COST-BENEFIT ANALYSIS AS OPERATIONALIZED NEOCLASSICAL ECONOMICS: FROM EVIDENCE TO FOLKLORE

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Neoclassical economics is an imposing theoretical edifice. But at another level it provides detailed operational guidance for public policy. At this *operational* level it is a technocratic tool that gives the *appearance* of scientific precision and evidence-based policy to underpin the day-to-day work that public servants do. This 'deep embeddedness' within the routine operation of government makes it difficult to dislodge the influence of neoclassical economics, even when it has been subjected to sustained theoretical critique, and even when there is a generalized sense that its impact on policy has been harmful. By providing tools that public officials use to resolve the workaday choices they confront, it becomes part of 'business as usual'; a set of 'engineering' instructions that are followed without much critical assessment.

One of the principal means by which neoclassical economics has achieved this embeddedness is through cost-benefit analysis (CBA). Governments across Australia now have guidelines that mandate the use of CBA for decision-making (see for example Commonwealth of Australia, 2006; NSW Treasury, 2017).

As a general principle, it is hard to argue with CBA: weigh up the costs and benefits of different options for achieving a particular objective, and choose the option for which the benefits most outweigh the costs. At this level, it imposes a discipline on public sector activity that appears largely

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beneficial, in that CBA:

- requires decision-makers to acknowledge that the same problem can be tackled through different means – there are options;
- recognises that all the costs and benefits of these choices should be taken into account – options should be evaluated in terms of their social impact rather than just on the immediate 'business case' for each.

From a political economic perspective, however, issues arise with CBA in so far as it adopts marginal utility theory as the principle upon which the costs and benefits are valued (usually in current dollar terms).[1] For example, whether to proceed with a road fatality reduction program by installing traffic lights or by building a roundabout will be judged in terms of the marginal consumer and producer surpluses that are gained or lost by each option relative to the other.

Previous criticism of CBA has focused on the conceptual difficulties of making social welfare judgments on the basis of aggregating individual utilities (Sen, 2000). The choice of the appropriate discount rate for 'telescoping' future costs and benefits into their 'current value equivalent is also contentious. So too is the question of how costs and benefits are distributed among different sections of the population. It is not only the aggregate value of costs and benefits that matters in what are inherently political decisions (see Stilwell 1999; Frank, 2000; and Argyrous, 2013, for an extensive discussion of these issues).

This article focuses on two further aspects of CBA that have a major bearing on its practical application. They are fundamental to the claim of neoclassical economics to act as an operational tool for public sector decision-making by providing dollar values enabling comparison of program options for public spending. The two issues are the so-called 'marginal excess burden of taxation' (MEBT) and the 'value of a statistical life' (VSL). It is argued that, in both instances, the default values that have been adopted in Australian CBA exercises are based on outdated data and methods. They serve a useful pragmatic function for policymakers, relieving public sector employees from doing the hard empirical work of constantly recalculating these values, while providing

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[1] See Allan Schmid (1994) for an alternative institutional approach to CBA based on the principle of collective action.

a superficial appearance of evidence-based decision-making. But the evidence is in fact folklore. Consequently, the decisions are unsound.

The value of a statistical life

Within the framework of neoclassical economics, everything has a price, including life itself, in so far as people will incur other economic costs to preserve it, or alternatively, accept an economic reward to put it at risk. In terms of the traffic control example above, CBA asks how much society is willing to pay to reduce road fatalities. The answer depends on the aggregated value of those lives saved, which can be given a dollar value through various empirical methods.

These dollar values are for 'statistical lives' (VSL). Abelson (2007: 3) notes that a statistical life is not the life of any specific person. He illustrates the distinction in the following way:

Suppose that a policy or project reduces a small risk of fatality by one in a thousand (by 0.1 per cent). If 1000 individuals are the subject of this policy, on average the policy will save one life. This is important because what we are valuing is the reduction in a small risk for each of 1000 persons. Accordingly empirical studies need to focus on the values that individuals attach to reductions in such risks. The value of VSL will reflect these values.

The Commonwealth Office of Best Practice Regulation (2014: 2) stipulates 'that departments and agencies use the estimate of $3.5m for the value of statistical life and $151,000 for the value of statistical life year (both of these are measured in 2007 dollars). Using CPI data to express these estimates in 2014 dollars gives a VSL of $4.2 million, and a VSLY of $182,000.'

On the basis of these guidelines, the VSL has been widely adopted by State governments (Victorian Office of Better Regulation 2016) and government agencies such as the Australian Competition and Consumer Commission. It has also been used to measure the VSL when evaluating myriad programs including non-emergency patient transport (Department of Health and Human Services, 2015), clinical trials (Australian Commission on Safety and Quality in Health Care, 2017), regulation of private swimming pool fences (CIE, 2016), and early intervention programs for deaf children (Deloitte Access Economics, 2017).

