GLAECONOMICS

The rationale for public sector intervention in the economy II

Transport for London

LONDON DEVELOPMENT AGENCY

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Executive summary

This report looks at the rationale for public sector intervention in the economy. The report sets out the theories underlying why and when the public sector should intervene and gives examples relevant to the GLA and LDA. The executive summary sets out the key concepts involved. Technical terms shown in bold are explained in more detail in the glossary.

Economic efficiency is the situation in which resources (raw materials, labour, land and capital) are allocated and used in the most productive manner possible. More specifically, it is the situation in which there is no waste of resources in the production process and no waste of resources in the allocation process.

In the absence of market failures, this efficient allocation of resources will be produced by the market mechanism with prices acting as the key balancing mechanism to ensure resources are allocated in an efficient manner.

Market failure occurs when a market does not deliver an efficient allocation of resources due to specific problems with the market mechanism. In most cases this will mean a situation in which the price is no longer accurately reflecting consumer or producer preferences and as such is leading to a situation where goods and services are no longer being allocated in an economically efficient manner.

The public sector should only intervene in the economy when markets are not efficient and when the intervention would improve efficiency. Therefore, the first condition for public sector intervention is evidence that a market failure exists. The second condition is that the intervention will make an improvement. This will depend on how significant the failure is and on the public sector's ability to design and implement an effective intervention.

Why should the public sector intervene in the economy?

Some goods and services have specific characteristics which suggest that a competitive market will not deliver an efficient amount of them.

- For a market to work efficiently it is important that a supplier is able to exclude people from consuming their product for free. However, some goods or services are said to be **non excludable** in that it is impossible to restrict consumption of the good just to those who pay for it. This leads to a **'free rider'** problem in which once one person chooses to consume the good or service, other consumers are able to 'free-ride' on this decision and consume the same product for free. The net result is that the good or service will not be supplied (or will be under-supplied) by the market because producers are unable to earn income from its supply.

- As described, it is the price of a good or service that acts to ensure resources are allocated in an efficient manner through balancing supply and demand to ensure an efficient quantity of the good or service is produced and allocated. For this to be the case, producers and consumers must bear the full costs and benefits of their activity. However, there are cases where producers and consumers do not bear the full costs and benefits of their activity. This is usually because there are costs or benefits obtained by people not directly

involved in the transaction. An **externality** therefore describes a cost or benefit resulting from an economic transaction that is borne or received by parties not directly involved in the transaction.

Where externalities exist, the market will not deliver the efficient quantity of the good or service. Where there are positive externalities, i.e. the benefits to others are not considered, the market will under supply the activity. Where there are negative externalities, such as pollution, i.e. the costs to others are not considered, the market will provide too much of the activity.

Externalities can sometimes be dealt with through negotiation if there are clear and enforceable property rights. Alternatively, it may be possible for individuals or firms to co-operate to overcome externality market failures provided the free rider problem can be overcome. In some circumstances, regulation may be required.

- Markets are efficient when all parties to a transaction have equal information about the good or service on offer. In practice, the overwhelming majority of markets are able to function even when this is not the case. However, particular problems may affect some markets displaying **imperfect information**.

  If the seller of a good or service has more information than the buyer on the quality of the good or service for sale then such a situation is known as **asymmetric information** and may result in less trade occurring than in a case where the consumer has better information. In the case where the consumer has much better information than the provider, information problems can produce examples of **adverse selection** with a similar result (less trade than in the case of perfect information).

  Moral hazard, meanwhile, exists when one of the parties to an agreement has an incentive, after the agreement is made, to act in a manner that brings additional benefits to himself or herself at the expense of the other party. It is in effect a problem of hidden action in that one party cannot observe the actions of the other party and yet the hidden actions of the other party are influencing the costs and benefits of their transaction.

- **Imperfect competition** usually occurs when there are not a sufficiently large number of suppliers in a market. In such a case there will be a lack of the competitive pressure necessary to ensure prices are kept at economically efficient levels. In other words, when there are few suppliers in a market then these suppliers have some market power and may in some cases be able to raise prices. In the UK, it is mainly the job of the competition authorities to ensure that abuse of market power by private sector companies does not occur.

Interventions for social justice or **equity** reasons are based on the subjective decisions and judgments of democratically accountable politicians, but a market failure framework should still be used to inform decisions and to ensure the desired outcome is achieved in the most efficient and effective way.

In total, public expenditure accounts for around 30 per cent of London's output (and around 40 per cent of the UK's output). In virtually every case it is possible to understand the reason for this public sector intervention using the market failure outline described in this report. For example, the public sector intervenes to provide a nationwide police service because policing is a public good; the public sector intervenes in health markets because of imperfect information market failures; and the public sector intervenes in children's education because of externality market failures etc.

For the London Development Agency (LDA), it is important that any decision to intervene in the economy is similarly made where market failures can be identified. To help illustrate the types of interventions that may be made the report includes nine case studies illustrating a number of the current interventions that the public sector makes in the London economy based on the market failure rationale.

What are the risks of public sector intervention?

The existence of a market failure is not a sufficient case for intervention. Public sector intervention comes at a cost. Therefore it also needs to be demonstrated that the intervention will make an improvement and that the benefits of intervention will exceed the costs.

The success of cost–benefit analysis, where all the costs and benefits of public sector intervention are considered, depends on the public sector's ability to accurately assess both the costs and benefits of intervention. This is important because the public sector frequently has poor mechanisms available to it in deciding how to allocate resources. Indeed, **government failure** frequently occurs because the public sector faces the same, or worse, information problems than the market itself.

Public sector intervention may also fail to deliver the anticipated benefit if private agents do not respond to the intervention in the way the public sector thought they would. In particular there is a risk that public sector intervention may crowd out or displace future activity by the private sector, such that there is no overall improvement. Consideration also needs to be given to the **displacement, substitution and income** effects of an intervention.

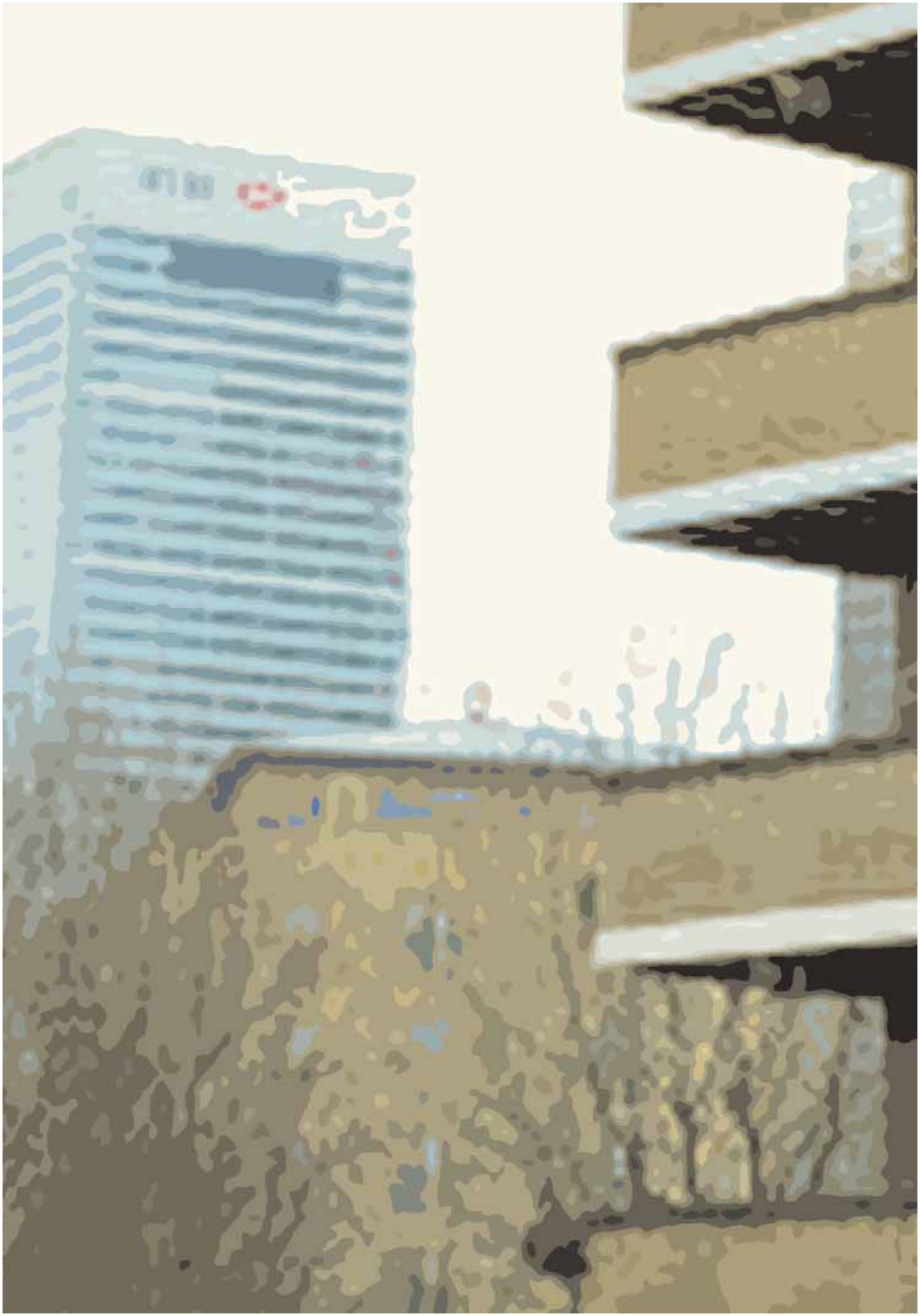
Political failings arise when individual interests override the public interest, for example when special interest groups are successful in lobbying for an intervention for their own rather than the public's benefit.
Administrative failings arise primarily because public servants work for others rather than themselves and face different incentive structures to those of the private sector.

When should the public sector intervene?

The public sector should only intervene when there is a market failure and when intervention will lead to an improvement. This is most likely to occur where:

- the market failure is big – there is evidence of a significant problem; and
- public sector intervention is effective.

Public sector intervention is more likely to be effective when it addresses the cause of the market failure, **and** where it seeks to improve the functioning of the market rather than supplanting it.



Introduction

This report looks at the rationale for public sector intervention in the economy. The report sets out the theories underlying why and when the public sector should intervene and gives examples relevant to the GLA and LDA. The primary audience for this report are those within the GLA and LDA although the principles set out in the paper are equally relevant to other public sector bodies. The report provides a framework to help the GLA and LDA make better interventions.

Technical terms shown in bold are included in the glossary.

