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Methodological Frameworks for Regulatory Impact Analysis: Valuation, Risk and Cost-Benefit Analysis

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This paper was written by Rex Deighton-Smith, (consultant).It presents a range of methodological issues for Regulatory Impact Assessment (RIA) based upon a comparative analysis of the RIA guidance material of selected member countries and academic literature. It includes draft guidelines which distill the lessons from the paper and which are intended to form the basis for further discussion by committees. An earlier version of the paper and the draft guidelines were presented at the meeting of the Working Party on Regulatory Management and Reform held 24-25 September 2007.

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NOTE BY THE SECRETARIAT

01. This report presents a review of methodological issues in relation to Regulatory Impact Analysis, based on a detailed analysis of RIA Guidance materials, specific questionnaire responses as well as academic literature. This paper follows on a previous paper presented to the Working Party and subsequently to the Group on Regulatory Policy in 2006 (SG/GRP(2006)3) which analysed the systemic and methodological determinants of quality in RIA, based on questionnaires received from a small number of participating countries. The current paper is focused on the methodological aspects, with a wider range of countries, and more in depth analysis. In addition, the paper also provides significantly more detail on, and analysis of, current practices and emerging trends.

02. The report attempts to identify good practices in terms of the methodological approaches. A set of draft proposed guidelines on RIA methodological guidance has been distilled from the analysis in the paper. Presented as an annex to this paper, the draft guidelines are intended to form the basis for further discussion with the Working Party on Regulatory Management and Reform and subsequent final endorsement by the Group on Regulatory Policy.

EXECUTIVE SUMMARY

1. High quality Regulatory Impact Analysis (RIA) is a product of appropriate processes and sound methodological approaches. High quality RIA produces more efficient regulation and better regulatory outcomes. However, the analytical discipline of RIA is a technical and methodologically challenging exercise, particularly as it is undertaken by regulators across a range of policy areas. Accordingly, jurisdictions must provide regulatory practitioners with clear and useful methodological guidance on how to do RIA, if its benefits as a method of evidence based policymaking are to be realised in regulatory results. This paper seeks to enhance our understanding of current methodological approaches and guidance in OECD member countries, highlighting good practices, as well as substantial areas of controversy and areas in which there is significant room for improvement on current practices.

2. The paper is based on a review of a range of the Regulatory Impact Analysis (RIA) guidance documents published by a number of OECD member country governments and other government guidance documents relating to specific methodological issues such as Benefit/Cost Analysis (BCA) and risk analysis. The analysis has also been supplemented by responses to a questionnaire on RIA methodological elements provided by some member countries, which had expressed an interest. Relevant academic literature has also been reviewed.

3. The choice of specific issues for inclusion and discussion in the paper reflects judgments as to which issues have substantial impact on the overall quality of RIA, as well as those that involve the most substantial controversies and/or complexities. Consequently, the paper includes the treatment by RIA guidance material of a broad range of methodological areas, including: the main generic rationales for regulation including promoting efficient markets and pursuing policy goals; the application of quantitative methods for benefit cost analysis (BCA) and cost effectiveness analysis as well as qualitative analytical techniques; the use of contingent valuation methodologies; the use and specification of a valuation of a statistical life (VSL) or a range of VSL for use in RIA; the use and calculation of discount rates; the use of sensitivity analysis in cases of significant uncertainty; decision rules for BCA; the coherent use of partial impact analysis, and; dealing with risk in a regulatory context.

4. The great majority of RIA guidance documents are less than comprehensive in their coverage of the above methodological issues. In many cases, this may at least partly reflect a conscious attempt to ensure that these guidance documents are readily intelligible to generalist policy officers, who will often be responsible for completing the RIA. While such an approach may have merit, there is a strong argument that these, less comprehensive RIA guidance documents should incorporate references to the more technical guidance material that is likely to be required by those responsible for completing more sophisticated RIA. The limited use of such references to other guidance material, even where such material has been published elsewhere within the same government, constitutes a significant shortcoming in many current guidance documents.

5. The RIA guidance documents surveyed are heterogeneous in their recommendations or requirements in respect of some methodological issues. A notable example is that of the discount rate: recommended rates vary from around 3% to 10%, while some guidance documents decline to recommend a rate at all. Moreover, while differences in approaches recommended often reflect different conceptual viewpoints, these are frequently not made explicit in the guidance documents.

6. In a number of important methodological areas, most or all of the guidance documents surveyed are silent, or near silent. Methodological issues in this category include the Value of a Statistical Life (VSL), appropriate qualitative methodological approaches such as Multi-Criteria Analysis (MCA) and, to a lesser extent, the use of risk analysis in the RIA context.

7. The silence of many RIA guidance documents in this area is the more remarkable given that other government published guidance documents in several cases provide guidance on these issues. A broader whole of government perspective could help to ensure that overall government policy positions are well reflected in RIA guidance. Improving the quality of the methodological guidance offered in this context is potentially a very effective means of improving the average quality of RIA completed, as well as reducing the degree of methodological inconsistency between different RIA. Enhanced methodological consistency both supports the credibility of the RIA process directly and increases its ability to ensure the optimal distribution of regulatory resources between different policy areas.

1. Introduction

8. Regulatory Impact Analysis (RIA) as a tool of regulatory quality assurance is now used by almost all OECD countries, by the European Commission and in many countries in transition. The history of RIA extends over more than 25 years in some member countries, while being substantially more recent in others. In all cases, practices and methodological approaches are continuing to evolve, reflecting continued policy learning and the accumulation of practical experience in implementing RIA in an ever-increasing range of countries.

9. Effective RIA implementation involves both systemic elements and methodological considerations. In the former category, key success factors include ensuring high level political support for RIA, commencing RIA at an early stage in the policy process, ensuring adequate quality control processes are in place, integrating RIA and public consultation, provision of adequate training and support for RIA authors and ensuring that the results of RIA are properly communicated to decision-makers.

10. In this context, it is important to assess that methodological issues are addressed properly and consistently to support coherence in policy making. As a result, this report focuses specifically on methodological issues in relation to RIA. However, the methodological aspects of RIA cannot be strictly separated from some of the systemic issues. A number of the methodological issues discussed in this paper have implications for the systemic application of RIA. While this paper focuses on a detailed analysis of RIA methodological issues, improvements to RIA methodology cannot be implemented without regard to systemic issues.

11. The methodological issues included in the paper have been chosen because of their substantial impact on the overall quality of RIA – and therefore of the resulting regulatory proposals – and, in many cases, because of the complexities and controversies that surround these issues.

12. The paper is intended to:

- Summarise similarities and differences in current methodological approaches and identify common practices and trends.
- In particular, identify differences in approach to benefit/cost analysis.
- Highlight key conceptual issues underlying differences in country practices.
- Highlight key issues for the formulation of best practice methodological guidance; and
- Consider what methodological issues should be included in such guidance.

13. Consistent with the above, Annex 1 contains a set of draft guidelines on RIA methodological guidance for consideration.

14. This paper has been prepared on the basis of a detailed review and analysis of relevant, available documents from a range of OECD member countries. These documents largely comprise RIA guidance documents and Benefit/Cost Analysis (BCA) guidance documents published by member country governments. Given linguistic access issues, RIA guidance documents from Australia, Canada, Ireland, New Zealand, the United Kingdom and the United States were reviewed. In addition, guidance documents on the use of BCA in the public sector context produced by finance ministries in a number of these countries was reviewed. Finally, a recent document stating French policy on the use of the discount rate in the public sector context was reviewed. A full list of the documents reviewed is contained in the bibliography. It may be the case that relevant material is also in the RIA guidance documents of other countries, but could not be fully exploited due to these linguistic limitations.

Box 1. Updating references to guidance documents analysed

Updated versions of the Australian and New Zealand RIA guides have been published since the drafting of the initial version of this paper was completed.[1] In addition, a New Zealand Treasury BCA guide has been identified. References to the Australian RIA guide have, accordingly, been updated in this revised version of the paper, while appropriate reference has been added to the New Zealand BCA guide.

However, references to the previous edition of the New Zealand guide have been maintained, following consultation with New Zealand regulatory reform officials. This reflects the nature of the specific changes made to the New Zealand guidance material. Specifically, the new RIA guide deliberately moves away from providing detailed methodological guidance in order to provide a guidebook that is more accessible to regulators and, hence, more likely to be consulted systematically. Thus, the RIA guidebook now focuses more on process and policy issues, while methodological guidance is provided directly to regulators by the Ministry of Economic Development and via the use of the Treasury BCA guide.

Given that a purpose of this paper is to highlight country practices and compare and contrast these in order to identify good practices, it is considered appropriate to retain the references to the methodological discussions contained in the 1999 New Zealand guide. This edition of the guide remains available from the MED as archived material.

1. The EU RIA guidebook is also currently under review. However, the new edition was not available at the time of writing, November 2007.

15. Data requests were also sent to a range of other member countries that had expressed an interest. In response, material relevant to RIA methodology received from Belgium, Denmark, Germany and Norway has been referenced where possible.[1] While the analysis is derived from a minority of countries, many of these countries have implemented regulatory impact analysis early on, and have therefore significant experience with the methodological aspects of RIA.

16. The analysis contained in this paper may provide specific guidance on the refinement of methodological approaches in key areas for some countries. The paper may also serve to highlight methodological issues that will require particular attention as countries further develop their RIA requirements. More generally, the focus of this paper is on facilitating enhanced methodological approaches in areas that are best able to contribute to improved policy outcomes: better methodologies imply better analysis and, consequently, better quality regulation.

17. There may also be benefits in encouraging greater consistency in RIA analytical methods and approaches between jurisdictions. To the extent that jurisdictions seek cross border regulatory co-operation as an aim, consistent analytical approaches should at least tend to reduce regulatory differences, notwithstanding the adoption within jurisdictions of different priorities and policy approaches.

18. The next four sections consider different aspects of RIA methodologies and the guidance provided by member countries. Section 2 looks at requirements and guidance in relation to the "threshold question" of whether to regulate. Section 3 considers general methodological requirements for conducting RIA. Section 4 looks specifically at a range of methodological issues in relation to benefit/cost analysis. Section 5 looks at the use of partial impact analysis and their relationship to the global analysis requirement.

2. Threshold questions

2.1. Overview

19. The decision as to whether regulation should be adopted properly belongs at the political level, with RIA constituting a means of providing relevant information to decision-makers in a systematic form. The 1995 OECD recommendation on regulatory quality,[2] and specifically the 10 point reference checklist which forms a part of it, includes a range of questions designed to both ensure that sound decision-making principles are followed and that appropriate regulatory development processes are followed that will lead to high quality information being provided to the decision-makers.

20. Questions 2 and 3 of the checklist ask "Is government action justified?" and "Is regulation the best form of government action?" These questions, which reflect an appropriate approach to decision-making in the light of the results of RIA, are also adapted in many RIA guidance documents as "threshold tests" that can also be applied to regulatory proposals at an early stage to enable a focus on whether a plausible rationale for regulatory intervention exists and what form that rationale takes. This approach can help to ensure that the problems that regulatory or other policy action seek to address are clearly and accurately defined and thereby increase the likelihood that the full range of feasible policy responses will be identified and subject to RIA. By contrast, if regulators are unable to articulate the general rationale for proposing policy action in a particular case (*i.e.,* is the problem market failure, a need to improve distributive equity, a need to address an unacceptable risk, etc), it is unlikely that a sound RIA can be developed to underpin the political decision-making process.

21. Among those RIA guidance documents that do provide substantial guidance in this area, the specific tests proposed or required vary significantly. From a best practice viewpoint, guidance in relation to threshold tests should highlight the full range of rationales for government intervention and provide guidance in relation to each. As an example, the Australian RIA guide attempts this approach:

> "Clearly define the problem, for example:
>
> - market failure (such as a lack of, or misleading information, presence of externalities or public goods, or use of excessive market power);
>
> - regulatory failure (such as a government imposed restriction on competition that is not in the public interest);
>
> - unacceptable hazard or risk (such as human health and safety hazards, person or entity bearing risk ill equipped to do so, or threat of damage to the physical environment); or
>
> - social goals/equity issues (such as individuals or groups being unable to access available market information, goods or services)." (OBPR, 2007, p. 58)

22. The identified rationales for regulation are much more broadly based than simply economic ("market failure") based approaches. It is notable, in particular, that the possibility of further regulatory action in response to past regulatory failure is explicitly cited as a possible rationale.

23. The accompanying text in the Australian RIA document requires regulators to assess the significance of the problem, including determining the magnitude of any risk being proposed as a rationale for regulation. It also proposes a test of whether there is a case for regulation or whether the problem is of "purely private interest". More unusually, the text proposes that the ability of existing regulation to deal with the issue, potentially by incorporating some modification, should be assessed, with preference given to modifying aspects of the existing regulatory structure, rather than adopting new regulation. This recommendation appears to have developed as a tool to limit regulatory inflation and enhance regulatory consistency by placing greater reliance on generalised regulatory approaches, rather than the use of regulation that is tailored to very specific circumstances.

24. As shown above, the Australian guide highlights a wide range of general rationales for regulatory intervention. Some guidance documents may still go further as is for example the case with the European Commission's RIA guidance document (2005). It proposes both economic (*i.e.*, market failure) based approaches to the threshold test and an assessment of whether there is a "Discrepancy between the fundamental goals of the Union and the existing Situation" (Annexes, p. 6). The guide enumerates 11 such "fundamental goals", most derived directly from EU treaties. These include broad economic goals (promoting sustainable economic development, competitiveness, a high level of employment, non-inflationary growth), social goals (promoting economic convergence & citizens' rights, reducing discrimination, strengthening social cohesion), environmental goals (protecting the environment, having regard to animal welfare) and foreign policy goals (promoting peace and international security).

25. The number and range of the "fundamental goals" cited in the EC document suggests a much broader approach to the question of the grounds on which regulation can be justified than the Australian formulation appears to contain. As a result, its ability to serve as a filter on regulatory proposals will be reduced.

26. Ireland adopts a combination of economic and "principles based" approaches to the threshold question. The RIA guidance document does not, in itself, address the threshold question at all. However, the 2004 White Paper "Regulating Better" identifies six principles of better regulation: necessity, effectiveness, proportionality, transparency, accountability and consistency. Of these, the principles of necessity and proportionality relate most directly to the threshold question. The guide's discussion of the necessity principle emphasises the importance of an evidence based approach to policy, as well as introducing principles of maximising competition and reducing red tape. The discussion of the proportionality principle effectively casts this in terms of the need to ensure that benefits outweigh costs and can therefore be seen as an economic threshold test.

27. Some of the RIA guidance documents prepared some time ago acknowledge the importance of the threshold issue, but provide little concrete guidance on how it is to be assessed. For example, Canada's guidance document (dating from 1992) highlights the questions "does a problem or risk exist" and "is government intervention justified," but goes no further in indicating how the answers to these problems should be derived.

28. The UK RIA guide does not refer explicitly to the threshold test, but highlights the need for a clear statement as to whether social, economic, environmental or equity concerns are being addressed and for quantification of the problem to be undertaken where possible, to assist in determining whether proposed responses are proportionate (UK Government, undated, Section 2). Notably, where the previous (2003) edition of the guide refers to a "risk assessment", this terminology has been removed and replaced with reference to the "rationale for government intervention."

29. The United States RIA guide (citing Executive order 12866) notes that:

> "Federal agencies should promulgate only such regulations as are required by law, are necessary to interpret the law, or are made necessary by compelling need, such as material failures of private markets to protect or improve the health and safety of the public, the environment, or the well being of the American people ..." (United States Government, 2003, pp. 3-4)

30. This construction appears to emphasise the economic rationale for regulation, given the highlighting of "material failures of private markets". However, the guide also states that:

> "Correcting market failures is a reason for regulation, but it is not the only reason. Other possible justifications include improving the functioning of government, removing distributional unfairness, or promoting privacy and personal freedom." (p. 4).

31. However, the limited application of the guidelines to subordinate legislation only is made apparent by the acknowledgement of the need to make regulations "required by law" or "necessary to interpret the law.

32. The New Zealand RIA guide (Ministry of Commerce, 1999) specifically requires that threshold testing be undertaken, although it provides limited guidance as to decision rules that should be followed in interpreting the test results. The guide largely focuses on market failure as a regulatory rationale, proposing in a "checklist" that the RIA document should include "discussion of why the market will not provide a satisfactory outcome (where this is not apparent)" (p. 5).

33. In sum, regulatory guidance documents appear generally to recognise the breadth of accepted rationales for regulation and, consequently, most discuss a range of potential justifications for regulation, rather than focusing solely or primarily on market failure. However, there are clear differences in emphasis between documents, as well as significant differences in the advice given under each of these headings. That said, most of the RIA guides analysed here give prominence to economic, or market failure, issues and to risk issues as being central to answering the "threshold question." Thus, the following considers these major elements in threshold testing in more detail.

2.2. Economic tests

34. Many guidance documents discuss the use of economic concepts to determine whether there is a likely case for government intervention. Necessarily, the range of economic rationales for government intervention discussed differs relatively little between guidance documents. For example, the Australian RIA guidance document identifies the following (OBPR, 2007, p. 60) and states that "any underlying market failure…should be identified" (*ibid*, p. 57):

- Monopoly and abuse of market power;
- Insufficient or inadequate information;
- Public goods;
- Externalities and spillovers.

35. The Australian guidance document does not require that these tests should necessarily be applied in establishing the case for regulation; rather, it introduces them by noting that:

> "Government action has often been justified in cases of 'market failure'." (p. 60)

36. As noted above, the EC's RIA guidance proposes both economic approaches to the threshold question and an alternative of assessing whether there is a "Discrepancy between the fundamental goals of the Union and the existing situation". The "Market Failures" section of the document notes that "the outcome of market forces may fall short of society's ideals for a number of reasons", identifying market prices not reflecting real costs to society (due to externalities), insufficient supply of public goods, missing or weak competition, non-existent or incomplete markets and imperfect information as sources of market failure.

37. As noted above, the New Zealand RIA guide largely focuses on market failure as a regulatory rationale. An appendix discusses common causes of market failure (externalities, imperfect competition, information problems, public goods). However, these are balanced by discussion of several sources of "government [*i.e.*, regulatory] failure". The guide clearly indicates that merely establishing the existence of market failure is insufficient to justify regulation, with the additional step of assessing the risk of government failure being required:

> "In developing options for government intervention, it is also important to consider the likelihood and nature of government failure..." (New Zealand Government, 1999, p. 24).

