Introduction

Economics from 30,000 feet:

1. Applies to situations where people make *deliberate*, *systematic* choices using the *information* and resources available.

2. Examines how people respond to *incentives*.

3. Focuses on *problems* that arise from *incentives* and *constraints*, not because people are stupid or ignorant.

Leads to two key questions:

- Where do things go wrong even when people are informed and trying?
- How can we design policies to fix those problems?

Analysis done by constructing and analyzing mathematical models:

- Qualitative insights about underlying issues
- Quantitative results: who's affected and how much?

Asymmetric Information: Lemons

Based on pioneering work in the economics of information:

George Akerlof: "The Market for Lemons: Quality Uncertainty and the Market Mechanism"

Stripped down model:

4 cars, each has a **state** and a **value**

Possible states: Good (G) or bad (B)

Value of each: $4000 if G, $2000 if B

Cars on the market:

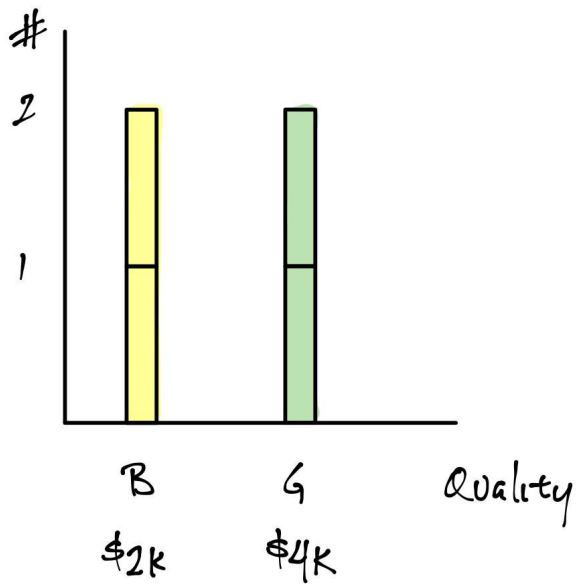
Car	State	Value
1	G	$4000
2	G	$4000
3	B	$2000
4	B	$2000

Adding information asymmetry:

Sellers: Know **true** state of each car

Buyers: Only know the **distribution** of states

Buyer's view:



Probabilities:

- 50% chance a car is B
- 50% chance a car is G

Buyer's decision:

How much to offer for a given car?

What about average or expected value (EV)?

Define terms:

N	Number of possible states
ρ_i	Probability of state i
X_i	Payoff in state i

General formula for EV:

$$EV = \rho_1 X_1 + \rho_2 X_2 + \cdots + \rho_N X_N$$

$$EV = \sum_{i=1}^{N} \rho_i X_i$$

Applying here:

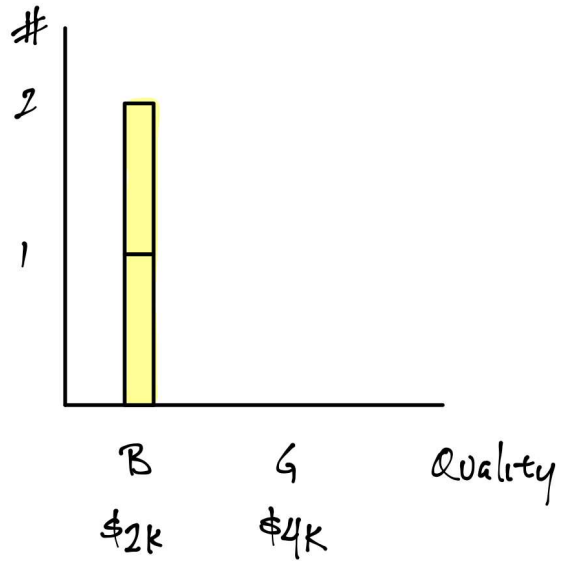
$$EV = \left(\frac{1}{2}\right) * \$4000 + \left(\frac{1}{2}\right) * \$2000 = \$3000$$

Offer $3000?

But, how would the seller react?

Car	State	Value	Offer	Impact on seller	Sell?
1	G	$4000	$3000	**-$1000**	**No**
2	G	$4000	$3000	**-$1000**	**No**
3	B	$2000	$3000	+$1000	Yes
4	B	$2000	$3000	+$1000	Yes

Equilibrium distribution of cars for sale:



- Good cars are driven out of the market
- Only B cars are left

Technically:

Asymmetric information leads to *adverse selection*

Buyer's offer after thinking through the reaction of sellers:

Chance of buying a G car = 0
Chance of buying a B car = 100%

$$EV = 0 * \$4000 + 1 * \$2000 = \$2000$$

- Offers $2000
- Only bad cars trade

Evaluating the outcome:

- Is it bad?

- What could be done to fix the underlying issue?

One type of solution is signaling:

- *Indirect* mechanism for conveying information
- Seller takes a *costly, observable action* to indicate quality

Example: certified used car programs

- Buyer can see if car is certified
- Buyer knows dealer won't want to certify bad cars
- Certification signals high quality

Signaling models were originally developed to understand job market:

- Why do employers care about grades in unrelated classes?