

GH VRU Model Solutions

Spring 2023

1. Learning Objectives:

1. The candidate will understand and apply valuation principles for insurance contracts.

Learning Outcomes:

- (1a) Describe the types of claim reserves (e.g., due and unpaid, ICOS, IBNR, LAE, PVANYD).
- (1b) Explain the limitations and biases of the traditional valuation methods.
- (1c) Calculate appropriate claim reserves given data.
- (1e) Evaluate data resources and appropriateness for calculating reserves.

Sources:

Group Insurance, Skwire, Daniel D., 8th Edition, 2021

- Ch. 39: Claim Reserves for Short-Term Benefits
- Ch. 40: Claim Reserves for Long-Term Benefits

GHFV-103-16: Health Reserves

Commentary on Question:

Generally, candidates performed well on this question, especially the first three sections.

Solution:

- (a) List and describe the types of claim reserves and claim liabilities required in regulatory statements.

Commentary on Question:

Candidates generally performed very well on this question. Some candidates listed other types of reserves, but were generally able to get part marks if these reserves contained concepts related to claim reserves or liabilities.

1. Continued

Points were awarded based on providing the list and describing each type of reserve, up to the maximum points allocated for the question.

Due and unpaid (D&U)
Liabilities for claims that have been reported, adjudicated and processed but final payment has not been recorded as of the valuation date. D&U are typically fairly small in relation to overall reserves. They may be estimated using historical averages.
In Course of Settlement (ICOS)
Liabilities for claims reported, received but not yet adjudicated or paid as of the valuation date.
Incurred but not reported (IBNR)
Liabilities for claims that are anticipated but have not been reported as of the valuation date. This is typically a very large accrual for health insurance. A wide range of estimation techniques can be applied to estimate this liability.
Loss Adjustment Expenses (LAE)
Liabilities for the administrative costs associated with the adjudication of unpaid claims. Usually developed as a percentage of the unpaid claims liability.
Present value of amounts not yet due, or Unaccrued
This reserve covers claims that were incurred on or before the valuation date which have not accrued as of the valuation date. These are most commonly done on a seriatim basis.
Resisted Claims
May vary from carrier to carrier, however, generally include claims for which known litigation situation exists
Outstanding Accounting Feed
Amounts acknowledged as payments, but for which no check has been cut as at the valuation date. Overlaps with Due and Unpaid definitions
Other extended benefits
May include deferred maternity benefits where claim payments after the valuation date are known but not yet due.

- (b)
- (i) List and describe basic techniques to estimate claim reserves.
 - (ii) Recommend reserve methods for each of XYZ's products. Justify your answer.

Commentary on Question:

Generally candidates performed well on this part.

1. Continued

Factor method
<ul style="list-style-type: none"> This method is generally used for reserves that are easily estimated due to a short lag or run off period.
Lag method (or development method)
This method assumes the historical lag pattern can predict the payment patterns for claims that have been incurred but not yet paid. The method provides an estimate of the ultimate aggregate fully incurred payment for all claims in a time period.
Tabular method
For products such as group long term disability (LTD) insurance, where benefits can be paid for many years on a single claim, industry practice and regulatory standards require the use of a tabular method to compute reserves.
Average Size Claim method
The claim reserve for reported claims is estimated by reviewing claim sizes for previously closed claims. The total reported reserve is then calculated as the estimated average size multiplied by the number of reported claims, less any payments made on these claims prior to the valuation date.
Loss Ratio method
The reserve under this method is based on earned premium times an estimated loss ratio minus paid claims.
Projection Methods
<ol style="list-style-type: none"> Develop projected incurred claims cost per unit of exposure. Multiply this value times the exposure base for each period being estimated. Subtract known paid claims. <p>Can assume the claims cost used in pricing as an estimate.</p>
Examiner's method or Case reserves
Generally, these estimates are based on doctors' statements and past history for such claims. This method is often used to estimate the liability arising from claims subject to lawsuits. In that case, the legal department should be involved in the process.

Life
<ul style="list-style-type: none"> Factor method is appropriate given the company has sufficient historical experience to establish a credible factor Waiver of Premium reserves can leverage the Tabular method
AD&D
<ul style="list-style-type: none"> Given the relatively minimal historic experience, the Loss Ratio method would be most suitable
STD
<ul style="list-style-type: none"> Given the relatively minimal historic experience, the Loss Ratio method would be most suitable
LTD
<ul style="list-style-type: none"> The Tabular method is best suited for long term reserves associated with Long Term Disability
Supplemental Health Plan
<ul style="list-style-type: none"> Given the relatively minimal historic experience, the Loss Ratio method would be most suitable While potentially not fully credible, the lag method can also be reviewed and potentially credibility weighted

- (c) Calculate the total incurred health claims from January 20X2 to June 20X2 using an average of the most recent six months' age-to-age factors. Show your work.

Commentary on Question:

Candidates who were able to calculate the correct incurred claims were able to get full marks even if they did not specifically calculate all steps in the model solution (i.e. calculate incurred claims from age to ultimate factors as opposed to completion factors). Candidates were also not required to perform all of the calculations below, as long as they performed enough calculation to derive the response. Some areas that candidates generally lost marks were not leveraging the most recent period and six months' of age-to-age factors for averaging.

1. Continued

Step 1 Calculate Cumulative claims

Cumulative Claims by payment months

		Prior	Jun 20X1	Jul 20X1	Aug 20X1	Sep 20X1	Oct 20X1	Nov 20X1	Dec 20X1	Jan 20X2	Feb 20X2	Mar 20X2	Apr 20X2	May 20X2	Jun 20X2
Incurral month	Jan 20X1	97	97	97	97	97	97	97	97	97	97	97	97	97	97
	Feb 20X1	231	243	243	243	243	243	243	243	243	243	243	243	243	243
	Mar 20X1	384	491	532	534	534	534	534	534	534	534	534	534	534	534
	Apr 20X1	97	407	737	916	969	969	969	969	969	969	969	969	969	969
	May 20X1	49	366	703	832	948	989	989	989	989	989	989	989	989	989
	Jun 20X1	0	112	668	820	952	1005	1010	1010	1010	1010	1010	1010	1010	1010
	Jul 20X1	0	0	124	691	815	919	995	1015	1030	1030	1030	1030	1030	1030
	Aug 20X1	0	0	0	106	746	892	989	1042	1051	1051	1051	1051	1051	1051
	Sep 20X1	0	0	0	0	161	751	880	966	1031	1072	1072	1072	1072	1072
	Oct 20X1	0	0	0	0	0	99	733	1026	1089	1093	1093	1093	1093	1093
	Nov 20X1	0	0	0	0	0	0	101	636	957	1035	1101	1115	1115	1115
	Dec 20X1	0	0	0	0	0	0	0	103	726	920	1036	1114	1137	1137
	Jan 20X2	0	0	0	0	0	0	0	0	105	686	979	1071	1128	1147
	Feb 20X2	0	0	0	0	0	0	0	0	0	117	669	900	1072	1137
	Mar 20X2	0	0	0	0	0	0	0	0	0	0	135	719	1021	1116
	Apr 20X2	0	0	0	0	0	0	0	0	0	0	0	163	739	934
	May 20X2	0	0	0	0	0	0	0	0	0	0	0	0	131	734
	Jun 20X2	0	0	0	0	0	0	0	0	0	0	0	0	0	165

