SOCIETY OF ACTUARIES
Strategic Decision Making Exam

Exam CFESDM

AFTERNOON SESSION

Date: Thursday, April 30, 2015
Time: 1:30 p.m. – 3:45 p.m.

INSTRUCTIONS TO CANDIDATES

General Instructions

1. This afternoon session consists of 4 questions numbered 6 through 9 for a total of 40 points. The points for each question are indicated at the beginning of the question. Questions 6, 7, and 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.

Tournez le cahier d'examen pour la version française.

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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 6

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

6. (*8 points*)

(a) (*1 point*) Define business-level strategy.

Five business-level strategies that firms may choose to establish and defend their desired strategic position are:

I. Cost Leadership

II. Differentiation

III. Focused Cost Leadership

IV. Focused Differentiation

V. Integrated Cost Leadership/Differentiation

(b) (*4 points*) Identify the business-level strategy used by any four RPPC subsidiaries. Justify your answer.

Information on Blue Jay Air can be found in Section 2 of the Case Study.

John Feather, Blue Jay Air (BJA) CEO, has suggested offering travel packages through "Blue Jay Air Vacations." This program will allow penetration into the vacation travel market. He is considering whether to target existing business customers or new customers.

(c) (*2 points*)

(i) Recommend a business-level strategy for existing business customers.

(ii) Recommend a business-level strategy for new customers.

Justify your recommendations.

6. Continued

Blue Jay Air hired a consultant to develop a model that determines the Net Present Value (NPV) of income for two business strategies. The following model results were shared with Blue Jay Air's CRO:

Business Strategy	NPV at 5%	Standard Deviation	Credit Rating after 1-in-100 year event
Strategy A	\$50M	\$5M	BB+
Strategy B	\$48M	\$2M	BBB

(d) (*1 point*) Recommend business strategy A or B based on Blue Jay Air's key risk management objective. Justify your recommendation.

Question 7 pertains to the Case Study.
Each question should be answered independently.

7. (*12 points*) Under the Market Consistent Embedded Value Framework, MCEV is the sum of the Value of Inforce (VIF), Free Surplus and Required Surplus. The four components of VIF are as follows:

1. Present Value of Future Profits (PVFP)
2. Time Value of Financial Options and Guarantees (TVFOG)
3. Frictional Costs
4. Cost of Residual Non Hedgeable Risks (CRNHR)

(a) (*1 point*) Describe each of the four VIF components.

Information on Darwin Life Insurance Company can be found in Section 7 of the Case Study.

Darwin Life Insurance Company is preparing its annual Market Consistent Embedded Value (MCEV) calculation for 2014.

Every three years, the actuarial analyst prepares a mortality experience study based on the last 5 years of experience to update the MCEV mortality assumptions. The summarized results of the most recent study are shown below:

Product Line	Actual/Expected Mortality
Variable Annuities	75%
Universal Life	95%
Traditional Life	97%
Term	94%
Other	93%
Total	88%

Based on these results, the actuarial analyst has recommended that the company use an overall mortality experience adjustment of 93% for the next three years of MCEV calculations, based on the overall ratio of 88% plus a 5% margin for adverse experience.

(b) (*3 points*) Given the principles of Market Consistent Embedded Value:

(i) Critique the actuarial analyst's experience study analysis.

(ii) Critique the actuarial analyst's experience study recommendation.

7. **Continued**

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

Extending the MCEV framework, company value considers value of future new business. The RPPC board of directors would like to apply some elements of this extended framework to Frenz in order to help better understand the company value of Frenz to RPPC.

(c) (*2 points*) List three key assumptions that would be specific to the retail coffee house market that Frenz needs to consider to calculate the present value of future new business for each of the following categories:

I. Revenue

II. Expenses

III. Economic

(d) (*2 points*) Identify the most impactful risk for each category I, II, and III in (c) for which Frenz should establish economic capital. Justify your answer.

(e) (*2 points*) Classify each risk identified in (d) as hedgeable or non-hedgeable. Justify your answer.

The RPPC board of directors would also like to calculate the value of future new business for Frenz.

