CSP-GH Model Solutions
Spring 2012

1. Learning Objectives:

8. Evaluate the impact of taxation on company/plan sponsor financial management.

Learning Outcomes:

(8a) Assess the tax implications of benefit offerings from a plan sponsor perspective.

Sources:

GH-C106-07: US Health Insurance Taxation, Chapter 16, pgs 325 - 327

GH-C126-12: Mercer, September 2010 Communique, "Employee Life and Health Trust: Modified Draft Legislation"

Commentary on Question:

Commentary listed underneath question component.

Solution:

(a) For the employees in Canada, describe the taxation of these benefits from the employees' perspective in regard to:

(i) Premiums paid by the employer

(ii) Benefit payments

Commentary on Question:

Generally most students answered this question correctly. Some students were confused with "taxable" vs. "deductible". Some students were also confused about employer premium vs. employee contribution.

a. i

Life	Taxable
STD (Short term disability)	Non taxable
LTD (Long term disability)	Non taxable
EHC (Extended Health Care)	Non taxable except in Quebec
DC (Dental Care)	Non taxable except in Quebec

1. Continued

a. ii

Life	Non taxable
STD (Short term disability)	Taxable as part of the premiums paid by employer
LTD (Long term disability)	Taxable as part of the premiums paid by employer
EHC (Extended Health Care)	Non taxable
DC (Dental Care)	Non taxable

(b) For the employees in the US, describe the taxation of the Health benefit from the employees' perspective in regard to:

(i) Premiums paid by the employer

(ii) Benefit payments

Commentary on Question:
Many students didn't understand that the question was asking for just Health. Most students did well in this section.

Health premiums and benefit payments are not taxable.

(c) List the qualification BI must meet to fully deduct their annual contributions to the ELHT.

Commentary on Question:
Most students did not understand the question or didn't answer qualifications for a multi-employer trust. Those who understood the question did really well.

No more than 95% of employee beneficiaries of the trust are employed by a single employer or a related group of employers.
Either 15 or more employers must contribute to the trust or at least 10% of the employee beneficiaries must be employed by more than one participating employer, with related employers being counted for this purpose as a single employer.

(d) Describe the tax implications if BI changes from fully-insured to self-funded.

Commentary on Question:
Most students completely missed this question with the exception of the premium tax. A lot of students explained the difference between insured and self funding but not the taxation.

1. Continued

Employer contributions are not taxable except in the province of Quebec and no difference between insured or self-funded.

Benefits are not taxable to the recipient in both situations.

Good and Sales tax

- Insured are exempt.
- Administration fees paid under a self-insured plan are subject to GST.
- If self-insured plan has a stop-loss, fees paid are exempt from GST.

2. Learning Objectives:

10. Evaluate the risks associated with health insurance.

Learning Outcomes:

(10b) Evaluate an enterprise risk management (ERM) system, including:

- Describe the components on an ERM program
- Describe ERM type risk
- Describe the types of analysis used to measure the risk
- Discuss methods for mitigating the risks

Sources:

Enterprise Risk Management, Chapter 8 Risk Transfer, pages 100-104

Commentary on Question:

Commentary listed underneath question component.

Solution:

(a) Briefly describe the advantages of ART

Commentary on Question:

Candidates performed very well simply listing the advantages. The question asked the candidates to *describe* the risks. Candidates could have scored much better on the question had they provided a brief description of the advantages and not simply listed them.

Several candidates mistakenly listed the benefits of Enterprise Risk Management.

ART has many advantages.

- Focus - ART allows company to focus on what it does best and outsource the rest.
- Customization - ART deals are company specific and made to order. The company does not buy what it does not need.
- Cost Reduction - ART can use natural hedges created by non-correlated risks to reduce overall costs.
- Simplified Administration - ART reduces administrative duties through less paperwork and fewer contacts.
- Earnings Stability - ART smoothes earnings using fewer and less costly hedges compared to conventional hedging.

(b) List the pitfalls of ART.

Commentary on Question:

Most candidates scored better on part (a) compared to part (b). Most candidates did not describe the pitfalls of ART regarding understanding the product and knowing the seller in the model solution.

2. Continued

ART Pitfalls

- Risk - ART can not completely eliminate risk.
- Complexity - May require large initial outlay and may make deal-making and legal process lengthier.
- Cultural Barrier / Inertia - Requires paradigm shift in way company measures and manages risk.
- Regulatory Standards - There is confusion regarding the regulation and accounting standards for ART.
- Understanding the Product - ART is less-standardized and more difficult to price and understand terms.
- Know the Seller - ART is new, making it difficult to assess the capabilities and reputation of ART counterparties.

(c) Recommend what WCH should do regarding the ART proposals. Show your work.

Commentary on Question:
Candidates were asked to perform a cost-benefit analysis of ART proposals. A majority of the candidates received full credit calculating the net cost of risk for all proposals and providing the correct recommendation not to purchase either of the ART proposals. For those candidates not receiving full credit, a common mistake was adding the cost of risk to the economic capital and the risk transfer cost to determine which ART proposal to select.

Economic Capital (w/o ART)	=	Credit + Market + Operational + Diversification Risks
		50 + 30 + 40 – 20
		100
Cost of Risk/Capital (w/o ART)	=	Economic Capital × Cost of Risk
		100 × 15%
		15
Net Cost of Risk (w/o ART)	=	Cost of Risk + Risk Transfer Cost
		15 + 0
		15
Economic Capital (with ART 1)	=	Credit + Market + Operational + Diversification Risks
		45 +20 + 30 – 15
		80
Cost of Risk/Capital (with ART 1)	=	Economic Capital × Cost of Risk
		80 ×15%
		12
Net Cost of Risk (with ART 1)	=	Cost of Risk + Risk Transfer Cost
		12.0 + 5.0
		17

2. Continued

Economic Capital (with ART 2)	=	Credit + Market + Operational + Diversification Risks 40 + 15 + 25 – 10 70
Cost of Risk/Capital (with ART 2)	=	Economic Capital × Cost of Risk 70 × 15% 10.5
Net Cost of Risk (with ART 2)	=	Cost of Risk + Risk Transfer Cost 10.5 + 7.5 18

Recommendation: West Coast should not purchase either ART product.
Net Cost of Risk (no ART) $<$ Net Cost of Risk (ART 1) $<$ Net Cost of Risk (ART 2)
$15 < 17 < 18$

3. Learning Objectives:

4. Formulate and evaluate insurer claim reserving techniques.

11. Prepare a Statement of Actuarial Opinion (SAO) for selected health matters.

Learning Outcomes:

(4c) Calculate appropriate claim reserves given data.

Sources:

Group Insurance, Chapter 41, page 871

FH-C30-10: SOA Session Materials: 2009 SOA Health Spring Meeting, Session 69, The Code of Professional Conduct, pgs70 – 71

Practice Note on the Revised Actuarial Statement of Opinion Instructions for the NAIC Health Annual Statement Effective December 31, 2009, http://www.actuary.org/pdg/practnotes/sao_sept09.pdf

Commentary on Question:

A high percentage of candidates could not get the new termination rates and build an updated continuance table. Section (a) seemed to be a basic question that a qualified candidate should be able to get full credit.

A higher percentage of candidates didn't know the actual definitions of the four types of opinions in section (b). Again a well prepared candidate should be able to get 80% of the points quickly.

Section (c) is the area that candidates struggled the most and I would think a well prepared candidate could get a most of the points.

Solution:

(a) Calculate the impact to reserves for each of the following assumption changes. Show your work.

3. Continued

(i) Decrease in interest rates of 100 basis points

Disabled Life Reserve = Present value of future Benefits
Benefit payable = 60% * 60,000 less SS benefit
expected SS benefit = probability of SS award * expected SS Award
expected SS award = 50% * $60,000

Termination Rate development
Survivorship (t) = (1- Termination rate (t-1)) * survivorship (t-1)

Develop current termination rates (2 points for each year)
Year 1 = 1 minus 90/100 = 10%
Year 2 = 1 minus 84/90 = 6.7%
Year 2 = 1 minus 80/84 = 4.8%

Current Disabled Life Reserves
Net Benefit = LTD benefit - expected SS award
Net Benefit = 60% * 60,000 - 40% * 50% * 60,000 = 24,000

Yearly Reserve = Net benefit * survivorship / (1 + interest rate)
Year 1 = $24,000 * 90% / (1 + 5%) = $20,571.43
Year 2 = $24,000 * 84% / (1 + 5%)^2 = $18,285.71
Year 3 = $24,000 * 80% / (1 + 5%)^3 = $16,585.68

Total DLR = sum of three years = $55,442.83

Recalculate Reserve with 4% interest
Year 1 = $24,000 * 90% / (1 + 4%) = $20,769.23
Year 2 = $24,000 * 84% / (1 + 4%)^2 = $18,639.05
Year 3 = $24,000 * 80% / (1 + 4%)^3 = $17,068.73

Total DLR = sum of three years = $56,477.01

Difference between 4% and 5% = difference in two reserves
$56,477.01- $55,442.83 = 1034.18
1.8% increase in reserves

3. Continued

(ii) Decrease in claim termination rates by 10% (for example if termination rate is currently 20%, project 18%)

New Term rate = (100% – 10%) * prior termination rates
Year 1 was 10%, now .9 * 10% = 9%, Survivorship = .910
Year 2 was 6.7%, now .9 * 6.7% = 6%, survivorship = .855
Year 3 was 4.8%, now .9 * 4.8% = 4.3%, Survivorship = .819

Yearly Reserve = Net benefit * survivorship / (1 + interest rate)

Year 1 = \$24,000 * 91%/ (1 + 5%) = \$20.,800.00
Year 2 = \$24,000 * 85.5% / (1 + 5%)^2 = \$18,612.24
Year 3 = \$24,000 * 81.9% / (1 + 5%)^3 = \$16,979.59

Total DLR = sum of three years = \$56,391.83

\$56,391.83- \$55,442.83 = 949.00
1.7% increase in reserves

(iii) Drop in Social Security approval rate to 30%

Net Benefit = 60% * 60,000 - 30% * 50% * 60,000 = 27,000

Yearly Reserve = Net benefit * survivorship / (1 + interest rate)

Year 1 = \$27,000 * 90% / (1 + 5%) = \$23,142.86
Year 2 = \$27,000 * 84% / (1 + 5%)^2 = \$20,571.43
Year 3 = \$27,000 * 80% / (1 + 5%)^3 = \$18,658.89

Total DLR = sum of three years = \$62,373.18

\$62,373.18- \$55,442.83 = 6,930.35
12.5% increase in reserves

3. Continued

(b)

(i) List and describe the options in creating a Statement of Opinion.

