

CFE SDM Model Solutions

Fall 2013

General Commentary on the Exam:

Many candidates struggled with higher level Analysis and Knowledge Utilization cognitive questions. Weaker candidates often used an approach that could be described as “list as many facts or as much information as possible.” In many cases the information had little relevance. In general, they provided a “list” of information from the syllabus material or from general knowledge without connecting the information. They struggled to apply the information in the context of the question and/or failed to recognize which items from this “list” were applicable in the context of the question. A list of statements, whether factually correct or not, is not a substitute for analysis, evaluation, application, and utilization nor does a list demonstrate critical thinking.

Stronger candidates selected information pertinent to the context of the question and connected the information to formulate and support positions. Stronger candidates were able to demonstrate a deeper understanding of the syllabus material by exploring relationships, providing cause and effects, assessing risk factors and impacts, linking factors and decisions to strategy, etc.

Several questions sequentially asked candidates to consider a question for companies in general, for an industry, for one of the case study companies (e.g., in parts (a), (b), and (c)). Weaker candidates tended to answer all parts at a general level often relying on general knowledge and resorting to lists without providing connections. Stronger candidates were able to differentiate between general situations and context specific situations. Stronger candidates were able to cite and link specific items from the case study.

1. Learning Objectives:

4. The candidate will understand organizational behavioral concepts and apply strategic management frameworks to corporate financial and ERM business problems.
5. The candidate will understand the decision making process and the lessons learned from the risk taking activities and experiences of other organizations. In particular, the candidate will be able to apply the learning objectives of all the prior sections of the syllabus to the risk management principles embodied within the case studies explored in this section.

Learning Outcomes:

- (4c) Use organizational behavior and strategic management concepts to evaluate and recommend corporate financial and ERM decisions.
- (5a) Critique financial models, assumptions and decisions including the impact of behavioral finance concepts.
- (5c) Assess the risk of the status quo alongside any other risky and or risk management decision.

Sources:

SDM-120-13: Ping An's Overseas Expansion: Financial Uncertainties and Risk Management

SDM-121-13: British Petroleum (PLC) and John Browne: A Culture of Risk Beyond Petroleum

Nudge: Improving Decisions about Health, Wealth and Happiness, Thaler, Richard and Sunstein, Cass, Chapter 1

Commentary on Question:

This question tests the candidates' ability to apply their understanding for availability bias to case studies and a described scenario. Most candidates did not do well in part (b). They failed to identify the cause of the bias, which is the recent successful acquisition experience. Some demonstrated the understanding of the bias, however failed to link it to the situation.

Solution:

- (a) Describe availability bias.

1. Continued

Commentary on Question:

Almost all candidates put down something relevant but most of the answers did not fully describe the bias. For example an answer of “choose the most recent experience” may be a result of availability bias but it does not describe what the bias is. Candidates are expected to describe how “easily recalled sample” affect the “assessment of likelihood”.

People exhibit availability bias when they:

- Assess the likelihood of risks based on how easily examples come to mind
- Become frightened and concerned if they can easily think of relevant examples

- (b) Explain how Ping An’s management team exhibits availability bias in its acquisition decision.

Commentary on Question:

Candidates are expected to relate the bias to Ping An’s oversea expansion decision. Some candidates failed to recognize how “successful experience” affected the executive team’s ability to assess the acquisition. Most of the candidates talked about “only use the available information”. Some referred to more generic reasons such as past growth or profit, which only plays a secondary role here.

Ping An’s competitors as well as other Chinese financial institutions made successful international expansions during 2006 and 2007 by acquiring stakes in foreign companies. Ping An’s decision to invest in Fortis may be influenced by these recent successful examples. Fortis, at that time, seemed to be a good investment target, since it has been growing and fit the profile for previous successful deals.

- (c) Compare what happened to BP in the article, “British Petroleum (PLC) and John Browne: A Culture of Risk Beyond Petroleum,” to what is happening at the bank.

Commentary on Question:

Candidates did relatively better in this part; most of them mentioned either or both of the communication and culture of risk.

At the middle management level, there is an ingrained culture of being comfortable at the bank, which contradicts senior management’s strategic vision; similarly, there is an ingrained culture of risk at BP’s refinery, where process safety is largely ignored. Both, at the business operation levels, have a culture that clashes with management’s view.

1. Continued

This culture clash demonstrates another similarity of the two, which is miscommunication or disconnection between the top, who set up the strategic objective and the working class, who is mandated to carry out the plan. Without appropriate sync-in, strategic plans may not be executed smoothly.

2. Learning Objectives:

4. The candidate will understand organizational behavioral concepts and apply strategic management frameworks to corporate financial and ERM business problems.

Learning Outcomes:

- (4a) Apply organization behavior concepts.
 - Describe the communication process and explain the strategic importance of communication to organizations.
 - Describe the fundamentals of decision making and explain decision-making styles and influences.
 - Describe common types and causes of organizational conflict and apply the elements of a basic negotiation process.
 - Assess how the behavior of individuals and groups in organizations drives organizational decisions and performance.

Sources: *Organizational Behavior: A Strategic Approach* Chapter 10

Commentary on Question:

This question tests the candidates' understanding of two decision making styles and their ability to apply it to the given situation. Candidates' performance is on par on this question. Different points were picked up by different candidates, but not a lot of candidates were able to cover a wide range of points.

Solution:

- (a) Compare and contrast the sensing style and intuition style of gathering and evaluating information.

Commentary on Question:

Most of the candidates were able to make one or two comparisons. Candidates are expected to compare the definition (e.g. concrete information vs. abstract examples) as well as the characteristics (e.g. long vs. short time to make the decision). The candidates who were able to make thorough comparisons performed above average.

Sensing - A decision style focused on gathering concrete information directly through the senses, with an emphasis on practical and realistic ideas. Sensing style is concerned with developing factual database, checking facts, following rules and logic and/or making decisions based on experience.

Intuition - A decision style focused on developing abstractions and figurative examples for use in decision making, with an emphasis on imagination and possibilities. Intuition style dislikes detail and the time required to interpret it. This style is often used when creative or innovative solution has to be built.

2. Continued

- (b) Evaluate whether the sensing style or intuition style is more appropriate for CEO Johnson to use. Justify your answer.

Commentary on Question:

Candidates did not do well on this question. There is no right or wrong answer here – the choice is not clear cut and there are pro’s and con’s for each. Therefore justification is the important factor to distinguish different levels of understanding. As long as the choice was justified by valid fact, candidates performed well. The discussion on what Johnson should do (i.e., what action and why) present little merit because the question was not asking for a recommendation.

The intuition style is more appropriate for Johnson to use. Below is a list of justifications:

- The 24-hour time frame is limited. It is difficult to use sensing style to gather data on tire production and make conclusions. The quick turnaround time would suggest using the intuition style.
- There are no precedents at BJT. BJT has a history of high level of quality control. There is little experience provided for sensing style decision making.
- It is hard to gather data to analyze potential reputation risk. Other companies may have faced similar situations; however, differences may be difficult to ascertain and to interpret. There are many possibilities. Reaction and potential impact is also hard to predict. Only intuition style would work well in this overly complex problem.
- This is simply a situation where the CEO may have to find a creative solution to create a win-win for BJT and the public.