1. Continued

Development factors by payment month

		Prior	Jun 20X1	Jul 20X1	Aug 20X1	Sep 20X1	Oct 20X1	Nov 20X1	Dec 20X1	Jan 20X2	Feb 20X2	Mar 20X2	Apr 20X2	May 20X2	Jun 20X2	
Incurral month	Jan 20X1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
	Feb 20X1	1.00	1.05	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
	Mar 20X1	1.00	1.28	1.08	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
	Apr 20X1	1.00	4.20	1.81	1.24	1.06	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
	May 20X1	1.00	7.47	1.92	1.18	1.14	1.04	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
	Jun 20X1			5.96	1.23	1.16	1.06	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
	Jul 20X1				5.57	1.18	1.13	1.08	1.02	1.01	1.00	1.00	1.00	1.00	1.00	
	Aug 20X1					7.04	1.20	1.11	1.05	1.01	1.00	1.00	1.00	1.00	1.00	
	Sep 20X1						4.66	1.17	1.10	1.07	1.04	1.00	1.00	1.00	1.00	
	Oct 20X1							7.40	1.40	1.06	1.00	1.00	1.00	1.00	1.00	
	Nov 20X1								6.30	1.50	1.08	1.06	1.01	1.00	1.00	
	Dec 20X1									7.05	1.27	1.13	1.08	1.02	1.00	
	Jan 20X2										6.53	1.43	1.09	1.05	1.02	
	Feb 20X2											5.72	1.35	1.19	1.06	
	Mar 20X2												5.33	1.42	1.09	
	Apr 20X2													4.53	1.26	
	May 20X2														5.60	
	Jun 20X2															NA

1. Continued

Completion Factors

Lag Mth	Development factor	Completion factor
8	1.000	1.000
7	1.000	1.000
6	1.002	1.000
5	1.016	0.998
4	1.054	0.981
3	1.108	0.931
2	1.371	0.840
1	5.794	0.613
0	NA	0.106

Incurral Claim by Month

		Paid to Date	Lag Mth	Completion Factor	Total Incurred
Incurral months	Jan 20X2	1147	5	0.998	1150
	Feb 20X2	1137	4	0.981	1159
	Mar 20X2	1116	3	0.931	1199
	Apr 20X2	934	2	0.840	1111
	May 20X2	734	1	0.613	1198
	Jun 20X2	165	0	0.106	1560
20X2 Total					7376

(d) Critique the use of the development method in part (c).

Commentary on Question:

In order to receive full marks, candidates were required to confirm all the necessary requirements for development method to be suitable, critique how that applies in this situation, and recommend some potential alternatives to improve.

- i) Development method works best if the following conditions are met:
1. Ability to record incurred date and payment date of each claim.
 2. Consistent lag patterns.
 3. Incurred periods should have a relatively short duration.
 4. Sufficient volume of business
 5. Requires either earned premium or exposed contract counts to assist in the calculation

1. Continued

ii) XYZ's health block does not meet criteria 2. 4. And unclear on 5. Significant business growth is observed in 2021 and 2022. The runoff pattern is not stable.

iii) Estimates for ultimate claims for months below the threshold are often based on an alternative estimate of the average incurred claim cost per contract or member. Two common methods of developing the alternative estimates are

1. an estimate based on the trend in claim cost (claim dollars per unit of exposure, such as PMPM), or
- an estimate based on applying an assumed loss ratio (ratio of incurred claims to earned premium) to earned premium.

(e) Calculate the Incurred But Not Paid (IBNP) reserve as of June 30, 20X2 by applying both credibility weights and an alternative method. State your assumptions and show your work.

Commentary on Question:

Some candidates did not consider an alternative method for this part of the question and considered alternative smooth techniques within the development method. Points were awarded for either Loss Ratio or Projection Method alternatives, although Loss Ratio method is described below. In order to get full marks, candidates were required to provide a reason for their determination of the credibility formula.

Calculate Loss Ratio

		Paid to Date	Earned Premium	Loss Ratio
Incurral months	Jan 20X1	97	150	65%
	Feb 20X1	243	350	69%
	Mar 20X1	534	750	71%
	Apr 20X1	969	900	108%
	May 20X1	989	1200	82%
	Jun 20X1	1010	1300	78%
	Jul 20X1	1030	1400	74%
	Aug 20X1	1051	1400	75%
	Sep 20X1	1072	1500	71%
	Oct 20X1	1093	1500	73%
	Nov 20X1	1115	1700	66%
	Dec 20X1	1137	1800	63%

$$\text{Loss Ratio} = \text{Sum of Paid to Date} / \text{Sum of Earned Premium} = 74\%$$

1. Continued

Calculate Incurred Claims based on LR Method

		Paid to Date	Earned Premium	Expected Incurred
Incurral months	Jan 20X1	1147	1750	1297
	Feb 20X2	1137	1700	1260
	Mar 20X2	1116	1750	1297
	Apr 20X2	934	1750	1297
	May 20X2	734	1800	1334
	Jun 20X2	165	1800	1334

Credibility-Blended Estimate

		Paid to Date	Completion Factor	Incurred (Development)	Incurred (Loss Ratio)	Incurred (Blended with Completion Factor)
Incurral months	Jan 20X1	1147	0.998	1150	1297	1150
	Feb 20X2	1137	0.981	1159	1260	1160
	Mar 20X2	1116	0.931	1199	1297	1205
	Apr 20X2	934	0.840	1111	1297	1141
	May 20X2	734	0.613	1198	1334	1250
	Jun 20X2	165	0.106	1560	1334	1358

IBNP

Total Paid = 15573

Total Incurred = 17605

IBNP = 2032

2. Learning Objectives:

1. The candidate will understand and apply valuation principles for insurance contracts.

Learning Outcomes:

(1b) Explain the limitations and biases of the traditional valuation methods.

(1c) Calculate appropriate claim reserves given data.

Sources:

Individual Health Insurance, Ch. 6

Claims Reserve Model

Commentary on Question:

Commentary listed underneath question component.

Solution:

- (a) Calculate the reserve per in-force policy for each year, using the prospective method for years 1 and 2, and the retrospective method for years 3 and 4. Show your work.

