The Market for Lemons, Akerlof

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Why are used cars worth so much less than new ones?

- When you buy a new car, there is prob p that it is a lemon
- However, after a certain time, information asymmetry develops because the sellers know whether the car is in fact a lemon
- Thus used cars must trade for less, else the owner would trade it for a new car with lower p.

A consequence is that good cars can only be sold at a discount to their true value and are unlikely to be traded.

price, not prob

The price p of a car and the average quality μ will determine the demand: $D = D(p, \mu)$

how much the car is worth $\neq$ price

$\mu = \mu(p)$ there will be more cars as $p \uparrow$

$S = S(p)$

In equilibrium: $S(p) = D(p, \mu(p))$.

Utility theory analysis

Two groups of traders:

utility for group 1

consumption of other goods

$$U_1 = M + \sum_{i=1}^{n} x_i$$

quality of ith auto

$$U_2 = M + \sum_{i=1}^{n} \frac{3}{2} x_i$$

$\leftarrow$ wants a car

utility $\propto n$ (auto) obviously unrealistic

uniform dist

① Has N cars with $X \sim U(0,2)$. Income of Y_1

② Has 0 cars, with income of Y_2.

demand: ①

$$\begin{cases} D_1 = Y_1/p, & \mu/p > 1 \\ D_1 = 0, & \mu/p < 1 \end{cases}$$

$\leftarrow$ i.e they will spend all their money on cars if they get favourable cars / \$.

· The supply from ①: $S_1 = pN/2$. This is because they have cars ranging in value from 0 to 2. When $p=0, S=0$. When $p=2, S=N$.
· The average quality $\mu = P/2$.

demand ②
$$\begin{cases} D_2 = Y_2/p, & 3\mu/2 > p \\ D_2 = 0, & 3\mu/2 < p \end{cases}$$
← because ② gets 1.5× utility.

$S_2 = 0$

In total:
$$D(p,\mu) = \begin{cases} (Y_1+Y_2)/p, & p<\mu \\ Y_2/p, & \mu < p < 3\mu/2 \\ 0, & p > 3\mu/2 \end{cases}$$

But because $\mu = P/2$, no trade can happen.

<u>Symmetric information</u> → quality $\sim U(0,2)$ i.e cars worth 1

$$\left.\begin{aligned} S(p) &= N, \ p>1 \\ S(p) &= 0, \ p<1 \end{aligned}\right\}$$
① will sell if they can get a return.

$$D_1 = \begin{cases} Y_1/p, & p<1 \\ 0, & p>1 \end{cases} \qquad D_2 = \begin{cases} Y_2/p, & p<\frac{3}{2} \\ 0, & p>\frac{3}{2} \end{cases}$$

$$\therefore D(p) = \begin{cases} (Y_1+Y_2)/p, & p<1 \\ Y_2/p, & 1<p<3/2 \\ 0, & p>3/2 \end{cases}$$

Solving $S(p) = D(p)$

$N = Y_2/p \therefore p = Y_2/N$

in range $1 < \frac{Y_2}{p} < \frac{3}{2}$.

$$\Rightarrow p = \begin{cases} 1, & Y_2 < N \\ Y_2/N, & 2Y_2/3 < N < Y_2 \\ 3/2, & N < 2Y_2/3 \end{cases}$$

Examples in other areas

- Insurance:
  - asymmetry between insurers and individuals drives prices up until nobody can buy insurance.
  - provides an argument in favour of a medicare system where everyone contributes their expected medical expenses.
- Employers not hiring racial minorities
- The economic cost of dishonesty
  - more of a problem in LDCs
  - merchants can recognise quality and thus profit, becoming the first entrepreneurs.
- Credit markets:
  - ridiculously high interest rates to compensate the lender for high default risk

Counteraction

- Institutional guarantees, including educational certification, which transfer risk to the seller
- Brand names give consumers a means of retaliation.