3. Learning Objectives:

3. The candidate will understand best practices for ERM processes and Capital Management and their use in setting a risk-return strategy.

Learning Outcomes:

- (3a) Explain ERM principles and frameworks.
- Describe the best practices and frameworks for ERM processes under various industry forums and regulatory guidelines and standards.
 - Explain the principles driving the direction of new regulation and industry standards in risk governance.
 - Describe the components of a risk appetite statement. Design and develop a risk appetite statement and risk return strategy.

Sources:

Corporate Value of Enterprise Risk Management Chapter 6

Risk Appetite Statements What's on your Menu

Risk Appetite for Variable Annuities

Commentary on Question:

Overall, candidates did not adequately provide an explanation or support for the given topic/situation, nor did they adequately recommend changes to RPPC's Risk Appetite Statement that would better fit Darwin.

Solution:

- (a)
- (i) Explain why defining Risk Appetite is more than simply a risk quantification step in an ERM process.
 - (ii) List three potential benefits that life insurance companies could derive from implementing a Risk Appetite framework with regard to Variable Annuity products.

Commentary on Question:

Cognitive level: Retrieval

- (i) *Candidates were asked to explain the reason that Risk Appetite was important, not list/describe risk quantification steps in an ERM process. But many candidates just listed risk quantification steps.*
- (ii) *Many candidates listed general potential benefits applicable to any life and annuity product, not specific benefits to variable annuity products. Additional elaboration was needed.*

3. Continued

- (i) Risk appetite is an expression of judgment by management (or more specifically by the ERM committee) as to the level of enterprise risk exposure, at the maximum limit, with which the key stakeholders are comfortable. This is an exercise that requires thoughtful discussion, debate, and ultimately, a consensus opinion among the members of the ERM committee.
- (ii) The following examples are illustrative but not exhaustive. Credit was given to answers with coherent explanations.

A risk appetite framework requires senior management and the Board of Directors to set risk tolerances around VA products and evaluate whether the risk appetite is in line with VA in-force and VA currently being issued.

VA business can be a material driver of overall company earnings. A risk appetite framework can help to reduce earnings surprises through the recognition of the risk exposure embedded in VA and provide a more reliable understanding of potential issues before they arise.

A risk appetite that explicitly links remedial risk management actions to risk tolerances will enable a company to quantify the impact of prospective risk management actions.

A risk appetite framework will help VA writers assess the evolution of VA risks since the framework should involve assessing VA exposures and risk mitigation strategies prospectively against risk tolerances.

A risk appetite framework will assist VA writers to shift risk management strategies as specific variables change.

A risk appetite creates transparency in how risks and exposures are managed by linking VA performance across a variety of metrics against risk tolerances.

- (b) State which of the above risk exposures would be most impacted by the following proposed Key Risk Indicators. Justify your response.
 - (i) Significant Increase in Sales
 - (ii) Stock Market Crash
 - (iii) Significant Errors Found in an Administration System

3. Continued

Commentary on Question:

Cognitive level: Knowledge utilization

Some candidates specified the risk exposures but lacked adequate and relevant support for them. Credit was given to any of the three exposures in (ii) and (iii), provided adequate and relevant support was given.

(i) **I. Capital – a 15 percent loss of statutory equity in one year**
Reason: An increase in sales can cause a drain on resources due to increased underwriting and other initial expenses due to issuance of new policies. Additional sales may also incentivize a further expansion of distribution channels, employing additional capital. Increased sales increases risk exposures due to guarantees and a subsequent stock market crash.

(ii) **II. Earnings – Negative GAAP earnings**
Reason: Darwin was slow at responding to spread compression. A stock market crash will increase the value of guarantees impacting current income and reduce future fee income. A stock market crash may also be indicative of a condensing economy, which could increase lapses. Since liquidity is a problem for Darwin, the assets sold in response to lapses could result in realized losses.

Capital – Defaults on assets and depressed asset values

Ratings – If rating agencies are concerned with Darwin's concentration risks, a stock market crash may initiate the process of downgrading. During crisis periods downgrades may increase throughout the industry.

(iii) **I. Capital – a 15 percent loss of statutory equity in one year**
Reason: The discovery of these errors could result in mistakes in the valuation of reserves, thus impacting the balance sheet. Errors could impact the payment of claims and/or other benefits. Depending on the nature of the error, Darwin could also face legal proceedings, including class action litigations, which could result in substantial judgments. These judgments can include lump sum payments, as well as increasing future benefits. Resources would be needed to redress the problems.

Earnings – Depending of the magnitude of the administrative errors and the directional impact on reserves, significant GAAP earning losses may occur.

Ratings – There is a chance of rating downgrades if the credibility of the company is significantly impacted. What else is wrong?

3. Continued

- (c) Recommend three changes to RPPC's Risk Appetite Statement to make it more appropriate for Darwin. Justify your recommendations.

Commentary on Question:

Cognitive level: Knowledge utilization

Many candidates performed poorly. To receive credit, the response should be specific to Darwin and RPPC. The following are examples, not exhaustive lists. Other relevant points with coherent explanation were accepted.

Review the risk metrics given, and include those that are more relevant to Darwin's risk exposure. Also include the pain points for each metric, the current likelihood of each point, and the risk tolerance likelihood limits for each pain point. Doing so illustrates a qualified amount of risk Darwin is willing to take for each risk exposure. Furthermore, including these items will "help to ensure that a suitably holistic management approach can be taken in implementing the risk appetite." Include the three elements from Darwin's current risk appetite.

The risk appetite definition and the risk limits should be derived by conducting a risk appetite consensus meeting within Darwin, which had the following positive effects.

- Helps to facilitate discussion by reviewing enterprise risk exposures, individual risk scenario exposures, and mitigation options.
- Different members of the ERM committee will bring different perspectives to the discussion.
- Arriving at a consensus regarding the definition of risk appetite

Holding a risk appetite consensus meeting also lines up with Darwin's ERM Committee Charter by 1) aligning risk preferences, appetite, and tolerances with strategy and 2) monitoring risk exposure and ensuring risks are measured and well-managed.

Add a statement highlighting the linkage between an organization managing risk and achieving its strategic goals.

- E.g. – "The risk strategy and risk appetite are formed based on our strategic plans in order to align risk, capital, and performance targets."
- Identify core risks – economic conditions, maintenance of distribution systems, liquidity risks because of the high-value products
- Identify non-core risks and/or collateral risks – data processing and systems risks, changes in tax law, litigation/law enforcement - as the result of operating an insurance company

3. Continued

The risk appetite statement should set out applicable approval protocols for the statement's limits and other requirements, be subject to explicit change management controls, and include minimum requirements for review/refresh frequency. This should be done to ensure that the appetite statement functions within an overall control environment commensurate with its importance as a foundational risk management tool. In addition, it will enhance (and should also be a part of) Darwin's ERM Committee Charter by further demonstrating the importance and Darwin's continued support of the appetite statement and its awareness of risk.

