
SOCIETY OF ACTUARIES
Strategic Decision Making Exam

Exam CFESDM

AFTERNOON SESSION

Date: Thursday, October 31, 2013

Time: 1:30 p.m. – 3:45 p.m.

INSTRUCTIONS TO CANDIDATES

General Instructions

1. This afternoon session consists of 5 questions numbered 8 through 12 for a total of 40 points. The points for each question are indicated at the beginning of the question. Questions 8-12 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.
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 morning or afternoon session for Exam CFESDM.

Written-Answer Instructions

1. Write your candidate number at the top of each sheet. Your name must not appear.
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****

Afternoon Session
Beginning with Question 8

Questions 8 – 12 pertain to the Case Study.
Each question should be answered independently.

- 8.** (4 points) You have been assigned to analyze Frenz's corporate overhead allocation based on the conversation between Kitty Dunn, Frenz Chief Accounting Officer and Jeff Bemowski, Frenz VP of Non-Coffee Product Marketing as shown in Section 4 of the Case Study.
- (a) (1 point) Calculate the overhead cost per unit of sales for the following two methodologies. Show your work.
- (i) Current methodology
 - (ii) The per-store methodology suggested by Bemowski, using budgeted overhead
- (b) (1 point) Determine a break-even sales volume level that would make the corporate overhead allocation identical under both the current methodology and the per-store methodology. Show your work.
- (c) (2 points) Recommend an allocation methodology for Frenz's corporate overhead based on your analysis. Justify your recommendation.

**Questions 8 – 12 pertain to the Case Study.
Each question should be answered independently.**

9. (9 points) Blue Jay Air has plans to expand in two years. Blue Jay Air would like to issue AA rated debt to fund the expansion. Twelve months ago, Insight Ratings' preliminary indications were that Blue Jay Air's debt would be rated A, citing concerns regarding Blue Jay Air's ability to service the additional debt.

- (a) (1 point) List five ways companies can increase reported cash flows.
- (b) (4 points) Explain two actions airline companies can take to increase reported cash flows for each way identified in part (a).

Consider Blue Jay Air's operational objectives as described in Section 2 of the Case Study.

- (c) (4 points) Recommend the actions identified in part (b) that Blue Jay Air should take to significantly increase its reported cash flows. Justify your answer.

Questions 8 – 12 pertain to the Case Study.
Each question should be answered independently.

10. (9 points) Frenz’s Chief Risk Officer (CRO) is concerned that Vietombia could stop its policy of pegging its currency to that of its neighboring countries. Hence the CRO has recommended using a United States dollar (US\$) / *Rubiaceae* European put, with a strike price 50 *Rubiaceae* / US\$, giving Frenz the right to sell \$10,000,000 and buy 500,000,000 *Rubiaceae* in 3 months. Frenz’s Chief Financial Officer (CFO) is considering an offer from State Bank of Vietombia (SBV).

You are given the following information and assumptions:

- The current *Rubiaceae* / US\$ exchange rate is \$55 *Rubiaceae* / US\$.
- The cumulative hazard rate, $h(t)$ for default of SBV is:

$$h(t) = \log \left[1 + \exp \left(-6 + 2.5 \times 10^{-8} \cdot EV(t) \right) \right]$$
 where, $EV(t)$ is the expected future value of foreign exchange (FX) portfolio in *Rubiaceae*.
- The recovery rate is 30%.
- The continuously compounded, US\$, risk-free rate is 5%.
- Monte Carlo simulations of FX rates yields:

Time (months)	Projected FX-rate <i>Rubiaceae</i> / US\$	Expected Value of FX portfolio (<i>Rubiaceae</i>)	Expected Exposure of FX-put to Frenz (<i>Rubiaceae</i>)	Cumulative default (SBV) probability
1	51.45	35,471,158	0	0.00598
2	48.13	68,654,675	18,654,675	0.01360
3	45.03	99,698,086	49,698,086	?
4	42.13	128,739,414	78,739,414	0.05833
5	39.41	155,907,779	105,907,779	0.10887

The currency option market for *Rubiaceae* indexed derivatives is not as liquid as most other currencies and the CFO feels the counterparty credit risk is significant enough to warrant inclusion of Credit Value Adjustment (CVA) within the valuation of deals with SBV.

