

Psychology and Economics Problem Set 1

Professor Botond Kőszegi

Due February 8, 2007

1. This question asks you to think about an experiment related to the endowment-effect experiments discussed in class. Knetsch (1989) ran an experiment in which he gave a randomly selected half of his subjects mugs, and the other half of his subjects pens. After subjects looked at both items, he offered to exchange each mug for a pen plus 5 cents, and each pen for a mug plus 5 cents. Only 12% of those who originally received a mug, and 10% of those who originally received a pen, chose to exchange it for the other item plus 5 cents.
 - (a) What would the neoclassical economic model predict should be the outcome of this experiment? Explain in words.
 - (b) Explain the experimental results in terms of reference-dependent preferences.

The rest of this question asks you to think about Knetsch's experiment in terms of actual utility functions. Let three dimensions of choice be mugs, pens, and money, with mugs being dimension 1, pens being dimension 2, and money being dimension 3. Denote outcomes in mugs, pens, and money by c_1 , c_2 , and c_3 , respectively, and reference points in the three dimensions by r_1 , r_2 , and r_3 , respectively. A person's utility is given by

$$4c_1 + 4c_2 + c_3 + v(4c_1 - 4r_1) + v(4c_2 - 4r_2) + v(c_3 - r_3),$$

where $v(x) = x$ for $x \geq 0$, and $v(x) = 3x$ for $x < 0$. You can think of the first part of the utility function ($4c_1 + 4c_2 + c_3$) as standard "consumption utility," and the second part ($v(4c_1 - 4r_1) + v(4c_2 - 4r_2) + v(c_3 - r_3)$) as the reference-dependent "gain-loss utility."

- (c) Does this formulation capture loss aversion? Does it capture diminishing sensitivity?
 - (d) Argue that the reference point of an owner of a mug is $r_1 = 1$ and $r_2 = r_3 = 0$. Given this reference point, would an owner of a mug exchange it for a pen plus \$3?
 - (e) What is the reference point of an owner of a pen? Give r_1 , r_2 , and r_3 . How much would a pen owner have to be paid to be willing to exchange her pen for a mug?
 - (f) Suppose a mug owner loses \$5 just before her selling price is elicited, and does not adjust her reference point in money to this situation. Would she exchange her mug for a pen plus \$3? Explain the intuition.
2. Explain the following phenomena using properties of the prospect theory value function. Carefully state what property of the value function explains the phenomenon, and why that property explains it.
- (a) A colleague of mine went to a conference where he did not expect to receive an honorarium. The organizers of the conference surprised him with a \$5,000 check. He immediately bought a large-screen TV. He would never have spent so much on a TV from his regular pay.
 - (b) When some stores started introducing charges for credit-card transactions, credit-card companies lobbied hard to have stores call the credit-card price the regular price and the difference a “cash rebate,” rather than call the cash price the regular price and the difference a “credit-card surcharge.”
 - (c) After losing a bet, people often want to go “double or nothing.” Winners of bets are often more reluctant to do so.
 - (d) In many contracts for services (such as cell-phone contracts), different features of the service are separated out in great detail, yet the price of the service is subsumed in a single relatively large payment.
 - (e) Half of the subjects in an experiment were asked to imagine that they had just decided to buy a calculator for \$125, and then learned that they could buy the same calculator \$5 cheaper at

another store 20 minutes away. 29% said they would drive to the other store. The other half of the subjects was asked the same question, except they were told the calculator cost \$15. This time, 68% reported that they would drive to the other store to save \$5.

- (f) On the residential housing market, each seller sets an initial “asking price” for her house that can be substantially different from the final sale price. *Controlling for the current market value of their house*, sellers for whom the housing market has gone down since they bought their house both set a higher asking price, and eventually receive a higher sale price. (Houses of such sellers sit on the market for a longer time.)
3. Suppose Johnny is an expected utility maximizer over wealth with $u(w) = -e^{-0.00002w}$. Johnny’s current lifetime wealth is \$1,000,000.
- (a) Confirm that Johnny would *accept* a fifty-fifty lose \$500 or gain \$510 gamble.
- (b) Confirm that Johnny would *reject* a fifty-fifty lose \$35,000 or gain \$100,000,000,000 gamble. What is the minimum gain for Johnny to accept the gamble?
- (c) How is this question related to our discussion of risk preferences in class?