QFI IRM Model Solutions
Fall 2022

1. **Learning Objectives:**

2. The candidate will understand and be able to apply the components of an effective risk management system.

3. Understand and be able to apply different approaches to measuring risk exposures.

Learning Outcomes:

(2b) Identify and describe the various kinds of risks, including market, credit, operational, etc.

(2c) Identify and describe various approaches for managing risks including risk budgeting, position limits, etc.

(2d) Explain the features of a best practices enterprise risk management system.

(3c) Analyze and evaluate risk aggregation techniques, including the use and misuse of correlation, integrated risk distributions and copulas.

(3d) Evaluate different measures of rare event risks.

(3e) Evaluate a company's or a portfolio's exposures to various risks.

Sources:

1. "Quantitative Enterprise Risk Management – Ch. 6: Copulas" by Hardy & Saunders, 2022

2. "Quantitative Enterprise Risk Management – Ch. 9: Stress Testing" by Hardy & Saunders, 2022

3. "The Top Ten Operational Risks: A Survival Guide for Investment Management Firms and Hedge Funds" by Miller and Lawton, 2010 (pgs. 8-18, 23-35)

4. "The Top Ten Operational Risks: A Survival Guide for Investment Management Firms and Hedge Funds" by Miller and Lawton, 2010 (pgs. 8-18, 23-35)

1. Continued

Commentary on Question:
This question aims to test candidates' knowledge in understanding the uses of copulas and the meanings associated with changing values. In addition, it tests candidates on risk management practices through identifying operational risks and tactics to mitigate the risks. Candidates generally did well on this question and many were able to get full points for parts a, d, and e.

Solution:

(a) Calculate the sample estimate of Tau for the dataset.

Commentary on Question:
Candidates performed as expected on this question.

Candidates should calculate Tau using the formula 2/n(n-1) * 75 = 0.71429

(b)

(i) Interpret the difference between your estimate for tau and the VP's estimate after their addition of 5 years to the data set.

(ii) Calculate Theta using the Gumbel copula and the VP's recommended Tau.

Commentary on Question:
Candidates performed as expected on this question. Most candidates got partial points for part (i) because they did not identify reasons why the tau could have changed. Most candidates received full points for part (ii) by calculating the appropriate tau.

The lower value of Tau calculated with the 20 years of information identifies that the indices were less likely to move in the same direction in the past and the relationship of the concordance was not as strong during the additional 5 years as in the 15 years.
For part (ii) the calculation of the Gumbel copula Theta using the Tau would be 1 / (1 – tau) = 2

(c)

(i) Calculate the probability that both Index A and B are negative using the Gumbel copula.

(ii) Calculate CTE(80) for Index A and B.

1. Continued

Commentary on Question:
Candidates performed poorly on this question. For part (i), candidates that attempted the question generally got full credit. Candidates did lose points for using the log function instead of LN when calculating the probability. For part (ii), few candidates attempted the question, and most did not receive full credit. Candidates failed to identify that the loss associated to Index A but not B would be included in the CTE (80) calculation and instead used an average of both having a loss.

For part (i),

1. Calculate the probability of loss for each index
    a. P (A < 0) = 30.85%
    b. P (B < 0) = 31.74%
2. Use the Gumbel Copula to calculate the joint loss chance
    a. Theta = 2; given
    b. EXP {-([-LN(.03085)]^2 + [-LN(.03174)]^2)^(1/2)} = 19.34%

For part (ii),

1. Identify that the joint loss accounts for 19.3% of the value calculated in the CTE (80)
2. Identify that the remaining portion of the CTE (80) calculation comes from when Index A has a loss and Index B does not.
3. Multiply each loss by the respective probability and scale the results out of 100%

CTE[80] = [(.193379)*(1035) + (.2 - .193379)*(500)]/.2 = 1017.29

(d) Describe three operational risks that could arise in this situation, based on *The Top Ten Operational Risks.*

Commentary on Question:
Candidates performed brilliantly on this question by listing 3 operational risks and explaining how they are relevant to the company. Candidates that did not receive full credit typically did not give all 3 risks. Full credit was given if three risks were listed with some explanation connecting to the question.

