GI FREU Model Solutions
Spring 2022

1. **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:

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

Sources:

General Insurance Financial Reporting Topics, Fifth Edition, Society of Actuaries

- Chapter 11 (Measuring Insurer Financial Strength)

Commentary on Question:

This question tested a candidate's understanding of NAIC IRIS ratios.

Solution:

(a) Identify two of these four NAIC IRIS ratios. The two ratios identified should not have resultant values that overlap significantly.

Commentary on Question:

The four ratios are 3, 6, 7 and 8. Ratios 7 and 8 have results that overlap considerably. The model solution is an example of a full credit solution that selected ratios 3 and 6. Note that the number of the ratio was not required, only the name of the ratio was required for full credit.

- IRIS Ratio 3: Change in Net Written Premium
- IRIS Ratio 6: Investment Yield

(b) Explain why values that are too high or too low may be signs of financial distress for each of the two NAIC IRIS ratios identified in (a).

Commentary on Question:

The model solution is an example of a full credit solution based upon the model solution for part (a).

- IRIS Ratio 3: Change in Net Written Premium
  - Large increase could be from underpricing.
  - Large decrease could be from a large increase in proportional reinsurance to mask cash flow issues.

1. Continued

- IRIS Ratio 6: Investment Yield
  - High yield could be due to an overly aggressive investment portfolio in high-risk investments.
  - Low yield could be due to use of speculative investments.

(c) Provide the following regarding IRIS Ratio 4:

(i) The formula for calculating surplus aid

(ii) A reason that an exceptionally high value may be a sign of financial distress

(iii) The effect that an exceptionally high value has on other IRIS ratios

(iv) The additional IRIS calculations that would likely need to be done when this ratio produces an exceptional value

Commentary on Question:
PHS = Policyholders' Surplus

(i) Surplus aid = Ceding commissions ratio × the sum of Ceded reinsurance unearned premiums (nonaffiliates)

(ii) Exceptionally high values for this ratio indicate that the company's surplus depends upon the continuance of the reinsurance treaty (or treaties) providing the ceding commissions and that the surplus may be inadequate.

(iii) High values for this ratio will improve IRIS ratios where PHS is the denominator. This may keep an insurer from having exceptional values.

(iv) Recalculate IRIS ratios that have PHS in the denominator by removing surplus aid from PHS.

2. 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.

(1b) Understand and compare different financial reporting standards for general insurers.

Sources:

General Insurance Financial Reporting Topics, Fifth Edition, Society of Actuaries

- Chapter 5 (The Annual Statement, Nonadmitted Assets and Surplus)

Commentary on Question:

This question tested a candidate's understanding of the statutory accounting rules for admitting assets.

Solution:

(a) State two reasons why U.S. statutory accounting requires certain assets to be designated as nonadmitted.

Commentary on Question:

There are more than two reasons. Only two were required for full credit. The model solution is an example of a full credit response.

- Mitigate investment risk
- Reflect an asset's inability to fund claim payments

(b) Determine the admitted amount that should be booked by this company for each of the following assets. Include the reasoning supporting each determination.

(i) Ten automobiles (for use by claims adjusters) purchased five years ago for a total of \$300,000 with a total current market value of \$80,000 and total current depreciated value of \$150,000.

(ii) Assumed premium balances from insurers, 70 days past due, in the amount of \$100,000.

(iii) Unsecured accrued retrospective premiums in the amount of \$500,000.

(iv) Reinsurance recoverables, from a slow-paying authorized reinsurer, in the amount of \$200,000. Management's best estimate is that \$10,000 of this amount is uncollectible.

(v) Goodwill from the purchase of an entity. The purchase price was \$3 million and the acquired entity's surplus was \$2.2 million.

2. Continued

(vi) Operating system software, with a useful life of four years, purchased for $360,000 two years ago.

(i) $0 admitted because material assets not held as investments are 100% nonadmitted.

(ii) $100,000 admitted because receivables less than 90 days past due are fully admitted.

(iii) $450,000 admitted because 10% of unsecured unbilled receivables are nonadmitted.

(iv) $200,000 admitted because the Schedule F provision handles any offsets.

(v) $0.735 million admitted because the admitted amount is limited to the minimum of the following two amounts:
- 10% of the acquiring entities surplus (0.1 × $7.35 million = $0.735 million)
- the difference between the purchase price of the acquired entity and the acquired entities surplus ($3.0 million – $2.2 million = $0.8 million)

(vi) $120,000 admitted because operating system software is depreciated over the lesser of the useful life of the asset or three years. In this case, it is three years.

3. Learning Objectives:

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

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:

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

(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, Fifth Edition, Society of Actuaries

- Chapter 7 (Schedule P, Statutory Loss Accounting)
- Chapter 14 (The General Insurance Actuarial Opinion)

Actuarial Standards Board of the American Academy of Actuaries, Actuarial Standard of Practice (ASOP),

- No. 23, “Data Quality”
- No. 36, “Statements of Actuarial Opinion Regarding Property/Casualty Loss and Loss Adjustment Expense Reserves”

AAA, Committee on Property and Liability Financial Reporting, “A Public Policy Practice Note, Statements of Actuarial Opinion on Property and Casualty Loss Reserves”

AAA, Council on Professionalism, Discussion Paper Prepared by Task Force on Materiality, “Materiality, Concepts on Professionalism”

NAIC Annual Statement

NAIC Statement of Statutory Accounting Principles,

- No. 65, “Property and Casualty Contracts”

Commentary on Question:

This question tested a candidate’s understanding of the responsibilities of the AA when dealing with data issues. Full credit was earned by providing a sufficient level of response for each of (i) to (iii). Widely varying full credit solutions were possible. The model solution is just one example of a full credit solution. It does not include all possible ways that the AA should proceed. The question was worth 8 points, so that was a guide for the candidate to write more than one short bullet point for each of (i) to (iii).

