Econ 455 Discussion Section-Handout 1

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1 Introduction:

1.1 About Your T.A.

- Name: Emilio Cuilty, Born in: Chihuahua, Mexico
- Occupation : Third year student of the Ph.D. program in Economics
- Research Interests:
  - Behavioral Economics: Prospect Theory and Emotions, Present Bias and Self-Control, Social Capital
  - Industrial Organization
  - Public Policies Evaluation
- Warnings: Strong accent and not the best handwriting

1.2 About Econ 455

- This course is about introducing recent findings in psychology and human behavior to the standard economic models.
- Why?
  - Because without them some conclusions, predictions or public policies might be completely wrong. (Important to economists)
  - Last Mile Problem (Important to society)
  - Free Lunches! (Important to you)
- Example: In India during 1960 the child mortality rate was 24%. The major problem was diarrhea, solution: oral rehydration salts available to everyone. This policy drop child mortality to 6.5% in 2009, still 400,000 diarrhea related deaths. Why can we just eliminate the 6.5%? The last mile problem. During 2009 Sendhil Mullainathan made this survey, If your child has diarrhea, should you increase decrease the number of fluids? 30-50 percent said that they should be decreased!!!!!. Why? You do not put water into a leaking bucket, the model seems to be right! however it does not apply to the real world.
- This course is an economics course, so you should not expect to be an easy course. You will need: your 301 econ tools since Econ 455 is an applied microeconomics course. Attend to lecture, Professor Wilson is an amazing lecturer and she has great publications on bounded rationality. Submitting good homework, homework will help you to practice and understand whatever you missed from lecture. Attending to discussions, here we are going to cover hard problems, in this way you will feel the exams easier.

1.3 About discussions

A typical discussion will contain a group quiz, where you can see how well prepared are for the midterm. Even if quizzes have no impact on your grade, they are good signs on how you will do on the midterm. The good part is that you will not have to solve them on your own. Therefore you can learn from your classmates, or understand even more if you explain to your classmates. After solving the quiz, I will try to cover some hard applications, so you can learn even more and be better prepared for the midterms. If at some point you need more help to get the full flavor of econ 455, do not hesitate and come to my office hours. If the office hours does not work we can set an appointment with two days in advance. Finally if you have a short question, you can send me an email an I will try to answer your doubts as soon as possible. Remember I am also a student, and that implies I also have midterms, homeworks etc. Lets set this rule, I will read your emails only before 8:00 P.M., if you send me an email after that time I will get back to you until next day.

Super Important Information

Office Hours	Thursday	12:30 P.M.-2:30 P.M.	Social Sciences 6470
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The web page will contain solutions to the handouts and the quizzes.

2 Problems:

1. **Independence of Irrelevant Alternatives (IIA):** In which of the following scenarios is this Axiom violated

   (a) The past Monday John Lennon had the following alternatives for breakfast {eggs, cereal, bagel} he had a bagel, on Tuesday he was able to choose between {eggs, cereal, bagel, waffles}, he selected waffles

   No, here there would be a violation of the IIA only if Lennon had chosen cereal or eggs on Tuesday.

   (b) Julian Casablancas was offered the following lotteries, $A = \{x = (1\,million)\,;\, p = 1\}$ $B = \{x = (1\,Million, 0, 5\,Million)\,;\, P = (.89, .01, .10)\}$, He selected A, then he was offered to $A' = \{x = (0, 1\,Million)\,;\, P = (.89, .11)\}$ and $B' = \{x = (0, 5\,Million)\,; P = (.9, .1)\}$ he selected B'

   Note that choosing A over B means that $EU(A) > EU(B)$, in other words $u(1M) > .89u(1M) + .01u(0) + .1(5M)$. Now $EU(B') > EU(A')$, which implies that $.9u(0) + .1u(5M) > .89u(0) + .11u(1M)$ or $.01u(0) + .1u(5M) > u(1M) - .89u(1M)$ or $.01u(0) + .89u(1M) + .1u(5M) > u(1M)$. Which contradicts the first choice, so IIA is violated. This is an example of Allais Paradox, which we will cover later on in the course.

2. **Limited Attention:** Consider again the case of Airlines that we covered in lecture. This time suppose that there is a monopoly in one specific route, the direct flight Madison to Mexico City (i.e. there is no Zero profit condition). The cost of the airline is cQ, and there are no cost for additional add-ons . Let $P_N = 10 - Q_N$, and $P_S = 5 - Q_S$ be the specific demands for each consumer

   (a) Find the prices the monopolist should charge for the price of the ticket, and the price of the add-ons

   First recall that the monopolist makes equal $MC = MR$. Therefore$MC = c$, $MR_N = 10 - 2Q_N$ and $MR_S = 5 - 2Q_s$

   So, $c = 10 - 2Q_N$ and $c = 5 - 2Q_S$, $Q_s = \frac{5-c}{2}$ and $Q_N = \frac{10-c}{2}$, from here we just find the price related to each demand

   note $P_N = \frac{10+c}{2}$ and $P_s = \frac{5+c}{2}$. But these are the prices that the monopolist will like to charge to each group, however he cannot do that by simply looking into their faces.

