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VALUING IMPACTS
the contribution of CBAx to improved policy practices

Abstract

Policymaking involves trade-offs to ensure the best possible use of limited resources. Identifying and measuring the impacts – for example, health gains – of different policy alternatives helps decision makers with these trade-offs, and is a key component of policy analysis. The New Zealand Treasury's approach to cost-benefit analysis includes CBAx, which is a toolkit for estimating the societal value of alternative policy options. A 2018 review showed increased quality of cost-benefit analysis in budget proposals following the introduction of CBAx. In this article, we provide some context to CBAx developments and share insights from agencies' practical experiences. We focus on the perspective of policy advisors using CBAx to undertake cost-benefit analysis, and touch on the application of the results to decision making. We conclude by outlining potential developments and inviting colleagues to make use of the CBAx toolkit to enhance cost-benefit analysis practices to better value policy impacts for New Zealanders.

Keywords cost-benefit analysis, CBAx, policy impacts, wellbeing, value, ethics

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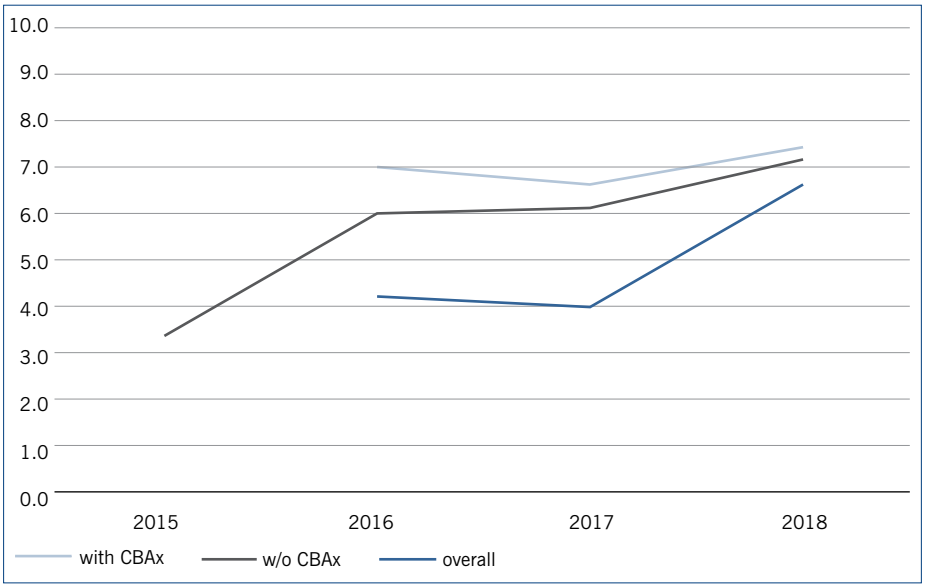
Figure 1: Trends in mean score by CBAx status, Budgets 2015 - 2018



Source: NZIER, 2018

Cost–benefit analysis in New Zealand improved with CBAx

Cost–benefit analysis is a standard economic technique used internationally for assessing policy options (see Weimer and Vining, 2005; Boardman et al., 2018). In essence, cost-benefit analysis involves comparing alternative courses of action by identifying the expected societal impacts of the alternatives over time, and estimating the value of these impacts. In the New Zealand public sector, agencies are expected to undertake ex ante cost-benefit analysis in a regulatory impact assessment for legislative change, a business case, a budget funding proposal, and as required by governing legislation (such as for resource management policies).

Views vary about the usefulness of doing cost-benefit analysis, and there are many challenges, as outlined in this article. Reasons in favour of undertaking cost-benefit analysis include that it 'forces the decision-maker to look at who the beneficiaries and losers are in both the spatial and temporal dimensions … and [insists] on all gains and losses of "utility" or "well-being" being counted [which] means that it forces the wider view on decision-makers' (OECD, 2018 p.32).

Cost–benefit analysis in New Zealand is not new. But, as with overseas experience, the lack of consistent usage, capability and standardisation are challenges (Dobes, Argyrous and Leung, 2015). Some agencies have undertaken cost-benefit analysis for many years (for example, in the transport sector). For other agencies, their practice in recent years has changed with the introduction in 2015 of CBAx, a toolkit for estimating the societal value of policy options. A 2018 review showed that the quality of cost-benefit analysis in Budget initiatives increased following the introduction of CBAx (NZIER, 2018). The review investigated the quality of the cost-benefit analysis in a stratified random sample of 50 Budget initiatives over four Budgets, 2015–18, giving each analysis a score out of 10 (see Figure 1).

The review showed that the main contribution of CBAx is not the modelling and monetisation in and of itself, but that CBAx requires agencies to be more systematic and robust in their policy thinking. The review saw improvements in the initial cost-benefit analysis steps, such as identifying a broader range of impacts, better problem definition, better quantification and more transparent assumptions. The review also raised a number of challenges, such as a need to improve the quality of the evidence provided for impacts and to not over-focus on the summary metrics.

Agencies doubled the quality of their cost-benefit analysis advice over just a few years – a remarkable achievement (though admittedly this comes from a low base). This improvement in agency practice deserves acknowledgement. And it is encouraging, given the political context in which ministers increasingly seek policy advice that covers multidimensional impacts, long-term implications and cross-sector solutions, and which is based on better use of data and evidence on what difference interventions make to New Zealanders' lives. Measurement capability within agencies is weak (Productivity Commission, 2018); we are not underestimating the challenges that agencies face.

Ethical assumptions

Before introducing CBAx, we set out here three of the major ethical assumptions underlying cost-benefit analysis. We do so to provide some context. Cost–benefit analysis is not ethically neutral or value free. This is not a criticism; the ethical assumptions underlying cost-benefit analysis should be considered as 'features', not 'bugs'. But appreciating this context helps with interpreting the results of cost-benefit analysis.

