
SOCIETY OF ACTUARIES
Exam RETRPIRM
Retirement Plan Investment & Risk Management Exam

Exam RETRPIRM

Date: Wednesday, October 29, 2014

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 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 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. (4 points)

- (a) (2 points) Describe the characteristics of hedge funds.
- (b) (2 points) Describe four hedge fund categories.

2. (7 points)

- (a) (2 points) List the inputs needed for an asset liability study.
- (b) (2 points) List the typical outputs from an asset liability study.
- (c) (3 points) Describe the following types of efficient frontiers that can be used in an asset liability study:
 - (i) Multi-period;
 - (ii) Downside risk; and
 - (iii) Surplus.

3. (11 points)

- (a) (2 points) Describe four of the properties of a valid benchmark for investment performance measurement.
- (b) (2 points) Describe how the following formula is used to measure a fund manager's value-added return.

$$r_v = \left[\sum_{j=1}^S (w_{pj} - w_{Bj})(r_{Bj} - r_B) \right] + \left[\sum_{j=1}^S (w_{pj} - w_{Bj})(r_{pj} - r_{Bj}) \right] + \left[\sum_{j=1}^S w_{Bj}(r_{pj} - r_{Bj}) \right]$$

- (c) (4 points) You are given the following:

Economic Sector	Equity Portfolio Weight	Sector Benchmark Weight	Portfolio Return	Sector Benchmark Return
Financial	50%	60%	3.6%	3.5%
Technology	20%	15%	2.4%	2.5%
Utilities	30%	25%	1.0%	1.0%
Total	100%	100%		

Calculate the components of the fund manager's total value-added return.

Show all work.

- (d) (3 points) Evaluate the fund manager's performance based on the results from (c).

- 4.** (8 points) A large government sponsored public sector defined benefit pension plan has a substantial unfunded liability.
- (a) (4 points) Describe the risks from the perspectives of the following stakeholders:
- (i) Plan participants
 - (ii) The Government
 - (iii) Taxpayers
- (b) (4 points) Describe possible solutions to address the risks identified in (a).
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- 5.** (5 points) Describe the key challenges and considerations in selecting and evaluating target date funds from a defined contribution plan sponsor's perspective.

6. (5 points) The Treasurer of XYZ Company is reviewing the asset allocation of its defined benefit pension plan. In an effort to maximize shareholder value, the Treasurer has proposed new target allocations for the plan. After this change is made, the Treasurer expects that the shareholders will rebalance their individual holdings to maintain the same overall asset allocation.

You are given the following:

- Total shareholder holdings: \$1 billion.
- Shareholder target asset allocation: 50% equity / 50% bonds.
- Shareholders' after-tax income under the current allocation: \$52.9 million.

You are also given:

Pension Plan Asset Allocation		
	Current	Proposed
Equities	\$150 million	\$50 million
Bonds	\$50 million	\$150 million

Tax Rates	
Personal equities	10%
Personal bonds	40%
Corporate	35%
Increase in shareholder equity	10%

Expected Returns	
Equities	9% per annum
Bonds	4% per annum

- (a) (3 points) Calculate the shareholders' after-tax income under the proposed policy using the Augmented Balance Sheet approach.

Show all work.

- (b) (2 points) Evaluate whether the proposed allocation meets the Treasurer's objective to maximize shareholder value.

****END OF EXAMINATION****

USE THIS PAGE FOR YOUR SCRATCH WORK