A EUROPE ECONOMICS HANDBOOK

IMPACT ASSESSMENT

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TABLE OF CONTENTS

1 INTRODUCTION

1.1 Regulatory authorities and other policy makers throughout the EU are now putting far more emphasis than before on formal impact assessments of new policies, and on evaluations of previous policies.[1]

1.2 Europe Economics has considerable expertise in this field. The firm has delivered training seminars to staff of the European Commission and a major UK regulator, as well as carrying out many policy assessments on behalf of clients.

1.3 The purpose of this handbook is to explain the main economic concepts and techniques that are needed in impact assessment in non-technical language, so as to be interesting to non-specialists as well as economists.

1.4 It does not address process issues, since the precise requirements of good process vary from one country and situation to another.

1.5 Most of the material in this handbook sets out established principles for conducting impact assessments, and is therefore in line with the approach taken in economics textbooks and in published guidance on impact assessments.

1.6 Impact assessments are used to assess the costs, benefits and risks of regulations or other policies. The term Regulatory Impact Assessment is often used for impact assessments which relate to regulations. This handbook uses the broader term, impact assessment, although examples are drawn from the regulatory field.

1.7 The underlying purpose of impact assessments is to improve the quality of regulation and other policies. The assessment should therefore cover all relevant impacts, whether economic, social or environmental. In some cases, an assessment of the impacts of a proposed policy may reveal that the policy should not be pursued, because its benefits are outweighed by its costs. In other cases, the conclusion may be that the policy should be re-designed in order to achieve its objectives better. Therefore, it is important to use impact assessments as an integral part of the policy-formation process, and not as a mechanical "box-ticking" exercise.

1.8 An impact assessment should be proportionate to the significance of the policy being considered. For relatively minor policies, a brief overview of policy impacts is likely to be sufficient, whereas more significant policy proposals are likely to require detailed analysis and quantification of policy impacts.

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[1] An action plan published by the European Commission in 2002 committed the Commission to the principle of subjecting all legislative proposals to a consolidated and proportionate impact assessment procedure, to be fully implemented in 2004/05. In the UK, the Prime Minister announced in 1998 that no proposal for regulation which has an impact on businesses, charities or voluntary bodies should be considered by Ministers without a Regulatory Impact Assessment being carried out, and in introducing the 2005 Budget the Chancellor of the Exchequer reinforced the importance attached to improving regulatory practice.

1.9 Section 2 goes through the key stages of an impact assessment. Section 3 discusses the assessment of benefits and costs, and section 4 deals with the treatment of risk and uncertainty. Section 5 looks at distributional effects, section 6 outlines how the impact on competition can be assessed and section 7 considers implementation issues. Our contact details are provided at the end of the handbook if further help is required.

2 KEY STAGES OF AN IMPACT ASSESSMENT

2.1 It is important that an impact assessment follow a reasonably structured process, to help ensure that all relevant considerations are taken into account. The following questions summarise the issues being addressed at each stage:

(a) What is the rationale for intervention?

(b) What are the policy objectives?

(c) What policy options are available?

(d) What are the impacts of each policy option?

(e) Which is the best policy option?

2.2 These questions are discussed in turn below.

What is the Rationale for Intervention?

2.3 The starting point for an impact assessment is to consider whether there is a robust justification for policy intervention. If this is not the case, then the policy should not be pursued. Economic theory provides important lessons to guide thinking in this area.

2.4 One of the key economic concepts used in carrying out impact assessments is economic efficiency. Economic efficiency may be defined as a situation in which no one can be made better off without someone else being made worse off. In order for this to be the case, other types of efficiency must be present::

(a) *Technical efficiency* — for a given set of inputs, the maximum possible output must be produced.

(b) *Productive efficiency* — in addition to technical efficiency, the lowest cost mix of inputs must be used.

(c) *Allocative efficiency* — in addition to productive efficiency, resources must be allocated optimally i.e. to those sectors where they have the highest value.

2.5 For policies which involve intervening in markets, the starting point is a finding referred to as the “First Theorem of Welfare Economics”. This can be summarised as follows:

> In the absence of market failures, a competitive market economy will lead to an efficient outcome.

2.6 This is an important result because it means that intervening in well-functioning markets can only make some people better off at the expense of making others worse off (i.e. there is no “win-win” policy intervention). Typically, intervention in such circumstances will reduce economic efficiency.

2.7 The implication is that policy intervention needs to be justified by one or more of the following:

(a) The existence of a market failure, such that competitive markets no longer work efficiently;

(b) considerations other than economic efficiency, such as equity; and

(c) failure of existing regulations.

Market failures

2.8 There are certain circumstances in which markets do not function well, and in which policy intervention may improve efficiency if the benefits outweigh the costs. However, it is important not to mis-use the label "market failure" by applying it to outcomes which are deemed undesirable on the basis of a value judgement. Market failures occur in well-defined circumstances, and can be placed into the following four categories.

(a) **Public goods** — these are goods such as national defence which are *non-rival* i.e. consumption of the good by one person does not diminish the ability of others to consume the good. Many public goods are also *non-excludable* i.e. it is not easy to prevent anyone from consuming the good. Where this is the case, consumers have an incentive to free-ride by receiving the benefits of the public good but leaving others to pay for its provision. The consequence is that free markets are unlikely to provide an appropriate level of the public good.

(b) **Externalities** — these occur when consumption of a good gives rise to impacts on other people which are not reflected in the market price. Externalities can be either positive or negative:

- Negative externalities such as pollution impose costs on other people which are not reflected in market prices. Free markets will tend to encourage over-consumption of goods which give rise to external costs.

- Positive externalities such as the amenity value of good architectural design provide benefits to others which are not reflected in market prices. Free markets will tend to under-provide goods which give rise to external benefits.

(c) **Market power** — markets may be distorted if they are dominated by a monopoly supplier or a small number of large firms. Such firms may face incentives to increase prices and reduce output in order to earn higher profits. This would reduce economic efficiency because some consumers would be deterred from consuming the good in question even though the value they place upon it is greater than its true cost.

There are some activities, such as the provision of water and electricity networks, where economies of scale are such that it would not make sense for more than one firm to undertake the activity in the same geographical area. These activities are

termed *natural monopolies*, and price regulation is often used to prevent monopoly pricing of such services where they are undertaken by private companies.

Market power can also be present in markets dominated by a single buyer (a situation known as monopsony). In such markets, the buyer may have an inefficient incentive to limit the volume of purchases in order to keep the price low.

