



Sample/practice exam June 2017, questions and answers

Financial Institutions Management II (The University of Adelaide)



Sample Examination Paper

FINANCIAL INSTITUTIONS MANAGEMENT II

Official Reading Time:	10 mins
Writing Time:	180 mins
Total Duration	<u>190 mins</u>

Instructions to Candidate:

1. Answer **ALL** questions in Sections A, B and two questions in section C
2. You should answer all questions in the answer book.
3. Please allocate your time according to the percentage contribution of the questions. Examination materials must NOT be removed from the examination room.
4. A copy of **formula sheet** is provided.

Materials:

- 1 Blue book
- A calculator, financial and graphics, incapable of storing text is permitted

PLEASE DO NOT COMMENCE WRITING UNTIL INSTRUCTED TO DO SO

PLEASE SEE NEXT PAGE

SECTION A: Multiple Choice

(Each question is worth 1 mark- select the answer you believe most correct. Answer these questions in the exam booklet, not on this paper)

A1. Which of the following is a method that may overcome weaknesses in the historic or back simulation model in measuring market risk?

- (a) The use of smaller sample sizes to estimate return distributions.
- (b) Weight sample size observations so that the more recent observations contribute a larger amount to the model.**
- (c) Decrease the number of assets in the trading portfolio so that past returns will provide more accuracy to the model.
- (d) Increase the number of assets in the trading portfolio in order to benefit from higher levels of diversification.
- (e) The weaknesses in the model cannot be overcome.

A2. Which of the following statements is NOT true?

- (a) Stored liquidity management involves liquidation of assets.
- (b) Traditionally Depository Institutions have stored cash reserves at the Central bank and in their vaults to overcome liquidity risk.
- (c) When the Depository Institution uses its cash as the liquidity adjustment mechanism, both sides of its balance sheet contract.
- (d) DIs hold cash reserves in excess of the minimum required to meet liquidity drains.
- (e) Bank sustains no cost under stored liquidity risk management.**

A3. Losses in asset values due to adverse changes in interest rates are borne initially by the

- (a) equity holders of an FI.**
- (b) liability holders of an FI.
- (c) regulatory authorities.
- (d) taxpayers.
- (e) insured depositor

A4. A criticism of the Basel I risk-based capital ratio is

- (a) the incorporation of off-balance-sheet risk exposures.
- (b) the application of a similar capital requirement across major banks in international banking centers across the world.
- (c) the more systematic accounting of credit risk differences.
- (d) the lack of appropriate consideration of the portfolio diversification effects of credit risk**
- (e) Answers B and C only.

A5. Which of the following statements best describes the treatment of adjusting for credit risk of off-balance-sheet activities under Basel II risk based capital ratio ?

- (a) All OBS activities are treated equally in making credit-risk adjustments.
- (b) Standby letter of credit guarantees issued by banks to back commercial paper have a 50 percent conversion factor.
- (c) The credit or default risk of over-the-counter contracts is approximately zero.
- (d) The current exposure component of the credit equivalent amount of OBS derivative contracts reflects the credit risk if the contract counterparty defaults.
- (e) The treatment of interest rate forward, option, and swap contracts differs from the treatment of contingent or guarantee contracts.

A6. Which of the following statements is true?

- (a) Convexity is desirable because the larger the convexity the greater the interest rate protection against interest rate decreases and the greater the potential gains following increasing interest rates.
- (b) Convexity is desirable because the larger the convexity the greater the interest rate protection against interest rate rises and the greater the potential gains following decreasing interest rates.
- (c) Convexity is undesirable because the larger the convexity the lower the interest rate protection against interest rate decreases and the smaller the potential gains following increasing interest rates
- (d) Convexity is undesirable because the larger the convexity the lower the interest rate protection against interest rate rises and the smaller the potential gains following decreasing interest rates.
- (e) None of the given answers.

A7. X Bank has a higher ROE than YBank, but YBank has a higher ROA than XBank. XBank also has a higher Asset Utilisation ratio than YBank; however, the two banks have the same total assets. Which of the following statements is most correct?

- (a) X Bank has a lower equity multiplier than YBank.
- (b) X Bank has a lower profit margin than YBank.
- (c) X Bank has a lower net income than YBank.
- (d) Statements b and c are correct.
- (e) All of the statements above are correct.

