Take-home - problem set 2

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1-

a)

First of all, as the mugs are randomly given to half of the subjects and the pens to the remaining half, the neoclassical economic model predicts that half of the subjects will trade. It is based on the fact that the assignment is randomly made. Therefore, you get 50% chance to assign the right object to the right subject.

Intriguing about the fact of giving plus 5 cents

b)

The neoclassical economic model predicts that half of the subjects will trade. However, 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. It is due to the endowment effect which is explained by the reference-dependent preferences and loss aversion.

Those who received the mugs randomly have their reference point shifted. Their reference point is now: owning the mug. As we have already seen, losses loom larger than gains. In this case, the non-utility of loosing the mug is bigger than the utility of gaining the pen plus 5 cents. The same applies to those who received the pens randomly but in this case, their reference point is now: owning the pen.

In conclusion, reference-dependent preferences and loss aversion explain the experimental results (less trades occur).

c)

No idea how to prove it, think we need to use FOC

d)

The reference points are $(r_1, r_2, r_3) = (1, 0, 0)$.

Her utility if she keeps the mug is given by:

$$u((1,0,0)|(1,0,0)) = 4*1+4*0+0+v(4*1-4*1)+v(4*0-4*0)+v(0-0)$$

$$u((1,0,0)|(1,0,0)) = 4$$

Her utility if she exchange the mug for a pen plus \$3

$$u((0,1,3)|(1,0,0)) = 4*0+4*1+3+v(4*0-4*1)+v(4*1-4*0)+v(3-0)$$

$$u((0,1,3)|(1,0,0)) = 4+3-12+4+3 = 2$$

Therefore as

$$u((1,0,0)|(1,0,0)) = 4 > 2 = u((0,1,3)|(1,0,0))$$

an owner of mug will not exchange it for a pen plus $3.

e)

The reference points of a owner of pen are $(r_1,\, r_2,\, r_3) = (0,\, 1,\, 0)$

Her utility if she keeps the pen is given by:

$$u((0,1,0)|(0,1,0)) = 4*0+4*1+0+v(4*0-4*0)+v(4*1-4*1)+v(0-0)$$
$$u((0,1,0)|(0,1,0)) = 4$$

For her to exchange the pen for the mug and an amount of x dollars, we must satisfy the following inequation:

$$u((1,0,x)|(0,1,0)) > u((0,1,0)|(0,1,0))$$
$$u((1,0,x)|(0,1,0)) = 4*1+4*0+x+v(4*1-4*0)+v(4*0-4*1)+v(x-0)$$
$$u((1,0,x)|(0,1,0)) = 4+x+4-12+x = 2x-4$$

Putting this result in the previous equation, we obtain:

$$u((1,0,x)|(0,1,0)) = 2x-4 > 4 = u((0,1,0)|(0,1,0))$$

$$2x > 8$$
$$x > 4$$

Hence, a pen owner must be paid more than $4 to agree to exchange it for a mug.

f)

Two points of view:

First

If she does not adjust her reference point in money to the situation, then we end up in the point discussed on d).

**Second*

If she does not adjust her reference point in money to the situation, her utility would be given by:

$$u((1,0,-5)|(1,0,0)) = 4*1+4*0-5+v(4*1-4*1)+v(4*0-4*0)+v(-5-0)$$
$$u((1,0,-5)|(1,0,0)) = 4-5-5 = -6$$
$$u((0,1,3)|(1,0,0)) = 4*0+4*1+3+v(4*0-4*1)+v(4*1-4*0)+v(3-0)$$
$$u((0,1,3)|(1,0,0)) = 4+3-12+4+3 = 2$$

Seems to weird for me: Because in one case we take into account the loss of $5 but not in the second case? What do you think?

2-

a)

As stated in the paper, the initial endowment is (0,0). In addition, the assumptions are: ** 1. m(c) = $c_1 +$ c_2 ** 2. c_1 {0, 1} indicates whether the consumer get a pair of shoes. ** 3. c_2 = -p if the consumer pays price p.

$$\mu(x) = \begin{cases} \eta x & , x > 0 \\ \eta\lambda x & , x \leq 0 \end{cases}$$

Therefore, the consumer buys shoes for all prices p if:

$$u((1, -p)|(0, 0)) > u((0, 0)|(0, 0))$$

$$u((1, -p)|(0, 0)) = 1 - p + \eta - \eta\lambda p > 0 = u((0, 0)|(0, 0))$$

By resolving the equation we get:

$$1 + \eta - p(1 + \eta\lambda) > 0$$

$$1 + \eta > p(1 + \eta\lambda)$$

$$p < \frac{1 + \eta}{1 + \eta\lambda}$$

Hence

$$p < p_{min} \equiv \frac{1 + \eta}{1 + \eta\lambda}$$

b)