(d) **Imperfect information** — an example of this is asymmetry of information, which occurs when one party to a market transaction has more information than the other party. Where the information asymmetry is serious, it can give rise to the following adverse outcomes:

- *Adverse selection* — this occurs when the uninformed party in a transaction ends up trading with the people that it would least want to if it had access to all the information. For example, if buyers have no way of discerning the quality of a product, then dishonest sellers who cut costs by selling poor-quality products without revealing this information could make the highest profits and thus end up dominating the market. In some circumstances, adverse selection could lead to a collapse of the market altogether.

- *Moral hazard* — this occurs when the actions taken by one party in a transaction are not observable by the other party and this gives rise to an incentive for the "wrong" action to be taken. An example would be individuals taking less care to protect property that has been insured.

2.9 The existence of a market failure does not on its own justify policy intervention. This is because the intervention may itself give rise to costs which in some cases could far outweigh the benefits gained from attempting to correct the market failure. Hence a key issue for impact assessments is whether the benefits of a policy proposal outweigh its costs.

Equity and other considerations

2.10 The fact that markets lead to efficient outcomes in the absence of market failure says nothing about whether or not those outcomes will be equitable. Hence policy makers may decide that market intervention may be justified on equity grounds, even where it reduces economic efficiency. For such policy proposals, impact assessments play a crucial role in assessing how any improvement in equity compares with any detriment to economic efficiency.

2.11 Regulators and policy-makers should understand the extent to which the powers at their disposal are suitable for realising equity goals. In some cases, it may be that such goals are better left to other policy-makers. For example, an economic regulator in a utility industry could seek to achieve equity goals by setting lower tariffs for poorer customers. However, if this had the effect of unduly distorting consumption patterns, then it might be better to leave such goals to the government, which would have the powers to help the poor in other ways (e.g. through the social security system).

2.12 There may also be other reasons (e.g. moral or cultural) why policy-makers may wish to intervene in markets.

Regulatory failure

2.13 In some cases, the rationale for a policy proposal might be to address problems associated with existing regulation. Examples of "regulatory failure" that policy-makers might wish to correct include:

(a) *Inadequately defined property rights* — in situations where the legal framework leaves uncertainty over who owns what, markets may be prevented from working effectively. For example, poorly defined land rights in developing countries might prevent trading in land, deter investment, and prevent individuals from using land as collateral when borrowing money.

(b) *Poorly defined objectives* — regulatory actions which were based on poorly defined objectives are unlikely to be well designed.

(c) *Unintended consequences* — even where the objectives of regulation were clearly specified, regulations may give rise to unexpected and unintended consequences.

(d) *Regulatory capture* — in situations where regulation has been delegated to independent regulators, the regulator may be "captured" by those it regulates and follow their interests rather than the wider public interest.

(e) *Implementation and enforcement failures* — corrective action may be appropriate where existing policies have not been properly implemented and enforced.

(f) *Excessive overall burden of regulation* —a sequence of regulatory decisions may lead to an excessive overall burden of regulation due to cumulative effects.[2]

2.14 When carrying out an impact assessment of policies aimed at correcting regulatory failure, it is worth considering what underlying market failure or equity consideration justified the original policy intervention and whether this still has validity.

2.15 If no market failures are present and the policy does not improve equity, then the appropriate way forward is likely to be deregulation.

2.16 Where the original policy was justified with reference to a market failure, the issue for policy-makers is whether policy can be re-designed to address the market failure while

[2] The impact assessment of each individual regulation should analyse its incremental impact given all the previous regulations which have been introduced. Thus, the regulation which has the effect of tipping the overall regulatory burden above some materiality threshold where it begins to have significant adverse effects may have incremental costs which outweigh the benefits. However, it is possible that this is simply the result of the sequence in which regulations have been introduced, and that the new regulation is actually more beneficial than some of the existing ones.

reducing or eliminating regulatory failure. Deregulation would be appropriate in situations where regulatory failure could not be avoided, and its costs exceeded the benefit of correcting market failure.

2.17 Likewise, where the original policy was motivated by equity considerations, policy-makers will wish to consider whether the equity benefits can be achieved without giving rise to regulatory failure. Where regulatory failure cannot be avoided and its costs are large, it would be appropriate for policy-makers to consider whether the equity considerations are sufficiently strong to warrant continued government intervention.

What are the Policy Objectives?

2.18 Once the rationale for a policy proposal has been identified, the next step is to produce a clear statement of policy objectives, addressing the market failure, regulatory failure or equity consideration that has been identified.

2.19 A clear statement of objectives plays an important role in policy development, by helping to promote a focused approach to the identification and assessment of policy options. Another benefit of setting clear objectives is that it makes it easier to evaluate whether the policy is working once it has been put in place.

2.20 In order to ensure that policy objectives are convincing, it is worth considering how the success or failure of a policy might be observed or measured. This might involve identifying indicators which could subsequently be monitored to determine whether or not the policy has achieved its objectives.

What Policy Options are Available?

2.21 An impact assessment should assess a range of policy options which could meet the stated policy objectives. Policy-makers may fail to identify the best policy option if only a single preferred approach is taken into consideration.

The counterfactual

2.22 It is necessary to specify what is referred to as a "counterfactual" as a benchmark against which the impact of each policy option can be assessed. The counterfactual will normally comprise the "do nothing" policy option. In circumstances where doing nothing is not an option (e.g. because there is a legal requirement to act), the counterfactual is likely to be the "do minimum" option.

2.23 In constructing the counterfactual, it should not be assumed that the "do nothing" or "do minimum" options imply a continuation of the status quo. This is because various developments may take place even with no changes in this area of policy. Examples of possible developments include:

(a) Economic growth, or structural changes in the economy.

(b) Technological change.

(c) Changes in individual markets (e.g. alterations in consumer behaviour, or in the structure of industries).

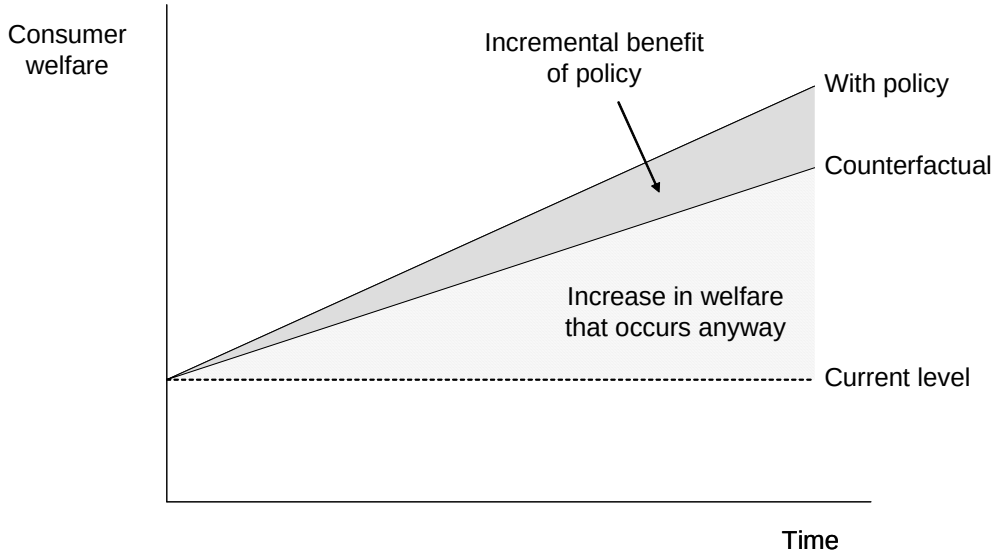
(d) Demographic changes.

