Chapter 8
Compensating Wage Differentials and Labor Markets

Chapter 8 introduces students to the concept of compensating wage differentials. Following the practice in earlier chapters, it seeks to move students from concepts they are familiar with to new concepts and tools. Again, the analysis begins with a *verbal* exposition of occupational choice and the wage outcomes that flow from this choice when jobs differ along nonpecuniary dimensions. Once the essential assumptions and predictions of economic theory in this context are explained, we introduce students to a graphic analysis that is intended to yield additional insights. The graphic analysis of the issue of occupational choice is also intended to provide students with a tool for analyzing the effects of government policies on the labor market.

We first apply the concepts of hedonic theory to a "bad:" job injuries. Policy implications are related to occupational safety and health legislation. We then apply the theory to an analysis of how elements in the employment "package" on which employees place a *positive* value affect the wage rate. The application in this section of the chapter relates to the regulation of employee benefits, particularly pensions.

For those who wish to enrich the coverage in Chapter 8, we have added an appendix that analyzes worker choice of jobs that have different probabilities of layoff. This appendix offers another application of the theory of compensating wage differentials to an interesting policy problem, and in so doing elucidates certain issues not commonly understood. The analysis also introduces the student to the notions of "risk aversion" and the willingness to pay for insurance ("certainty").

■ List of Major Concepts

1. In the context of full information and choice, worker behavior will generate compensating wage differentials for job characteristics that are unpleasant or costly.

2. Compensating differentials play a dual role in allocating labor to unpleasant jobs and in compensating those who accept unpleasant work.

3. The prediction that there will exist compensating wage differentials for unpleasant work rests on assumptions of utility maximization, worker information, and worker mobility.

4. Employee preferences are graphically expressed in the concavity and slope of indifference curves.

5. Employers with different costs of eliminating unpleasant job characteristics can be graphically represented.

6. A market equilibrium curve (or offer curve) is derived from the zero-profit isoprofit curves of the employers in the market.

7. If the market is working properly, employees who are least averse to an unpleasant job characteristic become employed with firms that find it most expensive to eliminate that characteristic.

8. The theory of compensating differentials can only be tested using techniques that control for other influences on job characteristics.

9. Government attempts to regulate the outcome of labor market decisions that are made in a perfectly functioning market could lead to a reduction of utility for the workers the government is intending to help.

10. Government intervention into the labor market can increase worker utility if the market is not functioning perfectly (that is, if not all costs or benefits of the decision are borne by those making them).

11. The mix of wages and benefits in the compensation package depends on both *employee* preferences and the tradeoffs *employers* are willing to make.

12. (Appendix) Some job characteristics normally considered bad may be considered good by some workers (layoffs may be preferred if they are known in advance).

13. (Appendix) There are two issues relating to the undesirable characteristics of layoffs: the degree to which yearly layoffs (known in advance) *constrain* a worker's hours of work to lie below those otherwise desired, and the degree to which layoffs cause the worker's income each year to fluctuate.

14. (Appendix) The concept of risk aversion is related to the hypothesis that the expected utility of a level of income ($X) received with *certainty is* greater than the expected utility of a stream of income that may fluctuate over time but yield an expected yearly value of $X.

■ Answers to Even-Numbered Review Questions

2. Statement 1: "Business executives are greedy profit maximizers, caring only for themselves."
   Statement 2: "It has been established that workers doing filthy, dangerous work receive higher wages, other things equal." Can both of these statements be generally true? Why?

   Answer: Both statements can be simultaneously true. If workers are informed about job hazards and have a choice about the jobs they take, their behavior will force even the most greedy executives to pay higher wages for filthy, dangerous work. Even the greediest profit maximizer must obtain a work force, and to do so must pay a wage that workers will accept. If workers have alternative job offers that pay the same wage but offer better working conditions, they will accept those offers and turn down work at the more dangerous or filthy workplaces. Their behavior then will force owners to either pay the compensating wage differentials or clean up the workplace.

4. A recent article stated, "Workers in low-wage jobs lack the basic security, the health benefits, and the flexibility in their work lives that most American workers take for granted." Assuming this statement is true, do these facts contradict the theory of compensating wage differentials?

   Answer: The theory of compensating differentials predicts that, other things equal, jobs with low non-wage benefits would have to pay higher wages. This statement is implicitly comparing those in low-skilled jobs with those in high-skilled jobs, where clearly "other things" are not comparable. Thus, the facts in this statement do not contradict the theory of compensating wage differentials.

6. Suppose Congress were to mandate that all employers had to offer their employees a life insurance policy worth at least $50,000 in the event of death. Use economic theory, both positively and normatively, to analyze the effects of this mandate on employee well-being.

   Answer: From the perspective of positive economics, mandating that employers offer at least $50,000 in life insurance will obviously have no effect on those who are already offering that much or more, but it will add to the costs of those who were previously offering less. To be competitive in the labor market, those previously offering less must have been compensating their workers in some other way (to make their jobs as attractive as those of their competitors). It is thus likely that low-insurance employers were paying higher wages than those offering more insurance. To now compete with their competitors in the product market, the affected employers must reduce their wages (to keep overall costs in the competitive range). Thus, the wages in firms previously offering less insurance will decline. Of course, if wages do not, or cannot, decline by enough to fully offset the added costs of more insurance, then employment among these employers will fall.