(ii) Critique the options for this situation.

Qualified
Actuary can determine all the liabilities, except for specifically defined components, make a good and sufficient provision.

Adverse
Adverse opinion arises when the actuary determines that the reserves and liabilities are not good and sufficient.

Inconclusive
Inconclusive opinion is when the actuary is unable to form an opinion due to deficiencies in data, analysis, assumptions or related information.

Unqualified
If none of the above apply.

(c)

(i) Identify and define the precepts you may be violating in the actuarial opinion based on the current assumptions.

(ii) Explain why each of the precepts identified in part (c) (i) has been violated.

Professional Integrity
Define: An Actuary shall act honestly, with integrity and competence, and in a manner to fulfill the profession's responsibility to the public and to uphold the reputation of the actuarial profession
Why: Knowingly using bad assumptions

Standards of Practice
Define: An Actuary shall ensure that Actuarial Services performed by or under the direction of the Actuary-satisfy applicable standards of practice
Why: With the Actuary feeling as though assumptions are not valid they could sign a qualified statement when clearly an unqualified statement would be more appropriate

3. Continued

Control of Work Product
Define: An Actuary who performs Actuarial Services shall take reasonable steps to ensure that such services are not used to mislead other parties
Why: With the assumption being in question the Actuary could easily leave an impression with the Company that the Level of the Reserves was ok even though they couldn't fully test them

4. Learning Objectives:

3. Evaluate techniques for claims and disease management.

Learning Outcomes:

(3h) Apply the actuarially adjusted historical control methodology.

(3j) Apply methodologies to reduce random fluctuation and maintain validity for disease management effectiveness studies.

Sources:

Duncan (HC Interventions), Chapter 10, pages 177, 179, 181-190

Commentary on Question:

Overall, candidates did not perform well on this question. Very few candidates scored points for part (c).

Part (c) asks for alternate ways to measure returns or savings from the disease management program. Many candidates suggested ROI's, etc. That was not a valid response. The question is asking how to measure the "R" in the ROI.

Solution:

(a) Describe the AHC methodology for estimating diabetes disease management program savings.

- Calculate trend factor by measuring experience of the non-chronic population in base year and again in the program year.
- Measure PMPM cost of chronic population in the base year and multiply by trend.
- Compare the trended PMPM cost in the base year to the PMPM cost in the program year.
- If DM program worked, there should be a difference between the trended baseline PMPM cost and the actual PMPM cost in the program year.

(b) Explain the potential impact of random fluctuations on the evaluation of diabetes disease management.

Large random fluctuations can misrepresent the potential savings from a DM program. Large claims can potentially overstate or understate the savings from a DM program if a large claim is present in one period and not the other. DM program sponsors need to know the sample size so that the effect of large claim fluctuations don't overwhelm the effect of claims reductions.

4. Continued

(c) Recommend potential measurement approaches you could take in evaluating these savings to help give PDHP management this assurance. Justify your recommendations

Use a "one-sided" test over a "two-sided" test
Since a DM program is not concerned about greater than expected savings

Use a trend adjuster that is less subject to variation than the employer non-chronic trend
If a larger population (such as an entire health plan) is available, the use of trend based on the whole population may be appropriate

Truncate large claims
Truncate claims at $100,000 or $50,000
Truncate claims at mean plus 2 standard deviations
Truncate claims at the 90^{th} percentile of claims distribution

Replace claim cost with a utilization measure
Look at hospital admissions
Look at hospital LOS
Look at ER visits
Look at physician visits or Rx spend

5. Learning Objectives:

11. Complete a capital needs assessment.

Learning Outcomes:

(11a) Calculate capital needs for a given insurer.

(11c) Determine actions needed to address issues identified by assessment.

(11d) Understand key elements of NAIC RBC model.

Sources:

Group Insurance – Chapter 19, Pages 371 – 373 and 379

Commentary on Question:

For part (a), candidates did not write enough in response to the question of why RBC is important to a company or why it would still be important to calculate regardless of Health RBC Model Act adoption. Listing one bullet regarding solvency alone is not sufficient.
Candidates faired well for the calculation of H2 in part (b).
A vast majority of candidates incorrectly classified the "other individual tiers" for the H2 calculation in part (c).
Candidates had a good understanding of the levels of regulatory actions and thresholds for TAC / ACL ratio in part (d).

Solution:

(a) Explain the reasons why Health RBC calculation is still important to ARIC even though the domicile state has not adopted the Model Act.

Even in states that have not adopted the Health RBC Model Act, regulators are very familiar with the RBC concept and are likely to express formal concern over a health insurer who's TAC to ACL ratio falls below 200%. This threshold is considered the minimum ratio to ensure that the company has a low risk of insolvency.
For internal reporting purposes, if the TAC to ACL ratio is low, then appropriate action by management may be required.
The concept of Health RBC has been embraced by various rating agencies so the threshold can affect the rating that a company receives.

(b) Determine the H_2 risk amount based on the 2010 Statutory Annual Statement in accordance with the NAIC Health RBC formula. Show your work.

Authorized control level risk-based capital (ACL) = \$24,120k
RBCAC = 2 ACL
= 2*\$24,120k = \$48,240k
$RBCAC = H_0 + (H_1^2 + H_2^2 + H_3^2 + H_4^2)^{0.5}$

5. Continued

$\$48{,}240k = \$1{,}730k + (\$15{,}138k^2 + H_2^2 + \$3{,}893k^2 + \$6{,}920k^2)^{.05}$
$H_2 = \$43{,}254k$

(c)

(i) Explain why the misclassification would cause the H_2 component to change

Different coverages are subject to different risk factors. For purpose of applying the earned premium tiers, all individual products are combined, and the ordering of products is RBC-maximizing.

(ii) Calculate the corrected H_2 risk amount in accordance with the NAIC Health RBC formula. Show your work.

Before misclassification:
$H_2 = \$40m*35\% = \$14m$
For Other Individual, only \$10m is applied to the 1st tier and the remaining \$80m to the 2nd tier:
$H_2 = \$10m*25\% + 80*7\% = \$8.1m$
Total H_2 for IDI coverage = \$14m + \$8.1m = \$22.1m

After misclassification:
For Non-Cancelable, the first \$50m is applied to the 1st tier and the remaining \$25m to the 2nd tier
$H_2 = \$50m*35\% + \$25m*15\% = \$17.5m + \$3.75m = \$21.25m$
For Other Individual, all \$55 mln is applied to the second tier
$H_2 = \$55m*7\% = \$3.85m$
Total H_2 for IDI coverage = \$21.25m + \$3.85m = \$25.1m

(d) Determine the level of regulatory action before and after the correction, including potential consequences. Show your work.

Total adjusted capital (TAC) = \$50,013k

Before misclassification:
TAC-to-ACL ratio = \$50,013k / \$24,120k = 207%
Regulatory Action Level is "No Action" since 207% >= 200%
Regulatory consequence: No company action is required

5. Continued

After misclassification:
Corrected RBCAC = \$1,730k + (\$15,138k^2 + \$46,254k^2 + \$3,893k^2 + \$6,920k^2)$^{0.5}$
= \$51,042k
Corrected ACL = \$51,042k / 2 = \$25,521k
Corrected TAC-to-ACL ratio = \$50,013k / \$25,521k = 196%
Corrected Regulatory Action Level is "Company Action Level" since 196% is between 150% and 200%.
Regulatory consequence: ACIC must submit a corrective action to the Commissioner.

6. Learning Objectives:

1. Analyze medical quality measures and their importance to companies, plan sponsors and members.

Learning Outcomes:

(1d) Compare the role of comparative effectiveness research and evidence based medicine in the quality of medicine.

Sources:

GH-C30-10: SOA Session Materials, 2009 Health Spring Meeting, Session 45 PD, Quality and Efficiency II, "Government Sponsored Research and Initiatives"

Commentary on Question:

Commentary listed underneath question component.

Solution:

(a) Describe the misperceptions about Evidence-Based Medicine.

Commentary on Question:

Most students were not clear on what the question was asking for. Some just described Comparative Effectiveness Research.

Excludes role of clinical judgment
Does not take into account the individual patient
Aims only to limit health services
Restricted to Randomized Controlled Trials

(b) List the types of studies that are considered Comparative Effectiveness Research.

Commentary on Question:

Most students missed most of this list.

Product A vs. Product B
Condition A vs. Condition B
Populations Segmentation such as by age, gender, geography
Short term vs. Long Term
Research setting vs. Community Setting

(c) Describe the limitations and benefits of Comparative Effectiveness Research.

Commentary on Question:

This was confused with "misperceptions" in part (a). Overall candidates did fairly well in this section.

6. Continued

Comparative Effectiveness Research Cannot
- Solve controversies due to values, costs
- Solve barriers due to
  - Misaligned incentives
  - Patient factors (cost sharing)

Comparative Effectiveness Research Can
- Reduce the chance of getting it wrong
- Help make decisions more
  - Rational
  - Consistent
  - Transparent
- Clarify the nature of disputes over practice and policy
- Persuade skeptical parties

(d) Describe the challenges and options of using Comparative Effectiveness Research.