3. Continued

Solution:
Describe how the AA should proceed in the preparation of LIT's SAO, with respect to each of the following data issues:

(i) Schedule P reconciliation

(ii) A&E claims data

(iii) S&S reporting in the Annual Statement

Your response should reference the following sources if applicable:

- Actuarial Standards of Practice (ASOPs)
- Statements of Statutory Accounting Principles (SSAPs)
- Additional guidance on SAOs
  - NAIC SAO Instructions
  - Academy Public Policy Practice Note: Statements of Actuarial Opinion on Property and Casualty Loss Reserves Developed by The Casualty Practice Council's Committee on Property and Liability Financial Reporting (Practice Note)

(i) Schedule P Reconciliation
The analysis can be completed on the data even though the breakdown by LOB does not match the Schedule P LOBs. ASOP 23 notes that the actuary should use available data that allows the actuary to perform the analysis. Furthermore, the Practice Note states that it is acceptable to reconcile the data after minimal necessary aggregation. Therefore, the data appears reasonable and the issue with the LOB Schedule P differences should not affect the ability of the AA to estimate unpaid claims. However, the AA should disclose in the Actuarial Report the difference in the reserving data by LOB with Schedule P LOB data.

(ii) A&E Claims Data
The issue with the A&E liabilities is a major issue for proper completion of the SAO. The fact that there exist two sources of data that differ significantly, although not materially, without explanation puts into question the data quality for A&E claims. This unresolved data issue does not reasonably meet the ASOP 23 standard that the data allows the actuary to perform the analysis. The A&E data is unreliable and, as such, the reserves cannot be reasonably estimated. Also, it appears that A&E liabilities are likely material after inclusion of IBNR. This would result in a qualified opinion because no opinion can be formed for the A&E liabilities.

3. Continued

Furthermore, SSAP 65 requires a disclosure in the Annual Statement regarding the reserving methodology for A&E (both case and IBNR reserves). The AA should communicate with LIT management and LIT's auditors that this disclosure is required and must be completed.

(iii) S&S reporting in the Annual Statement
The issue with the S&S figures in Schedule P is not an issue for the AA in completing the SAO. These columns are for informational purposes only. However, the AA should communicate with LIT management and LIT's auditors that these columns should be completed properly in the future.

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.

(5e) Describe and interpret legal cases/issues included in the syllabus resources.

Sources:

Cappelletti, A., “Tort Law: Topics for General Insurance Actuaries,” Society of Actuaries Study Note

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

Commentary on Question:

This question tested a candidate’s knowledge of the legal doctrine of “res ipsa loquitor.”

Solution:

(a) The doctrine of *res ipsa loquitor* has been applied in the courts for certain tort cases.

Explain this doctrine.

Under *res ipsa loquitor*, there is a presumption of negligence by the defendant. The plaintiff need not prove negligence for the defendant to be liable. It is the defendant that must disprove negligence or causation to be free from liability.

(b) Application of this doctrine requires that three conditions are met.

Describe these three conditions.

- The event must be of a kind which ordinarily does not occur in the absence of someone's negligence.
- It must be caused by an agency or instrumentality within the exclusive control of the defendant.
- It must not have been due to any voluntary action or contribution on the part of the plaintiff.

(c) Explain how the ruling by the New York State Court of Appeals in the case of *State v. Lourdes Hospital* expanded the use of this doctrine.

4. **Continued**

The condition of *res ipsa loquitor* in which “the event must be of a kind which ordinarily does not occur in the absence of someone's negligence” was interpreted as being established through *common understanding*. This interpretation precluded the use of experts. In *States v. Lourdes Hospital,* the appellate court expanded the use of *res ipsa loquitor* by permitting the use of an expert witness to allow non-experts to understand what is considered “common understanding for experts.”

5. 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.

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

Learning Outcomes:

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

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

(4c) Compare different forms of rate regulation.

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

Sources:

Actuarial Standards Board, Actuarial Standard of Practice

- No. 23, Data Quality
- No. 41, Actuarial Communications

Insurance Regulation, The Institutes

- Chapter 8 (Rate Regulation)

Edmunds, T., "Insurance and the discrimination laws: motor and travel insurance," House of Commons Library Standard Note SN04601

Canadian Council of Insurance Regulators, "Use of Credit Scores by Insurers," Issues Paper

Cappelletti, A., "Usage-Based Insurance and Telematics," Society of Actuaries Study Note

Commentary on Question:

This question tested a candidate's understanding of various regulatory issues and actuarial responsibilities when involved in a ratemaking assignment. This question is open to many possible correct responses. Information from numerous readings in the syllabus could be used to form a response. To earn full credit, the candidate was required to outline more than one consideration and more than one next step. The model solution is an example of a full credit response. It does not include all possible valid considerations and next steps.

5. Continued

Solution:
Outline VK's considerations in reviewing this proposal and potential next steps.

VK needs to ensure that their communications on this matter to both management and the insurance regulators follow the ASOP on actuarial communications. In any communications about the model, VK needs to ensure clarity of content and disclose any uncertainty in the findings, and reliance on the model and its internal data sources.

VK needs to investigate the correlations found in DNI's book to any prohibited rating factor (e.g., race). Even if a correlation exists, if it is a weak correlation, it could be acceptable with an explanation that a weak correlation of a prohibited factor to a valid rating factor should not eliminate the rating factor.

