
14.01 Principles of Microeconomics, Fall 2007

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December 7, 2007

Lecture 33

Asymmetric Information

Outline

1. Chap 17: *Adverse Selection*
2. Chap 17: *Moral Hazard*

1 Adverse Selection

1.1 Used Car Market

Buyers do not know the quality of each car but know quality distribution.

Assume there are three cars, and their prices are 0, 5, and 10, respectively.

The consumer's willingness to pay is 5, so the seller of 10 will leave the market.

As a result, the consumer's willingness to pay decreases to 2.5; thus the seller of 5 will leave the market.

Finally, the willingness to pay decreases to 0; market fails, and only car stays is the worst one. This is called the Lemon Problem.

1.2 Insurance Market

Insurance companies do not know how healthy each person is.

For instance, the probabilities of getting sick of A and B are shown in Table 1. When one is sick, the insurance company gives him 10 dollars to cover medical expense.

| | Sick | Healthy |
|---|------|---------|
| A | 0.1 | 0.9 |
| B | 0.5 | 0.5 |

Table 1: Probability of Health.

Thus the expected expense for A is 1, and that for B is 5.

Since the company cannot tell who is healthy, it sets a premium of 3.

Those healthy people who are risk-averse enough would accept the \$3 premium; those who are not risk-averse enough would reject the \$3 premium. If

only unhealthy people accept the insurance contract, the insurance company has to adjust the premium to \$5.

Solve this problem by requiring people to do a physical examination before buying insurance – the examination works as a certificate, like credit history for banks.

2 Moral Hazard

Moral hazard occurs when the insured party whose actions are unobserved by the insurer can affect the probability or magnitude of a payment associated with an event. For example, it often occurs in insurance: if my home is insured, I might be less likely to lock my doors or install a security system.

Assume jewelry is worth \$10. The probability to be stolen is 0.5. If the owner spend \$2 to hire a guard, the probability decreases to be 0.1. Because

$$10 \times 0.9 + 0 \times 0.1 - 2 = 7,$$

$$10 \times 0.5 + 0 \times 0.5 = 5,$$

one will hire a guard.

If the owner asks for insurance, and the insurance will pay \$10 if the jewelry is stolen. If the owner hires a guard, the actuarially fair insurance premium is

$$p = 10 \times 0.1 = 1.$$

However, the owner buys the insurance, he will not hire a guard.

If the insurance company only cover \$4.9 when stolen; and the insurance premium is P :

Hiring a guard, the owner's payoff is

$$10 \times 0.9 + 4.9 \times 0.1 - 2 - P = 7.49 - P;$$

not hiring a guard, the owner's payoff is

$$10 \times 0.5 + 4.9 \times 0.5 - P = 7.45 - P.$$

Thus, the owner will hire a guard, and the actuarially fair insurance premium is

$$P = 4.9 \times 0.1 = 0.49.$$