

Final Examination, Organizational Economics, BEM/Ec 146
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Fall 2004

Work alone. Spend no more than eight hours on this exam. This is an open-book/notes exam. Any materials handed out or available on the class website, or lecture notes from this term of your own or from other students, can be consulted throughout the exam. No other materials may be consulted.

Read and think before you write! Limit your answers to the amount of space suggested (this gives you a strong hint, as well, about the amount of depth that is expected in your answer). Please type; if you do, use 1.5 line spacing and 12-point font.

The exam is due at noon on the 8th of January; you can email it or hand it in to my mailbox in the 1st floor of Baxter, or to Karen Kerbs on 332 Baxter (feel free to thank Karen for being helpful in administering the class).

Thanks for your engagement and patience w/ erratic distribution of text materials in lieu of a real textbook.

1. (10 points each part, 1 page total) Insurance contracts usually have deductibles and/or copayment. A deductible is a prearranged dollar amount, say \$500 for car insurance, which is deducted from the amount the insurance company pays to reimburse you for cost of an accident. A copayment is a percentage, say 20% for medical coverage, of the costs the insured person must pay (insurance pays the rest, 80% in this example).

(i) Explain how deductibles and copayment might help alleviate problems arising from contracting for insurance under private information.

(ii) Deductibles are common in car insurance, and copayment is common in medical insurance. Why do you think the two features are differentially common in different types of insurance?

2. (15 points, 1 page total) Agricultural workers are often paid piece rates—that is, all or most of their earnings are determined by a fixed rate times some measured output. For example, pear pickers are paid a fixed amount for each box of pears they pick. But “tree thinners” are paid on an hourly basis. Tree thinners pick excess fruit from the pear trees so that the fruit which remains can grow larger (because each piece of fruit must be about six inches apart in order to grow large). Why are tree thinners paid by the hour, rather than by the box of “thinned” (discarded) fruit or by the tree?

3. (5 points each part, 1 page total) Consider two general types of sports teams, high- low-cooperation (denoted H and L). An H team is one in which the team performance is determined by some kind of cooperative or complementary interaction among players, rather than just the sum of individual performances. An L team is the opposite; an L team's performance is closely related to the sum of individual performances. Among major American professional sports, the best examples of H and L teams might be football (or soccer) (H) and baseball (L). (Other sports are very much L-team, like amateur bowling leagues and some golf tournaments, in which k players' scores are added up to form the team score.)

Assume teams pay workers their marginal revenue product, and that firms design selection, retention, and separation (firing) practices to maximize value. Ignore differences in team size, and the fact that the length of a productive lifetime might differ across different teams (e.g. baseball players have longer careers than football players).

How would you expect H and L teams to rank on the following criteria? Explain your answer for each one.

(i) Labor mobility or turnover (the percentage of players who leave the team in an average year).

(ii) Volatility of turnover (i.e., is the turnover a steady percentage each year, or does it vary wildly from 0 some years to high percentages in other years).

(iii) Relative importance of coaching versus playing.

(iv) The wage variation, for a single player, as he or she moves from team to team.

4. (10 points) Government agencies (typically OSHA, the Occupational Safety and Health Agency), regulate workplace safety. In some cases, workers actually *object* when OSHA requires their employer to make the workplace safer. Why would workers who have been working somewhere for a while object to having it made *safer*? (Hint: Think like an economist and use ideas from class.)

5. (5 points each, ½ page total) Jensen & Murphy (J&M), in an influential 1990 Harvard Business Review article on CEO compensation, argue that the best measure of how well a firm pays its CEO is the pay-for-performance sensitivity ratio

(1) $(\text{annual CEO total pay}/\text{annual change in firm value})$

(where total pay includes options, bonuses, etc.). Annual change in firm value is simply the market value of the firm's stocks at the end of the year, minus the value at the beginning of the year (in inflation-adjusted dollars, not percentage).

(i) Briefly summarize why one might think that high values of the ratio (1) are good for the firm.

(ii) Others argue that the best measure of how well a firm pays its CEO is the ratio

(2) $(\text{annual change in firm value}/\text{annual CEO total pay})$

(ii) Note that (2) is the reciprocal of (1). But the J&M argument is that high values of (1) are good. The opposite argument is that high values of (2) are good (i.e., *low* values of (1) are good). So there is a very sharp debate.

Briefly summarize why one might think that high values of the ratio (2) are better for the firm.

5. (15 points, 1 page total) Telecommuting refers to working at home and corresponding with fellow workers through the internet, phone, teleconferencing (and perhaps other media). What does agency theory, including “multitasking”, predict about how the sensitivity of pay to performance and job design will change as firms shift to telecommuting?

6. (15 lines, ½ page) A basic principle in accounting is “responsibility accounting”. Under this principle, it is inappropriate to base performance evaluation on measures that are beyond the control of the employee. Does the risk-incentive model in agency theory tell us anything about whether this principle is sensible or not? (Be precise.)

