

A The nature and scope of economics

1

Definitions

There are many definitions of economics linked to scarcity and the allocation of resources. Arguably the most quoted definition is that from Lionel Robbins who wrote that economics is:

‘...the science which studies human behaviour as a relationship between ends and scarce means which have alternative use.’

2

The economic problem

Economic problems like inflation and unemployment are symptoms of (and therefore should not be confused with) **the economic problem**. The economic problem is **scarcity**, i.e. not enough resources to satisfy everyone’s demand. All **economic goods** are scarce, some more and some less so, but all require an **allocative mechanism**. The only goods that do not require an allocative mechanism are **free goods**. An example of a free good is air, although it is interesting to note that in a polluted city like Los Angeles fresh air is likely to become an economic good.

Given a limited ability to obtain resources, both **consumers** and **producers** must choose between alternative products. Scarcity leads to **choice** and in theory it is assumed that, in a free market, economic units make **rational decisions**.

In a centrally controlled economy the aim is to maximise the **total welfare** of society. In reality, the sheer size of an undertaking which tries to match the sum of individual demands and direct resources to them has led to the **decline** of this allocative mechanism.

3

Political systems and the economics of resource allocation

3.1 Introduction

All economies require allocative mechanisms. At the theoretical extremes, economies are divided into:

- **free market or capitalist**
- **centrally-controlled or command**

In reality all countries are a mixture of central direction and marketplaces. More freedom in markets and the economy will be described as capitalist; more control in markets and the economy will be described as command. In command economies a lot of trade takes place on illegal or black markets.

If you want to impress your examiner, learn this quote. It comes from ‘An Essay on the Nature and Significance of Economic Science’ (Lord Robbins).

In this context, economic goods include services. Economics studies these allocative mechanisms in detail.

Look at Eastern Europe during the Communist era.

In the past, slavery meant people were owned.

Producer sovereignty is a market imperfection caused by monopolies.

In the heyday of the command economy, some economists estimated that between 30% and 50% of all trade was through black markets.

Externalities are a very important concept throughout economics.

Would you work harder if you were to get an individual grade at A-level or an average grade for the group?

3.2 Free market capitalism

Minimal government is concerned with creating a framework of rules that protects:

- **freedom of contract**
- **private property rights**

Producers are free to buy, hire and own non-human factors of production but only to hire and fire labour. They compete in product and productive factor markets.

Consumer sovereignty determines what is produced, who produces it and how it is produced. The marketplace is where the **invisible hand** of competition will harness the self-interest of the individual so that society benefits from the pursuit of **profit**. The invisible hand is a powerful concept in economics, first introduced by Adam Smith in his book, *Wealth of Nations*, published in 1776.

3.3 The command economy

Government tries to solve the economic problem by total planning. There are no rights to own property. Incomes are received for work, not as the result of ownership. Production and productive factors need to be under the direction of a central authority. Quotas are established for productive units. Consumption by workers can be directed through vouchers used as a part share of planned output. Alternatively incomes can be awarded through central planning and consumers can choose how to spend their incomes. The marketplace must be part of a system aimed at bringing about an equitable distribution of resources. Therefore, prices may be fixed and shortages and surpluses used as signals to expand or contract output.

Many command economies are currently going through a transitional phase as they free up their markets to competition. This has caused a number of problems as their industries are not competitive. Many of their resources need to be shifted from state bureaucracy and producer goods like armaments to the provision of consumer goods.

3.4 The mixed economy

3.4a The disadvantages of free market capitalism

- Instability in the form of **booms** and **recessions**.
- Product sovereignty caused by powerful single firm industries.
- **Inequalities**: millionaires and beggars.
- **Externalities**: uncontracted costs or benefits which are not paid for when goods are produced or consumed.

3.4b The disadvantages of a command economy

- Lack of incentive in pursuing collectivist ideals.
- **A paradox of equality**. On the surface it is easy to create an equality of ownership by removing private property — it is not so easy to ensure an even distribution of the resources that make up a person's standard of living.



In Moscow in the 1970s, it was reported that Muscovites spent several hours every day in queues.

Vilfredo Pareto, 1848–1923.

Optimal comes from the Latin *optimus*, which means 'best'.

This is explained in more detail under Microeconomics for A2.



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- Resource misallocation as consumer demand is not satisfied by producer supply.
- Shortages, and rationing through a queuing system.