Commentary on Question:
Students did very poorly on this section. Many students understand the challenges of interpreting the data and payment options.

Physician/Patients
- Availability of data
  - Reaction to medications

Payers/Policy Makers
- Cost differences between effective treatments
- "Better" treatment may not lead to better outcomes for everyone
- Options
  - Do you cover the less effective technology
  - Higher reimbursement for more effective technology

Future Challenges
- Downstream effects of policy applications
  - Payment Issues
  - Diffusion of Technology

7. Learning Objectives:

6. Evaluate financial performance measures for insurers for both short-term and long-term products.

12. Understand an actuarial appraisal.

Learning Outcomes:

(6c) Compare key differences and similarities in measures by accounting basis (statutory, tax, GAAP).

(12a) Describe applicable ASOP's and other guidelines.

(12b) Describe components of an actuarial appraisal.

Sources:

GH-C103-07: The Actuary and Health Insurance Mergers and Acquisitions

GH-C104: Mergers and Acquisitions, Toole and Herget, Chapter 4, Valuation Techniques

RSA, Vol. 30, No. 2, Session 15 PD, Actuarial Appraisals – Process and Issues

ASOP 23, Data Quality

Group Insurance, Bluhm, W. F., 5th Edition, 2007, Chapter 18, pgs 357 – 361

Commentary on Question:

The question was trying to discuss of the role of the actuary when performing an actuarial appraisal during an acquisition process.

Solution:

(a) List and explain the specific reasons why Copperfield might be more interested in an acquisition instead of a merger.

Commentary on Question:

Most candidates did well on that part.

- Copperfield wants to buy profitability
- Copperfield wants to buy growth
- Economies of scale
- Geographic diversification
- Lower income taxes in Canada which will increase profitability
- Get expertise in new products and new markets
- Copperfield would be able to administer the business at a lower cost

7. Continued

- Copperfield wants to bring the profitability back on track by implementing rate increases
- Copperfield can get the advantage of the value of Great Expectations brand name
- A win-win situation where Great Expectations gets the benefit of reserves release and Copperfield can establish lower reserves
- The buyer can obtain negotiation leverage when a regulatory fire sale occurs
- The business is truly profitable, but is non-core to the seller and is likely to be a core block for the buyer

(b) Determine the value of future business capacity of Great Expectation as of December 31, 2010 using the market capitalization as the actuarial appraisal value. Show your work.

Actuarial Appraisal Value = Market Capitalization

= Shares Outstanding x Price per share
= 498,009,660 × 120.00
= 59.8 B

Adjusted Book value (net worth) = Total Shareholders Equity = 21.1 B

Value of Inforce Business = 2009 Net Income × 6
=1,888,000,000 × 6
= 11.3 B

Actuarial Appraisal Value = Adjusted Book Value (Net Worth)
+ Value of Inforce Business
+ Value of Future Business Capacity

==> Value of future business capacity = Actuarial Appraisal Value
– Adjusted Book Value (Net Worth)
– Value of Inforce Business
= 59.8 B - 21.2 B – 11.3 B
= 27.3 B

(c) If the purchase price of Great Expectations is determined to be $60 billion, calculate:

(i) The acquisition premium paid by Copperfield for the purchase of Great Expectation. Show your work.

7. Continued

Commentary on Question:
Some candidates did well on this part.

Acquisition premium
= Price paid by Copperfield – Market Capitalization
= \$60.0 B – \$59.8 B
= \$0.2 B

(ii) The goodwill premium that Copperfield will have to include in its Canadian balance sheet. Show your work.

Commentary on Question:
Very few candidates did well on this part.
In order to get the maximum points allowed on this question, candidates must have applied the correct calculations but were generally unable to.

Goodwill premium
= Price paid by Copperfield – Adjusted Book Value (Net Worth)
= \$60.0 B – \$21.2 B
= \$38.8 B

(d) According to Actuarial Standard of Practice #19 (ASOP#19) and Actuarial Standard of Practice #23 (ASOP#23), list the items that your actuarial appraisal report should disclose.

Commentary on Question:
Most candidates did well on this part.

ASOP #19:
- Scope and intended use
- Reliance and limitations
- Description of business being valued
- Actuarial appraisal value
- Methods and assumptions
- Valuation techniques used
- Calculation of adjusted net worth

ASOP #23:
- Source of data
- Data quality and review
- Reliance on others
- Adjustments made on the data
- Limitations of data

7. Continued

- Unresolved data concerns
- Size of potential bias due to data uncertainty
- Conflicts with regulation

(e) Describe the types of group insurance financial reporting that would be needed in Canada after the acquisition.

Commentary on Question:
Most candidates did well on this part.

Statutory Reporting
- Same as GAAP reporting in Canada

Tax Reporting
- Federal income tax
- Investment income tax
- Provincial income tax
- Taxes on capital
- General business tax
- Premium tax

Managerial Reporting

Consumer Protection Plan

Policyholder Reporting

8. Learning Objectives:

4. Formulate and evaluate insurer claim reserving techniques.

Learning Outcomes:

(4c) Calculate appropriate claim reserves given data.

Sources:

The Handbook of Employee Benefits, Rosenbloom, J.S., 7th Edition 2011

- Chapter 29 Funding Health Benefit Plans: Insured Arrangements, pgs. 788 – 793 and 795 – 596

Group Insurance, Bluhm, W. F., 5th Edition, 2007

- Chapter 41 Claim Reserves for Long Term Benefits, pgs. 855 - 857

Commentary on Question:

Commentary listed underneath question component.

Solution:

(a) Describe participating and experience-rating arrangements.

Participating Arrangements

- ER (employer) shares in favorable and unfavorable experience during the policy period
  - If premium > claims + admin (favorable), then ER receives surplus
  - If premium < claims + admin (unfavorable) then there is a deficit balance
- Deficit balance is usually carried forward by ins co. to be recovered from future favorable years
- Surplus can be carried forward as stabilization reserve to cover future deficits
- True (net) cost of plan is premium paid in policy period, adjusted for YE balance

Experience-Rating Arrangement

- Actual financial experience of previous policy year's affect ER's future premium charges
  - Favorable past experience leads to premiums < than similar ER's
  - Unfavorable past experience leads to premiums > than similar ER's
- Can be included with participating and conventional insurance arrangements

(b) List potential advantages and disadvantages to NRG associated with entering a participating arrangement.

Advantages

- If results are favorable, then there are cost savings
  - Premium tax is reduced

8. Continued

- Administrative costs are reduced by lower general overhead charges

Disadvantages

- Higher risk charge relative to conventional insurance
- Higher underwriting margin relative to conventional insurance
- Carryover of deficit balances will increase the future year's plan costs due to:
  - Interest charges on the outstanding balance
  - Possible additional underwriting margins required by the insurance company

(c) Describe underwriting factors GE should consider under a participating arrangement.

Commentary on Question:
The key to this question is that the important factors are those that pertain to participating arrangements. Many candidates listed factors that would be important to underwriting in general, but missed those specific to participating arrangements.

Spread of risk

- Ability of ER benefit plan to absorb catastrophic risk relative to its paid premium base
- Larger EE group => Easier to absorb major loss from a few participants w/o substantially affecting the YE actual financial experience
- >= 100 EE's are typically large enough for PIA's

Predictability of loss

- Most important factor in % determination
- More predictable the total losses each year the greater the EE participation
- Medical plans are normally high frequency, high severity => More predictable
- ER participation is controlled by pooling points and is levied a pooling charge

Underwriting margin

- A charge for the possible fluctuation of actual costs in excess of the expected total plan costs during the policy year
- Reflects the normal range of deviation of the plan's actual loss experience in any year from the expected loss experience
- Determined from actuarial studies of actual claim experience relative to insurance norms for similar EE groups and types of insurance coverage
- As # EE's and volume of insurance increases, u/w margin decreases
- May vary substantially for similar ER groups, depending on ER's historic claim experience and market competition for the ER's business

8. Continued

Eligible employee participation

- When they have to pay part of the premium, some EE's opt out of ER benefit because they can get it at lower cost elsewhere (e.g. spouse) or is not valuable to them at all
- Nonparticipating EE's many times are a better risk (hence a concern)
- Insurers often require a minimum EE participation % in order to get best premium rates

(d) Assuming NRG were in a participating arrangement with GE in 2012, calculate the following as of January 1, 2013.

(i) Paid claims

Paid Claims = Sum of Cumulative Paid Claims over 2012
= $18,439,594

(ii) Reserve charge

Step 1 - Determine the % of claims complete by each lag period in January 2011.
Completion Factor (Lag i) = Cumulative Claims Paid (Lag i) / Ultimate Claims Paid

Step 2 - Complete the claims incurred in CY 2012, paid through 1/1/2013.
Completed Claims (Lag Month x) = Cumulative Paid (Lag Month X) / Completion Factor (Lag X)

Lag	January Paid by	Ultimate	Factor	Month	Paid	Ultimate Incurred	Reserve Charge
0	27,750	89,725	0.309	Dec	468,224	1,515,288	1,047,064
1	66,600	89,725	0.742	Nov	1,266,480	1,706,846	440,366
2	80,475	89,725	0.897	Oct	1,432,890	1,597,425	164,535
3	85,111	89,725	0.949	Sept	2,017,640	2,126,070	108,430
4	87,875	89,725	0.979	Aug	2,104,100	2,149,234	45,134
5	89,725	89,725	1.00	July	1,511,260	1,511,260	-
				Total	8,800,594	10,606,123	**1,805,529**

8. Continued

(iii) Deficit balance

Balance = Paid Premium − Claims Costs − Administrative Costs

Paid Premium = 5,000 × 12 × ($250 + $150) = $24,000,000

Claim Cost = Paid Claims + Reserve Charge + Conversion Charge + Pooling Charge

Paid Claims =	$18,439,594
Reserve Charge =	$1,805,529
Conversion Charge = 12 × $4 × 5,000 =	$240,000
Pooling Charge = 12 × $1 × 5,000 =	$60,000
Claim Cost =	$20,545,123

Administrative cost= Variable admin cost + Fixed Admin Cost + U/W margin

Variable Administrative cost = 10% × $24,000,000 =	$2,400,000
Fixed Administrative cost = 12 × $8 × 5,000 =	$480,000
U/W Cost = 2% × $24,000,000 =	$480,000
Administrative Cost	$3,360,000

Balance = $24,000,000 − $20,545,123 − $3,360,000 = **$94,877**

Comments:

Note that there is not a deficit balance. Also, it was important to realize that variable admin costs were given in the case study that was specific to the PPO plan so that is the admin charge needed.