   From the perspective of normative economics, we would like to know if this mandate improves the welfare of the workers affected. If the labor market is perfectly functioning, workers are able to obtain the combination of wages and life insurance that maximizes their utility. If the mandate forces them to take some other mix, then their utility will decline. If the market is not allowing workers to "buy" (in the form of lower wages) the life insurance they want, then mandating increased insurance *could* improve the welfare of affected workers (as long as the mandate does not require workers to buy more than they are willing to pay for).

8. "The concept of compensating wage premiums for dangerous work does not apply to industries like the coal industry, where the union has forced all wages and other compensation items to be the same. Because all mines must pay the same wage, compensating differentials cannot exist." Is this statement correct? (Assume wages and other forms of pay must be equal for dangerous and non-dangerous work and consider the implications for individual labor supply behavior.)

   Answer: This statement is not correct. To understand how the market would adjust, let us assume that we have a set of relatively safe coal mines and a set of relatively dangerous coal mines. Both sets of mines must pay the same wage rate and offer the same fringe benefits.

   They both advertise for help and, assuming workers quickly find out which mines are safe and which are dangerous, the safe mines receive many more applications than the dangerous mines. The safe mines can thus be highly selective about the applicants they choose, and they will tend to hire the most dependable, hardest working, most motivated employees. The dangerous mines, with very few applicants, will have to take who they can get (those workers not chosen to work in the safe mines). Safe mines will have high quality, highly productive workers getting wage $X, while the dangerous mines will have lower quality workers obtaining the same wage. Thus, workers of unequal productivity would receive the same wage, and this is tantamount to the receipt of a compensating wage differential.

   Put differently, the theory of compensating wage differentials says that people of equal skill will receive different wages when working conditions differ. But a natural corollary of this is that, when working conditions differ, people of different skills might receive the same wage. In both cases workers in less desirable circumstances receive higher wages than they would otherwise receive.

10. In 2005, a federal court authorized United Air Lines (UAL) to terminate its pension plan. The government will take over pension payments to retired UAL employees, but this action means that pension benefits will be less than promised by UAL to both its current retirees and current workers. What *future* labor-market effects would you expect to occur from this sudden and unexpected reduction of pension benefits?

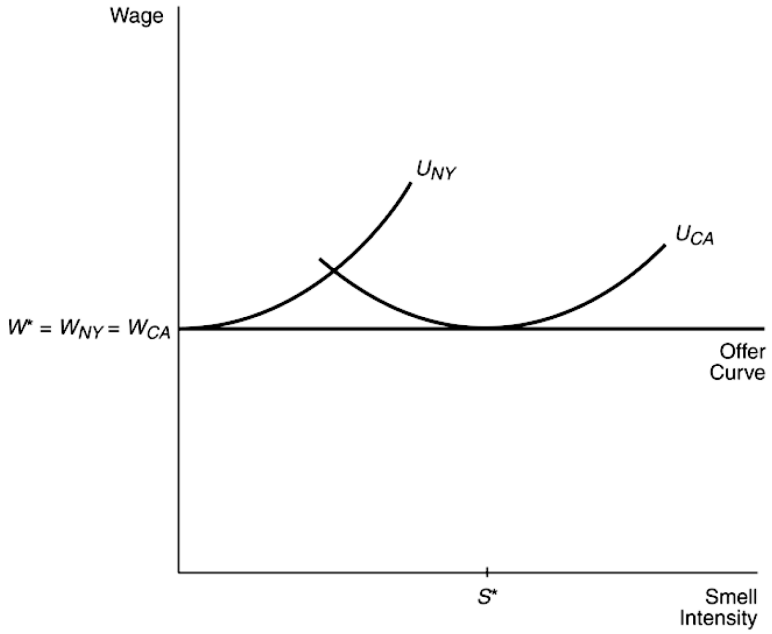
Answer: If the labor market is working well, a compensating wage differential will arise to compensate for the reduced pension benefits; thus wages will tend to rise. The effects on employment levels are ambiguous. The labor demand curve (expressed in terms of wages) will tend to shift to the right as employee benefits are reduced, while the labor supply curve will shift left at each given wage rate.