It would be appropriate to add qualitative criteria emphasizing Darwin's dedication to the distribution channels and policyholders because these two core competencies have fueled recent growth (distribution relationships and product/service development). For instance, the appetite statement can state that relationships with the products cannot fall below an elevated level by providing minimum amounts of contact, support, marketing materials, infrastructure, etc. Similar comments can be made with regard to policyholder contact and service.

4. Learning Objectives:

5. The candidate will understand the decision making process and the lessons learned from the risk taking activities and experiences of other organizations. In particular, the candidate will be able to apply the learning objectives of all the prior sections of the syllabus to the risk management principles embodied within the case studies explored in this section.

Learning Outcomes:

- (5a) Critique financial models, assumptions and decisions including the impact of behavioral finance concepts.
- (5b) Evaluate the robustness and flexibility of the risk management framework and recommend approaches for continual improvement in the framework and processes.

Sources:

SDM-118-13: The Six Mistakes Executives Make in Risk Management

Nudge: Improving Decisions about Health, Wealth and Happiness, Thaler, Richard and Sunstein, Cass, Chapter 1

Corporate Value of Enterprise Risk Management: Chapter 8: Risk Governance

RPCC Risk Framework

Commentary on Question:

This question tests the candidates' ability to recall the six mistakes executives make in risk management in part (a) and tests their understanding of why these mistakes are commonly made in part (b). Part (c) tests the candidate's knowledge of Enterprise Risk Management practices by assessing the effectiveness of RPCC Dynasty's risk management framework.

Parts (a) and (b) were generally answered well by candidates. Generally answers to part (c) were lacking in the amount of detail required to receive full points.

Solution:

- (a) Identify the six mistakes executives often make in risk management
 1. We think we can manage risk by predicting extreme events
 2. We are convinced that studying the past will help us manage the risk
 3. We don't listen to advice about what we shouldn't do
 4. We assume that risk can be measured by standard deviation
 5. We don't appreciate that what's mathematically equivalent isn't psychologically so

4. Continued

6. We are taught that efficiency and maximizing shareholder value don't tolerate redundancy
- (b) Characterize each of the mistakes from part (a) as one of the following behavioral biases and blunders. Justify your answer
- Anchoring
 - Framing
 - Optimism and Overconfidence
 - Representativeness
 - Gains and losses
 - Availability
 - Status Quo Bias
1. We think we can manage risk by predicting extreme events
 - Optimism and overconfidence - we believe that events with low probabilities will never happen and we can handle it when it happens
 2. We are convinced that studying the past will help us manage the risk
 - Anchoring - use what happened in the past as an anchor to adjust in the direction we think it is appropriate
 3. We don't listen to advice about what we shouldn't do
 - Gains and losses - humans are loss adverse, thus gaining a dollar makes us feel better than not losing a dollar
 4. We assume that risk can be measured by standard deviation
 - Representativeness - believe standard deviation covers all risk
 5. We don't appreciate that what's mathematically equivalent isn't psychologically so
 - Framing - one fact can be framed differently and thus people perceive it differently
 6. We are taught that efficiency and maximizing shareholder value don't tolerate redundancy
 - Optimism and Overconfidence - In corporations, redundancy means inefficiency, and most executives don't realize optimization makes companies vulnerable to changes in environment.
- (c) Assess how RPCC Dynasty's risk management framework promotes the coordination between business management and risk management as part of a value-based ERM program.

Set up (Role of Champion): the role of champion is critical to ensuring that there is buy-in to the process among both business managers and risk officers

4. Continued

Value-based ERM vs. traditional ERM approach - risk management embedded in daily business activities and planning process and considered a profit generating activity (vision statement)

Risk Identification - RPCC risk review and approval (Product value-based ERM approval process PVEAP).

- The burden on the business units for risk analytics and data is limited, there is evidence of engagement with appropriate expert risk officers (EROs) and finding consensus is promoted.

Risk Quantification - RPCC risk monitoring in particular stress testing, KRI and incentive compensation in accordance with risk appetite.

- There is a baseline company value (base business plan) which is then used to do "what if" analysis. These stress scenarios are identified by experts from each line of business. Scenario development and their results engage appropriate business leaders (SMEs).

Risk Decision Making - RPCC risk culture and risk principles that ensure alignment with risk appetite in all decision making.

- There is enterprise wide engagement, awareness of all material risks and clear communication of risk appetite

Risk Messaging - RPCC vision statement - includes "strengths and value drivers" and " path to differentiation". The key is communicating these both internally and externally to ensure everyone understands the value of risk management.

5. Learning Objectives:

4. The candidate will understand organizational behavior concepts and apply strategic management frameworks to corporate financial and ERM business problems.
5. The candidate will understand the decision making process and the lessons learned from the risk taking activities and experiences of other organizations. In particular, the candidate will be able to apply the learning objectives of all the prior sections of the syllabus to the risk management principles embodied within the case studies explored in this section.

Learning Outcomes:

- (4b) Evaluate and apply the concepts of strategic management, recognizing the factors that affect the development and implementation of strategies.
- Demonstrate the importance of analyzing the firm's external environment and the internal organization.
 - Define types of business-level strategies and recommend an appropriate business-level strategy for a given situation.
 - Explain the impact of competitive dynamics on strategic management.
- (5a) Critique financial models, assumptions and decisions including the impact of behavior finance concepts.

Sources:

Strategic Management: Competitiveness and Globalization, Concepts - Chapter 3

Strategic Management: Competitiveness and Globalization, Concepts - Chapter 4

Nudge: Improving Decisions about Health, Wealth and Happiness - Chapter 5

Commentary on Question:

Overall, this question tests candidates' understanding of different business level strategies; the ability to perform value chain analysis on a Case Study industry's primary and support activities and analyze if the activities are linked with the strategy; identify and apply choice architecture techniques to a Case Study situation. Candidates who did not do well tended to have difficulty recalling the five business-level strategies and applying them correctly in the various parts of the question. Most candidates demonstrated a good understanding of value chain analysis.

Solution:

- (a)
- (i) List the five business-level strategies.
 - (ii) Describe the relationship between customer value and target market for any three of the business level strategies in part (i).

5. Continued

Commentary on Question:

Candidates were expected to recall the five business level strategies and the relationship of customer value to target market for any three of the strategies. A number of candidates failed to describe the relationship to target markets in (ii) and did not receive credit. Full credit in (ii) was also given if the candidate correctly drew figure 4.2 from Chapter 4 of Strategic Management.

- (i)
 - 1. Cost leadership strategy
 - 2. Differentiation strategy
 - 3. Focused cost leadership strategy
 - 4. Focused differentiation strategy
 - 5. Integrated cost leadership/differentiation strategy

- (ii)
 - 1. Cost leadership strategy: Basis of customer value: lowest cost, Target market: broad market
 - 2. Differentiation strategy: Basis of customer value: distinctiveness, Target market: broad market
 - 3. Focused cost leadership strategy: Basis of customer value: lowest cost, Target market: narrow market segment(s)
 - 4. Focused differentiation strategy: Basis of customer value: distinctiveness, Target market: narrow market segment(s)
 - 5. Integrated cost leadership/differentiation strategy: Basis of customer value: combined low cost/distinctiveness value creation approach as the foundation, Target market: larger than a narrow market segment but not as comprehensive as a broad customer group

- (b) Identify one activity that Blue Jay Air performs for each of the eight categories of the value chain.

