GI FREU Model Solutions
Fall 2024

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.

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

Sources:

General Insurance Financial Reporting Topics, 5th Ed. (2021), Society of Actuaries

- Chapter 3 (Accounting for Financial Instruments)

Commentary on Question:

This question tested a candidate's knowledge of different accounting standards for investments in bonds.

Solution:

(a) Contrast attributes of the fair value versus the amortized cost of an asset.

Commentary on Question:

A complete solution needed to contrast at least two attributes. The model solution is an example of a full credit solution. It does not contrast all attributes.

Fair value is transparent in that it's easy for users to understand that it is the market value. In contrast, amortized cost is opaque in that most users don't know the purchase price and the amortization schedules, so they have difficulty understanding it.

Fair value is consistent in that the same asset will have the same value for all insurers. In contrast, amortized cost is entity specific dependent on the timing of the purchase and the interest rate at the time of purchase.

(b) Describe two conditions whereby debt securities may be held at amortized cost under IFRS.

1. Continued

- Assets are intended to be held to collect contractual cash flows.
- The contractual cash flows consist of repayment of principal and payment of interest on principal.

(c) Describe two conditions whereby the change in fair value of an asset may be treated as comprehensive income under IFRS

The assets are held to collect the contractual cash flows, consisting of repayment of principal and payment of interest on principal, and be available for sale at fair value.

2. 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.

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

Learning Outcomes:

(2d) Understand the development and principles of solvency regulation

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

Sources:

Insurance Regulation, The Institutes

- Chapter 11 (Solvency Regulation)

Commentary on Question:

This question tested a candidate's understanding of the different types of regulatory examinations in the United States for an insurer's solvency.

Solution:

(a) Describe what is included in this procedure.

- Examiners review the Annual Statement reports for accuracy and compliance with statutory accounting requirements.
- Examiners perform detailed financial analysis of the information.

(b) Describe two of the three situations that can trigger use of this procedure.

- The zone examiners' written reports indicate that the examination by the insurer's state of domicile is inadequate.
- The domiciliary state is reluctant to schedule an examination, although IRIS results or other information indicates the need to do so.

3. 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:

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

General Insurance Financial Reporting Topics, 5th Ed. (2021), 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"

Commentary on Question:

This question tested a candidate's knowledge regarding the duties of the Appointed Actuary in the United States.

Solution:

(a) Describe the four other types of SAOs.

- **Inadequate**: When the carried reserve amount is less than the minimum amount that the AA believes is reasonable.
- **Excessive**: When the carried reserve amount is greater than the maximum amount that the AA believes is reasonable.
- **Qualified**: When, in the AA's opinion, the reserves for a certain item or items are in question because they cannot be reasonably estimated, or the Appointed Actuary is unable to render an opinion on those items.
- **No Opinion**: When the AA cannot reach a conclusion for an opinion on the carried reserve amount due to deficiencies or limitations in the data, analyses, assumptions, or related information.

(b) Select three types of SAOs that could be provided for QRS with the information available. Justify each type selected.

3. Continued

Commentary on Question:
Widely varying responses for full credit were possible. The model solution does not raise all the possibilities and justifications. Also, justifications are subject to counterarguments. The model solution is an example of a full credit solution.

The Pool amount, 47.5M, is greater than the materiality standard of 10M so the pool must be considered in the analysis.

- If the AA takes responsibility for the share of pool reserves by assuming that that the pool carried amount is the Pool AA's best estimate, then the QRS share of the pool's carried reserve amount is the best estimate (47.5M) for QRS. If we assume that the pool's carried amount is the midpoint of the range and the range uses the same percentage from the midpoint of the QRS range (10% = 25/250), we get a total low end of the range of 269.2 with a midpoint of 297.5. The carried amount of 270 is in the range so it is reasonable.
- If the AA takes responsibility for the share of pool reserves and the pool carried amount is the low end of the Pool AA's range of reasonability, then we have a low end of the range at 47.5 for QRS pool share and 272.5 for the total. The carried amount of 270 is below 272.5 so it is inadequate.
- The actuary cannot accurately derive the range of reasonability for the QRS share of the pool. As such, the AA can only render an opinion on the total excluding QRS share of the pool.
- The pool represents 17.5% of the total reserves. This is significant. Without more data on the pool, the AA cannot accurately reach a conclusion for an opinion on the carried reserve amount due to deficiencies in the data.

(c) Select a type of SAO from part (b) that is the most appropriate for QRS in this scenario. Justify your selection.

