



NAMIBIA UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF MANAGEMENT SCIENCES

DEPARTMENT OF ACCOUNTING, ECONOMICS AND FINANCE

BACHELOR OF ECONOMICS HONOURS

(08BECH)

FINANCIAL ECONOMICS (FEO810S)

DATE: June 2022
DURATION: 3 Hours
MARKS: 100
Time: 08:00- 11:00am

FIRST OPPORTUNITY EXAMINATION QUESTION PAPER (2022)

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INSTRUCTIONS

1. This paper is made up two sections (A & B)
2. Section A is compulsory, answer any two questions in Section B
3. Show all your workings & round off only final answers to 4 decimal places
4. Financial/Scientific calculators are allowed

REQUIREMENTS: Scientific or Financial calculator

This paper consists of 5 pages excluding this cover page and the formulas sheet

SECTION A: Answer all questions

[20 MARKS]

1. Markets in which funds are transferred from those who have excess funds available to those who have a shortage of available funds are called? [2]
A) commodity markets.
B) fund-available markets.
C) derivative exchange markets.
D) financial markets.
2. Poorly performing financial markets can be the cause of [2]
A) wealth.
B) poverty.
C) financial stability.
D) financial expansion
3. Banks and other financial institutions engage in financial intermediation, which [2]
A) can hurt the performance of the economy.
B) can benefit economic performance.
C) has no effect on economic performance.
D) involves borrowing from investors and lending to savers
4. Stockholders are residual claimants, meaning that they [2]
A) have the priority claim on all a company's assets.
B) are liable for all a company's debts.
C) will never share in a company's profits.
D) receive the remaining cash flow after all other claims are paid.
5. Information plays an important role in asset pricing because it allows the buyer to more accurately judge [2]
A) liquidity.
B) risk.
C) capital.
D) policy.
6. The coronavirus pandemic led to a decline in stock prices because [2]
A) of a lowered expected dividend growth rate.
B) of a lowered required return on investment in equity.
C) higher expected future stock prices.
D) higher current dividends.

7. According to the efficient market hypothesis, the current price of a financial security [2]
A) is the discounted net present value of future interest payments.
B) is determined by the lowest successful bidder.
C) fully reflects all available relevant information.
D) is a result of none of the above.

8. Stock market crashes lead us to believe that [2]
A) factors other than market fundamentals influence asset prices.
B) unexploited profit opportunities never exist.
C) crashes are always predictable when market participants behave rationally.
D) bubbles are a natural outcome of an efficient market.

9. Suppose you are currently in the long position of a long-term bond. In this case, to hedge against a capital loss, you would enter a _____ contract to _____ a long-term bond in the future. [2]
A) interest-rate forward; sell
B) interest-rate forward; buy
C) exchange-rate forward; buy
D) exchange-rate forward; sell

10. The seller of an option has the _____ to buy or sell the underlying asset while the purchaser of an option has the _____ to buy or sell the asset. [2]
A) obligation; right
B) right; obligation
C) obligation; obligation
D) right; right

SECTION B: Answer any two questions

QUESTION 1

[40 MARKS]

1.1 Assume an investor utility function $U = 2E(r) - \frac{1}{4}A\sigma^2$, where $E(r)$ denotes portfolio expected returns, A is coefficient of risk aversion which is assumed to be greater than zero and σ^2 represent the variance. Show that the investor's utility function is increasing in the portfolio expected returns and decreasing in its risk. [4]

1.2 Suppose an investor utility function is presented as $U = E(r) - \frac{1}{2}A\sigma^2$. Use the information below to answer the following questions.

Portfolio	Expected Return	Standard Deviation
Standard Bank hares	6%	4%
MTC shares	10%	6%
Capricorn Holding shares	12%	8%

- a. Assume an investor with risk aversion $A=2$, which portfolio yields the highest utility. [4]
- b. Assume an investor with risk aversion $A=4$, which portfolio yields the highest utility. [4]
- c. Use your answers in a) and b) above to comment on what happened to Utility when risk aversion increases also advise an investor who is contemplating to invest in one of the three portfolios.[6]

1.3 Suppose the return on RMB Shares was quoted as 10% with a risk premium of 8%. Assume that the Capital Asset Pricing Model (CAPM) is correct. Use the Security Market Line (SML) to determine if RMB Shares are correctly prices. The current T-bill rate is 4% and RMB Beta is estimated to be 0.85. [6]

1.4 Suppose that a European call option price $c= 4$; spot price $S_0= 40$, $T= 6$ months; $r= 10\%$ per annum; strike price $K=35$ and dividends $D= 0$. Use the put-call parity to calculate the arbitrage possibilities when $p = 5$ and $p = 4$. [6]

1.5 Consider a 20-year bond with the following characteristics. The bond was issued at time $t = 0$ with face value $FV = 1000$, and annual coupon payment of $N\$ 10$, the current price of the bond is $N\$ 1200.77$.

- i) Calculate the yield to maturity [5]
- ii) Suppose at $t = 10$, the investor has faced liquidity constraints that prompted him/her to sell the current. Similar bonds are currently offering 8% coupon rate. At what price should the investor sell his/her bond? [5]

QUESTION 2

[40 MARKS]

1. Suppose you observe the following for two securities (X & Y). Answer the following question.

Outcome	Probability	Rate of Return X %	Rate of Return Y%
1	0.25	12	14
2	0.2	6	0
3	0.25	0	8
4	0.3	10	4

- a) Calculate the expected return of portfolio with 50% in asset X and 50% in asset Y. [4]
- b) Calculate the risk of this portfolio. [8]
- c) Show that the risk of the minimum variance portfolio is zero. [12]

2. Assume that the Development Bank of Namibia has a 10% bond outstanding with 7 years remaining to maturity. Coupon payments are paid semi-annually, and the par value is N\$ 1000-00. What is the value of the bond if the expected rate of return is?

