Strathmore
UNIVERSITY

STRATHMORE UNIVERSITY BUSINESS SCHOOL

BACHELOR OF COMMERCE – E.C

BCF 3204: FINANCIAL RISK MANAGMENT

END OF SEMESTER EXAMINATION

DATE: 16th December 2023 **TIME: 09:00-11:00**

INSTRUCTIONS:

Answer Question ONE in Section A and TWO other Questions in Section B.

SECTION A-COMPULSORY

QUESTION 1

(a) (i) Suarez, who is an investment manager for a defined benefit pension scheme is considering two bonds about to be issued by a large insurance company. The first bond is 30years, 4% semi-annual coupon payment bond. The second bond is a 100 year, 4% semi-annual coupon payment bond. Both bonds are expected to trade at par value at issuance and each has a par value of $100

Required:

Suppose the YTM increases or decreases by 5 basis points, calculate the approximate convexity of each bond (Retain your values to 6 decimal points) **(6 marks)**

(ii) Duration is commonly used as a measure of interest rate risk. However, duration does not consider yield curve risk. Why? **(2 marks)**

(iii) What does duration tell you about the sensitivity of a bond portfolio to interest rates? **(2 marks)**

(b) Explain **Four** Qualitative techniques of Credit Risk evaluation. **(4 marks)**

(c) Explain **Two** features of interest rates swaps. **(2 marks)**

(d) Liverpool Plc a company based in the UK is expecting to receive $900,000 in 6 months' time. The company's Finance Manager has determined the following: ($per1€)

Spot Rate: $1.700-$1.7040
3 Months Forward: $1.6902-$1.6944
6Months Forward: $1.6764-$1.6809

Money Market Rates p.a:	**Borrowing**	**Deposit**
US	6.5%	5%
UK	7.5%	6%

Required:

Advice the company whether to use money market hedge or a Forward Contract. **(5 marks)**

(e) The current share price of a company is currently selling at Sh10. The share price will increase by 5% or reduce by 5% six months from now. The risk free rate of return is 6% and the strike price is Sh10. The option will be exercised after six months.

Required:

Using the one period-binomial model, determine the value of the put option (Use binomial tree to present your answer) **(5marks)**

(f) A portfolio manager uses the Jensen's alpha to evaluate his performance for a one -year period. The portfolio beta is 1.5 and the Market risk premium is 6%. The Risk free rate of return is 8%. The actual return of the portfolio for the period is 19%.

Required:

Calculate the Jensen's Alpha. Comment on the performance of the portfolio manager? **(4marks)**

Total: 30 marks

SECTION B: ANSWER ANY TWO QUESTIONS

QUESTION TWO

(a) Pine Limited is considering an investment in one two corporate bonds namely A and B. Both bonds have a par value $1,000 and pay coupon interest on an annual basis.

The market price of bond A is $1,079.60 with a coupon rate of 6% and is due to be redeemed at par in five years. Bond B is about to be issued with a coupon rate of 4% and will also be redeemable at par in five years.

Additional information:

1. Both bonds are expected to have the same gross redemption yield (Yield to maturity)
2. The yield to maturity of a company bond is determined by its credit rating.

Pine Limited considers duration of the bond to be a key factor when making decisions on which bond to invest in.

Required:

(i) The Macaulay's duration for bond A and bond B. **(7marks)**

(ii) Discuss **TWO** limitations of duration as a measure of a bond price to changes in interest rates. **(2 marks)**

(b) (i) A British portfolio manager is considering investing in Japanese government bonds denominated in Yen. What are the major risks associated with this investment? **(4marks)**

(ii). Comment on the following statement. "Sovereign risk is the risk that a foreign government default on its obligation." **(2marks)**

(c) The price of a bond is equal to \$101.76 if the term structure of interest rates is flat at 5%. The following bond prices are given for an up and down shifts of the term structure of interest rates.

Required:

Using the following information calculate the effective duration of the bond? Interpret your answer.

Bond price: \$98.46 if term structure of interest rates is flat at 6%
Bond Price: \$105.56 if term structure of interest rates is flat at 4% **(3marks)**

(d) Explain the difference between a bank failure and bank insolvency. **(2marks)**

Total: 20 marks

QUESTION THREE

(a) You are analyzing a bond with a face value of \$1,000, 12% coupon rate and five years' maturity. The bond pay interest annually.