3.5 The market economy

All the world's major economies are now classed as market economies, although the degrees of intervention by government vary greatly, depending upon their perception of the extent to which free markets are imperfect or fail to allocate resources.

Optimality and efficiency

4.1 Pareto optimality

Most students know that a best case exists when the economy's resources are allocated in such a way that no reallocation can make anyone better off without making someone else worse off. However, they do not know how it is achieved. There are three maximising conditions:

- An optimal distribution of products between consumers requires that:

$$\frac{MUX_A}{MUY_A} = \frac{MUX_B}{MUY_B}$$

where MU = marginal utility
 X and Y = products
 A and B = consumers

- Optimal allocation of productive factors occurs where:

$$\frac{MPL_X}{MPC_X} = \frac{MPL_Y}{MPC_Y}$$

where MP = marginal product
 X and Y = products
 C and L = productive factors

- Optimal output is where:

$$\frac{MUX}{MC_X} = \frac{MUY}{MC_Y}$$

where MU = marginal utility
 X and Y = products
 MC = marginal cost

4.2 Economic efficiency

There are three types of efficiency commonly referred to:

- **allocative efficiency:** firms produce where price equals marginal cost
- **productive efficiency:** firms produce at the lowest average cost
- **dynamic efficiency:** firms reduce costs over time

5

The opportunity cost of resource allocation

One of the most important concepts in economics is **opportunity cost**. It is fitting to complete this first section by identifying its relevance to the analysis so far and highlighting its importance to the study of economics in general.

- Opportunity cost is a real measure in terms of the foregone alternative at the level of either production or consumption.

All the time that products and productive factors are scarce in economic terms, then transactions can be measured by opportunity cost. There is one good which is not scarce and therefore does not have an opportunity cost: **the free good**.

All economic goods have an opportunity cost of production. When they are provided free to the consumer, they do not have an opportunity cost of consumption.

Type of product	Opportunity cost of production	Opportunity cost of consumption
Free good	No	No
Public good	Yes	No
Merit good	Yes	No
Club good	Yes	Yes
Private good	Yes	Yes

These products are explained in more detail under Unit 1, Section F.

This is the first diagram in these notes. It is therefore timely to remind you that all diagrams must be drawn correctly with full labelling. Written work can be considerably enhanced by clear illustrations that are both correct and relevant.

Opportunity cost is often illustrated using a **production possibility boundary** (Figure 1.1).

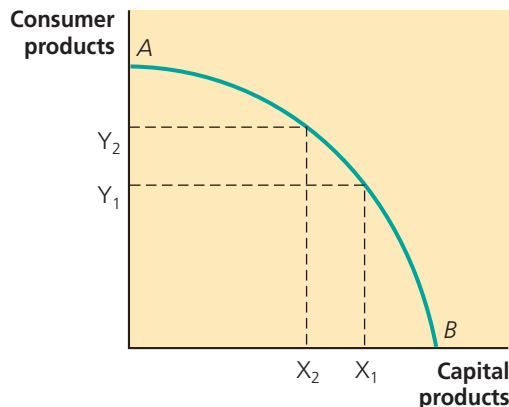


Figure 1.1
Production possibility boundary

The line *AB* represents the maximum quantity or combination of consumer and capital goods that can be produced given current resources. If Y_1X_1 represents current output, then the opportunity cost of moving from Y_1 to Y_2 is a contraction from X_1 to X_2 .



B The theory of demand

1 The concepts used in demand analysis

1.1 Utility

1.1a Introduction

Utility is defined as a measure of the satisfaction which is derived from the consumption of a good or service. The units of measurement are known as 'utils'.

Consumer theory is based upon the assumption that individuals will arrange their pattern of expenditure to maximise utility.

1.1b The law of diminishing utility

Over a specific period of time and assuming the consumption of other products is fixed, the utility derived from consuming successive units of the same product will add less to a rising total and may even reduce total utility past a certain level of consumption.

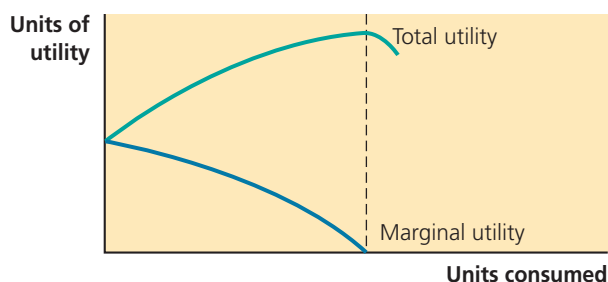


Figure 1.2

Figure 1.2 shows that marginal utility is falling as total utility rises by ever decreasing amounts.