A8. A decline in an FI's asset quality due to, for instance, increasing loan defaults:

- (a) exposes the FI to increasing credit risk.
- (b) can have an impact on the FI's funding cost.
- (c) might lead to refusal of lenders to renew or issue new loans to the FI.
- (d) might threaten the FI's solvency.
- (e) All of the given answers.

A9. Why are money market managed funds and general insurance companies more exposed to credit risk than, for instance, credit unions or banks?

- (a) Because the average maturities of their assets are longer than those of banks/credit unions.
- (b) Because the average maturities of their assets are shorter than those of banks/credit unions.
- (c) They are not.
- (d) Because they are not specialised in credit risk management.
- (e) Because banks and credit unions have more stringent credit controls.

A10. An Australian FI that invests €50m in 3-year maturity loans and partially funds these loans with €30m 1-year deposits is exposed to the following risks.

- (a) A depreciation of the Euro against the Australian dollar plus credit risk plus refinancing risk, i.e. increasing interest rates in the Euro zone.
- (b) An appreciation of the Euro against the Australian dollar plus credit risk plus refinancing risk, i.e. increasing interest rates in the Euro zone.
- (c) A depreciation of the Euro against the Australian dollar plus credit risk plus reinvestment risk, i.e. decreasing interest rates in the Euro zone.
- (d) A depreciation of the Euro against the Australian dollar reinvestment risk, i.e. increasing interest rates in the Euro zone.
- (e) A depreciation of the Euro against the Australian dollar refinancing risk, i.e. decreasing interest rates in the Euro zone.

A11. Consider a security with a face value of \$100,000 to be repaid at maturity. The maturity of the security is 3 years. The coupon rate is 9% p.a. and coupon payments are made semi-annually. The current discount rate is 12% p.a. What is the security's price (round your answer to two decimals)?

- (a) \$127,000.
- (b) \$73,668.38.
- (c) \$100,000.
- (d) \$76,046.08.
- (e) \$92,624.01.

A12. Assume you are the manager of an FI. How would you structure your balance sheet using the repricing gap model if you expected interest rates to decrease?

- (a) It would depend on my FI's current profitability.
- (b) I would create a negative gap.
- (c) I would create a positive gap.
- (d) I would create a neutral gap.
- (e) None of the given answers.

A13. The Basel capital requirements differ from previous capital standards in all except one of the following ways?

- (a) More stringent capital standards for large banks than for small banks.
- (b) Inclusion of off balance sheet assets in the asset base.
- (c) Restrictions on the amount of goodwill that can be counted towards primary or tier I capital.
- (d) Risk weighting of assets on the basis of credit risk exposure.
- (e) Risk weighting of off balance sheet contingencies.

A14. Investors in mortgage-backed pass-through securities are exposed to a variety of risks. Compared to other fixed-income securities, the most unique of these risks is

- (a) prepayment risk
- (b) default risk
- (c) credit risk
- (d) interest rate risk
- (e) liquidity risk

A15. Assume a \$500,000 loan has a duration of 2.5 years. The current interest rate level is 10% and a sudden change in the credit premium of 1% is expected. Further assume that the one-year income on the loan is \$2,500. What is the loan's RAROC (round to two decimals)?

- (a) 10.00%.
- (b) 11.00%.
- (c) 22.00%.
- (d) 50.00%.
- (e) None of the above answers

- A16. A disadvantage of using asset management to manage a FI's liquidity risk is
- (a) the resulting shrinkage of the FI's balance sheet.
 - (b) the high cost of purchased liabilities.
 - (c) the accessibility of international money markets.
 - (d) tax considerations.
 - (e) loss of flexibility as a result of dependence upon purchased liabilities.
- A17. A small local bank failed because housing market collapsed following the departure of the area's largest employer. What type of risk applies to the failure of the institution?
- (a) Firm-specific risk.
 - (b) Technological risk.
 - (c) Operational risk.
 - (d) Sovereign risk.
 - (e) Insolvency risk.
- A18. Assume the dollar market value of an FI's position is \$200,000 and the calculated price volatility is 1.25%. What is the VAR of the position if the FI is required to hold the position for 6 days (round to two decimals)?
- (a) \$2,683.28.
 - (b) \$6,123.72.
 - (c) \$200,000.00.
 - (d) \$489,897.95.
 - (e) None of the above answers
- A19. Assume the interest rate in the market for one-year zero-coupon government bonds is $i = 8\%$ and the rate for one-year zero-coupon grade BBB bonds is $k = 10.2\%$. What is the implied probability of repayment on the corporate bond (round to two decimals)?
- (a) 2.00%.
 - (b) 2.04%.
 - (c) 97.96%.
 - (d) 98.00%.
 - (e) 98.96%

A20. The following are the net currency positions of a US Financial Institution (stated in US dollars).

