

Question 1. (30%) - Concepts/models

Using economic terminology, explain the following concepts/models in words and give an example for each concept:

a. Opportunity cost.

The value that could have been produced if you would have chosen an alternative way to allocate your resources.

b. The Target income model.

The provider aims at achieving a specific level of income ($\bar{R}$). Where $\bar{R} = Ph$.

If the quantity of health care services by each provider (h) decreases, the providers will compensate by increasing the price (P).

The quantity may decrease as a result of a decrease in the number of patients (n), a decrease in the patients need for health care services (f) or an increase in the number of providers (d), according to the logic of $h = \frac{n \times f}{d}$.

c. Prospective and activity-based reimbursement systems.

Activity based:

- When the activity of the supplier is reflected in “revenues”.

Prospective:

- When the costs of the supplier do not directly determine the revenues. The size of the “prices” is determined before the treatment.

Examples:

Fee for service systems (FFS) where a preset, treatment specific, compensation is distributed to the provider for the health care service.

Diagnosis related group systems (DRG) where a preset, diagnosis specific, compensation is distributed to the provider for the health care service.

1. Further, discuss prospective and activity-based reimbursement systems in terms of risk for the provider (provider risk) and cost containment.

There is a risk for the provider that the cost of the treatment will be higher than the compensation if there are complications in the treatment. The provider will have an incentive to contain costs of the treatment, but there is no incentive to keep the number of treatments down (think FFS).

Question 2. (30%) – Grossman model

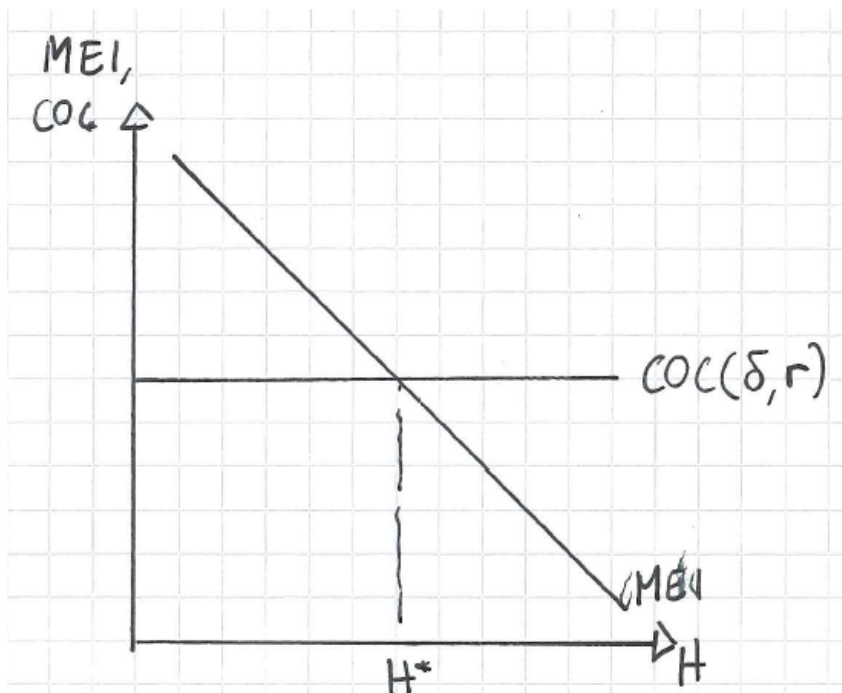
- a. In words, describe how individuals can attain utility from their health state according to the Grossmann model.

I) Consumption motive: $U(H,..)$ – Being healthy makes you happier and gives you more utility than being sick.

II) Investment motive: $U(..,C)$ where $C = F(H)$ – Better health gives more time to work, more income, and more consumption. We also get utility from consumption.

III) Life-length motive: $U(H,C)$ – Utility from being healthy and consuming in more time periods.