Commentary on Question:

Many candidates received no grading points on this one, and few candidates earned full credit. Many candidates were not able to calculate persistency correctly. Not all candidates calculated net premiums correctly. For reserves calculation, if the formula is correct but the calculation was wrong due to wrong persistency in previous step, we gave partial credit.

2. Continued

	A	B	C	D	E	F	G	H
3		Year (t)	Mortality at Year (t)	Annual Claims		Lapse Rate	Persistency at Year (t)	Cumulative Persistency
4		0	0.0000	\$0.00			1.0000	1.0000
5		1	0.0113	\$120.74		5%	0.9393	0.9393
6		2	0.0135	\$146.38		5%	0.9372	0.8803
7		3	0.0162	\$168.19		5%	0.9346	0.8227
8		4	0.0194	\$190.02		5%	0.9316	0.7664
9		5	0.0221	\$209.85		5%	0.9290	0.7120
10								
11	Annual Lapse Rate		5%					
12	Net Level Premium		\$153.26					
13								
14	<u>Prospective Method</u>							
15	Per Original t=1		\$39.85	=H6*D6+H7*D7+H8*D8+H9*D9-H5*C12-H6*C12-H7*C12-H8*C12				
16	Per Original t=2		\$54.96	=H7*D7+H8*D8+H9*D9-H6*C12-H7*C12-H8*C12				
17								
18	Per In-force t=1		\$42.43	=C15/H5				
19	Per In-force t=2		\$62.43	=C16/H6				
20								
21	<u>Retrospective Method</u>							
22	Per Original t=3		\$51.50	=C12*(1+H5+H6)-H5*D5-H6*D6-H7*D7				
23	Per Original t=4		\$31.95	=C12*(1+H5+H6+H7)-H5*D5-H6*D6-H7*D7-H8*D8				
24								
25	Per In-force t=3		\$62.59	=C22/H7				
26	Per In-force t=4		\$41.69	=C23/H8				

- (b)
- (i) Describe two examples of LTC claim administration practices that may create bias in the claims reserves.
 - (ii) Explain methods to adjust for bias in the examples in (i).

Commentary on Question:

For b(i), most candidates received partial credit but very few received full credit. For b(ii) most candidates got credit for mentioning keeping claims open. Credit was also given for other reasonable answers.

Part (i)

(1) Sometimes administrators try to help by attempting to be as up-to-date as possible with the claim status. They may unintentionally create a stronger bias, as the information may be easier to update on certain classes of people.

For example, it may be easier to close a claim for death or recovery than to update a surviving claimant's actual service dates and expenses. If the concluded claims are more up-to-date than the surviving claims, too many people contributing to shorter claims are removed from the population and the otherwise good continuance probabilities become biased towards understating the reserve.

2. Continued

(2) When administrators close claims upon hearing that a claim has terminated (either by death or recovery), without waiting for the last set of expenses to be submitted.

This means a reserve may not be set up for the final payment

These claims represent the claimants that are about to terminate, again causing the otherwise good continuance curve to be biased toward an understatement.

Part (ii)

When benefit administrators have a practice of closing out claims early, it is important to make adjustments to the reserves for the closed claims.

To avoid bias from administration processes, the actuaries may theoretically keep every claim open that has ever been open.

3. Learning Objectives:

1. The candidate will understand and apply valuation principles for insurance contracts.

Learning Outcomes:

- (1f) Describe, calculate and evaluate non-claim reserves and explain when each is required.
- (1g) Apply applicable standards of practice related to reserving.

Sources:

Individual Insurance, Chapter 6

Individual Insurance, Chapter 8

ASOP 23

ASOP 41

Commentary on Question:

This question was primarily a recall question asking the candidates to provide information directly from the syllabus without a great deal of analysis. On some of the parts, the lists were clearly from portions of the syllabus where the candidates had focused on as important and the candidates did very well while the candidates did not do as well on some other parts.

Solution:

- (a) List and describe six purposes for which financial models are created in the individual health business.

Commentary on Question:

Candidates did very well on this part with a majority of the candidates receiving full or nearly full credit for this part.

Pricing – Pricing models are used in individual health to arrive at reasonable and competitive rates, in line with the regulatory requirements that come with selling plans on the state exchange (ex: exclusions, mandatory coverages, etc.).

Reserving – Reserving models are used so the company can hold enough money to pay off its future obligations. Since the individual business is on the state exchange, this includes considerations of how risk adjustment may impact the company's financials.

Solvency testing – Used to determine the financial condition of the individual business segment; this compares premium to future obligations to see if there is concern over this business segment's performance.

3. Continued

Monitoring – Models to monitor the individual health business are used as a check for how various assumptions (example: expenses, enrollment, trend) are holding up and to determine if any assumptions or procedures used in this business need to be changed.

Actuarial Appraisals – Used to determine the value of the individual business segment. Can also be used in the context of considering mergers/acquisitions.

Forecasting – Forecasting models are used to project future cash flows in the individual health business to determine cash flow impacts, risk adjustments, etc. for the business.

- (b) Describe characteristics of a good forecasting model.

Commentary on Question:

Candidates also did very well on this part with a majority of the candidates receiving full credit for this part.

Reliable accuracy – the model should produce the results it is intended to provide

Sensibility – should have a logical construction of the process being modeled

Appropriate precision – refers to the number of decimal places included in the calculations

Effectively communicated – should effectively communicate the results and related model documentation

- (c)
- (i) Describe an auto-correlative model.
- (ii) Assess the need to build an auto-correlative forecasting model for Sparkle. Justify your answer.

Commentary on Question:

Candidates generally did not do well on this part. Few candidates were able to define an auto-correlative model and fewer recognized that by being part of the ACA, Sparkle was implicitly using auto-correlative models.

- (i)
- An auto-correlative model is one that recognizes the dependence nature of individual claims between the experience period and the projection period.
 - For example, if someone has a major claim in one year, they are more likely (than someone who has not) to have a sizable claim in the next year.

3. Continued

(ii)

Yes, an auto-correlative model is needed

- Help focus care management efforts. Insurers or clinicians may, for example, want to make such predictions in order to focus care management efforts where they are likely to do the most good.
- Needed for setting up reserves for potential future cash flows under the ACA's premium stabilization programs (such as risk adjustment).

(d) List four modeling validation approaches you plan to use.

Commentary on Question:

Candidates did very well on this part with the majority of the candidates receiving full credit for this part.

- The values of the model in the starting year are compared directly to actual values for the year.
- The year-to-year changes produced in the model are compared to actual historical results.
- The results of the model can be (and virtually always are) subjected to reasonableness checks by people familiar with the business.
- Another way models can be validated is by “stress testing” them. (or scenario testing or sensitivity testing)

(e) Describe considerations for reviewing the data used in your model according to ASOP 23.