Where does this value for a statistical life come from? In principle, there are various means by which it could be derived, including the value of a person's lifetime production less consumption (their 'net economic contribution' to society) or averaging the results of surveys of people's subjective valuations. In practice, governments seek a standard figure. In the Australian case, the Commonwealth (2014: 2) cites Abelson (2007) as providing 'recent empirical evidence' that 'has been assessed to ensure that it is comprehensive and rigorous'.[2] One may question whether a study in 2007 could be described in 2014 as recent. Moreover, Abelson's paper itself is a review of previous studies, so that the Commonwealth is in fact reaching back, through the Abelson review, to studies from as early as 1991. Table 1 shows the distribution of the studies included in the Abelson review by year of publication.

Table 1: Studies reviewed by Abelson (2007) by year of publication

Year of study	Nunmber of studies in review
1991	1
1993	1
1994	1
1995	3
1997	3
1998	1
1999	3
2000	2
2001	3
2005	2
Total	20
Median year	1998

2 Abelson (2007) is an updated version of Abelson (2003).

We can see from this table that the Commonwealth Government's VSL is derived from studies produced over a fourteen year period, the most recent of which was nearly a decade old at the time that the VSL was adopted. The only two Australian studies included in the Abelson review were from 1997 and 1991, with the rest coming from countries the US, Canada, the UK, Switzerland, France, Sweden, New Zealand, and Japan. Moreover, six of the papers included in the Abelson review were themselves reviews of other individual studies, so that some of these individual studies are 'double counted' by appearing in more than one review. For example, Viscusi (1993) and Mrozek and Taylor (2001) include the same study from 1974.

A closer look at Abelson's (2007) review also shows that the studies he cites produced an incredibly wide range of values for a statistical life. Some were less than $US1 million, and others as high as $US19.1 million (unadjusted for inflation). We note again some of these studies cited by Abelson were themselves reviews of a collection of studies that contained a wide variation in the estimated VSL. To adopt a simple average of such a disparate group of empirical valuations only hides the uncertainty in the estimates. It also ignores some of the more nuanced discussion that Abelson and others have raised about using a single, universal, and unchanging VSL, such as the fact that people weigh some risks more heavily than others, and that the same value may not be appropriate for all ages.

Yet none of these considerations have been taken into account in the Government adopting a single, universal measure for VSL that has been uncritically adopted in practice.

The marginal excess burden of taxation

According to neoclassical theory, all government spending needs to be financed. With an implicit assumption of long-run full employment, any increase in government spending must draw on financial resources that would have been used in some other way. The net loss in consumer and producer surplus from the activities that will no longer go ahead as a result of the increase in government spending constitute a deadweight loss in welfare, as understood by neoclassical microeconomics. The extra taxes that have to be raised to finance a new government spending commitment create a Marginal Excess Tax Burden (METB), defined as

the ratio of the loss of social surplus due to imposition of the tax, divided by the total amount of revenue collected. The argument for the use of MEBT in CBA is that higher tax rates will create labor supply disincentives, since they act in a way similar to a fall in the real wage rate.[3]

Interestingly, the latter presumption that there are always work disincentive effects resulting from more government expenditure sits uneasily with standard neoclassical microeconomic theory. As the introductory texts note, price changes have both substitution and income effects. This applies to labour as it does to all commodities. Thus a cut in the after-tax wage may cause workers to substitute leisure for work at the margin, since work is now 'less economically attractive' relative to leisure. Concurrently though, the income effect will work in the opposite direction, because the lowered after-tax income will tend to make workers choose longer hours of work in order to maintain their same total income. Formally, the net effect of the substitution and income effects pulling in different directions is indeterminate.

In practice, such theoretical niceties (or ambiguities) in neoclassical economics are set aside. The Australian Government's *Handbook of Cost-Benefit Analysis* simply posits that METB has a value of 25 per cent (Department of Finance and Administration 2006: 37), citing Campbell (1997) to justify that figure. In other words, for every direct dollar spent by government on a new program, the *social cost* is assumed to be $1.25. Similarly, the New Zealand Treasury's *Cost Benefit Analysis Primer* stipulates, on the basis of the same study, 'a rate of 20% as a default deadweight loss value in the absence of an alternative evidence based value' (2005: 18).

This METB value of 1.2–1.25 has been used in a number of CBAs (White *et al*. 2012; Abelson and Joyeux 2007). For example, Moore et al (2010: 9) defer to the 'default deadweight loss recommended by the [New Zealand] Treasury' of 20 per cent. Similarly, the *Independent Cost-benefit Analysis of Broadband and Review of Regulation Volume II – The Costs and Benefits of High-Speed Broadband* (Department of

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[3] Conceptually, two sources of deadweight loss may flow from higher taxation: changes in consumption patterns and changes in the supply of labor. Calculations of METB tend to focus on the labor supply effect, as it is not clear exactly how net consumption is affected by the provision of the program and the associated form of taxation.

