

Experimental Economics

Slides 4

Susana Peralta

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Based in part on course materials by Sandra Maximiano



Outline for today

- ▶ Lemons and Matching Markets
- ▶ Markets with asymmetric information
- ▶ Your experiment & Lab report 2

Main questions for today

- ▶ What happens if consumers cannot observe the quality prior to purchase?
- ▶ If there is imperfect information how can quality be sustained?
- ▶ https://www.youtube.com/watch?v=cYcsFyim_Cs
- ▶ Car dealers know the problems of their cars, but potential buyers don't
- ▶ Sellers may try to swindle unsuspecting buyers
- ▶ Potential buyers aren't stupid... they know that they can't trust the dealers to provide an honest appraisal of their cars

Lemons Market

- ▶ What happens in a market if buyers cannot observe quality?
- ▶ Nobel prize winning economist George Akerlof explains the consequences of quality uncertainty in his famous paper: “The Market for Lemons: Quality Uncertainty and the Market Mechanism.”



George Akerlof

Reservation price

- ▶ An owner's reservation price for an object is the smallest price that the owner would accept for the object
- ▶ For example, if you are a used-car owner you will want to keep your car unless if you are offered at least your reservation price
- ▶ You should be willing to sell to the person who makes you the highest offer that is greater than your reservation price

Asymmetric Information

- ▶ Asymmetric information occurs when traders on one side of the market know things that traders on the other side of the market do not.
- ▶ At first blush, asymmetric information might not seem to be a serious problem for markets.
- ▶ → Usually it would be cheap and easy for traders who know things that others don't know to pass this information on.

Asymmetric Information

- ▶ The problem, given your experiences in real-world markets and in the lab experiment, is that traders who have detailed information may benefit from concealing or misrepresenting this information.
- ▶ Talk is cheap
- ▶ If a buyer offers a higher price to those who say they have good cars than to those who say they have lemons, lemon owners will want to say they have good cars.
- ▶ If buyers don't decide to avoid this market, they end up betting on averages.
- ▶ They'll only pay a price that reflects the average frequency of lemons in the used car market.
- ▶ → a price too high for a lemon, but too low for a car of good quality.

What do sellers do?

- ▶ What is a dealer's strategy given that buyers aren't willing to pay too much?
- ▶ If the dealer has a good car, she is likely not to sell the car.
- ▶ And when sellers of good cars refuse to sell, lemons increase in frequency in the market.
- ▶ Market failure – only lemons remain on the market
There are buyers who want to buy good cars and sellers who have them to sell... but the lack of trust keeps good cars out.

The Market for Lemons – simple model with exogenous quality

There are two types of used cars:

	seller's value	buyer's value
Regular car	\$1,000	\$1,500
Lemon	\$500	\$750

A fraction θ of cars are regular cars.

A fraction $1 - \theta$ are lemons.

Which cars should be traded?

$$1500 > 1000 \quad \text{and} \quad 750 > 500$$

Efficient outcome: all cars should be traded.

What if Buyers Cannot Observe Quality?

Sellers know whether their car is a regular car or a lemon.

Buyers **cannot observe the quality** of the car.

Let μ be the probability that a car offered for sale is a regular car.

The buyer's expected value of a car is:

$$p = \mu(1500) + (1 - \mu)(750)$$

or

$$p = 750 + 750\mu$$

+

A seller will sell if the market price is at least as high as the value of keeping the car.

$$\text{Lemon: } p \geq 500$$

$$\text{Regular car: } p \geq 1000$$

When Do Good Cars Leave the Market?

Lemons are always offered for sale:

$$p = 750 + 750\mu \geq 500.$$

But a regular car is sold only if:

$$750 + 750\mu \geq 1000$$

which implies

$$\mu \geq \frac{1}{3}.$$

Therefore, if there are too few regular cars in the market:

$$\theta < \frac{1}{3}$$

regular-car owners do not sell.

A Simple Model of Quality Choice

A seller chooses the quality of the good, $g \geq 0$.

