

Variable Pay (Piece Rates)

1. A firm wishes to establish a wage

$$w = a + bE,$$

where E is worker effort and a and b are to be chosen by the firm. The worker maximizes utility given by

$$U = w - 2E^2 \quad (\text{which is to say the worker's cost of effort is } 2E^2.)$$

Each unit of effort generates 6 units of output which can be sold for \$2 per unit. Assume the workers' utility must be at least 0 for him to be willing to accept the job.

- a. Calculate the workers choice of effort E^* and the profit-maximizing values of a and b .
- b. Calculate the firm's profit, given this optimal wage schedule.
- c. On the same graph, plot the line that represents the firm's wage offers as a function of effort, $a^* + b^*E$, and plot the worker's cost of effort $C(E)$ as a function of effort.
- d. Calculate the numeric value of workers utility at different effort levels of effort: E^* , E^*-1 , and E^*+1 .
- e. Suppose the firm chooses the a^* you calculated above, but chooses $b=2$. What is its profit? (Hint: Draw a picture.)