Commentary on Question:
Widely varying responses for full credit were possible. The model solution does not raise all the possibilities and justifications. Also, justifications are subject to counterarguments. The model solution is an example of a full credit solution.

I would select *No Opinion* because *Reasonable* or *Inadequate* requires the AA to make assumptions about the pool's range of reasonability without any basis. Selecting *Qualified* requires separating the pool carried reserves from the total carried reserves. This requires assuming that QRS is carrying 5% of the Pool's carried reserves. This assumption is reasonable but since the total carried amount is close to the low end any deviation from this amount may change the type of opinion for the non-pool reserves. *No Opinion* does not require any unsupported assumptions and makes it clear that more information is required.

4. 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.

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

Sources:

General Insurance Financial Reporting Topics, 5th Ed. (2021), Society of Actuaries

- Chapter 12 (Solvency Monitoring)

Commentary on Question:

This question tested a candidate's knowledge of the NAIC RBC calculation.

Solution:

(a) Show the formula for each of LCF and WPCF.

LCF = 70% + 30% × *loss concentration ratio*

- *Loss concentration ratio* = held reserves in the largest line of business (LoB) divided by total held reserves

WPCF = 70% + 30% × *WP concentration ratio*

- *WP concentration ratio* = WP in the largest LoB divided by total WP

(b) Explain how each of the concentration factors gets applied within the RBC formula.

Total Adjusted Net Reserve RBC = Total L&LAE RBC After Discounts × LCF
Total Adjusted NWP RBC = Total NWP RBC After Discounts × WPCF

(c) Describe the following regarding the charge for excessive premium growth:

(i) Formula(s) to compute the charge

(ii) Method(s) for including the charge in the RBC formula

(i) Formula(s) to compute the charge

Excessive premium growth charge for reserves
= Held Reserves × 45% × *RBC Average Growth Rate*

Excessive premium growth charge for written premium (WP)
= Net WP × 22.5% × *RBC Average Growth Rate*

4. Continued

RBC Average Growth Rate
= Average of the latest 3 annual growth rates (each capped at 40%), in excess of 10%.

(ii) Method(s) for including the charge in the RBC formula

Excessive premium growth charge for reserves is added to the Total Net Reserve RBC in the calculation of NAIC RBC Reserving Risk Charge.

Excessive premium growth charge for WP is added to the Total NWP RBC in the calculation of NAIC RBC NWP Risk Charge.

(d) Describe the following regarding this adjustment:

(i) Purpose of the adjustment

(ii) Method for application of the adjustment

(i) This adjustment is intended to address the issue of correlation between credit risk for reinsurance recoverables and reserving risk.

(ii) If the reserving RBC charge is greater than the total RBC charge for reinsurance credit risk and non-invested assets credit risk combined, then 50% of the RBC charge for reinsurance credit risk goes into the reserve charge, R_4, while the remainder stays in the credit risk charge, R_3.

(e) Financial rating company A.M. Best has its own risk-based formula for net required capital (NRC), referred to as Best's Capital Adequacy Ratio (BCAR) NRC. The BCAR NRC is in many ways similar to the NAIC RBC formula. However, there are several major differences.

Describe four major differences.

Commentary on Question:
There are more than four major differences. The model solution is an example of a full credit solution.

- BCAR NRC unconditionally places half of the credit risk charge with reserving risk charge. The NAIC RBC credit risk adjustment is conditional as described in the response to part d (ii).
- BCAR NRC includes an interest rate risk charge. NAIC RBC does not include an interest rate risk charge.

4. Continued

- BCAR NRC uses VaR as a risk measure for all risks. NAIC RBC does not use a consistent risk measure across risks.
- BCAR NRC is has an adjustment that increases the risk charge for small insurers and immature insurers. NAIC RBC does not explicitly include such an adjustment.

(f) An interactive meeting between a financial rating company and an insurer is required for the insurer to obtain an interactive financial rating. During the interactive meeting, the financial rating company will consider certain qualitative attributes of the insurer.

Identify four of these qualitative attributes.

Commentary on Question:
There exists more than four of these qualitative attributes. The model solution is an example of a full credit solution.

- Management structure
- Underwriting strategy
- Organizational structure
- Capital structure

(g) For each qualitative attribute considered, the financial rating company will ask the insurer's management a number of questions.

Provide two such questions for one of the attributes identified in part (f).

Commentary on Question:
The model solution is an example of a full credit solution using the qualitative attribute "management structure."

How long have members of senior management worked in the insurance industry?