VK needs to produce statistics showing the relationship of insurance credit scores from model with insurance loss costs. Furthermore, VK needs to check whether or not there is overlap between insurance credit score and other rating factors already in use (e.g., occupation).

VK should discuss use of this model with the insurance regulators before implementing it. VK should provide regulators the results of their findings regarding this rating factor during pre-filing discussions.

6. Learning Objectives:

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

Learning Outcomes:

(1b) Understand and compare different financial reporting standards for general insurers.

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

Sources:

General Insurance Financial Reporting Topics, Fifth Edition, Society of Actuaries

- Chapter 2 (Accounting for Insurance Contracts)
- Chapter 15 (Federal Income Taxes for General Insurers)

NAIC Annual Statement

Commentary on Question:

This question tested a candidate's knowledge of insurance company taxation. This question required the candidate to respond in Excel. An example of a full credit solution is in the Excel solutions spreadsheet. The solution in this file is for explanatory purposes only.

All amounts shown are in millions. The following acronyms are used in the solution: EP = Earned Premium, WP = Written premium, UPR = Unearned Premium Reserve, L&LAE = Loss and Loss Adjustment Expenses, UW = Underwriting, Δ = change in, DRD = dividends received reduction

Solution:

(a) Demonstrate that the company's taxable investment income for 2021 is $11 million.

Taxable investment income is the sum of

- taxable interest income = 5.65
- realized capital gains = 2.5
- taxable portion of dividends received = 50% × 1.96 = 0.98
- prorated portion of tax-exempt interest income = 25% × 6.5 = 1.625
- prorated portion DRD = 25% × (1.96 – 0.98) = 0.245

Taxable investment income = 5.65 + 2.5 + 0.98 + 1.625 + 0.245 = 11

6. **Continued**

(b) Calculate the company's 2021 taxable income using each of the following methods:

(i) Indirect method

(ii) Direct method

(i) Indirect method

Taxable income = Taxable UW income + Taxable investment income

Taxable UW income
= Statutory UW income + Revenue offset + Δ Reserve discount

Statutory UW income = EP – incurred L&LAE – expenses
= (WP – Δ UPR) – (paid L&LAE + Δ undiscounted reserves) – Tax-deductible other expenses
= (60 – (35 – 25)) – (36 + (91 – 75)) – 21 = –23

Revenue offset = 20% × Δ UPR = 0.2 × (35 – 25) = 2
Δ Reserve discount = (91 – 77) – (75 – 67) = 6

Taxable income = ((–23) + 2 + 6) + 11 = –4

(ii) Direct method

Taxable income = tax basis EP – tax-basis incurred L&LAE – Tax-deductible other expenses + taxable investment income

Tax basis EP = WP – 80% of Δ UEPR = 60 – (0.8 × (35 – 25)) =52

Tax basis incurred losses = paid L&LAE + Δ discounted reserves
= 36 + (77 – 67) = 46

Tax-deductible other expenses = 21

Taxable income = 52 – 46 – 21 + 11 = −4

7. 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:

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

Sources:

Cappelletti, A., "Tort Law: Topics for General Insurance Actuaries," Society of Actuaries Study Note

Commentary on Question:

This question tested a candidate's understanding of asbestos liability.

Solution:

(a) Explain why liability costs from asbestos exposure have been relatively much lower in the UK than in the United States.

Commentary on Question:

There are several reasons for this. The model solution is an example of a full credit response. It does not provide all reasons for this.

The United Kingdom has several rules of tort law that differ from those in the U.S. that reduced tort cases. These include a prohibition on contingency fees and a requirement for the unsuccessful party to pay the legal costs of the other party.

(b) Describe the issues encountered by the asbestos trust funds in their attempt to compensate injured parties and reduce asbestos torts.

Commentary on Question:

There have been many issues encountered. The model solution is an example of a full credit response. It does not provide all the issues encountered.

The creation of trust funds may not have actually reduced asbestos litigation as plaintiffs are able to sue non-bankrupt defendants in addition to claiming from the trust.

Additionally, trust funds are inundated with claims when it becomes clear that the fund is insufficient to meet all its claims.

Furthermore, injured parties may make claims from multiple trusts. With multiple trusts and a vast number of claimants, it has been a challenge for trust administrators to be vigilant with respect to detecting fraudulent claims.

8. 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.

Sources:

Insurance Regulation, The Institutes

- Chapter 1 (Introduction to Insurance Regulation)
- Chapter 2 (Development of Insurance Regulation)
- Chapter 3 (Federal and Other Influences on Insurance Regulation)

Commentary on Question:

This question tested a candidate's understanding of some of the ways insurance regulation deals with the issue of insurance availability.

Solution:

(a) Provide three reasons why insurance markets have been found to be imperfectly competitive.

Commentary on Question:

There are more than three reasons. The model solution is an example of a full credit solution.

- There are too few independent insurers serving a given market.
- There are significant barriers to an insurer's entry and exit from the market.
- Insurance consumers have imperfect information about the product they are buying.

(b) Identify the following with respect to Fair Access to Insurance Requirements (FAIR) plans in the United States:

(i) the risk-taking entity

(ii) the business addressed

Commentary on Question:

For (ii), it was also acceptable to identify the business addressed as "property insurance on urban properties, especially those susceptible to loss by riot or civil commotion."

8. Continued

(i) Insurance pool through which private insurers collectively address an unmet need.

(ii) Property insurance for personal and commercial buildings that insurers might be reluctant to insure because of the age and condition of the structures.

