Lesson Six

Market Failure

Aims

The aims of this lesson are to enable you to

- examine the inadequacy of the market mechanism in real terms
- introduce the idea of social cost and benefit
- understand the concepts of public, merit and demerit goods and their influence on the allocation of resources
- look at the system of cost-benefit analysis
- examine some examples of cost-benefit analysis in practice
- understand the inadequacy of cost-benefit analysis.

Context

The last few lessons have looked at how markets work in theory and in practice; this lesson will look at where markets fail, and begin to examine the role of the government in correcting their failings, a topic which will be continued in the next lesson.

Maunder ch. 7.

Oxford Open Learning

Public and Private Costs

One of the major arguments against the market mechanism is its failure to make any allowance for public goods or, as expressed more frequently, **social costs and benefits**. Normally the price of a product reflects, to a greater or lesser extent, the costs of production – these can be termed **private costs**. Prices do not, however, reflect costs which the production may impose on the community at large – social costs.

Furthermore prices only reflect the benefits obtained by the users of the products. They do not reflect any benefit obtained by non-users of the products. The free market system thus fails to take into consideration production which can cause pollution, the destruction of recreational areas and serious traffic congestion. Thus the use of prices and profits can in effect lead to a misallocation of resources.

These issues have become more important in recent years as evidence has mounted of the damage to the environment caused by indiscriminate economic activity. Such problems as acid rain, the destruction of the ozone layer, climate change, oil spillages, the disappearance of the rain forests and desertification are life-threatening on a global scale and they have led many to question the goals of economic growth and the free market economy. The ecological movement has begun to question the fundamental assumptions behind the economic model of human behaviour.

Thinking point

The picture below shows logging in a forest, to use the timber for manufacture into products such as paper. Logging and deforestation can have a dramatic effect on the animals and plants in the area, and also on the wider environment.

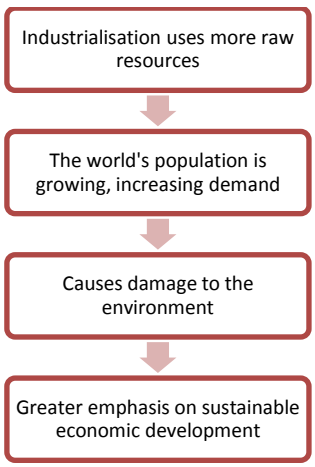
Think about the types of impacts it can have on the local and wider environment.

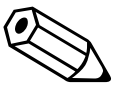
The number of human beings on the planet is still growing and all of them are demanding higher and higher standards of living, a bigger share of the global cake. There is no all-powerful organisation to oversee the workings of international economics and to prevent countries – and more crucially large multinational corporations – acting in their own interests (e.g. cutting down forests) in ways that run counter to global ecology. It is vital that solutions are found to these questions before catastrophe strikes. Humanity as a whole must learn to take a long-term view.

A distinction has developed between sustainable and non-sustainable economic activity.

- **Sustainable** activity uses the earth's resources in such a way that they are not permanently depleted. For instance, the growing of crops can be repeated year after year without damaging the environment (assuming no polluting chemicals are used and the soil is properly fertilised to maintain nutrient levels), or using solar energy instead of oil because solar energy is not finite.

- **Non-sustainable** activity, on the other hand, involves exploiting resources which cannot be replaced. For instance, the supply of oil from the North Sea and elsewhere will not go on for ever. It has become increasingly important to take account of the social cost of non-sustainable economic activity but it is very difficult to do this within the workings of a free market economy.



Activity 1	You have the choice of either driving your car or riding your bicycle to the shops. Suppose you choose to take the car. Outline the possible private costs and benefits to you, and the public costs and benefits to others, of your decision. Please jot down your answer in the box below and then compare your answer with the one given at the end of the lesson.
	**Costs** **Benefits** **Private** **Public**

Public Goods, Private Goods and Merit Goods

Public Goods

Public goods are goods which are normally communally provided because it is not possible to restrict their benefits to individuals or because their costs are too great for private groups to bear. A common example is the provision of police services.