■ Answers to Even-Numbered Problems

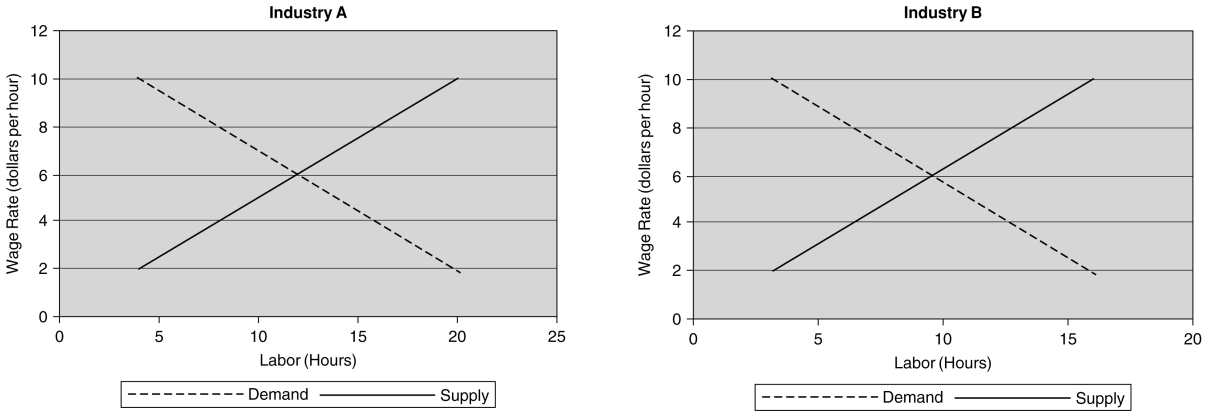
2. Consider the conditions of work in perfume factories. In New York perfume factories, workers dislike the smell of perfume, while in California workers appreciate the smell of perfume, provided that the level does not climb above S^*. (If it rises above S^*, they start to dislike it.) Suppose that there is no cost for firms to reduce or eliminate the smell of perfume in perfume factories and assume that the workers have an alternative wage, W^*.

Draw a diagram using isocost and indifference curves that depicts the situation. (The New York and California isocost curves are the same, but their indifference curves differ.) What level of perfume smell is there in the New York factories? In the California factories? Is there a wage differential between the California and New York workers?

Answer: See the figure below. The California workers are paid exactly the same as the New York workers. This wage equals W^*. The level of smell in California is S^*; in New York it is 0.



4. The following two figures represent the labor market for two industries that require workers with the same skills and experience; however, Industry B is characterized by much noisier working conditions than Industry A. What is the compensating wage differential between the two industries?



Answer: The equilibrium wage in Market A is \$6.00. The equilibrium wage is Market B is \$7.00. Market B, which is characterized by noisy working conditions, needs to offer a higher wage in order to attract workers. The compensating wage differential is \$1.00 per hour.

6. The demand for labor in Occupation A is $L_D = 20 - W$, where L_D = number of workers demanded for that occupation, in thousands. The supply of labor for Occupation A is $L_A = -1.25 + 0.5\ W$. For Occupation B, the demand for labor is similar but the supply of labor is $L_B = -0.5 + 0.6\ W$, which is indicative of a more pleasant work environment associated with that occupation in comparison with Occupation A. What is the compensating wage differential between the two occupations?

Answer: a. Occupation A:

$$\begin{aligned} L_D &= L_A \\ 20 - W &= -1.25 + 0.5W \\ 21.25 &= 1.5W \\ \$14.17 &= W \end{aligned}$$

Occupation B:

$$\begin{aligned} L_D &= L_B \\ 20 - W &= -0.5 + 0.6W \\ 20.5 &= 1.6W \\ \$12.81 &= W \end{aligned}$$

The compensating wage differential is \$1.36 per hour (\$14.17 − \$12.81).

■ Suggested Essay Questions

1. Currently, the U.S. Department of Transportation has a rule that allows commercial truck drivers to drive up a limit of 90 hours per week; after 40 hours per week, drivers' hourly pay goes up by 50%. A proposed rule would reduce this limit to 60 hours of driving per week. One supporter of the proposal said this: "Almost no drivers are *choosing* to work 90 hours per week; drivers will welcome the added time away from the job." Suppose that the proposal passes, and a subsequent study shows that after the new limit took effect, the straight-time wages of truck drivers rose, other things equal. Using economic theory, comment on this finding in the context of the quotation above; explain fully.

   Answer: If drivers were working 90 hours a week because they were compelled to, the new regulation would make them better off, and they should be attracted to the job at lower wages. If, however, drivers were working 90 hours a week by choice, cutting their hours to 60 would represent a reduction in their utility (they could have chosen 60 hours of work before, but chose 90 instead). The job would thus become less attractive to them, and to attract drivers, trucking firms would have to raise wages. Thus, the increase in wages would indicate that the truckers were working more than 60 hours a week by choice.

2. Courts in Japan have recently begun to make awards to the families of workers who have been judged to have been "worked to death." That is, employers have been increasingly required by courts to make large financial payments to the heirs of workers whose hours of work have been so long that they are judged to have played a role in causing their death. How is the growth in these awards likely to affect wages in occupations or industries that require long hours of work? Why?

   Answer: From the perspective of workers, the attractiveness of jobs requiring very long hours of work rises with these awards, which can be thought of as a form of life insurance. Thus, this new "benefit" provides an added inducement to enter these jobs, and the compensating wage differential needed to attract workers into these jobs should fall. On the demand side of the market, employers requiring long hours of work will want less labor at each potential wage rate, which will move the labor demand curve to the left. The rightward shift of supply and leftward shift in demand will serve to reduce wages, but its effects on employment in long-hour jobs is ambiguous.