
SOCIETY OF ACTUARIES
Financial and Regulatory Environment – U.S.

Exam GIFREU

MORNING SESSION

Date: Friday, May 2, 2014

Time: 8:30 a.m. – 11:45 a.m.

INSTRUCTIONS TO CANDIDATES

General Instructions

1. This examination has a total of 100 points. It consists of a morning session (worth 60 points) and an afternoon session (worth 40 points).
 - a) The morning session consists of 13 questions numbered 1 through 13.
 - b) The afternoon session consists of 9 questions numbered 14 through 22.

The points for each question are indicated at the beginning of the question.

2. Failure to stop writing after time is called will result in the disqualification of your answers or further disciplinary action.
3. While every attempt is made to avoid defective questions, sometimes they do occur. If you believe a question is defective, the supervisor or proctor cannot give you any guidance beyond the instructions on the exam booklet.

Written-Answer Instructions

1. Write your candidate number at the top of each sheet. Your name must not appear.
2. Write on only one side of a sheet. Start each question on a fresh sheet. On each sheet, write the number of the question that you are answering. Do not answer more than one question on a single sheet.
3. The answer should be confined to the question as set.
4. When you are asked to calculate, show all your work including any applicable formulas.
5. When you finish, insert all your written-answer sheets into the Essay Answer Envelope. Be sure to hand in all your answer sheets because they cannot be accepted later. Seal the envelope and write your candidate number in the space provided on the outside of the envelope. Check the appropriate box to indicate morning or afternoon session for Exam GIFREU.
6. Be sure your written-answer envelope is signed because if it is not, your examination will not be graded.

****BEGINNING OF EXAMINATION****
Morning Session

1. (5 points)

- (a) (1 point) Describe the difference between cash accounting and accrual accounting.
- (b) (2 points) Define the following accounting concepts and describe how they should be disclosed in statutory financial statements:
 - (i) Change in accounting principle
 - (ii) Change in accounting estimate
- (c) (0.5 points) Describe the Deferred Policy Acquisition Cost (DPAC) asset under GAAP.

An insurer issues a one-year catastrophe policy on July 1, 2013 covering hurricane claims. The hurricane season is assumed to be September and October. Acquisition expenses are 1,200 and the discount rate is zero.

- (d) (1.5 points) Calculate the DPAC as of the following dates under both statutory accounting and IFRS 4:
 - (i) August 1, 2013
 - (ii) October 1, 2013
 - (iii) December 1, 2013

2. (4 points)

- (a) (1 point) Explain why the “10% - 10% rule” is not considered appropriate for determining the existence of sufficient risk transfer.

The expected reinsurer deficit (ERD) is recognized as a better risk metric for measuring risk transfer.

- (b) (1 point) Describe the ERD method for measuring risk transfer.

You are given the following information regarding an excess of loss reinsurance agreement:

- The loss layer is 500 million excess of 250 million.
- Losses are assumed to be settled one year after inception of the agreement.
- The annual investment yield is 3%.
- The reinsurance premium of 16 million is paid at the inception of the agreement.

Layer loss amount	Probability
0	94%
100,000,000	3%
250,000,000	2%
500,000,000	1%

- (c) (2 points) Calculate the ERD.

3. (6 points)

- (a) (0.5 points) Describe a benefit that rating agencies provide to insurance company policyholders.
- (b) (0.5 points) Explain why an insurance company may want to receive a rating from more than one rating agency.

Many general insurers use the rating agency A.M. Best to obtain ratings. The A.M. Best Capital Adequacy Ratio (BCAR) has a formula for net required capital that is similar to the NAIC risk-based capital (RBC) formula.

- (c) (0.5 points) Identify two differences between the BCAR formula for net required capital and the RBC formula.