1. Naïve Reliance on Technology - Trusting whatever comes out of a computer without thinking more about the results can lead to problems. This might be something that becomes an issue if someone else takes this position.
2. Without proper checks and balances of the output, there could be errors going unnoticed. Your manager seems to believe automation will replace the need for review.

1. Continued

3. Blind Leading the Blind - Having knowledge of market risks does not necessarily mean you have the skillset or knowledge to build out the technical infrastructure. Additionally, your supervisor may not have this skillset either.
4. Novices, Apprentices, and Soloists - Developing this process by oneself (the VP tasked you alone with it) could lead to a soloist situation where you are the only one that has the necessary information to run the model and make improvements/adjustments to the model
5. Playbooks - You acknowledge that documentation will probably be subpar based on the busy work load. The lack of formal workflows and proper documentation can result in many mistakes happening throughout a company's procedures.

(e) Recommend two ways to mitigate each of the three operational risks described above.

Commentary on Question:
Candidates performed above average on this question by giving 2 ways to mitigate each operational risk given in part (d). Candidates that did not receive full credit did not give 2 distinct mitigation techniques for each of the 3 risks. Full credit was given for candidates who outlines 2 mitigating options for each of the 3 risks.

1. Naïve Reliance on Technology
   i. Prior to automation, you need a thorough knowledge of how to perform the activity manually
   ii. Don't allow people who don't understand how the model works to use it freely. Establish access rights.
   iii. Leave a complete audit trail whenever an update is made to a model.
   iv. Ensure a review process is still in place.

2. The Blind Leading the Blind
   i. The VP must spend more time learning the firm's operations in detail. This could mean engaging others to better understand what would be required to successfully implement the automated process.
   ii. Hiring and promoting individuals who demonstrate both leadership and sufficient technical skills. The VP doesn't really have the technical abilities to lead this project.

3. Novices, Apprentices, and Soloists
   i. Provide effective training, such as "lunch-and-learns" sessions that allow cross-training between departments or others on the team so that you are not the only person who knows how the process works
   ii. Establish a back-up person who is responsible for using the new system

1. Continued

iii. Job rotation, shadowing, and swaps are also great ways to ensure cross-training between teams or within a team
iv. Attend webinars, industry conferences, and networking events to enhance knowledge of team members

4. Playbooks
    i. Have a centralized workflow document that many different teams can utilize
    ii. Establish escalation procedures that notify upper management of higher level issues (i.e. when CTE levels are breached)
    iii. Ensure there are sufficient time and resources to properly document the new system

2. Learning Objectives:

1. The candidate will understand the value of governance and its key elements in general and in the context of an investment operation.

Learning Outcomes:

(1b) Identify sources of unethical conduct and explain the role of a fiduciary.

(1c) Describe governance mechanisms that attempt to address these conflicts.

(1f) Demonstrate understanding of how ethics relates to business decision-making, and relate ethics in business to personal ethics.

Sources:

Ch. 1-3 of "Investment Ethics" by Sarah Peck (pg. 2-84)

QFII-116-19: Chapter 45 of "Risk Management: Foundations for a Changing World" by Haslett Jr., Walter V. (pg. 673-680)

QFII-111-17 Tracing the True Origins of Bad Behavior

Commentary on Question:

Overall, candidates performed as expected on this question. The initial parts of the question attempted to test the ability to recall due diligence practices, and the later parts of the questions tested the application of these practices.

Solution:

(a) List the ten commandments of operational due diligence.

Commentary on Question:

For this part, candidates performed better than expected. Nearly all candidates were able to achieve full or at least partial credit for providing the required list. Credit was lost for incomplete or inappropriate lists.

Define roles / Hire CFO / Develop operational due diligence process/procedure.
Define goal(s).
Define objective / integrate controls
Segregate functions.
Do work / Perform review.
Document / Communicate.
Work with investment research.
Remember fundamentals.
Note the tone at the top.
Be vigilant with red flags.

2. Continued

(b) While getting acquainted with the models and past results, you observe some historical reported figures that you cannot reconcile with the historical model output. You bring this up with your manager Suzy, Head of Valuation. Suzy cannot reconcile or otherwise explain the difference between modeled and reported results. Suzy has been in her role for one year, and reports to Tim, Head of Sales.

Describe three violations of the commandments given this situation.

Commentary on Question:
Candidates performed as expected for this section. Many were able to identify the key violations with sufficient justification. However, less than full credit was allocated for insufficient descriptions of the violations.

