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## Exam 6-United States

### Regulation and Financial Reporting (Nation Specific)

October 28, 2013

4 HOURS

#### INSTRUCTIONS TO CANDIDATES

1. This 87 point examination consists of 29 problem and essay questions.
2. For problem and essay questions, the number of points for each full question and part of a question is indicated at the beginning of the question or part. Answer these questions on the lined sheets provided in your Examination Envelope. Use dark pencil or ink. Do not use multiple colors or correction fluid.
  - Write your Candidate ID number and the examination number, 6US, at the top of each answer sheet. Your name, or any other identifying mark, must not appear.
  - Do not answer more than one question on a single sheet of paper. Write only on the front lined side of the paper – **DO NOT WRITE ON THE BACK OF THE PAPER**. Be careful to give the number of the question you are answering on each sheet. If your response cannot be confined to one page, please use additional sheets of paper as necessary. Clearly mark the question number on each page of the response in addition to using a label such as "Page 1 of 2" on the first sheet of paper and then "Page 2 of 2" on the second sheet of paper.
  - The answer should be concise and confined to the question as posed. When a specified number of items are requested, do not offer more items than requested. For example, if you are requested to provide three items, only the first three responses will be graded.
  - In order to receive full credit or to maximize partial credit on mathematical and computational questions, you must clearly outline your approach in either verbal or mathematical form, showing calculations where necessary. Also, you must clearly specify any additional assumptions you have made to answer the question.
3. Do all problems until you reach the last page of the examination where "END OF EXAMINATION" is marked.

All questions should be answered according to the United States statutory accounting practices and principles, unless specifically instructed otherwise. SAP refers to Statutory Accounting Principles, and GAAP refers to Generally Accepted Accounting Principles. NAIC refers to the National Association of Insurance Commissioners.

**CONTINUE TO NEXT PAGE OF INSTRUCTIONS**

4. Prior to the start of the exam you will have a **fifteen-minute reading period** in which you can silently read the questions and check the exam booklet for missing or defective pages. A chart indicating the point value for each question is attached to the back of the examination. Writing will NOT be permitted during this time and you will not be permitted to hold pens or pencils. You will also not be allowed to use calculators. The supervisor has additional exams for those candidates who have defective exam booklets.
5. Your Examination Envelope is pre-labeled with your Candidate ID number, name, exam number and test center. Do not remove this label. Keep a record of your Candidate ID number for future inquiries regarding this exam.
6. Candidates must remain in the examination center until two hours after the start of the examination. The examination starts after the reading period is complete. You may leave the examination room to use the restroom with permission from the supervisor. To avoid excessive noise during the end of the examination, candidates may not leave the exam room during the last fifteen minutes of the examination.
7. At the end of the examination, place all answer sheets in the Examination Envelope. Please insert your answer sheets in your envelope in question number order. Insert a numbered page for each question, even if you have not attempted to answer that question. Nothing written in the examination booklet will be graded. Only the answer sheets will be graded. Also place any included reference materials in the Examination Envelope. BEFORE YOU TURN THE EXAMINATION ENVELOPE IN TO THE SUPERVISOR, BE SURE TO SIGN IT IN THE SPACE PROVIDED ABOVE THE CUT-OUT WINDOW.
8. If you have brought a self-addressed, stamped envelope, you may put the examination booklet and scrap paper inside and submit it separately to the supervisor. It will be mailed to you. Do not put the self-addressed stamped envelope inside the Examination Envelope.

If you do not have a self-addressed, stamped envelope, please place the examination booklet in the Examination Envelope and seal the envelope. You may not take it with you. Do not put scrap paper in the Examination Envelope. The supervisor will collect your scrap paper.

Candidates may obtain a copy of the examination from the CAS Web Site.

All extra answer sheets, scrap paper, etc. must be returned to the supervisor for disposal.

9. Candidates must not give or receive assistance of any kind during the examination. Any cheating, any attempt to cheat, assisting others to cheat, or participating therein, or other improper conduct will result in the Casualty Actuarial Society and the Canadian Institute of Actuaries disqualifying the candidate's paper, and such other disciplinary action as may be deemed appropriate within the guidelines of the CAS Policy on Examination Discipline.
10. The exam survey is available on the CAS Web Site in the "Admissions/Exams" section. Please submit your survey by November 18, 2013.

**END OF INSTRUCTIONS**

EXAM 6 – UNITED STATES, FALL 2013

1. (1.5 points)

a. (0.5 point)

Briefly describe two challenges faced by regulators when evaluating the reasonableness of catastrophe models.

b. (0.5 point)

Briefly describe two reasons insurers have readily accepted catastrophe modeling technology.

c. (0.5 point)

Briefly describe two benefits to consumers from the improved estimates of loss exposure produced by catastrophe modeling.

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EXAM 6 – UNITED STATES, FALL 2013

2. (2.5 points)

a. (1.5 points)

For each of the following lines of insurance, briefly describe the degree of regulatory scrutiny and provide a rationale for it.

- Inland marine
- Private passenger auto
- Commercial general liability

b. (1 point)

Describe how political influence could explain the difference in regulatory scrutiny between ocean marine insurance and workers compensation insurance.

EXAM 6 – UNITED STATES, FALL 2013

3. (3.25 points)

a. (0.75 point)

Briefly describe three arguments that support the need for insurance rate regulation.

b. (0.75 point)

Briefly describe three arguments that support the need for insurance solvency regulation.

c. (0.75 point)

Identify an area of overlap and an area of conflict between the goals of rate regulation and solvency regulation.

d. (1 point)

Describe one advantage and one disadvantage to insurance companies of having numerous state and federal agencies involved in solvency regulation.

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EXAM 6 – UNITED STATES, FALL 2013

4. (2 points)

A multi-line insurer that writes business in multiple states is trying to increase its homeowners market share. The company has proposed the following new strategies:

- Boycotting insurance agents who also represent other insurers
- Requiring the purchase of a homeowners policy with the purchase of an auto policy

a. (0.5 point)

Describe the impact of the Clayton Antitrust Act on the insurance industry.

b. (0.5 point)

Explain how each of this insurer's actions would be addressed under the Clayton Antitrust Act.

c. (0.5 point)

Describe the impact of the McCarran-Ferguson Act on the regulation of insurance.

d. (0.5 point)

Explain how each of this insurer's actions would be addressed under the McCarran-Ferguson Act.

EXAM 6 – UNITED STATES, FALL 2013

5. (3.5 points)

a. (0.75 point)

Briefly describe each of the following reasons for regulatory failures:

- Regulatory fallibility
- Regulatory forbearance
- Regulatory capture

b. (0.75 point)

Briefly describe each of the following elements of an effective insurance regulatory system:

- Duplication
- Peer review
- Diversity of perspectives

c. (1.5 points)

Describe how each element in part b. above can successfully address one of the failures in part a. above.

d. (0.5 point)

Discuss the likelihood of federal bailouts of insurers under the current regulatory structure.

EXAM 6 – UNITED STATES, FALL 2013

6. (3.5 points)

An insurance company is licensed to write business in all states. Based on the initially calculated information below:

- RBC ratio: 210%
- IRIS ratio 1 (gross premiums written to policyholders' surplus): 750
- IRIS ratio 2 (net premiums written to policyholders' surplus): 350
- IRIS ratio 4 (surplus aid to policyholders' surplus): 20
- IRIS ratio 6 (investment yield): 5.0
- IRIS ratio 10 (gross agent's balances to policyholders' surplus): 35
- IRIS ratio 13 (estimated current reserve deficiency to policyholders' surplus): 22
- All other IRIS ratios are well within the acceptable ranges.

Evaluate the financial condition of the company and describe any actions that might be taken by the state regulator and by the NAIC.



EXAM 6 – UNITED STATES, FALL 2013

7. (2.75 points)

a. (0.75 point)

Briefly describe three reasons that obtaining a financial strength rating from a rating agency is beneficial for a mutual insurance company.

b. (0.75 point)

Identify one similarity and one difference between interactive ratings and public ratings.

c. (0.5 point)

Provide a rationale for why an insurance company actuary would disclose data to a rating agency that could potentially damage the insurer's reputation.

d. (0.75 point)

Identify a major insurance rating agency and defend the economic capital model it uses.

EXAM 6 – UNITED STATES, FALL 2013

8. (3 points)

a. (0.75 point)

Briefly describe three reasons defense costs for asbestos litigation may increase in the future.

b. (0.75 point)

Briefly describe three changes in asbestos litigation since 2001.

c. (0.5 point)

Briefly describe two concerns insurers may have about asbestos litigation.

d. (0.5 point)

Briefly describe two standards a judge would have used to determine if expert evidence would be admitted in an asbestos injury trial before the *Daubert* decision.

e. (0.5 point)

Briefly describe two standards a judge would use to determine if expert evidence would be admitted in an asbestos injury trial after the *Daubert* decision.

EXAM 6 – UNITED STATES, FALL 2013

9. (1.5 points)

a. (0.5 point)

Briefly describe two characteristics of the Social Security program that affect the transfer of risk among program participants.

b. (1 point)

Assuming participants could invest their Social Security contributions in stocks or bonds, evaluate the effect on the two characteristics described in part a. above.

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EXAM 6 – UNITED STATES, FALL 2013

10. (2 points)

A state uses an assigned risk plan to provide insurance for consumers who are unable to obtain coverage in the voluntary market. This year, there were 5,000 applicants to the assigned risk plan.

The following table gives data for insurance companies in the voluntary market (all values in thousands of dollars):

Company	Written Premium	Earned Premium	Surplus
A	5,000	6,000	3,333
B	3,000	2,500	1,500
C	2,000	1,500	605

a. (0.5 point)

Calculate the number of applicants assigned to insurance company B.

b. (1.5 points)

Explain how coverage is obtained under the following residual market plans, with respect to the applicant and the insurer:

- An assigned risk plan
- A reinsurance facility
- A Joint Underwriters Association

EXAM 6 – UNITED STATES, FALL 2013

11. (3 points)

Government insurance programs can be grouped into three broad categories:

- Property-casualty insurance plans
- Social insurance plans
- Financial security plans

a. (0.75 point)

Identify one government insurance program for each category above.

b. (0.75 point)

For the three programs identified in part a. above, briefly describe the interaction between the government and the voluntary insurance sector.

c. (0.75 point)

For the three programs identified in part a. above, briefly describe the government's primary objective.

d. (0.75 point)

For the three programs identified in part a. above, briefly describe the government's success in meeting its primary objective.

EXAM 6 – UNITED STATES, FALL 2013

12. (2.75 points)

On December 29, 2007, the Medicare, Medicaid and SCHIP Extension Act of 2007 (MMSEA) was signed into law.

a. (0.75 point)

Describe the process mandated by the law and briefly describe how the law benefits Medicare.

b. (1 point)

Describe two features of existing Medicare law that may reduce Medicare's payment responsibility when it overlaps with other insurance programs.

c. (1 point)

A workers compensation insurance company has implemented the requirements of the MMSEA. Evaluate the impact MMSEA may have on the frequency and severity of the insurer's claims.

EXAM 6 – UNITED STATES, FALL 2013

13. (1.75 points)

The Casualty Actuarial Society's Statement of Principles Regarding Property and Casualty Insurance Ratemaking sets forth four principles for a set of premium rates to be considered actuarially sound. The first three principles are:

- A rate is an estimate of the expected value of future costs.
- A rate provides for all costs associated with the transfer of risk.
- A rate provides for the costs associated with an individual risk transfer.

a. (0.75 point)

Briefly explain whether or not the National Flood Insurance Program (NFIP) rates satisfy each of the three principles.

b. (1 point)

Briefly describe and justify two potential improvements to the NFIP.

EXAM 6 – UNITED STATES, FALL 2013

14. (2.5 points)

a. (1.5 points)

Briefly describe how guaranty funds both positively and negatively affect the following stakeholders:

- Large corporate insureds
- Small individual insureds
- Insurance companies

b. (1 point)

Briefly describe one advantage and one disadvantage for each of the following approaches to funding guaranty funds:

- Post-insolvency assessment
- Pre-funded assessment



EXAM 6 – UNITED STATES, FALL 2013

15. (3 points)

a. (1 point)

Fully describe how surplus is allocated by line of business in the Insurance Expense Exhibit (IEE).

b. (0.5 point)

Construct an argument against this method of allocation.

c. (0.75 point)

Propose and justify a method for allocating surplus that would address the argument from part b. above.

d. (0.75 point)

Briefly describe how the IEE might be used by the following stakeholders of an insurance company:

- Actuaries
- Investors
- Competitors

EXAM 6 – UNITED STATES, FALL 2013

16. (3.5 points)

A primary insurance company is reinsured by an authorized reinsurance company. The reinsurance company has provided a letter of credit of \$3 million. As of December 31, 2012, the primary insurance company has the following reinsurance recoverables from 2012 (all figures are in millions of dollars):

Amount of Recoverable	Status of Primary Insurer's payment	Due date for Reinsurer's payment	Status of Reinsurer's payment
5	Paid	February 3	Paid
1	Paid	February 27	In Dispute
12	Paid	June 20	Paid
2	Paid	July 6	In Dispute
3	Paid	August 2	Unpaid
4	Paid	October 5	Paid
10	Paid	November 17	Unpaid

a. (1 point)

Determine whether the reinsurer is “slow-paying.”

b. (0.75 point)

Calculate the insurer’s provision for reinsurance.

c. (0.75 point)

Assume that the reinsurer is unauthorized instead of authorized. Calculate the revised provision for reinsurance.

d. (1 point)

Propose two potential enhancements to Schedule F, and briefly explain how each would improve its capacity to monitor reinsurer credit risk.

EXAM 6 – UNITED STATES, FALL 2013

17. (3 points)

A primary insurer is seeking reinsurance recoverables from three reinsurers (all figures are in millions of dollars):

Reinsurer	Collateral	Amount of Recoverables	Due date	Status
A	2	3	April 1, 2012	Written off as uncollectible in 2012
B	15	15	June 15, 2012	Disputed via a voicemail to the claims department
C	1	5	October 5, 2012	Unpaid

The primary insurance company has policyholders' surplus of \$100,000,000.

a. (1 point)

Based on the information above, identify two required disclosures in this insurer's 2012 Notes to Financial Statements and briefly explain the purpose of each disclosure.

b. (1 point)

Identify and briefly describe two reinsurance transactions that appear in the Notes to Financial Statements and deal exclusively with ceding liabilities related to prior occurrences.

c. (1 point)

Describe the accounting treatment of the reinsurance transactions identified in part b. above in both the Statutory Balance Sheet and Schedule P.

EXAM 6 – UNITED STATES, FALL 2013

18. (7 points)

An insurance company began operations in 2008. The following information is from the company's 2012 financial statements (all figures are in thousands of dollars):

Net Written Premium	70,000
Unearned Premium Reserve (year-end)	45,000
Underwriting Expenses	16,250
Adjusting and All Other Expenses	0
Realized Capital Gains	1,500
Investment Income from Taxable Bonds	1,000
Change in Unrealized Capital Gains	500
Policyholder Dividends	200
Dividends Received from Unaffiliated Entities	800
Investment Income from Municipal Bonds	2,800

Schedule P Part 1 – Summary		
Years in Which Premiums Were Earned and Losses Were Incurred	Premiums Earned (\$000 omitted)	
	Direct and Assumed	Ceded
2008	50,000	10,000
2009	60,000	15,000
2010	70,000	20,000
2011	75,000	15,000
2012	85,000	20,000

Schedule P Part 2 – Summary					
Years in Which Losses Were Incurred	Incurred Net Losses and Defense and Cost Containment Expenses Reported at Year End (\$000 omitted)				
	2008	2009	2010	2011	2012
2008	20,000	30,000	36,000	37,000	37,500
2009	xxx	22,000	33,000	40,000	42,000
2010	xxx	xxx	30,000	36,000	40,000
2011	xxx	xxx	xxx	34,000	43,500
2012	xxx	xxx	xxx	xxx	32,000

<<QUESTION 18 CONTINUED ON NEXT PAGE>>

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EXAM 6 – UNITED STATES, FALL 2013

18. (continued)

<b>Schedule P Part 3 – Summary</b>					
Years in Which Losses Were Incurred	Cumulative Paid Net Losses and Defense and Cost Containment Expenses Reported at Year End (\$000 omitted)				
	2008	2009	2010	2011	2012
2008	5,000	10,000	20,000	25,000	35,000
2009	xxx	6,000	13,000	22,000	31,000
2010	xxx	xxx	7,500	16,000	24,000
2011	xxx	xxx	xxx	12,000	21,000
2012	xxx	xxx	xxx	xxx	9,000

The following information is used to calculate federal income tax (all figures are in thousands of dollars):

Prior Year Alternative Minimum Income Tax Credit	500
Beginning Average Reserve Discount Factor	90%
Ending Average Reserve Discount Factor	85%
Regular Income Tax Rate	35%
Alternative Minimum Tax Rate	20%

a. (6.25 points)

Calculate the insurance company's 2012 Statutory Net Income.

b. (0.75 point)

Briefly describe three considerations for the insurance company when determining the allocation of stocks and bonds in its investment portfolio.

