAP insurance contract liabilities, there would be no need for the actuary to make provision in the valuation for temporary differences between GAAP insurance contract liabilities and tax liabilities.
  - This methodology is simple, practical, and easy to disclose. It treats both the LCF and the underclaim as past events. The GAAP insurance contract liability is calculated prospectively not retrospectively. The future tax asset associated with the LCF or underclaim is deemed to belong to surplus.
  - The underclaims and LCFs are effectively ignored in the GAAP insurance contract liability valuation.
- The original source of the underclaim/LCF determines whether the associated projected taxes are insurance contract-related or not.
  - If the underclaim or the LCF arose because of an insurance contract-related item, then the projected reversal of the underclaim or amortization of the LCF is considered insurance contract-related. The actuary would assess whether the underclaim and LCF, or portions thereof, are insurance contract related. Consideration would be given to the company's tax allocation policy in determining which business segment "owns" the underclaim or the LCF (i.e., which business segment is entitled to realize the benefit when the underclaim or the LCF is utilized).
  - An underclaim can be thought of as an integral part of an LCF, since underclaims are typically used to manage expiry of loss carry forwards.
  - This methodology may be complicated to apply in a consistent and appropriate manner, particularly where underclaims and LCF are managed at a high level (e.g., entity level). Its use implies the future tax asset associated with the insurance contract-related portion of the underclaims or LCF belongs to the liability segment.
  - This methodology requires the actuary's understanding of the company's tax position and tax management strategies to model the prospective impact of the underclaim and LCF position.

Based on company circumstances, each of these approaches can be reasonable, and consistent with current standards of practice. However, it would not be appropriate to apply the approaches inconsistently; for example, by choosing different approaches by block of business.

8. Continued

(c) Assume that reported tax reserves are equal to the Maximum Tax Actuarial Reserve, and that the value of the assets backing the liabilities under the GAAP basis are the same as under the Tax basis. Calculate the following for the 2013 financial year:

(i) Net Income After Tax
(ii) Accounting balance sheet provision for future differences between GAAP and Tax income

Commentary on Question:
Most candidates struggled with this question. Many of them either did not receive any credit or received some small amount of credit for listing 1 or 2 formulas correctly. Very few candidates got both questions right.

Insurance Contract Liability Before Carve-Out (ICLBCO) = ICLIFT + DFTP
For 2013 = 2200 - 100 = 2100
For 2012 = 2347 - 78 = 2269

Change in ICLBCO = -169
2013 Net Income Before Tax = Cashflow + Net Investment Income - Change in ICLBCO
= -100 + 0 + 169 = 69

2013 Taxable Income = Cashflow + Net Investment Income - Change in MTAR
= -100 + 0 - (1900 - 2100) = 100

2013 Tax Payable = 100 * .35 = 35

2013 Net Income After Tax = Income Before Tax + Tax Payable + Change in Future Tax Liability
= 69 - 35 + (100 - 78) = 56

Future Tax Carveout = Tax Rate * (MTAR - ICLIFT - DFTP) / (1 - Tax Rate)
= .35 * (1900 - (2200 - 100)) / (1 - .35)
= -107.69

Future Tax Liaiblity appears on the balance sheet for the provision

Same as the Future Tax Carveout = -107.69

9. Learning Objectives:

2. The candidate will be able to understand and apply valuation principles of individual life insurance and annuity products issued by Canadian life insurance companies.

Learning Outcomes:

(2a) Describe valuation methods.

(2c) Calculate liabilities for life and annuity products and their associated riders.

Sources:

CIA Educational Note: Considerations in Valuation of Seg Fund Products –November 2007

Commentary on Question:

This question required candidates to compare and contrast valuation methods for segregated fund contracts where acquisition expenses are being amortized. Also, candidates were required to calculate additional margin and time 0 aggregate liabilities.

Candidates appeared to experience significant difficulties in performing the calculations required in parts (b) and (c). Specific comments are set out below.

Solution:

(a) Compare the Bifurcated Approach and the Whole Contract Approach, commonly used to value policy liabilities for segregated funds, with regard to:

(i) The allocation of revenue.

(ii) The write down of the allowance for acquisition expenses (AAE) and the change in policy liabilities as markets move down.

