

EXERCISE 2: DEMAND

Timing of Tutorial You should have covered chapters 3 through 7 before being able to fully tackle this tutorial.

Purpose of Tutorial To see the implications of preferences (tastes) on demands; to discover how revealed demands indicate the underlying preferences of individuals; to see how observations on demand can therefore be used to infer the preferences of individuals and hence to predict demand in other situations. This basic procedure reveals a key methodological approach used by economists in empirical work. It shows how theory is useful in guiding and informing empirical research.

Prior Preparation In Tutorial 1, when you meet your tutor and your fellow tutees, you should split the tutorial group into 2 teams, each of which should have a preliminary discussion in the formal tutorial and *should arrange to meet briefly between the first and second tutorials*. Such a meeting will make this tutorial run more efficiently; it will also increase the chances of your team winning the simple game that you will be playing then. In particular, I recommend that, for your chosen tastes (your type and your value for a) you work out a little formula which gives you the demands at any set of prices and income. Otherwise - if you have to work out these demands during the tutorial - you will appear rather unprepared.

Written Work after Tutorial Your group should collectively write up a report after the tutorial describing how you discovered the other groups' preferences and how and why you chose the questions that you did. Please hand this collective document into your tutor at the beginning of tutorial 3.

Relevance to Examination No direct relevance, in the sense that there will be a question like this on the examination paper, but the methodological point discussed above is central to the whole module, and it will be examined by some means.

This tutorial is as follows:

There are 2 goods, good 1 and good 2. Good 2 is the *numeraire* good - its price is 1. The price of good 1 is p . The income of your team is m . The quantities of the 2 goods demanded by your team are x_1 and x_2 . Note that $px_1 + x_2 = m$.

Your team should decide, either at Tutorial 1 or at your brief meeting between Tutorial 1 and this tutorial what your *tastes* concerning the two goods are. These tastes *must* be of one of the following three types:

Type 1: Perfect substitutes - with one unit of good 1 being always substitutable for or by a units of good 2. Hence the indifference 'curves' are linear with common slope $-a$ ($0 < a < \text{infinity}$).

Type 2: Perfect complements with 1 unit of good 1 always needing to be complemented by a units of good 2. Hence the indifference 'curves' are L-shaped with the kink being along a ray from the origin with slope a ($0 < a < \text{infinity}$).

Type 3: Cobb-Douglas with relative weights a and $(1-a)$ that is, $x_1^a x_2^{(1-a)} =$ constant ($0 < a < 1$).

Illustrations of these three types have been given in the lectures and particularly in Lecture 5; details can be found in the chapters 5, 6 and 7.

Your team should choose one of these 3 Types and a value for the parameter a . You should inform your tutor of these choices: he/she will act as the referee in what is to follow.

Each team knows its tastes - its Type and its value of a . The purpose of the exercise is for each team to discover the tastes of the other team - that is, its Type and its value of a - by asking questions of the form:

“What are your demands (x_1 and x_2) if p is _ and your m is _?”

Only questions of this type are allowed, but the p and m values can be any positive numbers.

Questions of this type will be asked, one at a time but simultaneously, by each team of the other. Answers must be honest - the tutor will check that the answers given are correct. Answers will be given simultaneously. The winning team is the one which discovers the preferences of the other team first.

Comments as to what you should take away from this tutorial. You should realise that the demands x_1 and x_2 depend upon p and m – but also, and crucially, on the preferences of the individual. You should draw graphs of the relationship between x_1 and m for each of the three types of preferences. And similarly of the relationship between x_2 and m for each of the three types of preferences. What do you note? Ha, ha! Nice neat linear relationships for each of the three types of preferences. So the shape of the relationship between demands and income (for the three preferences used in this tutorial) is not affected by the preferences. (Why not?) This is an interesting point – and tells you that there is no point in changing m when trying to determine the preferences of the other team. However what do you notice if you draw graphs of the relationship between x_1 and p for each of the three types of preferences? And similarly what do you notice if you draw graphs of the relationship between x_2 and p for each of the three types of preferences? The shape of the relationships is different for the three different types of preferences. You should work out what they look like. (Hint: for perfect substitutes, as p rises from 0 then x_1 falls (while x_2 remains at zero) until p gets to a particular value (what value?) at which point x_1 drops to zero and stays there while x_2 becomes non-zero but constant; for perfect complements, as p rises x_1 and x_2 both fall but in such a way that the ratio x_2/x_1 stays constant; for Cobb-Douglas as p rises x_1 falls and x_2 stays constant but in such a way that the ratio of expenditures p_2x_2/p_1x_1 stays constant.) So the shape of the relationship between demands and price (and with more general preferences between demands and income) enables us to infer from demands what the underlying preferences are. Moreover the precise shape of the relationship enables us to detect the value of the parameter a . (Note that with perfect complements the ratio x_2/x_1 is always equal to a ; with Cobb-Douglas the ratio of expenditures p_2x_2/p_1x_1 is always equal to $(1-a)/a$. What about perfect substitutes?)