Violation 1:
Segregate functions.
-Inappropriate to have head of modeling/valuation report to head of Sales / inappropriate to have back office report to front office

Violation 2:
Document / Communicate
-Adjustment not documented properly

Violation 3:
Be vigilant with red flags / Do the work
-Potential red flag that your manager was only recently hired and thus has not identified reconciliation gaps

(c)

(i) Evaluate the effectiveness of each change in reducing the risk of similar events happening in the future.

(ii) Recommend an additional action FND can take to reduce risks around trader behavior.

Commentary on Question:
Candidates performed as expected on this section. The majority of candidates were able to clarify the tone at the middle vs. tone at the top is often more crucial; however, a smaller percentage of candidates correctly identified the "push-back" risk with increased regulation.

2. Continued

Improving "Tone at the top" is likely inadequate; traders are more concerned about the behaviors of their peers and immediate managers.

Increased regulation will have a minimal effect or may backfire as subjects regard it as provokation.

(d)

(i) Assess whether each practice above aligns with the duties FND has as a fiduciary.

(ii) Recommend any necessary changes for those that do not.

Commentary on Question:
Candidates performed poorly on this section vs. the earlier parts of the question. While nearly all candidates recognized the importance of disclosing fees upfront, irrespective of client request, only a small number of candidates considered client investment strategy that may, for example, involve a high-frequency strategy, and, if appropriate and understood by clients, would not necessarily constitute churning.

A high-frequency strategy may be appropriate for some clients. These strategies require lots of trades, and charging commissions is acceptable practice.

Fund reporting software benefits the firm but not necessarily their client. FND should ensure allocation of "soft-dollars" for these general services to itself, not its clients.

Fees should be communicated proactively (not limited to request basis).

Pro-rata is allocation is acceptable for these accounts. However, IPOs are not suitable for all client accounts (depends on IPS).

3. Learning Objectives:

2. The candidate will understand and be able to apply the components of an effective risk management system.

3. Understand and be able to apply different approaches to measuring risk exposures.

Learning Outcomes:

(2c) Identify and describe various approaches for managing risks including risk budgeting, position limits, etc.

(3a) Explain the advantages and limitations of different risk metrics

(3c) Analyze and evaluate risk aggregation techniques, including the use and misuse of correlation, integrated risk distributions and copulas.

(3d) Evaluate different measures of rare event risks.

(3e) Evaluate a company's or a portfolio's exposures to various risks.

Sources:

QFII-125-22: Value at Risk, Jorion, Philippe, 3rd Edition, 2007 Ch. 17

QFII-127-22: Quantitative Enterprise Risk Management, Hardy & Saunders, 2022 Ch 3 Risk Measures

QFII-123-21: IAA Note on Stress Testing and Scenario Analysis

Commentary on Question:

This question aims to test candidates' knowledge on identifying and describing the various kinds of risks such as portfolio risk and operational risk, as well as their ability to apply different approaches to measuring risk exposures. Overall candidates did well in part a), (b), d) and e), but struggled with c) and f). However, many candidates were able to gain partial credit by answering part of the questions, or by demonstrating that they have some of the knowledge that the question was aiming to test.

Solution:

(a) Define the following risks:

- Policy-mix risk
- Active-management risk

Commentary on Question:

Candidates did very well on this question. Most candidates were able to provide sufficient definition to gain full credit.

3. Continued

Policy-mix risk: Risk of a dollar loss owing to the policy mix selected by the fund, or investing in the benchmark.

Active-management risk: Risk of a dollar loss owing to the total deviations from the policy mix.

(b) Calculate the pension fund's risk budget using VaR at the 99% confidence level.

Commentary on Question:
Candidates did well in this question. Many candidates failed to include the weight in the risk budget calculation, and therefore did not get the correct final answer. Partial credit was given to such candidates.

Z value is 2.3263 at 99 percent confidence level.
2.3263 * 0.13 * $350 = 105.85 million
The total risk budget = sqrt(105.852 + 105.852 + 2 * 0.34 * 105.85 * 105.85)
= $173.28 million

(c)

(i) Assess the current allocation of the pension fund.

(ii) Calculate the optimal allocation.

