Written Exam for the B.Sc. or M.Sc. in Economics winter 2015-16

# Behavioral Economics & Finance

Final Exam/ Elective Course/ Master's Course

February 16, 2016

(2-hour closed book exam)

Please note that the language used in your exam paper must correspond to the language of the title for which you registered during exam registration. I.e. if you registered for the English title of the course, you must write your exam paper in English. Likewise, if you registered for the Danish title of the course or if you registered for the English title which was followed by "eksamen på dansk" in brackets, you must write your exam paper in Danish.

**This exam question consists of 2 pages in total**

# Question 1: True or False

Please indicate if the following statements are true or false. Explain your answer.

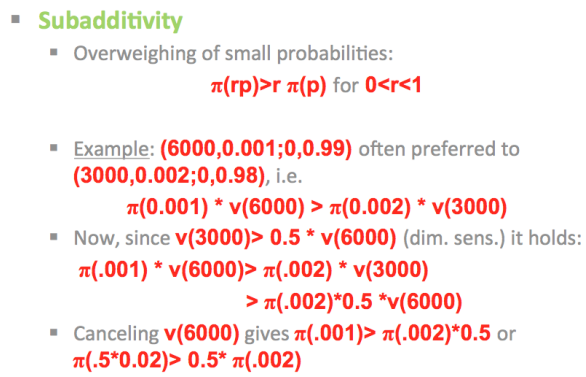
A. In prospect theory, people are risk-seeking in the gain domain.

   FALSE.
   Mental accounts are framed in losses and gains relative to some reference point. Behavior in the loss and gain domain is different, in that people exhibit risk seeking behavior in the loss domain and risk averse behavior in the gain domain. (Data: numerous Kahnemann Tversky experiments).

   See Lecture 7/8 slide 30ff.

B. Let $\pi(\cdot)$ denote the weighting function and **p** the probability of an uncertain event. Prospect theory implies that $\pi(rp)=r\pi(p)$ **for** $0<r<1$, which is denoted *subadditivity*.

   FALSE: $\pi(rp)>r\pi(p)$ **for** $0<r<1$
   See Lecture 7/8, slide 53:




C. The discounted utility model allows for people to have time-inconsistent preferences.

   False. The discounted utility model implies that people make time-consistent choices. The hyperbolic discounting model allows for time inconsistent choices. See Lecture 12.

D. Suppose you face a bet, where you win USD 200 and loose USD 100 with equal probability. If you exhibit Myopic Loss Aversion, and have a loss aversion factor of 2.5, you will reject the bet if it is played once, but accept it if it played twice.

   True.

An explantion like Lecture 9, slide 14-16 is expected:



- Intuition

  Let an individual bet be represented by

  **x=(200,0.5;-100,0.5)**
- Using a loss aversion function with loss aversion factor **2.5**

$$V(x)=\begin{cases} x, \text{ for } x>0 \\ -2.5(-x), \text{ for } x<0 \end{cases}$$

- Note › no diminishing sensitivity, only loss aversion





## Paul Samuelson's Lunch Colleague

- Paul Samuelson offered two-to-one odds to his colleague: colleague wins $200 if heads, loses $100 if tails. Colleague refused bet.
- Samuelson asked him if he would take 100 such bets. Colleague said yes.
- Samuelson proved mathematically that his colleague was not rational (from expected utility theory). [*Scientia* 98:108-13, 1963]





- This gives:

