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**SOCIETY OF ACTUARIES**  
**Strategic Decision Making Exam**

**Exam CFESDM**

**MORNING SESSION**

**Date:** Thursday, November 3, 2016

**Time:** 8:30 a.m. – 11:45 a.m.

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**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 6 questions numbered 1 through 6.
  - b) The afternoon session consists of 4 questions numbered 7 through 10.

The points for each question are indicated at the beginning of the question. Questions 2, 4-6, 8-10 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.

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**

**1.** (5 points)

(a) (2 points)

- (i) Describe how correlation drives wrong-way risk.
- (ii) Explain why it is challenging to quantify wrong-way risk using historical data.

Cyber security risk is the risk of financial loss to an organization from data security breaches. Company ABC is a cyber security firm that provides a single information security solution which is meant to prevent data breaches. Company ABC dominates 90% of the cyber security market.

Insurance Company XYZ provides cyber insurance protection to all of Company ABC's clients.

- (b) (3 points) Assess whether there is wrong-way or right-way risk on a cyber insurance policy provided by Insurance Company XYZ to one of Company ABC's clients. Justify your assessment.

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**Question 2 pertains to the Case Study.**  
**Each question should be answered independently.**

**2.** (12 points)

(a) (1 point) Define the following:

- (i) Cash accounting
- (ii) Accrual accounting

Company XYZ is a small travel insurance company founded in 2011. Below is the information on Company XYZ’s travel insurance business:

- Policies are single premium.
- On average, policies are bought 6 months before the trip.
- Sales are uniform over the year.
- All expenses are incurred at policy issue.
- Variable expenses are 15% of premium.
- Fixed expenses are \$10 million per year.
- Claims are reported and paid immediately.

Exhibit A is the historical income statement for Company XYZ’s travel insurance business up to the end of 2016. Company XYZ uses cash accounting for its reporting.

<b>Exhibit A: Income Statement (\$ millions)</b>						
	Financial Reporting Year					
	<u>2011</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>
Premium	25	85	105	104	145	120
Claims	(9)	(38)	(66)	(73)	(88)	(92)
Fixed Expenses	(10)	(10)	(10)	(10)	(10)	(10)
Variable Expenses	(4)	(13)	(16)	(16)	(22)	(18)
Profit	3	24	14	5	26	(0)
Loss Ratio = claims/ premium	35%	45%	62%	70%	60%	77%
*Financial reporting year is from Jan 1-Dec 31						

Company XYZ has distributed all of its profit each year.

Exhibit B shows the claims experience by cohort. The exhibit compares the premium for all policies issued in a specific year to the claims incurred by those policies.

## 2. Continued

	Issue Year				
	<u>2011</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>
Premium	25.0	85.0	105.0	104.0	145.0
Claims	(17.5)	(58.7)	(72.5)	(73.8)	(101.5)
Loss Ratio	70.0%	69.0%	69.0%	71.0%	70.0%
Reserve Factor per \$ Unearned Premium	70.0%	70.0%	70.0%	70.0%	70.0%

\*Unearned premium is the premium from policies that have not yet completed their trips  
\*Reserve Factor for 2016 is 70%

(b) (6 points)

- (i) Calculate Company XYZ's historical travel insurance profit for years 2011-2016 if it had chosen to use accrual accounting instead.
- (ii) Explain whether or not Company XYZ's use of cash accounting to analyze profits is appropriate. Justify your answer.

Company XYZ is able to take out a \$60 million loan at the beginning of 2017 to expand its business. The loan must be fully repaid by the end of 2017. The expansion would increase sales to \$200 million per year from 2017 to 2021.

Information on Blue Ocean can be found in Section 5 of the Case Study.

(c) (3 points)

- (i) Recommend whether or not Company XYZ can invest the \$60 million to expand its business. Justify your answer.
- (ii) Recommend whether or not Company XYZ could invest to expand its business if it were a subsidiary of Blue Ocean. Justify your answer using information from the Case Study.

Blue Ocean is considering an acquisition of Company XYZ.

- (d) (2 points) Describe the two most significant non-financial factors that Blue Ocean should consider when evaluating this acquisition.

**3.** (5 points)

- (a) (2 points) Describe two challenges faced by both Uber and Airbnb in their business practices.
- (b) (3 points)
  - (i) Describe how the Uber and Airbnb business model might be applied to insurance.
  - (ii) Evaluate how the challenges identified in part (a) could apply to this new insurance business model.



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**Question 4-6 pertains to the Case Study.**  
**Each question should be answered independently.**

- 4.** (15 points) Information on RPPC Dynasty (RPPC) and Blue Jay Air (BJA) can be found in Sections 1 and 2 of the Case Study.

A Risk Appetite Framework includes the following four risk management elements:

- A. Risk governance
- B. Risk infrastructure
- C. Risk management tools
- D. Risk culture

- (a) (4 points)

- (i) Describe how the four elements (A to D) above support a risk appetite framework.
- (ii) Provide one example for each of these elements (A to D) within RPPC's Risk Management Framework.

John Feather, CEO of BJA, is considering the following courses of action to stay competitive:

- A. Control costs by cutting back on safety training programs, reducing staff level, and limiting salary increases
- B. Obtain additional funding by capital injection from RPPC to enhance safety training programs
- C. Automate all booking and service process online to replace direct engagement with staff at front desk and call centers. Cost savings will be used to enhance safety training programs
- D. Obtain additional funding by issuing more long-term debt to enhance safety training programs

#### 4. Continued

(b) (4 points)

- (i) (3 points) Evaluate how each course of action (A to D) above aligns with BJA's strategic vision.
- (ii) (1 point) Recommend which one of A to D BJA should pursue. Justify your answer.

