Written Exam at the Department of Economics winter 2019-20

The Psychology of Choice
-
Experimental Theory and Methods

Re-Exam

February 18, 2020

(3-hour closed book exam)

Answers only in English.

This exam question consists of 3 pages in total

Falling ill during the exam
If you fall ill during an examination at Peter Bangs Vej, you must:

- contact an invigilator who will show you how to register and submit a blank exam paper.
- leave the examination.
- contact your GP and submit a medical report to the Faculty of Social Sciences no later than five (5) days from the date of the exam.

Be careful not to cheat at exams!
You cheat at an exam, if during the exam, you:

- Make use of exam aids that are not allowed
- Communicate with or otherwise receive help from other people
- Copy other people's texts without making use of quotation marks and source referencing, so that it may appear to be your own text
- Use the ideas or thoughts of others without making use of source referencing, so it may appear to be your own idea or your thoughts
- Or if you otherwise violate the rules that apply to the exam

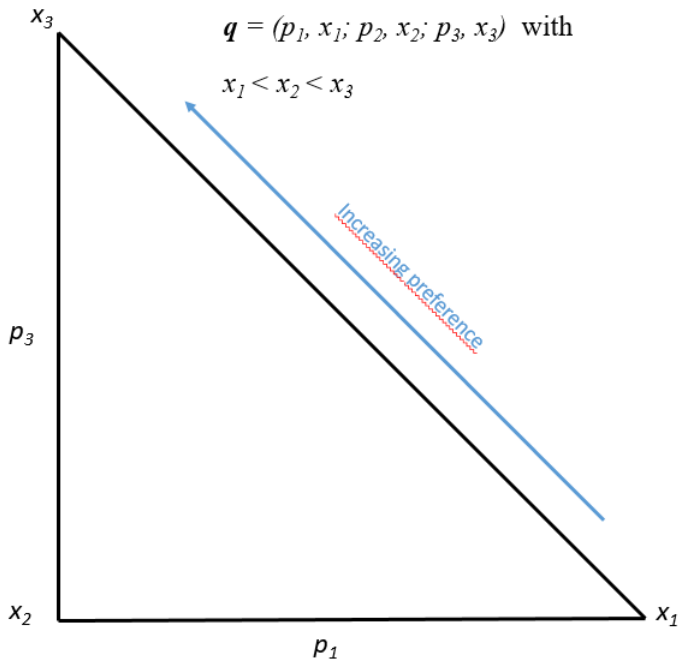
(1) Choice Theory

In many of the choice models we encountered during the course, preferences were defined over prospects where a prospect is to be understood as a list of outcomes with associated probabilities. Any prospect ***q*** can thus be represented by a probability distribution $(p_1,\ldots, p_n)$ over a fixed set of outcomes $(x_1,\ldots, x_n)$ where each p_i is the probability of a specific outcome x_i. All outcomes and probabilities are known to the agent, and hence, in choosing among prospects, the agent can be said to confront a situation of risk.

In *Starmer, C. (2000) "Developments in non-expected utility theory: The hunt for a descriptive theory of choice under risk", Journal of Economic Literature, 38(2), 332-382*, prospects are used as the foundation for numerus models defining choice under risk. In the following, we will consider expected utility theory and the common consequence paradox.

a. An agent has to consider the following prospect $\boldsymbol{q} = (p_1, x_1; p_2, x_2; p_3, x_3)$ with $x_1 < x_2 < x_3$. Write up the agent's expected utility $V(\boldsymbol{q})$ when his utility function is given by $u_i(x_i)$.

b. Since any prospects ***q*** can be described as a vector of probabilities $(p_1, x_1; 1\text{-}p_1\text{-}p_3, x_2; p_3, x_3)$ we can also locate them, graphically, in two-dimensional probability space. Below is a probability triangle that does this.



