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Introduction

Economics is about choice. The resources available to society — from people, machines and materials to environment goods — are limited. Scarcity means that using a specific resource for one project or policy will preclude its availability for alternative uses.

Project funding should thus be considered against the context of missed opportunities. At the most confronting level, a decision-maker may need to ask how many people will die because the government spent money to reduce bushfire hazards (e.g. Ashe et al., 2012), for example, rather than providing more diagnostic equipment in hospitals. As Gittins (2015) observes, ‘the moral of opportunity cost is: since you can’t have everything, choose carefully’.

It is a primary role of governments to direct social resources to where they will most benefit the community as a whole. Cost-benefit analysis (CBA) can be used to assist governments in making relevant decisions. While it should not be seen as replacing common sense, or political judgement, it is an important tool in ensuring that government is informed of the costs and benefits to society of proposed actions.

Although it is difficult to formulate a concise, non-technical definition of CBA, however, its objective can be summarised as the assessment of proposed public projects, policies or regulations to determine whether their social benefits exceed their social costs. Chapter 4 describes the technique of CBA as a series of sequential steps.

The basic decision rule in CBA is that the additional social benefits should exceed the additional social costs, even if some members of society may be adversely affected by a project. Social cost-benefit analysis is the most systematic and rigorous tool for informing decision-makers of the likely net benefits of a policy, program or project.

In principle, CBA can be applied to virtually any project or policy. Examples include reducing blood alcohol limits for drivers (Leung, 2013), addressing gambling addiction (Productivity Commission, 1999), including health warnings on tobacco products (Abelson, 2003a), phasing out lightweight plastic bags (Allen Consulting, 2006), pursuing water fluoridation (Doessel, 1979), climate change mitigation (Garnaut, 2008), and preservation of river red gum forests through improved environmental water flows (Bennett, 2008). In practice, it is generally easier to estimate the costs and benefits of infrastructure projects, such as a dam (Saddler et al., 1980) or a transport improvement (Tsolakis et al., 1991), than less tangible elements, such as the effect on national pride or esprit de corps of a country that proposes to host the Olympic or Commonwealth games (Moore et al., 2010). It is for this reason that pedagogic presentations of CBA tend to use infrastructure projects as examples.

The terms 'economic analysis', 'economic appraisal' and 'economic evaluation' are sometimes used as substitutes for 'cost-benefit analysis'. The term cost-benefit analysis itself is a shortened form of the more descriptive 'social cost-benefit analysis', which indicates that conventional CBA automatically includes all social elements of a proposal — financial, environmental and social — from the perspective of all the actors in a society. While these alternative terms may have specialised meanings in some bureaucracies or disciplines, they are generally used interchangeably in the literature, and have been treated as being equivalent in this monograph. A slight difference in the United States is usage of the term 'benefit-cost analysis' (BCA) or 'social benefit-cost analysis'.

North American textbooks typically ascribe the emergence of the official use of CBA to the 1936 US *Flood Control Act*, although it has been argued that the antecedents of CBA in America extend back further in time (e.g. Reuss, 1992). The 1936 legislation contained the now-famous phrase that flood-control projects should proceed 'if the benefits to whomsoever they may accrue are in excess of the estimated

cost, and if the lives and social security of people are otherwise adversely affected'. Several presidential executive orders in the last three decades have extended and strengthened requirements for Federal US agencies to undertake economic appraisals for projects and regulatory proposals.

1.1 Economic evaluation in Australia

Economic appraisal of projects has firm roots in Australia. In evidence to a committee of the Victorian Parliament discussing railways legislation in 1871, the responsible engineer provided a detailed exposition of the application of discounted cash flow methodology (*Evidence Taken at the Bar of the Legislative Council ...*, 1871, appendices K & L). His example demonstrated that it would be cheaper to build a wooden viaduct that would last for only 10 years and rebuild it every decade thereafter, than to build a stone structure with steel girders that would last for 100 years.

In examining proposals for gauge unification prior to Federation, the colonial railways commissioners drew on rudimentary economic appraisals (Dobes, 2008). Studies were published by academics (e.g. Webb & McMaster, 1975) and on behalf of government (see Sinden & Thampapillai, 1995, app. 1) intermittently during the latter part of the 20th century (mainly for a couple of decades from the 1960s), which was the heyday of CBA in Australia.