Commentary on Question:

Candidates were expected to provide an example from Blue Jay Air for each of the eight categories of the value chain. A number of candidates gave examples for just a limited number of the categories or did not correctly match their example to the correct value chain category. There were alternate examples not listed below that earned full credit.

- 1. Supply-Chain Management
 - Order or refurbish some large planes with updated features to take delivery over the next few years
- 2. Operations
 - Booking system enhancement (enhance internet booking capability, introducing different mobile phone apps, more added features)

5. Continued

3. Distribution
Expansion to international operations, negotiating with several international airport authorities
4. Marketing & Sales
Loyalty program to encourage frequent business travelers
5. Follow-up Service
Referral program will be offered to its business clients
6. Finance
Established a risk management committee headed by a well-known risk manager
7. Human Resource
Employee and labor relationship management
8. Management Information Systems
Booking system enhancement (enhance internet booking capability, introducing different mobile phone apps, more added features)

(c)

- (i) Identify which one of the five business-level strategies from part (a)(i) Blue Jay Air is pursuing. Justify your answer.
- (ii) Evaluate whether the value chain activities identified in part (b) support Blue Jay Air's strategy.

Commentary on Question:

Candidates were expected to correctly identify the business-level strategy that Blue Jay Air is currently pursuing. Partial credit was earned for other responses if justification was given. In part (ii), there were alternate examples from (b) not listed below that were acceptable, as well.

- (i) As the new strategy vision is to become the most customer-oriented airline company in the world, providing best services to the marketplace, Blue Jay Air is using a "focused differentiation strategy".
- (ii) Focused differentiation strategy
Support:
 1. Plans to order or refurbish some large planes with updated features (in-flight services)
 2. Renovate business lounges
 3. Expand international operations
 4. Tougher standards for "top-scaled commercial pilot" category
 5. Booking system upgrade
 6. Direct to business relationships with its business client base

5. Continued

7. Loyalty program changes
8. Referral program changes
9. Re-branding

Doesn't support:

1. Airline staff training programs cut due to expense control measures
2. Management information system technology expenditures are being cut
3. Charge made for all pieces of luggage checked-in
4. No upgrade being made to baggage tracking system

Blue Jay Air wishes to increase the completion rate of applications for the loyalty program. The marketing team proposes the following three changes to the current application:

1. Upon starting the application, the applicant is told that completing the application results in a \$10 voucher for Frenz coffee.
 2. Each question now produces a drop down menu with a list of suggested valid responses and the default choice is yes.
 3. An application completion progress bar that estimates the time to completion, is visible on the top of the page, and it is updated when each question is answered.
- (d) For each of the three proposed changes:
- (i) Identify the choice architecture technique applied.
 - (ii) Evaluate the behavioral impact on the completion rate.

Commentary on Question:

Candidates were expected to know the various choice architecture techniques from Nudge and correctly apply them. Candidates that did not do well on this question typically forgot to provide answers for each of the three proposed changes.

- (i) For Proposal 1, the technique applied is Incentive.

For Proposal 2, the technique applied is Default.

For Proposal 3, the technique applied is Feedback.

5. Continued

- (ii) For Proposal 1, the choice architecture provides monetary reward to people and thus should increase the completion rate of the loyalty program application.

For Proposal 2, the choice architecture leverages the fact that people take the option with the least effort. Thus it will likely increase the completion rate of the loyalty program application.

For Proposal 3, the choice architecture provides feedback to the users during the process. The impact could be either positive or negative. People might be discouraged if they are aware of how much extra time they need to spend in order to complete the application.

6. Learning Objectives:

4. The candidate will understand organizational behavioral concepts and apply strategic management frameworks to corporate financial and ERM business problems.

Learning Outcomes:

- (4b) Evaluate and apply the concepts of strategic management, recognizing the factors that affect the development and implementation of strategies.
- Demonstrate the importance of analyzing the firm's external environment and the internal organization.
 - Define types of business-level strategies and recommend an appropriate business-level strategy for a given situation.
 - Explain the impact of competitive dynamics on strategic management.

Sources:

Strategic Management: Competitiveness and Globalization, Concepts Chapter 2

Commentary on Question:

This question tests the candidates' ability to perform a five forces of competition analysis. Candidates need to identify relevant material from the textbook and qualify it correctly. Few candidates were able to perform an analysis and correctly link pertinent information with impacts. Many candidates simply listed some (or much) information from the case study without linking them to the five forces. Some candidates discussed general knowledge on business or coffee companies unrelated to the five forces.

Solution:

- (a) Analyze Frenz using the five forces of competition model.

Commentary on Question:

General discussion on coffee or business did not receive credit. Providing and linking 8 items/factors to the five forces achieved a full score.

Threat of new entrants

Economies of Scale - Frenz has a well-established marketing function built over many years of investment that is difficult for new entrants to build/copy which reduces the threat of new entrants.

Product Differentiation - Frenz has innovative products which differentiates itself from its competitors, thus reducing the threat of new entrants

Capital Requirements - Capital requirements to enter the coffee industry are low which increase the threat of new entrants.

Switching Costs - Frenz has an effective loyalty card program which incentivizes customers to not switch to competitors, thus reducing the threat from new entrants.

Access to Distribution Channels - Frenz has nurtured its relationship with its distributors, creating switching costs for them and reducing the threat from new entrants.

6. Continued

Cost Disadvantages Independent of Scale - Frenz has favorable access to its raw materials (high-end coffee beans) through its exclusive arrangement with the Vietombia government reducing the threat from new entrants

Bargaining Power of Suppliers

Arrangement with government - Frenz's exclusive arrangement with the Vietombia government allows it to become the supplier thus reducing the bargaining power of other suppliers

Bargaining Power of Buyers

Loyalty Program - Frenz's loyalty program increasing switching costs for buyers thus reducing their bargaining power

Threat of Substitute Products

Differentiated products - Frenz has innovative, differentiated products which reduces a substitute's attractiveness and its threat

New Products - Frenz can quickly roll out new products which reduces the threat of substitutes

Intensity of Rivalry among Competitors

Slow Industry Growth - The coffee industry is growing in third world countries where there is less pressure to take customers from competitors and reduces the intensity of rivalry

High Fixed Costs or High Storage Costs - Storage costs are low because coffee/tea can be kept for long periods of time which reduces the intensity of rivalry

Lack of Differentiation or Low Switching Costs - Frenz has differentiated products which reduces the intensity of rivalry

- (b) Assess Frenz's ability to earn above-average profits based on the analysis in part (a). Justify your assessment.

Commentary on Question:

Candidates are expected to assess Frenz's ability based on the answer provided in (a). Some candidates brought up new points in (b), as long as these points were valid they received credit. Some candidates provided discussion not relevant to (a) or general knowledge about business or coffee which did not receive credit.

Economies of Scale reduced the threat of entrants, therefore it increased Frenz's ability to earn above-average profits.

