Economics 8104: Problem Set 1

March 29, 2008
Due Thursday, April 3

1. This question deals with the numerical implications of Rabin's paper on agents' characteristics.

   a. Consider an agent with log utility who is known to reject a 50-50 bet of lose \$100/gain \$110. Find an upper bound on the wealth level of the agent so that the agent actually rejects this bet.

   b. Studies frequently suggest that the level of relative risk aversion is between 0.5 and 4. Consider and agent with CRRA preferences, $U(w) = w^{1-\sigma}/(1-\sigma)$, and wealth level of \$350,000. What level of relative risk aversion is required for the agent to turn down a 50-50 bet of lose \$100/gain \$105?

2. Suppose an expected-utility maximizer over wealth, w, with VN-M preferences $U(w)$ likes money and is risk-averse (so that U is strictly increasing and weakly concave).

   a. Suppose for all wealth levels, the agent is known to reject 50-50 lose \$100/gain \$101 bets. Rabin's result implies that the agent will then reject a 50-50 lose \$8,000/gain \$34,940. If you also know that for all wealth levels, the agent rejects 50-50 lose \$10/gain \$10.10 bets, what 50-50 bet must the agent also reject?

   b. Can you generalize this result? That is, state and prove a result of the form "If we know that you reject 50-50 lose l/gain g bets implies you will reject 50-50 lose L/gain G bets, then for all $r > 0$, if you reject 50-50 lose rl/gain rg, you will reject lose xL/gain yG bets for some x, y (note, you should find x and y)."

3. MWG Exercise 6.B.5

4. Dekel defines betweenness as follows:

   Definition 1 (Betweenness Axiom)**.** *The preference relation* $\succeq$ *on the space of simple lotteries* $\mathcal{L}$ *satisfies the* betweenness axiom *if for all* $L, L' \in \mathcal{L}$ *and* $\alpha \in (0, 1)$

   (a) if $L \prec L'$ *then* $L \prec L\alpha L' \prec L$

   (b) if $L \sim L'$ *then* $L \sim L\alpha L' \sim L$ [1]

   Using Dekel's definition, prove that the indifference curves have to be *thin* lines; that is, they cannot be thick sets. Is this true if you use MWG's definition?

[1] Obviously, this statement holds for $\alpha = 0, 1$ as well.