

Moving the Boundaries – Reinventing Practical Approaches to Cost-Benefit Analysis

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ABSTRACT

When I conduct training on project design and appraisal, program evaluation and output/outcomes budgeting frameworks, participants typically want to know more about cost-benefit analysis (CBA). Primarily they seek practical tools to help determine whether the overall benefits of an intervention (program, project or activity) outweigh its costs. My response depends on the context. For program evaluation, I link CBA to the performance assessment criteria of appropriateness, efficiency, effectiveness and cost effectiveness. For project design and appraisal, more typically applied to developing countries, I relate such queries to the formalised CBA used by economists which encompasses financial, economic and social CBA. This form of CBA has waned somewhat since its heyday of the 1970s and 1980s when it was routinely adopted by the World Bank, other development assistance providers and also to a degree by Commonwealth agencies, including my work as a practitioner in the Commonwealth Department of Finance in the early 1990s. Formal CBA and Internal Rates of Return (IRR) barely seem to rate a mention in the modern public sector environment, and texts on CBA are often out of print. Given that CBA can provide information which can help determine the overall worth of an investment from a variety of stakeholder perspectives before, during or after implementation, it remains a useful analytical and accountability tool. This paper provides an insight into recent trends in the application of CBA and points to key elements of a cost-benefit framework for assessing projects, programs and the relationship to output-outcome budget initiatives.

Key words: Cost-Benefit Analysis; evaluation; practical; outcomes; international

1. INTRODUCTION

This paper arose out of a paradox. Why has interest in Cost-Benefit Analysis (CBA) declined when the issue of how best to use our scarce resources is more pressing than ever for public policy and for resource allocation purposes?

The issue was brought more clearly to my attention when I was asked to undertake a course in project design, encompassing financial and CBA for the United Nations. Part of the terms of reference called for provision of an available publication which could be used as an ongoing resource for those unfamiliar with CBA concepts. It was not straight forward to find an appropriate readily-accessible living example.

A quick review of available publications on CBA at the National Library of Australia and other searches gave an overall impression that:

- There do not appear to be any major new general texts on CBA.
- Most of the significant texts were written between the mid 1970's to the mid 1990s.
- An apparently large number of sound and practical books on the subject are now out of print, such as *Practical Cost Benefit Analysis* (Perkins, 1994). Even the ubiquitous, well received and affordable Department of Finance Cost Benefit Analysis Handbook (DOF, 1991) and program managers' guide (DOF 1994), targeted to Commonwealth Public Service Managers, are now out of print and hence no longer available. They were an important part of my own CBA toolkit.
- Some apparently recent texts are largely updates of earlier texts, such as *Cost Benefit Analysis for Developing Countries* (Brent 2000). Such books were originally developed for the purposes of helping analysts undertake the Cost Benefit Analyses required when large projects were being prepared and appraised for the international financial institutions, notably the World Bank, particularly in the 1970s and 1980s. It is too early to say whether the reappearance of such texts indicates a renaissance in the use of CBA, though Brent offers some interesting analysis on the causes of the decline, which are mentioned below.
- A by product of this search was to discover there is an increasing body of CBA material on the Internet in various forms for learning purposes. This presents an interesting topic for further investigation. The question is whether such specialised technical topics as CBA may better lend themselves to provision via the Internet, with more accessible updating, publishing and distribution, compared to the costs and vagaries of traditional book publishing and marketing.
- There are still plenty of signs of life in specific applications of CBA in such areas as transport and related infrastructure, the environment and the economics of regulation.

2. REASONS FOR THE CHANGES IN THE USE OF CBA

One reason why CBA texts have declined and generally not been reprinted is that there is not the same demand for courses as previously. Interestingly, the National Centre for Development Studies at the Australian National University continues to run a successful CBA training course predominantly for overseas students. And there is on going demand from overseas countries such as Vietnam to undertake short courses in CBA, particularly where they are of an applied and practical nature.

The lack of recent CBA texts and decline in CBA courses offered seem to be a manifestation of the general decline in CBA as a routine practice in the ex-ante assessment of public sector investments. What are some of the influences that have attributed to this decline?

In the developing country context, a couple of influences appear to be at work. One of the more recent publications on CBA (Brent, 2000) is primarily an update of an earlier book on project appraisal for developing countries. However, Brent also sets out and challenges the rationale given by the World Bank for its decline in interest in CBA as part of the appraisal process for projects. According to Brent, the World Bank's rationale for the decline in the application of CBA arises from two main developments that have taken place since these CBA methods were developed in the 1960s and 1970s.

Firstly, there has been an almost universal move towards privatisation. This trend has diverted attention away from the question of the economics of public investment to the issue of whether a project under consideration should be in the private sector or public sector. This begs the question of whether there should, or should not be, a project at all. In such a context, financial institutions will undertake whatever financial analysis they consider necessary to assess such projects. However, private investors and promoters still continue to seek government input and concessions to ensure a good return on their investment and reduce their risks. CBA can help analyse the implications from the perspective of the public purse and the national benefit.