Product Differentiation reduced the threat of entrants, therefore it increased Frenz's ability to earn above-average profits.

6. Continued

Capital Requirements increased the threat of entrants, therefore it reduced Frenz's ability to earn above-average profits.

Switching Costs reduced the threat of entrants, therefore it increased Frenz's ability to earn above-average profits.

Access to Distribution Channels reduced the threat of entrants, therefore it increased Frenz's ability to earn above-average profits.

Cost Disadvantages Independent of Scale reduced the threat of entrants, therefore it increased Frenz's ability to earn above-average profits

Arrangement with government reduced the bargaining power of the suppliers therefore it increased Frenz's ability to earn above-average profits.

Loyalty Program reduced the bargaining power of the buyers therefore it increased Frenz's ability to earn above-average profits.

Differentiated products reduced the threat of substitute products therefore it increased Frenz's ability to earn above-average profits.

New Products reduced the threat of substitute products therefore it increased Frenz's ability to earn above-average profits.

Slow Industry Growth reduced the intensity of competition therefore it increased Frenz's ability to earn above-average profits.

High Fixed Costs or High Storage Costs reduced the intensity of competition therefore it increased Frenz's ability to earn above-average profits.

Lack of Differentiation or Low Switching Costs reduced the intensity of competition therefore it increased Frenz's ability to earn above-average profits.

Frenz's has a strong ability to earn above average profits because most of the above factors are beneficial to Frenz.

7. Learning Objectives:

3. The candidate will understand best practices for ERM processes and Capital Management and their use in setting a risk-return strategy.

Learning Outcomes:

- (3b) Explain ERM and capital management concepts to evaluate and recommend corporate financial and ERM decisions.
 - Apply capital allocation models to a multi-line organization.
 - Compare and contrast various ERM and Capital Management frameworks as to their ability to assess value and articulate the risk-return strategy of an organization.
 - Evaluate the value-added for an organization by jointly evaluating risk measurement and capital allocation.
 - Assess how an ERM process can improve capital efficiency and articulate the risk-return strategy.

Sources:

Economic Capital – A Case Study to Analyze Longevity Risk

Commentary on Question:

Candidates were asked to demonstrate their understanding of the impact of risks by comparing and contrasting risk factors across different businesses and evaluating the impact of these factors on reserves and capital.

Solution:

- (a) List risk factors of mortality variability that could be reflected in a stochastic analysis of economic reserves and capital for longevity risk in the SPIA business.
 - Volatility in future mortality improvement
 - Trend risk such as a breakthrough in medical research
 - Mismatch between the population used to generate the mortality table and the actual population in the annuity block

- (b) List risk factors of energy production variability that could be used to estimate the economic reserves and capital for energy production in the solar energy business.

Commentary on Question:

Many candidates were able to identify risk factors affecting energy production variability which were discussed in the case study. A simple list of valid risk factors underlying solar energy variability was all that was required to receive full credit

7. Continued

- Weather (number of cloudy/rainy days in a given period)
 - Solar panel default rate
 - Technological advances resulting in more efficient solar panels
- (c) Draw three similarities between attributes of the longevity risk factors for the SPIA business and attributes of the solar energy business.

Commentary on Question:

Many candidates were able to draw similarities between SPIA business and solar energy business. Candidates who received full credit also explained why the attributes of the risk factors were similar.

1. Medical breakthroughs could significantly increase the expected lifespan of policyholders just as technological breakthroughs in solar panel energy production increases the amount of energy produced and lengthens the lifespan of the business.
 2. Variation in solar panel default rate will have the same impact on the solar energy production as the mismatch between underlying mortality assumption and the population mortality. Both factors can be viewed as deviations from expected.
 3. Volatility between actual and expected scenarios are similar between mortality and solar energy production. Volatility will cause uncertainties in future mortality longevity and solar energy production amounts.
- (d) Evaluate the directional impact on two of the risk factors in each of parts (a) and (b) on the level of the economic reserves and capital. Justify your answer.

Commentary on Question:

Many candidates were able to provide the correct directional impact for several risk factors and received partial credit. Those candidates that received full credit also provided an explanation of the movement.

SPIA

1. Medical breakthrough – people will live longer and company will have to pay more benefits (longevity rates increase). Economic reserves and capital will increase.
2. Population mortality mismatch – the impact will depend on the direction of the mismatch. Higher than expected mortality will decrease annuity payments so economic reserves and capital will decrease. Lower than expected mortality will increase annuity payments so economic reserves and capital will increase.

7. Continued

Solar Energy

1. Technology advances – advances resulting in more efficient solar panels will result in more energy produced. Economic reserves and capital will decrease.
2. Weather – greater number of cloudy/rainy days will result in less energy produced. This will increase the chance that guarantees will be in the money and therefore economic reserves and capital will increase.

8. Learning Objectives:

1. The candidate will understand measures of corporate value and their uses in risk management.

Learning Outcomes:

- (1a) Apply basic accounting concepts used in producing financial statements.

Sources:

SDM-100-13: Managerial Accounting for CERAs and FSAs, 2013, by Tim Cardinal

Commentary on Question:

Commentary listed underneath question component.

Solution:

- (a) 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

Commentary on Question:

Candidates generally did well at setting up the formulas for each overhead allocation. The number of stores and budgeted overhead were inadvertently omitted from the case study. Full credit was given to candidates who correctly described the overhead they chose.

Existing Method: Percentage of Sales

$$\begin{aligned}\text{Corporate Overhead Rate} &= \text{Total Overhead (Actual)} / \text{Total Sales} \\ &= \$65,000,000 / \$1,166,000,000 \\ &= \$0.0557/\$1 \text{ Sales}\end{aligned}$$

Per-store Method w/ Budgeted Overhead

$$\begin{aligned}\text{Corporate Overhead Rate} &= \text{Total Overhead (Budget)} / \text{Total Stores (Budget)} \\ &= \$63,500,000 / 11,500 \\ &= \$5,522/\text{store}\end{aligned}$$

$$\text{Projected Sales} = \$115,000/\text{store} (= \$1,322,500,000/11,500)$$

$$\text{Corporate Overhead Rate} = \$0.0480/\$1 \text{ sales}$$

- (b) 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.

8. Continued

Commentary on Question:

Candidates were intended to set up an equation to solve for the point at which a store would be indifferent to the allocation basis. Credit was given to candidates that set up an equation, but did not solve it and/or candidates that indicated how they would solve given their part (a) answer.

From Part (a):

Per-store Method w/ Budgeted Overhead = \$5,522/store
Percentage of Sales Overhead allocation = \$0.0557 per \$1

For Sales of X,

$$\$5,522 = \$0.0557 * X$$

$$X = \$99,138$$

Stores with more than \$99,138 in annual sales would benefit from a change in overhead allocation to the budgeted per store method. Stores with less than \$99,138 in sales would be better off under the existing methodology

- (c) Recommend an allocation methodology for Frenz's corporate overhead based on your analysis. Justify your recommendation.