Commentary on Question:

For part (a)(i), most candidates recognized allocation of revenue is fixed under the Bifurcated Approach, but not so for Whole Contract Approach. Candidate performance was significantly stronger for part (a)(i) than for part (a)(ii) A few candidates confused Bifurcated Approach with the Whole Contract Approach. Some candidates commented on subsequent rise in markets even though the question only asked for the effect of dropping markets

(i) The allocation of revenue

- Bifurcated Approach
  - Revenue allocation to guarantee based on additional price charged for guarantee
  - All other revenue available to amortize AAE
  - Allocation between guarantee and AAE does not change over time

9. Continued

- Whole Contract Approach
  - Future revenues first allocated to AAE to ensure recoverability
  - Any remaining revenue goes to support guarantee
  - Allocation between guarantee and AAE will change over time

(ii) Write down of acquisition expenses (AAE) and the policy liability change as markets move down

- As markets move down, liability for guarantees increases under both approaches
- The change in the guarantee liability is larger under the Whole Contract Approach than under Bifurcated Approach, since revenue moves from guarantee funding to the AAE amortization
- At all times, total liability under Whole Contract Approach is less than or equal to the total liability under Bifurcated Approach. This is because the WCA recognizes all revenue.
- The liability for the guarantee remains negative longer under Whole Contract Approach
- WCA will defer possible write-down of acquisition expenses because all available revenue is allocated to the AAE
- When acquisition expenses must be written down under WCA, all revenue is allocated to AAE, leaving none for the guarantee
- Once the AAE has been completely written down under the Bifurcated Approach and the liability for the guarantee is positive, both methods will produce the same liability

(b) Calculate the additional margin embedded in the liability using the Bifurcated Approach. Show all work.

Commentary on Question:
Some candidates applied Whole Contract Approach instead of the Bifurcated Approach. Some candidates incorrectly identified the booked liabilities for the guarantee and the acquisition expenses (AAE)

- Booked liabilities for the guarantee = max[0, liability at CTE (80)] = max (0,45) = 45
- Margin for the guarantees = booked liability – liability at CTE(0) = 45 – (-25) = 70
- Booked liabilities for the AAE = liability at CTE (60) = -35
- Margin for the AAE = booked liability – CTE(0) = -35 – (-50) = 15
- Total margin = margin for guarantee + margin for AAE = 70 + 15 = 85
- PfAD on guarantees = booked liability – max[0, CTE(0)] = 45 – max(0,-25) = 45 – 0 = 45
- PfAD for AAE =0, since AAE cannot be written up from current level
- Total PfAD = PfAD for guarantees + PfAD for AAE = 45 + 0 = 45

9. Continued

- Additional margin = Total margin – total PfAD = 85 – 45 = 40

(c) Calculate the time 0 aggregate liability for the guarantees using the recommended approach in the CIA Educational Note "Considerations in Valuation of Segregated Fund Products, November 2007." Show all work.

Commentary on Question:
Most candidates evaluated the liability for term=3 but did not evaluate terms 0, 1, and 2. Some candidates did not combine the cohorts, as set out in the recommended approach. Some candidates computed only the present value of fee income or only the present value of benefit payments

- Liability can be aggregated at segment level as long as term determined that maximizes liability at each duration
- Liability at time 0:
  - For term = 3: 1,000,000/1.05^2 – (350,000/1.05^2 + 450,000/1.05 + 450,000) = (289,002)
  - For term = 2: 1,000,000/1.05^2 – (450,000/1.05 +450,000) = 28,458
  - For term = 1: 0 – 450,000 = (450,000)
  - For term=0: 0
- Liability = maximum over all terms = 28,458

10. Learning Objectives:

4. The candidate will be able to explain and apply the methods, approaches and tools of financial management and value creation in a life insurance company context.

Learning Outcomes:

(4a) Describe and calculate performance measures.

(4d) Apply methods of valuation to business and asset acquisitions and sales. This includes explaining and applying the methods and principles of embedded value.

(4e) Explain and apply methods and approaches of surplus management and earnings management.

Sources:

Embedded Value: Practice and Theory, SOA, Actuarial Practice Forum, March 2009

LFV-106-07: Merger and Acquisitions, Chapter 4 (Sections 4.1-4.6)

Commentary on Question:

Commentary listed underneath question component.

Solution:

(a) Describe three ways in which embedded value differs from actuarial appraisal value.