If these were not provided by central or local governments a rather inadequate system would have evolved. Arrest of a criminal in one area will benefit people in other areas but the individual does not always connect their benefit from public goods to the required amount of their contribution. A strong incentive to minimise payment would ensue and an inadequate law enforcement system would result. A similar analysis could be provided for areas such as the fire brigade and preventive as opposed to curative medicine.

It is worth stressing that a public good is one that can be consumed collectively. One person's enjoyment of a public good in no way

prevents someone else's. What is more, no-one can be prevented from enjoying public goods if they wish to; exclusion is impossible. These are contrasted with private goods (clothes, fruit, etc.) from which generally only one person can derive satisfaction.

Some goods may have some characteristics of public goods but exclusion may be possible, so they are not true public goods. When exclusion is impossible, direct charges for consumption are impossible.

Example: the installation of flood defence systems by governments over recent years is a public good. This is because they are communally provided, do not restrict use and would be too expensive for individuals to fund.

Flood defence systems benefit all those who would otherwise be flooded when river waters rise.

Private Goods

In thinking about goods in an economy, it is useful to group them according to two characteristics.

- Is the good **excludable**? Can people be prevented from using the good?
- Is the good **rival**? Does one person's use of the good diminish another person's use and enjoyment of it?

Private Goods are both ***excludable and rival***. Public Goods are neither excludable nor rival. Consider a packet of crisps as an example. The crisps are excludable because it is possible to prevent someone from eating them. Crisps are rival because if one person eats a packet of crisps another person cannot eat the contents of the same packet.

Most goods in the economy are Private Goods. When we analyse demand and supply and how efficient markets are, you should assume that the goods mentioned are both excludable and rival.

Production and Productivity

Production is defined as the total amount of a commodity produced by using the factors of production in a specific combination. Productivity is the amount of a commodity produced per unit of resources used.

When a firm attempts to improve its productivity it may do so by altering its shift and labour patterns, it may re-train or re-skill management, or it may introduce more efficient and technically superior manufacturing equipment. It will attempt to increase output using a smaller amount of resources. Productivity is difficult to measure, so one of the most common methods is to take the total output and divide it by the number of workers to give ***labour productivity.***

Increasing productivity, and in particular labour productivity, is vital if we are to compete effectively with other countries, both inside Europe and internationally.

The government tries to encourage increases in labour productivity through education and training, whilst firms are given tax incentives to invest in new technology and research into new products and methods of production.

Merit Goods

Merit goods are goods which are of benefit to society either collectively or as individuals, but frequently are undervalued. Education and health are two often-quoted examples. The point is that if there were no state provision of **education** and parents were not required to send their children to school then many parents could disregard their children's interests. Children would certainly be no better judges of their interests, so attendance is made compulsory. This does not of itself lead automatically to the provision of free education for all; but the additional argument that education is good for society and the economy (more educated workers are more productive, and education can help to instil social responsibility) means most governments that can afford it now provide free education for all children (though some parents still choose to pay extra for private education).

Example: Health is similar to education – it is too expensive for many people to provide for themselves, and they may neglect the interests of their children or other dependants.

Again, a healthy population is more productive in economic terms. Finally, the provision of medical services may help to prevent contagious diseases – thus provision of healthcare, at least for those unable to afford it themselves, is viewed as a good idea by many governments.

Health provision fails as a public good on at least two counts – only one patient can occupy a bed and charges are possible!

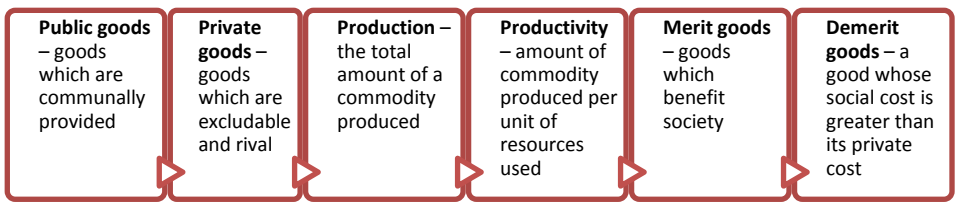
These two merit goods, education and health, are dominant items of public expenditure, frequently consuming together one seventh or more of total UK expenditure. Other goods may sometimes be defined at least partially as merit goods – e.g. housing, in the case of social housing, or, in some countries, childcare for pre-school age children.