Secondly, the decline in the use of CBA is partly seen as a corollary of the policy reform and structural adjustment process which have become a more important mechanism for World Bank lending. Formal CBA methods were developed in an international environment where distortions to the economy from protectionism, tariffs, subsidies and other interventions were regarded as the norm. These distortions meant that an analysis of costs and benefits based solely on market prices was considered to give a poor indication of the real costs and benefits to the economy as a whole in terms of resource use. Rather than accept such distortions as given, it is argued that the policy reform and structural adjustment process endeavour to remove such distortions so that market prices would more closely reflect their real resource opportunity cost. Therefore, it is argued, there is less need to undertake the complex CBA practices developed a decade or two earlier.

For instance, a study I undertook in the late 1980's was able to demonstrate that the high rates of return estimated for investment in an expensive overseas dairy factory could be attributed to inconsistencies in the way the analysis was undertaken. Government controlled prices were used for valuing the main inputs, and black-market affected prices used for valuing the final product. By assuming sugar and tin plate were purchased at government controlled prices, which reflected official exchange rates, and the canned sweetened condensed milk was sold in the open market at prices that reflected black market prices and the black market exchange rate, the investment in a large scale factory appeared highly viable. By using a consistent basis for pricing inputs and outputs, the much lower viability of the factory, which intuitively was thought to be marginal, became more transparent.

Another issue in the decline in the use of formal CBA can be attributed to its complexity. The regular application of formal CBA methods on a rigorous basis requires an adjustment for perceived distortions, such as use of conversion factors, shadow pricing, distribution

weights and other adjustments. The set of welfare economics considerations underpinning such analysis are frequently not well understood, and difficult to measure in a practical sense when undertaking project analysis in many of the countries where the projects were being developed. In addition, at the end of the day, when budgets are tight, the analysis may not be able to be acted on, as the financial cost to government may be high, even though the project is assessed as being economically and socially desirable.

In the Australian context, a likely further influence on the use of CBA during the 1990s was the promotion and implementation of the Commonwealth of Australia's evaluation strategy and subsequently the move to outputs/outcomes based accrual budgeting. Whilst there is an obvious link between "value for money" and CBA, the assessment criteria for evaluation is wider but less rigorous than CBA, and includes issues of appropriateness, efficiency, effectiveness, and to some extent cost effectiveness. In addition, the emphasis in promoting evaluation in the public sector was less about technique and more directed towards bringing about a cultural change where public sector managers would routinely assess, and be accountable for, performance rather than managing inputs (Martin and Sadlier, 1998). With the introduction of the new accrual budgeting framework, the focus has been primarily on the financial costs and benefits, with less attention given to economic issues such as opportunity costs and government transfers in decision making.

Under the accrual framework and output/outcome based budgeting, the output/outcome focus was taken further than in the previous program budgeting era. An additional influence was a reduced emphasis on the public sector as the delivery mechanism and a change in the formal accountability mechanisms. A clear distinction was made between what Departments were responsible for (Departmental outputs) and what others were considered accountable for (administered items), though the distinction has become blurred in practice. These developments could further help explain the reduced interest in CBA in terms of a tool used in assessing the costs and benefits of public sector investments from an economic and social point of view. Perhaps the underlying issue is that the financial reforms in the public sector in the late 1990s were primarily seen for their contribution to deficit reduction than their contribution to economic growth.

3. CRITICAL ASSUMPTIONS IN APPLYING CBA

Those proficient in CBA tools generally acknowledge that whilst CBA has a relatively well defined set of basic considerations, it does not produce defined objective results, but is primarily a tool to aid decision making. The critical issue is not the CBA result itself, but the way CBA makes explicit many implicit assumptions and considerations. It is essential that these underlying assumptions are made explicit. CBA can make a project appear more viable or less viable by changing a few key assumptions, such as

- the time period covered in the analysis,
- the value placed on assets at the end of the life of the project,
- the discount rate used in the cash flow analysis,
- the prices adopted for inputs and outputs,
- how the "without project" case is treated, and
- assumed adoption rates for the take up of a new idea or practice.

Some of these principles can well be considered good evaluation practice (Martin and Lin, 1994). For instance, it is typically necessary to assess what would have happened without the program/project/activity. Also, in an evaluation it is critical to make the assumptions (or external factors or risks) explicit. For instance, for an export promotion program, changes in the level of the exchange rate will clearly influence success since on face value, it is possible that the program will appear wildly successful at low exchange rates, and possibly a complete failure when exchange rates firm.