  **V(x)= 0.5 ×(200)+ 0.5 × [2.5 × (-100)]=-25**
- But if the bet is played twice:

  **x'=(400,0.25; 100,0.5; -200,0.25) :**

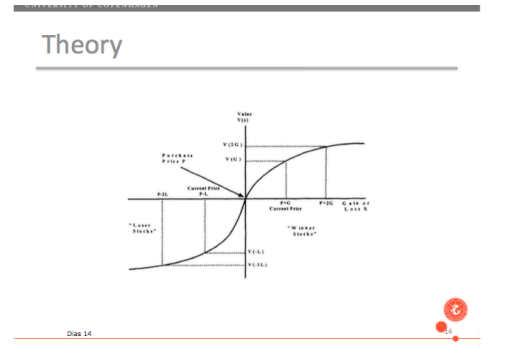
  **V(x') = 0.25 × (400)+0.5 × (100)**

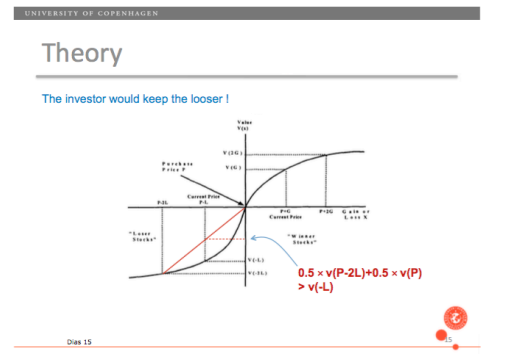
  **+ 0.25 × [2.5 × (-200)]**

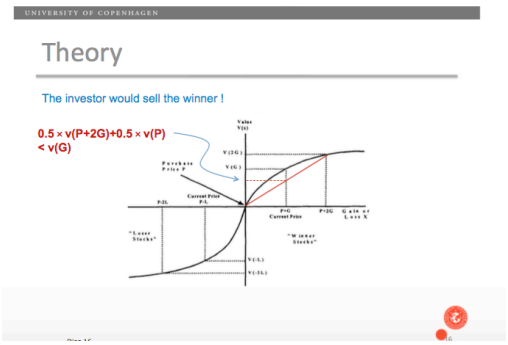
  **=25**
- Interpretation › somebody that evaluates losses and gains after each bet might reject bet
- But › somebody that evaluates losses and gains only after each second bet might accept

E. The term ‘disposition effect’ relates to the tendency of people to perform momentum trading.

False.
Momentum trading occurs because investors exhibit ‘conservatism bias’ and do not fully update their belief of a stock price when new information is announced. The disposition effect is the tendency to sell assets that have gained value (‘winners’) and keep assets that have lost value (‘losers’)
Disposition effects can be explained by two features of prospect theory:
– the idea that people value gains and losses relative to a reference point (the initial purchase price of shares), and (reference point effect)
– the tendency to seek risk when faced with possible losses, and avoid risk when a certain gain is possible. (reflection effect).
See Lecture 10, slides 14-16.




# Question 2: Ellsberg Paradox

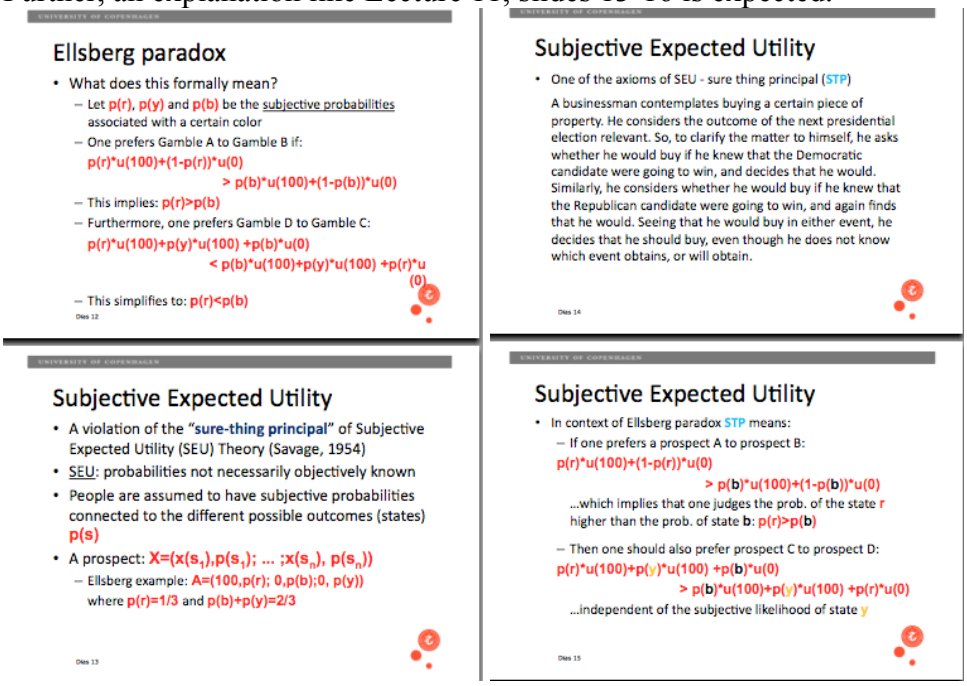
Suppose you have 30 red balls and 60 other balls that are either black or yellow. Two similar groups are now faced with two gambles each.

