Take Home Exam and Problem Set

1. Risk Aversion

From the experimental data of Peter Boessarts and William Zame, individuals in the laboratory are indifferent between getting nothing, and a gamble paying \$15.00/p, -\$6.00/p, \$0.00 each with probability 1/3, where p is an endogenously determined price. For an individual with CES preferences, find the coefficient of relative risk aversion as a function of wealth, using the standard approximation. Suppose first that p=1.0.

a. If wealth is \$350,000, what is the coefficient of relative risk aversion?

b. If the coefficient of relative risk aversion is 20, what is wealth?

c. If preferences are logarithmic what is wealth?

d. If "wealth" is \$400 and preferences are logarithmic, what is p?

e. When would it make sense for "wealth" to be \$400?

2. Interactions [Note that you can find this in the lecture notes: you are being asked to work through the details carefully]

Consider the "Pride Game" a two player simultaneous move symmetric game with three options and payoffs given by

	proud	not confess	confess
proud	40, 40	54, 36	12, 0
not confess	36, 54	50, 50	-40, 100
confess	0, 12	100, -40	10, 10

a. Show using iterated strict dominance that this has a unique Nash equilibrium at proud-proud.

Now suppose that people become better in the sense of being more altruistic. Suppose specifically that each player gets utility equal to 2/3rd of his own payoff plus 1/3rd of his opponents payoff. In other word he is not completely selfish so cares about how well his opponent does. However, he cares more about himself than his opponent. This is the "Altruistic Pride Game"

b. Write down the normal form of the altruistic pride game.

c. Find the unique pure strategy equilibrium (there are also mixed equilibria) of the altruistic pride game.

d. In what sense is everyone worse off in the altruistic pride game than in the pride game? Be sure to explain what alternative criteria there might be.

3. Bargaining

Consider the following variation on ultimatum bargaining: there is a pie worth 10 dollars. Player 1 makes a proposal to divide the pie either 50-50, or 60-40 with the larger share going to himself. Player 2 can accept or reject. If he accepts the pie is divided as proposed; otherwise neither player gets anything. Let m_i be the monetary payoff to player i. Suppose that player i's utility is $m_i - cm_{-i}$ where $0 \leq c < 1$. Suppose that it is observed that all 50-50 offers are accepted and 60% of 60-40 offers are accepted.

a. Assuming that player rejecting and accepting offers strictly prefer to do so explain why you need two different values of c to explain the data.

b. Suppose that one "type" has $c = 0$. Is this consistent with the facts? What fraction of the population must be this type?

c. Based on the fact that offers of 60-40 are rejected, what range must of other value of c lie in? What fraction of the population must be of this type?

d. Which type makes 60-40 offers? What fraction of the offers must be 60-40 offers? What does this tell you about the value of c by the second type?

e. Suppose you were told that the same people who made 50-50 offers also rejected 60-40 offers (and in particular that only 40% of offers were for 50-50). Explain why this is not consistent with the theory?

4. Repeated Games

Consider the following chain store game played between a patient player one (chain store) with discount factor δ and a sequence of short-run myopic player 2's (entrants – with discount factor 0)

	out	in
fight	3,0	-2,-2
give in	4,0	2,2

a. What is the Nash equilibrium if the game is played once?

b. What is the Stackelberg equilibrium in which player 1 gets to commit if the game is played once?

c. What is the subgame perfect equilibrium if the game is repeated $T < \infty$ times?

d. If the game is infinitely repeated, find a δ and strategies for both players such that the long-run player gets 3.