Econ 1820: Behavioral Economics

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Midterm 2015

DON'T PANIC

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PLEASE ANSWER EACH QUESTION IN A DIFFERENT BOOK. PLEASE PUT YOUR NAME ON EACH BOOK

REMEMBER - PROVE STATEMENTS, DON'T JUST STATE THEM!

Question 1 (40 pts) Imagine you observed the following choices over bundles of Oil, Eagles, and Miniature American Flags

Observation	Price O	Price E	Price M	Amount O	Amount E	Amount M
1	5	α	1	1	2	0
2	5	1	1	2	1	0
3	1	1	5	0	2	1
4	1	2	5	0	1	1

1. **(5 pts)** Which bundles are revealed directly preferred to which other bundles? Which bundles are revealed preferred to which other bundles? Which bundles are revealed strictly preferred to which other bundles (assuming local non-satiation)? Note, that your answer will depend on the value of α (which is greater than 0).
2. **(10 pts)** Is this data rationalizable by a strictly monotonic utility function? If not, why not?
3. **(10 pts)** We will now consider a model in which the consumer may not see every good on every shopping trip. So for example, it might be the case that one particular trip

they did not walk down the aisle on which Miniature American Flags were being sold, and so they did not know that they were available. Thus, if a good is not purchased on a particular shopping trip it may be that the consumer did not see that good. The new model of behavior is that the decision maker makes choices in order to maximize utility, but only can only purchase the goods they knew were available. Thus, if faced with prices p^i and income I^i they will choose a bundle x^i in order to solve

$$\begin{aligned} x^i &= \arg\max u(x) \\ \text{subject to } p^i x &\leq I^i \\ \text{and } x_k &= 0 \ \forall \ k \in N^i \end{aligned}$$

where N^i is the subset of goods (i.e. oil, eagles and Miniature American Flags) that are NOT seen on shopping trip i - so if Miniature American Flags were not seen on shopping trip i, $N^i = \{\text{Miniature American Flags}\}$.

Under this model, what goods do we KNOW were seen in each of the above observations? What is the revealed preference information we can take from these observations?

4. **(10 pts)** For what values of α is this data consistent with the model described in part 3? Write down utility numbers for the chosen bundles (i.e. the bundles chosen in observations 1-4 - no need to apply utility numbers to all possible bundles of Oil, Eagles and Minature American Flags) and N^i for each observation which would rationalize this data

5. **(5 pts - HARD - ONLY ATTEMPT IF YOU ARE FEELING COCKY OR HAVE COMPLETED THE REST OF THE EXAM)** Can you come up with an equivalent to the GARP condition such that your condition is satisfied if and only if the data is consistent with the model in part 3?

Question 2 (40 pts) Consider someone who is going to have to choose between jobs, which will vary in their pay and the number of days holiday they will get. When asked to choose between jobs, they will do so in order to maximize $p(x)+d(x)$, where $p(x)$ is the pay of job x and $d(x)$ is the number of days holiday given by job x. However, they will also feel sad if the job they choose is not the one that gives the highest pay, or the most days holiday. So, for example, if you are asked to choose between a job with good pay and good holidays and one that has great pay and terrible holidays, you may end up choosing the former, but you will be upset because you have turned down the great pay available from the latter.

Thus preferences over *menus* of jobs is given by

$$U(A) = \max_{x \in A}[p(x) + d(x)] + \theta \left[p(x) - \max_{y \in A} p(y)\right] + \theta \left[d(x) - \max_{z \in A} d(z)\right]$$

where A is the menu, x is the job that they will eventually choose, y is the available job which gives the highest pay and z is the job that gives the most days off. $\theta \geq 0$ is a parameter that measures how sad they will be for forgoing the highest possible pay and nuumber of days off.

1. **(10 pts)** Give an example in which the decision maker would strictly prefer a smaller menu of jobs to choose from. For what values of θ will the decision maker always weakly prefer a larger menu of jobs?
2. **(10 pts)** Will this decision maker satisfy set betweenness in their choice between menus?
3. **(10 pts)** Will they satisfy sophistication?
4. **(10 pts - HARD)** Can you come up with a testable condition for this model using only preference over menus? i.e. something that has to be true about menu preferences if this model is true?

Question 3 (20 pts) Imagine that we observe a racing cyclist choose between either using tires that are suitable in the wet conditions, or those suitable for dry conditions. It rains exactly half the time. If they choose the right tires, they win the race with probability 1. If not, they lose the race with probability 1. The prize for winning the race is ln(2) dollars (this is to make the maths easier). We observe that, when it rains, they use wet condition tires 2/3 of the time, and when it is dry they use wet condition tires 1/3 of the time

1. **(10 pts)** Is this behavior in line with rational inattention with Shannon mutual information costs? If so, what is the appropriate value of λ - the cost of information?
2. **(10 pts)** Now say that the cyclist has access to all condition tires, which mean that they would win the race in any conditions with probability p. How high would p have to be for the racer to stop using a combination of wet condition and dry condition tires and switch over to always using the any condition tires (if you don't have a calculator to work out p precisely, write down an expression for p as a function of the parameters of the problem)?