Commentary on Question:

Part (a) is designed to test knowledge of embedded value and actuarial appraisal value. Most candidates were able to list the key aspects and detail the difference.

1. AAV usually assigns a value to the contribution of New Business. EV does not.
2. AAV typically calculate using a higher discount rate than EV.
3. EV uses expense assumptions that are typically more company specific.
4. AAV reflect market expense expectations.

(b) Assume no change in future assumptions.

(i) Determine the embedded value at 31 Dec 2013. Show your work.

(ii) Explain what the impact on Embedded Value might be with respect to each of the following events:

- An increase in the target MCCSR Ratio from 200% to 225% during 2013.

10. Continued

- A valuation basis change to the mortality assumption which releases reserves.
- A transaction which replaces some of the equity capital with debt capital paying 10%.

Commentary on Question:
Part (b) was intended to test the candidate's knowledge of how the value of a company might be established along with the uses of embedded value. In general, this was a poorly answered question by candidates. Most candidates demonstrated a knowledge of the components within the formula for IBV and ANW. Some candidates lost points for errors in the ANV formula and a few lost points by not including Non-admitted assets. But only a few candidates calculated PV values correctly.

Use the values given to determine the PV of cost of capital for December 31, 2012
Embedded Value (EV) = Adjusted Net Worth (ANW) + Inforce Business Value (IBV)
ANV = Required Capital (RC) + Free Surplus (FS) + Non-admitted Assets
Include Non-admitted Assets since these are realizable.
= 1,400 + 500 + 100 = 2,000

IBV = PV Book Profits (PVBP) - PV Cost of Capital (PVCoC)
'= 4000 - PV CoC

PVCoC = PVBP + ANV - EV = 1,000
PVCoC = 4,000 + 2,000 - 5,000 = 1,000

Start with PV values at year end 2012 and back out the 2013 portion, and accrue with one-year's interest
PVBP (2013) = (PVBP (2012) - Book Profit (2013)) (1 + Interest Rate)

Use expected after-tax profit as Book Profit (2013) since that was basis for EV from 2012 Year End
Interest rate is the Risk Discount Rate (RDR) = 15%

PVBP (2013) = (4,000 - 1,000 / (1.15) ^.5) (1.15) = 3,528

Start with PV CoC from year end 2012 and back out the 2013 portion, and accrue with one year's interest
PV CoC (2013) = (PV CoC (2012) - Cost of Capital (2013)) * (1 + Interest Rate)

Cost of Capital = Required Capital at beginning of year * (RDR - it)
= 1,400 * (15% - 5%) = 140

10. Continued

PV CoC (2013) = (1,000 - 140) * (1.15) = 989

Inforce Business Value = PVFP - PV CoC = 3,528 - 989 = 2,539

Adjusted Net Worth = RC + FS + Non-admitted Assets
Required Surplus = RC (2012) + Increase in RC (2013)
= 1,400 + 400 = 1,800
FS (2013) = FS (2012) + Distributable Earnings (2013)
= 500 + 400 = 900
ANW (2013) = 1,800 + 900 + 100 = 2,800

EV(2013) = IBV (2013) + ANW (2013) = 2,539 + 2,800 = 5,289

An increase in the target MCCSR Ratio 200% to 225%

- No effect on the EV since the target ratio doesn't come into play
- Required surplus is based on reported amount, not target

A valuation basis change to mortality assumption which releases reserves.

- Expected book profit in the future would be lower.
- Free surplus would be higher.
- To the extent that the valuation rate differs from the risk discount rate, there is a change in EV.

A transaction which replaces some of the equity capital with debt capital with a rate of 10%.

- In some jurisdictions, debt is not considered in EV calculations
- Interpretation is that RDR is the equity cost of capital
- This interpretation was adopted by Canadian EV even though certain qualifying debt can fund capital req.
- Lowers the RDR or Weighted Average Cost of Capital, lowers the PV of cost of capital. It would raise the Embedded Value

11. Learning Objectives:

7. The candidate will understand the professional standards addressing financial reporting and valuation

Learning Outcomes:

(7d) Explain the actuary's professional responsibilities to stakeholders including obligations under Sarbanes-Oxley.