The report answers questions such as:

- Why should the public sector intervene in the economy?
- What are the risks of public sector intervention?
- When should the public sector intervene?

It is important to note that this report mainly focuses on why and when the public sector should intervene, rather than how. For example, the report shows that the public sector may wish to intervene in an economy to operate a police service (which of course it does in the UK) because policing is a public good displaying the free rider problem.

However, this report does not, in most cases, say how the public sector should manage its intervention. The report does not say, for example, in what way the public sector should manage the police service (e.g. which layer of government should be in charge etc) or any other interventions in the economy.

The one key focus of this report is to provide an economic framework, via the market failure rationale, to allow informed decisions to be made on which areas and activities of the London economy the public sector should intervene, and just as importantly on which areas and in which cases it should not.

Section A looks at the reasons for intervention, namely the existence of economic market failures and their causes. It also addresses the subject of interventions due to equity considerations.

Section B looks at some of the reasons why public sector intervention may not lead to an overall improvement - the risks of public sector intervention.

Drawing on the rationale for and risks of intervention, the third section briefly considers when the public sector should intervene – when intervention is likely to be effective, and suggests some rules of thumb when deciding whether to intervene.

The document ends with a number of illustrative case studies of market failure that are likely to be relevant to the LDA and GLA. These are intended to help understand market failure in the GLA and LDA context and to help with thinking about how to intervene to alleviate market failure. They are not intended to give prescriptive or detailed policy advice, and do not represent position statements on any of the case studies considered.

Section A: Why should the public sector intervene?

A) Market failure

Goods and services are produced, distributed and then consumed. For example, loaves of bread are baked at a bakery then distributed to a shop and then eaten by the consumers who purchase them.

In aggregate, people prefer to consume more goods and services rather than less. Therefore, it is important that goods and services are produced and allocated in an efficient manner. Failure to do so would result in fewer goods or services being available for consumption and/or resources being wasted.

Economic efficiency is therefore the situation in which resources (raw materials, labour, land and capital) are allocated and used in the most productive manner possible. More specifically, it is the situation in which there is no waste of resources in the production process and no waste of resources in the allocation process.

In the absence of market failures, this efficient allocation of resources will be produced by the market mechanism with prices acting as the key balancing mechanism to ensure resources are allocated in an efficient manner.

Market failure occurs in the situation where a market does not deliver an efficient allocation of resources due to specific problems with the market mechanism. In most cases this will mean a situation in which the price is no longer accurately reflecting consumers or producers preferences and as such is leading to a situation where goods and services are no longer being allocated in an economically efficient manner.

There are four common causes of market failure. These are:

1) Public goods
2) Externalities or spill-overs
3) Imperfect information
4) Imperfect competition

In this report, each one is examined in turn and an explanation provided.

In total, public expenditure accounts for around 30 per cent of London's output (and around 40 per cent of the UK's output). In virtually every case it is possible to understand the reason for this public sector intervention using the market failure outline described in this report. Thus, the public sector intervenes to provide a nationwide police service because policing is a public good; the public sector intervenes in health markets because of imperfect information market failures; and the public sector intervenes in children's education because of externality market failures etc.

The importance of market failure, therefore, is that it provides the basis for understanding situations in which it may be worthwhile for the public sector to intervene in the market.

Thus, there may be situations in which a specific market failure exists and through an intervention the public sector is able to bring about an economically more efficient allocation of resources than the market alone would provide.

It is for this reason that the Regional Development Agencies (RDAs) are tasked with improving the regional economy specifically through the alleviation of market failures.

This section looks at the four key causes of inefficient markets or market failure:

1 Public goods

Public goods are goods that are **'non-rival'** and **'non-excludable'**.

Non-rival means that one person's consumption of a good does not prevent anyone else from consuming it. Clean air, television or radio services, and national defence are all examples of a non-rival good. In other words, whilst my eating a loaf of bread prevents you from eating that same loaf of bread, my listening to a radio broadcast does not stop you from also listening to the same radio broadcast. As a result, a radio broadcast is termed 'non-rival'.

Non-excludable means that if one person can consume a good, it is not possible to prevent others from also consuming that good. This is not the case for most goods. For example, I can prevent you consuming a specific loaf of bread by eating it myself. Or a television company can exclude people who do not pay a fee from watching their broadcast. However, there are some examples where if a good is available to one person then it is effectively available to everyone. National defence and street lighting are examples of such non-excludable goods.

Examples of public goods that are both 'non-rival' and 'non-excludable' are clean air, national defence and street lighting. In such cases, government will usually provide these services because in the case of a public good, the normal 'market pricing mechanism' breaks down. This occurs because it is not possible for a private company to get individuals to pay for a good that is both 'non-rival' and 'non-excludable' because once one consumer receives the good then all other consumers are also able to freely consume the good. This inability to create a functioning market for the good would result in an inefficient or non-existent level of provision of the good by private companies.

Some goods will display one of the characteristics of 'non-rivalry' and 'non-excludability' but not both. Cable and satellite television is one example. This is a good that is 'non-rival' because your consumption of it does not impact upon my ability to consume it. However, it is possible for this good to be excludable. By encrypting signals and requiring consumers to obtain a decoder it is possible for suppliers to exclude those who do not pay a subscription. As a result, it has been possible to create a fully-functioning market for cable and satellite television and public sector intervention is not required. This is an example of the fact that provided a good is excludable then it is usually possible for a market to function.

By contrast, for non-excludable goods, the market will frequently not be able to function correctly. This is because, once provided, the good can be consumed beyond those who were prepared to pay for its provision. This leads to the **'free rider'** problem where people avoid paying for the provision of the goods because they know they will be able to benefit from them anyway. This reduces the returns to potential suppliers and therefore the good will be under-supplied by the market.

An example of the 'free rider' problem would be if you were able to watch a fireworks display organised by someone else (for example because you can see it from your own house or garden). It may be that you enjoy firework displays and would have been happy to pay a fee to watch one. However, because you can see it without paying then there is no incentive to pay. In other words, in such an example you are a 'free rider', consuming the fireworks display without contributing to its cost.

Whilst your watching of this firework display is not harming anyone, it does nevertheless have an economic effect, this being that firework displays will be undersupplied relative to the true demand. To understand this consider what would happen if the organiser of the display had been able to exclude you and others from watching the display for free (e.g. by holding it in a more enclosed location). In such a situation the organiser could have asked for a fee for you to come and watch the display. People who enjoy fireworks displays would be willing to pay the fee and the result is that the organiser would have more money with which to put on a far bigger fireworks display than would be the case where she was having to finance it alone and where people were able to 'free-ride'.

In other words, when the organiser is able to fully exclude non-payers then the price mechanism works to ensure that demand for fireworks displays and their supply are matched. So in the fireworks example, the organiser is able to put on a large display which those who enjoy fireworks displays are happy to pay to watch. By contrast, in the case where the organiser can not exclude people from watching the display for free then there is no incentive for consumers to pay and less incentive/ability for the organiser to put on a large display (even though the demand exists for one) as she is unable to charge fees to cover her costs and/or make a profit. The net result is that there will be only a small fireworks display or perhaps none at all.

The 'free rider' problem leads to the normal 'market pricing mechanism' - whereby changes in the price co-ordinates the number of goods demanded by consumers and supplied by producers - breaking down because people are able to consume the good for free rather than paying a fee reflecting their true interest in the good. The result is an inefficient (too low) level of provision of the good. The public sector may, therefore, intervene in the supply of public goods because the market alone is unlikely to provide the most efficient quantity of the good.

Therefore whilst the fireworks example may appear relatively trivial, in the case of public goods such as national defence the issues are not trivial. In this case the public sector intervenes to ensure this good is supplied because in a free market the free rider problem would lead to it being undersupplied relative to the real demand for them.

Government, either national or local, is also usually involved in the provision of other public goods related to providing public amenity such as street cleaning, street lighting, security (i.e. policing) and general maintenance of the public realm. In most cases these are supplied by the government via taxation in order to overcome the free rider problems as discussed.

However, there are cases where the private sector or private individuals wish to be more directly involved in the provision of local public goods. This will generally occur in the case where those involved are dissatisfied with the current provision of local public goods. For example, retailers unhappy about the levels of cleanliness and crime in the streets outside their stores, or tenants of a block of flats unhappy at the poor upkeep of communal areas within their block. For such intervention by the private sector or private individuals to occur, however, the free rider problem must be overcome and in most cases it cannot. This is because of **co-ordination failure**.

Co-ordination failure occurs in such cases because when there are many parties involved in the transaction, the costs of negotiating to reach agreement with them all, whilst avoiding other parties free riding, is usually prohibitive. In such a case a good or service will usually need to be provided by government via taxation, or will not be supplied at all.

However, there are examples of where co-ordination failure can be overcome such that private parties are able to join together to provide public goods. For example, tenants in flats often co-operate to maintain and improve the appearance of common areas, and firms co-operate through trade associations. In these cases members of the group share common interests and benefit from co-operating with other members to meet these interests.

Individuals and firms may co-operate to overcome market failures where:

- The potential beneficiaries are a fairly small group and therefore the effort of co-operating/co-ordinating is low;
- The potential beneficiaries are a homogenous group[1] and therefore the benefits are valued equally;
- Even though some of the beneficiaries will 'free ride' on the investments of others the private benefits of the co-operative activity are expected to be greater than the private costs of co-operation/co-ordination; or,
- There are incentives or mechanisms to overcome free riding.

In the example of a block of flats, for example, the benefits of co-operation are contained within a relatively small group who will benefit equally which meets the first two criteria listed above. However, for the co-ordination to be successful there is likely to be a need to ensure that a requirement to financially contribute to the maintenance of the common areas is included in the rental or ownership contracts of all the flats residents. This way the free riding problem is avoided. If the co-operation is entirely voluntary then the incentive to free ride would be very strong and could lead to a number of residents refusing to pay.

Public sector intervention, any intervention should be aimed at overcoming the problems that can prevent groups of potential beneficiaries from local public goods co-operating.

Circumstances in which there may be a case for the public sector to intervene to encourage, enable or catalyse co-operation might include:

- alleviating some of the risk to private agents of initial costs of co-ordination;
- mechanisms for enforcing collective decisions to overcome the free rider problem;
- mechanisms for people with shared interests to find one another.

In particular, the public sector may wish to provide the legal framework under which groups of individuals or businesses can join together without falling victim to the 'free rider' problem. A good example of this is the legislation that has enabled Business Improvement Districts (BIDs) to be set up such that retailers can join together to contribute to paying towards improvements in the local amenity of their area – which in turn brings positive benefits to all the businesses in the area. The BID process involves a vote by businesses on whether to set up and fund a BID company. If the ballot is successful, a levy of one per cent of business rates is charged to all businesses (even those who voted no) to fund the activities. By making the contributions compulsory in this manner, the free rider problem is thus overcome.

