



**Strathmore**  
UNIVERSITY

INSTITUTE OF MATHEMATICAL SCIENCES  
BBS FINANCIAL ECONOMICS  
SPECIAL EXAMINATION  
BSE 4122 BEHAVIORAL FINANCE

DATE: **April 2022**

Time: **2 Hours**

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**Instructions**

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

**Question 1**

- a) Discuss the following biases and give one concrete example of financial errors that may result from each bias. **(8 marks)**

- i. Hot hand fallacy
- ii. Ambiguity aversion
- iii. Gambler's Fallacy
- iv. Anchoring Bias

- b) Consider an individual with the following value function under prospect theory:

$$v(z) = z^{0.88}, \text{ when } z > 0$$

$$v(z) = -2(-z)^{0.88}, \text{ when } z < 0$$

The individual has the following weighting function:

$$(pr) = \frac{pr^\gamma}{(pr^\gamma + (1 - pr)^\gamma)^{1/\gamma}}$$

set  $\gamma=0.65$ .

Where  $\gamma$  is set at 0.65.

Choose between:

A (0.8, Ksh150, Ksh0) and B (0.4, Ksh300, Ksh0)

C (0.00002, Ksh1,500,000, Ksh0) and D (0.00001, Ksh3,000,000, Ksh0)

- i. Determine which of the above prospects will be preferred by the individual according to prospect theory. **(7 marks)**

- ii. Explain whether or not these choices are consistent with expected utility theory. **(4 marks)**
- c) Some aspects of stock price behavior are both baffling and potentially hard to reconcile with market efficiency. Researchers call these market anomalies.
- i. Name and briefly describe 5 calendar anomalies. **(5 marks)**
- ii. “Calendar anomalies are at odds with semi-strong market efficiency.” Discuss! **(6 marks)**
- (TOTAL: 30 MARKS)**

### Question 2

- a) Odean [1998] 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 three arguments why the disposition effect may be considered suboptimal behavior from the standard economic point of view. **(6 marks)**
- b) The following table shows the composition of Anna’s portfolio as of 1 January 2021 along with information about the average purchase price for each stock holding.

Table 1 Anna’s portfolio as of 1 January 2021

Stock	No of stocks	Average purchase price
A	120	80
B	30	100
C	23	50
D	34	12
E	100	60

Since the beginning of 2021 Anna has actively traded in five different stocks: A, B, C, D and E. On 15 February he sold 5 C-shares. On 4 April he sold 10 A-shares. On 20 May he sold all of his D shares.

Table 2 shows the price movements of A, B, C, D, and E shares during 2021:

Day	A-share	B-share	C-share	D-share	E-share
15-February	Ksh110	Ksh120	Ksh52	Ksh27	Ksh9
04-April	Ksh70	Ksh80	Ksh57	Ksh40	Ksh15
20-May	Ksh120	Ksh25	Ksh60	Ksh47	Ksh15

Calculate the disposition effect for Anna for the period from 1 January 2021 till now. Use the same method as Odean (1998) in his main analysis and the average purchase price as reference point. **(8 marks)**

- c) Describe three mistakes surrounding retirement and pensions and give behavioral explanations for each of them. **(6 marks)**

**(TOTAL: 20 MARKS)**

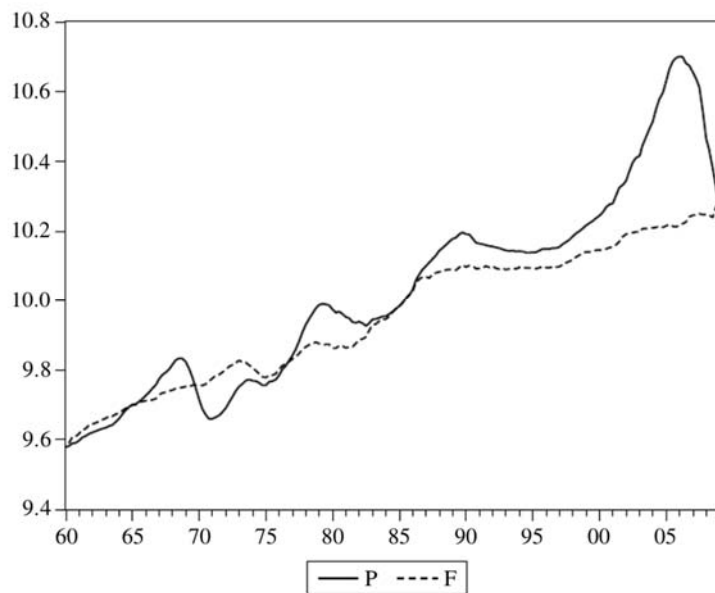
### Question 3

- a) Explain the three supports on which market efficiency rests. Why is it that only one of them is required? **(6 marks)**
- b) Behavioural finance recognises that investors are subject to biases and heuristics when making investment decisions. Define and discuss the concepts used in the models proposed by Daniel, Hirshleifer & Subrahmanyam (DHS, 1998) and Barberis, Shleifer & Vishny (BSV, 1998). **(14 marks)**

**(TOTAL: 20 MARKS)**

### Question 4

- a) 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. **(6 marks)**

- b) Financial decision-making is related to investor emotions“. Discuss this statement in detail. **(9 marks)**
- c) In behavioural corporate finance researchers are investigating the potential impact of irrationality in financial markets on corporate decisions. Discuss how managers might exploit irrational markets when making investment and financing decisions. Assume that the rational manager acts within non-rational markets. **(5 marks)**

**(TOTAL: 20 MARKS)**

**Question 5**

- a) The probability of breast cancer is 1% for a woman at age forty who participates in routine screening (base-rate). If a woman has breast cancer, the probability is 80% that she will get a positive mammography (hit-rate). If a woman does not have breast cancer, the probability is 9.6% that she will also get a positive mammography (false-alarm rate). A woman in this age group had a positive mammography in a routine screening. Calculate the statistical probability that she actually has breast cancer. **(5 marks)**

- b) In a study by Eddy (1982) titled “*Probabilistic reasoning in clinical medicine: Problems and opportunities*”, less than 5% of the respondents gave answers that conformed to the Bayesian solution. Discuss four biases that people are subject to when they estimate probabilities.

**(8 marks)**

- c) Consider two investors (Ann and Ben) with the following demand curves for a stock:

$$\text{Ann: } p = 200 - q$$

$$\text{Ben: } p = 150 - 2q$$

Determine which of these investors is more overconfident assuming the current market price of the stock is Ksh 50 and this price is expected to fall to Ksh30 in the next few days. Justify your response using suitable workings. **(7 marks)**

**(TOTAL: 20 MARKS)**