
SOCIETY OF ACTUARIES
Retirement Benefits United States – Design & Pricing

Exam DP-RU

Date: Thursday, November 3, 2011

Time: 8:30 a.m. – 12:15 p.m.

INSTRUCTIONS TO CANDIDATES

General Instructions

1. This examination has a total of 70 points.

This exam consists of 9 questions, numbered 1 through 9.

The points for each question are indicated at the beginning of the question. Questions 2, 6 and 7 pertain to the Case Study, which is enclosed inside the front cover of this exam booklet.
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 since 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 Exam DP-RU.
6. Be sure your written-answer envelope is signed because if it is not, your examination will not be graded.

CASE STUDY INSTRUCTIONS

The case study will be used as a basis for some examination questions. Be sure to answer the question asked by referring to the case study. For example, when asked for advantages of a particular plan design to a company referenced in the case study, your response should be limited to that company. Other advantages should not be listed, as they are extraneous to the question and will result in no additional credit. Further, if they conflict with the applicable advantages, no credit will be given.

****BEGINNING OF EXAMINATION****

- 1.** (5 points) Your client has asked you to conduct a valuation of a plan using the same census data that was used in a valuation previously completed by another actuarial firm. The prior valuation and your valuation both have the same calculation date.
 - (a) (3 points) Describe the professional guidelines with respect to conducting census data reviews and validations that should be performed prior to using this data.
 - (b) (2 points) Your review has uncovered a number of census data issues. In order to complete your valuation, describe the actions and steps you need to undertake to resolve these issues and the applicable professional standards.

Question 2 pertains to the Case Study.

- 2.** (12 points) In order to become more competitive in the future, NOC is considering freezing the Salaried Full-Time Pension Plan and providing future retirement benefits through a defined contribution plan.

NOC's key objectives are to:

- Encourage greater cost sharing for retirement benefits
- Provide competitive retirement benefits
- Minimize impact on late career employees

NOC's key competitors provide the following retirement programs:

	Company 1	Company 2	Company 3
Employer non-elective contributions	4% of pay	None	None
Employer matching contributions	50% on first 6% of employee contributions	100% on first 6% of employee contributions	25% on first 8% of employee contributions, plus discretionary match on up to an additional 6% of employee contributions based on profits

- (a) (3 points) Discuss the implications of the plan freeze for:
- (i) NOC; and
 - (ii) the salaried employees.
- (b) (6 points) Compare and contrast the following two design alternatives in light of NOC's objectives:
- (i) Extend the Part-Time DC Pension Plan to the salaried employees.
 - (ii) Implement a DC pension plan providing 5% of compensation up to the wage base and 8% above, plus a 401(k) matching program of a 50% match on employee deferrals up to 4% of pay.
- (c) (3 points) Critique the following two transition approaches:
- (i) Allow pay run-up on past service for the next 7 years on the DB plan.
 - (ii) Members age 40 and over at transition receive an additional 1% contribution for up to 7 years.

3. (10 points) Your client's CFO is considering liability driven investment (LDI) strategies to minimize the volatility of the pension plan's funded status.

(a) (2 points) List the characteristics of LDI strategies.

(b) (4 points) Describe the following LDI strategies:

- Dedication
- Immunization
- Contingent immunization

(c) (2 points) You are given:

Pension plan assets: \$683,000,000

Pension plan liabilities:

	Funding Liability	Duration
Active Members	\$529,000,000	20 years
Retired Members	\$234,000,000	10 years

Calculate the optimal duration of the pension plan assets given the CFO's objective.

Show all work.

(d) (2 points) Describe two alternative approaches to extend the duration of the liability hedging portfolio.

- 4.** (4 points) A company would like to add post-65 retiree medical coverage to their existing retiree medical plan and coordinate this new benefit with Medicare.
- (a) (3 points) Describe the 3 basic methods for coordinating post-65 retiree medical coverage with Medicare, including why the company may want to use each method.
- (b) (1 point) You are given:
- The plan's benefit provisions cover 80% of covered expenses (accounting for any copayments, deductibles, and coinsurance)
 - The covered expense (C) = \$1000
 - The Medicare payment (M) = \$700

Calculate the company cost under each of the methods described in (a).

Show all work.

5. (12 points)

- (a) (1 point) List the key design characteristics of employer supported retirement plans now prevalent in the Netherlands.
- (b) (8 points) For each of:
- the Netherlands plan described in part (a),
 - US traditional defined benefit plans,
 - hybrid plans, and
 - defined contribution plans,

Compare and contrast the following plan characteristics:

- (i) investment risk
 - (ii) benefit portability
 - (iii) plan governance
- (c) (3 points) Describe the considerations in implementing the design characteristics in part (a) for single employer defined benefit pension plans in the United States.

Question 6 pertains to the Case Study.

6. (8 points) In 2011, NOC has implemented the following cost containment measures in order to control its salaried employees' payroll costs.

- No new hires until 2017
- Salary freeze for current workers through 2015
- An early retirement window until 2015 which would allow workers with a minimum of 20 years of service to retire as early as age 50 with a reduction in pension of 0.25% per month from age 60

Compare and contrast the considerations in setting the following assumptions for the NOC Full-Time Salaried Pension Plan for a point-in-time closed group valuation versus a stochastic 10-year open group projection valuation.

- (i) Salary Increases
- (ii) Termination Scale
- (iii) Retirement Scale
- (iv) New Entrant Profile

Question 7 pertains to the Case Study.

7. (10 points)

- (a) (3 points) Describe, from both an employee and employer perspective, the key pension objectives of a global retirement program for Third Country Nationals.
- (b) (3 points) Describe the key practical considerations and constraints in implementing a global retirement program.

NOC is expanding into Asia starting next year. A new division called the International Operations Team (IOT), comprised of a group of NOC's brightest Full-Time Salaried Pension Plan participants, will be sent to Asia to set-up operations and train local employees in multiple Asian countries. Employees in the IOT will be expected to remain in Asia for a minimum of 10 years.

NOC's VP of Human Resources is designing a new global retirement program to cover employees in the new IOT and has asked for your help.

- (c) (4 points) Propose a global retirement program design for employees in the IOT identifying how the program addresses or fails to address the considerations in part (b) and the objectives in part (a).

- 8.** (4 points) Your client is considering providing a supplemental retirement benefit to help employees pay for post-retirement expenses, including medical expenses, and better prepare for retirement. Your client would like to know more about Health Savings Accounts (“HSAs”) as a possible solution.
- (a) (2 points) Describe HSAs including the related regulatory constraints in their design.
 - (b) (2 points) Compare and contrast using a qualified defined contribution plan and HSA to provide a supplemental retirement benefit, assuming the same level of employer funding.
- 9.** (5 points) The CEO of ABC Company is concerned about a recent increase in the number of key executives leaving ABC to take executive positions with other companies, and has decided to implement a new executive retirement arrangement, specifically a defined contribution plan.
- (a) (1 point) Describe the general plan features of an executive retirement benefit program.
 - (b) (2 points) Describe the key characteristics of the benefit structure for a defined contribution executive retirement plan.
 - (c) (2 points) Compare and contrast three funding options for a defined contribution executive retirement plan.

****END OF EXAMINATION****

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