As mentioned, such co-operation amongst private individuals or firms is only likely to prove successful if the potential beneficiaries are a fairly small group and therefore the effort of co-operating/co-ordinating is low. In many cases these requirements are not met as the beneficiaries are a very large group. That is why the police service is financed by taxation as are refuse collections. It is also the reason why the public sector may intervene to promote certain sectors that exhibit atomistic market structures, like tourism for example – where in London, VisitLondon acts as a co-ordinating body for all London tourism businesses.

Public sector co-ordination may also be necessary to respond to major events which effect very many people, such as a natural disaster, or which cause temporary shocks to the market. In these circumstances, only the public sector is likely to have the capacity to organise and mobilise a strategic response.

Case study examples of public goods
Case study 6: Business Improvement Districts

1 Those people in the group have similar characteristics, tastes and preferences.

2 Externalities

As described in the introduction, **economic efficiency** is the situation in which resources (raw materials, labour, land and capital) are allocated and used in the most productive manner possible. More specifically, it is the situation in which there is no waste of resources in the production process and no waste of resources in the allocation process.

It is the price of a good or service that acts to ensure resources are allocated in an efficient manner through balancing supply and demand to ensure an efficient quantity of the good or service is produced and allocated. However, for this to be the case producers and consumers must bear the full costs and benefits of their activity.

In most transactions this is the case. For example, in producing a loaf of bread, the baker will have paid to obtain all his raw materials, power and labour and will make a decision on what price to sell his loaf of bread based upon this information together with his view on the demand for the loaf of bread he has produced, and the prices charged by his competitors.

However, there are cases where producers and consumers do not bear the full costs and benefits of their activity. This is usually because there are costs or benefits obtained by people not directly involved in the transaction. For example, if a neighbour allows his house to become dilapidated and run-down, this will not only affect the price of his own house – but is likely to also lower the prices of other houses in the neighbourhood. In other words the neighbour in this case is not bearing the full costs of his (in)activity because his neighbours are also having to bear a cost (lower house prices) from his failure to maintain his property. This is an example of a negative **externality**.

An externality therefore describes a cost or benefit resulting from an economic transaction that is borne or received by parties not directly involved in the transaction. In such a case the market will not deliver the efficient quantity of the good or service. This is because, when making output and price decisions, rational profit-maximizing buyers and sellers do not take into account costs and benefits they do not have to bear. Hence they ignore the 'external' costs and benefits. Thus, the 'external' portion of the true costs or benefits of the transaction will not be reflected in determining the market equilibrium prices and quantities of the good produced.

Therefore, where there are externalities (costs or benefits applying to people not involved in the transaction) then normal market incentives for the buyer and seller to maximize their personal welfare (or utility) will lead to either an over- or under-production of the commodity in question from the point of view of society as a whole, instead of the socially optimal level of production (which would occur if all the costs and benefits of the transaction were being fully borne by those involved in the transaction).

Goods involving a positive externality will be under-produced from the point of view of society as a whole. A positive externality exists when there are benefits to parties not involved in the transaction. As these benefits are not considered by those involved in the private transaction, the result is that the good or service is undersupplied.

An example of a positive externality is an investment in improving a derelict house in a terrace (the opposite of the negative externality described above). The owner of the house will only consider the impacts upon the price and saleability of the actual house involved when making his home improvements. However, in making these improvements, there may be additional positive benefits to the saleable value of other houses in the terrace. In other words, there are positive benefits to others not directly involved in the transaction.

Another example of a positive externality is preventative health care such as vaccinations that stop the spread of infectious diseases. In a free market, the price that someone is prepared to pay for a vaccination will depend on personal, private valuations of the benefits they will receive. However, when someone is vaccinated they are not

the only ones to benefit. Other people will also gain because they are now protected against catching the infectious disease from the person vaccinated. A free market will therefore under-provide vaccinations compared to the optimal level for society.

In contrast to goods involving a positive externality, goods or services involving a negative externality will be 'overproduced' from the point of view of society as a whole. A negative externality occurs where an activity or transaction imposes an external cost to others not involved in the activity or transaction. As a result, there will be too much of this activity because individuals do not bear the full costs, and therefore are not having to fully consider the total costs of their activity. Therefore, they engage in excessive amounts of the activity.

A common example is river pollution caused by industrial production, for example by a chemical plant. In a free market the chemical plant involved will not suffer any costs from creating the pollution. Instead, the costs of the pollution will be borne by other users of the river such as anglers or water companies. By contrast, if the chemical plant had to fully bear the costs of its pollution (for example by paying for the river to be cleaned on a regular basis) then its overall costs of production would rise and as a result it would choose to reduce its overall production of chemicals. In other words, the efficient level of output for society occurs when the chemical plant fully balances all the costs and benefits of its production, including those costs such as river pollution, that fall on others. However, because in a free market the chemical plant does not in actual fact have to take into account the costs of its pollution then the plant will over-produce compared to the socially efficient level. i.e. it will over-produce because the firm does not take into account in its production activity the negative externalities that it creates.

Dealing with the externalities problem

i) Negotiation and property rights

As described, the ideal situation for economic efficiency is one in which the parties engaged in a transaction take into consideration the full costs and benefits of their actions, even if they fall on other people. Therefore, from an economic perspective, the solution to externalities is to 'internalise' those third party costs and benefits such that those involved in the transaction do indeed bear the full costs and benefits.

For example, if the polluter described in the river pollution example had to pay for any costs its actions had upon anglers and water companies, then it would reduce its production level. This is because its total costs would be higher (due to its need to pay compensation) than in the case where it is able to ignore the impact of its pollution on others – and if its costs are higher it will reduce its overall production. This is therefore an example of 'internalising' the third party costs (the externalities) into the output decision-making process of the polluting firm.

A key question, therefore, when considering the issue of externalities is whether or not it is possible in reality to 'internalise' the externalities or not. Two situations in which it is possible are:

- through mergers of the parties involved so that one new larger party 'internalizes the externality' (so using the same example this would involve merging the chemical plant and the water company); or

- through negotiation if there are clear and enforceable property rights - i.e. if the water company owned (had property rights to) the river, it would be able to sue the chemical plant for the damage to its property (or alternatively the two parties could negotiate to avoid such legal action).

It follows from this that a key first step in overcoming externalities, and therefore an important intervention by government, is the definition of property rights and a mechanism for the enforcement of those rights. Provided the transaction costs of negotiation are not high (see below) then in such a case the problem of externalities can be solved through negotiation.

However, there are some cases where such a solution is not possible. For example in the property rights example, the reality in the UK is that the river will not be privately owned by the water company. It is instead publicly owned and will remain so. Therefore in this example property rights are not enforceable and the externality problem of the pollution remains. In such a case, the public sector may introduce regulation to limit the pollution activities of firms upon public goods such as rivers and clear air – public goods for which property rights cannot be enforced.

ii) Co-ordination

Another reason why the market solution of property rights and negotiation may not work is when there are so many parties involved in the transaction that the costs of negotiation are too high i.e., where there is co-ordination failure. This is usually the case in the provision of public goods such as policing, street cleaning etc which have positive externality benefits to society but which are difficult for the private sector to provide due to the free rider problem. The issues involved in overcoming co-ordination failure are discussed in detail in the previous section on public goods.

Case study examples of externalities

Case study 1: Innovation
Case study 2: Environmental Externalities
Case study 5: Investment in Training
Case study 7: Active Labour Market Programmes

3 Imperfect information

An economically efficient market assumes perfect knowledge (of products and prices) amongst both consumers and producers. In reality this is often not the case. However, because the overwhelming majority of markets are able to function efficiently without all participants having perfect information then this is not usually a problem and the vast majority of markets can therefore be left to operate without any public sector intervention.

For example, when shopping for clothes, a consumer does not have perfect knowledge of all the different items of clothes that are available across all different retailers or the prices of all these potential clothes purchases. Nevertheless, through their previous experiences of shopping for clothes the consumer will have some information about the types of clothes available and typical prices and in practice this is enough for the consumer to make a decision on what to buy and for the clothes retail market to function efficiently.

However, there are certain markets where the lack of perfect knowledge can create a market failure. This is because there are some markets where one party in an economic transaction has significantly better information than the other. This is often the case where the seller of a good or service has more information than the buyer on the quality of the good or service for sale. This is known as **asymmetric information**.

A typical example of asymmetric information is in the market for used cars. Typically most consumers will have very little knowledge on which to judge the quality of a used car they wish to buy. By contrast the garage owner will know exactly how good or bad the car is. If the consumer was equally well informed we would expect a situation in which there would be a high price for a good car and a lower price for a bad car. However, because the consumer is not informed there is an incentive for the garage owner to ask a high price for both the good and bad car. The consumer is aware of this and because of their lack of trust in the process may decide not to buy either car as they are unwilling to take the risk of purchasing a bad car at a high price.

In this example, to enable an efficient transaction to proceed it is necessary for the consumer to have information upon which they can make an informed judgement. Because of this, where there is the existence of asymmetric information, the private sector will often develop a solution to provide information to the consumer in order that the market can indeed function efficiently. Examples include industrial standards certified by trade bodies, warrantees, consumer information magazines, guides, or through professional services such as, using the used car example, vehicle inspections.

Any public sector intervention with regard to asymmetric information will in most cases involve either regulation to ensure the suppliers provide information or on occasion the direct provision of information. The key here is that this intervention tackles the cause of the problem (the lack of full information) and helps the market to work efficiently.

In direct contrast to the asymmetric information example in which the seller has better information than the consumer, there also exist situations in which the consumer has much better information than the provider. Such situations can produce examples of **adverse selection**.

The main market in which adverse selection occurs is the insurance market. A consumer will have better information than the insurance company about whether they are a cautious person or a risk taker. This asymmetry of information can lead to the uninformed side of the market (the insurer) finding itself only trading with exactly those people it wouldn't want to, i.e. those who are most likely to claim on the insurance.

Consider an example where an insurer doesn't know the characteristics of potential clients and offers insurance to everyone at the same average price. For potential clients who know that they are cautious and unlikely to need to claim on the insurance, the average price is too high and they won't take up insurance. Only relatively high-risk customers will take insurance at the average price – those the insurance company would not want to trade with.