Demerit Goods

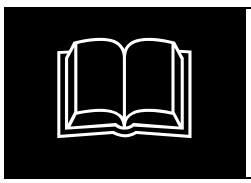
If a merit good is defined as one whose social benefit is sufficiently larger than its private benefit to justify the state in providing it or at least encouraging its consumption (this is obviously a value judgement), a demerit good can be defined as one whose social cost is sufficiently larger than its private cost to justify the state in discouraging its consumption, by taxation, regulation or prohibition. The most frequently quoted examples are:

- illegal drugs
- tobacco
- private car use, and
- other forms of highly polluting activity

These terms can be summarised as:



Cost Benefit Analysis



Read Maunder, pp. 181-88.

Cost-benefit analysis (CBA) is a practical method of evaluating individual public projects concerned with the provision of specific goods and services, such as education, health, transport and civil amenities.

A public body aiming to maximise social welfare will take account of the social costs and benefits of individual projects, as opposed to a private firm which takes account only of its private costs and benefits.

The cost-benefit technique attempts to identify the social costs and benefits associated with a scheme over a long period of time and tries to quantify them by expressing them in a common monetary unit.

Consider, for example, the building of a motorway. Its social costs include its construction and maintenance costs, noise, pollution from dirt and exhaust fumes, loss of landscape and general disfigurement of the environment.

Its social benefits include savings in journey time to existing and new road users, possibly fewer accidents and deaths and a smaller fleet of commercial vehicles needed to meet the same demand.

Example: think about the implications of the type of motorway below, being built close to where you live. How could this benefit you and your community, and what impacts would it have?

If the Government was outlining its plans to build the motorway, what types of issues would you expect it to consider?

Viewed in this way, cost-benefit analysis is an alternative technique for resource allocation in the public sector to that of allocation by the market mechanism. It enables the decision maker to choose from the alternative projects the one which maximises net social

benefit. This narrow objective of the maximisation of net social benefit of a given project should, in principle, however, be consistent with the broader objectives of allocation and distribution.

The Problems

1. The existence of **externalities and monopolistic elements** in the market mechanism means that prevailing market prices do not reflect the true social marginal cost of resources in alternative uses. This leads the cost-benefit practitioner to resort to the device of using shadow prices which are imputed prices designed to reflect the 'true' social costs and benefits of a project.

   For instance, the journey time saved by motorists as the result of the building of a motorway may be valued at an appropriate average hourly wage rate. Similarly, savings from a reduction in the number of accidents can be estimated in terms of the reduced cost of medical treatment.

2. The costs and benefits of a project, once given monetary values through shadow pricing, must be **discounted** before the present worth of the project can be determined. This is necessary because people generally prefer present consumption to future consumption. A sum of £100 received today, for example, is worth more to a person than the same sum received in two years' time.

   This is because by investing the £100 at, say a 10% rate of interest compounded annually, both the principal (£100) and the accumulated interested (£21) would be received at the end of the two-year period. Reversing this process, we can say that the present value of £121 to be received in two years' time (given a current rate of interest of 10%) is £100. The same discounting process has to be applied to the costs and benefits of a capital project.

3. The technique attempts to measure the social costs and benefits of a project, but fails to take account satisfactorily of **income distribution effects and 'intangibles'.** Consider the following limitations:

   (a) Some studies ignore the income distribution effects in that they avoid the crucial issue of the actual distribution of the gains and losses of the projects under consideration – for example, might the building of a bypass save 1 million people 2 hours per year each on journey times, but lead to the demolition of the homes and massive disruption in the lives of 100 people who live in the proposed path of the bypass. In terms of overall 'value' the tiny benefit to each of the million might be greater, but perhaps the massive cost to each of the hundred should outweigh it.

One way to overcome this problem might be to give different weights to the gains and losses of different affected groups in the population: the main problem with this, though, would be the difficulty of devising appropriate weights.

