

Sample Problems to Accompany Chapters 7-9
Economics 136 – Human Resources
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- 1) State 4 cases in which it might make sense for your firm to “raid” workers from another firm.
- 2) Let $PV(A_t)$ be the present value of an employee’s best alternative job, $PV(W_t)$ be the present value of wages to be paid by your firm to this worker up to retirement, $PV(V_t)$ be the present value of the worker’s output at your firm up to retirement, and B be the present value of a buyout offer you make to the employee. Prove that the only way that the buyout offer will be in the interests of both the employee and the firm is if $PV(A_t) > PV(V_t)$.

3) You are trying to set up the salary scale at your firm where there are two levels of jobs, workers and bosses. All individuals at the firm produce the same thing, coal, and the two jobs are merely set up for reasons of motivation. It is very difficult to count or weigh coal, but when stacked up, it is easy to see which worker’s output fills a larger truck. Coal sells for \$5.00 per pound and is produced as follows:

$$q = m + e$$

where q is the number of pounds of coal, m is effort, and e is a luck factor, reflecting the hardness of the shaft that was mined on a particular day, and other factors over which the worker has no control.

You are told that if a worker is required to work at an effort level that produces 1 lb. of coal per period he must be paid \$1 to work or he will resign. If he must produce 2 lbs. he must be paid \$4, for 3 lbs. \$9, for 4 lbs. \$16 etc. There are two workers, j and k . Each worker experiences luck, e_j and e_k , respectively. $x = e_k - e_j$ takes on values between $-\frac{1}{2}$ and $\frac{1}{2}$ with a uniform probability distribution.

- a) Suppose that you announce that both workers will receive \$10 in period 1, but that at the end of the period the worker with the larger pile of coal will be promoted to boss for period 2. If a worker receives \$10 in period 2 and a boss receives \$20 during the period that he is boss, what is the expected output of coal per worker in period 1? (Show your work.)
- b) What is the expected profit level in a)?
- c) If bosses receive \$30 and workers receive \$10 what would happen to total production at the firm in period 1? What would expected profits be?
- d) What about expected output and profits if bosses earned \$9 and workers \$3?

4) List two potential advantages of tournaments over piece rates, and two potential disadvantages.