Are business lines and branch offices relatively independent, or do home office managers control major underwriting decisions?

5. 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.

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

Sources:

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

Commentary on Question:

This question tested a candidate's understanding of the possible reasons for regulatory failure.

Solution:

(a) Describe two notable failures of regulation across the financial services industry related to (or during) the economic crisis of 2007-2009.

Commentary on Question:

There are several failures of regulation noted in the resources. Only two were required for full credit. A full credit response was required to provide sufficient information to identify the failure but did not necessarily require the names of the institutionsinvolved. The model solution is an example of a full credit solution.

- SEC made a mistake in the creation of the Consolidated Supervised Entity as it relaxed capital standards for investment bank holding companies.
- Inadequate supervision of operations involved in the purchasing of mortgages from lenders, packaging them into securities, and selling the securities to investors (*i.e.*, *Fannie Mae and Freddie Mac oper*ations).

(b) Explain how each of these two causes of regulatory failure can contribute to insurance company insolvency.

Commentary on Question:

The model solution is an example of a full credit solution.

Regulatory forbearance is a failure to take prompt and stringent action in the face of a troubled firm. This can increase the ultimate size of the deficit as troubled insurers continuing without regulatory restrictions tend to take on greater risks in an attempt to recover. These risks taken on by financially troubled insurers tend to accelerate their insolvency and increase the losses.

5. Continued

Regulatory capture is the tendency for regulators to take the mindset of an interest group. When insurance regulators are captured by the insurance industry, they tend to make regulation less stringent which can increase the likelihood of insurer insolvency.

(c) Explain how each of the causes of failures in part (b) relate to a notable failure of regulation cited in your solution to part (a).

Commentary on Question:
The model solution is an example of a full credit solution based on the model solution response to part (a).

When the SEC relaxed capital standards for investment bank holding companies, it is a clear example of regulatory capture. The SEC purposely relaxed standards applied to the industry to make it easier for the companies to operate even though it could lead to an increase in failures.

Inadequate supervision of Fannie Mae and Freddie Mac operations appears to be from regulatory forbearance. Regulators should have known about the financial risks from these products. However, they chose to delay regulatory intervention. This delay increased the size of the loss as continuing this business increased the losses from it.

6. 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:

(3d) Discuss the International Actuarial Association position on the function of the actuary in prudential supervision.

Sources:

International Actuarial Association, "The Function of the Actuary in Prudential Supervision," September 2002

Commentary on Question:

This question tested a candidate's understanding of how the actuary can be part of the prudential supervision of insurers according to the IAA report.

Solution:

(a) Describe what makes actuaries good candidates to be involved in the prudential supervision of insurance according to the IAA paper "The Function of the Actuary in Prudential Supervision."

Commentary on Question:

Widely varying responses were acceptable. The model solution is an example of a full credit solution.

Actuaries, as members of a professional body, must meet high standards of conduct, qualification and practice. Actuarial professional bodies develop codes of conduct that set the priorities by which actuaries must abide, regardless of commercial pressures.

(b) Describe four key insurance company functions where active actuarial participation may be considered valuable under a regime of prudential supervision.

Commentary on Question:

There are more than four functions. Only four were required for full credit. The model solution is an example of a full credit solution.

- Pricing and product design.
- Establishing aggregate policy and claim liabilities.
- Determining compliance with regulatory capital requirements and recommending appropriate capital levels.
- Reporting responsibility directly to the Board and, if required, to Regulators.

6. Continued

(c) Actuaries may help determine whether the total assets of the insurer can meet the following:

I. Funding adequacy

II. Earnings capacity

Describe what each of I and II requires in this determination.

Commentary on Question:
Note that a full credit solution was not required to include all the elements for each criterion (i.e., I and II). The model solution is an example of a full credit solution.

I. Funding adequacy
The total assets backing insurance liabilities and required capital plus future premiums and asset revenues are expected to be sufficient to cover a number of obligations and costs such as: the current expected value of the contractual obligations under the business in force and claim obligations, with an appropriate margin for risk, and capital requirements.

II. Earnings capacity
An assessment of the expected future free cash flows that should, under reasonably rigorous future scenarios, be adequate at any point in the future to provide for the appropriate incidence of profits and the transferability of policy liabilities.

7. 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, 5th Ed. (2021), Society of Actuaries

- Chapter 10 (Performance Measurement for General Insurers)

NAIC Annual Statement

Case Study, Fall 2024, SOA Exam General Insurance, Financial and Regulatory Environment – U.S.

