Information Asymmetry

Vani Borooah
University of Ulster

Hidden Information

One form of information asymmetry occurs when one party to a transaction knows the quality of a good/service and the other party does not

- In health insurance, the purchaser knows his state of health, the insurer does not
- For used cars, the seller knows the quality of the car, the buyer does not
- Job applicants know their quality as workers, the potential employer does not

Adverse Selection

- When information is hidden, we get ***"adverse selection"***
- Adverse selection arises when high-quality products, and high-quality customers, ***are forced out of the market***
- This this entirely due the operation of the market, we regard this non-availability of high-quality products, and high-quality customers, as ***market failure***
- George Akerlof, in his classic paper "The Market for Lemons" explained why this happened

How Does Adverse Selection Happen? Buyers

- If I know that a car being offered to me is a good quality car, I am prepared to pay $\$p_H$
- For a low quality car I am prepared to pay $\$p_L$
- But I do not know whether the car being offered to me is good or bad
- This information is available only to the seller: hence ***information asymmetry***
- But I do know that, on average, a proportion α of cars offered are bad cars
- So, given my lack of information, for the car that is offered to me, I am prepared to pay a price:

➢ $p=(1-\alpha)p_H + \alpha p_L$

How Does Adverse Selection Happen? Sellers

- Sellers know the quality of their cars
- Sellers of good cars will be disappointed by the low price, p, being offered on their cars
- For some sellers of good cars, p is lower than their ***reservation price***
- These sellers will withdraw their cars from the market
- As a consequence, the proportion of bad cars being offered will ***rise*** from α to β
- As a consequence, the price a buyer will be prepared to pay for the car offered will ***fall*** to:

➢ $p=(1-\beta)p_H + \beta\, p_L$

The Process Continues

- This will cause more good cars to be withdrawn from sale
- The proportion of bad cars in the market will rise further
- The price buyers are prepared to pay will fall further
- Finally, there will not be any good cars being offered for sale
- Adverse selection has occurred!!

Signalling to Overcome Adverse Selection

- The seller of high quality products can send a ***signal*** of quality

- Reputation
- Warranties
- Informative Advertising
- Recommendation
- Certification by Professional Associations

Problems with Signalling

- A Signal should be credible
- A signal should separate high and low quality sellers
  - A signal sent by a seller of a high quality product should not also be capable of being sent by the seller of a low quality product
  - A signal should not be too costly for high quality sellers to send

Separating Equilibrium

- Sellers of low quality products find it more costly to send a signal (a warranty on a car) than sellers of high quality products
- If the signal is pitched sufficiently high (a one-year warranty), sellers of low quality products cannot afford to send this signal but sellers of high quality products can
- So the signal (a one year warranty) separates sellers of low and high quality products

Pooling Equilibrium

- If the signal is pitched too low (a one-week warranty), sellers of low quality products can also afford to send the signal
- If the signal is pitched too high (a 5 year warranty) sellers of high quality products cannot afford to send the signal
- So, the signal pools sellers of low and high quality products

Hidden Action

- Very often a “principal” engages an “agent” to do a piece of work
- However, the care and effort with which the agent performs this work is entirely within his control – hence “hidden action”
- The principal cannot observe this care and effort because of asymmetric information
- Consequently, unless he has an incentive to do otherwise, the agent will put in a low level of effort
- This is known as ***moral hazard***

Hidden Action

- A principal engages an agent to act on his behalf and agrees to make a certain payment for this service
- The fact that the action of the agent cannot be observed by the principal, creates the possibility of ***moral hazard*** for the agent
- Moral Hazard means that the agent will be tempted to act “without due care and attention” to the interest of the principal
- He can do this because his ***action is hidden*** from the principal

Contract Design

- Faced with the possibility that the agent will face “moral hazard” the principal has to design the payment contract so as to avoid this
- A contract needs to satisfy two constraints

➢ A ***participation constraint***: the agent must be willing to work for the principal

➢ An ***incentive constraint***: the agent must be willing to work in the best interests of the principal

Moral Hazard in Production

- A land owner produces rice using labour and land and his objective is to maximise rice production
- He employs a worker whose *effort* will influence the output of rice, y
- In addition to effort, output will be affected by rainfall (good or poor)
- A worker’s effort (low or high) is entirely within his control and hidden from the employer

Payoffs from rice example

	Poor rainfall (p=0.5)	Good rainfall (p=0.5)
Low effort (e=0)	$10,000	$20,000
High effort (e=1)	$20,000	$40,000

Fixed wage payment

- The cost of effort is c_0 when effort is low and c_1 when effort is high: $c_0 < c_1$
- Owners offer a fixed wage:
  - $w^* > c_0$ ← participation constraint
- Then the net wage to the worker is:
  - $w^* - c_0$ with low effort
  - $w^* - c_1$ with high effort
- So, the effort supplied is low and the expected rice output is: \$15000 = \$10000×0.5+ \$20000×0.5
- Participation constraint is satisfied ($w^* > c_0$) but incentive constraint is not (e=0)

Incentives

- The worker has an incentive to put in high effort if:

➢ $(w_0+w_1)/2 - c_1 > w_0 - c_0$

➢ $w_1 - w_0 > 2(c_1-c_0)$ ← Incentive constraint

- If the participation and incentive constraints are satisfied the worker will work supplying high effort
- Owner is better off since expected output $30,000

Getting Teachers to Come to School

http://econ-www.mit.edu/faculty/download_pdf.php?id=1238

In the rural areas of developing countries, teacher absence is a widespread problem. This paper tests whether a simple incentive program based on teacher presence can reduce teacher absence, and whether it has the potential to lead to more teaching activities and better learning. In 60 informal one-teacher schools in rural India, randomly chosen out of 120 (the treatment schools), a financial incentive program was initiated to reduce absenteeism. Teachers were given a camera with a tamper-proof date and time function, along with instructions to have one of the children photograph the teacher and other students at the beginning and end of the school day. The time and date stamps on the photographs were used to track teacher attendance. A teacher's salary was a direct function of his attendance. The remaining 60 schools served as comparison schools. The introduction of the program resulted in an immediate decline in teacher absence. The absence rate (measured using unannounced visits both in treatment and comparison schools) changed from an average of 42 percent in the comparison schools to 22 percent in the treatment schools. When the schools were open, teachers were as likely to be teaching in both types of schools, and the number of students present was roughly the same. The program positively affected child achievement levels: a year after the start of the program, test scores in program schools were 0.17 standard deviations higher than in the comparison schools and children were 40 percent more likely to be admitted into regular schools.

Moral Hazard and Corporate Management

- Shareholders, who own companies, wish to maximise share value
- They employ managers and pay them a high, but fixed, salary
- Managers are not interested in maximising share value but in management perks, subject to satisfactory share performance
- So, shareholders (as principals) lose out
- Solution: pay managers in share options

Moral Hazard and Insurance

- The probability of an adverse event can often be influenced by the person insured (the “agent”) taking “due care”
- Consequently, the insurance company (the “principal”) will never offer full insurance because then the person insured has no incentive to take “due care”