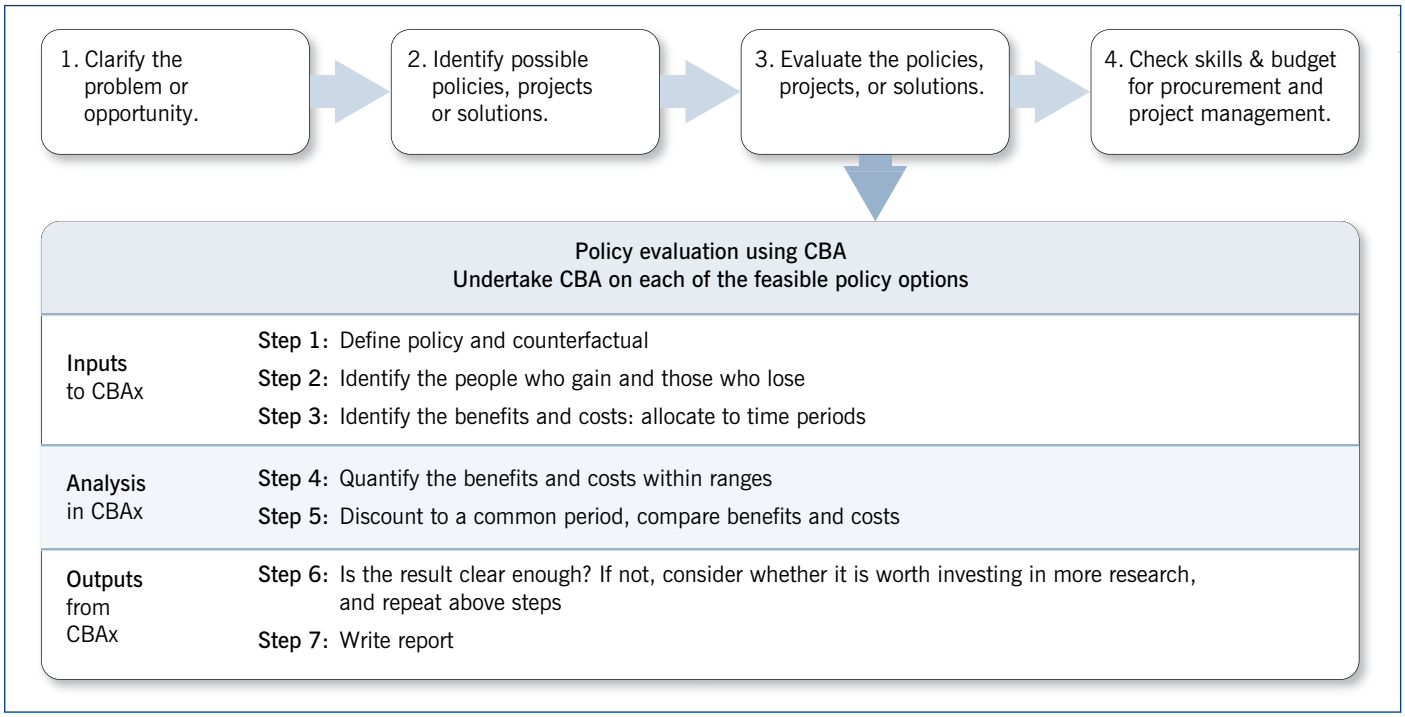
First, cost-benefit analysis is necessarily *normative* in the sense that it addresses the issue of what course of action we should take. In particular, cost-benefit analysis is *consequentialist*: it assumes that the course of action we should take depends on the consequences (or outcomes or impacts) of that course of action.

Second, evidence and data have a central role in cost-benefit analysis, given the importance of outcomes for determining the recommended course of action. But gathering this evidence and data is not a purely empirical or positive exercise. The decision over what to measure, and what metrics to use, implies a particular view of 'good' and 'bad', or more generally a particular view of *value*.

Third, cost-benefit analysis is often silent on the issue of *distribution*. To infer from this that the best alternative is the one that maximises the aggregate benefits over costs would be to take a substantive position on justice in distribution.

Again, bringing attention to these three particular underlying ethical assumptions should not be interpreted as a criticism. There are, however, alternative ethical assumptions that could be made. For example, it may seem obvious that the correct course of action depends on the impacts of that action. Consequentialism is certainly a prominent normative ethical theory, but it is by no means the only view.

Figure 2: CBAx cost-benefit analysis steps



Source: The Treasury (2015), and with CBAx additions in The Treasury (2019)

Consequentialism's most prominent rival is *deontology*. Deontological normative ethical theories claim that we can determine what course of action we should take directly, independently of the expected consequences of our action. According to deontology, the correct course of action is the one that conforms to certain norms, and often these norms are couched in terms of the rights and duties of individuals. For example, a proposal for compulsory organ donation might have more benefits than costs, but we might reject the proposal on the grounds that it violates a fundamental right to bodily integrity (and so rule out a proposal before we even begin to consider the impacts). Such reasoning involves deontological normative ethical theories.

We revisit some of these underlying ethical assumptions of cost-benefit analysis later in this article. A lot of attention is given to the second ethical assumption noted above – the issue of value – and the challenge of capturing it. We turn to that issue in the next section.

What is CBAx?

CBAx is a cost-benefit analysis toolkit developed by the New Zealand Treasury for considering a wide range of impacts across time and multiple dimensions. It is designed to improve cost-benefit analysis practice. In principle, cost-benefit analysis is simply a matter of providing an evaluation of policy alternatives. However, in practice, estimating the value of impacts can be challenging.