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EXAM 6 – UNITED STATES, FALL 2013

19. (4.25 points)

The following provides the statutory balance sheet as of December 31, 2012 for a monoline insurer that writes annual homeowners policies without reinsurance protection (all figures are in thousands of dollars):

<u>ADMITTED ASSETS</u>	
Bonds	615
Cash, cash equivalents and short-term investment	30
<b>TOTALS</b>	<b>645</b>
<u>LIABILITIES, SURPLUS AND OTHER FUNDS</u>	
Losses	50
Unearned premiums	550
Total liabilities	600
Surplus as regards policyholders	45

Additional company information is below:

- The company had \$100,000 in revenue each month in 2012, which included \$96,000 in premium and \$4,000 in payment plan service fees.
- Policies are written evenly throughout each month.
- The company calculated earned premium as follows (all figures are in dollars):

<u>2012 Month</u>	<u>Written Premium</u>	<u>Earned Fraction</u>	<u>Earned Premium</u>
Jan	100,000	12/12	100,000
Feb	100,000	11/12	91,667
Mar	100,000	10/12	83,333
Apr	100,000	9/12	75,000
May	100,000	8/12	66,667
Jun	100,000	7/12	58,333
Jul	100,000	6/12	50,000
Aug	100,000	5/12	41,667
Sep	100,000	4/12	33,333
Oct	100,000	3/12	25,000
Nov	100,000	2/12	16,667
Dec	100,000	1/12	8,333
<b>TOTAL</b>	<b>1,200,000</b>		<b>650,000</b>

<<QUESTION 19 CONTINUED ON NEXT PAGE>>

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EXAM 6 – UNITED STATES, FALL 2013

19. (continued)

- The company holds the following bonds as of December 31, 2012 (all figures are in thousands of dollars):

NAIC Bond Rating	Amortized Cost	Fair Value	Balance Sheet Value
1	650	600	600
2	10	15	10
4	10	5	5

- Over the last few years, the company’s losses have been quite volatile. Still, management and the company actuary believe that sufficient assets are carried to maintain solvency for the company’s desired risk profile.

a. (1.5 points)

Identify and briefly describe three items in the information provided above that are inconsistent with Statutory Accounting Principles (SAP). Assume no revenue is recognized in 2012 from policies written in prior years.

b. (1.75 points)

Calculate the insurer’s policyholders’ surplus in accordance with SAP as of December 31, 2012.

c. (0.5 point)

Briefly describe two possible reasons, using the information provided, that this insurer might purchase reinsurance.

d. (0.5 points)

Provide one objection the regulator may have to using fair value as a bond valuation method, and recommend an alternative method.

EXAM 6 – UNITED STATES, FALL 2013

20. (2.75 points)

The following excerpts from Schedule P triangles have been provided for Commercial Multiple Peril from an insurance company's 2012 Annual Statement (all figures are in thousands of dollars). Only the prior year, first two accident years and the first four valuation years are shown.

Part 2E - Incurred Net Losses & DCC Reported at Year End

	2003	2004	2005	2006
Prior	1,101	1,076	1,106	1,149
2003	1,287	1,284	1,213	1,204
2004	XXX	1,347	1,346	1,272

Part 3E - Cumulative Paid Net Losses & DCC Reported at Year End

	2003	2004	2005	2006
Prior	000	479	718	832
2003	405	785	972	1,074
2004	XXX	412	801	989

a. (1.5 points)

Calculate the prior year row and the accident year 2004 row for Schedule P, Part 2E and Part 3E as they would appear in the company's 2013 Annual Statement.

b. (0.5 point)

Explain how to derive the average net case outstanding loss & DCC reserves triangle using the various parts in Schedule P.

c. (0.75 point)

Briefly describe three functions of Schedule P, other than measuring reserve adequacy.



21. (3.25 points)

Given the following information for an insurance company:

Risk charges under the NAIC's Risk-Based Capital (RBC) formula:

$$R_0 = \$12,000,000$$

$$R_1 = \$5,000,000$$

$$R_2 = \$6,000,000$$

$$R_3 = \$4,000,000$$

$$R_4 = \$20,000,000$$

$$R_5 = \$25,000,000$$

The reserve RBC exceeds the sum of the credit risk RBC for non-invested assets and reinsurance recoverables. This has already been contemplated in the R3 and R4 figures shown above.

Policyholders' surplus: \$35,000,000.

Tabular discount on workers compensation reserves: \$10,000,000

Tabular discount on medical reserves: \$1,000,000

Non-tabular discount: \$4,000,000

a. (1 point)

Identify and briefly describe two of the four major risk categories measured by the RBC formula.

b. (1 point)

Calculate the company's RBC ratio.

c. (0.25 point)

Identify the action level triggered by this RBC value.

d. (1 point)

Using the result from part b. above, describe the actions of both the regulator and the company under the RBC Model Act.

22. (2.75 points)

a. (1 point)

Briefly describe two differences between automobile liability and workers compensation that should be considered when developing a loss reserve risk margin.

b. (1 point)

Identify and briefly describe two approaches to estimating risk margins that are acceptable according to the International Actuarial Association.

c. (0.75 point)

Briefly describe how Statutory Accounting Principles, Generally Accepted Accounting Principles and International Financial Reporting Standards differ in their treatment of risk margins for loss reserves.

23. (3.75 points)

a. (2.25 points)

Identify and describe the three pillars of Solvency II.

b. (0.5 point)

Describe the solvency capital requirement under Solvency II.

c. (1 point)

Fully explain the own risk self-assessment (ORSA) under Solvency II.

EXAM 6 – UNITED STATES, FALL 2013

24. (5.25 points)

Using only the information below, propose language to be disclosed in the RELEVANT COMMENTS section of an insurance company's 2012 Statement of Actuarial Opinion. Show all calculations that support the required disclosures. All figures are in millions of dollars.

	2012	2011	2010
Gross Reserves for Unpaid Losses and Loss Adjustment Expenses	350	200	100
Net Reserves for Unpaid Losses and Loss Adjustment Expenses	55	49	50
Development in estimated losses and loss expenses incurred prior to current year	6	(1)	-
Development in estimated losses and loss expenses incurred two years before the current year and prior year	5	-	-
Surplus	35	29	28
Earned Premium	90	85	80
Authorized Control Level	15	-	-
Lower End of Actuary's Range of Reasonable Net Reserves for Unpaid Losses and Loss Adjustment Expenses	47	-	-
Upper End of Actuary's Range of Reasonable Net Reserves for Unpaid Losses and Loss Adjustment Expenses	63	-	-

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EXAM 6 – UNITED STATES, FALL 2013

25. (2.25 points)

The following was included in the 2012 Statement of Actuarial Opinion for Zeta Insurance Company:

“I have examined the actuarial assumptions and methods used in determining reserves listed in Exhibit A, as shown in the Annual Statement of the Company as prepared for filing with federal regulatory officials, as of December 31, 2012, and reviewed information provided to me through November 30, 2012.

“I evaluated the data provided by Zeta Insurance Company for reasonableness and consistency. I also reconciled that data to Schedule P – Parts 2 and 3 of the company’s current Annual Statement. In other respects, my examination included such review of the actuarial assumptions and methods used and such tests of the calculations as I considered necessary.”

a. (0.25 point)

Identify the section of the opinion that contains the above paragraphs.

b. (2 points)

Identify and correct four errors in the above paragraphs.

EXAM 6 – UNITED STATES, FALL 2013

26. (3 points)

Schedule P – Part 1 – Summary (all figures are in thousands of dollars):

	1	2	3	4	5	6	7	8	9	10
	Premiums Earned			Loss and Loss Expense Payments						
	Gross	Ceded	Net	Loss Payments		Defense and Cost Containment Payments		Adjusting and Other Payments		Salvage and Subrogation Received
				Gross	Ceded	Gross	Ceded	Gross	Ceded	
Prior	XXX	XXX	XXX	10	5	10	5	0	0	0
2003	600	300	300	200	100	100	50	25	0	0
2004	800	400	400	360	180	180	90	45	0	0
2005	1,100	500	600	400	200	200	100	50	0	0
2006	1,600	800	800	600	300	300	150	75	0	0
2007	2,000	1,000	1,000	600	300	300	150	75	0	0
2008	2,200	1,100	1,100	600	300	300	150	75	0	0
2009	2,400	1,000	1,400	500	250	250	125	63	0	0
2010	2,800	1,400	1,400	400	200	200	100	50	0	0
2011	3,000	1,400	1,600	300	150	150	75	38	0	0
2012	3,200	1,600	1,600	100	50	50	25	13	0	0
Totals	19,700	9,500	10,200	4,070	2,035	2,040	1,020	509	0	0

	13	14	15	16	17	18	19	20	21	22
	Losses Unpaid				DCC Unpaid				AO Unpaid	
	Case Basis		Bulk + IBNR		Case Basis		Bulk + IBNR		Gross	Ceded
	Gross	Ceded	Gross	Ceded	Gross	Ceded	Gross	Ceded		
Prior	100	50	75	37	25	12	10	5	5	0
2003	120	60	90	45	30	15	12	6	6	0
2004	160	80	120	60	40	20	16	8	8	0
2005	200	100	150	75	50	25	20	10	10	0
2006	300	150	225	112	75	38	30	15	15	0
2007	400	200	300	150	100	50	40	20	20	0
2008	400	200	300	150	100	50	40	20	20	0
2009	500	250	375	188	125	62	50	25	25	0
2010	600	300	450	225	150	75	60	30	30	0
2011	800	400	600	300	200	100	80	40	40	0
2012	900	450	675	338	225	113	90	45	45	0
Totals	4,480	2,240	3,360	1,680	1,120	560	448	224	224	0

a. (2 points)

Identify the name and calculate each of the values that an Appointed Actuary is required to include in Exhibit A of the 2012 Statement of Actuarial Opinion. Assume that there are no unearned premium reserves for long-duration contracts or reserves related to retroactive reinsurance.

b. (1 point)

Identify whether each value calculated in part a. above appears elsewhere in the Annual Statement, and if so, identify one location.

CONTINUED ON NEXT PAGE

EXAM 6 – UNITED STATES, FALL 2013

27. (2.25 points)

In the context of a Statement of Actuarial Opinion:

a. (0.5 point)

Define “Qualified Actuary.”

b. (0.75 point)

Describe the necessary conditions for an insurance policy to be considered a long-duration contract.

c. (0.5 point)

Describe how an insurance company would qualify for the financial hardship exemption.

d. (0.5 point)

Describe the disclosures that the Appointed Actuary must make when there are significant risks and uncertainties that could result in material adverse deviation.

EXAM 6 – UNITED STATES, FALL 2013

28. (2.25 points)

An actuary is testing whether a reinsurance contract qualifies for risk transfer. The Expected Reinsurer Deficit (ERD) for the contract is 0.9%.

a. (0.25 point)

Given a 1% threshold for ERD, briefly describe whether the contract passes risk transfer.

b. (0.5 point)

Given the conclusion reached in part a. above, describe the accounting impact of this contract on the ceding company's statutory balance sheet.

c. (1.5 points)

Identify and briefly describe three practical considerations when calculating ERD.



EXAM 6 – UNITED STATES, FALL 2013

29. (3.25 points)

a. (0.75 point)

Define commutation.

b. (1 point)

Describe two reasons a reinsurer might pay more than the nominal reserve recorded on its balance sheet to commute a book of assumed workers compensation business.

c. (1 point)

Describe two reasons, excluding those provided in part b. above, that a primary insurer might accept less than the amount it is recording on its balance sheet as reinsurance recoverable to commute a book of business.

d. (0.5 point)

Describe how a reinsurer's balance sheet would be affected by a commutation.

# Exam 6 - United States Fall 2013

October 28, 2013

## POINT VALUE OF QUESTIONS

QUESTION	VALUE OF QUESTON	SUB-PART OF QUESTION						
		(a)	(b)	(c)	(d)	(e)	(f)	(g)
1	1.50	0.50	0.50	0.50				
2	2.50	1.50	1.00					
3	3.25	0.75	0.75	0.75	1.00			
4	2.00	0.50	0.50	0.50	0.50			
5	3.50	0.75	0.75	1.50	0.50			
6	3.50	3.50						
7	2.75	0.75	0.75	0.50	0.75			
8	3.00	0.75	0.75	0.50	0.50	0.50		
9	1.50	0.50	1.00					
10	2.00	0.50	1.50					
11	3.00	0.75	0.75	0.75	0.75			
12	2.75	0.75	1.00	1.00				
13	1.75	0.75	1.00					
14	2.50	1.50	1.00					
15	3.00	1.00	0.50	0.75	0.75			
16	3.50	1.00	0.75	0.75	1.00			
17	3.00	1.00	1.00	1.00				
18	7.00	6.25	0.75					
19	4.25	1.50	1.75	0.50	0.50			
20	2.75	1.50	0.50	0.75				
21	3.25	1.00	1.00	0.25	1.00			
22	2.75	1.00	1.00	0.75				
23	3.75	2.25	0.50	1.00				
24	5.25	5.25						
25	2.25	0.25	2.00					
26	3.00	2.00	1.00					
27	2.25	0.50	0.75	0.50	0.50			
28	2.25	0.25	0.50	1.50				
29	3.25	0.75	1.00	1.00	0.50			
TOTAL	87.00							

## Fall 2013 Exam 6US – Sample Answers and Examiner’s Report

### General comments:

- Incorrect responses in one part of a question did not preclude candidates from receiving credit for correct work on subsequent parts of the question that depended upon that response.
- Candidates should try to be cognizant of the way an exam question is worded. They must look for key words such as “briefly describe” within the problem. Candidates could lose some credit because they stated an answer but did not briefly describe the answer when asked.
- Also, some candidates provided lengthy responses to a “briefly describe” question, which does not provide extra credit and only takes up additional time during the exam. For example, candidates should recall that a response to a “briefly describe” question should be very brief (e.g. bullet points), while a response to a “fully describe” should be several sentences (but does not need to be paragraphs).
- Generally candidates were fairly well prepared for this exam. However, candidates should be cautious of relying solely on study manuals, as some candidates lost credit for failing to provide basic insights that were contained in the syllabus readings.

### Exam statistics are shown below:

Number of Candidates	615
Available Points	87
Passing Score	60.75
Number of Passing Candidates	249
Effective % Passing	42.64

### 1. Sample Answers

- a. Any two of the following:
  - Raw insurance data for modeling was often exposure (i.e. coverage amounts) which unlike premiums or losses, was not reported in financial statements or other verifiable sources.
  - Raw data was sent to modeling company in policy level detail and processed in the modeler’s proprietary software (black box), making it difficult to follow calculations.
  - Storm simulations and damage functions used in the models are extremely complex and difficult to understand without extensive technical expertise
  - Models use discretion: inputs of models can vary depending on company or management needs or wants
  - A lack of past events to use as a base for reasonability comparisons (CATS are sporadic by nature: high severity, low frequency)
  - Introduction of CAT models may cause huge swings to rates in coastal areas which may not be representative of historical experience
  
- b. Any two of the following:
  - Modeling represented a clear technological improvement over the historical alternatives.
  - Modeling was not new to most as similar techniques had been used in the past to perform economic forecasts for example.

- Insurers had the benefit of a competitive market for modeling services.
  - Insurers lacked the type of safety net available to consumers, such as windpools, leaving them little choice but to accept modeling favored by reinsurers and investors, or else risk losing reinsurance or equity capital.
  - Fair pricing in the market may increase availability as insurers may offer coverage to more people when they can price more appropriately
  - Cat models result in reduced information risk which creates the possibility of more access to capital and reinsurance.
  - Cat models are accepted to stay in line with other insurers using more sophisticated Cat models, thus reducing risk of adverse selection
  - Retrospective testing has proven the predictive power of CAT models, leading to more acceptance than current models
  - Cat models provide more information on exposure to CAT risk which helps insurers understand their book of business better
- c. Any two of the following:
- **Comprehensibility of Prices.** Identifying characteristics that represent higher exposure to loss will help consumers better understand, and control, insurance costs.
  - **Rational Behavior.** When the cost of a good reflects its economically correct long term price, consumers will take that cost into account and act accordingly.
  - **Fair Pricing.** More accurate information will reduce subsidies and reward consumers who engage in loss prevention and mitigation.
  - **Reduced Information Risk.** Investors demand higher returns to compensate for uncertainty. Improved information will reduce this risk and lead to lower prices and/or greater availability.
  - **Stable Pricing:** Since models use long term seismic or weather data and all available information on the risk to develop loss estimates, they should be less susceptible to variation than other methods.
  - **Improved estimates** will help insurers better fund for CATs which will increase likelihood of insurer solvency hence protecting consumers (e.g., claim payments made in whole)

## 1. Examiner's Report

All parts are fairly straightforward questions with some brief descriptions. The most common errors as a whole on this question were candidates only listing a phrase (e.g.: 'black box') and not providing any explanation as required by the "briefly describe".

- a. Most common errors were related to candidates not clearly explaining the difference between needing technical expertise to review the models versus understanding due to the proprietary nature of the models.
- b. Most common errors were related to candidates not considering the perspective of the insurer, or listing a phrase but not taking the next step to say why that impacted the insurer.
- c. Most common errors were related to candidates not providing any detail beyond a listed item (e.g., "stable rates").

## 2. Sample Answers

a.

Inland Marine is regulated very little.

Inland Marine has low/minimal regulation.

IM is the least scrutinized of the three lines

- The risks are highly individualized.
- There is no statistical information to justify rates.
- Diverse coverages and classifications
- The buyers are sophisticated and knowledgeable

CGL has only general regulation (except during tight markets).

CGL has medium regulation

General Liability is moderately regulated

CGL is not as highly scrutinized as PPA but more than IM

- The buyers are sophisticated and knowledgeable

PPA typically requires regulatory review of overall rates and details of the rating plan.

Auto is heavily regulated

PPA has the most regulation of the three lines

- Coverage is legally required
- Consumers tend to be uninformed
- The statistical plan is highly uniform with credible data for analysis
- Rates and classification systems involved are complicated

b. Political Theory of regulation explains that regulatory attention can be greatest for issues that attract substantial voter interest and are easy for policymakers to understand.

Ocean Marine insurance attracts little regulatory interest since it:

- directly affects few voters
- coverage can be difficult for policymakers to understand.

Workers' Compensation attracts much regulatory interest since it:

- affects thousands of employers and employees
- affects a large population of the people
- mandatory coverage- political influence needs to make sure that coverage is available and affordable
- a large expense for most businesses
- has a well-defined experience rating system that policymakers can understand
- social benefit

## 2. Examiner's Report

This question tests basic knowledge of the current state of rate regulation.

a. Most candidates did very well on this part. Common errors included:

- Vague descriptions of the degree of regulatory scrutiny (Sort of, Not a little, Not a lot, Not Heavily...)
- Talked about the number of people impacted by the line of insurance, but the number of people affected by the insurance is not always representative of the degree of regulatory scrutiny.

b. The most common errors were not addressing the impact of political influence in the response and not mentioning the different degrees of regulatory scrutiny between Ocean Marine and

Workers Comp. Several candidates described the Workers Comp environment in detail, but made no mention of Ocean Marine. Some candidates did not focus on political pressure or regulatory environment and rather focused on comparing what each line of business is.