Commentary on Question:

Credit was given to candidates that supported a recommendation with ideas from the case study or assigned readings surrounding the impact of a change in cost basis for Frenz. Partial credit was given for a recommendation coupled with additional context, but not directly related to the impact of changing the cost basis. No credit was given if a candidate failed to make a recommendation or recommended both allocations. Part (c) did not depend on answers to parts (a) or (b).

Solution Recommending the Per Store Overhead Allocation:

I would recommend Frenz move to the Per Store Overhead Allocation because overhead cost is not a function of sales and an allocation based on sales could be misleading. Overhead by definition is cost that cannot be attributed to a cost object in a practical or feasible way. The current allocation also skews product costs and impacts store profitability. The allocation basis employed should consider the cause and effect of relationship of the activity and its usage. Allocating overhead using standard costing (based on budgeted overhead) on a per-store basis will smooth fluctuations and allow store owners to better price their products and predict profitability.

8. Continued

Solution Recommending the Current Overhead Allocation:

I would recommend that Frenz continue to allocate overhead based on sales. Overhead costs are incurred to drive business, so using sales as the base to allocate them makes sense. Changing the allocation base will also impact product cost (product costs are function of the allocation base) and disrupt pricing. Good store managers should understand the current cost base and what drives their bottom line, changing the cost base will disrupt current operations.

9. Learning Objectives:

1. The candidate will understand measures of corporate value and their uses in risk management.

Learning Outcomes:

- (1a) Apply basic accounting concepts used in producing financial statements.

Sources:

SDM-100-13: Managerial Accounting for CERAs and FSAs, 2013, by Tim Cardinal

Commentary on Question:

Most candidates did well on parts (a) and (b) but did not do well on part (c). For part (a), most candidates successfully listed 4 or 5 ways firms can increase reported cash flows. For part (b), most candidates did well; however, a few candidates only answered one action rather than two actions for each way identified in part (a). For part (c), most candidates could not link their recommendation to the case study.

Solution:

- (a) List five ways companies can increase reported cash flows.

Commentary on Question:

Most candidates did well in part (a). There are many ways to increase reported cash flows. The model solution lists a few. Candidates received full credit if s/he provided reasonable ways to increase reported cash flows. For example, issue more bonds or issue more equity, etc.

1. Increase Sales
2. Reduce cash expenses
3. Utilize leases
4. Sell assets
5. Delay paying suppliers

- (b) Explain two actions airline companies can take to increase reported cash flows for each way identified in part (a).

Commentary on Question:

Most candidates did well in part (b). Airline companies can take many different actions to increase reported cash flows. The model solution illustrates a few. Candidates received full credit if s/he provided two reasonable actions to increase reported cash flows for each way identified in part (a).

1. Increase revenue
 - Reduce prices to price-sensitive customers to increase overall sales volume and/or increase prices to price-insensitive customers
 - Find other revenue sources such fees as vacation packages, flight insurance, etc.

9. Continued

2. Reduce cash expenses
 - Go on an aggressive cost-cutting campaign to reduce fixed expenses.
 - See if creditors/employees will accept in-kind services instead of cash
 3. Utilize leases
 - Lease fixed assets (ex. Aircraft, gates, etc.).
 - Lease home office, operations center, hangers, etc.
 4. Sell assets
 - Sell unused/underutilized aircraft to another airline or aircraft broker.
 - Sell unused gate capacity to another airline.
 5. Delay paying suppliers
 - Institute a just-in-time payment system that pays invoices at the last possible moment
 - Utilize late payment options with suppliers as long as interest costs are reasonable.
- (c) Recommend the actions identified in part (b) that Blue Jay Air should take to significantly increase its reported cash flows. Justify your answer.

Commentary on Question:

*Most candidates did poorly in part (c). Most candidates did not recommend actions related to the case study. The model solution illustrates acceptable actions. Candidates received full credit if s/he recommended actions for **Blue Jay Air** to increase reported cash flows.*

1. Increase revenue
 - Do not recommend adding extra fees since Blue Jay is focused on the business traveler. For example, baggage fees, food, drinks, etc.
 - Recommend increasing short advance booking flight costs since business travelers (Blue Jays market) aren't as price sensitive
2. Reduce cash expenses
 - Recommend that Blue Jay go on an aggressive cost-cutting campaign to reduce fixed expenses. Since Blue Jay is a tightly managed organization this should be easier for them to do than some of their airline competitors.
 - Recommend that Blue Jay see if creditors/employees will accept in-kind services instead of cash. This would fit with their model to be the preferred air carrier for businesses. Blue Jay's long and deep relationships with those businesses would make negotiations easier and increase the value of those relationships.
3. Utilize leases
 - Recommend that Blue Jay lease aircraft rather than purchasing aircraft. The international expansion will require new and different planes. It would be better for Blue Jay to lease to make sure that the international operation is viable plus it would help cash flows over the short term.

9. Continued

- Recommend that Blue Jay lease fixed assets (ex. gates, landing rights, etc.) as it pursues its international expansion. Helps short-term cash flows.
4. Sell assets
 - Recommend that Blue Jay sell unused/underutilized and older aircraft to another airline or aircraft broker. These old planes have higher maintenance costs and Blue Jay needs to replace them soon.
 - Recommend that Blue Jay sell customer lists/frequent flyer information to a third party marketing organization. They have a niche in the business traveler market so their customer list would be more valuable than the average airline.
 5. Delay paying suppliers
 - Recommend that Blue Jay use its strong Treasury function to institute a just-in-time payment system that pays invoices at the last possible moment
 - Recommend that Blue Jay utilize late payment options with suppliers as long as interest costs are reasonable. This is possible because Blue Jay has instituted a strong Treasury and Risk Management function.

10. Learning Objectives:

2. The candidate will understand various approaches to measuring and managing credit and liquidity risk.

Learning Outcomes:

- (2a) Apply credit and liquidity risk concepts.
- Describe and analyze credit, counterparty, liquidity, and wrong-way risk.
 - Analyze the credit risk exposure of a given contract.
 - Explain the various forms of credit risk models. Demonstrate the ability to perform analysis with these models.

Sources:

Counterparty Credit Risk, Gregory, Jon, 2nd Edition, Chapters 3, 9, 10, 12 and 15

Commentary on Question:

Overall, most candidates did well on parts b) and c) and poorly on parts a) and d). Please see the commentary on each part.

Solution:

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

Commentary on Question:

Most candidates did poorly in part (a) confusing PD(3) and h(3) - they only calculated h(3) rather than PD(3); however, the question asked for the cumulative default probability. Most candidates did not get the correct answer. Partial credit was given to candidates providing the correct CVA formula.

The Cumulative Default Probability at t= 3 months:

$$PD(3) = 1 - \exp[-h(3)] = 0.02910$$

Where

$$h(t) = \log \left[1 + \exp \left(-6 + 2.5 \times 10^{-8} \cdot EV(t) \right) \right]$$

$$\text{and } EV(3) = 99,698,086$$

$$CVA = (1 - \text{Rec}) * DF * EE * PD$$

Where

Rec = Recovery Rate; EE = Expected Exposure; PD = Probability of Default

$$EE(3) = 49,698,086 / 45.03 = \$1,103,666$$

$$PD(0,3) = 0.02910$$

$$DF(3) = \exp(-0.05 * 3/12) = 0.98758$$

$$(1 - \text{Rec}) = 1 - 0.3 = 0.7$$

10. Continued

$$\begin{aligned} \text{CVA} &= (1 - \text{Rec}) * \text{DF}(3) * \text{EE}(3) * \text{PD}(0,3) \\ &= 0.7 * 0.987581 * 1,103,666 * 0.02910 = \$22,201.06 \\ \text{CVA as a percentage of \$ Notional} &= 22,201.06/10,000,000 = 0.0022201 \end{aligned}$$

- (b) Describe wrong-way risk.

