Strathmore
UNIVERSITY

STRATHMORE INSTITUTE OF MATHEMATICAL SCIENCES
BACHELOR BUSINESS SCIENCE IN FINANCIAL ECONOMICS
END OF SEMESTER EXAMINATION
BSE 4122: BEHAVIORAL FINANCE

DATE: 4th August 2022 **Time: 2 Hours**

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

Question 1

a) Prospect Theory is the behavioral model of decision-making under risk and uncertainty. There are several unique features of prospect theory that distinguish it from the traditional model of decision-making under risk and uncertainty. Explain three of these unique features. **(6 marks)**

b) An investor (Mike) is given an opportunity to take one of two prospects. The first prospect A offers a 25% chance of winning Ksh2,000 and 75% chance of winning Ksh9,000. The second prospect B offers a 40% chance of winning Ksh6,000 and a 60% chance of winning Ksh8,000.

i) Mike's utility function is that of the natural log function where U(w) = Ln(w). Describe Mike's risk attitude and show how Mike would evaluate the two prospects (A and B) above and choose between them. **(5 marks)**

ii) Assuming Mike chose prospect A, at what cash value would he be indifferent to taking the prospect or having the cash (that is what is the certainty equivalent of prospect A)? **(2 marks)**

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

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

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

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

i) Which of the following two prospects would he prefer if he makes his decision based on objective probabilities rather than decision weights? Assume a reference point of zero. **(5 marks)**

Prospect Q (0.8, Ksh2,200, 0)

(i.e. a probability of 0.8 of winning Ksh2,200 and a probability of 0.2 of getting nothing)

Prospect R (Ksh1,500)

(i.e. a certain gain of Ksh1,500)

ii) Repeat this calculation using decision weights rather than probabilities and explain what these results illustrate about people's preferences. **(6 marks)**

d) Critics of behavioural finance argue that any effect an irrational investor might have on stock price behaviour will be eliminated by the activities of rational arbitrageurs. Is this actually the case? **(6 marks)**

(TOTAL: 30 MARKS)

Question 2

a) You obtain data on the portfolio holdings and trades of two retail investors, Abdi and Jane. 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	Purchase price
Abdi	A	16
Abdi	B	25
Abdi	C	30
Jane	B	40
Jane	C	35
Jane	D	20

Transactions at time t_1

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

Transactions at time t_2

Investor	Buy/Sell	Stock	Transaction price
Abdi	sell	C	32
Abdi	sell	E	35
Abdi	sell	D	10
Jane	sell	B	35
Jane	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 Abdi and Jane as at the end of t_2. Use the same method as Odean (1998) in his main analysis and the purchase price as the reference point. Which investor is more inclined to the disposition effect? **(16 marks)**

b) 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

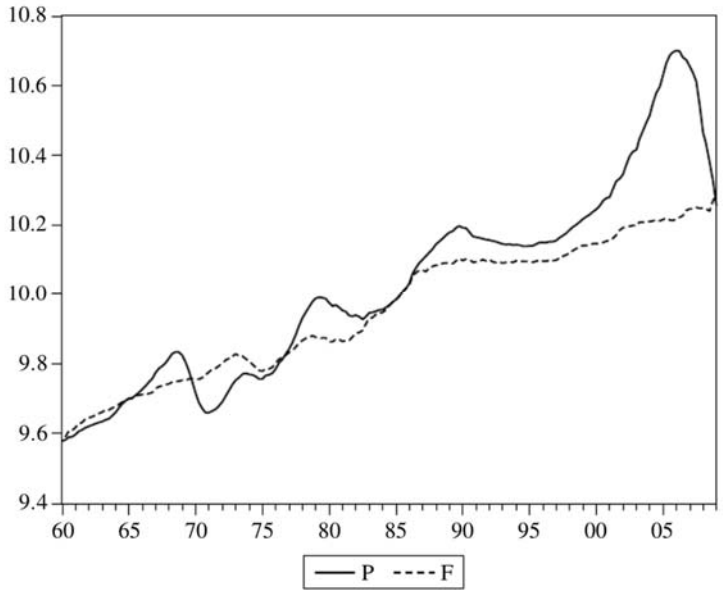
a) Imagine you are a financial analyst at an investment bank. According to your research of publicly-traded companies, 60% of the companies that increased their share price by more than 5% in the last three years replaced their CEOs during the period.

At the same time, only 35% of the companies that did not increase their share price by more than 5% in the same period replaced their CEOs. Knowing that the probability that the stock prices grow by more than 5% is 4%, find the probability that the shares of a company that fires its CEO will increase by more than 5% based on Bayes' theorem where

$$p(B|A) = p(B) \times \left[\frac{p(A|B)}{p(A)}\right]$$ **(5 marks)**

b) People are prone to biases when estimating probabilities resulting in probability estimates that do not conform to the Bayesian solution. Discuss how four relevant biases could impact your estimation of the probability in part (a) above. **(8 marks)**

c) The figure below represents the US housing market from 1960 until 2009. The solid line is the market price P and the dotted line the fundamental price F.



Barberis and Thaler (2003) state that limits to arbitrage can be caused by three reasons: 1) fundamental risk; 2) noise trader risk; 3) implementation costs. Explain whether or not there are limits to arbitrage in the US housing market according to the figure above and explain the role of each of the three reasons. **(7 marks)**

(TOTAL: 20 MARKS)

Question 4

a) Overconfidence is a behavioral bias that is especially dangerous in a financial market. Discuss three potential drivers of overconfidence while providing concise and clear examples of retail investor behaviour that may [partly] be explained by each driver.

(6 marks)

b) 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 based on behavioural concepts. **(8 marks)**

c) Benarzi and Thaler (1985) provide a behavioral explanation of the equity premium puzzle. Please define this puzzle and explain their myopic loss aversion argument. **(6 marks)**

(TOTAL: 20 MARKS)

Question 5

a) Please briefly describe the behavioral implications of the three main models of time preferences (i.e., Exponential Discounting, Quasi-hyperbolic Discounting and Hyperbolic Discounting). Please emphasize any similarities and differences between the models. Give an example of why it is important to understand why people might have Quasi-hyperbolic Discounting. **(12 marks)**

b) Home bias is the tendency to invest close to home. Economists and financial analysts are frequently somewhat puzzled, not so much by the mere existence of home bias, but rather by how strong it remains even as globalization renders world markets more and more interconnected. Discuss four possible explanations of home bias. **(8 marks)**

(TOTAL: 20 MARKS)