Commentary on Question:

Candidates did not do as well on this part. Many candidates provided answers from ASOP 23 that went well beyond just considerations for reviewing the data such as selection of data and use of data.

a. Make a reasonable effort to determine the definition of each data element used in the analysis

b. Make a reasonable effort to identify data values that are questionable or relationships that are significantly inconsistent

- If the actuary believes questionable or inconsistent data values could have a significant effect on the analysis, the actuary should consider taking further steps, when practical, to improve the quality of the data.
- The actuary should disclose in summary form any unresolved questionable data values that the actuary believes could have a significant effect on the analysis.

3. Continued

- c. The actuary should also consider comparing current data with the data used in the prior analysis for consistency, if similar work has been previously performed for the same or recent periods and if such consistency can reasonably be expected.
- (f)
- (i) List disclosures required in an actuarial report, pursuant to ASOP 41.
- (ii) Describe four standards against which you might compare your results in the report.

Commentary on Question:

Candidates did very well on part (i) with nearly all candidates receiving full credit. The sample answer below provides only a few of the items provided by candidates that received credit. On part (ii), candidates did not do as well with most candidates not understanding the question. Many candidates provided ASOPs that might apply as opposed to standards against which results could be compared.

- (i)
- Risks or uncertainties
 - Reliance on other sources for data or other information
 - Information date of report
 - Scope and intended purpose
 - Acknowledgement of qualifications
- (ii)
- Original pricing targets (to evaluate original pricing relativities and levels)
 - Current pricing targets (to evaluate current re-rating processes)
 - Corporate performance (including prior projection) targets (for a multitude of reasons, including profitability, evaluation of the projection process itself, underwriting effectiveness, identifying antiselection issues, measuring medical management, etc.)
 - Management basis targets (for similar reasons)

4. Learning Objectives:

2. The candidate will understand how to prepare and be able to interpret insurance company financial statements in accordance with U.S. statutory principles and GAAP.

Learning Outcomes:

- (2a) Prepare financial statement entries in accordance with generally accepted accounting principles.
- (2b) Interpret the results of both statutory and GAAP statements from the viewpoint of various stakeholders, including regulators, senior management, investors.

Sources:

Group Insurance, Skwire, 8th ed., Ch. 43: Analysis of Financial and Operational Performance

Commentary on Question:

Commentary listed underneath question component.

Solution:

- (a) In the table below:
 - (i) List the formula(s) for each component of the DuPont Formula.
 - (ii) Describe what each component measures.

Component	Formula(s)	Measures
Net Profit Margin		
Total Asset Turnover		
Total Leverage Ratio		
Return on Equity		
Return on Assets		

Commentary on Question:

Most candidates did well in providing the formulas and measures. Candidates who simply defined a measure as a ratio of two items did not receive credit. Most candidates struggled to identify the correct measure for Return on Equity.

4. Continued

Component	Formula(s)	Measures
Net Profit Margin	$= \frac{[Net\ Income]}{[Revenue]}$	<i>How profitable is each customer? In other words, what percent of each dollar of sales does Company X earn as profits?</i>
Total Asset Turnover	$= \frac{[Revenues]}{[Total\ Assets]}$	<i>How much total investment in assets (e.g., real estate, medical equipment) is needed to meet the requirements of Company X's customers?</i>
Total Leverage Ratio	$= \frac{[Total\ Assets]}{[Shareholder\ Equity]}$	<i>To what degree can Company X utilize other peoples' money (e.g., trade and long-term creditors' money) to magnify Return on Assets for shareholders' benefit?</i>
Return on Equity	$= \frac{[Net\ Income]}{[Shareholder\ Equity]}$ OR $= [Return\ on\ Assets] * [Total\ Leverage\ Ratio]$	<i>How fast does Company X's net worth grow, assuming all earnings are reinvested? Also measures the limits of such growth, without external sources of capital</i>
Return on Assets	$= \frac{[Net\ Income]}{[Total\ Assets]}$ OR $= [Total\ Asset\ Turnover] * [Net\ Profit\ Margin]$	<i>What is the level of profits, as a percent, that can be earned on Company X's assets?</i>

- (b) You are an actuary at Company X, a publicly traded company. Company X's Finance department provides you the following information for 20X1.

Health benefit ratio	82.0%
Administrative expense ratio	17.4%
Investment Income, as a percent of revenue	4.6%
Non-operating expense, as a percent of revenue	2.2%
Total Asset Turnover	2.28
Total Leverage Ratio	1.75
Corporate tax rate	21%

Calculate Company X's shareholder equity as a percent of revenue. Show your work.

4. Continued

Commentary on Question:

Most candidates earned full credit with providing the correct ratio of equity to revenue. Candidates who earned full credit either defined all parts of the DuPont to arrive at the answer or used algebra to isolate the answer given the provided metrics.

Partial credit was given in accurately calculate parts of the Dupont formula or relevant algebra and formulas.

$$\begin{aligned} \text{Pre-tax profit, as a percent of revenue} &= 1 - [\text{Health Benefit Ratio}] - [\text{Admin} \\ &\text{Expense Ratio}] - [\text{Non Op Expenses}] + [\text{Investment Income}] \\ &= 3.0\% \end{aligned}$$

$$\begin{aligned} \text{Net profit, as a percent of revenue} &= [\text{Pre-Tax Profit}] * (1 - [\text{Corporate Tax Rate}]) \\ &= 2.4\% \end{aligned}$$

$$\begin{aligned} [\text{Return on Assets}] &= [\text{Net Profit Margin}] \times [\text{Total Asset Turnover}] \\ &= 5.40\% \end{aligned}$$

$$\begin{aligned} [\text{Return on Equity}] &= [\text{Net Income}] / [\text{Equity}] \\ &= [\text{Total Leverage Ratio}] \times [\text{Return on Assets}] \\ &= 9.46\% \end{aligned}$$

$$\begin{aligned} \text{Equity as \% of Revenue} &= [\text{Net Profit as \% of Revenue}] / [\text{Return on Equity}] \\ &= 25.06\% \end{aligned}$$

Alternatively, algebra could be used:

$$\begin{aligned} [\text{Equity}] / [\text{Revenue}] &= \frac{1}{[\text{Total Asset Turnover}] * [\text{Total Leverage Ratio}]} = \\ &= \frac{1}{\left(\frac{\text{Revenue}}{\text{Assets}}\right) * \left(\frac{\text{Assets}}{\text{Equity}}\right)} \end{aligned}$$

- (c)
- (i) Identify a component of the DuPont Formula that would differ significantly between a staff model plan and a fee-for-service plan, all else being equal. Justify your response.
 - (ii) Recommend an adjustment that could be made to a different component of the DuPont Formula to counteract the effect described in (i) and achieve the same Return on Equity. Justify your response.

4. Continued

Commentary on Question:

Candidates in general gave mixed responses. Some common incorrect responses were that Staff Models have lower profit margins because of increased assets or that FFS Models had decreased profit margins because providers had an incentive to overutilize. These both are not inherently true.