CBAx is distinctive in that CBAx provides policy practitioners with a database of some New Zealand values, and standardises modelling – for example, standardising discounting of impacts over time. CBAx makes it easier and faster to do a cost-benefit analysis of options, and makes analysis more consistent, transparent and comparable for decision makers.

At the core of CBAx is a spreadsheet to model benefits and costs: i.e., the positive and negative societal impacts, such as income and loneliness. But CBAx is more than a cost-benefit analysis spreadsheet. The CBAx approach involves the Treasury working alongside agencies to build capability and improve cost-benefit analysis practice – for example, through the CBAx community of practice. In addition to the spreadsheet model, the CBAx toolkit[1] includes:

- the *CBAx Tool User Guidance*, with tips for measuring fiscal and wider societal impacts based on agencies' practical experiences (Treasury, 2019);
- the Treasury's *Guide to Social Cost Benefit Analysis* (Treasury, 2015). This was assessed, alongside Australian and international guidelines, to 'provide high quality, readable and practical guidance' (Abelson, forthcoming, p.27);
- the CBAx wellbeing domains template, to set out a wide range of societal impacts of policy alternatives, whether these impacts can be monetised or not; and
- additional resources, including applied CBAx examples and the Australian Social Value Bank (Social Value International, 2019).

Evaluating impacts

CBAx provides a systematic approach to cost-benefit analysis, with defined steps that can be applied in a fit-for-purpose way for a specific policy decision (see Figure 2). However, CBAx is not intended to be a comprehensive toolkit to cover all of the steps in the policy cycle, from agenda setting to monitoring and evaluation. Cost–benefit analysis can be used alongside other policy tools, such as multi-criteria decision analysis and distributional analysis.[2] CBAx is particularly relevant when appraising the impacts of policy alternatives. (Thinking about impacts is also useful when identifying policy problems and potential policy options for intervening.) Policy advisors choose the analytical approaches, including whether to undertake cost-benefit analysis, and, if

doing this, whether to use CBAx.

The Treasury expects agencies to provide fit-for-purpose cost-benefit analysis to support policy proposals. We think of this as 'pragmatic rigour'. So, what does a fit-for-purpose cost-benefit analysis cover? We start with dispelling potential misconceptions and set out what it is *not*.

- It is not about monetising all the impacts. Ideally, all significant impacts are monetised, but that may not be possible. Indeed, only a subset of the impacts are expected to be monetised. A reverse analysis, to identify the assumptions needed to break even, may be the best that can be done; for example, due to weak evidence (covered later in the article).
- It is not a one-size-fits-all approach. The CBAx steps are adaptable. The approach can be varied to reflect the nature and significance of the options as well as the available policy resources, including common constraints of time and information. Also, in some cases, simpler cost-effectiveness analysis may be sufficient, or more complex modelling may be warranted.
- It is not just for economists or consultants. CBAx aims to empower agency policy advisors and make cost-benefit analysis practicable. Agencies can use the comparable CBAx model for free, rather than pay for bespoke models.

A simple way to approach CBAx is to work through the 'IQM' steps (Jensen, 2019):

- *Identify* impacts widely. At a minimum, this involves developing the intervention logic, establishing a clear counterfactual[3] and identifying the main impacts. Many different people may be involved in identifying a range of impacts, including external stakeholders. Taking a longer-term perspective brings into view preventive and intergenerational impacts. Thinking broadly about the impacts and interconnections can include consideration of path dependency and irreversibility (for example, the loss of species or entire ecosystems). Policy advisors' sound professional judgement is needed to decide what to include and what to leave out. This is a key policy skill.
- *Quantify* impacts to the extent possible, relative to the counterfactual. This is usually resource intensive and the evidence base is often variable. An initial run of the CBAx model and sensitivity analysis can be helpful for adjusting efforts, so that effort focuses on impacts that matter. This starts with available information, and then goes on to fill information gaps for significant impacts.
- *Monetise* the significant impacts where possible. It can be useful in the policy development process to monetise a wide range of impacts to clarify and test assumptions and sensitivities. After thinking widely about the impacts and ways of measuring these, agencies can choose the most appropriate impact measures. For the final results, it is better to be selective and focus on monetising the significant impacts, to avoid double counting and avoid reduced confidence in the results from the inclusion of tenuous, weakly evidenced impacts that boost the overall ratios.

The IQM steps build on each other and increase in difficulty. In reality, cost-benefit analysis tends to be iterative. Impacts should be identified and quantified to the extent possible. It is not necessary (or indeed possible) to monetise every impact. However, to forego a cost-benefit analysis when evidence of impacts is relevant and available would be to forego an opportunity to achieve a good outcome, and itself a potential ethical lapse.

Many values in the CBAx database are fiscal impacts for government, reflecting the fact that these values are easier to access and are already in dollar terms. But CBAx goes beyond fiscal impacts.

Beyond fiscals to wellbeing

The Treasury released the first CBAx version in October 2015, and agencies first applied CBAx to funding proposals in the 2016 Budget. At the time, ministers, including the minister of finance, took a 'social investment approach', which sought better outcomes from policies and spending.[4] While cost-benefit analysis was a widely accepted technique for measuring impacts, views varied about what impacts to include. For example, as Boston and Gill note:

> At the heart of these concerns [about the social investment model] is the failure, at least thus far, of ministers and their advisers to incorporate an appropriately broad range of costs and benefits into their evaluation of specific policy interventions. While fiscal objectives are unquestionably important, they are not a sufficient measure of overall performance. (Boston and Gill, 2017, p.24)

This comment reinforces the point made above, that the choice over what to measure is an assumption of what is valuable, and a substantive ethical and policy choice.