Australian governments, including at the federal level, however, have been diffident at best in requiring economic appraisals of projects and regulatory measures. There is no statutory equivalent in Australia to the 1936 US *Flood Control Act* to require analysis of social costs and benefits of policy or project proposals. The Commonwealth Treasury (1966) published an information bulletin supplement that outlined the essentials of CBA and, in 1988, New South Wales became the first government in Australia to require all proposals by all agencies for new capital projects to be supported by an economic appraisal (pers. comm. NSW Treasury, 20 August 2015).

Upon taking office, new governments have on occasion announced that Cabinet would only consider expenditure proposals supported by an economic appraisal. These good intentions have been wont

to fall into abeyance, particularly as senior or politically influential ministers have often been able to gain prime ministerial approval to have their submissions considered 'under the table' in Cabinet, thus circumventing any prescribed evaluation processes.

Further, projects are necessarily submitted by ministers to Cabinet at different times during the life of a government. They cannot, therefore, be compared at the same time, with only the best ones being chosen. Clearly, standards of some sort are required to ensure a degree of intertemporal comparability. One commonplace standard is that net present value (NPV) exceed zero, or the benefit-cost ratio (BCR) should exceed one. In the absence of a harmonised approach, however, the calculation of the components of NPVs and BCRs can be manipulated in different ways, limiting their utility as decision rules (see also Chapter 5). It is therefore something of a mystery how the Cabinets of state and national governments can validly compare the relative merits of different proposals.

A potential source of public cynicism about government appraisal of major projects is the avoidance of CBA entirely, even for major projects that generate negative externalities. One means of avoiding undertaking a CBA that captures the effect of a project on the whole affected community is to establish so-called community consultation groups.

In 2011, for example, the Australian Government established such groups (Department of Infrastructure and Transport, 2011) to ostensibly allow 'Australians to have a bigger say in the planning and operation of ... airports'. Australian airports are able to seek approval for major changes of use through the development of 20-year master plans, without CBA. The private sector lessees of Canberra Airport, for example, obtained approval (Truss, 2015) to introduce international flights in a curfew-free situation. Given the obvious potential for large aircraft to increase noise disturbance for residents of Canberra and Queanbeyan, it is disconcerting that, in this case, social costs have been ignored in policy formulation.

1.2 Regulatory impact statements

Australian Government processes that are intended to ensure rigorous evaluation of proposals for regulatory measures have fared little better than general economic appraisal. The Office of Regulation Review was established in 1986 and succeeded by the Office of Best Practice Regulation (OBPR), which issued detailed guidelines on conducting a CBA. Harrison (2009, pp. 44–45) pinpointed the reasons for the flawed nature of the processes involved:

Many regulations (such as delegated legislation) do not go to Cabinet, and can be passed without OBPR approval. Whether a Department that does so is declared non-compliant depends on OBPR staff detecting regulations that should have been subject to an RIA [regulatory impact assessment] process. There is not much incentive to declare regulations that have already been passed as non-compliant, as this could upset the Department and Minister, and potentially embarrass the government. Not only is it easier (and less work) to declare a regulation compliant with (or exempt from) the RIA process, it is difficult for the conscientious to see any positive results from declaring a passed regulation non-compliant. The only sanction is an increased non-compliant proportion of the Department's regulations in the OBPR Annual Report (a fact which may even be seen to reflect badly on the OBPR and the RIA process if it is in fact noticed by anyone) ... Likewise, life is more difficult for an OBPR officer if an RIS [regulatory impact statement] is declared inadequate. Rejections are scrutinised closely; acceptances are not. Pressure on the junior staff can include irate telephone calls to their supervisor from a Departmental Secretary or Minister. The result is the so-called tick-and-flick mentality.

Detailed CBA guidelines were removed from the OBPR website soon after the transfer of the OBPR from the Department of Finance to the Department of Prime Minister and Cabinet following the September 2013 election. The guidelines were replaced by the *Australian Government Guide to Regulation* (Commonwealth of Australia, 2014), which is focused specifically on the regulatory impact statement (RIS) process.

The current *Guide to Regulation* presents a general framework template for appraising proposed regulations. Although it requires an evaluation of the net benefit of the proposed regulation, it adopts triple bottom line language and an approach that recommends assessing impacts

such as 'lower prices ... improved productivity or the creation of new jobs' to 'achieve some form of desirable social outcome'. Quantification of benefits and costs is specified in terms of 'business, community organisations and individuals to a level of detail commensurate with the impact of the policy proposal'. It therefore bears little relationship to a rigorous, conventional CBA.