Note: Net currency positions are foreign exchange bought minus foreign exchange sold restated in US dollar terms.

Currency	Net Position
Canadian Dollar	+US \$1,200
Euro	-US\$ 245,900
Japanese Yen	+US\$ 505,000
Swiss Franc	-US\$ 36,700
British Pound	+US\$ 447,900

How would you characterize the FI's risk exposure to fluctuations in the Euro to dollar exchange rate?

- (a) The Financial Institution is net short in the Euro and therefore faces the risk that the Euro will rise in value against the U.S. dollar.
- (b) The Financial Institution is net short in the Euro and therefore faces the risk that the Euro will fall in value against the U.S. dollar.
- (c) The Financial Institution is net long in the Euro and therefore faces the risk that the Euro will fall in value against the U.S. dollar.
- (d) The Financial Institution is net long in the Euro and therefore faces the risk that the Euro will rise in value against the U.S. dollar.
- (e) The Financial Institution has a balanced position in the Euro.

Section B: Short Answers (3 questions)

(Answer all questions, each question is worth 10 marks)

B1. ABC Bank has a \$1 million position in a five-year, zero-coupon bond with a face value of \$1 402 552. The bond is trading at a yield to maturity of 7.00 per cent. The historical mean change in daily yields is 0.0 per cent, and the standard deviation is 12 basis points.

- (a) What is the maximum adverse daily yield move given that we desire no more than a 5 per cent chance that yield changes will be greater than this maximum?
- (b) What are the daily earnings at risk for this bond?
- (c) What is meant by value at risk (VAR)? What would be the VAR for the bond held by ABC Bank for a 10-day period?

B2. XYZ Bank issues a six-month, \$1 million Eurodollar deposit at an annual interest rate of 6.5 per cent. It invests the funds in a six-month British pound bond paying 7.5 per cent per year. The current spot rate is \$0.18/GBP.

- (a) The six-month forward rate on the pound is being quoted at \$0.1810/GBP. What is the net spread earned on this investment if the bank covers its foreign exchange exposure using the forward market?
- (b) Explain how forward and spot rates will both change in response to the increased spread?
- (c) Why will the bank still be able to earn a spread of 1 per cent knowing that interest rate parity usually eliminates arbitrage opportunities created by differential rates?

B3. How can liquidity and interest rate risk management objectives conflict in a Depository Institution? Are these conflicts resolvable? Explain.

Section C: (Answer all questions, each question is worth 15 marks)

C1. Explain how modern portfolio theory can be applied to lower the credit risk of a Financial Institution's portfolio. Why is it difficult for small banks and Non-Bank Financial Institutions to minimise credit risk using modern portfolio theory?

C2. The arguments on whether banks should be regulated have made regulation on banks' capital adequacy a topic of controversy.

- (a) Explain why do you think banks' capital adequacy need to be regulated?
- (b) Why do some banking scholars argue that deposit insurance is the only justified reason to regulate capital?
- (c) What are the weaknesses of Basel I Risk Based Capital Requirements?
- (d) What is the major feature in Basel II Capital Requirements?

END OF EXAMINATION PAPER

Formula Sheet

Bond Valuation

$$P_0 = \sum_{t=1}^n \frac{C_t}{(1+R)^t} + \frac{FV}{(1+R)^n}$$

Share Valuation

$$P_0 = \frac{D_1}{(1+k)} + \frac{D_2}{(1+k)^2} + \dots + \frac{D_\infty}{(1+k)^\infty}$$

$$P_0 = \frac{D_0(1+g)}{(k-g)}$$

Maturity Model with a portfolio of assets and liabilities

$$M_i = W_{i1}M_{i1} + W_{i2}M_{i2} + \dots + W_{in}M_{in}$$

Duration

$$D = \frac{\sum_{t=1}^N CF_t \times DF_t \times t}{\sum_{t=1}^N CF_t \times DF_t} \quad D = \frac{\sum_{t=1}^N PV_t \times t}{\sum_{t=1}^N PV_t}$$