Commentary on Question:

All candidates did well in part (b).

The wrong way risk is the existence of a positive correlation between exposure and counterparty default.

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

Commentary on Question:

Most candidates did well in part (c). A few candidates contradicted themselves with inconsistent explanations and conclusions. Candidates received full credit if s/he demonstrated the mechanism of the wrong-way risk was present in the deal with SBV.

Yes, wrong-way risk is present

The export-driven nature of Vietombia's economy can potentially create an inverse relationship between the strength of their currency, and the strength of the economy. Since the strengthening of the Vietombia currency may lead to decreased demand for exports. At the same time, appreciation of Vietombia's currency increases the value of Frenz's FX-Put, and hence creates exposure to default of their counterparty, SBV. Further, since Frenz's counterparty to the FX-deal, State Bank of Vietombia (SBV), is part of the Vietombia economy, economic stagnation, or even severe recession in Vietombia will increase the chances of the State Bank of Vietombia (SBV) defaulting. Hence, as Frenz's exposure to SBV increases, so does the chance of SBV defaulting.

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

Commentary on Question:

Most candidates did poorly in part (d). They unsuccessfully showed the relationship between fair risky value, risk-free value and CVA. Candidates received full credit if s/he successfully demonstrated the relationship between fair risk value, risk-free value and CVA, even s/he had an incorrect CVA number from part (a).

10. Continued

Frenz should not take the offer

Risky Value = Risk-free value – CVA

Applied to the FX-put with SVB:

Fair Risky Value = Risk-free value – CVA = 0.01967 – 0.0022201 < 0.0185

The 0.0185 priced required by SBV, is more than the fair price which incorporates credit risk, as calculated by Frenz

11. Learning Objectives:

1. The candidate will understand measures of corporate value and their uses in risk management.
2. The candidate will understand various approaches to measuring and managing credit and liquidity risk.

Learning Outcomes:

- (1a) Apply basic accounting concepts used in producing financial statements.
- (2a) Apply credit and liquidity risk concepts.
 - Describe and analyze credit, counterparty, liquidity, and wrong-way risk.
 - Analyze the credit risk exposure of a given contract.
 - Explain the various forms of credit risk models. Demonstrate the ability to perform analysis with these models.
- (2b) Compare and contrast risk metrics and their uses in risk management.
 - Compare and contrast commonly used credit risk metrics.
 - Compare and contrast various credit risk mitigation strategies, and recommend a course of action.
 - Compare and contrast various liquidity risk measures, and recommend a strategy for managing liquidity risk.

Sources:

SDM-108-13: Chapter 2 of Liquidity Risk – Measurement and Management, Matz and Neu editors

SDM-118-13: The Six Mistakes Executives Make in Risk Management

Case Study: RCPP Risk Management Principles

GARP – Liquidity Risk, Saunders and Cornett – Chapter 17

Commentary on Question:

Commentary listed underneath question component.

Solution:

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

Commentary on Question:

Most candidates performed well. Full credit was given to candidates that identified 5 risks that were relevant to sovereign bonds; credit was not given for duplicative answers within their lists.

11. Continued

1. Counterparty Risk
2. Credit Risk
3. Liquidity Risk
4. Interest Rate Risk
5. Foreign Exchange Risk

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

Commentary on Question:

Most candidates identified that significant withdrawals or a "run-on-the-bank" scenario would be the cause of increased liquidity risk for Big Ben. Full credit was awarded to candidates that indicated why the Sovereign X downgrade would lead to a "run-on-the-bank" scenario.

When Sovereign X debt is downgraded, the asset side of Big Ben's balance sheet will shrink due to the decreased value of Sovereign X bonds. Big Ben will be required to either write-down the Sovereign X asset or recapitalize, which will signal negative news to the market. Negative news surrounding Big Ben could cause customers to lose confidence and withdraw deposits. 50% of Big Ben's liabilities are deposits, so a run-on-bank by customers presents significant liquidity risk.

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

Commentary on Question:

Most candidates performed well in part (i). Full credit was awarded to candidates that correctly indicated that purchase liquidity management would mean Big Ben raises external capital by adding to their liabilities while stored liquidity management would require further shrinking the balance sheet and a reduction to assets.

For part (ii), candidates that did well illustrated balance sheets with explanatory comments. Explanatory comments allowed for partial credit in the event the final balance sheet illustrated was incorrect.

11. Continued

(i)

Possible Transactions on the liabilities side through purchase liquidity management:

- (1) Big Ben can raise cash by borrowing at market rates
- (2) Big Ben can raise cash by issuing additional stock

Possible Transactions on the liabilities side through purchase liquidity management:

- (1) Big Ben could further shrink the balance sheet by selling assets to raise cash.

(ii)

Big Ben's starting balance sheet:

Assets		Liabilities	
Treasury/Agency	\$3.00B	Deposits	\$3.75B
Sovereign Treasury	\$3.75B	Borrowed Funds	\$0.75B
Corporate > B+	\$0.75B	Equities	\$3.00B
Total	\$7.50B	Total	\$7.50B

Asset changes under Purchase Liquidity Management:

- (1) Downgrade in Sovereign Treasury to \$1.50B

Liability Changes under Purchase Liquidity Management:

- (1) Deposit Drain reduces Deposits to \$0.75B
- (2) Bank issues added debt to raise cash

Assets		Liabilities	
Treasury/Agency	\$3.00B	Deposits	\$0.75B
Sovereign Treasury	\$1.50B	Borrowed Funds	\$3.75B
Corporate > B+	\$0.75B	Equities	\$3.00B
Total	\$5.25B	Total	\$5.25B

Indicating that Big Ben would raise cash by issuing equity or a combination of debt and equity are equally acceptable answers. Keys to receiving full credit is showing the appropriate reduction to assets and the corresponding reduction to deposits, requiring an increase to debt or equity and matching Total Liabilities and Total Assets at \$5.25B.

Asset changes under Stored Liquidity Management:

- (1) Downgrade in Sovereign Treasury to \$1.50B
- (2) Bank sells other assets to raise cash

11. Continued

Liability Changes under Stored Liquidity Management:

(3) Deposit Drain reduces Deposits to \$0.75B

(4) Bank's equity is reduced

Assets		Liabilities	
Treasury/Agency	\$0.00B	Deposits	\$0.75B
Sovereign Treasury	\$1.50B	Borrowed Funds	\$0.75B
Corporate > B+	\$0.75B	Equities	\$0.75B
Total	\$2.25B	Total	\$2.25B

12. Learning Objectives:

2. The candidate will understand various approaches to measuring and managing credit and liquidity risk.

Learning Outcomes:

- (2c) Explain how regulatory requirements impact capital and management of credit and liquidity risks.
- Explain and calculate Credit Value Adjustment.
 - Explain the impact of Regulation, including Basel II, Basel III, and Dodd-Frank on Capital requirements.
 - Explain exposure and regulatory capital as prescribed in these regulations.