Commentary on Question:
Candidates did poorly on this question. Full credit can be earned in part a) by recognizing that 1) the current allocation is not ideal in maximizing the information ratio of the fund, and 2) more risk budget should be allocated to Jane for having a higher Information Ratio (IR). In part b), many candidates gained partial credit by getting the correct portfolio IR. However, only 16% of candidates were able to calculate the correct weights among Jane, Dave and the Index.

(i) The current allocation is not ideal in maximizing the information ratio of the fund, nor achieving the target TEV. Because managers are commonly evaluated on the basis of their IR, more risk budget should be allocated to Jane for having a higher IR. In addition, fund should also be allocated to the Index to help achieve the target TEV.

(ii) With 4 percent TEV, the portfolio IR = 2.9/4.0 = 0.725
x_{Jane}*6.0% = 0.60(1/0.725)(4.0%), therefore xJane = 55%
Use the same formula listed above, the weights for Dave and Index are calculated below.
xDave = 37%, and xIndex = 1 – 55% - 37% = 8%

3. Continued

Therefore, the ideal allocation is to allocate 55% of the total fund to Jane, 37% to Dave, and the remaining 8% to index.

(d)

(i) Identify one coherent criterion that VaR does not satisfy.

(ii) Explain why the coherent criterion in (i) is a desirable characteristic for an economic capital risk measure.

Commentary on Question:
Candidates did well in this question, where many candidates were able to receive full credit. Some candidates identified the correct coherent criterion but failed to provide the definition. Partial credit was given to these candidates.

(i) VaR does not satisfy subadditivity, which means VaR(X+Y) <= VaR(X) + VaR(Y). A risk should not be lowered by reducing it into smaller parts.

(ii) When setting risk based economic capital, consolidating risks cannot make the risk greater, but it might make the risk smaller, if there is any diversification benefit. If subadditivity is not satisfied, a company may overstate the overall risk, and hence the overall economic capital.

(e) Calculate the 95% Expected Shortfall.

Commentary on Question:
Candidates did well in this question. Some candidates only received partial credit because they either failed to calculate the correct E(U), or they did not apply the conditional probability of 5%.

E[U] = (200 + 50) / 2 = 125
CTE[95%] = (.04 x 125 + (.05 - .04) x 50) / .05 = 110

(f)

(i) List the three considerations recommended from IAA Note on Stress Testing and Scenario Analysis in formulating a scenario.

(ii) Describe how Simple Life should apply the three considerations in formulating a scenario.

3. Continued

Commentary on Question:
Candidates performed poorly on this question. Only a handful of candidates received full credit in part (i), but many quoted considerations from a different reading, when the question asked for IAA Note on Stress Testing and Scenario Analysis. Although these candidates did not receive any point in part (i). many were able to receive partial credit in part (ii) even with an incorrect answer in part (i).

(i) Narrative: The first step in formulating a scenario is to explain in a concise and understandable narrative that describes the conditions, including the risks (events) that generated the scenario. Formulating a convincing and believable narrative is crucial to achieve buy-in from scenario management, the Board and other stakeholders.

Initial Events: Some scenario conditions emerge as at least an initial powerful event that may give rise to a cascade of secondary consequences. The initial event(s) can be global event, regional event, or company-specific event.

Time evolution: The sequence in which events occur can be quite important in assessing the financial impact on the firm. The qualitative description therefore should not only contain the sequence of effects but also a time-line. It is especially relevant for the evaluation of a scenario, which usually evolves over months and years, especially where management actions/reactions would be incorporated

(ii) Narrative:
Covid-19 is a highly contagious virus which leads to widespread and extreme panic around the world, causing companies to evacuate their staff from the office to work from home for extended period of time. This exposes Simple Life to multiple operational risks such as business processing risk and technology risk, as all work and meetings have to be conducted electronically. In addition, the stay-at-home order can lead to significant changes in the way people work and live. Videoconferencing is likely to become the preferred mode for business meetings and working from home may become permanent for many. Depending on Simple Life's return-to-work policies, the company may see higher turnover and experience employee dissatisfaction, which can increase Simple Life's key people risk.

3. Continued

Initial Event:
COVID-19 pandemic should be considered as a global event, which affects most if not all industries. Globally disruptive events are often seen as encompassing a sequence of different events that evolve over time. Therefore, a global scenario will expose a firm to multiple related stress consequences.

