GI FREU Model Solutions
Spring 2014

1. Learning Objectives:

1. The candidate will understand the elements of financial reporting for general insurance companies.

Learning Outcomes:

(1a) Understand and apply the concepts of insurance accounting.

Sources:

General Insurance Financial Reporting Topics, Society of Actuaries, Part 1 (Accounting Systems for General Insurers) and Part 2 (Accounting for Insurance Contracts)

NAIC Statement of Statutory Accounting Principles 3, "Accounting Changes and Corrections of Errors"

Solution:

(a) Describe the difference between cash accounting and accrual accounting.

In cash accounting, income is recognized when cash is received, expenses are recognized when they are paid. In accrual accounting, income is shifted to better match earning patterns. Expenses can be shifted to reflect the income. Premium revenue is accrued, unearned premiums are deducted from written premium to form earned premium, which is revenue for earnings measurement. Losses are recognized when they are incurred, not when they are paid.

(b) Define the following accounting concepts and describe how they should be disclosed in statutory financial statements:

(i) Change in accounting principle

(ii) Change in accounting estimate

1. Continued

(i) A change in accounting principle results from the adoption of an accepted accounting principle, or method of applying the principle, which differs from the principles or methods previously used for reporting purposes. The cumulative effect of changes in accounting principles shall be reported as adjustments to surplus in the period of the change. The cumulative effect is the difference between the amount of capital and surplus at the beginning of the year and the amount of capital and surplus that would have been reported at that date if the new accounting principle had been applied retroactively for all prior periods.

(ii) Changes in accounting estimates are necessary consequences of periodic presentations of financial statements that require estimating the effects of future events. Accounting estimates change as new events occur, as more experience is acquired, or as additional information is obtained. A change in accounting estimate shall be included in the statement of income in the period when the change becomes known.

If the effect of a change in accounting principle is inseparable from the effect of a change in accounting estimate, then the change shall be considered as a change in accounting estimate for purposes of applying the accounting principles.

(c) Describe the Deferred Policy Acquisition Cost (DPAC) asset under GAAP.

GAAP capitalizes a DPAC asset at policy inception to represent the underwriting and acquisition expenses paid at policy inception and amortizes it over the policy term as the premiums are earned.

(d) Calculate the DPAC as of the following dates under both statutory accounting and IFRS 4:

(i) August 1, 2013

(ii) October 1, 2013

(iii) December 1, 2013

1. Continued

Deferred expenses are 0 under Statutory Accounting at all times.

While not specifically referred to as DPAC in IFRS 4, expenses in IFRS 4 are linked to the loss incurral pattern creating deferred expenses (i.e., DPAC).

(i) Aug. 1, 2013: 0% of the expenses are written off, deferred expenses = 1,200
(ii) Oct. 1, 2013: 50% of the expenses are written off, deferred expenses = 600
(iii) Dec. 1, 2013: 100% of the expenses are written off, deferred expenses = 0

2. Learning Objectives:

1. The candidate will understand the elements of financial reporting for general insurance companies.

Learning Outcomes:

(1e) Understand and apply the concepts of reinsurance accounting.

Sources:

General Insurance Financial Reporting Topics, Society of Actuaries, Part 5 (Accounting for Reinsurance Contracts)

Brehm, P. and Ruhm, D., "Risk Transfer Testing of Reinsurance Contracts"

Solution:

(a) Explain why the "10% - 10% rule" is not considered appropriate for determining the existence of sufficient risk transfer.

The rule does not take into account a high loss amount offsetting a low probability of loss. Certain reinsurance contracts that most clearly transfer risk do not satisfy the 10% probability of loss. Examples of such contracts are catastrophe covers and higher layer excess-of-loss treaties. The 10% - 10% rule is no longer a preffered approach by either regulators or the actuarial community to measure risk transfer.

(b) Describe the ERD method for measuring risk transfer.

The ERD measure is derived from the probability distribution of net economic outcomes. ERD = pT/P where p = probability of net income loss; T = average severity of net economic loss, when it occurs; and P = expected premium.

The critical point in the distribution is economic breakeven, where net gain is exactly zero. The part of the distribution below breakeven, where net economic loss occurs, is the risk zone.

(c) Calculate the ERD.

Reinsured loss	Probability	Net gain/loss
0	94%	16M
100M	3%	16M – 100M/1.03 = –81.1M
250M	2%	16M – 250M/1.03 = –226.7M
500M	1%	16M – 500M/1.03 = –469.4M

p = 3% + 2% + 1% = 6%, P = 16
T = (81.1M × 3% + 226.7M × 2% + 469.4M × 1%)/6% = 194.4M
→ ERD = 6% × 194.4/16 = 72.9%

3. Learning Objectives:

2. The candidate will understand the analysis of a general insurer's financial health through prescribed formulas, ratios and other solvency regulation methods.

Learning Outcomes:

(2b) Understand and apply the elements of the NAIC RBC formula.

(2h) Compare different solvency standards.

(2i) Discuss the function of credit rating agencies and their impact on general insurers.

Sources:

General Insurance Financial Reporting Topics, Society of Actuaries, Part 12 (Solvency Monitoring) and Part 13 (General Insurance Financial Ratings)

Solution:

(a) Describe a benefit that rating agencies provide to insurance company policyholders.

Policyholders depend on the financial strength of insurers to fulfill long-term promises, but lack the expertise, resources, and time to examine insurers themselves. Rating agencies hire financial analysts, actuaries, and economists to assess the financial strength of insurers.

(b) Explain why an insurance company may want to receive a rating from more than one rating agency.

Commentary on Question:

Three reasons are shown in the model solution. Only two are required for full credit.

- The insurer may want to issue debt through a holding company and seeks a rating from an agency with more experience in debt ratings.
- The insurer may be publicly traded and wants a rating from an agency better known to investors.
- The insurer may be dissatisfied with its current rating and believes the second rating will be higher.

3. Continued

(c) Identify two differences between the BCAR formula for net required capital and the RBC formula.

Commentary on Question:
Many differences exist. Five differences are shown in the model solution. Only two differences are required for full credit.

- NAIC RBC formula uses a "worst case" year over a limited time frame as the measure to calibrate reserving and new business risks (roughly a 87.5% VaR). BCAR uses a 1% EPD measure (for all risks).
- NAIC RBC has a conditional rule for moving half of credit risk into reserving risk. BCAR always splits the credit risk charge.
- NAIC RBC does not include interest rate risk. BCAR includes it.
- BCAR adjusts written premium (WP) and reserving risk for age and size of insurer. NAIC RBC does not.
- BCAR includes a reserve deficiency factor in the reserving risk charge. NAIC RBC does not.

(d) Calculate CCI's 2013 RBC written premium risk charge.

Company adjustment (Cadj) by line = (co. average/industry average)
PL: 0.80/0.70 = 1.1429 and
AL: 0.85/0.75 = 1.1333

Company adjusted RBC adverse scenario L&LAE by line (CadjA)
= (industry adverse scenario L&LAE) × (1 + Cadj)/2
PL: 1.05 × (1 + 1.1429)/2 = 1.125
AL: 0.90 × (1 + 1.1333)/2 = 0.96

Basic WP RBC Charge (BWC)
= (CadjA × investment income factor + co. expense – 1.0) × WP
PL: (1.125 × 0.9 + 0.2 – 1) × 12M = 2.55M
AL: (0.96 × 0.95 + 0.2 – 1) × 4M = 0.45M
Total BWC = 2.55 + 0.45 = 3.0M

Premium Concentration Factor (PCF)
= 0.7 + 0.3 × (WP from largest lob/total WP)
PCF = 0.925 (= 0.7 + 0.3 × (12/16))

WP RBC Charge before XS Growth Charge = BWC × PCF = 3.0 × 0.925
= 2.77M

3. Continued

XS Growth rate by LOB (4 year average growth xs 10%) = XSG
PL: Average(10/10, 10/10, 12/10) – 1 = 6.7% → XSG = 0%
AL: Average(4/2.5, 4/4, 4/4) – 1 = 20% → XSG = 10%

XSG Charge = 22.5% × NWP × XSG
PL: 0 and
AL: 22.5% × 4 x 10% = 0.09M

WP RBC Charge = WP RBC Charge before XS Growth + XSG Charge
= 2.77 + 0.09 = 2.86M

(e) Calculate CCI's 2013 RBC ratio.