(f) (*2 points*)

(i) Define the value of future new business under the MCEV framework for a typical life insurance company such as Darwin.

(ii) Recommend a definition for the value of future new business for Frenz.

8. (*10 points*)

(a) (*1 point*) Describe one trigger event that can lead to liquidity problems for banks. Justify your answer.

The CRO asked you to assess quantitatively the liquidity risk of two regional bank subsidiaries, Bank A and Bank B, based on a balance sheet liquidity analysis. Consider the following balance sheet structure of the two banks:

Liquefiable Assets ($)	**Bank A**	**Bank B**
Loans and receivables	90	130
Trading assets	30	20
Reverse repos	30	0
Total	150	150

Liquefiable Liabilities ($)	**Bank A**	**Bank B**
Non-bank deposits	60	90
Certified liabilities	20	20
Equity	10	10
Unsecured bank deposits	20	25
Trading liabilities	30	5
Repos	10	0
Total	150	150

(b) (*2 points*) Identify which bank has more liquidity risk based on the balance sheet liquidity analysis. Justify your answer.

8. Continued

The CRO asks you to use a maturity mismatch approach as an alternative to a balance sheet liquidity analysis for assessing the liquidity risks of the two banks. The following are the liquidity gap profiles for the two banks' balance sheets in a pure run-off mode, that is, no new business and no rollover of funding.

	Gap Profile									
Bank A	Balance	Over Night	8 Days	14 Days	1 Month	3 Months	1 Year	3 Years	6 Years	≥ 10 Years
Cash	10	10								
Unencumbered securities	50	20	12	10	5	2	1	0	0	0
Continuous inflow	5	5								
Net inflow		35	12	10	5	2	1	0	0	0
Net cumulative inflow		35	47	57	62	64	65	65	65	65
Loans	40	10	10	5	5	2	2	2	2	2
Retail deposits	−60	−10	−10	−10	−10	−7	−4	−3	−3	−3
Own funds	−40	−20	−15	−5						
Continuous outflow	−10	−4	−4	−2						
Net outflow		−24	−19	−12	−5	−5	−2	−1	−1	−1
Net cumulative outflow		−24	−43	−55	−60	−65	−67	−68	−69	−70
Net cumulative gap		11	4	2	2	−1	−2	−3	−4	−5

Question 8 continued on next page

8. Continued

		Gap Profile								
Bank B	Balance	Over Night	8 Days	14 Days	1 Month	3 Months	1 Year	3 Years	6 Years	≥ 10 Years
Cash	10	10								
Unencumbered securities	50	20	12	10	5	2	1	0	0	0
Continuous inflow	5	5								
Net inflow		35	12	10	5	2	1	0	0	0
Net cumulative inflow		35	47	57	62	64	65	65	65	65
Loans	40	10	10	5	5	3	2	2	2	1
Retail deposits	−60	−10	−10	−15	−10	−3	−4	−3	−3	−2
Own funds	−40	−15	−10	−7	−3	−3	−1	−1		
Continuous outflow	−10	−5	−3	−2						
Net outflow		−20	−13	−19	−8	−3	−3	−2	−1	−1
Net cumulative outflow		−20	−33	−52	−60	−63	−66	−68	−69	−70
Net cumulative gap		15	14	5	2	1	−1	−3	−4	−5

(c) (*1 points*) Identify which bank is more likely to survive a liquidity crisis based on a maturity mismatch approach.

(d) (*3 points*) Assess which bank is more likely to survive a liquidity crisis after consideration of parts (b) and (c). Justify your answer.

A bank that is perceived as having lots of liquidity is less likely to lose the confidence of counterparties with which the bank does business.

(e) (*3 points*) Identify and describe three lessons learned to mitigate liquidity risk considering J.P. Morgan's analysis in "J.P. Morgan Private Bank: Risk Management during the financial crisis 2008-2009."

Question 9 pertains to the Case Study. Each question should be answered independently.

9. (*10 points*) Information on Frenz can be found in Section 4 of the Case Study.

In the case study, "Frenz is also exploring vertical integration by owning and controlling its sources of key ingredients such as coffee beans plantations and tea plantations in order to enhance its quality control as well as developing its own niche products."

