

EXERCISE 1: AN ALLOCATION PROBLEM

Timing of Tutorial You should be able to tackle this after the first two chapters of the book, though the basic ideas contained in this tutorial underlie the whole of the text.

Purpose of Tutorial To get you thinking about the problem of *exchange*; why people want to exchange; what they achieve from exchange; what might be the best way of exchanging; who benefits from particular forms of exchange, and whether certain exchange institutions/mechanisms might be better than others.

Prior Preparation No preparation is necessary - other than thinking a little about the problem before the tutorial. Your tutor might ask you some questions to check whether you have in fact done so.

Written Work after Tutorial You should write at least a couple of pages addressed to the various questions below and hand this in to your tutor at the start of the next tutorial.

Relevance to Examination The general theme of this tutorial underlies the whole of the module, but there will not be an examination question specifically answerable by this tutorial.

The tutor will begin by dividing the tutorial group up into two roughly equal halves. One convenient way to do this is by sex - let me call the two 'halves' the *men* and the *women*. Let me call these two 'halves' *groups*. The tutor will then order the students in each group somehow, perhaps in alphabetical order by name. For example:

men: Andy, Ben, Charles, David, Edwin, Franco and George

women: Alice, Barbara, Cathy, Di, Elisabetta, Fabrizia, Georgina and Hermione.

The tutor (or the group) will then designate one group as the *sellers* and the other group as the *buyers*. *Reservation prices* for some hypothetical good (which can be bought and sold only in discrete units) will then be assigned as follows: to the first member of each group a reservation price of £11, to the second a reservation price of £12, to the third £13, and so on. The meaning of these depends whether the person is a *buyer* or a *seller*.

If the person is a *buyer* with a reservation price of £ x , then that buyer is willing to pay up to and including £ x to buy one unit of the good; moreover if the buyer buys the unit at a price £ y then the buyer makes a *surplus* (or profit) of £ $(x-y)$ out of the purchase (note that the surplus is *negative* if the price paid is *more* than the reservation price).

If the person is a *seller* with a reservation price of £ x , then that seller is willing to sell one unit of the good for a price higher than or equal to £ x ; moreover if the seller sells the unit at a price £ y then the seller makes a *surplus* (or profit) of £ $(y-x)$ out of the sale (note that the surplus is *negative* if the price at which the unit is sold is *less* than the reservation price).

Now notice that *exchange* between men and women is *potentially beneficial*. For example, if the men are buyers and the women sellers, then George has a reservation value of £17 and is willing to pay up to £17 for a unit of the good while Alice has a reservation value of £11 and is willing to accept as little as £11 for her unit. Clearly, exchange between George and Alice is possible - though the surpluses made depend upon the price at which the exchange takes place. For example, suppose Alice agrees to sell her unit to George at a price of £12, then Alice makes a surplus (or profit) of £1 while George makes a surplus (or profit) of £5; however, if Alice agrees to sell her unit to George at a price of £16, then Alice makes a surplus (or profit) of £5 while George makes a surplus (or profit) of £1.

The purpose of this tutorial is to examine different possible mechanisms for exchange between the two groups - and the implications in terms of realised surpluses. We might then be able to shed light on whether particular exchange mechanisms are *efficient* and *fair* (for example). I shall suggest various exchange mechanisms. You should think of others.

(1) First, we take the obvious - which is termed in the economics literature *competitive exchange* (we shall see later why). Consider any price, for example £12, and ask how many of the buyers would want to buy at that price and how many would want to sell. Hence work out how many units would be exchanged at that price and also the surpluses realised. Repeat this exercise for all possible prices and ask the question: is there a price at which the number of exchanges is maximised? Note the realised surpluses - both individual and aggregate - at this price. Note also that for several people the realised surplus is *zero* because they cannot enter into any exchange. Is this fair?

(2) Now suppose that the *women* all gang together and form a women's cooperative while the men remain disorganised. Suppose the cooperative chooses a single price at which they will sell (assuming they are sellers; buy if they are buyers) and that each of the men individually either buys at that price if they want to and does not buy if they do not want to. What is the women's chosen price? What are the realised surpluses - both individual and aggregate. Is this better for anyone than the first scheme? Is it fairer?

(3) Now do the same as suggested in the paragraph above but with the men this time forming the cooperative and the women being disorganised. Answer the same questions.

(4) What *might* happen if *both* groups form cooperatives? (*There is no definitive answer to this question.*)

(5) There are obviously other exchange mechanisms and I would ask you to think about them and their properties. For example, is there a mechanism which maximises the number of exchanges? What are its properties?

(6) Finally - do these findings generalise?

Comments as to what you should take away from this tutorial. You should realise firstly that *voluntary trade is mutually beneficial and that gains are made from trading. Trading is not just done for fun – but precisely because some gain is made from it. (Conversely if there was no gain or a loss people would not voluntarily participate in trade.) Moreover, in the simple context of the tutorial, we can very easily measure the gain from trade – for a buyer the difference between the buyer's*

reservation price and the price paid, and for a seller the difference between the price received and the seller's reservation price. You should take away from this tutorial the key idea that the way that the trade is organised (the market institution if you like) affects the gains being made by all the participants in the market. Some people make big gains, some small gains and some no gains at all – because these latter do not end up trading. You should have noticed that some ways of organising trade are more efficient than others – in the sense that the total surplus realised is higher. You should also have noticed that the market trading institution affects the distribution of the realised surplus. You might like to think whether this is fair or not. Is it fair for me as a seller, if I have a high reservation price, if I am unable to sell (because I have a high reservation price)? And ask the converse for a buyer.