Sources:

CIA Educational Note: Guidance on Fairness Opinions Required Under the Insurance Companies Act Pursuant to Bill C-57 (2005)

Commentary on Question:

The question is testing if students understand the concept of "adjustable" products as per the Educational Note, and their ability to apply this concept to real-life product examples. In general, students did well on questions (i) to (v), and had trouble on questions (vi) and (vii) since these did not have clear-cut answers, and the student had to give further commentary to opine one way or another.

To get full credit for each question, the student needed to "justify" the judgment, and also explain the conditions to the judgment where applicable.

Solution:

Determine which of the following products should be considered "adjustable" according to the terms of Bill C-57. Justify your responses.

(i) A whole life policy whose policy loan interest rate changes quarterly, and is guaranteed never to exceed 90% of the Government of Canada 3-5 Year Bond Yield.

(ii) A Universal Life policy with three investment options: a daily interest account tied to 30-day T-Bill rates, an equity account tied to the TSX return, and a 5-year Guaranteed Investment Account whose credited rate is guaranteed to be at least equal to the company's overall rate of return on AAA 5-Year Corporate Bonds less 2%.

(iii) A Universal Life policy with a death benefit that includes a Return of Premium whose mortality charges are guaranteed and whose expense charges may increase with the Consumer Price Index. Mortality charges are calculated by multiplying contractually guaranteed Yearly Renewable Term rates by the current net amount at risk.

(iv) A whole life policy where the contract allows the company to increase premiums in the event interest rates fall below a certain benchmark, but does not require the company to decrease premiums should interest rates remain above the same

benchmark. Future premiums are guaranteed not to exceed 150% of the original premium.

(v) A segregated fund annuity contract that guarantees the death benefit will be 100% of deposits paid, and guarantees a maturity benefit of 90% of deposits paid. The Management Expense Ratio (MER) is guaranteed never to exceed 3%, and is currently at 2.50%.

(vi) A Universal Life policy whose cash value equals the policy account less a surrender charge in the first 10 years, and less a market value adjustment (MVA). The MVA is determined by comparing the current 5-Year GIC rate for new deposits to the rate being credited to the existing deposits.

(vii) A 10-Year Term policy whose annual premium increases at each 10^{th} anniversary according to a schedule in the contract. Policyholders can qualify for a discount on these rates by providing satisfactory evidence of insurability, in which case the rate is never more than 95% of the rate for newly issued 10-Year Term policies.

Commentary on Question:
Above

(i) Loan rates that vary over time do not, by themselves, make a policy adjustable.
Product is not adjustable.

(ii) The daily interest account does not make it adjustable.
The equity fund with a rate tied to the TSX does not make it adjustable.
However, 5-year Guaranteed Interest Account rates are not linked to market rates or indicies, i.e. the rate is not tied to a measure the p/h could determine.
This last part makes the product adjustable.

(iii) Death benefit is not unilaterally set by the Company.
Mortality charges are contractually guaranteed.
The fact they are increasing doesn't make them adjustable. They are on a schedule.
Expense charges increasing using a known index does not make the product adjustable.
Product is not adjustable.

(iv) This is a one-way contract but that doesn't determine whether policy is adjustable or not.
Since the company can increase premiums when interest rates fall, policy is adjustable.
The guarantee that premiums cannot exceed 150% of original doesn't change adjustability definition. Even if premiums were already at the maximum range, policy would stay adjustable.
Product is adjustable.

11. Continued

(v) Annuities are not normally considered adjustable life policies.
But death benefit guarantee makes it have a variable life component, because of the relationship to maturity benefit.
But it must have something else which qualifies it as adjustable.
Since expense deduction can go as high as 3%, policy now has an adjustability feature.
Product is adjustable.

(vi) Existence of surrender charge is immaterial.
The existence of an MVA does not make it adjustable in and of itself.
If rates used for crediting/MVA are linked to market rates or indices, then it's not a reason for adjustable treatment.
If rates used for crediting/MVA are at sole discretion of company, then it would be adjustable contract.
Adjustability depends on terms of rate setting in contract.

(vii) With the schedule of premium increases defined in the contract, the policy would normally not be adjustable.
If T10 policies are continuing to be sold then it's not adjustable.
If T10 is not sold anymore then company may have to review the classification.
Satisfactory evidence of insurability is not relevant.
May be adjustable - depends on whether company is still selling T10.