The buyer's valuation of quality is

$$v(g), \quad v'(g) > 0$$

and the seller's cost of providing quality is

$$c(g), \quad c'(g) > 0.$$

If trade takes place at price p :

$$\pi_B = v(g) - p$$

$$\pi_S = p - c(g)$$

Total surplus is

$$W(g) = v(g) - c(g).$$

Full Information: Efficient Quality

Suppose buyers can observe quality before purchasing.
The efficient quality maximizes total surplus:

$$g^* = \arg \max_g \{v(g) - c(g)\}.$$

For an interior solution:

$$v'(g^*) = c'(g^*)$$

The marginal benefit of additional quality equals its marginal cost.

With observable quality, sellers can be rewarded with a higher price for providing higher quality.

Hidden Quality: The Lemons Problem

Now suppose buyers observe the price p , but cannot observe quality g before purchasing.

Buyers are therefore willing to pay according to expected quality:

$$p \leq E[v(g)].$$

But for a given price, the seller chooses:

$$g^S = \arg \max_g \{p - c(g)\}.$$

Since higher quality is costly but does not increase the price received:

$$g^S = g_{\min}$$

Hidden Quality: The Lemons Problem

Buyers anticipate this:

$$E[g] = g_{\min}$$

and therefore

$$p = v(g_{\min}).$$

Unobservable quality $\rightarrow$ low quality $\rightarrow$ low willingness to pay

Difference between the two models

- ▶ exogenous quality – only lemons remain in the market
- ▶ endogenous quality – sellers choose to sell only low quality goods

How to solve the inefficiency?

- ▶ Can you think about some mechanisms that can avoid this inefficiency?
- ▶ Formal (Standard economics): warranties, return policies
- ▶ Informal (Behavioral economics): social preferences and reciprocity

Adverse Selection:

- ▶ Adverse selection occurs when your trading partners have less favorable characteristics than the population at large.
- ▶ Occurs in a market when buyers or sellers would, on average, be better off trading with someone selected at random from the population than with those who volunteer to trade.

Adverse Selection: Insurance markets

- ▶ The problem of adverse selection also applies to insurance markets:
- ▶ The customers that are most likely to want insurance are the people who face the highest risks, but these are the people that insurance companies would least like to have as customers:
 - ▶ who most want to buy collision insurance for their cars are those who drive a lot and are most likely to have accidents.
 - ▶ who are most eager to buy health insurance are those who have reason to think that they are going to have an expensive illness.
 - ▶ who are most likely to buy life insurance are those who have reason to believe that they are likely to die soon.
 - ▶ who are most eager to buy annuities are those who have reason to believe that they will live for a long time. (An annuity is a promise to pay somebody a fixed amount every year until he or she dies.)

Moral Hazard: Examples

- ▶ Moral hazard is the other information-related cause of market failure
- ▶ it is linked to unobservable behaviour (adverse selection: unobservable characteristics)
- ▶ People who have fire insurance will be less interested in preventing fires than those without fire insurance.
- ▶ People who have insurance against auto theft are likely to take fewer precautions against having their car stolen than people who do not have insurance.
- ▶ People with unemployment insurance may search less intensely for jobs.
- ▶ Workers whose performance is not monitored may shirk.
- ▶ Construction contractors whose work is not closely inspected may do shoddy work, the flaws of which do not become apparent until after they are paid.

Quiz – Question 1

What is the key feature of asymmetric information?

- a) Buyers and sellers have different preferences.
- b) One side of the market has information that the other side does not.
- c) Buyers always know more than sellers.
- d) Prices are not publicly observable.

Quiz – Question 2

Consider our used-car market:

	Seller's value	Buyer's value
Regular car	\$1,000	\$1,500
Lemon	\$500	\$750

Suppose buyers believe that half of the cars offered for sale are regular cars. What is their maximum willingness to pay?

- a) \$750
- b) \$1,000
- c) \$1,125
- d) \$1,500

Quiz – Question 3

In the lemons model, why may good-quality cars disappear from the market?

- a) Buyers value good cars less than sellers.
- b) Good cars become more expensive to produce.
- c) The price buyers are willing to pay may be below the reservation price of good-car sellers.
- d) Sellers of lemons leave the market first.

Quiz – Question 4

Which of the following is an example of **moral hazard** rather than adverse selection?

- a) High-risk drivers are more likely to buy car insurance.
- b) People expecting high medical expenses are more likely to buy health insurance.
- c) A worker exerts less effort because her performance cannot be observed.
- d) Owners of low-quality cars are more willing to sell their cars.