Strathmore
UNIVERSITY

STRATHMORE INSTITUTE OF MATHEMATICAL SCIENCES
BACHELOR OF BUSINESS SCIENCE IN FINANCIAL ENGINEERING, FINANCIAL ECONOMICS
BSF 4126 FINANCIAL RISK MANAGEMENT

END OF SEMESTER EXAM

DATE: 25th July 2023 Time: 2 Hours

Instructions

1. This examination consists of **FIVE** questions.
2. Answer **Question ONE (COMPULSORY)** and any other **TWO** questions.

QUESTION 1 (30 Marks)

1. Explain the significance of adopting a qualitative approach within the domain of credit risk evaluation, integrating theoretical perspectives and empirical evidence to support your argument (6 Marks)
2. Besides its involvement in stress testing, analyze three other ways that the risk committee is able to influence risk culture and capabilities in an organization. Provide examples of recent corporate governance scenarios where the risk committee has played a pivotal role in fostering an effective risk culture. (6 Marks)
3. Failure of the risk committee to perform the duties explained or their involvement in the risk function or risk management process may bring about costs. Explain. (4 Marks)
4. Discuss the three practical implications of adopting new technology applications, including AI/ML, in risk management processes. Further outline the potential risks associated with these technologies, and how can they be effectively mitigated (6 Marks)

5. Compare and contrast three distinct methodologies applied in the process of risk identification (4 Marks).
6. Differentiate the following terms as used in financial risk management
    i) static vs dynamic risks (2 marks)
    ii) pure vs speculative risks (2 marks)

QUESTION 2 (20 Marks)

1. An analyst's credit management desk is involved with 3 classes of borrower's namely: students, small businesses and financial institutions. The analyst estimates that the expected credit losses from each borrower class would be 9%, 16%, 6% and that the aggregate credit loss would be $60M. The analyst assumes a Gaussian distribution function for loss distributions of the categories. They estimated the annual default correlations naively by a Pearson correlation coefficient across the categories and found this to be zero, although the analyst insisted in the report that this did not strictly imply probabilistic independence. He further reported that 99% VaR for the portfolio was 12.5% and that the total credit desk portfolio amounted to $600M. He however failed to provide the credit exposure for each borrower class. Determine the credit exposures for each class of borrower (8 Marks).
2. An analyst after joining a new firm goes through the previous year's files for the Risk Management Department. He makes note of the following that the reported weekly 95% VaR, the h-day 99% VaR and the h-day 70% volatility stressed h-day 99% VaR are summarized as follows:

Estimated	Reported
95% VaR	9%
h-day 99% VaR	12.5%
Stressed h-day 99% VaR	17%
Portfolio Size	USD 115,000

He is interested in determining the first 2 moments - expected return and the volatility of the portfolio and assessing the previous analysis h period estimate. Determine the values these variables that the analyst is interest in. (6 marks)

3. "Operational risk, arising from failures of systems, processes, people, or external events, has gained heightened attention in recent years due to several high-profile incidents and increasing regulatory scrutiny. Measurement of operational risk, while challenging, is vital for effective risk management and regulatory compliance." Discuss in-depth three distinct approaches to measuring operational risk, covering both traditional and contemporary methods. (6 Marks)

QUESTION 3 (20 Marks)

1. Discuss the benefits and criticisms of regulatory frameworks for banks and insurance companies. Use contemporary examples to illustrate your points and focus on the effects of recent changes in regulatory expectations, such as the increased focus on individual accountability and documentation (8 marks).
2. Examine the 3 primary advantages of stress testing within the domain of financial risk management. Provide a substantive argument for each benefit (6 Marks).
3. Discuss the essential components within the internal risk model validation process, highlighting their significance and interrelation (6 Marks).

QUESTION 4 (20 Marks)

SVB Financial Group, more commonly known as Silicon Valley Bank, is a high-tech commercial bank specializing in providing various financial services to startups and growth-stage companies in the technology, life sciences, and other innovation sectors.

Credit Risk. In the volatile landscape of the tech startup industry, SVB faces significant credit risk. The bank has to perform due diligence in assessing the potential success of these firms. The health and stability of the startups it lends to directly impact the credit risk SVB faces. The bank has to continuously monitor and manage this risk to ensure loan repayments.

Market Risk: As a high-tech commercial bank, SVB is exposed to market risks such as interest rate risk, foreign exchange risk, and equity price risk. Changes in these variables could affect the bank's investment portfolio's value. For instance, changes in interest rates may impact the value of SVB's fixed-income securities.

Operational Risk: As with any banking institution, SVB faces operational risks such as cybersecurity threats, technology disruptions, and human errors. The bank needs robust internal

controls and IT systems to manage these risks. Given the high-tech nature of its clientele, SVB may face higher cybersecurity risks compared to traditional banks.

Regulatory Risk: SVB operates in a heavily regulated industry and needs to comply with various banking regulations. Non-compliance could result in fines, sanctions, or reputational damage. Additionally, changes in banking regulations could affect SVB's business model and profitability.

Reputation Risk: SVB's reputation as a leading bank for high-tech firms and startups is crucial to its business. Any negative incidents affecting its reputation could have a significant impact on its client base and overall business.

Required:

(i) Explain how SVB can mitigate the credit risk associated with lending to startups and growth-stage companies in the volatile tech industry (3 marks).

(ii) Discuss the specific market risks that SVB faces due to its unique client base (3 marks).

(iii) Given SVB's technological focus and the sensitive nature of its client's work, how should SVB address the heightened cybersecurity risk it faces compared to the traditional banks (3 marks)

(iv) Discuss the importance of reputation management for SVB. How could a reputational crisis impact SVB's client base and profitability? Suggest a reputation management strategy for SVB (5 marks)

(v) Discuss the importance of integrating risk management into top-level decision making in a banking institution. Using SVB as an example, how does risk governance impact the overall risk profile of the bank? (6 marks)

QUESTION 5 (20 Marks)

1. "Risk identification forms the foundation of comprehensive risk management. Given the evolution of risks in the modern global context, including technological, environmental, and geopolitical risks, traditional risk identification methods may need to be supplemented or rethought."

    i) Discuss the concept of emerging risks, and explain how they might be identified. What challenges do emerging risks present for traditional risk identification methods? Consider recent examples such as cyber threats, climate change risks, or global pandemics (4 marks).

    ii) Risk identification should not be a one-time event, but a continuous process integrated into the organization's operations. Discuss how this can be achieved, considering factors such as organizational culture, information sharing, and reward systems (4 marks).

2. Analyze the role of derivatives in risk management, providing examples of their use in managing different types of risk (such as interest rate risk, foreign exchange risk, and credit risk) in recent market scenarios, and discuss any potential challenges or risks associated with their use (6 marks).

3. Discuss the risk management control cycle, clearly explaining each step (6 marks).