An alternative acceptable answer for part (ii) was to identify that Return on Assets would be lower in a Staff Model and that increasing the Total Leverage Ratio by financing with debt would balance out the difference.

- (i) Total Asset Turnover will be lower in the staff model because it needs to have more assets (e.g., clinics, pharmacies, pharmacy medication inventory, hospitals) to deliver health care. FFS plans do not need this level of assets because they do not deliver healthcare.
- (ii) Increase the profit margin to offset the decrease in Total Asset Turnover for the staff model. This will result in the same Return on Assets, and assuming Total Leverage Ratio is consistent, will achieve the same Return on Equity.

5. Learning Objectives:

3. The candidate will understand how to evaluate the impact of regulation and taxation on companies and plan sponsors in the US.

Learning Outcomes:

- (3a) Describe the regulatory and policy making process in the US.
- (3b) Describe the major applicable laws and regulations and evaluate their impact.
- (3d) Apply applicable standards of practice.

Sources:

Group Insurance Chapter 27

Group Insurance Chapter 17

ASOP 8

Commentary on Question:

The model solution below is an example of full credit but the syllabus contained more opportunities to achieve points not included below. More detailed commentary is listed underneath each question component.

Solution:

- (a) List and describe the rating characteristics allowed for these plans under the Affordable Care Act (ACA).

Commentary on Question: Candidates generally performed well on this part of the question. Candidates needed to provide a description of each item listed to earn full credit.

- Plan design – plans must be within a corridor around the target actuarial value to comply with metal level requirements
- Age – all insurers in a state use the same age curve with most states using a standard age curve created by CMS but the standard curve is not mandated on the states
- Family Composition – each insurer can develop their own relativities based on actuarial basis to reflect family size
- Tobacco Usage – allowed to increase rates up to 50% but many small groups do not assess tobacco usage due to technical and time constraints

5. Continued

- (b) Explain how the Coronavirus Aid, Relief, and Economic Security (CARES) Act directly affected health insurers.

Commentary on Question: Some candidates explained how the Coronavirus more broadly affected health insurers. Candidates needed to explain how the CARES Act specifically affected health insurers to earn credit.

- Covid testing was covered with no cost sharing
- Created a telehealth cost sharing safe harbor for high deductible plans
- Removed requirement that over the counter medications must be prescribed to be paid with HSA, HRA, or FSA

- (c) Describe the core components required by the Centers for Medicare and Medicaid Services (CMS) for non-grandfathered plan rate filings.

Commentary on Question: Candidates generally performed well on this part of the question. Candidates needed to provide a description of each item listed to earn full credit.

- Unified rate review template – Excel spreadsheet that insurer must provide showing a number of values pertaining to the rate increase; the spreadsheet is a rate review document not a pricing template
- Written explanation of rate increase – for products with a rate increase of 15% or more (formerly 10%) the insurer must provide a plain language narrative explaining the increase
- Actuarial memorandum – summarizes the URRT components, need for the increase, support of assumptions and signed by a qualified actuary
- Unique plan design supporting documentation and justification – documentation and certification of any areas where actuarial adjustments were required

- (d) Describe the items you should disclose in your report to comply with ASOP 8.

Commentary on Question: Candidates generally struggled with this part of the question. Many candidates provided extraneous lists that did not describe the items that should be disclosed in a report to comply with ASOP 8.

- Document sources of information
- Describe any material information provided by others and extent of actuaries reliance
- Document any unresolved concerns that may have a material impact

5. Continued

- Any material changes to rating methodology, plan provisions, sources or quality of experience data, or assumptions since a substantially similar previous filing, if any. This includes, but is not limited to, changes in covered services, cost sharing, rating factors, and non-benefit expenses
- Document limitations on the use of the work product
- Document adjustments to past experience to project future results
- ASOP 41 disclosure pertaining to any material assumptions or methods prescribed by law
- Define the term actuarially sound if the term is used

6. Learning Objectives:

4. The candidate will understand how to evaluate retiree group and life benefits in the United States.

Learning Outcomes:

- (4b) Recommend appropriate baseline assumptions for benefits and population

Sources:

GHFV-816-18 page 15 - 16; GHVR-109-19 page 106, 116, 128

Commentary on Question:

Commentary listed underneath question component.

Solution:

- (a) Describe the accounting treatment(s) applied to the recognition of the plan change for the Accumulated Postretirement Benefit Obligation (APBO) and Net Periodic Postretirement Benefit Cost (NPPBC).
 - (i) For active employees
 - (ii) For retired employees

Commentary on Question:

Candidates generally performed well on this part of the question. Not all of the parts in the answer were needed to receive full credit. If a candidate simply listed formulas for APBO or NPPBC, they did not receive credit.

- (i) This plan change would be a settlement for the active employees because it's a transaction that eliminates all future obligation with respect to the benefit plan. This settlement will reduce the APBO. This will be measured at the date at which the event occurs. The maximum gain or loss recognized in the NPPBC is unrecognized net gain or loss plus any remaining transition asset. Maximum amount is recognized if entire APBO is settled.
- (ii) The change for retired employees is considered a prior service cost because it is considered a change in plan amendments. The prior service cost is negative, so it reduces the APBO. This change will be recognized at the date the event occurs. The change will be recognized in NPPBC over future service of participants. In this case, since all participants are retired, recognized over remaining life expectancy. Since Plan terminates in three years, recognize over three years.

Note: this event is not a curtailment because this affects retirees, not active plan participants.

6. Continued

- (b) Calculate the APBO as of January 1, 20X1 under the new plan. Show your work.

Commentary on Question:

Candidates generally did well on this question. Claims were assumed to be paid out, and therefore trended and discounted at the mid-year; however, if a candidate stated they assumed either end of year or beginning of year claims payment and discounted accordingly, they would receive full credit. Common issues included forgetting to consider the spouses or incorrectly trending or discounting claims. Some candidates also calculated the APBO for active employees, which was not appropriate in this situation.

Actives are excluded due to the settlement therefore the APBO is only calculated for the retirees over the next 3 years.