RBC = R0 + (R1^2 + R2^2 + R3^2 + R4^2 + R5^2)^0.5
= 0 + (0.1^2 + 0.5^2 + 0^2 + 10^2 + 2.86^2)^0.5 = 10.4M

ACL = RBC/2 = 5.2M

RBC Ratio = Total Adjusted Capital/ACL = 6/5.2 = 115.4%

(f) Identify the action level indicated by the RBC ratio calculated in part (e) and specify any actions that are required of CCI and the regulator.

Since RBC ratio is between 100% and 150% it is the Regulatory Action Level.

Action by Company:
Must submit a plan to the insurance commissioner of the domiciliary state.

Plan must explain how the company will obtain capital or reduce operations/risk exposure to meet RBC standards.

Action by Regulator:
Commissioner has the right to take corrective actions against the company (e.g., new business restrictions). Action is discretionary.

4. **Learning Objectives:**

5. The candidate will be able to understand tort law and insurance law with respect to its impact on the general insurance industry.

Learning Outcomes:

(5a) Describe and interpret the key elements of tort law and the underlying principles of insurance law.

(5d) Understand mass torts/class action suits and discuss their impact on the general insurance industry.

(5e) Describe and interpret legal cases/issues from *Important Legal Cases with Respect to the U.S. General Insurance Industry*.

Sources:

Excerpts from Business Law for Insurance Professionals, Institutes Custom Publishing, Assignment 1 (Contract Law: Insurance Applications) and Assignment 2 (Tort Law)

White, M., "Asbestos and the Future of Mass Torts"

Rose, B. and Falletta, C., "Wyeth v. Levine: Where Do We Go From Here?"

Solution:

(a) Define *contract of adhesion*.

A contract of adhesion is one in which one party must either accept the agreement as written by the other party or reject it.

(b) Explain how an interpretation of the policy as a premises liability policy may lead to increased payments by the insurer.

In a premises liability situation, each claim is entitled to compensation, regardless of how many such claims there are. There is no aggregate limit.

(c) Explain how interpreting the policy as a *contract of adhesion* may lead to such an interpretation.

Contracts of adhesion are generally interpreted as being favorable to the insured. Because the insured must take or leave the policy terms, any ambiguities are resolved in favor of the insured.

4. Continued

(d) Identify three major differences between asbestos and other mass torts that have led to significant asbestos claims.

Commentary on Question:
There exist a number of major differences. Four differences are shown in the model solution. Only three differences are required for full credit.

- The number of defendants is much larger in asbestos.
- Exposure may be to several sources and thus multiple defendants may be at fault in a single case.
- Cases proceed even if there has been no impairment.
- Multiple insurance companies may be declared to have covered a single claimant's case.

(e) One possible defense against a products liability lawsuit is compliance with statutes and regulations. Describe this defense.

A manufacturer could claim that because its product complied with statutes and regulations it must be appropriate for use.

(f) Describe the situation in the case Wyeth v. Levine, state the ruling and provide the reasoning for that ruling.

Situation: A drug carried a risk that it might be injected into an artery rather than a vein. The label warned against this possibility but the plaintiff claimed that there was insufficient warning of the risks of such injection. Wyeth claimed that the label was mandated by the FDA and could not be altered and that a jury should not be able to overrule the FDA's expert judgment.

Ruling: The Court found for the plaintiff.

Reasoning: Under FDA rules, the label could have been strengthened without formal approval. There was no clear evidence that the FDA would have objected. The Court also ruled that Congress did not intend the FDA to be the exclusive means of ensuring drug safety.

5. Learning Objectives:

4. The candidate will be able to describe the current and historical regulatory environment.

Learning Outcomes:

(4b) Describe and interpret the current state of general insurance regulation in the U.S. and its development.

(4d) Discuss market conduct regulation.

Sources:

Insurance Regulation, The Institutes, Chapter 2 (Development of Insurance Regulation) and Chapter 7 (Underwriting Regulation)

Edmunds, T., "Insurance and the discrimination laws: motor and travel insurance"

Solution:

(a) Identify the type of organization that the South-Eastern Underwriters Association (SEUA) was and describe its market conduct that led to the landmark SEUA decision in 1944.

SEUA was a rating bureau (or compact). It set premiums and commissions and actively enforced its terms with regard to member and nonmember insurers.

(b) Define fair discrimination in an insurance context and provide an example.

Commentary on Question:
Many different examples are possible. One example is provided in the model solution as a guide to a full credit response.

Fair discrimination is applying different standards and prices to insureds based on differences in loss potential.

An example of fair discrimination is charging more for a personal liability policy where the insured has a swimming pool relative to a policy where there is no pool, all other factors being the same. The discrimination is fair because an insured having a pool adds more potential for serious accidents, which leads to a higher probability of liability and thus higher insured costs.

5. Continued

(c) The European Court of Justice has banned the use of gender in pricing insurance products in the European Union. Critique this decision and provide a concurring or dissenting opinion.

Commentary on Question:
Widely varying responses are possible for full credit. Grading of this type of question takes into account how clearly the information is presented in the response as well as the content of the response. The response should be in the form of a concurring or dissenting opinion, not simply a listing of the arguments on both sides. Two model solutions are shown as examples of full credit responses.

Sample solution 1 (concurring opinion):
The ECJ, in its decision to ban the use of gender in pricing insurance products in the EU, strengthens the notion of social equity by making insurers subject to the Equality Act. Society generally does not allow discrimination by gender. Insurers should not have an exemption from following discrimination laws.

Insurers may argue from the point of view of actuarial equity noting the existence of cost differences by gender for certain insurance products. But this is not a sufficient reason to allow discrimination. If insurers could prove a cost difference between races or religious backgrounds, it would still be both legally and socially unacceptable for insurers to discriminate on this basis. Discrimination by gender is not socially acceptable and against discrimination laws.

Sample solution 2 (dissenting opinion):
The ECJ, in its decision to ban the use of gender in pricing insurance products in the EU, strengthens the notion of social equity by making insurers subject to the Equality Act. Insurers had historically been given some exemptions from the Equality Act. Many in society are willing to permit discrimination by gender in insurance pricing when it represents fair discrimination, reflecting true cost differences, i.e., actuarial equity.

The ECJ ruling will, on average, increase insurance costs. Insurance pricing that reflects actual price differences by gender creates more accurate rating. Less accurate rating is riskier and invites adverse selection; insurers will require more capital to support the increased risk and require a greater return, thereby increasing rates. Insurers will also need to invest in new rating variables to replace gender so rates reflect costs as much as possible.

5. Continued

(d) Recommend two responses that an automobile insurer in the European Union should consider in response to the European Court of Justice ban on the use of gender in insurance pricing.

Commentary on Question:
Many different responses are possible. Three responses are provided in the model solution. Only two are required for full credit.

- Introduce factors into risk classification structure to substitute for predictive value of gender
- Target marketing toward women
- Move toward usage-based insurance

(e) Identify two aspects of an insurer's operations, other than potential unfair discrimination in rating or underwriting, that may be within the scope of an examination.

Commentary on Question:
Many aspects are within the scope of an examination. Three are provided in the model solution. Only two are required for full credit.

- Certificate of authority
- Internal audit program
- Computer systems

6. Learning Objectives:

1. The candidate will understand the elements of financial reporting for general insurance companies.

Learning Outcomes:

(1h) Estimate the premium asset for retrospectively rated polices for financial reporting.

Sources:

Teng, M. and Perkins, M., "Estimating the Premium Asset on Retrospectively Rated Policies"

Solution:

(a) Explain why premium booked through 42 months should or should not be used to calculate the results of third retro adjustments.

