Econ 1820: Behavioral Economics

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Midterm 2014

DON'T PANIC

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

Question 1 (30 pts) Imagine you observed the following choices over bundles of guns and health-care at different prices per unit

Observation	Price G	Price H	Amount G	Amount H
1	2	2	6	1
2	1	3	4	2
3	3	1	1	4

1. Which bundles are revealed directly preferred to which other bundles?
2. Which bundles are revealed preferred to which other bundles?
3. Which bundles are revealed strictly preferred to which other bundles (assuming local non-satiation)?
4. Is this data rationalizable by a non-satiated utility function? If not, why not?
5. What is the Afriat index for this data set (hint: remember the concept of revealed preferred at level e defined by $ep^i x^i \geq p^i x^j$)?

Question 2 (40 pts) Consider the following model of choice with limited attention

Definition 1 *We say a set of choice data can be explained as choice with consideration sets if there is (i) a utility function $u : X \to \mathbb{R}$ and (ii) a consideration set correspondence $\Gamma : 2^X/\emptyset \to 2^X/\emptyset$ such that $\Gamma(A) \subseteq A$ and*

$$C(A) = \max_{x \in \Gamma(A)} u(x)$$

In other words, for each set A, $\Gamma(A)$ defines the set of alternatives that the decision maker considers. They then choose the best option from $\Gamma(A)$ according to u.

For simplicity, let's assume that we are dealing with choice functions (not correspondences) and that there is no indifference

1. Show that a model of choice from consideration sets can explain any choice function

2. Now add the restriction

   $$\Gamma(A) = \Gamma(A/x) \text{ if } x \notin \Gamma(A)$$

   (by A/x I mean the set A with x removed). In other words, If you did not consider x in choice set A, then removing x from the choice set should not affect what you consider

   Is the following set of choices consistent with this model?

   $$\begin{aligned} C(\{x, y, z\}) &= x \\ C(\{x, y\}) &= y \end{aligned}$$

3. Show that, if we observe that $C(A) \neq C(A/x)$ (i.e. removing x from A changes the choice from A), it must be the case $x \in \Gamma(A)$

4. Show that the model implies the following property (hint, let x^* be the object in the set S with the highest utility)

$$\begin{aligned} \text{For any non-empty set } S\text{, there exists } x^* &\in S\text{, such that, for any set } T \text{ including } x^* \\ C(T) &= x^* \text{ whenever} \\ (i)\ C(T) &\in S \text{ and} \\ (ii)\ C(T) &\neq C(T/x^*) \end{aligned}$$

5. Show that, if $x = C(A)$ and $y \in A$, then it is not necessarily the case that $u(x) > u(y)$, but if $C(A) = x \neq C(A \backslash y)$, then it must be the case that $u(x) > u(y)$

6. (DO THIS PART ONLY IF YOU HAVE COMPLETED THE REST OF THE EXAM) Come up with a pattern of choices that cannot be explained by this model

Question 3 (30 pts) Consider the following two player game

	Column Player	
Row Player	In	Out
In	a, b	$0, 0$
Out	$0, 0$	$-1, -1$

The row player can choose to play either 'In' or 'Out', as can the column player. The table tells you the outcome for each player (row player first) depending on the strategy of both (so for example, if both row player and column player play 'Out', then both receive -1). a and b represent real numbers.

Consider the level k model we discussed in class. Assume that level 0 players play 'In' 50% of the time and 'Out' 50% of the time. Remember that level 1 players best respond to level 0 players and level 2 players best respond to level 1 players.

1. Find values for a and b such a level 1 column player will play 'In'
2. Find values for a and b such a level 1 row player will play 'In'
3. Find values for a and b such a level 2 column player will play 'In'
4. Find values for a and b such a level 2 row player will play 'In'
5. Find values for a and b such that a level 2 row player playing against a level 2 column player will play strategies that also form a Nash Equilibrium
6. Find values for a and b such that a level 2 row player playing against a level 1 column player will play strategies that also form a Nash Equilibrium