Status	Age	(a)	(b)	(c)	(d)
		Claims Cost 20X0	20X1	Claims Cost 20X2	20X3
Retiree	70	\$3,250	\$3,461	\$3,686	\$3,926
Spouse	65	\$2,800	\$2,982	\$3,176	\$3,382
Retiree	70	\$3,250	\$3,461	\$3,686	\$3,926
Retiree	80	\$4,250	\$4,526	\$4,820	\$5,134
			= (a) * (1.065)	= (b) * (1.065)	= (c) * (1.065)

Status	Age	(a)	(e)	(f)	(g)	(h)	(i)
		Claims Cost 20X0	20X1	Discounted Claims Cost 20X2	20X3	Total	Headcount
Retiree	70	\$3,250	\$3,378	\$3,426	\$3,475	\$10,279	45
Spouse	65	\$2,800	\$2,910	\$2,952	\$2,994	\$8,856	45
Retiree	70	\$3,250	\$3,378	\$3,426	\$3,475	\$10,279	33
Retiree	80	\$4,250	\$4,417	\$4,480	\$4,544	\$13,442	76
			= (b) * (j)	= (c) * (k)	= (g) * (l)	= (e) + (f) + (g)	

Discount Factor (Assumes Mid-Year Payment)

(j)	(k)	(l)
20X1	20X2	20X3
0.9759	0.9294	0.8852

Total PV of Benefits @ 1/1/20X1 (Retiree APBO)

\$2,221,836

= SUMPRODUCT((h) , (i))

6. Continued

(c)

- (i) Explain the aspects of short-duration contracts relevant to the Oculus Inc. retiree healthcare liability under US GAAP.
- (ii) Describe US statutory accounting concepts that influenced the development of National Association of Insurance Commissioners (NAIC) guidance for financial reporting for tax purposes.

Commentary on Question:

Candidates generally performed poorly on (i) and well on (ii). Some candidates did not discern what was being asked for in part (i).

(i)

- a. Revenue Recognition. Over the period of the contract in proportion to the amount of insurance provided (evenly over period). For Oculus, premiums would be due each month and recognized in full, leading to no unearned premium reserve each month.
- b. Discounting of claims liabilities. The SEC believes the discounting requires that the payment pattern and ultimate cost should be fixed and determinable on an individual claim basis which is generally untrue for unpaid claims liabilities like Oculus retiree health claims.
- c. Claim liability disclosures. A Reserve roll forward table is typically required.
- d. Premium deficiency reserve. The insurer (Oculus) may need to accelerate recognition of expected future losses associated with future coverage. Generally, DAC would be excluded.

(ii)

- a. Established by the NAIC in their APPM
- b. Conservatism. Margin of protection for policyholders. Applies to estimates and establishing principles. Covers span of economic cycles. Primary responsibility to regulate for financial solvency. Emphasis on helping providers of capital assess the entity's prospect for future net cash inflows.
- c. Consistency. Meaningful, comparable financial information to determine financial condition. Rule-based measurement. Encourages uniformity in accounting treatment.
- d. Recognition. NAIC has a different stance than GAAP in recognizing intangible assets. Purpose is to assess the insurer's ability to meet its financial obligations

6. Continued

- (d)
- (i) Compare and contrast the various approaches the team could use to measure the liabilities under US GAAP.
 - (ii) Recommend an approach for preparing the financial statements. Justify your response.

Commentary on Question:

Candidates did not realize they needed to consider different methods to measure liabilities for an international company instead of just a US GAAP approach, since Oculus was being acquired by a company based in a different country. For the 2nd part of the question, credit was given to candidates for providing a reasonable recommendation and justifying it, even if they did not receive all points for part (i). Full credit was given for recommending either approach described in part (i) or IFRS.

- (i)
- a. General Model or Building Block Approach measures liabilities with fulfillment cash flows for a group of insurance contracts. Segmented contracts into portfolios of similar risks which are managed together. The building blocks of the fulfillment cash flows are based on the boundary of the contract, the impact of discounting, and explicit risk adjustment. Fourth block is the contractual service margin. Similar to US GAAP in use of current estimates, aggregation of contracts for valuation, market interest rates, and insurance liability instead of investment yields. Difference is the introduction of the CSM and explicit risk adjustment.
 - b. Premium Allocation Approach, resembles short-duration US GAAP, unearned premium reserve net of acquisition costs and premiums not yet received, separate liability for incurred claims. Can establish a PDR. Difference in liability reflection: must include risk adjustment to reflect compensation required for bearing uncertainty around timing and amount of cash flows. Liabilities are discounted (TVoM) unless receivable inside of 1 year from date of claims incurral.
 - c. Additional credit was awarded to candidates who mentioned the variable fee approach and that it is not applicable.
- (ii)
- a. Partial credit was awarded to candidate who recommended either approach and provided a thoughtful justification, even if it was not one of the approaches in part (i).
 - b. Full credit was awarded for recommending and justifying either of the approaches mentioned above.

7. Learning Objectives:

2. The candidate will understand how to prepare and be able to interpret insurance company financial statements in accordance with U.S. statutory principles and GAAP.

Learning Outcomes:

- (2a) Prepare financial statement entries in accordance with generally accepted accounting principles.
- (2b) Interpret the results of both statutory and GAAP statements from the viewpoint of various stakeholders, including regulators, senior management, investors.
- (2d) Apply applicable standards of practice.

Sources:

GHVR-109-19 Health Insurance Accounting Basics for Actuaries

GHVR-818-18 Revised Statement of Opinion Instruction for NAIC Statement

GHVR-819-18 Practices for Preparing Health Contract Reserves

GHVR-831-23 Supplemental Comments on SOA Study Note GHVR-819-18

Commentary on Question:

Candidates were largely successful at answering key points about an Appointed Actuary and the Reserve types. However were slightly less successful when attempting to apply the definitions. Candidates struggled with Part D.

Solution:

- (a) Describe the role of an Appointed Actuary, including relevant rules and responsibilities for the position.

Commentary on Question:

Generally, candidates performed well on this question. The most common mistake was to not list and define the education requirements for an Appointed Actuary.

- Defined as a qualified actuary appointed by the board of directors (or its equivalent) who must report to the board or audit committee each year on items within the scope of actuarial opinion
- Must comply with current Qualification Standards to issue Statements of Actuarial Opinion and be a member of the American Academy of Actuaries
- Must follow all relevant and applicable ASOPs promulgated by the ASB
- Responsible for preparing supporting documentation actuarial memorandum to convey the actuary's work and conclusions

7. Continued

- (b) Contrast the purposes of an Unearned Premium Reserve and a Contract Reserve.

Commentary on Question:

Candidates were successful in defining both the unearned premium reserve and the contract reserve. However, very few candidates discussed the purpose of the reserve and its impact on a company's finances. Partial credit was awarded for defining however many candidates did not receive full credit due to not contrasting the two reserves.

Unearned premium reserves represent the portion of premium collected which is needed to cover the period for which coverage/service is intended, such as a product where premium is collected at the start of the year for a full year coverage period. Unearned premium reserves are needed to reduce fluctuation in profitability stemming from premium collection patterns.

Contract reserves represent the portion of current and past premiums needed to prefund future costs, such as a product with level premium where costs increase in later benefit periods. Contract reserves are needed to avoid overstating the insurer's net worth and reporting excessive profits in early years.

- (c) Describe circumstances in which Mockingbird would not need to hold a Contract Reserve.

Commentary on Question:

There was a wide variety of responses for this question and largely candidates performed well. Even if candidates were not able to suggest an alternative they still received some credit for explaining why a Contract Reserve was necessary for Mockingbird.