38. The Australian guide arguably makes the same point in an indirect fashion by highlighting "regulatory failure" as a potential rationale for further regulatory change (implicitly including deregulation).

39. The US guide highlights externalities, common property resources and public good, market power and inadequate or asymmetric information as major sources of market failure. Where market failure is considered the key rationale for regulation, RIA documents are required to identify the nature of the market failure and to describe it qualitatively and, where possible, quantitatively. As well, they are required to show that "government intervention will do more good than harm". This is, of course, essentially a positing of a "positive net benefit" rule in the context of benefit/cost analysis. Its importance in this context is as an indicator that the threshold test extends to consideration not only of whether there is a possible rationale for regulation, but of whether regulation can effectively deal with the problem identified. The guide also indicates a need to show that regulation at the Federal against the State level is the best way to solve the problem, thus arguably introducing what, in the European context, would be described as the "principle of subsidiarity".

40. In Canada, neither the regulatory policy, the regulatory process standards nor the RIA guide address the issue of market failure and how this economic test can or should be employed in meeting the general threshold tests (set out in the regulatory process management standards) of ensuring that there is evidence "that a problem has arisen, that government intervention is required and that new regulatory requirements are necessary." Even the guide to performing benefit/cost analysis in the regulatory context (Canadian Government, 1995) does not include a general discussion of market failure and its role in making the case for regulation.

2.3. Risk analysis

41. Risk analysis clearly forms part of the "threshold test" of whether government intervention, and specifically regulation, can be justified. However, risk analysis clearly has a wider role in RIA methodology, also constituting a key means of assessing alternative approaches and having a significant part in the analysis of the appropriate degree of regulatory stringency. Thus, the following discussion of risk analysis focuses specifically on the issue of using risk analysis as part of the threshold test. (Section 6, below, considers a wider range of technical issues in relation to the use of risk analysis in the RIA context).

Acceptable risk threshold

42. In conducting threshold tests, the key concept in relation to risk is the distinction between acceptable and unacceptable risks. As noted above, the Australian RIA guide identifies "unacceptable hazard or risk" as one of the standard rationales for regulatory intervention. Similarly, the New Zealand RIA guide (p. 5) states that risks should be identified and quantified where possible, as part of a demonstration that government intervention is justified. However, neither of these documents explicitly discusses the question of how to determine whether an identified risk falls within the "acceptable" range, much less identifies a specific risk level (or levels) as being acceptable.

43. It can be argued that the requirement to conduct risk analysis itself functions as some degree of assurance that regulatory responses will not be adopted where risks are so low as to be arguably "acceptable". In this view, the existence of a requirement to conduct an objective assessment of the risk will help to address the danger of regulation being adopted in response to highly inaccurate risk perceptions. However, without a clear set of statements about how the acceptability of various levels of risk is to be judged, subjective – or at least inconsistent – judgements would appear to be the inevitable result.

44. Nonetheless, very few RIA guidance documents or government risk publications provide clear statements about the threshold between acceptable and unacceptable risks (OECD, 2006). The thresholds proposed by the United Kingdom's Health and Safety Executive[3] were identified as a rare exception. These thresholds are as follows:

- Fatality risks of 1 in 1 million years should be regarded as broadly acceptable;
- Fatality risks of 1 in 10 000 years should be regarded as at the boundary between tolerable and unacceptable risks for members of the public who have a risk imposed upon them in the broader interests of society;
- Fatality risks of one in 1 000 years should be regarded as the boundary between tolerable and unacceptable risks for workers to voluntarily assume a risk.

45. The adoption of these thresholds by HSE would seem particularly important in practical terms, given the wide remit of that agency in relation to risk based regulation. That is, the publication of these guidelines should lead to the adoption of consistent approaches to risk assessment across the wide range of regulatory areas within the UK for which HSE has responsibility.

46. That said, there is some reason to question the extent to which these thresholds are actually being employed in practice in regulatory decision-making in the United Kingdom. It is notable that the major report on government management of risk issues (United Kingdom Government, 2006) does not cite the HSE acceptable risk thresholds, rather recommending that:

> "…by the end of 2007, each Department and agency with responsibility for regulation should work with the Better Regulation Executive and Better Regulation Commission to identify the principal risks they are protecting against and what short and longer-term outcomes their interventions are designed to achieve." (p. 43)

47. In this case there appears to be an inconsistency between government guidance documents on key methodological issues. This issue of consistency between guidance documents is highlighted further in other sections of this document and appears to constitute a significant challenge for RIA methodological guidance, where a multidisciplinary approach would help improve coherence and consistency in policy making.

48. Another example of an explicit acceptable risk threshold is that adopted by the United States Occupational Health and Safety Authority (OHSA). OHSA describes as a "significant risk" any hazard that implies a mortality risk of more than 1 in 1 000 over a 45 year working life (*i.e*., in effect, a risk of 1 in 45 000 years). The US Supreme Court has ruled that OHSA is not required to undertake BCA to justify its regulatory proposals and that it is entitled to rely instead on this significant risk concept. It can be noted that the significant risk threshold is rather lower than either that set in relation to workers or the general public by HSE.

49. The relative rarity of published "acceptable risk" thresholds may reflect a preference on the part of regulatory policy officials in most countries for adopting an explicit benefit/cost based approach to this risk, in preference to setting a threshold. For example, the Australian RIA guide argues that:

> "Government-legislated principles frequently call on departments and agencies to 'reduce overall risk' or 'prevent unreasonable risk'. However, achieving any level of risk reduction entails costs, and in reality individuals make decisions about the level of risk (versus the cost) they are prepared to accept every day. The achievement of zero risk is neither an appropriate, nor technically feasible, goal of government intervention.
>
> The aim of a RIS is to identify 'how much' risk is acceptable to society, and the cost that society is prepared to pay to achieve that. In the end, transparency and consultation are the best way of identifying this trade-off" (OBPR, 2007, p. 138).

50. This appears to be a less explicit formulation of the rule, propounded in the previous edition of the Australian guide, that stringency of risk-based regulation should be set at the point at which the marginal benefits and costs of further risk reduction are equated. This differs from a policy based on an acceptable risk threshold in that it effectively requires that risk reduction activity should still be undertaken, regardless of any "acceptable risk" threshold, to the extent that there is robust evidence that a positive net benefit would be generated.

51. Given acceptable risk thresholds such as those cited above, it seems likely as a practical matter that any conflict between these two approaches would be rare: *i.e.*, that cases in which a positive net benefit from undertaking risk reduction below an identified acceptable risk threshold would be extremely uncommon. However, at the level of principle, the pure "benefit/cost based" rule advocated in the Australian RIA guide can be seen as directly contrary to the notion of acceptable risk and to its employment as a key element in threshold testing. That is, the benefit/cost based approach adopts a purely utilitarian view of risk, requiring that risk reduction activity should always be undertaken where the expected benefit of so doing exceeds the expected cost, regardless of the severity of the *ex ante* risk.

52. By contrast, "acceptable risk" based approaches proceed from a view that implicitly sees a more limited scope for government intervention, with an underlying philosophical preference that citizens should be responsible for managing their own risk exposures as far as practicable. In this view, government intervenes only where the extent of the risk passes some threshold and, at least arguably, where citizens are not able to take effective private action to mitigate risks.

53. A clear exposition of the latter view appears in the recent report by the Better Regulation Commission (BRC, 2006), in which it is argued strongly that policies that fail to make clear that populations should bear the primary responsibility to make their own decisions on risk based issues will have wider costs to society that are likely to be extremely important. This view is based on the desirability, from broader social perspectives, of emphasising personal responsibility, as well as an acute consciousness of the limits to government capacity for regulatory (or other policy) action.

54. In comparing these two views it can be noted, firstly, that the pure benefit/cost based approach is clearly consistent with the general OECD view in favour of BCA as the core RIA methodology. At the same time, the work of the regulatory management and reform programme has also long highlighted the problem of regulatory inflation and the issue of the practical limits to governments' capacities to regulate – both factors which clearly underlie the "acceptable risk" based approach.

55. As the above discussion suggests, there is a degree of philosophical difference implicit in the contrast between approaches to risk that emphasise a dichotomy between "acceptable" and "unacceptable" risks and those that focus on a purely benefit/cost based approach. To the extent that this is so, it is clearly appropriate for RIA and general policy guidance to adopt different approaches in different countries. However, it is also likely that the use of the acceptable risk concept is, in part, used as a convenient means of seeking to distinguish between risks that are or are not likely to be susceptible to cost-effective policy action, without the need to undertake more detailed analysis.

2.4. Conclusions on threshold questions

56. As indicated in Section 2.1, above, RIA guidance on the issue of applying "threshold tests" identifies an extremely broad range of a potential rationales for government intervention generally, and regulations specifically. Some significant differences in coverage and emphasis between countries are visible. These may well reflect differences in legislative contexts and approaches, as well as institutional constraints imposed on the bodies in charge of the guidance documents, rather than underlying differences of view as to the circumstances in which regulation can be justified.

57. Moreover, notwithstanding this degree of difference between countries in terms of the rationales for intervention presented in their guidance documents, most of the individual documents reviewed advance a very broad range of potential rationales for regulation. Indeed, so broad is the range of conceptual rationales in many cases that they may not be very effective in guiding policy officials as to whether regulation may be justified in a particular instance.

58. This suggests that, if treatment of the "threshold test" issue is to form a useful part of RIA guidance documents, a significant rethinking of current approaches is necessary. Specifically, it appears that the discussion of the threshold tests may need to be integrated with a discussion of the characteristics of different policy tools, and their consequent merits in addressing different types of policy problems.

59. Such an approach would potentially allow the guidance documents to highlight in what precise circumstances regulation is, and is not, likely to constitute the most appropriate form of government intervention. By doing so, it may be possible to provide more precise guidance in relation to both the general threshold question of whether government intervention can be justified and the more specific formulation of this question: is regulation likely to constitute the most appropriate form of intervention.

3. Basic methodological requirements

60. In 2002, the OECD stated that:

> "The best practice is that a RIA system should require use of the benefit-cost principle for all regulatory decisions, but the form of analysis employed should be based on practical judgements about feasibility and cost." (p. 129)

61. It also pointed out that other RIA methodologies are essentially partial benefit-cost analyses. The use of BCA in OECD member countries RIA systems has steadily expanded and now reached a position in which it has, at least in formal terms, the dominant role, having been adopted by a majority of OECD countries that use RIA. Indeed, the seven RIA guides reviewed extensively in this paper all endorse the use of BCA as the preferred methodology for undertaking RIA. Norway also requires that BCA be used in RIA where feasible, although cost effectiveness analysis (CEA) is to be adopted where monetisation of benefits is found not to be feasible (Norwegian Government, 2005). Germany indicates that the use of BCA may be appropriate in some cases (German Government, 2005, p. 15).

62. However, OECD (2006) noted that a large proportion – probably a majority – of BCA continue to fail to quantify all major benefits and costs in monetary terms, largely as a result of data and/or analytical limitations. Thus, in practical terms, a range of other methods also continue to be routinely used in conducting RIA, reflecting a gap between the theoretical guidance and its implementation due to empirical constraints. This section briefly reviews the treatment of different methodologies in RIA guidance documents.

63. As a fundamental point, it should be underlined that the adoption of the "benefit/cost principle" implies that RIA should be comprehensive in nature. That is, all significant impacts should be brought within the scope of the analysis, whether they be economic, financial, social or environmental. There is arguably a common misconception that RIA, particularly that based on BCA, is primarily concerned with economic or financial impacts and does not give adequate weight to other factors. However, a distinction can be drawn between a "financial" analysis, which measures dollar impacts, and an "economic" analysis which, properly defined, includes all factors which are valued by people – necessarily incorporating environmental, social, distributional and other matters.

64. Of course, substantial difficulties arise in attempting to express these values in monetary terms and bring them within the framework of a formal BCA. It is for this reason that the concept of "soft benefit/cost analysis", which seeks a sophisticated integration of monetised and non-monetised impacts is increasingly prominent within the RIA debate. However, it is essential to recognise that, while the focus of much of the methodological discussion contained in this paper is on BCA-related issues, this does not imply that RIA practice in the countries studied favours those impacts that can be expressed in dollar terms over other impacts, including the environmental and social, which often cannot be so expressed. Equally, the OECD's identified best practices in relation to RIA continue to emphasise the need to take account of all important policy impacts, not simply those expressible in monetary terms.

3.1. Benefit/cost analysis

65. The results of successive OECD Regulatory Indicator Surveys show that BCA is increasingly the formal methodological requirement underpinning RIA within OECD countries, progressively supplanting more narrowly based analytical requirements.[4] This is consistent with the OECD's recommendation that the BCA principle should be used where feasible in conducting RIA. It should be noted that BCA, when applied appropriately in the regulatory context, attempts to take account of the full range of impacts, including environmental and social impacts, as well as financial (or "economic") impacts.

66. In the above context, it is unsurprising that all of the seven RIA guides reviewed extensively in this paper endorse BCA as the preferred RIA methodology, particularly given that there is a long history of RIA implementation in almost all of these countries.

67. In practical terms, however, the extent to which BCA can be adopted in practice, and guide actual regulatory decision-making depends crucially on both the technical expertise available within regulatory agencies and on the assistance provided by regulatory reform bodies. BCA is the only methodology theoretically capable of answering the fundamental question posed by welfare economics – would a particular policy intervention provide net benefits from the point of view of society as a whole. Its practical ability to do so depends on the extent to which sound quantitative estimates of benefits and costs can be derived.

68. As OECD (2006) points out, the formal adoption of BCA does ensure that the broadest possible approach is taken to RIA and therefore maximises the contribution of RIA to policy decision-making. However, given uncertainty and inadequate information, BCA must make underlying assumptions explicit and utilise tools such as sensitivity analyses in relation to the major variables. It must also ensure that quantitative and qualitative aspects of the analysis are appropriately integrated, so that factors that cannot be quantified are not effectively excluded from the analysis. Section 4 of this paper includes a discussion of the issue of indirect valuation techniques that can be used to increase the degree of quantification achieved in BCA. Section 3.4, below, discusses methodologies that can potentially assist in ensuring a better integration of qualitative and quantitative analysis and so enhance the ability of RIA to provide relevant and useful guidance to policy-makers in contexts in which major variables have not been able to be expressed in monetary terms.

3.2. Break even analysis

69. Arguably, break even analysis does not constitute a separate methodology. On one view, it is a subset of BCA, with the basic approach being to provide monetary estimates of costs and then determine what degree of effectiveness must be achieved by the regulatory intervention in order for a positive net benefit to be attained. It can be distinguished from cost effectiveness analysis (see below) in that, with BEA, the major area of uncertainty relates to regulatory effectiveness, whereas CEA is most likely to be used where the major area of uncertainty relates to the appropriate valuation of the identified benefit.

70. A BEA is thus likely to be used when a new regulatory approach is being implemented and there is little or no basis in previous experience upon which to make estimates of likely effectiveness – or else past experience suggests that levels of effectiveness vary widely in ways that are not easily predictable.

71. BEA receives surprisingly little attention in RIA guidance manuals, given the widespread recognition of the problem of predicting regulatory effectiveness. Arguably, the use of BEA to deal with this uncertainty represents an alternative, or supplement, to the conduct of sensitivity analysis and the limited attention given to BEA may be indicative of a preference for the sensitivity analysis approach.

72. That said, the two approaches differ in that BEA allows analysis of effectiveness in relation to only one variable to be undertaken, whereas sensitivity testing can be conducted across a range of key variables.

3.3. Cost effectiveness analysis

73. Cost effectiveness analysis involves comparing a range of policy options in terms of the respective costs of achieving a given outcome (or benefits). Given the general acceptance, on the countries whose RIA guidance has been reviewed, of the OECD position that BCA represents the "gold standard" for RIA, it is unsurprising that CEA is put forward in many guidance documents essentially as either a supplementary or alternative methodology to be used in particular circumstances. For example, the Australian guidance document states: (Australian Government, 2006a, C-6)

> "Cost-effectiveness analysis is a widely used alternative to CBA in circumstances where policy officers are unable to monetise the most important policy impact. It compares alternatives on the basis of the ratio of their costs and a single quantified, but not monetised, effectiveness measure, such as lives saved. It may be reasonable to use cost-effectiveness analysis if the effectiveness measure captures most of the policy's benefits."

74. In contrast to the previous edition of this guide, the key drawbacks of CEA are not identified. The 2006 edition of the Australian RIA guide argued:

> "Cost-effectiveness analysis does not provide an absolute criterion for accepting or rejecting options, and should not be used to aid decisions as to how much money or resources governments should allocate to a particular problem."

75. It is not clear why this additional guidance has been removed in the course of redrafting the guide.

76. The Irish RIA guidance document states the case for CEA and its drawbacks in similar terms:

> "Its drawbacks are that it does not provide any insights into the level of benefits which should be sought, or whether the desired benefits are worthwhile. Nor does it identify unanticipated or secondary impacts." (p. 78)

77. By contrast to the above approaches, the US RIA guide arguably places BCA and CEA on a broadly equivalent footing. Since 2005, all major rules have been required to be supported by both CEA and BCA wherever possible. However, the Office of Management and Budget states that it continues to believe that the use of BCA, using willingness to pay based valuations, is theoretically superior to the use of CEA.[5]The US RIA guide states that:

> "...you should prepare a CEA for all major rulemakings for which the primary benefits are improved public health and safety to the extent that a valid effectiveness measure can be developed to represent expected health and safety outcomes." (US Government, 2003, p. 9).

78. The US guide provides significantly greater detail than other guides reviewed for this paper on the appropriate use of CEA. In particular, it discusses the need for care in using cost-effectiveness results based on averages, arguing that these suffer from the same drawbacks as benefit/cost ratios ("The alternative that exhibits the smallest cost-effectiveness ratio may not be the best option, just as the alternative with the highest benefit-cost ratio is not always the one that maximises net benefits." (p. 11)) and counseling the use of incremental cost-effectiveness ratios as a means of preventing such problems, with successively more stringent options being analysed in order to assist in identifying the preferred option.

