

# Exam CFESDM

## MORNING SESSION

**Date:** Thursday, November 1, 2018

**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 5 questions numbered 1 through 5.
  - b) The afternoon session consists of 4 questions numbered 6 through 9.

The points for each question are indicated at the beginning of the question. Questions 1, 3, 5, 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 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 CFESDM.
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.



## **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\*\***  
**Morning Session**

*Question 1 pertains to the Case Study.*  
*Each question should be answered independently.*

- 1.** (10 points) Information on Big Ben Bank can be found in Section 6 of the Case Study.
- (a) (2 points)
- (i) Explain the measures Big Ben uses to monitor its liquidity risk.
  - (ii) Assess the change in Big Ben's liquidity risk from 2011 to 2015 based on the above measures. Justify your answer.
- (b) (3 points)
- (i) Identify two flaws with the current liquidity measures Big Ben is using. Justify your answer.
  - (ii) Recommend one solution to address each of the two flaws identified in part (i). Justify your recommendations.
  - (iii) Assess whether or not the flaws identified in part (i) are material to Big Ben based on recent trends. Justify your answer.

## 1. Continued

There are several strategies Big Ben can use to access liquidity in the event of a liquidity crisis:

- I. Line of credit from credit facility
  - II. Capital injection from parent company
  - III. Sell liquid assets
- (c) (5 points) Assess which of the above strategies (I to III) can best address Big Ben's liquidity requirements for each of the following events. Justify each of your answers.
- (i) Mild downgrade of Big Ben's rating
  - (ii) Seasonal withdrawal of deposits
  - (iii) Run on deposits, but only at Big Ben
  - (iv) Failure of the entire financial system
  - (v) Exercise of a \$990 million loan commitment in 2015

2. (10 points) ABC Company writes \$10 of premium on January 1 and issues a one-year non-renewable term life insurance policy with a face amount of \$100.

The policyholder's mortality is known to be distributed as follows:

- Survives up to and including December 31 with probability 95%
- Survives up to but passes away on December 31 with probability 5%

The firm has no expenses and pays no taxes. Assume the following:

Parameter	Value
Risk-free interest rate	5%
Critical percentage loss of initial surplus	60%

If ABC's operating loss exceeds the critical percentage loss of initial surplus, it will undergo bankruptcy. If ABC becomes bankrupt upon the occurrence of a claim, the policyholder's beneficiary is expected to recover only half of the original face amount value.

If solvent at the end of the year, ABC will pay out any remaining surplus as a one-time dividend to its shareholders.

- (a) (1 point) Calculate how much initial surplus ABC should hold on January 1 to guarantee its solvency at the end of year. Show your work.

According to Panning's study note "Managing the Invisible: Identifying Value-Maximizing Combinations of Risk and Capital", the value of the firm has two components: franchise value and residual value.

- (b) (3 points) Calculate Value Added if ABC holds the following amount of initial surplus at the beginning of the year:

- (i) Amount calculated in part (a)
- (ii) \$40

Show your work.

- (c) (1 point) Explain whether it is preferable for ABC to hold the amount of initial surplus from part (b) (i) or part (b) (ii) from the point of view of:

- (i) ABC's shareholders
- (ii) ABC's regulatory body

Justify your answers.

## 2. Continued

- (d) (1 point) Explain why ABC's market capitalization on a stock exchange may be lower compared to the values calculated in part (b). Justify your answer.

ABC's CRO wants to implement a risk capital framework such that ABC will be able to withstand a 99<sup>th</sup> percentile loss.

- (e) (2 points) Explain whether or not the shareholders would support the CRO's proposal based on Value Added. Justify your answer.

ABC wants to write more term insurance policies and plans to fund the expansion by issuing debt. XYZ rating agency will analyze and rate the firm. XYZ's ratings are widely published.

- (f) (2 points) Explain two reasons why the answer from part (e) might change. Justify your answer.

*Question 3 pertains to the Case Study.  
Each question should be answered independently.*

- 3.** (14 points) Information on Blue Jay Tire (BJT) can be found in Section 3 of the Case Study.

The RPPC Board would like to know how the following risks may impact BJT's net income.

- Commodity risk
- Manufacturing risk
- Labor risk
- Foreign exchange risk

- (a) (2.5 points)

- (i) Identify one income statement line item for each risk that is directly impacted by that risk.
- (ii) Describe how each line item identified in part (i) has been impacted by the applicable risk if at all. Justify your answer.
- (iii) Propose a solution to mitigate the most volatile of the four risks above. Justify your answer.

- (b) (3.5 points)

- (i) Calculate Quick Ratios for BJT from 2012 to 2015. Show your work.
- (ii) Calculate the Days Sales Outstanding for BJT from 2012 to 2015. Show your work.
- (iii) Assess the implication of the Quick Ratios and the Days Sales Outstanding from parts (i) and (ii).

- (c) (2 points) Describe how the tire recall crisis was reflected in BJT's Non-Consolidated Statement of Cash Flows and Non-Consolidated Statements of Operations. Justify your answer.

### 3. Continued

The Board is questioning the profitability of the Production Expansion Committee's ambitious growth strategy ahead of purchasing a third plant. They wonder why the net income for BJT has not improved in year 2015, although the acquisition of the first two manufacturing plants in the USA was considered as a success.