The scope for CBA to be used in decision-making has recently been expanded by a number of jurisdictions. Queensland Government (2014), New South Wales Government (2013) and the Western Australian Program Evaluation Unit (2015) are examples of whole of government evaluation frameworks that refer explicitly to both cost-effectiveness and CBA as relevant types of summative evaluation approaches. These frameworks tie funding for a program to the adoption of explicit plans for how the program will be assessed in terms of effectiveness and efficiency. Such evaluation plans are increasingly including CBAs to address the issue of allocative efficiency.

1.3 Economic evaluation in New Zealand

Like Australia, New Zealand has a long history of economic appraisal of projects, and all regulatory and legislative proposals require completion and publication of a RIS. Initially used for major highway improvements, the use of CBA was extended in the 1980s to all road projects. The New Zealand Transport Agency (2013) *Economic Evaluation Manual (EEM)* provides a set of detailed input variable values for use in transport analysis, with update factors published regularly.

The New Zealand Treasury has developed expertise in CBA over the years. It provides evaluation and assessment guidelines to government departments on how to complete CBAs and regulation impact statements. It updated its 2005 *Guide to Social Cost Benefit Analysis* (the *Guide*) in July 2015 (New Zealand Treasury, 2015). The *Guide* (pp. 48–49) covers the principal aspects of CBA, specifies values for discount rates and the value of statistical life, as well as specifying a factor of 20 per cent of project costs to allow for the deadweight loss of taxes where a project is funded by general taxation.

However, the *Guide* (p. 45) also outlines a living standards framework that is intended to complement a CBA, if not already taken into account in the CBA. The living standards framework promoted by the Treasury has the following five elements:

- economic growth (intended as a proxy for increases in overall economic welfare, which is what CBA tries to measure)
- sustainability for the future (usually taken to refer to impacts on climate change, biodiversity and loss of natural habitat, but can also refer to fiscal sustainability)
- increasing equity (usually taken to refer to ensuring there is a safety net, to reducing income inequality and to achieving procedural fairness)
- social infrastructure (refers to institutional structures and customs that underpin the way society works. They reduce the transaction costs of doing business, of securing one's income and property, and of social interactions)
- managing risks.

It is not clear from the *Guide*, however, how these principles are practically implemented during Cabinet consideration of project proposals, or why the underlying principles would not have already been taken into account in a social cost-benefit analysis.

1.4 Confusion and opaqueness in the area of economic evaluation

An instructive comment made by an agency in one Australian jurisdiction during background research for this volume was that politicians often call for a CBA, but few, if any, actually understand what a CBA is. The same appears to be true of many public servants.

This raises the broader question of whether politicians can rely on the advice of public servants, or even on their advice regarding studies commissioned from specialist consultants. At the extreme, it raises the fundamental question of whether a minister who presents what is purported to be a CBA in support of legislation is guilty of misleading parliament if the analysis is not based firmly on established economic principles.

Clarke's (1995) examination of the abortive introduction of the Australia Card scheme illustrates the lack of even basic levels of expertise in the Australian Public Service. An excerpt is worth quoting at length:

The over-enthusiasm of the Department [of Social Security] for the program is of historical interest. Of ongoing concern, however, was the Department's failure to apply conventional cost/benefit analysis principles to the exercise. Indeed, there was evidence of failure to even understand the concepts involved. In the 1992 [Annual] Report, for example, net present value techniques were not applied, hardware and maintenance costs were overlooked, no costs were imputed for the efforts of other agencies and clients (which in the case of a program of such wide scope is essential), and the bases on which savings were projected into the future were not stated. The most glaring error was the complete omission of the staff costs involved in 137,000 manual examinations of files, 18,000 actual reviews, 10,000 actions against clients, 1,300 queries by clients, 150 formal appeals, 1,500 debt recovery actions (of which 700 involved negotiations with the debtor), and 100 briefings of the Director of Public Prosecutions. This omission was despite statements that 'the real cost has been in the time and effort of staff administering the program' and 'the reporting requirements are stringent and a lot of time and effort is needed to comply with them' ...

The Privacy Commissioner expressed similar concerns, albeit more gently ... An external audit [by the Australian National Audit Office] of the Parallel Data Matching Program also criticised the quality of cost/benefit analysis undertaken, and pointed out that the Act 'requires the tabling of a comprehensive report in both House of Parliament ... Sufficiently comprehensive cost/benefit information had not been included in either Report ...'

Clarke's example highlights the importance of requiring a rigorous and comprehensive analysis of social costs and benefits. More importantly, it demonstrates that mandating the use of rigorous cost-benefit (or other) analysis will not be effective unless the bureaucracy understands the underlying principles, and applies them of its own volition. Cultural factors are more important, therefore, than formal guidelines and rules.

