Answers To Chapter 11

Review Questions

1. **Answer c.** Although it would be possible for even non-union employers and employees to draw up formal employment contracts that precisely specify the obligations of each party in a way that would be legally enforceable, such agreements would be costly to form and would limit the flexibility of employers in responding to new situations. As a result, most employment contracts take the form of implicit and incomplete understandings. These characteristics, however, also make employment contracts difficult to enforce.

2. **Answer a.** Answers b to d are the characteristics that create the necessity for self-enforcing contracts.

3. **Answer d.** Employment contracts that are implicit and incomplete can be very vague and difficult to enforce. These problems are compounded when information is asymmetric since the likelihood of being able to successfully cheat on the employment contract increases.

4. **Answer d.** When employment contracts contain precise promises, formal financial penalties may be helpful in ensuring compliance. When contracts are not precise, compliance becomes a matter of contracting with the “right” person. How can you tell the kind of person with whom you are contracting? Information about an individual’s characteristics can often be inferred through choices individuals make. For example, in Appendix 9A, it was shown that under certain conditions, different levels of education can serve as reliable signals of individual ability. While that information might be acquired through better interviewing and screening of applicants, b (and hence d) is a better answer.

5. **Answer b.** When the worker’s marginal revenue product exceeds the alternative offers, the employment relationship can be said to generate a surplus that is capable of making each party better off—even when it is not divided evenly. It is the fear of losing one’s share of the surplus that assures compliance. Firm-specific training is only one example of an investment that generates such a surplus.

6. **Answer d.** While close supervision and pay for performance are not feasible options for all firms, fair treatment is a principle that can be adopted at any firm to help increase productivity.

7. **Answer c.** Although most workers are concerned about their treatment relative to others in the firms, they also place some value on seeing the group as a whole succeed. The more workers are willing to work for group success, the less likely they are to shirk.

8. **Answer d.** Under output-based pay, external factors can have a significant effect on the pay received in any one period. The fluctuations in income, in turn, produce lower average levels of utility if the worker is risk averse. Answer c essentially repeats the question.

9. **Answer d.** Output-based pay leads to higher levels of pay because of quality differences between workers, risk-averse preferences, and the productivity increases caused by the pay scheme.
10. **Answer a.** Firm profits are more stable under an incentive-pay scheme. If workers do not exert their best efforts and output falls, the compensation per worker also falls, helping to lower costs below what they would be under time-based pay. This additional cost reduction would help to offset losses in revenue caused by the lower output.

11. **Answer b.** Group incentive-pay plans are more likely when it is difficult to measure individual output. When employees work interdependently in teams, it is difficult to decide how much of the group’s output is attributable to each member. Answers a and c would make group incentive pay less likely.

12. **Answer b.** Stock prices can fluctuate considerably over time due to factors beyond an executive’s control. This variability in earnings would be viewed as an undesirable job characteristic by an executive having risk-averse preferences. Note that when executives are employed under these terms, evidence suggests that the stock market performance of the firm is superior to that of other firms. Incentives for managers to emphasize short-run profits tend to be created only when pay is tied to short-run measures of profitability, not to the firm’s stock market performance.

13. **Answer c.** Saying that individual output is highly correlated with individual effort is the same as saying that external factors do not play a significant role in determining output. It is in these situations that merit-pay plans have the most potential for motivating workers. Unfortunately, such situations are relatively rare. While relative rankings of workers help to create a sense of fairness and acceptance for the outcomes, if rankings are subjective and not based on readily identifiable individual performance that can be observed by all, they will typically be very unpopular among those being rated.

14. **Answer d.** Although it would seem in the firm’s interest to set the wage so as to keep as much of the surplus as possible, the higher turnover and reduced motivation that may result can actually lead to increases in the firm’s total costs.

15. **Answer a.** The tendency of workers to undercut rivals and invest time trying to win over supervisors is more a function of how the pay is based rather than the level of pay. Such problems are especially likely when merit-pay raises are based on a supervisor’s ranking of a worker’s relative performance.

16. **Answer b.** This is the most specific correct answer. Answers a and d are really subsets of Answer b. The situation in c would make an efficiency wage strategy impossible.

17. **Answer d.** If output were easily measurable, the firm could use an individual incentive-pay plan to increase worker motivation, and paying an efficiency wage would not be necessary. Efficiency wages are most likely when the firm anticipated a long-term attachment with the worker and other ways of increasing effort (e.g., increased supervision) are not feasible.

18. **Answer c.** Setting the present value of the underpayment equal to the present value of the overpayment yields

\[
5 + \frac{5}{1 + .06} = \frac{W_2 - 20}{(1 + .06)^2} + \frac{10}{(1 + .06)^3} \Rightarrow \frac{W_2 - 20}{(1 + .06)^2} = 1.32
\]

\[
\Rightarrow W_2 = (1.32)(1.06)^2 + 20 \Rightarrow W_2 = 21.48.
\]
19. **Answer c.** Note that the firm just breaks even even over the time period since at the end of period 3, the present value of the total compensation just equals the present value of the marginal product values. If workers continue to be paid more than they contribute, the firm will eventually go out of business. On the other hand, if workers had left before period 3 was complete, the firm would have made positive economic profits.