Time evolution:
e.g. Simple life should consider over what time horizon the pandemic will take place and if there will be any after effect when the pandemic is over. So far, the pandemic has lasted more than two years, during which time Simple Life's employees have changed the way they work. Many have even changed their life style or have relocated. Simple Life's COVID-19 related operational risk can last well beyond 3 years, but likely more so in the first few years immediately after the pandemic is over, and decreases over time after that.

4. Learning Objectives:

2. The candidate will understand and be able to apply the components of an effective risk management system.

3. Understand and be able to apply different approaches to measuring risk exposures.

Learning Outcomes:

(2c) Identify and describe various approaches for managing risks including risk budgeting, position limits, etc.

(3a) Explain the advantages and limitations of different risk metrics

Sources:

QFII-122-21: Chapter 9, Section 6 of Managing Investment Portfolios, Maginn, John L. & Tuttle, Donald L., 3rd Edition, 2007

Commentary on Question:

The question was trying to assess the candidate's understanding of different ways to manage credit risk and means to measure risk. Overall, candidates performed well on part (a), but found the numeric calculations in (b) and (d) particularly challenging.

Solution:

(a) Describe four ways to manage credit risk other than marking to market.

Commentary on Question:

Candidates needed to describe four ways to manage risk to receive full credit. Many candidates only provided a list without description.

1. Limit exposure: Do not lend too much to one party
2. Collateral: Require one party to post collateral for its credit obligation
3. Netting: Reduce obligations owed between parties into one transaction
4. Credit Derivatives: Control exposure to credit downgrades by companies separate from the parent organization and not liable for its debts
5. Reducing Credit Risk with minimum credit standards and Enhanced Derivative Product Companies

(b)

(i) Compare and contrast the Sharpe and Sortino ratios.

(ii) Calculate the Sharpe and Sortino ratios for Investment A.

4. Continued

Commentary on Question:
Candidates struggled on this part of the question. Most were able to find the mean portfolio return correctly and had the correct formulas for the Sharpe and Sortino ratios, but did not compute volatility correctly.

(i) The Sharpe Ratio is analytically more tractable than the Sortino ratio and better grounded in financial theory but the Sortino ratio does not penalize for volatility arising from positive performance.Both do not price nonlinear risks well. Non-normal returns can cause issues for both ratios.

(ii)

Sharpe Ratio = (Average Return – Risk Free Rate) / Volatility
Sortino Ratio = (Average Return – Minimum Acceptable Return) / Downside Volatility

The mean portfolio return = (12-2-3+12)/4 = 4.75
There are two possibilities for the computation of volatility: dividing by the total number of periods or the total number of periods minus one.

Method 1: Dividing by Total Number of Periods
To compute downside volatility:
Subtract the MAR from each year's return (7.5, -6.5, -7.5, 7.5). Square those values that are negative (years 2 and 3 yield 42.25 and 56.25, respectively). Sum those values (98.5). Divide by total number of periods examined (4 years, so 98.5/4 = 24.625). Take square root of that value (4.9624).

To compute volatility:
Subtract the mean portfolio return from each year's return (7.25, -6.75, -7.75, 7.25). Square and then sum all the values (210.75). Divide by total number of periods (4 years, so 210.75/4 = 52.6875). Take square root of that value (7.2586).

Sortino = (4.75-4.5)/4.9624=0.0504
Sharpe = (4.75-1)/7.2586=0.5166

4. Continued

Method 2: Dividing by Total Number of Periods Minus One
To compute downside volatility:
Subtract the MAR from each year's return (7.5, -6.5, -7.5, 7.5). Square those values that are negative (years 2 and 3 yield 42.25 and 56.25, respectively). Sum those values (98.5). Divide by total number of periods examined minus 1 (4 years, so 98.5/(4-1) = 32.833). Take square root of that value (5.7300).

To compute volatility:
Subtract the mean portfolio return from each year's return (7.25, -6.75, -7.75, 7.25). Square and then sum all the values (210.75). Divide by total number of periods examined minus 1 (4 years, so 210.75/(4-1) = 70.25). Take square root of that value (8.3815).

Sortino = (4.75-4.5)/5.7300=0.0436
Sharpe = (4.75-1)/8.3815=0.4474

(c) Recommend Investment A or B for the farm bureau.