Concerns such as a too-narrow focus on fiscal impacts shaped the design of CBAx from the start. Many values in the CBAx database are fiscal impacts for government, reflecting the fact that these values are easier to access and are already in dollar terms. But CBAx goes beyond fiscal impacts. For example, the Australian Social Value Bank social impact values are available (outside the CBAx database) under a sub-licence.[5] In 2018 CBAx included Housing New Zealand subjective wellbeing values. The subjective wellbeing values offer opportunities to value wider impacts, and could be further expanded

using New Zealand data such as the New Zealand General Social Survey and Te Kupenga (Grimes, 2019). Subjective wellbeing could contribute to policy in a number of ways (O'Donnell et al., 2014). For example, it could potentially be used as a common measure across a wide variety of impacts (Layard, 2016). Associate Professor Jan-Emmanuel De Neve at the University of Oxford has developed policy tools to apply subjective wellbeing weightings for different wellbeing domains.[6]

Users need to be aware that different CBAx values monetise different types of impacts and are derived from different methodologies: fiscal savings to the government from avoided costs of diabetes ($4,075 per year), for example, or the subjective wellbeing value to an individual of living in a cold house for every point change on a 0–3 point scale (–$6,991 per year – the more often a house is cold, the more subjective wellbeing is reduced). In early 2019 the CBAx impact values, and the robustness of these, attracted public debate (Jensen, 2019). Users should review the source data that can be accessed through links in the database.

For many government interventions, there is no market value for the relevant impacts. We therefore need to use non-market valuation methodologies to derive a value. The a range of methodologies include: revealed preferences (estimating implicit value through related market prices and travel costs); contingent valuation (survey stated preferences of willingness to pay); discrete choice experiments; value transfer (from other primary studies); and subjective wellbeing (life satisfaction regressions) (Boardman et al., 2018; OECD, 2018). There is no 'one right' valuation methodology; each has strengths and weaknesses (Fujiwara, 2016). Surveys to estimate individuals' willingness to pay can have a number of biases, and good survey design and practice are critical. Confidence increases when a value is estimated similarly using different methodologies. However, sometimes policy advisors will be fortunate to have even one valuation.

In general, cost-benefit analysis values impacts on human wellbeing. The view that human wellbeing exhausts what constitutes the good impacts is an ethical assumption that ought to be borne in mind when interpreting the results; it is plausible that good and bad consequences are broader than just the impact on human wellbeing. For example, the preservation of an endangered species might be an intrinsically good impact, irrespective of any implications for human wellbeing.

The requirement in CBAx for broader consideration of impacts using a societal perspective encourages agencies to work with others outside their immediate sector, putting *people* – not agencies or sectors – at the centre of the analysis.

The view that human wellbeing should be interpreted as the satisfaction of preferences (measured, for example, by willingness to pay for benefits or to avoid costs) is a further ethical assumption. The preference-satisfaction view of wellbeing is just one of three standard views of wellbeing, the other two being the hedonist view (wellbeing consists in a certain mental state) and the objective list view (there is a list of certain things such as health and education that make an individual's life go well).

Note, though, that CBAx is pluralistic and does not constrain the user's choice of impacts, measurement or valuation methodology. It does, however, require the user to be transparent about these and the assumptions. Users can freely add other impacts to those already included.

The Treasury updated CBAx in 2018 to support Budget wellbeing analysis by categorising specific impacts, such as changes in income, within the wellbeing domains, such as 'jobs and earnings', from the Treasury's Living Standard Framework.[7] New Zealand hosted the Third International Conference on Wellbeing and Public Policy in September that year, and has gained international attention through the prime minister's and the minister of finance's emphasis on wellbeing, with much attention being given to the 2019 Wellbeing Budget.[8] The OECD's *OECD Economic Surveys: New Zealand 2019* provided a wellbeing focus and included information on CBAx as a mechanism for including wellbeing analysis in policy development (OECD, 2019, p.103). Durand and Exton covered CBAx in the Global Happiness and Well-being Progress Report (Durand and Exton, 2019, p.159). Measurement is one of the challenges for New Zealand becoming the leading light in the wellbeing approach to public policy. As Weijers and Morrison note, 'The critical issues in the measurement of wellbeing are what to measure, how to measure and how to construct a model of wellbeing out of those measures' (Weijers and Morrison, 2018, p.6).

Co-design – the discount rate example

Since its introduction, the role of the CBAx toolkit has evolved and the government's requirements to use it for Budget purposes have changed. Initially there were structural changes to the model. The model is now structurally stable and the changes are mainly to the database. The CBAx toolkit, while led by the Treasury, is collaborative and co-designed with agencies. The CBAx database is an example of this partnership. All of the values in the database are supplied from publicly available agency information. These are not Treasury values, but the Treasury has a system enabler role, making it easier for users to access these values, standardising the values to a common year, and allowing for consistent assumptions across

initiatives (for example, by using the same assumption about the value of a GP visit).

The partnership has not been without tensions. For example, the discount rate[9] was a point of disagreement early on. Agencies, and ministers, were concerned that the Treasury public sector discount rate was too high (8% real at the time, now 6%), rendering longer-term impacts inconsequential. The tensions led to a review of the approaches to setting the discount rate. The Treasury working paper concluded that there is no completely objective way of determining public sector discount rates; value judgements and assumptions are inevitable (Creedy and Passi, 2017). The discount rate reflects three separate things: time preference, risk and the opportunity cost of capital. The appropriate choice of discount rate to reflect these three factors is still subject to considerable disagreement amongst theorists and cost-benefit analysis practitioners. To address the concerns, the Treasury changed the design of CBAx to automatically produce a sensitivity analysis including the standard rate and an alternative rate. Jonathan Boston welcomes CBAx sensitivity analysis, and proposes a lower discount rate 'especially for periods exceeding thirty years and when there are risks of catastrophic or irreversible consequences' (Boston, 2017, p.129). CBAx is designed so that agencies are able to change the discount rate (though for comparability reasons agencies are expected to retain the two CBAx rates of 6% and 3% respectively).[10] The Treasury reviews the CBAx models submitted as part of Budget proposals to assess whether the relative ranking of different Budget initiatives would change under different discount rate assumptions. To date, the relative ranking of initiatives on their '50-year return on investment' is insensitive to 3% or 6% rates.

