

Asymmetric Information

Main topics



- problems due to asymmetric information
- response to adverse selection
- how ignorance about quality drives out high-quality goods
- price discrimination due to false beliefs about quality
- market power from price ignorance
- problems arising from ignorance when hiring

Problems due to asymmetric information

- if both parties to a transaction have limited info, neither has an advantage
- asymmetric info leads to *opportunism*, whereby informed person benefits at expense of those with less info

Types of opportunistic behavior

- adverse selection
- moral hazard

Adverse selection



- opportunism characterized by
 - an informed person's benefiting trading (contracting) with less informed person
 - who does not know about an *unobserved characteristic* of the informed person
- people who buy life insurance know more about their own health than does the insurance company

Adverse selection market failure

- reduces size of a market (possibly eliminating it)
- example: few older people regardless of their health buy term life insurance because rates are extremely high because of adverse selection

Moral hazard

- opportunism characterized by an informed person taking advantage of a less-informed person through an *unobserved action*
- examples
 - sleazeball sells you swamp land in Florida
 - employee shirks if not monitored by employer



Moral hazard not necessarily harmful

- pregnant women with health insurance make more prenatal doctor visits
- extra cost bad for insurance firms, but society benefits from healthier women and babies



Responses to adverse selection

main methods for solving adverse selection problems are to

- restrict opportunistic behavior
- equalize information

Restrict opportunistic behavior

- universal coverage: provide insurance to all employees of a firm
- thus both healthy and unhealthy people are covered
- firm buys medical insurance at a lower cost per person than workers could obtain on their own (where relatively more unhealthy individuals buy insurance)

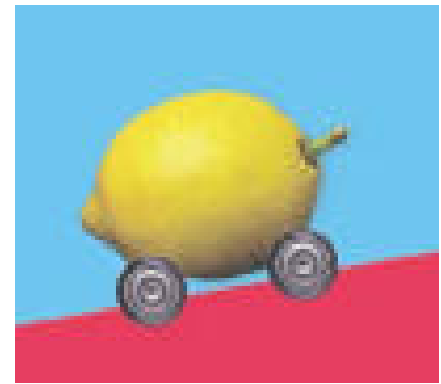
Means of equalizing information

- *screening*
 - action taken by an uninformed person to determine info possessed by informed people
 - buyer test drives many used cars
- *signaling*
 - action taken by an informed person to send information to a less-informed person
 - firm distributes a favorable report on its product by an independent testing agency to prove its quality is high



How ignorance about quality drives out high-quality goods

- buyer cannot judge a product's quality before purchasing it
- low-quality cars – lemons – may drive high quality products out of the market (Akerlof)
- owners of lemons are more likely to sell their cars, leading to adverse selection



Lemons market buyers

- many potential buyers for used cars
- all are willing to pay
 - \$1,000 for a lemon
 - \$2,000 for a good used car



Lemons market sellers

- owners willing to sell up to
 - 1,000 lemons
 - 1,000 good used cars
- reservation price of owners (lowest price at which they'll sell their cars)
 - \$750 for lemons
 - \$1,250 or \$1,750 for good cars



Two possible equilibrium

- all cars sell at average price, \$1,500 (sellers of good cars are implicitly subsidizing sellers of lemons)
- only lemons sell for a price equal to the value that buyers place on lemons (bad drives out good)

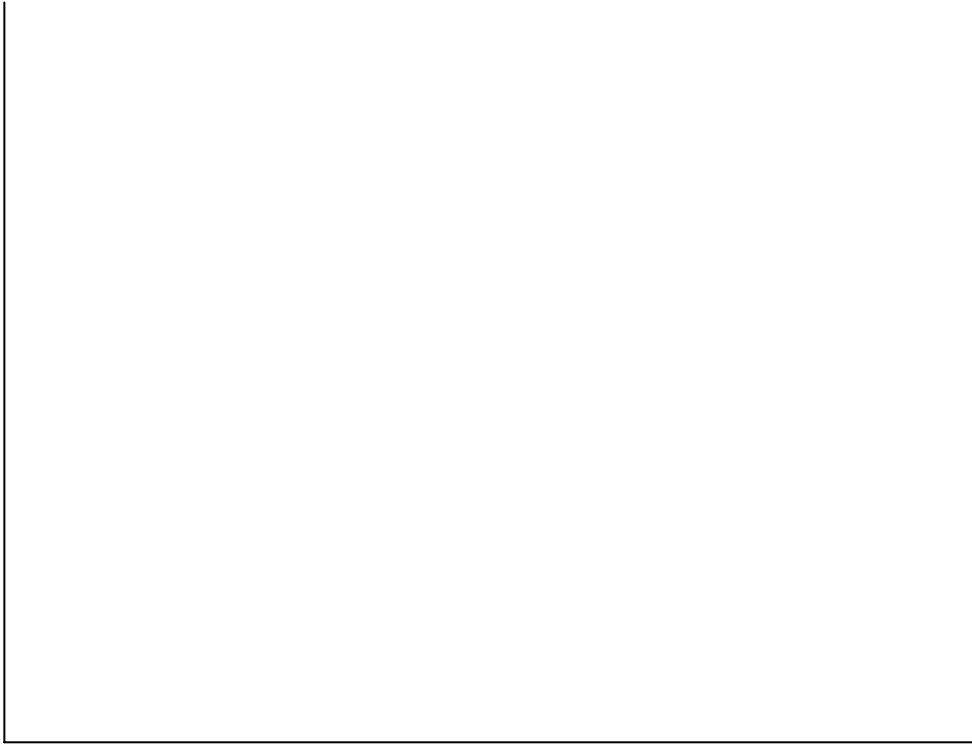
Value to sellers of good cars is \$1,250