Every point at which expected utility is at the same constant level c defines an indifference curve. Draw the indifference curves implied by expected utility in the probability triangle. Show algebraically that the expected utility indifference curves are linear and parallel.

c. A well-known violation of expected utility is known as the common consequence paradox. The first example of this effect came in the form of the following pair of hypothetical choice problems. In the first you have to imagine choosing between the two prospects:

$$\mathbf{s_1} = \{\ 1M \quad \text{with prob. } 1.$$

$$\mathbf{r_1} = \begin{cases} 5M & \text{with prob. } 0.1, \\ 1M & \text{with prob. } 0.89, \\ 0 & \text{with prob. } 0.01. \end{cases}$$

In the second you will have to choose between the two prospects:

$$\mathbf{s_2} = \begin{cases} 1M & \text{with prob. } 0.11, \\ 0 & \text{with prob. } 0.89. \end{cases} \qquad \mathbf{r_2} = \begin{cases} 5M & \text{with prob. } 0.1, \\ 0 & \text{with prob. } 0.9. \end{cases}$$

When asked most prefer s_1 to r_1 and r_2 to s_2. Show algebraically why this behavior is paradoxical for an expected utility maximizer.

d. Use the probability triangle from question *1.b* as an expositional device to describe what property expected utility need to have in order to explain the common consequence paradox.

(2) Ref. Dependence, Framing and Loss Aversion

During the course, we saw that information that were irrelevant in the rational assessment of choice options, nonetheless affect choice behavior. The framing of outcomes were on such source of bias. We will now consider this kind of framing.

a. Explain the concept 'framing of outcomes'.

b. *Tversky, A. and Kahneman, D. (1981) "The Framing of Decisions and the Psychology of Choice", Science, 211(4481), 453-458*, presented the framing of outcomes by citing different examples. One example was:

> Problem 8 [N = 183]: Imagine that you have decided to see a play where admission is \$10 per ticket. As you enter the theater you discover that you have lost a \$10 bill.
> Would you still pay \$10 for a ticket for the play?
> Yes [88 percent] No [12 percent]
>
> Problem 9 [N = 200]: Imagine that you have decided to see a play and paid the admission price of \$10 per ticket. As you enter the theater you discover that you have lost the ticket. The seat was not marked and the ticket cannot be recovered.
> Would you pay \$10 for another ticket?
> Yes [46 percent] No [54 percent]

Describe the "psychological account" associated with choosing in problems 8 and 9.

c. Explain the concept of "minimal account". Use it to describe the marked difference between the responses to problems 8 and 9.

d. *Tversky A. and Kahneman, D. (1981)* gives another example. One group of subjects were given the values that appear in parentheses and the other group the values shown in brackets.

Problem 10: Imagine that you are about to purchase a jacket for ($125) [$15], and a calculator for ($15) [$125]. The calculator salesman informs you that the calculator you wish to buy is on sale for ($10) [$120] at the other branch of the store, located 20 minutes drive away. Would you make the trip to the other store?

The response to the two versions of problem 10 were markedly different: 68 percent of the respondents were willing to make an extra trip to save $5 on a $15 calculator; only 29 percent were willing to exert the same effort when the price of the calculator was $125. Explain how the subjects frame the outcomes in Problem 10.

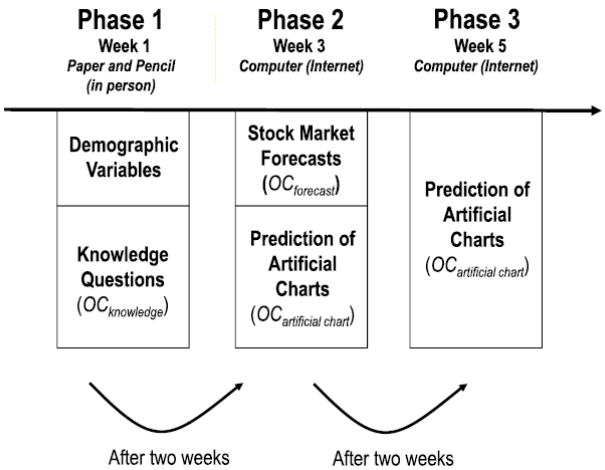
(3) Overconfidence

During the course, we talked about overconfidence. People may be overconfident in many different ways: they may overestimate their abilities; they may perceive themselves more favorably than others perceive them; or finally, they may overestimate the precision of their information. The latter bias will be the topic of the following.

a. Explain how overestimating the precision of one's information could be tested in an experimental setting.

b. *Glaser, M., Langer, T. and Weber, M. (2013) "True Overconfidence in Interval Estimates: Evidence Based On a New Measure of Miscalibration", Journal of Behavioral Decision Making, 26(5), 405–417*, designed a method to measure "true overconfidence". Explain the identification problem they are trying to overcome with their method.

c. *Glaser et al. (2013)* implement an experimental design with three phases:



Describe how this experimental design can overcome the identification problem you explain in question *3.b*.

d. Discuss the generalizability of "true" overconfidence as measured in *Glaser et al. (2013)*.