Lessons learned from practice

The collaborative approach to developing CBAx also includes the sharing of user experiences and troubleshooting. We share some of the lessons here, which all relate to the central themes of what to measure and how to measure it.

A common problem is for policy advisors to think that the impacts they know the most about, or that are the policy aim, are the most important impacts. Some agencies, for example Pharmac, are tasked with delivering outcomes within a particular domain (health) and have focused their perspective accordingly (Alsop and Crausaz, 2017). But impacts on employment or social services may be the most significant impact from a particular health policy. These are not traditionally considered when undertaking a cost-benefit analysis from a health sector perspective, and may be overlooked (Neumann et al., 2017). The requirement in CBAx for broader consideration of impacts using a societal perspective encourages agencies to work with others outside their immediate sector, putting *people* – not agencies or sectors – at the centre of the analysis.

While many challenges remain, there has been a strong drive towards better data, evidence and quantification in recent years.

CBAx encourages agencies to identify impacts comprehensively, including fiscal impacts for government, such as hospital cost savings, and wider wellbeing impacts, such as less physical pain. While the costs and benefits to government tend to be the easiest to quantify (because they are often already measured in monetary terms), they may not be the most important impacts based on the intervention analysis.

A variety of frameworks can help agencies identify the relevant wellbeing impacts. Some agencies, such as Sport New Zealand, have outcome frameworks for their policy area; other agencies, including the Ministry for Women, provide population-based frameworks, such as 'Bringing Gender In'.[11] CBAx encourages agencies to use these, and to think beyond sector-specific frameworks. The Treasury's Living Standard Framework covers 12 multidimensional wellbeing domains (such as health, housing, safety, environment). CBAx categorises specific impacts according to these 12 wellbeing domains (there is also an 'other' category, as there may be impacts that are not captured by the 12 domains). Total economic value is another framework that people can apply in combination with sector outcomes and the wellbeing domains. It distinguishes use values (including direct use, indirect use and option value) and non-use values (including existence, bequest and altruistic value). Non-use values can be relevant for environmental policies (OECD, 2018).

Policy practitioners often raise concerns that the evidence base for impacts is weak. The 2018 review highlighted this problem. In spite of this limitation, practitioners can at least do the first step of identifying the expected impacts and the intervention logic, and it can be useful to apply the CBAx model to undertake a reverse analysis (see Treasury, 2019). This looks at what assumptions are necessary for the option to be worthwhile; the plausibility of these assumptions can then be considered and sensitivity tested. Reverse analysis focuses on one, or maybe two, key expected impacts. Often people have enough experience to draw on to assess how reasonable or unreasonable those assumptions would be. Usually, this can also provide a basis for developing an ex post evaluation of the policy if it goes ahead, thereby building a better evidence base over time, as well as an ability to change approach if the assumptions turn out not to hold.

While many challenges remain, there has been a strong drive towards better data, evidence and quantification in recent years. New Zealand can use international evidence, such as the Environmental Valuation Reference Inventory,[12] the United Kingdom What Works centres[13] and the Washington State Institute of Public Policy benefit–cost studies.[14] Statistics New Zealand and agencies have made significant progress in developing the Integrated Data Infrastructure,[15] which is a large research database that holds microdata about

people and households. The Hub[16] provides access to social science research and helpful guidance on how to assess evidence (Superu, 2017). The CBAx guidance includes links to such sources.

The monetisation of impacts – valuing of impacts in dollar terms – can be challenging. In many situations agencies will not have the time or resources to develop values. This is where the CBAx database can be particularly helpful. The database aims to:

- make New Zealand values publicly available and easily accessible for users;
- standardise the values used for particular impacts: for example, the value used for the statistical value of life ($5,000,000);
- make the values consistent: for example, by adjusting all values to a common year, including values that users add themselves;
- increase the monetisation of impacts and thereby the comparability across multiple dimensions of wellbeing; and
- make undertaking a cost-benefit analysis more efficient by reducing the research costs and time.

The CBAx database helps with standardising; however, policy advisors need to use their professional judgement of what the most appropriate values are and make any variation transparent, including the basis for the variation. If the CBAx database misses values relevant for a particular proposal, agencies can add in values that they have found outside CBAx. These may be values from agency statistics or adapted from overseas studies. In using the values, agencies need to look at the quality and nature of the source data, make any adjustments for the particular proposal, and document the rationale and method for making adjustments.

Acknowledging the practical challenges and imperfections, the question is whether the policy practices and advice, and ultimately the decisions, are better with, or without, CBAx. In the words of one agency policy advisor: 'If you care about outcomes, get comfortable with this discipline.'