Measuring price sensitivity with duration :

$$\frac{\partial P}{P} = -D \left(\frac{\partial R}{1+R} \right)$$

$$\Delta E = \left[-D_A \times A \times \frac{\Delta R}{(1+R)} \right] - \left[-D_L \times L \times \frac{\Delta R}{(1+R)} \right]$$

If the level of interest and expected shock to interest rates are the same for both assets and liabilities, then:

$$\Delta E = -(D_A - D_L k) \times A \times \frac{\Delta R}{(1+R)}$$

Duration and Convexity

$$\frac{\Delta P}{P} = -D \frac{\Delta R}{(1+R)} + \frac{1}{2} CX (\Delta R)^2$$

Repricing Model on interest rate risk :

$$\Delta NII_i = (GAP_i) \Delta R_i = (RSA_i - RSL_i) \Delta R_i$$

Simple promised return on loan :

Loan rate = Base Rate + Credit risk premium or margin

Contractually Promised return on loan :

$$1+k = 1 + [f + (BR+m)] / [1 - b(1-R)]$$

Expected return on loan : $E(r) = p(1+k)$.

Term Structure Derivation of Credit Risk:

$$p(1+k) = 1+i \quad \text{or}$$

$$[(1-p)\gamma(1+k)] + [p(1+k)] = 1+i$$

$$K - I = \Phi = (1+i) / (\gamma + p - p\gamma) - (1+i)$$

RAROC = one year income on a loan / loan (asset) at risk or capital at risk

$$\text{Loan (asset) at risk or capital at risk} = DLN = -D_{LN} \times LN \times (DR/(1+R))$$

$$\text{Credit Metrics : } VAR_{\text{one day}} = P \times 1.65 \times \text{std dev}$$

CreditRisk+ Model :

$$\text{Probability of n defaults} = \frac{e^{-m} m^n}{n!}$$

Concentration Limits for a Loan Portfolio:

$$\text{Concentration limit} = \text{Maximum loss as a percentage of capital} \times \frac{1}{\text{Loss rate}}$$

KMV Portfolio Manager Model :

$$\text{Expected return on a loan to borrower } i \quad R_i = AIS_i - E(L_i) = AIS_i - (EDF_i \times LGD_i)$$

Risk of a loan to borrower i (σ_i):

$$\sigma_i = UL_i = \sigma_{D_i} \times LGD_i = \sqrt{EDF_i(1-EDF_i)} \times LGD_i$$

$$\begin{aligned} \text{Net FX exposure of an FI} &= (\text{FX assets}_i - \text{FX liabilities}_i) + (\text{FX bought}_i - \text{FX sold}_i) \\ &= \text{Net foreign assets}_i + \text{Net FX bought}_i \end{aligned}$$

Daily earnings at risk (DEAR) = Dollar market value of the position \times Price sensitivity \times Potential adverse move in yield, or

$$\text{Daily earnings at risk (DEAR)} = \text{Dollar market value of the position} \times \text{Price volatility}$$

$$\text{Market value at risk (VAR)} = \text{DEAR} \times \sqrt{N}$$

DEAR for Foreign Exchange :

$$\text{DEAR} = \text{dollar value of position} \times \text{FX volatility}$$

$$\text{Dollar equivalent value of position} = \text{FX position} \times \text{spot exchange rate}$$

DEAR for Equities

DEAR = dollar value of position × stock market return volatility
 market return volatility = 1.65 std dev_M.

$$\mathbf{DEAR\ portfolio} = [DEAR_a^2 + DEAR_b^2 + DEAR_c^2 + 2r_{ab} \times DEAR_a \times DEAR_b + 2r_{ac} \times DEAR_a \times DEAR_c + 2r_{bc} \times DEAR_b \times DEAR_c]^{1/2}$$

Liquidity Index :

$$I = \sum_{i=1}^N \left[(W_i) \left(\frac{P_i}{P_i^*} \right) \right]$$

Securitisation :

$$\text{Size of pool} = \left[\frac{1 - \frac{1}{\left(1 + \frac{r}{m}\right)^{mm}}}{\frac{r}{m}} \right] \times PMT$$