Premium booked through 42 months should not be used. It takes time to do the retro calculation and record adjusted premiums, so there is a time lag between the recording of losses and the recording of premiums.

(b) Explain why the first PDLD ratio is generally greater than unity and why the PDLD ratios tend to decrease with later adjustments.

The basic premium is included in the first retro premium computation and the loss conversion factor and tax multiplier are applied to the loss. As time goes on, more of the loss is limited by the retro maximum or per accident limitation.

(c) Calculate the premium asset on retrospectively rated policies as of December 31, 2013 arising from policy years 2010, 2011 and 2012.

1^{st} CPDLD ratio = (50% × 1.75 + 30% × 0.75 + 20% × 0.50)/(50% + 30% + 20%)
= 1.20
2^{nd} CPDLD ratio = (30% × 0.75 + 20% × 0.50)/(30% + 20%) = 0.65
3^{rd} CPDLD ratio = (20% × 0.50)/20% = 0.50
2010 Premium Asset = 0.50 × 20,000 = 10,000
2011 Premium Asset = 0.65 × 50,000 = 32,500
2012 Premium Asset = 1.20 × 100,000 = 120,000 – 122,500 = –2,500
Total Premium Asset = 10,000 + 32,500 – 2,500 = 40,000

7. Learning Objectives:

3. The candidate will be able to apply the standards of practice regarding the responsibilities of the actuary as defined by regulators and the American Academy of Actuaries.

Learning Outcomes:

(3a) Describe, interpret and apply the applicable Standards of Practice.

(3d) Describe and apply the concept of materiality.

Sources:

Actuarial Standard of Practice

- No. 41, Actuarial Communications
- No. 43, Property/Casualty Unpaid Claim Estimates

American Academy of Actuaries, "Materiality, Concepts on Professionalism"

Solution:

Describe the issues raised by this scenario. Include references to:

(i) Materiality

(ii) Actuarial Standard of Practice No. 41, *Actuarial Communications*

Commentary on Question:

Widely varying responses are possible for full credit. Grading of this type of question takes into account how clearly the information is presented in the response as well as the content of the response.

The response should address several issues raised by the scenario, either directly or indirectly, that would be of concern to the consulting actuary. It should demonstrate familiarity with the AAA discussion paper on materiality and ASOP 41 as they relate to these issues.

No credit is given for statements made without any reference to the scenario presented. Three paragraphs are sufficient for full credit. The model solution shown is just one example of the style and content that represents a full credit response. A full credit response may contain less information than what is shown in this model solution.

7. Continued

In any actuarial assignment, the actuary must consider the principal and the intended users of the work. This is noted in both ASOP 41 and ASOP 43. For my assignment to peer review CLIC's unpaid claim estimates, the principal is CLIC. However, intended users of the assignment can include the insurance supervisor, the SEC and investors, especially with the possibility of a takeover. This must be taken into account when the materiality standard is selected. Since the difference between the estimates from the two methods is significant, it should be considered a material difference.

My peer review assignment was constrained by time. ASOP 41 does allow standards to be followed to the extent reasonably possible within constraints such as time. This would suggest that there is some allowable relaxation in the application of all applicable standards. However, ASOP 41 notes that this may not be appropriate if the findings may receive broad distribution. There is certainly the possibility that this peer review may receive broad distribution with a potential takeover so care should be taken to strictly follow all applicable ASOPs. Furthermore, all recorded communications must be considered to be discoverable in legal proceedings. With the possibility of a takeover, great care must be taken to ensure that there is full compliance with all applicable ASOPs.

As per ASOP 41, my findings must contain a disclosure that there was a constraint on time and a reliance on the results of one method being supplied by another source (the principal of the assignment). ASOP 43 requires the following:

- Consideration of the use of multiple methods
- Consideration of the appropriateness of the chosen methods

Given the material difference in estimates between the method selected and the chain ladder method, and the fact that the chain ladder approach had been relied upon in the past, my findings should consider the reasons for the difference between the methods and attempt to ascertain which is more appropriate. My peer review finding also concludes that that the chief actuary at CLIC, subject to the ASOPs, should not make a significant change in methodology with a material effect on the estimates without disclosing the change and the appropriateness of the change in the report of CLIC's unpaid claims.

8. Learning Objectives:

1. The candidate will understand the elements of financial reporting for general insurance companies.

Learning Outcomes:

(1f) Understand and apply the elements of discounting for general insurance loss reserves.

(1g) Demonstrate knowledge of taxation for general insurers in the U.S.

Sources:

General Insurance Financial Reporting Topics, Society of Actuaries, Part 3 (Accounting for Financial Instruments) and Part 15 (Federal Income Taxes for General Insurers)

Solution:

(a) Calculate the tax basis average reserve discount factor for the loss and loss adjustment expense reserve as of Dec. 31, 2013.

For accident year (AY) 2012, use a 2.5% discount rate as it is fixed for the AY.

As of year end (YE) 2013 these reserves are entering the second year following the year of occurrence. According to the payment pattern they should all be paid off in 2014. Therefore the AY 2012 discount factor at YE 2013 is (1.025)^–0.5 = 0.9877.

For AY 2013, use a 4% discount rate. As of YE 2013 these reserves are entering the first year following the year of occurrence. Payment pattern has 50% being paid off after the year of occurrence in the pattern (30% then 20%). AY 2013 discount factor at YE 2013 is [(1.04)^–0.5] × (30%/50%) + [(1.04)^–1.5] × (20%/50%) = 0.9655.

For reserves at 12/31/2013, the tax basis average reserve discount factor is (3.4 × 0.9655 + 1.2 × 0.9877)/4.6 = 0.9713.

(b) Calculate regular taxable income for NIC in 2013.

Taxable investment income is the sum of:

- taxable interest income = 400,000
- the prorated portion of tax exempt interest income = 15% × 600,000 = 90,000
- the taxable portion of dividends received = 30% × 200,000 = 60,000
- the prorated portion of the DRD = 15% × (200,000 – 60,000) = 21,000
- realized capital gains = 100,000

Taxable investment income = 671,000 (= 400,000 + 90,000 + 60,000 + 21,000 + 100,000)

8. Continued

Taxable UW income equals statutory UW income plus 20% of the change in the UEPR plus the change in the loss reserve discount.

- statutory UW income is given = –400,000
- unearned premium reserve change is 200,000, of which 20% is 40,000.
- reserve discount is 4M × (1 – 98%) = 80,000 at Dec. 31, 2012 and 4.6M × (1 – 97.13%) = 132,000 at Dec. 31, 2013 → a change of 132,000 – 80,000 = 52,000.

Taxable UW Income = –400,000 + 40,000 + 52,000 = –308,000

Regular Taxable Income = taxable UW Income + taxable investment income
= –308,000 + 671,000
= 363,000

(c) General insurers tend to include a greater proportion of municipal bonds in their investment portfolios than other investors. Explain the rationale for this.

Commentary on Question:
Widely varying responses are possible for full credit as there are a number of reasons for this.

General insurers have far higher ratios of after-tax to pre-tax cash flows than other financial sector companies, with incentives to invest in tax-exempt securities such as municipal bonds.

9. **Learning Objectives:**

1. The candidate will understand the elements of financial reporting for general insurance companies.

Learning Outcomes:

(1e) Understand and apply the concepts of reinsurance accounting.

Sources:

General Insurance Financial Reporting Topics, Society of Actuaries, Part 5 (Accounting for Reinsurance Contracts)

NAIC Statement of Statutory Accounting Principles 62 Revised, "Property and Casualty Reinsurance"

Solution:

(a) Determine the likely range of values that AA should be willing to accept for the loss commutation.

If AA settled first, the expected recovery is 50% × 0 + 50% × 60 = 30, which is the fair value (FV) for the claim.