(e) Changes to other areas of policy and regulation.

2.24 The counterfactual should be based on reasonable expectations of what might happen in these areas. For example, it may be appropriate to assume that the economy grows in line with past trends, or that all other policies that have been announced by the government are implemented.

2.25 The importance of defining the counterfactual is illustrated by Figure 1, which takes the example of a policy which is aimed at increasing the welfare of consumers in a particular market. The diagram shows that consumer welfare is expected to increase through time under the counterfactual scenario. If the impact assessment were to ignore this and assume that any increase in consumer welfare above its current level was attributable to the policy, then the benefits of the policy would be significantly over-estimated.

Figure 2.1: The Importance of Defining a Counterfactual



2.26 However, in most cases it would be disproportionate to develop detailed forecasts under the current policy framework in order to construct the counterfactual. The focus should be on identifying the most important changes that are likely to take place, so that the incremental effect of the policy can then be estimated.

2.27 As well as forming the counterfactual, the “do nothing” or “do minimum” option should be regarded as a serious policy option. If, when assessed relative to the counterfactual, the

costs of other policy options are found to outweigh their benefits, then "do nothing" or "do minimum" is the optimal policy.

Other policy options

2.28 Alongside the counterfactual, policy-makers need to develop a range of policy options to assess.

2.29 While there is no single correct way of doing this, one approach would be to use brainstorming sessions and other idea-gathering exercises to draw up a wide-ranging list of all possible policy options. Preliminary evaluation of each policy option could then be used to filter out the most promising policy options for more detailed assessment.

2.30 Particular rationales for policy intervention tend to be associated with certain types of policy, as shown by the high-level summary in Table 2.1.

Table 2.1: Examples of High-level Policy Options

Rationale for intervention	Possible policy options
Market failure	
Public good	Public provision, public tender
Market power	Competition law Price regulation (e.g. for natural monopolies)
Externalities	Define property rights for good not reflected in market price Tradable permits (e.g. for right to pollute) Tax/subsidy reflecting external cost/benefit Regulation
Information asymmetry	Public provision Regulation
Equity considerations	Progressive taxation Benefits/tax credits Intervention in labour market
Regulatory failure	Policy redesign Deregulation

2.31 For the purpose of an impact assessment, policy options will need to be specified in sufficient detail to allow the benefits, costs and risks associated with the policy to be assessed.

What are the Impacts of Each Policy Option?

2.32 The impacts associated with each policy option should be identified and, as far as possible, quantified. Risks and uncertainties surrounding policy impacts should also be analysed and taken into account.

2.33 Relevant impacts include:

(a) economic benefits and costs;

(b) environmental impacts;

(c) distributional impacts; and

(d) effects on competition.

2.34 Alongside immediate policy impacts, consideration should be given to whether there are any likely dynamic effects. For example, regulation can affect how markets evolve through time, particularly in industries characterised by rapid innovation.[3]

Quantifying impacts

2.35 It is important to adopt a consistent approach with regard to whether benefits and costs are calculated in nominal terms (projected cash values, before adjustments for inflation) or in real terms (after adjustments for inflation). It is generally preferable to state benefits and costs in real terms.

2.36 Where there are limited data available to inform an assessment of the benefits and costs of a policy, it may be appropriate to carry out data-gathering exercises or to commission external research. Such data collection or other research should obviously be proportionate to the significance of the policy.

2.37 While it is often worth being ambitious in trying to quantify the main impacts of policy proposals, it is important to be realistic about the likely accuracy of quantitative estimates. In some cases, estimates of benefits and costs are likely to be only ball-park figures. Where benefits significantly outweigh costs, this may be sufficient to reach a conclusion on whether the policy is attractive. In other cases where the gap between benefits and costs is smaller, the uncertainty surrounding estimated impacts may mean that firm conclusions cannot be reached.

Effect on processes

2.38 It can sometimes be difficult to predict and quantify the final outcomes that are likely to result from the introduction of a policy. An example would be the difficulty of trying to predict the effects of policy on a dynamic industry where the pace and direction of innovation is unpredictable. In such circumstances, an alternative to quantifying final benefits and costs is to look at the likely effects on processes (e.g. the process of innovation, or the competitive process) which are known to be beneficial or harmful to

[3] For analysis of competition in dynamic markets, see Europe Economics (2003), "The Development of Analytical Tools for Assessing Market Dynamics in the Knowledge Based Economy", September.

society. In some cases, the effect on these processes might form the basis of multi-criteria assessment (see paragraph 2.51(b)).

2.39 All impact assessments should include an assessment of the impact on the competitive process, and this is covered in more detail in section 6.

Incremental impacts

2.40 The impact assessment should focus on the incremental benefits and costs of each policy option, relative to what would happen anyway under the counterfactual scenario.

2.41 In the case of policies involving support for activities regarded as socially worthwhile, the extent to which benefits are additional (sometimes referred to as the "additionality" of benefits) may be reduced because of the following:

(a) *Leakage* — where a policy is imperfectly targeted, some of the benefits of government support may leak outside the group of intended beneficiaries;

(b) *Deadweight losses* — some of the activity being subsidised may have happened in the absence of government support;

(c) *Displacement* — the subsidised activity may displace similar activities which would otherwise have taken place;

(d) *Substitution* — firms may substitute between inputs (e.g. subsidised workers and non-subsidised workers) in order to qualify for support, without increasing the overall level of activity; or

(e) *Practicality of enforcement* — the effectiveness of a policy will be undermined if it cannot be enforced.

2.42 The focus on incremental effects also ensures that irreversible costs which have already been incurred (known as "sunk costs") are irrelevant to an impact assessment. This is because the choice of policy option will make no difference to sunk costs — these will exist under the counterfactual as well. Hence if the government has pursued a policy which has led to large sunk costs, but subsequent analysis shows that forward-looking benefits are insufficient to justify forward-looking costs, then the policy should be abandoned (assuming there are no equity considerations).