(e) Recommend potential actions NRG can take to mitigate the deficit balance, including any associated trade-offs.

Commentary on Question:
One of two directions could have been taken. The first would be to discuss what actions could be taken in situations where a deficit has occurred. The second would be to discuss what actions could be taken to reduce the risk of deficit balances in the future. Either was acceptable for this part of the question.

To deal with current deficit balances:

- Carry forward the deficit balance and repay through surplus premium balances that may result in future years
  - Trade-off: Will have to pay interest on the balance

8. Continued

- Negotiate with GE to repay it as a lump sum or in installments
  - Trade-off: Will have to pay interest on the balance
- NRG can refuse to repay the balance and switch insurers, a risk that GE assumes and prices into its margins
  - Trade-off: GE bakes this into risk and underwriting margin
- Do nothing and only share gains in positive years
  - Trade-off: GE bakes this into risk and underwriting margin

To reduce risk of future deficits:

- Modify Pooling Point
  - Trade-off: greater costs up front
- Negotiate admin charge
  - Trade-off: greater costs up front
- Implement Disease Mgt programs
  - Trade-off: greater costs up front, uncertain on amount or timing of savings
- Put Surplus into Stabilization fund
  - Trade-off: May miss out on investment opportunities than might occur if company controls funds
- Change plan: more employee cost share
  - Trade-off: Employees have greater share of cost, may be unhappy

(f) NRG mentioned that if it is unsatisfied with the arrangement proposed by GE, then it would consider self-funding its medical plan. Describe the potential advantages and disadvantages to NRG of self-funding.

Advantages

- **Potential for capturing favorable claims experience**
  - If GE is confident that its expected annual claims costs are less than similar costs in a traditional insurance arrangement
  - The greatest potential source of savings
- **Reduces expenses incurred by insurer (and passed onto ER) because ER assumes financial risk**
  - More certain source of savings
  - No premium tax liability
  - No risk charge
  - No commission payments
  - General administrative and underwriting services performed by insurance company are much less
  - NRG could consider internally administering the plan to further reduce costs

8. **Continued**

- **Avoiding or simplifying state-mandated benefits**
  - Mandated by ERISA
  - Especially important if NRG is in multiple states, whose benefit mandates vary
- **Greater flexibility and control in managing the benefit plan**
  - Since financial risk is assumed by NRG, GE is not restricted by state or federal insurance laws and is less concerned with the underlying benefit levels and cost of the health care plan
  - NRG can change medical plan more quickly and creatively in response to savings and quality of care opportunities

Disadvantages

- NRG may be unable to accurately predict annual plan costs
- NRG may have lower costs in an insurance arrangement
- NRG would have ultimate financial responsibility for plan financial performance
- NRG would miss out on GE's underwriting, legal and administrative services
- NRG may have to deal with EE concerns about the financial security of their health care benefits
- NRG may have to respond to specific collective-bargaining negotiations and stipulations
- NRG would lose GE as a financial and administrative third-party buffer
- NRG would incur additional financial risks associated with COBRA participants
- NRG would not be able to participate in HMO's and other managed care options that are limited or prohibited in self-funding arrangements due to state insurance laws

9. Learning Objectives:

6. Evaluate financial performance measures for insurers for both short-term and long-term products.

Learning Outcomes:

(6a) Assess key financial measures used by various entities (insurers, HMOs, provider-owned plans).

(6b) Project financial outcomes and recommend strategy to management to achieve financial goals.

Sources:

Group Insurance, Bluhm, W. F., 5th Edition, 2007

- Chapter 43 Analysis of Financial and Operational Performance, pgs 911 - 917

Commentary on Question:

Commentary listed underneath question component.

Solution:

(a) Identify the advantages and disadvantages of using same-size-income statements.

Commentary on Question:

Many candidates successfully listed a few advantages and disadvantages of same-size-income statements. To achieve a passing mark, a candidate needed to supply further details on the advantages and disadvantages of the statements.

Advantages:

1. All components are expressed as percents of revenue
2. Profit margins can be divided into relative components
3. Change in expense items can be immediately understood in their impact on profit margins

Disadvantages:

1. Need adjustment for the presence of capitated mental health and other benefits that would otherwise lead to distortions
2. Can be confusing to compare plans of different models
3. The same-size-income statements have several reporting challenges that should be considered by the analyst to make the best use of this analytical tool
   a. Reinsurance
      i. Consider premiums paid as health expenses
      ii. Consider recoveries as offsets to health expenses
   b. Commissions
      i. Payments to brokers are sometimes excluded from premiums

9. Continued

c. Investment Income
   i. Interest earned on float sometimes considered in operating revenues
d. ASO Revenues
   i. The only revenue received is payments for admin services

(b) Create the same-size-income statement of CITR for the year 2011.

Commentary on Question:
The most successful students on this portion of the problem showed all work for their calculations. This way, even if a small portion of the equation was missed, the candidate could still receive a portion of the credit for using the correct equation.

	Calendar Year 2011		
Revenues	**Nominal Revenues and Expenses**	**Same Size Income Statement**	
Premiums	18,245	97.3%	= 18245 / 18753
Other revenue	180	1.0%	= 180 / 18753
Total operating revenue	18,425	98.3%	= 18,425 / 18753
Net investment income	178	0.9%	= 178 / 18753
Other realized (losses) gains	150	0.8%	= 150 / 18753
Total non-operating revenue	328	1.7%	= 328 / 18753
Total revenues	18,753	100.0%	= 18753 / 18753
Expenses			
Benefit expense	16,111	85.9%	= 16,111 / 18753
Selling expense	821	4.4%	= 821 / 18753
General and admin expense	820	4.4%	= 820 / 18753
Total operating revenue	17,752	94.7%	= 17752 / 18753
Total non-operating expenses	114	0.6%	= 114 / 18753
Total expenses	17,866	95.3%	= 17866 / 18753
Income before income tax expense	887	4.7%	= 887/ 18753
Income tax expense at 35%	310	1.7%	= 310 / 18753
Net income	577	3.1%	= 577 / 18753

(c) List the administrative functional areas of health plans in which PMPM costs can be grouped.

Commentary on Question:
A recall question, most candidates listed the areas in bullet form.

- Rating and underwriting
- Sales and marketing (except advertising and promotion)
- Commissions (external)
- Enrollment / Membership / Billing
- Customer services

9. Continued

- Medical Management / Quality assurance / Wellness
- Claim and encounter capture and adjudication
- Finance and accounting
- Actuarial
- Corporate services (HR, facilities, Legal Regulatory)

(d) Create the PMPM income statement of Great Expectation for the year 2011.

Commentary on Question:
Part (b) of this question asks for an income statement for CITR while part (d) asks for an income statement for Great Expectations. Many candidates continued on from part (b) and completed the answer for CITR. The PMPM income statement should be done on fully-insured members only.

	Revenues	**2011 - GEIC**
	Premiums	51,474
	Administrative Fees	3,497
	Other revenue	561
	Total operating revenue	55,532
	Net investment income	-1,098
	Other realized (losses) gains	0
	Total non-operating revenue	-1,098
	Total revenues	54,434
	Expenses	
	Benefit expense	43,408
	Selling expense	2,581
	General and admin expense	6,865
	Total operating revenue	52,854
	Total non-operating expenses	1,271
	Total expenses	54,125
	Income before income tax expense	309
	Income tax expense at 35%	108
	Net income	201
	Enrollment	37,387
		Including Self-Funded Membership

9. Continued

To create PMPM income statement, divide through above figures by total enrollment figure.

Premiums	$	114.73
Administrative Fees	$	7.79
Other revenue	$	1.25
Total operating revenue	$	123.78
Net investment income	$	(2.45)
Other realized (losses) gains	$	-
Total non-operating revenue	$	(2.45)
Total revenues	$	121.33
Expenses		
Benefit expense	$	96.75
Selling expense	$	5.75
General and admin expense	$	15.30
Total operating revenue	$	117.81
Total non-operating expenses	$	2.83
Total expenses	$	120.64
Income before income tax expense	$	0.69
Income tax expense at 35%	$	0.24
Net income	$	0.45

10. Learning Objectives:

9. Evaluate the impact of regulation on company/plan sponsor financial management.

Learning Outcomes:

(9a) Evaluate the interrelationship of state versus federal regulation on company financial management and marketing.

Sources:

Bluhm, Chapter 15

Commentary on Question:

Commentary listed underneath question component.

Solution:

(a) You are the Chief Actuary for Marc-Andre Fleury Insurance Company. You have been asked to research diversifying into HMOs. Outline the requirements for a certificate of authority and rate regulations that are applicable to HMOs.

Commentary on Question:

This part was testing specifics of HMO regulations.
Many candidates knew "the list" (or much of it), but did not expand (details) on the items in the list.
Few candidates commented on the 2nd part of the question – HMO rate regulations.
Candidates did not need to have all 8 items on the list to receive full credit, but did have to explain and include comments on rate regulation.