79. The US guide also notes that BCA and CEA are not mutually exclusive analytical tools. For example, it states that, where some benefits can be monetised while others cannot, the value of these monetised benefits should be subtracted from estimated gross costs to obtain a net cost figure, which can be used in assessing the cost-effectiveness of the proposal in relation to the non-monetisable dimension(s) of benefit. (p. 12)

80. It would appear that CEA is accepted as having a significant role in RIA in the US and as being able to yield important analytical insights. OMB notes that rule of thumb decision rules can be adopted for use with CEA, for example setting a benchmark cost-effectiveness figure of $X per life saved, or per QALY.[6] That said, there is also some suggestion that the prominence accorded to CEA stems in part from statutory limitations that exist on the use of BCA in some cases. The guide notes:

> "In undertaking these analyses, it is important to keep in mind the larger objective of analytical consistency in estimating benefits and costs across regulations and agencies, subject to statutory limitations. Failure to maintain such consistency may prevent achievement of the most risk reduction for a given level of resource expenditure. " (US Government, 2003, pp. 9-10).

81. The reference to the need to achieve analytical consistency "subject to statutory limitations" appears to reflect the fact that the regulatory mandates established in some legislation effectively prevent benefit-cost analysis being used as the basis for decision making but will allow CEA to be employed.

82. The EC guidance document (p. 42) suggests that CEA offers "a more relaxed approach to benefit measurement" and highlights the drawbacks of this methodology in very similar terms to the (2006) Australian guidance document. The New Zealand document is of note in providing a slightly different explanation of the circumstances in which it is appropriate to use CEA:

> "Cost effective analysis can be used on those occasions when Government specifies an objective below which it will not be willing to trade off other objectives. For example, in introducing competition to the Employers' Account of the ACC Scheme, it was agreed that claimant access to entitlements was not to be compromised by insurer insolvency. The appropriate mechanism for assessing options for achieving this objective then becomes cost effectiveness analysis. That is, the option expected to achieve the specified objective at least cost. Analysis of benefits, in this case, is not required." (p. 19)

83. Finally, Norway's handbook on socio-economic analysis (published by the Ministry of Finance) identifies "Cost-effect analysis" as an appropriate methodological tool. This approach is arguably a variant of cost-effectiveness analysis which explicitly seeks to account for the fact that different policy or regulatory options will rarely have exactly the same degree of effectiveness in addressing the policy problem, as required by pure CEA:

> "Sometimes various actions aimed at solving the same problem, have effects that are not identical. (…) In such cases one cannot simply chose the least-cost action. Measuring the costs in connection with a description of the effects of the various actions can anyway provide useful information to the decision-maker."[7]

84. Alternatively, this approach can be considered to amount to a partial BCA, in that it involves seeking to develop a qualitative assessment of the benefits attributable to different options and to compare these with identified costs. The explicit acknowledgement of this approach in the Norwegian guide suggests that a flexible approach to methodological issues which recognises feasibility constraints is generally taken in that country.

85. In sum, there appears to be broad consensus within the guidance documents reviewed to the effect that CEA is less preferred to BCA in cases where it is feasible to complete the latter. However, CEA can provide important analytical insights and is appropriately used in a range of circumstances, particularly where it is not considered practicable to take a BCA approach. Thus, CEA is seen as having a legitimate and important role in RIA, but one that is essentially subordinate to that of BCA.

3.4. Multi-criteria analysis

86. Multi criteria analysis may have a number of important advantages as a supplementary methodology to BCA or, in some cases, as an alternative. Some member countries have emphasised that distributional or other ethical factors may frequently be of such major importance in assessing regulatory options as to render the outcomes of BCA of secondary importance in choosing between alternatives. In such cases, MCA may provide an alternative means of achieving a systematic and objective analysis which is better able to account for distributional factors.

87. MCA may also provide a useful alternative when monetisation presents significant challenges. As discussed above, the quantification and expression in monetary terms of all major regulatory impacts continues to be a fundamental challenge to BCA, and RIA generally, despite decades of accumulated experience. While progress continues to be made in developing more sophisticated approaches to quantification and the estimation of market values, there will remain significant regulatory impacts that cannot reasonably be quantified and monetised. In this context, previous OECD publications (*e.g.*, OECD, 2002; OECD, 2006), as well as other policy analysts RIA (*e.g.*, Jacobs, 2006) have highlighted the importance of ensuring that important impacts are not effectively excluded from the analysis, simply because they cannot be quantified. Discussing this concept, the European Commission refers to "integrated analysis" in its RIA guidance, while Jacobs speaks of "soft benefit/cost analysis" (Jacobs, 2006, pp. 78-80, *et passim*).

88. However, while discussions of RIA increasingly highlight the need to integrate qualitative and quantitative analyses, there appears to be little guidance provided on how this can be achieved in practice, with no widely accepted methodological approach being identifiable. Multi-Criteria Analysis (MCA) appears to be the sole, partial exception in this regard. While it is apparently not yet widely discussed, four RIA guidance documents have been identified that highlight its potential utility and provide some discussion of when and how it should be used in the RIA context. All four of these guidance documents have been adopted in the past few years.

89. OECD (2006) pointed out that at least one Australian RIA guidance document (Victorian Government (2005, revised 2007) requires the use of multi-criteria analysis in all cases in which significant impacts are unable to be quantified in monetary terms. The Irish and EC RIA guides also discuss MCA and support its use in at least some circumstances although, unlike the Victorian RIA guide, they do not mandate the use of multi-criteria analysis in circumstances in which all major impacts are not able to be quantified in monetary terms. The New Zealand RIA guide only briefly mentions MCA, simply noting that it constitutes "one systematic technique that can be used to undertake this type of analysis within the overall CBA framework." (New Zealand Government, 1999, p. 12)

90. A key benefit of MCA that is usually cited is that it is a mechanism for *systematically* comparing the impact of different alternative policy responses in circumstances in which major identified impacts cannot be quantified. The Irish RIA guide discusses this methodology in some detail, presenting it as a relatively non-technical method to be used where there are substantial difficulties in monetising benefits or costs. It also states that the methodology should be used "where possible" in initial screening RIA. The discussion sets out the fundamentals of the approach as follows:

> "One technique which is often used is multi-criteria analysis (MCA). This involves the identification of the objectives behind a policy proposal as well as criteria which would indicate the achievement of these objectives. The various policy options are then compared as to which best meets the criteria identified and therefore are most likely to achieve the overall objectives." (pp. 45-46)

91. The Irish discussion of multi criteria analysis highlights the fact that this methodology can simultaneously incorporate both qualitative and quantitative elements. The Irish Government also provides training in the use of MCA to officials responsible for RIA.

92. The EU guide also highlights its use *in conjunction with* BCA or CEA as an appropriate means of combining quantitative and qualitative analysis. This is consistent with its emphasis on "integrated analysis," as indicated by the guide listing key advantages of this methodology as being that it "recognises the multi-dimensionality of sustainability" and "allows distributional issues and trade-offs to be highlighted." (p. 43)

93. The EU guide also highlights the fact that a number of different variants of MCA exist and cautions that this technique brings an element of subjectivity to the analysis, particularly where weightings of the different criteria are employed. It discusses the use of MCA in some detail and includes a detailed example (pp. 40-43).

94. While these examples suggest that several countries have embraced this methodology, several other recently adopted RIA guidance documents are silent on this mechanism. These include the new Australian guidance document (2007) and the US guidance document (2003). The UK RIA guidance document (undated) does not mention MCA either. However, the UK Treasury's Green Book does briefly discuss this methodology. Moreover, it is unique in providing a reference to a further document which deals extensively with the issue of MCA and places it in the context of other RIA methodologies.[8] This reference provides a much more detailed and technical discussion of MCA than that contained in any of the RIA guidance documents and, in so doing, implicitly raises the issue of the degree of sophistication that should be required where MCA is used in the RIA context.

95. If MCA is to become a core part of RIA methodology, it is likely that a medium term process of progressively developing expertise in this approach and disseminating it among policy officials will need to be undertaken, analogous to that which has occurred in respect of other RIA methodologies in most member countries. By contrast, there is a risk that an unsophisticated promotion of MCA as an easier alternative methodology in the RIA context could tend to undermine efforts to improve the rigour of BCA by increasing the extent of quantification of impacts.

96. The issue of the robustness of MCA is occasionally discussed in the guidance documents. The UK Treasury Green Book describes it as being a process of "weighting and scoring" and highlights the risk that certain criteria on which relatively high cost options score well will be weighted heavily by stakeholders who are most likely to benefit from them. It counsels that this risk should be "tempered by at least one stakeholder representing the opportunities that in an expensive solution would be foregone elsewhere."

97. More broadly, the risk that manipulation of the weightings applied to the different criteria will bias the outcome of the MCA toward one which would not otherwise be chosen is widely recognised. However, experience with the use of MCA in the State of Victoria (Australia) suggests that this risk may not, in practice, be particularly large: all RIA prepared in Victoria since mid-2004 have been required to utilise MCA whenever a fully quantified BCA has not been prepared. Victorian officials[9] have stated that the weightings employed in MCA have, in practice, rarely been determinant of the relative scores of the alternatives considered in the RIA. In some cases in which weightings have been employed, sensitivity analyses have been conducted on the basis of the use of different weightings (or no weightings) in order to

demonstrate this fact explicitly. Given these results, these officials are relatively confident in the robustness of MCA as used in practice in their jurisdiction.[10] Moreover, they argue that the use of MCA has ensured that a consistent methodological approach is taken to the analysis of a wide range of regulatory proposals.

98. A key benefit of the MCA approach is that of transparency: An MCA makes transparent to the reader the specific criteria according to which regulatory proposals and alternatives have been assessed and compared, the weight accorded to each and the assessed merits of each option in respect of each criterion. In this respect, it has a number of significant advantages over a purely qualitative, text based discussion of alternatives:

- It promotes a robust consultation process, allowing stakeholders to contest each of the judgments made by regulators in reaching their conclusions.

- It encourages consistency and rigour in the analytical process by requiring that objectives, weightings and performance are identified and assessed at a disaggregated level.

- It potentially provides better information to political decision-makers, as a result of both of the above effects.

99. Moreover, as noted by a Victorian regulatory policy official, MCA forms the basic methodology used in most major tender evaluations and in most recruitment processes. That is, it is a methodology that is widely used for evaluative purposes in government and in the wider economy. This suggests, *a priori*, its likely suitability in the RIA context, at least where benefits are not easily quantified and where multiple objectives exist.

100. As noted in OECD (2006), the MCA approach was originally derived in the context of the management literature and is therefore not at all specific to public policy. However, there appear to be no substantive aspects of this approach that limit its suitability to public policy applications. Certainly, the UK guide to MCA, noted above, cites no significant concerns in this regard, instead emphasising the need to match particular MCA methodologies to the appropriate problem types. Moreover, review of this material indicates the complexity and sophistication of some approaches to MCA and is suggestive of its potential power as a decision tool in areas in which significant impacts are not amenable to quantitative analysis.

101. That said, it is clear that MCA remains essentially a supplement to BCA and other, more quantitative methodologies. As noted in the UK MCA guide:

> "[MCA is] in many respects an 'alternative' to defining monetary values for all the major costs and benefits *when this is impractical*. However MCA must not be seen as a short cut, or as an easier technique for inexperienced people to use. The use of these techniques is in important ways more demanding of experience and good training than the use of CEA … or of CBA…" [emphasis added]**,** (p. 8)

102. In sum, while many or most RIA guidance documents emphasise the importance of providing a detailed, high quality qualitative analysis of impacts that cannot be quantified, little usable guidance on how to comply with these injunctions is provided, other than the material on MCA discussed above. This constitutes a significant gap in the available guidance which should be addressed as a matter of priority.

103. An important question is whether the absence of usable guidance in this area reflects a lack of clearly formulated views on the part of regulatory reform officials as to preferred approaches to conducting qualitative analysis and integrating this analysis with quantitative analytical elements. The issue of whether

MCA should be actively promoted in the RIA context must be considered within this broader context of what alternatives exist for conducting sophisticated and systematic qualitative analyses and integrating them with quantitative elements.

3.5. Conclusions on methodologies

104. The OECD has previously stated as best practice that the benefit/cost principle should drive all regulatory decisions. All seven of the RIA guidance documents analysed for this paper recommend the use of BCA as the preferred RIA methodology, and they are consistent with this identified best practice.

105. The approaches taken to discussing the contexts in which cost-effectiveness analysis might constitute an appropriate alternative methodology also appear generally to be sound, placing significant stress in most cases on the disadvantages of using these methodology and the need, therefore, to ensure that it is adopted only where the use of BCA has been clearly established to be infeasible.

106. However, guidance on the use of break even analysis is largely absent from the documents analysed. This may reflect a view that break even analysis can be considered to constitute a form of cost effectiveness analysis. There would arguably be significant benefits in identifying break even analysis as a separate methodological approach and highlighting its potential uses to regulators.

107. The second major area in which RIA documents' current treatment of methodological approaches is clearly lacking is in providing practical advice on how to conduct qualitative analysis in a systematic and objective manner and how to integrate qualitative and quantitative elements in the analytical process. In this context, Multi-Criteria Analysis appears as an appropriate methodology. The question of whether its use should be mandated in cases in which benefits and costs are not fully quantified (as in Victoria, Australia) should also be considered.

108. To the extent that MCA is promoted, consideration also needs to be given to the specific guidance to be provided regarding this methodology: given its wide-ranging uses, the issue of what form it should appropriately take to make it most suitable to the specific context of regulatory decision-making requires consideration. Finally, while regulatory reform officials frequently have well-developed skills in BCA and related methodologies, it is not clear that they commonly have equivalent skills in the technicalities of MCA. Thus, if MCA is to be promoted in the way indicated above, attention would need to be given to ensuring that reform officials had sufficient relevant skills to both ensure the provision of adequate training to regulators and conduct adequate quality control.

4. BCA methodological elements

4.1. Overview

109. Benefit/cost analysis is a well developed and widely accepted methodological tool. Given this, there would seem *a priori* to be little reason to expect that major methodological differences would be observed in terms of countries' RIA guidance materials, their general BCA guidance documents or their RIA practice more generally.

110. However, review of the seven countries' guidance documents indicates that there are areas of significant difference. At least three explanations for this can be advanced. First, while BCA is generally a well-developed methodology, its application to the regulatory context is specific in some respects (*e.g.*, in relation to issues relating to the discount rate, or to acceptable risk) and its use in this specific context is less well-established.

111. Second, RIA guidance on BCA is often relatively cursory (in the interests of producing generally accessible material) and often does not provide references to other, more authoritative sources. Related to this, there is often no officially endorsed source of detailed BCA guidance. Thus, the problem in some instances is that guidance material does not address important methodological issues, or addresses them in insufficient depth.

112. Third, and perhaps most obviously, different methodological guidance may reflect real differences in preferences and/or values between countries. To the extent that differences are attributable to this third explanation, there is clearly no reason to believe that there will or should be convergence over time.

113. The following discussion of specific BCA related methodological elements focuses on BCA guidance provided in the context of RIA guidance material and in documents published by governments that provide guidance on using BCA in broader contexts. Differences between RIA and BCA guidance documents have been highlighted in some cases, as have instances in which RIA guidance fails to refer the reader to the more detailed guidance provided in general BCA guides.

4.2. Valuation methodologies

114. The difficulties encountered in quantifying and monetising the benefits and costs associated with regulatory proposals are widely acknowledged within the RIA literature. It is likely that recognition of the extent of these difficulties explains, at least in part, the fact that RIA guidance in many OECD countries does not explicitly require that regulatory benefits and costs be quantified. However, as suggested in OECD (2006, pp. 14-15), the contribution of RIA to policy decision-making will be maximised if attempts at quantification are made wherever possible – even in the presence of significant uncertainty – provided that the underlying assumptions and assessment are made explicit and appropriate sensitivity analysis is also incorporated.

115. If regulators responsible for RIA are to be encouraged to quantify regulatory impacts wherever possible, RIA guidance documents clearly need to provide substantial information on the range of valuation methodologies that are available. These are, for the most part, quite well established in the economics literature, a fact that is reflected in the generally similar set of methods discussed where this issue is treated in RIA guidance documents. A (non-exhaustive) list of valuation methodologies that may be appropriately used, at least in some cases, in the RIA context includes the following:

Stated preference methods:

- contingent valuation
- choice modelling

Revealed preference methods:

- travel cost studies
- hedonic price studies
- defensive expenditures

116. Review of available RIA documents suggests that relatively few include substantial information on valuation methodologies. However, in those countries where more specialised guides to the conduct of BCA within policy contexts are published, most include detailed guidance on these points. RIA documents sometimes explicitly reference the specialised BCA guides for this purpose. In other cases, more general advice is given that specialist economic expertise should be sought.

117. For example, the UK RIA guidance document identifies a range of valuation techniques in general terms, but does not provide any explanation of their use or merits. It recommends that "In the absence of prices, you should, in consultation with departmental economists, consider if monetary quantification using economic valuation techniques is possible." It also cites the Treasury Green Book (United Kingdom Government, undated, a), which contains extensive discussion of valuation methodologies. However, the citation to the Green Book lists this source as only one among a "wide range of sources of information" that are available, rather than indicating that there is any presumption that approaches consistent with it should be adopted.

118. The Australian RIA guide includes a brief discussion of valuation methodologies within its main text, as well as devoting a substantial part of an appendix to this issue (pp. 79-80, Appendix B-2). The Department of Finance and Administration's *Handbook of Cost-Benefit Analysis* provides significant additional detail but, consistent with the UK practice noted above, is cited only as a source of "further reading", rather than as having any particular authority.

119. The US RIA guide includes a relatively detailed discussion of valuation methods (pp. 20-26), which divides these methods into categories of revealed preference, stated preference and benefit transfer approaches. It does not explicitly reference any other, more specialised material as a source of additional guidance. The Irish RIA guide includes no discussion of valuation techniques and does not refer to any other Irish sources of specialist advice on BCA. It provides general references to some BCA guidance material from other countries (notably the UK Treasury Green Book), but does not highlight their coverage of valuation techniques.

120. The 1999 New Zealand RIA guide provides a single page appendix which identifies a range of valuation techniques and provides brief explanations of the purposes of each. However, no specific reference is made to sources of further information on these issues. The general bibliography identifies the Australian BCA guide as a source of guidance on BCA matters generally.