Applying CBAx results to decision making

The purpose of undertaking a cost-benefit analysis using CBAx is to inform decisions by measuring the impacts of different options within a policy or across different initiatives, and helping decision makers make trade-offs. The CBAx results include:

- the standard cost-benefit analysis summary metrics, such as net present value for five, ten and 50 years and the benefit–cost ratio using two standard methods (Abelson, forthcoming), with automatic sensitivity analysis of the discount rate (6% and 3% currently);
- impacts for government (mainly fiscal impacts) and for society overall;
- a chart of the present value of impacts across the wellbeing domains;
- the strength of the evidence base for specific impacts (qualitative contextual information that does not affect the calculations);
- the present value for specific impacts, which is helpful for focusing on the impacts and assumptions that matter the most;
- qualitative indication of the unmonetised impacts, and key assumptions.

> Issues of distributive justice should be considered alongside the results of cost-benefit analysis. … Different theories of distributive justice may be relevant.

The simplest and most visible way to use the results of cost-benefit analysis would be to assess and rank the options according to their performance against the (monetised) summary metrics, such as net present value, benefit–cost ratio and return on investment. However, the Treasury has used CBAx results to inform value-for-money judgements (including unmonetised impacts) and considered this alongside a range of decision factors.

The Treasury encourages consideration of all impacts, whether these are monetised or not, and factors the evidence base into the judgement about the relative value of options. This is a broader value-for-money judgement than the summary metrics. For example, option A with a return on investment of '2' (i.e., $2 net societal benefits for every $1 invested) may be preferred over an option B with a return of '3', if option A's evidence base gives greater confidence in the return or if the unmonetised impacts are significant.

In many cases there is a default and implicit equal weighting of all impacts. This can be changed. There may be various reasons for greater emphasis and weight on some impacts than on others. Previously we shared the example of using subjective wellbeing information to weight wellbeing domains (Government of Dubai, 2018). Decision makers may weight impacts for different people differently: for example, place higher weight on impacts for children or disadvantaged groups (see distribution below). A third possibility could be greater weighting on catastrophic or irreversible impacts (Boston, 2017). Impact weightings are best as a distinct step; they should be transparent, include sensitivity analysis and inform (not make) political judgements.

In addition, there are a range of decision factors and criteria, other than value for money, that inform policy advice. Consequently, a good or bad cost-benefit result is not deterministic and does not preclude decision making on other grounds. The nature and magnitude of the impacts can be overshadowed by other factors, such as:

- affordability (for government and users) – often scaling is considered;
- evidence strength and planned ex post evaluation;
- collaboration or fit within a package of initiatives;
- implementation readiness and practicality;
- alignment with ministerial priorities – a key driver in practice;
- rights, if not considered earlier in the policy process;

- distributional effects – who is affected matters.

The last two factors – rights and distribution – may be considered as separate steps from the cost-benefit analysis. Regarding the last factor, as noted earlier, cost-benefit analysis is often silent on the issue of distribution.

Cost–benefit analysis does not (necessarily) require recommending the alternative that maximises the sum total of benefits over costs – i.e., overall net benefits (the 'efficient' policy alternative); to do so would be to make a substantive ethical choice. Kaldor-Hicks potential Pareto improvements occur when the benefits of a proposal outweigh the costs so that it is theoretically possible for the winners to compensate the losers such that no one is worse off and at least someone is better off (see Hausman, McPherson and Satz, 2017; Boardman et al., 2018). Note, though, that a Kaldor-Hicks potential Pareto improvement does not imply that the compensation is actually paid. To recommend the policy option that maximises the aggregate net benefits (with or without weights applied to individuals) is to apply the ethical theory of utilitarianism. Utilitarianism ignores what Rawls (1973) terms the 'moral separateness of persons'. While it may be permissible for an individual to trade off costs and benefits in their own life, it is illegitimate (so it is claimed) to aggregate costs and benefits across individuals.[17]

Issues of distributive justice should be considered alongside the results of cost-benefit analysis. And consideration of issues of distributive justice are compatible with the CBAx framework. Different theories of distributive justice may be relevant, depending on the policy case.[18] Policymakers could, for example, recommend the policy option that:

- allocates the greatest benefits to the worst-off members of society (prioritarianism) (see Parfit, 1997);
- allocates some minimum level of benefits to each individual (sufficientarianism) (see Frankfurt, 1987);
- ensures people receive the costs and benefits they are personally responsible for, and allocates all other costs and benefits equally (luck egalitarianism) (see Dworkin, 1981a, 1981b).

Conclusion – incentivising better practices

CBAx can contribute to better valuing of impacts and better policy practices. CBAx challenges the view that cost-benefit analysis is too difficult and time consuming for policy advisors to do. It offers a practical way forward to make cost-benefit analysis easier and less resource intensive. It takes a broad perspective on impacts and makes different initiatives comparable, thereby facilitating trade-off discussions.

> [CBAx] takes a broad perspective on impacts and makes different initiatives comparable, thereby facilitating trade-off discussions.

Mandatory cost-benefit analysis requirements have provided impetus and practical insight for the development of the CBAx toolkit, using a 'learning-by-doing' approach. The Treasury and agencies have invested in the development and use of CBAx. Agencies have demonstrated that they can do better cost-benefit analysis with CBAx than without CBAx. CBAx allows for more robust, transparent and comparable evaluation of the broader impacts of policy options. So, where to from here? User feedback matters – it incentivises public sector behaviours and policy practice.

The Treasury has a key role, one not just limited to providing the CBAx toolkit and setting requirements. Importantly, the Treasury has a role in making use of agency CBAxs and in providing feedback to agencies, both on the agency analysis and on how this has been used by the Treasury. If it is not clear to agencies what they can do better, or it is unclear if their analysis influences Treasury advice, they lack incentives to undertake and improve their use of CBAx.

Agency policy leaders play several important roles. First, they set the expectations for staff of what analysis to undertake in support of policy advice. Internal agency expectations for when to use CBAx may need to be explicit. Second, they are responsible for the capability build that is needed to make staff well placed to undertake quantitative analysis. Third, they can support the change agents in their organisations. Often one or two key people drive the change in practice, and they need support to challenge the accepted practices and to build the capability to adopt new practices.