Must submit a detailed filing including:

1. Description of HMO's organization, governance and management
2. Contracts with providers, TPAs and other 3rd party vendors
3. Coverage agreements – copies of individual and group policies and evidence of coverage forms
4. Financial information – financial statements and financial feasibility plan
5. Provider information – list of providers and description of the geographical coverage area
6. Grievance procedures – description of the HMO's procedures for handling written grievances/complaints

Must report material modifications/changes annually or before change

Rate regulation

- Regulated by most states
  - Some states have more stringent regulations

10. Continued

- Generally can't use rates unless file and approve schedule of rates or methodology
  - Can't be excessive, inadequate or unfairly discriminatory
  - Must be actuarially sound

(b) Outline the advantages and disadvantages of federally qualified HMOs.

Commentary on Question:
This part was testing knowledge of the federal HMO Act.
Candidates generally got the same few items, but many more points available.
Some candidates did not specify what part of ERISA was superseded (claim appeals) or what was more stringent (rating restrictions).
Candidates missed some of the more "common sense" responses to the question (i.e., a disadvantage of federal regulation is additional regulatory requirements).

Advantages
- Many stripped away by amendments
- Equal contribution requirement – employers can't financially discriminate against employees enrolling in the HMO (i.e. contributions)
- Federal HMO act preempts state law
- Deemed to automatically comply with ERISA's claim appeal procedures
- Can contract as a Medicare or Medicaid provider
- May be seen as quality seal of approval

Disadvantages
- Additional regulatory requirements
  - Must have separate LOB for non-qualified HMOs
  - Specified minimum coverage
  - Only nominal copays
  - Rating restrictions are sometimes stricter than state requirements

11. Learning Objectives:

5. Formulate and evaluate insurer reserving techniques for other liabilities.

Learning Outcomes:

(5a) Describe different types of reserves and explain when each is required:

- Deficiency reserves
- Active life reserves
- Premium reserves
- Deferred acquisition costs
- Claim administration expense reserves
- Calculate the reserves given data

Sources:

ASOP 18: Long Term Care Insurance

Commentary on Question:

Commentary listed underneath question component

Solution:

(a) With regard to pricing and reserve setting, describe considerations that need to be assessed for the following:

(i) Morbidity assumptions

(ii) Mix of business assumptions

(iii) Voluntary lapse assumptions

Commentary on Question:

Some students answered the question related to long term disability coverage, but the question asks about long term care.

(a)(i)

Morbidity assumptions should be consistent with significant plan features including:

- Benefits and benefit levels being provided including benefit amounts, limits, and exclusions including optional benefits.
- Eligibility Criteria
- Claim Adjudication Process

Assumptions for total claim costs should consider:

- Claim costs vary by nursing home, assisted living facility, and home care.
- Interaction of benefits including substitution effect.

11. Continued

- Presence of LTC insurance impact on incidence rates and cost.
- Availability of other coverages such as Medicare and Medicaid.
- Availability of LTC services
- Effect of selection and classification of applicants.
- Financial benefit for the insured to maintain coverage
- The effect of mortality on termination rates.

(a)(ii)
Assumptions should reflect the characteristics of the anticipated distribution of business including:

- Age
- Gender
- Marital status
- Underwriting classes
- Distribution system
- Plan options

(a)(iii)
Higher lapse rates generally produce lower expected costs and voluntary lapse rates expectations are critical to the estimation of costs and liabilities.
Lapse rates are impacted by:

- Marketing methods
- Policy holders characteristics
- Product and premium competitiveness
- Potential rate increases
- Premium mode and payment method
- Non-forfeiture benefit
- Service level

(b) Describe how this strategy might impact the assumptions in part (a) used in pricing and reserving for the LTC product.

Commentary on Question:
This question asks the student to integrate material from multiple sources.

11. Continued

Marketing plan would result in selling a greater proportion of the line of business to older individuals who are closer to needing the benefits. This would give less time to build reserves requiring higher premiums.

Since these older individuals can add additional coverage to supplement their MA/MAPD plans and given their age, these individuals are less likely to voluntarily lapse.

The higher premiums would lead to higher voluntary lapses among the younger and healthy population resulting in a potential antiselection spiral and collapse with membership concentrated with older higher risk members and fewer younger members to help build up reserves.

12. Learning Objectives:

3. Evaluate techniques for claims and disease management.

Learning Outcomes:

(3g) Describe value chain analysis as it applies to the planning and management of disease management and other intervention analysis.

Sources:

Managing and Evaluating Healthcare Intervention Programs, Duncan 2008, Chapter 5 The Use of the Value Chain in Disease Management Program Planning, pgs. 92 – 97, 102 and 119

Commentary on Question:

Commentary listed underneath question component.

Solution:

(a) Describe the components of the Disease Management (DM) Value Chain.

Commentary on Question:

A majority of the candidates knew the key components.

- Data warehousing
  - Includes administrative and eligibility data
  - Maintain electronic patient records
  - Identify member conditions
- Predictive modeling
  - Used to identify members for intervention based on risk rank
  - Identify gaps in care
- Intervention development
  - Development of programs and intervention
  - Development of campaigns to deliver interventions to target population
  - Member referral/transfer between programs
- Outreach and enrollment
  - Deploy members to campaigns
  - Reach and enroll members
  - Follow-up/transition between programs
- Member assessment and coaching
  - Perform assessments
  - Coach members
  - Graduate members/maintenance program
- Outcomes measurement
  - Financial – total savings or ROI
  - Clinical

12. Continued

(b) Explain the role of the Value Chain components in program design and assessment.

Commentary on Question:
A majority of the candidates missed this part of the question. Many candidates repeated part (a) for this question.

- Breakdown the components of a DM program allows for comparison between program and vendors
- Provide a framework for analyzing the effectiveness/value of the different components of the DM program and how they work as an integrated product
- Assess the program's success at targeting members
- Allocate resources more efficiently by determining which predictive model is most effective at indentifying targeted members
- Used to determine which identification, outreach, and enrollment strategy offers the greatest contribution to the overall outcome of the program
- Help determine the design of the intervention program that will be most effective at changing the members' behavior to lead to improved health outcome
- Indentifies interim measures of progress

(c) Calculate if the program was effective. Show your work. Justify your answer.

Commentary on Question:
A majority of the candidates understood this part and completed the calculation correctly. Some candidates only looked at the readmission rates and did not calculate the savings, but the program was implemented to both reduce readmissions and reduce costs.

Calculate the readmit percentage = number of re-admits/number of admissions

2010

Congestive heart failure	70/200 = .35
Bacterial pneumonia	75/300 = .25
Chronic obstructive pulmonary disease	83/250 = .332

Savings = sum((2011 admissions*2010 admission rate – 2011 readmissions) * average cost

Congestive heart failure	((220 * .35) – 55) * 8000 = 176,000
Bacterial pneumonia	((310 * .25) – 46.5) * 8000 = 248,000
Chronic obstructive pulmonary disease	((260 * .332) – 78) * 7550 = 62,400

Savings total = 176,000 + 248,000 + 62,400 = 486,400

12. Continued

(d)

(i) Determine if there are additional savings opportunities in the program. Show your work.

Commentary on Question:
A majority of the candidates understood this section of the question.

Calculate the readmit percentage = number of re-admits/number of admissions

2011

Congestive heart failure	55/220 = .25
Bacterial pneumonia	46.5/310 = .15
Chronic obstructive pulmonary disease	78/260 = .30

The program was successful as the readmission rate dropped across all categories

Congestive heart failure and bacterial pneumonia have readmission rates that are already below the benchmark.

Chronic obstructive pulmonary disease has room for improvement.
The additional savings compared to the benchmark is

$$78 - (260 * .25) * 7{,}500 = 97{,}500$$

(ii) Propose potential next steps to achieve additional savings.

Commentary on Question:
Approximately half of the candidates proposed steps to achieve additional savings.

- Hire additional nurses
- Implement a reach out program
- Consider the cost of doing additional services

13. Learning Objectives:

11. Prepare a Statement of Actuarial Opinion (SAO) for selected health matters.

Learning Outcomes:

(11a) Describe the U.S. Qualifications Standards and Statements of Actuarial Opinion (SAOs) as outlined in the Standard.

(11c) Develop documentation for an SAO.

Sources:

Practice Note on the Revised Actuarial Statement of Opinion Instructions for the NAIC Health Annual Statement Effective December 31, 2009, pgs 3 - 7

Commentary on Question:

Understand the components of the NAIC annual statement, the supporting actuarial memorandum, and the role of the appointed actuary.

Solution:

(a) List and define what must be included in the body of the actuarial opinion contained in the NAIC annual statement.

Commentary on Question:

Candidates frequently just listed the items. There should also be a description about each component.

1. Table of key indicators – uses a series of checkboxes to alert reader to classification of opinion, modifications to prescribed wording, and deviations from actuarial standards
2. Identification section – identifies the appointed actuary
3. Scope section – identifies the subjects on which opinion is to be expressed and describes scope of actuary's work
4. Reliance section – identifies anyone the actuary relied on for underlying data
5. Opinion section – expresses the actuarial opinion on subjects in scope section
6. Relevant comments section – any additional concerns or issues

(b) Explain the purpose of the Supporting Actuarial Memorandum and briefly describe its components.

Commentary on Question:

The well prepared candidate should list several of the items that are included. Key points include documentation, reporting methods and assumptions, reconciling to other exhibits, and conveying the outcome and recommendations.

13. Continued

Purpose:
1. Formal way to convey the professional conclusions and recommendations
2. To document the actuary's work and conclusions
3. Assures that the audience is aware of the significance of the actuary's findings

Include:
1. Disclosure of analysis used in sufficient detail for analysis to be replicated
2. An exhibit that ties to the Annual Statement
3. Reconciliation of data to Underwriting and Investment Exhibit Part 2B
4. Follow-up studies documenting prior year's claim liability and claim reserve runoff
5. Documentation of assumptions used for policy reserves

(c) Define the role of the appointed actuary.

Commentary on Question:
Here, we're looking for a comment on presenting to the Board of Directors or Audit Committee, preparing the actuarial memorandum, and making the opinion and memorandum available to the Board of Directors. Many candidates included comments on continuing education requirements; which, while important, was not part of the answer to this question.

