Strathmore UNIVERSITY

STRATHMORE BUSINESS SCHOOL

BACHELOR OF FINANCIAL SERVICES

END OF SEMESTER EXAMINATION

BNK 4102: CREDIT RISK ANALYSIS AND MANAGEMENT

Date: Friday, 4th August 2023 **Time**: 08.00 - 10.00

Instructions:

Time Allowed 2 hours

Answer question 1 (Compulsory) and any other 2 questions

Question 1

(a) X intends to borrow a loan of sh.10M for a period of 5 years at 10% interest rate

Required: compute the annual loan repayment and monthly loan repayment **(2 marks)**

(b) carryout sensitivity analysis for

(i) loan amount, (ii) repayment period, (iii) interest rate **(8 marks)**

(c) With the aid of a table explain the concept of aging of debtors (accounts receivable) **(4 marks)**

(d) Suppose a credit portfolio value is sh.500M and the portfolio has a volatility of 30%

Required:

(i) compute the 30-day value at risk (VAR) at 99% level of confidence **(3 marks)**

(ii) Suppose the confidence level is 95%

Required: compute the 90-day VAR **(3 marks)**

(e) Suppose a customer wants to borrow a sh.10M loan at 10% interest rate 3 months from today for a period of 10 months i.e '3 – 10 FRA and that in 2 months' time suppose the interest rate is either 8% or 10% or 12%

Required: compute and plot the profits / losses for the customer **(10 marks)**

(Total 30 marks)

Question 2

(a) A Ltd is a lender and wishes to assess whether to grant credit to B Ltd (borrower) who has the following details: B Ltd wishes to borrow sh.20 million for 5 years. The cost of sales is sh.40M, sales is sh100M., default rate probability of 80% and discounting rate was 12%

Required: assess and advice on the credit grant to decision using NPV technique

(5 marks)

(b) Suppose in question 2 (a) above the default rate probability of 20% while all other information remains constant

Required: assess and advice on the credit grant to decision using NPV technique

(5 marks)

(c) Suppose the profits and losses of N Traders was as follows:

Period	**Returns**
1	9
2	8
3	-6
4	-8
5	4
6	7
7	-9

Required: Compute the following measures of risk:

(i) range, (ii) standard deviation, (iii) variance and (iv) semi-variance **(10 marks)**

(Total 20 marks)

Question 3

(a) A lender P has advanced a loan to a borrower T Ltd of Ksh.8 million and T Ltd has expected revenues for next year that depend on expected state of the economy whose respective probabilities as follows:

Economic state	**probability**
Best scenario	0.3
Expected scenario	0.4

Worst scenario 0.3

Expected revenues:

Best scenario	**Expected scenario**	**Worst scenario**
sh.30 million	sh.20 million	shs.10 million

Required: establish the expected profits for next year **(5 marks)**

(b) A Ltd advanced a loan to a borrower B Ltd of sh.6M and B Ltd expects to have the following risky cash flows: sh.8M, sh.6M, sh.4M and sh.2M occurring in years 1 to 4 respectively. Assume that the certainty equivalent factor (α) of year 0 α = 1; year 1 α = 0.9; year 2 α = 0.7; year 3 α = 0.5 and year 4 α=0.3. Assume that the risk free discounting rate is 12%

Required: assess the viability of the advancing the loan to B Ltd using NPV technique **(5 marks)**

(c) Draw a credit risk matrix and explain its variables **(5 marks)**

(d) Describe the techniques of managing credit risks **(5 marks)**

(Total 20 marks)

Question 4 (a)

A borrower takes out a sh.6,400,000 loan for a house. After making installment payments on the loan for some years, the borrower begins to face financial difficulties. It is estimated that the borrower has an 70% of default. The outstanding loan balance is sh.3,500,000, and the bank will be able to sell the condo for sh.2,800,000 upon foreclosure.

Required:

(i) Calculate the loss given default (LGD) in sh. **(2 marks)**

(ii) Calculate the loss given default as a percentage of collateral **(2 marks)**

(b) L Bank Ltd is carrying out financial distress assessment of V Ltd a potential loan borrower and the following information is available:

- Current assets sh.11,000,000
- Current liabilities sh.4,000,000
- Operating profits sh.3,000,000

- Interest expense sh.800,000
- Taxation sh.660,000
- Profits after tax sh.1,540,000
- Dividends payable sh.500,000
- Market value of equity sh.6,000,000
- Non-current liabilities sh.2,400,000
- Sales sh.12,000,000
- Non-current assets sh.3,500,000

Required: compute the Altman's financial distress Z score and advise on the financial distress status of V Ltd **(8 marks)**

(c)

A SACCO has advanced loans to 100 borrowers. The records show that the average loan repayment period is 7 years with a standard deviation of 0.8 years. If the life of employees is expected to be normally distributed

Required:

(i) Determine the probability that the borrowers will repay the loans before 9 years **(2 marks)**

(ii) Determine the probability that employees will repay the loans after 9 years **(2 marks)**

(iii) Determine the probability that employees will repay the loans before 6 years **(2 mark)**

(iv) Determine the probability that employees will repay the loans after 6 years **(2 marks)**

(Total 20 marks)

Question 5

(a) Suppose X MFI Ltd on 1/4/2021 had the following information regarding its loans and advances:

probability of default = 18%,

loss severity = 5% and

loans amount advanced = sh.200 million.

Required: establish expected loss and interpret the answer **(3 marks)**

(b) A firm had assets valued at sh.200M, 5 year zero coupon bond which was currently valued at sh.120M, equity of sh.80M, interest rate of 5%, standard deviation of 25%, bond life of 5 years

Required: establish the probability of defaulting and not defaulting using the Merton model **(5 marks)**

(c) A borrower had a loan of sh.800,000 and after paying installments of 1 year the borrower had financial challenges and begun defaulting on the loan. It was estimated that the borrower had 0.8 default rate and an outstanding loan balance of sh.600,000. The bank was able to sell collateral given for the loan at sh.400,000

Required: compute the loss given default (LGD) **(3 marks)**

(d) NZ Ltd had a receivable of $400,000 expected in 6 months' time and the FOREX rates were as follows:

Spot rate = $/€ 1.593 (+/- 0.0002)

1 month forward rate = $/€ 1.594 (+/- 0.0003)

6 months forward rate = $/€ 1.593 (+/- 0.0004)

The interest rates were as follows:

	Lending /Borrowing rate	deposit rate
One year Belgium	4.9%	**4.6%**
One year USD (USA)	**5.4%**	5.1%

Required: advice on the better hedging strategy between forward hedge and money market hedge **(9 marks)**

(Total 20 marks)