Market Failure: Asymmetric Information

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Microeconomic Theory

Lecture 22
Information and Market Transactions

Examples

- Individuals buy and sell goods/services from one another
- Consumers buy goods and services from firms/experts/doctors/lawyers
- Firms buy Factors of Production from consumers

Information Structure

- So far, we assumed the symmetric information structure
  - the interested parties have symmetric and full information about the good or the service
- However, in many cases the information is Asymmetric
  - One party has better information than the other
  - Typically, the seller knows more than the buyer
Akerlof (1970): Consider markets in second hand cars

- Some cars are of good quality
  - an owner values a good car at 200
  - a buyer values a good car at 220
- Other cars are of bad quality (lemons)
  - an owner values a bad car at 100
  - a buyer values a bad car at 110

Question

Suppose the buyer can NOT tell a good car apart from a bad car. She knows only the probability - a car is good car with probability 0.5. How much price she will be willing to pay for a car?
Example:
- There is a population of 10,000 risk-averse people, who face risk of a disease.
- Treatment cost is 100,000
- There are two types of people:
  - 9,000 are ‘Low risk-type’: Probability of falling ill is (1 percent) 0.01
  - 1,000 are ‘High risk-type’: Probability of falling ill is (5 percent) 0.05
- Expected treatment cost for
  - ‘Low risk-type’ is $0.01 \times 100,000 = 1,000$
  - ‘High risk-type’ is $0.05 \times 100,000 = 5,000$
- For each individual the actual treatment cost will be:
  - 100,000 if s/he falls ill
  - 0 if does not fall ill
Asymmetric Information: Adverse Selection II

- Willingness to pay for insurance - the maximum amount an individual is willing to pay to buy complete insurance.

- Suppose, willingness to pay for insurance is
  - ‘Low risk-type’: 1,200
  - ‘High risk-type’: 5,600

- Insurance company is risk-neutral.

- Risk-type is privately known to individuals - insurance company cannot tell

- So, an insurance company will have to charge the same price/premium

- If everybody buys insurance, for the insurance company the average treatment cost is

\[
1,400 = \frac{9}{10} \times 1,000 + \frac{1}{10} \times 5,000
\]
So, the insurance company will charge at least 1,400.

However, Low risk-type will not buy at this rate.

There is market failure. In what sense?

Question

What would be the outcome if there was no informational asymmetry?
Example:

- There is a population of 1,000 car-owning, risk-averse people who also have cell phones. There is a risk of a car accident.
- In case of accident, the cost to the car owner is 10,000.
- The risk of accident is
  - ‘Low’ if cell phone is not used: Probability of accident is (4 percent) 0.04
  - ‘High’ if cell phone is used: Probability of accident is (8 percent) 0.08
- Expected cost of accident to the owner is (Beware! here we are talking about the money cost and NOT the dis-utility of accident costs)
  - ‘Low risk’: 0.04 \times 10,000 = 400
  - ‘High risk’: 0.08 \times 10,000 = 800
- Suppose Benefit from driving is $B$
Asymmetric Information: Moral Hazard II

- Additional, benefit from cell use while driving is 300

- Note the expected (accident) cost from cell phone use is: 
  \[400 = 800 - 400\]

- Willingness to pay for insurance
  - 600 when probability of accident is 0.04
  - 1,200 when probability of accident is 0.08

- Use of cell phone is privately known to individuals - third party cannot tell

- So, an insurance company will have to charge the same price/premium, say \(P\)

- Insurance company is risk-neutral

- Should a driver use cell-phone?
  - If an individual buys insurance, and does not use cell, her payoff is 
    \[B - P\]
If an individual buys insurance, and does use cell, her payoff is

\[ B + 300 - P \]

So, the insurance premium will be at least 800. Why?

Everybody buys insurance at this rate. Why?

If an individual buys insurance, his/her payoff is

\[ B + 300 - 800 = B - 500 \]

If an individual does NOT buy insurance, his/her payoff is \( B - 600 \)

Is there market failure. In what sense?
Question

What would be the outcome if there was no informational asymmetry?

Question

What would be the outcome if benefit from Cell phone use comes down to 100?
Markets make use of the following to mitigate the cost of informational asymmetry:

- Costly signals can be used to screen quality
- Conditional Contracts to elicit information about quality
- Certifying authorities
- Mediating institutions - Placement Cell
Asymmetric Information: A Basis for Discrimination

There are two types of discrimination:

1. Taste-based Discrimination - it is based on observable personal attributes
   - Discrimination based on gender/colour/caste/religion/region

2. Statistical Discrimination - it based on the belief about a subgroup/section of population
   - Discrimination based on observable average values of attributes of a group
   - Statistical discrimination between Men Vs Women; one group Vs another
1. Taste-based Discrimination - Gary Becker argued that:
   - If only employers engage in taste-based discrimination - but consumers do not do so
   - Discriminating firms will loose business and go out of business

2. Statistical Discrimination
   - Costly signals can be used to screen quality
   - Conditional Contracts to elicit information about quality
   - Certifying authorities
   - Mediating institutions - Placement Cell
Other Issues

For a better understanding of markets, you need to know more about

- Monopoly and its regulation
- Monopolistic market and its regulation - Game Theory and Industrial Organizations
- Nature for Firms - Coase (1937)
- Regulation - Adverse selection and Moral Hazard
- Incentive structures in Public Versus Private organizations