

Games and Information

Problems Sets

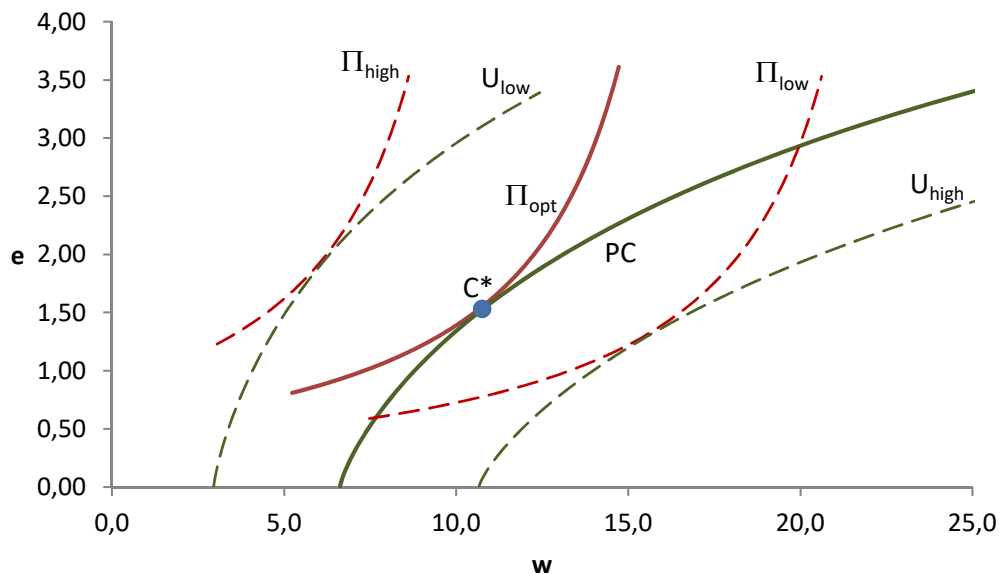
Summer Semester 2025

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Problem Set 4

Exercise 6

The picture below shows isoquants, i.e. level curves of the agent's and the principal's objective function, for some selected levels.

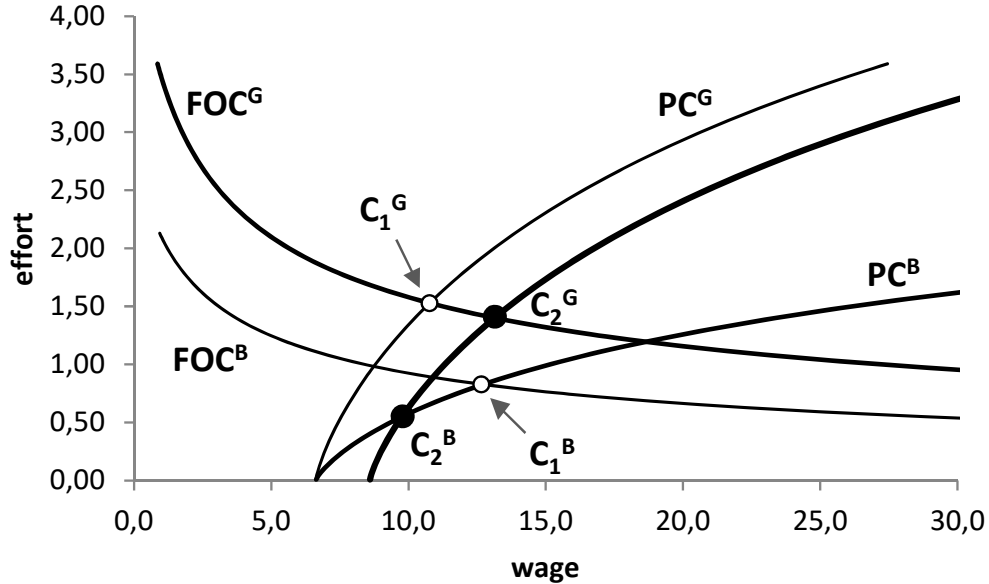


- (1) Recall the objective function (utility) of the agent. Pick any of the levels of utility U depicted in the graph and identify the domain (area) of contracts with utility larger than U and the one with utility smaller than U .
- (2) Recall the objective function (profit) of the principal. Pick any of the levels of profit Π depicted in the graph and identify the domain (area) of contracts with profit larger than Π and the one with profit smaller than Π .
- (3) Add a rough sketch of the (FOC) to the picture.
- (4) Convince yourself by inspection of the picture, that the first order condition of the problem identifies the contracts such that you cannot increase profits without decreasing utility, nor can you increase utility without decreasing profit. Do you know the terms in your repertoire of microeconomic concepts which correspond to the curve of the first order condition (FOC)?