John Feather noticed that more than 10% of BJA's aircrafts in the Philadelphia Operation Hub have not undergone the safety checks as required. He was very concerned as to why this issue was not identified earlier.

John asked BJA's Head of Operations to investigate this issue. Below were comments from the staff:

Operating Technician A: *"Well, I don't think any aircraft would breakdown just because of some missed safety checks! Besides, we have been doing it this way forever."*

Operating Technician B: *"I don't think the safety checks reduce risk any more than just doing the daily routine checks. It just gives me more work."*

Supervisor: *"Yes, I am aware of the issues. I did mention this issue to the manager several times; however, this never went anywhere. Oh well, what can I do?"*

Manager: *"You guys from corporate talk about risk appetite, but that means absolutely nothing to me!!! There was only one formal communication on this topic. I am still trying to figure it out. This initiative is not as easy as it sounds. You guys don't like to hear bad news. That is why I don't even bother escalating the safety issue."*

(c) (4 points)

- (i) (1 point) Identify the most problematic risk management element that is evident in the Philadelphia Operation Hub.
- (ii) (3 points) Describe the three most significant issues associated with the element identified in part (i).

***Question 4 continued on next page.***

#### 4. Continued

John Feather wants BJA to be in the top quartile of the safety standards in the airline industry. Of the airlines in the top quartile, none has a missed safety check rate greater than 5%. John Feather wants BJA to aim for less than 3%. The Risk Committee proposed the following measures:

Missed Safety Check Rate	
Risk capacity	X%
Upper risk limit	Y%
Risk trigger	Z%

(d) (3 points)

- (i) Describe how using the risk trigger and upper risk limit acts as a risk control mechanism within a firm.
- (ii) Recommend appropriate measures, X%, Y%, Z%, for the Philadelphia Operation Hub. Justify your recommendation.

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**Question 4-6 pertains to the Case Study.**  
**Each question should be answered independently.**

**5.** (12 points)

- (a) (1 point) Define the two types of wrong-way risk:
- (i) General wrong-way risk
  - (ii) Specific wrong-way risk

Information on Frenz can be found in Section 4 of the Case Study.

As part of the ongoing negotiations with the government of Vietombia, a new proposal is being considered by Frenz. Rather than Frenz owning and operating the coffee distribution, a new corporation would be formed by the Vietombia government which would deal exclusively with Frenz. The corporation would operate under the following guidelines:

- I. The corporation would be responsible for negotiating with and purchasing coffee beans from the growers.
  - II. Coffee beans would be sold to Frenz at a fixed price relative to the 6-month future price of coffee, set on January 1 of every year, for the entire year.
- (b) (2 points) Describe how this new arrangement exposes Frenz to both general and specific wrong-way risks.
- (c) (1 point) Describe the following elements of the five forces of competition:
- (i) Bargaining power of suppliers
  - (ii) Bargaining power of buyers

The new corporation must supply beans to Frenz at a fixed price, but purchase beans from growers at a variable price. Consider that Vietombia is experiencing a drought, increasing the input costs of water and fertilizer.

## 5. Continued

- (d) (2 points)
- (i) Describe how the bargaining power of suppliers applies to growers.
  - (ii) Describe how the bargaining power of buyers applies to the new corporation.
- (e) (2 points) Describe how the bargaining power of buyers mitigates specific wrong-way risk for Frenz.

Frenz's CEO, David Gillet, views the proposed structure as quasi-vertical-integration, with potential wrong-way risk. Gillet is also considering a full vertical integration in Vietombia.

Four reasons to vertically integrate:

- A. Responding to Industry Life Cycle
- B. Creating and Exploring Market Power
- C. Defend Against Market Power
- D. Vertical Market Failure

However, due to recent growth, Frenz is now facing two major issues: operating cash flow strain and capital availability.

- (f) (4 points)
- (i) Assess whether or not each of the four reasons (A to D) above is applicable to Frenz. Justify your assessment.
  - (ii) Recommend whether or not the new government-backed option is a better approach to support Frenz's growth strategy than vertical integration of the supply chain. Justify your recommendation.

**Question 4-6 pertains to the Case Study.**  
**Each question should be answered independently.**

- 6.** (11 points) Information on Blue Jay Air (BJA) can be found in Section 2 of the Case Study.
- (a) (4 points) Assess the impact of each of the five forces of competition on BJA's profitability potential. Justify your assessment.
  - (b) (2 points) Explain why BJA has sustainable competitive advantage from maintaining a good relationship with its labor force. Justify your answer.
  - (c) (2 points) Rank the importance of each of the five forces as it relates to the sustainable competitive advantage in part (b). Justify your ranking.
  - (d) (1 point) Assess whether or not the air travel market is attractive to BJA. Justify your assessment.

BJA is considering the following options:

Option X: Improve the customer experience by enhanced amenities. This will be funded by laying off 20% of aircraft servicing and maintenance technicians.

Option Y: Increase the aircraft fleet by 20% to improve flight turnaround time. This will be funded by reducing BJA's amenities.

- (e) (2 points)
  - (i) Describe the most significant risk for each of the options X and Y above with respect to capabilities and market attractiveness.
  - (ii) Recommend which option BJA should implement. Justify your recommendation.

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



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