ECOS3997

Tutorial 1

1 Cake vs. apple

One of the principal topics in behavioural economics is *temptation* – sometimes referred to as *present-biased preferences*. An example is when a person plans to skip the tempting but fattening dessert, but ends up eating it anyway. We can model this situation using the concept of flow utility—utility that is obtained in certain times. We will suppose that the fattening dessert yields a flow-utility of 2 when you eat it (it's tasty), and -3 later (when it makes you fat).

The standard model in economics for preferences over flow-utility is the *exponential discounting model* (behavioural economists use other models). Decision-makers have a discount factor δ (between 0 and 1), which they use to discount future utility as a function of its distance from the present. Suppose you eat the apple in period 1 and (potentially) get fat in period 2. In period 0 (before the time for dessert), you discount the flow-utilty from eating the apple by δ and the flow utility from getting fat by δ^2. Your total utility is

$$U_{t=0} = 2\delta - 3\delta^2$$

In period 1, you don't discount the flow-utility from eating the apple (because it's not in the future), but you discount the flow-utility from getting fat by δ (it's one period in the future). Your total utility is

$$U_{t=1} = 2 - 3\delta$$

1. Are there values of δ for which you would eat the dessert, even though you know it would make you fat later?

2. Are there values of δ for which: (i) in period 0, you prefer to skip dessert in period 1, but (ii) in period 1, you eat the dessert anyhow?

2 Casino black lists

Casinos in Australia offer customers the option of self-excluding themselves from gambling.

1. Why would someone want to do that?

2. What may limit the effectiveness of these programs in preventing problem gambling?

3 Procrastination

Procrastination involves a series of choices. In each period, the decision maker can do the task now, or she can postpone it to some future time.

Consider a student who has 100 days to write a report. The utility from writing the report at time t is $100 - t$ (starting at 100 in period 0, and going down to 1 in period 99. The cost of writing the report is 3. This cost is discounted if the report is written at some later time.

Suppose the discount factor is 0.5, so that the cost of writing the report in a future period is 1.5 or less (as compared with 3 —the cost of writing the report in current period).

1. In period 0, what is the optimal time for writing the report? (what would the student prefer?)

2. In period 1, what is the optimal time for writing the report? (what would the student prefer?)

3. Why do you think procrastination happens?

4 Risk aversion

This question is about risky prospects, such as a 50% chance of winning \$50,000. The *certainty equivalent* of such a prospect is the minimum amount

of money the decision maker would prefer to the risky prospect. A person is *risk averse* if their certainty equivalent is below the expected value of the prospect ($25,000 in this case). The standard assumption in economics is that people maximise the expected utility of their wealth using a concave utility function. Thus, the certainty equivalent of the above prospect for a person with wealth w is an amount c such that

$$u(w + c) = 0.5u(w + 50000) + 0.5u(w)$$

where u is some concave function such as $\sqrt{x}$ or $\ln x$.

1. Jack has a wealth of $1,000,000 and a utility function over wealth of $u(x) = \sqrt{x}$. Compute (perhaps with the aid of a spreadsheet) the certainty equivalent of the following prospects:

   a. A 50% chance of winning 500,000
   b. A 50% chance of winning 50,000
   c. A 50% chance of winning 5,000
   d. A 50% chance of winning 500
   e. A 50% chance of winning 50

Research shows that most people are substantially risk averse over all these prospects. For example, many people (regardless of their wealth level) would prefer a certain $20 to a 50% chance of $50. How would you explain this?