

Practice problem set 4

Contracts

This problem set constitutes recommended material for the relevant lab. The choice of tasks to be presented instructionally in every lab is in the discretion of the individual teacher. Students are expected to work on practice problems, however, are not required to submit written solutions. It is non-negotiable policy in this course to not provide hand-outs with the solutions of practice problem sets.

1. For some firm, the relationship between managerial effort and the probability of cash flow is shown in the table

Manager's effort	v_H	v_L
e_H	p_H	$1 - p_H$
e_L	p_L	$1 - p_L$

where $e_H > e_L$, $v_H > v_L$ and $p_H > p_L$. Suppose that the manager and the owner of the firm are risk-neutral, the manager's effort is unobservable and the manager's reservation payoff is 0. Cost of effort is $c(e_H) = c > 0$ and $c(e_L) = 0$. The owner wants the manager to exert e_H . The manager receives a positive compensation w only if v_H is realized.

- Calculate the expected total payoff for the manager from accepting the incentive compatible w that the owner will offer.
- Should the manager be offered a different w if his reservation payoff was $\bar{u} > 0$?

Final Examination – 2014

2. "While profit maximization is often taken to be the goal of the firm in standard industrial economics models, this is an unrealistic and misleading view of firm behavior in the real world". Discuss this statement, pointing out reasons why profit maximization is or is not a reasonable hypothesis of firm behavior.

UoL: 2011 za/zb #1a

3. A principal hires an agent to perform a task which will stochastically affect the principal's profit. The agent's effort on this task may be either low or high. The principal is a profit maximizer. Explain what the agent's payment should be contingent on.
- If both *effort* and *profit* are verifiable.
 - If only *effort* is verifiable.
 - If only *profit* is verifiable.

End-module 1 test – October 2016

4. In LA the penalty for an illegally parked vehicle is \$ x and the probability to get a ticket if you park illegally is p . The daily cost for parking at a private parking is \$ c per car and there is always availability. The probability that there is a free of charge parking spot in the street is h . The representative driver will look for free parking and only if none is found will park at a private one. The reservation utility of the representative driver is 2. State and explain the IC condition for the city parking authority if they want to dis-incentivize illegal parking.

End-semester 1 exam – December 2015

5. The profit of a firm can take one of two values, Π_1 and Π_2 , where $\Pi_2 - \Pi_1 > 10$. The firm is run by a manager who chooses between two levels of effort, $e = 1$ (high) and $e = 0$ (low). The manager's utility function is $U = w^{1/2} - e$, where w is her wage. Whether the firm makes Π_1 or Π_2 depends on the manager's effort and on the firm's environment, which is uncertain. In particular, if the manager's effort is high, the profit is Π_2 with probability 0.8 and Π_1 with probability 0.2. If the manager's effort is low, the profit is Π_2 with probability 0.3 and Π_1 with probability 0.7. Before the manager decides on the level of effort, the owners of the firm choose a contract for the manager which specifies the value of w for each of the two possible values of Π . The owners' objective is to maximize expected net profit $E(\Pi - w)$. Given the incentive scheme chosen by the owners, the manager decides whether to take the job and, if she accepts, chooses e to maximize her expected utility $E(U)$. Her reservation wage is $w_0 = 4$. After the manager has made her choice, the profit is observed and the manager gets paid.
- What is the optimal contract if the owners *can* observe the manager's effort?
 - What is the optimal contract if the owners *cannot* observe the manager's effort?
 - Show that the net profit of the owners is lower if the manager's effort is unobservable than if it is observable.

UoL: 2004 zb #2 / 2008 za/zb #2