2.43 However, an exception might be where going back on previous policy commitments leads to a loss of credibility which has adverse economic and/or political consequences, or where reneging on policy commitments would raise moral or equity issues. For example, suppose an economic regulator were to encourage investment in a utility network by agreeing to allow investors a certain rate of return on their investment. If once the network were built the regulator were to renege on this commitment and set prices at a lower level to encourage usage of the network, then investors would have less confidence when considering similar investment projects in the future.

2.44 The assessment of benefits and costs is central to an impact assessment, and further detail on quantifying impacts is given in section 3. Sections 4–7 discuss related issues, such as the treatment of risk, distributional effects, the impact on competition and implementation issues.

Which is the Best Policy Option?

2.45 Once the costs, benefits and risks associated with each policy option have been assessed, policy-makers need to decide which policy option should be pursued.

2.46 Impact assessments should not be viewed as a decision-making tool which replaces the political process. Rather, they are a systematic way of presenting benefits and costs to allow decision-makers (including elected politicians) to make more informed choices. For example, a valid output of an impact assessment might be to state what value the decision-maker would be putting on unvalued benefits of a proposed policy if he were to decide to go ahead with implementation. Nonetheless, economics can provide helpful guidance as to which policy option might best achieve the policy-maker's objectives.

Decision rules

2.47 Where benefits and costs can be quantified, the appropriate decision rule is usually to select the policy option which gives rise to the highest net present vale (NPV), calculated as the present value of benefits less the present value of costs. (Present values are computed by discounting costs and benefits — see paragraphs 3.20 to 3.25.) The aim is to identify the policy which yields the highest possible net benefit to society.

2.48 There are other less satisfactory ways to rank different policy options, which are discussed below for reference, but not recommended:

(a) *Internal rate of return (IRR)* — this rule involves selecting the option with the highest IRR, defined as the discount rate at which the net present value is zero. This may sometimes yield a different answer to the NPV rule. For example, consider two projects: a small project which has a high rate of return and a much larger project with a lower return but a higher absolute level of benefits. In this example, the IIR rule would select the first project, whereas the NPV rule would select the second.

(b) *Payback* — this rule involves selecting the option with the shortest payback period, defined as the period required for the benefits of a project to pay back the costs. This rule ignores any benefits or costs which occur further into the future.

2.49 Where it is not possible to value all the impacts of a proposed policy, an impact assessment should identify the value that would have to be placed on unvalued impacts in order for the policy to be the best available option.

Treatment of risk and uncertainty in decision-making[4]

2.50 Risk and uncertainty surrounding policy impacts should also enter the decision-making process.[5] There are several ways to treat risk and uncertainty in an impact assessment.

(a) *By making judgements when selecting the best policy option*, based on prior analysis of risks and uncertainties. Section 4 describes how sensitivity and scenario analyses and the use of ranges when presenting estimated benefits and costs can help to make the uncertainties surrounding policy impacts clear to the policy-maker. The policy-maker can then use this information in making a judgement about which policy option to adopt. For example, suppose the central estimate of benefits from a policy exceeds the central estimate of costs. A policy-maker might nonetheless decide not to adopt the policy if the ranges for benefits and costs are wide and to a large extent overlap, because this implies a significant risk that actual costs may turn out to be higher than actual benefits.

(b) *Through explicit adjustments to the valuation of benefits and costs*, such that the NPV figure presented for each policy option takes account of risks and uncertainties. This is discussed further in section 4, and might involve:

- Inclusion of a "variability cost" or the use of a higher discount rate to reflect the risk and uncertainty surrounding the impacts of each policy option.

- Where a policy would lead to large sunk costs in a context of uncertainty, the inclusion of a cost (referred to as a "real option value") which reflects the lost opportunity of waiting for better information.

(c) A very risk-averse decision-maker might follow one of the following rules:

- *Maximin rule*: this states that the preferred policy option is that which yields the highest net benefit in the worst possible "state of the world". This may not be the policy which yields the highest expected return over all possible "states of the world". Hence the maximin rule may lead to a different outcome than that which would result from the straightforward application of the NPV rule.

- *Precautionary principle*: this states that where a possible outcome is sufficiently bad, then precautionary action may be justified even though there is only a small probability of that outcome occurring.

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[4] See also section 4.

[5] Although similar concepts, the terms "risk" and "uncertainty" have different meanings. "Risk" refers to variability where the probability distribution of potential outcomes is known, whereas "uncertainty" refers to situations where the distribution of potential outcomes is unknown.

Alternatives to full cost-benefit analysis

2.51 Sometimes policy-makers may decide that a full cost-benefit analysis is either disproportionate or else not feasible due to the difficulty associated with valuing impacts. More limited approaches that can be used to compare policy options include:

(a) *Cost-effectiveness analysis* — this involves identifying the least costly way of achieving a given result. The desired outcome is taken as given, and no analysis is undertaken of whether it is worthwhile. Hence this approach does not demonstrate that the chosen policy will yield benefits that are greater than the costs involved.

(b) *Multi-criteria analysis* — this involves assessing the policy against a number of different criteria. On its own, this does not necessarily lead to the selection of a preferred option, since one policy option may score well against one criterion while an alternative may score better against another. Therefore, a decision needs to be made on the trade-off between different criteria, either by making a judgment or by placing explicit weightings on each criterion to produce an overall ranking of options.

2.52 To illustrate multi-criteria analysis, suppose that a new website is being designed. Possible criteria include:

(a) attractiveness of web pages;

(b) ease of navigation;

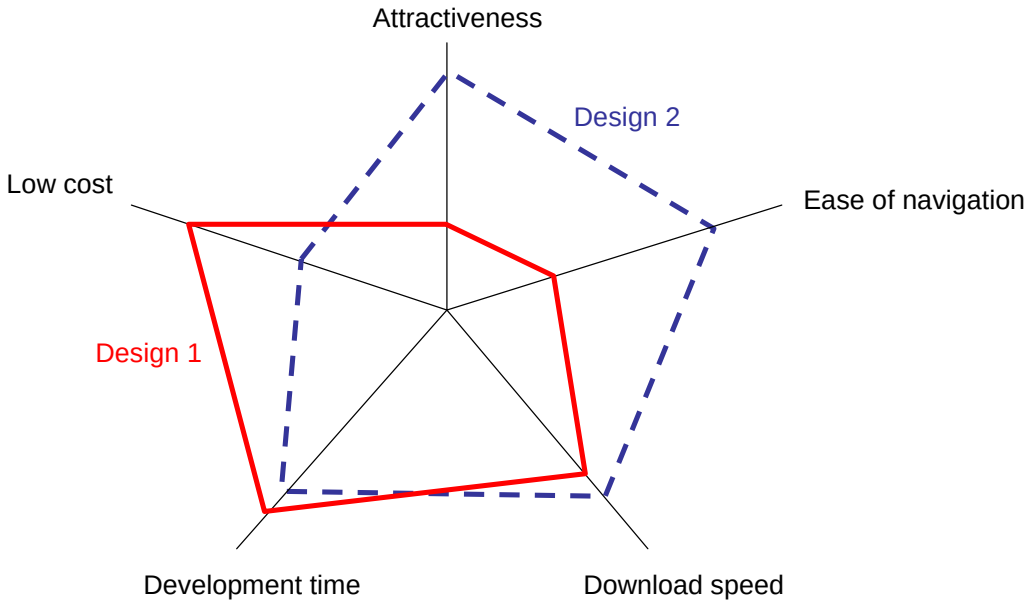
(c) speed of down loading;

(d) cost of development;

(e) development time.

