

Exam RETRPIRM

Date: Thursday, April 30, 2020

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.

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Tournez le cahier d'examen pour la version française.

****BEGINNING OF EXAMINATION****

1. (6 points)

- (a) (3 points) Describe the characteristics of hedge funds.
- (b) (3 points) Describe the advantages and disadvantages of including hedge funds in the assets of:
 - (i) Defined benefit plans; and
 - (ii) Defined contribution plans.

2. (8 points) Company XYZ sponsors a defined benefit plan with the following characteristics:

Discount Rate	Liability
4.0%	\$550 million
5.0%	\$500 million
6.0%	\$450 million

Market value of assets	\$500 million
Asset duration	2.5 years

The following interest rate swaps are available to Company XYZ:

	Duration
Receive-fixed (pay-floating) interest rate swap	15 years
Pay-fixed (receive-floating) interest rate swap	12 years

- (a) (3 points) Construct an overlay strategy that minimizes interest rate risk.

Show all work.

- (b) (3 points) Describe swaption strategies that Company XYZ could consider for the purpose of managing interest rate risk.
- (c) (2 points) Describe prudent investment practices for derivatives.

3. (7 points)

- (a) (3 points) Describe practical considerations for implementing a glide path investment strategy.
- (b) (4 points) Describe arguments for and against a glide path investment strategy from a financial economics perspective.

- 4.** (7 points) Explain the following observations about rules-based equity investment strategies:
- (i) Not all smart beta is created equal; carefully review the risk exposures of the specific strategies considered.
 - (ii) Factor outperformance is driven by market mistakes and risk.
 - (iii) Virtually all investments are active in some way.
 - (iv) There are several possible approaches to factor investing; a typical institutional portfolio probably already employs at least some of them.

- 5.** (6 points) You are the actuary for a government that is setting up a new defined benefit public pension plan. Government officials want to ensure there are robust risk mitigation strategies related to the governance of the pension plan.
- (a) (4 points) Describe the following risk mitigation alternatives and techniques:
- (i) System discipline;
 - (ii) Pricing discipline; and
 - (iii) Budgetary discipline.
- (b) (2 points) Describe how the maturity of a defined benefit public pension plan influences the ability to take investment risk in the plan.

6. (6 points)

- (a) (3 points) Describe three factors that are compelling private sector defined benefit pension plan sponsors to implement de-risking strategies.

Company ABC sponsors a defined benefit pension plan. Company ABC would like to reduce the volatility of the plan's funded position.

- (b) (3 points) Compare and contrast the following strategies in light of the Company's objective:

- Increasing the allocation to fixed income investments; and
- Purchasing a buy-in annuity for the pensioner liabilities.

****END OF EXAMINATION****

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