

Finish Lecture 1.

Problem 1. The Market for Lemons: A General Set-Up.

The players are two buyers and a seller. A seller has a used car whose quality $\theta \in [0, 1]$ is his private information. θ represents his benefit from owning the car. It is drawn from cdf F that satisfies $F(\theta) > 0$ for all $\theta > 0$. We can view this as the distribution of car quality among sellers in the population, with the actual seller being drawn at random. There are two potential buyers. Each would obtain benefit $b(\theta) \geq \theta$ from owning a car of quality θ . Thus the buyers always value the car at least as much as the seller.

The game proceeds as follows: (i) the seller learns the quality of her car, (ii) the buyers simultaneously make price offers $p_i, p_j \geq 0$; (iii) the seller can accept one of these offers or reject both.

Buyer's utility is $b(\theta) - p$ for buying at price p ; 0 for not buying. Seller's utility is $p - \theta$ for selling at price p ; 0 for not selling.

1. Derive the general expression for buyer's expected benefit of obtaining the car.
2. Suppose $F \sim U[0, 1]$ and $b(\theta) = \beta\theta$ with $\beta \in (1, 2)$. Solve for a subgame perfect equilibrium.
3. Suppose $F \sim U[0, 1]$ and $b(\theta) = \alpha + \beta\theta$ with $\alpha \in (0, 1)$ and $\beta \in (1 - \alpha, 2 - 2\alpha)$. Solve for a subgame perfect equilibrium.