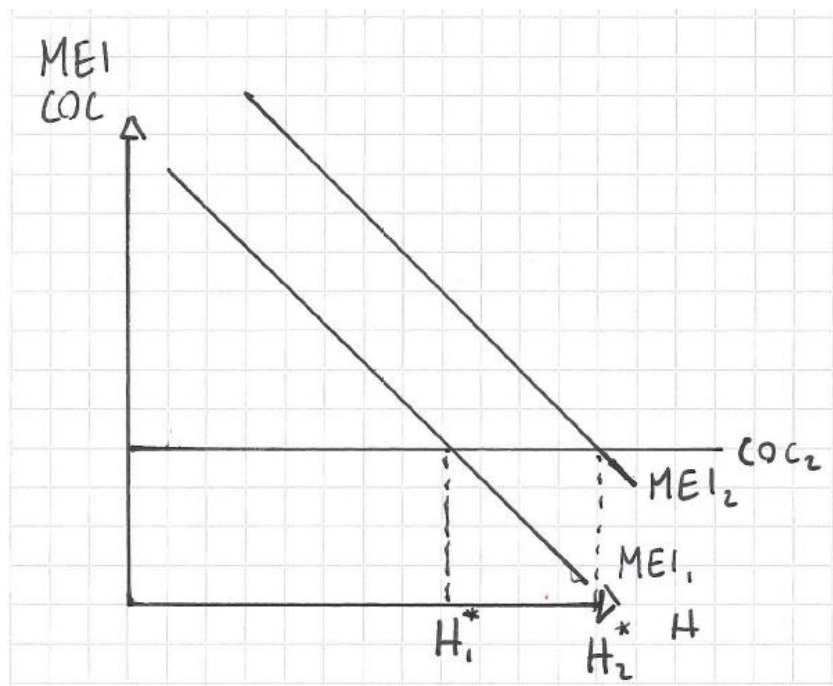
- b. Using the Grossman model, Illustrate (by using a sketch sheet) the individual's desired health stock as a function of the cost of capital and the marginal efficiency of investments.



H^* is the individual's desired health stock.

That is where the Cost of holding Capital (COC) is equal to the Marginal Efficiency of Investment (MEI), i.e., when your return from investing in health is equal to the depreciation and the discount rate.

- c. Assume that the Norwegian Directorate of Health runs an information campaign about a specific fruit with significant health benefits. Assume that this fruit is easily accessible for the public. Illustrate (by using a sketch sheet) and describe how such a campaign is expected to affect the individual's desired health stock.



When a public health authority runs information campaigns about how we could improve our health, the motive is generally to make it easier for people to improve their health. That implies that the investment that we make in our health has a higher efficiency because it results in a larger increase in health stock. This is illustrated by an outward shift of the curve for marginal efficiency of investment, and a higher desired health stock.

Question 3. (40%) – Optimal quality – Probabilistic model

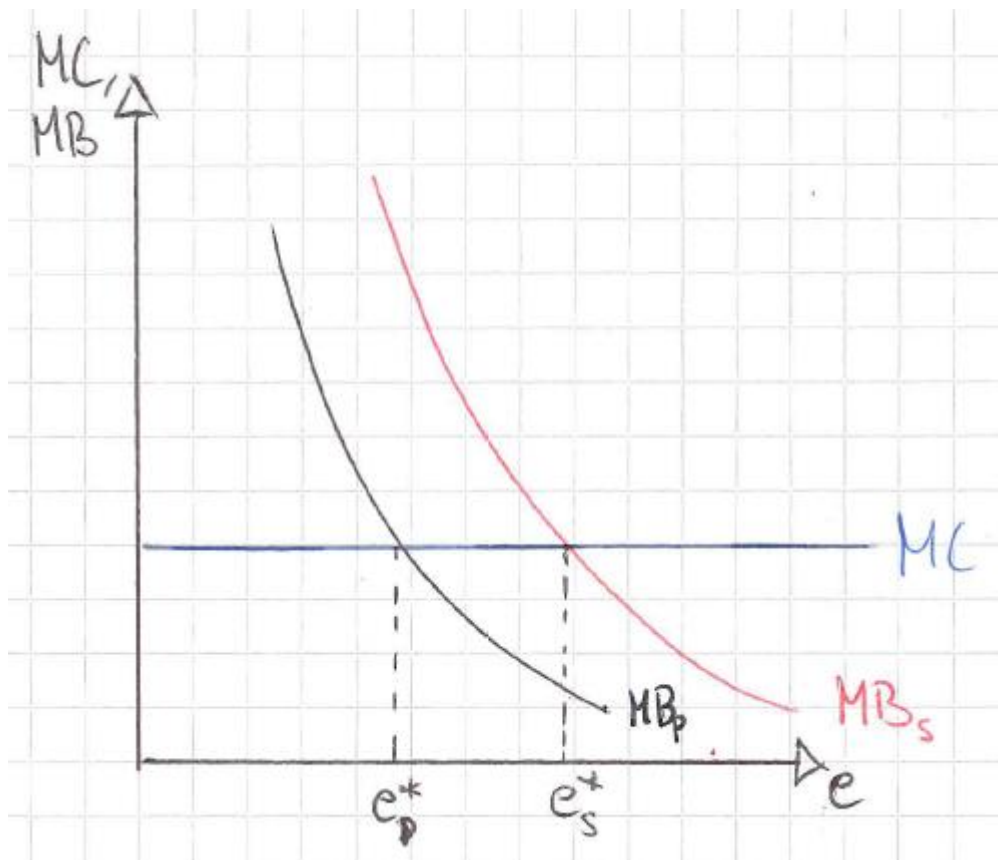
- a. Define the social costs and the provider's cost function of patient harm.