1. Must report annually to the Board of Directors or audit committee on items within the scope of the SAO
2. Must prepare supporting actuarial memorandum to document actuary's work and conclusions
3. Must make the actuarial opinion and supporting actuarial memorandum available to the Board of Directors

14. Learning Objectives:

13. Demonstrate an understanding of the accounting requirements and methodology regarding retiree life and health benefits.

Learning Outcomes:

Sources:
Fundamentals of Retiree Group Benefits, Yamamoto, 2006

- Chapter 7 U.S. Accounting, pgs. 178 - 189 and 199 - 200

Commentary on Question:
Commentary listed underneath question component.

Solution:

(a) Calculate the net periodic benefit cost for JSCC prior to the above change. Show your work.

Commentary on Question:
Some students rolled forward the liability one year without ever calculating the pension cost for the year, and received very little credit for this part because it was asking for cost, not the liability. Some students chose the wrong value for the discount rate. Some students chose the wrong amortization period for the amortization of gains and losses. Many students forgot about the 10% corridor rule with amortizing gains and losses and lost some points, and some knew about it, but did not apply it correctly. Students are encouraged to supplement the reading by reviewing the examples shown in the accounting standards, so that they can see how their reading is applied in practice.

Service cost = 100,000

Interest cost
Liability * discount rate
14,170,000 * 6%
850,200
Service cost * discount rate
100,000 * 6%
6,000
Less expected benefit disbursements * discount rate * ½
-950,000 * 6% * 1/2
-28,500
827,700

14. Continued

EROA is zero since there are no assets

Amortization of ITO is zero since there is no more unrec ITO

Amortization of PSC
Unrecognized PSC / remaining years from case study
1,500,000 = unrecognized PSC
5 - years remaining
300,000

Amortization of gains and losses

Unrecognized gains and losses outside of 10% corridor (greater of assets and liabilities) / average service to retirement age
3,500,000 = unrecognized loss
1,470,000 – 10% of liability
10 – amortization period
208,300

Total cost = 1,436,000

(b) Calculate the one-time financial impacts to JSCC as a result of the above change. Show your work.

Commentary on Question:
The most important aspect of this subpart was to recognize that this event caused a special accounting event of a curtailment. Additional points were given if the calculations were done correctly.

Curtailment accounting required
Portion of unrecognized prior service cost recognized in earnings
1,500,000 – unrecognized PSC
* 20% – portion to recognize
300,000
The initial amount is a curtailment loss
Liability gain offsets existing unrecognized loss
None of the gain is taken into earnings
Final curtailment loss is 300,000

14. Continued

(c) Calculate the net periodic benefit cost for JSCC after the above change. Show your work.

Commentary on Question:
While the math in this example is similar to part (a), all the values are affected because 1) the ongoing service cost and liability is reduced, 2) some of the amortizations were partially recognized earlier than initially expected, leaving less to amortize going forward, and 3) the average future service for gain/loss amortization is affected.

Service cost = 100,000 – 20,000
80,000

Interest cost
Liability after gain * discount rate
14,170,000 – 1,000,000 = 13,170,000 – liability after the gain
* 6%
790,200
Service cost after gain * discount rate
100,000 – 20,000 = 80,000 – service cost after the gain
* 6%
4,800
Less expected benefit disbursements * discount rate * ½
-950,000 * 6% * ½
-28,500
766,500

EROA is zero since there are no assets

Amortization of ITO is zero since there is no more unrec ITO

Amortization of PSC
Unrecognized PSC after gain / remaining years after gain
1,200,000 / 5
240,000

14. Continued

Amortization of gains and losses

Unrecognized gains and losses outside of 10% corridor after gain / average service to retirement age after gain

3,500,000 − 1,000,000 − loss after the curtailment gain
1,317,000 − 10% of the liability
/ 8
147,875

Total cost = 1,234,375

15. Learning Objectives:

10. Evaluate the risks associated with health insurance.

Learning Outcomes:

(d) Complete a capital needs assessment (including identifying capital needs, actions to be taken and understanding key elements of Canadian formula).

Sources:

CIA Educational Note on Dynamic Adequacy Testing, Chapters 2-4, pages 5-19

Commentary on Question:

Commentary listed underneath question component.

Solution:

(a) Identify the elements you would have expected to see included in the DCAT report.

Commentary on Question:

This part was testing specifics of DCAT reports.

Many candidates knew "the list" (or much of it), but did not expand on the items in the list.

Few candidates organized their main bullets with sub-bullets underneath and noted things like assumptions just randomly in their response; should have been listed under one of the main points.

Many candidates critiqued the DCAT report under part (a) – the intention of part (a) was to generally describe DCAT report sections, and the review and critique was to take place under part (b).

Elements expected in a DCAT report:

1. Executive Summary
   - High level summary of the results of the analysis
   - Recommendations for management to mitigate or eliminate risk
2. DCAT Opinion
   - Signed opinion on the future financial condition of the insurer
3. Introduction
   - Purpose and scope of the DCAT report
4. Capital Adequacy Measurement
   - Definition of minimum capital requirement
5. Background Discussion
6. Base Scenario
   - Main assumptions
   - Consistency of base scenario with business plan
7. Adverse Scenarios
   - Minimum of 3 adverse scenarios which show greatest risks

15. Continued

8. Conclusions and Recommendations
   - Summary of results
9. Appendices

(b) Critique the base scenario and adverse scenario portions of the target's DCAT report that you reviewed.

Commentary on Question:
This part was testing knowledge of the requirements of DCAT reporting, and being able to critique and provide commentary on a report.
Candidates generally got the same few items, but many more points available
Many candidates would circle around a main point, but not state it clearly or would not mention an item in part (b) that they "knew" in part (a); needed to specify that an item was missing, not just imply.
Few candidates defined "plausible" or "adverse."
Points were heavily weighted towards understanding how to apply the "list" in part (a); even though there were fewer items in the answer, part (b) was worth the same as part (a).

Base Scenario:
- Base scenario should be consistent with business plan
  - If not, should disclose any differences
- The income statement is only for 2012 – should project for a longer time horizon
  - 5 years is typical for life insurers

Adverse Scenarios:
- Should include at least 3 adverse scenarios, not just 1
- Need to include any scenarios that cause the insurer to fall below minimum regulatory capital
  - Plausible scenarios are defined at the 99^{th} percentile
  - Adverse scenarios are defined at the 95^{th} percentile
    - So, an adverse disability rate that occurs once every 10 years is definitely plausible
- Need to model ripple effects

16. Learning Objectives:

4. Formulate and evaluate insurer claim reserving techniques.

Learning Outcomes:

(4c) Calculate appropriate claim reserves given data.

(4d) Identify adjustments to IBNR (margins, trend, seasonality, claims processing changes, etc.).

(4e) Evaluate data resources and appropriateness for calculating reserves.

(4f) Test adequacy of the reserves vs. actual claims experience.

Sources:

Group Insurance, Bluhm, W.F., 5th Edition, 2007

- Chapter 41 Claim Reserves for Long Term Benefits, pgs 869 – 872 and 883 – 885

ASOP5 Incurred Health and Disability Claims, pgs 3 – 6 and 8

Commentary on Question:

There were three parts to the question, each addressing STD reserves. Candidates generally knew generic formulas/approaches but many did not respond to the stated assumptions/questions.

Part (a) asked candidates to calculate seriatim claim reserves given claim detail at a specified valuation date. Candidates were expected to know the reserve "formula" and to determine the correct payment amounts and continuance rates based on information provided. Most candidates correctly identified the generic formula and correctly identified the timing/size of benefit payments for which a reserve is needed. Few, however, were able to determine the correct continuance rates based on the stated assumptions.

Part (b) asked candidates to calculate actual and expected continuance rates based on information provided and to assess reserve adequacy based on a comparison of continuance rates. Candidates were expected to calculate the continuance rates observed and expected for each period and comment on reserve adequacy and any necessary changes that should be made to the assumed continuance table as a result of this analysis. Candidates generally understood the concept of comparing actual to expected results and generally could draw appropriate conclusions on reserve adequacy. Concepts candidates struggled with included calculating A/E ratios of termination rates (instead of continuance rates), comparing cumulative continuance rates (instead of period-specific rates), and not understanding that claimants reaching the end of a benefit period should be excluded from the analysis (and not be considered terminations).

16. Continued

Part (c) asked candidates to identify plan provisions and other factors that could influence the required reserves and to assess the impacts of these items when reviewing reserve adequacy. Candidates were expected to list a number of considerations and briefly identify an A/E study of continuance rates. Candidates who responded to the question generally provided appropriate considerations, although many either did not comment on their impact or addressed the impact on reserves and not on continuance rates. Many other candidates either listed the key components of ASOP 5 instead of the requested considerations or provided little in response to part (c).

Solution:

(a) Calculate the reserve at the valuation date for each claim above. Assume all policies pay benefits from the end of the Elimination Period (EP) until 6 months from the date of disablement. Show your work.

Each reserve is the sum of the product of the applicable benefit amount, continuance rate, and discount rate. Benefits are paid mid-month and interest is 1% per month, so discount terms are $1.01^{-0.5}$, $1.01^{-1.5}$, etc.

This is a year-end valuation – so we need to reserve for benefits paid in January and later. We can infer that each of the two claimants is believed to be disabled at 12/31 but note that January disability validations have not been performed. We'll assume that duration 0 corresponds to the date of disability and durations 1, 2, etc. are the beginning of each subsequent month when disability status is evaluated. So, for Claimant 1, duration 0 is 10/1/11, duration 1 is 11/1/11, etc. Also, since disability status is only evaluated at the beginning (first) of the month, we are only concerned with continuance rates for 1/1 vs. 12/31, 2/1 vs. 12/31, etc. where the continuance rate for 12/31 is the same as the continuance for 12/1.