(c) Identify the following with respect to *surplus lines* in the United States:

(i) the risk-taking entity

(ii) the business addressed

(i) Nonadmitted insurers in the state that are permitted to write certain types of business.

(ii) Coverage for risks that have underwriting characteristics that make it difficult to place with admitted insurers in the state.

(d) Describe the key issue that GLB addressed with respect to banks writing insurance.

GLB addressed concerns that banks would use insurer assets to prop up failing banks.

(e) Explain how GLB addressed this key issue.

GLB prohibits national banks from forming subsidiaries to underwrite insurance. However, banks can arrange for financial holding companies to create insurance affiliates.

9. 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, Fifth Edition, Society of Actuaries

- Chapter 2 (Accounting for Insurance Contracts)
- Chapter 8 (Notes to Financial Statements)

NAIC Annual Statement

Case Study, Spring 2022, SOA Exam General Insurance, Financial and Regulatory Environment – U.S.

Commentary on Question:

This question tested a candidate's knowledge Annual Statement Note 25.

Solution:

(a) Describe the purpose of Note 25.

It is to provide the reasons for changes in the provision for incurred loss and loss adjustment expenses attributable to insured events of prior accident years.

(b) Complete R-Dan's Note 25 for the 2021 Annual Statement, including both required numbers and narrative, using the information provided in the case study.

Commentary on Question:

This part could be answered in either the Word document or the Excel spreadsheet. There are many possible items that could be included in Note 25. Not all were required for full credit. However, to earn full credit the response must include some numbers showing the changes in incurred losses and loss adjustment expenses. The model solution in this document is an example of a full credit solution. The solution included in the Excel solutions spreadsheet contains more information than was required for full credit. Neither the model solution shown here, nor the Excel solution, includes everything that could, or should be included in Note 25 for R-Dan.

9. Continued

A breakdown of R-Dan's current year incurred losses and loss adjustment expenses (LAE) is as follows:

All Lines	2021 Total	Current Accident Year	Prior Accident Years
Incurred Losses	482,100	450,000	32,100
Incurred LAE	70,700	70,600	100
Paid Loss	446,500	304,300	142,200
Paid LAE	65,700	45,700	20,000
Change in Loss Reserve	35,600	145,700	-110,000
Change in LAE Reserve	5,000	24,900	-19,900

The incurred losses and total LAE of 32,200 on prior accident years are due to adverse development in the Private Passenger Liability/Medical (PPL) line of business. The development of PPL incurred loss and DCC for prior accident years was 37,400.

Methodologies and assumptions used in calculating ultimate amounts has remained consistent over the past several years. The adverse development on PPL is likely a result of the increased uncertainty in development patterns due to the significant growth of business in non-core territories.

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:

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

Sources:

General Insurance Financial Reporting Topics, Fifth Edition, Society of Actuaries

- Chapter 12 (Solvency Monitoring)

NAIC Annual Statement

Case Study, Spring 2022, SOA Exam General Insurance, Financial and Regulatory Environment – U.S.

Commentary on Question:

This question tested a candidate's knowledge of the NAIC RBC calculation using information from the GI FREU Case Study. This question required the candidate to respond in Excel. Data from the GI FREU Case Study was preloaded in Excel for the candidate to use in their solution. An example of a full credit solution is in the Excel solutions spreadsheet. The model solution in this file is for explanatory purposes only.

Solution:

(a) Calculate R-Dan's 2021 NAIC Risk-Based Capital (RBC) *base loss and LAE reserve risk charge* for Homeowners/Farmowners (H/F).

Amounts in $000

- Held reserves = 36,200
- Industry average development = 0.970
- Company average development = 0.9665 [= (19,500+31,200+ …+93,700) / (18,900+42,000+…+94,100) (= *Schedule P Part 2A, sum of amounts at 12/31/21 divided by sum of initial reported amount for all accident years except the current one*)
- Company adjustment factor = 0.9665 / 0.970 = 0.9964
- Industry loss & LAE RBC % = 0.2
- Company adjusted loss & LAE RBC% = 0.2 × 0.5 × (1 + 0.9964) = 0.1996
- Investment income factor = 0.95

Base charge = 36,200 × ((1 + 0.1996) × 0.95 – 1)
= 5,055

10. Continued

(b) Calculate R-Dan's NAIC RBC *underwriting risk charge for reserve risk before conditional adjustment*.

Amounts ($000)	Base reserve charge	Reserves from Schedule P	Loss Concentration
H/F	5,055	36,200	12.53%
PPL	28,180	248,300	85.98%
CAL	50	600	0.21%
APD	340	3,700	1.28%
SP	0	0	0%
TOTAL	33,625	288,800	

Amounts in $000

- No loss sensitive adjustment is required
- Loss concentration factor = 70% + 30% × 85.98% = 95.793%
- Reserve charge before excess growth and conditional adjustment = 33,625 × 0.95793 = 32,210
- Gross Written Premium growth rates [13.6%, 10.3%, 6.4%]
- RBC Average Growth Rate = average growth rate in excess of 10% = 0.085%
- Excessive Premium Growth Charge = 288,800 × 45% × 0.085% = 111

Reserve charge before conditional adjustment = 32,210 + 111
= 32,321

(c) Calculate R-Dan's 2021 NAIC RBC charge R_3 (*credit risk charge after conditional adjustment*).

Amounts in $000

- The reserve charge before conditional adjustment (32,321) is greater than the credit risk charge for reinsurance recoverables (3,100). Therefore, a credit adjustment is required in the amount of 50% of the credit risk charge for reinsurance recoverables.

