



Home Office

BUILDING A SAFE, JUST
AND TOLERANT SOCIETY

Understanding policy options

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The views expressed in this report are those of the authors, not necessarily those of the Home Office (nor do they reflect Government policy).

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1. Introduction

This report summarises the evidence base on the use of policy instruments to address market failures in different contexts. It aims to provide guidance to policy makers in diagnosing problems by market failure and generating a shortlist of policy options. It arose from a Home Office project in 2005, which looked at the potential to change the behaviour of intermediaries and victims to prevent crime.¹

Chapter 2 discusses the criteria by which policy options should be considered, Chapter 3 identifies the policy instruments, Chapter 4 examines alternative explanations of behaviour and the following chapters are divided by market failure. Within each of these chapters, an assessment is made of the relative applicability of each policy instrument. The appendix to the report contains a matrix showing all the policy instruments and market failures and a set of short questions to help identify a market failure. This appendix can be used as a freestanding guide.

The report is largely aimed at a technical, economist audience and therefore it assumes some knowledge of economics and policy making on the part of the reader. It aims to be consistent with and a complement to existing guidance [e.g. Green Book (HMT, 2003)², Regulatory Impact Assessment (RIA) guidance³, and Public Policy: Using Market-Based Approaches (DTI Economics Paper No.14, September 2005)⁴]. The paper is relevant to all government departments and, as such, the examples used are from a range of government departments and the private sector. It is intended to be used by policy makers to classify problems as market failures and identify potential policy responses.

The report will be updated in the future and, as such, the authors would like to invite comments on its content or suggestions for future updates. These should be sent to:

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¹ Changing behaviour to Prevent Crime: an incentives-based approach.

http://www.homeoffice.gov.uk/rds/changing_behaviour.html

² HM Treasury (2003) *The Green Book: Appraisal in Central Government*. London: HMSO.

<http://greenbook.treasury.gov.uk/>

³ Please see: http://www.cabinetoffice.gov.uk/regulation/ria/ria_guidance/index.asp

⁴ DTI (2005) Public Policy: Using Market-Based Approaches. DTI Economics Paper No.14.
<http://www.dti.gov.uk/ccp/pdf/pubpolicy0905.pdf>

2. Criteria for policy selection

Introduction

This chapter discusses the criteria by which potential policy options should be considered.

Criteria for short-listing policy options

In identifying and selecting policy options, the basic criterion is the public interest.⁵ Typically, a policy is considered to be in the public interest if the benefits to the public exceed the costs, taking into account who enjoys the benefits and incurs the costs.

In general, the following considerations should be taken into account:⁶

- **Likely effectiveness against objective.** The first assessment that should be made is whether the intervention is going to meet the desired objective. This requires a robust understanding of the nature of the problem and why the market is currently not providing an optimal outcome.
- **Cost.** A number of parties may incur costs in complying with interventions and these should be taken into account.
- **Unintended consequences.** Options may have unintended side effects which reduce/increase their desirability. There are two main types:
 - *Intervention produces a market failure or exacerbates existing ones.* For example, raising taxes on goods such as cigarettes may lead to an increase in activities to avoid or evade the tax, and smuggling.
 - *Intervention has an impact on other policy objectives.* For example, excluding disruptive pupils from school may increase the educational attainment of the remaining pupils but may increase juvenile offending.
- **Impact on international competitiveness.** When generating and short-listing options the impact on UK competitiveness should be considered.
- **Additionality/deadweight.** Government should seek to ensure that the impacts associated with an option are additional and would not have happened anyway. For example, a proposal to supply deadlocks free of charge to all new houses might be rejected on the basis that this would have only a marginal effect on the take-up of deadlock alarms.⁷
- **Distribution.** Proposals for intervention should ensure that they do not disproportionately harm particular groups, especially the most vulnerable in society (e.g. those on low income, elderly).
- **Uncertainty.** Sensitivity analysis should be undertaken to examine how the balance of advantage among the options is affected by variations in assumptions.

⁵ In most policy areas general objectives, and sometimes specific targets, are set by the Government of the day, and it is the task of government departments to implement these. However, in assessing and advising on policy options, and indeed on the targets by which they might be judged, the underlying criterion remains the public interest. See HM Treasury (2003) *The Green Book: Appraisal in Central Government*. London: HMSO.
<http://greenbook.treasury.gov.uk/>

⁶ See Risk and Policy Analysts (2004) *Review of the key issues related to economic instruments to reduce the environmental impact of pesticide use*. Report prepared for DEFRA.

<http://www.defra.gov.uk/environment/chemicals/pesticides/pesticidesuse-keyissuessummary.pdf>

⁷ 72 per cent of the existing housing stock have deadlocks and this proportion could be higher for new-builds (Budd, T. (1999) *Burglary of Domestic Dwellings: Findings from the British Crime Survey*. Home Office Statistical Bulletin 4/99. London: Home Office.
[http://uk.sitestat.com/homeoffice/homeoffice/s?rds.hosb499pdf&ns_type=pdf&ns_url=\[http://www.homeoffice.gov.uk/rds/pdfs/hosb499.pdf\]](http://uk.sitestat.com/homeoffice/homeoffice/s?rds.hosb499pdf&ns_type=pdf&ns_url=[http://www.homeoffice.gov.uk/rds/pdfs/hosb499.pdf])

There are a number of practical considerations that policy makers should be aware of when drawing up a short list of the most promising options. These include:⁸

- **Legality.** European law, international law and Human Rights legislation places a limit on government action.
- **Enforcement.** The effectiveness of options in changing behaviour will often depend on whether the option can be enforced and the scope for parties to evade enforcement. For example, firms may employ illegal workers because they do not expect to be caught.
- **Public acceptability.** Enforcement will generally be more difficult when the public fails to accept an intervention (e.g. Poll Tax) or fails to accept or trust the evidence supporting an intervention (e.g. combined MMR vaccine).
- **Capacity.** Some options will require large specialised resources that cannot be obtained in the short-run (e.g. reducing crime by increasing the prison population by 50,000 is not possible in the short-run). Where capacity issues are a concern, policy makers should either consider alternatives or interim solutions.
- **Affordability.** Expensive (but value for money) options might be rejected given the scale of expenditure required and departmental budget constraints.

⁸ For a more wide-ranging discussion see Prime Minister's Strategy Unit (2004) *Strategy Survival Guide*. London: Cabinet Office. <http://www.strategy.gov.uk/downloads/survivalguide/index.htm>

3. Policy options

Introduction

This chapter identifies the main policy instruments available to government and some general issues associated with their use. The five categories of instrument are adapted from the typology presented in PMSU (2004).⁹ These are:¹⁰

- information, education and advice;
- direct intervention;
- economic instruments;
- regulation and other legislation; and
- market-based solutions.

Policy options

Information, education and advice

The variants of information, education and advice can be considered along a spectrum of increasing government involvement in decision making. At one end, government can act by provision of information or increasing access to information (e.g. by providing experts, signposting information sources). At the other end, government can seek to shape people's preferences and attitudes (see Table 3.1).

Table 3.1: Variants of information, education and advice

Variant	Description	Examples
Provision of information	Information is provided to the public.	<ul style="list-style-type: none">• School league tables• Crime statistics
Public education campaign	These are often used to raise awareness of particular issues and present basic information.	<ul style="list-style-type: none">• Safer sex campaigns• Crime reduction campaigns• "Talk to Frank" anti-drugs campaign
Reporting and disclosure requirements	Government imposes regulations which require agents to provide information. These regulations may cover issues about the information including frequency and detail.	<ul style="list-style-type: none">• Company accounts• FOI
Labelling	Manufacturers are required to state information on products in a particular format.	<ul style="list-style-type: none">• Nutritional information• Energy labels on fridges
Advisory service	An expert provides information and advice to a person or business.	<ul style="list-style-type: none">• Connexions (advice for young people)• Citizens Advice Bureau• NHS direct
Representation service	An expert is appointed to act on behalf of a person or business.	<ul style="list-style-type: none">• Ombudsman

Generally, information, education and advice options are attractive because they leave the decision about how to behave up to the individual/firm. However, effectiveness depends on

⁹ Prime Minister's Strategy Unit (2004) *Strategy Survival Guide*. London: Cabinet Office.

<http://www.strategy.gov.uk/downloads/survivalguide/index.htm>

¹⁰ Readers should note that the instruments may be interdependent. For example, legislation is often required to apply taxes. Moreover, it is likely that an effective response to any problem will require a mix of instruments.

whether the target audience has the capacity and incentives to act on the information and change their behaviour. It depends also on how the information is provided (e.g., whether it is targeted, clear, well-timed, delivered by credible messengers, etc.). These are discussed in more detail in Chapter 6.

Direct intervention

Government can intervene by ensuring that a good/service is provided. Within this, government can choose whether to provide the service itself or contract the private sector to provide it. Typically, financing is through taxation though, in recent years, government has shifted the burden of financing to the private sector through Private Finance Initiatives (PFIs) and Public Private Partnerships (PPPs).

Table 3.2: Variants of direct intervention

Variant	Description	Examples
Direct provision of service	Government directly provides the services in the public sector.	<ul style="list-style-type: none"> • Police
Commissioning of services	Government contracts the non-public sector (e.g. firms, charities) to build/operate particular services.	<ul style="list-style-type: none"> • Private prisons

The advantage of direct intervention is that it ensures that the service is provided. The disadvantage is the distortionary impact of taxation required to finance it (see section 5, *Taxes*, p.16).

One of the main advantages of involving the private sector in providing and/or financing is the transfer of risk from the public to private sector. However, the demise of Railtrack demonstrated some of the limits to risk transfer.

Contracting out can result in principal-agent problems in which the private sector fails to act in ways that the government would like, although these problems may also occur in different forms within the public sector. Government can reduce principal-agent problems by specifying standards and behaviours in contracts though these may result in perverse incentives and incur significant costs of monitoring and enforcement.

Economic instruments

Economic instruments can be defined as either changing the prices/costs faced by agents or changing the budget within which agents operate. Variants of this category are set out in Table 3.3.

Table 3.3: Variants of economic instruments

Variant	Description	Examples
Taxes	The government raises the price paid by the consumer or costs faced by industry.	<ul style="list-style-type: none"> Fuel duty VAT
Charges	Government charges for services that are consumed.	<ul style="list-style-type: none"> Policing at football matches Congestion charge
Subsidies and vouchers	The government reduces the price paid by the consumer or the costs faced by industry.	<ul style="list-style-type: none"> Pre-school education voucher
Tax credits	The government reduces the cost of an activity at the margin.	<ul style="list-style-type: none"> Working Tax Credit Child Tax Credit
Benefits and grants	Similar to subsidies but often used when the emphasis is on who receives the subsidy rather than the goods/services that are being promoted (grants and benefits can be ring-fenced or can be used for any expenditure).	<ul style="list-style-type: none"> Education maintenance allowances Incapacity benefit Warm Front Scheme (Home Energy Efficiency Grant)
Tradable permits and quotas	Systems under which a right to produce a good/service (or by-product) is created and a market is created to allow companies to buy or sell these rights.	<ul style="list-style-type: none"> Carbon emissions trading scheme
Award and auctioning of franchises and licences	System under which the right to produce a good/service is sold.	<ul style="list-style-type: none"> Radio spectrum of mobile phones Airport landing slots
Government loans, loan guarantees and insurance	Government directly provides loans and/or provides a subsidy for the loan (e.g. through guarantees or insurance).	<ul style="list-style-type: none"> Student loans Export credit guarantee

A key characteristic of economic instruments is that they are decentralised (i.e. the decision whether to take a particular action or not remains with the individual). This can lead to a much more efficient outcome.

Taxes

The costs imposed by the imposition of taxes are potentially significant. These include:

- **Administration costs** – costs may be incurred by the government in collecting taxes, enforcing tax rules, informing individuals/firms about the tax system, and by individuals/firms in administering the taxes and demonstrating compliance to tax authorities.
- **Excess burden of taxation**¹¹ – taxes collect less revenue than the loss in welfare to the consumer of the product being taxed.¹²
- **Unproductive activity** – introducing taxes may lead to activity to avoid the tax (e.g. lobbying policy makers, use of accountants to find tax loop holes) or to evade the tax altogether.¹³

A number of other issues should be considered when considering tax as an option:

¹¹ Commonly known to economists as the deadweight loss – this is different to the term ‘deadweight cost’ used in this document to refer to additionality (or lack of it).

¹² Cullis, J. and Jones, P. (1998) *Public Finance and Public Choice*. Oxford University Press.

¹³ According to estimates presented in the Green Book, for each £100 raised in taxes there is about £30 “forgone” in economic activity. See HM Treasury (2003) *The Green Book: Appraisal in Central Government*. London: HMSO.
<http://greenbook.treasury.gov.uk/>

- **Elasticity** – the degree to which taxes change behaviour depend on how responsive agents are to changes in prices.
- **Incidence of taxation** – one should consider who bears the burden of taxation. This will depend on price and income elasticities. For example, if a tax is applied to a particular product, a producer will often respond by raising prices and the burden may fall on consumers.

Recent experience also emphasises the importance of considering complementary measures when trying to change behaviour. Recent examples are the provision of nicotine patches on the NHS to complement tobacco taxation and the introduction of a 100 per cent first year enhanced capital allowances (ECAs) scheme for firms investing in energy-efficient technologies to complement fuel duty.