121. The EC RIA guide includes a brief section on assessing and monetising non-market impacts (pp. 37-8) and, like the US RIA guide and the Australian BCA guide, focuses on the basic distinction between revealed preference and stated preference approaches. Unlike the Australian guide, it does not indicate any general view in favour of the former approach. No references to more detailed guidance are contained in the EC guide.

Conclusions

122. Given the fundamental importance to BCA quality of maximising the extent of quantification and monetisation of regulatory impacts, RIA guidance documents will be more helpful if they alert the reader to the fact that a range of valuation methodologies is available to assist in this task. A number of the guidance documents reviewed here do not offer this information. This omission could be, clearly, relatively easily remedied, particularly given the well-established nature of the different methodologies and high degree of consensus on their relative merits.

123. A second basic requirement in this regard is that the RIA guide should contain a statement of what is expected in relation to the use of these valuation methodologies. Arguably, RIA guidance could indicate an expectation that consideration be given to available methodologies for valuing non-market impacts and that the rationale for those chosen (or for not adopting any such methodologies[11]) should also be made explicit in the RIA document.

124. As demonstrated by a number of the RIA guidance documents discussed above, it is feasible to provide an introduction to a range of these methodologies and their essential characteristics, even where the focus is on generalist audiences. It is almost certainly not feasible to incorporate detailed discussions of these methodologies in the RIA guides. However, where more specialised BCA guidance documents have been produced, as in a minority of the countries reviewed above, these should clearly be referenced in the RIA guides. Current practices in this area are variable, with one concern being that even where such specialist guides exist, they are often referenced in only general terms (rather than their discussions of specific issues, such as valuation methods, being highlighted) and are not presented as being authoritative, or required to be used.

125. A positive element is that, where specialist BCA guides have not been produced, some countries have demonstrated willingness to reference those of neighbouring countries (*e.g.*, Ireland & the United Kingdom, New Zealand and Australia[12]). Another positive observation is that works with a more general perspective are also sometimes cited, *e.g.*, academic works on BCA that do not relate specifically to its use in the government policy context.

4.3. Discount rates

126. Discounting is fundamental to BCA methodology, yet OECD (2006) demonstrated that there is considerable divergence between member countries in terms of the guidance provided on this issue. This divergence is evident both in terms of the specific rates recommended (or the absence of such recommendations) and in terms of the conceptual rationale advanced for the choice of discount rates.

Recommended discount rates

127. Specific discount rates recommended in countries' RIA guidance documents, or related materials, include the following:

- France *requires* a 4% real discount rate to be used[13]. Prior to 2005, an 8% rate was required.
- Denmark *requires* a 6% real discount rate to be used.[14]
- The State of Victoria (Australia) *recommends* that the real 10 year government bond rate (currently 3.5%) be used. Previously a 5% real rate was recommended.
- The EC *recommends* a real discount rate of 4%.
- Norway *recommends* a real discount rate of 4% in most cases, with higher rates to be used in cases involving substantial "systemic risk."
- Ireland *recommended* a base rate of 5% real prior to 2005 and now *recommends* an "official discount rate" equal to the cost of government borrowing.
- The United States *recommends* a real discount rate of 7%, but also requires a sensitivity analysis to be conducted using a 3% discount rate.[15]

- Australia *"suggests"* a real discount rate of 7% be used, with sensitivity testing at 3% and 11%.

- Canada's BCA guide for regulation *recommends* that a default (real) social discount rate of 10% should be used (citing a Treasury Board BCA guide, published in 1976), with sensitivity analyses conducted at 5% and 15%.

- New Zealand's 1999 RIA guide recommends different approaches to setting discount rates for different purposes. It notes that where government expenditure is concerned, the long term bond rate is appropriate, reports a survey showing people's expressed preferences translate to a discount rate of 5-7% in respect of avoidance of death and injury and argues that much lower rates may be justifiable in relation to long-term environmental issues. It does not specifically indicate a preferred approach for regulatory purposes.

- By contrast, New Zealand's 2007 RIA guide does not address the issue of the appropriate discount rate. This issue is, instead, dealt with in the Treasury BCA Primer (2005), which argues that different rates are appropriate to different projects (or, by extension, regulations), dependent on assessed risk. However, it also notes that Treasury uses a benchmark rate of 10% "wherever there is no other agreed sector discount rate for costing policy proposals" (NZ Government 2005, p. 27).

- The United Kingdom RIA guide simply suggests that departmental economists be approached for guidance on setting the discount rate and the time horizon. It fails to reference the Treasury Green Book, even though this sets out specific recommended rates, including a 3.5% real discount rate for time horizons of 1 – 30 years (see below).

128. These examples demonstrate, firstly, that member countries vary widely in terms of the degree of consistency they require (*i.e.*, between different RIA) in the discount rate used. While some require or strongly recommend a single rate, others accept rates within a given range and a few provide conceptual guidance but do not specifically nominate an acceptable range at all. Others still specifically indicate that different rates can and should be used in respect of different regulatory proposals.

129. A notable element is the number of RIA guidance documents that refer regulators to the Department of Finance or other sources of expertise for guidance. This corresponds to a shift in responsibility. It would seem more effective for regulatory policy officials to assimilate general government guidance on project appraisal, including the appropriate discount rate(s) to be used, in consultation with the Finance ministry and integrate this in the context of RIA guidance.

130. Secondly, the extent of the divergence between recommended discount rates in member countries is great, with a range of 3.5% to 10% (in real terms) being apparent within this relatively small sample. The difference between these rates is likely to be substantial in terms of their impact on a long-term regulatory proposal characterised by significant differences between the timing of benefits and costs. As discussed in OECD (2006), higher discount rates will tend to reduce the number of regulatory proposals able to demonstrate a positive NPV, given that regulation is most commonly characterised by a preponderance of costs being incurred in the early years following implementation, while benefits are weighted more towards later years.

131. Divergence between countries in terms of recommended discount rates is not necessarily problematic – to the extent that the rate is intended to reflect the social rate of time preference (see below), real differences between countries in this rate should be reflected in different recommended RIA discount rates. The extent of the observed differences may be less reflective of real differences in the social rate of time preference and more related to differing views on the appropriate conceptual basis for setting discount rates.

Conceptual issues

132. The BCA literature generally highlights two conceptual rationales that can be used as the basis for selecting discount rates: the social rate of time preference and the opportunity cost of capital. RIA guidance in some countries is silent on the conceptual rationale for the recommended discount rate, impeding analysis of the reasons for different rates being recommended. However, others indicate a different view on this issue. The US guidance document provides a general conceptual basis for approaching the setting of discount rates as follows:

> "The analytically preferred method of handling temporal differences between benefits and costs is to adjust all the benefits and costs to reflect their value in equivalent units of consumption and to discount them at the rate consumers and savers would normally use in discounting future consumption benefits. This is sometimes called the "shadow price" approach to discounting because doing such calculations requires you to value benefits and costs using shadow prices, especially for capital goods, to correct for market distortions." (p. 33)

133. The guide goes on to highlight the practical difficulty of this task, before recommending that a real discount rate of 7% should be used as a base-case for regulatory analysis and stating that "The 7% rate is an estimate of the average before-tax rate of return to private capital in the U.S. economy." (*ibid*.) The guide then notes that:

> "The effects of regulation do not always fall exclusively or primarily on the allocation of capital. When regulation primarily and directly affects private consumption (*e.g.*, through higher consumer prices for goods and services), a lower discount rate is appropriate. The alternative most often used is sometimes called the social rate of time preference."

134. The guide identifies a 3% discount rate as the appropriate proxy for the social rate of time preference. It then states that RIA should be conducted using both the 3% and 7% discount rates, notwithstanding that it has identified the 7% rate as the appropriate "base case".Thus, the US guide appears to argue that the opportunity cost of capital approach is generally preferable, but that an alternative (or sensitivity analysis) based on the social rate of time preference should also be performed.

135. Norway similarly indicates that the discount rate should be set equal to the rate of return that a private investor would require in order to embark on a project with similar risk characteristics. It regards its recommended "standard" discount rate of 4% as comprising a risk free rate of return of 2% and a risk premium equal to 2%.[16]

136. The new Australian RIA guide argues that the appropriate discount rate is the social opportunity cost of capital and that this amount is conceptually derived as the weighted average return on different sources of capital, with the weights being given by "the proportion of funds drawn from each source" to fund regulatory compliance expenditures. (OBPR, 2007, p. 130). The suggested 7% real rate of return is calculated as follows:

> "estimates of the real before-tax market return on investment in Australia are at least 8%, the real after-tax return to consumers at least 6%, and the marginal cost of foreign funds at least 5%. Using these bottom-of-the-range numbers, plausible weights on the sources of capital give a weighted average discount rate of between 6.5 and 7.5%." (*ibid*)

137. Thus, the current Australian RIA guide adopts a similar conceptual approach to its US equivalent and, interestingly, also recommends the same base case discount rate. This represents a significant change from the approach adopted in the 2006 edition of the Australian guide. In that edition, no recommendation was made as to whether the social rate of time preference or opportunity cost of capital approaches should be preferred and, concomitantly, no recommended value for the discount rate was provided. This constitutes a significant step forward in terms of the provision of clear methodological guidance to regulators and ensuring consistency in methodology between RIA.

138. It is arguable that the costs of capital measures are themselves proxies for the social discount rate. However, the question of whether the implicit risk premium involved should be applied to regulatory expenditures (in preference to a "risk free" social discount rate based on the long-term bond rate) necessarily arises, as does the issue of whether the post-tax rate of return should be preferred to the pre-tax rate.[17]

139. The approach taken in the US and Australian RIA guides inevitably includes an allowance for market risk in the calculation of the base case discount rate. By contrast, the new RIA guidance issued in the State of Victoria (Australia) states that the discount rate used should be the real risk-free opportunity cost of capital, as estimated by the Finance Ministry for use in the public/private partnerships context (Victorian Government, 2007, pp. 5-16. As noted above, this rate is currently 3.5%). The conceptual issue underlying the choice of whether to include allowance for market risk in selecting the discount rate is not discussed explicitly in either RIA guide. However, at least one other published Australian Government source does discuss this issue in some detail. This discussion (BTRE, 1999, pp. 73-77) concludes with the statement that:

> "BCAs should make some allowance for risk,[18] because people tend to be risk-averse. However, raising the discount rate is a crude allowance that can introduce other distortions to the analysis. Researchers should be seeking to develop better allowances that are also practical."

140. However, this injunction clearly fails to provide any more useful practical guidance on the issue than does the RIA guidebook, since the policy-maker is presumably to fall back on the adoption of a premium for market risk in the absence of better alternatives having been derived by "researchers." This approach appears to have been adopted in formulating the advice contained in the current Australian RIA guide.

141. The New Zealand BCA guide states that the discount rate represents the sum of the social rate of time preference and an allowance for the risk that "a future dollar will not be received" (p. 27). Similarly, the 1999 New Zealand RIA guide (p. 16) argues that the discount rate should reflect the sum of the social rate of time preference, uncertainty and inflation (the latter obviously being irrelevant where real discount rates are considered). However, it appears to favour a "sector specific" discount rate in some cases, at least, noting that effective discount rates of 5-7% have been estimated via survey results of the population in relation to health and safety related issues.

142. The EU is essentially silent on the conceptual issue underlying the choice of the discount rate, although the RIA guidelines refer to the "social" discount rate – suggesting that a social rate of time preference concept may underlie their recommendations.

Inclusion of risk premiums

143. The above discussion raises the possibility that a major factor explaining the difference between the lower recommended discount rates (*i.e.,* 3.5% to 5%) and the higher recommended rates (*i.e.,* 7% to 10%) is the question of whether a risk premium is used in the calculation of a rate. Where the rate is based on the concept of a social rate of time preference, a risk premium is clearly not applied. There appears to be a divergence in views as to whether a risk premium ought to be included when calculating a discount rate on the basis of a notional opportunity cost of capital: for example, the Victorian guide includes no allowance for risk, while the Australian, Norwegian and the US guides do include an allowance for market risk.

144. In this context, it is important to distinguish between "market" and "non-market" risk. Another Australian BCA guide distinguishes between these two concepts as follows:

> "Market risk stems from unanticipated fluctuations in the overall state of the economy. Such fluctuations affect the returns to investments generally, including transport facilities. Non-market risk, on the other hand, stems from factors that are more specific to particular investments." (BTRE, 1999, p. 74)

145. As noted above, it argues that it may be appropriate to allow for market risks, but that non-market risks should be dealt with through the use of sensitivity analysis, since the use of the discount rate to make allowance for these risks introduces the possibility of significant distortions being brought into the analysis.[19]

146. Conceptually, proposed regulatory expenditures compete for scarce resources with private investments. In all cases, decisions about whether to undertake private investments effectively include a risk premium. Differing views appear to be expressed in the literature as to whether regulatory expenditures imply lesser risks, on average, then do private investments. However, there can be little doubt that significant risks are inherent in most regulation.

147. The BTRE view, cited above, can be paraphrased as being that these risks should be accounted for in one way or another in BCA and that, in the absence of a superior alternative, the discount rate should be adjusted to include an allowance for risk.

Box 2. Conceptual approach to the discount rate in France

The French approach to the determination of the discount rate to be used for assessing public investments is based on a distinct conceptual approach. The basis for determining the rate is the addition of the values of three variables: the "pure" rate of time preference,[1] the elasticity of the marginal utility of consumption and the rate of growth of *per capita* consumption. These values have been estimated at 1%, 2% and 2% respectively.

However, while this suggests a real discount rate of 5%, other factors have also been taken into account. These include uncertainty as to the rate of growth of per capita consumption and the need to ensure that the discount rate used for public sector purposes does not depart significantly from that adopted by the market (which is estimated at 3-4% in real terms). Taking account of these factors, a rate of 4% was determined.

This rate is substantially lower than the 8% rate used from 1985-2005. Several factors were identified as contributing to the need to adopt a substantially lower rate. In general terms, the major contextual factors were identified as European integration, globalisation and freer international movement of capital. Specific contributing factors identified included significant reductions in real interest rates, increasing uncertainty over future rates of economic growth, a reduction in the "pure" rate of time preference and a substantial reduction in the extent of the "crowding out" of private investments by public investments, due to freer international movements of capital.

1. The appropriateness of including this factor is regarded as debatable in the French document.

Source: CGdP (2005), p. 37, pp. 77-81.

148. In the absence of a clear argument in favour of the proposition that regulation entails lesser risks than do private investments, the benchmark risk premium should probably equate to the concept of the "general market risk," as discussed in the Australian BCA guidance cited above.

Social vs. "sector specific" discount rates

149. The RIA guidance documents reviewed for this paper are largely silent on the conceptual issue of whether a single discount rate or varying discount rates should be used. The special case of whether lower discount rates should be used in respect of proposals with longer time horizons is considered below. However, in the more common case, the question arises whether it is more appropriate to adopt a rate that reflects a "whole of society" estimate of the time rate of preference or opportunity cost of capital, or whether attempts should be made to determine a "sector specific" value for one or other of these variables.

150. The latter view appears to imply that the rates used would need to be aligned with those experienced by the party or parties paying the main part of the regulatory cost or, alternatively, the party receiving the main part of the regulatory benefits. To do so might be considered to yield a theoretically superior outcome. However, at the practical level there would be no means of adopting this approach. Moreover, it appears quite likely that an attempt to do so would be extremely controversial. An alternative justification of adopting differential rates might be that regulatory proposals involving higher risk should have higher discount rates applied to them.

151. However, the BTRE view, cited above, strongly suggests that alternative treatments of these kinds of risks will create less risk of distortions being introduced to the analysis. Similarly, it was argued in OECD (2006) that the preferred means of dealing with this issue is to apply sensitivity analysis to the major uncertain variables. This view is coherent with the various RIA guides which, on the one hand do not propose differential rates for different regulations but, on the other, frequently emphasise the need to conduct sensitivity analysis.

152. The use of a single discount rate can thus be defended on practical as well as conceptual grounds. Practically, it arguably represents the only feasible approach. Conceptually, the single discount rate represents the averaging of all the private discount rates. While its application in specific regulatory contexts may not be consistent with the discount rates of the affected parties, these "errors" are expected to be randomly distributed when the range of regulatory interventions is considered as a whole.

153. One document which does deal specifically with the question of whether differential discount rates should be adopted is the French guide on discount rates (CGdP, 2005). This document states that a single discount rate should be adopted, reasoning that:

> The discount rate, which expresses the effort that society is prepared to make to prepare for the future cannot vary from one sector to the other. To accept different rates would destroy the transparency and coherence that this method offers. Public investments should be evaluated according to the same rules. If certain sectors seem to require a specific approach, this should be achieved through direct adjustments to the valuations of benefits and costs associated with the project and not by manipulation of the discount rate (CGdP, 2005, p. 73).

Varying discount rates with the time horizon

154. An apparently increasing number of RIA and BCA guidance documents argue for the adoption of lower discount rates in respect of projects with very long time horizons. It might be speculated that this approach responds in part to the critique of BCA from environmentalists and others who argue that it systematically favours short-term perspectives in policy-making. However, a number of different conceptual views are advanced in favour of this proposition – some more generalised, while other appear to relate specifically to the environmental context.

155. The 1999 New Zealand RIA guide, arguing that lower discount rates may reasonably be applied to long-term projects in the environmental context states that:

> "…it may be possible to justify applying much lower discount rates to environmental values in the expectation that 1) as people become wealthier; and 2) the extent and nature of the environment decline, people in the future can be expected to place greater value on the natural environment." (p. 17)

156. While both propositions appear plausible in themselves, their use to justify adopting a lower discount rate seems conceptually equivalent to estimating future social utility functions and postulating future relative prices accordingly. Considered alternatively: this approach does not simply posit that the real price of environmental goods is likely to increase in future, but that their *relative* price is also likely to rise. However, while increased relative scarcity (plausible, though not inevitable) would underpin such a speculation, increased wealth would not.

157. Notably, current New Zealand guidance on this topic is less accepting of the use of lower discount rates for very long-term projects. While the BCA guide notes that some sources recommend using lower rates if the appraisal of the project depends materially on the valuation of very long term effects, citing the UK Treasury Green Book in this respect, it concludes that "It is anticipated that, in New Zealand, lower discount rates would be used only in exceptional circumstances". (New Zealand Government, 2005, pp. 28-29).

