

Written Exam at the Department of Economics winter 2016-17

Incentives and Organizations

Final Exam

December 20, 2016

(3-hour closed book exam)

Please note that the language used in your exam paper must correspond to the language for which you registered during exam registration.

This exam question consists of 4 pages in total

NB: If you fall ill during the actual examination at Peter Bangsvej, you must contact an invigilator in order to be registered as having fallen ill. Then you submit a blank exam paper and leave the examination. When you arrive home, you must contact your GP and submit a medical report to the Faculty of Social Sciences no later than seven (7) days from the date of the exam.

The exam consists of 4 questions, some of which containing several parts. Please note that, because of differences in the workload needed to answer the different questions, different (parts of the) questions may have different weights in determining your overall exam result. When answering mathematical questions, all steps of your analysis must be comprehensible. When answering non-technical questions, your answers can be short and concise (e.g., using bullet points), but your arguments must be explained sufficiently.

Good Luck!

Question 1: (overall weight = 30%)

- a) What is a "self-enforcing relational contract"?
- b) Describe an empirical regularity that is puzzling from the perspective of the static (one-shot) principal-agent model, but could be explained as the outcome of a relational contract.
- c) The presence of future rents is important to prevent shirking in relational contracts. Provide two examples of what may give rise to such rents in employer-employee relationships.
- d) Discuss the following statement:
"To successfully establish relational contracts, it is crucial that the relationship has an infinite duration (i.e., that the contracting parties play an infinitely repeated game)."
Do you agree with the statement? Why / why not?
- e) Why is difficult to demonstrate empirically that relational contacting is the driving force behind individuals' behavior in an employer-employee relationship or other organizational settings?

Question 2: (35%)

Consider the following rank-order tournament with two risk-neutral agents ($i = A, B$) who produce output y_i by individually and independently exerting effort e_i .

The output produced by agent i is the sum of the agent's effort and an idiosyncratic noise term, ε_i :

$$y_i = e_i + \varepsilon_i$$

Assume that $\varepsilon_A, \varepsilon_B$ are drawn independently from a uniform distribution $\varepsilon_i \sim U[-q, q]$ with $q=5$.

Agents A, B are rewarded based on the following rank-order "tournament" reward scheme:

$$w_A = \begin{cases} W = 25 & \text{if } y_A > y_B \\ w = 15 & \text{if } y_A < y_B \end{cases}$$
$$w_B = \begin{cases} w = 15 & \text{if } y_A > y_B \\ W = 25 & \text{if } y_A < y_B \end{cases}$$

That is, the agent who produces more output than the other agent receives a "winner prize" of $W=25$, whereas the agent with the lower output receives a "loser prize" of $w=15$. (For sake of completeness, assume that prizes are awarded randomly in case of a tie, i.e., if $y_A = y_B$)

Both agents are risk-neutral and maximize a utility function of the following form:

$$u_i = E[w_i] - C(e_i),$$

where $E[w_i]$ is the expected reward received by agent i , and

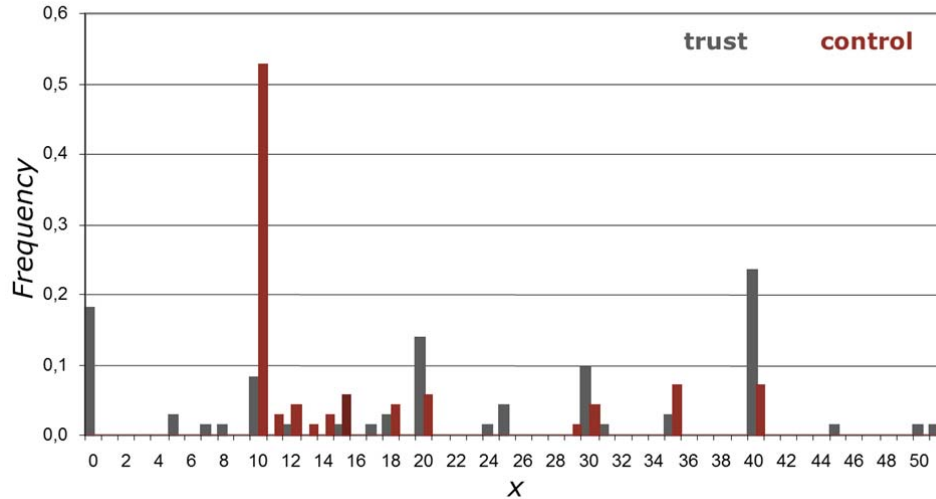
$$C(e_i) = \frac{1}{10}e_i^2$$

is agent i 's effort-cost function.

- a) Write down the agents' maximization problem and derive the first-order conditions for agents A and B.
- b) Solve for the symmetric equilibrium in pure strategies (i.e., assume that $e_A = e_B = e^*$ in equilibrium and solve for e^*).
 - Note: Remember that $g(0) = \frac{1}{Z}$ for a symmetric triangular distribution with density g and support $[-Z, Z]$.
- c) How does the agents' effort in the symmetric equilibrium change if $q = 4$ instead of $q = 5$? What is the intuition behind this result?
- d) What are practical advantages and potential problems of rank-order tournaments in organizations, compared to compensation systems that rely on individual performance pay (e.g., piece rates)? Describe at least 2 advantages and 2 potential problems.

Question 3 (25%):

Consider the following figure, taken from the paper "The Hidden Costs of Control" by Armin Falk and Michael Kosfeld (2006 AER).



- What is the research question of the paper?
- Sketch the design of the experiment from which the figure above was taken. How does this experiment allow the authors to answer their research question (i.e., what is the authors' identification strategy)?
 - Note:* restrict your discussion to the key qualitative / strategic features of the basic game and to the experimental procedures that are crucial for understanding the paper's main results. You don't need to summarize the detailed parameter values of the experiment.
- What is depicted in the figure? Based on these findings, what is the answer to the research question from part a)?
- Summarize the behavior of principals in the experiment. Do the results indicate that some of them behave in an irrational manner?

Question 4: (10%)

Consider the following statement by Bengt Holmström, taken from an interview that he gave briefly after he had been announced as winner of the 2016 Nobel Prize in Economics:

"So the issue of motivation is hugely broader than just asking [...] how should people get the CEO to behave in a particular way, and financial monetary incentives are in some sense too effective often. They are very powerful in sending signals as well as, of course, rewarding financially. And so one has to be very careful in their use."

What could Holmström mean with the statement that monetary incentives can be "too effective"? Provide two examples where we have seen that this can be the case. Explain.