$$SC = C(e) + P(e)D(e)$$

$$PC = C(e) + \alpha P(e)D(e)$$

Where α is between 0 and 1 and denotes the share of the patient harm that the provider internalizes through psychological distress, loss of reputation and time costs.

- b. Illustrate (by using a sketch sheet) the society's and the provider's optimal level of effort to avoid patient harm.



The provider would want to invest less effort to avoid patient harm (e_p^*) than the social optimum (e_s^*).

- c. Discuss why it is not desirable to invest more effort than the socially optimal effort level.

Overinvestment

If the health care provider invests $e > e^*$ in safety efforts she would cause a DWL by

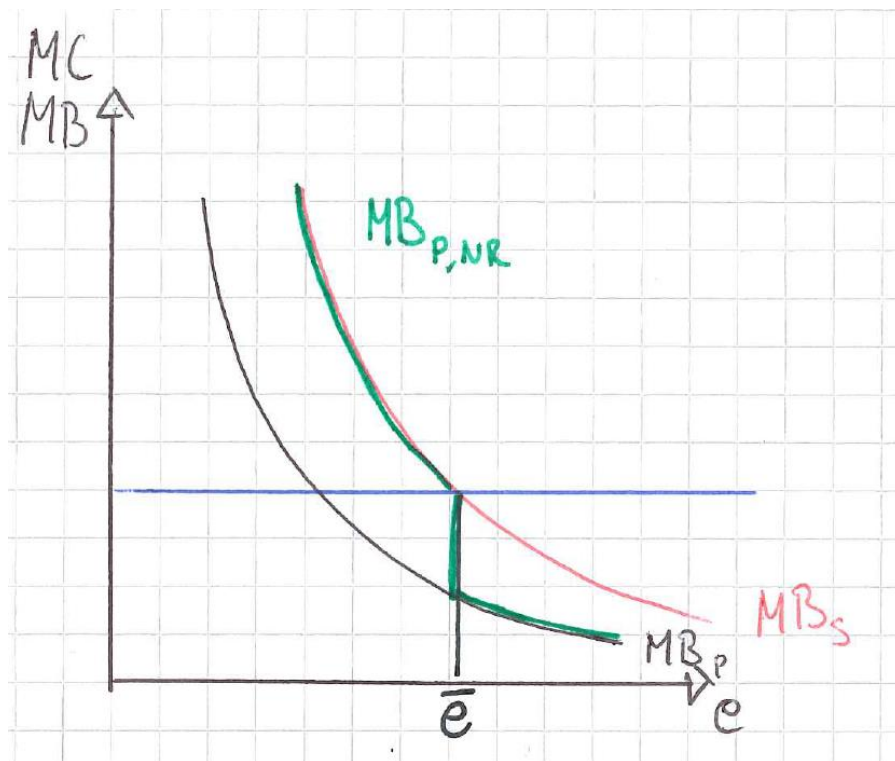
overinvesting in safety measures that are more costly than they prevent costs from patient harm.

- d. Define the optimal fine (i.e. “award”) that providers should pay if they are in the risk of causing patient harm.

$$A^* = [1 - \alpha]P(e)D(e)$$

This means that the award is equal to the part of the patient harm that is not already internalized by the provider.

- e. Illustrate (by using a sketch sheet) the cost function of patient harm for providers that only have to pay the award in case they have provided negligent care.



The provider will only have to pay the award if she put in less effort into prevention of patient harm (e) than the authorities' standard ($\bar{e}$).