- In cases where a contract cannot be continued after 1 year from issue, or
- If rates are determined such that each policy year's premium is designed to cover that policy year's costs with no prefunding of future years needed

- (d) Explain why having appropriate Claims Reserves, Unearned Premium Reserves, and Contract Reserves may not always be sufficient to demonstrate reserve adequacy under Statutory Accounting Principles (SAP)

Commentary on Question:

Of this entire question, candidates struggled the most with part d. Many were listing reasons why the reserve set would not be appropriate (adverse events, etc.) rather than focus on the practice of reserve adequacy.

7. Continued

- Reserve adequacy demonstrated under SAP using a Gross Premium Valuation
- Compares present value of future claims, expenses and ending reserves with the present value of future premiums and current reserves
- Even when Unearned Premium Reserves and Contract Reserves are appropriate, a Gross Premium Valuation may determine a need for a Premium Deficiency Reserve (PDR) to recognize a loss in the current period
- When a Gross Premium Valuation determines reserves to be inadequate, there may be a need to recognize a loss in the current period (e.g., PDR)

(e) Calculate the following:

- Contract Reserve as of 1/31/2022
- Unearned Premium Reserve as of 1/31/2022

Show your work.

Commentary on Question:

A common mistake was to not recognize the chart provided was for \$2,000 worth of benefit. Many answers were inflated because they did not adjust for the actual coverage amount. However, partial credit was awarded in those instances. Alternate solutions were considered that included all four people and/or using duration from policy start date with appropriate justification.

For part ii, full credit was also awarded if candidates recognized no premium is being earned because of waiver of premium.

	Reserve factor	Benefit factor	Contract reserve = reserve factor * benefit factor
person 1	70.84	$\$4,000/\$2,000 = 2.00$	\$141.68
person 2	31.13	$\$2,500/\$2,000 = 1.25$	\$38.91
person 3	69.13	$\$3,000/\$2,000 = 1.50$	\$103.70
person 4	0	$\$1,500/\$2,000 = 0.75$	\$0.00
	Months of unearned prem	Gross Monthly premium	Unearned Prem Reserve
person 1	all earned because paid monthly	\$5.00	\$0
person 2	1/12 earned	\$3.50	$\$3.50 * (12 - 1) = \38.50
person 3	1/12 earned	\$6.00	$\$6.00 * (12 - 1) = \66.00
person 4	25 months earned	\$4.50	$\$4.50 * (60 - 25) = \157.50

8. Learning Objectives:

- 3. The candidate will understand how to evaluate the impact of regulation and taxation on companies and plan sponsors in the US.

Learning Outcomes:

- (3b) Describe the major applicable laws and regulations and evaluate their impact.
- (3c) Interpret a capital needs assessment and calculate RBC.

Sources:

Skwire 8th Edition: Chapter 41: Pages 705 – 714

Commentary on Question:

Many candidates are not familiar with guidelines for choosing blue blank vs orange

Solution:

- (a) Assess whether the company should be filing the Blue Blank or the Orange Blank. Show your work. Justify your answer.

Commentary on Question:

Many candidates are not familiar with the guidelines for blue vs orange blanks

If health premiums and reserves are >95% of total premiums and reserves for this year and prior year, insurer must file Health Blank

Coverage	Premiums	Incurred Claims	Reserves	Include in Numerator
Comprehensive Medical and Managed Care	\$100,000,000	\$64,799,100	\$20,200,900	1
Hospital Indemnity & Specified Disease	\$2,000,000	\$1,900,000	\$350,000	1
AD&D	\$6,000,000	\$300,000	\$3,000,000	
Medicare Supplement	\$25,000,000	\$20,000,000	\$2,500,000	1
Dental	\$17,000,000	\$8,000,000	\$5,000,000	1
Long Term Care	\$175,000,000	\$155,000,000	\$50,000,000	
Premiums for Comparison Numerator	\$144,000,000			
Reserves for Comparison Numerator	\$28,050,900			
	\$172,050,900			
Premiums for Comparison Denominator	\$325,000,000			
Reserves for Comparison Denominator	\$81,050,900			
	\$406,050,900			
Ratio	42.4%			
Insurance R Us SHOULD use the Blue blank filing according to the Health Blank Test, because the ratio of Premiums and reserves is less than 95%				

- (b) Calculate the Authorized Control Level (ACL) for the company using the Blue Blank. Show your work.

8. Continued

Commentary on Question:

The solution includes multiple calculations to get to the final answer, many candidates had difficulties calculating the RBC numbers accounting for various discount factors.

				Initial Risk Charge	Discount Factor Pre Calculation	Secondary Risk Charge	Premium Threshold: Additional
	Calc Comp Factor	10.5%		15%			\$25,000,000.00
	Calc Category 0 Disc Factor				3.0%		
	Calc LTC Disc	5.3%		10.0%			3%
Coverage	Premiums	Incurred Claims	Reserves	Initial Risk Charge	Discount Factor Pre Calculation	Secondary Risk Charge	Premium Threshold: Additional
Comprehensive Medical and Managed Care To	\$100,000,000	\$64,799,100	\$20,200,900				
Category 0 Total	\$95,000,000	\$60,799,100	\$20,200,900				
Category 0 - no Rate Guarantees	\$80,750,000	\$40,375,000	\$12,120,540	10.5%	0.0%	\$4,112,193.75	
Category 0 - WITH 24 month Rate Guarantees	\$14,250,000	\$20,424,100	\$8,080,360	10.5%		\$2,422,194.59	\$342,000.00
Category 3 Total	\$5,000,000	\$4,000,000	\$0	10.5%	60%	\$407,400.00	
Hospital Indemnity & Specified Disease	\$2,000,000	\$1,900,000	\$350,000	3.50%		\$120,000.00	\$ 50,000
AD&D	\$6,000,000	\$300,000	\$3,000,000	5.50%		\$9,330,000.00	\$ 9,000,000
Medicare Supplement	\$25,000,000	\$20,000,000	\$2,500,000	10.50%		\$1,789,000.00	6.70%
Dental	\$17,000,000	\$8,000,000	\$5,000,000	12%		\$1,379,000.00	7.60%
Long Term Care Total	\$175,000,000	\$155,000,000	\$50,000,000				
Non-Cancelable Long Term Care	\$157,500,000	\$146,250,000	\$47,375,000	5%		\$24,031,451.61	10%
Cancelable Long Term Care	\$17,500,000	\$8,750,000	\$2,625,000	5%		\$920,161.29	
						\$44,511,401.24	
LTC Claims				25%		\$18,350,000	8% \$ 35,000,000
LTC Reserves				5%		\$2,500,000	