R_3 = 90 + 470 +100 + 3,100 – (0.5 × 3,100)
= 2,210

(d) Explain why the RBC calculation includes the conditional adjustment.

This is done to account for the fact that there is positive correlation between reinsurance credit risk and underwriting risk.

10. **Continued**

(e) Calculate R-Dan's 2021 NAIC RBC Ratio.

Amounts in \$000

- RBC before Operational Risk = $60 + (8{,}820^2 + 5{,}280^2 + 2{,}210^2 + 33{,}860^2 + 47{,}000^2 + 21{,}860^2)^{0.5} = 62{,}861$
- RBC = 1.03 × 62,861 = 64,746
- Total Adjusted Surplus = 209,400
- ACL = 0.5 × RBC = 32,373

RBC Ratio = 209,400 / 32,373
= 647%

11. 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.

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:

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

(2a) Evaluate the financial health of a general insurer using information contained in the Annual Statement.

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

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

(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, Fifth Edition, Society of Actuaries

- Chapter 11 (Measuring Insurer Financial Strength)
- Chapter 12 (Solvency Monitoring)
- Chapter 13 (General Insurance Financial Ratings)
- Chapter 14 (The General Insurance Actuarial Opinion)

NAIC Annual Statement

Case Study, Spring 2022, SOA Exam General Insurance, Financial and Regulatory Environment – U.S.

Commentary on Question:

This question tested a candidate's broad understanding of insurer financial health and how it affects an insurer's financial rating.

Solution:

(a) Explain what concerns the rating agency may have regarding R-Dan's year-end 2021 reserves.

11. Continued

Commentary on Question:
Widely varying valid responses were possible. To earn credit, the response must address concerns regarding 2021 reserves. The model solution is an example of a full credit response.

R-Dan's calendar loss ratio has gone from 88% in 2020 to 95.5% in 2021. This is concerning on its own, especially since growth at the cost of profitability will continue in 2022 and 2023. But this is even more of an issue given that the AOS shows that R-Dan holds reserves at the lower end of the actuary's range and that R-Dan had one-year adverse development in excess of five percent of the prior year's surplus in at least three of the last five calendar years. This all points to the fact that R-Dan may be under-reserved.

(b) Explain what concerns the rating agency may have regarding R-Dan's projected underwriting results.

Commentary on Question:
Widely varying valid responses were possible. To earn credit, the response must address concerns regarding the projections. The model solution is an example of a full credit response.

The projected loss ratios appear to be based off of the historical loss ratios which may be understated due to under-reserving. Furthermore, the 2022 projection shows an improvement in underwriting results over 2021 despite showing significant growth. This level of growth should, in all likelihood, cause a further deterioration of loss ratios. The fact that the growth is mainly in non-core territories and non-core business should also increase the loss ratio. This all points to the fact that R-Dan's projected underwriting results should be much worse than what is shown in the projections.

(c) Explain the likely implications for R-Dan if the rating agency's projection for 2022 is accurate.

Commentary on Question:
Widely varying valid responses were possible. In order to earn credit, the response must address the likely implications. The model solution is an example of a full credit response.

If R-Dan has a net loss of 30 million, surplus will be 189.4 million, assuming that A-Eye still injects 10 million of capital. This will cause R-Dan to have a net premium-to-surplus ratio (IRIS ratio 2) of 370%. so they will fail this test. Furthermore, R-Dan will likely fail all three IRIS reserve tests. This will bring about regulatory action and a significant ratings downgrade.

12. **Learning Objectives:**

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

Learning Outcomes:

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

Sources:

General Insurance Financial Reporting Topics, Fifth Edition, Society of Actuaries

- Chapter 9 (Insurance Expense Exhibit (IEE))

NAIC Annual Statement

Case Study, Spring 2022, SOA Exam General Insurance, Financial and Regulatory Environment – U.S.

Commentary on Question:

This question tested a candidate's knowledge of the calculations included in the IEE. It required the candidate to respond in Excel. Data from the GI FREU Case Study was preloaded in Excel for the candidate to use in their solution. An example of a full credit solution is in the Excel solutions spreadsheet. The model solution in this file is for explanatory purposes only.

Solution:

Determine the following items for R-Dan's 2021 corrected IEE using the restated amount for the current year's *Taxes, Licenses & Fees*:

(i) Prepaid expense ratio for PPAL

(ii) Investment gain ratio

(iii) Investment gain on funds attributable to capital and surplus for PPAL

Commentary on Question:

WP = Written Premium, UPR = Unearned Premium Reserve,
LR = Loss & LAE Reserves, AB = Agents' Balances,
PPE = Prepaid Expense Ratio,
PHS = Policyholders' Surplus, PHSR = PHS Ratio,
IG = Investment Gain, IGR = IG Ratio

12. **Continued**

Amounts in millions

(i) PPE_{PPAL}

PPE_{PPAL} = Prepaid expenses for PPAL / WP for PPAL
Prepaid expenses for PPAL =
Commission and brokerage expenses incurred for PPAL
+ Taxes, licenses and fees incurred for PPAL
+ Other acquisition, field supervision, collection expenses incurred for PPAL
+ One-half of general expenses incurred for PPAL
= 7.4 + (5.8 + 1.0) + 13.7 + (13.3 / 2) = 34.55

PPE_{PPAL} = 34.55 / 242.9 = 14.224%

(ii) IGR

IGR = IG / Investable assets
IG = 33.0 + 0.6 = 33.6 (*note that IEE is on pretax basis so we must add back the capital gains tax to have pretax IG*)
Investable assets = Mean LR + Mean UPR – Mean AB + Mean PHS
= (289.5+248.9)/2 + (208.8+179.6)/2 – (54.7+48)/2 + (209.4+209.1)/2
= 269.2 + 194.2 – 51.35 + 209.25 = 621.3