Subsidies, tax credits, vouchers, benefits, grants, prizes and loans

There are a number of issues to consider with these instruments:

- **Costs of taxation** – most of these instruments are financed by taxation and incur the costs of taxation (as set out in the previous section).
- **Administration costs** – in addition to the costs of administering taxation to finance these instruments, there are administration costs incurred, for example, in deciding eligibility for the schemes, in distributing the funds, and in informing the public about the schemes.
- **Additionality** – some of those receiving subsidies, grants, etc. may have behaved in the same way without the incentives. This problem can be overcome with careful targeting (e.g. means testing), although this can raise costs.
- **Competition** – subsidies, tax credits, vouchers, benefits and grants can distort competition.¹⁴ These should be avoided as a policy instrument if they are likely to be in breach of the State Aid Rules (see Box 3.1).

Box 3.1: State Aid Rules

What is State aid?

The State Aid Rules were put in place to protect the free market by ensuring that state resources do not distort competition or give an unfair advantage. State aid is considered to be any advantage given by a State to an undertaking in their domestic economy where such an aid may benefit particular industrial sectors or individual undertakings and affect trade in the European Union. The European Commission considers that such aid is contrary to the notion of the European Single market and prohibits it.

How do we know if aid is present?

There are four tests that must be met for State aid to be present:

- Aid is granted by a Member State or through a State resource.
- The aid favours certain undertakings or production of certain goods.
- It is aid which distorts or threatens to distort competition.
- The aid affects trade between Member States.

It is considered that if these four tests are met State aid is present.

Who does it affect?

Any support provided by an arm of the government, as well as direct support from central government, can be classed as State aid. Thus, any grants or other forms of support from Government Offices, Regional Development Agencies, Non-Departmental Public Bodies, English Partnerships, Urban Development Corporations, Local Authorities or other public institutions funded by State resources are potentially State aid.¹⁵

¹⁴ For more detail on how competition considerations can be taken into account when analysing the potential for subsidies to correct for market failures, please see a recent OFT report <http://www.of.gov.uk/Business/Market+studies/subsidies.htm>

¹⁵ For more information on when these apply see <http://www.erd.odpm.gov.uk/StateAidHomePage/>

Recent studies comparing the effectiveness of prizes with that of Government subsidies, grants and tax credits for R&D into new technologies, suggest that prizes have a number of advantages over more traditional “push-type” of economic incentives. However, there are also potential disadvantages. According to a recent report by the Better Regulation Task Force (BRTF),¹⁶ these include: low media support for “good news”; they can be very resource-intensive to operate fairly, they require publicity, an application process and a judging system. In addition, entrants may feel it is too complicated or time consuming to apply. A further downside is that if there are already a large number of award schemes, a new one may fail to enthuse potential candidates.

Loans and loan guarantees are a tool traditionally used to address capital market imperfections arising from adverse selection and moral hazard (more detail on these types of problem are provided in Chapter 7).

Theories of behaviour that reject the role of rationality in decision-making stressing factors such as habit, emotion and peers may provide a richer justification for some of these instruments. For example, if individuals are relatively short-sighted, loans may be relatively more effective.

Franchises and Licences

One of the main advantages of franchises and licences is the transfer of risk from public to private sector. However, there are a number of issues to consider with this instrument:

- **Length of concession/franchise** – there is a trade-off between problems of monopoly associated with long concessions and lack of investment associated with short franchises. Some of these problems can be overcome with regulatory review and provisions in regulatory contracts (e.g. monitor price).
- **Numbers of suitable bidders** – there must be enough companies interested in the franchise/licence for there to be a successful bid.
- **Barriers to entry** – this is created by the expertise of the existing contractors and the insider knowledge that they have. These issues make it more likely that the existing contractors will continue to win future contracts. Disclosure requirements may help to alleviate the problem but could enhance ability of firms to collude.
- **Bidding costs** – bidding costs may be high and are socially wasteful. The existence of costs also makes it less likely for risk-averse firms to participate in bids. One solution may be to subsidise the costs involved in forming a suitable bid.

Tradable quotas and permits

Quotas and permits are a way of restricting the quantity of an output. When considering tradable permit or quota schemes, policy makers need to be aware of the following:

- **Initial allocation of permits/quotas** – this can be hard to arrive at. Although the initial allocation does not have an effect on the overall outcome, it will have an impact on the distribution of income within a market and can cause resentment if it is felt the allocation is unfair.
- **Entry to and exit from market** – new entrants may require some assistance for permits/quotas to not act as a barrier to entry. The design of schemes can lead to further market failures and reduce innovation in the longer run.
- **Costs** – there are costs to the government in monitoring compliance with set quotas/permits. Firms may also incur costs in collecting additional data, monitoring output/pollution and trading permits/quota. These costs are potentially compounded by the complexity of schemes.
- **Size and liquidity of market for permits** – the potential benefits from trading permits and quotas will depend on the permit/quota market operating efficiently. Sufficient

¹⁶ See Better Regulation Task Force (2003) *Imaginative Thinking for Better Regulation*. Better Regulation Task Force. <http://www.brtf.gov.uk/reports/imaginativeregulation.asp>

participants in the market are required to make trading possible and the market should not be dominated by one large firm. The market must also be relatively liquid to ensure prices do not vary widely creating instability.

Regulation and other legislation

Government can act by setting restrictions on the actions of others. These can be defined positively (e.g. 'you must do z') and negatively (e.g. 'you cannot do y'). Variants of this category are set out in Table 3.4.

Table 3.4: Variants of regulation and other legislation

Variant	Description	Examples
Price and market structure regulation	Laws or rules that: i) set out the prices companies can charge for particular goods/services; ii) set out how companies can organise themselves and their relations with other companies.	<ul style="list-style-type: none"> • Rail fare regulation • Utility regulation
Production and consumption regulation	Laws or rules relating to how products are produced – these can cover: characteristics of product/service, how the product/service is produced, who can produce a product/service etc.	<ul style="list-style-type: none"> • Planning rules • Compulsory motor insurance • Licensing laws
Standards setting regulation	Rules which set minima/maxima for particular characteristics of goods/services and production techniques.	<ul style="list-style-type: none"> • Trading standards • Health and safety
Prescription and prohibition legislation	Rules which state what an agent must/must not do.	<ul style="list-style-type: none"> • Criminal acts • Banning tobacco advertising
Rights and representation legislation	Rules which provide agents with rights and/or representation.	<ul style="list-style-type: none"> • Human rights legislation

Regulation is a common response of government. However, there are a number of issues to consider. These include:

- **Information requirements** – unlike economic instruments, regulation compels individuals to behave in certain ways. To be effective, government must have considerable information on the costs and benefits of alternative actions.
- **Costs** – these include the costs of compliance and monitoring compliance, and costs of lobbying against regulation.
- **Inflexibility** – it is difficult to design regulation that is sensitive to different individuals and circumstances.
- **Time** – regulation takes time to develop, bring into force and administer effectively, by which time the problem may have disappeared or changed.
- **Limits to regulation** – to prevent excess regulation, government has imposed limits and developed processes for developing regulation that policy makers must comply (e.g., Regulatory Impact Assessment).

The Better Regulation Task Force (2004)¹⁷ has identified five questions that policy makers should ask when considering a regulatory tool. These are set out in Box 3.2.

¹⁷ For more detail see the Better Regulation Task Force leaflet (2004) *Alternatives to Regulation*. Better Regulation Task Force. <http://www.bruf.gov.uk/docs/pdf/alternative.pdf>

Box 3.2: Deciding on a regulatory tool: five key questions

1. What kind of harm is being dealt with?

- Where the likelihood of harm is small, it is worth considering whether it would be better to do nothing.
- Sometimes there is pressure for action when something has gone wrong. But better enforcement or information may be more appropriate than new law.

2. What are the unintended consequences of any proposed action?

- Most intervention has unintended consequences.
- It might be necessary to think laterally in order to consider fully all the possible consequences of intervention. Careful consultation will help.

3. Is there a role for a creative approach?

- Self-regulation or incentives may not work in all circumstances.
- Self-regulation may work where there is a strong trade association, but a weak option if their sanctions do not bite.
- A system of trading permits and quotas may work well if there are sufficient participants in the market, but may be inappropriate if the market is dominated by one large firm.

4. Is “classic” regulation necessary?

- Other options should be considered first.
- On some occasions, the issues may already be covered by existing legislation, and the solution might be better enforcement or more publicity.
- Sometimes, classic regulation may work best in conjunction with other measures.
- Even when it is decided that classic regulation is the best way forward it may still be desirable to consider flexible measures such as exemptions and “comply or explain” approaches. Similarly, sunset clauses can help to overcome the inflexibility of classic regulation in fast-developing areas.

5. How difficult or expensive would enforcement be?

- It is rare for compliance with the law to reach 100 per cent even when there is active enforcement. Another method may be more effective in changing behaviour.
- Before any regulation is introduced, the resources that will be needed to ensure the desired level of compliance must be considered.
- Enforcement measures may be necessary for tools other than classic regulation. For instance, a system of targeting may require monitoring.

Market-based solutions

This category is difficult to define. It involves ‘soft’ interventions to encourage markets to resolve problems largely by themselves. One important variant is self-regulation, whereby firms regulate themselves through, for example, codes of practice and accreditation schemes. Examples are set out in Table 3.5.

Table 3.5: Variants of self-regulation

Variant	Description	Examples
Voluntary agreement	These are rules (not backed up by regulation) which a community (industry, area) agrees to abide by – often there are no formal sanctions.	<ul style="list-style-type: none"> ▪ Advertising standards ▪ Corporate Social Responsibility initiatives
Codes of practice	Codes of practice are similar to voluntary agreements in that they are agreed within communities (usually industries) – codes of practices tend to be consumer focused (are presented to consumers) and can be certified by the OFT.	<ul style="list-style-type: none"> ▪ Banking code
Co-regulation	Between the extremes of voluntary agreement and regulation there are points in between – Co-regulation is voluntary codes of practice with significant Government involvement (statutory backing).	<ul style="list-style-type: none"> ▪ Advertising Standards Agency ▪ HSE Approved Codes of Practice ▪ Soil Code¹⁸

¹⁸ The Soil Code consists of a set of practices to help farmers and growers avoid causing long-term damage to the soils which they farm, and to enhance their ability to support plant growth. For more on this, please see <http://www.defra.gov.uk/environment/land/soil/information/publications.htm#soilcode>

Summary assessment

This chapter identifies the main policy instruments available to government and some general issues with each. These are summarised in Table 3.6.

Table 3.6: Summary of general issues associated with policy instruments

General issues	<ul style="list-style-type: none"> • Government action generally results in a cost – this can include direct costs (faced by both the government and those whose behaviour changes), enforcement and compliance costs, and diversionary activity. • Government action can also impose significant informational requirements which may be costly and/or seen to challenge civil liberties.
Information, education and advice	<ul style="list-style-type: none"> • Information may be a relatively rapid instrument to use. • Allows individuals to make decision. • Should only be considered if individuals have capacity and incentives to react to new information. • Effectiveness depends on many factors (e.g. how well information is targeted, timing, credibility of messenger, etc.).
Direct provision	<ul style="list-style-type: none"> • Direct provision can be delivered either by the Government itself or through contracting out to the private sector. • Ensures good is provided. • It can represent a transfer of risk from the public to private sector if contracted out. • May lead to other principal-agent problems. • May have an effect on competition e.g. crowd out private sector, perception of favouritism towards in-house provider could deter new entrants, but maintaining in-house supplier provides credible fall-back option which is beneficial for competition. • Typically financed by taxation which has costs.
Economic instruments	<ul style="list-style-type: none"> • Behavioural change will depend on how responsive individuals/firms are to price/cost changes. • Decentralisation of decision making may mean that government requires less information than other alternatives.
Regulation and legislation	<ul style="list-style-type: none"> • Makes it clear how people are expected to behave. • Informational requirements are large. • Can be inflexible and have unanticipated consequences. • Can produce barriers to entry.
Self-regulation	<ul style="list-style-type: none"> • Potential to be quick and relatively inexpensive alternative to ‘classic’ regulation and legislation. • May be toothless and dominated by large firms. • Can create barriers to entry.

Table 3.7: Further issues to be considered for variants of economic instruments

	Key issues/questions
Tax	<ul style="list-style-type: none"> • Useful where individuals/firms are responsive to changes in prices (or might have to be used in conjunction with other levers). • Taxes levied to address market failures can be used to reduce other, more distortionary taxes.
Subsidy	<ul style="list-style-type: none"> • Most appropriate when targeting is not required or is easy – so as to avoid deadweight costs and ensure additionality. • Subsidies are tax financed – taxes are distortionary (see above).
Franchises	<ul style="list-style-type: none"> • When determining the length of franchise there may be a trade-off between market structure and investment (longer franchises may increase problems of monopoly but increase investment).
Loans	<ul style="list-style-type: none"> • Where does the liability of the loan rest?
Quotas and permits	<ul style="list-style-type: none"> • How is the initial allocation of permits/quotas likely to influence development/entry to markets? • Is the market for permits likely to be liquid enough to ensure prices do not vary widely and create instability and other problems?