If AA settled second, there are two possibilities, depending on the BB settlement:

- 50% BB settles for 0, reinsurer has assets of 100
  → expected recovery for AA is 50% × 0 + 50% × 60 = 30
- 50% BB settles for 60, reinsurer has assets of 40
  → expected recovery for AA is 50% × 0 + 50% × 40 = 20
- Average is 25

Expected recoverable amount is 50% × 30 + 50% × 25 = 27.5 (assuming AA and BB have equal probability of settling first)
Range is expected recoverable amount to FV → 27.5 to 30

(b) Determine the likely range of values that AA should be willing to accept for the loss commutation if:

- AA now believes that its ceded claim has a 30% probability of a zero loss payment and a 70% probability of a 60 million loss payment.
- AA continues to believe BB's ceded claim has a 50% probability of a zero loss payment and a 50% probability of a 60 million loss payment.

9. Continued

If AA settled first, the expected recovery is 30% × 0 + 70% × 60 = 42, the FV.
If AA settled second, there are two possibilities, depending on the BB settlement:

- 50% BB settles for 0, reinsurer has assets of 100
  → expected recovery for AA is 30% × 0 + 70% × 60 = 42
- 50% BB settles for 60, reinsurer has assets of 40
  → expected recovery for AA is 30% × 0 + 70% × 40 = 28
- Average is 35

Expected recoverable amount is 50% × 42 + 50% × 35 = 38.5 (assuming AA and BB have equal probability of settling first)
Range is expected recoverable amount to FV → 38.5 to 42

(c) Explain the merits of AA being the first to commute in the scenario described in part (b) versus waiting for either claim to settle first before making a decision.

Commentary on Question:
Widely varying responses are possible for full credit. The following is an example of a full credit response.

Commuting first leaves less to chance, but any benefit is dependent on AA's negotiating skills. If AA can get close to fair value, it should commute first. If the reinsurer won't commute above 35, it should wait. By waiting, it may get full recovery at 60 if BB's claim is zero. Also, if AA waits, BB may commute at 30 leaving enough assets for full recovery of AA's claim.

(d) Describe the statutory accounting treatment of the commutation transaction for the cedent, making reference to the effect on assets and income.

The ceding entity immediately eliminates the reinsurance recoverable recorded against the ultimate loss reserve and records the cash received as a negative paid loss. Any net gain or loss shall be reported in underwriting income in the statement of income.

Commuted balances shall be written off through the accounts, exhibits, and schedules in which they were originally recorded.

10. Learning Objectives:

2. The candidate will understand the analysis of a general insurer's financial health through prescribed formulas, ratios and other solvency regulation methods.

Learning Outcomes:

(2e) Understand the development and principles of solvency regulation, including that in the U.S., Canada and the E.U.

(2f) Demonstrate knowledge of the E.U. Solvency II standard formula solvency capital requirement.

(2h) Compare different solvency standards.

Sources:

General Insurance Financial Reporting Topics, Society of Actuaries, Part 12 (Solvency Monitoring)

Vaughan, T., "The Implications of Solvency II for U.S. Insurance Regulation"

Solution:

(a) Identify the implicit risk margins for reserving risk and written premium risk used in statutory accounting in the U.S.

For reserving risk: Implicit margin is the use of undiscounted loss reserves where the margin is the difference between undiscounted and fair value discounted.

For written premium risk: Gross unearned premium reserves are shown as a liability. Prepaid acquisition costs are an implicit margin.

(b) Describe one advantage and one disadvantage of using implicit risk margins in statutory accounting.

Commentary on Question:
The following represents a full credit response. Other advantages and disadvantages exist.

Advantage: Implicit margins provide the legal authority for insurance supervisors to intervene before an insurer's market value falls below the flat minimum.

Disadvantage: Implicit margins are not transparent. The insurance supervisor may not know the total actual margin for the insurer.

10. Continued

(c) Identify and describe these tests including any applicability to Solvency II.

Statistical Quality Test:
- Must have high quality data, reasonable assumptions and accurate parameters.
- For Solvency II, actuaries, statisticians, and economists spent years gathering data, selecting distributions, and estimating parameters.

Calibration Test:
- An internal capital model allows the insurer to substitute its own model, not to replace the solvency goal.
- For Solvency II, the model must be calibrated to a 99.5% VaR.

Use Test:
- Internal capital models encourage the insurer to identify, assess, and manage its risks.
- The Solvency II use test requires the insurer to ensure that the internal model, its methodologies, and results are embedded in the risk strategy and operational processes of the insurer.

(d) Describe two differences between Solvency II and U.S. financial regulation with respect to the use of internal capital models.

Commentary on Question:
Many differences exist. Three differences are shown in the model solution. Only two are required for full credit

- The U.S. is introducing internal models in an incremental way and maintaining a number of controls as they are introduced. In contrast, Solvency II encourages internal models for the entire framework.
- In the U.S., regulators have largely relied upon the company's actuaries to attest to the appropriateness of the models and their results. There has been discussion held to examine creation of a centralized review office for internal models. In Solvency II, supervisors will review internal models before granting permission to use the models.
- In the U.S., internal models are generally used to address a risk not well-captured in the factor-based formula. Solvency II considers internal models superior and encourages their use for all risks.

11. Learning Objectives:

2. The candidate will understand the analysis of a general insurer's financial health through prescribed formulas, ratios and other solvency regulation methods.

Learning Outcomes:

(2e) Understand the development and principles of solvency regulation, including that in the U.S., Canada and the E.U.

(2g) Demonstrate knowledge of ORSA and its implementations.

(2h) Compare different solvency standards.

Sources:

NAIC

- "The United States Insurance Financial Solvency Framework"
- "NAIC Own Risk and Solvency Assessment (ORSA) Guidance Manual"

General Insurance Financial Reporting Topics, Society of Actuaries, Part 12 (Solvency Monitoring)

Vaughan, T., "The Implications of Solvency II for U.S. Insurance Regulation"

Solution:

(a) Compare the following Core Principles, including the purpose of the assessment, the type of information assessed, and the frequency of the assessment:

(i) Off-site Monitoring and Analysis

(ii) On-site Risk-focused Examinations

Commentary on Question:
For types of information assessed, there are many potential correct responses. Two are shown for each of (i) and (ii) in the model solution. Two types of information assessed for each of (i) and (ii) are expected for full credit.

(i) Off-Site Purpose:
Assess on an on-going basis the financial condition of the insurer as of the valuation date and to identify and assess current and prospective risks through risk-focused surveillance.

Frequency:
quarterly basis

Types of Information Assessed:
regulatory financial reports, rate/policy filings

11. Continued

(ii) On-Site Purpose:
Allow state regulators to evaluate and assess the solvency of insurers as of the valuation date and to develop a forward-looking view of an insurer's risks and its risk management practices. Focus is on the areas of greatest risk to an insurer.

Frequency:
Full scope once every five years. Results of off-site analysis indicating issues may make this more frequent.

Type of Information Assessed:
Corporate governance practices in place to identify/mitigate risk, internal control processes

(b) Identify a potential (or planned) enhancement to NAIC RBC suggested by Solvency II with respect to:

(i) Calibration of the RBC system

(ii) Catastrophe risk

Commentary on Question:
There are a number of possible responses for full credit. The following is an example of a full credit response.

(i) Calibration: move to a strict definition of a particular statistical level of safety (e.g., TVaR). Solvency II uses 99.5% VaR.

(ii) Catastrophe risk: Planned catastrophe risk charge to be added to the NAIC RBC formula based upon commercially available models using a 1-in-100 year standard. Solvency II includes catastrophe risks in its SCR.

(c) Describe two ways in which an actuary can assist a general insurance company with its NAIC ORSA.

Commentary on Question:
Many different responses are possible for full credit. The following is an example of a full credit response.

11. Continued

An actuary can assist in the ORSA report in many ways including reinsurance structure and strategic planning.

For reinsurance structure, the actuary can produce models testing various different reinsurance structures, looking at a cost-benefit analysis, extent of risk transfer and effect on capital under various stress tests.