1.1c Can utility be measured?

It may seem strange to be asking this question after diagrams have been drawn. However, in reality it is not possible to measure utility in any meaningful way that allows comparisons between one consumer and another. It is, though, much easier to rank products for each individual consumer. Their expenditure reflects the expected utility that will be derived from each unit of money spent.

1.1d The paradox of value

Some early economists were confused by the fact that people were prepared to pay high prices for non-essential goods like diamonds when they spent little or nothing on essential goods like water.

The confusion was generated by looking at the high marginal utility from the last diamond and the low marginal utility from the last drop of water. The answer was found by looking at relative scarcity and the total utility derived from each product. The total utility from water was much greater than the total utility from diamonds, as shown in Figures 1.3(a) and 1.3(b). Where the sum of the marginal

In reality most individuals will admit to purchasing something which gave them little or no satisfaction. This is usually explained by imperfect knowledge or pressure from advertising.

A common mistake is to write that marginal utility rises before it starts to fall.

Alfred Marshall (1842–1924) solved the problem.

Ask yourself this question: You are dying of thirst in the desert and one glass of water can save your life. Someone offers you either water or the world's biggest diamond. Which will you take?

utility for water is far greater than for diamonds, and because diamonds command a price, they would be consumed at much lower quantity Q_1 in Figure 1.3(a), whereas water, if it is free to the consumer will be consumed at a much higher level Q_1 in Figure 1.3(b).

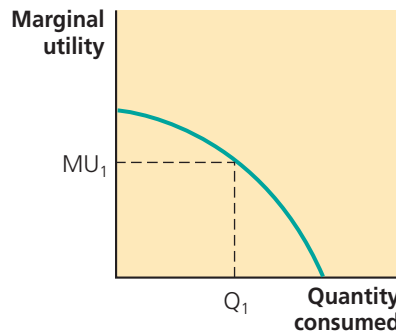


Figure 1.3(a) Marginal utility schedule for diamonds

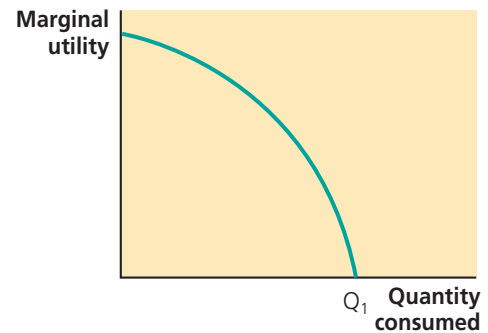


Figure 1.3(b) Marginal utility schedule for water

1.2 The budget line

The budget line joins together different combinations of X and Y that can be purchased given a fixed sum of money (Figure 1.4).

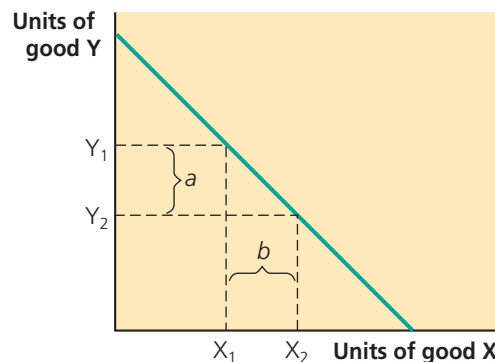


Figure 1.4

The slope of the budget line identifies the opportunity cost of more X or more Y.

$$\text{Opportunity cost of X} = \frac{a}{b}$$

$$\text{Opportunity cost of Y} = \frac{b}{a}$$

Parallel shifts in the budget line occur if income changes or if each price changes by the same percentage.

The **slope** of the budget line changes when relative prices change, i.e. one price changes by a different percentage to the other.

2

Consumer theory: the individual demand curve

The demand curve for an individual establishes the functional relationship between the price of a product and the quantity demanded.

This is a very simple example, but we will use the same numbers to build up a more complex model. If you get lost, then keep going back to pick up the argument.

This can be illustrated in its simplest form if we assume a person has only £50 to spend on one product and total utility increases with each successive purchase. Table 1.1 shows how many will be purchased at various prices.

Price	Quantity demanded
£50	1
£25	2
£10	5
£5	10

Table 1.1

I will leave you to graph this function, remembering that the convention is price on the vertical axis and quantity on the horizontal axis.

