

# Exam CFESDM

## MORNING SESSION

**Date:** Thursday, May 2, 2019

**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 6 questions numbered 1 through 6.
  - b) The afternoon session consists of 3 questions numbered 7 through 9.

The points for each question are indicated at the beginning of the question. Questions 1 - 4, and 6 - 9 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 Blue Jay Tire (BJT) can be found in Section 3 of the case study.

BJT estimates the new invoice system will increase annual expenses by \$8,000,000. The costs will be split between BJT-Canada and BJT-USA. BJT is evaluating three different cost allocation bases for the new invoice system:

The three allocation bases under consideration are:

- I. Number of Employees
- II. Number of Plants
- III. Revenues

- (a) (1 point) Identify whether or not each cost allocation basis (I to III) is an insulating or non-insulating cost allocation basis. Justify your answer.
- (b) (1 point) Explain why BJT may choose to use an insulating cost allocation basis.

BJT financials can be found in Exhibit 4 of Section 3A of the Case Study.

Under each cost allocation basis (I to III):

- (c) (1 point) Calculate the allocated expense for the new system to BJT-USA. Show your work.

BJT has decided to implement the allocation basis that maximizes expense allocation to BJT-USA.

- (d) (3 points) Critique this decision.

## 1. Continued

Pierre Beaudry, the CEO of BJT, has seen increased hostility between CCC Tire Stores and BJT-USA regarding transfer pricing. The head of BJT-USA believes the transfer price should be set using a variable-cost approach, while the leader of CCC argues for a market-cost approach. Beaudry strongly supports transfer prices using a full-cost approach.

- (e) (2 points) Explain why each of BJT-USA, CCC Tire Stores and Beaudry supports their particular approach.
- (f) (2 points) Recommend one potential way to reorganize BJT to eliminate the transfer pricing problem. Justify your answer.

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

**2.** (9 points) Information on Darwin Life can be found in Section 7 of the Case Study.

Julia Reich, CRO, has requested that you lead the project of drafting a revised ORSA. Julia asks you to address the following:

- (a) (1 point) List four primary risks that Darwin should include on the Risk Register underlying the ORSA.
- (b) (2 points) Describe the considerations specific to Darwin that must be included when determining the frequency of the review of the Risk Register. Justify your answer.

Darwin has decided to pursue the proposal of Anne Kofsky, VP Life Insurance Division, to expand the offering of Indexed Universal Life products.

- (c) (3 points) Describe the changes that Darwin should make to its ORSA as a result of the new product with respect to:
  - (i) Market risk;
  - (ii) Frequency of review.
- (d) (2 points) Explain how two secondary risks have changed due to the introduction of the Indexed Universal Life product.
- (e) (1 point) Describe how to discount very long-dated cashflows using the European Embedded Value rules.

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

**3.** (10 points) Information on Frenz can be found in Section 4 of the Case Study.

Frenz has introduced the Vietombia bean in some of its product offerings. Frenz has negotiated a short-term fixed price for beans with Vietombia. Based on positive feedback from its customers, Frenz wants to increase the amount of coffee beans supplied from Vietombia.

(a) (2 points)

- (i) Describe two benefits to Frenz of increasing its coffee supply from Vietombia.
- (ii) Describe two potential risks associated with increasing supply from Vietombia.
- (iii) Explain how the partnership with Vietombia impacts Frenz' Bargaining Power of Suppliers.

Frenz has decided to use a linear optimization model to determine the optimal amount of coffee beans to import from each country.

Frenz imports 25,000 tons of coffee beans a year. Frenz uses a Customer Taste Index (CTI) indicating customer feedback on various coffee beans. Higher CTI indicates better customer satisfaction. Frenz management team wants to have a minimum average CTI of 5 and wants to limit long-term price volatility to 15%.

Table 1

Identifier	Country	Price/ton (\$USD)	Price Volatility (%)	Political Risk	Customer Taste Index
A	Ethiopia	600	25%	Medium	3
B	Costa Rica	1,200	5%	Low	8
C	Colombia	750	15%	Medium	6
D	Vietombia	850	20%	High	8

Pricing and production levels are assumed to independent among countries.



### 3. Continued

A Frenz analyst proposed the following decision model be used to determine the quantity of coffee to import from each country:

$$\text{Minimize: } 600A + 1,200B + 750C + 850D$$

$$\text{Constraint: } A + B + C + D = 25000$$

(b) (4 points)

- (i) Critique the proposed decision model.
- (ii) Explain three ways to improve the decision model to address concerns identified in part (i).
- (iii) State the objective function and constraint function(s) based on your answer to part (ii).

