Applications

Reforming Income Maintenance and Income Replacement Programs

30. A common theme in welfare reform proposals is the notion of mutual obligation. That is, society has an obligation to help the poor, but the poor also have a responsibility to strive to become self-sufficient. A concrete way in which this notion is implemented is to make the receipt of benefits conditional on the recipient first performing some task, e.g., enroll in job training or accept part-time government employment, etc.

Suppose an individual’s preferences for leisure and income can be represented by a Cobb-Douglas utility function of the form

\[ U = L^\alpha Y^\beta. \]

Assume the going wage rate is $4 per hour and that the maximum time available per month is 400 hours. Also assume initially that the person has no nonlabor income. Concerned about the work disincentives that can accompany income maintenance programs, suppose Congress legislates that to qualify for the maximum benefit of $200 you must work 100 hours per month. Those working in excess of 100 hours will see the maximum benefit scaled back by 40 cents for each additional dollar they earn once they have qualified for the program.

30a. Draw the budget constraint facing an individual in the absence of the welfare program. Then draw the constraint with the welfare system in place. What is the breakeven point under this program?

30b. Using the graph as a guide, find the effects of the welfare program on hours worked for each of the following preference parameter combinations.

1. \( \alpha = 0.65, \quad \beta = 0.35. \)
2. \( \alpha = 0.75, \quad \beta = 0.25. \)
3. \( \alpha = 0.85, \quad \beta = 0.15. \)

30c. Assess the usefulness of threshold provisions such as this in reforming welfare programs.

The Earned Income Tax Credit

31. Suppose that the Earned Income Tax Credit (EITC) program is set up so that a maximum payment of $2,700 can be earned when a qualified worker earns $9,000. This represents a payment of 30 cents for each additional dollar earned. Suppose also that workers earning between $9,000 and $12,000 are eligible for the maximum payment, but that once earnings exceed $12,000, additional earnings cause the payment to be reduced by 45 cents for each additional dollar earned.

Assume the maximum number of hours a person can work in a year is 3,000, and that the going wage rate is $6 per hour. Recall that individuals who do not work receive no benefits under this program.

31a. Graph the budget constraint facing a typical individual before the program is enacted. Then graph the budget constraint after the program in enacted. Be sure to find the coordinates of the point where a person is no longer eligible for the program.
31b. What is the slope of the constraint for anyone earning less than $9,000? What is the slope of the constraint for anyone earning more than $12,000?

31c. Consider a worker with preferences such that before the tax credit program she would have worked 500 hours. Is this individual likely to work more or less because of the tax credit program? How can you tell?

31d. Discuss the work incentives for someone with preferences such that before the program he worked more than 1,500 hours.

Effects of Progressive Taxes on Labor Supply

*32. Suppose an individual’s preferences for leisure and income can be represented by a Cobb-Douglas utility function of the form

\[ U = L^{a}Y^{b}. \]

Assume the going wage rate is $4 per hour and that the maximum time available per month is 400 hours. Also assume that the person has nonlabor income of $200. Suppose that the government raises revenue through a tax on total income. As an example, suppose that when total monthly income is $1,000 or less, income is taxed at the rate of 20%. Anyone with income above $1,000 must pay 20% on the first $1,000 they received, but also 40% on every dollar over $1,000. Such a system is called a progressive tax, and the two rates are called marginal tax rates. For simplicity, ignore the issue of how the tax revenues would be used.

*32a. Draw the before-tax budget constraint facing an individual. Then draw the constraint with the income tax system in place.

*32b. At what point on the leisure (hours worked) axis does the 40% marginal tax rate begin to apply? Find the slope of the constraint to the left and to the right of this point.

*32c. Assuming \(a = b = 1\), find the optimal hours supplied by this individual before and after the tax. What is the average tax rate the individual faces?

*32d. If one follows the budget line associated with the 40% marginal tax rate to the point where leisure is at its minimum (the full income level), it will be as if the level of nonlabor income has increased above $200. Use the value of income at this point, and the formula for full income \((WT + V)\) to find the height of the constraint (the implicit value of \(V\)) at this point.

*32e. Assume \(a = 1\) and \(b = 3\). Using your answer to 32d, find the optimal hours supplied by this individual before and after tax. What is the average tax rate this individual faces?

*32f. Assess the consequences for labor supply of tax proposals that call for the wealthy to face significantly higher marginal tax rates.
Reducing the Costs of Working Through Telecommuting

33. Consider an individual with preferences given by the formula \( U = LY \). Assume the going wage rate is $4 per hour and that the maximum time available per month is 400 hours. Also assume initially that the person has nonlabor income of $200. Suppose the individual incurs a fixed monetary cost of $100 per month associated with working and a fixed time cost of 30 hours per month.

33a. Find the optimal amount of leisure and work that can be attained and the level of utility achieved. Verify that the level of utility is greater than that attained by not working at all.

33b. Suppose both the monetary and time costs of working are eliminated by telecommuting; that is, the person now works at home and sends her work to the office via a home computer equipped with a modem. Find the optimal number of leisure and work hours and the level of utility achieved.