Adverse selection is therefore a particular problem in attempts to operate private health insurance schemes. In such schemes, if there was one average price then unhealthy people would be highly likely to purchase health insurance because they anticipate large medical bills. On the other hand, people who consider themselves to be reasonably healthy may decide that medical insurance is an unnecessary expense. This is bad news for the insurance company because to operate it needs a balanced set of customers such that the insurance company obtains income from the premiums of the healthy to cover the costs of paying out for the medical bills of the unhealthy. If the insurance company only has unhealthy clients it will struggle to raise enough income to pay for the high level of medical bill claims.

To try to overcome this problem, insurers typically demand detailed information from potential customers and use this to charge higher premiums to higher risk customers whilst offering lower premiums to lower risk customers. In doing so it can ensure a balanced customer base and operate profitably. However, this solution can in turn create equity issues that society may wish to consider. In particular the fact that in a wholly privately run health system unhealthy individuals will face very large premiums which they may not be able to afford.

Another example of imperfect information can occur in labour markets because if an employer does not have knowledge of the productive abilities of potential recruits then it is difficult for them to make an informed decision on whom best to recruit. To overcome this problem, employers should engage in a series of measures to obtain better information on potential recruits such as the use of application forms, interviews, tests etc. In doing so, employers are able to build up information on the productive abilities of applicants and thereby make recruitment decisions based on this information.

Discrimination occurs in economic terms when employers don't base their recruitment and pay decisions on direct information regarding an individual's productivity, but instead make their decisions based on characteristics of the candidate such as sex, race, age, national origin or sexual preference. Such behaviour by employers can lead to certain groups being discriminated against such that people of equal productive ability receive fewer labour market opportunities and/or lower pay relative to equally productive individuals from other groups. The government has introduced a series of regulatory measures making it unlawful to discriminate against individuals in labour-market situations based on personal characteristics.

A further example of imperfect information occurs via **moral hazard**. This exists when one of the parties to an agreement has an incentive, after the agreement is made, to act in a manner that brings additional benefits to

himself or herself at the expense of the other party. It is in effect a problem of hidden action in that one party cannot observe the actions of the other party and yet the hidden actions of the other party are influencing the costs and benefits of their transaction.

A common occurrence of moral hazard occurs in the insurance markets where someone who has insurance may take greater risks than they would do without it because they know they are protected. As a result, the insurer may get more claims than it bargained for. One way to consider this is to consider two individuals without insurance for their bicycles. Aware that they will have to meet the full cost of any theft or loss of their bicycles they are likely to take significant measures to prevent its loss or theft (good quality locks, not leaving it in certain areas etc). However, if one of these individuals obtained insurance for their bicycle such that they would have it replaced if it is stolen, then having obtained this insurance their behaviour is likely to change. They will be less concerned about preventing the potential theft of their bicycle and may start to leave the bike in more risky areas or use a cheaper lock (which is lighter and easier to carry) rather than the heavy lock they previously used to minimise the chance of a theft. In other words once an individual has made an agreement with an insurance company, their behaviour may well change and this is moral hazard.

To prevent against moral hazard, the market will usually develop solutions to ensure that customers' incentives are aligned to the providers. For example, in the bicycle example they will make use of a high quality lock an obligatory condition of the insurance cover. It is also done through gearing insurance premiums with excesses and no claims bonuses to ensure that there remains an incentive for the insured to avoid the need to make a claim. In financial markets, the use of collateral to back up a loan acts in a similar manner to provide the consumer with a similar incentive as the lender.

For both adverse selection and moral hazard problems, the public sector will only need to intervene if the market cannot overcome the problems sufficiently to operate at close to an efficient level. The intervention is normally through regulation, such as compulsory motor insurance, or the development and enforcement of a quality signalling mechanism.

A note of caution: Information failures are often badly understood as a rationale for public sector intervention. As noted, in practice the overwhelming majority of markets are able to function without all individuals having perfect information. It may be useful to consider imperfect information as a market failure worthy of public sector intervention only when there are such severe information problems that:

- most people would be unable or not confident to make consumption or investment decisions; and/or,
- most producers would be unable or not confident to make production or investment decisions.

It is also important to bear in mind that, although the public sector may intervene to ensure information is made available, frequently, if not always, it will not have better information on which to base decisions than private individuals.

Case study examples of imperfect information
Case study 3: Discrimination
Case study 4: Business Support
Case study 5: Investment in Training
Case study 8: SME Finance

4 Imperfect competition

As discussed in preceding sections, economic efficiency occurs when resources (raw materials, labour, land and capital) are allocated and used in the most productive manner possible in both the production and allocation process. It is the price of a good or service that acts to ensure resources are allocated in an efficient manner through balancing supply and demand to ensure an efficient quantity of the good or service is produced and allocated.

This economic efficiency is achieved when there is **perfect competition**. Perfect competition exists in a market when there are a large number of suppliers and a large number of consumers. In such a market no producer (or consumer) has the power to influence prices. Instead prices are set by the market taking into account the total supply and demand for the good across all suppliers and consumers. In such a market each producer becomes a 'price taker' – selling its goods at the prevailing market price rather than being able to influence the price itself.

There are a number of assumptions implicit in the model of perfect competition and in reality they will rarely all exist. However, most markets with large numbers of suppliers and consumers do function close to the perfect competition model even if all the conditions of the model are not fully met. However, where the conditions for perfect competition are significantly impeded then the model can break down and situations can result in which firms can act to distort the market. Such cases will bring about an inefficient allocation of resources (as compared to the economically efficient allocation described above) and are therefore examples of market failure.

Imperfect competition usually occurs where there are not a sufficiently large number of suppliers in a market. In such cases, there no longer exists sufficient competitive pressure on the suppliers to ensure that they set prices at an economically efficient level. **Monopoly** is where there is just one provider of a good or service and is the most extreme example of where a market is likely to lack competition. **Oligopoly** is where there are only a small number of suppliers. In oligopolistic markets, there is a possibility that full competition can be impeded, resulting in an inefficient market outcome.

A monopoly is the extreme case in which there is only one provider of a good or service. In such a case the firm will not face any competitive pressure. As a result it will raise the price of the good it supplies to the market (above that which would occur if there were many competing suppliers) so reducing the amount consumed by consumers to below the economically efficient level.

One method of overcoming the market failure of monopoly is to increase competition in the market. This will be the case particularly if there are regulatory constraints that inhibit competition and that could be removed.

However, increasing competition is not always possible. In particular, there are some industries that exhibit the characteristics of a **natural monopoly** in which the actions of the free market itself will lead to just one seller. In such cases, government may allow the existence of a monopoly but will regulate it to prevent abuse of its market power.

Strong mechanisms for public accountability, independent regulation, project management and cost control are some important features, in the absence of competitive pressures, of the good management of private sector monopoly services.

Oligopoly is the case where a market is characterised by a small number of sellers. Cases of oligopoly in the UK include the supermarket sector and the accountancy sector, both of which have four major companies accounting for the majority of sales in the sector. In oligopolistic markets, there is a possibility that full competition can be impeded, resulting in an inefficient market outcome.

Problems and risks from oligopolies include potential collusion on price and other matters. In theory a small number of producers could decide to collude with each other to all raise prices together – they would all earn higher profits as a result but it would be at the expense of the consumer who would have to pay the higher prices. Less innovation and risk-taking might also occur as well as predatory pricing to prevent new entrants into the market (which means lowering prices in areas where someone attempts to compete in the anticipation of raising them in the future).

In the UK, it is the job of the competition authorities (specifically the Office of Fair Trading and the Competition Commission) to ensure that abuse of market power by oligopolistic private sector firms does not occur.

While the LDA is not directly responsible for market regulation, it will still need to play an important role, with the Mayor and the GLA, in understanding how particular markets operate especially in relation to London. As well as providing information on how London's economy operates, which will be useful in framing some interventions (or in deciding not to intervene), this will also enable the GLA Group where relevant to influence regulatory and other government action, either at the local or national level. In particular, given the size of London's economy it is not unreasonable to assume that some UK competition issues, relating to imperfect competition, might manifest themselves in the London region. In this instance, it is to the benefit of the UK as a whole, not just London, that the GLA Group contributes effectively and where relevant to national policy making and that the LDA plays its role effectively within that process.

It is important to note that the above discussion relates to the potential existence of monopoly and oligopolistic markets within the private sector. This section is saying that where such imperfect competition exists in the private sector, there may potentially be a role for the public sector to regulate or intervene in these industries.

This issue of market failure within private markets should not be confused with the fact that the public sector itself has intervened in a number of sectors of the economy (such as health, education and emergency services) and chosen to run them in the form of monopolies or oligopolies. The structure of the health or education sectors and the way in which the LDA or GLA interacts with them is an issue related to how the public sector should best manage and operate areas of the economy into which it has intervened. However this issue is not within the scope of this report. This report solely concentrates on assessing the reasons why the public sector has, or may wish to, intervene in particular markets based on the existence of market failures.

B) Equity considerations

In some cases there may not be any of the market failures as described but nevertheless the efficient market outcome may be seen by society or by government as one that is not desirable. In such circumstances, the public sector may decide to intervene to try to change the outcome of the market. In such a case, the intervention is not to rectify a market failure but instead, it is an intervention on equity grounds.

Interventions on equity grounds occur because elected politicians have a mandate from the electorate to intervene in markets for social or equity reasons. Such interventions are based on the subjective decisions and judgements of democratically accountable politicians but a market failure framework should still be used to consider the potential consequences of the intervention and to ensure the desired outcome is achieved in the most efficient and effective way.