Frenz is considering the following options for its Vietombia strategy:

- I. Vertical integration
- II. Non-equity strategic alliance

(c) (4 points)

- (i) Describe how each strategy (I and II) changes your decision model in part (b)(iii).
- (ii) Recommend a strategy based on your answer to part (i). Justify your answer.

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

**4.** (13 points) Information on Frenz can be found in section 4 of the case study.

During an Executive Committee meeting, Olivier Collignon proposed that Frenz move forward with the vertical integration initiative in Vietombia, building a local production facility and securing exclusive use of the Vietombia coffee beans. Others on the committee expressed concern that the capital needed for this initiative would increase liquidity risk too much.

Olivier has performed discrete scenario testing to forecast change in available capital levels for what he believes are the appropriate scenarios for liquidity stress testing, showing that the company will have lower liquidity risk with the Vietombia deal in place.

Scenario	Change in available Capital		Reasoning for improved results
	without Vietombia Deal	with Vietombia Deal	
Frenz credit downgrade	-30	-20	Diversification reduces overall volatility
10% Increase in global coffee bean price	-40	-5	Pegged currency ensures low-cost of beans
Reputation deterioration from third party actions	-20	-15	Relying on fewer third parties reduces overall risk

Assumptions:

- The projection period is 6 years.
- Capital amount in the table above shows the amount of free capital Frenz has at the end of the projection period.
- 1000 simulations are projected for each scenario based on 70 years of historical data.
- Simulations incorporate both local market disruption and national market disruptions.
- During times of liquidity needs, 10% haircuts are used in the sale of junk assets.
- Management actions are reflected in each scenario.

#### **4. Continued**

While Olivier would still like more analysis to be done, he has concluded that this initiative will help Frenz meet performance objectives while lowering the company's risk profile.

- (a) (2 points) Describe two risks to which Frenz's exposure would increase as a result of setting up operations in Vietombia.
- (b) (4 points) Describe five ways in which Olivier's testing of liquidity could be improved.
- (c) (2 points) Critique Olivier's overall conclusion of the Vietombia initiative.

A member of the executive committee argued against Olivier's suggestion: "This plan is risky and we need certainty to prosper. That's what our customers need. I don't even want to look at Olivier's data, it is not relevant at this point".

- (d) (1 point) Identify two biases that exhibited in this statement. Justify your answer.
- (e) (4 points) Design a risk response plan for Frenz to manage liquidity risk.

5. (11 points) Airline WXY must decide how many morning flights to offer from Boston to New York, and from Boston to Toronto. WXY retained a consulting firm for \$10,000 USD which compiled the following data:

Item	Boston to New York	Boston to Toronto
Demand for morning flights	150 passengers	350 passengers
Ticket price (USD)	\$125	\$150
Operating cost per flight (USD)	\$1000	\$1500

- WXY has a fleet of five aircrafts, each of which has a maximum capacity of 50 passengers.
  - At least four aircrafts should be used to service the above routes.
  - There must be at least as many flights to New York as there are to Toronto.
- (a) (1 point)
- (i) Identify the decision variables.
  - (ii) State the objective function.
- (b) (2 points) State the required constraint functions.
- (c) (4 points) Sketch the feasible region with binding constraints clearly labelled.
- (d) (2 points) Calculate the optimal solution. Show your work.

## 5. Continued

Airline WXY reports results in \$USD. Management would like to incorporate the following variables:

- I. Foreign exchange rates
- II. Fuel prices
- III. Airport Hub costs

For part (e) only, Assume:

- The ticket price for flights going to Toronto are now \$150 CAD
  - The ticket price to New York is unchanged
  - Operating costs do not include the cost of fuel
  - It takes 100 units of fuel to travel from Boston to New York, and 200 units of fuel from Boston to Toronto
  - Airport Hub Costs in Toronto are \$500 CAD per flight
  - Airport Hub Costs in New York are \$450 USD per flight
  - All other costs are incurred and paid in USD
- (e) (2 points) Revise the model from part (a) to account for each variable I-III. Justify your answer.

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

- 6.** (7 points) Information on Frenz Corporation can be found in Section 4 of the Case Study.

Based on the discussion of overhead allocation between Jeff Bemowski and Kitty Dunn in Section 4.2 of the case study:

- (a) (2 points) Identify Jeff and Kitty's individual decision making styles with respect to gathering information and evaluating alternatives. Justify your answer.
- (b) (1 point) Describe the five steps of Sequential Analysis.
- (c) (4 points) Apply Sequential Analysis to the problem Jeff has identified.

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

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