4. Understanding behaviour

Policy development requires an understanding of why problems arise and the reasons individuals (and others) behave as they do. Traditionally, this has been founded on an economic model of rational choice. This assumes that individuals are rational and can make the best choices for themselves. It follows that public policy problems arise where 'markets fail'. For example, this may be because individuals are poorly informed about the choices available to them or because their actions incur costs on others which they do not take into account. The structure of the remaining chapters is founded on this model. Taking each 'market failure' in turn, the policy instruments are assessed to determine which is more or less appropriate.

It is important to recognise that there are alternative theories of behaviour and these have implications for policy design. Box 4.1 sets out some of these. In the remaining chapters, these are taken into account.

Box 4.1: Alternative explanations of behaviour

Rational choice model

Individuals are assumed to be self-interested and make decisions based on an assessment of the expected personal costs and benefits of different activities. Government intervention is justified where there is imperfect information, asymmetric information, externalities, public goods, imperfect competition and inequity.

Individual level theories

Individual level theories stress the role of cognitive ability (habits and heuristics), emotional or affective responses, and moral and normative judgments in individual decision-making. They imply that individuals may systematically misjudge the personal costs and benefits of their behaviour. Individual level theories suggest that traditional policies that assume rational behaviour such as provision of information or taxation may be less effective.

Interpersonal behavioural theories

Interpersonal behavioural theories emphasise the importance of other people on an individual's behaviour and decision making (e.g. peers, family and role models). Interpersonal behavioural theories suggest that government should intervene where people in authority or influence are giving out the wrong "message", and that government should work towards building positive networks and breaking up negative ones.

Community theories of behaviour

These theories highlight the importance of an individual's wider social context and the role it can play on an individual's behaviour and decision making. Communities with high social capital can have positive impacts on crime and efficiency. Community theories suggest the role for government is to promote and ensure equal access to social capital.

5. Externalities

Introduction

Externalities occur when an individual's actions directly impact on others, and these effects are not taken into account in the individual's decision-making. Examples include pollution and vaccination.

There are two main reasons why the market fails to overcome externality problems.

- A lack of property rights. If property rights were well defined, agents can negotiate and trade to the optimal outcome regardless of who is assigned the rights – only the distribution of income will differ.
- Trading incurs transaction costs (e.g. drawing up agreements, enforcing agreements) and may offer the opportunity for individuals and firms to act strategically. This is a particular problem when the numbers of people involved in an exchange is large.

Government intervention can therefore raise society's welfare where negotiations do not occur. Where negotiations do occur, government intervention can raise society's welfare by lowering transaction costs.

Policy options

Information, education and advice

Non-traditional models of behaviour suggest information, education and advice may be used to address externalities. For example, government can use information to appeal to altruism (e.g. to encourage recycling of waste) or encourage social censure (e.g. to boycott certain products).

Labelling and 'naming and shaming' involve provision of information to help consumers distinguish between good and bad products and producers. Pawson (2001) suggests 'naming and shaming' is more likely to be effective when:

- those being named and shamed need to/want to be part of the group;
- naming can trigger a number of other sanctions (e.g. refusal of public to buy certain products) and people can act on the information;
- the message/information being communicated is clear and unambiguous;
- messages are newsworthy (picked up by the media) but not scandalous (which can lead to inappropriate reactions e.g. naming of paedophiles by tabloid newspapers); and
- those naming and shaming are independent and trusted.

Information, education and advice can be used to reduce the costs of adjusting to other instruments. For example, information and advice may be provided on how to minimise the costs of taxation and regulation.

Direct intervention

The government may intervene to provide goods or services that yield strong positive externalities (e.g. immunisation programmes). Alternatively, the government may provide alternatives. For example, heroin substitutes and nicotine patches are prescribed to reduce the negative externalities associated with drug use and smoking (e.g. stealing to fund a drug habit, costs of passive smoking).

In general, there is little theoretical justification for direct provision to address externalities.

Economic instruments

Economic instruments can embed the value of an externality into market prices, so in principle providing an efficient and equitable way of overcoming the market failure that the externality otherwise presents.

The main economic instruments are:

- taxes;
- charges;
- grants, subsidy and loans; and
- tradable permits.

Taxes

Taxes are frequently applied on products that produce negative externalities (e.g. petrol, cigarettes and alcohol). The aim is to force people to consider the wider costs of their actions.

In general, taxes are regarded as the most efficient tool for addressing externalities. As HMT note,¹⁹ a key advantage of taxes is that they *'can influence people's buying power, while still allowing individuals to decide whether and how much to consume'*.

The main problems with taxation are difficulties estimating the marginal social cost of the externality, the political and administrative feasibility of applying an appropriate tax, and the fact that public opinion often encourages governments to control quantities rather than accept market solutions. The following sub-sections set out the key issues that influence the desirability of taxes when addressing externalities:

a) How easy is it to estimate the marginal cost of an externality?

To apply a tax, policy makers need to estimate external marginal costs and, in practice, this may be difficult especially where there is uncertainty. For example, in valuing the wider costs of CO₂ emissions a number of assumptions have to be made about the contribution of CO₂ emissions to climate change and the subsequent impact of climate change on other things of value (e.g. health, production).

b) How easy is it to impose the tax close to the externality?

Taxes are most efficient in addressing externalities when they are imposed as close as possible to the activity causing the externality. Often it will not be possible or practical to impose a tax on the externality itself (e.g. Carbon Dioxide). A second-best solution is to apply the tax to the process, product or input which causes the external cost (e.g. consumption of fossil fuels). If the tax is not imposed closely to the source of the externality, consumption and production distortions will result.

c) How does the social cost of an externality vary by the context and level of consumption/production?

The marginal cost of some externalities will depend on the situation in which they are produced or consumed and the level of production/consumption.²⁰ For example, the negative externality associated with alcohol consumption depends on the amount consumed – large amounts of alcohol can lead to increased violence, disorder and antisocial behaviour, whilst consuming small amounts is unlikely to have an effect. Ideally, when introducing a tax, it should be set at the value of the last unit of the good consumed. In this case, the optimal tax applied to the heavy drinker would be higher than that applied to the occasional drinker.

¹⁹ See section 8.16 in Wanless, D. (2004) *Securing Good Health for the Whole Population: Final Report*. London: HM Treasury.

http://www.hm-treasury.gov.uk/consultations_and_legislation/wanless/consult_wanless04_final.cfm

²⁰ The following discussion is adapted from Wanless, D. (2004) *Securing Good Health for the Whole Population: Final Report*. London: HM Treasury.

http://www.hm-treasury.gov.uk/consultations_and_legislation/wanless/consult_wanless04_final.cfm

Given administrative costs and technical restrictions, it will often be impossible to design a tax to reflect variable externalities.

d) Whether a specific level of (or limit on) externality is required?

With taxation, it is left to the market to decide on the level of externality. This may be inappropriate when a policy maker wants to ensure that the external costs do not exceed a certain level (e.g. zero).

Charges

Charges reflect costs that are imposed on other agents as a direct result of an action. For example, charges are currently applied by police forces to reflect the costs they bear policing special events and football matches.

There are three issues which need to be considered when assessing the use of charges.

- Charges fail to reflect the less tangible costs imposed on other people (e.g. emotional costs to victims of crime). Therefore they fail to fully internalise the social costs of a particular action.
- The impact of charging on incentives need to be carefully considered. For example, charges imposed in response to crime (e.g. attendance of police officers at the scene of a commercial burglary) may lead to less reporting of crime (to avoid the charges).
- The distinction between taxes and charges is not always clear (e.g., London congestion charge).

Grants, subsidy and loans

The same arguments about taxes can be applied to subsidies when the externality is positive and the government wants to promote an activity. Additional issues include:

- subsidies will often be funded through general taxation which is itself distortionary; and
- subsidies may incur 'deadweight'²¹ – expenditure to promote activities that would have happened in the absence of the externality.

Subsidies can also be used to promote alternatives to processes, products and inputs that produce negative externalities, though, in general, this approach is unlikely to produce an efficient solution.²²

Grants can be considered to be a variant of subsidies (and often the terms are used interchangeably). Grants can be paid out to promote particular action when there is a positive externality or to promote actions to reduce negative externalities.

Grants tend to be less efficient than subsidies/taxes because they fail to reflect the marginal costs/benefits of activities. They can also incur significant deadweight although this can be reduced through careful targeting (e.g. eligibility for grants under the Home Energy Efficiency Scheme is linked to benefits such as Income Support). As with subsidies, grants to address negative externalities are unlikely to be efficient particularly over time as more companies may be attracted to the industry to claim the grants.²³

Grants can also be used more directly to reduce production (e.g. the government can pay a fixed amount to a company in return for a commitment not to produce above a certain level). As with regulation (discussed below) these type of grants impose significant information requirements to set the most efficient level of grants, a problem which is exacerbated by the fact that the agent being 'targeted' has an incentive to over-declare the cost of reduced production.

²¹ Note that this definition of externality should be distinguished from that traditionally used by economists.

²² Effectiveness will depend on the cross-elasticities of demand and the amount of the externality produced by the alternative product.

²³ These dynamic problems may be less prevalent when another market failure, imperfect competition, is present. Barriers to entry may mean that the government is able to offer grants without other companies being attracted to the industry.

From a theoretical perspective the case for the use of loans to address externalities is severely limited as the main rationale for using loans is to address credit market imperfections. However, they may in some cases be more effective than conventional subsidisation if, for example, households give greater weight to a single charge than to an equivalent amount spread over time. People may also discount heavily, and be more responsive to a loan which spreads up front costs over time.

Tradable permits

Under a tradable permit scheme the quantity of a pollutant is set in advance and agents responsible for polluting processes are issued with permits, allowing a certain quantity of pollutant. These permits are tradable, so allowing agencies for whom the costs of reducing the polluting activity are relatively low to sell permits to those for whom the costs are relatively high.

Such a scheme has the advantage of government being able to specify a total quantity of pollutant and to achieve this total more efficiently than by setting limits for each individual polluter; but in contrast to a tax, it does not allow the market to determine the “efficient” level of pollution at which its marginal social cost equals the marginal benefits to producers.

Practical issues include the initial allocation of permits or quotas, the treatment of new entrants and of firms leaving the market, and the operation of the trading scheme.

Table 5.1: Summary of economic instruments to address externalities

	Context/situation for use	Examples
Tax	Value of externality can be estimated. Most effective when tax can be imposed close to the cause of the externality. Externality is negative. Value of externality is relatively homogeneous (does not significantly vary in value). It is not important to be certain about quantity of externality.	Landfill tax.
Subsidy	As tax (apart from imposed on positive externalities). Can be used to promote alternatives to causes of negative externalities. Deadweight costs can be minimised by targeting.	Passenger rail services.
Grants	As subsidies. Can be more flexible than subsidies but potentially more expensive.	Warm Front – to promote energy efficiency. Freight Facilities Grants.
Charges	Can be used to internalise tangible costs borne by others. Does not cover intangible costs or costs directly attributable to action.	Charging for policing of football matches (officers inside the stadium). London Congestion Charge
Tradable permits	Appropriate when certainty over the level of externality required and the value of the externality is homogeneous (that is, tradable permits are not appropriate for situations where the impact of the externality is dependent on where and when it takes place). Liquid market for permits needs to be established (which will be dependent on number of firms trading and concentration of market power).	Renewable Obligations Certificates can be sold and bought. Landfill allowance trading scheme.
Loans	Can be used to increase effectiveness of interventions when faced with other market failures or barriers to behavioural change (e.g. high discounting).	Career Development Loans, Phoenix Fund.

Regulation and legislation

Regulation and legislation can be used to address externalities by:

- defining property rights and reducing transaction costs;
- setting and enforcing standards; and
- prohibition.

Defining property rights and reducing bargaining costs have the benefit of leaving decisions to the market, where, in general, they will best reflect people's preferences. Interventions include provision of advisory services, representation, and establishing of rights and responsibilities.

Setting and enforcing standards is widely used in the context of environmental and conservation externalities. It is used for example to control emissions from nuclear plants, noise levels of mobile machinery, fish quotas, the numbers of days that fishing vessels can be at sea, and safety zones around airport runways or hazardous plants.

In relatively few cases is the best interest of society served by prohibition.^{24,25} However the prohibition of smoking in public places (e.g. New York, Republic of Ireland) has been introduced on the grounds of a negative externality – passive smoking.

A number of issues need to be considered when setting regulations to address problems raised by externalities:

(a) Whether there is sufficient information with which to determine standards

In addition to estimating the value of the costs imposed by the externality, the policy maker is required to estimate the costs of complying with regulations. This is a problem because the firms/individuals on whom the regulation is imposed have an incentive to overestimate the cost of compliance.

(b) Whether regulations can be smart enough to reflect different technologies

Whilst regulations create a level playing field they often fail to reflect the fact that firms operate with different technologies and that these different technologies lead to different levels of externalities. When regulation fails to reflect these variations the total cost of complying with regulations across an industry can be higher than the costs incurred when using other instruments (e.g. tax). Given different technologies it makes sense to allow those companies that produce smaller externalities at the margin to produce more than those that produce more externality at the margin.²⁶ The optimal solution will be one in which the marginal social cost of each firm is equalised.²⁷

(c) Whether it is possible to impose the regulation close to process, input or product producing the externality

As with taxes, if the focus of regulation is on the final output (rather than the source of negative externality where it is not the final output) then firms may face few incentives to reduce the amount (per unit) of the externality produced. Alternatively, if the government regulates the level of an input used (e.g. pesticides) rather than its use, there may be efficiency losses associated with changing the behaviour of 'good' producers.