Public sector intervention to improve equity or distributional outcomes may be to:

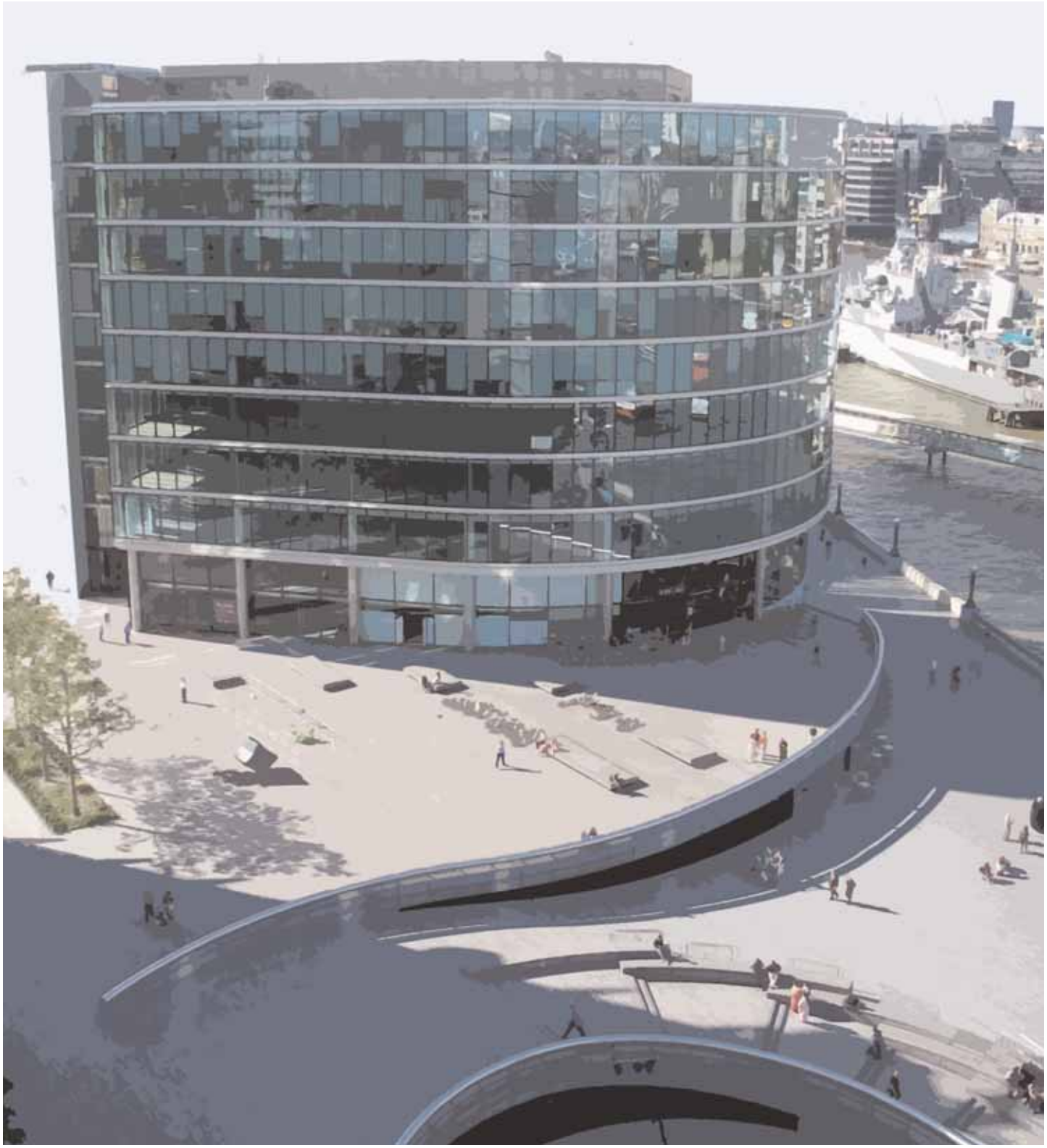
- Improve the distribution of market outcomes between rich and poor, for example through taxes and income support – vertical equity;
- Ensure people in similar circumstances are treated equally, for example have equal access to services – horizontal equity; or to,
- Consider the needs and outcomes for future generations, for example ensure that future generations are not made worse off by the activities of the present generation.

In practice redistributive interventions are mainly controlled by central government in England. There is a significant body of literature which considers the rationale for and best methods of intervening to improve equity or social justice. In the main, the literature recommends that redistribution should be in cash benefits which allow individuals to make their own choices on how they wish to spend this income within the market, rather than in the form of in-kind benefits, such as financial assistance for child care or housing.

However there may be some cases where externalities or spill-overs mean that the public sector wants to encourage or discourage consumption of a particular good and therefore intervenes with a benefit in-kind. As

with interventions for efficiency, it is important that the public sector gives strong consideration to whether in-kind benefits will have the effects on consumption it hopes for (see income and substitution effects in the next section).

Some interventions have equity and efficiency objectives, for example interventions to address discrimination. Interventions such as regeneration or employment support which seek to improve equity and efficiency are likely to be of particular interest to the GLA and LDA. In these cases, the justification for intervention needs to identify the intended beneficiaries and how equity will be improved, and how the project will improve the functioning of markets, as well as the cost of intervention. The rationale for intervention framework set out in this paper should still be used to inform decisions and to ensure the desired outcome is achieved in the most efficient and effective way.



Section B: The risks of intervention

The previous section has shown the main arguments underlying why the public sector may intervene in the economy. However these arguments alone are not a sufficient case for intervention. For intervention to be justified the benefits of the action must exceed the costs. This is very important and arises because public sector intervention comes at a cost. The cost being the loss of money to individuals and businesses in taxation that provides this public sector expenditure. If the benefits of public sector expenditure do not exceed the costs then it would be better for this money to remain in the hands of individuals and businesses to spend as they desire. Therefore, for a public sector intervention to occur it needs to be demonstrated that the intervention will make an improvement and that the benefits of intervention will exceed the costs. In other words, the public sector should only intervene when there is a market failure and when an intervention is likely to be effective.

These considerations are particularly important when you bear in mind that raising revenues through taxation itself has a number of costs. These include the compliance and administrative costs of their collection and the fact that taxes impose economic costs (known as a deadweight cost) because they induce individuals to make decisions that they would not have made in their absence. As such they make markets less efficient.

There are a number of factors that may mean that a public sector intervention is not effective. These include:

Lack of information

In an economically efficient market, information about how individuals and firms value goods and services can be seen directly through the price they are prepared to pay for a good or service. However, in some of the examples of market failure described in Section A (particularly those under the subheading imperfect information), a lack of information can prevent a market operating efficiently and the price becomes a less reliable indicator of how individuals and firms value goods and services. However, it is important to recognise that public sector interventions may not be effective in such cases because the public sector does not have any better information than the market about how individuals and firms value goods and services. Indeed in most instances the public sector has less information about the needs and preferences of individuals and firms.

Moreover, the public sector has poor mechanisms available in deciding how to allocate resources. As has been described, in the market, prices are an automatic mechanism through which consumers indicate the value they place on different goods and services. In many instances the public sector does not have this mechanism at its disposal. Moreover, where price information is available it is arguably the case that the private sector will be more effective at interpreting the information than the public sector. Where price information is not available the public sector tends to use cost-benefit analysis to determine whether the benefits or value of an intervention outweigh the costs. The success of cost-benefit analysis as a mechanism depends on the public sector's ability to accurately assess both the costs and benefits.

Crowding out

A very real problem for the public sector in assessing the benefits of intervention is knowing how individuals and

firms in the private sector will respond. It is possible that investment in goods or services by the public sector will **crowd out** or **displace** investment by individuals and firms. For example, improving state provision of pensions may encourage less private saving for retirement among individuals, with the result that nobody is better off in retirement than they would have been before the intervention. Similarly, intervention to improve the provision of business accommodation will crowd out private sector firms which operate or are looking to operate in this market.

This issue of displacement could be the case with public provision of any good or service for which a market exists, including markets for goods and services which the GLA/LDA might consider intervening in, such as training, business support, etc.

Substitution/income effects

Public sector intervention may fail if the private sector does not respond to the intervention in the way the public sector thought it would. This is particularly the case where an intervention is intended to change production or consumption of goods and services by adjusting their relative prices (which might be the case in trying to overcome externalities). For example, it is often the case that making something cheaper will encourage greater consumption, but it is difficult to know how much extra will be consumed. This is because such subsidies have both income and substitution effects and the overall effect will depend on the relative strength of these two.

The **substitution** effect refers to the situation where a price reduction for one particular good encourages consumers to buy more of that particular good. For example, it might be anticipated that a subsidy to reduce the price of milk will lead to more milk being consumed because of its cheaper price. The **income** effect refers to a situation where, after a cut in the price of milk (through a subsidy) the consumer would have more income left after buying the same amount of milk so could either buy more milk or buy more of other goods. So in this instance the income effect of the price cut acts as if the consumer has had an increase in their income which they can spend across a range of goods and services.

There may be unexpected income and substitution effects of public subsidy of any good or service for which a market exists, including a market for goods and services which the GLA/LDA might consider intervening in, such as training, business support, etc.

To be sure of the impact of an intervention, the policy maker would have to be in possession of all relevant information about how agents will be affected and how agents will respond. Such information is rarely if ever available, but thorough consideration should be given to the income, substitution and displacement effects of any intervention to ensure that the anticipated benefits are not going to be negated by the unexpected responses of individuals and firms.

Political and administrative failings

Political failings arise when individual interests override the public interest, for example when special interest groups are successful in lobbying for an intervention for their own rather than the public's benefit, or influence the design and implementation of policy to serve their own interest. For example, an industrial or sector lobby may successfully seek preferential treatment or selective support on the grounds that it is a more important sector or a growth sector in the region.

Administrative failings arise primarily because public servants work for others rather than themselves, they face the information problems already discussed and, importantly, they face different incentive structures to those of the private sector. Moreover, the interests of public servants may not coincide with the public interest, for example a public servant may be concerned with job security, promotion, and perceptions of their own importance. Some also argue that, because the quantity and quality of public sector work is difficult to monitor and measure, the public sector is inherently less efficient than the private sector.

Section C: When should the public sector intervene?

The previous sections have shown the arguments for and against public sector intervention. The difficulty for policy makers is balancing these considerations in deciding in the first instance whether to intervene at all, and then, if necessary, exactly how to intervene.

The public sector should only intervene when there is a market failure and when any intervention is likely to be effective. Intervention based on market failure is a necessary, but not sufficient, reason for intervention. It is also necessary to ask:

- Even if the market is not perfect, is it good enough? That is, even if a market failure does exist, is the market still operating relatively efficiently?
- Which type of intervention might alleviate the market failure and are we best placed to deliver it?
- Would the benefits of the intervention outweigh the costs?

Intervention is most likely to lead to an improvement where:

- The market failure is big;
- Public sector intervention is likely to be effective; and,
- The intervention tackles the cause of the market failure rather than supplanting the market.

Given the risks and government failures discussed, intervention should aim to try and help markets work more efficiently rather than to supplant them altogether. This is increasingly being recognised by governments and others. For example the OECD has reported that support to SMEs has tended to neglect the issue that the policies themselves can be the problem and the rationale for intervention. The OECD notes that existing support has served to "protect SMEs from normal business pressures, leading to dependence on public sector programmes that has served to diminish their competitiveness and innovativeness, ultimately leading to even greater difficulties".

This requires that intervention should aim to tackle the cause rather than the consequence of market failure.

Effective policy making therefore requires:

- identifying the cause of the market failure, and assessing whether the private sector can overcome the problem,
- (if the public sector is to intervene) an analysis of the ways the cause of the market failure can be tackled (ideally through helping the market work, rather than supplanting the market) without creating a culture of dependency on the state,
- evidence that the public sector intervention will be effective, including a robust assessment showing that the costs of an intervention will be less than the benefits.

