Labor Supply

Introduction

A simplistic view is that the supply of labor is simply the number of workers. If we think of the workers as utility maximizing agents, however, the supply of labor should depend on the wage rate. In addition, establishing a utility-maximization framework for the labor supply makes it possible to analyze workers' responses to income taxes and transfer payments.

The Model

Labor supply can be derived from a variation on the two goods - two prices model. In this case, the two goods are consumption C and leisure L. Labor supplied is the complement to leisure. If we let TH denote total hours available, then TH - L is hours worked.

The agent's utility function is

$$U = L^{1/2} + 0.5\, C^{1/2} / (1 + 0.05\, C^{1/2}).$$

His or her budget constraint is

$$P\,C = (1 - T)\, W\, (TH - L) + TR,$$

where P is the price of the consumption good, T is the tax rate on labor income, and TR is a non-taxed transfer payment..

Exercises

1.   Setting the tax rate and the transfer to zero, graph the budget constraint and the indifference curve tangent to that budget constraint. (Hint: you are going to need EconModel to have much luck with this exercise.) Put a big dot at the agent's optimal values for L and C.

2.   Increase or decrease the wage rate, which pivots the budget constraint about the point of full-time leisure. (The wage rate has no effect on people who do not work.) Redraw the budget constraint and indifference curve tangent to that budget constraint. Put a big dot at the agent's optimal values for L and C.

3.   The optimal values for L at different wages rates imply optimal values for hours worked TH - L. Graph the hours worked vs. the wage rate to derive the labor supply curve.

4.   How is the labor supply curve affected by an increase in the tax rate on labor income? (Hold the transfer at zero.)

5.   How is the labor supply curve affected by an increase in the transfer? (Hold the tax rate at zero.)