(d) Whether there are incentives in place to innovate to reduce the level of externality over time

By specifying the technology, processes or inputs to be used there is little incentive for firms/individuals to innovate over time to reduce the level of externality. Once they have met

²⁴ These are likely to be cases in which the external cost is very large (meaning that the transaction costs associated with other approaches are relatively high), uncertain or because of moral concerns (e.g. equity).

²⁵ Prohibition may also make it easier to monitor compliance although enforcing compliance may be time-consuming and not fully effective.

²⁶ For more information see Chapter 2 in Cullis, J. and Jones, P. (1998) *Public Finance and Public Choice*. Oxford University Press.

²⁷ Under certain conditions, this can be achieved by permitting the trading of quotas (see section 5 *Tradable Permits*, p.18).

the conditions of regulation, they face no incentive to reduce the externality further (as they do not face the full social costs of any residual externalities).²⁸

Market-based solutions

Self-regulation can be an alternative to full government regulation where individuals/firms are dependent on the views of others (e.g. for sales or social approval). An example is illustrated in Box 5.1.

Self-regulation can create problems of free-riding. If the government is concerned with the total amount of externality produced (not the performance of individual companies) then there is an incentive for firms to free-ride on the performance of others.

Box 5.1: The Portman Group

The purpose of The Portman Group is to promote sensible drinking and to help to prevent alcohol misuse. Its members are the major drinks producing companies, together responsible for 95 per cent of the alcohol on the UK market. The code came into being in 1996, in response to fierce criticism over the marketing of alcopops. In addition to the member companies, some 150 other companies, manufacturers and retailers (including all the major supermarket groups) are signatories to the Code. The Code includes a powerful sanction: the 'Retailer Alert', which requires signatories of the Code to remove the offending product from retailers' shelves.²⁹

²⁸ Contrast the situation with economic instruments (see section 5 *Economic Instruments*, p.16).

²⁹ See Better Regulation Task Force (2003) *Imaginative Thinking for Better Regulation*. Better Regulation Task Force. <http://www.brtf.gov.uk/reports/imaginativeregulation.asp>

Summary assessment: externalities

Externalities occur when an individual's actions directly impact on others, and these effects are not taken into account in the individual's decision-making. Examples include the environmental impact of fossil fuels or aircraft noise around an airport, treatment of infectious diseases and employment of ex-offenders. The appropriate response is to try to 'internalise' the externality, so that those who generate them are appropriately punished or rewarded.

Summary assessment

Instrument	Assessment	Key issues to consider	Examples
✓ Information, education and advice	Can be used to complement other instruments to speed up the desired behaviour change. Information can be used to appeal to altruism or social censure (e.g., use of name and shame).	Depends on whether individuals/firms care about the externality they create.	'Stop smoking' adverts (emphasising impact on children)
✓ Direct intervention	Government can provide goods or services which yield strong positive externalities or alternatives to goods that produce negative externalities. However, little theoretical justification.	Need to be aware of deadweight costs.	Nicotine gum and patches on the NHS
✓✓✓ Economic instruments	Economic instruments (particularly taxes and tradable permits) allow markets to make own decisions and provide incentives to invest in activities that produce less/more of the negative/positive externality.	Difficulties estimating external costs and designing an appropriate tax that impact on the source of the externality. There are a number of practical issues with permits.	Fuel taxes Climate change levy
✓✓ Regulation and legislation	Where certainty about the amount of the externality produced/consumed is required, policy makers should consider regulation, legislation or prohibition/prescription. In general, less efficient than economic instruments.	Requires more information than other instruments. Need to know cost of compliance.	MOT emissions standards Environment Agency standards
✓ Market-based solutions	If businesses and individuals can be credibly threatened with full regulation they may choose to self-regulate as it can be less costly. This is likely to be easier when there are a limited number of agents having to agree.	May be relevant where firms/individuals are dependent on views of others. Can create free-rider problems amongst firms.	Portman Group

6. Public goods

Introduction

“Pure” public goods are said to be ‘non-rival’ (the consumption of a good by one person does not impact on the amount available to others) and non-excludable (once the good is made available, it is not possible or very difficult and expensive to exclude others from consuming it). Examples include security measures on industrial estates, the benefits arising from criminal justice, national defence and clean air. The problem with these goods is that they tend to be under-provided.

Most public goods exhibit differing degrees of non-rivalry and non-excludability. Many non-renewable natural resources are non-excludable but exhibit rivalry. For example, no fisherman may be excluded from fishing grounds but fishing depletes the stock of fish available to others now and in the future. In most cases, the problem with these goods is that they are over-consumed (e.g., over-congestion of roads). Conversely, there are non-rival goods that exhibit excludability. For example, encryption enables broadcasters to exclude individuals who are not willing to pay. Other examples are private schools and cinemas. In these cases, the market has incentives to provide. The problem is that some individuals who are unwilling to pay may be excluded from consumption even though there is no extra cost in provision of the good.³⁰

Policy options

Information, education and advice

The government can publish or facilitate the provision of information to encourage censure of free-riders and reward those that contribute to a public good.

Governments can seek to change public attitudes. For example, by changing attitudes about benefit fraud the government can promote the production of a public good (information about suspected offenders). The Grabiner Report (HMT, 2000) on the informal economy recommended *‘the use of advertising as a tool for changing public attitudes, insofar as they currently regard the hidden economy as socially acceptable’*.³¹

In general, however, information, education and advice are unlikely to have a major impact on public good provision.

Direct intervention

A common response to public good problems is provision and/or financing by government (e.g., national defence, healthcare, criminal justice system).

The main argument in favour of direct intervention is that it ensures the good is provided. Direct intervention is most appropriate where the public good problem is acute or where other market failures are present.

However, there are a number of costs. Taxation incurs significant costs by reducing incentives to work and save. Moreover, because public goods problems rarely lead to zero provision by the markets, by directly providing the good, the government ends up paying for some of the good that would have been provided in the absence of government intervention (‘deadweight costs’). For excludable goods, some of these problems can be overcome by charging users (as in road tolls). However, there are usually equity concerns related to

³⁰ This problem occurs where providers do not perfectly price discriminate (i.e. fail to charge different prices according to individuals’ willingness to pay).

³¹ See HM Treasury (2003) *The Green Book: Appraisal in Central Government*. London: HMSO.
<http://greenbook.treasury.gov.uk/>

exclusion of individuals who would benefit but are unable to pay. Exemptions are often used to address these (e.g. discounts for OAPs when they use public transport). A fundamental problem with direct intervention therefore relates to the large information requirements for determining how much public good to provide and developing a discriminatory pricing regime.

Economic instruments

Taxes and subsidies

Tax and subsidy schemes may be used to address public good problems and have been shown to work in laboratory environments (Falkinger *et al.*, 1996). They create incentives to contribute to a public good by subsidising individuals whose contributions are higher than the mean and taxing those that are lower. Similarly, a Clarke tax provides a mechanism for public good provision (see Varian, 2003³²). However, no examples of these approaches have been identified and it is not clear how easy they would be to implement in practice. In general, tax incentives do not directly address the problem of public goods because, in most cases, they do not encourage individuals to act collectively.

Subsidies may be used to increase access to excludable goods (e.g., subsidies to museums).

Rewards

Rewards may be used as a tool to change attitudes by signalling societal approval for certain actions (e.g., Teaching Awards). They are particularly effective when individuals are altruistic. However, they may incur deadweight costs by reinforcing behaviour of those who do not need them.

Quotas

Quotas have been employed to address over-consumption of rival non-excludable goods (e.g., fishing grounds). Efficiency may be increased where quotas are auctioned and are transferred (i.e., can be bought and sold).

Regulation and legislation

Variants of regulation and legislation which can be used to address public goods problems include:

Assigning property rights

In some cases, public goods problems can be solved by defining and/or assigning individual property rights so as to make goods and services more excludable. For example, by creating a patent system, governments create a mechanism through which firms can exclude others from exploiting the knowledge they have produced. Firms can then levy licence fees on other companies for the use of that knowledge to capture some of the benefits that others receive. Assigning property rights does not perfectly exclude free-riders (i.e., it is possible for firms to violate intellectual property rights). However, it makes free-riding less likely because it carries a cost in the threat of punishment by law.

The patent system demonstrates the trade-offs that have to be considered when providing for exclusion – the benefits of increased private provision of the public good (knowledge) needs to be weighted against the lack of wider exploitation of that knowledge.³³ In the production of knowledge this is achieved by limiting the life span of patents so that knowledge becomes 'free' after a specified period of time.

³² Varian, H. (2003) *Intermediate Microeconomics*. Sixth edition. London: Norton.

³³ This trade-off can be observed in the debate over the cost of HIV drugs in the Third World. Campaigners for reductions in drug prices point to the cost of producing drugs (which fails to incorporate the costs of development). Pharmaceutical companies counter these arguments by pointing out they would fail to develop these drugs if they were not able to charge prices that reflect the cost of research.

Making goods less excludable

The Government might want to consider using regulation to reduce the excludability of goods. This is most likely to apply for excludable public goods where there exist strong incentives for provision. Examples of this approach include:

- The Broadcasting Act 1996 which contains provisions to protect the availability of live coverage of certain 'listed' sports events (e.g. FA Cup Final, the Grand National, Wimbledon Tennis Finals etc.) on free-to-air television;³⁴ and
- Countryside and Rights of Way Act 2000 which extended the public's right to access to mountain, moor, heath, down and registered common land.³⁵

Manipulating the characteristics of groups

There has been considerable research on the characteristics of communities that foster co-operation. This research suggests that small homogeneous groups are more likely to co-operate. In principle, therefore, policy can be used to manipulate the structure of groups so as to increase public good provision. Planning regulations, for example, are used to manage the size and make-up of communities. However, the relationship between community characteristics and co-operation is unclear and there are costs in terms of restricting markets.

Merging free-riders' resolves the public good problem by creating a single owner. For example, planning controls could ensure that the land and property on new industrial estates have a single owner.

Using regulation to force private provision

Policy makers can use regulation to force a certain level of public goods to be provided privately. This is particularly common when other market failures are present. For example, regulation of the banking industry helps to produce a public good (trust in the financial system). The underlying problem is one of asymmetric information where consumers cannot distinguish between 'good' financial institutions and 'bad' ones.

Regulation is increasingly being used to enforce processes (e.g., Crime and Disorder Reduction Partnerships are compelled to develop plans for crime prevention). This may be a less costly approach but there is a risk that it will not generate the desired outcomes.

In addressing public good problems, the use of regulation requires significant information (e.g., on the benefits each individual accrues). There is a risk that it will be inflexible and lead to waste.

Market-based solutions

Voluntary provision

This option is appropriate where individuals are altruistic or in 'privileged groups' where an individual is 'selfish' but accrues sufficient benefit that he will provide the good (e.g., the computer operating system, Linux). Voluntary provision may also occur where a public good confers other private benefits, such as reputation. In addition, voluntary provision *may* be more likely where groups are small because the impact of free-riding on the overall level of provision is greater.

However, voluntary provision does not eliminate free-riding and will not lead to the optimal level of provision.

Tying public goods to private goods

Public goods can be tied to purchases of private goods. Lighthouses are one of the most famous examples of public goods.³⁶ However, lighthouses have been provided privately by

³⁴ See www.ofcom.org.uk for more details on 'listed' events.

³⁵ It could be argued that the Act addressed issues of equity and externalities. However, access to particular lands could have public good characteristics (non-rivalrous) at low levels of use.

³⁶ See Coase, R. (1974) *The Lighthouse in Economics*, Journal of Law and Economics 17: 357-76.

owners selling their service to the owners of the nearby port, who in turn passed on cost to the ships.³⁷ Shopping malls provide shoppers with services that are considered public goods: lighting, protection services, benches, etc. As charging directly for these services would be impractical, the mall finances them through receipts from the sale of private goods. Firms may be 'encouraged' to contribute to public goods (e.g., collective security, more attractive environment) by packaging these with goods that they can only enjoy if they pay (e.g., access to IT support, traffic news, etc.)

The effectiveness of tying public to private goods depends on a number of factors. As with other options, an appropriate cost-sharing scheme must be devised (see below). Excludable goods must be identified that are of sufficient value and there must be no way that free-riders can 'de-couple' the private from public good.

Creating excludability

For some goods, it is possible to fully exclude individuals from free-riding. Characteristically, this approach involves developing technological or physical barriers combined with charging for access. Examples include road tolls and pay-per-view.

Developing institutions

Research has demonstrated that groups are capable of resolving public good problems by creating 'institutions'. Clear and detailed rules governing behaviour must be established and agreed by all participants (including rules governing how costs and benefits are shared). The share of costs borne by each participant should be proportional to the benefits they derive (see below). Behaviour must be monitored and sanctions established for deviance, which are credible and easy to implement. Punishment is made public. There must be a forum to resolve conflicts and discuss changes in rules in response to changes in circumstances.

Examples include rules for management of water and other natural resources in agricultural communities, political systems such as democracy and the rule of law.