(b) The forecasting of the flows of benefits and costs during the lifetime of a project is an extremely hazardous business. It requires predictions of supply and demand patterns over a period of perhaps twenty or thirty years, estimates of future rates of inflation, population growth and spatial movements of population, all of which are extremely difficult to assess accurately.

Intangibles, such as pollution and the general disfigurement of the landscape, are difficult to measure. For example, the environmental damage caused by a motorway in an area of scenic beauty is impossible to evaluate objectively.

Nevertheless this type of analysis is being used with increasing frequency. Despite its problems it is an advance on some of the guesswork of earlier decades. [For more on problems with CBA and its problems, see Lesson 15].

These can be summarised as:

- Externalities and monopolistic elements mean the true social cost is not accurately identified
- The costs and benefits must be discounted
- Does not take income distribution and externalities into account

Activity 2

The Local Authority must make a decision on whether to allow a supermarket to build a new large superstore on a green public park in your town.

In the box below, note the possible costs and benefits associated with the build, which the Local Authority may take into consideration.

Then think how these would fit with a cost benefit analysis, if it was undertaken for this project.

	Costs **Benefits**

Transport Policy: Toll-Roads

The increased traffic congestion in and around all major cities, the severe traffic jams experienced on M1, M6 and most notoriously on the M25 have made the question of tolls highly significant. Traffic congestion is very costly but almost all roads in the UK are provided without direct change.

Economists now argue that charging for road use would help to relieve congestion and ensure efficient use of the roads. If you really need to use a road at peak time, you should be willing to pay for the right to use it. If the correct price is set non-essential users are deterred – they may make the journey later – and congestion is alleviated.

Thinking point

Below is a picture showing where the congestion charge starts in London, and drivers taking the decision to drive into the charging zone.

Think about what a driver might consider when driving into the charging zone. They must feel that payment of the charge is beneficial, otherwise they would seek alternatives.

CBA and Roads

Cost-benefit analysis helps illuminate the problem.

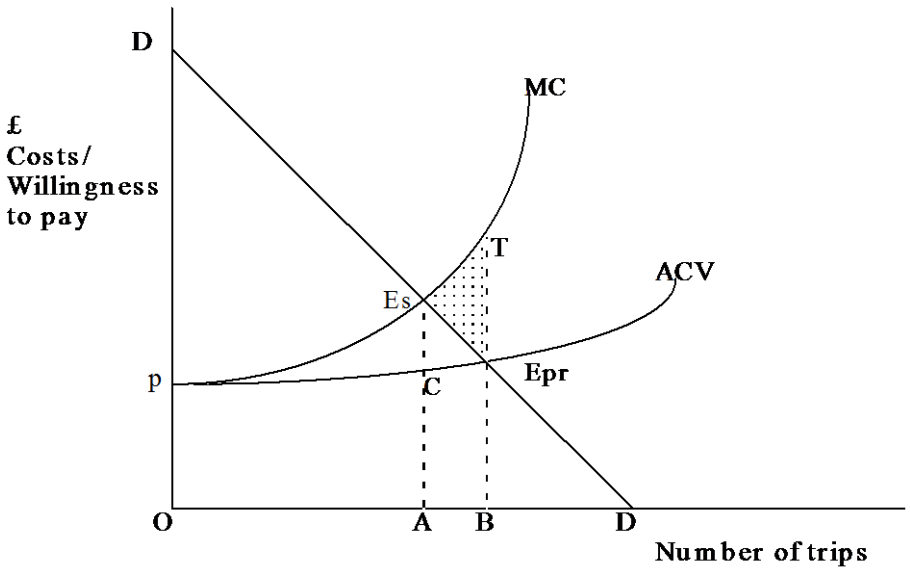
1. First the **private costs** of the motorist. In addition to the petrol and wear and tear on the vehicle, the driver's time is the key cost. If this is valued at the motorist's rate of pay it is possible to work out the private cost of making a journey.

2. Secondly, the journey also involves negative externalities or costs to society. In addition to pollution (both noise and chemical) there is the basic fact that one more car reduces the possible speed of all other vehicles and so increases the time taken by all other drivers. So the marginal cost (MC) of the extra trip will be above the average cost per vehicle (ACV).

