**NRU HSE-2020, Microeconomics Class-15**

# Asymmetric information

**1.** Consider a perfectly competitive insurance company that sells car insurance and offers only full insurance. Let’s for simplicity assume that operation costs are zero. Consider a group of car drivers with the same cars, valued at , and the same initial wealth  (including the value of the car). Assume that all car drivers have the same utility function , but are characterised by different probabilities of accident. Half of drivers have p=1/4 and the remaining drivers have p=1/2.

Find equilibrium under asymmetric information (when each driver knows his/her probability of accident but insurance companies cannot identify the driver’s type) and represent it graphically. Is this equilibrium efficient?

**2.** Consider the market for second-hand gadgets. There are 1000 sellers with good quality gadgets and 2000 sellers with bad quality gadgets and there are 4000 of potential buyers (each buyer is willing to purchase one gadget). A good quality gadget is worth $104 to the seller and $130 to a buyer, while a bad quality one is worth only $80 to the seller and $100 to a buyer. All agents are risk-neutral. Suppose each seller knows the quality of his/her gadget but buyers are not able to distinguish a good one from a bad one. All this information is common knowledge. Each seller can sell the gadget together with a guarantee that costs $5 per year to the quality sellers, and costs $10 per year to the bad ones. Suppose that sellers can choose the duration of the guarantee X (X is any nonnegative number, not necessarily an integer number).

**(a)** Find efficient allocation.

**(b)** Find all separating equilibria both graphically and algebraically. Illustrate the best (Pareto superior) equilibrium graphically. Is it efficient? If not, find the value of deadweight loss.

**3**. Consider a firm that produces output using labour and other factors of production. The firm owner is going to hire a project manager. Unfortunately, the manager does not like to work hard. Manager derives utility from his income () and shirking hours (): . His reservation utility is 80 and working hours cannot exceed 36. The firm’s profit is a declining function of shirking hours: . Note that π stays for a gross profit since manager’s wage was not subtracted.

**(a)** If shirking is observable, find the profit-maximising combination of wage and shirking hours.

**(b)** Find the optimum flat salary scheme.

**(c)** Design a performance-based compensation scheme that results in efficient level of shirking.