It is important to note that institutions have strong public good characteristics themselves, and, in many cases, are established by government.

Voting

Voting is a widely used mechanism to determine the provision of public goods. However, in certain circumstances, it will not deliver an unambiguous outcome because the outcome depends upon how the vote is structured and is unlikely to correspond to the optimal solution.³⁸ There are incentives to misrepresent preferences in order to manipulate the voting outcomes.

The Business Improvement District Scheme (BIDS) is a voting model designed to increase provision of public goods by businesses which was first implemented in the US during the 1970s (for details, see Box 6.1).

³⁷ This solution involves identifying a third party whose welfare depends indirectly on your service, who can only enjoy the benefits of it by purchasing it, and who can pass on costs to the direct beneficiaries. Financing of commercial TV is another example. It is provided for by TV commercials whilst access to TV programmes is non-rival and non-excludable.

³⁸ Varian, H. (2003) *Intermediate Microeconomics*. Sixth edition. London: Norton.

The BIDS Model³⁹

The Business Improvement District Scheme (BIDS) concept is based on a model of local area management pioneered in the United States in the 1970s. In the UK, provision for BIDS was set out in the Local Government Act 2001 and subsequent regulations. Under BIDS, a proposal is made to provide services for a designated area over and above services that are provided by Local Authorities and other statutory bodies. These extra services are then financed by a levy on all ratepayers in the area. Approval of a proposal under BIDS is subject to a ballot which must meet two tests. Firstly, a simple majority of those voting in the ballot must vote in favour. Secondly, those voting in favour must represent a majority by rateable value of the properties of those voting. As of November 2005, the majority of BIDS have been in town and city centres with approximately 50 per cent in London.

BIDS has many strengths. At the voting stage, there is no opportunity to under or over-estimate preferences. Firms will vote yes or no depending on whether benefits are greater or less than costs. It involves a contract that commits individuals by law to make contributions over time and, because it involves a vote, BIDS may be perceived as fair. Some of the weaknesses are that it is circumscribed by regulation and there is a cost in terms of bureaucracy. Moreover, BIDS is unlikely to produce an optimal solution to the public goods problem as it does not take into account the scale of benefits and costs across firms. For example, 49 per cent of firms may anticipate very large benefits whilst 51 per cent may anticipate small costs. Under such a scenario, the proposal will be rejected although net benefits exceed costs.

In practice, the effectiveness of BIDS will depend on how costs are allocated across firms. Though BIDS is NOT prescriptive on how costs are shared, in most cases, the allocation of costs has been proportional to business-rates; i.e., to the value of the business. A weakness of this is that cost allocation may bear no relation to the benefits that firms enjoy from the services or goods being produced. For example, in provision of collective security (e.g., CCTV, patrols) benefits depend on the risk and cost of crime which is a function of the type of goods used and produced by each firm. Moreover, under BIDS there is no formal mechanism for determining what the appropriate level of provision should be. This depends on an initial consultation process and carries the risk that firms may under value their preferences for strategic reasons.

Assurance contracts

Assurance contracts are contracts in which participants make a binding pledge to contribute to a contract for providing a public good, contingent on a quorum of a predetermined size being reached. Otherwise their money is refunded. Although, assurance contracts assure individuals they will not lose anything unless sufficient funding is generated to provide the good, they do not eliminate free-riding.

A dominant assurance contract is a variation of an assurance contract in which an entrepreneur creates the contract. If sufficient donations are received to meet the costs of the public good he/she will provide it and keep any excess. If not, the entrepreneur commits to refund the initial pledge plus an additional sum of money if the quorum is not reached. However, no examples of its implementation have been identified.

Cost sharing

It has been argued that equal cost-sharing is the best approach to the provision of a pure public good.⁴⁰ Under an equal cost-sharing scheme, each individual reveals his/her demand for a public good anonymously and independently, and the lowest demand is produced with costs shared equally across all individuals. An advantage of this approach is that it is simple and no group of agents can gain by co-ordinating deviation and not revealing their true

³⁹ For more information on BIDS see <http://www.ukbids.org>

⁴⁰ Moulin, H. and Schenker, S. (1992) *Serial cost sharing* in *Econometrica*, 60, pp1009-37.

preferences. A disadvantage is that it will lead to a low level of provision and costs will bear no relation to the relative benefits a firm derives from the provision of the good or service.

Under a serial cost-sharing scheme agents reveal their demand for a public good and the highest demand level is produced with the individual/firm that demands the highest, also paying the most.⁴¹ This approach is appealing because, in principle, the contribution an individual/firm makes is related to the benefits it receives. A problem is that this approach is designed for an excludable good and firms that pay more also receive more of the good or service. For pure public goods, there is a strong incentive for agents to act strategically and underestimate demand.

Provision of information and publicity

Markets can also use information to encourage collective action. For example, groups can publicise meetings and involve the media. This approach is most effective where individuals care about their reputation within the wider community (e.g., large firms with established brands and individuals located in relatively small and cohesive communities). On the other hand, poorly managed publicity can undermine collective-working.

⁴¹ Yu, Y. (2004) *Unit-by-unit proportional cost sharing of public goods*. HKUST Business School Working Paper EC03/04.

Summary assessment: public goods

“Pure” public goods are said to be ‘non-rival’ (the consumption of a good by one person does not impact on the amount available to others) and non-excludable (once the good is made available, it is not possible or very difficult to exclude others from consuming it). In practice, most public goods exhibit some degree of non-rivalry and/or non-excludability. In general these goods are under-provided by the market. Examples are the benefits arising from criminal justice, national defence and clean air.

Summary assessment Instrument	Assessment	Key issues to consider	Examples
x Information, education and advice	Government can use name and shame tactics to distinguish contributors to public goods. Education can be used to change public attitudes and promote altruism. In general, however, does not address the problem.		Campaigns to shop benefit cheats
✓ Direct intervention	Likely to be justified only where the public good problem is acute, the good conveys significant benefits and there are other market failures.	Government may provide services to help groups come to an agreement on collective action.	Defence
✓ Economic instruments	In theory, Clarke tax, and tax and subsidy schemes but no examples have been identified of their practical application. Subsidies have been used to incentivise providers to increase access to excludable goods (e.g., museums).	With public goods, there are often multiple market failures. Subsidies and grants may be used to cover high transactions costs (of individuals coming to agreement) and where pay-offs are uncertain.	Research Gift aid
✓ Regulation and legislation	May be used in certain circumstances. Assigning property rights increases private provision of public goods where violations of rights can be identified and prosecuted. May be used to increase access to excludable goods (e.g., public broadcasting of sports). Forcing provision likely to be very wasteful.	Threat of regulation can promote market-based solutions.	Patent system 'Listed' sporting events (which may only be transmitted on free-to-air TV channels) Regulation of the financial sector
✓✓ Market-based solutions	Wide-ranging and include voluntary provision, creating excludability through technological change, tying public goods to private goods and development of rules and institutions for eliciting individual preferences and allocating costs. Assurance contracts, voting, use of publicity and equal and serial cost-sharing are also options.	Voluntary provision appropriate where one individual benefits enough to provide and/or where individuals are altruistic. Tying public goods to private goods is appropriate where private goods are sufficiently valuable and not possible to de-	LINUX, donations to museums, health research Shopping malls, private lighthouses

There is considerable uncertainty over effectiveness and, in general, these are more effective where individuals have some degree of altruism.

couple goods.

Development of institutions (involving rules, voting, cost-sharing, credible punishment of deviators, etc.). Very effective though not clear what rules work best and how easy it is to implement.

Assurance contracts. Good where individuals are altruistic but does not address/prevent free-riding (see dominant assurance contracts).

Publicity effective where there is a reputational cost to free-riding.

Management of natural resources in agricultural communities (e.g., irrigation, protection of wildlife), political systems, BIDS, OPEC.

7. Imperfect information

Introduction

The standard economic model assumes that people are fully informed about the costs and benefits of all the choices available to them. In reality, perfect information is rarely achieved.

The implication of imperfect information is that individuals are unlikely to correctly assess the costs and benefits to themselves of their actions, leading to sub-optimal choices. For example, where they are not well-informed, individuals may under or overestimate the probability of being a victim of crime, leading to either too little or too much crime prevention activity.

Policy options

Information, education and advice

The provision of information, education and advice comprises a broad spectrum of interventions that differ in the degree to which government becomes involved in individuals' decision-making.

In the traditional 'economic' model, it is assumed that individuals know what is best for them, and can process information and make the best choices for themselves. In this case, the appropriate response to imperfect information is to provide information (e.g., school league tables, crime statistics). If these assumptions do not hold there is a stronger case for government becoming more involved in individuals' decision-making. This may occur because individuals do not have the cognitive capacity to process information, the information is complex or it is believed individuals do not 'know' what is best for them.

Many government information campaigns contain some level of advice (e.g., don't smoke). Representation involves a degree of delegation of decision-making to government although this delegation is within certain bounds. It is often used where people do not have the necessary skills or knowledge to undertake a particular task but are relatively clear what outcome they desire (e.g., solicitors acting on behalf of their clients). Typically, education involves attempts to develop individuals' cognitive capacity and shape their attitudes and preferences.

Box 7.1 contains examples of the provision of information and advice.

Box 7.1: Examples of provision of information and advice by government

- Fire safety campaigns (OPDM).
- Healthy eating campaigns (Food Standards Agency).
- Health advice to travellers (DoH).
- Encouraging people to obtain pensions (DWP).
- School league tables (DfES).
- Quality Hospital (DoH).
- 'Beat the Burglar'. Television broadcast (HO).
- Car Theft Index. Index providing information on risk of theft by model of car (HO).
- 'If you've got it, don't flaunt it'. Advertising campaign for potential victims of mobile phone theft (HO).
- 'Know when to stop'. Campaign by UK alcohol manufacturers to promote sensible drinking. Uses television advertising.

It should be recognised that, in many cases, markets are capable of addressing the problem of imperfect information (e.g., through information-gathering, research, learning etc.). Intervention is only therefore justified where government can provide at a better quality and/or lower unit cost (or where there are other market failures present). Intervention may be

favoured where the information is complex and there is a strong evidence base to which government has greater access than individuals. Government provision of information and advice is most beneficial where the target group is large and relatively homogeneous.

In appraising and designing interventions, a number of factors should be taken into account. These include:

- *Timing and location*

Timing can determine the willingness of target audiences to receive information. An advantage of food labelling is that it provides information at the point of purchase. Advertisements appealing for car security have been attached to petrol pumps as this provides access to large numbers of potential victims at a point of time when they may be victimised.

- *Credibility of agents providing the message*

Some agents have wide access and can act rapidly (the media, celebrity figures and political representatives). Other agents may have greater credibility (community groups, charities and role models).

- *Appeal to individuals' emotions and senses*

Information may be provided in traditional formats, through leaflets and publications. Increasingly, information is provided in ways that seek to ensure the information is 'received', through, for example, use of visual stimulate, such as advertising campaigns, and appeals to emotions such as fear of disease and accident.

- *Specificity of information to the environment concerned and how rapidly the environment changes*

The informational needs of individuals may change through time. For example, advice on crime prevention must be sensitive to changes in offending behaviour. Where this is the case, information campaigns must respond quickly and have short-term objectives.

"Belt up in the back. For everyone's sake"

In 1998, a campaign was launched with the slogan "Belt up in the back. For everyone's sake". The campaign was supported by television commercials depicting a car crash in which the rear seat passenger was thrown forward and killed the driver, a member of the family. It is credited with a significant impact on use of seatbelts. The campaign was effective because individuals were uninformed about these risks, were capable of change and, importantly, because the campaign was developed from an understanding of their preferences, i.e., that they care about their families!

Are you doing your bit?

This was an information campaign to promote environmental awareness. It had little effect on consumer attitudes or behaviour, however, and was suspended by DEFRA. The reason that it failed was that the underlying problem was not one of imperfect information but that individuals had insufficient incentive to make changes to their behaviour.

Direct intervention

Direct intervention does not address the problem of imperfect information.

Economic instruments

Economic instruments are not regarded as the most efficient response to imperfect information. However, they may be used to raise awareness and influence attitudes. For example, in Ireland, a 1p tax was introduced on plastic bags. This tax was too small to change behaviour directly but was introduced as a way to remind consumers of the impact of their decisions on the environment.

Regulation and legislation

Typically, regulation is not considered the best response to problems of imperfect information. However, regulation is used where it is believed that individuals systematically misperceive costs and benefits, or are considered incapable of assessing the true costs and benefits of decisions by themselves. For example, regulation may prohibit individuals from doing something that could cause them harm or force them to do things that are good for them. Examples include prohibition of hard drug-use, forced savings for pensions and compulsory school attendance up to 16. In addition, regulation may be required to force individuals to obtain or supply information. Examples include risk assessments in work, pension statements, nutritional advice on foods and police reports of crime statistics.

Market-based solutions

As discussed at the beginning of Chapter 7, markets can resolve imperfect information. Individuals have incentives to seek out information that will benefit themselves (e.g., through research, learning and use of telecommunications).

Summary assessment: imperfect information

Imperfect information arises where individuals are not perfectly 'informed' about the options available to them and the costs and consequences of their decision-making leading to sub-optimal choices. For example, in deciding whether to pursue further education, an individual may not be aware of the full private returns to education thus under-investing. Individuals may be poorly informed about the risks of being a victim of crime, leading to either too little or too much crime prevention activity.