Agency behaviour is strongly driven by ministers. Ministers set expectations, for example via Cabinet circulars. Ministerial demand for, and use of, advice incentivises officials (Productivity Commission, 2018). Demand for advice on the nature and value of the impacts, and on the comparable value across wider policy options, provides incentives for agencies to make use of CBAx.

One possible scenario is that CBAx, while useful and supportive of the strategic direction in the public sector, dies from lack of demand and use. Another scenario is that New Zealand policymakers (and others) embrace CBAx and take up the challenge to build capability and continually improve the toolkit and policy practices. One practical action could be for the public sector, academia, the community sector and the private sector to contribute to the publicly available CBAx database with robust values, measures and methodologies, thereby building a public asset. This could include subjective wellbeing measures, as encouraged by Arthur Grimes. Officials and academics could work together to contribute to this fast-growing area in wellbeing economics, and to apply wellbeing economics to public policymaking (Grimes, 2019). As with neural pathways, so with CBAx – use it or lose it. We invite policy practitioners and decision makers to use CBAx to value

impacts and improve cost-benefit analysis practice, strengthening policymaking in the service of New Zealanders.

1 https://treasury.govt.nz/information-and-services/state-sector-leadership/investment-management/plan-investment-choices/cost-benefit-analysis-including-public-sector-discount-rates/treasurys-cbax-tool.
2 For a range of policy tools, see Scott and Baehler, 2010, and the Policy Project resources at https://dpmc.govt.nz/our-programmes/policy-project/policy-methods-toolbox-0.
3 The counterfactual is the impacts estimated to happen in the absence of the proposed intervention.
4 See Boston and Gill, 2017, for a range of perspectives on social investment. Developments included a moving from a fiscal focus on reducing the Crown's future fiscal liabilities, such as welfare benefit payments, to a broader consideration of impacts.
5 The Treasury paid for a New Zealand government licence to the Australian Social Value Bank values when these were launched in 2017. Due to licence conditions, these values cannot be publicly included in CBAx. However, under a sub-licence, agencies can use these values in their specific CBAx models.
6 Weights for each wellbeing domain can be derived from a regression analysis of subjective wellbeing, indicating the relative importance of the domains in driving wellbeing. The Policy to People (P2P) Impact Assessment Tool adjusts domain ratings with the relative wellbeing importance weights (Government of Dubai, 2018, pp.214–23). Domain weights could potentially be developed and included in CBAx.
7 See the Living Standards Framework: https://treasury.govt.nz/information-and-services/nz-economy/living-standards/our-living-standards-framework. Cost–benefit analysis estimates the societal impacts across the wellbeing domains over time: i.e., the specific impacts for a particular policy option, not the high-level national indicators such as the Dashboard indicators.
8 See the Wellbeing Budget: https://www.budget.govt.nz/budget/2019/wellbeing/index.htm.
9 The public sector discount rate reflects how the government values outcomes that occur in the future relative to those that occur in the present (Creedy and Passi, 2017).
10 The Treasury recommends that specified real, pre-tax discount rates be used, unless a project-specific discount rate can be determined on objective grounds. The Treasury's approach is that the discount rate reflects long-term investment opportunities as set out at https://treasury.govt.nz/information-and-services/state-sector-leadership/guidance/financial-reporting-policies-and-guidance/discount-rates. The Treasury recommends that agencies do sensitivity analysis. That can include different discount rates.
11 Sport NZ published an outcomes framework to articulate the contributions play, active recreation and sport make to the wellbeing of all New Zealanders (Sport NZ, 2019). The Ministry for Women launched the 'Bringing Gender In' policy tool in 2019 to help agencies explore gender policy impacts: see https://women.govt.nz/gender-tool.
12 New Zealand contributes to the Environmental Valuation Reference Inventory: see http://evri.ca/en.
13 See https://www.gov.uk/guidance/what-works-network and What Works Network, 2018.
14 See http://www.wsipp.wa.gov/BenefitCost.
15 See Statistics New Zealand https://www.stats.govt.nz/integrated-data/integrated-data-infrastructure/.
16 See https://thehub.sia.govt.nz/about-the-hub/.
17 Note that this is the case even if we were to add weights – for example, to give greater emphasis to the costs (the harms, misery, pain etc.) of those who are worse off. This still allows for aggregating costs and benefits across individuals, and for some individuals to face costs so that other individuals may enjoy benefits. Indeed, this criticism applies to any form of public policy that involves policy trade-offs.
18 For a useful overview and introduction to the basic theories of distributive justice see Arneson, 2013. Note that there is ongoing debate among philosophers regarding the correct theory of justice. It is appropriate for government to consider a range of theories of distributive justice.

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References

Abelson, P. (forthcoming) 'A partial review of seven official jurisdictional guidelines for cost-benefit analysis', *Journal of Benefit–Cost Analysis*

Alsop, P. and S. Crausaz (2017) 'Implementing social investment: Pharmac's experience', in J. Boston and D. Gill (eds), *Social Investment: a New Zealand policy experiment*, Wellington: Bridget Williams Books

Arneson, R. (2013) 'Egalitarianism', in N. Edward and E.N. Zalta (eds), *The Stanford Encyclopaedia of Philosophy*, https://plato.stanford.edu/entries/egalitarianism/

Boardman, A., D. Greenberg, A. Vining and D. Weimer (2018) *Cost–Benefit Analysis: concepts and practice*, 4th edn, Cambridge: Cambridge University Press

Boston, J. (2017) *Safeguarding the Future: governing in an uncertain world*, Wellington: Bridget Williams Books