### 3. Sample Answers

a. Any three of the following:

- Promote the financial stability of insurers/mitigate disruptive market failures
- Prevent collusion/monopolistic pricing amongst insurers
- Reduce unfair price differences between insurance products
- Ensure affordable coverage
- Protect consumers from purchasing high-priced insurance
- Protect public interest by controlling what insurers charge
- Risk classification achieves greater equity/fairness
- Prevent excessive insurer profits (when insurance is mandatory)
- Encourage some parties to buy insurance who otherwise would engage in risky activity without insurance (when insurance is mandatory)
- Promote price information disclosure

OR

Any one of the following:

- Rate regulation seeks to remedy issues of fairness, equity, or affordability in insurance
- A rate is reasonable and not excessive, inadequate, or unfairly discriminatory if it is an actuarially sound estimate of the expected value of all future costs associated with an individual risk transfer

b. Any three of the following:

- Due to complexity of insurance industry, consumers have an inability to evaluate an insurer's financial condition and long-term viability, hence the need for solvency regulation
- Protects policyholders/claimants/beneficiaries by ensuring ability of insurers to fulfill their contractual obligations (claims, unearned premium)
- Facilitates an effective and efficient marketplace for insurance products
- Promotes market stability
- Protects public interest
- Insurer insolvency affects consumer, who must absorb the resulting costs / can decrease consumer access to insurance (availability) / can affect the rates consumers pay for insurance (affordability)
- Insurers have incentives to take risk because of guaranty fund (moral hazard)
- Guaranty funds pay for insolvent insurers and solvency regulation prevents this cost from getting out of control
- Compared to other business transactions, insurance transactions involve a considerable amount of risk (The potential future loss amount is unknown, yet the insurance policy is sold for a specific premium amount).
- Large cash flow up front. Regulators must monitor loss reserves to assure future claim payment.
- Concern that policyholder surplus is inadequate
- Purpose of policyholder surplus (regulation ensures it's adequate):

- provides financial capacity
- supports growth
- supports underwriting activities
- buffer against business risk to ensure company can meet debt obligations
- buffer against insurance risk (price inadequacy, reserve error, underwriting risk)
- ensures investments are compliant
- Prevents “betting the farm” when insurers are on the brink of insolvency
- Obviates need for costly rate regulation
- Protects reputation of the insurance industry (extension of efficient/effective market argument)
- Encourages a risk management culture where insurers are aware of their own specific risks

c. Any one of the following areas of overlap:

- Protecting the policyholder
- Protecting public interest
- Ensuring an effective insurance marketplace
- Solvency concerns are somewhat encompassed in rate regulation
- Rate adequacy
- Solvency regulation obviates rate regulation’s role in preventing insolvencies
- Both protect uninformed buyers
- Both interested in keeping insolvency costs low
- Solvency regulation increases transparency in industry which leads to decreased information risk and decreased rates

Any one of the following areas of conflict (need to address both rate and solvency):

- Affordability/availability concerns of rate filings vs. adequacy/solvency concerns of solvency regulation
- Adequacy concerns of solvency regulation vs. rate equity concerns of rate regulation. Rate equity leads to adverse selection which can impact solvency
- Facilitating an efficient marketplace vs. restrictions on rate/risk classification
- Encouraging some risky parties to buy subsidized insurance vs. insurer solvency
- Preventing excessive profits to insurers vs. insurer solvency
- Fairness/no discrimination vs. adequate rates
- Costs related to keeping up with solvency regulations passed on to policyholders and can increase rates or impact solvency
- Regulator costs for doing rate regulation may interfere with solvency regulation
- Rate regulation can limit competition but solvency regulation promotes it

d.

Any one of the following advantages:

- Having numerous agencies working in coordination reduces the risk of regulatory forbearance
- Having numerous agencies working in coordination reduces the risk of regulatory capture
- Having a system of peer review and peer pressure provides incentive for the domestic regulator to be responsive to the concerns of other states
- Having some duplication and overlap can be advantageous in detecting warning signs more easily

- Having a diversity of perspectives tends to produce centrist solutions, making it unlikely that excessive deregulation or over-regulation could occur
- Having a state regulatory system reduces moral hazard problems that accompany a market expectation of bailouts due to the difficulty of accessing federal government funds

Any one of the following disadvantages:

- Having a single regulator would increase national uniformity
- Reinsurers operating in a global market can compete better with uniform federal regulation and capital requirements per Dodd Frank
- Higher costs associated with duplicative and overlapping regulation (multiple rate filings, delays)
- Inefficiencies associated with duplicative and overlapping regulation / need to keep track of regulations for multiple states
- Uniform regulation can stifle innovation
- Tendency for states to rely on rating agencies in their RBC system
- States ignore unregulated affiliates within an insurance group in a practice known as “ring-fencing”. A rating downgrade of these affiliates can negatively impact the regulated parts of an insurance group.

### 3. Examiner’s Report

Parts a and b of this question were not difficult and there were many possible correct answers. Parts c and d are slightly more difficult in that they require synthesizing the basic concepts.

- a. Candidates generally performed very well on this part. Common errors included:
- Giving arguments to support solvency regulation instead of rate regulation.
  - Providing duplicate arguments (eg stating that one goal was affordability and another that there should be a limit to what one should pay for insurance)
  - Stating that rate regulation helps ensure availability (rather than “ensure coverage is available and affordable” or “ensure coverage is affordable”)
  - Stating that rates should not be discriminatory (rates can and should be discriminatory, it is when they are unfairly discriminatory that problems arise)
- b. Candidates performed well on this part. Common errors included:
- Giving arguments to support rate regulation instead of solvency regulation.
  - Providing duplicate arguments (eg stating that guaranty fund assessments hurt insurers for one answer and that guaranty funds hurt policyholders in another answer)
  - Providing too general of an answer (eg “there have been many cases of insurers becoming insolvent”)
  - Stating that taxpayers pay for insurer insolvencies (guaranty funds are designed to pay for insolvencies, which are funded by insurer assessments)
  - Stating that solvency regulation obviates the need for rate regulation (solvency regulation obviates the need for rate regulation’s role in preventing insolvencies)
  - Stating that solvency regulation protects investor funds (no evidence of solvency regulation being concerned with investor funds)
  - Stating that solvency regulation protects employees of company from losing their jobs (no evidence of solvency regulation being concerned with company employees)



- c. Candidates did fairly well on this part. However, there were many candidates who lost some credit by providing only a partial answer (eg only describing an overlap or only describing a conflict). Other common errors included:
- Stating that ensuring availability was an overlap
  - Stating that ensuring policyholder obligations are met was an overlap (this is a solvency goal)
  - Stating that an area of conflict was: rate regulation wants to ensure rates not excessive while solvency regulation wants to ensure high rates (regulators want rates to be adequate, not necessarily high, to meet all costs and provide a reasonable profit)
- d. Candidates generally scored very well on this part. Some candidates lost credit by providing incomplete or partial answers.

#### 4. Sample Answers

- a.
- Clayton Anti-Trust made illegal activities that lessened competition or created monopoly power.
  - Clayton Anti-Trust made illegal activities that created monopoly power, including tying, exclusive dealing, and mergers between competitors.
  - Cooperative arrangements (rate making in concert) is not allowed under Clayton Anti-Trust, which are necessary and incidental to establishing adequate coverages, and related concerns.
  - Robinson-Patman Act (Clayton Anti-Trust amendment) prohibits price discrimination with the exception of price differentials.
  - Clayton Act is a federal law and didn't apply to the insurance industry before the SEUA case.
- b. Boycotting: Not explicitly addressed by Clayton Act. Explicitly prohibited by the Sherman Act. Requiring purchase of both homeowners & auto policies: Tying of purchases explicitly prohibited by Clayton Act.
- c. Any two of the following:
- Returned insurance to the states.
  - Federal regulations still apply in boycotting, intimidation and coercion per Sherman Act.
  - Bureau ratemaking is allowed
  - Federal regulation still takes precedent in any law specifically regarding insurance and to the extent not regulated by the states.
- d. Boycotting: Explicitly prohibited by Sherman Act which is still applicable per McCarran-Ferguson Act.  
Requiring purchase of both homeowners & auto policies: Not explicitly addressed by Sherman Act. It is addressed by the Clayton Act or would be handled by state insurance law/statutes.

#### 4. Examiner's Report

Parts a and c of this question are very straightforward. Parts b and d are slightly more difficult in that they require applying the Acts in a specific example.

- a. Most candidates knew the definition of the Clayton Act. However, some candidates were confused by the difference between the Clayton Act and Sherman Act.

- b. Most candidates knew how the Clayton Act applied to tying. Some candidates made the mistake of trying to stretch the Clayton Act to cover boycotting, even though boycotting is not addressed by Clayton.
- c. Most candidates knew the definition of the McCarran-Ferguson Act.
- d. Most candidates knew how boycotting would be addressed under McCarran and the federal regulation of insurance.

## 5. Sample Answers

- a.
  - Fallibility → regulators are human, human makes error
  - Forbearance → regulators may be unwilling to take action promptly on troubled insurers
  - Capture → tendency for regulators to side with interested party
- b.
  - Duplication (any one of the following):
    - Multiple states have the authority to regulate an insurer
    - Different regulators can perform several of the same regulation activities, to avoid potential errors
  - Peer review
    - Other regulator can request regulator to take action; peer pressure
  - Diversity of Perspectives (any one of the following):
    - An effective system considers diversified perspectives and strikes to reach compromise
    - Regulators having different viewpoints on issues and hopefully reaching centrist solutions
    - Extreme outcomes are unlikely due to shared information and common ground
- c. For each of the regulatory failures, any one of the descriptions:
  - Duplication counters fallibility
    - More than one set of eyes so less chance of human error
    - Less likely that the same error is made by different people
  - Peer review counters fallibility
    - Sometimes regulators do not have a perfect system in place to regulate effectively. When other regulators review and critique them, it improves their processes and leads to better regulation overall.
  - Duplication counters forbearance
    - One regulator may not take action but another might
  - Peer review counters forbearance
    - Peer review puts pressure on regulators to take action, so effectively reduces regulatory forbearance
  - Diversity of perspectives counters forbearance
    - Div. of Perspectives can address regulatory forbearance through communication/ discussion & bringing a reluctant regulator to a more reasonable position (if the majority of players believe the insurer is troubled)

Duplication counters capture

- Others may not have the same political influences that created the capture problem

Peer review counters capture

- Peer review would address regulatory capture as other unbiased agencies would make sure an agency is not playing favorites by ignoring a company's issues

Diversity of perspectives counters capture

- This applies to capture, those that are at one end of the spectrum watch those that are likely to be influenced by the industry
- Many perspectives ensure that no faction is favored over another and reduces regulatory capture

d. Any one of the following arguments:

Not likely:

- Under the current system, states still regulate the insurance industry so it is unlikely to be bailed out by the Federal Government. Dodd-Frank was enacted in 2012 but the FIO has not produced the report on the insurance industry regarding systemic exposure. So at this point Dodd-Frank is mute on the subject of Fed bailouts.
- Unlikely, since insurance is regulated at the state level and there are Guaranty funds specifically for insolvent insurers.
- The chance is low due to less regulatory errors, peer pressure and ongoing collaboration in the insurance industry. Compare to the 2008 financial crisis, insurers are performing much better than financial industry due to the good regulations in place.
- Likelihood of federal bailouts under current regulatory structure is low because the states don't have direct access to federal funds (AIG and the two insurers helped by TARP are exceptions). This restricted access to federal funds reduces moral hazard in insurance.

Likely:

- "Too big to fail" was an ideology used by the government when bailing out banks after the 2008 financial crisis. While, for the most, insurers escaped clean and did not require bailouts at the time, there is nothing to say that bailouts wouldn't be available for large insurers should there be turmoil in the future.
- Likelihood of federal bailouts of insurers is likely to happen if needed. Recent Dodd- Frank Act opens door for federal regulation as Federal Insurance office is created within Department of Treasury. FIO may assess the insurance industry and will try to reduce insolvencies to protect the public. Hence, federal bailout will likely occur if needed.

## 5. Examiner's Report

Parts a, b, and c of this question are fairly straightforward. Part d is more difficult since it requires the candidate to give an opinion and support it, which can't be adequately answered by simply memorizing the syllabus readings.

For parts a and b, most candidates were able to briefly describe each of the reasons. For part c, some candidates made the proper link between the problem and the remedy, but did not explain HOW that remedy solved the problem. For part d, some candidates only provided a brief statement rather than a discussion.

## 6. Sample Answers

Candidates were asked to evaluate the financial condition of the company:

- RBC Ratio – 210% Healthy, no action necessary >200% assuming denominator ACL
- IRIS Ratio 1 – 750 Healthy, this is a usual value since it is <900
- IRIS Ratio 2 – 350 Unhealthy, usual value should be <300
- IRIS Ratio 4 – 20 Unhealthy, usual value should be <15
- IRIS Ratio 6 – 5 Healthy, usual value between 3 and 6.5
- IRIS Ratio 10 – 35 Healthy, usual value <40
- IRIS Ratio 13 – 22 Healthy, usual value <22

Since the company failed IRIS Ratio 4, then IRIS Ratios 1, 2, 10, and 13 should be recalculated excluding surplus aid:

- #1 =  $750 (1/.8) = 937.5$  Unhealthy, >900
- #2 =  $350 (1/.8) = 437.5$  Unhealthy, >300
- #10 =  $35 (1/.8) = 43.75$  Unhealthy, >40
- #13 =  $22 (1/.8) = 27.5$  Unhealthy, >35

Candidates were also asked to demonstrate knowledge of the actions that might be taken by the NAIC and the regulator. Common acceptable responses included any one of the following:

- Insurer might not have adequate reinsurance. NAIC can further investigate ratio 2 for affiliates, mix of product. Shorter tail line can afford higher ratio.
- NAIC will make sure that the company does not escape review, especially if nationally significant, and provide additional support during review if necessary.
- State regulator would look at the combined ratio; if it is >120% and since RBC ratio is between 200 -300% this would fail the trend test and the company would have to comply with the company action level of RBC model act.
- NAIC's Financial Analysis Division (FAD) should be involved, as this insurer writes business in all states => nationally significant insurers, by collaboration with state regulators in financial exam to ensure its solvency is not impaired.
- Results in 5 unusual IRIS ratios which is >4; therefore, requiring a higher priority level by NAIC analyst team in prioritization. State regulators might need to conduct an onsite financial exam since the off-site financial monitoring is showing potential concern.
- The regulator should consider reinsurance collectability with a high leverage ratio, regulators should also review profitability, mix of long-tailed versus short-tailed lines.
- The regulator should review the reinsurance contracts to see if any excessive commissions are being used to provide surplus aid.
- The company might be using ceding commissions from reinsurance contracts to inflate their surplus.
- Ratio 2 can indicate that company's reinsurance program can be inadequate, but this needs to be analyzed together with overall profitability and taking into account other factors such as if company writes long-tail or short-tail lines. Companies writing long-tail business need to maintain lower ratios.
- $\text{Surplus Aid} = \text{UEPR} * (\text{ceding com all}) / (\text{ceded prem all})$   
The surplus aid is artificially inflating surplus.
- NAIC may monitor insurer through FAD and if condition worsens refer to FAWG.

## 6. Examiner's Report

This was a challenging question. Common errors included the following:

- Mentioning that 4 IRIS ratios need to be recalculated since IRIS 4 fails, but not recalculating the IRIS ratios. Also, some candidates multiplied the ratios by 1.2 rather than dividing them by 0.8.
- Mentioning that only ratios 1 and 2 need to be recalculated, rather than all ratios with surplus in the denominator
- Not mentioning that failing 4 ratios requires the state regulator to do a more extensive review
- Not discussing actions to be taken by NAIC and the state regulator if a company fails (or may fail) 4+ IRIS ratios
- Not distinguishing between actions of the NAIC and state regulators
- Incorrectly listing actions of the company rather than the NAIC or state regulator
- Not mentioning that the state regulator would need to do more extensive review before requiring a plan of action
- Mentioning surplus aid, but not explaining the cause of surplus aid as high ceding commissions to unearned premium
- Not knowing the correct thresholds for the IRIS ratios and/or not understanding their meaning
- Many candidates thought that the RBC ratio should be recalculated without surplus aid. The denominator of the RBC ratio is an estimate of required surplus based on factors such as asset risk, liability risk, etc, and does not include an adjustment for surplus aid. The RBC is evaluated by a trend test.
- Some candidates correctly identified that the trend test would apply since the RBC ratio is between 200% and 300%, but incorrectly referenced the 2-year operating ratio <120% or stated that the threshold was a combined ratio of 100% rather than 120%. The trend test requires the company to submit a plan of action if the current year combined ratio is >120%.

## 7. Sample Answers

- Any three of the following:
  - Agent is cautious of non-rated insurer
  - It is an efficient way for the insurers to exhibit their financial strength, which is often required by customers
  - Bonds will sell easier and at a higher price to fund operations if company is rated highly
  - Banks may require a top-rated homeowner insurer prior to issuing mortgage
  - Courts may require top-rated insurer for structured settlements
  - Could obtain cheaper reinsurance with a high financial strength rating
  - Consumer may consider the rating when purchasing insurance
  - May allow them to enter surety lines (if rating  $\geq$  A)
  - External evaluation of their financial strength to balance internal evaluations
  - Marketing – it can advertise its rating (if good) to get more buyers
  - To show its financial strength to regulators, policyholders, creditors
  - May lower borrowing costs
  - Underwriters & other parties often don't have the time, expertise, or resources to perform ratings themselves
- Similarities (any one of the following):
  - Both of them are evaluating financial strength
  - They both use public financial statement information
  - Both result in public disclosure of financial strength ratings
  - Both use a capital model
  - In both situations the final ratings are determined by a rating committee instead of a rating

analyst

- Both assign a “grade” to the insurer for comparison within the market
- They both affect the image of the company (affects business and investors)
- Both done by rating agencies
- Both ratings are based on the same scale

Differences (any one of the following – should compare interactive and public ratings):

- Interactive is much more costly and time consuming for the firm than public ratings
- An insurer presents additional proprietary data to a rating agency in an interactive rating and a public rating only uses public data
- Interactive requires participation of insurer, public does not

c. Any one of the following:

- One reason for disclosure is to provide transparency since the rating agency may suspect the insurer of hiding facts resulting in a more adverse rating than actually fair.
- Nondisclosure could be a far worse undertaking, as once the agency discovers (on its own) that data was concealed, it would very adversely affect the opinion of the agency on the financial stability of the insurer. It is far less damaging to provide any data necessary.
- The actuary is abiding by their ASOP’s and need to display all data even if it could damage insurer’s reputation.
- The actuary would want to disclose this because if the company fails it would reduce the credibility of the third party ratings. It is important for the ratings to be credible so people believe that they are an indicator of financial strength.
- A company wants its rating to be as accurate as possible. If this data would be disclosed at a later time, it might have a more significant impact on their rating.
- Integrity of insurer is a key factor in the qualitative rating. Having a problem come up that rating agent didn’t know about can adversely affect ratings.

d. Any one of the following:

- AM Best (BCAR) Capital Model – this model is similar to RBC structure in that it assesses individual risks separately and combines them with a covariance adjustment.  
Benefits (any one of the following):
  - Similar to RBC so it's easier to understand than a stochastic model
  - Includes interest rate risk which is an improvement over RBC
  - Uses EPD of 1% which analyzes tail risk a bit more thoroughly than RBC's worst year approach
- S&P – Uses combination of accounting and company's own internal model. Company would know better the risks it faces and is best equipped to evaluate them.
- Moody's/Fitch uses a stochastic cash flow model which can better model the multivariate structure of insurance risks.