Rules of thumb

This section suggests some questions that may help policy makers to make effective interventions, particularly in identifying whether there is a market failure rationale for intervention and what the causes of the market failure are.

Questions to ask about the rationale for intervention are:

- Is there a reason why the pricing mechanism wouldn't work/provide the most efficient outcome?
- Is there a reason why the buyer would not have enough information to assess the value of the product, (or the seller would not have enough information to assess the cost)?
- If the service is a good thing to provide, why hasn't it already been done? Why isn't the private sector providing the service? Why isn't the market working properly?

If these questions can't be answered with reference to the market failures described in Section 1 it is unlikely that there is a rationale for intervention based on market failure.

The design of the intervention should relate to the market failure it seeks to address so answering these questions will also help to develop a successful intervention.

Questions to ask about the design of the intervention are:

- Is the intervention designed to tackle the cause or the consequence of market failure?
- Will the intervention displace an existing market? Could something be done to help this market to be more efficient rather than displacing it?
- Could something be done to support individuals and firms to co-ordinate to overcome the failure themselves?

And of course, in deciding whether to intervene it is important to consider how much the intervention will cost and the extent to which the benefits outweigh the cost. Guidance on cost-benefit analysis is available in the Treasury publication 'Appraisal and Evaluation in Central Government', commonly known as the Green Book[2].

Conclusion

Where markets work they are the most efficient means of meeting the needs and preferences of individuals and firms. However, there are a number of reasons why markets may not work efficiently which suggest that there may be a case for public sector intervention. These are public goods, externalities, information problems and imperfect competition. The market can only be said to have failed when one of these factors is present.

Evidence of a market failure, i.e. evidence of a problem caused by one of the reasons listed, is a necessary but not sufficient condition for public sector intervention. A second condition is that intervention will lead to an improvement. Intervention is costly and complex, and is not always effective. Careful consideration needs to be given to how intervention can address the cause of the problem without creating a dependency, and to how individuals and firms will respond. A strong case for intervention will draw on evidence to suggest intervention will be effective, and cost-benefit analysis to suggest that it is worthwhile.

2 HM Treasury, 2003, The Green Book, Appraisal and Evaluation in Central Government, www.hm-treasury.gov.uk/

Case studies of public sector interventions to overcome market failures

Case study 1 - Innovation

The market failure associated with innovation is a positive externality. If private benefits are frequently less than the social benefits the market will under invest in innovation. This could occur if a firm is unable to appropriate all of the benefits of the innovation for themselves, for example, because a competitor is able to copy the findings of the innovation following the release of a new product or process. There is an externality argument for intervention.

How should the public sector intervene?

Patents are one policy response to problems associated with research and development. Patents grant the firm rights to the use of the innovation for a period of time, allowing them to appropriate the benefits of the work. Other ways that the public sector may intervene are to:

- Co-ordinate collaborative innovation by firms and universities who share the costs and 'internalise' the benefits with wider use of the results in the short term. This disadvantage of collaboration on innovation among firms is the dampening of competitive innovation between the firms.

- Produce or finance the innovation, which doesn't place restrictions on its use but is a heavy cost to the public sector. The public sector tends to directly support academic scientific research, which has the widest application and spillover and is less likely to be undertaken by the private sector.

- Subsidise innovation by the private sector to encourage extra investment. Subsidies such as tax credits also have pros and cons. On the plus side, tax credits are self-selecting - they put businesses in control of the research or innovation to be undertaken and do not rely on the public sector being able to guess what type of research or innovation will benefit the private sector most. On the down side, they are likely to encourage research or innovation with the least positive spillovers for other businesses rather than the greatest collective benefit. Therefore, tax credits may have a heavy deadweight cost – they support the research or innovation that was most likely to be undertaken anyway. Tax credits may also have an income effect, such that not much extra research or innovation is undertaken but the subsidy leaks out to support other activities.

This example shows the complexities facing the public sector in considering whether intervention is merited and what type of intervention will be most cost-effective, and illustrates the importance of considering how the private sector will respond to an intervention. It also demonstrates that in terms of the public sector, central government controls most of the policy instruments available to alleviate market failure including patents, tax subsidies, and, financing academic research.

At a regional level, the main instrument used to correct market failure associated with innovation described above is co-ordination between businesses and research organisations and to encourage greater involvement and use of innovation by business. With coordination, as with other direct interventions, it is important to remember that there is no rationale for the public sector 'picking winners' by selectively providing support to innovation or research which it considers will have the greatest commercial value. The public sector has no better information than the private sector about what will succeed and what will fail; arguably it has worse information.

Case study 2 - Environmental externalities

A long standing market failure is negative externalities which affect the environment. Many economic activities have environmental costs which are not reflected in the market price for the activity. A particularly topical issue at the moment are activities which, through consumption of energy and fuel, produce a higher level of carbon dioxide than collectively society would like.

How should the public sector intervene?

The market failure arises because not all of the costs of carbon dioxide emissions are considered by those who undertake polluting activities. One way round this is to provide 'rights to pollute' which a firm can purchase at a cost.

Tradable emissions permits are a market co-ordinating mechanism where rights to produce a certain volume of emissions are granted. Firms must either reduce their output of emissions, or purchase a permit for their extra output, with the effect of increasing the private costs of producing the emissions. In this instance the public sector introduces a cost to polluting which increases the private costs towards the social costs and makes the companies consider this extra cost in their decision making.

Other interventions which are available to government include:

- Regulation of inputs, production methods, or the volume of emissions.
- Fines or taxes on activities which produce carbon dioxide to bring better alignment between the private cost of the activity and the social costs of the activity. This may encourage private agents to undertake less of the activity or to switch to less energy intensive methods.
- Subsidising those alternative inputs or production methods which produce less emissions, or other forms of emission abatement, to bring better alignment between the private and social benefits of these alternatives. However, as with all subsidies, it is important to consider the **deadweight, income and substitution effects**.
- Encouraging innovation and use of best practice in environmental solutions through support for research and dissemination.

Many of the interventions available to alleviate environmental externalities are controlled by central government, in particular regulation and taxation. The Central London Congestion Charge is an example of regional intervention to tackle a particular local issue, namely to raise the private cost of travel by car relative towards its true social cost.

Case study 3 - Discrimination

In a well functioning market, employers will employ people and decide what to pay people based on the productivity that such individuals offer the firm. Discrimination occurs in economic terms when employment and wages are not determined by individual productivity but by other factors such as sex, race, age, national origin or sexual preference.

How should the public sector intervene?

Decisions related to employment or pay should be based on the productive ability of individuals. Through application forms, interviews, work appraisals etc employers have the opportunity to build up evidence on the productive ability of an individual which they can then use to make an informed recruitment or pay decision. Discrimination occurs when instead of attempting to more fully understand the productive ability of an individual in this way, an employer instead bases their employment or pay decision partly or fully on characteristics of the candidate such as race or sex or age.

If an employer bases a recruitment or pay decision on the characteristics of a worker in this way then the decision is likely to be influenced by the employers own preconceptions of people with a certain characteristic rather than from an attempt to truthfully gauge the individual's productivity. Furthermore, if many employers allow their own preconceptions to influence their recruitment and pay decisions and many of these employers view individuals within certain groups to be less productive than others, then this will lead to individuals in certain groups being discriminated against and receiving fewer labour market opportunities and/or lower pay relative to equally productive individuals from other groups.

The government has introduced a series of regulatory measures to outlaw discrimination. The 1970 Equal Pay Act, the 1975 Sex Discrimination Act, the 1976 Race Relations Act and the 1995 Disability Discrimination Act are all examples of regulation making it unlawful to discriminate against individuals in labour-market situations based on personal characteristics.

The discrimination highlighted is an example of a market failure based on information asymmetry and the government has sought to overcome it through regulation. Thus, labour market decisions must be made solely on the basis of information directly related to productive ability (e.g. qualifications etc) and not via individuals' personal characteristics unrelated to productivity. Overcoming this market failure leads to a more efficient labour market. However, it will not necessarily lead to equal job market outcomes for all groups. This is because if a particular group on average has fewer qualifications (acting here as a proxy for productive ability) than other groups then in an efficient labour market, in which all recruitment and pay decisions are based solely on the productive ability of workers, the employment rates and average pay of people in this group will be lower on average than other groups with higher average qualifications.

Society may decide that such an outcome is not acceptable and the public sector may therefore decide on equity considerations to attempt to engineer a more equal pattern in labour market outcomes. If the public sector wishes to make such an intervention, the best way to do so is to improve the educational attainment and work related skills of low-performing groups or individuals such that they will have greater productive ability. Employment and pay prospects of these individuals will then improve within the efficiently operating labour market without causing any inefficiencies at firm level.

Case study 4 - Business support

Information problems may create market failures in the provision of business services. These include:

- firms not having enough information to make efficient decisions; and
- asymmetric information about the quality or relevance of business support services. This may mean that businesses are reluctant to purchase support services because they cannot be confident of their value. There are potential efficiency losses because of a reluctance to trade.

How should the public sector intervene?

The introduction of the Business Link Information, Diagnostic and Brokerage service (IDB) is a positive intervention in addressing these problems. The service is impartial and independent of the provision of intensive business support services. This service provides insight into the business's needs and independent brokering to appropriate business support providers. The IDB service can also act as a quality assurance mechanism to overcome asymmetric information problems about quality. In this model, the public sector intervenes:

- to provide information; and,
- to develop an effective mechanism for signalling service quality.

In this model there is no need for public sector intervention in the provision of services.

Case study 5 - Investment in training

It is widely recognised that market failures affect investment in training, and this understanding is often based on analysis of externalities that affect employer's investment in training for employees. In fact, information problems are also a significant market failure in investment in individual's investment in training.

Employer's investment in training for employees is affected by positive externalities – if the trained worker moves to another firm, the employer will be unable to appropriate the full benefits of the investment. Positive externalities are greater where training is more general and widely transferable, for example the greatest positive spillovers come from primary school education, whereas there are likely to be few spillovers from firm-specific training.

Therefore, government may intervene:

- in the provision of children's education; and,
- to encourage adults to invest in their own intermediate and higher level skills and make a return on this investment through higher wages, in this way the individual 'internalises the externality'.

The market failures associated with under investment by individuals are information problems. In particular, individuals do not know what the return on their investment in skills will be, and therefore find it difficult to make an optimal level of investment. A related issue is information problems that restrict borrowing to invest in skills development – lenders do not know what the return is likely to be either and face problems of adverse selection and moral hazard. The case for intervention would depend on evidence to suggest that there is significant under investment in skills and that this would be improved by the intervention.