Cheap Commercial Insurance (CCI) writes Products Liability - Occurrence (PL) and Allied Lines (AL) insurance. You are given the following information for CCI, with amounts in millions:

	Total	PL	AL
Net written premium 2013	16.0	12.0	4.0
Net written premium 2012	14.0	10.0	4.0
Net written premium 2011	14.0	10.0	4.0
Net written premium 2010	12.5	10.0	2.5
Net written premium 2009	10.0	8.0	2.0
Ten-year average net loss and loss expense (L&LAE) ratio as of Dec. 31, 2013	81.0%	80.0%	85.0%
Underwriting expense ratio 2013	20.0%	20.0%	20.0%
Total adjusted capital as of Dec. 31, 2013	6.0		
2013 RBC charge for off-balance-sheet items and investments in insurance company subsidiaries	0.0		
2013 RBC charge for credit risk	0.0		
2013 RBC charge for fixed-income securities risk	0.1		
2013 RBC charge for equities risk	0.5		
2013 RBC charge for reserves risk	10.0		
Industry average net L&LAE ratio for 2013 RBC		70.0%	75.0%
Industry adverse scenario L&LAE ratio for 2013 RBC		105.0%	90.0%
Investment income factor for 2013 RBC written premium charge		0.90	0.95

3. Continued

- There is no assumed or ceded reinsurance.
 - CCI qualifies for the company adjustment in the RBC calculation.
- (d) *(3 points)* Calculate CCI's 2013 RBC written premium risk charge.
- (e) *(0.5 points)* Calculate CCI's 2013 RBC ratio.
- (f) *(1 point)* Identify the action level indicated by the RBC ratio calculated in part (e) and specify any actions that are required of CCI and the regulator.

4. (5 points) An insurance policy is considered to be a *contract of adhesion*.

(a) (0.5 points) Define *contract of adhesion*.

Products liability policies generally have an aggregate limit on coverage. Some courts have, with respect to asbestos coverage, interpreted the policies as premises liability policies. One possible reason for this is that the policy is a *contract of adhesion*.

(b) (0.5 points) Explain how an interpretation of the policy as a premises liability policy may lead to increased payments by the insurer.

(c) (0.5 points) Explain how interpreting the policy as a *contract of adhesion* may lead to such an interpretation.

(d) (1.5 points) Identify three major differences between asbestos and other mass torts that have led to significant asbestos claims.

One possible defense against a products liability lawsuit is compliance with statutes and regulations.

(e) (0.5 points) Describe this defense.

(f) (1.5 points) Describe the situation in the case *Wyeth v. Levine*, state the ruling and provide the reasoning for that ruling.

5. (6 points)

- (a) (1 point) Identify the type of organization that the South-Eastern Underwriters Association (SEUA) was and describe its market conduct that led to the landmark SEUA decision in 1944.

One of the goals of market conduct regulation is to prevent unfair discrimination.

- (b) (1 point) Define fair discrimination in an insurance context and provide an example.

The European Court of Justice has banned the use of gender in pricing insurance products in the European Union.

- (c) (2 points) Critique this decision and provide a concurring or dissenting opinion.
- (d) (1 point) Recommend two responses that an automobile insurer in the European Union should consider in response to the European Court of Justice ban on the use of gender in insurance pricing.

Insurers in the U.S. are periodically subject to market conduct examinations.

- (e) (1 point) Identify two aspects of an insurer's operations, other than potential unfair discrimination in rating or underwriting, that may be within the scope of an examination.

6. (4 points) You are given the following information about an insurer's retrospectively rated policies:

Retro Adjustment Period	Loss Evaluation Point in Months	Percentage of Loss Emerged Since Prior Evaluation	Selected Premium Development to Loss Development (PDL) Ratio
First	18	50%	1.75
Second	30	30%	0.75
Third	42	20%	0.50

Policy Year	Completed Retro Adjustments as of 12/31/13	Expected Loss Emergence after Last Completed Retro Adjustment
2010	2	20,000
2011	1	50,000
2012	0	100,000

No premium has been booked after the last completed retro adjustments for the 2010 and 2011 policy years. Premium in the amount of 122,500 has been booked for the 2012 policy year.