158. The EU RIA guidance document similarly argues (Appendices, p. 39) that, where very long time horizons are concerned, the application of lower discount rates "might be justified by the longer-term implications of sustainable development and in particular, the need to take proper account of the preferences of future generations." Interestingly, in neither of the above cases is any specific, lower discount rate proposed or recommended.

159. The French guidance on the public sector discount rate also supports the use of a declining discount rate for analyses with time horizons longer than 30 years. Its recommendation is for rates declining from 4% at 30 years to a minimum of 2%, although it does not recommend any specific set of rates for particular time-horizons. In common with the New Zealand guide, the French document argues that the relative price of environmental goods is likely to rise over time as their scarcity increases. However, contrary to the New Zealand view, the French guide explicitly argues that this does not constitute a justification for using a declining discount rate – rather, this effect should be taken into account by directly incorporating higher values for environmental goods into the present value calculations.

160. Rather, the French approach to justifying the use of a declining discount rate proceeds from consideration of the variables that are used to determine the discount rate. As noted above, these are the pure rate of time preference, the elasticity of the marginal utility of consumption and the rate of growth of per capita income. In respect of the latter variable, the guide argues that there is reason to believe that current rates of growth of per capita consumption may not be maintained into the future and that a precautionary approach should be introduced to take account of this uncertainty:

> "The basic formula used for deriving the discount rate supposes that the mean rate of growth of consumption in the long term is known and constant. This optimistic vision of the future does not appear very realistic and the debates on sustainable development illustrate the degree of uncertainty which our societies face today when they consider the future. It appears more appropriate to introduce a precautionary effect to deal with the uncertainties of growth. This will tend to reduce the discount rate." (CGdP, 2005, p. 32)

161. That is, to the extent that the rate of growth of per capita consumption declines in future periods, vis-à-vis current rates, a reduction in the discount rate as applied to these future period is justified in terms of the formula. However, the French guide notes that "the decline in the discount rate over time, however, can only be very gradual, given the hypotheses underlying it." (CGdP, 2005, p. 46). The rationale for the use of a declining discount rate for very long-term time horizons adopted by the French guide is therefore based on a specific assumption about probable long-term future growth rates and seems inevitably to be based on judgements that this assumption is plausible. By contrast, other literature argues on more general grounds for the use of a declining rate[20].

162. A generalised rationale for differentiating discount rates according to the relevant time horizon is recommended in the US guidance document. This rationale, attributed to Weitzman,[21] is conceptually entirely distinct from those noted above, being based on the argument that the *appropriate* value of the discount rate becomes increasingly uncertain as the time horizon lengthens. This seems to involve a proposition diametrically opposed to that advanced (see above) in the EU guidance document: *i.e.*, that it is not possible for us to know the effective discount rate of future generations. The US guidance document then argues that:

> "The properly averaged certainty-equivalent discount factor (*i.e.*, $1/[1+r]^{t}$) corresponds to the minimum discount rate having any substantial positive probability. From today's perspective, the only relevant limiting scenario is the one with the lowest discount rate - all of the other states at the far-distant time are relatively much less important because their expected present value is so severely reduced by the power of compounding at a higher rate." (p. 36)

163. The UK Green Book also argues in general terms for the use of lower discount rates where the time horizon exceeds 30 years, similarly citing Weitzman. The Green Book provides a Table providing explicit discount rates for a range of different time horizons, as follows:

Table 1. Recommended real discount rates (UK Green Book)

Time horizon	1-30 years	31-75 years	76-125 years	126-200 years	201-300 years	301+ years
Discount rate	3.5%	3.0%	2.5%	2.0%	1.5%	1.0%

164. Notably, however, while the Green Book cites Weitzman as its primary authority in respect of the concept of declining long-term discount rates, the values reproduced above differ significantly from those proposed by that author and reproduced below. No reason for departing from Weitzman's conclusions on appropriate discount rates is cited.

Table 2. Recommended real discount rates (Weitzman, 2001)

Time horizon	1-5 years	6-25 years	26-75 years	75-300 years	301+ years
Discount rate	4.0%	3.0%	2.0%	1.0%	0%

165. While the US and UK guides have both adopted (variants of) the Weitzman view on this issue, there is evidence to suggest that this view constitutes a minority one. Portney & Weyant (1999),[22] in summarising contributions to a book dealing specifically with the appropriate discounting treatment of very long term projects, noted only four of 16 contributions advanced this proposition (p. 7). On the other hand, they refer to several studies of individuals' behaviour which appear to:

> "…show rather consistently that while individuals do appear to attach lower weights to distant benefits, they do not use a constant exponential discount rate. Rather, the longer the time period before effects are felt, the lower the implicit discount rate used."[23] (p. 7)

166. Regardless of the views taken on several issues in relation to very long-term project, Portney & Weyant report that there was virtual unanimity among contributors that a positive discount rate should be applied, while there was complete unanimity on the proposition that a discount rate reflecting the opportunity cost of capital should be used in respect of all projects with a time horizon of forty years or less (p. 7).

167. In sum, while there is both some empirical and theoretical support for the notion of using lower discount rates where time horizons are very long, substantial objections to this approach also exist. Perhaps more importantly, the issue only arises in respect of time horizons of longer than forty years, indicating that this issue will not be relevant to the conduct of BCA on the great majority of regulatory proposals.

Incentive issues

168. An additional issue in considering the appropriate discount rate to recommend for RIA purposes is that of whether there is a need to attempt to counterbalance an inherently pro-regulatory bias arguably held by regulators by adopting a higher than otherwise defensible discount rate.

169. In this view, RIA is conducted by regulators, who face strong pro-regulatory incentives, both because of their specific regulatory responsibilities (and the lobbying of interest groups) and as a result of political pressures. To this extent, they can be expected to incorporate, either consciously or unconsciously, a degree of systematic bias in favour of regulation in their RIA, either through over-estimation of benefits, under-estimation of costs, or both.

170. While regulatory reform agencies may have some ability to counteract such biases, to the extent that they have a quality assurance/gatekeeper role in relation to RIA, this mechanism is likely to function imperfectly in practice. If this is so, it is arguable that the adoption of a higher discount rate could be a mechanism through which compensation for this pro-regulatory bias could occur, given that most regulation is characterised by a greater proportion of costs occurring in the short term, while benefits are spread over a longer period.

Box 3. **Systematic bias?**

It is arguable that the systematic bias toward over-regulation of risk identified by the Better Regulation Commission (2006, p. 11) is validated, even where rigorous BCA is undertaken, by a separate dynamic, identified in the Australian handbook of benefit-cost analysis. This argues that:

> "Optimism bias occurs when favourable estimates of net benefits are presented as the most likely or mean estimates. It is an endemic problem in cost-benefit analysis and may reflect over-estimation of future benefits or underestimation of future costs." (DoFA, 2006, p. 78)

This optimism bias is identified by DoFA in the context of the use of BCA in project appraisal generally, rather than in the specific regulatory context. The New Zealand BCA guide similarly identifies optimism bias as a problem (p. 36), as does the UK Treasury Green Book. The latter argues that optimism bias is a "worldwide phenomenon, affecting both public and private sectors"[1] and states that explicit adjustments should be made to account for this bias, by increasing cost estimates and reducing or delaying benefits. However, the New Zealand guide argues that sensitivity analysis is the appropriate tool to use in this regard.

Others have argued that the incentives operating on regulators (who are primarily responsible for generating BCA) particularly incline them toward this bias. This view is certainly not unchallenged, however, with critics of the use of BCA in regulation[2] pointing to an alleged "pessimism bias" in which the costs of proposed regulations are said to be systematically over-estimated.

Harrington *et al.* (2001), having researched this issue empirically, has concluded that these biases, while both frequently present, tended to cancel each other, yielding no "net" bias in the estimation of the unit costs of regulatory benefits.

1. UK Government (undated) p. 29. This statement attributed to: Flyvbjerg, B., Holm, MS, & Buhl, S. *Underestimating Costs in Public Works Projects – Error or Lie, Journal of the American Planning Association*, Vol. 68, Issue 3, pp. 279-296, 2002.

2. See, for example, OMBWatch: *www.ombwatch.org/article/articleview/2749/1/134*. This article contains links to a number of citations.

Conclusions on discount rates

171. There is a strong argument that RIA guidance documents should recommend a specific discount rate or rates to ensure policy coherence, rather than leaving this issue to be determined in a decentralised manner by regulators. This reflects the fact that the rate reflects a broader question of government policy, or its interpretation of social preferences and also implies that RIA guidance should state explicitly the conceptual rationale which underlies the recommended discount rate.

172. Moreover, consistency in the choice of discount rates favours optimisation of the expenditure of regulatory resources. This does not necessarily imply that a single rate should be used for all regulatory purposes, but does imply the need for consistent approaches, so that like regulatory expenditures are assessed using like discount rates.

173. There appears to be little consensus on the conceptual question of whether discount rates should reflect the social rate of time preference or the opportunity cost of capital. Given the need to include allowance for market risk in the latter case, the practical implications of this question are substantial. Indeed, the observed very broad spread of recommended discount rates in current RIA guidance materials appears likely to reflect the adoption of different views on this question. While there is clearly no "best practice" to be identified on this substantive issue, there is a strong argument that the conceptual view underlying the recommended discount rate should be made explicit and explained in some detail. This would enable stakeholders to understand the reasoning used by government and, as a result, facilitate debate about the appropriate approach to be taken.

174. There is clearly substantial support in the literature for lower discount rates to be applied in respect of very long time horizons. There appear to be unresolved conceptual issues in this regard, suggesting that governments should be cautious when considering the adoption of lower discount rates where longer time horizons are relevant. Only a small proportion of regulatory decisions are likely to involve time horizons beyond the 30-40 year period within which there is general consensus on the use of a single rate.

175. Appropriate discount rates can vary over time, if views of the underlying social rate of time preference change. However, they should not vary in the short term along with proxy measures such as the government borrowing rate, for at least two reasons. First, these factors are partially reflective of other factors that are transient and not conceptually relevant. Second, long run stability in the rate is also favourable for the achievement of optimum distribution of regulatory resources in the longer-term. At the other extreme, a review of rates actually recommended in various member countries indicates that, in some cases, these have remained unchanged over several decades. There would seem to be a case for ensuring that the continuing appropriateness of the discount rate is reviewed from time to time – say at five, or even ten yearly intervals. In this context, it is noted that the French guide on discount rates explicitly argues that the rate to be used should be revised at five-yearly intervals (CGdP, 2005, p. 88). This document appears to be the only guide at present specifically arguing for regular review of the rate at fixed intervals.

176. Finally, while differences in discount rates within the range of recommendations cited above would seem to be potentially highly significant in determining whether regulatory proposals would be able to demonstrate a positive NPV, research by Hahn (2005) suggests that, in practice, this effect is not likely to be large.[24]

4.4. Valuation of a Statistical Life

177. The issue of the Valuation of a Statistical Life (VSL) is discussed in a majority of the RIA guidance documents and BCA guides reviewed for this paper. Most of these discussions point to the desirability of adopting such a value in order to enable a quantified BCA to be completed in respect of risk-related regulation.

178. Perhaps paradoxically, only one guide recommends the use of a particular VSL. This is the EC guidance document, which recommends a VSL of €1 million, with sensitivity analyses to be conducted at values of €2.5 million and €0.65 million. In Norway, the Ministry of Finance handbook on socio-economic analysis refers to a range of national and international studies and, on this basis, suggests a standard VSL figure of NOK 15 million (approximately €1.9 million) for all public projects and regulations.[25]

179. Other guidance documents cite particular values of a statistical life but refrain from endorsing them. For example:

- The Canadian BCA guide noted that most values cited in the research literature fall in the range between $1 million and $10 million.
- The United States BCA guide makes the same statement.
- The 1999 New Zealand RIA guide does not directly address the issue of VSL, but does note in passing (p. 26) that a VSL of NZ$2 million was derived for use in the transport sector in 1991.
- The UK Treasury Green book notes that, the Department for Transport (DfT) values the reduction of the risk of death in the context of road transport at about £1 145 m per fatal casualty prevented (in 2000 prices).

180. In other cases, the discussion of this issue mentions no specific values for a statistical life.

181. Several of the VSL cited in the guidance documents have been developed by transport departments. These included the New Zealand and United Kingdom valuations cited above. In addition, the Australian Bureau of Transport and Regional Economics (BTRE) has also published documents containing a specific VSL figure.[26] This suggests that, in this policy area at least, regulators are comfortable with the application of specific VSL figures as part of project analysis.

182. More broadly, a number of the RIA guides note that several government departments adopt specific, standardised VSL. For example, the Canadian BCA guide notes that "a number of Federal departments use explicit figures for the value of a life." Thus, there appears to be a level of recognition that the practice of adopting a standard VSL is relatively common. In this context, it is difficult to understand the apparent reluctance of the RIA/BCA guides to recommend specific figures. In the case of Australia, the RIA guide states that the Office of Best Practice Regulation should be contacted for advice on an appropriate VSL to be used in analysing any particular regulatory option. OBPR officers indicate that, to date, inquirers have been directed to the general literature and that OBPR practice is currently to accept any proposed value that is regarded as defensible in these terms.[27] The new edition of the RIA guide, published in August 2007, is consistent with its predecessor in not including a specific recommended VSL figure. However, Australian officials have stated that it is intended to publish additional guidance, together with a recommended value or values for VSL on the OBPR website in the near future. This indicates an apparently significant change of approach on this issue.

183. A few guidance documents more or less explicitly address the question of whether a single VSL should be used for all purposes, or whether a range of VSL figures should be preferred. The Australian case, noted above, arguably adopts the latter view in referring to "the appropriate VSL to be used in analysing any particular regulatory option." The US guide addresses this issue more explicitly, stating:

> "There is a continuing debate within the economic and public policy analysis community on the merits of using a single VSL for all situations versus adjusting the VSL estimates to reflect the specific rule context. A variety of factors have been identified, including whether the mortality risk involves sudden death, the fear of cancer, and the extent to which the risk is voluntarily incurred. The consensus of EPA's recent Science Advisory Board (SAB) review of this issue was that the available literature does not support adjustments of VSL for most of these factors. The panel did conclude that it was appropriate to adjust VSL to reflect changes in income and any time lag in the occurrence of adverse health effects."
>
> The age of the affected population has also been identified as an important factor in the theoretical literature. However, the empirical evidence on age and VSL is mixed. In light of the continuing questions over the effect of age on VSL estimates, you should not use an age-adjustment factor in an analysis using VSL estimates.

184. This advice seems to indicate that a single VSL should be used for most or all purposes. Thus, it inevitably appears somewhat paradoxical that the guide then does not put forward an appropriate VSL figure.

Conceptual basis for VSL

185. A minority of guidance documents address the issue of the appropriate conceptual basis for calculating VSL. As noted in OECD (2006), the Australian guide discusses both the human capital and revealed preference (or willingness to pay) approaches and argues strongly for the latter. Similarly, the UK Treasury Green Book argues in favour of the willingness to pay approach (p. 61). The Canadian BCA guide mentions a number of revealed preference approaches, but does not mention the human capital approach, presumably indicating a clear preference for the former (p. 80).

186. The brief discussion of this issue contained in the EC guidance document also appears to demonstrate a preference for revealed preference or stated preference models. However, the notably low VSL figure employed in the EC RIA guidance document leaves one to speculate that it has been arrived at via the human capital approach.[28] That said, the *caveat* included in the text at this point (p. 38) indicates that this value is applicable to:

> "…deaths in a largely elderly population where the reduction in life expectancy is likely to be short – maybe one year or less."

187. Interestingly, recent work by Aldy and Viscusi (2007) suggest that the relationship between age and VSL is more complex than previously supposed. They argue that:

> "... It is clear that VSL does vary with age. The labour market VSL increases with age, peaks in midlife, and subsequently declines." (p. 19)

188. While this may be a fruitful area for future research, the current level of sophistication of the discussion of VSL issues in RIA guidance is well below this level. It would seem that the major challenge at present involves reaching agreement on a single VSL figure to be adopted in most or all RIA contexts. As Viscusi has previously pointed out, maximising regulatory cost effectiveness requires that the cost effectiveness of individual regulations should be equalised. If this outcome is to be achieved, the VSL used across the range of risk related regulation must be equalised.

189. Hahn (2005) argues that the impact of adopting different VSL figures may be relatively limited in practice. Reviewing a sample of over 100 sets of regulations in the United States, he concludes that

> "The percentage of regulations that pass [a benefit/cost test] varies from 47% when the VSL is very low and the discount rate is very high to 62% when the VSL is very high and the discount rate is very low." (pp. 26-27)

190. Hahn chose a base value for the VSL of $5 million, based on "a review of the literature and discussion with economic experts within and outside the government" and notes that "a meta-analysis of several studies by Viscusi and Aldy places the median value at $7 million (in year 2000 dollars) for a worker in the United States."

191. Hahn's analysis suggests that the specific VSL adopted is relatively unimportant, but that the process of adopting a VSL figure and using it consistently in RIA is likely to be very important in improving the cost effectiveness of regulation. It arguably follows from this that a relatively high VSL figure should be selected from within the range offered by the literature, so as to render explicit the adoption of VSL and stem controversy as far as possible (*i.e.*, by minimising the scope for argument that this figure has been set too low).

Conclusions on the Valuation of a Statistical Life

192. Notwithstanding the evidence of Hahn (above), which casts some doubt on the likely extent of the impact of adopting differing VSL on regulatory outcomes, the provision of clearer guidance on VSL would appear to be high priority area for improvement in RIA and BCA guidance documents in the future. This reflects the fact, discussed above, that it is not possible to complete a quantified BCA in respect of health and safety-related regulations without adopting, implicitly or explicitly, a VSL. Given the central importance of VSL to the conduct of BCA, RIA guidance should address this issue in a clear and consistent fashion and provide unambiguous advice to regulators.

193. Moreover, the presence of a substantial literature on this issue, which reflects a significant a degree of consensus, or at least convergence, on both conceptual issues and practical valuations, provides a sound basis for developing and adopting appropriate guidance in the RIA context.

