



Strathmore
UNIVERSITY

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

DATE: 11th August 2020

Time: 2 Hours 15 minutes

Instructions

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

Question 1

a) Prospect theory introduced by Kahneman and Tversky (1979) is an analysis of decision under risk. In addition to risk aversion, already accounted for by Expected Utility Theory, this theory models 2 other attitudes toward risk. Explain these two attitudes toward risk and provide two examples (1 for each risk attitude) of how individuals react when they are offered a gamble. **(5 marks)**

b) Martin is deciding whether to invest in stock A or stock B.

Stock A pays \$700 or \$500 with a 50/50 chance

Stock B pays \$1000 or \$200 with a 70/30 chance

Suppose Martin is instead is a prospect theory (PT) maximiser with the following value function.

$$\alpha = 0.8 \quad \lambda = 2.0 \quad \gamma = 0.7$$

$$v(z) = z^\alpha \quad \text{if } z \geq 0$$

$$v(z) = -\lambda(-z)^\alpha \quad \text{if } z < 0$$

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

$$\alpha = 0.8 \rightarrow \lambda = 2.0 \rightarrow \gamma = 0.7$$

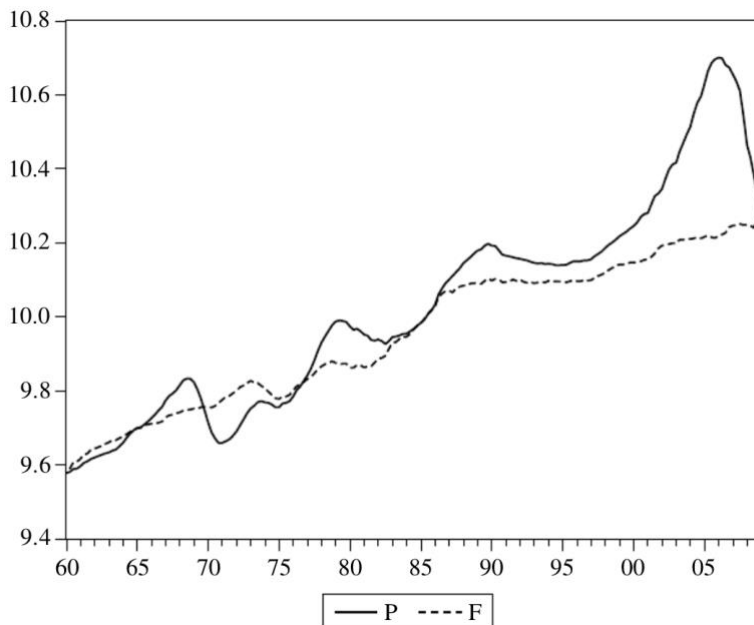
$$v(z) = z^\alpha \rightarrow \text{if } z \geq 0$$

$$v(z) = -\lambda(-z)^\alpha \rightarrow \text{if } z < 0$$

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

Which stock will he choose if his reference point is 1) zero? and 2) \$550. Comment on differences (if any) in Martin's choices in the two cases. **(10 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. **(6 marks)**

- d) Financial decision-making is related to investor emotions". Discuss this statement in detail. **(9 marks)**

(TOTAL: 30 MARKS)

Question 2

- 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) Briefly describe the behavioral implications of two models of time preferences (i.e., exponential discounting and quasi-hyperbolic discounting). Please emphasize any similarities or differences between the models. **(6 marks)**
- c) Discuss three behavioral mechanisms that underlie the disposition effect. **(6 marks)**

(TOTAL: 20 MARKS)

Question 3

- a) An individual with cash to invest has two investment choices:
1. Buy a stock fund that every year either earns 40% or -20% with a 50/50 probability.
 2. Buy a bond fund that every year returns either 5% or 0% also with a 50/50 probability.
- Assume that the returns on the two funds are independent, and that returns from year to year are also independent. Also assume an initial portfolio value of \$1. (The answers, however, will be unaffected if you use a different initial portfolio value.)
- In addition, suppose the value function is linear and is specified as:
- $$v(z) = z \text{ for } z > 0$$
- $$v(z) = 3z \text{ for } z < 0$$
- i. Which fund does the investor prefer if he looks at his portfolio (1) once a year; or (2) once every two years? **(10 marks)**
 - ii. How does your answer to part (i) help us understand the equity premium puzzle? **(4 marks)**
- b) Using the DHS model, suppose that $\theta=1$; $\sigma_{\theta}^2 = 1$; $\sigma_{\varepsilon}^2 = 2$; $\sigma_c^2 = 1$; and $S_1 = 2$. Describe and comment on the path of prices when overconfident investors determine prices versus the rational path of prices. **(6 marks)**

(TOTAL: 20 MARKS)

Question 4

- a) Investment activity is driven by both rational value-maximization and behavioral influences on the part of managers. Discuss. **(10 marks)**
- b) Several studies in behavioral finance try to explain the momentum (underreaction) and mean reversion (overreaction) anomalies using psychological biases. In reference to the concepts in the model proposed by Barberis, Shleifer & Vishny (BSV, 1998), discuss the potential issues that could arise from the model's approach? **(10 marks)**

(TOTAL: 20 MARKS)

Question 5

- 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. **(9 marks)**
- b) The table below shows changes in the value of the Nairobi Securities Exchange All Share Index (NASI) as result of changes in the interest rates.

		Interest rates		Total
		Decline	Increase	
NASI Index	Decline	200	950	1150
	Increase	800	50	850
Total		1000	1000	2000

Determine probability of the NASI decreasing given an increase in interest rates.

(5 marks)

- c) People are prone to biases when estimating probabilities resulting in probability estimates that do not conform to the Bayesian solution. Discuss how three relevant biases could impact your estimation of the probability in part (b) above. **(6 marks)**

(TOTAL: 20 MARKS)