IGR = 33.6 / 621.3 = 5.41%

(iii) $IG_{PPAL}(CS)$

PHSR = Mean PHS / (Mean LR + Mean UPR + EP)
= [(209.4 + 209.1)/2] / [(289.5+248.9)/2 + (208.8+179.6)/2 +578.5]
= 20.08%
Mean PHS_{PPAL} = PHSR × (Mean LR_{PPAL} + Mean UPR_{PPAL} + EP_{PPAL})
= 20.08% × ((207.0+33.9+7.9+176.2+30.6+7.1)/2 +(56.9+62.5)/2 + 237.3]
= 20.08% × (231.35 + 59.7 + 237.3] = 106.111
IG_{PPAL}
= IGR × (Mean LR_{PPAL} + Mean UPR_{PPAL} + Mean PHS_{PPAL} – Mean AB_{PPAL})
= 5.41% × [231.35 + 59.7 +106.111 – (22 + 19.3)/2] = 20.362
$IG_{PPAL}(INS)$ = IGR × (Mean LR_{PPAL} + Mean UPR_{PPAL} × (1 – PPE_{PPAL}) – Mean AB_{PPAL})
= 5.41% × [231.35 + 59.7 × (1 – .14224) – 20.65] = 14.164

$IG_{PPAL}(CS)$ = IG_{PPAL} – $IGP_{PAL}(INS)$ = 20.362 – 14.164 = 6.198

13. 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, Fifth Edition, Society of Actuaries

- Chapter 4 (Accounting for Reinsurance Contracts)

Commentary on Question:

This question tested a candidate's understanding of deposit accounting for reinsurance.

Solution:

Describe the difference between the interest method and the present value method for deposit accounting of reinsurance under U.S. GAAP in terms of the following:

(i) Cash flows/Income pattern used

(ii) Discount rate used

(iii) Amortization period of the deposit

(iv) Income presentation in the Annual Statement for changes in the deposit

(i) Cash flows/Income pattern

- The interest method uses the income pattern from the estimated cash flows.
- The present-value method derives the income pattern after the claims occur.

(ii) Discount rates

- The interest method uses the internal rate of return of the cash transactions between the reinsurer and the primary insurer.
- The present-value method uses risk-free rates for the maturity of the losses.

(iii) Amortization

- The interest method amortizes the deposit from inception to claims settlement, using the IRR derived from the cash flows.
- The present-value method amortizes the initial deposit through the end of the contract period and separately amortizes the loss costs from occurrence to settlement.

13. **Continued**

(iv) Income presentation

- The interest method presents changes in the deposit as interest income.
- The present-value method presents changes in the deposit as underwriting income.

14. **Learning Objectives:**

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

Learning Outcomes:

(4a) Describe the functions of key regulatory bodies in the U.S. including the NAIC and SEC.

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

Sources:

Insurance Regulation, The Institutes

- Chapter 1 (Introduction to Insurance Regulation)
- Chapter 2 (Development of Insurance Regulation)
- Chapter 3 (Federal and Other Influences on Insurance Regulation)
- Chapter 4 (Roles of State Regulators and the NAIC in Insurance Regulation)

Commentary on Question:

This question tested a candidate's understanding of insurance regulation and its development in the United States.

Solution:

(a) Identify two common justifications for the regulation of insurance.

- To protect consumers who do not fully understand the insurance product
- To prevent insurer insolvency

(b) The McCarran-Ferguson Act (1945) requires that the Sherman Act, the Clayton Act and other federal Acts apply to the business of insurance only if the states are not regulating the activities described in these acts. However, there are two exceptions to this requirement.

Describe these two exceptions.

- The Sherman Act applies to insurers' antitrust activities (i.e., state legislation will not supersede federal antitrust authority).
- A federal law that applies exclusively to the insurance industry, as opposed to business in general, supersedes any state regulation in the areas addressed by the federal legislation.

14. **Continued**

(c) The following concepts have been used to explain insurance regulatory failures:

- Regulatory fallibility
- Regulatory forbearance
- Regulatory capture

Define each of the three concepts identified above.

- Regulatory fallibility: Regulators are human. Humans are fallible (i.e., make mistakes). Hence, regulation is fallible.
- Regulatory forbearance: The failure of regulators to take prompt and stringent action in the face of a troubled firm.
- Regulatory capture: The tendency for regulators to take the mindset of an interest group because of the groups influence or political interference.

(d) Explain how regulatory forbearance may affect the costs borne by policyholders and insurance guaranty funds.

A delay in regulatory intervention can increase these costs because a troubled firm tends to increase its risk-taking in an attempt to solve its financial difficulties. This is because the cost of any failure from the increased risk will not be borne by the insurer taking on the risk but by others.

(e) Even though individual states are the primary regulator of insurance, there is substantial uniformity of insurance regulation among the states.

Describe two reasons for this.

Commentary on Question:
There are more than two reasons for this. The model solution is an example of a full credit solution.

State regulators established the National Association of Insurance Commissioners (NAIC) to engage in cooperative activity. The NAIC produces model acts that most states adopt (with some modification). This creates significant uniformity in regulation between the individual states.

Under the NAIC's accreditation program, states undergo an evaluation of laws and regulations to determine if the state meets accreditation standards. There is peer pressure among the states to be accredited by the NAIC and have effective regulations. This also creates significant uniformity in regulation between the individual states.