- (0.5 points) Explain why premium booked through 42 months should or should not be used to calculate the results of third retro adjustments.
- (0.5 points) Explain why the first PDL ratio is generally greater than unity and why the PDL ratios tend to decrease with later adjustments.
- (3 points) Calculate the premium asset on retrospectively rated policies as of December 31, 2013 arising from policy years 2010, 2011 and 2012.

7. (4 points) You have recently opened your own consulting business after having worked for a number of years heading the reserving department at Chain Ladder Insurance Company. The chief actuary at Chain Ladder has hired you to peer review the estimate of the company's unpaid claims made by your successor.

The chain ladder method always figured prominently in your reserving methodology while at Chain Ladder, but your successor has relied heavily on software that applies a new method that has just been published in a peer-reviewed actuarial journal. When you apply the chain ladder method to the data you have been provided, you obtain a significantly higher estimate of unpaid claims than that estimated by the software.

The tight timeframe provided for the assignment does not permit you to figure out why the two estimates differ. While you are contemplating what to put in your report, you read in the trade press that Chain Ladder is considered an attractive takeover target.

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

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

8. (4 points) You are given the following accounting items for Nola Insurance Company (NIC):

Accounting Item	Amount (000)
Unearned Premium Reserve as of Dec. 31, 2012	4,000
Unearned Premium Reserve as of Dec. 31, 2013	4,200
Statutory Underwriting Gain (Loss) 2013	(400)
Taxable Interest Income 2013	400
Municipal Bond Interest Income 2013	600
Dividends Received 2013	200
Realized Capital Gains 2013	100
Statutory Loss and Loss Adjustment Expense Reserve as of Dec. 31, 2012	4,000
Statutory Loss and Loss Adjustment Expense Reserve as of Dec. 31, 2013	4,600

- NIC operates in the U.S. and only writes allied lines business.
 - The annual discount rate set by the Treasury Department for 2012 is 2.5%.
 - The annual discount rate set by the Treasury Department for 2013 is 4.0%.
 - The tax basis average reserve discount factor for the loss and loss adjustment expense reserve as of Dec. 31, 2012 is 0.98.
 - For the loss and loss adjustment expense reserve as of Dec. 31, 2013, 1.2 million is for accident year 2012 and 3.4 million is for accident year 2013.
 - Assume that the tax basis loss payment pattern for this line of business is 50% in the year of the loss occurrence, 30% in the first year following the year of occurrence and 20% in the second year following the year of occurrence (using mid-year loss payments).
- (a) (1 point) Calculate the tax basis average reserve discount factor for the loss and loss adjustment expense reserve as of Dec. 31, 2013.
- (b) (2 points) Calculate regular taxable income for NIC in 2013.

General insurers tend to include a greater proportion of municipal bonds in their investment portfolios than other investors.

- (c) (1 point) Explain the rationale for this.

9. (4 points) Consider a scenario in which two primary insurers, AA Insurance and BB Insurance, each have a claim ceded to a single reinsurer, Faulty Re, with the following details:

- AA believes that each claim has a 50% probability of having a zero loss payment and a 50% probability of having a 60 million loss payment (recoverable from Faulty Re).
- The claims are independent of each other.
- Faulty Re is financially distressed with assets of 100 million held in cash deposits.
- The two claims from AA Insurance and BB Insurance are the only potential reinsurance claims against Faulty Re. These claims are Faulty Re's only liabilities.
- Assume that Faulty Re remains solvent if its net worth is greater than zero.
- Assume that both claims will be settled in the near future so that the time value of money can be ignored.

(a) (1 point) Determine the likely range of values that AA should be willing to accept for the loss commutation.

(b) (1 point) Determine the likely range of values that AA should be willing to accept for the loss commutation if:

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

(c) (1 point) Explain the merits of AA being the first to commute in the scenario described in part (b) versus waiting for either claim to settle first before making a decision.

