
SOCIETY OF ACTUARIES
Retirement Plan Investment & Risk Management Exam

Exam RETRPIRM

Date: Tuesday, November 1, 2016

Time: 2:00 p.m. – 4:15 p.m.

INSTRUCTIONS TO CANDIDATES

General Instructions

1. This examination has a total of 40 points.

This exam consists of 6 questions, numbered 1 through 6.

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 Exam RETRPIRM.
6. Be sure your written-answer envelope is signed because if it is not, your examination will not be graded.

Tournez le cahier d'examen pour la version française.

****BEGINNING OF EXAMINATION****

- 1.** (8 points) Company XYZ sponsors a member-directed Defined Contribution (DC) plan.
- (a) (2 points) Explain why Target-Date Funds (TDFs) may be a better default investment option than money market funds in a DC plan.
 - (b) (1 point) State one advantage and one disadvantage of including a higher fixed income allocation in a TDF.
 - (c) (2 points) Describe four key characteristics or preferences of a DC plan participant that influence the proportion of assets the participant would allocate to equities.
 - (d) (3 points) Describe six actions that a plan sponsor can take to ensure a successful DC plan.

- 2.** (6 points) XYZ Company's objective is to limit the funded status volatility of its defined benefit pension plan. XYZ Company is considering the following two strategies for the assets backing the retiree liabilities of the pension plan:
- (i) Entering into a buy-in annuity contract; or
 - (ii) Investing in a duration-matched fixed income portfolio.
- (a) (2 points) Describe the due diligence XYZ Company should complete prior to entering into a buy-in annuity contract.
- (b) (4 points) Compare and contrast the two strategies in relation to XYZ Company's objective.

- 3.** (9 points) XYZ Company sponsors a defined benefit pension plan that is open to new members.

The plan is currently 90% funded on an accounting basis and 75% funded on a plan termination basis. The current investment strategy includes a glide path that increases the allocation to fixed income assets as the funded status improves.

- (a) (3 points) Describe the merits and risks of following a glide path strategy for XYZ Company's open pension plan.
- (b) (3 points) The current glide path is as follows:

Accounting Funded Status	Equity Allocation	Fixed Income Allocation
110%	20%	80%
105%	25%	75%
100%	30%	70%
95%	35%	65%
90%	40%	60%
85%	45%	55%
80%	50%	50%
75%	55%	45%
70%	60%	40%
65%	65%	35%
60%	70%	30%

XYZ Company is considering closing the plan to new members and freezing accruals.

Recommend changes to the glide path in light of the proposed plan closure and freeze. Justify your recommendation.

- (c) (3 points) Critique the concept of glide paths for pension plans from the perspective of financial economics.

- 4.** (5 points) Company ABC wants to mitigate longevity risk in their defined benefit pension plan.
- (a) (2 points) Describe how longevity swaps operate.
 - (b) (3 points) Describe three other approaches to mitigate longevity risk.

5. (7 points)

- (a) (2 points) Describe in words the differences between time-weighted and money-weighted rates of return.
- (b) (2 points) Explain why using money-weighted rates of return may not be an appropriate method to compare fund returns to a benchmark.

You are evaluating the performance of the U.S. equity fund of the XYZ pension plan. You are given the following for the fund:

	Fund weight (%)	Sector benchmark weight (%)	Sector benchmark return	Fund return
Sector A	20	25	4%	5%
Sector B	30	35	12%	9%
Sector C	50	40	6%	10%

- (c) (3 points) Calculate the three sources of added value for each sector.

Show all work.

- 6.** (5 points) Describe the following three risk budgeting approaches for a company that sponsors a defined benefit pension plan.
- (a) (2 points) Value-at-Risk Approach.
 - (b) (1 point) Traditional Sensitivity Analysis.
 - (c) (2 points) Maintaining the same Equity and Debt Beta.

****END OF EXAMINATION****

USE THIS PAGE FOR YOUR SCRATCH WORK

USE THIS PAGE FOR YOUR SCRATCH WORK