14. Continued

(f) Provide arguments for and against the state system of insurance regulation versus a federal system.

Commentary on Question:
There are several possible arguments that can be made for and against the state system of insurance regulation. The model solution is an example of a full credit solution.

Having many state regulators, as opposed to one federal regulator, oversee insurance regulation clearly increases the direct costs of regulation. However, it may reduce the total cost of regulation. This is due to the fact that having duplicative state reviews may be more effective than a single federal review in detecting insurers in financial difficulty and preventing their insolvency. Thus, it is possible that the increase in direct costs may be more than offset by the reduction in the costs of insolvencies.

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 1 (Contract Law: Insurance Applications)

Commentary on Question:

This question tested a candidate's understanding of insurance contract law.

Solution:

(a) Describe what is meant by *contract of adhesion*.

Any contract in which one party must either accept the agreement as written by the other party or reject it.

(b) Identify four other special characteristics included in most insurance contracts.

Commentary on Question:

There are more than four other special characteristics identified in the syllabus reading. Only four were required for full credit. The model solution is an example of a full credit solution.

- They are conditional
- They are contracts of utmost good faith
- They involve fortuitous events and the exchange of unequal amounts
- They are contracts of indemnity

(c) Describe two of the four other special characteristics identified in part (b).

Commentary on Question:

The model solution is based on selecting the first two characteristics identified in the model solution for part (b).

- Conditional: whether the insurer pays a claim depends on whether a covered loss has occurred.
- Utmost good faith: Both parties to the contract are expected to be honest and forthcoming in their dealings with each other.

15. **Continued**

(d) Identify the three elements required for an insurer to establish *false representation* by the insured.

- A statement is made that is false or misleading.
- The statement relates to a material fact.
- The insurer relies on the statement in issuing the policy.

(e) Describe what distinguishes *false representation* from *fraud*.

False representation involves a lack of intent to deceive whereas fraud involves the intent to deceive.

16. 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.

(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, Fifth Edition, Society of Actuaries

- Chapter 2 (Accounting for Insurance Contracts)
- Chapter 4 (Accounting for Reinsurance Contracts)
- Chapter 7 (Schedule P, Statutory Loss Accounting)

Commentary on Question:

This question tested a candidate's knowledge of how intercompany pooling is accounted for under statutory accounting principles.

Solution:

(a) Explain why intercompany pooling agreements do not typically represent agreements of true risk transfer.

All the risks remain within the group of affiliated insurers. The financial solvency of an insurer in the group is dependent upon the financial solvency of the insurance group.

(b) Determine how an intercompany pooling agreement will affect the following components of a U.S. statutory Annual Statement (AS) exhibit for a pool participant.

(i) Income Statement (i.e., AS page 4) components:
- Underwriting income
- Investment income
- Capital and surplus account

(ii) Assets (i.e., AS page 2) component:
- Cash and invested assets

(iii) Liabilities, Surplus and Other Funds (i.e., AS page 3) components:
- Losses and loss adjustment expenses
- Surplus as regards policyholders

16. **Continued**

(i) Income Etatement

- Underwriting income: Any premiums, losses and loss adjustment expenses, underwriting and general expenses covered by pooling agreements are shown net of pooling transactions.
- Investment income: Investment income is not affected by pooling transactions.
- Capital and surplus account: This is affected by pooling transactions indirectly because net income affects it. Net income includes underwriting income that is directly affected by pooling transactions.

(ii) Assets

- Cash and invested assets: These are not affected by pooling transactions.

(iii) Liabilities and Surplus and Other Funds

- Losses and loss adjustment expenses: These are after pooling transactions.
- Surplus as regards policyholders: This is only affected by pooling through retained earnings.

(c) Under a scenario of changing percentages of intercompany pooling participation from year to year, the historical figures in the current year's Schedule P may not agree with the corresponding Schedule P entries from the AS of previous years.

Explain how Schedule P should be constructed under this scenario.

One constructs a pooled schedule, and then each insurer takes its current pooling percentage of every entry, not the percentage for the year in which the losses occurred.

(d) Explain how intercompany reinsurance transactions that are not pooling agreements are treated in Schedule P.

They are treated in the same manner as external reinsurance transactions.

17. **Learning Objectives:**

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

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:

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

(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, Fifth Edition, Society of Actuaries

- Chapter 14 (The General Insurance Actuarial Opinion)

Actuarial Standards Board of the American Academy of Actuaries, Actuarial Standard of Practice (ASOP),

- No. 36, "Statements of Actuarial Opinion Regarding Property/Casualty Loss and Loss Adjustment Expense Reserves"
- No. 43, "Property/Casualty Unpaid Claim Estimates"

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

NAIC Annual Statement

Commentary on Question:

This question tested a candidate's understanding of several issues regarding the actuarial opinion.

Solution:

(a) Actuarial Standard of Practice (ASOP) 43 identifies a problem with using the term "best estimate" for an actuarial estimate of unpaid claims.

Describe this problem.

Best estimate does not sufficiently identify the intended measure.

17. Continued

(b) Select the type of Statement of Actuarial Opinion (SAO) you would render for the Company in this scenario. Justify your selection.

I would opine that carried reserves are inadequate because the carried reserves are outside the reasonable range produced by the new method. The new method is the more appropriate method.

(c) Describe two disclosures you would include in your SAO in this scenario.

Commentary on Question:
There are several potential disclosures relevant to this scenario. Only two were required for full credit. The model solution is an example of a full credit response.

