Strathmore
UNIVERSITY

STRATHMORE INSTITUTE OF MATHEMATICAL SCIENCES

BACHELOR OF BUSINESS SCIENCE IN FINANCIAL ECONOMICS

END OF SEMESTER EXAMINATION

BSE 4122 BEHAVIORAL FINANCE

DATE: 31st July 2024 Time: 2 Hours

Instructions

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

Question 1

a) An investor (Meg) is given an opportunity to invest in one of two prospects. The first Prospect X offers a 70% chance of earning Ksh3,000 and a 30% chance of earning Ksh10,000. The second Prospect Y offers a 65% chance of earning Ksh5,000 and a 35% chance of earning Ksh7,000. Meg's utility function is that of a power utility function where $U(w) = w^{0.5}$.

i) Describe Meg's risk attitude and show how Meg would evaluate the two Prospects (X and Y) above and choose between them. **(5 marks)**

ii) Now assume that Meg has the following value function and probability decision weighting function under Prospect Theory.

$\alpha = 0.75, \quad \lambda = 2, \quad \gamma = 0.65$

$$v(z) = \begin{cases} z^{\alpha}, if\ z \geq 0\ (for\ gains) \\ -\lambda(-z)^{\alpha} if\ z < 0\ (for\ losses) \end{cases}$$

$$\pi(p) = \frac{p^{\gamma}}{(p^{\gamma} + (1-p)^{\gamma})^{\frac{1}{\gamma}}}$$

Which of the two Prospects (X or Y) would she prefer? Assume a reference point of zero. **(9 marks)**

b) Explain the core principles of Prospect Theory and how it challenges the Expected Utility Theory. **(10 marks)**

c) Define limits to arbitrage and explain how they can prevent the correction of market anomalies. **(6 marks)**

(TOTAL: 30 MARKS)

Question 2

a) Evaluate the impact of framing and anchoring on investor decision-making, providing examples for each. **(6 marks)**

b) You obtain data on the portfolio holdings and trades of two retail investors, Alvin and Meg. The investors can only trade at times t_1 and t_2. The prices of all stocks at these two points in time are shown below.

Initial portfolio holdings

Investor	Stock	Average purchase price
Alvin	A	16
Alvin	B	25
Alvin	C	30
Meg	B	40
Meg	C	35
Meg	D	20

Transactions at time t_1

Investor	Buy/Sell	Stock	Transaction price
Alvin	sell	A	20
Alvin	buy	D	15
Alvin	buy	E	30
Meg	sell	C	30
Meg	buy	E	30
Meg	buy	A	20

Transactions at time t_2

Investor	Buy/Sell	Stock	Transaction price
Alvin	sell	C	32
Alvin	sell	E	35
Alvin	sell	D	10
Meg	sell	B	35
Meg	sell	E	35

Stock prices

Stock	Price at t_1	Price at t_2
A	20	17
B	30	35
C	30	32
D	15	10
E	30	35

Calculate the disposition effect for Alvin and Meg as at the end of t_2. Use the same method as Odean (1998) in his main analysis and the average purchase price as the reference point. Which investor is more inclined to the disposition effect? **(10 marks)**

c) Shefrin and Statman (1999) uses Prospect Theory [along with other behavioral phenomena] to explain the disposition effect, the higher propensity of investors to realize winner stocks than loser stocks. Provide two of these behavioral explanations for disposition effect **(4 marks)**

(TOTAL: 20 MARKS)

Question 3

a) Please define the following terms and illustrate your explanations with an example in each case. **(6 marks)**

i) Base Rate Neglect

ii) Miscalibration

iii) Affect heuristic

b) Explain the concept of noise trading and its impact on stock prices and market anomalies. **(7 marks)**

c) Discuss how rational explanations of market anomalies differ from behavioral finance explanations. Provide an example for each. **(7 marks)**

(TOTAL: 20 MARKS)

Question 4

a) According to corporate finance theory an ongoing capital investment project should be terminated as soon as the net present value of the project's continuation becomes negative. However, in practice managers can be reluctant to terminate a losing project. Behavioral Corporate Finance provides an explanation for this reluctance. Describe this behavioral explanation.. **(10 marks)**

b) Discuss the concept of overconfidence and its various manifestations and the impact on financial decision making. Provide examples and discuss the implications of overconfidence in different areas of finance. **(10 marks)**

(TOTAL: 20 MARKS)

Question 5

a) Michael and Sarah have been offered today [t=0] to make an additional investment of $2,000 in their savings plan at t=1 that will lead to an extra payoff of $2,500 at t=3. Michael is a quasi-hyperbolic discounter, whereas Sarah discounts exponentially. Both their intertemporal preferences can be represented by the Beta-Delta model with a delta of 0.9. In addition, Michael's preferences represent a beta of 0.6, while Sarah's preferences represent a beta of 1.0. What will Sarah and Michael decide today? [Show calculations] **(6 marks)**

The Beta-Delta model is defined as: $D(t) = \begin{cases} 1 & if\ t=0 \\ \beta\delta^t & if\ t>0 \end{cases}$

b) What would Sarah and Michael decide today if the investment has to be made today? [that is: invest €2,000 at t=0, with a payoff of +2,500 at t=2]. Show calculations. **(6 marks)**

c) Alex, a fourth-year finance student, has recently studied the concept of home bias and wants to understand how it affects his investment portfolio. Alex is considering two investment options:

1. Domestic Fund: Expected return of 8% per year with a standard deviation of 15%.
2. International Fund: Expected return of 10% per year with a standard deviation of 20%.

Alex has the following correlations between the returns of these funds and his current domestic-focused portfolio:

- Correlation between the Domestic Fund and his portfolio: 0.8
- Correlation between the International Fund and his portfolio: 0.4

Assume Alex's current portfolio has an expected return of 7% per year and a standard deviation of 10%.

i) Calculate the expected return and standard deviation of a new portfolio if Alex decides to invest 50% in the Domestic Fund and 50% in the International Fund. **(3 marks)**

ii) Discuss the impact of home bias on Alex's portfolio, considering the calculated expected return and risk. **(5 marks)**

(TOTAL: 20 MARKS)