4.5. Decision rules

194. A number of different decision rules can be employed, where benefit/cost analysis is adopted in RIA. Among those commonly discussed in RIA guidance and/or in the literature upon benefit/cost analysis are:

Net Present Value

195. A decision rule of NPV>0 effectively states that the benefits of the regulation must exceed the costs, when expressed in discounted terms. This is the basic condition for a regulation to be welfare enhancing and is the most commonly cited decision rule.

Benefit/Cost Ratio

196. A benefit/cost ratio of 1:1 is equivalent to NPV = zero. However, the important characteristic of a rule based on benefit/cost ratio is that it allows different alternatives to be ranked according to their *efficiency* (*i.e.*, dollars of benefit produced for each dollar of costs expended), rather than their effectiveness, as with the NPV rule.

Internal Rate of Return

197. Conceptually equivalent to the benefit/cost ratio rule, this rule simply expresses the results in terms of an annual rate of return on the costs incurred (*i.e.*, the investment made). The equivalent of the rule NPV>0 is IRR>0.

Current practice

198. While RIA guidance documents almost invariably discuss the question of decision rules few, if any, set out a definitive requirement to use one particular rule. Where a preferred decision criterion is identified, it is in most cases that alternatives should be ranked in terms of their NPVs, while NPV>0 is in several cases established more or less explicitly as the decision rule to be employed.

199. For example, the US RIA guide indicates clearly that an NPV rule should be preferred:

> "The size of net benefits, the absolute difference between the projected benefits and costs, indicates whether one policy is more efficient than another. The ratio of benefits to costs is not a meaningful indicator of net benefits and should not be used for that purpose. It is well known that considering such ratios alone can yield misleading results." (US Government, 2003, p. 10)

200. This appears to be an unusual use of the concept of "efficiency" which, it has been suggested above, is better determined through the application of benefit/cost ratios. It is also unclear why an explicit warning against the use of the benefit/cost ratio as an "indicator of net benefits" is required. However, it should be noted that the US guide also states that agencies should strive to *maximise* the net benefits associated with their regulatory activities, rather than simply ensuring that regulation has positive net benefits.

201. The UK Government Green Book argues in general terms for the use of an NPV rule, stating:

> "The NPV is the primary criterion for deciding whether government action can be justified. If a full cost-benefit analysis has been undertaken, the best option is likely to be the one with the highest risk adjusted net present value." (UK Government, undated, a, pp. 26, 36).

202. It also states that "If there is a budget ceiling, then the combination of proposals should be chosen that maximises the value of benefits. The ratio of the net present value to the expenditure falling within the constraint can be a useful guide to developing the best combination of proposals." (UK Government, undated, a, p. 37)

203. The exact form of the ratio proposed as a "useful guide" is unclear, but it would appear to be correlated positively with the benefit/cost ratio. Indeed, in the example given (*ibid*) of a budget constraint, the Green Book advises choosing two options with higher benefit/cost ratios over that with the lowest ratio, even though the latter has the highest NPV. That the benefit/cost ratio is nowhere mentioned in the Green Book seems a surprising omission, given the possibility of using it to state a clear and unambiguous decision rule for deciding between projects where a budget constraint exists, and the lack of clarity in the advice actually given.

204. The EU RIA guidance document states that the use of BCA implies the adoption of a NPV>0 rule, but then argues that this rule is invalidated in circumstances in which different time horizons are considered. Instead, it argues that the "annualised value" of competing options should be calculated, given as "NPV/time horizon" (years) and states that the one with the highest "annualised value" represents "best value" (European Commission, 2005, p. 40). The rationale for this conclusion is not explained in any detail.

205. The 1999 New Zealand RIA guide also argues for the predominance of NPV over the benefit/cost ratio as a decision criterion:

> "Without risk, or uncertainty surrounding the results of the analysis, the option with the highest NPV… is favoured as this would contribute the most to public welfare, *i.e.*, an expected gain of $15 million against an expected gain of only $10 million for option two." (New Zealand Government, 1999, p. 18)

206. This rule is clearly based on a simplified approach and does not take account of the possible need to trade off between different regulatory initiatives. By contrast, New Zealand's 2005 BCA Primer highlights the value of the benefit/cost ratio in guiding the allocation of limited expenditures where there are large numbers of potential initiatives which all have NPV>0. Also of note, this guide highlights the fact that a definitive NPV, including monetised values for all major benefits and costs and properly accounting for distributional objectives, will often be infeasible in a government policy setting:

> In a commercial setting, it is typical for the project with the highest NPV to be chosen, but in a government setting where many costs and benefits may be difficult to quantify, the NPV may be just one of the decision-making criteria. Put simply, a proposal with a higher NPV ranks ahead of the alternative, assuming the proposals are otherwise equal. If the proposals are not the same in all other respects, a higher NPV is not conclusive. For example, one proposal may have much greater intangible net benefits. *A negative NPV does not rule out proceeding with a proposal. There may be other qualitative influences on the decision to proceed, and these may be important.* (New Zealand Government 2005, p. 29).

207. The Canadian RIA guides do not explicitly address the issue of choice between decision rules, but highlight the fact that government policy generally requires a net benefit to be demonstrated. This could equally be interpreted as endorsing an NPV>0 rule or a B/C > 1 rule.

208. The current Australian RIA guide also fails explicitly to address the issue of choosing between NPV and B/C based decision rules, although its advice clearly favours the approach of maximising NPV. It also identifies, apparently with approval, the possibility of adopting a risk averse use of sensitivity analysis as part of the decision rule:

> The policy officer should specify which option is the most efficient. Generally, it will be the one with the largest NPV. Given NPVs are predicted (average) values, the sensitivity analysis might suggest that the alternative with the largest NPV is not necessarily the best alternative under all circumstances. For example, the policy officer might be more confident in recommending the option with a lower expected value of net benefits, but with a smaller chance of imposing a significant net cost on the community (lower 'downside risks'). (OBPR, 2007, p. 123)

209. Interestingly, the previous Australian RIA guidance document did explicitly discuss the use of a B/C based decision rule:

> "Options can be ranked, on the basis of their economic impact, by their NPVs. An alternative step is to estimate benefit-cost ratios for each option. …The use of benefit-cost ratios can change the ranking of options, and may be useful when a decision maker has to choose between different projects when subject to a capital constraint." (OBPR 2006, p. C-11)

210. It is not clear why the current guidance document has eliminated this discussion.

211. The Australian BCA guidance document does address both decision rules and also generally favours the NPV > 0 approach. It states that "Subject to budget constraints and other considerations, and assuming that there are no alternative projects under consideration" (DoFA 2006, p. 54) the rule of NPV>0 may be used and notes that, where budget constraints intervene, that subset of projects which maximise total NPV should be chosen. In relation to the benefit/cost ratio, it states:

> "…the BCR can assist with the selection of projects when agencies have capital constraints (more projects than can be funded at the selected discount rate), but it does not displace the objective of maximising net present value. However, in more general cases, the BCR is biased towards small projects and must be used cautiously." (DoFA 2006, p. 59)

212. Thus, both of the Australian guidance documents demonstrate a tendency to favour NPV based rule over rules based on the benefit/cost ratio. It is notable that the assertion in DOFA (2006) that the latter is biased towards small projects is not explained or justified.

213. The Irish RIA document is the only RIA guidance surveyed that states a clear preference for the use of the benefit/cost ratio, arguing: "There are a number of decision rules which can influence the choice of option but as a general rule the greater the ratio of benefits to costs the better" (Irish Government, 2004, p. 77). However, the basis for this preference is not elucidated. Moreover, the Irish guidelines on appraising public sector capital expenditure proposals argue the contrary view:

> "In choosing between options A and B, the NPV method may suggest that A is preferable, while the IRR method may suggest that B is preferable. In such cases, the results indicated by the NPV method are more dependable." (Irish Government, 2005, pp. 35-36)

214. The reason for the allegedly greater dependability of NPV analysis is not cited. However, the existence of two directly contradictory views on the appropriate decision rule throws into sharp relief a wider problem of lack of co-ordination between RIA guidance and broader BCA and/or project appraisal guidance issued within governments.

Discussion

215. The above discussion focuses specifically on the various formal decision rules traditionally associated with benefit/cost analysis. The difficulties associated with applying benefit/cost analysis to the the policy context and, in particular, to the regulatory context have long been recognised. As pointed out in OECD 2006, there is a current trend toward explicit recognition in RIA guidance documents of the limits to the ability to quantify all relevant benefits and costs in respect of many regulatory proposals. As a consequence, there has been an increasing focus on the need to integrate qualitative and quantitative elements of the analysis in order to ensure that all the important economic, social and environmental impact of a regulatory proposal are properly taken into account.

216. For example, the Norwegian guide to socioeconomic analysis emphasises that a simple NPV >0 decision rule is insufficient in a range of circumstances including:

- Where all effects of action cannot be measured satisfactorily;
- where distributional effects are important to the assessment of different alternatives; and
- Where it is believed that measures of willingness to pay do not fully capture effects on individuals' utility.

217. The guide argues that a judgement must often be made as to how far attempts to monetise impacts should be taken:

> "(…) It is hard to describe in general terms how far the analyser should go in monetising effects. Considering this question, one should have in mind the purpose of the analysis, which is to identify and provide information on effects of the possible action. Sometimes putting a monetised value on an effect is clearly problematic, *e.g.*, if the effect is closely linked to controversial ethical questions. A criterion for when to monetise is if describing in money terms gives the decision-makers [*i.e.*, politicians] a better and more complete understanding of the effects than an analysis in purely qualitative terms."[29]

218. Jacobs (2006) has dubbed attempts to integrate qualitative and quantitative elements in a more systematic way as "soft benefit/cost analysis". Section 3.4 above, discusses the use of Multi-Criteria Analysis as a promising means of incorporating a systematic and relatively objective approach to qualitative analysis within RIA. The integration of qualitative and quantitative aspects of RIA would seem

to require that best practice qualitative approaches, such as MCA, should be applied and the outcomes explicitly considered in conjunction with quantitative information developed via BCA or CEA in the – many – cases in which quantified BCA results are not believed able to capture all of the significant impacts of a regulatory proposal.

219. In addition to these *caveats* concerning the use of strict BCA decision rules in the regulatory context, it is also arguable that, in practice, the choice of decision rules will only rarely affect the choices made between different identified policy alternatives. Nonetheless, the issue of the relative merits of these rules would seem to merit explicit consideration in RIA guidance documents, if only for the purpose of clarifying the conceptual concerns which regulatory decision-makers should consider. The issue of whether, in a regulatory context, decision-makers should see themselves as necessarily having to "choose between different projects" is clearly significant in determining views on decision rules. The preponderance of advice in favour of maximising NPV suggests that regulatory reformers are implicitly advancing a view that such trade-offs are not required to be made by regulators.

220. It is frequently argued that governments tend to favour regulation over "tax and spend" measures in many cases because there is less scrutiny over the size and effectiveness of "regulatory expenditures." This argument suggests that regulatory expenditures are seen as essentially unlimited, so that decision-makers are not required to choose between different projects.

221. Although the concept of the regulatory budget has made little headway in OECD countries in formal terms, the development of the concept recognises, in part, the importance of the issue of consent in determining the effectiveness and legitimacy of regulation and, by implication, suggests that governments do increasingly recognise a constraint on the amount of regulation that can be implemented. More broadly, government policies with the announced objective of "reducing the regulatory burden" can be interpreted as being founded on the same recognition.

222. To the extent that this is the case, there is clearly merit in favouring decision rules that will maximise the *efficiency* of the regulations chosen, rather than their effectiveness. This implies that the benefit/cost ratio should be favoured over the NPV as the primary measure to be used, albeit that they should necessarily be applied in tandem. That is, if there is an implicit regulatory budget operating, the welfare maximising rule is to maximise the benefit/cost ratio: if cost is fixed in the global sense, maximising the ratio maximises global benefits.

223. Favouring options with the highest benefit/cost ratio will yield the goal put forward in this context in the Australian BCA guidance document (see above) of selecting that subset of projects which will maximise total NPV, and is also consistent with the advice in the UK Green Book. Indeed, it is at least arguable that this subset of projects can only be reliably identified by determining the benefit/cost ratio of each available project (or regulation), since achieving this goal *requires* all the projects (regulations) with the highest benefit/cost ratios to be chosen.

224. In practice, there are clearly additional sources of complexity. The above argument effectively assumes that the choices to be made are discrete choices between policy options. Regulatory decision-making frequently also includes the question of choosing between differing degrees of stringency within the context of the same policy approach. In this context, while the objective of maximising the (average) benefit/cost ratio remains, as a practical matter, changes in the marginal benefit/cost ratio at different levels of regulatory stringency would need to be tracked in order to identify reliably the point at which the (average) benefit/cost ratio is, in fact, maximised.

225. While the above provides theoretical guidance on how to maximise the contribution of regulation to economic welfare in conditions in which the supply of regulation is effectively limited, there will be significant practical constraints on implementing this approach.

226. For example, when considering different possible levels of stringency for a regulation, the point at which the average benefit/cost ratio is maximised may often occur at a stringency level which risk analysis would suggest was too low. That is, that the residual risks existing after regulation of this level of stringency had been introduced would continue to exceed benchmarks for "acceptable risk."

227. Secondly, because regulatory decisions are not being taken simultaneously, the rule of maximising the benefits/cost ratio can only be implemented in practice if a threshold for "acceptable" benefit/cost ratio can be identified. That is, a specific benefit/cost ratio must be put forward as constituting the threshold dividing "effective" from "ineffective" regulations. In theory, this ratio is knowable provided that all possible regulatory interventions are known. However, even in this case, the value of the ratio will vary according to the size of the "regulatory budget."

228. These practical difficulties in formulating a specific rule based on the benefit/cost ratio are apparently insurmountable. The fundamental conclusion highlighted by the above discussion is that, given implicit constraints on the quantity of regulation that can be made, a decision rule that NPV>0 is insufficient to ensure that regulatory effectiveness is maximised.[30]

229. Moreover, while it is not possible to determine an optimal value of the benefit/cost ratio, it may be feasible to identify an appropriate "rule of thumb" threshold value by surveying the range of benefits/cost ratios identified in RIA documents that have been able to quantify most or all of the important benefits and costs and using the results as the basis for reaching such a judgment.

230. Even in the absence of such a limited calculation, it is at least arguable that acknowledgement of the practical limits to the overall quantum of regulation that can be made requires a more stringent rule than that of NPV>0 to be adopted in RIA guidance. The option of citing a threshold value for the benefit/cost ratio – for example a minimum of 2:1 – would seem to merit consideration for inclusion in RIA guidance as a general decision rule.

231. Such a rule would also have the benefit of providing a greater degree of certainty that the regulation will, in practice, achieve a positive NPV. As pointed out by some Australian regulatory reformers,[31] the higher is the benefit/cost ratio, the more robust is the conclusion that NPV will be greater than zero. That is, where the benefit/cost ratio is only 1.2:1, the true NPV figure will be negative if the true benefits turn out to be overestimated in the BCA by anything more than 20%. By contrast, if the benefit/cost ratio figure is 2:1, true NPV will be negative only where the true benefits are over estimated by at least 100% in the BCA. Thus, where projects with an equivalent NPV are considered, there should be a strong preference toward that with the higher benefit/cost ratio. However, the adoption of this approach can be criticised as amounting to the introduction of a degree of bias against regulation into the RIA process.

232. That said, it is arguable that this issue is dealt with most appropriately through the application of sensitivity analysis and the simultaneous presentation of both NPV and benefit/cost ratio results for all identified alternatives in the RIA context, with decision-making being required to take account of performance in terms of both rules, rather than one or the other.

4.6. Other methodological issues

233. The preceding sections discuss a non-exhaustive list of methodological issues in relation to benefit/cost analysis. As noted in the introduction, the issues highlighted for discussion are those that have substantial impact on the overall quality of RIA – and therefore of the resulting regulatory proposals – and those in respect of which there are major complexities and controversies among analysts. Within this context, two other methodological issues deserve brief attention.

Sensitivity analysis

234. All of the seven detailed RIA guidance documents reviewed for this paper include discussion of sensitivity analysis, as does that of Norway. These discussions are essentially similar and are, for the most part, quite brief. The advice given is that sensitivity analysis should be undertaken wherever there is significant uncertainty surrounding the value of a variable and that variable may have a significant impact on the assessed outcome of the regulatory proposal. In some cases, the discussions also acknowledge that these are likely to be practical limitations on the amount of sensitivity analysis that can be undertaken and that judgement therefore needs to be exercised as to what variables, and what values of those variables, should be used in undertaking sensitivity testing.

235. Thus, the discussion of this topic reveals a relatively rare degree of consensus among the RIA guidance documents. To the extent that issues can be identified from the best practice perspective, the main point would appear to be that little detail on how to conduct sensitivity analysis in practice is given. Two issues in respect of which further guidance may be useful are:

- *How to identify appropriate variables for the conduct of sensitivity analysis*: The generic advice that variables that are uncertain and which may have a significant impact on the NPV could conceivably be supplemented with an indicative list of the types of variables likely frequently to fall within these criteria; and

- *How to select appropriate values for the conduct of sensitivity testing*: guidance on how to set limiting values, in terms of probability factors and, perhaps, consequences could also be considered.

236. Finally, some sources[32] argue that the use of alternative statistical techniques, notably Monte Carlo analysis, can constitute a better means of dealing with uncertainty than does sensitivity analysis, at least in some contexts. Thus, it may be appropriate for RIA guidance to include some discussion of the potential use of this alternative.

Adjusting prices to remove distortions

237. Some of the specialist benefit/cost analysis guides reviewed for this paper discuss the question of adjusting market prices in order to account for a range of distortions (see, for example, Australian Government, 2006b, pp. 10-11).[33] This discusses potential adjustments to market prices under the headings of value of final outputs, the value of physical inputs, interest on borrowed capital, depreciation allowances and land.). This issue is rarely treated in RIA guidance documents, although the Norwegian handbook on socio-economic analysis provides an exception in this regard, containing an extensive discussion of the potential need for price adjustments to take account of factors such as imperfect competition, public monopoly, externalities, common goods and unemployment.