Summary assessment

Instrument	Assessment	Key issues to consider	Examples
✓✓✓ Information, education and advice	Most appropriate response. Information is appropriate where individuals have the capacity to take on board new information and make the best choices for themselves. If the information is complex, advice may be provided. Education is provided when there is scope to develop individuals' capacity to make better choices and when government may believe that individuals do not know what is in their best interests.	The market can address the problem (e.g. by information-gathering, research, etc.). Government intervention only justified if it provides at higher quality/lower unit cost. May depend on size and homogeneity of target group, and whether government has greater access to evidence base.	Healthy eating campaigns School league tables etc. Provision of education
x Direct intervention	Does not address underlying source of problem.		
✓ Economic instruments	Limited scope and no example has been identified. If it is believed that individuals will respond to economic instruments, they may be used as a device to raise awareness.		Minor tax on plastic bags in Ireland
✓ Regulation and legislation	May be used when there is little scope for using education to change people's preferences or when government may believe that individuals do not know what is in their best interests.	There is a fundamental issue about the rights of government to make decisions for individuals.	Prohibition of use of hard drugs Requirement that young people are educated
✓ Market-based solutions	Individuals have incentives to seek out information that will benefit themselves.	Limits to access to information. Information-gathering is costly.	Use of internet, media and telecommunications to raise awareness of costs of smoking, poor diet, etc.

8. Asymmetric information

Introduction

Asymmetric information (where one party to a transaction is better informed than the other party is and uses this to their advantage) leads to three problems; moral hazard, adverse selection and the principal agent problem.

Moral hazard arises when a contract or agreement actually increases the probability of the occurrence of the event that the individuals are insured against.

Adverse selection occurs when people are deciding whether to enter into a contract or agreement. One party cannot observe the “type” or quality of the good or it is too expensive to do so. For example, if buyers are unable to tell if a good is high or low quality prior to purchasing the good they will only pay an average price based on the probability of purchasing a low quality good. Assuming high quality goods cost more to produce, selling these goods will be unprofitable and eventually, unless the market failure is corrected for, only low quality goods will be produced.

The principal agent problem occurs in situations where a principal (e.g. government, individuals, firms, employers etc.) contracts an agent to provide a service, the principal cannot fully observe the agent's behaviour, and the interests of the agent are not fully aligned with those of the principal.

Asymmetric information differs from imperfect information in that, under conditions of imperfect information all parties are equally ill informed or the degree of asymmetry in information is so slight that the informed party obtains no advantage from it.

Policy options

Information, education and advice

In situations where the informed parties are willing but unable to disclose information, either because the cost of doing so is high or because any information provided by them would not be credible, provision of information by the government may be appropriate. For example, a school that knows it is of a good standard will want to signal this but providing information to prospective students and their parents will be virtually meaningless if it is not accompanied by comparative information from other schools. Therefore, there is a rationale for the Government to provide this information (see Box 8.1 on school league tables), although the information may have unintended consequences.

Box 8.1: School league tables

Government policy has promoted parental preference through the adoption of national targets and the publication of school performance tables in England and Wales.

School league tables address the issue of asymmetry of information between the school and its pupils. The school knows “how good it is” based on its exam results, however, unless these are widely publicised, prospective students will not know – with any degree of certainty – how good the school is. This can also lead to a problem of adverse selection whereby only the children of parents in the lower income groups will go to state schools. The lack of information about the school’s performance deters other parents from using the state system and encourages them to opt for private schools instead for which there is more widely available information on performance.

Evidence from studies so far suggests that although only slightly over half of parents claim to understand school performance tables (West and Pennell 2000)⁴², the league tables are certainly being used by parents to make choices about schools, and there seems to be a tendency for their use to increase over time. In three areas studied by Woods *et al.*, (1998), responses to questionnaires showed that roughly a fifth of parents stated that they had used the league tables as a source of information, with an increase over the period 1993 to 1995.⁴³

Direct intervention

In situations where the information is of a sensitive nature, it may be necessary for the government to provide it itself. For example, the Criminal Records Bureau (an executive agency of the Home Office) provides information on the criminal records of potential employees to employers. The service is provided to ensure that those who are unsuitable are not able to work with children and vulnerable adults. The government can however decide that a particular conviction is not relevant to a particular job and may therefore choose not to disclose it.

Economic instruments

Economic instruments do not address the underlying problems associated with asymmetric information.⁴⁴

Regulation and legislation

Variants of regulation and legislation which can be used to address problems of asymmetric information include:

Forcing the disclosure of information

Regulation and legislation can be used to force informed parties to disclose information to uninformed parties (see Box 8.2) or to force the informed parties to disclose the relevant information in a format that can be understood by the uninformed party. For example, The Consumer Credit Act requires that lenders prominently state the APR of loans and provide information as to how much the loan will cost. However, there is a possibility that the provision of too much information may lead to it being ignored or that forced disclosure of a particular characteristic may lead to overinvestment in that characteristic.

⁴² West, A. and Pennell, H. (2000) *Publishing School Examination Results in England: incentives and consequences*. Educational Studies: Volume 26, Number 4.
[http://journalsonline.tandf.co.uk/\(setum2vux4cu5g3os2q44h45\)/app/home/contribution.asp?referrer=parent&backto=issue,3,9;journal,19,25;linkingpublicationresults,1:102211,1](http://journalsonline.tandf.co.uk/(setum2vux4cu5g3os2q44h45)/app/home/contribution.asp?referrer=parent&backto=issue,3,9;journal,19,25;linkingpublicationresults,1:102211,1)

⁴³ Wood, P., Bagley, C. and Glatter, R. (1998) *School Choice and Competition: markets in the public interest*. London: Routledge.

⁴⁴ The specific case of national insurance could be considered as using the tax system to correct the problem of adverse selection. As everybody is forced to contribute to national insurance the pensions provided through this system do not encounter adverse selection. The policy is ‘fair’ in the aggregate.

Ensuring the accuracy of information

Legislation can be used to ensure that the information provided is accurate. An example of this is the The Control of Misleading Advertisements Regulations. If the OFT considers an advert to be misleading it can take court action against the advertiser.⁴⁵

Setting standards

Standards setting can also be used to ensure that the information provided is accurate. If the cost of obtaining information is high for individuals, or if the cost of educating consumers so that they can interpret the information provided is prohibitively high, it may be appropriate for the Government to set a common standard. Examples of standards setting include MOT certificates, licences issued to private security staff by the Security Industry Authority, the DTI TrustMark,⁴⁶ and educational qualifications.

Market-based solutions

Self-regulation

Self-regulation may be more efficient than government regulation where informed agents in the market have an incentive to signal the characteristics of their good to the market (i.e. through signalling). Uninformed agents may also be able to alleviate asymmetric information problems by screening.

Box 8.2: OFT investigation into private dentistry

In 2003 the OFT investigated the private dentistry industry. The investigation found that consumers were ill informed about the relative costs and quality of the services offered by different practices. The investigation found that dentists were not providing the relevant information to their clients and therefore the clients could not make informed choices about their treatment. The OFT recommend that a combination of self-regulation and provision of information be used to correct this problem. The report stated that professional guidance on the clarity and quantity of information provided by dental practices should be increased and monitored effectively and that the OFT should run an information campaign encouraging patients to check their dentists for accreditation and to get second opinions.

Signalling

Signalling is often used when the uninformed parties have an incentive to signal the quality of their goods or services to the uninformed parties. This can be achieved through membership of trade and professional organisations (e.g. the Association of Chartered Certified Accountants (ACCA); The British Dental Association (BDA)) through the issuing of warranties and guarantees (e.g. Vauxhall's Network Q) and through a process of reputation building when there is repeated interaction (e.g. reputation building through transactions on electronic auctions such as eBay).⁴⁷

Screening

Screening is the process of learning or attempting to approximate insider information. For example, insurance companies often use information on the average characteristics for

⁴⁵ The OFT defines an advert to be deceptive if it:

- contains a false statement of fact – this may be possible to prove or disprove by evidence;
- conceals or leaves out important facts;
- promises to do something but there is no intention of carrying it out;
- creates a false impression, even if everything stated in it may be literally true.

⁴⁶ In June 2005 TrustMark, an initiative between government, consumer groups and industry was launched. The scheme endorses trade organisations that require their members to adhere to government set minimum standards. To gain accreditation organisations must inspect their members' technical competence, trading record and creditworthiness and provide a complaints investigation service. The TrustMark therefore provides a minimum standard and signals to consumers the quality they can expect from firms who are members of the scheme.

⁴⁷ A study by McDonald and Slawson found a positive relation between prices and eBay's reputation measure. In their study higher-reputation sellers experienced higher auction prices, *ceteris paribus*. McDonald, C. and Slawson, C. (2002) *Reputation in an Internet Auction Market* in *Economic Inquiry*, Vol, 40 (4), pp 633-650.
<http://www.econ.jhu.edu/People/Harrington/375/ms02.PDF>

particular socio-demographic groups in order to reward “good” risks and penalise “bad” ones (e.g. they offer lower premiums to women drivers because of their lower accident rates). In addition, they also offer lower premiums to incentivise observable preventative actions such as installing sprinklers and fitting of British Standard locks. They also encourage preventive but unobservable actions through the use of excess policies and no-claims bonuses.

However, it is important to note that excess policies do not result in an efficient allocation of risk because the insured party would ideally like to take out more insurance (i.e. without the excess) and the insurance company would like to provide more insurance. However, because of the potential for hidden actions, insurance companies cannot profitably provide full insurance.

Incentives in contracts

Principle agent problems are often corrected through the use of contracts that attempt to align the interests of the principal and agent. For example, where managers have been contracted by shareholders to run a firm, the managers are often paid partly in shares.⁴⁸ Moreover, principal agent problems can also be alleviated by increasing the cost of acting against the principal's interests.

Government intervention

Government intervention can inadvertently encounter principle-agent and moral hazard problems.

Can government intervention cause moral hazard?

Moral hazard problems are usually the result of either a market transaction or of government intervention to correct for another market failure. The provision of unemployment benefits, for example, reduces the potential costs of losing your job and could lead people to take more risks in their jobs or to stop looking for a job if they are unemployed.

To reduce the potential for moral hazard government insurance schemes, such as the Job Seeker's Allowance (JSA), only represent a realistic insurance to people on low incomes. Moreover, in order to claim the JSA, recipients must meet regularly with employment advisers to demonstrate that they are actively seeking work.

Box 8.3: The Working Families' Tax Credit (WFTC)

The Working Families' Tax Credit was introduced in 1999 to replace Family Credit. WFTC was replaced in 2003 by Working Tax Credits and Child Tax Credits. WFTC substantially increased the benefits paid to working families and included help with childcare costs. It was intended to influence the work incentives of those with low potential returns in the labour market. For lone mothers and fathers in couples the WFTC has increased participation in the labour market. A 2002 IFS study estimated that the changes in participation rates were equivalent to a reduction in workless families of 99,000 and a net increase in participation of 81,000 workers. However for mothers in couples participation rates have fallen. This is because the design of the benefits is such that, in certain circumstances, women whose partners work full-time will receive a higher family income if they reduce their work hours or move out of the labour market altogether.⁴⁹

⁴⁸ However, this is not a perfect solution because some managers with large amounts of shares can engage in accounting fraud, as was seen in the Enron case, in order to increase the value of those options long enough for them to cash some of them in, but to the detriment of their firm and its other shareholders.

⁴⁹ Brewer, M., Duncan, A., Shephard, A. and Suarez, M.J. (2005) *Did Working Families' Tax Credit work? The final evaluation of the impact of in-work support on parents' labour supply and take-up behaviour in the UK*. HM Revenue and Customs. http://www.ifs.org.uk/publications.php?publication_id=3379

Box 8.4: Moral hazard in Export Credit Guarantees (ECGs)

Export Credit Agencies (ECAs) are used to provide insurance cover against non-payment for medium to long-term capital goods exports, mainly to developing countries. The rationale for public provision of this insurance has been linked to the following factors: insufficient risk bearing capacity in the private sector; access to better information; more effective procedures for recovering assets; and as a means of export promotion.

Providing ECGs has the potential to create a moral hazard problem because the exporter could take actions, not observable to the ECA, that increase the probability of a default such as delivering lower quality goods or delivering the goods later, as they are assured of payment.

To reduce the potential for moral hazard, export credit agencies will only ever insure a certain percentage of the value of the project. This is effectively an excess to the policy and as such creates an incentive for the exporter to try to reduce the risk of a default. Some ECAs also require exporters to sign a right of recourse contract where they can recover all or part of any payments made if it is proven that the exporter did not fulfil any part of their contract with the overseas buyer.

Can government intervention cause principal-agent problems?

Principal agent problems in the public sector, like those in the private sector, can be alleviated through the use of incentives in contracts. However, in public sector this may be more complicated. The pursuit of social welfare as a policy goal can result in a more complex set of objectives than is the case with private sector relationships. Moreover, progress against the objectives can also be difficult both to define and measure and can lead the agent to focus on measurable outputs at the expense of the non-measurable objectives.