For strategic planning, the actuary can develop a model that simulates the base plan producing percentiles for results, probability of ruin and other statistics. Various plausible modifications and stress tests can be run on the model to analyze the strategic plan.

(d) Contrast the approaches of the NAIC ORSA and the Solvency II ORSA with respect to required capital.

Results from NAIC ORSA will not affect RBC requirements.

Under Pillar 2 of Solvency II, ORSA results can directly lead to capital add-ons.

12. Learning Objectives:

1. The candidate will understand the elements of financial reporting for general insurance companies.

Learning Outcomes:

(1a) Understand and apply the concepts of insurance accounting.

(1c) Describe the elements of the NAIC Annual Statement.

(1d) Complete and interpret selected pages/schedules in the NAIC Annual Statement as included in the resources.

Sources:

General Insurance Financial Reporting Topics, Society of Actuaries, Part 7 (Statutory Loss Accounting and Schedule P)

NAIC 2012 Annual Statement

Solution:

(a) Calculate the allocation by accident year of AGI's paid AAO expenses in calendar year 2013 using the old statutory procedure for Schedule P reporting.

Percentage paid loss in 2013 by accident year (AY) is as follows:
2010 0%
2011 7.5% (150/2000)
2012 27.5% (550/2000)
2013 65% (1300/2000)

Allocate 50% of AAO to AY using above computed percentages. In addition to this, allocate 45% of AAO to AY 2013 and 5% of AAO to AY 2012.

Therefore the allocation by AY of AGI's paid AAO expenses in calendar year 2013 using the old statutory procedure for Schedule P reporting is as follows:
2010 0
2011 9,000 (= 7.5% × 50% × 240,000)
2012 45,000 (= 27.5% × 50% × 240,000 + 5% × 240,000)
2013 186,000 (= 65% × 50% × 240,000 + 45% × 240,000)

(b) Calculate the allocation by accident year of AGI's paid AAO expenses in calendar year 2013 using the method of distributing AAO by claim counts. Assume the following relativities of AAO expense by type of claim for the application of this method:

Reported claim	4
Claim closed with payment	3
Claim closed with no payment	2
Outstanding claim	1

12. Continued

First, calculate weighted claims by AY:
2010 0
2011 10 (= 1×4 + 2×3 + 0×2 + 0×1)
2012 119 (= 15×4 + 19×3 + 0×2 + 2×1)
2013 1,160 (= 170×4 + 151×3 + 8×2 + 11×1)
Total weighted claims = 10 + 119 + 1,160 = 1,289

It follows that the weights applying to each AY are:
2010 0%
2011 0.8% (= 10/1,289)
2012 9.2% (= 119/1,289)
2013 90.0% (= 1,160/1,289)

Multiply these weights by AY by the total AAO of 240,000 to get the allocation of AAO by AY.
2010 0
2011 1,920 (= 0.8% × 240,000)
2012 22,080 (= 9.2% × 240,000)
2013 216,000 (= 90.0% × 240,000)

(c) Explain why an AAO allocation method using claim counts should be more accurate than the old statutory procedure for Schedule P reporting.

The old procedure uses paid loss amounts to allocate AAO. However, many AAO expenses are routine costs that do not vary much by size of loss.

All claims must be recorded, files must be set up, and accidents must be investigated. Large claims do receive more attention than small claims, but the differences may not be as great as that implied by the differences in claim amounts.

13. Learning Objectives:

4. The candidate will be able to describe the current and historical regulatory environment.

Learning Outcomes:

(4b) Describe and interpret the current state of general insurance regulation in the U.S. and its development.

(4i) Understand the regulation of reinsurance.

Sources:

Insurance Regulation, The Institutes, Chapter 12 (Insolvency Regulation)

Vaughan, T., "The Economic Crisis and Lessons from (and for) U.S. Insurance Regulation"

Mayer Brown, "Understanding the New Financial Reform Legislation: The Dodd-Frank Wall Street Reform and Consumer Protection Act"

Solution:

(a) Identify two common reasons for insurer insolvency.

Commentary on Question:
There are many common reasons for insurer insolvency. Three are shown in the model solution. Only two are required for full credit.

- Rapid premium growth
- Inadequate rates
- Fraud

(b) Describe two regulatory actions that an insurance commissioner may take if fact-finding reveals that policyholders or the general public may be adversely affected by an insurer's financial condition.

Commentary on Question:
A number actions are possible (mandatory corrective action, administrative supervision, receiverships, rehabilitation, and liquidation). Only two are required for full credit.

13. Continued

Mandatory corrective action: In serious situations, the insurance commissioner is authorized to order an insurer to take specified corrective actions. These actions may include: take actions to reduce liabilities, limit new business, and document adequacy of its premium rates.

Receivership: If the insurer's condition is severe it may be placed in receivership. Receivership is a type of bankruptcy in which the court appoints a receiver (the state insurance commissioner) to run the insurer. The receiver makes sure that the insurer's policyholder obligations are fulfilled to the extent possible.

(c) Describe the characteristics of the U.S. regulatory system that may have contributed to the relatively strong performance of insurance companies in the recent financial crisis.

Commentary on Question:
There are a number of potential characteristics that may have contributed to the relatively strong performance of insurance companies in the recent financial crisis. Four characteristics are shown in the model solution. Only two are required for full credit.

Duplication: The state-based system creates duplicative regulatory oversight. This duplicative effort, while creating additional costs, creates greater scrutiny whereby more regulators have a chance to detect problems.

Peer Review and Peer Pressure: The state-based system has a peer review system (e.g., NAIC accreditation program) to promote sound insurance regulation. Peer pressure from other state regulators also provides a state regulator with incentives for effective insurance regulation.

Diversity and Compromise: The state-based system requires compromise among diverse views. This compromise ensures that there will not be a move toward excessive deregulation or overregulation.

Market Discipline and Moral Hazard: Under the state regulatory system, there is difficulty accessing federal government funds. This lack of a federal safety net may create more market discipline as there can be an increase in moral hazard with the expectation of a federal government bailout.

(d) Identify how the Dodd-Frank Act changes the regulation of reinsurer solvency.

States that are NAIC accredited or have financial solvency requirements substantially similar to those imposed by the NAIC are solely responsible for regulating the financial solvency of reinsurers domiciled in their state.

14. Learning Objectives:

4. The candidate will be able to describe the current and historical regulatory environment.

Learning Outcomes:

(4f) Describe the development of general insurance programs controlled by government or collective insurance industry organizations.

(4g) Describe the mechanisms of operation for government and/or collective insurance industry controlled programs as included in the resources.

Sources:

Cappelletti, A., "Government Provision of General Insurance"

American Academy of Actuaries, "The National Flood Insurance Program: Past, Present … and Future?"

Pankow, S. and Robben, S., "Biggert-Waters Flood Insurance Reform Act of 2012"

Solution:

(a) Identify two reasons for government involvement in the provision of workers compensation insurance.

Commentary on Question:
Four reasons are shown in the model solution. Only two are required for full credit.

- Residual market needs
- Compulsory insurance
- Efficiency and convenience
- Collateral social purpose

(b) Compare the roles of U.S. state governments with those of Canadian provincial governments in the provision of workers compensation.

U.S.: This varies by state. It is mostly private insurers, with some competitive and monopolistic state funds. Residual market mechanisms vary by state.

Canada: All provinces have monopolistic government-run insurers for workers compensation. A residual market mechanism is not required.

14. Continued

(c) Identify the primary reason why the National Flood Insurance Program (NFIP) was created in 1968.

Private insurers considered flood risk uninsurable.

(d) Identify one purpose of the NFIP, other than providing flood insurance.

Commentary on Question:
Two purposes are shown in the model solution. Only one is required for full credit.

- Flood risk identification
- Flood plain management

(e) Describe two key differences between private-sector insurance and the NFIP.

Commentary on Question:
There are a number of key differences. Four differences are shown in the model solution. Only two differences are required for full credit.