2.53 A multi-criteria chart such as Figure 2.2 can be used to illustrate how two alternatives score against each criterion. The policy-maker's decision will depend on the weight attached to the different criteria.

Figure 2.2: Multi-criteria Chart



3 ASSESSMENT OF BENEFITS AND COSTS

Exclusion of Transfers

3.1 In carrying out an impact assessment, it is important to be aware of the distinction between economic benefits and costs, and transfers.

3.2 Transfers are payments for which no goods or services are received in return e.g. state benefits. Transfers do not give rise to efficiency benefits or costs, since they are not directly associated with any change in output. However, they change the distribution of income and hence may well be important in their own right; also, they may lead to indirect impacts e.g. on patterns of consumption.

3.3 In most cases, the assessment of costs and benefits should focus on economic efficiency impacts, and should exclude transfers. However, transfers will still be relevant when assessing distributional impacts (discussed further in section 5).

3.4 An exception is in cases where the policy-maker is concerned solely with the effect of a policy on a particular group of people. For example, a regulator might be under a statutory obligation to protect the interests of particular groups of consumers. In such circumstances, an impact assessment might focus on costs and benefits that accrue to the relevant group of people, including transfers.

Conceptual Approach

3.5 At a conceptual level, assessing the benefits and costs of a policy involves the following:

(a) Quantifying the various impacts of a policy in physical terms (e.g. time spent on compliance activities, reduction in statistical risk of death);

(b) Placing a value on these physical impacts, and where possible expressing it in terms of a monetary equivalent;

(c) Discounting costs and benefits to take account of the different points in time at which they occur.

3.6 In some cases, monetary values might be obtained for particular policy impacts without quantification of the underlying physical effects. For example, survey work might collect data on firms' estimates of their compliance costs, without requiring them to provide a detailed breakdown of the staff time and other resources that would be involved.

Collection of Data

3.7 There are a variety of ways in which information on the potential impacts of policy proposals could be gathered, including:

(a) *Literature review* — there may be existing theoretical or empirical studies on the impact of policies similar to the options under consideration;

(b) *Precedents* — analysis of the impact of similar policies in the past and/or in other countries could provide useful information;

(c) *Surveys* — these could be commissioned to gather data on the potential impact of policy proposals (the design and interpretation of surveys is discussed in the box below);

(d) *Consultation* — an impact assessment will normally involve consultation, which provides interested parties with the opportunity to contribute relevant information or even their own assessment of benefits and costs; and

(e) *Modelling* — in some cases, an impact assessment could be informed by modelling work. For example, engineering modelling could be used to examine the technical effect of certain policies, or an economic model of market behaviour could be used to examine how a policy might affect market outcomes.

CARRYING OUT SURVEY WORK

Surveys should always be designed and interpreted with care to avoid misleading results. Considerations to take into account include:

- *Choice of sample* — the survey should cover a representative sample of those affected by the proposed policy, since impacts may vary. If the sample is self-selecting (e.g. a survey is circulated to many of those likely to be affected but only a few choose to respond), then it is essential to consider whether this may have introduced a bias into the results.

- *Size of sample* — generally, the larger the sample, the more confidence that can be attached to the results of a survey. However, in some cases there may only be a few relevant organisations to approach (e.g. if there are only a few firms in the industry affected by a new policy).

- *Design of survey* — careful design is particularly important in situations where it would be difficult to go back to respondents to seek clarification or further information. There will generally be merit in undertaking pilot studies to test and refine the survey questions.

- *Truthfulness of responses* — respondents may have an incentive to over– or under–state the impacts of policy proposals if they believe it to be in their interest to influence the development of policy in a particular direction. In some cases, it may be possible to address these issues through the design of the survey e.g. by asking respondents to set out the basis on which they

have calculated impacts.

- *Scaling of results* — where not all of those affected by a policy are included in a survey, it may be necessary to scale up survey results. The variable used to scale results will depend on the specific situation. For example, in estimating total costs in an industry, the choice between scaling according to the number of firms, the volume of sales or some combination of the two will depend on which is likely to be most closely related to total costs. The issue of scaling should be considered when designing surveys, to ensure that the necessary data are collected.

Valuation of Impacts

3.8 A resource should be valued at its opportunity cost, defined as the value that the resource would have in its next most productive use. If the benefits of the policy are lower than the costs when calculated on this basis, then the policy will reduce efficiency because resources will be re-allocated away from more productive uses.

Market values

3.9 Where there is a market value for a particular good or service, it will normally be appropriate to use this value in carrying out the impact assessment. This is because, in the absence of distortions, market prices reflect underlying opportunity costs.

3.10 However, there may be situations in which it would be appropriate to adjust market prices when valuing policy impacts:

(a) *Tax differences* — where market prices are affected by the application of a different tax rate to that particular good or service (compared with the tax rate applying to other goods and services in the economy), then adjustments should be made to remove these distortions.

(b) *Market power* — prices may be higher than opportunity cost if companies operating in a particular market have market power and have used this to increase prices above competitive levels.

3.11 Consideration should be given to whether there may be significant changes in relative prices through time (i.e. after allowing for the effects of general price inflation) which need to be incorporated into the analysis. For example, prices of scarce natural resources might be expected to increase in the longer term, or high-technology products may fall in price due to innovation.

Non-market impacts

3.12 Policy proposals can often give rise to costs and benefits for which there is no market value (e.g. change in air quality). Nonetheless, an impact assessment should seek to place a monetary value on such impacts where possible. This may be done by seeking to derive estimates for:

(a) "willingness to pay" for an increment of the outcome; or

(b) "willingness to accept", defined as the amount of compensation required to induce consumers to accept a negative outcome.