Affiliated Investments	Book Value	Owned percentage				
Subsidiary - Insurance RU Owned	\$3,000,000	30%				\$900,000
Investments	Book Value	Risk Charge				
Security 1 - Common Stock	1,678,496	15.0%			2 \$	503,548.84
Security 2 - Common Stock	4,876,694	15.0%			2 \$	1,463,008.16
Security 3 - Common Stock	2,998,266	15.0%			2 \$	899,479.71
Security 4 - Common Stock	3,266,105	15.0%			2 \$	979,831.37
Security 5 - Common Stock	4,710,968	15.0%			2 \$	1,413,290.26
Security 6 - Cash	4,083,279	0.3%			2 \$	24,499.68
Security 7 - Common Stock	429,014	15.0%			2 \$	128,704.13
Security 8 - Corporate Conds	176,161	5.0%			2 \$	17,616.09
Security 9 - US Government Bond	1,377,289	0.0%			2 \$	-
Security 10 - Common Stock	7,027,671	0.0%			2 \$	-
Various Other Investments	1,000,000	15.0%			1 \$	150,000.00
C(a4) Credit Risk	2,000,000					2,000,000
C(4b) Administrative Risk	0					0
					C(0)	\$900,000
					C(1cs)	\$ 5,579,978.24
					C(1o)	\$ -
					C(2)	\$65,361,401.24
					C(3a)	\$0.00
					C(3b)	2,000,000
					C(3c)	0
					C(4b)	0
					C(a4)	0
RBC after Covariance Before Operational Risk =						\$66,529,634.53
						$=C(0) + C(4a) + \{(C(1o)+C(3a))^2 + (C(1cs) + C(3c))^2 + C(2)^2 + (C(3b))^2 + C(3b)^2 + C(4b)^2\}^{1/2}$
					Operational Risk	3% \$1,995,889.04
					ACL	\$34,262,761.78

- (c) Propose two options for lowering the ACL, including a numeric example for each that illustrates its potential impact.

Commentary on Question:

Very open ended and straight forward question, though more than a few candidates didn't come up with the impacts,

8. Continued

VERY OPEN ENDED – this is not an exhaustive list
1 Points for each example that would reduce ACL
3 Point for a numeric Example
Below are some examples
Move more Health claims to Managed Care, NOT category 0
Example:
Currently \$80,750,000 in Category 0 – no rate guarantee
Resulting in \$17,535,000 of a risk charge
Moving to Capitated charges would result in
$(\$25m \cdot .15 + 80.75m \cdot .15) \cdot .6 = \$7,267,500$
Move common stock investments in the top 10 to more conservative – say corporate bonds
Security #5 has a risk charge of \$1.4m
Moving that exposure to corporate bonds means a risk charge of 5% instead, so a risk charge of \$235,548
Set up a Premium Stabilization reserve for LTC
Risk charge is reduce by 50% of the premium stabilization reserve, so if a PSR of \$20m was set up, it would reduce the risk charge by \$10m
Purchase Reinsurance for Rate Guarantees
H(2) is considered NET of any ceded reinsurance
Purchasing Reinsurance on all Rate Guarantee business would reduce the risk to \$0.

9. Learning Objectives:

2. The candidate will understand how to prepare and be able to interpret insurance company financial statements in accordance with U.S. statutory principles and GAAP.

Learning Outcomes:

- (2a) Prepare financial statement entries in accordance with generally accepted accounting principles.
- (2b) Interpret the results of both statutory and GAAP statements from the viewpoint of various stakeholders, including regulators, senior management, investors.
- (2d) Apply applicable standards of practice.

Sources:

GHVR-109-19 Health Insurance Accounting Basics for Actuaries

GHVR-819-18 Practices for Preparing Health Contract Reserves

Commentary on Question:

Commentary listed underneath question component.

Solution:

- (a) Describe the considerations in determining the need for a premium deficiency reserve for a health insurer.

Commentary on Question:

Very few candidates provided the detailed grouping and timing questions that must be considered. However, most candidates received partial credit for generally describing when a PDR is needed and for providing assumptions to consider when calculating it. To receive full credit, candidates could either list the grouping and timing considerations, or a combination of some of the grouping and timing considerations in addition to describing when a PDR is needed and assumptions to consider.

Grouping Considerations:

- Should all commercial be combined or grouped based on how each block is regulated (small group more heavily regulated than large group)?
- Do ancillary group coverages like dental and vision constitute their own PDR grouping or are these coverages combined with group medical?
- Does ACA individual medical business constitute a separate PDR grouping, or is it combined with another block of business, such as pre-ACA individual medical, or small group medical, or even Medicaid?
- Do Medicare Advantage, standalone Medicare Part D, and Medicare Supplement products each constitute a separate PDR grouping, or are they combined together?

9. Continued

- For a health insurer that participates in multiple states' Medicaid managed care programs, does each state program constitute a separate grouping, or are all the insurer's Medicaid programs combined together?
- Does business assumed by the insurer through reinsurance get grouped together with similar business directly written by the insurer, or not?

Timing Considerations

- What are the renewability characteristics of the underlying insurance contracts?
 - Are there insurance contracts with future effective dates that need to be included in the PDR calculation?
- (b) Justify whether you have sufficient information to calculate a premium deficiency reserve as of December 31, 20X1.

Commentary on Question:

Most candidates correctly stated not enough information was provided and included one or two reasons for support. Candidates needed to provide three reasons to justify their decision to receive full credit.

Not enough data is provided to calculate a premium deficiency reserve. Information is needed at a more granular level, splitting out the long-term care business. Renewability and premium increases limitations is needed for the guaranteed coverage. Information may be needed to project profit/loss beyond the next 12-month period.

- (c) Specific to the requirements of Diversity as regulated by a state agency that is a member of the National Association of Insurance Commissioners (NAIC):
- (i) Describe the publicly available statutory financial reports that Diversity is required to submit to the state regulatory agency based on NAIC rules.
 - (ii) Describe the confidential statutory financial reports that Diversity is required to submit to the state regulatory agency based on NAIC rules.

Commentary on Question:

Most candidates did well on this question. In order to receive full points, candidates had to be able to differentiate between the types of reports. Partial credit was given for providing the type of report without a description.

9. Continued

Part (i)

- Annual Statement Blank
 - Annual pre-formatted template consisting of core financial statements together with a wide variety of supplemental exhibits
- Quarterly statement blank
 - Similar but less voluminous pre-formatted template submitted on a quarterly basis
- Annual audited financial statement
 - Presents the core financial information found in the annual statement blank in more condensed form, and includes an opinion statement from the audit firm
- Annual actuarial opinion
 - Statement signed by the insurer's appointed actuary attesting to the adequacy of the actuarial liabilities and assets recorded by the insurer

Part (ii)

- Annual risk-based capital (RBC) report
 - A pre-formatted template that computes an insurer's minimum capital requirement under formulas adopted by the NAIC
- Annual actuarial opinion memorandum
 - Documents the appointed actuary's work supporting the conclusions expressed in the opinion