Robert Kaplan, Frenz's Chief Risk Officer, understands that vertical integration such as this will also impact the company's exposure to market risks.

(a) (*4 points*) Describe examples of two risks and two rewards as a result of Frenz vertically integrating the production of tea leaves and coffee beans.

Frenz's earnings per share since 2008 have been volatile. This volatility is a key factor in Kaplan's decision as to which process, if any, to integrate vertically into Frenz's production. Kaplan's primary goal with this decision is to improve the stability of earnings, measured as the proportion of years that Frenz recognizes positive pre-tax earnings. In addition to this concern, Kaplan also mentioned that it will be nice to also achieve secondary goals of reducing operational costs and reducing the volatility of the cost of good sales.

The following figures shows the historical prices at which Frenz has purchased tea and coffee, and Kaplan's price estimate under a potential vertical integration of that process.

Figure I: Coffee – Fiscal Year Ended Historical Production Cost Figures and Estimates

Price/ton($)	**Dec 2012**	**Dec 2011**	**Dec 2010**	**Dec 2009**	**Dec 2008**
Historical Actual	1,575	1,925	1,750	1,663	1,575
Standalone Vertical Integration	1,378	2,246	1,670	1,746	1,741

Contribution to Cost of Good Sales	**Dec 2012**	**Dec 2011**	**Dec 2010**	**Dec 2009**	**Dec 2008**	**Mean**	**Std. Dev.**
Historical Actual	216	198	220	210	161.5	201.1	23.6
Standalone Vertical Integration	189	231	210	220.5	178.5	205.8	21.7

Question 9 continued on next page

9. Continued

Items	Dec 2012	Dec 2011	Dec 2010	Dec 2009	Dec 2008	Mean	Std. Dev.
Tons Purchased (million)	0.13714	0.10286	0.12571	0.12628	0.10254	0.11891	0.01548
Vertical Integration Impact on Cost of Good Sales	−27	33	−10	10.5	17	4.7	23.5

Figure II: Tea – Fiscal Year Ended Historical Production Cost Figures and Estimates

Price/ton($)	Dec 2012	Dec 2011	Dec 2010	Dec 2009	Dec 2008
Historical Actual	220	400	420	340	160
Standalone Vertical Integration	186	284	450	444	110

Contribution to Cost of Good Sales	Dec 2012	Dec 2011	Dec 2010	Dec 2009	Dec 2008	Mean	Std. Dev.
Historical Actual	412.5	900	840	612	324	617.7	253.72
Standalone Vertical Integration	350	638	900	800	224	582.6	288.80

Items	Dec 2012	Dec 2011	Dec 2010	Dec 2009	Dec 2008	Mean	Std. Dev.
Tons Purchased (million)	1.88	2.25	2.00	1.80	2.03	1.99	0.17
Vertical Integration Impact on Cost of Good Sales	62.5	261	−60	−188	100	35.1	169.5

(b) (*3 points*) Evaluate which vertical integration: tea only, coffee only, neither or inconclusive, Kaplan should pursue solely based on the information provided above. Justify your answer.

9. **Continued**

Figures III and IV provide historical earnings and pro-forma historical earnings under vertical integration for Frenz.

Figure III: Historical Earnings at Fiscal Year Ended

Items	Dec 2012	Dec 2011	Dec 2010	Dec 2009	Dec 2008	Mean	Std. Dev.
Cost of Good sales ($million)	495	445	375	255	760	466.0	187.4
Historical Earnings pre-tax	204	91	−128	−482	401	17.2	338.4

Figure IV: Pro-Forma Historical Earnings under Vertical Integration

Vertical Integration Strategy	Dec 2012	Dec 2011	Dec 2010	Dec 2009	Dec 2008	Mean	Std. Dev.
Coffee Vertical Integration	231	58	−118	−493	384	12.5	339.1
Tea Vertical Integration	17	271	72	−446	77	−1.9	266.3
Coffee and Tea Vertical Integration	44	238	82	−457	60	−6.6	263.2

(c) (*3 points*) Recommend which vertical integration strategy, if any, Kaplan should pursue, based on Figures I to IV. Justify your recommendation.

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

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