Commentary on Question:
To receive full credit on this part, candidates needed to provide some justification for the recommendation.

Recommend Investment B.
The Sharpe ratio is lower for Investment B, but the Sortino ratio is much higher. This implies that the upside volatility is the reason for the lower Sharpe ratio. Upside volatility is not a risk that many investors are concerned with due to the higher returns that can result.

(d)

(i) Explain why RoMAD would be preferable to the Sharpe or Sortino ratio for this investment.

(ii) Calculate RoMAD over the four-year period.

Commentary on Question:
Candidates struggled on the question. Many candidates did not acknowledge that the inclusion of options in the portfolio mean that the RoMAD will be more suitable. Candidates also struggled with the correct calculations for the RoMAD.

(i) Sharpe and Sortino ratios are more suitable when there is normality of returns, whereas RoMAD does not have this limitation. The options in the new strategy will yield non-normal returns, so RoMAD will be more suitable.

4. Continued

(ii) RoMAD is found by dividing the average return by the maximum drawdown. The max drawdown is the difference between the highest and subsequent lowest point in the investment's value, expressed as a % of the highest value. If we assume the value of the investment is 1 at the beginning, then the value is as follows for each year:

	Yr1	Yr2	Yr3	Yr4
Investment Value	1.1	1.067	1.0243	1.1165

Max drawdown = (1.1 - 1.0243)/1.1 = 6.88%
The average return is (10%-3%-4%+9%)/4=3%.

RoMAD=3/6.88=0.4360

(e)

(i) Critique the client's current capital allocation strategy.

(ii) Recommend changes to the capital allocation strategy, if needed.

Commentary on Question:
Candidates needed to include recommendations with their critique and the critique needed to mention both non-normality and tail risk to receive full credit. To receive full credit for the recommendations, candidates needed to include mention of regulatory capital requirements.

(i) Critique: Options introduce non-linearity to the portfolio returns. VaR-based position limits may not adequately reflect nonlinear risks due to it not providing insight into the tail. The relationship between the overall VaR and the VaR of the individual positions may be difficult to determine.

(ii) Recommendation: The firm will likely want to look at regulatory capital requirements since the firm operates in a highly regulated industry. Other stratetegies included:
1. Nominal, notional, or monetary position limits
2. Maximum loss limits
3. Internal capital requirements
4. Use of CTE

5. Learning Objectives:

1. The candidate will understand the value of governance and its key elements in general and in the context of an investment operation.

Learning Outcomes:

(1b) Identify sources of unethical conduct and explain the role of a fiduciary.

(1f) Demonstrate understanding of how ethics relates to business decision-making, and relate ethics in business to personal ethics.

Sources:

Ch. 1-3 of "Investment Ethics" by Sarah Peck

Commentary on Question:

Most candidates did well on this question. Many candidates are able to provide some of the information needed for part (a) but not all. Almost all candidates are able to list the four ethical principles in (b)(i). In (b)(ii), most candidates are able to identify whether the directions are acceptable but some candidates didn't provide justification. Most candidates did poorly in (c), not recognizing their fiduciary duty to their client.

Solution:

(a) Provide six additional pieces of information you need to assess the adequacy of any investment strategy for Rami.

Current value of his portfolio
Risk aversion level/risk tolerance
Liquidity needs
Demographics (i.e., age, marital status, dependents, etc.)
Financial goals, e.g. Estate planning needs, retirement expectations
Any special circumstances – E.g., special tax details, additional sources of income, etc.
Rami's financial knowledge and expertise
Other answers related to the aforementioned items are acceptable

(b)

(i) List the four ethical principles that guide your role as Rami's investment advisor.

(ii) Explain whether each point of Rami's direction is acceptable given these principles.

(i)
Ethical understanding
Ethical use of information
Responsible investing
Trust and Fairness

5. Continued

(ii)
Rami is a high-level employee and may have insider information. You should not follow this direction before going through proper due diligence and ensuring compliance with applicable regulations. (Ethical use of information)
You cannot utilize information you do not understand or on which you cannot perform adequate due-diligence (ethical understanding). You cannot follow this direction.
This is fine, even if you agree with his assessment; there are no specific concerns with substandard/lax regulation/products elsewhere that point to irresponsible investing.