(d) (3 points)

- (i) Critique the Board's assertion that the expansion program has not helped to improve income.
- (ii) Identify the primary funding strategy for BJT's past production expansion. Justify your answer.
- (iii) Explain the risk associated with the funding strategy identified in part (ii).

The Board is considering contracting with an insurance company to insure the warranty program on future tire sales.

(e) (2 points)

- (i) Evaluate the tire warranty program with respect to the following three aspects:
    - BJT's core business
    - Strategic importance to BJT
    - Profitability
  - (ii) Describe the pros and cons of using insurance to mitigate the risk of the warranty program on future tire sales.
- (f) (1 point) Describe the impact on BJT's Non-Consolidated Statement of Financial Position if BJT also insures its liability on outstanding warranties. Justify your answer.

**4.** (12 points)

(a) (1 point)

- (i) Identify two common organizational barriers to effective communication.
- (ii) Describe one way to minimize the adverse impact from each of the two barriers identified in part (i).

XYZ is an insurance company that specializes in online peer-to-peer product initiatives in the UK. Based on its research, a ride-sharing insurance product has been identified as feasible.

Currently there is no formal regulatory process required to launch this type of insurance product. However, XYZ foresees the need to work with regulators. XYZ's proposed collaboration effort with the regulators is to send them the following:

- I. Written summary of XYZ's business plan
- II. Current summary of regulations implemented in other jurisdictions that could be applicable in the UK
- III. High-level financial analysis to support the value of a ride-sharing insurance product

Consider the following actions to improve interpersonal communication:

- A. Know Your Audience
- B. Select an Appropriate Communication Medium
- C. Listen Actively
- D. Encourage Feedback
- E. Regulate Information Flow and Timing

- (b) (3 points) Assess the merits of the proposed collaboration effort and its effectiveness with regulators based on each of the five identified actions (A to E). Justify your answer.

#### 4. Continued

One week after XYZ submitted its initial proposal, the regulators replied as follows:

*Thank you XYZ for the information that you have provided on your plan to provide ride-sharing insurance. Given the recent news story about a ride-sharing accident, the need for this insurance is apparent.*

*Examining the initial financial analysis you have provided, we find it difficult to believe that passengers are going to be properly protected with your product as the average premium you project is far less than the average premium a taxi driver would pay. We would rather see premium levels comparable to what taxi drivers currently pay. This would seem fair and ensure proper coverage.*

(c) (2 points)

- (i) Identify two cognitive biases demonstrated by the regulators. Justify your answers.
- (ii) Describe two approaches through which XYZ may overcome the cognitive biases identified in part (i).

XYZ would like a “Win-Win” outcome to the potential conflict with regulators.

(d) (3 points)

- (i) Recommend a negotiation tactic that could create a Win-Win situation for XYZ and the regulators. Justify your recommendation.
- (ii) Recommend three actions that XYZ could undertake in pursuing the negotiation tactic recommended in part (i). Justify your recommendations.

(e) (3 points) Draft a written response to the regulators incorporating your answers to parts (c) and (d).

**Question 5 pertains to the Case Study.**  
**Each question should be answered independently.**

- 5.** (14 points) Information on Darwin Life Insurance Company can be found in Section 7 of the Case Study.

Roger Heilman, Chief Corporate Actuary, forwards you an email outlining the agenda for the upcoming review with Insight Ratings and asks you to help with the preparation. He notes that Insight follows the A.M. Best rating process for insurance companies, and stresses the importance of showcasing the strength of Darwin's Enterprise Risk Management (ERM) framework. He mentions that Insight is likely to focus on the following three key areas encompassed by ERM:

- I. Culture
- II. Identification & Management
- III. Measurement

- (a) (1.5 points) Describe one strong characteristic and one weak characteristic of an insurance company with respect to each key area (I-III).
- (b) (3 points) Evaluate Darwin's abilities with respect to each key area (I-III). Justify your response.
- (c) (1.5 points) Recommend one action for each key area (I-III) to improve the strength of Darwin's ERM framework. Justify your recommendation.
- (d) (1 point) Describe how a strong ERM framework can be reflected in internal measures of risk, such as economic capital.

## 5. Continued

Darwin's economic capital study indicates that both the Variable Annuity and Term product lines consume less capital on an economic basis relative to a statutory basis. Additionally, overall economic capital is lower than statutory capital.

(e) (2 points)

- (i) Explain why the Variable Annuity product line may consume less capital on an economic basis relative to a statutory basis.
- (ii) Explain why the Term product line may consume less capital on an economic basis relative to a statutory basis.

Justify your answers.

Roger says: "...because Statutory Capital is more punitive than Economic Capital in aggregate, Darwin can achieve its desired credit rating solely based on its RBC ratio".

(f) (2 points) Critique Roger's statement.

Roger accepts your critique from part (f) and wants to know how the Economic Capital results above can be used to create value.

(g) (3 points)

- (i) Recommend one strategy for the Variable Annuity product line that may create value for Darwin.
- (ii) Recommend one strategy for the Term product line that may create value for Darwin.

Justify your answers based solely on the divergence of Statutory Capital and Economic Capital.

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

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