

Tutorial Questions 4

November 4, 2010

1. Suppose the utility function is

$$u(c, l) = \log c - \gamma \frac{l^{1+\sigma}}{1+\sigma}$$

Assuming the real wage is w , write down the first order condition for labour supply. Assuming $c = wl$, find the optimal level of labour supply. What is the interpretation of γ ? Could differences in labour supply across countries be explained by differences in γ ?

2. Suppose the utility function is

$$u(c, l) = \log c - l$$

Consumption is financed with labour income and dividend income d . Solve for the optimal level of labour supply, and show it is decreasing in d .

3. Suppose lifetime utility is given by

$$u(C_1, l_1, C_2, l_2) = \log C_1 - .5l_1^2 + \log C_2 - .5l_2^2$$

The real interest rate is r and wages in periods 1 and 2 are w_1 and w_2 , resp. Write down the intertemporal budget constraint, assuming the government imposes a lump sum tax of T each period. Write down the first order conditions for labour and indicate how labour supply is affected by this change. How does your answer change if the government redistributes the income again?

4. Suppose lifetime utility is given by

$$u(C_1, l_1, C_2, l_2) = \frac{C_1^{1-\theta}}{1-\theta} - .5l_1^2 + \beta \left(\frac{C_2^{1-\theta}}{1-\theta} - .5l_2^2 \right)$$

Write down the first order conditions for labour. If the government distributes income to people, explain how the labour response changes with θ . Give the intuition.

5. Now assume the same utility function as above, but assume now the government taxes wage income at a proportional rate of t . Write down the first order conditions, and explain how labour supply is affected.
6. Write down the labor optimality condition and use it to explain why a consumption tax has similar economic implications to a proportional tax on the wage.
7. Find the equilibrium real wage if labour supply is given by your answer to question 2, while labour demand is given by maximizing the firms profit function:

$$\pi = Al^{.5} - wl.$$

Assume there is one firm and one household and l refers to labour hours.