Written Exam at the Department of Economics summer 2021

Incentives and Organizations

Final Exam

18 June 2021

(3-hour closed book exam)

Answers only in English.

This exam question consists of 5 pages in total

Falling ill during the exam
If you fall ill during an examination at Peter Bangsvej, you must:
- submit a blank exam paper.
- leave the examination.
- contact your GP and submit a medical report to the Faculty of Social Sciences no later than five (5) days from the date of the exam.

Be careful not to cheat at exams!
You cheat at an exam, if during the exam, you:
- Make use of exam aids that are not allowed
- Communicate with or otherwise receive help from other people
- Copy other people's texts without making use of quotation marks and source referencing, so that it may appear to be your own text
- Use the ideas or thoughts of others without making use of source referencing, so it may appear to be your own idea or your thoughts
- Or if you otherwise violate the rules that apply to the exam

The exam consists of four questions, which in turn consist of several parts. Please note that, because of differences in the workload needed to answer the different questions, different questions may have different weights in determining your overall exam result. Your answers can be short and concise, but your arguments must be explained sufficiently in your own words. Whenever relevant write the general formula and explain what you do in each step. The numerical answer alone is not sufficient.

Good Luck!

Question 1

Consider the following principal-agent model with one principal, P, and a risk-neutral agent, A. The output produced by the agent is determined by her effort devoted to two different task, e_1 and e_2, and the technology of production can be characterized by the following function:

$$y = e_1 + 2e_2 + \epsilon.$$

The principal cannot observe the output y, but only a performance measure x and it is therefore possible to base the agent's compensation only on x, but not on y. The technology of the performance measure is given by:

$$x = 2e_1 + e_2 + \vartheta.$$

ϵ and ϑ are exogenous noise terms drawn from two independent normal distributions with mean 0 and variance $\sigma_\epsilon > 0$, respectively $\sigma_\vartheta > 0$.

The agent is paid according to a linear incentive contract such that her income is $w = s + bx$. Exerting effort levels e_1 and e_2 cause effort costs $C(e_1, e_2) = \frac{1}{2} e_1^2 + \frac{1}{2} e_2^2$. The agent's utility is given by $u(w, e_1, e_2) = w - C(e_1, e_2)$. Suppose that her utility from an outside option is 0. The principal is risk neutral and maximizes her expected profit $E(\pi) = y - w(x)$.

a) What is A's optimal effort choice e_1^* and e_2^* for a given s and b?

b) Which condition needs to be fulfilled for the agent to be willing to accept a contract offer with salary s and commission rate b?

c) Derive the optimal commission rate b^* that P should offer to the agent to maximize P's profit.

d) Show whether the optimal incentive contract from part b) elicits the socially optimal (i.e., "first-best") level and distribution of effort.

e) Explain intuitively why or why not the equilibrium solution characterizes the social optimum. You can use your answers to parts a) – d) to illustrate your response (but you are also encouraged to respond if you have not answered all of the above questions).

Question 2

During the course, we discussed two phenomena, which are observationally equivalent in many situation: (i) reciprocity-based cooperation and (ii) relational contracting.

a) Explain both concepts. Describe the underlying assumptions for each concept as well as similarities and differences.

b) How can we disentangle the two phenomena empirically? *Note: for your discussion you can rely on the following figure taken from the paper "Relational Contracts and the Nature of Market Interactions" by M. Brown, A. Falk and E. Fehr (Econometrica, 2004).*