- Private sector insurance is motivated to provide coverage at a profit. NFIP is motivated to identify flood risks, offer flood insurance and work with communities regarding flood plain management.
- In private sector insurance, litigation arises over ambiguities in policy language. A general principle in contract law is that ambiguities in the contract must be construed against the drafter. NFIP policy language is provided by federal statute whereby the insured may not be able to assert that he/she did not understand the policy.
- Types of coverage and limits offered differ between private sector insurance and the NFIP. NFIP limits are restricted, whereas private insurance limits can go as high as a company is willing to sell. NFIP policies are actual cash value whereas private insurance policies have replacement cost as an option.
- Private sector rates are typically actuarially sound. NFIP rates can be subsidized.

14. Continued

(f) The Biggert-Waters Flood Insurance Reform Act of 2012 made changes to the NFIP that may improve its financial position. Explain two of these changes.

Commentary on Question:
There are a number of changes. Four changes are shown in the model solution. Only two changes are required for full credit.

- The Act phases out subsidies for vacation and second homes, as well as businesses, severe repetitive loss properties or substantially improved/damaged properties. Rates for these properties are to increase 25% per year until they reach the full actuarial cost.

- The Act requires a premium rate adjustment to any property located in an NFIP-participating area to accurately reflect the current risk of flood. Any increase in the risk premium is to be phased in over a five-year period at a rate of 20%.

- The Act imposes minimum deductibles on flood claims that vary by pre-FIRM / post-FIRM status and the insured amount. Post-FIRM minimum deductibles are lower than pre-FIRM minimum deductibles.

- The Act requires FEMA to establish a reserve fund to help meet future obligations of the NFIP in higher-than-average loss years. The reserve fund will phase in a reserve ratio or balance equal to 1% of the sum of the total potential loss exposure of all outstanding flood insurance policies in force during the prior fiscal year.

15. Learning Objectives:

5. The candidate will be able to understand tort law and insurance law with respect to its impact on the general insurance industry.

Learning Outcomes:

(5a) Describe and interpret the key elements of tort law and the underlying principles of insurance law.

Sources:

Excerpts from Business Law for Insurance Professionals, Institutes Custom Publishing, Assignment 2 (Tort Law) and Assignment 3 (The International Legal Environment)

Solution:

(a) Identify the three other essential elements of negligence.

- Breach of duty
- Proximate cause
- Actual injury or damage

(b) Provide an example of a situation where three of the four essential elements are present, but the fourth is not.

Commentary on Question:

Widely varying responses are possible for full credit. Grading of this type of question takes into account how clearly the situation is presented in the response as well as the validity of the response. A full credit response should describe a situation, and then go through the four essential elements noting how the three are present but one is absent. The following is an example of a full credit response.

Consider a situation where:

- Motorist A hits Motorist B from behind causing minimal damage to Motorist B's rear bumper.
- Motorist B becomes agitated and then drives off and slams into a tree sustaining bodily injury and damage to the front of the vehicle.
- Motorist B sues Motorist A for bodily injury and damage to the front of the vehicle.

Legal duty of care: This element is met. Motorist A has a legal duty of care to operate the vehicle in a safe manner.

Breach of duty: This element is met. The duty was breached when Motorist A's vehicle hit Motorist B's vehicle.

15. Continued

Actual injury or damage: This element is met. Motorist B suffers an actual injury and the vehicle sustained actual damage.

Proximate cause: This condition is not met. The damage and injury suffered by Motorist B were not due to the actions of Motorist A. Motorist B made a decision after a minor incident to drive while in a distracted state which caused the actual injury and damage.

(c) Contrast the role of a judge in a common law system with the role of a judge in a civil law system.

Common law relies on a judge's reasoning for the final decision.

Under civil law, a judge finds correct legislative provisions to apply and performs little interpretation.

(d) Evaluate the liability of the motorist and the truck owner.

The motorist may be partially liable for the truck driver's injuries as a result of negligence. The truck owner may be strictly or statutorily liable for all injuries and runoff into river because the truck was transporting an explosive and toxic substance that escaped into the environment.

(e) Provide two examples of intentional torts.

Commentary on Question:
There are many examples of intentional torts. Four are shown in the model solution. Only two are required for full credit.

- Battery
- Assault
- False imprisonment and arrest
- Intentional infliction of emotional distress

16. Learning Objectives:

1. The candidate will understand the elements of financial reporting for general insurance companies.

Learning Outcomes:

(1b) Compare different financial reporting standards for general insurers including: U.S. Statutory Account Principles (SAP), U.S. Generally Accepted Accounting Principles (GAAP), Canadian Generally Accepted Accounting Principles (CGAAP), Solvency II and International Financial Reporting Standards (IFRS).

(1c) Describe the elements of the NAIC Annual Statement.

(1d) Complete and interpret selected pages/schedules in the NAIC Annual Statement as included in the resources.

(1e) Understand and apply the concepts of reinsurance accounting.

Sources:

General Insurance Financial Reporting Topics, Society of Actuaries, Part 6 (Schedule F, Statutory Credit for Reinsurance)

NAIC 2012 Annual Statement

Solution:

(a) Calculate BZIC's total Schedule F provision for reinsurance.

Reinsurer BRC:

- Reinsurer BRC is unauthorized.
- The total unsecured recoverables are total recoverables minus collateral (letters of credit + funds withheld)
  = 200M – (15M + 50M) = 135M.
- Collateral does not apply to overdue recoverables or amounts in dispute.
- The loss recoverables more than 90 days past due are 60M and amounts in dispute are 15M. Amounts in dispute are part of total recoverables but not of overdue recoverables.
- The total provision for reinsurance is: total unsecured recoverables + the lesser of (20% of overdue recoverables + 20% of amounts in dispute) and collateral.
- BRC Schedule F Provision is
  135M + minimum(20% × (60M + 15M), 65M)
  = 150M.

16. Continued

Reinsurer MRE:

- Reinsurer MRE is authorized, so we determine whether it is slow-paying.
- The test ratio is the loss recoverables more than 90 days past due divided by the total loss recoverables (on claims not in dispute) plus the payments received in the past 90 days.
  - Recoverables more than 90 days past due = 10M
  - Total recoverables on paid loss and ALAE = 70M
  - Amount in dispute = 10M
  - Recoverables received in the past 90 days = 8M
  - The test ratio is 10M / (70M – 10M + 8M) = 10/68 = 14.7% < 20%, so the insurer is not slow-paying.
- The provision for reinsurance is 20% of overdue recoverables + 20% of amounts in dispute.
- MRE Schedule F Provision is
  20% × 10M + 20% × 10M
  = 4M.

Total Schedule F Provision is 150M + 4M = 154M.

(b) Describe the GAAP approach to estimating the potential uncollectibility of reinsurance recoverables with respect to the balance sheet.

In GAAP financial statements, counterparty credit risk is estimated by the insurer and subtracted from the reinsurance recoverable asset.

17. Learning Objectives:

1. The candidate will understand the elements of financial reporting for general insurance companies.

Learning Outcomes:

(1a) Understand and apply the concepts of insurance accounting.

(1c) Describe the elements of the NAIC Annual Statement.

Sources:

General Insurance Financial Reporting Topics, Society of Actuaries, Part 4 (Accounting Perspectives for Non-Admitted Assets) and Part 10 (Statutory Surplus: Computation, Pricing, and Valuation)

NAIC Statement of Statutory Accounting Principles 65, "Property and Casualty Contracts"

Solution:

(a) Identify three assets that are classified as non-admitted assets in statutory accounting and for each of the three assets identified explain why statutory accounting treats them as non-admitted.

Commentary on Question:

There are a number of assets that are classified as non-admitted. Four assets are shown in the model solution. Only three are required for full credit.

- Common stocks above 25% of total assets or 100% of statutory surplus are non-admitted. This serves to mitigate investment risk.
- Equipment, office furniture, automobiles and deferred tax assets have high value in use for the insurer and no credit risk or volatility risk, but have low resale value. They are non-admitted to reflect the assets' inability to fund claim payments.
- Receivables more than 90 days past due are non-admitted to provide a conservative view of counterparty credit risk.
- Non-admitted portion of accrued retrospective premiums (usually 10% of the unsecured portion). This provides a conservative view of counterparty credit risk

(b) Describe the other method.

