AS/ECON 4070A   Public Finance I   Assignment 1

due : Wednesday October 8 2003   before class

Answer all 5 questions. All count equally.

1. Would the allocation resulting from the following economic system be Pareto efficient?
Explain briefly.

The economic system : there are two goods in the economy, food and clothing ; there is no
production ; goods are allocated by competitive markets ; people buy and sell the two goods, taking
the prices of the goods as given ; each person has a given endowment of food and clothing ; the
government levies a 25 percent tax on the value of all people's consumption of food and clothing ;
the proceeds of this tax are given to the oldest people in the economy.

2. Find **all** the Pareto optimal allocations in the following two–person, two–good exchange
economy.

Person 1's preferences can be represented by the utility function

$$u(x_1, y_1) = \ln x_1 + \ln y_1$$

(where "ln" refers to the natural logarithm).

Person 2 regards goods x and y as perfect substitutes, so that his preferences can be represented
by the utility function

$$u(x_2, y_2) = x_2 + y_2$$

The total quantities available of the two goods are 15 units of good x and 20 units of good y.

3. What would the cost be of a tax on wine of $12 a bottle to a person whose preferences can
be represented by the utility function

$$U(x, y) = x + 40y - 2y^2$$

where y is the number of bottles of wine she consumes per year, and x is her consumption of all
other goods, if the price of all other goods is $1, and if wine is in perfectly elastic supply at a
(before tax) price of $20 a bottle?

4. What would the incidence be of a unit tax of 50 cents per blank CD, if the market for blank CDs were perfectly competitive, if the demand curve for blank CDs had the equation

$$Q^D = 120 - 3P^D$$

where Q^D is the quantity demanded by demanders and P^D the price (in cents) paid by demanders, and if the quantity supplied of blank CDs were

$$Q^s = 7p_s - 180$$

where Q^s is the quantity supplied by suppliers and p_s is the price (in cents) received by suppliers?

5. Canada is a major producer of cranberry juice, which is produced using cranberries and sugar as the main inputs to production. Suppose that this production exhibits **fixed proportions** : ten kilograms of sugar for every kilogram of cranberries. The supply of sugar to the Canadian cranberry juice industry is relatively elastic ; the supply of cranberries is relatively inelastic.

Suppose as well that the quantity demanded of cranberry juice is relatively elastic with respect to the price paid by juice drinkers.

Suppose that a tax is imposed on purchases of sugar by cranberry juice manufacturers. That is, the juice manufacturers would have to pay a tax of 10 cents for every kilogram of sugar they purchase. (Purchases of cranberries are not taxed.) What would be the incidence of this tax?