3.13 There are two main approaches that can be used to arrive at such estimates:

(a) **Revealed preference** — this involves estimating the value that consumers are implicitly placing on an outcome by their observed behaviour in a similar or related market. Examples include:

- The premium on house prices in an area offering environmental amenity could be used to estimate the value of that amenity.
- The higher wage rate for dangerous occupations (compared to alternative jobs that might be open to the workers in question) could be used as an indication of the value that workers place on their own safety.

(b) **Stated preference** — this involves undertaking surveys or interviews of consumers to elicit information directly on their preferences. There are different ways in which this can be done, including:

- Contingent valuation studies which ask consumers directly how much they would be willing to pay for particular outcomes.
- Choice modelling, which involves asking consumers to identify their preferred choice from a series of alternatives.

3.14 For certain common non-market impacts, it may be possible to use values drawn from existing studies or appraisal guidelines rather than conducting primary research. Examples of non-market impacts which have been studied include time, the prevention of a fatality or injury, and carbon emissions. However, the appropriate value to use may differ according to circumstances (e.g. the value of time is likely to depend on income).

Adjusting for Optimism Bias

3.15 It has been observed that the assessment of proposals can often suffer from optimism bias. In other words, benefits tend to be overestimated, costs tend to be underestimated, and the proposed timetable may be too ambitious.

3.16 The implication of this phenomenon is that proposals may proceed on the basis of an optimistic assessment of their impact, when a more realistic assessment would have concluded that the proposals were not worthwhile.

3.17 Therefore, once benefits and costs have been estimated, it may be appropriate to consider adjustments to correct for optimism bias. Three approaches may be adopted:

(a) *Higher discount rate* — this has the effect of placing a higher weight on costs incurred in the near future relative to the weight placed on benefits further in the future.

(b) *Explicit adjustments* — this would involve reducing estimates of benefits and increasing cost estimates to adjust for optimism bias. Adjustments could also be made to timing assumptions, to take account of the possibility of timing over-runs.

(c) *Sensitivity or scenario analyses* — these can be used to show how the results would be affected if less favourable assessments were made (including of compliance and enforcement costs). These approaches are discussed in section 4 below.

3.18 Another factor affecting the appropriate size of adjustment is the objectivity and reliability of the data used to produce the initial estimates of benefits, costs and timescales. Smaller adjustments would usually be appropriate where data are relatively objective and reliable, whereas larger adjustments are likely to be appropriate where initial estimates are based partly on subjective judgements.

3.19 Policy-makers should be aware of the danger that staff could compensate for adjustments for optimism bias by making their initial estimates of benefits, costs and timetables more favourable, thus defeating the purpose of the exercise.

Discounting

3.20 The value placed upon costs or benefits typically depends on when they occur: generally, people prefer to receive benefits sooner in time and to incur costs later. Indications of individuals' time preference rate (i.e. the value placed on current as compared with future consumption) can be obtained, for example, from the yields on indexed government bonds.

3.21 Impact assessments should discount the value of future costs and benefits using the social time preference rate. The formula for discounting to the current year is shown below, where C is the cost (or benefit) to be discounted, r is the discount rate and n is the number of years in the future in which the cost (or benefit) is expected.

$$\frac{C}{(1+r)^{n}}$$

3.22 A nominal discount rate should be used if benefits and costs are calculated in nominal terms, whereas a real discount rate should be used if they are calculated in real terms.

3.23 The appropriate discount rate to use in an impact assessment may vary from one country or group of countries to another. In some cases, the precise discount rate that should be

used may be specified in guidance published by the relevant government or public sector body.

3.24 Ideally, the discount rate would reflect the social time preference rate, and other factors (e.g. optimism bias, project risk) would be taken into account through explicit adjustments to estimated benefits and costs. However, in practice this may not always be possible and a higher discount rate may be used instead (see paragraphs 3.17(a) and 4.10(b)).

3.25 There is evidence that discount rates decline through time, due to effects arising from uncertainty over the social time preference rate. Hence for projects which involve costs and benefits which occur more than several decades into the future, it may be appropriate to use a schedule of declining discount rates.

4 DEALING WITH RISK AND UNCERTAINTY

4.1 In most circumstances, the level of future costs and benefits will not be known for certain. Impact assessments should therefore take account of the risks and uncertainties surrounding policy impacts rather than just focusing on central estimates.

Analysing Risk and Uncertainty

4.2 There are various ways in which the risks and uncertainties associated with policy impacts can be analysed.

4.3 **Sensitivity analysis** involves changing the value used for one input variable at a time, in order to investigate whether the conclusions of the analysis are affected. For variables subject to risk, the choice of values to use in sensitivity analysis would be informed by the known probability distribution. Where variables are subject to uncertainty, a range of plausible values should be used. A potentially useful exercise is to identify the "switching value" for the variable in question at which the policy recommendation would change.

4.4 **Scenario analysis** involves constructing scenarios in which the values used for a number of variables may differ. For example, scenarios might be intended to reflect potential outcomes under different "states of the world." This type of analysis can help analyse how robust different policy options are to a range of scenarios. In some situations, it may be possible to attach indicative probabilities to different scenarios, allowing calculation of the expected value of net benefits for each policy option.

4.5 **Monte Carlo modelling** involves running many repeated simulations in which the values used for input variables are drawn randomly from specified distributions. By carrying out many model runs each with a different set of randomised inputs, the overall variability of outcomes can be analysed. It is important to consider whether input variables are correlated or independently distributed, and to reflect this in the modelling exercise. Dedicated software packages are available to carry out this type of analysis.

4.6 **Ranges** should often be used when presenting estimated benefits and costs, perhaps based on the results of sensitivity or scenario analysis, or Monte Carlo modelling. Where policy impacts are very uncertain, then ranges are likely to be relatively wide; conversely, ranges may be narrow when policy impacts are more certain. The use of ranges makes clear to the policy-maker the extent of uncertainty, whereas the presentation of only a central estimate of benefits and costs can give a misleading impression.

Managing Risk and Uncertainty

4.7 Different policy designs can allocate risks in different ways (e.g. between the public or private sector, or between producers and consumers). It is generally appropriate to allocate risks in line with the following considerations:

(a) *Ability to control risk* — risks are most likely to be managed efficiently if they are borne by the party or parties which have the greatest ability to control those risks;

(b) *Ability to bear risk* — some party or parties may be less able to bear risk.

Incorporating Risk and Uncertainty into Decision-making

4.8 A risk-neutral policy maker would be concerned only with the expected value of costs and benefits. The expected value of net benefits is calculated by multiplying the net benefit associated with each possible outcome by the probability that it will occur, and then summing the result across all possible outcomes.