4. TOWARDS SOUND AND PRACTICAL APPROACHES

Whilst there are many elements in the formal CBA processes adopted by institutions such as the World Bank, there was no real effort to halt the decline. A return to a modified formal CBA framework was advocated by Devarajan and others (1995) which tried to focus on the key elements of CBA relating to resource use. This approach advocated:

1. As a matter of routine, use border prices, a discount rate and a standard conversion factor
2. Where there are thought to be large tax distortions, or there are many World Bank Projects, the marginal cost of funds should be estimated
3. Sectoral expenditure programmes should be reviewed before projects are appraised, to see what areas are likely to have the highest return
4. Analysts should assess the feasibility of private sector alternatives to public projects
5. The introduction of distribution weights is not necessary, as distributional objectives can be undertaken more effectively through other instruments (such as the allocation of public expenditures and tax policy as part of the Budget process).

Whilst not all of these issues are relevant to the Australian context, posing the questions remains a good discipline.

From a practical viewpoint, a useful set of rules for today is not too much different than the questions that my colleagues and I in the Department of Finance proposed for managers when undertaking a CBA, as espoused in the Handbook of Cost-Benefit Analysis (DOF, 1991) and booklet "CBA for Program Managers" (DOF, 1995). A modified version of these questions is posed below.

A good starting point to address the questions raised is to find out whether the project/program or other intervention has undergone an analysis of its outcomes/outputs program logic and performance information. This is a very similar starting point to determining and valuing the benefits of a project or program.

When combined with cost information, the CBA undertaken can focus on efficiency (the value of outputs to the value of inputs), cost effectiveness (the cost of achieving a given level of benefits expressed in physical rather than money value terms) or various simplified versions of a CBA, given that both costs and the value of outcomes are expressed in dollar value terms). The key questions would include:

1. What is the underlying problem that is being addressed by this project/program intervention?

2. Can the benefits of the intervention be extracted and quantified from the outcomes and outputs and quantifiable performance information of the project or program?
3. Who is likely to be disadvantaged by this project/program intervention?
4. From whose perspective is the analysis being conducted? For instance, is the analysis undertaken from a government perspective, business perspective, economy-wide perspective or consumer social equity perspective?
5. What alternative strategies to address the underlying problem have been considered?
6. What would have happened without the program? Do the benefits and costs included in the analysis take into account the gains and losses that would have arisen without the intervention?
7. What is the discount rate used to express future costs and benefits in current terms?
8. Are values for costs and benefits consistently treated in nominal (current) or real (constant) dollar terms?
9. What are the critical factors which affect the results of the CBA. Typical factors include:
 - Capital costs, price of outputs and residual values
 - The discount rate
 - Time period used in the analysis.
10. How has allowance been made for risk? Typically this is covered by determining the net benefit (Net Present Value or Internal Rate of Return) of the intervention after allowing for changes in the value of key parameters (known as sensitivity analysis).
11. Are external benefits and costs an important aspect of this intervention and are they taken account of in the analysis? This issue is particularly relevant where environmental factors are involved.
12. Finally, a critical issue to look out for when considering the viability of investments in this age of privatisation is whether the analysis is undertaken in terms of a return to all resources involved, or just to the equity invested by the owner, which may be government. If the rate of interest on borrowed money is less than rate of return for the project as a whole (assuming nominal or real rates are used for both) then the rate of return to the investor's equity will increase as more borrowed money is used. Hence, the analyst needs to know the internal rate of return to all resources employed as well as the rate of return after financing.

5. EQUITY ISSUES

A big debate in the CBA literature from around the mid 1970s centred on the use of distribution weights. The rationale for using distribution weights was that from a social welfare economics perspective, an extra dollar of income is worth more to a poor person than to a rich person (or the marginal utility of an extra dollar to a poor person was higher than an extra dollar to someone better off). Projects which gave more benefits to the poor should have this reflected in the magnitude of the internal rate of return of the project/program/intervention by giving a higher value to those dollars which go to those less fortunate. Opponents argued that a dollar was a dollar, and the best way to address social welfare and income redistribution issues was through the taxation system. They felt that by giving each dollar of costs and benefits the same numerical weight, the efficiency of the use of resources in adding value to the economy would be better measured. Giving

different weighting to some benefits and costs would cause distortions and detract from the transparency of the analysis.

Whilst the use of distribution weights in CBA remains contentious, it does provide useful insights into how the interests of the poor might be incorporated into CBA and public policy debates.

6. CONCLUSION

It is interesting to link the rise and fall of CBA to the issue of structural adjustment, policy reform and the international trade and economic environment, including the reforms of the public sector. There remains an interest, particularly in developing countries, for simple practical tools to quantitatively assess the benefits and costs of individual policy interventions. There is even more interest in working through practical case studies so that the general principles can be actually applied.

There are already in existence a range of suitable CBA texts that can be used to aid decision making on resource use. As demonstrated in this article, there are also some good questions that analysts can pose which will help direct sound analysis. Whilst this paper has been able to touch on some of these, the information is available in texts that in many instances are now out of print. Subject to any world wide resurgence in CBA as an analytical tool, the Internet offers potential to make the tools already developed more accessible and usable than has been the case in the past. CBA used appropriately remains an important tool to help decision making in relation to socially beneficial expenditure decisions.

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