- The actuary should disclose the changes in methods that have a material effect on the actuary's unpaid claim estimate.
- If the actuary determines reserves are deficient, the actuary should disclose the minimum amount that the actuary believes is reasonable.

(d) Draft a Relevant Comments paragraph to address the RMAD in this scenario.

I have selected a materiality standard of $5 million which represents a 10% change in surplus. COVID-related claims present a material risk in estimating unpaid claims because they are a new type of claim which increases the uncertainty in its estimation.

(e) The carried reserves result in a one-year loss development in excess of 5% of surplus in at least three of the past five calendar years.

Describe the SAO reporting required of the AA in this scenario.

The actuary must include a relevant comment or disclosure on the factors that led to these results.

(f) Describe the Annual Statement reporting required of the Company in this scenario.

The Company's Annual Statement would need to include an explanation of this in the Notes to Financial Statements.

17. Continued

(g) Six months after issuance of all actuarial documentation, an examination by the department of insurance noted an error in the Company's paid losses as reported in Schedule P of the Annual Statement.

Describe what is required of the AA after being informed of the error.

Commentary on Question:
There are a number of requirements. Only three were required for full credit. The model solution is an example of a full credit response.

- Determine the materiality of the error with respect to the Actuarial Opinion.
- Have a discussion with, or report to, the domiciliary regulator regarding this error.
- Re-issue the Actuarial Opinion if it is necessary.

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, Fifth Edition, Society of Actuaries

- Chapter 2 (Accounting for Insurance Contracts)
- Chapter 5 (The Annual Statement, Nonadmitted Assets and Surplus)

Commentary on Question:

This question tested a candidate's ability to calculate certain amounts in the Statutory Statement of Income. This question required the candidate to use Excel. The model solution in this document does not represent the actual model solution. It is for explanatory purposes only. Refer to the Excel solution file for an example of a full credit solution.

Solution:

Calculate the following Statement of Income amounts for the company's 2021 statutory Annual Statement.

(i) Net investment gain (Line 11)

(ii) Total other income (Line 15)

(iii) Net income (Line 20)

(iv) Capital changes: Paid in (Line 32.1)

(v) Surplus adjustments: Paid in (Line 33.1)

(vi) Change in surplus as regards policyholders (Line 38)

18. **Continued**

Amounts in millions

(i) Net investment gain
= Net investment income earned + (Realized capital gains less Capital gains tax)

Net investment gain = 55 + 22 – (0.21 × 22) = 72.38

(ii) Total other income
= Net gain (loss) from agents' or premium balances charged off + Finance and service charges not included in premiums + Aggregate write-ins for miscellaneous income

Total other income = (3.2) + 1.5 + 0 = (1.7)

(iii) Net income
= Net underwriting gain (loss) + Net investment gain (loss) + Total other income − Dividends to policyholders – Income taxes

Income taxes = 21% of the sum of underwriting gain, investment income earned and total other income = 0.21 × (16 + 55 + (1.7)) = 14.553

Net income = 16 + 72.38 + (1.7) – 0.25 – 14.553 = 71.877

(iv) Capital changes: Paid in
= *Number of shares sold at par value per share*

Capital changes: Paid in = 2 million shares × $1.50 = 3

(v) Surplus adjustments: Paid in
= *Number of shares sold at sale value per share excess of par value*

Surplus adjustments: Paid in = 2 million shares × ($2.00 – $1.50) = 1

(vi) Change in surplus as regards policyholders
= Net income + Change in net unrealized capital gains less tax − Change in net deferred income tax − Change in nonadmitted assets – Change in provision for reinsurance + Paid in capital and surplus −Dividends to stockholders

Change in net unrealized capital gains less tax = (10 – (0.21 × 10)) = 7.9
Change in net deferred income tax = increase in deferred tax liability on unrealized capital gains = 0.21
Change in net deferred income tax = change in DTAs = 0.8 + 2.4 = 3.2
Change in nonadmitted assets = Change in intangible assets = 2
Paid in capital and surplus = 3 + 1 = 4

Change in surplus as regards policyholders
= 71.877 + 7.9 – 3.2 – 2 – 6.5 + 4 – 1.75 = 70.327

19. **Learning Objectives:**

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

Learning Outcomes:

(4e) Describe the development of general insurance programs controlled by government or collective insurance industry organizations and their mechanisms of operation.

Sources:

Cappelletti, A., "Government Provision of General Insurance," Society of Actuaries Study Note

Commentary on Question:

This question tested a candidate's knowledge of the government provision of insurance for several lines of business in the United States and Canada. The model solution is an example of a full credit solution.

Solution:

Compare the level of government provision of insurance between the United States and Canada for the following lines of business:

(i) Workers compensation

(ii) Automobile insurance

(iii) Homeowners insurance

(iv) Agriculture insurance

(i) Workers compensation (WC)

In the United States, WC is provided by the private sector. However, the residual market is provided by the government in some states. In Canada, WC is entirely provided by the provincial governments.

(ii) Automobile insurance

In the United States, automobile insurance is provided by the private sector. In Canada, some provinces have a government insurer providing the insurance whereas other provinces are served by the private sector. One province has split coverage in which the government provides bodily injury coverage, and the private sector provides physical damage coverage.

19. **Continued**

(iii) Homeowners insurance

Both the United States and Canada make use of the private sector for homeowners insurance. However, in the United States, the federal government provides coverage for some risks (e.g., flood insurance through the NFIP) and some state governments provide coverage for some risks (e.g., earthquake in California).

(iv) Agriculture insurance

In the United States and Canada, all-risk agriculture coverage is provided by the government while other types (e.g., crop) are provided by the private sector.