20. **Answer d.** If the firm develops a reputation for treating the losers poorly, it will not be able to attract enough entrants to make the tournament possible. Also, since the winner will be the one with the best relative performance, some effort may be diverted to undercutting rivals instead of enhancing the interests of the firm. The willingness of the firm to tolerate “deadwood” is one of the factors that make such tournaments possible.

### Problems

21a. If the owners cooperate, the workers attain a higher level of utility by shirking. If the owners shirk, the workers again attain a higher level of utility by shirking.

21b. If the workers cooperate, the owners attain a higher level of utility by shirking. If the workers shirk, the owners again attain a higher level of utility by shirking.

21c. The employment contract is not self-enforcing since both parties have an incentive to shirk (i.e., not exert their best efforts). Note that when both parties shirk, however, they each end up with a lower level of utility than if they both cooperated.

21d. Knowing that the other party plans to shirk does not change the outcome. Each party perceives it to be in their self-interest to shirk regardless of the decision made by the other.

21e. Note that the payoffs from cooperation have all been increased, while the payoffs from shirking have all been reduced. Perhaps this occurred because each party developed a sense of loyalty to the group, and so feels bad when cheating on the employment contract.

21f. The employment contract is now self-enforcing. Regardless of the choice made by the owners, workers attain a higher level of utility by cooperating. Similarly, regardless of the choice made by workers, owners attain a higher level of utility by cooperating.

*22a. To make the compensation per worker \( Y \) under the profit sharing scheme equal to what the workers can attain elsewhere, the guaranteed wage and the profit sharing parameter must be set such that \( Y \) in long-run equilibrium equals the market clearing wage of $9. Substituting the appropriate values into the expression for \( Y \) yields

\[
Y = 7 + \frac{1}{11} \left( \frac{38}{20} - \frac{7}{20} - \frac{9}{20} \right)
\]

\[
\Rightarrow Y = 7 + \frac{1}{11} \left( \frac{440}{20} \right) = 7 + \frac{1}{11} \times 22 = 9.
\]

*22b. Since the compensation per worker will be more variable under profit sharing, risk-averse workers will prefer a time-based wage. They will require a compensating differential to work at firms offering profit sharing. In other words, \( W_g \) and \( s \) must be set in such a way that they yield a compensation per worker slightly above $9.
*22c. Substituting the long-run equilibrium values into the marginal revenue and marginal product expressions yields

\[
MR = 58 - 2(20) = 18,
\]

\[
MP_L = \frac{1}{2} \sqrt{20} = \frac{1}{2}.
\]

Substituting these values into the marginal expense of labor expression yields

\[
ME_L = 7 + \frac{1}{11}[(18)(.05) - 7] = 7.18.
\]

*22d. Since \( MRP_L = 9 > 7.18 = ME_L \), the firm has an incentive to increase employment.

*22e. Substituting \( L = 21, K = 20 \) into the production function yields

\[
Q = \sqrt{21} \sqrt{20} = 20.494
\]

\[\Rightarrow P = 58 - 20.494 = 37.506.\]

*22f. Substituting into the profit pool expression yields

\[
\pi = (37.506)(20.494) - (7)(21) - (9)(20)
\]

\[\Rightarrow \pi = 768.648 - 147 - 180 = 441.648.\]

*22g. Compensation per worker (\( Y \)) falls from 9 to

\[
Y = 7 + \frac{1}{11} \frac{441.648}{21} = 7 + 1.912
\]

\[\Rightarrow Y = 8.912.\]

Since the compensation per worker is less than what workers can attain elsewhere, the firm would not be able to retain 21 workers.

*22h. Although profit sharing will not lead to a higher level of employment in this example, it should lead to a more stable employment relationship because a gap exists between what the marginal worker contributes to the firm (9) and what the marginal worker costs the firm (7.18). If the \( MRP_L \) falls because of a decline in the demand for the product, but stays above 7.18, the firm does not have an incentive to lay off workers. Although workers do not have any incentive to quit the firm, the firm does not really have any protection against quits since the compensation per worker is just comparable to what workers can attain elsewhere (plus a compensating differential if workers are risk averse).

23a. At a wage of $50, 9 workers would be needed to produce 36 units of output since each worker only produces 4. Total labor costs will be ($50)(9) = $450. At a wage of $100, only 4 workers will be needed since each worker produces 9. As a result, total labor costs fall to $400. Since total revenue should be the same in each case, paying the higher wage will actually increase profits.