## 7. Examiner’s Report

Parts a, b, and c were fairly straightforward and most candidates were able to respond using knowledge gained from the syllabus readings or their own experience. Part d was slightly more difficult in asking for candidates to defend a rating agency’s capital model.

a. The first common issue was repetition of answers. For example, some candidates would say

“Certain lines of business require a high rating such as homeowners.” They would then also use “Surety requires a high rating to write.” Another example is the responses of “increases policyholder retention” and “increases new business.” These both fall under the larger heading of “policyholders use ratings to make decisions.”

The second common issue was vagueness. Many candidates said “third parties rely on ratings.” This, while true, does not give any information on which third parties or why they rely on ratings.

- b. Some candidates provided generic similarities such as “they are both ratings.” This doesn’t provide any information that wasn’t already given in the question. Also, some candidates stated that public ratings were released to the public while interactive ratings are only used internally – this is incorrect.
- c. Some candidates assumed that the choice was between total honesty by the actuary or a public rating. They then gave reasons why a public rating was inferior to an interactive rating.
- d. One common issue on this part was a mismatch between the rating company named and the defense of their economic model. For instance a candidate may have named S&P but then defended AM Best’s model. There were also a number of candidates who would only describe the economic model but not defend it. Some candidates confused a rate organization with a rating agency and answered “ISO”. Finally, some candidates would describe and defend the qualitative portions of the rating method while ignoring the economic capital model.

## 8. Sample Answers

- a. Any three of the following:
  - Costs for expert evidence may increase (due to heightened scrutiny)
  - More defendants are now involved in litigation
  - Litigation is no longer routinely handled on a joint basis
  - Many new defendants have abandoned settlement strategies
  - Newer defendants are incurring significant discovery costs
  - Coverage disputes may increase
- b. Any three of the following:
  - Defense costs have increased
  - More defendants are now involved in litigation
  - Litigation is no longer routinely handled on a joint basis
  - Many new defendants have abandoned settlement strategies
  - More focus/resources to seriously injured or severe claims
  - Restrictions on non-malignancy claims
  - Decrease in non-malignancy claims
  - Increasing scrutiny of potentially fraudulent claims
  - Restrictions on combination of claimants
  - Venue reform
  - Inactive dockets
  - Medical criteria statutes
  - Joint and several liability reform
  - Challenges to validity of chest x-rays

- Caps on punitive damages
  - Challenges to prepackaged bankruptcies
- c. Any two of the following:
- Concern about defense costs
  - Interpretation of their contracts to include some liabilities they never intended or charged for
  - Payments to claimants who have no clearly identifiable injury
  - Payments to claimants who may not be able to establish product identification
  - Unpredictability of financial results and timeline and the difficulties this causes in reserving
  - Threat of loss of policyholder funds or insolvency
  - Threat of bad faith judgments
  - Threat of fraud
  - Can't get a fair trial in state court
  - Disproportionately high awards to nonseriously injured
  - Awards should be funded by other parties (tobacco)
  - Uninjured plaintiffs are being compensated
  - Current compensation system is prohibitively expensive
  - Wants to achieve finality
  - Should not be held liable due to encapsulation of asbestos in their product
  - Taking on share of liability previously borne by bankrupt manufacturers
  - Unfair to hold accountable for same knowledge of health risks
  - Trial venues favorable to plaintiffs
  - Courts fail to require the use of objective evidence
  - Defendants held responsible for liability that should be borne by non-US companies
  - Defense expenses are higher for peripheral defendants
  - Concerns about a changing legal/judicial/regulatory environment
- d. Both of the following:
- Relevancy to the case
  - Whether it is generally accepted in the expert/scientific community
- e. Any two of the following:
- Whether it can or has been tested
  - Whether it has been subject to peer review and publication
  - Its known or potential rate of error
  - The existence and maintenance of standards controlling the particular technique's operation
  - Whether or not it is reliable
  - Relevancy to the case
  - Whether it is generally accepted in the expert/scientific community

## 8. Examiner's Report

This was a fairly straightforward question and answers could be drawn from a variety of sources, especially for part c.

- a. Candidates generally responded well to this part, although many candidates could only provide two accurate responses. Some candidates confused claims/claimants with defendants. Some candidates described factors that would have no effect on litigation costs. There was a fair amount of confusion between discovery costs and the cost of expert evidence. Finally, some candidates



provided responses that identified phenomena which have not occurred or were not expected to occur.

Common incorrect responses included:

- Increases in non-malignant claims
- Increases in number of claims (as opposed to defendants)
- Increases in discovery costs for claimants (as opposed to defendants)
- Claimants are filing earlier
- Reduced life expectancy for critically ill claimants
- More class action suits
- Long latency periods
- Claimants reaching trial have more serious illness
- Increased medical costs

- b. Candidates had difficulty with this part. In particular, many candidates provided responses that were the *opposite* of a correct response. Many others referenced the Daubert changes, which occurred in the 1990s (not since 2001). Others provided vague responses, along the lines of “reforms” or “legal environment”, without describing which elements of these factors had an impact on asbestos litigation. Finally, others referenced things that may or may not have happened, but in any case did not have any effect on asbestos litigation.

Common incorrect responses included:

- Increasing nonmalignant claims
- Increasing number of class-action lawsuits
- Daubert changes
- Establishment of a federal no-fault fund
- “Reforms”, “state reforms”, “federal reforms”, “law reforms”, etc.

- c. Many different responses to this part were accepted, and candidates performed very well. Most answers that did not receive credit lost points because they were incomplete or vague (for example, responding that insurers may be concerned about manufacturers’ bankruptcies without mentioning peripheral defendants).
- d. Many candidates provided responses that would have been valid for part e but were not valid for part d.
- e. The vast majority of candidates received full credit for this part.

## 9. Sample Answers

- a. Multiple correct answers were accepted, including references to the following:
- The benefit formula favoring lower wage earners
  - The benefit formula providing a minimum and maximum benefit
  - Benefits being loosely related to wages, so giving greater (but not proportional) benefits to higher wage earners
  - The social security program being compulsory
  - That current benefits are funded by current contributions and not contributions from the current recipients, creating an intergenerational transfer

- The program being expected to continue indefinitely
  - The program not being fully funded
  - The benefit formula favoring certain groups such as large families, older people, and disabled people
- b. A wide range of correct answers were accepted. As this question refers to a possible policy change which could be implemented in different ways, answers were accepted that could refer to the policy change under a variety of assumptions.
- The program will continue to be compulsory (as the question made no reference to any change)
  - The program will no longer be compulsory as individuals choosing to invest their own contributions would effectively be opting out of the current program
  - Benefits will be more skewed to higher wage earners since the “banded” benefit formula will no longer apply
  - Actuarial equity will be enhanced; social adequacy will be reduced
  - The formula will no longer favor groups such as larger families, older workers, and the disabled
  - Benefits will be inherently more unstable if based on the performance of individually managed accounts.
  - Wealthier participants will tend to have more investment expertise, which can increase the discrepancy in benefit levels for different earnings cohorts.
  - Wealthier participants may have other sources of retirement income and therefore be able to comfortably take more risk and earn greater returns, while less wealthy participants may need the benefits more and be unable to risk their accounts in higher-yield investments
  - There may no longer be a minimum floor of benefits
  - Wealthier recipients may have less incentive to invest wisely if there is a benefit cap and they would not personally benefit from gains in their accounts beyond a certain level
  - There would no longer be intergenerational transfer
  - The program would now be fully funded
  - Since current contributions would go to individual accounts, there would be no source for payments to current recipients
  - Beneficiaries living longer would no longer be protected with a lifetime income

## 9. Examiner’s Report

- a. This part was answered successfully by many candidates, as a candidate who read and absorbed the material would succeed on this part most of the time. Common errors included providing overlapping answers – for example, not fully funded is another explanation of intergenerational transfer.
- b. A wide range of correct answers were accepted, and candidates who made reasonable assumptions and provided logical conclusions in support of those assumptions received credit.

## 10. Sample Answers

- a.
- Sample 1  
 Company writes 3,000 of the  $(5000+3000+2000)$  WP in the market = 30% of market (voluntary)

$5000 \times 0.3 = 1500$  applications will be assigned to company B.

Sample 2

Assigned base on market share premium

A –  $5M / 10M = 50\% \times 5000 = 2500$

B –  $3M / 10M = 30\% \times 5000 = 1500$  # of applicants

C –  $2M / 10M = 20\% \times 5000 = 1000$

b.

Sample 1

Assigned Risk Plan

1. Insured applies to company in voluntary market
2. Voluntary market denies coverage
3. Insured applies to the assigned risk plan
4. Assigned risk plan assigns the insured to a company
  - a. # of insured assigned to each company depends on voluntary market share

Reinsurance Facility

1. Insured applies to company in voluntary market
2. Company decides whether to write as voluntary risk or to write & cede to the risk to the reinsurance facility

Joint Underwriting Association

1. Insured applies to company in voluntary market
2. Company decides whether to write as voluntary or forward to one of the carriers who service the JUA
3. If forwarded, the carrier will service account for the JUA

Sample 2

Assigned Risk Plan: The insured applies to the assigned risk plan after being rejected by the voluntary market. He or she is then assigned to an insurer based on market share of WP.

Reinsurance Facility: Insured applies to a company but is too high a risk than what the company normally accepts. The company writes the insured but then cedes all premiums and loss to the reinsurance facility.

Joint Underwriting Association: The insured applies to an insurer who would reject them due to their high risk, so the insurer passes the application on to the Joint Underwriters Association who proceeds to write them.

10. Examiner's Report

- a. This question applied a straightforward concept (allocation of assigned risk policies among insurers) to a specific example. Most candidates did well on this part. The most common error was the allocation of assigned risk policies by earned premium.
- b. Although this question was similarly straightforward, candidates sometimes confused the processes used by the various residual market plans.

Assigned Risk Plan

Each candidate needed to describe how the applicant obtains insurance under the ARP, which includes the following three elements

- 1 – Applicant applies to insurer
- 2 – Insurer denies the applicant
- 3 – Applicant applies to the ARP

Common errors on this portion included applicant applies to the insurer, gets denied, and then assigned directly to the ARP. Other answers neglected that the applicant must be rejected in the voluntary market first before applying to the ARP.

Each candidate needed to describe how the insurer obtains coverage under the ARP.

Responses needed to mention the assignment of residual market applicants to insurers by the ARP. The most common error here was candidates not being clear who was assigning the residual policies to the insurer.

#### Reinsurance Facility

Each candidate needed to describe how the applicant obtains insurance under the RF.

Candidates must mention the applicant applies for insurance in the voluntary market.

Common errors on this portion included not addressing what the applicant does or applying directly to the RF.

Each candidate needed to describe how the insurer obtains coverage under the RF. Responses must illustrate the insurer has to make the decision on whether or not to cede the risk to the facility. A common error was to imply that all applicants were then ceded to the facility after they applied to an insurer. Candidates using insurer actions other than 'cede' were required to explain what they meant. These responses used terminology like sends, forwards, gives policies or applicants to the RF. For these responses acceptable clarification needed to include that the insurer handles all claims and services the policy or that the candidate understands that the policy is being reinsured and not physically moved to the RF.

#### Joint Underwriting Association

Each candidate needed to describe how the applicant obtains insurance under the JUA.

Acceptable answers must mention the applicant applies for insurance in the voluntary market.

Common errors on this portion included not addressing what the applicant does or the applicant applying directly to the JUA.

Each candidate needed to describe how the insurer obtains coverage under the JUA.

Responses must demonstrate that the insurer has the decision on whether or not to forward the applicant to a servicing carrier of the JUA. Common errors include the applicant applying directly to the JUA or if they applied to an insurer they were automatically forwarded to a JUA carrier. Candidates implying other verbiage such as send, pass, give, cede in lieu of 'forward the applicant' was required to explain that they understood the policy was given to one of the servicing carriers to write and service the policy.

## 11. Sample Answers

### **Property-casualty insurance plans**

#### NFIP

- a. NFIP Program
- b. Gov't acts as U/W, voluntary sector services policies only without bearing any U/W risk through WYO program
- c. Fill unmet need  
OR  
Achieve social purpose
- d. Successful to a certain extent but flood coverage is still not available in some areas that local authority doesn't cooperate  
OR  
Still has to borrow heavily from government after Hurricane Katrina  
OR  
Rates are inadequate

OR  
Not enough people participate

#### WC

- a. Worker's Compensation
- b. May partner with private market, act as exclusive insurer or compete with private market
- c. Fulfill unmet need  
OR  
Make compulsory WC insurance more affordable  
OR  
Compel insurance purchase  
OR  
Greater efficiency
- d. Successful, although competitive states also show ability to offer efficiently  
OR  
It has been successful in increasing affordability and availability  
OR  
Insurance is available to all

#### TRIA

- a. TRIA
- b. Insurers write the business and government acts as reinsurer
- c. To fulfill unmet need  
OR  
Achieve social purpose  
OR  
Avoid economic disruption
- d. Not entirely successful as it turns out there is not as much need for this coverage as first anticipated  
OR  
There have been no economic disruptions from terrorism

#### Residual Auto Market

- a. Residual Auto Market
- b. Government accepts applicants and sets rates for coverage. They then allocate insureds to private insurers based on market share. Insurers service the policies and retain profit/loss as if they had written the business themselves.  
OR  
Government is exclusive (for MAIF)  
OR  
Partner with private insurers. Acts as a pool and private insurers share in profits and losses.
- c. Fill an unmet need  
OR  
Address availability and affordability issues for high risk drivers
- d. Effective at providing insurance to high risk drivers who would otherwise go without coverage.

#### FAIR plans

- a. FAIR plans
- b. Voluntary sector is assigned risks in the pool and government provides fee to voluntary providers.
- c. Fulfill unmet need for property coverage due to location being high risk.
- d. Successful in that property coverage is being made available and affordable.

## **Social insurance plans**

### Social Security

- a. Social Security
- b. Gov't acts as exclusive insurer to provide social security coverage  
OR  
No interaction  
OR  
Government competes with private insurance retirement plans
- c. To achieve collateral social purpose by ensuring benefits of a minimum standard of living is made available
- d. Successful as many people are able to receive benefits of a minimum standard of living  
OR  
Not successful as it may have future funding issues

### Medicare

- a. Medicare
- b. No interaction  
OR  
100% government provided except for some private insurers provide supplementary policies
- c. Provide social equity  
OR  
Fulfill unmet needs
- d. Coverage is provided for retirees and people unable to get it in the private market

### Unemployment Insurance

- a. Unemployment Insurance
- b. No interaction
- c. To provide a safety net to people to be able to maintain minimum living standard when out of a job.  
OR  
Achieve collateral social purpose  
OR  
Fulfill unmet need
- d. Not so successful as only 1/3 of wage is replaced, 2/3 bother to collect  
OR  
May prolong periods of unemployment  
OR  
Provides safety net to people who are unemployed

### PBGC

- a. Pension Benefit Guaranty Corporation
- b. No interaction
- c. Protect financial security of individuals promised pension benefits by a company that had to terminate the plan
- d. Yes, people continue to have benefits paid, but potential shortfall looms

## **Financial insurance plans**

### FDIC

- a. FDIC
- b. No interaction; exclusively provided by federal gov't
- c. To stabilize financial market, prevent bank run in the event of rumored insolvency, give protection to depositors
- d. Successful as bank run hasn't occurred in US for many decades

#### Guaranty Funds

- a. Guaranty funds
- b. Insurers pay assessments to the fund
- c. Protect policyholders when insolvent companies can't pay claims
- d. Yes, it pays claims (although subject to limitations) to policyholders

### 11. Examiner's Report

For property-casualty insurance plans, this was a fairly straightforward question. It was more difficult to discuss the social insurance plans and the financial insurance plans. Part d was the most challenging part of this question, as it required candidates to evaluate the success of the various programs.

- a. There were several acceptable answers under each category. The property-casualty insurance plans were the most straightforward. For social insurance plans and financial insurance plans, Nyce lists unemployment insurance, social security, FDIC, and PBGC. Among these, the social insurance plans are unemployment insurance, social security, and PBGC. It was also acceptable to categorize guaranty funds as a financial insurance plan as they protect an insured's unearned premium.
- b. The question asked candidates to describe the interaction between government and private insurers. Some candidates failed to describe the interaction and instead described how the program operates.
- c. Some candidates stated inaccurate information or did not understand the program referenced in part a. However, most programs have multiple objectives that could be argued as a primary objective, and the papers referenced several objectives for government programs (eg fulfill unmet needs, compel insurance purchase, achieve social collateral purpose, etc.). It was acceptable to discuss the category or accurate examples of the category. For example, for Social Security the primary objective is to achieve a social collateral purpose, but it's also acceptable to state "provide a minimum floor of income to retired or disabled people".
- d. Some candidates stated inaccurate information or failed to communicate that they understood the performance of the program. Candidates needed to provide more than just "successful", "not successful", or "this program met its primary objective" by providing a very brief example of how it was a good or bad program as shown in the sample answers.

### 12. Sample Answers

a.

