



Beer and Quiche

The title of this game is based on the book in the 1980's, "Real Men Don't Eat Quiche."

There are two classes of sequential equilibrium.

Eq. 1: Strong and weak types of player 1 choose B. Player 2 fights if he observes Q, but not if he observes B. Beliefs: Player 2 uses Bayes' rule if he observes B, and believes that player 1 is at least as likely to be weak as strong if he observes Q.

Given the beliefs, player 2's strategy is sequentially rational. The beliefs are consistent. Given player 2's strategy, player 1's strategy is sequentially rational. A weak player 1 receives a payoff of 2, but deviating to Q would give him a payoff of 1, due to the fact that player 2 is prepared to fight.

Eq. 2: Strong and weak types of player 1 choose Q. Player 2 fights if he observes B, but not if he observes Q. Beliefs: Player 2 uses Bayes' rule if he observes Q, and believes that player 1 is at least as likely to be weak as strong if he observes B.

Given the beliefs, player 2's strategy is sequentially rational. The beliefs are consistent. Given player 2's strategy, player 1's strategy is sequentially rational. A strong player 1 receives a payoff of 2, but deviating to B would give him a payoff of 1, due to the fact that player 2 is prepared to fight.

Here is the problem: consistency does not take into account the fact that a weak player 1 is receiving a payoff of 3, and would never consider a deviation to B. A strong player 1 could consider B, hoping that player 2 chooses not to fight. Thus, player 2 should infer that anyone deviating to B must be strong, and not fight. This logic invalidates this sequential equilibrium.

The **Intuitive Criterion** is a refinement of sequential equilibrium that formalizes this logic. See Cho and Kreps (QJE 1987).

Given an equilibrium, let $S(m)$ denote the set of types who prefer the equilibrium to the out-of-equilibrium strategy m , for any beliefs of player 2 and any best response by player 2. [Types in $S(m)$ are ruled out.]

If, for some out-of-equilibrium strategy m , there is a type who prefers to play the strategy m , given that player 2 rules out types in $S(m)$ and chooses a best response accordingly, then the equilibrium outcome fails the intuitive criterion.