Now let us make it a little more difficult by assuming the consumer has a choice of two products X and Y, the same expenditure constraint, i.e. £50, and a price for both products of £5. In order to answer this, let us use some made-up numbers for marginal utility (Table 1.2).

Units consumed	Marginal utility of X	Marginal utility of Y
1st	20	15
2nd	18	12
3rd	16	10
4th	14	8
5th	12	6
6th	11	5
7th	10	2
8th	4	1
9th	3	0
10th	1	0

Table 1.2

The answer is that the consumer will purchase 7X and 3Y and will maximise utility at 138 utils. No other pattern of expenditure can achieve this total.

To work this out, you can proceed in an iterative way, i.e. the first purchase of X gives 20, the second purchase gives 18 and so on until all the money is gone. Alternatively, you can search for the expenditure pattern which spends all the money and equals the marginal utility of the last pound spent on X and Y, i.e.:

$$\frac{\text{marginal utility of X (MUX)}}{\text{price of X (PX)}} = \frac{\text{marginal utility of Y (MUY)}}{\text{price of Y (PY)}} = \frac{10}{5}$$

The analysis is made more complex if we assume a change in relative prices. Suppose the price of X rises to £10 and the same expenditure constraint remains. To approach this in an iterative way, notice that doubling the price of X halves the utility from each pound spent.

$$\text{Using } \frac{\text{MUX}}{\text{PX}} = \frac{\text{MUY}}{\text{PY}} = \frac{16}{10} = \frac{8}{5}$$

the answer is 3X and 4Y with utility maximised at 99 utils.

3

Market demand

'Horizontal sum' means you are adding up on the horizontal axis while the vertical axis remains constant.

You need to get this clear. It is one of the first signs that you are going to be a good economist.

By definition an inferior good must have a superior alternative.

3.1 The normal product demand curve

The total demand for an individual product is referred to as the market demand. It is the horizontal sum of each individual demand curve and its normal shape is downward sloping from left to right.

The uneven distribution of income in a country like the UK will mean that as the price falls, so more consumers will be able to enter the market. Each consumer will also gain more utility per pound spent as the price falls and will therefore increase consumption as purchases are rearranged to maximise utility.

3.2 Shifts and movements in a demand curve

If the first thing that changes in the relationship between price and quantity demanded is **price**, then this will be represented by a **movement** along the demand curve. If it is **quantity demanded**, then this will be represented by a **shift** in the demand curve.

A movement along a demand curve occurs as the result of a change in price, whereas more or less of the product demanded at the same price constitutes a shift.

Consider one final variation to make sure you have got this right: **more or less demanded at different prices is a movement; more or less demanded at the same price is a shift.**

Shifts in the demand curve can be the result of:

- rising real income
- economic growth
- change in consumer tastes
- new products entering the market
- new ways of buying and selling, e.g. the internet
- the cost of loans
- advertising
- changes in the price of other competing or complementary products
- changes in the structure or size of the population

3.3 Normal goods and inferior goods

Normal goods have two characteristics:

- The quantity demanded is negatively related to price, i.e. a fall in price raises demand.
- The quantity demanded is positively related to income, i.e. a rise in income raises demand.

Inferior goods have only one characteristic:

- The quantity demanded is negatively related to income, i.e. a rise in income causes a fall in demand.



For those of you who find elasticity difficult, there is good news and bad news: point elasticity is simple to understand and very helpful, but does not attract examination questions.

It is common to identify two types of inferior good, one of which has a normal demand curve while the other has a perverse demand curve. The distinguishing feature is the relative strength of the income effect of the price change.

It is important to understand that a change in price has two effects:

- It changes **real income** by raising or lowering spending power.
- It causes a **substitution** of one product for others as the utility per pound spent changes.

Although these two effects take place simultaneously, their separation clearly identifies the two types of inferior good.

4 Price elasticity of demand

4.1 Introduction

The elasticity coefficient measures the responsiveness of a change in demand to a change in price.

Theoretically this relationship is precise and relatively easy to calculate, while in reality the inclusion of many more variables than just price and quantity demanded make it impossible to identify with the precision implied by theory.

Point elasticity: every point along a demand curve has an elasticity value that can be calculated using a ruler. All you have to do is measure the projected distance from the point to the quantity axis and divide it by the projected distance to the price axis (Figure 1.5).