#### Sample 1

Requires claim payers (Liability/NF/WC insurers) to report claim data to CMS (Center for Medicare & Medicaid Services) and determine Medicare enrollment status of claimants.

Assist in coordinating benefits & uncover reimbursable claims (paid by Liability/NF/WC insurance)

Sample 2

Claim payer must submit claim data to CMS. Insurer must determine if claimant is Medicare eligible. Both of these benefit Medicare because determining status prevents benefit overlaps (saves costs)

Sample 3

Responsible Reporting Entities (RREs) are required to determine the Medicare enrollment status of all claimants and submit certain information of the claims to the Center of Medicare and Medicaid Services (CMS). The law benefits Medicare as the responsibility of payment can be clearly determined.

b. Any two of the following:

- Medicare is secondary to both WC and liability insurance and pays only if/when benefits are exhausted.
- Medicare is secondary to workers compensation or liability insurance coverages.
- Medicare makes conditional payments (on medical costs that may be incurred before eligibility to collect insurance is determined) to medical providers which can be reimbursed by an insurer determined to be the primary
- Conditional payments allow Medicare to be reimbursed for payments it made while liability was being determined.
- Conditional payments – if Medicare begins paying bills early in a case before liability is determined, it gives them the ability to recover these conditional payments from the responsible party.
- All parties to a settlement agree to set aside a portion to be primary over Medicare for future treatment after injured party becomes Medicare eligible
- Medicare set asides require that settlements include a portion of funds for the time period when Medicare would apply. This prevents settlements from escaping their primary duty to pay.
- Medicare set aside requirements ensure that part of the settlements from other insurance will be set aside and be primary to Medicare in the future when the worker becomes Medicare eligible.

c.

Sample 1

Could increase frequency and severity of medical claims. Previously, if a claim had both medical and indemnity component, it was sometimes coded as indemnity only. With new reporting requirements, it is more important to correctly code as medical, so medical frequency will increase. Also, because they now have to better make sure settlements account for future medical costs (and don't incorrectly expect Medicare to pay), severity will increase – Medicare must approve that amount in MSA is adequate.

Sample 2

Frequency may not change much as reporting requirement mainly affects size of the claim but looking at frequency of medical itself, may increase due to reclassification of claim lumped into indemnity to indemnity and medical.

Severity may increase due to additional payment over Medicare not previously paid, and higher LAE due to reporting requirement procedures.



Sample 3

Frequency may increase if claimants were previously getting benefits from Medicare instead of the insurer.

Severity will increase due to increased cost of complying with new reporting law.

Sample 4

Frequency will increase for medical workers compensation since medical portion is clearly identified and in the past, it may have been entirely coded as indemnity.

Decrease in indemnity severity since now medical portion is clearly identified and split out rather than all coded as indemnity

Sample 5

The impact of MMSEA should have little effect on frequency, but may see claims remain open longer as approval is needed for settlement amounts. Severity may see an increase as the company now must set aside any amounts that previously would have been covered by Medicare. Also, the company may need to reimburse Medicare for amounts Medicare paid historically that should have been paid by the company. This would also increase severity.

Sample 6

The frequency won't be affected assuming accidents are always initially reported to the WC carrier.

Severity may go down if insurer now covers more small claims.

Sample 7

The impact of MMSEA will increase the frequency of claims. It will force insureds to look to the workers comp insurer first, when previously they may have erroneously used Medicare first.

It should have little effect on the severity as it does not change the nature of the claim.

## 12. Examiner's Report

Parts a and b were straightforward questions drawn from the syllabus readings. Part c involved some synthesizing of the potential impacts on a insurer with properly-stated assumptions to support the impacts.

- a. Some candidates knew the law requirements while others answered with anything they may remember about the papers (MSAs, secondary payer, etc...). Common errors included:
  - Assuming the 2007 law was about Medicare Set Aside Act or Medicare Secondary Payer Act, rather than the new reporting requirements
  - Mention of reporting requirement in the law without discussing benefit
- b. Generally, most candidates were able to identify at least 1 feature when there was an overlap. Common errors included:
  - Not understanding how an MSA works (provision for insurer to set aside portion of settlements for when claimant is Medicare eligible) and how conditional payments work
- c. Generally, candidates were able to identify one of the impacts (frequency or severity) MMSEA had on claims. Common errors included:
  - Describing from the viewpoint of Medicare

- Discussing historical statistics, settlement rates
- Discussing settlement/closure rates rather than claim frequency
- Thinking that the insurer may not report claims due to costs of reporting from the new requirement – frequency going down (but insurer is incentivized to report since there are heavy penalties for not reporting)

### 13. Sample Answers

a.

Principle 1 (any one of the following):

- Rate is estimate of expected future costs for full risk rates in NFIP. However pre-FIRM risks are subsidized and pay less than actuarially fair.
- Satisfy for full-risk premium. Not satisfy for subsidized risk.
- Yes, the full-risk rates satisfied this principle.
- No, the NFIP rates underestimated the expected value of future costs.
- The subsidized rates under the NFIP do not reflect the expected future costs. The risk rated policies do.
- Rates are suppressed in order to make affordable.
- No – some insureds were grandfathered in when the flood maps changed.
- The NFIP rates for some do provide for this, however those in the SFHAs are not in compliance.
- NFIP rates are based on expected value of costs, but they are inadequate in aggregate so doesn't satisfy.

Principle 2 (any one of the following):

- Cost of capital is not included in the rate determination for NFIP, so the rates do not provide for all costs. However cost of capital may not be necessary since federal government can borrow and tax to fund.
- Not satisfy – not include cost of capital
- Yes they meet this. NFIP doesn't charge cost of capital unlike private insurers but this isn't necessary since they have the backing of the US government.
- Does not satisfy because it doesn't have any profit load.
- No, no investment income is considered, doesn't cover all expenses in settling claims.
- No. NFIP rates do not have a risk load. A risk load is not necessary because the federal government backs the program.
- NFIP rates do not include a risk margin so not all costs are included.

Principle 3 (any one of the following):

- Individual risk transfer is also not true, due to subsidies. However, the subsidies encourage participation via some premium paid in and help fulfill NFIP's social objectives.
- Subsidized properties are way below the actuarially sound price, so because of the grandfathered properties, this is not satisfied.
- The broad class plan creates subsidies so this is not satisfied.
- Not satisfied as there is a subsidized part in the NFIP rates.
- Not satisfied because certain risk characteristics are not allowed to be considered in the rates.

- NFIP only has five rate classes, so there is cross-subsidization within classes. However, even insurers with many more rate classes also have some degree of cross-subsidization within those classes.
- Rate increases are capped at 10%, so individuals aren't paying their correct rate.
- No, some policies are subsidizing others.
- The presence of wide rate / risk classes creates cross-subsidies. Hence, principle 3 is not satisfied.
- No, severe repetitive loss properties are subsidized.

b.

- They could not transfer subsidized rates with the sale of a property
  - This would eventually lead to actuarially sound rates being charged
- Produce better flood maps and improve flood management
  - Better align risks with the rate
  - Increase awareness of flood exposure
- Increase borrowing authority
  - Less disruptions to WYO companies
- Remove sunset provision
  - Improve certainty for viability of the program
  - It is difficult for insurers to plan if they are unsure of whether the plan will renew
- Adjust coverage and limits (adding coverage for living expense / higher limits / replacement cost / high deductible / business interruption)
  - Encourage participation
  - More adequate to needs of the market
- Use fair / actuarial rates
  - Discourages the building of homes near flood-prone areas
  - Encourages insureds to control their risk
  - Minimize borrowing from government
  - Decrease reliance on government aid
  - Improve financial solvency and future of NFIP
- Make it tougher for communities to receive disaster relief if required insureds don't have flood coverage
  - Improve penetration
  - Reduce / mitigate losses
- Remove / reduce subsidized / grandfathered / multiple loss / vacation and secondary home property rates
  - Should charge actuarially sound rates
  - Increase awareness of actual flood risk
  - Increase incentives for loss control / mitigation
  - Creates a moral hazard as subsidized risks have less incentive for loss control
- Remove / reduce subsidies on vacation and secondary homes
  - This program is subsidized to help those who need it. Since it is not their primary residence, they should not receive government subsidies.
- Make purchase mandatory in flood-prone areas
  - Decrease reliance of disaster relief after a flood
  - Increases awareness of actual flood risk
  - Increases incentives for loss control / mitigation
- Enforce updating of old buildings
  - Prevent future losses
- Allow rates to be calculated using rating variables associated with all known risk

- So that the full rate is obtained
- Require flood mitigation actions to be taken after first claim on a property in order for coverage to continue going forward
  - Properties with repeat claims account for a disproportionate amount of flood losses
- Expand coverage to include earthquake / wind risk
  - Increase the diversity of the book
- Allow for larger rate increases, there is currently a cap on rate increases
  - Rates are inadequate
  - Improve rate adequacy
- Encourage more private insurer involvement
  - NFIP can act as a reinsurer. Private carriers have the expertise to handle other catastrophic type exposures
- Better enforce flood insurance requirements on federally backed mortgages
  - Increases participation
  - Reduces need for government aid after a flood
- Don't allow repetitive loss properties to rebuild in the same area unless loss mitigation is employed
  - Severe repetitive loss properties account for a disproportionate amount of losses
- Increased participation
  - Increase diversification
- Better educate the public on how to mitigate and control flood loss
  - Increase participation
  - Increase awareness of actual flood risk
- Increase penalties on lenders who don't enforce NFIP requirements
  - Increase participation
  - Increase awareness of actual flood risk
- Include cost of capital to account for all costs associated with risk transfer
  - Reduce need to borrow from government
- Enhance and enlarge the classification plans (right now it is very broad with only five categories)
  - This will help to identify the rating differentials in the plan and make it more actuarially sound
- Make disclosures in how rates are set
  - Will improve risk management incentives of insureds

### 13. Examiner's Report

This question requires candidates to evaluate the NFIP using ratemaking principles, and then propose and justify improvements. Both parts are rather open-ended and answers could be drawn from a variety of sources.

#### a. Common errors included:

- Stating “yes/does satisfy” or “no/does not satisfy” – the question asked for a brief description, which is different than just identifying whether or not the NFIP rates satisfy the principle. Candidates must show an understanding of the NFIP with a brief example.
- For all three principles, saying that the NFIP has borrowed money from the government or that it owes money that will take time to pay back. This is historical and has nothing to do with future costs.
- For Principle 2, stating that aggregate cost was not in alignment with aggregate premium – need to provide an example of one of those costs to show understanding.

- For Principle 3, stating that non-subsidized risks satisfy this principle.
- For Principle 3, saying that NFIP meets this requirement because it is difficult for private insurers to meet. This does not mean that the NFIP meets it.
- For Principle 3, confusion over how low-risk properties pay for high-risk properties. This is due to wide risk classes, not grandfathering (where low risks are not subsidizing high risks, the government subsidizes).

b. Common errors included:

- Many candidates provided improvements but no justifications for them.
- Some candidates supplied an improvement with an inappropriately matched justification.
- Some candidates stated that increased rates would be an improvement, but the goal should be actuarially sound rates and therefore not all rates may need to be increased.
- Eliminating coverage was not an acceptable improvement. Per pg 16 of the AAA paper “The NFIP is not allowed to refuse to cover an “eligible” property, regardless of the property’s loss history. Ineligible structures are few and are prescribed by the federal program.” Refusing coverage without reference to potential loss mitigation strategies goes against the goals of the NFIP.

#### 14. Sample Answers

a.

Small individual insureds –

Positive (any one of the following):

- get the total value of most claims paid promptly rather than waiting to receive a fraction of the claim under federal bankruptcy laws
- receive payment promptly
- provides temporary coverage
- allows them to collect unearned premiums
- Don’t have to do own analysis or be as concerned w/ insurer strength since they are covered (partially) in case insolvency
- Insurers will be more aggressive, lower price for insured
- Duty to Defend claim

Negative (any one of the following):

- willing to tolerate risky insurer underwriting;
- Increases the cost of insurance
- higher costs through assessments being passed onto consumers
- Small claim deductible may limit small claims & they won’t get all of unearned premium back most likely
- There may be delays/decreases in outstanding claim payment
- Maximum limit in addition to policy limit applies

Large corporate insureds -

Positive (any one of the following):

- receive payment promptly
- allows them to collect unearned premiums
- Protected by Guaranty Fund if they purchase from admitted market
- provides temporary coverage

- Duty to Defend claim
- Workers comp unlimited claim benefit

Negative (any one of the following):

- Are subject to large net worth deductibles
- Increases the cost of insurance
- higher costs through assessments being passed onto consumers
- may not benefit from GF as it excludes marine, excess, etc.
- Unlikely they will see benefits if guaranty fund is required because they have financial capacity to cover own losses.
- if they participate in RRGs or non-admitted market
- There may be delays/decreases in outstanding claim payment
- Maximum limit in addition to policy limit applies

Insurance companies -

Positive (any one of the following):

- They benefit however from the ability of GF to intervene and attempt to assist in rehabilitation prior to insolvency, which makes the market more stable for customers/investors
- Gives their policyholders reassurance that they are protected if they go insolvent
- Help promote financial soundness and integrity of the industry as insured won't be left high and dry from insolvencies
- Allows financially weak insurers to compete at same level as strong ones
- Amt paid is known + will be enough to cover cost of insolvency

Negative (any one of the following):

- Insurers have to pay operating expenses for the fund, increasing costs of doing business.
- Increases the cost of insurance
- They are directly assessed to fund guaranty fund
- Competition is distorted, as insurers can be lax in their underwriting standards.
- Allows financially weak insurers to compete at same level as strong ones

b.

Post-Insolvency Assessment -

Advantages

- Assessments offset by recoveries from insolvent insurers' estates
- Tax credits may allow insurers to avoid part of the cost of their assessments
- More accurate assessment.
- Company retains asset to earn investment income
- If no one goes bankrupt, no payment is required, so rates and/or expens are kept down and there is less interference in the market

Disadvantages

- Assessment on all solvent insurers currently operating in the state
- Could be a large amount at once, not expected
- Maximum assessment may not cover insolvencies due to catastrophes
- Can be costly and adversely impact financial results abruptly (cause erratic financial results)

Pre-Funded Assessment -

#### Advantages

- Assessment on all insurers operating in the state
- Pre-funding can build a catastrophe fund
- GF can invest funds so smaller assessments
- Even, small and regular payments will need to put in. This allows for insurers to plan for assessments
- Motivates insurers to accurately make rates to avoid insolvency
- Less delay in paying claims affected insureds because funds available
- Insured's (Public) peace of mind that fund is present

#### Disadvantages

- Requires insurers to fund when there may not be a need. They could be investing those funds.
- Assessments may be passed on to policyholders and the fund might never be used.
- If not enough funds, may be exhausted and still have to assess more.
- It is difficult to estimate cost ahead of time so could be over/under assessing

#### 14. Examiner's Report

Part a is straightforward, while Part b is somewhat less straightforward especially since the pre-funded approach is discussed only briefly in the syllabus readings. Nevertheless, candidates could provide logical responses that evaluated the advantages and disadvantages.

Common errors included:

- In part a, some candidates didn't list both the positive and negative effects and only opined on whether it was positive or negative overall.
- In part b, some candidates confused the pre and post funding attributes and answered the parts in reverse.
- Some confused the effects of insureds with insurers and vice versa.
- Some candidates incorrectly mentioned that guaranty funds apply to reinsurers.
- Some candidates repeated answers, for example, reporting the same answer for all stakeholders in part a, "Increases the cost of insurance." For part b, some candidates stated that an advantage of pre-funded assessment was the speed of claims payments (quicker) while a disadvantage of the post-insolvency assessment was the speed of claims payments (slower).

#### 15. Sample Answers

a.

##### Sample 1

Surplus is allocated according to following formula:  
$$\text{total mean surplus} \times (\text{mean loss reserve} + \text{mean UPR} + \text{EP during the year of the line of business}) / (\text{total mean loss reserve} + \text{total mean UPR} + \text{total EP during the year})$$

##### Sample 2

$$\text{avg PHS} / \text{Total}[\text{avg L\&LAE RSV} + \text{avg UEPR} + \text{cur EP}] * \text{LOB}[\text{avg L\&LAE RSV} + \text{avg UEPR} + \text{cur EP}]$$

##### Sample 3

allocated by the lines proportion of the insurers "A: mean net loss and LAE reserves, mean net unearned premium reserves, and calendar year earned premium" where net means net of

reinsurance (direct + assumed – ceded) and mean is the average of the latest two years, e.g.  
Surplus of line = Surplus Total x A (line) / A (total)

Sample 4

For all lines: Surplus Ratio (A) = Mean PHS / [Mean loss & LAE + Mean UEPR + Earned Premium (current year only)] aggregate all lines. For each line A x [Mean Loss & LAE + Mean UEPR + Earned (current year only)] = Surplus allocated to LOB

b.

Sample 1

Does not consider the amount of risk inherent in a LOB. Eg: home & per. Auto -> auto may have more reserves but if home is exposed to Hurricane risk, we'd need to consider that in our surplus allocation.

Sample 2

This method used retrospective reserves to allocate surplus which may not be directly proportional to the amount of risk inherent in each LOB, e.g. HO usually short tailed so this method would allocate little surplus as well but HO is subject to CAT risk, should allocate more. This method is not appropriate for pricing.

Sample 3

Retrospective approach. Not account for rapid growth in premium, and changes in mix of business.

Sample 4

The surplus is allocated based on premiums, reserves, but not based on the inherent risk of a LOB.

Sample 5

Surplus is not actually allocated to each line. When one line has a deficit, surplus from another line can still be used to offset this deficit.

Sample 6

Some lines of business will have more volatile results & therefore should require more surplus e.g. low frequency, high severity lines.

c.

Sample 1

Allocate surplus based on internal model; incorporates CAT & operation risk as well as the risks that RBC includes; incorporates investment & assets risk as well as underwriting risk (reserve & WP)

Sample 2

Should use TVaR approach to allocate surplus as it considers the risk profile of the new business (prospective of each LOB and is better indicator than IEE method i.e. allocate more surplus to HO due to CAT risk which is tail event captured by TVaR)

Sample 3

Formulaically allocate the company's RBC requirement by line based on the above allocation method and allow the company to judgmentally allocate any additional surplus if they deem appropriate. RBC already indicates a minimum capital requirement and is formulaically



derived and allows the company to reflect its operation and business strategies to better indicate its lines of business profitability.