Since each claimant receives uniform benefit payments, we can then summarize the calculations as follows:

Claimant 1: Benefit Amount * Sum [Cont_3/Cont_2 * $1.01^{-0.5}$ + Cont_4/Cont_2 *$1.01^{-1.5}$ + Cont_5/Cont_2 * $1.01^{-2.5}$]
= 100 * [7600/8000 * $1.01^{-0.5}$ + 6800/8000 * $1.01^{-1.5}$ + 6400/8000 * $1.01^{-2.5}$]
= 100 * [.9453 + .8374 + .7803] = 256.30

Claimant 2: Benefit Amount * Sum [Cont_2/Cont_1 * $1.01^{-0.5}$ + Cont_3/Cont_1 *$1.01^{-1.5}$ + Cont_4/Cont_1 * $1.01^{-2.5}$ + Cont_5/Cont_1 * $1.01^{-3.5}$]
= 150 * [8500/9000 * $1.01^{-0.5}$ + 8000/9000 *$1.01^{-1.5}$ + 7500/9000 * $1.01^{-2.5}$ + 7000/9000 * $1.01^{-3.5}$]
= 150 * [.9398 + .8757 + .8129 + .7512] = 506.92

16. Continued

(b) For durations 1, 2, and 3:

(i) Calculate the ratio of Actual/Expected (A/E) Continuance rates for each duration. Show your work.

Continuance = Open claims at the end of the period / [Open claims at the end of the period + deaths during the period + recoveries during the period]

We need to ignore members reaching the end of their benefit period (for the period in which they reach the end) since we don't know if those members would be disabled or recovered at the end of the period.

Since the question asks for durations 1, 2, and 3, we'll ignore information for durations labeled 0 and 4-7.

Actual Continuance rates are:
N=1 29850 / [29850 + 100 + 30] = 29850/29980 = 0.9957
N=2 26710 / [26710 + 3000 + 90] = 26710/29800 = 0.8963
N=3 22260 / [22260 + 4000 + 150] = 22260/26410 = 0.8429

Assuming that duration 0 corresponds to the beginning of period 1 and duration 1 corresponds to the end of period 1, we have the following expected continuance rates:
N=1 9000/10000 = 0.9000
N=2 8500/9000 = 0.9444
N=3 8000/8500 = 0.9412

The A/E continuance rates are:
N=1 0.9957 / 0.9000 = 1.1063
N=2 0.8963 / 0.9444 = 0.9490
N=3 0.8429 / 0.9412 = 0.8955

(ii) Using your results in (i), assess the adequacy of reserves for each duration.

An A/E greater than 1 indicates that more claimants remain disabled at the end of the period that assumed – so the reserve will be inadequate. Since the A/E for period 1 is greater than 1, period 1 reserves will be inadequate. Since the A/E for periods 2 and 3 are less than 1, the reserves for each of these periods will be adequate.

16. Continued

(iii) Based on your calculations, describe changes that should be made to the assumed continuance table.

Since the data is fully credible and differs from our assumption, we should revise the assumed continuance rates to reflect the actual experience. In particular, we should increase the continuance rate assumed for duration 1. We can also decrease the continuance rates assumed for durations 2 and 3 as long as the observed continuance rates can be expected to continue into the future.

(c) Actuarial Standard of Practice #5 (ASOP #5) discusses the items an actuary should consider in setting health and disability claim reserves.

(i) List plan provisions that need to be considered when setting STD reserves.

Elimination period
Benefit amount
Benefit period/limit
Definition of disability

(ii) List other significant factors that should be considered when setting STD reserves.

Age at disability
Gender
Type of disability
Economic environment
Occupation

(iii) For each provision/factor identified above, describe how it could impact the A/E study performed in part (b) and any adjustments that should be made to the raw data used for the study as a result of the provision/factor.

Elimination period – In general, the EP should not impact continuance rates. This assumption could be validated by grouping data by EP and comparing results. However, there may not be enough data for policies with short EPs to adequately review experience in early claim durations.

Benefit amount – Higher benefit amounts could be associated with selection and can serve as a disincentive to members to recover. The actual amount generally won't impact the continuance rate so no adjustments to the data should be needed.

16. Continued

Benefit period/limit – Claimants reaching the end of their benefit period or a benefit maximum should not be considered terminations. We should exclude these claimants from the data for the period in which the maximum/limit is reached but can include them for earlier periods.

Definition of disability – Types of disability and recovery rates will differ significantly depending on the definition of disability used (any occupation vs. own occupation). Experience should be grouped by definition of disability and separate studies performed if enough data is available.

Age at disability – The type and severity of disabilities differ by age as does the ability of claimants to recover from those disabilities. Data should be grouped by age at disability if possible (or at least normalized for the mix of ages).

Gender – Continuation rates will differ by gender in part due to the types of disability incurred. The data should be grouped by gender if possible (or at least normalized for the mix of genders).

Type of disability – Continuance rates differ by type of disability. Maternity claims are generally quite predictable and continuance rates will also differ between mild vs. severe disabilities. Data should be grouped by type of disability (and severity of disability if possible).

Economic environment – Disability claims and continuance rates both tend to increase in bad economic climates. The data (and resulting continuance rates) may need to be adjusted to reflect changes in the economic environment.

Occupation – The mix of disabilities (and as a result, their average severity) differ by occupation. Data should be grouped by occupation or type of disability if possible to reflect differences in continuance rates caused by the severity (and claimant's ability to recover) of disabilities associated with the claimant's occupation.

17. Learning Objectives:

2. Typical markets: Understands customer segments and how products are marketed to each.

Learning Outcomes:

(2a) Compare group vs. individual product vs. government financed markets.

(2b) Describe common marketing channel to each major customer segment.

(2c) Describe the effect of the distribution channel on pricing and underwriting.

(2d) Compare the relationship between different marketing channels and the underlying needs of the consumers.

Sources:

Individual Health Insurance, Bluhn. W. F., 2007, chapter 10, Other Insurance Functions, pgs. 295 – 300

Group Insurance, Bluhm, W. F. Fifth Edition, 2007, Chapter 1, The Group Insurance Marketplace, pgs 2, 6 - 9

Managed health Care Handbook, Kongstvedt, P.R., Fourth Edition, 2001

- Chapter 41 Sales and Marketing/The Distribution Process
- Chapter 42 The Employer's View of Managed Health Care

Commentary on Question:

Commentary listed underneath question component.

Solution:

(a)

(i) List and describe the types of sales and marketing channels used to distribute group and individual insurance products.

Commentary on Question:

Most candidates answered the types of sales/marketing channels. To obtain the maximum points candidates need to provide additional descriptions such as group size (e.g. small, large group) and type of products offered by each distribution channel.

Agents /general agency

- Generally offer an array of products
- Sell to small groups and individuals

Brokers

- Single type of coverage
- Small to medium size groups (up to 1000 or 5000 lives)

17. Continued

Consultants
- Experts in the products they support
- Large groups (over 500 or 1000 lives)

Captive agents
- All of the insurer's products
- Agents so smaller end of market

Direct sales (company staff)
- Insurer's products
- Small group and individual

Telemarketing or mass marketing (e.g. internet, direct mail)
- Supplemental products due to UW and selection concerns
- Smaller end of market

Financial institutions
- New development so still not clear but likely simple products
- Smaller end of market

(ii) Describe the types of compensation arrangements and identify which arrangements are used for each channel.

Commentary on Question:
To receive maximum points both the type of compensation arrangements with a description and identification of commission structure by channel, were required. Most candidates answered with commissions (percent of premium, flat, and overrides) and service/renewal fees but did not include stipends and commission restrictions.

Types of compensation arrangements:
1. Commissions -- vary by policy type and duration, other metrics to drive behavior beneficial to the insurer, treatment of premium differs for inflation-sensitive products; often a percent of premium
2. Stipends -- may be used for captive agents in early years until they can develop a portfolio of business
3. Flat/level commissions -- some movement toward flat commissions instead of percentage of premium
4. Service/renewal fees -- may be provided to agents/brokers that provide services related to policy administration and renewal
5. Commission override -- additional commission payment to general agency to support overhead of managing agents/brokers and marketing the agency
6. Commission restrictions -- 1st year payment on Medicare Supplement no more than twice (dollar or percentage) rate of renewal commissions; may not pay commissions on conversion policies

17. Continued

Commission structure by channel:
1. Agents / general agency -- commissions, incentives, overrides for GAs
2. Brokers -- commissions, incentives
3. Consultants – service fees
4. Captive agents -- commissions, incentives, stipends in early years
5. Direct sales -- salary, commissions, bonus
6. Financial institutions -- commissions or service fees

(iii) List and describe the types of groups to which CIC could sell a group product.

Commentary on Question:
Most candidates answered this question. To receive maximum points, the candidate must list the type of group along with a description.

Types of groups:
1. Single Employers
2. Multiple Employer Trusts -- trust is policyholder; anticipate improved purchasing power and/or spreading of risk
3. Associations and affiliation groups -- association or trust is policyholder; members pay full cost possibly through dues (affinity groups)
4. Labor Unions -- union or MET trustees is policyholder; coverage usually specified in CBA (collective bargaining)
5. Government Employee Groups -- FEGLI, FEHBA, TRICARE (CHAMPUS) -- governmental sponsor is policyholder
6. Government Social Insurance Programs -- Medicare, Medicaid, Social Security, Canadian Medicare
7. Creditor Groups -- typically banks and other lenders (policyholder) for life/disability coverage
8. Discretionary Groups -- include purchasing alliances; trust usually policyholder

(b) CIC has decided to introduce a Health Savings Account (HSA) product for the small group market. Recommend two distribution channels that CIC should use to market this new group product. Explain your rationale.

Commentary on Question:
Partial credit was given if a candidate mentioned brokers, agents, or a type of mass marketing (e.g. internet, worksite, direct mail). Maximum credit was given if a thorough explanation of why CIC should use the preferred distribution channel was provided with each option.