- a. 12% [2]
- b. 10% [2]
- c. 8% [2]
- d. Use answers in a., b. & c. above to explain relationship between bond prices and interest rate. [4]

3. Briefly explain the concept of market anomalies in Efficient Market Hypothesis; also provide reasons why they do not disappear if markets are completely efficient.[6]

QUESTION 3**[40 MARKS]**

1. Suppose you want to buy 1000 MTC shares at a price of N\$ 10/share. Your broker has indicated you can use Short Selling under the following conditions: Initial margin is 50%, maintenance margin is 20% and initial price of the stock is N\$ 10 per share. How much can a stock price rise before you receive a margin call? [5]

2. TALAMO FOODS Pty Ltd has a total value of \$ 1 million made of 50% common stock and 50% debt in forms of bonds. The bonds have a face value of \$ 1000, pay 10% coupon per annum, matures in 10 years with yield to maturity (YTM) of 12%. TALAMO FOODS dividends are expected to grow at the constant rate of 5% and they just paid dividends of \$ 10 per share. The ex-dividend price is \$ 40 per share. TALAMO FOODS tax rate is 35%.
 - a. Use Gordon growth model to calculate cost of Equity. [5]
 - b. Calculate TALAMO FOOD weighted average cost of capital. [5]

3. Consider a 2-year bond with the following characteristics. The bond was issued at time $t = 0$ with face value $FV = 100$, and annual coupon payment of N\$ 5, the current price of the bond is N\$ 102.77. You are now in period $t = 2$, suppose that all market interest rates increased by 2%. Calculate the return (holding period return) at period between $t = 0$ & $t = 2$ [4]

4. Suppose that the expected return on the market portfolio $E(R_m) = 0.08$, return on the risk-free rate $r_f = 0.01$ and a variance $\sigma_m^2 = 0.025$. Use the Capital Asset Pricing Model (CAPM) to calculate the expected return of a risky asset i that has a covariance $\sigma_{im} = 0.01$ with the market return, also interpret the beta of this security. [6]

5. Explain the term structure of interest rates and discuss any 2 theories that determine the shape of a yield curve. [10]

6. Consider a call option with a strike price of N\$ 50. Compute the intrinsic value of this option if stock prices were to be N\$ 55, N\$50 and N\$ 45 on the t exercise date. [5]

***End ***

Formula Sheet

$$U = E(r) - \frac{1}{2} A \sigma^2$$

$$E[r_p] = \sum_{i=1}^n w_i E(r_i)$$

$$\sigma_p^2 = E[r_p - E(r_p)]^2 = \sum_{i=1}^n w_i^2 \sigma_i^2 + \sum_{i=1}^n \sum_{j=1}^n w_i w_j \sigma_{i,j} = \sum_{i=1}^n w_i^2 \sigma_i^2 + \sum_{i=1}^n \sum_{j=1}^n w_i w_j \rho_{i,j} \sigma_i \sigma_j$$

$$\forall n=2 \Rightarrow \sigma_p^2 = w_1^2 \sigma_1^2 + w_2^2 \sigma_2^2 + 2w_1 w_2 \sigma_{1,2}$$

$$\sigma_{1,2} = \sigma_{x,y} = \rho_{x,y} \sigma_x \sigma_y$$

$$\rho_{x,y} = \frac{COV(x,y)}{\sigma_x \sigma_y}$$

$$COV(x,y) = E[(X - E(X))(Y - E(Y))]$$

$$FV = PV(1+r)^T$$

$$E(R_i) = R_f + \frac{\sigma_{im}}{\sigma_m} [E(R_m) - R_f]$$

$$E(R_i) = R_f + [E(R_m) - R_f] \beta_i$$

$$\beta_i = \frac{\sigma_{im} - COV(R_i, R_m)}{\sigma_m^2 - VAR(R_m)}$$

$$P = \frac{PMT}{(1+y)} + \frac{PMT}{(1+y)^2} + \dots + \frac{PMT}{(1+y)^n} + \frac{FV + PMT}{(1+y)^n}$$

$$P = \frac{C}{1+i} + \frac{C}{(1+i)^2} + \frac{C}{(1+i)^3} + \dots + \frac{C}{(1+i)^n} + \frac{F}{(1+i)^n}$$

$$P = PMT \left[\frac{1 - (1+y)^{-n}}{y} \right] + \frac{FV}{(1+y)^n}$$

$$RET = \frac{C}{P_t} + \frac{P_{t+1} - P_t}{P_t}$$

$$YTM = \frac{C + \frac{FV - PV}{n}}{\frac{FV + PV}{2}}$$

$$WACC = W_D R_D + W_P R_P + W_C R_C$$

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

$$R_j = R_f + \beta_j (R_m - R_f)$$

$$R_p = \frac{\text{Divident payable}}{\text{Market value}(ex - dividend)}$$

$$R_D = R_d(1 - C_T)$$

$$R_c = WACC + \frac{D}{E} (WACC - R_D)$$

$$R_c = WACC = \frac{EBIT}{\text{Market value of Equity}}$$

$$V_L = V_U + T_c D$$

$$r_{CL} = r_c + \frac{D}{E} * (1 - T_c) * (r_c - r_D)$$

$$R_c = WACC + \frac{D}{E} (WACC - R_D)$$

$$F_0 = S_0(1+r)^T$$

$$F_0 - S_0 e^{rT}$$

Lower bound European Call Price = $S_0 - Ke^{-rT}$

Lower bound European Put Price = $Ke^{-rT} - S_0$

Put - call - parity: $c + Ke^{-rT} = p + S_0$