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WW FAKULTÄT FÜR
WIRTSCHAFTSWISSENSCHAFT

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Please answer all of the following questions. Do not expect all numerical results to be integers. Please explain all your answers briefly, so that calculations and derivations can be fully accounted for. The use of calculators is permitted in accordance with the regulations of the faculty's examination office. Please, write your answers in English, if you are in our international Program. You may only answer in German, if you are in our German language program.

The exam includes in total 35 points.

Task

The company "Safe your money" is a traditional Greek manufacturer, selling little safes in shops in Greece. Corresponding to the recent development, the company plans to close the shops and start selling their safes via the Internet. But since the owners of "Safe your money" are pretty old, they have no experience with online sales and therefore decide to hire an e-tailer (online retailer).

a.) Give two examples for information deficits a potential e-tailer may face? Explain in 1 Sentence, why this might be a problem. (3 points)

There are three potential e-tailers in the market. It is known that two of the e-tailers will perform well and the company is willing to pay 10,000 € (Euro) for a contract with one of these e-tailers. For the contract with the badly performing e-tailer, the company is only willing to pay 4,000 € (Euro).
According to some market studies, it is known that the well performing e-tailer only accepts contract offers of 8,500€ (Euro) and the bad performing e-tailer accepts contract offers of 3,500€ (Euro).

b.) Show that a market failure exists, if the company cannot distinguish between the good performing and the bad performing e-tailers. Calculate the optimal contract offer. Will they hire a well performing or a badly performing e-tailer? Why is this a market failure? (4 points)

Please find further tasks and information on the next page!

Now suppose that a well performing e-tailer is hired. From market research studies it is known that the demand for safes in Greece depends not only on the sales price **p** but also on the promotion effort **X** of the e-tailer. Additionally, the decision of the International Monetary Fund (IMF) will affect the situation **θ** in the country. The IMF might either decide to support Greece with additional help ($\theta = 1$) or cancel any help ($\theta = 0$). In general, demand follows

$$\mathbf{D(p, X, \theta) = 100 * (X + \theta) - 2p.}$$

"Safe your money" offers two contracts to the e-tailer, one for each of the two possible economic situations. A contract includes a production quantity, a suggested price (that the retailer cannot exceed) and a sales fee, which the e-tailer has to pay to the company.

c.) For both scenarios: First, derive the profit function of the e-tailer. Then find the optimal sales price as well as the optimal promotion effort. Also calculate the e-tailer's demand, if he decides optimally. What is his profit? (10 points)
(Assume that the only cost the e-tailer is faced with is the fee. Assume furthermore that the promotion effort of the retailer can be modeled as a fraction of the sales price.)

d.) According to your findings in c., what are the two optimal contracts for both scenarios? (2 points)
Assume that the company can perfectly observe the e-tailer's decisions and therefore can make sure that he acts as predicted in task c.)

Now suppose that "Safe your Money" can no longer observe the e-tailer's promotion effort.

e.) Check whether the retailer has always an incentive to choose the contract that represents the real economic situation. (5 points)
Hint: Check both scenarios!

f.) Explain, how setting the right fees can induce an honest choice by the e-tailer? What problem may arise? Name the new contract, which is economically more plausible. Briefly explain the term information rent in this context. (6 points)

g.) Calculate the retailer's information rent. Who pays the information rent? (2 points)

h.) Look at the promotion effort in both economic situations. How does this contribute to the so called "Dorfman-Steiner-condition"? (1 point)

i.) Look again at your answer from task f.). Is there a probability distribution over both economic situations so that the company will change the fee in the other contract, if the company wants to maximize its expected profit? (2 points)
Hint: What problem may arise, if the fee in the other contract is changed? Is this problem still important, if the probability of the bad economic situation ($\theta = 0$) is very low?