How should the public sector intervene?

In the first instance, intervention should seek to encourage provision of information about the financial returns of investment in different types of training and qualifications. This will allow more informed decisions by individuals and lenders. Government may also intervene to alleviate the risks of lending to fund investment in training and skills development (see Case study 8 - SME Finance).

If there are cases where good information about the returns to training cannot be made available, there may be an argument for government underwriting the risk to individuals of investment in training. It should be noted that government has no better information than private individuals in this respect and should not seek to selectively alleviate risk in what it considers are "winning" areas but not others.

Case study 6 - Business Improvement Districts

Business Improvement Districts (BIDs) have been established to overcome co-ordination problems in the provision of goods with positive externalities for retail, leisure and service businesses.

Without co-ordination, there is likely to be under investment by firms in activities such as:

- local marketing and promotion;
- investment and maintenance of the public realm; and,
- cleaning and crime prevention.

Investment in such activities may, for example, encourage more visitors to a shopping area. The benefits of these activities are likely to extend to all retail, leisure and service businesses in the local area and no single business is likely to be motivated to invest in the activities alone.

How should the public sector intervene?

BIDs are a co-ordination mechanism for encouraging businesses to collaborate in the provision of such activities. Businesses in a potential business improvement district vote on whether to set up and fund a BID company to deliver beneficial activities. If the ballot is successful, a levy on business rates is charged to all businesses (to alleviate the free rider problem) to fund the activities.

Government intervention facilitates co-ordination among firms by putting in place a framework of mechanisms and regulation that enable retailers who recognise a return on investment to co-operate.

Case study 7 - Active labour market programmes

Programmes supporting people into employment are justified under social and economic rationales. Employment brings income and social justice to individuals, and also brings productive activity and competitiveness to the economy with positive externalities.

Market failures affect both the social and economic objectives of supporting people into employment.

- Society is committed to offering poverty relief benefits to those who are not in employment, but there are incomplete markets for unemployment insurance because of asymmetric information and moral hazard problems.

- The tax and benefits system creates institutional and administrative barriers to employment – people are caught in, or perceive themselves to be caught in, a 'benefits trap'.

- There are positive externalities from bringing people into employment. If employment support services were left solely to the private sector, for example recruitment agencies, then the level of support offered to the unemployed will be lower than the socially efficient level, particularly to those who will find it most difficult to compete effectively for jobs.

How should the public sector intervene?

Active labour market programmes such as the New Deal offer an integrated service that alleviates the social, economic and institutional failures, and some of the market failures that affect investment in training. Intensive employment support programmes often include a combination of:

- benefits administration;
- labour market orientation;
- job readiness or preparation for work;
- information and signposting to education and training opportunities;
- job search and vacancies information; and
- help alleviating the benefits trap.

Intensive employment support programmes can be targeted at those groups furthest away from the labour market, where there may be significant positive externalities.

Case study 8 – Small and Medium (SME) Finance

The market failure associated with SME finance is asymmetric information between a business and a lender. The business knows more about their own characteristics and the proposition which they are seeking finance for. This makes it difficult for the lender to price a loan accurately. To overcome adverse selection problems, lenders have typically used collateral as insurance against default on the loan.

Collateral signals to lenders the borrower's commitment to the venture and their own assessment of the risk - low risk borrowers are more likely to put their own assets at risk than high risk borrowers who would rather pay a high premium for risk than lose their own assets. However, not all borrowers have collateral with which to demonstrate their commitment and therefore some good, low risk borrowers may be denied access to credit. This leads to efficiency losses and equity losses.

Recent reviews of this problem have found that banks are increasingly using statistical analysis of data, or credit scoring, to overcome asymmetric information problems. The data used to develop a credit score includes:

- information about the applicant and their business;
- the applicant's management of business and personal accounts; and,
- banks experience of existing and past customers.

Where applicants have a track record and homogenous characteristics, credit scoring provides banks with information on which it can base a lending decision. This suggests that there may still be a market failure in lending to:

- start-up businesses with no track record, and businesses with non standard characteristics; and,
- people or businesses that cannot signal their commitment to the venture, through collateral or other means.

How should the public sector intervene?

A good intervention in this case is for the public sector to alleviate the risk to the private sector caused by asymmetric information. This works with the market rather than displacing it. The Small Firms Loan Guarantee Scheme (SFLGS) has been a long-standing government intervention to alleviate this market failure.

Through the SFLGS, government guarantees 75 per cent of a loan made by a commercial lender to a small firm who has a viable proposition but has failed to get a conventional loan because of lack of security. In return for the guarantee, the borrower pays a premium to the government of 2 per cent a year. Most of the risk of asymmetric information and moral hazard therefore shifts from the lender to the government.

Case study 9 - Enterprise in deprived areas

In deprived areas, market failures and the effects of market failures may combine and exacerbate to build more severe barriers to enterprise than in other areas.

For example, the case study on SME access to finance has shown the importance of collateral for start–up businesses. In deprived areas, individuals are more likely to lack collateral, and low house prices/housing equity is likely to exacerbate the problem. Individuals are also more likely to lack a historic relationship with the bank, which is an important element of the credit scoring process. Information asymmetries and lack of experience among lenders of lending in deprived areas may lead to lower levels of understanding of the needs and performance of businesses in deprived areas. In combination these factors may lead to erroneous perceptions of poor credit risk due to fragile markets, lack of capitalisation and collateral, and therefore lead to restricted access to finance.

Potential entrepreneurs in deprived areas may also face more acute personal barriers to enterprise, for example lower educational attainment, less access to training opportunities, and less work experience within a small business. Institutional and administrative barriers may affect those living in deprived areas more acutely. Entrepreneurs in deprived areas may lack informal sources of advice from friends and family with business experience and therefore be more reliant on formal mechanisms of support in overcoming institutional barriers such as:

- Loss of benefits or perceptions of loss of benefits,
- Fixed bureaucratic and regulatory costs falling heavily on small businesses; and,
- Costs of dealing with a wide array of different public sector institutions that are not ‘joined-up’.

Finally, crime and perceptions of crime can be a barrier to enterprise.

How should the public sector intervene?

Intervention in deprived areas often has social and economic efficiency objectives and it is important that such projects are clear about how the intervention will alleviate the causes of market failure as well as the consequences of the failure. Effective intervention is likely to:

- boost interventions which alleviate market failure for deprived areas;
- target take up of interventions in deprived areas; and
- tackle institutional and administrative barriers.

Public sector intervention may also seek to create confidence among potential entrepreneurs, lenders, and inward investors in the prospects of an area or to co-ordinate other agents to overcome the market failures that prevent investment in deprived areas.

Glossary

Administrative failure
Administrative failures arise because public servants often face information problems in making decisions and they also face different incentive structures to those of the private sector.

Adverse selection
This concept is closely related to the concept of asymmetry of information and covers those cases where the buyer of a good or service has better information than the seller. The notion of adverse selection is often employed when analysing the provision of insurance services. For example an insurance company may adversely select to provide life cover to an individual who engages in activities (rock climbing) that unbeknown to the insurance company expose them to a level of risk that they have not factored into the insurance premium. Insurance companies will attempt to insulate themselves from the possibility of adverse selection by inserting exclusion clauses in their insurance contracts.

Asymmetric information
This is a situation where there is an imbalance of information on either the buying or selling side of a transaction. For example, when you enter into a contract for plumbing services, if you lack knowledge on the subject of plumbing than it is very difficult for you to assess whether £50.00 per hour is an appropriate fee to pay for plumbing services, and what you should expect to get from those plumbing services for a fee of £50.00 per hour. This creates the opportunity for people (plumbers in this example) to behave opportunistically and either overcharge for a given level of plumbing services or under-provide in terms of service for the fee that they have charged.

Co-ordination failure
Co-ordination failure is the problem that must be overcome if the private sector is to supply non-excludable goods. Co-ordination failure occurs when it proves impossible for all the parties involved in a potential transaction to reach agreement, usually because of the costs of negotiating to reach an agreement that can overcome the free rider problem.

Crowding out
Investment undertaken by the public sector, through the impact of public sector borrowing on interest rates and through revenue raising, increases the cost of borrowing and investment to the private sector, and so reduces private sector investment. In this way the public sector is said to crowd out private sector investment.

Deadweight
The expenditure used to achieve an impact that would in fact have occurred anyway without the expenditure.

Deadweight cost Of taxation
The deadweight loss is a measure of the inefficiency caused by the imposition of taxation.

The imposition of taxation changes the income received by producers and the price paid by a consumer for a good. This moves the market from its optimal level.

Displacement

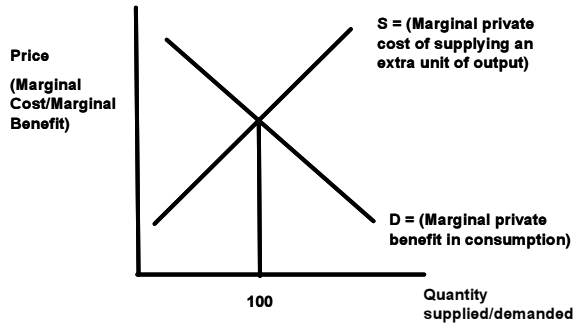
Displacement occurs when public sector intervention in the market leads to a reduction in the amount of activity that the private sector would have undertaken had the public sector not intervened. Therefore the net effect of public sector intervention may be significantly reduced when displacement effects are taken into consideration.

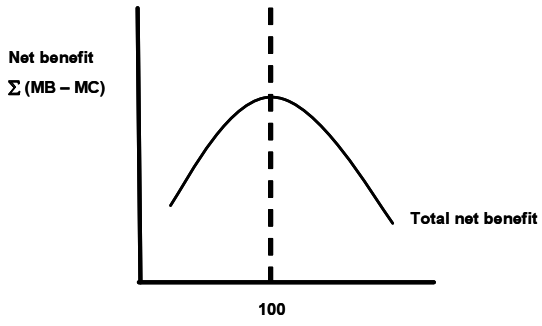
Economic efficiency

Free markets allocate resources through the price mechanism. The quantity of a good or service which is produced and purchased in a free market is determined by the forces of supply and demand.

If a consumer's willingness to pay for a good or service (the price they will pay) reflects all of the benefits which the consumer, and society in general get from the individual's act of consumption and if the individual producer's willingness to supply at the market price reflects all of the costs incurred when producing a good or service then a market will allocate resources efficiently. In order to see why this is the case consider Figure 1 below.