Required:

(i) The price of bond when yield to maturity (YTM) is 10%, 12% and 16%. **(4marks)**

(ii) Sketch a graph to illustrate the relationship between price and yield of the bond. **(3marks)**

(**iii)** What explains the relationship between the bond price and the yield as illustrated on the graph sketched above? **(3marks)**

(b) Discuss how each of the following theories could account for downward slopping of the term structure of interest rates:

(i) Pure expectation theory **(2marks)**

(ii) Liquidity preference theory **(2marks)**

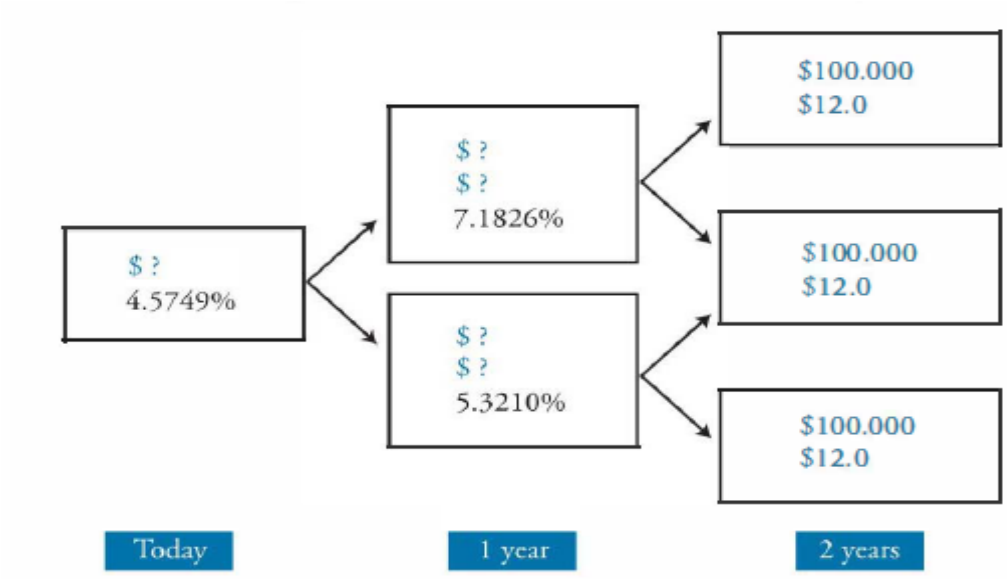
(iii) Market segment theory **(2marks)**

(c) A bond investor holds a 15 years and coupon rate of 8%. The par value of the bond is $100 and the current Yield to Maturity (YTM) is 7.4%. If the Yield changes by 1 basis point, calculate the Approximate convexity of the bond. **(4marks)**

Total: 20 marks

QUESTION FOUR

(a) A bond has par value of $100 and annual coupon rate of 12%. The bond has two years to maturity and is puttable at the end of year one at $105. The following interest rates tree has been provided.



Required:

(i) Calculate the value of the puttable bond and the embedded put option. **(6marks)**

(ii) Suppose the bond in (a) above is callable at the end of year one at $105, calculate the value of the callable bond and the value of the embedded call option **(4marks)**

(b) A bond has a par value of $100 with annual coupon rate of 5.25% has 3 years to maturity. Assume you have the following observed yield curve, spot rates and forward rates

Maturity	YTM	Market Value	Spot Rate	Forward Rate
1 yr	3.5%	100	3.5%	3.5%
2 yr	4.0%	100	4.01%	4.5225%
3 yr	4.5%	100	4.531%	5.5792%

Required:

Use the spot rates and forward rates to demonstrate that this is an Arbitrage free bond. **(4marks)**

(c) Credit Risk is the probability that a borrower will not pay back a loan in accordance with the terms of the credit agreement. Explain ***Three primary*** components of credit risk evaluation. **(3 marks)**

(d) Calculate the Present Value of Expected Loss on a 1.75%, 1 year, $100 par annual pay bond with recovery rate of 70% and probability of default of 2%. Assume that the 1-year risk free rate is 2%. **(3marks)**

(e) Interest rate risk is the probability of a decline in the value of an asset such as a bond resulting from unexpected fluctuations in interest rates. ***Explain Two tools*** commonly used in interest rate mitigation. **(4marks)**

Total: 20 marks

QUESTION FIVE

(a) The profit/Loss distribution for XYZ is normally distributed with an annual mean of $15 million and a standard deviation of $10 million.

Required:

Calculate the Value at Risk (VaR) at the 95% and 99% confidence levels using a parametric approach. Interpret your answer. **(5marks)**

(b) Explain **Three** Characteristics of Forex Swaps as a technique for hedging Foreign Exchange Risk**.** **(3marks)**

(c) A US company buys goods worth €720,000 from a German company payable in 30 days. The US company wants to hedge against the € strengthening against the dollar.

Current spot is 0.9215 – 0.9221 $/€ and the € futures rate is 0.9245 $/€.

The standard size of a 3 month € futures contract is €125,000.

In 30 days' time the spot is 0.9345 – 0.9351 $/€.

Closing futures price will be 0.9367.

Required:

Evaluate the hedge. **(6 marks)**

(d) Explain the Mean- Variance Rule as used in risk and return. **(2marks)**

(e) Using a well labeled diagram, explain the difference between efficient and inefficient portfolios. **(4marks)**

Total: 20 marks