Box 8.5: Private sector prisons

The first prison to be operated by a private company opened in 1992. In this situation the quality of service provision, rather than price alone, is important and cannot be easily observed. The management of these contracts provides an example of how principal agent problems are alleviated in the public sector. In the USA the private sector provision of prisons has encountered some problems; under qualified or fewer staff have been employed and as a result there have been riots and improper prisoner care. In the UK a series of measures have been adopted to ensure the quality of service provided and avoid these problems. Potential contractors must demonstrate, before their bid is even considered, that they have the capability to operate a prison safely. After this, they must submit detailed proposals and the deliverability, quality, innovativeness and price of the bid are then assessed. The weighting attached to each criterion differs dependent on the prison service's concerns for that particular prison. This ensures that the contract is not awarded purely on the basis of cost. Once the contract has been awarded, it is monitored, against conditions specified in the contract, by a dedicated controller who ensures that the conditions are being met. More recent contracts have also included provisions for benchmarking, where targets are set comparative to other similar prisons so that if industry costs change dramatically over the life of the contract the targets will not be invalidated.⁵⁰

⁵⁰ Department of Trade and Industry (2005) *Public Policy: Using Market-Based Approaches*. DTI Economics Paper No.14. <http://www.dti.gov.uk/ccp/pdf/pubpolicy0905.pdf>

Summary assessment: asymmetric information

Definition

Asymmetric information exists where one party to a transaction is better informed than the other is and is able to use this to their advantage. It leads to three specific problems: adverse selection, moral hazard and principal agent problems. All three problems can lead to agents making sub optimal choices and failing to undertake mutually beneficial trades. Examples of asymmetric information include individuals failing to take crime preventative actions because they are insured, ensuring the quality of provision after services have been contracted out to the private sector by government and consumers' inability to determine the quality of services before they have purchased them.

Summary assessment

Instrument	Assessment	Key issues to consider	Examples
✓ Information, education and advice	If the informed parties are unable to signal information or it is prohibitively expensive for individuals to obtain information in a useful form, it may be appropriate for government to provide information.	<ul style="list-style-type: none"> Provision of information is appropriate when the cost of obtaining the information is sufficiently high that it is cheaper for government to provide it. Provision may also be appropriate when informed agents are unable to signal information. Advice may be appropriate when information is available but is not being accessed. Provision of education can be used to enable individuals to seek out information, process it accurately and make optimum choices. 	School League tables OFT campaigns Provision of education
✓ Direct provision	Does not address the underlying market failure but may be necessary if the information is sensitive.	<ul style="list-style-type: none"> Direct provision can be used where the Government is the better-informed party or the information is sensitive. Does not address the underlying market failure. 	
✓ Economic instruments	These do not address the underlying market failure but they may be used to alter behaviour.	<ul style="list-style-type: none"> These cannot address the underlying problem but can be used to change behaviour. 	
✓✓✓ Regulation and legislation	Can be used to force the disclosure of information, set standards and ensure the accuracy of information. When information is available in a usable form, regulation and legislation can be used to compel to provision of information.	<ul style="list-style-type: none"> Can be used to force the informed party to provide information or to provide it in a usable form. Can ensure the accuracy of information. If the collection of information is costly and would require specialist skills to understand, standard setting may be appropriate. 	Consumer Credit Act Control of misleading advertisement regulation 1988 Educational qualifications MOTs Secured by design products
✓✓ Market-based solutions	Are appropriate when traders have an incentive to signal the characteristics of their good to the market.	<ul style="list-style-type: none"> If the informed parties have an incentive to provide accurate information, e.g. signalling that their products are high quality then self-regulation may be appropriate. The market may be able to self-correct adverse selection by signalling and screening. 	Trade Organisations Reputation building on eBay

9. Imperfect competition

Introduction

In the extreme cases, market structure is characterised by perfect competition and monopoly. Most markets tend to fall in between these two extremes. There are various implications. Monopolists tend to under-provide and over-price. Non-contested markets and perfectly competitive markets may fail to generate incentives to innovate. In oligopolistic markets (i.e. markets with only a few relatively large providers) there may be incentives for firms to collude resulting in adverse outcomes for society.

Policy options

Information, education and advice

Provision of information can reduce the 'switching costs' consumers face and thereby help to foster competition. For example, provision of information can help consumers switch bank accounts, mortgages or energy suppliers.⁵¹ The Government can also use 'naming and shaming' techniques to influence firm behaviour.

In general, however, provision of information, education and advice does not address most problems associated with imperfect competition.

Direct intervention

If a monopoly is natural,⁵² it may be regulated or brought under public ownership. The benefit of public ownership is that government controls provision directly. In general, because of the various benefits⁵³ associated with private ownership, public ownership is not favoured unless there are other market failures present.

Economic instruments

In theory a case may be made for use of economic instruments to alleviate some of the consequences of monopoly. For instance, tax credits, subsidies and loans can alleviate the effect of monopoly pricing on consumers of new technologies where monopoly is justified in order to motivate research.⁵⁴

Regulation and legislation

Where monopoly power is not natural, government policy should aim to promote competition through regulation and legislation. Where the monopolist is a private entity, competition policy provides the principal policy response. This involves use of legislation to criminalise anti-competitive practices (see Microsoft case study, Box 9.1). In the context of collusion between a few large firms, legislation involves prohibition of explicit agreements amongst firms, and anti-competitive practices such as sharing of information and price schedules (see case of auction houses, Box 9.2). When public service provision has characteristics of a non natural monopoly, options to encourage competition include privatisation and contracting-out parts of the service.

⁵¹ For more detail on switching costs please see the joint DTI (2003) *Switching costs*. Economic Discussion Paper 5. <http://www.offt.gov.uk/nr/rdonlyres/cfd52220-7862-41a7-8f6f-53f3b4fe78fe/0/oft655.pdf>

⁵² A natural monopoly arises where a monopolist provides potentially the most efficient service. The main reasons are economies of scale, network externalities and innovation. An unnatural monopoly arises where there are no fundamental economic reasons for monopoly power. Unnatural monopoly may arise for many reasons such as predatory pricing, 'bullying' of firms upstream and downstream, or as a result of government intervention, through subsidy or government purchasing.

⁵³ These include the capacity to raise finance and respond quickly to changing circumstances.

⁵⁴ For more on the criteria for design of tax credits and subsidies for R&D see www.ifs.org.uk/lectures/rupeyth2005.ppt

Box 9.1: Application of competition policy to Microsoft

In March 2004 the European Union fined Microsoft Europe and ordered it to disclose interface documentation which would allow non-Microsoft work group servers to achieve full interoperability with Windows PCs and servers. It was also required to produce a version of its windows operating system without Window's media player. These remedies were imposed as Microsoft was found to have abused its market power by 'deliberately restricting interoperability between Windows PCs and non-Microsoft work group servers, and by tying its Windows Media Player (WMP), a product where it faced competition, with its ubiquitous Windows operating system'.

Box 9.2: Application of competition policy to Sotheby's and Christie's

In 2002 the European Commission found that Sotheby's and Christie's auction houses had breached EU competition rules when they formed a cartel agreement to fix commissions paid by sellers and other fees. Sotheby's was fined €20.4 million for its part in the cartel but Christie's escaped a fine as it had provided decisive proof of the cartel at a time when the Commission had no investigation open and because it was the first to come in with such evidence. As Sotheby's co-operated fully with the investigation and volunteered documents its fine was reduced by 40 per cent.⁵⁵

For the case of a natural monopoly, the policy objective is to manage the potential harms of monopoly. Where the monopolist is private, this may be achieved by regulating the characteristics of the service such as price and quality (e.g. regulation of rail fares).⁵⁶ This approach requires considerable information and a difficulty much of which is 'owned' by the monopolist.

If the natural monopoly is publicly owned, various forms of 'internal' regulation may be used to avert principal-agent problems. In healthcare, for example, Primary Care Trusts (PCTs) use contracts to regulate secondary care providers, specifying cost and service levels. Performance measures and targets are examples of regulatory tools that are widely-used to manage public monopolies such as local police authorities and Crime and Disorder Reduction Partnerships. In addition, the Government has also introduced competition in the provision of forensic services [See case study in Box 9.3 below]. There are currently ten private prisons contractually managed by private companies such as Group 4, Premier and Securicor.⁵⁷

⁵⁵ For more information on this case see:

<http://europa.eu.int/rapid/pressReleasesAction.do?reference=IP/02/1585&format=HTML&aged=0&language=EN&guiLanguage=en>

⁵⁶ There are a number of difficulties associated with use of regulation or legislation to combat problems associated with imperfect competition.

⁵⁷ See <http://www.probation.homeoffice.gov.uk/output/Page137.asp>

Box 9.3: Introduction of competition in the provision of forensic services

The provision of forensic services accounts for approximately £400 million of the police budget in England and Wales. External suppliers account for just under half of this money. Prior to 1991 forensic services were provided exclusively by The Forensic Science Service (FSS). There was no charging mechanism in place for forensic services and, as such, they were effectively provided free at the point of use. In 1991, the FSS became an executive agency of the Home Office. Changing the status of the FSS allowed other firms to enter the market. The Association of Chief Police Officers noted that the introduction of a market for forensic services “introduced financial discipline into forensic science provision and procurement” such that “Costs and value added by forensic support became clearer to police forces”. Since competition was introduced two other major companies, a few small companies and some private practitioners have begun offering forensic services. The local Government Act 1999 further enhanced competition in the market as it required police authorities to obtain best value in local policing service. Most police forces now obtain their forensic services from multiple suppliers.⁵⁸

Market-based solutions

It should be recognised that markets tend to promote competition. Monopoly provides high profits and attracts competitors. Collusion may be difficult to sustain because individuals have incentives to breach.

Self-regulation may enable consumers to take advantage of competitive markets by discriminating between good and bad practice. On the other hand, self-regulation can be used by markets to create barriers to entry.

⁵⁸ House of Commons Science and Technology Committee (2005) Forensic Science on Trial. Seventh Report of Session 2004–05. www.publications.parliament.uk/pa/cm200405/cmselect/cmsctech/96/96i.pdf
The Forensic Science Service (2005) Annual Report and Accounts 2004–05.
<http://www.forensic.gov.uk/forensic/index.htm>

Summary assessment: imperfect competition

There are various implications of alternative market structures. Monopolists tend to under-provide and over-price. Non-contested markets and perfectly competitive markets may fail to generate incentives to innovate. In oligopolistic markets (i.e. markets with only a few relatively large providers) there may be incentives for firms to collude resulting in adverse outcomes for society.

Summary assessment

Instrument	Assessment	Key issues to consider	Examples
✓ Information, education and advice	Provision of information may be used to reduce switching costs and enable consumers to realise the benefits of competitive markets. Threats to name and shame firms may have an impact. Does not address most issues, however.		
✓ Direct intervention	Generally, not favoured unless other market failures present. A benefit is that government controls provision.	Public ownership may be preferable if the service is essential and must be accessed by all regardless of income.	Post Office
✗ Economic instruments	May be used to subsidise cost to consumers of new technologies developed by monopolists. Generally, does not address problem.		
✓✓ Regulation and legislation	Enforcement of competition law is the standard response. If the monopoly is unnatural (i.e. no fundamental economic reason) remedies include divestment and rejection of merger. If the unnatural monopoly is a public body, privatisation and contracting are options. Competition law provides criminal sanctions for collusion and other anti-competitive behaviour. To address a natural private monopoly, regulation of product characteristics (i.e. quality, cost and quantity) is the appropriate policy response.	Informational burden of regulating private provision may be too great.	Use of competition policy - Microsoft - Prosecution of auction houses
✓ Market-based solutions	Monopoly power may be short-lived because high profits attract competitors. Collusion is difficult to sustain because individuals have incentives to breach agreements.	Strength of collusion depends on whether breach is punished, whether there is a dominant player, a relationship between individuals, e.g. cultural, religious, 'game is repeated'	International coffee agreement

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Glossary

Additionality – the extent to which a policy has impacts that are additional to those that would have happened anyway. It is measured in relation to the counterfactual.

Adverse selection – adverse selection occurs when people are deciding whether to enter into a contract or agreement. One party cannot observe the “type” or quality of the good or it is too expensive to do so. For example, if buyers are unable to tell if a good is high or low quality prior to purchasing the good they will only pay an average price based on the probability of purchasing a low quality good. Assuming high quality goods cost more to produce, selling these goods will be unprofitable given the low price in the market. Eventually only low quality goods will be produced unless the market failure is corrected.

Asymmetric information – asymmetric information describes the situation where one party to a transaction is better informed than the other. In the standard economic model, all parties (e.g. buyers and sellers) are perfectly informed about the costs and benefits of all their possible actions and choices. In reality, however, it is often the case that one party has better information than the other. For example, the seller of a good is likely to be better informed as to the quality of the good than the buyer. Under these conditions even optimising agents can make decisions resulting in sub-optimal outcomes. Asymmetric information differs from imperfect information in that, under conditions of imperfect information all parties are equally ill informed or the degree of asymmetry in information is so slight that the informed party obtains no advantage from it.

Barriers to entry – economic or technical factors which prevent or make it difficult for a new firm to enter a market. For example, an existing firm may be able to produce on a larger scale and therefore exploit economies of scale.

Classic regulation – the regulation of a market, firm or industry by government legislation.