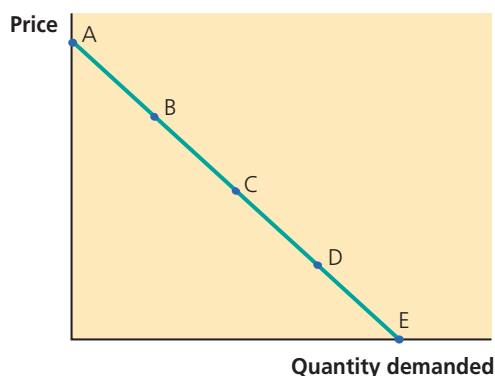


Figure 1.5

$$\text{Point A} = \frac{AE}{A} = \text{infinity}$$

$$\text{Point B} = \frac{BE}{BA} = \text{elastic}$$

$$\text{Point C} = \frac{CE}{CA} = \text{unitary}$$

$$\text{Point D} = \frac{DE}{DA} = \text{inelastic}$$

$$\text{Point E} = \frac{E}{EA} = \text{zero}$$

It is a common mistake to assume that a straight line has uniform elasticity.

All calculations produce a positive answer and strictly there must be a minus sign in front of the percentage changes.

Doing this reminds you that every straight line has a different elasticity at every point. If the line is not straight, use tangents to make the calculations.

4.2 The algebra

The universal equation that you must familiarise yourself with is:

$$\text{price elasticity coefficient of demand (c)} = - \frac{\text{percentage change in quantity demanded}}{\text{percentage change in price}}$$

An alternative calculation using averages is:

$$c = - \frac{\text{average price} \times \text{change in quantity demanded}}{\text{change in price} \times \text{average quantity}}$$

Both calculations produce slightly different answers as one is a percentage change from one point to another whereas the other is the average of a number of points. Do not worry about this — either answer will be accepted.

4.3 The graphs

As well as the straight line in Figure 1.5, there are three **uniform** shapes.

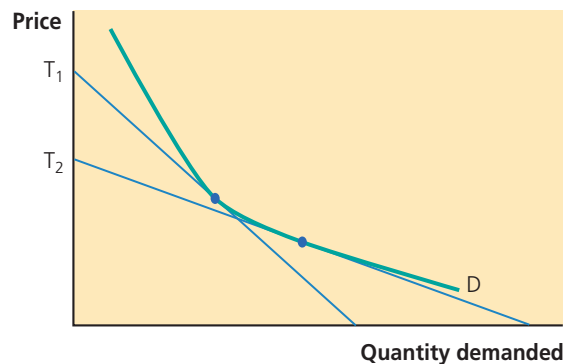


Figure 1.6
The unitary curve

The shape in Figure 1.6 is a rectangular hyperbola. Although it is a curve, each point is equidistant from each axis along the tangents T_1 and T_2 and therefore it has a constant value of 1.

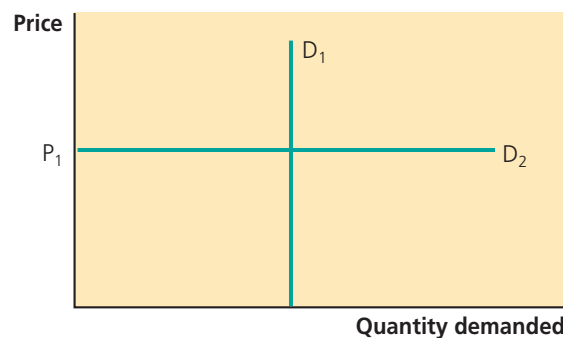


Figure 1.7
The perfectly elastic and perfectly inelastic curves

D_1 is perfectly inelastic (0): as price changes there is no change in demand.
 D_2 is perfectly elastic (infinite): as the price rises above P_1 , demand is zero. At and below P_1 , the demand is infinite.

Most students will say that demand rises when price goes down. Ask them what happens to expenditure on a product as demand rises and they will usually start by saying that expenditure rises. Place two numbers on the axes and they will realise that selling nothing at £100 or giving away 1,000 at a zero price produces no revenue.