Communications and the Arts 2014: 42) applied a METB of 0.24 cents per dollar.

Thus practice has settled on 'default values' for METB of 1.2–1.25 that can be 'plugged in' to a CBA, effectively penalizing proposed public spending programs, which must show a much greater benefit than would otherwise be the case before they can be approved to go ahead.

Before we investigate the empirical basis for these 'default values' of 1.2–1.25 for METB, we should note some underlying theoretical issues. We can begin with the premise that any increase in government spending must lead to some future increase in taxation. Although never explicitly articulated, this premise seems to rest on the belief that the economy operates, or at least tends to operate over the long run, at the full employment level.

Political economists, by contrast, emphasize that persistent structural unemployment is the norm. In these more typical real-world conditions, increases in public spending will tend to lead to higher output levels, which may at least partially generate the tax revenue to 'fund' the program. This Keynesian reasoning challenges the presumption that public spending is a burden, emphasizing that it can generate more output and more jobs. Moreover, even if full employment were to be assumed, it is important to recognize that particular types of government spending such as infrastructure may increase productivity and therefore net tax revenue (Otto and Voss, 1994; Paul 2003).[4]

But what is the empirical basis for assuming a METB value of between 1.2–1.25? The key Australian study is Campbell and Bond (1997) whose basic methodology was to construct a representative agent model for each of the 10 gross income deciles in Australia and then to simulate for each group the labor supply effects of a 1 percent increase in marginal income tax rates. Their main conclusion is that 'a project proposed to be undertaken by the Australian federal government needs to have a benefit/cost ratio in the range 1.19–1.24 if it is to receive serious consideration' (1997: 32). Apart from a host of very restrictive assumptions, this study draws on data that are now seriously out of date.

In particular, Campbell and Bond draw on an earlier study by Apps and Savage (1989) to provide the parameters for labor supply elasticities

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[4] Freebairn (1995) has shown how relaxing the assumption of full employment seriously affects the estimate of METB.

from which Campbell and Bond simulate the welfare loss from higher tax rates. But Apps and Savage used income data and marginal income tax rates from *1981–82*. Their analysis is also based on a very restrictive set of assumptions about the structure of households and the way they allocate resources, including income, among their respective members.

Whatever the merits of this analysis may have been in the 1980s, it is questionable whether the results can still be uncritically applied over thirty years later. The nature of the labor market in Australia and New Zealand has changed dramatically since the 1980s. Two particular developments cast doubt on such dated empirical estimates for the MEBT:

- changes in the labor market and how these might affect labor supply elasticities;
- changes in income tax rates (Harding et al, 2009) and the distribution of tax collection.

The classic single-earner/male-breadwinner household, which is the model assumed by Apps and Savage (1989: 341), is no longer as common and there has been a noticeable shift from full-time to part-time and casual employment, corresponding with a growth in employment for females (see Harding *et al* 2009 for a detailed breakdown of these changes and implications for tax rates).

Moreover, a wealth of research has emerged to show that the labor supply effects of taxation changes vary across groups in the labor market (see for example Creedy 2004). Indeed, for some groups, such as working wives, the labor supply curve might be backward bending. As Miller (1985) found in an early study in Australia, labor supply may *increase* for this group as the effective wage rates goes down.

Calculating the MEBT of government programs also crucially depends on the choice of tax assumed to be used to raise finance. For example, Econtech KPMG (2010: 5), provides estimates for the METB ranging from 80% (tobacco excise) to 192% (gambling taxes) (see also Bates, 2001). Generally, the values for MEBT are lower for consumption than for income taxes (Diewert and Lawrence, 1995); given the shift in the tax base in the last 30 years toward consumption, this suggests a need to revise assumptions.

Conclusion

Cost-benefit analysis is an attempt to apply mainstream economic reasoning to public policy decision-making. It is fraught with conceptual and empirical difficulties. This article has emphasized some features that are particularly problematic in its Australian applications. These relate to the valuation of life and the presumption that there is a measurable loss in social welfare resulting from additional government spending that is financed by taxes. Official Australian CBA guidelines have mandated specific values for both that must be adopted in the CBA calculations. These values have the appearance of being empirically grounded and, in each instance, the guidelines refer to a 'classic' study. But closer inspection of these classic studies shows that they draw from other studies and earlier data, often going back to the 1970s and 1980s. What appears to be evidence in fact has become folklore. Uncritically adopting these values, even where there is a literature to suggest that they need to be treated with caution or dramatically updated (even accepting, that is, the neoclassical idiom in which they sit) reflects a profound intellectual slovenliness.

Political economists need to continue challenging the theoretical premises behind the use of cost-benefit analysis. But the flawed empirical basis for this operationalized version of neoclassical economics should also be challenged. Otherwise decisions about public spending will continue to be made on an unsound basis.

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