A Model of Job Search

23. Consider a labor market where employers differ in the level of skill \((K)\) that they require, where \(K\) ranges from 1 to 6. Each employer then pays a wage equal to the skill level of the job multiplied by 10. Assuming for simplicity that there is an equal proportion of employers at every wage level, the distribution of wage offers can be represented by the uniform distribution

\[
f(W) = 0.02.
\]

Now consider an unemployed individual with a skill level of \(K^* = 5\). Assuming that the person does not know the skill level associated with any particular employer, suppose that he or she searches randomly over all the firms in this labor market.

23a. Assuming the worker will accept any job that is offered, what is the probability that a job offer will be forthcoming at any particular employer?

23b. Now suppose that the worker plans to use a reservation wage strategy. What is the probability of the worker getting a better offer than the reservation wage?

23c. What is the wage gain that can be expected from such an offer?

23d. What is the expected gain from additional job search under the reservation wage strategy?

23e. Assuming for simplicity that the marginal cost of an additional period of job search is $1, what is the optimal value of the reservation wage?

23f. What is the probability of a job offer given the reservation wage strategy?

23g. Using the stock flow model of the labor market, explain how the use of a reservation wage strategy impacts the unemployment rate.

Applications

The Effects of a Government Training Program on Job Search

24. Consider the distribution of wages used in the Summary section Example problem. Suppose that a government-sponsored training program has increased the person’s skill level to \(K^* = 3\).

24a. Assuming the worker will accept any job that is offered, what is the probability that a job offer will be forthcoming at any particular employer?

24b. Now suppose that the worker plans to use a reservation wage strategy. What is the probability of the worker getting a better offer than the reservation wage?

24c. What is the wage gain that can be expected from such an offer?

24d. What is the expected gain from additional job search under the reservation wage strategy?
24e. Assuming for simplicity that the marginal cost of an additional period of job search remains at $2, what is the optimal value of the reservation wage? How does it compare with the value derived in the Example problem?

24f. What is the probability of a job offer given the reservation wage strategy?

24g. How will the training program affect the proportion of people flowing from unemployment to employment?

The Inter-industry Effects of Unemployment Insurance

25. If real wages are inflexible downward, workers employed in seasonal industries may be subjected to temporary layoffs as the demand for labor fluctuates over the course of the year. If these layoffs cause workers to consume more leisure than desired, the firm may be forced to pay a compensating wage differential to attract the needed workers during the rest of the year. In general, the greater the use of layoffs, the larger the compensating differential that must be paid. However, the existence of unemployment insurance would tend to reduce the size of the compensating differential since layoffs would not impose as large an income loss on workers.

25a. Consider a firm that never uses temporary layoffs. Describe how this firm’s unemployment insurance tax would be computed.

25b. Consider a firm with a regular history of using large temporary layoffs to meet seasonal changes in demand. Suppose all the workers together receive a total of $100,000 in unemployment insurance benefits annually during the layoffs. Why is it likely that the firm has paid less than $100,000 in unemployment insurance taxes? Where did the system get the rest of the money it paid out to the workers?

25c. Assuming that the unemployment benefits paid to workers reduce the total amount of the compensating differential the firm must pay by $100,000, what effect does the manner of financing unemployment insurance have on the proportion of workers flowing from employment to unemployment?

The Tax Treatment of Unemployment Benefits

26. Since 1987 all unemployment insurance benefits have been subject to federal and state income taxation. However, recipients do not pay Social Security and Medicare taxes on the benefits. Consider the case of a worker earning a wage of $10 per hour for 40 hours a week. Assume the federal tax rate is 15%, the state tax rate is 3%, and the Social Security and Medicare tax rate is 7.5%.

26a. How much does this worker pay per week in taxes? What is his or her after-tax earnings per week?

26b. Suppose the unemployment insurance system replaces 55% of a worker’s before-tax earnings. How much would this worker receive per week if unemployed? How much would the recipient pay per week in taxes? What would be the after-tax “pay” associated with not working?

26c. What is the marginal cost associated with being unemployed for a week? How will the tax treatment of unemployment benefits affect the duration of job search?
Social Norms and Unemployment

*27. One recent theory for why wages remain fixed in the face of declining demand is that the prevailing market wage becomes a social norm. If unemployed workers plan to remain in the labor force a number of periods, such a norm may be in the workers’ best interest since offers to work for less than the going wage in the current period may lead employers to permanently cut wages in future periods as well. An individual may obtain a higher present value of compensation stream by remaining unemployed and waiting for a job at the current wage. The model is presented formally in Robert M. Solow’s book *The Labor Market as a Social Institution* (Cambridge: Blackwell Publishers, 1990). The book demonstrates that the desirability of an unemployment strategy increases the longer the worker plans to remain in the labor force and the higher the probability of finding a job in future periods. This probability, in turn, is inversely related to the unemployment rate. Note that this explanation for wage rigidity is similar to the model of wait unemployment first introduced in Chapter 13.

Consider a labor market where the prevailing market wage is $10. There are many identical unemployed workers at this wage. Each worker values the sum of his or her unemployment benefits and household production time at $5. Each unemployed worker plans to remain in the labor force for 2 periods after the current one and each has a discount rate ($r$) of 6%. At the current market wage, the probability of employment in any future period is 0.6.

*27a Suppose an unemployed worker offers to work in the current period for $9.90, 10 cents below the going wage. If this wage cut leads firms and workers to bid the wage down to $5 in future periods, what is the present value of the earnings stream that the worker can expect from offering to work at the lower wage?

*27b What is the level of expected earnings in any given period for a worker who will not accept less than the going wage?

*27c What is the present value of the earnings stream associated with refusing to work for less than the going wage?

*27d Which strategy leads to the higher present value on average?