Group 1:
Gamble A: You receive USD 100 if you draw a red ball.
Gamble B: You receive USD 100 if you draw a black ball.

Group 2:
Gamble C: You receive USD 100 if you draw a red ball or yellow ball.
Gamble D: You receive USD 100 if you draw a black ball or yellow.

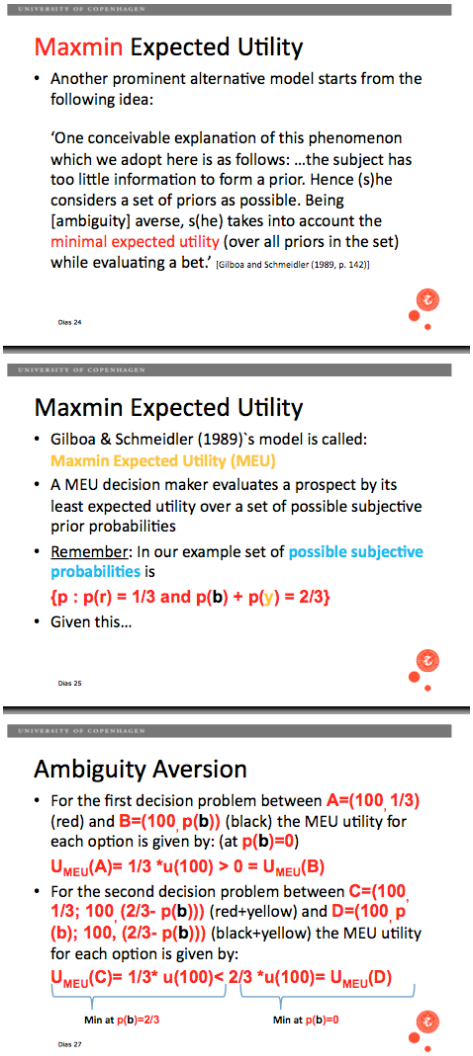
A. Using this example, explain the Ellsberg Paradox.

A describtion of observed behavior is expected (Gamble A preferred to Gamble B, Gamble D preferred to Gamble C).
Further, an explanation like Lecture 11, slides 13-16 is expected.




B. Explain how Maxmin expected utility can explain behavior observed under the 'Ellsberg Paradox'.

Lecture 11, slide 25-28:




# Question 3: Social preferences

The Fehr & Schmidt (1999) model can be summarized as:

$$u_i(\cdot) = x_i - \alpha_i[max[x_j - x_i, 0]] - \beta_i[max[x_i - x_j, 0]]$$

A. Explain the model (parameters, variables), and explain the intuition of the model. Lecture 13, slides 12-14:

- Formally: let there be two players $i$ and $j$

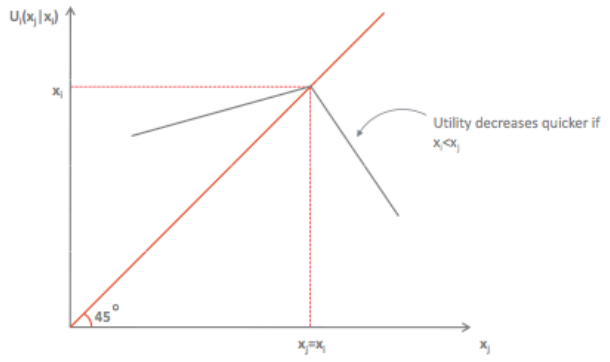
$$u_i(\cdot) = x_i - \alpha_i[max[x_j - x_i, 0]] - \beta_i[max[x_i - x_j, 0]]$$

  - $i$ cares about his own payoff: $x_i$
  - $i$ dislikes being better or worse off then $j$: $\alpha_i, \beta_i > 0$
  - $i$ suffers more from being worse off, than from being better off:

$$\alpha_i \geq \beta_i$$

  - and $0 \leq \beta_i \leq 1$








- Assumption: utility function is linear in inequality aversion as well as in $x_i$
- Implication: marginal rate of substitution between monetary income and inequality is constant
- In reality: non-negligible fraction of people who exhibit nonlinear inequality aversion in the domain of advantageous inequality
- Example: Dictator Game

B. Describe and explain a situation, where the Fehr-Schmidt model has been applied to explain behavior. Discuss alternative models/explanations to describe behavior.

The dictator game should be described and explained. It should be mentioned that F&S is a model of distributional concern and that other models (i.e. Reciprocity) can be models of procedural concern.