Sample 4

Surplus could be allocated based on leverage ratios. This would allow surplus to be applied by the relative risk of each line of business. Higher leverage ratios/more risky may need more surplus to support that line and lower leverage ratios/less risky may need less surplus.

Sample 5

Look at TVaR of each LOB and allocate it that way. This will give more surplus to a cat exposed LOB.

Sample 6

Using prospective pricing models to assess riskiness & cost of capital. This better reflects risk than just using premium & reserves.

Sample 7

Calculate a risk premium per line and add to the mean loss & LAE reserves to allocate surplus. Surplus allocation would then better match the relative risks of each line of business.

d.

Actuaries (any one of the following):

- For benchmarking data: premium, loss, trend etc.
- Identify LOB/segments that have been more/less profitable -> decide where growth or product innovation may be possible
- Can use the IEE when doing rate filings or comparisons to competitor results by LOB since the information is audited and publically available.
- Determine if there is subsidization between each line and also determine rate adequacy of each line
- Pricing can use for selecting/assessing expense loads

Investors (any one of the following):

- Help decide which insurers to invest in based on results
- Analyze insurer historical profitability to determine investment strategy
- Can see if the company is making good use of the capital they have
- Determine if a given LOB is providing an acceptable return on capital. If the insurer is proposing to grow in a line that is not producing an acceptable return, the investor may pull his investment.

Competitors (any one of the following):

- Competitors can use IEE to see how expenses are allocated and how their expenses compare
- Compare investment income, expenses, UW income, etc. to determine how competitive they are in the market
- Gauge profitability of company vs. themselves -> if comp is profitable in HO but competitor is not, perhaps competitor is pricing in accurately or being adversely selected
- May use to see if a certain line of business is particularly profitable so the competitor can potentially grow in that LOB to earn more profit and compete with the insurer

## 15. Examiner's Report

Parts a and d were straightforward questions. Parts b and c asked candidates to critically evaluate the allocation method and justify an improved method.

- a. The common errors were confusing the surplus allocation with the investible assets or the funds attributable to insurance transactions. In addition, some candidates confused which metrics were averages while others only provided the components without explaining how they are used to allocate to line.
- b. While the majority got full credit for their argument, some candidates failed to construct a complete argument against the current methodology. In some cases, candidates commented on short-tail and long-tail lines of business but didn't provide any detail, such as how cat risk leads to more surplus needed in some short-tail lines.
- c. Many candidates did not provide an answer, while in other cases candidates would propose a method without any justification. Numerous candidates were able to tie in material from other parts of the syllabus or draw from their own experiences.
- d. The vast majority received credit for their descriptions.

#### 16. Sample Answers

- a.  
Ratio = (Reinsurance recoverables over 90 days overdue)/(total recoverable on paid loss & LAE + recovery in last 90 days)  
 $3/(3+10+4) = 17.65\%$  which is less than 20%. Reinsurer is not slow-paying.
- b.  
Provision = 20% \* amount > 90 days overdue (include dispute)  
 $20\%*(3+2+1) = 1.2M$
- c.  
Provision = unsecured recoverables + 20% amount > 90 day late + 20% dispute  
 $[1+2+3+10-3]+20\%[3]+20\%[1+2]= 14.2M$
- d. Any two of the following:
  - It could disclose contract terms. The largest threat to solvency is inadequate reinsurance and it would help identify gaps in coverage.
  - Schedule F could be supplemented by management's best estimate of uncollectibility, which would give an insight into how management views the reinsurer's stability and ability to pay.
  - Provide analysis of reinsurer financial stability in an adverse situation. If a major catastrophe happens, this would ensure the reinsurer has the funds to handle all its obligations.
  - Focus on reinsurer's ratings, since credit risk should vary based on this. Schedule F does not do this at all right now.
  - Redefine arbitrary "20% slowpaying" threshold and focus on reasons for being slowpaying which may be more indicative of credit risk.

- Identify financially strong unauthorized reinsurers and modify their provision. Large provision given to reinsurance placed with unauthorized reinsurers when they could indeed be safe.
- Include exhibit of capital structure of reinsurers. This would give insight of reinsurer financial stability and its risk of uncollectibility.
- Add exhibit of any prior collectability issues with reinsurers. This would allow consideration of ongoing risk associated with the provision.
- It should monitor the quality of collateral that reinsurers are holding. Collateral is worthless if it is unlikely to be redeemable.

## 16. Examiner's Report

Parts a through c represent a fairly straightforward and typical Schedule F question. Part d is much more open-ended, but allows candidates to receive credit if they provide logical and well-supported enhancements. Most candidates were able to provide an answer worth full credit. For those that did not, common errors are listed by part.

- Common errors on the slow pay test ratio:
  - Calculation errors
  - Included disputes in the calculation
  - Did not apply the table amounts provided to the formula correctly
- Common errors on provision for reinsurance for non slow-payer reinsurer:
  - Calculation errors
  - Used the slowpay calculation when concluded the reinsurer was not a slow payer in Part A.
  - Did not include disputes
  - Did not apply the table amounts provided to the formula correctly
- Common errors on provision for reinsurance for unauthorized reinsurer:
  - Included paid amounts in the recoverables amount
  - Used unsecured recoverables to cap the final answer instead of total recoverables
  - Calculation errors
  - Did not include disputes
  - Did not apply the table amounts provided to the formulas correctly
- Common errors on proposing two enhancements to Schedule F:
  - Didn't propose an enhancement, just pointed out shortcoming
  - Didn't explain how suggestion would improve the capacity to monitor credit risk

## 17. Sample Answers

- Any two of the following:
  - Uncollectible reinsurance written off from reinsurer A  
Purpose: To show retrospective fact of how much reinsurance was deemed uncollectible and can be used to compare with provision for reinsurance
  - Unsecured collectibles of 4 million from reinsurer C (> 3% of surplus)  
Purpose: to show potential credit risk of the recoverables

- No disclosure required for reinsurer B because it is not technically considered "in dispute" (needs to be in writing, not by voicemail)  
Purpose: Identify companies that are trying to over-recover from reinsurance

b. Any two of the following:

- Retroactive reinsurance: Covers liabilities that occurred before the effective date of the reinsurance contract.
- Run-off agreements: This is aimed to transfer the risks and benefits of a specific line of business which is not marketed by the company any more.
- Commutations: Insurer accepts payment from reinsurer to release reinsurer from their liability.

c.

- Retroactive reinsurance

Balance Sheet:

- Consideration paid will decrease assets
- Reserves ceded will be recorded as write-in contra-liabilities
- Any surplus gain from the transaction will be recorded as special surplus until the actual recoverable amount received exceeds the consideration paid

Schedule P:

- Since the loss reserves are unaffected by this transaction, Schedule P is not affected

- Run-off agreements

Balance Sheet:

- Reserves transferred recorded as ceded
- Consideration paid recorded as paid loss

Schedule P:

- Schedule P affected by the change in net incurred loss

- Commutations

Balance Sheet:

- Consideration received will increase assets
- The reserve assumed back will increase the loss reserves
- Any gain/loss is recorded as unassigned surplus

Schedule P:

- Since the loss reserves are affected, Schedule P will be affected by an increase of reserves for the current year

## 17. Examiner's Report

All parts of this question were fairly straightforward.

- Common errors included not providing purposes of the disclosures and listing reinsurer B as a required disclosure for being "in dispute."
- Common errors included listing but not describing the transaction and listing transactions not dealing with ceding liabilities for prior occurrences. The most common incorrect answers were structured settlements, novations, and financial reinsurance.
- Common errors included not describing treatment in both the Balance Sheet and Schedule P. Some candidates described treatment in the Income Statement instead of Schedule P.

## 18. Sample Answers

a.

### INDIRECT METHOD:

$$\text{Net EP} = 85,000 - 20,000 = 65,000$$

$$\text{Net IL} = 32k + (43.5k - 34k) + (40k - 36k) + (42k - 40k) + (37.5k - 37k) = 48,000$$

$$\text{U/W Profit} = 65,000 - 16,250 - 48,000 = 750$$

$$\text{Investment Income} = 1,000 + 1,500 + 800 + 2,800 = 6,100$$

$$\text{Net Income Pre-Tax} = 750 + 6,100 - 200 = 6,650$$

Revenue Offset:

$$\text{Chg UEPR} = 2012 \text{ WP} - 2012 \text{ EP} = 70,000 - 65,000 = 5,000$$

$$\text{Offset} = 5,000 * 0.2 = 1,000$$

Chg in Reserve Disc:

$$\text{Beg Reserve} = (37k - 25k) + (40k - 22k) + (36k - 16k) + (34k - 12k) = 72,000$$

$$\text{End Reserve} = (37.5k - 35k) + (42k - 31k) + (40k - 24k) + (43.5k - 21k) + (32k - 9k) = 75,000$$

$$\text{Chg} = 75,000 * (1 - 0.85) - 72,000 * (1 - 0.90) = 4,050$$

Tax Exempt Investment Income:

$$\text{Municipal Bonds: } 2,800 * 0.85 = 2,380$$

$$\text{Dividends: } 800 * [1 - (0.3 + 0.7 * 0.15)] = 800 * 0.595 = 476$$

Regular Taxable Income = Net Income Pre-tax + Revenue Offset + Chg in Res Discount - Tax Exempt Investment Income

$$6,650 + 1,000 + 4,050 - 2,856 = 8,844$$

$$\text{Regular Income Tax} = \text{RTI} * 35\% = 8,844 * 0.35 = 3,095.40$$

$$\begin{aligned} \text{Alternative Minimum Taxable Income} &= \text{RTI} + 75\% * (\text{Tax Exempt Investment Income}) \\ &= 8,844 + 0.75 * 2,856 \\ &= 10,986 \end{aligned}$$

$$\text{Alternative Minimum Tax} = \text{AMTI} * 20\% = 10,986 * 0.20 = 2,197.20$$

$$\text{Tax Liability} = \max(3,095.40 - 500, 2,197.20) = 2,595.40$$

$$\text{Net Income} = 6,650 - 2,595.40 = 4,054.60$$

### DIRECT METHOD:

$$\text{Net EP} = 85,000 - 20,000 = 65,000$$

$$\text{Chg UEPR} = 2012 \text{ WP} - 2012 \text{ EP} = 70,000 - 65,000 = 5,000$$

$$\text{Net IL} = 32k + (43.5k - 34k) + (40k - 36k) + (42k - 40k) + (37.5k - 37k) = 48,000$$

$$\text{Investment Income} = 1,000 + 1,500 + 800 + 2,800 = 6,100$$

Chg in Discounted Reserves:

$$\text{Beg Reserve} = (37k - 25k) + (40k - 22k) + (36k - 16k) + (34k - 12k) = 72,000$$

$$\text{End Reserve} = (37.5k - 35k) + (42k - 31k) + (40k - 24k) + (43.5k - 21k) + (32k - 9k) = 75,000$$

$$\text{Chg} = 75,000 * 0.85 - 72,000 * 0.90 = -1,050$$

$$\text{Paid Loss} = 9k + (21k - 12k) + (24k - 16k) + (31k - 22k) + (35k - 25k) = 45,000$$

$$\text{Taxable EP} = 70,000 - 0.8 * 5,000 = 66,000$$

$$\text{Taxable IL} = \text{Paid Loss} + \text{Chg Discounted Reserves} = 45,000 - 1,050 = 43,950$$

Taxable Investment Income:

$$\text{Municipal Bonds: } 2,800 * 0.15 = 420$$

$$\text{Dividends: } 800 * (0.3 + 0.7 * 0.15) = 800 * 0.405 = 324$$

$$\text{Taxable Investment Income} = 1,000 + 1,500 + 420 + 324 = 3,244$$

$$\text{Regular Taxable Income} = \text{Tax EP} - \text{Tax IL} - \text{Exp} + \text{Tax Inv Inc} - \text{P/H Div}$$

$$66,000 - 43,950 - 16,250 + 3,244 - 200 = 8,844$$

$$\text{Regular Income Tax} = \text{RTI} * 35\% = 8,844 * 0.35 = 3,095.40$$

$$\begin{aligned} \text{Alternative Minimum Taxable Income} &= \text{RTI} + 75\% * (\text{Tax Exempt Investment Income}) \\ &= 8,844 + 0.75 * (6,100 - 3,244) \\ &= 10,986 \end{aligned}$$

$$\text{Alternative Minimum Tax} = \text{AMTI} * 20\% = 10,986 * 0.20 = 2,197.20$$

$$\text{Tax Liability} = \max(3,095.4 - 500, 2,197.20) = 2,595.40$$

$$\text{Net Income} = 65,000 - 48,000 - 16,250 + 6,100 - 200 - 2,595.4 = 4,054.60$$

b. Any three of the following:

- Yields for stocks are typically higher than yields for bonds
- Stocks are more volatile than bonds, and management dislikes erratic income
- Taxes are minimized when stocks and bonds are allocated such that the regular income tax equals the alternative minimum income tax
- Stocks, like loss reserves, are inflation sensitive. Bonds are typically not inflation sensitive.
- State mandated limits on investment holdings may dictate permissible allocations of stocks versus bonds
- Stocks have a higher RBC charge than most bonds
- Should reduce investment risk through diversification by having a proper mix of stocks and bonds
- Stocks are more liquid than municipal bonds
- Should allocate stocks and bonds such that the duration of assets equals the duration of liabilities

## 18. Examiner's Report

- a. Part a of this question involved some very straightforward calculations (EP, incurred loss, change in UEPR, investment gain, etc) and some more challenging calculations (reserve discount, tax-exempt portion of bonds, etc). Common errors included:
- Only including the Incurred Loss from Accident Year 2012 (32,000 instead of 48,000)
  - Policyholder dividends is part of Other Income, it is not part of Underwriting Income or Investment Income
  - Change in Unrealized Capital Gains is a direct charge to surplus and is not to be considered in the Income Calculation
  - Using the Unearned Premium Reserve instead of the Change in the Unearned Premium Reserve (45,000 instead of 5,000)
  - Incorrectly calculating the beginning and/or ending reserves
  - The indirect method uses the change in the reserve discount while the direct method uses the change in discounted reserves
  - Policyholder dividends is part of Regular Taxable Income
  - Many candidates did the maximum (RIT, AMIT) – credit versus maximum(RIT – credit = ARIT, AMIT)
  - A few candidates interpreted “net income” to mean “net of reinsurance” rather than “net of taxes”. However, the syllabus is very clear about what net income means: the annual statement and specifically the statement of income, line 20 says “Net Income”, line 19 is federal and foreign income taxes, and line 20 includes line 19.
- b. Although this part was more open-ended, a variety of considerations could be listed, and most candidates were able to do so. Instead of briefly describing, many candidates only provided a list, which received partial credit.

## 19. Sample Answers

a.

### Sample 1

- The \$4K of pmt plan service fees does not get included in premium
- If policies are written evenly through month, then January should have been weighted 23/24, Feb 21/24 ... Dec 1/24
- NAIC Bond 1 should be carried at amortized cost = \$650

### Sample 2

- Plan Service fee should be put under other income rather than added to written premium
- Earned premium calculation is incorrect. For example the earned premium fraction for Jan should be  $1/24 + 11/12 = 23/24$  rather than  $12/12$
- NAIC bond rating 1 should be recorded as amortized cost rather than fair value

### Sample 3

- Payment plan service fee should not be part of premium calculation
- The way EP is calculated, earned function should consider mid-month
- Bonds:  $650 + 10 + 5 \rightarrow$  Bond Rating 1 should use amortized cost

### Sample 4

- 4000 in payment plan service fees should not be included in premium
- The earned premium allocation method is incorrect; should be 23/24 for Jan, etc. using monthly pro rata.
- Bond NAIC 1 s/b amortized cost of 650

Sample 5

- Payment Plan fees are other income (not Earned Premium revenue)
- EP calculation – only 23/24 of Jan WP is earned in 2012, 21/24 of Feb is earned, etc.
- Bond Class 1 should be at amortized cost (650)

b.

Sample 1

Admitted Assets

$$\text{Bonds} = 650 + 10 + 5 = 665$$

$$\text{Cash} = 30$$

$$\text{Total Assets} = 695$$

$$\text{Earned Premium} = 96 (23 + 21 + \dots + 1)/24 = 576$$

$$\text{UEP} = 96 \times 12 - 576 = 576$$

Liabilities

$$\text{Losses} = 50$$

$$\text{UEP} = 576$$

$$\text{Total Liab} = 626$$

$$\text{Surplus} = 695 - 626 = 69$$

Sample 2

$$\text{Assets} = (650+10+5) + 30 = 695$$

$$\text{Liabilities} = 96 (1/24 + 3/24 + 5/24 + 7/24 + 9/24 + 11/24 + 13/24 + 15/24 + 17/24 + 19/24 + 21/24 + 32/24) + 50 = 626$$

$$\text{Surplus} = \text{Asset} - \text{Liability} = 695 - 626 = 69$$

Sample 3

Asset

$$\text{Bond} = 650+15+5 = 665$$

$$\text{Cash} = 30$$

$$\text{Total} = 695$$

Liab

$$\text{Liab} = \$50$$

$$\text{UEPR} = 576 = 96,000 \times 12 \times 0.5$$

$$\text{Total} = 626$$

$$\text{Surplus} = 69$$

Sample 4

$$\text{Fixed Policyholder Surplus} = 45 + 50 (\text{Change in Bonds}) - 26 (\text{Change in UEPR}) = 69$$

Sample 5



WP – 96,000 (12) = 1,152,000  
EP = 23/24 (96,000) + ... 1/24 (96,000) = 576,000  
UEPR = 576,000  
Surplus = 650 + 10 + 5 + 30 – 50 – 576 = 69

c.