Write off the non-admitted asset as an expense in the income statement.

17. Continued

(c) Explain why an increase in non-admitted assets decreases statutory surplus.

Consider total assets as a fixed amount, so an increase in the non-admitted portion is a decrease in the admitted portion.

(d) Identify two direct charges (or credits) to statutory surplus, other than the change in non-admitted assets.

Commentary on Question:
There are a number of direct charges (or credits) to statutory surplus. Four are shown in the model solution. Two are required for full credit.

- Change in the provision for reinsurance
- Unrealized capital gains
- Stockholder dividends
- Capital contributions

(e) Describe the relationship between invested capital and statutory surplus for a general insurance company.

Invested capital is statutory surplus plus the capital embedded in gross unearned premium reserves and full value loss reserves.

(f) Describe the accounting treatment of policyholder dividends in statutory accounting with respect to their recognition as a liability and when they are recognized in the statement of income.

Dividends to policyholders immediately become liabilities of the reporting entity when they are declared by the board of directors and shall be recorded as a liability. Incurred policyholder dividends are reported in the statement of income.

18. Learning Objectives:

1. The candidate will understand the elements of financial reporting for general insurance companies.

Learning Outcomes:

(1c) Describe the elements of the NAIC Annual Statement.

(1d) Complete and interpret selected pages/schedules in the NAIC Annual Statement as included in the resources.

Sources:

General Insurance Financial Reporting Topics, Society of Actuaries, Part 8 (Measuring Total Income for General Insurers)

Solution:

(a) Calculate GIC's investment gain ratio for the 2013 Insurance Expense Exhibit (IEE).

The net investment gain is the sum of two entries on the statement of earnings: net investment income plus realized capital gains.

The insurer's investment gain ratio is its net investment gain divided by investable assets, or
Net investment gain /
[Mean net loss and LAE reserves (LR) + Mean net UEPRs – Mean net agents' balances (AB) + Mean policyholders' surplus (PHS)].

Investment gain ratio (IGR)
= (525 + –10)/((2,750 + 3,450 + 1,500 + 1,900 – 500 – 650 + 1,900 + 2,500)/2)
= 515/6,425
= 8.0%.

(b) Calculate GIC's allocated mean surplus by line of business using the IEE method of allocation.

Allocate the company's mean surplus to line of business in proportion to:
Mean net loss and LAE reserves + Mean net UEPR + Earned premium for the year.

Total = (2,750 + 3,450 + 1,500 + 1,900)/2 + 3,800 = 8,600
CAUTO Liability (2,200 + 3,000 + 1,000 + 1,300)/2 + 2,600 = 6,350
CAUTO Liability % = 6,350/8,600 = 73.8%

18. Continued

Mean Surplus = (1,900 + 2,500)/2=2,200
CAUTO Liability allocated surplus = 73.8% × 2,200 = 1,624
FIRE allocated surplus = 2,200 – 1,624 = 576

(c) Calculate GIC's allocated investment gain by line of business for the 2013 IEE.

The IG by line of business (lob) on funds attributable to insurance transactions is:
IGit = IGR ×{LRlob + UEPRlob × [1 – (PPElob/WPlob)] – ABlob}.

The IG by line of business attributable to capital and surplus is:
IGcs = [IGR × (LRlob + UEPRlob + PHSlob – ABlob)] – IGit.

Therefore IG by LOB is [IGR × (LRlob + UEPRlob + PHSlob – ABlob)].

CAUTO Liability IG is:
[8.0% × (((2,200 + 3,000)/2) + ((1,000 + 1,300)/2) + 1624 – ((300 + 500)/2))]
= 399.

Since total IG is 515 (= 525 + –10), FIRE IG is 515 – 399 = 116.

19. Learning Objectives:

1. The candidate will understand the elements of financial reporting for general insurance companies.

2. The candidate will understand the analysis of a general insurer's financial health through prescribed formulas, ratios and other solvency regulation methods.

Learning Outcomes:

(1c) Describe the elements of the NAIC Annual Statement.

(1d) Complete and interpret selected pages/schedules in the NAIC Annual Statement as included in the resources.

(2c) Calculate and interpret the results of financial health ratios.

Sources:

General Insurance Financial Reporting Topics, Society of Actuaries, Part 7 (Statutory Loss Accounting and Schedule P) and Part 9 (Notes to Financial Statements)

NAIC "Insurance Regulatory Information System (IRIS) Ratios Manual"

Solution:

(a) Calculate JENRI's 2013 IRIS ratio for P/C Reserve Ratio 12 (Two-Year Reserve Development to Policyholders' Surplus).

For 2013, the two-year development ratio uses accident years (AY) up to 2011 and Policyholders' Surplus (PHS) as of year-end 2011.

Two-year development by AY is as follows:
2008 30 (= 450 – 420)
2009 75 (= 1,580 – 1,505)
2010 550 (= 1,800 – 1,250)
2011 390 (= 1,850 – 1,460)
Total two-year development = 1,045.

IRIS Ratio 12 = Total two-year development / PHS 2011 = 1,045/4,750 = 22.0%

19. Continued

(b) Assess the results of the ratio calculated in part (a) making reference to the usual range for the ratio, areas for further analysis and the Statement of Actuarial Opinion (SAO).

- The usual range for the ratio includes results less than 20 percent.
- JENRI's result represents an exceptional score showing two-year adverse development of over 20%.
- Since this is an exceptional score on a loss reserve adequacy test, it must be commented on in the Statement of Actuarial Opinion.
- Four or more exceptional scores on IRIS tests serve as a warning of potential financial weakness and may trigger a financial examination.
- Further analysis should focus on which lines of business and which accident years resulted in the deficiency.

(c) Adverse results on the IRIS reserve ratio tests can be an indication of inadequate reserves. However, there are other possible reasons for adverse results. Identify two other possible reasons.

Commentary on Question:
Many reasons are possible. Four reasons are shown in the model solution. Only two are required for full credit.

- Large rate increases
- Changes in mix of business from long tail to short tail
- Strengthening of deficient loss and LAE reserves held at the end of the second prior year-end
- Rapid business growth

(d) Explain why a disclosure of loss reserve discounts is also required in the Notes to Financial Statements of the NAIC Annual Statement.

Non-tabular discounts are explicitly disclosed in Schedule P, but tabular discounts can only be inferred by a comparison of two parts of Schedule P.

The IRS requires explicit disclosure of all discounting in the annual statement. The Note provides this information explicitly.

20. Learning Objectives:

5. The candidate will be able to understand tort law and insurance law with respect to its impact on the general insurance industry.

Learning Outcomes:

(5a) Describe and interpret the key elements of tort law and the underlying principles of insurance law.

(5b) Discuss the influence of the U.S. tort litigation environment in Canada.

(5c) Discuss the issues of tort trends and tort reform as it applies to the general insurance industry.

Sources:

Excerpts from Business Law for Insurance Professionals, Institutes Custom Publishing, Assignment 2 (Tort Law)

Cappelletti, A., "Tort Issues for General Insurance Actuaries"

Kent, N., "Insurer Bad Faith Damages: A USA-Canada Comparison"

Solution:

(a) Define the term bad faith in a tort context.

Tort causing another person severe emotional distress through one's extreme or outrageous acts.

(b) Provide an example of a situation in which a general insurer can be alleged to have acted in bad faith.

Commentary on Question:
Many examples are possible. Three examples are shown in the model solution. Only one example is required for full credit.

Insured alleging bad faith of the insurer for:

- Negligent denial of a claim
- Failure to process or pay a claim without reasonable cause
- Failure to protect the insured's rights

20. Continued

(c) Identify two defenses to suits alleging bad faith.

Commentary on Question:
Four defenses are shown in the model solution. Only two are required for full credit.