23b. This move would be consistent with an efficiency wage strategy. Whether $100 could actually be considered the efficiency wage depends on whether further increases in the wage continue to increase profits. If they do, then $100 is not the efficiency wage.
24a. Setting the present value of the underpayment equal to the present value of the overpayment yields

\[ 3 + \frac{2}{1.06} + \frac{1}{(1.06)^2} = \frac{W_4 - 16}{(1.06)^4} \]

\[ \Rightarrow \frac{W_4 - 16}{(1+.06)^4} = 5.78 \]

\[ \Rightarrow W_4 = (5.78)(1.06)^4 + 16 \]

\[ \Rightarrow W_4 = 23.29. \]

Given this value of \( W_4 \), note that both the marginal product and wage schedules yield identical present values of 52.27 even though the marginal product values sum to 60 and the wage values sum to 61.29. The underpayment (6) must be less than the overpayment (7.29) to compensate workers for the time value of money.

24b. A necessary condition for such a deferred payment scheme is a long-term relationship between workers and the firm. Internal labor market strategies promote long-term attachments by filling upper-level positions with workers from within the firm.

24c. A deferred payment scheme is thought to increase productivity for two reasons. The first is that such a scheme will appeal mainly to those types of workers who anticipate staying with the firm and working hard enough to avoid being fired before the deferred compensation is completely recovered. Thus such a scheme may be a way for a firm to attract workers with above average commitment and motivation. The second reason is that such a scheme provides an incentive for all employees to work hard since the penalty for shirking and being fired can be very large. Knowing that workers have less incentive to shirk, the firm can devote fewer resources to supervision.

24d. The prohibition of mandatory retirement means that the firm cannot prohibit workers from staying past period 4. In this example, workers who stay past period 4 will receive a deferred payment that exceeds, in present value terms, the earlier underpayment (assuming the firm cannot lower the wage to older workers). This means that firm will not be able to earn even a normal profit.

### Applications

25a. Under such a “piece-rate” scheme, doctors have an incentive to see many patients quickly. The fear is that doctors provided with this type of incentive may not provide quality care to all patients, particularly those who need a great deal of attention.

25b. A flat fee system may help to keep costs down by taking away the incentive to provide excessive treatment.

25c. The fee must be set in such a way that it provides long-run compensation consistent with what the doctors can earn elsewhere. If the compensation elsewhere involves more certainty, a compensating differential will also be required to make the more variable income stream yield the same level of utility as the certain one.
25d. The advantage of such an incentive-pay plan is that it should make doctors more accountable to their patients, provide an incentive for them to keep careful records, and give those who work hard a chance to get ahead. Such plans also tend to appeal to those who have above-average ability and motivation. On the other hand, the plans may cause doctors to focus excessively on the aspects of the doctor-patient relationship asked about in the questionnaire. Also, the systems may be perceived as unfair since often patients are not in a position to understand the quality of the care they are receiving. Differences in pay can also cause resentment because of concern about relative standing. The questions used in measuring quality should ultimately be things that are under the doctor’s control and not influenced by external factors. Also, the questions should relate to qualities that further the organization’s overall objectives (e.g., providing quality care at a reasonable cost).

25e. The incentive-pay plans should work better with those who have private practices. Since the doctors do not interact with one another, differences in pay will not generate resentment due to concern about relative standing or status.

25f. To the extent that performance ratings are influenced by external factors, merit-pay plans may create little incentive for the doctors to exert extra effort. If the performance ratings are based on relative success, doctors may be less cooperative with one another and divert extra effort into ingratiating themselves with their supervisors.

25g. If measures of individual output cannot be constructed, it may make sense to base a portion of an individual’s pay on the group success. Since most HMOs are non-profit organizations, however, some measure of success other than profits must be used. For example, the extent to which the organization can keep costs down may be an alternative measure. Such group incentives may be relatively ineffective, however, if the efforts of the typical doctor have little influence on the attainment of the goal. In those situations, individuals have an incentive to free ride on the efforts of others.

25h. While time-based pay is preferred by workers with risk-averse preferences, it provides little incentive for individuals to exert their best efforts and so may require increased supervision.

26a. The idea behind an efficiency wage strategy is that if workers are receiving more than they can earn elsewhere, they will avoid shirking so as to reduce the risk of being fired and losing the surplus they are accumulating. If a worker is planning on leaving the job anyway, the fear of being fired is not an effective deterrent to shirking. Also, workers with broader career concerns are less likely to shirk since being fired may affect opportunities at other firms. If workers are not likely to shirk, there is little reason to pay an efficiency wage.

26b. The argument that large firms are more likely to pay efficiency wages stems from the fact that large firms present employees with a wide variety of job options and so there is likely to be a longer-term attachment between employer and employee. Such long-term attachments increase the likelihood of efficiency wages. The highly interdependent production processes at large firms also require that firms take steps to stop shirking. To the extent that monitoring worker effort is more costly at a large firm, efficiency wages may be an effective alternative to motivate workers to exert their best efforts.

27. Layoff policies that do not protect those with longer job tenures inhibit the use of deferred payment schemes. Workers will not be willing to be paid less than their marginal product early in their career if they are likely to be laid off during the period when they are receiving the deferred payment.