BACHELOR OF ECONOMICS
THAMMASAT UNIVERSITY

EE434 Sem1/2021

Review Question

This review questions are only for the purpose of helping you review the content in chapter 1, 2, and 3 in the outline. The questions are **not** an exhaustive list of questions for what we have learned. You **don't need to** hand in your answers. This is **NOT** included in the assignment score.

1. Differentiate the following terms/concepts:

(1.a) Risk and uncertainty

(1.b) Risk aversion, risk seeking, and risk neutrality

2. When eating out, Rory prefers spaghetti over a hamburger. Last night, she had a choice of spaghetti or macaroni and cheese and decided on the spaghetti again. The night before, Rory had a choice of spaghetti, pizza, or a hamburger, and this time she had pizza. Then, today, she chose macaroni and cheese over a hamburger. Does her selection today indicate that Rory's choices are consistent with economic rationality? Why or why not?

3. Consider a person with the following utility function over wealth: $u(w) = e^w$, where e is the exponential function (approximately equal to 2.7183) and w = wealth in hundreds of thousands of dollars. Suppose that this person has a 40% chance of wealth of $50,000 and a 60% chance of wealth of $1,000,000 as summarized by ($50,000, 0.40; $1,000,000, 0.60).

(3.a) What is the expected value of wealth?
(3.b) What is the expected utility from ($50,000, 0.40; $1,000,000, 0.60) ?
(3.c) Construct a graph of this utility function.
(3.d) Is this person risk averse, risk neutral, or a risk loving?

4. An individual has the following utility function: $u(w) = w^{0.5}$ where w = wealth.

(4.a) Using expected utility, order the following prospects in terms of preference, from the most to the least preferred:

$$P1 = (1{,}000, 0.80; 600, 0.20),$$

$$P2 = (1{,}200, 0.70; 600, 0.30),$$

$$P3 = (2{,}000, 0.5; 300, 0.5)$$

(4.b) What is the certainty equivalent for prospect P2?

(4.c) Without doing any calculations, would the certainty equivalent for prospect P1 be larger or smaller? Why?

5. Consider two prospects:

Problem 1: Choose between

Prospect A:	\$2,500 with probability .33,
	\$2,400 with probability .66,
	Zero with probability .01.
And Prospect B:	\$2,400 with certainty.

Problem 2: Choose between

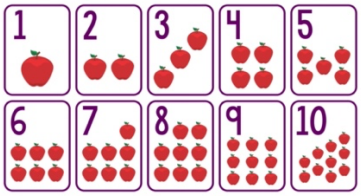
Prospect C:	\$2,500 with probability .33,
	Zero with probability .67.
And Prospect D:	\$2,400 with probability .34,
	Zero with probability .66.

It has been shown by Daniel Kahneman and Amos Tversky (1979, "Prospect theory: An analysis of decision under risk," *Econometrica* 47(2), 263-291) that more people choose B when presented with problem 1 and when presented with problem 2, most people choose C. These choices violate expected utility theory. Why?

6. Risk attitude is a fundamental concept in finance, with risk aversion commonly assumed. A 2002 paper by Charles Holt and Susan Laury provides a simple choice experiment that allows us to measure the extent of risk aversion.[1]

In this experiment you will complete the table below indicating your choice of option A or option B. You have ten decisions to make and should record your choice in the final column of the table.

The experimenter has a set of cards numbered one to ten. The back of all cards are the same and are what you can only see. The card will be **randomly drawn**. The number on the card will determine the payoff as stated in each option in the table.



Decision	Option A	Option B	Your choice (A or B)
1	\$2.00 if card is 1 \$1.60 if card is 2-10	\$3.80 if card is 1 \$0.10 if card is 2-10	
2	\$2.00 if card is 1-2 \$1.60 if card is 3-10	\$3.80 if card is 1-2 \$0.10 if card is 3-10	
3	\$2.00 if card is 1-3 \$1.60 if card is 4-10	\$3.80 if card is 1-3 \$0.10 if card is 4-10	
4	\$2.00 if card is 1-4 \$1.60 if card is 5-10	\$3.80 if card is 1-4 \$0.10 if card is 5-10	
5	\$2.00 if card is 1-5 \$1.60 if card is 5-10	\$3.80 if card is 1-5 \$0.10 if card is 6-10	
6	\$2.00 if card is 1-6 \$1.60 if card is 7-10	\$3.80 if card is 1-6 \$0.10 if card is 7-10	
7	\$2.00 if card is 1-7 \$1.60 if card is 8-10	\$3.80 if card is 1-7 \$0.10 if card is 8-10	
8	\$2.00 if card is 1-8 \$1.60 if card is 9-10	\$3.80 if card is 1-8 \$0.10 if card is 9-10	
9	\$2.00 if card is 1-9 \$1.60 if card is 9-10	\$3.80 if card is 1-9 \$0.10 if card is 10	
10	\$2.00 if card is 1-10	\$3.80 if card is 1-10	

(6.a) In each decision, which option is more risky?

(6.b) What are your choices in each option? Holt and Laury categorize those as taking 0 to 1 safe choices as "highly risk loving" and, at the other extreme, those taking 9 to 10 safe choices as "stay in bed." How many safe choices did you make?

[1] See Holt, C. A. and S. K. Laury, 2002, "Risk aversion and incentive effects," *American Economic Review* 92(5), 1644-1655.

7. Differentiate the following two concepts: Risk aversion and Loss aversion. Is there any aspect that the two concepts can be related? If so, how?

8. According to prospect theory, which is preferred?

(8.a) Choose between:

$$A = (\$50{,}0.8; 0, 0.2) \text{ and } B = (\$100, 0.4; 0, 0.6)$$

(8.b) Choose between:

$$C = (-\$50{,}0.8; 0, 0.2) \text{ and } D = (-\$100, 0.4; 0, 0.6)$$

(8.c) Are these choices consistent with expected utility theory? Why or why not?

9. Consider a person with the following value function under prospect theory:

$$v(x) = \begin{cases} x^{0.5} & , x \geq 0 \\ -2(-x)^{0.5} & , x < 0 \end{cases}$$

(9.a) Is this individual loss-averse? Explain.

(9.b) Assume that this individual weights values by objective probabilities, instead of using a prospect theory weighting function. Which of the following prospects would be preferred?

$$P1 = (1000, 0.8;\ -800, 0.2)$$
$$P2 = (1200, 0.7;\ -600, 0.3)$$
$$P3 = (2000, 0.5;\ -1000, 0.5)$$

10. Now consider a person with the following value function under prospect theory:

$$v(x) = \begin{cases} x^{0.8} & ,x \geq 0 \\ -3(-x)^{0.8} & ,x < 0 \end{cases}$$

This individual has the following weighting function:

$$\pi(p) = \frac{p^{0.65}}{(p^{0.65} + (1-p)^{0.65})^{\frac{1}{0.65}}}$$

(10.a) Which of the following prospects would he choose?
$A = (-5000, 0.001; 0, 0.999)$ and $B = (-5, 1)$

(10.b) Repeat the calculation but using probabilities instead of weights.

What does this illustrate?