Commentary on Question:

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.

This question tested a candidate's ability to derive capital under various accounting standards applying high level adjustments to policyholders' surplus under U.S. statutory accounting. It made use of information included in the GI FREU Case Study. Data from the GI FREU Case Study was preloaded in Excel for the candidate to use.

Solution:

(a) Estimate R-Dan's capital under the following financial reporting systems using high-level adjustments:

(i) U.S. GAAP

(ii) IFRS 17

(iii) Market value

(i) U.S. GAAP capital ≈
Policyholders surplus
+ nonadmitted assets
+ provision for reinsurance

7. Continued

+ (deferrable underwriting and acquisition expenses as a percent of premium × net unearned premiums)
− bad debts

(ii) IFRS 17 capital ≈
U.S. GAAP capital
+ [(1 − discount factor for unpaid net L&LAE using a rate based on risk-free investments with a liquidity premium) × L&LAE]
+ [total cash and invested assets × (market value to statutory value percent for invested assets − 1)]
− estimate of risk margins for insurance risk

(iii) Market value ≈
IFRS 17 capital
+ estimate of franchise value for renewals and distribution systems

(b) Describe how the market value of capital is typically estimated for an insurer that is not a publicly traded company.

Commentary on Question:
The model solution is an example of a full credit solution.

One takes an average of the market value to book value ratio for similar insurance companies that are publicly traded and apply it to the book value of capital for the insurer that is not publicly traded.

(c) Explain why any allocation method selected may be considered arbitrary for general insurance.

Commentary on Question:
The model solution is an example of a full credit solution.

Firstly, there is no legal basis for allocation so any reasonable method may be used. Secondly, any allocation of equity for a general insurance company does not affect the rights of claimants and policyholders to the insurer's assets. All of the company's assets are available to meet the obligations of claimants and policyholders. As such, any allocation is arbitrary.

8. 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, 5th Ed. (2021), Society of Actuaries

- Chapter 7 (Schedule P, Statutory Loss Accounting)

NAIC Annual Statement

Case Study, Fall 2024, SOA Exam General Insurance, Financial and Regulatory Environment – U.S.

Commentary on Question:

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.

This question tested a candidate's knowledge of Schedule P and the ability to allocate AO expenses by accident year using the claim count relativity methodology from General Insurance Financial Reporting Topics. It made use of information included in the GI FREU Case Study. Data from the GI FREU Case Study was preloaded in Excel for the candidate to use.

Solution:

(a) Calculate the calendar year 2023 AO expense payments by accident year using the methodology from *General Insurance Financial Reporting Topics*, the sample relativities provided here, and the claim counts from R-Dan's Annual Statement.

Commentary on Question:

SchP1A = Schedule P Part 1A, Sec = Section,
CY = Calendar Year, AY = Accident Year, Col = Column,
Rep = Reported claim, CCpay = Claim closed with payment,
CCnopay = Claim closed with no payment, OC = Outstanding claim

8. Continued

Step 1: Determine the following claim counts by accident year (AY) for CY 2023

Rep	SchP1A Sec 3 (Col 10 – Col 9)
CCpay	SchP1A Sec 1 (Col 10 – Col 9)
CCnopay	(SchP1A Sec 3 Col 10 – Sec 2 Col 10 – Sec 1 Col 10) – (SchP1A Sec 3 Col 9 – Sec 2 Col 9 – Sec 1 Col 9)
OC	SchP1A Sec 2 Col 10

Step 2: Multiply Step 1 AY counts by the appropriate relativities provided

Step 3: Calculate AO weights by AY as the sum of the Step 2 weighted counts by AY divided by the Step 2 weighted counts all AY total

Step 4: Calculate CY 2023 AO payments by AY as Step 3 AO weights by AY × the provided AO paid of 13.25 million

(b) Determine if the amounts from part (a) are consistent with the amounts reported in R-Dan's Annual Statement.

Commentary on Question:
The model solution is an example of a full credit solution. Note that the only source of AO payments by line of business and AY is Schedule P. These amounts are cumulative, and they are only shown as of year-end 2023. It is not possible to get the CY paid by AY for a line of business.

We can get CY 2023 AO payments for AY 2023 from Schedule P because the prior year payments would be zero.

From part (a), 12.351 million was allocated to AY 2023.
From Schedule P, 9.9 million is for AY 2023 (Part 1A, Row 11, Col 8 – Col 9)
This is a significant difference between the two amounts by approximately 25% for the latest AY. From this, we can assume that the part (a) amounts are not consistent with those in Schedule P.