Contestable markets - in a perfectly contestable market there are no barriers to entry or exit, i.e. all firms are able to freely enter and exit the market without any costs. In a contestable market a monopolist may be efficient as the threat of competition is enough to compel the monopolist to act like a competitive firm.

Co-ordination failure – failure to reach an agreement to provide a service by a group where the benefits to the group would have exceeded the cost.

Crowding out – the process by which an increase in government spending displaces private spending.

Deadweight loss – a loss in social welfare arising from a policy or action that has no corresponding gain.

Distortionary impact – when a tax is imposed on a good, for example on labour, then the decision by individuals to supply labour to the market will be distorted in that they may supply more or less than they otherwise would have chosen to.

Economies of scale – factors that cause the average cost to fall as production increases.

Elasticity – a measure of the sensitivity of one factor such as the quantity of good that is demanded relative to the good's price.

Externalities (negative and positive) – externalities occur when an individual's actions or behaviour directly impacts on others' welfare and the individual does not take these spillover effects into account because they are not included in market prices. This leads to overprovision and/or over consumption if they are negative or under provision and/or under consumption if they are positive. Examples of positive externalities include R&D. Examples of negative externalities include air, noise and water pollution; and crime.

Fixed costs – costs that do not vary with output e.g. the rent on a factory

Free-rider problem – a problem associated with public goods. No individual is willing to pay for the provision of a non-excludable and/or non-rivalrous good as they hope someone else will and they will be able to enjoy the benefits for free.

Hidden actions – the actions of one agent that are not observable by another. The presence of hidden actions is a factor in principal agent and moral hazard problems.

Hidden information/characteristics – the information regarding an individual or good that is not observable by another agent. For example a buyer may be unable to assess the quality of the good before they have purchased it, a homeowner may not know the quality of a plumber's work before they have completed the work. The presence of hidden information is a definitive factor in asymmetric information problems.

Imperfect competition – imperfect competition arises when one or more firms have some degree of market power. In the extreme, market structure is characterised by perfect competition and monopoly. In reality though, most markets tend to fall in between these two extremes. The most common example of imperfect competition is the concentration of market power in the hand of a few large providers (i.e. oligopolistic markets). In oligopolistic markets, there may be incentives for firms to restrict production – through deliberate or tacit collusion – thereby leading to a suboptimal level of production from society's viewpoint.

Imperfect information – imperfect information arises where individuals are not perfectly ‘informed’ about the options available to them and the costs and consequences of their decision-making. Individuals are therefore unlikely to assess correctly the costs and

benefits to themselves of their actions, leading to sub-optimal choices.

Incidence of taxation – if a tax is applied to a particular product, a producer will often respond by raising prices to cover increases in tax. The relative shares of tax paid by producer and consumer in competitive markets will depend on the elasticity of supply and demand.

Liquidity of markets – for market liquidity to be achieved there must be sufficient buyers and sellers making continuous offers and completing transactions.

Marginal benefit – the increase in total benefits caused by the production of one extra unit of a good or service.

Marginal cost – the increase in total cost caused by the production of one extra unit of a good or service.

Marginal social cost/benefit – the increase in total costs/benefits to society from the production of one extra unit of the good or service.

Market failure – a situation where the market has not and cannot deliver an efficient allocation of resources.

Monopoly – a market in which there is only one supplier. Monopolies are considered inefficient as they reduce production in order to increase the price to a level above marginal cost. Consequently, some consumers who value the good more than it costs to make it don't purchase it at the monopoly price.

Moral hazard – arises when a contract or agreement actually increases the probability of the occurrence of the event that the individuals are insured against. For example individuals who have home insurance have less incentive to take preventative actions such as locking windows and installing burglar alarms. By failing to take these actions they effectively increase the probability of becoming a victim of burglary.

Natural monopoly – a monopoly where technical factors in the industry make it inefficient or unpractical to have more than one supplier in that industry.

Non-excludability – the inability to exclude someone from benefiting from a good once it has been provided. The classic example is street lighting, once this has been provided by one agent, all agents can benefit from it. Non-excludability is a defining characteristic of a pure public good.

Non-rivalry – the situation where the usage of a good by one individual does not diminish another individual's ability to consume the good. The classic example is air. Non-rivalry is a defining characteristic of a pure public good.

Oligopoly – a market that is dominated by a few large suppliers. Petrol sales in the UK is an example. Oligopolistic markets are often characterised by long periods of price stability interspersed with intensive price competition. Firms in oligopolistic markets often engage in non-price competition such as product differentiation through advertising.

Perfect competition – a market structure where there are many small firms selling a single product. None of the firms are able to have an impact on the market price. Perfect competition is efficient because the price of the good equals the marginal cost of producing the good. If the price were any higher, consumers would buy from another supplier. Under perfect competition, everybody who values the good more than it costs to make the good will be able to buy it.

Policy instruments – instruments that can be used to achieve policy goals. In the context of this paper this refers to information; education and advice; direct provision; economic instruments; and regulation and legislation.

Principal agent problems – principal agent problems can occur in any situation where a principal (e.g. government, individuals, firms, employers etc) contracts an agent to provide a service for them but cannot fully observe the agent's behaviour. If there is the potential for the interests of the agent to differ from those of the principal this situation can arise. Principal agent problems, like moral hazard problems, are often (though not always) corrected by the market or can occur as the result of government intervention. Examples include the management of assets on behalf of investors and the running of public services by private firms.

Private Finance Initiative (PFI) – the scheme where by private sector companies can provide public services and then rent the usage of them back to the government.

Public goods – "pure" public goods are said to be non-rival and non-excludable. In practice, most public goods exhibit some degree of non-rivalry and/or non-excludability. In general, these goods are under-provided by the market. Examples are the benefits arising from criminal justice, national defence and clean air.

Public Private Partnerships (PPP) – A collaboration between a public body (e.g. local authorities, central government) and a private company.

Rate of return regulation – regulation that places a limit on the rate of return on capital a firm is permitted to earn. Price must be set so that the target rate of return is achieved.

Screening – the use of a mechanism that allows an individual to make a judgement about the characteristics of another individual even though the characteristics are not directly observable. For example insurers offer lower premiums to women drivers because women in general have lower claim rates.

Self-regulation – regulation imposed on an industry or group by that industry or group as opposed to the government. Examples include, trade organisation membership rules or professional guidelines.

Signalling – the use of a mechanism by which an individual indicates to another individual that they (or the product they are selling) have certain characteristics, even though those characteristics are not directly observable.

For example, individuals may obtain qualifications to indicate that they are competent to do a certain job, sellers may offer guarantees on their goods to signal the good's quality.

Sunset clauses – a provision within a piece of legislation that means the legislation effectively repeals itself on a specified date unless it is deliberately extended by another piece of legislation.

Tradable permits – an economic policy instrument under which rights to discharge pollution or exploit resources can be exchanged through either a free or a controlled permit-market. Examples include individual transferable quotas in fisheries, tradable depletion rights to mineral concessions and marketable discharge permits for water-borne effluents⁵⁹. This term is used interchangeably with tradable quotas in this paper.

Tradable quotas – when quotas (e.g. for certain emissions) are issued to a firm these can be traded with other firms such that firms that produce below the quota can sell to those that produce over the quota. In the long run this should encourage firm to produce less of the product that is subject to the quota.

Variable costs – costs that vary with the level of output such as the cost of the materials used to make the end product.

⁵⁹ http://glossary.eea.eu.int/EEAGlossary/T/tradable_permits

Appendix

		Policy instruments				
Market failure	Questions to identify market failure	Information, education and advice	Direct provision	Economic instruments	Regulation and legislation	Market-based solutions
Externalities	<p>The questions listed below are meant to help policy makers identify situations where externalities may be present. They are, however, not exhaustive.</p> <ol style="list-style-type: none"> Which individuals/parties have an interest in the action or its impact? What are the individual (private) marginal costs and benefits from taking action (tangible and intangible)? What are the marginal (social) costs and benefits incurred by others not directly involved in the activity as a result of the individual taking action? Is there a difference between individual and social costs and benefits? No → No externality present Yes → $MSC < MPC$; $MSB > MPB$ = Positive externality Yes → $MSC > MPC$; $MSB < MPB$ = Negative externality Who gains from the benefits of the externality? Who incurs the costs of the externality? Is there any evidence to suggest that the individual taking the action does or may take into account the spillover effects/externality (as suggested by alternative theories of behaviour)? Do individuals/parties identified in 5 or 6 trade/bargain with individuals/parties taking the action? <p>Why do individuals/parties identified in 5 or 6 fail to trade/bargain with individuals/parties taking the action?</p>	✓	✓	✓✓✓	✓✓	✓

		Policy instruments				
Market failure	Questions to identify market failure	Information, education and advice	Direct provision	Economic instruments	Regulation and legislation	Market-based solutions
Public goods	<p>The questions below are aimed at helping policy makers identify whether there is a market failure due to the presence of a public good, free-riding or co-ordination problems. Identify good/service to be considered.</p> <p>1. Once good/service is available, is it difficult (e.g. very costly) to exclude others from consuming it or from enjoying the benefits of it? Yes → Non-excludable = Public good characteristic No → Excludable = Private good characteristic</p> <p>2. Does consumption of good/service reduce the amount for another person? Yes → Rival = Private good characteristic No → Non-rival = Public good characteristic Does this change as the good/service becomes more heavily used? Yes → Congestible</p>					
	<p><u>Free-riding</u></p> <p>3. Is it possible to enjoy the benefits of the good/service without having to pay for it and simply allow others to pay for it? Yes → Free-rider problem</p> <p>4. What is the extent of free-riding? Is there any evidence to suggest that people may not fully exploit free-riding (as suggested by alternative theories of behaviour)?</p> <p>5. Why do/may people not fully exploit free-riding? What incentives are there to not free-ride? How large is the size of the group that will enjoy the immediate benefits if the public good is provided?</p>	x	✓	✓	✓	✓✓
	<p><u>Co-ordination</u></p> <p>6. Is it possible to get agreement for action within a group? Are the transactions costs of obtaining agreement high? Yes → Co-ordination failure</p>					

		Policy instruments				
Market failure	Questions to identify market failure	Information, education and advice	Direct provision	Economic instruments	Regulation and legislation	Market-based solutions
Imperfect information	There are a number of questions which policy makers need to ask in order to identify whether imperfect information is present. These include:					
	<ol style="list-style-type: none"> 1. What information is required for the individual to make the decision? 2. Is there demand for the information? 3. Is the information available? <ol style="list-style-type: none"> a. Does the market supply the information? If not, why not? b. What are the costs and benefits of supplying the information? c. Can the information be accessed? d. What is the quality of the information? 4. What are the marginal costs of acquiring the information (tangible and intangible e.g. time, search costs)? 5. What are the marginal benefits of acquiring the information? 6. Are the marginal benefits of acquiring information greater than the marginal costs? 7. Given the information, are individuals able to make the “best” choice? If not, why not? <ol style="list-style-type: none"> a. Do individuals have the capacity to process the data? b. Are individuals likely to miscalculate so that perceived costs benefits differ from actual costs and benefits? How complex are the calculations? c. Will mental short-cuts or heuristics be used (as suggested by alternative theories of behaviour)? 8. Do emotional or affective responses play a part (as suggested by alternative theories of behaviour)? 9. Are perceived benefits/costs equal to actual benefits/costs? In other words, do individuals under or overestimate the benefits/costs of taking action? 	✓✓✓	✗	✓	✓	✓

		Policy instruments				
Market failure	Questions to identify market failure	Information, education and advice	Direct provision	Economic instruments	Regulation and legislation	Market-based solutions
Asymmetric information	Asymmetric information 1. Which parties are involved in the contract? 2. Is one party better informed than another? 3. Is it possible for the uninformed party to obtain more information or is it too costly?					
	Adverse selection 4. Are there hidden information/characteristics in entering the contract? In other words, can the uninformed differentiate between “type” or quality? 5. Are there incentives/opportunities for the informed party to act against the interests of the uninformed party? Does this happen? 6. Is it possible for the informed party to signal to the uninformed party?	✓	✓	✓	✓✓✓	✓✓
	Moral hazard 7. Are there hidden actions once the contract is agreed? In other words, can the uninformed observe the actions of the informed? Are there incentives/opportunities for the informed party to act against what was agreed in the contract? Does this happen?					

		Policy instruments				
Market failure	Questions to identify market failure	Information, education and advice	Direct provision	Economic instruments	Regulation and legislation	Market-based solutions
Imperfect competition	<p>There are a few questions which policy makers need to ask when identifying whether imperfect competition is present. These include:</p> <p>1. What is the market structure?</p> <ul style="list-style-type: none"> a. How many firms are there? b. What is their market share? c. Are products differentiated? d. Do the firms have power to control prices/output in the market? <p>2. Where the market is dominated by a single provider:</p> <ul style="list-style-type: none"> a. Is the market contested? b. Can you identify potential competitors? c. How high are the barriers to entry? d. How high are the costs of innovation? e. Does the monopolist behave in a competitive/profit-maximising way as under competition? <p>3. Where there are a small number of firms in strategic competition:</p> <ul style="list-style-type: none"> a. Can they benefit by co-operating? <p>Alternatively, are they colluding to prevent competition that would provide positive benefits to society?</p>					
		✓	✓	✗	✓✓	✓

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