7. (10 points, ½ page) Durable goods are those that last—beds, cars, carpeting, diamonds and so forth. Often they are goods that are purchased very infrequently, and how long they will last is actually a positive feature that is heavily promoted. Many stores that sell these goods are named after the people (or families) that own and manage them (e.g., Cal

Worthington Ford, Don Luby Chevrolet, Krazy Karl's Karpet Barn, Robbins Brothers diamonds, Crazy Eddie's and Crazy Gideon's). Often the people named show up in television ads promoting their store. Why would using personal names be helpful in a business where consumers make infrequent purchases?

8. (15 points, 5 each, 1 page total). The sociologist James Baron et al described three dimensions of organizational architecture—attachment, selection, and coordination/control-- in their American Journal of Sociology study of Silicon Valley high-tech firms, and the possible choices within each dimension. The dimensions and associated choices are:

Attachment: What motivates workers?

- The nature of the work and pride in mastery (“work”);
- Being part of a successful team (“love”);
- Money (“money”).

Selection: How do you pick people & promote them?

- Potential (not the best person for the job, but the "best athlete" who is most talented);
- Skills (they have the skill you most need);
- Fit (they fit into your culture even if their potential is not that great and their skills are not a match).

Coordination/control: How do you ensure that people are working hard and working together?

- Professional (rely on professional standards and pride, as in a scientific R&D organization, rather than loyalty to the firm per se);
- Peer/cultural (workers regulate the behavior of each other);
- Formal (explicit rules, deadlines);
- Direct (a boss tells people what to do).

Baron et al note that given the possible choices on each dimension that they specify, there are in principle $3 \times 3 \times 4 = 36$ possible configurations. (A configuration is a choice on each dimension—e.g., love/fit/direct. But they find that almost all of the firms they studied fell into only five of those 36 possible configurations. Give three possible explanations (5 points each) for why their sample of firms clustered into only five configurations rather than spreading more evenly among the 36.

9. (30 points) Multitasking: Suppose a worker exerts two types of effort, e_1 and e_2 . The cost of effort for each is ce_i^2 (for $i=1,2$) (note that c is a constant). Firms can only measure the output of effort imperfectly, so performance is measured as $ae_1 + e_2$. In fact, the actual productivity of effort—that is, the total output the firm really wants to maximize—is $de_1 + 0e_2 = de_1$. That is, think of effort of type 2 as worthless socializing or goofing off that does not benefit the firm at all (e.g. calling in sick but you get paid anyway) and which the firm cannot measure directly (that is, the firm knows the worker

is secretly dividing her time between e_1 and e_2 but it only observed the combined measure ae_1+e_2).

The firm pays a piece rate b times measured output, i.e., $b(ae_1+e_2)$. Note that e_1 and e_2 are control variables (choices) by workers, and b is the firm's only control variable. The parameters a, b, c , and d are all positive numbers fixed by the economic environment (i.e. the workers and firm cannot choose those values). The worker wants to maximize the piece rate pay (b times measured output), minus the disutility of effort, which is $b(ae_1+e_2)-ce_1^2-ce_2^2$. The firm cares about finding an arrangement which maximizes the total surplus to the firm-worker combination, $de_1+0e_2-ce_1^2-ce_2^2$. (Keep in mind that the piece rate payment is a transfer from the firm to the worker, so it cancels out when figuring out the total surplus. We are using the Coase theorem here, assuming that firms that find the most efficient surplus-maximizing arrangement will always be able to find a way to share the gains with workers that outcompetes other firms with less efficient arrangements.)

- (1) (3 points each except part 5) First compute the worker's optimal efforts e_1^* and e_2^* given a piece rate b .
- (2) Given these efforts, compute the total firm-worker surplus ($de_1+0e_2-ce_1^2-ce_2^2$) generated by those efforts, for a given b .
- (3) Keeping in mind that effort will generally depend on b , write the surplus completely as a function of b (efforts e_1, e_2 should disappear). Now maximize the surplus with respect to b (i.e. find a piece rate b^* that generates the highest surplus, accounting for the effect of b^* on optimal effort).
- (4) Now figure out what the total surplus is, for the optimal piece rate b^* , given b^* 's effect on e_1^* and e_2^* .
- (5) (12 points) Now suppose the firm considers a different arrangement which prohibits e_2 entirely. None of that e_2 allowed around here!!! If I see anyone e_2 'ing you'll be fired by the Donald! Work through the steps (1-4) above under this new $e_2=0$ regime. Note that the worker will only choose an optimal e_2^* .
- (6) Which optimal piece rate b^* is higher, under the e_2 -is-allowed regime (part 3) or when e_2 is prohibited (part 5)? Why?
- (7) Now compare the optimal surpluses derived when e_2 is allowed (part 4) and when e_2 is prohibited (part 5). When is prohibiting e_2 worthwhile from the point of view of the maximizing total surplus?

Epilogue: The point of this simple "multitasking" exercise is that good effort cannot always be encouraged simply by adjusting the piece rate b^* . Sometimes other tools are needed, like prohibiting certain kinds of activity on the job. (E.g. my friend and Pulitzer-Prize winning LA Time science writer Lee Hotz is not allowed to write for other outlets, even if he goes to a fun conference and gets all excited about typing up something on his own time.)