   What he ends up doing is charging a price for ticket $P = P_s = \frac{5+c}{2}$, and a price for add-ons$\bar{P} = P_N - P_S = \frac{5}{2}$

   (b) Does the curse of education holds?

   There are several ways to understand this question, first note that $P = P_s$ and $P_S = P_N - \bar{P}$. So $P = P_N - \bar{P}$. If suddenly there is a mechanism that educates the naives, they will not longer consume add-ons. In this case $\bar{P} = 0$, and hence P rises. So there is curse of education. You can also understand this problem by changing the demand of the Naives to be equal to the demand of the sophisticated. In this case $P_N = 5 - Q_N$, Now the monopolist can only charge one price, to find this price we need to get the aggregated demand. $Q = Q_N + Q_S = 5 - P + 5 - P = 10 - 2P$. So $P = \frac{10-Q}{2}$. Then $MR = 5 - Q$, and $MC = 2c$, $5 - Q = 2c$ or $Q = 5 - 2c$, hence $P = \frac{10-5+2c}{2} = \frac{5+2c}{2}$, which is greater than the original ticket price, $\frac{5+c}{2}$, so there is curse of education.

   (c) What happens if the monopolist cannot longer tell how many naive consumers and sophisticated consumers are there?

   Now the monopolist cannot longer tell who is who, so he can only charge one price. The market demand is $Q = Q_s + Q_N = 5 - P_s + 10 - P_N = 15 - 2P$ if $P < 5$ and $Q = 10 - P$ if $5 \leqq P < 10$.

Which means that the marginal revenue is a discontinuous function, $MR = \frac{15}{2} - Q$ if $p < 5$ and $MR = 10 - 2Q$, if $5 \leq p < 10$.

Recall $Mc = 2c$, so we have to check both cases, case 1:

$\frac{15}{2} - Q = 2c$ $Q = \frac{15}{2} - 2c$ and $P = \frac{15-(\frac{15}{2}-2c)}{2} = \frac{15}{4} + c$ it holds as long as $c < 5$.

Case II: $10 - 2Q = 2c$, so $Q = 5 - c$ and $P = 10 - 5 + c = 5 + c$, holds as long as $c > 0$.

To tell which case will the monopolist will choose we need to compare profits, case 1: $\pi = PQ - 2cQ = (\frac{15}{2} - 2c)(\frac{15}{4} + c) - 2c(\frac{15}{2} - 2c) = (\frac{15}{2} - 2c)\left[\frac{15}{4} - c\right]$

Case 2: $\pi = (5 + c)(5 - c) - 2c(5 - c) = (5 - c)(5 - c)$

3. **Grading Homeworks:** Suppose that the T.A. has to check if the homework you submitted is not a copy. A homework with a grade Δ could be a copy of another homework with probability k_Δ. The T.A. submits the homework to the professor and the professor makes an additional check. The T.A. can detect if the homework is original depending on his level of attention η, the same occurs for the professor. Finally the professor submits the homeworks to the dean, which also has to check if the homework is a copy or an original. If the homework is a copy and someone detects it, the T.A. gets a utility value of *zero*, if it is original, or no one detects it is a copy the T.A. gets a value of $U(\Delta)$. Suppose there is a cost of $c\eta^2$ for everyone.

   (a) What is the probability the the $T.A.$ will get an utility value of 0

   It has to be the case that the T.A. does not detect the homework and either the professor sees it is a copy or the the professor cannot detect a copy but the dean does, so

   $k_\Delta(1 - \eta_{TA})\eta_P + k_\Delta(1 - \eta_{TA})(1 - \eta_P)\eta_D$

   (b) What is the probability of getting an utility value of $U(\Delta)$

   Again it is just the complement, $1 - k_\Delta(1 - \eta_{TA})\eta_P - k_\Delta(1 - \eta_{TA})(1 - \eta_P)\eta_D$

   (c) What is the problem the $T.A.$ has to solve

   As we can see

   $\max_{\eta_{TA}} EU = 0\left\{k_\Delta(1 - \eta_{TA})\eta_P + k_\Delta(1 - \eta_{TA})(1 - \eta_P)\eta_D\right\} + U(\Delta)\left\{1 - k_\Delta(1 - \eta_{TA})\eta_P - k_\Delta(1 - \eta_{TA})(1 - \eta_P)\eta_D\right\} - c^2\eta_{TA}$

   (d) Find the first order conditions and then assume a symmetric equilibrium

   Taking first order conditions we get that $U(\Delta)\left\{k\eta_P + k_\Delta(1 - \eta_p)\eta_D\right\} - 2c\eta_{TA} = 0$.

   Assuming symmetric eq $U(\Delta)\left\{k_\Delta\eta + k_\Delta(1 - \eta)\eta\right\} = 2c\eta$,

   which implies $U(\Delta)\left\{k_\Delta + k_\Delta(1 - \eta)\right\} = 2c$, or $\eta = 2 - \frac{2c}{k_\Delta U(\Delta)}$

   (e) What can we say about C and Δ?

   If the cost increases the level of attention decreases, if the grade of the homework increases the level of attention increases.