Sample 1

- Losses have been volatile --> reinsurance can be used to stabilize losses
- Writes homeowners so exposed to cat risk --> reinsurance can offer cat protection

Sample 2

- GWP/PHS = 1200/69 = 1739% --> unusual IRIS ratio
- Homeowners insurance is exposed to catastrophe loss thus the insurer should buy reinsurance to protect

Sample 3

- to stabilize loss experience
- to provide cat loss protection since its HO monoline insurer

Sample 4

- Losses have been volatile
- GWP:PHS = 1,152,000 / 69,000 = 16.7 > 900%, so there is too much risk relative to PHS

Sample 5

- Provide surplus relief (high prem:surplus)
- Stabilize loss experience

Additional acceptable responses (any 2 of the following):

- Share Large Risks with Other Insurers – company has a very high premium to surplus ratio
- Reduce Net Liability appropriate to Financial Resources
- Expand Capacity
- Seek Guidance from Reinsurers
- To reduce the impact of large losses
- To increase market share (expand capacity)

d.

Sample 1

- Fair value doesn't adequately reflect the price of the bond
- a better method would be to use min of (amortized costs, fair value) because this is conservative and regulators using SAP want conservatism

Sample 2

- Objection: Fair value doesn't accurately measure historical cost
- Alternative: Amortized cost more accurate

Sample 3

- Insurer usually holds bond until maturity so fair value just introduces more volatility to the evaluation

- should use NAIC valuation and make it consistent

#### Sample 4

- It results in volatility in PHS
- Amortized cost or the lower of Amortized Cost and Face Value may be preferable

#### Sample 5

- Not accurate if now selling now, Volatile
- Amortized cost if holding to maturity

#### Additional acceptable regulator objections:

- Not Verifiable
- Too optimistic/Not Conservative
- Not Liquid
- Not Conservative enough
- More ambiguity
- Overstate or Understate
- Lack of Transparency
- Might fail to pay at the end

#### Additional acceptable alternatives:

- Original Purchase Price Less Depreciation
- Actual Purchase Price
- Face Value
- Average of Fair Value and Amortized
- Book Value
- Average of Face Value and Amortized
- Par Values
- Historical Value/Historical Cost
- Investment Grade Should be Amortized
- Securities Valuation Office (SVO) Value
- Amortized or Fair based on Bond Quality
- Categorize Bonds by Expected Time Held/GAAP Method

### 19. Examiner's Report

- This part was straightforward. The most common error was to discuss that service fees were expensed immediately. The answer needed to make it clear that service fees were not part of written and earned premium. Other common errors were to state the problem but not explain how to correct it.
- Candidates needed to calculate surplus incorporating the 3 corrections from Part A. Candidates could calculate surplus as assets minus liabilities or original surplus plus the change in assets less the change in liabilities. Common errors included the handling of service fees. Service fees were added to assets, left in written premium and added to earned premium. Some candidates included additional items in their calculation of liabilities and assets.
- This was very straightforward and candidates generally received full credit for this part.

- d. The first piece of this question is to explain why a regulator might not accept the use of Fair Value, and many answers were possible. Stating that it should be amortized is not a reason. Another common error was to state that bonds are held to maturity without explaining why Fair Value was not acceptable.

The second part was to recommend another valuation method that the regulator may accept, which is similarly open-ended and many alternatives were possible. However, valuations were not accepted that would not be better than Fair Value in the regulator's viewpoint. Most candidates responded with SAP and GAAP methods.

## 20. Sample Answers

a.

### Part 3E

Subtract the 2004 column from each of the prior and 2003 rows:

$$(479 + 785) - (479 + 785) = 0$$

$$(718 + 972) - (479 + 785) = 426$$

$$(832 + 1,074) - (479 + 785) = 642$$

	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>
Prior	N/A	0	239	353
2003	N/A	0	187	289
New Prior	XXX	0	426	642

The 2004 accident year numbers are the same from the provided data table.

### 2013 Part 3E

	<u>2004</u>	<u>2005</u>	<u>2006</u>
Prior	0	426	642
2004	412	801	989

### Part 2E

Subtract the original table for Part 3E from the table for Part 2E to calculate the reserves. Add the prior and 2003 rows to calculate the 2013 Part 2E prior year reserves.

	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>
Prior	N/A	597	388	317
2003	N/A	499	241	130
New Prior	XXX	1,096	629	447

Add the 2013 Part 3E prior year paid to get the total incurred prior year row:

$$(1,076 - 479) + (1,284 - 785) + 0 = 1,096$$

$$(1,106 - 718) + (1,213 - 972) + 426 = 1,055$$

$$(1,149 - 832) + (1,204 - 1,074) + 642 = 1,089$$

The 2004 accident year numbers are the same from the provided data table.

### 2013 Part 2E

	<u>2004</u>	<u>2005</u>	<u>2006</u>
Prior	1,096	1,055	1,089
2004	1,347	1,346	1,272

b.

(Part 2 Incurred – Part 3 Paid – Part 4 Bulk & IBNR Reserves) / (Part 5 Section 2 Claims Outstanding)

c. Any three of the following:

- Monitoring the solvency of insurers.
- It shows experience by line and by accident year, thereby isolating blocks of business with good or poor experience.
- The accident year figures in Schedule P show the effects of changes in loss reserve margins on the calendar year results reported elsewhere in the Annual Statement.
- It provides the loss payment patterns for the federal income tax loss reserve discounting procedure
- It provides the disclosures needed for grossing up losses for interest discounts and for anticipated salvage and subrogation for the federal income tax calculation.
- It provides data for computing the reserving risk and/or written premium risk charges in the risk-based capital (RBC) formula
- It provides the loss payment patterns for the investment income offsets in the RBC formula.
- Provides the data for the non-tabular discount adjustment to surplus for the RBC ACL ratio.
- It shows the percentage of premiums and reserves related to loss-sensitive contracts
- To determine the sensitivity of premiums and/or reinsurance commissions to losses on loss sensitive contracts.
- Allows for the calculation of the loss-sensitive contract offset in the RBC formula.
- It separates occurrence from claims-made experience for the RBC claims-made offset.
- It supports the opinion (SAO) of the Appointed Actuary on loss and loss adjustment expense reserve adequacy.
- It shows the development of exposure year premiums from audits and retrospective adjustments.
- Part 6 allows for a more accurate comparison of loss ratios by accident year/exposure year.
- Provides the information to determine the tax basis earned premium for lines with audits or retrospective adjustments.
- It shows direct plus assumed versus ceded experience, so that the effects of reinsurance on accident year loss ratios can be examined.
- It shows claim count development patterns and changes in average claim severity by year, allowing better analysis of claims department performance.
- Used by actuaries and/or financial analysts to estimate a company's net worth.
- Shows loss development patterns for use in rate indications.

### 20. Examiner's Report

- a. Generally, candidates did well on this part. The majority understood how to calculate the prior year row for Part 3E (Paid); however, the most common error was forgetting to write down the 2004 accident year row. Also, subtracting out the 2003 column (rather than 2004 column) in the calculation of the prior year paid was another common error. The prior year row for Part 2E (Incurred) was more of a challenge, but many candidates were able to successfully calculate the

reserves, and add in Part 3E. The most common error here was also the omission of the 2004 row.

- b. This part was fairly straightforward, and many candidates provided the correct answer. The most common error was forgetting to subtract Part 4 (Bulk & IBNR) to derive the case outstanding.
- c. The majority of candidates were able to successfully describe two or three additional functions of Schedule P, as there were many acceptable answers to this part.

## 21. Sample Answers

- a. Candidates could select 2 of the 4 risks:
  - Asset Risk – either of the following:
    - The risk that bond will default, the market value of stock and other investments will fluctuate
    - Risks that assets such as bond and equity investments lose value
  - Credit Risk – either of the following:
    - The risk that counterparties will be unable or unwilling to pay such as reinsurance recoverables default
    - Risk that counterparties such as reinsurers will not pay as expected
  - Underwriting Risk – either of the following:
    - Risk that losses will develop adversely and risk that business written over the coming year will be unprofitable
    - Risk that premiums will be insufficient to cover losses & expense and that reserves may develop adversely
  - Off-Balance Sheet Risk – either of the following:
    - Risk related to having insurance subsidiaries and off-balance sheet items (RO)
    - This includes pass-throughs from affiliates; outside the square root covariance adjustment; & other misc. items like non-controlled assets & contingent liabilities
- b.
  - $RBC \text{ (in \$millions)} = 12 + \text{SQRT}[5^2+6^2+4^2+20^2+25^2] = \boxed{\$45.196M}$
  - $\text{Authorized Control Level (ACL)} = 50\% * RBC = \boxed{\$22.598M}$
  - $\text{Adjusted Capital} = \text{PHS} - \text{Non-Tab discount} - \text{Tab discount on Medical} = 35 - 4 - 1 = \boxed{30M}$
  - $RBC \text{ Ratio} = \text{Adjusted Capital} / \text{ACL} = 30.0/22.6 = \boxed{1.327}$
- c. Regulatory Action Level
- d. Actions
  - Company – either of the following:
    - i. The company must submit a plan to the commissioner on how it plans to reduce risks or increase surplus
    - ii. Company must submit a plan to regulator detailing how it will raise capital or reduce risk
  - Regulator – either of the following:
    - i. Regulator may ask the insurer to take corrective action such as limit new business but this action is discretionary
    - ii. Regulator has the power to take corrective action against insurer but is not required to do so.

## 21. Examiner's Report

All parts of this question involved straightforward recall of basic RBC concepts.

a.

- The most common error was candidates listing R4 Reserve Risk and R5 Written Premium Risk as the 2 risks. These are both part of Underwriting Risk as described in both the Porter and Odomirok readings. Partial credit was given for this answer.
- Similarly, R1 Fixed Income Risk and R2 Equity Risk are both part of Asset Risk. Partial credit was given for this answer.
- R4 Reserve Risk is the risk that the company's recorded loss & LAE will develop adversely under assumption that current reserves are adequate; it does not account for reserve inadequacy (insufficient reserves). No credit was given for a description of insufficient or inadequate reserves.

b.

- Candidates were required to calculate the RBC ratio as described in the Odomirok reading.
- The most common errors were miscalculation of Adjusted Capital (Policyholder Surplus) with the tabular discount and failure to apply the ACL adjustment.
- A less common error was the miscalculation of RBC with a duplicate application of the reinsurance charge adjustment. As stated in the question "The Reserve RBC exceeds the sum of the credit risk RBC for non-invested assets and reinsurance recoverable. *This has already been contemplated in the R3 and R4 figures shown above.*" No adjustment was required for R3 and R4 prior to calculating the covariance adjustment.
- Another frequent error was incorrectly stating the RBC ratio formula by inverting the ratio (i.e.  $PHS / (\text{Adjusted Capital} \times 0.50)$  )

c.

- Incorrect answers tended to be with the application of the ACL adjustment to the ranges.

d.

- At the Regulatory Action Level (correct response), the most common error was failing to indicate that all regulator actions were discretionary; nothing is mandated.
- Credit was not given for indicating that the company needed to "improve the RBC ratio". More specific actions were required such as reduce risks, increase surplus, raising additional capital, etc.
- For the Authorized Action level (resulting from an incorrect calculation in Part B), the most common error was listing the company actions similar to the Regulatory Action Level (i.e submitting a plan for Capital improvement or risk reduction) when no company action is required.

## 22. Sample Answers

a. Any two of the following:

- The less that is known about the current estimate and its trend, the higher the risk margin should be. Generally, WC should have a higher risk margin than AL as it is longer-tailed and subject to uncertainties such as medical inflation.

- Risks with low frequency and high severity (i.e., WC) will have higher risk margins than risks with high frequency and low severity (AL).
- AL generally has specified policy limits whereas WC medical benefits are generally unlimited.
- Risks with a wide probability distribution will have higher risk margins than those risks with a narrower distribution. WC generally has a wider probability distribution than AL due to the nature of the coverage, the higher level of uncertainty, and the longer run-off period.
- To the extent that emerging experience reduces uncertainty, risk margins will decrease, and vice versa. As WC and AL experience emergencies, the uncertainty in estimates of each will generally decrease, leading to decreasing risk margins. However, as AL tends to be shorter-tailed in nature than WC, the risk margins for AL liabilities should decrease quicker than those for WC liabilities.
- WC could be impacted by mass tort claims (e.g., asbestos) that could have a significant impact on loss reserves and may not emerge for years or decades. Because AL does not have this type of exposure, the risk margins for WC should be higher to reflect this possibility.

b. Any two of the following approaches (with one of the corresponding descriptions):

- Confidence Level Technique / Value at Risk (VaR)
  - Expresses uncertainty in terms of the extra amount that must be added to the expected value so that the probability that the actual outcome will be less than the amount of the liability (include the risk adjustment) over the selected time period equals the target level of confidence.
  - Set risk margin equal to the x% percentile of the loss distribution minus the expected level (mean) of the distribution.
  - Set risk margin to limit probability of ruin to a certain percentage.
  - Set risk margin such that the probability that the actual loss outcome is greater than [booked reserve + risk margin] is equal to a target probability.
- Conditional Tail Expectation (CTE) / Tail Value at Risk (TVar)
  - Set risk margin equal to the mean of losses within a certain band (or tail) of pre-defined percentiles of the loss distribution minus the expected level (mean) of the distribution.
  - Set risk margin equal to the average conditional loss given the loss exceeds certain threshold minus the expected level (mean) of the distribution.
- Cost of Capital Method
  - Set risk margin based on the amount of return required for the total return for the insurance enterprise to be adequate.
  - Set risk margin equal to the present value of [the amount of capital required to support future reserves] x [the required cost of capital in excess of the risk free rate].
  - Calibrate risk margin to reflect a certain return on investment that would satisfy investors for bearing the risk of insurance reserve liability.

c.

SAP:

- No risk margin
- No risk margin allowed
- No explicit risk margin but undiscounted reserves imply a risk margin

GAAP:

- No risk margin
- No risk margin allowed
- No explicit risk margin but undiscounted reserves imply a risk margin
- Generally no risk margin

- Risk margin is allowed for fair value (i.e., P-GAAP) reserves
- IFRS:
- Risk margin required
  - Explicit risk margin must be included

## 22. Examiner's Report

Parts a and c required candidates to compare basic principles of risk margins. Part b was straightforward.

- a. Candidates generally did well on this part. Common errors included:
- Listing two generic differences between lines of business relevant to risk margins, but not specifying how they corresponded to auto liability and workers compensation. This type of answer displayed an understanding of risk margin considerations, but not of the lines of business addressed in the question.
  - Incorrectly classifying the characteristics of each line of business. Common incorrect answers included “Workers compensation has a shorter tail than auto liability” or “Auto liability is a high-severity, low-frequency line relative to workers compensation”.
  - Focusing on differences that related to prospective pricing concerns as opposed to reserve risk margin concerns (e.g., legislation changes or catastrophes). For example, a common answer stated that auto liability was subject to more catastrophic exposure due to weather-related catastrophes (such as hurricanes), but this is more of a pricing concern than a reserve risk concern.
  - Mentioning an additional desirable characteristic of risk margins that is not relevant to the question. For example, stating that “For similar risks, contracts that persist over a longer timeframe will have higher risk margins than those of shorter duration.” However, the risks underlying WC and AL are different, so this characteristic is not applicable.
- b. Candidates did not do as well on this part. Common errors included:
- Listing ideal characteristics of a risk margin, rather than IAA’s approved approaches to calculating the risk margin. In these answers, candidates did not comment on methods used to compute the risk margin itself, which is what the question asked.
  - Stating that metrics such as the VaR or TVaR were equal to the risk margins, rather than demonstrating how the risk margin is derived from these metrics (for example, when using TVaR to compute a risk margin, the TVaR gives the sum of booked reserves (the mean) and the risk margin, and so to get the risk margin, one must subtract the mean estimate from the TVaR). In general, candidates did not do an adequate job of providing sufficient definitions of the methodologies that displayed an understanding of how the margin was calculated under each approach.
  - Listing generic methodologies not addressed in the syllabus readings as IAA-approved methods of computing risk margins. Common alternative answers falling in this category include % of Reserves, % of Premium, and Expected Policyholder Deficit.
  - Using other generic descriptions of risk margins that did not refer to any specific methodology, such as simply stating “implicit risk margin” and “explicit risk margin”.
- c. The quality of responses to this part varied greatly among the candidates. Common errors included:
- Answering the question in the context of discounting rather than risk margins. For example, many candidates only referenced that the lack of discounted reserves in SAP and GAAP represents an implicit risk margin. While this is true, it does not address whether or not the



- accounting standard allows and/or requires an explicit risk margin (which is the point of the question).
- Responding that SAP/GAAP “do not require” risk margins (as opposed to “do not allow” risk margins, which is the correct response) and/or that IFRS “allows” risk margins (as opposed to “requires” risk margins, which is the correct response).
  - Incorrectly specifying the IFRS requirement (e.g., stating that IFRS requires the use of the VaR metric).

## 23. Sample Answers

a.

### Sample 1:

**Quantitative Requirements:** Each company must calculate their required capital for the SCR requirement. (Capital to reduce firm failure to 0.5%). They can use an internal model, the defined formula, or a combination of the two.

**Supervisory Review:** This step allows the supervisors to review the risks to ensure they hold enough capital. They also review compliance with internal audit requirements, actuarial function requirements, that they are effectively using risk management, and compliance with Solvency II as a whole. Supervisors have the ability to intervene when they think necessary.

**Supervisory Reporting:** This pillar focuses on transparency. The results of the review are available to the public so they can ensure appropriate, timely actions are taken by the supervisors.

### Sample 2:

**Quantitative Requirements:** Includes calc of reserves, required capital, and investment management

2 separate capital requirements, MCR and SCR (see part b)

Internal models encouraged to determine capital requirement – better alignment of risk with required capital and stronger incentive for risk management – models require regulator approval

Focuses on asset and liability risk – market consistent valuations

**Supervisory Review:**

Identifying firms with high risk profiles

Make sure regulators have authority to intervene

Evaluating the quality of management, corporate governance, internal controls, etc.

Functions for insurer include internal audit, risk management, actuarial, and compliance

Also requires the development of ORSA

**Supervisory Reporting & Public Disclosure:**

Making sure info is available for market discipline

### Sample 3:

**Pillar I – Quantitative Requirement – Capital needed, SCR & MCR.** Either standard formula or models calculate this

**Pillar II – SRP Qualitative Requirements – Supervisory review process.** Extent to which companies’ strategies, reporting procedures, and processes are compliant with Solvency II

**Pillar III – Disclosure – How transparent the company is with the public.**

b.