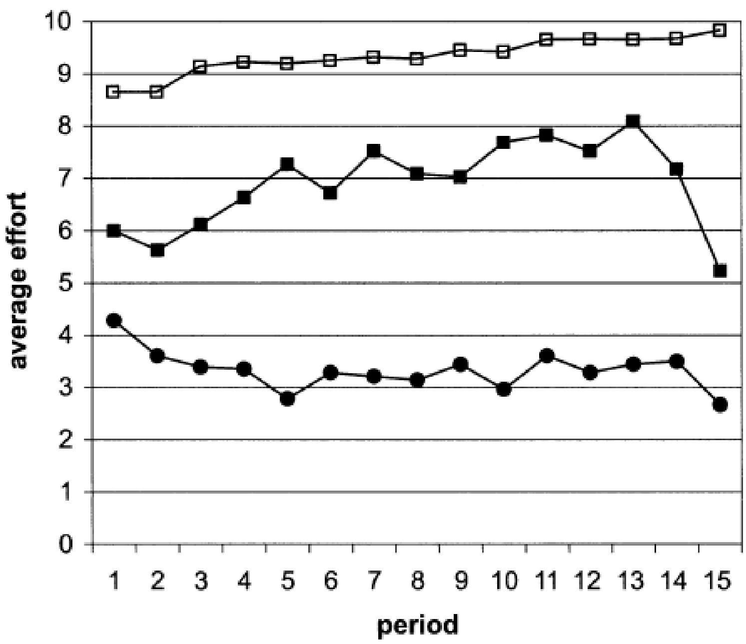


FIGURE 5.—Evolution of average effort over time (C; ICF; ICR).

c) The presence of future rents is important to establish relational contracts. Provide two examples of sources of such rents in employer-employee relationships in the real labor market.

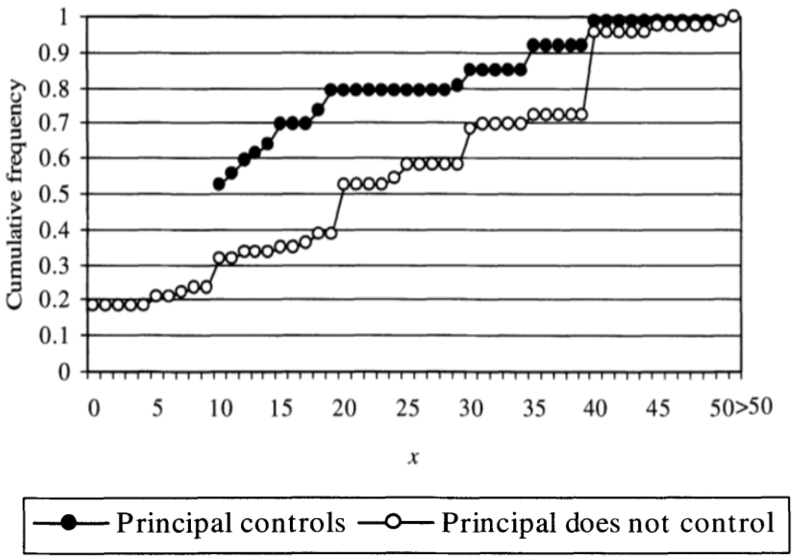
d) Consider the following statement: *"The fact that many workers receive fixed hourly wages without explicit performance incentives shows that self-enforcing relational contracts are widespread and allow maintaining high levels of cooperation." Do you agree? Why / why not?*

Question 3

Consider the paper "The Hidden Costs of Control" by A. Falk and M. Koesfeld (AER, 2006).

a) Explain how the authors analyze the consequences of the principal's decision to control on the agent's motivation. *Note: focus on the key aspects of the basic experiment that are crucial for understanding the paper's main results.*

b) What is depicted in the following figure that is taken from the paper? What conclusion can be drawn based on these findings?



c) Consider the following statement: *"Given the findings of the paper it becomes evident that trusting your employees is always beneficial for employers as it increases workers' motivation".* Do you agree? Why / why not?

Question 4

Consider the study “Performance Pay and Productivity“ by Lazear (AER, 2000).

He makes the following claim regarding the implications of his results: *“Some conclusions are unambiguous. Workers respond to prices just as economic theory predicts. Claims by sociologists [e.g. Deci (1971)] and others that monetizing incentives may actually reduce output are unambiguously refuted by the data. Not only do the effects back up economic predictions, but the effects are extremely large and precisely in line with theory.”*

Discuss whether and why you do / do not agree with this statement. Base your discussion on Lazear’s findings and at least three empirical examples discussed throughout the course.

References

Brown, M., A. Falk, and E. Fehr (2004): “Relational Contracts and the Nature of Market Interactions,” Econometrica, 72, 747-780.

Deci, E. L. (1971): “Effects of Externally Mediated Rewards on Intrinsic Motivation”, Journal of Personality and Social Psychology, 18, 105-115.

Falk, A and M. Kosfeld (2006): “The Hidden Cost of Control”, American Economic Review, 96, 1611-1630.

Lazear, E. (2000): “Performance Pay and Productivity”, American Economic Review, 90(5), 1346-1361.