4.4 Expenditure and the price elasticity of demand

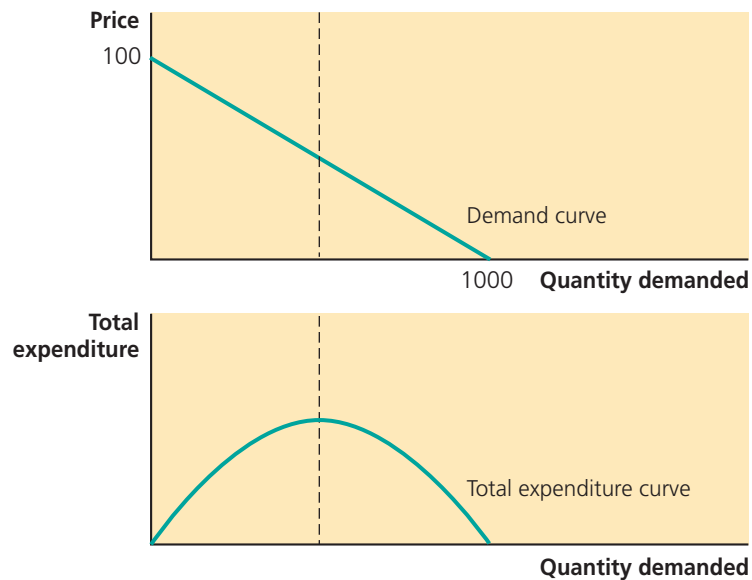


Figure 1.8

Figure 1.8 shows that as price falls there is a range over which:

- demand rises and expenditure rises
- demand rises and expenditure stays the same
- demand rises and expenditure falls

Many firms around the world have gone bankrupt because they do not understand this relationship. Ask a person in business how they will improve profitability. 'Sell more' is usually the answer. How will you sell more? 'Lower the price' may be the answer. As we can see, there is a price range over which this is exactly the **right answer** and a price range over which this is exactly the **wrong answer**.

Another interesting point is illustrated by the unitary demand curve: whatever the price, the expenditure on the product remains unchanged. In Figure 1.9, multiply the price by the quantity sold.

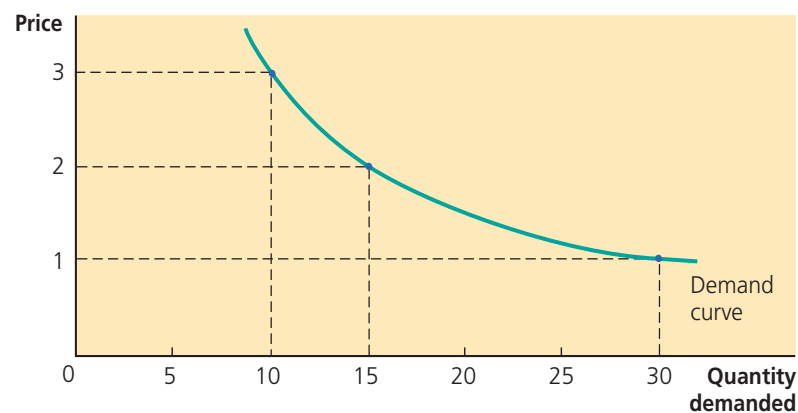


Figure 1.9

4.5 Be thankful for smokers, drinkers and gamblers

We have already pointed out that, in reality, you cannot calculate precisely an elasticity. However, anyone who changes a price does so with some expectation

Here the + or – signs used to record a rise or fall are important as they are the first sign of the possible type of relationship between two products. A positive or negative cross-price elasticity is a necessary, though on its own not a sufficient, condition to prove the relationship. Products could have changed together but be totally independent.

In all three elasticity calculations the quantity demanded is on the top. If you remember this, you are less likely to make a mistake.

5

Cross-price elasticity of demand

This is the responsiveness of demand for one product to a change in the price of another product.

The formula is:

$$\text{cross-price elasticity of demand} = \frac{\text{percentage change in demand for X}}{\text{percentage change in the price of Y}}$$

Competitive products which are **substitutes** for each other will have a **positive** cross-price elasticity: a rise in the price of one product will raise demand for the other product.

Products in **complementary** or **derived demand** will have a **negative** cross-price elasticity: a rise in the price of one product will reduce the demand for the other product.

Independent products will have a zero or infinite cross-price elasticity of demand, i.e. a change in one product will not affect the other product.

6

Income elasticity of demand

Income elasticity of demand is the degree of response of demand to a change in income.

The formula is:

$$\text{income elasticity of demand} = \frac{\text{percentage change in quantity demanded}}{\text{percentage change in income}}$$

Consumption of a **normal** good will rise as income rises.

Normal goods which are **necessities** will at some point have elasticities which tend towards zero, i.e. at some point as your income rises you will want to stop eating more food. Normal goods which are **luxuries** will produce income elasticities with higher numerical values.

Inferior goods will have income elasticities of demand which are negative because a rise in income will lead to a fall in demand.