- No intent or recklessness
- No outrageous or extreme conduct
- No breach of implied duty of good faith and fair dealings
- No valid insurance contract existed

(d) Compare the treatment of bad faith claims against insurers in the U.S. court system with their treatment in the Canadian court system with respect to punitive damages.

Commentary on Question:
Widely varying responses are possible. Five comparisons are made below. At least three comparisons are required for full credit. Alternatively, a full credit response can consist of a comparison of Whiten v. Pilot in Canada to Campbell v. State Farm in the United States.

- The Supreme Court of Canada limited punitive damages to 1 million dollars, while there is no such limit in the United States.
- The U.S. has had mega-million dollar punitive damage awards for bad faith (though with reductions on appeal) where the average is 7 to 10 million dollars.
- U.S. awards can be a large multiple of the compensatory damages award. However, where the compensatory damages awarded to the insured plaintiff are significant, the U.S. Supreme Court has suggested that a 1:1 ratio would be appropriate.
- Punitive damages are fairly common for bad faith in the U.S.; in Canada they are the exception.
- In a departure from the U.S. Supreme Court, the Supreme Court of Canada rejected the adoption of a ratio between punitive and compensatory damages.

(e) Identify a type of tort reform that should lessen the financial impact on U.S. insurers found responsible for acting in bad faith.

Commentary on Question:
Two types are shown in the model solution. One is required for full credit.

- Punitive damages reform
- Noneconomic damages reform

20. Continued

(f) Explain how the type of tort reform you identified in part (e) would lessen the financial impact on insurers found responsible for acting in bad faith. Use an actual state-enacted tort reform law as the basis for the explanation.

Commentary on Question:
A full credit response for this part is expected to explain the effect of the tort reform identified in part (e) with an appropriate example. Widely varying responses are possible. An example of a full credit response is provided using punitive damages reform as the type identified in (e).

Punitive damages reform focuses on capping punitive damage awards and/or applying stricter criteria on when punitive damages are awarded. Bad faith claims against insurers often include a claim for punitive damages. By putting restrictions on the amount payable for punitive damages, punitive damages reform directly lessens the financial impact on insurers found responsible for acting in bad faith. For example, the state of New Jersey enacted a punitive damages reform that limits most punitive damages to the greater of $350,000 or five times the compensatory damages award. This reform will directly reduce the amount payable by insurers found responsible for acting in bad faith.

21. Learning Objectives:

3. The candidate will be able to apply the standards of practice regarding the responsibilities of the actuary as defined by regulators and the American Academy of Actuaries.

Learning Outcomes:

(3a) Describe, interpret and apply the applicable Standards of Practice.

(3b) Describe, interpret and apply the responsibilities of the actuary with respect to the Statement of Actuarial Opinion and the Actuarial Report.

Sources:

General Insurance Financial Reporting Topics, Society of Actuaries, Part 14 (Overview of the General Insurance Statement of Actuarial Opinion)

Actuarial Standards of Practice, No. 36, Statements of Actuarial Opinion Regarding Property/Casualty Loss and Loss Adjustment Expense Reserves

American Academy of Actuaries, "A Public Policy Practice Note, Statements of Actuarial Opinion on Property and Casualty Loss Reserves," Committee on Property and Liability Financial Reporting

Solution:

(a) Explain which category of opinion the Appointed Actuary for OIC should provide in the SAO.

Determination of Reasonable Provision.
The stated reserve amount is within the actuary's range of reasonable reserve estimates.

(b) Identify the amounts listed in the tables above that are required to be disclosed in the SAO and which amounts are not to be disclosed in the SAO. Provide an explanation.

Commentary on Question:
Identification as to where these amounts are recorded in the SAO (i.e., Exhibits A or B) is not required for full credit.

Company estimate of 115 (Exhibit A), Pool amount of 12 (Exhibit B) and materiality standard of 10 (Exhibit B) are in the SAO as these represent the amounts opined on and the materiality standard for these amounts.

SAO must exclude the actuary's estimates because it is a public document and the actuary's estimates are considered to be proprietary.

21. Continued

(c) Describe any disclosures that need to be included in the SAO regarding the risk of material adverse deviation, making reference to any applicable Actuarial Standards of Practice.

Commentary on Question:
The notation of the section within ASOP 36 (i.e., 4.2.e) is not required for full credit.

- Need to disclose that there exists a risk of material adverse deviation because of rapid growth in two lines of business.
- This is from ASOP 36. (4.2.e)

(d) Explain which category of opinion the Appointed Actuary for OIC should provide if OIC's carried reserves were 135 million.

Determination of Redundant or Excessive Provision.

- This is due to the fact that the amount of carried reserves (135) is greater than the upper end of the range of reasonable estimates.

(e) Describe the purpose of the Actuarial Opinion Summary and identify the amounts listed in the tables above that are required to be disclosed in it.

- The Actuarial Opinion Summary (AOS) is a supplemental filing, separate from the Annual Statement and the SAO.
- The SAO and Annual Statement are public documents that should not provide proprietary information. The purpose of the AOS is to contain significant proprietary information regarding the actuarial opinion.
- The AOS should not be filed with the NAIC and should be kept separate from any copy of the SAO.
- From the tables, the AOS is to include the range of reasonable estimates, the point estimate and the company's carried reserves.

21. Continued

(f) Explain which category of opinion the Appointed Actuary for OIC should provide for the SAO in this situation where an estimate from the industry involuntary pool is not available.

Qualified Opinion.
The reserves for a certain material item (pool) are in question because they cannot be reasonably estimated by the Appointed Actuary.

Materiality can be assumed because the prior year's amount was above the materiality standard.

(g) Describe two factors the actuary should consider in judging whether or not to make use of another's analyses or opinions.

Commentary on Question:
Four factors are shown in the model solution. Only two are required for full credit.

- The amount of the reserves covered by another's analyses or opinions in comparison to the total reserves subject to the actuary's opinion
- The nature of the exposure and coverage
- The way in which reasonably likely variations in estimates covered by another's analyses or opinions may affect the actuary's opinion on the total reserves subject to the actuary's opinion
- The credentials of the individual(s) that prepared the analyses or opinions

22. Learning Objectives:

4. The candidate will be able to describe the current and historical regulatory environment.

Learning Outcomes:

(4e) Discuss the issues regarding usage based insurance and telematics in automobile insurance.

Sources:

Cappelletti, A., "Usage-Based Insurance and Telematics"

Solution:

(a) State two benefits of a Pay-As-You-Drive system of insurance.

Commentary on Question:
Four benefits are shown in the model solution. Only two are required for full credit.

- Increased accuracy of the rates
- Potential for policyholders to control costs
- Increased affordability for high risk drivers who drive less
- Reduction to overall level of driving as policyholders seek to reduce their premiums

(b) Describe two ways a Pay-How-You-Drive system of insurance can be useful to either policyholders or insurance companies, other than providing more refined insurance pricing.

Commentary on Question:
Widely varying responses are possible. Below is an example of a full credit response.

Pay-How-You-Drive can be useful to policyholders as it can:

- Assist a driver immediately after an accident (e.g., airbag deployment information is transmitted to the insurer, the insurer can then send assistance and begin the claims handling process)
- Track a vehicle after it has been reported stolen

(c) Explain how anti-selection can occur when the introduction of a usage-based insurance (UBI) telematics program is optional in a jurisdiction.

Lower risk drivers are the most likely to sign up for UBI telematics policy.

Aggressive and higher mileage drivers are less likely to sign up for a UBI telematics policy.

22. Continued

(d) Explain how premiums will be affected for UBI telematics policies as well as for non-UBI telematics policies when there is anti-selection.

UBI telematics policies: Premiums are based on usage so they should be unaffected by the anti-selection.

Non-UBI telematics policies: Lowest risk policyholders are more likely to opt for UBI telematics policies. Therefore, average loss cost per non-UBI telematics policy will increase, thus increasing the non-UBI telematics policy premiums.