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.

(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, 5th Ed. (2021), Society of Actuaries

- Chapter 8 (Notes to Financial Statements)

NAIC Annual Statement

Case Study, Fall 2024, SOA Exam General Insurance, Financial and Regulatory Environment – U.S.

Commentary on Question:

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.

This question tested a candidate's knowledge of the Annual Statement and the contents of Note 23 on reinsurance recoverables. It made use of information included in the GI FREU Case Study. Data from the GI FREU Case Study was preloaded in Excel for the candidate to use.

Solution:

Complete the following for R-Dan's Annual Statement Note 23, Reinsurance, as of December 31, 2023:

(i) Note 23A, Unsecured Reinsurance Recoverables

(ii) Note 23B, Reinsurance Recoverables in Dispute

Commentary on Question:

UWIE = Underwriting and Investment Exhibit, UPR = Unearned Premium
Note that total reinsurance recoverables include:
(A) Loss & LAE recoverables on paid amounts (Annual Statement Page 2, Row 16.1, Column 3),

9. Continued

(B) Loss & LAE recoverables on unpaid amounts (only UWIE Part 2A Columns 3 and 7 applies as Schedule P shows no ceded unpaid for DCC and AO) and
(C) Recoverables on UPR (Annual Statement Page 3, Row 9, amount in the row before Current Year column 1) .

(i) Note 23A, Unsecured Reinsurance Recoverables
This note is to disclose if R-Dan has unsecured recoverables from a reinsurer greater than 3% of policyholders surplus (6.28 million = 3% of 209.4 million).

Step 1: Retrieve amounts (A), (B), and (C) from the Annual Statement and calculate the total.
Step 2: Allocate amounts from Step 1 to Auto Liability and Other as follows:
For (A) use UWIE Part 2 Column 3 paid distribution.
For (B) retrieve from UWIE Part 2A Columns 3 and 7
For (C) use UWIE Part 1 Column 3 UPR distribution
The total recoverable by Auto Liability and Other is the sum of the allocated (A), (B), and (C) amounts for each.
Step 3: Allocate total recoverable amounts from Step 2 to A-Re and B-Be using the provided "Share of R-Dan's Ceded" percentages for Auto Liability and Other Lines of Business. Sum the appropriate amounts to get totals for A-Re (19.86 million) and B-Re (11.14 million).
Step 4: Calculate the unsecured amounts for A-Re and B-Re using the provided "Secured by Reinsurer" percentages to get 6.951 million form A-Re and 5.013 million for B-Re.
Step 5: Check Step 4 amounts against 6.28 million. Only A-Re exceeds this amount. We create Note 23A as follows:

Number	Name	Amount
Unknown	A-Re	6,951,083

(ii) Note 23B, Reinsurance Recoverables in Dispute
This note is to disclose if R-Dan has reinsured recoverables in dispute exceeding 5% of PHS for an item or 10% of PHS in aggregate.
Step 1: Retrieve amounts from (i) Step 3 for A-Re and B-Re.
Step 2: Using Step 1 amounts and the provided "Amount in Dispute" percentages calculate the amounts in dispute by reinsurer and sum these to get the aggregate total amount in dispute (2.359 million). Note that the aggregate is only 1.1% of PHS so there are no amounts to disclose. We create Note 23B as follows:

The Company did not have reinsurance recoverables from any disputed items exceeding 5% of surplus or aggregate of all disputed items exceeding 10% of surplus as of December 31, 2023.

10. 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:

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

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

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

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

Sources:

General Insurance Financial Reporting Topics, 5th Ed. (2021), Society of Actuaries

- Chapter 1 (Accounting Concepts for General Insurance)
- Chapter 2 (Accounting for Insurance Contracts)
- Chapter 11 (Financial Ratios for Insurers)
- Chapter 12 (Solvency Monitoring)

NAIC Annual Statement

Case Study, Fall 2024, SOA Exam General Insurance, Financial and Regulatory Environment – U.S.

Commentary on Question:

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.

This question tested a candidate's knowledge of insurance accounting, the Annual Statement, IRIS Ratio tests and the NAIC RBC calculation. It made use of information included in the GI FREU Case Study. Data from the GI FREU Case Study was preloaded in Excel for the candidate to use. This was a 12-point question and was expected to take significant time (i.e., > 30 minutes) to provide the solution.

Solution:

(a) Calculate R-Dan's 2023 IRIS ratios 5, 11, 12 and 13 under scenario II.