17. Continued

Distribution channels to use to recommend HSA product:

1. Brokers and independent agents
   - Specialize in given type of product
   - Have established relationships (contacts)
   - Don't need to build distribution network/infrastructure
   - Can provide feedback on market suitability/receptivity (already familiar)
2. Mass marketing (internet marketing, worksite marketing, direct mail)
   - Curate can leverage experience/relationships from individual products (if they have used mass or telemarketing for their individual products)
   - Can easily target a broad audience and make aware of this new offering
   - Don't need to build distribution network/infrastructure (low overhead)

18. Learning Objectives:

10. Evaluate the risks associated with health insurance.

Learning Outcomes:

(10c) Complete a capital needs assessment:

- Calculate capital needs for a given insurer
- Assess capital needs against assets
- Determine actions needed to address issues identified by assessment
- Understand key elements of NAIC and Canadian RBC models

Sources:

Group Insurance, Bluhm, Fifth Edition, 2007

- Chapter 19 Risk-Based Capital Formulas, pgs. 373. 375 and 381 - 383

Commentary on Question:

Part (a) was a straight forward recall question. Most candidates were able to name H1 through H4 although many candidates did not provide any information beyond the name.

Part (b) was an application of the NAIC RBC formula. Nearly all candidates successfully completed this calculation. The only common mistake was not dividing RBC by two to get ACL RBC.

Part (c) was more difficult for candidates. The expected answer was that Target would become a subsidiary of SOATA and would therefore be included in HO for SOATA and the RBC level of Target. In addition, SOATA H1 RBC would decline because of the disposal of mutual funds from the asset portfolio by the amount of the asset reduction times the capital factor. Common errors included:

- Incrementing H0 for SOATA by the amount paid for Target instead of by the amount of Target's RBC
- Not reflecting change in H1 as a result of selling assets to purchase Target
- Reducing H1 by the amount of assets sold instead of the RBC charge related to those assets
- Combining RBC values for each of H1 through H4 for SOATA and Target instead of treating Target as a subsidiary of SOATA.

Part (d) proved to be an even greater challenge for candidates. The expected answer was that the business was SOATA and so the RBC elements for Target and SOATA would have to be combined. You would still have to reflect the H1 reduction due to the sale of mutual funds that you needed to consider in part (c). Most candidates were able to combine the H1 through H4 values although very few candidates made the asset adjustment to H1 for SOATA. In the second piece to part (d), candidates performed relatively poorly. The expected answer was to address areas where the approximation of adding the separate RBC values would result in flaws.

18. Continued

These include the asset concentration risk adjustment to H1, the size related underwriting factors in H2, the size based administrative expense risk in H4 and the excessive growth factor in H4. Many candidates made mention of diversification of risks but few addressed specific elements of the RBC formula. Several candidates addressed operating efficiencies and other changes that may result from the implementation of the combination but this was non-responsive to addressing the question of items the approximation of the calculation does not address.

Solution:

(a) Define what each of $H_1, H_2, H_3,$ and H_4 represent.

H1 is asset risk; risk that investments default or decline in value.
H2 is underwriting risk; risk of inadequate future premium levels due to fluctuations in claim expenses.
H3 is credit risk; risk that amounts owed to health plan will not be recovered (this includes risk that capitated providers may not provide agreed upon services)
H4 is business risk; this includes administrative expense risk, guarantee fund risk, and excessive growth risk.

(b) Calculate the TAC-to-ACL ratio for SOATA HMO. Show your work.

RBCAC=H0 + {H1 ^ 2 + H2 ^ 2 + H3 ^ 2 + H4 ^ 2} ^ 0.5
ACL RBC=.5 * RBCAC

For ABC=.5 * {200 + (15000 ^ 2 + 50000 ^ 2+ 1000 ^ 2 + 1500 ^ 2) ^ 0.5} =	26216
TAC to ACL ratio=60000/26216=	229%

(c) Assume SOATA sells $10 million of mutual funds and uses the proceeds to acquire all of the outstanding shares of GO stock. Calculate SOATA's revised ACL RBC. Show your work.

H0 increases by Target RBC	
Target RBC = (5000 ^ 2 + 7000 ^ 2 + 200 ^ 2 + 250 ^ 2) ^ .5	8608
Modified H0=200 + Target RBC	8808
H1 decreases by mutual funds sold	
modified H1 = 15000 – 10000 * .15	13500
Modified RBCAC = 8808 + (13500 ^ 2 + 50000 ^ 2 + 1000 ^ 2 + 1500 ^ 2) ^ .5	60630
Modified ACL RBC = .5 * RBCAC	30315

18. Continued

(d) Assume instead of acquiring GO stock, SOATA acquires all of the assets, liabilities and business contracts of GO for the same amount.

(i) Approximate the change in SOATA's revised ACL RBC. Show your work.

(ii) Identify the items your approximation does not effectively address and describe the impact of each item on SOATA's revised ACL RBC.

H1:	decreases by mutual funds sold	
	increases by target	
	modified H1 = 13500 + 5000	18500
H2:	increases by target	
	modified H2 = 50000 + 7000	57000
H3:	increases by target	
	modified H3 = 1000 + 200	1200
H4:	increases by target	
	modified H4 = 1500 + 250	1750

Modified ACL RBC = .5 * {200 + (18500 ^ 2 + 57000 ^ 2 + 1200 ^ 2 + 1750 ^ 2) ^ .5} 30082

Values approximate due to:

doesn't account for changes in asset concentration risk
doesn't address potential excess growth risk

19. Learning Objectives:

7. Integrate reinsurance arrangements with overall financial strategy of company plan/sponsor.

Learning Outcomes:

(7b) Recommend a type of reinsurance for a given scenario.

Sources:

GH-C30-10: SOA Session Materials: Spring meeting 2009, Session 44, Update on Employer Stop-loss

Commentary on Question:

This question was trying to test the knowledge of leveraged trend in the stoploss area where a threshold is involved. Most candidates correctly answered part (b) and demonstrated this knowledge. Part (a) asked for pricing considerations in stoploss. Most candidates received partial credit for this section demonstrating some knowledge of pricing stoploss, but not full knowledge.

Solution:

(a) Outline the pricing considerations in stoploss coverage

Commentary on Question:

Most writers got part of this answer correct, although some answered a different question of considerations in selecting a reinsurer.

1. Underlying trend versus leveraged trend
2. Deductible level
3. Frequency and severity of large claims
4. Shift in risk mix
5. Incidence of catastrophic claims
6. Underlying plan design
7. Credibility of claims experience

(b)

(i) Demonstrate fixed-cost leveraging by calculating the stoploss claims trend for year 2. Show your work.

Year 1 Stoploss Claims = (750K – 500K) + (1.2M – 500K) + (800K – 500K)

= 250K + 700K + 300K

= 1.25M

19. Continued

Year 2 Stoploss claims = (750K*1.08–500K) + (1.2M*1.08–500K) + (800K*1.08–500K)
= (810K – 500K) + (1.296M – 500K) + (864K – 500K)
= 310K + 796K + 364K
= 1.47M

Leveraged Trend = Year 2 stoploss claims / Year 1 stoploss claims − 1
= 1.47M / 1.25M − 1
= 17.6%

(ii) Calculate the year 2 stoploss threshold that would be required to keep the year 2 stoploss claim trend equal to the medical trend. Show your work.

Stoploss claims trended at 8% = 1.25M * 1.08
= 1.35M

Reduction in stoploss claims to get to 8% = 1.47M – 1.35M
= 120K

Since there are three stoploss claims, need to reduce each claim by 40K

New Stoploss threshold = old threshold + 40K = 540K

20. Learning Objectives:

5. Formulate and evaluate insurer reserving techniques for other liabilities.

Learning Outcomes:

(5a) Describe different types of reserves and explain when each is required:

- Deficiency reserves
- Active life reserves
- Premium reserves
- Deferred acquisition costs
- Claim administration expense reserves
- Calculate the reserves given data

Sources:

Group Insurance, Bluhm, W.F., Fifth Edition, 2007

- Chapter 17 Group Insurance Financial Reporting: US, pg. 337
- Chapter 18 Group Insurance Financial Reporting: Canada, pgs 359 - 360

Commentary on Question:

Candidates were generally able to explain the basic concept of the DAC tax and understood why the DAC tax is more burdensome to a new insurer. However, most candidates did not provide enough detail or supporting comments to earn full credit in part (a).

Candidates did not perform well on part (b). Several candidates listed the tax rules applicable to employer sponsored benefits, which was not the intent of this question. Some candidates listed one or two main points, but the majority of candidates did not provide adequate responses.

Solution:

(a)

(i) Describe the U.S. Deferred Acquisition Cost (DAC) tax.

- The DAC tax delays recognition of certain expenses for purposes of taxable income.
- It is generally over a ten year period.
- This tax is not related to real expenses.
- The tax is typically calculated as a percentage of in-force premium.

(ii) Explain why the DAC tax is more burdensome to a new insurer versus an existing long-standing insurer.

- A new insurer will have much more proportionately higher actual acquisition expenses than an existing long-standing insurer, but will not be able to expense the full current costs for purposes of income tax.

20. Continued

- A new insurer may be taxed on income that they do not even have.

(b) Compare ways in which the U.S. Federal Tax rules are more or less detrimental to group insurance income than the Canadian Tax Rules.

- Both Canada and US start with statutory reporting and then adjust, but Canada statutory is more based upon actuarial judgment and reasonable assumptions than US.
- The US has a minimum interest rate requirement and mandated bases for reserve calculations.
- US Group carriers must reduce their provisions for unearned premiums by 20%.
- US Group carriers must also reduce their provisions for experience refunds by 20% of that in statutory.
- Canada IBNR limited to 95% of that used in statutory.
- Canadian rules use more actuarial judgment while US rules constrains actuarial judgment.