In recent years, the term cost-benefit analysis has been appropriated by the financial sector, where it is now frequently used to refer to additional costs and revenues — in terms of cash flows alone — that are generated by a private sector (i.e. commercial) project. Such studies

are based on financial, rather than economic values. Compounding the problem is the fact that media commentators rarely, if ever, explain their terminology. Confusion about the meaning of CBA is, therefore, understandable.

A further source of potential confusion is the fact that public projects and programs can validly be analysed from a number of different perspectives: government budgets, social CBA, a 'business case', off-budget financial analysis of a public-private partnership, or impact analysis. Any or all of these approaches may constitute valid analytical or presentational perspectives, depending on the purpose at hand. It is not always clear to non-technical audiences, however, which is being presented or why. The lack of technical understanding, compounded by a lack of clarity in usage, can spark debate that flows at cross-purposes because protagonists do not make sufficiently clear which perspective or technique is being discussed.

Possibly due to the complexity of social CBA, or simply in reaction to its perceived focus on economic efficiency alone, policymakers in many countries, including Australia, began to use multi-criteria analysis (MCA) from about the 1980s. Appendix 2 uses a road-widening example to illustrate why 'composite index' approaches like MCA are subjective and arbitrary (see also, Ergas, 2009; and Dobes & Bennett, 2009). Nevertheless, some government agencies present MCA as an alternative to CBA when it is felt that not all costs or benefits can be quantified (e.g. Government of Victoria, 2014, p. 14), or as a complementary approach that supplements perceived gaps in CBA. It is therefore not surprising that some public servants and politicians may be confused about the appropriateness of different methods of undertaking a project or policy appraisal.

1.5 What can be done to improve the use of economic evaluation?

Handbooks of CBA have been produced by a number of state agencies, as well as by the Commonwealth (Department of Finance and Administration, 2006). While these handbooks are useful, and help raise general awareness about the technique, they can provide only a summary of the theory and techniques available in more detailed

textbooks and journal articles. Moreover, they generally tend to outline what *should* be done, but often neglect to address the issue of what should *not* be done.

Despite the existence of government manuals and handbooks that provide the basics of CBA, all does not seem to be well in terms of the application of CBA in the various jurisdictions. Chapter 2 reports the results of a survey of academics, public servants, non-government organisations and private sector (including consultants) individuals in Australia and New Zealand. Their responses indicate that CBA is not conducted independently and objectively, is used to 'justify rather than inform' and is not always undertaken on important decisions.

Almost two-thirds of survey respondents supported, with qualification, greater harmonisation of variable values and methodologies in CBA as a means of increasing consistency in analysis. A third or so supported the approach without qualification. Interviews with government officials in the various jurisdictions confirmed that there was some degree of underlying support for increased harmonisation, either to achieve better quality or to facilitate the use of CBA by agencies with limited expertise. Chapter 3, therefore, examines different possible approaches to harmonisation, but concludes that harmonising variable and parameter values or methodologies at a national or state level would require a level of effort that would be impracticable.

Chapter 4 proposes harmonisation of only the framework to be used for CBA. While such frameworks already exist in textbooks and many government manuals and handbooks, Chapter 4 proposes a framework that requires an increased level of consistency and transparency. For example, in the first step of specifying the objective of a project, a list of alternative means of achieving the objective is required, *as well as* the reasons for not including any of them in the CBA analysis. Similarly, where standard features like risk analysis are not used, an explicit explanation for the omission is required.

A 'belts and braces' approach is advocated in Chapter 5. Government handbooks are invariably authored by an official or consultant who is familiar with CBA and the emphasis tends to be on what ought to be done in carrying out an economic evaluation. True, warnings and caveats are typically included about issues like double counting or the limitations of benefit-cost ratios, but it is rare, for example, to see

a comprehensive discussion on why the number of jobs created by a project should *not* be included in the CBA. At best, a handbook will indicate that issues such as job creation should be discussed separately to the CBA. While such advice is not incorrect, a non-expert may not fully appreciate the reason for it. To reduce the scope for potential error, an explicit explanation of erroneous approaches would assist in harmonising the quality of CBA studies.

Finally, a number of appendices have been included to assist readers who may wish to further explore some of the points made in the main chapters.

This text is taken from *Social Cost-Benefit Analysis in Australia and New Zealand: The State of Current Practice and What Needs to be Done*, by Leo Dobes, Joanne Leung and George Argyrous, published 2016 by ANU Press, The Australian National University, Canberra, Australia.