As noted in the NAIC Statement of Statutory Accounting Principles No. 62, *Property and Casualty Reinsurance*, "A commutation of a reinsurance agreement, or any portion thereof, is a transaction which results in the complete and final settlement and discharge of all, or the commuted portion thereof, present and future obligations between the parties arising out of the reinsurance agreement."

(d) (1 point) Describe the statutory accounting treatment of the commutation transaction for the cedent, making reference to the effect on assets and income.

10. (5 points)

- (a) (1 point) Identify the implicit risk margins for reserving risk and written premium risk used in statutory accounting in the U.S.
- (b) (1 point) Describe one advantage and one disadvantage of using implicit risk margins in statutory accounting.

Internal capital models are useful for enterprise risk management but present some concerns for insurance supervisors. The International Association of Insurance Supervisors recommends three tests that internal capital models must pass in order to be permitted for setting regulatory capital standards.

- (c) (2 points) Identify and describe these tests including any applicability to Solvency II.
- (d) (1 point) Describe two differences between Solvency II and U.S. financial regulation with respect to the use of internal capital models.

11. (4 points) The NAIC has developed a number of Core Principles for U.S. Insurance Financial Solvency in its Solvency Modernization Initiative.

(a) (2 points) Compare the following Core Principles, including the purpose of the assessment, the type of information assessed, and the frequency of the assessment:

- (i) Off-site Monitoring and Analysis
- (ii) On-site Risk-focused Examinations

Development of Solvency II in the European Union has suggested a number of enhancements to insurance regulation in the United States.

(b) (0.5 points) Identify a potential (or planned) enhancement to NAIC RBC suggested by Solvency II with respect to:

- (i) Calibration of the RBC system
- (ii) Catastrophe risk

Both Solvency II and the NAIC now include an Own Risk and Solvency Assessment (ORSA) as a part of the regulatory framework.

(c) (1 point) Describe two ways in which an actuary can assist a general insurance company with its NAIC ORSA.

(d) (0.5 points) Contrast the approaches of the NAIC ORSA and the Solvency II ORSA with respect to required capital.

12. (4 points) You are given the following information for Actuarial General Insurance (AGI):

Calendar /Accident Year	Earned Premiums	Paid Losses in 2013	Reported Claims in 2013	Claims Closed in 2013 with payment	Claims Closed in 2013 with no payment	Claims Outstanding as of year end 2013
2010	1,000,000	0	0	0	0	0
2011	2,000,000	150,000	1	2	0	0
2012	2,400,000	550,000	15	19	0	2
2013	2,800,000	1,300,000	170	151	8	11
Total	8,200,000	2,000,000	186	172	8	13

- Premiums in the table are by calendar year while losses and claim counts are by accident year.
 - AGI began operations in 2010.
 - AGI only writes direct Homeowners business.
 - Adjusting and Other (AAO) expenses paid in calendar year 2013 amounted to 240,000.
 - There is no reinsurance or pooling.
- (a) (1.5 points) Calculate the allocation by accident year of AGI's paid AAO expenses in calendar year 2013 using the old statutory procedure for Schedule P reporting.
- (b) (2 points) Calculate the allocation by accident year of AGI's paid AAO expenses in calendar year 2013 using the method of distributing AAO by claim counts. Assume the following relativities of AAO expense by type of claim for the application of this method:

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

- (c) (0.5 points) Explain why an AAO allocation method using claim counts should be more accurate than the old statutory procedure for Schedule P reporting.

13. (5 points)

- (a) (1 point) Identify two common reasons for insurer insolvency.
- (b) (1.5 points) Describe two regulatory actions that an insurance commissioner may take if fact-finding reveals that policyholders or the general public may be adversely affected by an insurer's financial condition.
- (c) (2 points) Describe the characteristics of the U.S. regulatory system that may have contributed to the relatively strong performance of insurance companies in the recent financial crisis.
- (d) (0.5 points) Identify how the Dodd-Frank Act changes the regulation of reinsurer solvency.

****END OF EXAMINATION****
Morning Session

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