4.9 A risk-averse policy-maker would perceive the variability of potential outcomes as a negative thing in itself. Such a policy-maker would prefer a policy which yields a given level of benefits with certainty rather than a policy where the impact is uncertain, even if the expected level of benefit were the same.

4.10 Risks can be placed into two categories:

(a) *Diversifiable* risks, which are specific to individual projects. These risks will tend to cancel out across a large number of projects, and should therefore be of less concern to policy-makers. For example, there are risks associated with adopting new technologies, but involvement in a large number of projects using different technologies will reduce exposure to this risk because those technologies which prove failures are likely to be offset by others which prove to be successes.

(b) *Systematic* or *non-diversifiable* risks, which are correlated with economic growth. These should be of more concern to policy-makers because they will not cancel out across a large number of projects.

4.11 There are two ways in which the "aversion" attached to risk and uncertainty could be factored into the calculation of net benefits:

(a) *Variability cost* — an additional cost could be included in the calculation of the net present value of each policy option. The guiding principle is that this cost should represent the amount that society would be willing to pay in order to achieve the same expected benefits with certainty, although estimating the variability cost in practice may be difficult.

(b) *Use of a higher discount rate* — as might be used in the private sector in considering risky projects.

4.12 There is an additional issue when a policy involves committing to large sunk costs in a context of uncertainty over the level of future benefits and costs. In such circumstances, committing to a policy extinguishes the option of waiting until better information becomes available. To justify going ahead with the policy now rather than waiting for better information, the additional benefits of investing sooner should be large enough to offset the greater level of uncertainty. This can be taken into account by including an explicit cost (referred to as a "real option value", because it reflects the loss of the option of waiting) in the assessment of costs and benefits.

4.13 In addition to making explicit adjustments to the calculation of benefits and costs, decision-makers may wish to take risks and uncertainties into account in reaching a judgement on which is the best policy option to pursue. This was discussed in more detail in paragraph 2.50(a).

5 DISTRIBUTIONAL EFFECTS

5.1 An impact assessment should often include consideration of the distributional implications of each policy option. This is obviously a central part of the impact assessment for policy proposals motivated by equity rather than efficiency objectives. However, even where the primary objective of a policy proposal is to improve efficiency, policy-makers may be interested in whether there are any significant distributional implications that they might wish to take into account.

5.2 For some policies, however, it may be relatively obvious that there are no significant distributional impacts e.g. where there is no reason to expect the impacts of the policy to fall disproportionately on any group in society. In such cases, this part of the impact assessment might be limited to noting why this is expected to be the case.

5.3 When carrying out an impact assessment, it is important to check that policy proposals do not breach any anti-discrimination laws that are in force in the country concerned.

Identifying Distributional Impacts

5.4 An assessment of distributional impacts should take account of transfers as well as economic costs and benefits (as mentioned in paragraph 3.3).

5.5 The starting point for this part of an impact assessment is to consider which groups in society are affected by the benefits, costs and transfers associated with the policy. This should include analysis of the impact on different income and/or social groups (for example, by dividing the population into quantiles based on their income). It may also be appropriate to consider whether the policy will have disproportionate effects on other groups in society e.g. groups defined on the basis of ethnic background, gender, age, location or disability.

5.6 Care should be taken to distinguish between those directly responsible for making payments and those who ultimately bear the impact once markets have adjusted. For example, if the government were to tax producers of a particular good, the incidence of the tax would depend on the extent to which market prices increased in response. If prices rose by the full amount of the tax, then the tax would ultimately be paid by consumers (even though producers would be responsible for sending the money to the government). On the other hand, if market prices did not adjust at all, then the shareholders of the companies concerned would bear the full incidence of the tax.

5.7 The impacts on different groups in society should be quantified, where this is possible and proportionate to the significance of the policy.

Making Judgments on Equity Issues

5.8 Often the value placed on equity outcomes is a matter of judgement. For example, a policy-maker considering policies aimed at improving outcomes for disabled people would need to reach a judgement on the appropriate balance between this equity objective and

the imposition of costs on the wider society. In democratic societies, the political process is expected to play a key role in reaching such judgments. However, as discussed in paragraph 2.10, impact assessments can help in reaching a judgment on the appropriate trade-off between equity and efficiency considerations by providing an assessment of what these impacts might actually be.

5.9 In some cases, a policy outcome may be considered undesirable on equity or moral grounds because, even though it may lead to net benefits overall, it imposes very heavy costs on particular individuals. In such circumstances, it may be appropriate to consider whether the policy might be redesigned to include a mechanism for providing compensation to those who are worse affected.

5.10 It may sometimes be appropriate to consider a package of policies as a whole when analysing distributional implications. For example, suppose two policies are each considered to have an undesirable distributional impact when considered individually because they lead to politically-sensitive transfers between rival groups in society. If the distributional effects of the second policy offset those of the first, the policies may be politically acceptable when considered as an overall package.

Distributional Weights

5.11 Where the breakdown of impacts between income groups has been identified, distributional weights can be used to adjust estimated benefits and costs. The argument is that low-income earners will value an additional £1 more than high-income earners, and that costs and benefits should therefore be weighted according to whom they affect.

5.12 It may also be possible to use distributional weights where the income of those affected is not known directly, but where other characteristics (e.g. region) that are correlated with income are known.

5.13 In carrying out this analysis, household incomes should be adjusted to reflect the size and composition of a household. This reflects the fact that a single person household will tend to be better off than a couple living on the same income, and likewise a couple without children will tend to be better off than a couple with children living on the same income.

6 IMPACT ON COMPETITION

6.1 This section provides guidance on how the potential impact of a policy on competition can be assessed. Further information on the approach set out here can be found in guidelines published by the UK Office of Fair Trading.[6]

6.2 Competition is defined as the process whereby suppliers compete to sell their products and services to customers.

6.3 Effective competition can provide significant benefits to society. It gives firms an incentive to reduce costs and offer products which match customer needs, thus promoting efficiency and innovation. Consumers tend to benefit from lower prices, a greater choice of products and product innovation over time.

6.4 The nature of competition may vary. In some markets, competition may focus on the price that competing firms are able to offer customers. In other markets, competition may focus on some other aspect of firms' offerings (e.g. quality or brand recognition).

6.5 The reason for including competition analysis in an impact assessment is that regulation can have a substantial effect on the competitive process. This impact can often be a negative one, because regulation typically involves restricting the freedom of market participants in some way. However, in some cases regulation could improve competition (e.g. if it improved consumer information in a market which would otherwise be characterised by seriously asymmetric information).