Boston, J. and D. Gill (eds) (2017) *Social Investment: a New Zealand policy experiment*, Wellington: Bridget Williams Books

Creedy, J. and H. Passi (2017) *Public Sector Discount Rates: a comparison of alternative approaches*, working paper 17/02, Wellington: The Treasury, https://treasury.govt.nz/publications/wp/public-sector-discount-rates-comparison-alternative-approaches-wp-17-02

Dobes, L., G. Argyrous and J. Leung (2015) *Social Cost–Benefit Analysis in Australia and New Zealand: the state of current practice and what needs to be done*, Acton: ANZ Press, http://dx.doi.org/10.22459/SCBAANZ.04.2016

Durand, M. and C. Exton (2019) 'Adopting a wellbeing approach in central government: policy mechanisms and practical tools', in Global Happiness Council, *Global Happiness and Well-being Policy Report*, http://www.happinesscouncil.org/

Dworkin R. (1981a) 'What is equality? Part 1: equality of welfare', *Philosophy and Public Affairs*, 10, pp.228–40

Dworkin, R. (1981b) 'What is equality? Part 2: equality of resources', *Philosophy and Public Affairs*, 10, pp.283–345

Frankfurt, H.G. (1987) 'Equality as a moral ideal', *Ethics*, 98, pp.21–43

Fujiwara, D. (2016) 'Social impact valuation', Simetrica, https://treasury.govt.nz/sites/default/files/2016-07/tgls-fujiwara-slides.pdf

Government of Dubai (2018) *Public Policy Guide*, http://tec.gov.ae/media/6791/pg-en.pdf

Grimes, A. (2019) 'Wellbeing economics and policy: past, present, future', inaugural lecture, Victoria University of Wellington, https://www.victoria.ac.nz/about/news-events/victoria-public-lecture-series/wellbeing-economics-and-policy-past,-present,-future

Hausman, D., M. McPherson and D. Satz (2017) *Economic Analysis, Moral Philosophy, and Public Policy*, New York: Cambridge University Press

Jensen, K. (2019) 'What is the value of a policy proposal?', https://treasury.govt.nz/publications/research-and-commentary/rangitaki-blog/what-value-policy-proposal

Layard, R. (2016) *Measuring Wellbeing and Cost-effectiveness Analysis: using subjective wellbeing*, Measuring Wellbeing discussion paper, London: What Works Centre for Wellbeing, https://whatworkswellbeing.files.wordpress.com/2016/08/common-currency-measuring-wellbeing-series-1-dec-2016.pdf

Neumann, P., G. Sanders, L. Russell, J. Siegel and T. Ganiats (eds) (2017) *Cost-effectiveness in Health and Medicine*, 2nd edn, Oxford: Oxford University Press

New Zealand Transport Agency (2013) *Economic Evaluation Manual*, https://www.nzta.govt.nz/resources/economic-evaluation-manual/

NZIER (2018) *Review of CBA Advice to Support Budget Initiatives: the impact of CBAx and lessons for future budget processes*, Wellington: New Zealand Institute of Economic Research for The Treasury, https://treasury.govt.nz/publications/review-cba-advice-support-budget-initiatives-nzier-report-treasury

O'Donnell, G., A. Deaton, M. Durand, D. Halpern and R. Layard (2014) *Wellbeing and Policy*, Legatum Institute report

OECD (2018) *Cost–Benefit Analysis and the Environment: further developments and Policy Use*, Paris: OECD Publishing, https://doi.org/10.1787/9789264085169-en

OECD (2019) OECD *Economic Surveys: New Zealand 2019*, Paris: OECD Publishing, https://doi.org/10.1787/b0b94dbd-en

Parfit, D. (1997) 'Equality and priority', *Ratio*, 10 (3), pp.202–21

Productivity Commission (2018) *Improving State Sector Productivity*, final report of the measuring and improving state sector productivity inquiry, vol.1, Wellington: New Zealand Productivity Commission

Rawls, J. (1973) *A Theory of Justice*, London: Harvard University Press

Scott, C. and K. Baehler (2010) Adding Value to Policy Analysis and Advice, Sydney: UNSW Press

Social Value International (2019) *The Australian Social Value Bank and the Social Value Principles*, Australian Social Value Bank and Social Value International, https://asvb.com.au/

Sport New Zealand (2019) *Outcomes Framework: creating a Sport NZ outcomes framework*, Sport New Zealand and New Zealand Government, https://sportnz.org.nz/managing-sport/search-for-a-resource/tools-and-resources/sport-nz-outcomes-framework

Superu (2017) 'An evidence rating scale for New Zealand: understanding the effectiveness of interventions in the social sector: using evidence for impact', https://thehub.sia.govt.nz/resources/evidence-rating-scale/

Treasury (2015) *Guide to Social Cost Benefit Analysis*, Wellington: The Treasury, https://treasury.govt.nz/publications/guide/guide-social-cost-benefit-analysis

Treasury (2019) CBAx *Tool User Guidance: guide for departments and agencies using Treasury's CBAx tool for cost benefit analysis*, https://treasury.govt.nz/publications/guide/cbax-tool-user-guidance

Weijers, D. and P.S. Morrison (2018) 'Wellbeing and public policy: can New Zealand be a leading light for the "wellbeing approach"?', *Policy Quarterly*, 14 (4), pp.3–12

Weimer, D.L. and A.R. Vining (2005) *Policy Analysis: concepts and practice*, 4th edn, New Jersey: Pearson/Prentice Hall

What Works Network (2018) *The What Works Network: five years on*, UK Government, https://www.gov.uk/government/publications/the-what-works-network-five-years-on.