- sellers willing to sell their cars at average price (\$1,500)
- equilibrium price \$1,500 in both markets
 - lemons market equilibrium: f , intersection of S^L and D^*
 - good market equilibrium: F , intersection of S^1 and D^*
- asymmetric information does not cause an efficiency problem, but has equity implications

Markets for Lemons



Markets for Good Cars



Value to sellers of good cars is \$1,750

- lemons drive good cars out of market
- buyers know that only cars they can buy at $<$ \$1,750 is a lemon
- lemons sell for \$1,000: e , intersection of S^L and D^L
- equilibrium is inefficient: high quality cars remain in hands of people who value them $<$ than do potential buyers



Lemons market with variable quality

- many firms can vary quality of their products
- if consumers cannot identify quality
 - all goods sell at same price
 - raising your quality raises average price of all firms
 - inadequate incentive to produce high quality
 - social value of raising the quality is greater than the private value

Limiting lemons

- laws to prevent opportunism
- consumer screening
- third-party comparisons
- standards and certification
 - *standard*: metric or scale for evaluating the quality of a particular product (e.g., R-value of insulation)
 - *certification*: report that a particular product meets or exceeds a given standard level
- signaling by firms
 - guarantees and warranties
 - brand name



Price discrimination due to false beliefs about quality

- noisy monopoly
- multiple brand names
 - refrigerators
 - Amana and Kenmore
 - Whirlpool and Kenmore
 - cars
 - Ford Taurus & Mercury Sable
 - Toyota *Camry* & *Lexus* ES 300
 - Dodge Colt, Mitsubishi Mirage, Plymouth Colt, & Eagle Summit
 - Bentley Brookland (\$152,400) & Rolls-Royce Silver Spur III (\$178,200)



Price ignorance \Rightarrow market power

- limited information about price leads to market power
- consumers who do not know that a product can be bought for less elsewhere buy from high-price stores



Tourist-trap model



- many souvenir shops
- guidebook tells distribution of prices
- costs tourist c in time and expenses to visit a shop and check price or buy
- if price = p , costs
 - $p + c$ if tourist buys from first store
 - $p + 2c$ if tourist buys from second store

Is a competitive price charged?

Monopoly price

Problems arising from ignorance when hiring

- asymmetric information creates problems in labor markets
- worker signaling and firm screening may reduce problems



Cheap talk

- *cheap talk*: unsubstantiated claims or statements
- people use cheap talk to distinguish themselves or their attributes at low cost



Education as a signal

- college education could pay because
 - it provides valuable training, or
 - it serves as a signal to employers about worker's ability
- suppose education doesn't provide training
 - it's only a signal



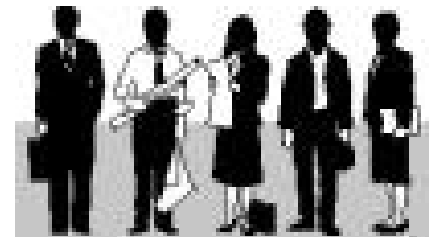
Example

Two types of equilibria

type of equilibrium depends on whether firm can distinguish high-ability workers from others

- pooling equilibrium
- separating equilibrium

Pooling equilibrium



Separating equilibrium



- suppose high-ability workers can get a degree at cost of c to attend college
- low-ability workers cannot graduate from college
- thus, degree is a signal of ability
- outcome is a *separating equilibrium*: one type of people take actions (send a signal) that allow them to be differentiated from other types of people
 - high-ability workers get w_h
 - low-ability workers get w_l

Is separating equilibrium
possible?

Is pooling equilibrium possible?

Solved problem

For what values of θ is a pooling equilibrium possible in general?

Answer

Unique or multiple equilibria

Pooling and Separating Equilibria



Efficiency

in separating equilibrium, high-ability people's education is

- privately useful
- socially wasteful



Everyone may lose in a
separating equilibrium