238. Such adjustments have the potential to have a substantial impact on the outcomes of RIA in some circumstances and, where relatively sophisticated RIA are being undertaken, it may well be reasonable to expect such adjustments to be incorporated within the analysis. Given this, the fact that this issue is not discussed at all in most RIA guidance documents would appear problematic.

239. Both fully explaining the underlying conceptual issues, and providing practical guidance on how to undertake the necessary adjustments, constitute highly technical tasks. Given this, and the mostly generalist audience for most RIA guidance, it would be unrealistic, and probably counterproductive, to expect a full discussion of the issue to be incorporated in these documents. However, there may be an argument for ensuring that the issue is at least acknowledged in the RIA guidance documents and reference made to available sources of more detailed guidance on the subject. Were this issue to be addressed in RIA guidance documents it would also presumably be necessary to indicate the circumstances in which the making of such a price adjustments is likely to be required to ensure regulatory quality.

Assessing macro-economic effects of regulatory actions

240. OECD 2006 noted that several RIA guidance documents including those of Ireland, the European Commission and Australia, now require assessment of the effect of proposed regulation on a range of macroeconomic impacts, including employment, GDP, innovation, poverty or other important macroeconomic variables. This trend appears to result from concern that the traditional micro-economic approaches to RIA, based on BCA and related methodologies, do not always capture the full effects of a proposed regulatory intervention.

241. Certainly, for a small proportion of regulatory proposals which have impacts throughout many sectors of the economy, it is likely that their adoption will have a discernible impact on macroeconomic variables. In such cases, RIA based solely on micro-economic approaches will inevitably fail to capture the full impact of the proposal. Instead, a macro-economic analysis, based on a general equilibrium approach will be required. Such an approach is inevitably relatively resource-intensive and can be justified only where there is a reasonable likelihood that a regulatory proposal will, indeed have a discernible macro-economic effect. Requiring a macro-economic analysis in other cases entails a serious risk of a misallocation of scarce RIA resources, as well as potentially undermining support for RIA by setting the required analytical standard at a level that is effectively reachable only by contracted specialists, rather than staff of regulatory agencies. It is not clear that all the RIA documents proposing that impacts on specific macro-variables be included in RIA do so from the point of view of an understanding and acceptance that this implies the use of general equilibrium approaches if it is to be properly executed.

242. An *ad hoc* expert committee reporting to the Norwegian Parliament in 1997 addressed this issue, highlighting both the need to use macro-economic approaches in some cases and the need to recognise that, even for many very large scale regulatory proposals, an adequate RIA could be derived using only the micro-economic BCA approach:

> "Fixed calculation prices can only be used for projects or reforms that do not significantly influence the opportunity costs of resources. To analyse large reforms, for instance a complete reform of Norwegian agricultural policy or a substantial change of the pension rules, it is necessary to use a more complete description of the economy. The usual procedure in such cases is to use so-called general equilibrium models to describe the economy…. [However] even relatively large projects, *inter alia* the winter Olympics in Lillehammer and the new main airport of Oslo, could as a good approximation be studied with fixed calculation prices."[34]

243. In addition to the high resource costs of adopting macro-economic approaches to RIA, theoretical limitations also exist. Specifically, most available general equilibrium models have been designed to model changes in economic variables such as public spending, tariffs and taxation, rather than changes in regulation. Thus, they will often be limited in their ability to analyse such regulatory changes. The

development of a dedicated model may be required in order to complete a sound general equilibrium analysis – as has occurred in Norway in recent times in the context of possible reforms to regulation governing the agriculture, fisheries and food processing sectors and previously in the United States[35].

244. In sum, macro-economic analysis may substantially enhance the accuracy and value of RIA in a relatively small number of cases involving far reaching regulatory proposals. The use of such approaches should not be widely mandated, given the high cost of these analyses, the substantial data and analytical constraints that often exist and the need to ensure that RIA resources are put to their highest value use[36].

Measurement of administrative burdens

245. Among the RIA guidance documents reviewed, only the Australian handbook specifically requires the administrative costs of regulatory proposals to be assessed using a standard methodology, based on the Standard Cost Model (SCM). This is perhaps surprisingly, given that some 22 European countries are currently members of the SCM network, but may also reflect the fact that the Standard Cost Model was developed and diffused relatively recently and that the estimates are both complex and still experimental in some countries.[37]

246. While the Australian government (and the Victorian State government) have only recently adopted approaches to administrative burden measurement that are based on the SCM, some concerns have already risen in relation to the practical application of this methodology. In particular, it is arguable that the application of the extremely disaggregated SCM model to administrative burdens implies that this subset of regulatory costs must be assessed in much greater detail, and with much greater rigour, than the significantly larger substantive compliance costs.

247. To the extent that this is the case, obvious issues of the potential misdirection of the RIA resources arise. Related to this, there may be implications for the perceived credibility among regulators of the RIA process. Detailed analysis of these emerging issues does not appear to be feasible at this time. Further review and discussion of these potential concerns would appear to be warranted.

5. The role of specific partial analyses

248. OECD (2006) highlighted the apparent trend toward the adoption of requirements for an increasing range of partial impact assessments to be included within the larger RIA task. It analysed this trend in terms of sometimes widespread concerns that RIA tends to focus unduly on a narrow range of "economic" impacts, that is, those that are capable of expression in monetary terms, with inadequate attention being paid to important intangible impacts.

249. At the same time, a clear distinction must be made between 1) countries that require a comprehensive RIA covering all impacts to be completed and impose specific partial impact analysis requirements in addition to the general RIA, and 2) countries that have no comprehensive RIA requirement but do require certain specific impacts to be assessed. The latter group was formerly the more numerous among OECD Member countries, but has declined in size as the BCA principle has increasingly been adopted as the basis of RIA and generalised RIA requirements have been established.

250. An example of a country which requires a number of partial impacts to be assessed but does not require a generalised RIA or use BCA is given by Belgium. The Belgian government requires the "Kafka test" to be applied to estimate the expected change in administrative burdens due to a regulatory proposal and adopts the Standard Cost Model methodology in undertaking the test. It also requires an assessment of fiscal impacts and has also recently implemented requirements for environmental impacts (including impacts on sustainable development) to be assessed, as well as impacts on gender equality. However, Belgium has indicated its intention of progressively broadening these tests in order to implement a comprehensive RIA requirement in the near future.[38]

251. Table 3., below, provides a non exhaustive overview of partial impact assessments required to be included in the RIA in the countries whose guidance documents were assessed for this paper. The table highlights practices in relation to a sample of eight of the more commonly required partial impact assessments. Review of the RIA guidance documents clearly indicates that a substantially wider range of partial assessments is required to be completed in one or more of the countries reviewed. Other partial impact assessments required in some cases include: poverty and social inclusion, racial equality, voluntary organisations and charities, consumers, the rights of citizens, the disabled, those of differing sexual orientations, members of the traveller community, growth, competitiveness and jobs, health, those of different religions and races, industrial sectors and even the public sector – notwithstanding that, by definition, they are the sponsors of the regulatory proposal.

Table 3. Specific partial impacts explicitly required to be assessed in RIA (where relevant)

Country	Competition[1]	Trade	Small business	Administrative burdens	Environment/ESD	Regions	Gender equality	Native populations or ethnic impacts
Australia	✓	✓	✓	✓	✓			
Belgium				✓	✓		✓	
Canada					✓	✓		
EU				✓		✓	✓	✓
Ireland	✓				✓		✓	
NZ				✓				✓
Norway			✓	✓	✓	✓	✓	
UK	✓		✓			✓	✓	✓
US			✓					
Victoria (Australia)	✓		✓	✓				

1. Arguably, competition impact assessments should not be regarded as being "partial impact assessments" in the same sense as the other elements enumerated in this table. Rather, the increasing tendency to require these impacts to be assessed explicitly reflects increased acceptance of the concept of well-functioning competitive markets as the key guarantor of economic well-being and the importance of analysing all regulatory interventions in terms of their impacts on this fundamental economic organising principle.

252. This enumeration of partial impact assessments clearly indicates the potential, also highlighted in OECD (2006), for the proliferation of partial impact assessment requirements to undermine the coherence and focus of the generalised regulatory impact analysis, where this is also completed. Moreover, by adding layers of complexity, there is a substantial risk that the ability of RIA documents to communicate effectively with decision-makers, particularly at the political level, will be severely compromised.

253. A notable difference in approaches can be highlighted. Some RIA documents require that all RIA include a certain number of partial impact assessments whereas other guides (notably those of Canada, the European Commission and Norway) provide detailed templates, or checklists, and require that RIA authors assess whether their regulatory proposals would have any significant impacts in relation to each of the items noted.[39] This latter approach could have advantages in terms of ensuring that only particularly relevant partial impacts are highlighted in the assessment.

254. OECD (2006) suggested that the main driver of requirements for partial impact assessments to be completed in the RIA context was probably concern that BCA may have a systematic tendency to underplay distributional issues and so lead to them being given inadequate weight in the policy choice process. Thus, the choice of partial impact analyses required to be undertaken would tend to indicate which groups in a given society are believed to have particularly compelling distributional claims. Certainly, review of the various RIA guidance documents indicates that there are very substantial differences between countries as to which partial impact analyses are required. For example, the Irish RIA guidance particularly highlights issues of poverty and social exclusion, the Australian RIA guidance highlights small business

impacts and impacts on competition and the New Zealand guidance document highlights impacts on the indigenous population.

255. At the same time, it seems likely that policymakers would agree that virtually all of the partial impact highlighted above could be potentially relevant to a consideration of the distributional impacts of a regulatory proposal. To this extent, the choice of particular partial impact assessments required to be completed might be seen as reflecting, to a considerable degree, medium-term currents in the political debate within a given country, rather than long-term differences in values, or social/economic circumstances.

256. Partial impact analyses tend to proliferate over time, once having been introduced to the RIA process. For example, requirements for Australian RIA to include assessments of impact on competition, implemented in the mid-1990s, have been followed by requirements to assess regional impacts, administrative burdens, small business impacts and impacts on ecologically sustainable development, with assessment of family impacts also on the horizon.

257. To the extent that this is so, there may be a case for reconsidering the most appropriate means of ensuring that important distributional impacts are taken into account in RIA. One possible approach would be to incorporate in RIA guidance documents a substantial discussion of the range of groups whose distributional claims may be particularly important to considering regulatory analysis, together with some general indication of how different kinds of regulatory proposals may affect different groups.[40] This could be combined with a requirement that RIA incorporate a generic "distributional impacts" section, which would highlight distributional impacts that were found to be important in the particular case, highlighting the impacts on each group that was substantially affected separately.

258. A second possibility, which could work in conjunction with the first, would involve requiring the regulatory reform authority responsible for RIA quality assurance to consider the potential distributional issues and determine which distributional impacts appeared to be potentially substantial and were required to be discussed explicitly in the particular RIA. This would then form the minimum set of distributional issues to be discussed, with the proponent regulatory agency able to add to them as desired.

259. By partially transferring responsibility to identify relevant impacts to the regulatory reform authority, one apparent underlying reason for requirements for all RIA to explicitly address particular impacts (*e.g.*, on competition) may be addressed more effectively. That is, it would no longer be necessary to create a requirement for a particular partial impact analysis to ensure that regulatory proponents did not avoid discussion of important partial impacts in the RIA because of competing incentives.

260. Whether via the adoption of one, or both of the above proposals, or in some other way, there appears to be an argument for RIA guidance documents to acknowledge the potential risks to policy coherence arising from the incorporation of several partial impact assessment into the larger RIA and to indicate to regulators how these risks might best be avoided or minimised.

6. Risk assessment

261. The use of risk assessment in the specific context of undertaking the "threshold analysis" of whether there is a case for government intervention has been considered in Section 2, above. This section supplements that discussion by considering a number of more technical issues relating to the use of risk analysis in the RIA context more generally.

6.1. Subjective vs. objective risk

262. The issue of the sometimes very substantial differences between subjective perceptions of risk magnitudes and their actual or objective magnitudes is widely discussed in the risk literature. This issue is also recognised in several RIA guidance documents, although its implications for policy, and for RIA, seem not always to be fully drawn out.

263. For example, the Australian RIA guide discusses the distinction between "perceived" and "actual" risk and argues that perceived risks may either under- or over-estimate actual risks. It argues that the RIA document should present an objective risk analysis:

> "The problem section should distinguish between real (or actual) risks and perceived risks. Governments frequently implement regulation in response to public calls for increased protection, particularly following significant adverse events. Public perception of risk is often exaggerated and based on unfamiliar or 'sinister' risks (such as the possibility of becoming sick from drinking recycled water), but frequently underestimates more common and much more likely risks (such as the likelihood of being involved in a motor vehicle accident). A RIS should always present an evidence-based assessment of risk." (OBPR, 2007, p. 138).

264. This statement seems to imply a clear view that it is a key role of RIA to separate objective risks from subjective risk perceptions. However, the guide seems to state quite unequivocally that RIA and subsequent policy decision-making should be based solely on the former.

265. By contrast, a recent publication by the UK Government's Better Regulation Commission (BRC) (United Kingdom Government 2006) deals explicitly with the issue of the reasons for the influence of subjective risk perceptions in public policy decision-making. The BRC effectively argues that subjective perceptions of risk are systematically biased toward over-estimation of objective risks, noting:

> "There is a view that the policy dilemma at the heart of risk management is that policies responding to lay-people's perceptions of risk tend toward over-regulation, while policies based entirely on scientific evidence will be seen as an inadequate response and will not be supported by the public." (United Kingdom Government, 2006, p. 11)

266. This systematic bias is attributed to a range of factors, including the impact of the promotion of sectional interests (including the demands of opposition politics, the need to sell newspapers and "a bias for bad news rather than good") and poor communication of risk data to the public. The report suggests that an important source of this perceived bias toward over-regulation of risk is the emergence of a "regulatory spiral", where the increasing propensity to regulate in response to perceptions of risk reinforces a generalised perception in the community that the world is characterised by "ever growing dangers that must be kept in check, usually by more government regulation" (*ibid*). This concept of increasing risk-aversion becoming self-reinforcing apparently underlies in large part the strong view of BRC about the need for policy action aimed at addressing these concerns.

267. Having considered some underlying causes for differences between objective and subject to risks and for what it analyses as a diminishing tolerance for risk, the BRC put forward recommendations aimed at changing perceptions of risk and of the role of government in managing risk. This approach would seem to be potentially more fruitful as a means of ensuring that regulatory decision-making increasingly responds to objective risk assessments than the alternative of simply arguing for a clear separation of objective risks and subjective risk perceptions and for ignoring the latter in the policy decision-making context.

268. That said, this approach seems largely to conflict with the underlying presumption of the risk literature, which is that subjective risk perceptions should be regarded as essentially exogenous by the policy-maker. For example, Hokstad & Steiro (2006) argue:

> "Risk should neither be defined nor managed without placing it in a cultural, sociological and psychological context... This is one reason why a RAS[41] approach cannot be defined as a purely quantitative/mathematical model. One needs also to consider for instance the public's acceptance of risk."

269. More particularly, in the context of the current paper, the issue of changing societal risk perceptions and expectations regarding government responses to identified risk is a broad one which is probably not feasible to address fully in the context of RIA guidance documents. Perhaps the more relevant point is that it is not realistic to put forward the view that, having separated objective risks from subjective risk perceptions, the latter should simply be ignored in undertaking the analytical process.

270. This is perhaps an area in which the issue of integrating quantitative and qualitative elements of RIA becomes particularly important. From an economic perspective it can be suggested that subjective risks may be at least as important in policy analysis as objective risks. That is, to the extent that differences between subjective risk assessments and objective assessments are not attributable simply to lack of information, the utility gains that result from reducing risks that are subjectively highly rated are the same, regardless of whether the objective risk is high or low.

271. While subjective risk perceptions may be changeable over time in response to government actions, as suggested by the conclusions of the BRC report this is clearly a longer term issue while, in the RIA context, it is arguable that subjective risk perceptions should be regarded as essentially exogenous.

6.2. Risk rules (risk neutrality vs. risk aversion; the precautionary principle)

Are populations risk accepting, risk neutral or risk averse?

272. Theoretically, it is not possible to weigh different policy responses to identified unacceptable risks without adopting assumptions as to whether the population as a whole can best be characterised as being risk accepting, risk neutral or risk averse. This is because the relative merits of different regulatory or other policy responses to the risk will differ according to this characteristic of the population.

273. Despite this, only one of the eight RIA guides reviewed for this paper discusses this issue. The United States RIA guide incorporates a brief discussion (p. 40) which states that RIA authors should assume risk neutrality in their analysis, while recognising that this assumption will not be met in practice in all cases. Importantly, the US guide points out that the assumption of risk neutrality validates the use of expected value analysis as the fundamental tool for weighing different alternatives. It may also be the case that guidance on specific risk analysis may not be contained in general document but may remain embedded in specific sectoral agencies in charge of managing specific risks, without necessarily being publicly available.

274. To the extent that one departs from this assumption, there would appear to be a need to specify the characteristics of the risk averse nature being postulated for the relevant population, in order to be able to reach a definitive analytical conclusion using other approaches. This clearly involves major, perhaps insurmountable, difficulties. Based on the restricted sample above, an assumption of risk neutrality may represent the "second best" option, in that it is the only analytically feasible approach to adopt.

6.3. The precautionary principle

275. OECD (2006) argued that:

> "…the increasingly widespread promulgation of the precautionary principle in the regulatory context necessarily introduces this concept [of whether populations are risk neutral or risk averse] in the substantive sense. That is, the precautionary principle amounts to the integration of varying, but unspecified, degrees of risk aversion into the policy decision-making process."

276. Three of the eight RIA guides reviewed discuss the precautionary principle and, in all cases, counsel that it should be used in the RIA context. However there is some lack of clarity as to how it should be taken into account. The Australian RIA guide notes that the principle was specifically endorsed by Federal, State and Territory governments in the context of an inter-governmental agreement on ecologically sustainable development, implying that its use may be restricted to this context. No specific guidance is given as to how the principle is to be incorporated in RIA.

277. The EU guide states that the precautionary principle "must therefore be viewed within the overall framework of risk analysis, with the possible extreme scenarios identified by undertaking routine sensitivity analysis." (p. 48). The guide includes a brief (1/2 page) discussion of the use of the principle in RIA.