   The difference between the MC and ACV represents the external costs imposed by one person making the trip on all other people making the trip.

3. But drivers do not have to use the road. They can use rail or a different route or travel at a different time. Provided the amount each driver is willing to pay not to use their next best alternative is known, it is possible to construct a demand curve for trips, DD in the following diagram.

Diagram 1



In a system with no government intervention, drivers will make the trip provided the benefits equal the cost of making the trip – where the demand curve cuts the ACV curve at OB.

It is only *socially* correct if the benefit to the driver exceeds the cost to everyone of that extra trip – where the demand curve cuts the MC curve at OA. If there is no intervention, the shaded area T.Es.Epr measures the welfare loss of making OB trips.

Solutions

Charge a price of Es–C for each trip made at the congested period. The cost to each driver will then be ACV plus the tax Es–C. which will be equal to the benefit of the marginal user when OA journeys are made. So, by charging the correct tax or **toll** for the right to use the road, the amount of road use is reduced to the optimal level.

Problems

The whole traffic system must be considered, as otherwise a toll on one road shifts the traffic a few miles to a less convenient route.

Furthermore, tolls tend to penalise the less affluent members of society who are forced on to secondary routes or public transport.

The cost of collecting tolls can be high and cars stopping to pay actually causes increased congestion.

Higher licence fees, petrol prices and/or parking fees all reduce congestion but fail to distinguish between areas of use and time of use.

A Congestion Charge was introduced in London in 2003. The daily fee of £8 must be paid by the registered owner of a vehicle that enters, leaves or moves around within the Congestion Charge zone between 7am and 6.30pm, Monday to Friday. Vehicles' details are picked up as they pass cameras which are installed at the edge of the zone.

Technological developments could make toll-roads even more viable in reducing road congestion in the UK.

Case study - The Channel Tunnel

The Channel Tunnel, finally opened in 1994, engendered both fervent support and opposition during the many years of planning and construction. Its success is questionable and cost-benefit-analysis can be applied to help decide on the project's validity.

Below is a photograph of the Channel Tunnel terminal, demonstrating the level of construction work required.

Private Costs/Benefits

- Originally forecast to cost approximately £56m, it cost more than double that by the time it was completed.

- Its revenue comes from car passengers, coach passengers and freight.

- Originally the project showed a profit as there was a surplus of private revenue over costs.

Externalities

These were both positive and negative.

Positive

1. Improved journey times to the Continent
2. Job-creation
3. Accelerated industrial developments for all regions directly linked by high-speed trains to the tunnel

Negative

1. Destruction of rural tranquillity of Kent
2. Job losses for workers on ferry companies
3. Danger of animals bringing rabies into the UK
4. Destruction of habitat of many animals, fish, etc.
5. Increase in noise, pollution from extra road and rail traffic

Long term impact

Under the 1973 Land Compensation Act residents are entitled to secondary noise insulation for their houses if average noise levels of more than 68 decibels are detected. British Rail (BR), though not obliged by law, indicated it would pay for insulation for average noise levels above 70 decibels in houses near the high-speed link.

But neither of these standards was acceptable to Kent residents because they related to an average noise level over a 24 hour period. Professor Robert Bottle, the chairman of the noise committee of the North Downs Rail Concern pressure group, said 'If it was a steady drone going on outside you would be able to get to sleep, but it will be more like a shotgun going off every seven minutes.'

Professor Bottle wanted BR to make extensive use of cuttings and cut-and-cover construction techniques to reduce noise.

The tunnel had the same problem as most public work projects – that of the distribution of gains and losses. The people who suffer the negative externalities are frequently different from those who gain from the positive externalities (benefits).

In the last few years, environmental groups have been more vociferous in their campaigns against the building of new motorways and by-passes because of the damage they inflict on the environment. Decisions of this nature are, inevitably, problematical.

Summary

Sustainable development does not permanently deplete the world's resources. It uses resources which are not finite, such as wind power or recycled products.

The differences between public goods and private goods.

Cost benefit analysis (CBA) evaluates projects providing goods and services, such as transport and health.

