AS/ECON 4070 3.0AF : F2007   Assignment 2   due : Wednesday November 14

Do **all 5** questions. All count equally

1. If a person's preferences can be represented by a utility function

$$u(Y, Z) = Z + 4\sqrt{Y}$$

where Y and Z are the person's quantities consumed of clothing and other goods, and if the net–of–tax price of each of the goods is 1, and if the person's income is 8, what would be the total excess burden of a unit tax of $1 on clothing (good Y)?

2. Supppose that a person's preferences can be represented by a utility function

$$u(Y, Z) = Z - \frac{1}{X} + 2\sqrt{Y}$$

where X, Y and Z are the person's quantities consumed of food, clothing and other goods, if the net–of–tax price of each of the goods is 1, and if the person's income is 8

If the government could not tax good Z, but could choose whatever tax rates it wanted on goods X and Y, what would be the relative tax rates on the two goods?

3. If good Z cannot be taxed, and if the world ("before tax") prices of goods X, Y and Z are

$$p_X = 2 \quad ; \quad p_Y = 2 \quad ; \quad p_Z = 1$$

and if the compensated demand functions for goods X and Y are

$$X = 225[\frac{P_Z^2}{P_Y P_X - P_Z^2}]^2$$

$$Y = 225[\frac{P_Z P_X}{P_Y P_X - P_Z^2}]^2$$

then what would be the tax rate on good X, if good Y were taxed at a rate of 50 percent (as a fraction of the before–tax price p_Y), if the tax system were optimal? Explain briefly.

continued over

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4. An economy consists of 3 million people. Each person has the same preferences over her consumption C and the number of hours she works per week H, represented by the utility function

$$U(C, H) = C - H^2$$

Each person's wage depends on her productivity (which is exogenous, and not affected by government policy). One million people each earn a wage (before any tax deductions) of $10 per hour ; one million people each earn a wage of $20 per hour ; the remaining one million people each earn a wage of $50 per hour. Each person chooses how many hours she wishes to work. Her net wage income is spent on consumption C.

If the government taxes all labour income at a rate τ, how does the government tax revenue per person vary with the tax rate τ?

5. In the country described in question #4, if the government tax revenue from the labour income tax were distributed (in cash) equally to all 3 million people, which tax rate would people earning a wage of $20 per hour prefer most?