Commentary on Question:

AY = Accident Year, CY = Calendar Year
Amounts are shown in millions

10. Continued

IRIS Ratio 5:

Step 1: The scenario II 2% increase in loss & DCC reserves for CY 2022 is calculated as 4.71, and the 17% increase for CY 2023 is calculated as 46.665. This means that incurred loss & DCC reserves should be increased by 4.71 for CY 2022 and 41.955 for CY 2023.

Step 2: The scenario II ratio 5 is the scenario I ratio 5 (102.5%) plus the two-year increase in incurred (46.665) divided by current and prior years' premium earned (578.5 plus 511.6). This is equal to 107.0%.

IRIS Ratio 11:

Step 1: Calculate the scenario II increase in loss & DCC reserves for CY 2023 into AYs 2023, 2022 and prior to 2022 using Schedule P Part 2 minus Part 3 column 10 times 17%. Calculate the scenario II increase in loss & DCC reserves for CY 2022 into AYs 2022, 2021 and prior to 2021 using Schedule P Part 2 minus Part 3 column 9 times 2%.

Step 2: *The step 1 amounts for CY 2022 are also the change in incurred loss & DCC for CY 2022.* The change in incurred loss & DCC for CY 2023 is the change in reserves for CY 2023 less the change for CY 2022.

Step 3: Calculate the scenario II 2% increase in loss & LAE reserves for CY 2022 as 4.978, and the cumulative increase of 2% for CY 2022 and 17% for CY 2023 as 49.215.

Step 4: Calculate scenario II PHS as PHS less the scenario II additional cumulative increase in loss & LAE reserves. For 2023 it's 160.185 (209.4 – 49.215) and for 2022 it's 204.122 (209.1 – 4.978).

Step 5: The scenario II ratio 12 is (Schedule P Part 2 Summary Column 12, Row 12 plus Step 1 increase in CY 2023 incurred for loss & DCC for AY 2022 and prior to 2022) divided by the scenario II 2022 PHS from Step 4 (204.122) which is 26.3% [(36.2 + 9.165 +8.225) / 204.122].

IRIS Ratio 12:

Step 1: Calculate the scenario II increase in loss & DCC reserves for CY 2022 into AYs 2022, 2021 and prior to 2021 using Schedule P Part 2 minus Part 3 column 9 times 2%. *Note: Calculated in Ratio 11 step 1.*

Step 2: *The step 1 amounts for CY 2022 are also the change in incurred loss & DCC for CY 2022 (the payments are not affected by the scenario).*

Step 3: *From Ratio 11 step 3, the scenario II 2% increase in loss & LAE reserves for CY 2022 is 4.978*.

10. Continued

Step 4: The scenario II ratio 12 is (Schedule P Part 2 Summary Column 11, Row 12 plus Step 1 increase in CY 2023 loss & DCC incurred for AYs prior to 2022 plus increase in CY 2022 loss & DCC incurred for AYs prior to 2021) divided by the 2021 PHS which is 24.3% [(36.2 + 8.225 + 0.972) / 197.8].

IRIS Ratio 13:

Step 1: Calculate the scenario II developed reserves-to-premium ratio prior year as follows: CY 2022 loss & LAE reserves plus Schedule P One Year Development plus scenario II CY 2023 increase to loss & DCC reserves for AYs 2022 and prior all divided by 2022 net earned premium which is 59.5% [(248.9 + 36.2 + 10.251 + 9.197) / 511.6].

Step 2: Calculate the scenario II developed reserves-to-premium ratio 2nd prior year as follows: CY 2021 loss & LAE reserves from Five-Year Historical Data plus Schedule P Two Year Development plus scenario II CY 2023 increase to loss & DCC reserves for AYs 2021 and prior all divided by 2021 net earned premium which is 57.9% [(224.5 + 38.9 + 9.197) / 470.9].

Step 3: Calculate the scenario II reserves-to-premium as the average of the two ratios from steps 1 and 2 which is 58.7%

Step 4: Calculate estimated reserves required as 2022 earned premium times the scenario II reserves-to-premium which is 339.629 (511.5 × 58.7%).

Step 5: Calculate estimated reserve deficiency as estimated reserves required from step 4 minus (CY 2023 loss & DCC reserves from Schedule P plus scenario II CY 2023 increase to loss & DCC reserves) which is 18.364 [339.629 – ((289.5 – 14.9) + 46.665]

Step 6: Calculate scenario II estimated reserve deficiency to PHS as 18.364 from step 5 divided by 160.185 from Ratio 11 step 4 which is 11.5%.