278. The UK guide states that "you may need to apply the precautionary principle" and that "The UK, along with other developed countries, is committed to using this principle." The UK RIA guide is unique in that it provides a link to a paper providing a detailed discussion of the use of the precautionary principle (UK Government, 2002). A notable element of this paper is that it specifically counsels that action in pursuit of the precautionary principle should be consistent with principles of good regulation; specifically that it should be "proportionate, consistent, targeted, transparent and accountable."

279. The UK is thus apparently unique in having published a document that specifically seeks both to provide guidance on how the precautionary principle should be used in practical policy contexts and in seeking to reconcile the principle with the principles of good regulation. To the extent that the precautionary principle is actually adopted by governments, at least in some contexts, as an element in decision-making, it would seem that this approach of interpreting it in light of the regulatory policy agenda is a significant step forward. The reality in many other countries may well be that the principle is a part of the policy process, but is not being examined as part of the regulatory policy and quality agenda.

280. The risks for regulatory quality inherent in the adoption of an ill-defined precautionary principle have been discussed by Majone (2006), who argued that the precautionary principle risks diverting risk reduction efforts toward risks that are poorly understood but of relatively low importance at the expense of efforts to control more substantial risks. The opportunity costs that arise, to the extent that this dynamic operates, underline the need to ensure that the interpretation of the precautionary principle in practice is consistent with regulatory quality concepts.

Conclusions

Comprehensiveness vs. comprehensibility

281. There is an apparent tension between issues of comprehensiveness and comprehensibility in RIA guidance. This paper has suggested at several points that RIA guidance is lacking in its coverage of particular methodological issues and that it often fails to set out the conceptual underpinnings of certain issues. These omissions are likely, in many cases, to result from efforts to ensure that RIA guidance is made accessible to generalist policy officers by avoiding both undue detail and technical complexity. Such considerations are clearly important in ensuring that RIA guidance is used by its intended audience and so able to assist in improving analytical standards.

282. However, there is obviously a tension, in that less sophisticated guidance is less able to support higher analytical standards in those cases where more complex analyses are needed. One potential way of resolving this tension could be to develop a relatively brief and non-technical RIA guide which is supported by a number of technical appendices, providing additional detail and sophistication in their coverage of relevant methodological issues. Alternatively, the RIA guide can be supplemented by other, stand-alone documents providing this additional detail. Several variants on this approach can be identified:

- In Australia, Canada, the United Kingdom, and the United States BCA guides are also published, which provide substantially greater methodological guidance but largely discuss BCA in more general terms, rather than specifically in the regulatory context.

- In Australia and in Victoria, the RIA guidance document is itself relatively brief, but is supported by a substantial number of appendices dealing in some detail with specific issues.

- In several countries, a range of RIA-related materials are published on the internet sites of regulatory reform authorities.

283. A significant problem is the lack of cross-referencing between the various guidance documents available. For example, The Australian RIA guidance document contains no reference to the Department of Finance and Administration's BCA guidance document. Similarly, while the UK RIA guide provides a small number of references to the Treasury Green Book, it makes no mention of the detailed guide to the use of Multi-Criteria Analysis published by the former Department of Transport and Local Government. More remarkably, the Irish RIA guide actually contradicts the guidelines on appraising public sector capital expenditure proposals with regard to BCA decision rules, as noted above.

284. These observations suggest that an important area for improvement is ensuring that the drive to make RIA guidance "user friendly" does not come at the expense of adequate levels of detail and sophistication being included in the guidance offered. This is likely to imply the use of several interlocking documents with different, but related purposes and means that efforts to ensure consistency between them and appropriate cross-referencing and cross-promotion of their availability should be seen as crucial.

285. A related issue in regard to the above is the need for RIA systems to incorporate the concept of proportionality in relation to required analytical standards. That is, regulatory proposals with relatively limited effects should be subject to more limited RIA requirements, with the commitment of resources to RIA being broadly proportionate to the likely extent of the regulatory impact. A number of member countries have "triage" arrangements in place which attempt to ensure this proportionality is achieved in practice. However, there is also a need for RIA guidance material to acknowledge this issue. This implies that, if RIA guidance is to be made more comprehensive and rigorous, it will be necessary to clarify that this, more detailed guidance is intended to apply largely to the more substantial regulatory proposals.

286. The perspective underlying the examination of RIA methodological guidance contained in this paper is that better quality RIA methodological practices should lead systematically to better quality regulation. The provision to regulators by regulatory reform authorities of published methodological guidance, supplemented by formal training and less formal advisory/helpdesk functions, can be expected to have a major influence on the quality of RIA achieved in practice. Thus, systematic attention needs to be paid to the quality of published RIA guidance documents and steps taken to update these documents on a regular basis in the light of policy learning, changes in RIA policy and improvements in RIA expertise and resource availability among regulators over time.

Notes

1. The German RIA guidelines document was provided in English translation (see bibliography). However, the more detailed Handbook was not available. This latter document is understood to contain the majority of the relevant methodological material.

2. *Recommendation of the OECD Council on Improving the Quality of Government Regulation.* 9 March 1995.

3. *Reducing Risks, Protecting People: HSE'S Decision-Making Process.* Health and Safety Executive, United Kingdom, 2001, pp. 44-45.

4 In 2005, 17 member countries reported requiring in RIA a quantification of costs and benefits and the demonstration that benefits justify costs *always*, *at least for major regulation or in selected cases*. Jacobzone, Stéphane, Chang-Won Choi, and Claire Miguet (2006), *"Quality Indicators of Regulatory Management Systems"*, OECD Working Papers on Public Governance, No. 4, forthcoming, Paris.

5. Communication with Mr Dominic Mancini, OMB, 1 November 2007.

6. QALY = Quality Adjusted Life Year. Communication with Dominic Mancini, OMB (1 November 2007).

7. Translation supplied by Mr Aarne Røvik, Ministry of Finance, 12 October 2007.

8. Department of Transport, Local Government and Regions Multi-Criteria Analysis Manual, (undated). See: *www.communities.gov.uk/pub/252/MulticriteriaanalysismanualPDF1380Kb_id1142252.pdf* Note that, in Australia, BTRE (1999) also includes a chapter discussing MCA in some detail.

9. Personal communications with author (various).

10. All Victorian RIA published since 2004 can be viewed in full text form at *www.vcec.vic.gov.au*

11. Issues of proportionality might suggest that it is inappropriate to employ such indirect valuation methodologies in some cases. In others, it may be possible for a judgement to be reached that none of the available methodologies is likely to be appropriate to the particular case.

12. Since 2005, the New Zealand Treasury has published its own BCA guide.

13. This rate is applicable to public investments generally, rather than being specific to RIA.

14. Established in the Danish Manual of Socio-Economic Analysis cited in OECD (2004), p. 20.

15. See United States Government (2003), p. 33, United States Government (1992), p. 8.

16. Ministry of Finance (2005) "Behandling av kalkulasjonsrente, risiko, kalkulasjonspriser og skattekostnad i samfunnsøkonomiske analyser", stipulation of social discount rate, risk, calculation prices and cost of tax funding in socio-economic analyses (only in Norwegian).

17. Arguably, regulatory costs incurred by businesses constitute pre-tax expenses. The effective cost to equity holders of these expenses is thus the expense less the tax that would have been levied on the additional profit that would have been earned in the absence of the regulatory expense. This implies that, where a cost of capital approach is taken, a post-tax rate of return should be used. On the other hand, the US BCA guideline specifically states that the recommended 7% discount rate represents the pre-tax opportunity cost of (incremental) capital.

18. Risk here refers only to general market risk, with the discussion elsewhere specifically rejecting the notion of adopting an allowance for non-market risk in the discount rate (see below).

19. It also notes the practical difficulty of distinguishing between market and non-market risks.

20. It should be noted that the French guide also refers to the analysis of Weitzman and that of Gollier. However, these analyses are not discussed in detail and do not underpin the rationale for the use of a declining discount rate presented in the main part of the guide.

21. While the same author is cited, different articles are cited by the two sources. The US RIA guide cites Weitzman ML, *Just Keep Discounting, But…,* in Portney and Weyant (1999). The UK Green Book cites: Weitzman in *Gamma Discounting*, American Economic Review, Vol 91, No 1, March 2001. Also cited is Gollier, C. (2002), *Time Horizon and the Discount Rate*, IDEI, University of Toulouse, mimeo

22. This publication was based on commissioned papers, discussed at a workshop sponsored by Resources for the Future, Stanford University's Energy Modelling Forum, the US EPA & Department of Energy and the Electric Power Research Institute.

23. The authors also note problems with the use of time-dependent discount rate functions:

> "Using a discount rate that depends on the period over which the analysis is being conducted is not without problems. For one thing, it leads to time-inconsistent decisions: plans that people will not follow if given the opportunity to reconsider their actions. This property of hyperbolic discounting functions makes many people uneasy about their use in benefit-cost analysis." (p. 10)

24. Hahn reviews a sample of 108 regulations passed in the US and shows that substituting values of between 1% and 9% for the discount rate varies the proportion of regulations in the sample demonstrating net benefits by only 1-3% (depending on the VSL figure used). This reflects the very wide range in regulatory effectiveness found in the sample. (See esp. Hahn 2005, p. 22)

25. Ministry of Finance *Handbook on Socio-economic Analysis*. The NOK 15 million figure is derived primarily from the EU Environment Directorate.

26. See, for example, BTRE (2002)

27. Personal communication with Rod Bogaards, head of BCA section, OBPR, 12 June 2007.

28. Given the general observation that human capital based VSL figures tend to be significantly lower than revealed preference based figures, as a result of the conceptual differences between them.

29. Translation supplied by Aarne Rovik, Ministry of Finance, Norway, 12 October 2007.

30. Note that the use of a rule of NPV>0 has also been criticized on the basis that it does not account for the alleged tendencies among regulators toward overestimating expected benefits and/or underestimating expected costs. However, some empirical work on this issue (see OECD, 2006) has concluded that the BCA contained in RIA documents do not exhibit any systematic bias in practice.

31. Personal communication with officials of the Victorian Competition and Efficiency Commission.

32. See for example: *On the value of formal assessment of uncertainty in regulatory analysis*, Judson Jaffe and Robert N. Stavins, Regulation and Governance (2007) 1, p.p. 154-171, *www.blackwell-synergy.com/doi/abs/10.1111/j.1748-5991.2007.00008.x*

33. The Norwegian Government has also indicated that it typically adjusts prices to account for the impact of taxation.

34. NOU (1997), p. 27 ”Nytte-kostnadsanalyser”, report on BCA by an *ad hoc* expert committee (only in Norwegian) *www.regjeringen.no/Rpub/NOU/19971997/027/PDFA/NOU199719970027000DDDPDFA.pdf*

35. See Ivar Gaasland (2003): “En numerisk model for analyse av norsk bioproduksjon og foredling”, a numerical model of Norwegian bio-production and processing, Report 32/03, SNF Institute for Research in Economics and Business Administration (only in Norwegian). Similarly, as noted in OECD 2006, Hazilla and Kopp presented a study of the costs of the United States' Clean Air and Water Acts in 1990, using a dynamic computable-general-equilibrium (CGE) model developed for the study.

36. See also OECD 2006 for additional discussion of this issue.

37. Of particular note in this context is the fact that the EU RIA guidance document specifically discusses administrative burdens without mentioning the SCM model.

38. Communications from Mme Dominique de Vos, Prime Minister's Department, 10 July 2007, 7 October 2007.

39. Norwegian Government (2005): “Instructions for Official Studies and Reports”, Ministry of Government Administration and Reform, translated into English, but only available in Norwegian online: *www.regjeringen.no/upload/FAD/Vedlegg/Statsforvaltning/Utredningsveileder_rev2007.pdf*

    The Norwegian checklist (Norwegian Government, 2005, p. 4) is explicitly stated to be non-exhaustive in nature, with any additional partial impacts of significance also required to be identified and assessed.

40. Comprehensive tables of potential impacts, such as those included in the EC RIA guidance document (pp. 29-32) could form appendices for reference purposes.

41. RAS = Risk Across Sectors.

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ANNEX 1. DRAFT GUIDELINES ON RIA METHODOLOGIES

287. The OECD has produced a number of guidelines in relation to the conduct of RIA, commencing with the recommendation of the OECD Council on improving the quality of government regulation, in 1995. The checklist accompanying the recommendation highlighted the importance of "a clear assessment of total costs and benefits" to ensure that the former justified the latter and also required that the distribution of effects across society should be made transparent.

288. In 1997, the OECD published ten RIA best practices, highlighting the need to adopt a consistent but flexible methodological approach and to ensure that RIA was integrated with the policy-making process. In 2005, the OECD Guiding Principles on Regulatory Quality and Performance confirmed and updated the 1997 best practices. The 2005 guidelines provide broad guidance on regulatory policy, including the role of RIA within this context.

289. The following draft guidelines on RIA methodologies are intended to be seen within this broad context of the OECD work on regulatory policy and regulatory impact analysis. These guidelines provide detailed guidance on a range of RIA methodological issues that are of fundamental importance to the overall quality of RIA and, consequently, its ability to contribute to better regulation.

290. The draft guidelines draw on the paper's comparative analysis of RIA guidance documents, other government published methodological guidance and the academic literature. The draft guidelines are intended to form the basis for further discussion with the Working Party on Regulatory Management and Reform and subsequent final endorsement by the Group on Regulatory Policy.

Threshold tests

1. *RIA guidance should include information on the main generic rationales for regulation, including correcting market failure, creating the conditions in which efficient markets can operate and pursuing equity and distributional goals.*

   Regulatory officials should be able to identify the underlying rationale for a particular regulatory proposal in terms of one or more of the above factors. Undertaking this exercise will help to ensure that the problem being addressed is correctly defined and that the objective being sought by regulation is properly specified. This, in turn, will help to ensure that appropriate alternative policy interventions are identified and that impact analysis is relevant and accurate.

   Integrating discussion of the characteristics of different policy tools and their merits in addressing different types of policy problems with the discussion of threshold tests is likely to be a useful addition to RIA guidance in this context.

Guidance on appropriate methodologies

2. *Guidance on RIA methodologies should indicate what methodology or methodologies are required to be used in specific RIA context and should clearly set out the conceptual advantages and disadvantages of each methodology.*

   Information should be provided on both Benefit/Cost Analysis (BCA) and Cost Effectiveness Analysis (CEA). Consideration should also be given to including an explicit discussion of the potential benefits of adopting break-even analysis as a supplementary methodology in situations where there is substantial uncertainty regarding major benefits.

3. *Practical guidance should be provided on how to conduct qualitative analysis in as systematic and objective a fashion as possible and on how to integrate qualitative and quantitative analyses.*

   Consideration should be given, in this context, to explicit endorsement of the use of Multi Criteria Analysis in contexts in which major benefits cannot be quantified and/or expressed in monetary terms. Where the use of Multi Criteria Analysis is endorsed, explicit guidance on its use should also be provided, either in the context of RIA guidance documents themselves or through referencing specialised guidance documents in relation to this particular methodology. Discussion of the need to integrate BCA and MCA should also be included.

Guidance on valuation methodologies

4. *RIA guidance documents should highlight the range of methodologies available for indirectly estimating the values of benefits and costs in respect of which there is no direct market value.*

   Guidance documents should make clear what is expected in terms of the use of these indirect valuation methodologies in particular contexts. This will assist in ensuring that the resources devoted to RIA are proportionate to the expected sizes of the regulatory impacts being considered.

Valuation of a statistical life (VSL)

5. *RIA guidance documents should specify a particular VSL, or a range of VSL, to be used for RIA purposes.*

   Providing a recommended VSL aids in ensuring that health and safety related benefits are monetised wherever feasible. It also ensures consistent treatment of these benefits between different RIA, thus aiding the direction of regulatory efforts towards their most productive uses. For reasons of transparency and acceptability, the conceptual basis for the VSL figure adopted should be made explicit in RIA guidance materials.

Guidance on discount rates

6. *RIA guidance documents should recommend the use of a specific discount rate for regulatory purposes and should clearly specify any particular regulatory contexts in which different discount rates can, or should, be used.*

   Specifying a discount rate aids consistency between RIA, in turn helping to ensure regulatory resources are directed to their most productive uses. While the adopted discount rate would not be expected to change frequently, it should be reviewed from time to time to determine whether any changes in the average values of the variables which underpin it require revision of the rate. The conceptual rationale underlying the chosen discount rate should be made explicit in the RIA document.

Sensitivity analysis

7. Guidance on BCA should highlight the need to conduct sensitivity testing in relation to variables with uncertain values which are likely to affect significantly the outcome of the analysis.

Conducting sensitivity analysis makes BCA results more informative by illustrating how the results are affected by changes in the values of key variables. This acts as a test of the robustness of "base case" RIA results.

Decision rules

8. RIA guidance documents should include an explicit discussion of decision rules for BCA (where this methodology is recommended or required to be used) and should provide guidance on what rule or rules should be adopted.

Partial analyses

9. Specific consideration of impacts on particular groups within society should be required only where these distributional concerns are likely to be germane to regulatory decision-making.

Care should be taken to ensure that requirements to conduct partial impact analyses do not risk undermining the coherence of the overall RIA and reduce its usefulness to decision-makers. This suggests that there should not be requirements to complete partial impact analyses relating to particular groups in all cases. Rather, RIA guidance should emphasise the need to identify and adequately assess any significant distributional impact that are likely to constitute significant considerations for decision-makers in assessing regulatory proposals.

This outcome will be supported if RIA guidance includes an indicative list of possible partial impacts, together with discussion of the issues that are likely to require consideration in each case. Guidance on partial impact analyses should emphasise the need to discuss the results of the partial impact analysis in the broader RIA context in order to ensure that policy coherence is safeguarded.

Risk assessment

10. RIA guidance should include a discussion of risk issues which clearly sets out the governments' expectation in relation to dealing with risk in the regulatory context.

Guidance on risk assessment should include information on optimising the degree of risk reduction, potentially including an introduction to the concept of acceptable risk thresholds. The issue of subjective versus objective risks should be discussed and policy guidance on highlighting any areas of conflict should be provided where feasible. If the "precautionary principle" is to be advocated as part of RIA decision-making, the specific meaning to be ascribed to this principle in the RIA context should be set out as clearly as possible. This specific meaning should be made consistent with the principles of good regulation, and of RIA and BCA, as far as possible.