The Channel Tunnel is a useful example of using CBA in a public project.

Self-Assessment Test (Lesson Six)

1. Which of the following should be (i) financed and (ii) produced by governments and why?

   (a) roads
   (b) beer
   (c) heroin
   (d) cosmetic surgery
   (e) opera
   (f) civil defence

   (N.B. This question involves **normative economics** – you can argue the case in any direction you wish, providing you base yourself on economic reasoning.)

Suggested Answer to Activity One

Private Costs	**Private Benefits**
Petrol, wear & tear on the car, time taken. Opportunity cost of foregone exercise through not biking!	Economy of effort, time saved, ease of transporting groceries.
Public Costs	**Public Benefits**
Exhaust pollution, delay to other road users, possible danger to other road users.	Very few.

Suggested Answer to Activity Two

Costs may include:

- The loss of green space used by local residents
- A built-up area
- Congestion and pollution from the build and cars/lorries
- Safety issues from these cars and lorries

Benefits may include:

- Local jobs in the new superstore
- Shorter journey time to the shop **(**= cheaper**)**
- Will bring other people to the town
- May improve the park area

Syllabus Review of Section 3.1.4: Market Failure

The Meaning of Market Failure

Candidates should understand that market failure occurs whenever a market leads to a misallocation of resources. They should appreciate the difference between complete market failure (resulting in a missing market), and partial market failure, where a market exists but contributes to resource misallocation.

Candidates should understand how public goods, positive and negative externalities, merit and demerit goods, monopoly and other market imperfections, and inequalities in the distribution of income and wealth can lead to market failure.

Candidates should be able to give examples of each of these causes of market failure.

Public Goods

Candidates should understand that pure public goods are non-rival and non-excludable and recognise the significance of these characteristics. Candidates should understand the difference between a public good and a private good, and consider whether under certain circumstances, a public good may take on some of the characteristics of a private good.

Positive and Negative Externalities in Consumption and Production

Candidates should understand that externalities exist when there is a divergence between private and social costs and benefits and that negative externalities are likely to result in over-production.

Candidates should be able to illustrate the misallocation of resources resulting from the production of externalities, using diagrams showing marginal private and social cost and benefit curves.

Merit and Demerit Goods

Candidates should understand that the classification of merit and demerit goods depends upon a value judgement and that such products may also be subject to externalities. They should also understand how under-provision of merit goods, and over-provision of demerit goods may result from imperfect information.

Candidates should be able to illustrate the misallocation of resources resulting from the consumption of merit and demerit goods using diagrams showing marginal private and social cost and benefit curves.

Note: at AS, externalities and merit and demerit goods provide the only contexts in which candidates are expected to use diagrams showing the concept of the margin.

Monopoly and the Allocation of Resources

Candidates should understand that monopolies have market power and that the basic model of monopoly suggests that higher prices, inefficiency and a misallocation of resources may result in monopoly, compared to the outcome in a competitive market. Candidates should understand that monopoly can provide an example of market failure.

Candidates should be aware of the various factors which affect the behaviour and performance of firms in a variety of real world markets and are sources of monopoly power. The factors include different barriers to entry and the degree of concentration and product differentiation.

Candidates should understand the potential benefits from monopoly, for example, economies of scale and possibly more invention and innovation.

Note: candidates are not expected to know the formal model of monopoly. However, candidates should be able to use two diagrams to illustrate the costs and benefits of monopoly: a market demand curve showing the effect on price of producing a lower output; and a cost curve to show economies and diseconomies of scale. Knowledge of monopoly revenue curves is not required. These topics are assessed in Unit 3.

Immobility of Factors of Production

Candidates should understand that the immobility of factors of production is likely to result in a misallocation of resources and therefore cause market failure.

Inequalities in the Distribution of Income and Wealth

Candidates should understand that, in a market economy, an individual's ability to consume goods and services depends upon his/her income and wealth and that an unequal distribution of income and wealth may result in an unsatisfactory allocation of resources.

Note: it is not necessary at this stage for candidates to study the causes of inequalities in the distribution of income and wealth. This is assessed in Unit 3.