Exercise 7

Consider the following picture of two menus of contracts a principal may offer to two types of agents

$$\mathcal{M}_1 = (C_1^G, C_1^B), \quad \mathcal{M}_2 = (C_2^G, C_2^B)$$



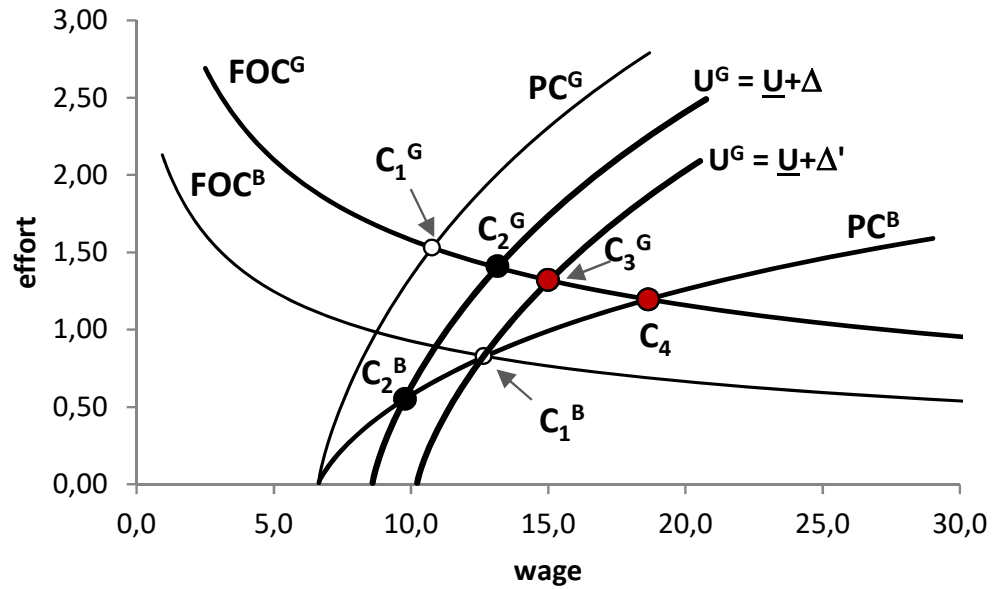
Recall, that for any given contract the expected profit of the principal does not depend on the type of agent.

- (1) Does a shift from C_1^G to C_2^G increase or decrease the principal's profit or the agent's utility if the principal hires any type of agent?
- (2) Does a shift from C_1^B to C_2^B increase or decrease the principal's profit or the agent's utility if the principal hires a bad agent?
- (3) What will be the choice of agents when the menu \mathcal{M}_1 is offered to the agents or \mathcal{M}_2 ? Which menu is pooling which is (weakly) separating?
- (4) Keep the choice of the agents in mind and check what a shift from menu \mathcal{M}_1 to \mathcal{M}_2 implies for the utility of agents and the efficiency of contracts.

Exercise 8

In the following picture we add more menus of contracts. \mathcal{M}_4 is a "menu" that leaves the agents no choice.

$$\begin{aligned}\mathcal{M}_1 &= (C_1^G, C_1^B), & \mathcal{M}_3 &= (C_2^G, C_2^B) \\ \mathcal{M}_3 &= (C_3^G, C_1^B), & \mathcal{M}_4 &= (C_4)\end{aligned}$$



- (1) Compare \mathcal{M}_2 and \mathcal{M}_3 . Is \mathcal{M}_3 separating? Which contract yields higher expected profit (keeping in mind the preference of the agents).
- (2) Compare \mathcal{M}_3 and \mathcal{M}_4 .