(b) Determine if IRIS ratios 5, 11, 12 and 13 are in the usual range for each of scenarios I and II.

Commentary on Question:
The usual range for Ratio 5 is < 100%, for Ratios 11 and 12 is < 20% and for Ratio 13 is <25%.

10. Continued

Using the results from part (a) we have:

	In Usual Range		Results	
	Scenario I	Scenario II	Scenario I	Scenario II
Ratio 5	No	No	102.5%	107.0%
Ratio 11	Yes	No	17.3%	26.3%
Ratio 12	Yes	No	19.7%	24.3%
Ratio 13	Yes	Yes	16.0%	11.5%

(c) Calculate R-Dan's 2023 NAIC RBC Ratio under both scenarios.

Commentary on Question:
RBC Ratio is PHS / ACL, ACL is 50% of RBC, RBC is operational risk factor of 1.03 times R0 + the square root of the sum over i (for i=1 to 5 and CAT) of R_i^2

For scenario I:

$ACL = 0.5 \times 1.03 \times [0.15 + (8.82^2 + 5.29^2 + 2.25^2 + 33.87^2 + 47^2 + 18.44^2)^{0.5}]$
$= 31.853$
RBC Ratio = 209.4 / 31.853 = 657%

For scenario II:

- We use scenario II PHS of 160.185 (calculated in part (a)) and adjust R_4 for the scenario II reserves increase of 17%.
- Scenario II R_4 is (before R_3 adjustment) increased by 17% plus the R_3 adjustment.
- For the R_3 adjustment we make a simplifying assumption that the R-Dan's ceded reinsurance RBC charge factor is 10% and that ceded reinsurance is not affected by the scenario. We then have 10% of 30.9 = 3.09 as the ceded reinsurance risk charge. Half of this, 1.545, is the R_3 adjustment.
- Therefore, scenario II R_4 is 39.365 [(33.87 – 1.545) × 1.17 + 1.545]
- We can assume that scenario II R_5 is R_5 without adjustment. This is because any change to R_5 for scenario II would be negligible because the company average loss & LAE ratio used in its calculation is a 10-year average to net earned premium and only given 50% credibility by formula.

$ACL = 0.5 \times 1.03 \times [0.15 + (8.82^2 + 5.29^2 + 2.25^2 + 39.365^2 + 47^2 + 18.44^2)^{0.5}]$
$= 33.491$
RBC Ratio = 160.185 / 33.491 = 478%

(d) Explain what adjustments may be required to R-Dan's projected financials (Section 6 of the case study) to be consistent with scenario II.

10. Continued

Commentary on Question:
Widely varying correct responses were possible as there are a number of items that could be adjusted. A full credit response was expected to explain at least two fully explained adjustments or at least three briefly described adjustments. The model solution is an example of a full credit response. It does not explain all of the possible adjustments that should be made.

Clearly, the current year has surplus and reserves adjustments. This should affect the loss & LAE projections in that they were initially based on lower observed loss ratios before the reserve increase. The loss & LAE (reserves and incurred) for the projected years should be increased to be consistent with the higher reserves from scenario II. This will affect surplus in the current and projected years for scenario II.

Before the scenario II reserve increase, R-Dan's loss ratio is high enough that a PDR could be considered. The assumption of no PDR under scenario II must be reconsidered. It is likely that a PDR should be included under scenario II for the current year and possibly some of the projected years. This will affect surplus in the current and projected years for scenario II.

11. 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.

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

Sources:

Insurance Regulation, The Institutes

- Chapter 3 (Federal and Other Influences on Insurance Regulation)
- Chapter 5 (State Department of Insurance Operations)
- Chapter 6 (Insurer Formation, Licensing and Marketing Regulation)

Commentary on Question:

This question tested a candidate's understanding of the influences on insurance regulation, how marketing regulation protects consumers and DOI funding.

Solution:

(a) Describe how each of the following may influence insurance regulation.

I. Consumers

II. News media

III. Insurance Regulatory Examiners Society (IRES)

IV. Insurance industry trade associations

Commentary on Question:

Widely varying correct responses are possible. The model solution is an example of a full credit solution.

I. Consumers indirectly influence insurance regulation through filing complaints against insurers with the regulator. Regulators may see a need to change regulations to address complaints.

II. News media indirectly influence insurance regulation through their access to a large audience by bringing attention to an insurance industry issue. Negative publicity in the media can put pressure on insurers or regulators to make changes.