(c) Determine how to proceed and whether to recommend the CDO fund to Rami. Justify your response.

Both of the following actions should be taken:
- Recommend to client.
- Either (1) educate yourself first further or (2) enlist assistance for management of CDO risks with approval of client or (3) refer client to another fiduciary who does understand the risks.

Justification:
- you have a fiduciary duty to benefit your client, we are told your analysis is sufficiently comprehensive to understand the value and appropriateness.
- you may not have a complete understanding of all risks.

6. Learning Objectives:

2. The candidate will understand and be able to apply the components of an effective risk management system.

Learning Outcomes:

(2c) Identify and describe various approaches for managing risks including risk budgeting, position limits, etc.

(2f) Examine examples of risk management failure.

Sources:

QFII-117-19: Chapter 7 of Strategic Risk Management Practice: How to Deal Effectively with Major Corporate Exposures, Andersen & Schroder.

Commentary on Question:

Commentary listed underneath question component.

Solution:

(a)

(i) Describe two risks overlooked in both the Barings and LTCM cases.

(ii) Identify one risk that is unique to each case.

Commentary on Question:

Candidates did extremely well recognizing the case studies and listing facts about each of them. The expectation was for candidates to go beyond recalling information and consider comparisons between the case studies.

Market Risk – Both cases involved the trading of securities which led to significant exposure to financial losses from adverse price movements.

Currency Risk – Both cases involved trades in foreign markets that subjected the firms to foreign currencies.

Unique to LTCM – Model Risk
Overreliance on models at the expense of good judgment.

Unique to Barings – People Risk
Inadequate operating structure allowed a rogue trader to jeopardize the firm.

(b)

(i) Define the four modes of environmental scanning.

(ii) Explain which of these modes of environmental scanning is least appropriate for ABC.

6. Continued

Commentary on Question:
Candidates listed and defined the four modes with ease; however, many fell short of directly connecting elements of ABC to the unsuitability of a scanning mode. Several candidates recommended the most—rather than least—appropriate mode.

Formal Search – a *structured* way of obtaining information of *specific interest* to support planning and decision-making.
Conditional Viewing – tracks *pre-selected information* from *particular sources*.
Informal Search – actively looking for information through *unfocused* and *unstructured* efforts.
Undirected Viewing – looking through *diverse sources* of information *without a specific informational need* in mind.

Undirected Viewing is least appropriate for ABC because:

- ABC has a fixed budget, but undirected viewing is not cost-effective because of its lack of structure.
- Undirected viewing is most needed in complex environments, but the business model is simple.
- Undirected viewing is most needed in volatile environments, but the market is stable.

(c)

(i) Compare and contrast a risk map and risk timing map.

(ii) Describe what is unique about an influence matrix compared to a risk map.

Commentary on Question:
The objective was to clearly identify and describe both similarities and differences. Overall, candidates did very well on this part.

Similar: Both maps consider severity of the risk.
Different: A risk timing map takes into account when the risk might occur while a risk map identifies the potential likelihood of the risk.

Unlike risk maps, an influence matrix conveys the interdependencies between the various risk factors.

(d)

(i) Identify which risk corresponds to each of Risk 1, Risk 2, and Risk 3 in the influence matrix. Justify your response.

(ii) Recommend a strategy to mitigate the risk with the lowest passive score.

6. Continued

Commentary on Question:
This subpart tests the candidate's understanding of influence matrices, specifically how interdependency of the risks is captured, and apply it to ABC. Most candidates were able to identify fire as Risk 3 but justifying the remaining two risks was more challenging. The best-performing candidates were able to incorporate information about ABC's business into the justifications.

Risk 1: Competition
Competition might weakly impact consumer preferences. For example, if ABC only sells trading cards but a competitor offers cards as well as games or cafes, it might make consumer preference change.

Risk 2: Consumer Preferences
Consumer preferences would heavily impact competition. As consumer preference changes the number of competitors will likely change. For example, if trading cards become more popular, more trading shops might appear.

Risk 3: Fire
Fire is unrelated to the other two risks.

The risk with the lowest passive score is the one with the lowest column total: *Fire*. Since fire cannot be indirectly addressed by mitigating other risks, fire risk must be mitigated directly.

Recommendation: Install sprinklers and/or buy fire insurance