Sample 1:

MCR – minimum required; can't operate below

\* SCR: based on a 99.5% VaR, which can be determined using standard formula or internal model – amount of capital required to remain solvent at 99.5% percentile of aggregate loss distribution

Sample 2:

It is the economic capital needed to limit the probability of ruin to 0.5%. Falling below this level may lead to supervisory action.

c.

Sample 1:

ORSA is an internal assessment of the firm's risk and solvency need. It should review capital requirements, make sure it satisfies the requirements of the technical provision, and review large differences to the SCR. It can be used as a tool for decision making and allows the supervisors a better understanding of the firm's risks. It's a comprehensive review of all the company's investments, practices, risks.

Sample 2:

ORSA Processes used to identify, assess, manage, monitor, and report all risk insurance company faces or may face, and determine own funds needed to ensure solvency at all times. 2 objectives = assist insurer decision-making and help regulators better understand risk profile of company.

Should include minimum of:

Overall solvency needs

Compliance with capital requirement

Extent to which risk profile deviates from assumptions underlying SCR

Sample 3:

An internal assessment of the overall solvency need based on a firm's risk profile. It can be a tool for decision making, and a tool for supervisors to better understand a firm's risks.

At a minimum it should contain:

The overall solvency need based on the specific risk profile

Compliance with solvency capital requirements and the requirements of the technical provision

The extent to which the risk profile deviates from the underlying assumptions in the SCR

## 23. Examiner's Report

All parts of this question were straightforward.

- a. Most common error was not describing the qualitative aspect Pillar II. Many candidates' responses were similar to their Pillar I answers about the solvency requirement calculations.
- b. Most common error was giving only a limited description of SCR. Generally, these candidates only provided the VaR component and didn't include the option to use standard or internal models or discuss the regulatory action levels.
- c. Most common error was giving too limited of a description of ORSA. Many candidates that knew the definition of ORSA only included the risk identification and monitoring component but

didn't include the link to solvency assessment or any of the uses or objectives of ORSA or the minimum requirements of an ORSA.

#### 24. Sample Answers

##### Materiality Standard:

A \$5m drop in surplus (=\$35m) will make the company fall into the Company Action Level (= \$30m)

OR

5% of surplus (1.75M)

OR

10% of surplus (3.5M)

OR

25% of surplus (7M)

##### Risk of Material Adverse Deviation:

The actuary's range of reasonable reserves is 47-63. The current booked reserve is 55. Since  $55+5 = 60$  is still within the actuary's range of reasonable reserves, there is a risk of material adverse deviation.

OR

Based on this standard, there exists a risk of material adverse deviation. Risks include Asbestos and environmental exposures.

##### IRIS Ratios:

IRIS 11:  $6/29 = .207$ , which is greater than the 20% threshold. This is an unusual value

IRIS 12:  $5/28 = .179$ , which is less than the 20% threshold. This value is in the usual range.

IRIS 13: Average of  $(49+6)/85$  and  $(50+5)/80$  equals 0.66725.

$$0.66725 * 90 = 60.05$$

$$60.05 - 55 = 5.05$$

$5.05/35 = .144$  This is less than the 25% threshold. This value is in the usual range.

##### Reinsurance collectability:

Reinsurance collectability may be an issue. The company is ceding a significant portion of its total reserves.

#### 24. Examiner's Report

This is a very open-ended question where candidates needed to evaluate the information provided in the table, discuss the conclusions that could be drawn, and provide the required disclosures for the SAO.

##### Materiality Standard:

Most candidates correctly selected a reasonable materiality standard. A few candidates lost some credit by suggesting a high standard of \$20M.

##### Risk of Material Adverse Deviation:

Most candidates answered correctly. Some candidates failed to receive full credit by stating that there was risk without any explanation.

##### IRIS Ratios:

The question required the candidates to calculate the IRIS ratio, compare to a threshold, then explain whether the ratio was usual or unusual. Most candidates calculated IRIS 11, 12 and 13 correctly and included the correct threshold and verbiage. Many only included verbiage for IRIS 11 (unusual) and excluded verbiage for 12 (usual). Others included either the threshold or the verbiage but not both. Some left out the IRIS ratios entirely.

Reinsurance collectability:

Most candidates failed to discuss reinsurance collectability.

## 25. Sample Answers

a. Scope

b.

- 1) Federal regulatory officials → State regulatory officials
- 2) November 30, 2012 → December 31, 2012
- 3) Schedule P, Part 2 and 3 → Schedule P, Part 1
- 4) Zeta Insurance Company → Need to specify the person who provided the data. (Full credit still given for answers that did not specify that it must be an officer of the company)

## 25. Examiner's Report

Part a is straightforward. Part b required candidates to apply basic concepts from the SAO to a specific example.

a. Credit was given for answers that identified that any portion of the excerpt was in the Scope section. Common incorrect answers included:

- Actuarial Report
- Introduction
- Relevant Comments
- Opinion
- Summary Section
- Actuarial Opinion Summary
- Identification

b. Credit was given for answers that correctly identified the solution while only implying the error. There were two types of common errors:

1. identification of something that wasn't an error
2. providing an incorrect solution to a correctly stated error

1. Common incorrectly identified errors:

- Opining actuary not identified
- Use of "the Company" in the first paragraph not specific enough
- "Reserves listed in Exhibit A", in first paragraph not specific enough (e.g. Loss and LAE)
- In paragraph one, Exhibit B should replace or be included in addition to Exhibit A
- In the second paragraph, the "tests of the calculations" were not named
- In the second paragraph, the "tests of the calculations" should state "In accordance with the laws and regulations of state of domicile"
- Exhibit A is not in the Annual Statement

- Statement of Opinion on the reserves is missing
  - Significant changes in assumption/methods used was not listed
  - No reference to discussion with management
  - Did not state that the assumptions/methods are consistent with the accepted practices in the actuarial community
  - Did not state that they reviewed Schedule F for any possible reinsurance uncollectability issues
  - Should state “booked in the financial statements” instead of “listed in Exhibit A”
  - “Reasonableness and accuracy” should be used in place of “consistency” in the second paragraph
  - Should mention whether the amount in Exhibit A meets the requirements of the insurance laws of domiciled state.
  - Should comment on the result of the data reconciliation
2. Common incorrect solutions:
- Identified that filing with the federal regulator officials was incorrect, but:
    - Implied that the federal filing should be in accordance with the laws of the state
    - Stated that it should be filed with the NAIC
  - Identified that the review date of November 30, 2012 was incorrect, but:
    - Stated the item was unnecessary, should be removed, or moved to another section of the Actuarial Opinion
    - Changed both review date and the evaluation date, resulting in evaluation date that was after the new review date
  - Identified that the data should not be reconciled with Schedule P, Part 2 and 3, but:
    - Stated that it should be reconciled to all of Schedule P, the Income statement, current or previous year’s annual statement
    - Specifically listed only incorrect portions of Schedule P
    - Stated the item was unnecessary, should be removed, or moved to another section of the Actuarial Opinion
  - Identified that it was wrong to reference Zeta Insurance Company in the first sentence of the second paragraph, but:
    - Stated the item was unnecessary, should be removed, or moved to another section of the Actuarial Opinion Remove the section (or not need)
    - Replaced Zeta Insurance Company with something other than a responsible individual for the data (e.g. auditor, IT department)

## 26. Sample Answers

- a. The appointed actuary is required to opine on:
- Direct & Assumed Loss Reserves
  - Direct & Assumed LAE Reserves
  - Net Loss Reserves
  - Net LAE Reserves

$$\text{D\&A Loss Reserves} = \text{columns } 13+15 = 4,480 + 3,360 = 7,840$$

$$\text{D\&A LAE Reserves} = \text{columns } 17+19+21 = 1,120 + 448 + 224 = 1,792$$

$$\text{Net Loss Reserves} = \text{D\&A} - \text{ceded} = 7,840 - \text{columns } 14 \ \& \ 16 = 7,840 - 2,240 - 1,680 = 3,920$$

$$\text{Net LAE Reserves} = \text{D\&A} - \text{ceded} = 1,792 - \text{columns } 18, 20, 22 = 1,792 - 560 - 224 - 0 = 1,008$$

Alternative answers for part a:

- For Direct and Assumed, also accepted Gross Loss Reserves and Gross LAE Reserves
- For Net, also accepted just Loss Reserves and LAE Reserves – Exhibit A of Actuarial Opinion does not specifically include the word Net
- Also accepted word Unpaid in lieu of Reserves

b.

D&A Loss Reserves – No, they do not appear elsewhere in the Annual Statement

D&A LAE Reserves – No, they do not appear elsewhere in the Annual Statement

Net Loss Reserves – Yes they do appear elsewhere – accepted any one of the following:

- Page 3, Liabilities
- Five Year Historical Data Exhibit
- Underwriting and Investment Exhibit

Net LAE Reserves – Yes they do appear elsewhere – accepted any one of the following:

- Page 3, Liabilities
- Five Year Historical Data Exhibit
- Underwriting and Investment Exhibit

Alternative answers for part b:

Answers such as Balance Sheet, simply Page 3 were accepted in lieu of Page 3, Liabilities

26. Examiner's Report

a. This part required candidates to demonstrate their knowledge of the SAO by evaluating the Schedule P information provided. Most candidates did very well on this part. Three common errors were:

- Listed DCC Reserves rather than LAE or showed DCC and AO as separate items to be shown on Exhibit A
- Listed LAE Reserves but then only included DCC in the calculation portion of those reserves
- Combined the Loss and LAE amounts into a single entry (eg. Net Loss and LAE instead of Net Loss and Net LAE as two separate values on Exhibit A)

b. This part required candidates to recall items within the Annual Statement.

On a D&A basis, common errors were:

- Listed IEE or AOS as alternative locations – these are not part of the Annual Statement.
- Listed Schedule P as an alternative location – Schedule P does not show the D&A Loss and LAE Reserves other than in Part 1 shown in the question. (Some candidates mentioned they could be calculated by subtracting/adding different parts of Schedule P but that is not the same as appearing in the Annual Statement.)
- Listed Schedule F as an alternative location – Schedule F, Part 9 (formerly Part 8), which restates the balance sheet from a Net to Gross basis, shows Gross Loss and LAE Reserves in Total/Combined.

On a Net basis, common errors were:

- Net Loss and LAE Reserves shown combined or mentioned that they are combined on Page 3 or other exhibit, as opposed to separately

- Listed IEE or AOS as alternative locations. These are not part of the Annual Statement.

There were also numerous candidates who listed correct locations for the net reserves, but did not comment on D&A at all. The question clearly said to “Identify whether each value” appears elsewhere “and if so identify one location”.

## 27. Sample Answers

- a. “Qualified Actuary” is a person who is either:
  1. A member in good standing of the CAS, or
  2. A member in good standing of the American Academy of Actuaries (AAA) who has been approved as qualified for signing casualty loss reserve opinions by the Casualty Practice Council of the AAA.
- b. Refers to contracts, excluding financial guaranty contracts, mortgage guaranty contracts and surety contracts, that fulfill both of the following conditions:
  1. The contracted term is greater than or equal to thirteen months
  2. The insurer can neither cancel nor increase the premium during the contract term
- c. Financial hardship is presumed to exist if the projected reasonable cost of the Actuarial Opinion, exceeds the lesser of:
  1. 1% of the insurer’s latest quarterly reported statutory surplus
  2. 3% of the insurer’s direct plus assumed premiums written during the calendar year.
- d. The actuary should include an explanatory paragraph in the statement of actuarial opinion. The explanatory paragraph should include the following:
  1. The amount of adverse deviation that the actuary judges to be material with respect to the statement of actuarial opinion
  2. A description of the major factors or particular conditions underlying risks and uncertainties that the actuary believes could result in material adverse deviation.

## 27. Examiner’s Report

All parts of this question required straightforward recall from COPLFR.

- a. Common errors included:
  - It is not sufficient to simply mention that you be a member of the CAS, “Good standing” is key.
  - Saying you need to be an FCAS is wrong, despite mentioning one needs to be in good standing.
  - Not enough to mention in good standing with the AAA, should also mention something relevant to being qualified by the AAA to sign opinions.
- b.
  - Many candidates missed the need to mention excluding financial guaranty contracts, mortgage guarantee contracts and surety contracts, etc.
- c.

- Some candidates failed to mention the *lesser* of those two conditions (or include an either/or statement since this implies lesser and is therefore acceptable).
- Statement on premium or reserves <\$1M is not appropriate for this question, this is geared towards the small company exclusion.
- Some candidates swapped the 1% / 3% figures, or included incorrect amounts.

d.

- Answers similar to “Deviation Standard” implies amount and is acceptable.
- There were many variations for this answer. Any answers with the correct ideas were accepted.

## 28. Sample Answers

a.

Sample 1. The contract does not pass the threshold since  $0.9\% < 1.0\%$

Sample 2. No, since  $ERD = 0.9\% < 1\%$

Sample 3. It does not pass as it does not exceed the 1% threshold. Not enough risk is transferred.

b.

Sample 1. Cannot use reinsurance accounting

-reserves cannot be shown net of reinsurance

-will have to account for as a deposit

Sample 2. This contract is recorded as a deposit with the reinsurer and loss reserves are not shown net of this contract.

Sample 3. The insurer accounts for this contract as a deposit, whereby the reserves are not reduced by the recoverable amount.

Sample 4. This will receive deposit accounting, and will not receive the surplus benefits of reinsurance accounting

c. Candidates could provide any three of the following answers:

- Reinsurer expenses should not be included because only transactions between insurer and reinsurer should be considered.
- Profit commission should not be considered as there will be no commission in a loss scenario.
- Assumptions from pricing analyses should be used with extreme caution, as pricing analyses focus on the expected value of losses under all scenarios. ERD/risk transfer analyses only focus on the tail of the distribution.
- Parameter Risk: can be accounted for explicitly (distribution around parameter) or implicitly (higher expected loss and standard deviation).
- Selection of Payment Patterns: Select the ceding company’s payment pattern carefully because this affects the tail of the distribution.
- Loss distribution needs to be considered, especially for reasonable results in the tail.
- Interest rate should be reasonable and the same for premiums and losses. Interest rate risk should not be a factor to consider.
- Parameter Selection: the model will be sensitive to the loss distribution parameters that we select. So be diligent in the study of those parameters.
- Commutation Clause: If commutation clause exists, how does this impact reinsurer’s potential loss.
- Loss sensitive business: appropriately reflect structure of contracts when evaluating, especially those factors that would limit a reinsurer’s loss.



- Premium Amounts (if change with contract provisions) could use:
  - a. Initial – can be manipulated easily
  - b. Expected – overstates risk transfer if not adjusted up with losses
  - c. Actual – from simulation. Most difficult and best

## 28. Examiner's Report

This is a straightforward question asking candidates to recall basic elements of risk transfer.

- a. Common errors included:
  - Only answering that it failed the risk transfer test without briefly describing why.
  - Stating that the contract passed the threshold test.
- b. The most common error was answering the question with deposit accounting, but failing to describe the accounting impact on the ceding company's statutory balance sheet.
- c. Common errors included:
  - Candidate listed practical considerations but did not briefly describe them.
  - Candidate listed considerations relating to the ERD threshold. The question asked the candidate to identify and briefly describe practical considerations when calculating the ERD, not the threshold.
  - Candidate listed general considerations but was not specific in the description of those considerations (i.e. commissions, assumptions, etc.)
  - Candidate listed the same consideration multiple times with different explanations.

## 29. Sample Answers

- a. Any one of the following:
  - A process where all future obligations are current valued, taking into account financial and non-financial aspects, to speed up run off and pay out
  - A contract where future obligations of one party is current valued, taking into consideration financial, legal, administration and taxes to accelerate payment and close claims
  - Commutation is where an insurer accepts payment from reinsurer to be responsible for the entire reserve amount and development on those reserves for a payment (usually ambivalence point). Effectively ends the reinsurance agreement/contract
- b. Any two of the following:
  - Reinsurer wants to accelerate settlement
  - End relationship with insurer not paying premium or reporting on time
  - The reinsurer values "perceived" wealth when considering financial & non-financial aspects
  - Reinsurer may lack attractive investment opportunities in the funds held, so it's better off paying off the obligation
  - Concerned about future legislative changes that could increase costs of WC claims
  - Reinsurer is willing to pay extra to avoid the uncertainty of how the losses will develop in the future
  - Reinsurer may save loss adjustment expenses due to the sale of the contract
  - ALAE and ULAE savings
  - Reduce admin cost

- Tax benefit – loss observed will give income tax relief
  - To aid the insurer in exiting a market
- c. Any two of the following (if unique from those provided in part b above):
- Insurer may want accelerated settlement over disputed obligations between both parties
  - Insurer's actual wealth would increase because it now holds more cash
  - The insurer is looking for cash flow for investments or liquidity reasons
  - Increase in cash – ceding may need cash to meet current claim payment badly
  - Certain payments – no worry about reinsurer insolvency
  - Insurer has concerns about the financial strength of the reinsurer and its ability to pay
  - The insurer wants to reduce administrative costs associated with monitoring and collection efforts
  - Potential tax savings from underwriting loss
  - Believes it can settle claims for less than current values
  - Price is greater than the calculated ambivalence point so thinks it is a good decision
- d. Any one of the following:
- Loss reserves would be reduced and asset would be reduced since cash/consideration is paid
  - Cash reduced and reserve set to 0 to reduce liabilities

## 29. Examiner's Report

This question required some extrapolation from the syllabus material.

- a. Candidates generally did not answer this part of the question in enough detail. However, most candidates received some credit. Common incorrect answers included:
- Insurer re-assumes business previously ceded – does not provide sufficient information
  - Agreement by which reinsurer and reinsured agree to settle the reinsurance contract's outstanding obligations and finalize their duties – does not provide sufficient information
- b. Candidates generally responded well to this part of the question. An explanation was needed if a listed reason was not self-evident. Common incorrect answers included confusing the reinsurer and primary insurer roles in commutation and assuming that discounting would increase the commutation price.
- c. Candidates generally responded well to this part of the question. An explanation was needed if a listed reason was not self-evident. Common incorrect answers included confusing the reinsurer and primary insurer roles in commutation and listing the same reasons from part b.
- d. Most candidates received some credit on this part. The most common error was that candidates answered with effects on the income statement instead of the balance sheet. Some candidates listed an increase in paid loss but did not mention a decrease in assets.