Initial Filter

6.6 It is a good idea to filter policy proposals to work out which are likely to have an effect on competition and should therefore be assessed in more detail. The initial filter would consider the following:

(a) *Market concentration* — regulation is more likely to undermine competition if the market concerned is already concentrated. If the market definition is reasonably clear and data are readily available at this stage, the following indicators might be examined:

– the market shares of the largest players in the industry;

[6] OFT (2002), "Guidelines for competition assessment; A guide for policy makers completing Regulatory Impact Assessments", February.

– the Herfindahl-Hirschman Index (HHI), which is calculated by squaring the percentage market shares of each firm in the market and summing them.[7]

(b) *Degree to which firms are equally affected* — regulations may undermine competition if some firms are more adversely affected than others. For example, regulations which impose significant administrative costs on firms may disproportionately affect small businesses. There may be circumstances in which these effects could alter market structure e.g. by driving some firms out of business, or by encouraging the merging or acquisition of firms that are adversely affected by the policy.

(c) *Barriers to entry and exit* — competition may be undermined if the policy imposes higher set-up or ongoing costs on new entrants to the industry which existing players do not face. Regulation could also deter entry if it makes it more costly for firms to exit from the industry if business does not prove profitable.

(d) *Degree of innovation* — there is a particular risk that regulation could undermine competition where the markets most affected are characterised by rapid innovation.

(e) *Restriction on product differentiation* — this restricts the scope for firms to compete by differentiating their product.

6.7 If the initial filter reveals that the policy is unlikely to have a significant impact on competition, than this result and the reasons for it should be recorded in the impact assessment and no further analysis is then required.

6.8 In cases where the initial filter suggests that the policy may affect competition, or where there is insufficient information to reach a conclusion at this stage, a detailed competition assessment should be carried out.

Detailed Assessment

6.9 There are three steps in a detailed assessment of the competition impacts of a policy:

(a) Define the market or markets which are affected by the policy.

(b) Examine the current nature of competition in these markets.

(c) Assess how the proposed policy will affect the competitive process in these markets.

[7] The US Department of Justice merger guidelines suggest that markets are highly concentrated if they have an HHI score above 1,800; that markets are moderately concentrated if they have an HHI score in the range 1,000 to 1,800; and that an HHI score below this level indicates that the market is not concentrated.

Market definition

6.10 The purpose of market definition is to identify the group of products which together constitute a distinct economic market for the purposes of competition, along with the geographical area over which competition takes place (which may be local, national or international).

6.11 The standard approach used to define a relevant market is to begin with a narrow market definition and consider whether a hypothetical monopolist in that market could profitably increase prices by a small but significant amount for a non-transitory period. If such a price increase would not be profitable, either because consumers would switch in sufficient numbers to other products (demand side substitution) and/or because suppliers of other products would switch to supplying the product in question (supply side substitution), then the products which act as substitutes are added to the definition of the market.

6.12 In addition to defining the markets directly affected by the policy, an impact assessment should consider whether there are related markets which may be indirectly affected. Related markets can often be identified by considering the value chain for the product in question: both upstream suppliers of services used to produce the product and downstream purchasers may be indirectly affected by the policy. Related markets should be filtered (as described above) to determine whether a detailed assessment of competition impacts is necessary.

Nature of competition

6.13 Explaining how competition works in a specific market will involve describing:

(a) relevant supply and demand factors;

(b) the competitive process itself; and

(c) market outcomes.

6.14 Supply and demand factors help to explain the way in which producers and consumers may behave in the market. Examples of factors that may be relevant in some markets are shown in Table 6.1.

Table 6.1: Examples of Demand and Supply Factors

Supply-side factors
Importance of different types of input (land, labour, capital, raw materials, transport costs)
Balance between fixed and variable costs
Economies of scale
Economies of scope
Capacity constraints
Seasonality in production costs
Demand-side factors
Trends in demand for product
Seasonality in demand
Proportion of consumers' income spent on product
Frequency of purchase
Search costs (the cost of comparing rival products)
Switching costs (the cost of switching between rival products)
Whether consumers are well informed (e.g. can they easily ascertain the quality of products?)
Whether consumers' requirements are heterogeneous

6.15 Analysing the competitive process will involve looking at:

(a) The structure of the market, including the number of players, their relative size and the overall concentration of the industry.

(b) Barriers to entry and exit, which may include industry cost structures (e.g. economies of scale may favour large, established players), high search or switching costs for consumers, and regulation (e.g. licensing or intellectual property regimes).

(c) The strength of competition — for example, in some markets firms may compete vigorously for customers, whereas in others firms may have a relatively static customer base.

(d) Degree of product differentiation.

(e) Pace of innovation.

6.16 Market outcomes might include prices and price dispersion, product quality, branding, the range of products offered by firms, and whether or not firms compete on customer service or by offering tailor-made products and services.

Impact of regulation

6.17 Having analysed the market in detail, the final stage of the assessment is to examine how regulation will affect competition in the market. This analysis should seek to ascertain

whether or not market power may increase or whether regulation will restrict the supply offerings of competing firms (which may in turn reduce innovation).

6.18 While the ultimate issue is whether regulation may adversely affect the competitive process, sometimes negative impacts may occur indirectly through effects on supply and demand factors or market outcomes. For example, if a policy introduces very significant administrative costs which do not vary with firm size, then smaller firms might be driven out of the market and new entrants might be deterred, leaving large, existing players with greater market power.

7 IMPLEMENTING THE POLICY

7.1 There are a number of issues associated with the implementation, enforcement and subsequent evaluation of policy which need to be taken into account when carrying out an impact assessment.

7.2 First, the impact assessment should consider the ease with which different policy options can be implemented. For example, some policy options available to government may require primary legislation, whereas others may require only secondary legislation. Thinking through this issue will act as a check on the feasibility of each option, and should ensure that any costs, timing delays or risks associated with implementation are identified and taken into account.

7.3 Second, consideration should be given to enforcement of the policy and likely levels of compliance. If compliance is likely to be less than 100 per cent then the estimated level of benefits should be adjusted accordingly. The impact assessment should include a realistic assessment of compliance levels and any costs associated with enforcing the policy.

7.4 Finally, as mentioned in paragraph 2.20, advance thought should be given to the issue of when and how the success of the policy will be evaluated once it is in place. The purpose of *ex post* evaluation is to assess what the actual benefits and costs of the policy have been, and hence whether it has delivered results in line with original expectations. In some cases, it may then be possible to adjust the policy if appropriate in light of findings. In other cases where it is too late to change the policy, lessons can be learnt to inform future policy-making exercises.

7.5 In order to facilitate *ex post* evaluation, it may be appropriate to build monitoring arrangements into the design of the policy so that the necessary data are collected.

ABOUT EUROPE ECONOMICS

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