*21c. Suppose the probability of finding a comparable job during this recession is $\pi$. What is the return to taking an hour away from household production activities to look for a job?

*21d. Assuming $\pi = 0.5$, would an hour spent in the labor force searching for a job make this person better off or worse off? Would the worker continue to be a member of the labor force under these conditions? If not, how would he or she be categorized?

*21e. Assuming $\pi = 0.1$, would an hour spent in the labor force searching for a job make this person better off or worse off? Would the worker continue to be a member of the labor force under these conditions? If not, how would he or she be categorized?

*21f. Suppose that if the worker were willing to accept a job paying only $2 per hour, the probability of finding a job would rise to $\pi = 1/3$. Would the worker continue to be a member of the labor force under these conditions?

### Applications

#### Changes in the Allocation of Time by Men and Women

22. Data from time-use diaries suggest that as wages have risen, leisure consumption has increased for both men and women. At the same time, however, women have devoted more hours to market work and less to household production, while men have devoted less time to market work and slightly more time to household production. One key to explaining these differences is to realize that the substitution effect between market work and leisure is likely to be much smaller than the substitution effect between market work and household production.

Figure 7-3 represents a model of an individual’s choice between market work and leisure, while Figure 7-4 shows the choice between market work and household production. In each figure, the person has no nonlabor income and an initial wage of $3, leading to the initial budget line $ab$. Preferences between purchased goods or income ($Y$) and non-market time are indicated by the curves labeled $U_i$. The initial point chosen is point $c$ in Figure 7-3, and point $a$ in Figure 7-4.
22a. For Figure 7-3, compute the substitution effect associated with an increase in the wage from $3 to $5.

22b. For Figure 7-4, compute the substitution effect associated with an increase in the wage from $3 to $5.

22c. Although Figures 7-3 and 7-4 represent extreme situations, why is Figure 7-3 a better model of the choice between market work and leisure?

22d. Similarly, why is Figure 7-4 a better model of the choice between market work and household production?

22e. Explain how these different substitution effects could help to explain the different changes in the allocation of time made by the men and women completing the time-use diaries.

**Effects of Social Security on the Choice of Retirement Age**

23. Consider again the situation presented in the Example problem in the Summary section of this chapter.

23a. Why is the constraint shown in Figure 7-1 a concave curve rather than a straight line? What would it take to make it a straight line?

23b. Analyze the work incentives associated with changing the constraint to a straight line. Given the formula for ranking combinations of leisure time and income used in the Example, how would the optimal retirement age be affected?

**Changes in the Social Security Retirement Test**

24. Prior to 1990, Social Security recipients whose earnings after retirement exceeded some threshold level saw their benefits reduced by 50 cents for each additional dollar earned in excess of the threshold amount. Effective in 1990, the reduction in benefits was lowered to 33 cents for each additional dollar earned in excess of $10,200.

Consider a 65-year-old Social Security recipient who is eligible for a maximum yearly benefit of $11,000. If the person chooses to work, suppose that he or she can earn a wage of $20 per hour. Also suppose that the maximum number of hours that can be worked in a year is 3,000.
24a. Draw the budget constraint facing this recipient assuming the reduction in benefits is 50 cents for every dollar earned in excess of $10,200. How many hours would the person have to work before they no longer qualified for Social Security benefits? How much would the person be earning at this point?

24b. On the same graph as in 24a, draw the budget constraint facing this recipient assuming the reduction in benefits is 33 cents for every dollar earned in excess of $10,200. How many hours would the person have to work before they no longer qualified for Social Security benefits? How much would the person be earning at this point?

24c. Analyze the change in work incentives associated with reducing the rate at which benefits are scaled back. What would be the effect of the change on someone who was previously working 1,000 hours? What would be the effect of the change on someone who was previously working 1,800 hours?

24d. For the worker previously working 1,000 hours, how would this change in the Social Security program be likely to affect his or her labor supply over the entire life cycle?