

Written Exam at the Department of Economics winter 2018-19

Incentives and Organizations

Final Exam

18 January 2019

(3-hour closed book exam)

Answers only in English.

This exam question consists of 4 pages in total, including this page.

NB: If you fall ill during an examination at Peter Bangs Vej, you must contact an invigilator who will show you how to register and submit a blank exam paper. Then you 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.

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 4 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. 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%)

Consider the following principal-agent model with one principal, P , and a risk-neutral agent, A . The agent chooses an effort level, $e \geq 0$. The output produced by the agent, y , is the sum of the agent's effort and an exogenous noise term, ε :

$$y = e + \varepsilon.$$

ε is drawn from a normal distribution with mean 0 and variance $\sigma^2 > 0$. Exerting effort level e causes effort costs $C(e) = \frac{1}{4}c e^2$.

The agent is paid according to a linear incentive contract such that her income is $w = s + by$. Her utility is given by $u(w, e) = w - C(e)$. Finally, suppose that her utility from an outside option is 0.

The principal P is risk neutral and maximizes her expected profit, $E(\pi) = E(y - w) = e - s - be$

- a) What is A 's optimal effort choice e^* for a given s and b ?
- b) Derive the parameters of the optimal incentive pay contract b^* and s^* that P should offer to the agent to maximize P 's profit.
- c) Show that the optimal incentive contract from part b) elicits the socially optimal (i.e., "first-best") level of effort.
- d) Assume now that the principal interacts with another agent, agent B , who is risk averse. Explain why the optimal linear incentive contract in this case is generally not "first-best" anymore (i.e., the optimal contract for a risk-averse agent does not elicit the socially optimal level of effort).

NOTE: You don't need to derive the optimal contract formally. Explain verbally, building your arguments on the "incentive-insurance trade-off".

Question 2 (weight = 35%)

The following questions are based on the study “Performance Pay and Multidimensional Sorting: Productivity, Preferences, and Gender” by Dohmen and Falk (2011).

- a) Explain briefly what “worker sorting” and the selection effects of compensation schemes mean.
- b) How do Dohmen and Falk test for sorting effects in their study?

NOTE: Describe the setup and the authors’ empirical strategy to identify sorting effects. Restrict your attention to the “Piece Rate Treatment” and focus on the key aspects of their design that allow them to test for sorting effects.

- c) Discuss the role of productivity and preferences in employee sorting, using the following estimation table:
 - Sketch briefly (!) how the authors measure individuals’ productivity and the different preferences/attitudes.
 - Explain the effects presented in the table and discuss whether they are in line / in conflict with the predictions of the standard principal-agent model.

Table: Determinants of Sorting

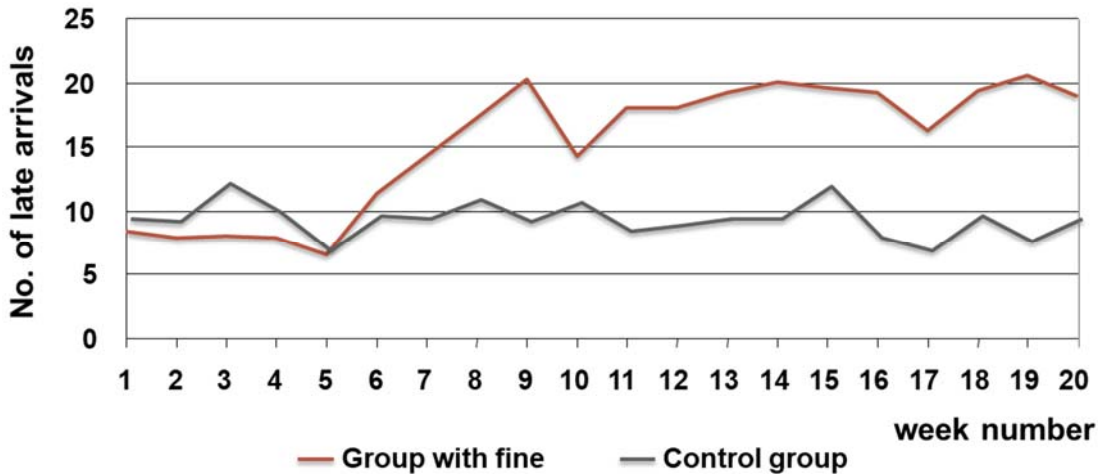
Dependent variable	1 if piece rate (1)
Productivity indicator 3	0.044*** [0.009]
Risk attitude	0.053*** [0.015]
Relative self-assessment	0.003 [0.015]
Trust (amount sent)	0.002* [0.001]
Reciprocity	0.006 [0.041]
1 if female	0.029 [0.121]
Pseudo R ²	0.410
Observations	120

Notes: Probit estimates. Marginal effects (evaluated at the mean of independent variables) reported; * significant at 10%; ** significant at 5%; *** significant at 1%. Robust standard errors clustered for sessions are reported in brackets below the marginal effects estimates. The smaller the value of the self-assessment variable is, the more productive a subject thinks he is relative to others.

- d) Are women more or less likely than men to choose the performance-dependent piece-rate scheme in Dohmen and Falk’s experiment? Substantiate your response using the table from part c) as well as further evidence discussed in the paper.
- e) Why is it important for firms to consider sorting effects when designing their compensation schemes? Please explain.

Question 3 (weight = 20%)

Consider the following figure, which is based on the study “A Fine is a Price” by Gneezy and Rustichini (2000).



- a) In the paper, the authors study how fines for coming late in child care centers affect parents' behavior. Discuss in detail how the authors test for the impact on fines (i.e., describe their empirical strategy).
- b) What should the effect of the fine be according to standard economic arguments? Please also explain *why* there should be an effect / no effect.
- c) Are the findings in line with the idea that extrinsic incentives crowd out of intrinsic motivation? Explain what parts of the findings are consistent with the crowding-out hypothesis, and how Gneezy and Rustichini's findings have contributed to earlier findings in the psychology literature.
- d) Are there also potential other explanations for the observed effects? Discuss at least 1 alternative explanation that is consistent with the empirical results depicted in the figure.

Question 4 (weight = 15%)

- a) Give (at least) one reason for, and one against, strong performance-related incentives. Explain using theories and empirical findings learned in the course.
- b) Give (at least) two distinct reasons why workers may exert more than the minimum required / contractually enforceable effort.