Figure 1: An efficient equilibrium market





As units of output are produced up to 100, each additional unit of output creates more benefit in consumption (shown by the demand curve) than it does cost of production (shown by the supply curve). Hence from society's perspective total net benefit, (obtained from allocating additional resources to the production of this good) is increasing.

However on production of the 101st unit of output, the cost of producing that output (shown by the supply curve) is greater than the benefit derived in consuming that 101st unit of output (shown by the demand curve)

and hence the net benefit of the 101st unit of output is negative. As a result of this the total net benefit from consuming this good or service declines, and this trend will continue should we continue to produce additional units of output in excess of the market equilibrium 100 units of output.

Therefore this market is said to be allocatively efficient because price will adjust until market demand is equal to market supply (= 100). At this point the resources which have been allocated to the production of 100 units of output maximise the total net benefit which society derives from the consumption of those 100 units.

For a market to be economically efficient, it is also necessary that it displays productive efficiency. This occurs when production of one good is achieved at the lowest cost possible, given the production of other goods. Equivalently, it is when the highest possible output of one good is produced, given the production level of the other goods. When this is the case, an economy is said to be operating at its production possibility frontier.

Equity

An intervention in the economy on equity grounds is one in which there is an attempt to try to change the outcome of the market because the current market outcome is seen as undesirable. This contrasts with a market failure intervention that is made to improve economic efficiency. Interventions on equity grounds occur because elected politicians have a mandate from the electorate to intervene in markets for social or equity reasons.

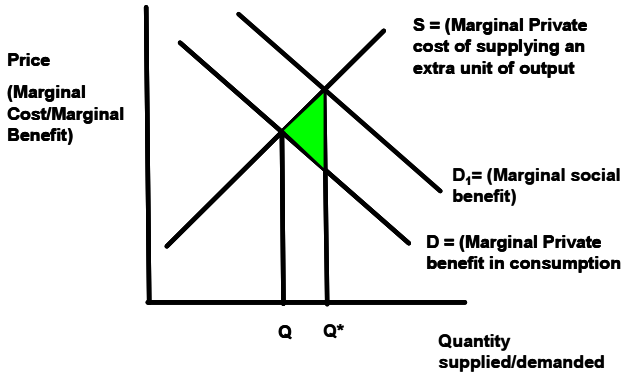
Externalities

The assertion that markets will efficiently allocate resources is dependant on a number of critical assumptions.

On the demand side we assume that the individual's benefit from the consumption of a good reflects the total benefit which society derives from that individual's consumption. Where this is not so, we get a consumption externality. That is a benefit or cost which an individual consumer does not take into account when deciding how much of a good or service to consume.

For example, if a person chooses to consume a flu vaccine this will not only generate benefit for him/her, it will generate benefits for those people to whom he/she does not pass on the flu virus. However, when deciding to pay for a vaccine a person does not take into account the benefits they are generating for others. To use the jargon of economics they have not internalised the benefit that they have generated for others. Hence marginal social benefit (the extra benefit to society) will exceed marginal private benefit (the extra benefit to the individual).

Figure 2: Impact of a positive externality



If the market were left to allocate resources, a quantity 'Q' of flu vaccines would be produced and consumed. However this does not take into account the fact that the marginal social benefit of an individual consuming a flu vaccine is greater than the individual's evaluation (marginal private benefit) of the value of the flu vaccine. The higher level of marginal social benefit is represented in Figure 2 by demand curve 'D1'. Given this higher lever of benefit the optimal level of consumption and production of flu vaccines is Q*.

On the supply side we assume that the individual producer's cost reflects the costs to society of the production of additional units of output. That is we assume that marginal private cost is equal to marginal social cost. If this is not the case we have a production externality.

Figure 3: Impact of a negative externality

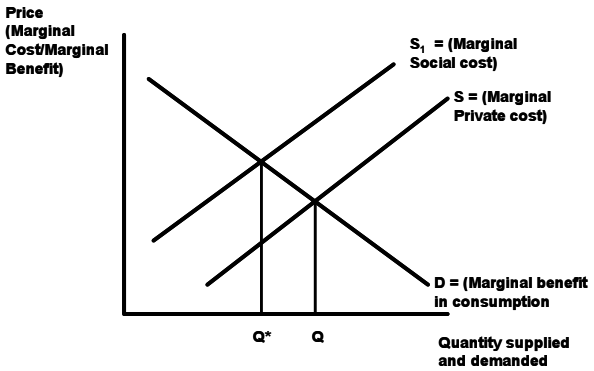


Figure 3 illustrates the negative production externality in the example of an industrial producer who pumps effluent into the river, imposing a cost to the water company for water treatment.

If the industrial producer is not forced to take into account the cost that its pollution of the river is imposing on the water company, then an amount of industrial output 'Q' would be produced. In allocating resources to the production of industrial output the market only accounts for private costs and benefits. However, as Figure 3 illustrates the marginal social costs of production, that is those that include the external pollution costs, are greater than the marginal private costs of production. The socially optimal level of output is Q*, that is, that level of output which equates marginal social cost with marginal benefit. Note that for every unit of output in excess of Q* marginal social cost is greater than marginal benefit and hence allocating resources to the production of those units generates a net cost to society.

Free rider

Often used in the context of a public good to describe a situation where a consumer cannot be excluded from consuming a good or service for which they have not paid. In the case of a public good this market failure can be corrected by government provision of a good or service with the cost financed out of general taxation revenues.

Government failure

The term is used here to refer to the reasons why a public sector intervention may fail to lead to an overall improvement.

Imperfect competition

Resources will be allocated efficiently if markets are competitive. A key assumption underpinning the concepts of competitive markets is that no one buyer or seller in the market controls a sufficient quantity of market supply or market demand to be able to influence market price. Where this is not the case and we have a situation of dominant suppliers or dominant buyers the market is said to be imperfectly competitive and output will be restricted below that which is consistent with an efficient allocation of resources to that market.

Imperfect information

An optimal allocation of resources assumes that consumers can clearly evaluate the benefits of consuming an extra good or service. It also assumes that producers can clearly identify the private cost of a particular production activity. Where this does not occur there is said to be imperfect information.

Income effect

Consumers have a fixed income that acts as a constraint on their spending. Within their budget constraint,

consumers have a preferred mixture of goods and services depending on the relative prices of such goods and services. A change in the price for one particular good within the overall basket of goods and services affects consumers' demand both for that particular good and all other goods and services. The effect of a price change for good 'A' on all other goods and services is known as the income effect. For example, if the price of good 'A' is reduced, after buying the same amount of good 'A' as before the price reduction the consumer now has income left over – it is as if the consumer has had an increase in their income which they can spend across a range of goods and services.

Intervention cost

Governments cannot intervene in markets costlessly. For example, the recent intervention to reduce congestion on the roads in London necessitated an expenditure on infrastructure to police the congestion charge area, collect the congestion charge and pursue those who failed to pay. In order to justify government intervention to correct the market failure that resulted in congestion, government agencies needed to demonstrate that the benefits of reduced congestion exceed the intervention costs, including the deadweight cost of taxation (see above).

Market failure

Market failure occurs in the situation where a market does not deliver an efficient allocation of resources due to specific problems with the market mechanism. In most cases this will mean a situation in which the price is no longer accurately reflecting consumers preferences and as such is leading to a situation where goods and services are no longer being allocated in an economically efficient manner.

Monopoly

Monopoly describes a situation in which there is only one provider of a product or service in a particular market. Monopolies are characterized by a lack of economic competition for the good or service that they provide and a lack of viable substitute goods. A monopoly will sell a lower quantity of goods at a higher price than firms would in a purely competitive market.

Moral hazard

Moral hazard occurs after individuals have entered into a contract to buy or sell a good or service. A moral hazard occurs because individuals have an incentive to behave in a manner post-contractually that they were not expected to behave in pre-contractually. For example, returning to the case of insurance that was discussed in the explanation of adverse selection, there is a moral hazard such that if an insurance company provides you with life cover, perversely this may increase your willingness to engage in risky activities, safe in the knowledge that should there be an accident your partner and children will be provided for.

Natural monopoly

A natural monopoly is a situation in which production is characterised by falling long-run marginal cost throughout the relevant output range. In such situations, the market would only produce a single seller. In other-words, it describes a market in which the natural economic response of the market is to produce a monopoly seller.

Non excludable

Non excludable characteristics mean that once the good has been produced it is difficult to exclude consumers from consuming the good, e.g. of policing, defence or street lighting.

Non rival

Non rival characteristics mean that consumption by one individual does not reduce the amount of the good or service available for consumption by another consumer, e.g. street lighting or clean air.

Oligopoly
Oligopoly is the case where a market is characterised by a small number of sellers. In oligopolistic markets, there is a possibility that full competition can be impeded, resulting in an inefficient market outcome.

Political failings
This occurs when individual or sectional interests are allowed to supersede the public interest because of effective lobbying on the part of those interests. This is often referred to as regulatory capture and represents a significant danger when a small number of interest groups are able to get very close to the public sector decision-making process.

Private good
A private good is a good that can be provided efficiently by the market because it is excludable and rivalrous e.g. a loaf of bread. The person who purchases a loaf of bread can prevent others from consuming it and once it has been consumed it cannot be used again.

Public good
A public good is a good that it is impossible to produce for private profit and therefore is a good for which no market exists. The reason for this market failure is because public goods exhibit two important characteristics.

(i) They are non excludable once the good has been produced it is difficult to exclude consumers from consuming the good, e.g. policing, defence or street lighting. This leads to the free rider problem and means that private producers are unable to charge for the good (see above).

(ii) The above cause of market failure is compounded by the fact that public goods are often non rivalrous and hence consumption by one individual does not reduce the amount of the good or service available for consumption by another consumer e.g. street lighting or clean air.

Spillovers
This relates to a situation where producers of a good or service may find it difficult to appropriate all the returns to their activities, there is a spillover (or positive externality) from the producer to other parties (innovation is a common example). As a result producers' incentives to engage in certain activities that have spillovers are lower than the optimal level.

Substitution effect
Individuals and firms have a fixed income that acts as a constraint on their spending. Within their budget constraint, consumers have a preferred mixture of goods and services depending on their relative prices. A change in the price for one particular good within the overall basket of goods and services affects consumers' demand both for that particular good and all other goods and services. A substitution effect is where the effect of a price reduction for good 'A' encourages greater consumption of the good because of the price change. Consumers are said to substitute towards the relatively cheaper good. Public sector interventions such as grants and subsidies create incentives for private individuals and firms to substitute one activity for a similar activity (such as recruiting a different job applicant) to take advantage of government assistance.

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