

ASYMMETRIC INFORMATION contd.

Problem #1

Are the following statements true or false?

(...)

d) Education is a significant signal for productivity whenever it is equally accessible for all.

Problem #4

Assume there are 3 types of employees: bad ones, medium ones and good ones. Each employee knows his/her type but the firms seeking to employ them are not able to determine the type of an employee at the moment of signing the employment contract. At the same time, each employee has a possibility to take a free test that can specify his/her type and this employee will receive a credible certificate for the potential employers stating his/her type. Employees of which type will take the test? If the employee willing to take the test was to pay for it, how would this influence the decisions of the employees?

Problem #5

Suppose X is a good used for the production of good Y . Firm A holds a license for the production of X , which can be produced at zero costs. Firm B considers purchasing a machine transforming X into Y . After transforming 10000 units of X the machine is no longer usable. However, it cannot be resold. This machine costs 30 000. Firm B is able to sell Y for the price of 5 per unit. Firm A is offering to supply X to firm B for the price of 1, after B has already bought the machine.

- Assume that firms A and B can sign a binding agreement, where they will specify the price of X . Will firm B buy the machine? Find the profits of both firms.
- Assume that it is impossible to sign such an agreement. Is firm A's promise credible? Will firm B buy the machine? Find the profits of both firms. Compare your results with those of point a).

Problem #7 (modified)

The owner of a sugar-cane plantation is planning to employ a new worker. He is considering, how to construct the remuneration system so as to obtain the highest benefits from the employee's work.

The employee's utility function takes the form $U(w, e) = \sqrt{w} - e^2$, where w stands for wage and e – for the effort level. While working he may undertake effort on a high or low level ($e = 2$ or $e = 1$, respectively). If the worker is not hired at this plantation, he can undertake work at a nearby plant. The latter will guarantee him a utility level of $\bar{u} = 2$.

The owner of the plantation does not observe the effort of the worker directly. He observes the revenue from selling the sugar-cane but it depends both on the worker's effort and on random factors. The probability of reaching a certain level of revenue with the given level of effort is presented in the table below (R – revenue):

	$R_1 = 120$	$R_2 = 150$
$e = 1$	2/3	1/3
$e = 2$	1/3	2/3

The owner of the plantation is risk-neutral, i.e. he maximizes the expected value of his profits:
 $E\Pi = p_1(R_1 - w_1) + p_2(R_2 - w_2)$.

- How should the owner of the plantation construct the motivation system so as to induce the employee to work at an effort level $e = 2$? Find the expected profits of the owner.
 - How high should the remuneration of the worker be if the owner does not differentiate the wage depending on the profits level (i.e. he will not care for the employee working at a higher effort level)? Find the expected profits in this case. Is it profitable for the owner to introduce the motivation system from point a)?
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Problem #1

Assume that in a system of lease in exchange for a 20% share in the harvest the marginal cost of cultivation (borne in its entirety by the farmer) is constant and amounts to 10 *złoty* per hour. The relationship between the harvest and the farmer's effort is described by the formula $f(x) = 1000x - x^2/2$. Find the farmer's effort level that is optimal from the point of view of the owner and the one that is optimal for the farmer.