

Problem 1 (20%)

Consider the following model: A worker chooses effort, e . By exerting effort, the worker produces a product in quantity $y = e + a$. The principal earns profit $\pi = py - W$, where p is the price on output, and W is the wage paid to workers. We first consider two cases. (i) The principal observes output and pays wages $W = by + B$, where b and B are chosen by the principal. The worker is maximizing $u = W - c(e) = W - \frac{1}{2}e^2$. (ii) The worker owns the firm and maximizes $\pi + u = py - W + W - \frac{1}{2}e^2$.

- a) Show that in (i) the worker will choose effort $e = b$. What would be the worker's optimal effort in case (ii)?

The worker has an outside option which gives utility u_0 . Take for granted that to ensure that the worker gets this utility, the principal must, for a given b , choose $B = u_0 - \frac{1}{2}b^2 - b(b + a)$.

- b) Show that the profit maximizing choice for the principal is to choose $b = p$.
c) Wage contracts of the form above, with a piece rate such as the by term, are rather uncommon. The model above is simple. Discuss elements that would make the model more realistic, and that can explain why firms don't use more piece rates.

Problem 2. (60%; a:20% + b:40%) (Note: There is no need to write a full essay.)

The enclosed paper is from the curriculum. Note: You can refer to tables and figures from the papers without copying them into your own text. Enclosed paper: Andreas Born, Eva Ranehill, Anna Sandberg, 2018, "A man's world? – The impact of a male dominated environment on female leadership"

- a) Explain briefly the basic experimental design and main results of the experiment.
b) In the introduction the authors motivate their study by pointing out that "A large literature shows that women are persistently underrepresented in leading positions." Discuss the extent to which you think the study contributes to explaining this observation. Discuss also to what extent other papers in the curriculum can provide alternative explanations.

Problem 3. (20%)

One paper in the curriculum studies the effect of offering an award for the best effort, when the award is announced before the work starts (Kosfeld, M., & Neckermann, S. (2011). Getting more work for nothing? Symbolic awards and worker performance. *American Economic Journal: Microeconomics*, 3(3), 86-99. **The paper is not enclosed.**) The paper concludes that "The contribution of this paper is to show that status and social recognition alone can be strong motivators for agents to increase their effort in the presence of awards."

- a) Describe shortly the basic design of their experiment, and the main results.
b) To what extent do you think that the study supports the conclusion stated above?