Now, the consumer never buys shoes for all prices p if:

$$u((1, -p)|(1, -p)) < u((0, 0)|(1, -p)))$$

$$u((1, -p)|(1, -p)) = 1 - p$$

$$u((0, 0)|(1, -p)) = -\eta\lambda + \eta p$$

Therefore, by replacing the terms into the first inequation:

$$u((1, -p)|(1, -p)) = 1 - p < -\eta\lambda + \eta p = u((0, 0)|(1, -p))$$

$$1 - p + \eta\lambda - \eta p < 0$$

$$1 + \eta\lambda < p(1 + \eta)$$

$$p > \frac{1+\eta\lambda}{1+\eta}$$

Hence

$$p > p_{max} \equiv \frac{1+\eta\lambda}{1+\eta}$$

c)

Given the solutions above, the consumer will buy the shoes at price smaller than p_{min} but not at price bigger than p_{max}.

Just trying

Make the assumption that the probability that the price p is smaller than p_{min} is q.

Hence, she expects to consume shoes and spend p with probability $(1-q)$

$$1 - p + (1-q)(\eta - \eta\lambda p) -$$

AUCUNE IDEE - je comprends le concept, mais j'arrive pas à le mettre en place...

3-

a)

The probability that the consumer buys from firm i over firm j is given by

$$Pr(s_i \geq s_j) = Pr[x_j - p_j - L(p_j, p^e) \leq x_i - p_i - L(p_i, p^e)]$$

where L(p_i, p^e) = max{0,λ (p_i - p^e)}, $\lambda > 0$

$$= Pr[x_j \leq x_i - (p_i - p_j) - L(p_i, p^e) + L(p_j, p^e)] = F(x_i - (p_i - p_j) - L(p_i, p^e) + L(p_j, p^e))$$

The proportion of consumers who buys from firm j is given by:

$$Pr(s_i \geq max_{j \neq i} s_j) = \int \prod_{j \neq i} F[x_i - (p_i - p_j) - L(p_i, p^e) + L(p_j, p^e)] f(x_i) dx_i$$

b)

Let the expected demand of firm i be given by the proportion of consumers who prefer that brand times the number of consumers L:

$$D_i(p_i, p_j) = Pr(s_i \geq max_{j \neq i} s_j) L$$

The profit function of firm i is given by:

$$\pi_i(p_i, p_j) = (p_i - c_i) * D_i(p_i, p_j)$$

The profit function of firm i is differentiable with respect to p_i

$$\frac{\delta pi_i(p_i,p_j)}{\delta p_i} : D_i(p_i,p_j) + (p_i - c_i)\frac{\delta D_i(p_i,p_j)}{\delta p_i} = 0$$

$$p_i - c_i = -\frac{D_i(p_i,p_j)}{\frac{\delta D_i(p_i,p_j)}{\delta p_i}}$$

c)

$$D_i(p_i,p_j) = Pr(s_i \geq max_{j\neq i}s_j)L$$

$$D_i(p_i,p_j) = L\int\prod_{j\neq i}F[x_i - (p_i - p_j) - L(p_i,p^e) + L(p_j,p^e)]f(x_i)dx_i$$

Assuming that there is no loss aversion (i.e. when $\lambda = 0$)

$$D_i(p_i,p_j) = L\int\prod_{j\neq i}F[x_i - (p_i - p_j)]f(x_i)dx_i$$

$$D_i(p_i,p_j) = L\int F[x_i - (p_i - p_j)]f(x_i)dx_i$$

Differentiating the last equation with respect to p_i we have that:

$$\frac{\delta D_i}{\delta p_i} = -L\int f(x_i - (p_i - p_j))f(x_i)dx_i$$

Therefore:

$$D_i(p_i,p_j) = L\int F[x_i - (p_i - p_j)]f(x_i)dx_i = L/n$$

Thus the equilibrium mark-up is given by:

$$p_i - c_i = -\frac{L/n}{-L\int f(x_i - (p_i - p_j))f(x_i)dx_i}$$

$$p_i - c_i = \frac{1}{n\int f(x_i - (p_i - p_j))f(x_i)dx_i} = \frac{1}{n * M(n)}$$

where $M(n) = \int f(x_i - (p_i - p_j))f(x_i)dx_i$

NOT WORKING