- (a) (4 points) Calculate the CVA of the FX-put with SBV as counterparty. Express your answer as a percent of US\$ notional value.

**Questions 8 – 12 pertain to the Case Study.
Each question should be answered independently.**

10. Continued

- (b) (1 point) Describe wrong-way risk.

Consider Frenz's information as described in Section 4 of the Case Study.

- (c) (3 points) Evaluate whether the *FX*-put represents wrong-way risk. Justify your answer.

Frenz estimates the fair price of the default-free US\$ / *Rubiaceae* *FX*-put to be 1.967% as a percentage of the US\$ notional. SBV has offered to take the other side of the deal in exchange for 1.85%, as a percentage of the US\$ notional.

- (d) (1 point) Determine whether Frenz should buy the *FX*-put from SBV based on your analyses from parts (a), (b) and (c) above. Justify your answer.

*Questions 8 – 12 pertain to the Case Study.
Each question should be answered independently.*

11. (9 points)

- (a) (1 point) List five significant risks of investing in sovereign bonds.

Big Ben Bank's Investment Policy and data can be found in Section 6 of the Case Study. On January 1, 2013, Insight Ratings downgraded Sovereign X to below investment grade.

- (b) (2 points) Describe how Sovereign X's downgrade increases Big Ben Bank's liquidity risks.

After the downgrade, the market value of Big Ben Bank's Sovereign X Treasury holdings decreases to \$1.5 billion. The news has triggered a request for deposit withdrawals. It is expected that the deposit drain will be \$3.0 billion. Big Ben Bank is proposing using purchase liquidity management or stored liquidity management techniques.

- (c)
- (i) (2 points) Describe possible transactions required to execute the two proposed liquidity management techniques to manage Big Ben Bank's liquidity profile.
 - (ii) (4 points) Calculate the balance sheets immediately after the deposit drain under the two proposed liquidity management techniques using the suggested transactions in part (i).

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**Questions 8 - 12 pertain to the Case Study.
Each question should be answered independently.**

12. (9 points)

- (a) (2 points) Describe the advantages and disadvantages of centralized clearing for derivatives.
- (b) (2 points) Describe the possible effects of requiring centralized clearing for derivatives on:
 - (i) counterparty risk
 - (ii) systemic risk
 - (iii) liquidity risk

Consider Big Ben Bank's information, as described in Section 6 of the Case Study.

- (c) (2 points) Explain the potential impact of centralized clearing on Big Ben Bank.

Big Ben Bank has received approval to use Internal Model Method (IMM) under BASEL III. This will allow Big Ben Bank to use its internal Value at Risk (VaR) models to calculate Credit Value Adjustment (CVA) VaR.

Credit spreads for the portfolio of interest rate and cross-currency swaps have been simulated at time intervals of 10 calendar days, using Monte Carlo simulations. A simplifying assumption in the calculation of CVA VaR is that exposure is unchanged over the 10-day period.

*Questions 8 – 12 pertain to the Case Study.
Each question should be answered independently.*

12. Continued

You are given:

- The CVA of the portfolio is \$300,000 for a flat credit default swap (CDS) spread of 500 basis points (bps), and recovery rate of 40%.
 - The annual volatility is 300 bps for the CDS spread of 500 bps.
 - The credit-delta of this portfolio is 400 \$/bp.
 - The *Variance-Covariance* form of VaR is used, assuming a 250 day year, to calculate the worst-case scenario CDS spread.
 - The following value is from the standard normal distribution:
 $\Phi^{-1}(99\%) = 2.33$
- (d) (2 points) Calculate the additional CVA capital charge using a 99% confidence level, and a multiplier of 3. Show your work.
- (e) (1 point) Big Ben Bank is considering using the standardized approach for the additional capital charge.

Assess the feasibility of this consideration.

****END OF EXAMINATION****
Afternoon Session

USE THIS PAGE FOR YOUR SCRATCH WORK