Sources:

Counterparty Credit Risk, Gregory, Jon, 2nd Edition, Chapters 7, 9 and 17

Commentary on Question:

Commentary listed underneath question component.

Solution:

- (a) Describe the advantages and disadvantages of centralized clearing for derivatives.

Commentary on Question:

The model solution illustrates advantages and disadvantages and the associated descriptions that would have received full credit. Credit was given to advantages and disadvantages not listed below if an adequate explanation was provided. No credit was given for listing an item with no description.

Advantages:

- I. Multilateral netting – contracts traded between different counterparties, through a CPP, can be netted. This increases the flexibility of entering into new, or terminating existing, transactions, and reduces margin costs. Netting may alleviate systemic risk by reducing exposure.
- II. Loss mutualization - losses caused by the failure of one or more counterparties to the Central Counterparty (CCP) will be shared among all CPP members, similar to how insurance losses are essentially shared by all policyholders. Loss mutualization mitigates systemic risk.
- III. Legal and operational efficiency - Operational efficiency is achieved as a result of the margining, netting, and settlement function performed by the CCP. The centralization of rules and mechanisms reduces Legal risk.
- IV. Improves the liquidity of derivatives market, by allowing market participants to easily trade and also benefit from multilateral netting.
- V. Improves transparency for participants in the derivatives market, since a CCP has access to the trading information of all of its members, including their overall exposure.

12. Continued

- VI. Default Management - Price disruptions, in the event of the default of a CCP member, are likely to be minimized through a well-managed central auction.

Disadvantages:

- I. Collateral requirements likely to be high. CCPs use collateral, or margins, to mitigate the counterparty risk they face. CCPs require an initial margin that overcollateralizes the counterparty risk they face, in addition to the standard variation margin, which covers the change in the value of a position.
 - II. Centralized clearing potentially creates moral hazard and adverse selection – fellow clearing members may have to absorb losses above the margin posted the defaulting member.
 - III. Centralized Clearing may take away the incentive to properly price and manage counterparty risk.
 - IV. Central Clearing can increase systemic risk, as the failure of a CPP could potentially have more impact than the failure of any single financial institution.
 - V. Central Clearing could also potentially increase systemic risk by increasing liquidity strain during times of crises, as a result of the potential requirement for additional initial margins during periods of crises.
- (b) Describe the possible effects of requiring centralized clearing for derivatives on:
- (i) counterparty risk
 - (ii) systemic risk
 - (iii) liquidity risk

Commentary on Question:

Full credit was given to candidates correctly identifying the impact of central clearing on all 3 risks. Partial credit was given to candidates that correctly identified the impact on only 1 or 2 risks. Candidates needed to describe the impact of central clearing on the risk by indicating the directional change and describing why central clearing would cause the change. The solution provided below exceeds what would be expected of candidates in an exam setting to receive full credit.

Effect of central clearing on Counterparty risk:

12. Continued

By interposing itself between two counterparties, a CCP assumes the role of counterparty to each. Hence, each of the original counterparties in a deal would only be concerned with the credit quality of the CCP. As a result, CCPs absorb, and centralize, the counterparty risk. Further, to mitigate the counterparty risk, CCPs require collateral in the form of initial and variation margins.

Effect of central clearing on Systemic risk:

One of the main motivations for the use of Central Counterparties is to reduce systemic risk. Central Counterparties reduce counterparty risk, and hence reduce the chance of failure of a large financial institution, or intermediary, and the resulting domino-effect.

Moreover, CCPs reduce systemic risk by providing an efficient mechanism for containing, and absorbing, the shock resulting from the failure of large financial institutions. CCPs accomplish this by guaranteeing the contracts of all members of the CPP.

Further, the presence of CCPs should help mitigate concern within the community of financial market participants, in the event of the failure of a large financial institution, and thereby reduce the chance of extreme actions by non-defaulting institutions, which could worsen a crisis.

Central Clearing can also increase systemic risk, as the failure of a CPP could potentially have more impact than the failure of any single financial institution.

Effect of central clearing on Liquidity risk:

By requiring higher initial margins, which over-collateralize the counterparty risk they face, CPPs essentially transform a portion of the counterparty risk into Liquidity risk, as well as into Operational and Legal risk.

Central Clearing could also potentially increase liquidity risk during times of crises, as a result of the potential requirement for additional initial margins during periods of crises.

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

Commentary on Question:

Full credit was awarded to candidates correctly identifying several impacts of central clearing on Big Ben Bank with an explanation to support each impact. Partial credit was given for correctly identifying impacts of central clearing without providing clear support for the impacts. No credit was awarded for impacts accompanied by support that was unclear or incorrect.

12. Continued

The overall collateral requirements, under centralized clearing, are likely to be significant and more restrictive.

Since Big Ben Bank currently has a high credit rating, it is likely that Big Ben could trade on the OTC market with low initial margins. However, Big Ben Bank will likely to be required to post higher initial margins under centralized clearing, since the initial margins required by CCP are more level across CCP members, and are not largely determined by the credit quality of the particular counterparty to the CCP. So, it could be argued that, high credit quality CCP members, such as Big Ben, will end up subsidizing the lower credit quality members.

Also, Big Ben will be required to commit additional financial resources to the CCP's default fund, or reserve fund, to mitigate the cost of Big Ben's potential future default.

Big Ben Bank may have previously been able to post illiquid collateral, such as corporate bonds and gold, when trading on the OTC market. However, frequent postings of liquid collateral will be required by a CCP.

Big Ben may benefit from the multilateral netting which CCPs facilitate.

The margining, netting, and settlement functions performed by CCPs may increase Big Ben's operational efficiency, and reduce costs.

- (d) Calculate the additional CVA capital charge using a 99% confidence level, and a multiplier of 3. Show your work.

Commentary on Question:

Few candidates were able to correctly perform the calculation required for this question. Significant partial credit was given to candidates that correctly set up the calculation.

Worst case scenario of CDS spread = VaR(99%)

$$= \sqrt{\frac{10}{250}} \cdot \Phi^{-1}(99\%) \cdot \sigma_{\text{CDS spread}} = 0.2 \cdot 2.33 \cdot 300 = 140 \text{bps}$$

Therefore, the CVA increase is: $400 \cdot 140 = 56,000$

Using the multiplier of 3, the CVA capital charge is: $3 \cdot 56,000 = 168,000$

12. Continued

- (e) Big Ben Bank is considering using the standardized approach for the additional capital charge.

Assess the feasibility of this consideration.

Commentary on Question:

Full credit was given to candidates the correctly indicated that Big Ben Bank cannot use the standardized approach.

Since Big Ben bank has received approval to use Internal Model Method (IMM) under BASEL III, it MUST use the IMM method. Hence, use of the Standardized Approach is not feasible.