11. Continued

III. IRES is a regulatory professional association in the United States for market conduct regulatory personnel. One of its functions is to improve the professionalism of insurance regulators, which, in turn, improves state insurance regulation.

IV. Insurance industry trade associations perform services for their members (insurers, reinsurers, producers, claims personnel). Members can have prompt access to legislative developments and can use association personnel as their lobbying forum to change regulations.

(b) Describe two ways that market conduct regulation can be used to protect insurance consumers.

Commentary on Question:
Widely varying correct responses are possible. There are more than two ways. The model solution is an example of a full credit solution.

Market conduct regulation protects insurance consumers by reviewing consumer complaints to see if there is anything that needs regulatory attention for the benefit of consumers.

Additionally, market conduct regulations protect consumers by reviewing the sales and advertising practices of insurers (and producers) to ensure that they are not trying to deceive consumers.

(c) Identify four sources of funding for DOI operations.

Commentary on Question:
There are more than four sources of funding. The model solution is an example of a full credit solution.

- Appropriations from state treasuries (dedicated funding)
- Insurance premium taxes
- Fees/assessments on insurers
- Fines/penalties on insurers

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.

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

Sources:

General Insurance Financial Reporting Topics, 5th Ed. (2021), Society of Actuaries

- Chapter 6 (Schedule F, Statutory Credit for Reinsurance)

NAIC Statement of Statutory Accounting Principles

- No. 53, "Property Casualty Contracts-Premiums"
- No. 65, "Property and Casualty Contracts"
- No. 66, "Retrospectively Rated Contracts"

Commentary on Question:

This question tested a candidate's understanding certain aspects of U.S. statutory accounting.

Solution:

(a) Describe the circumstances under which a premium deficiency reserve should be recorded under the rules of SSAP No. 53 for a general insurance company.

When the anticipated losses, loss adjustment expenses, commissions and other acquisition costs, and maintenance costs exceed the recorded unearned premium reserve, and any future installment premiums on existing policies

(b) Describe how accrued additional retrospective premiums are to be recorded under the rules of SSAP No. 66 for a general insurance company.

They are recorded as a receivable with a corresponding entry made either to written premiums or as an adjustment to earned premiums.

(c) Identify two SSAP No. 66 disclosures.

Commentary on Question:

There are more than two disclosures. The model solution is an example of a full credit solution.

12. Continued

- The method used by the reporting entity to estimate retrospective premium adjustments.
- The amount of net premiums written that are subject to retrospective rating features.

(d) Definitions for portfolio reinsurance are included in both SSAP 62R and the NAIC Annual Statement Instructions regarding Schedule F.

Identify the difference between the two definitions.

Under Schedule F, it is the transfer of liability from in force policies. Under SSAP 62R, the transfer of liability need not be only for in force policies.

13. 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:

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

Sources:

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

General Insurance Financial Reporting Topics, 5th Ed. (2021), Society of Actuaries

- Chapter 14 (The General Insurance Actuarial Opinion)

Commentary on Question:

This question tested a candidate's understanding of issues regarding the Appointed Actuary and the SAO.

Solution:

(a) Compare the use of internal appointed actuaries (AAs) versus external AAs with respect to independence.

Commentary on Question:

Widely varying correct responses are possible. The model solution is an example of a full credit solution.

It is generally believed that external actuaries may be more independent than internal actuaries for actuarial opinions. While internal actuaries may face job pressures to agree with the company's senior management, external actuaries may also face pressure to agree with clients to retain their business.

(b) Identify two each for the following:

(i) Primary intended users

(ii) Secondary intended users

Commentary on Question:

There are more than two secondary intended users. The model solution is an example of a full credit solution.

13. Continued

(i) Regulators and the insurer's Board of Directors

(ii) Insurer's senior management and rating agencies

(c) State the two conditions for a contract to be categorized as a long-duration contract.

- The contract term is greater than or equal to thirteen months; and
- The insurer can neither cancel the contract nor increase the premium during the contract term.

(d) If the AA issues a qualified SAO for a U.S general insurer, four disclosures specific to a qualified opinion are required.

Describe these four required disclosures.

- The item (or items) to which the qualification relates.
- The reasons for the qualification.
- The amounts for such items, if disclosed by the entity, that are included in the reserve. If the amounts for such items are not disclosed by the entity, the actuary should disclose that the reserve includes unknown amounts for such items.
- The actuary should disclose whether the reserve amount makes a reasonable provision for the liabilities associated with the specified reserves, except for the item or items to which the qualification relates.