NSW Treasury

Ex-post Cost-Benefit Analysis

TPG 22-22 Policy and Guidelines: Evaluation – Technical Note

June 2023

Acknowledgement of Country

We acknowledge that Aboriginal and Torres Strait Islander peoples are the First Peoples and Traditional Custodians of Australia, and the oldest continuing culture in human history. We pay respect to Elders past and present and commit to respecting the lands we walk on, and the communities we walk with.

Artwork:
Regeneration by Josie Rose

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Abstract

Technical Note: Ex-post Cost-Benefit Analysis	
Background	Ex-post cost-benefit analysis (CBA) is a form of economic evaluation that takes place after, or during, the implementation of an initiative. It can provide evidence of outcomes, net social benefits and value for money.
Scope	*TPG23-08 NSW Government Guide to Cost-Benefit Analysis* sets out mandatory requirements that apply to all CBAs. This note provides supplementary guidance for ex-post CBAs.
When to use this technical note?	*TPG22-22 Evaluation Policy and Guidelines* recommends ex-post CBA be conducted for initiatives over $50 million or for pilot initiatives. Ex-post CBA may also be valuable for smaller projects where findings can alter or finetune other similar projects.
Potential implications	Ex-post CBA follows the same principles and steps as ex-ante CBA, with some adjustments. Determining the counterfactual in ex-post CBA requires consideration of actual changes including alternative actions or policies pursued during the analysis period. Attributing the specific impacts of the intervention amidst external factors is necessary to accurately assess effectiveness. Plausible options may also be compared to the counterfactual to assess potential outcomes under different scenarios and identify lessons learnt. Ex-post CBA is subject to risk and uncertainty in the estimated counterfactual and any other key estimates. Sensitivity testing and probabilistic analysis are methods that can be used to account for risk and uncertainty in CBA.
Keywords	Forecasting, net benefits, distributional analysis, base year, discount rate, present values, real values
Associated resources	*TPG23-08 NSW Government Guide to Cost-Benefit Analysis (The CBA Guide)*

Context

Cost-benefit analysis (CBA) systematically estimates economic, social, environmental and cultural costs and benefits of an initiative. It may be undertaken after or during implementation to assess actual costs and benefits, drawing on observed data (or informed estimates). The New South Wales Government Guide to Cost-Benefit Analysis (the CBA Guide) identifies CBA as the preferred approach for economic evaluation.

Ex-post CBA can provide better information than is possible with an ex-ante CBA. This can, for example, improve understanding of actual net benefits, which may in turn improve future ex-ante CBAs. Ex-post CBA is particularly useful where ex-ante appraisal was limited or incomplete, or where performance monitoring suggests intended benefits are not being achieved.

Ex-post CBA is an opportunity to use evidence to identify:

- the implementation and impact schedule of the initiative
- cost, outcome and benefit categories
- the relationships between inputs, outputs, outcomes and benefits
- the extent of change in outcomes and benefits
- estimation of costs and benefits, including quantitative and qualitative.

Ex-ante CBA models may be adapted for ex-post assessment, which is useful to consider during development of an ex-ante model.

Table 1: Steps in undertaking a cost-benefit analysis–ex-ante and ex-post comparison

Step	TPG23-08 NSW Government Guide to CBA step	Ex-post CBA considerations
1	**State the objectives** (Section 2.1) Specify the intended initiative objectives and outcomes.	**Define the evaluation purpose, scope and timeframe** • Restate the initiative's objectives and outcomes from the initial business case • Define the evaluation purpose and scope to determine the appropriate analysis period and the base year for analysis.
2	**Define the base case and develop options** (Section 2.2) Establish and clearly define a: • realistic base case • range of realistic options to be assessed.	**Define the counterfactual and assess options** • Define the counterfactual by estimating outcomes in the absence of the initiative • Consider other feasible options that could have been implemented to achieve outcomes with greater efficiency or effectiveness. • Assess whether better options might now be available. .
3	**Identify and describe all (anticipated) costs and benefits** (Section 2.3) Identify all the costs and benefits attributable to each option.	**Identify and describe all actual and anticipated costs and benefits** • Use evidence to identify realised outcomes, and the costs and benefits attributable to the initiative. • Identify impacts not anticipated in the ex-ante stage.
4	**Forecast all quantifiable costs and benefits** (Section 2.4 and Appendix 3A 3.2): Forecast the volume or quantity of outcomes.	**Measure or forecast all quantifiable costs and benefits** • Use an outcome evaluation or performance monitoring to measure outcomes achieved. • Use historical evidence to update any forecasts of the volume of outcomes and their underlying assumptions.
5	**Value quantified costs and benefits** (Section 2.5): • Use market prices or robust non-market valuation techniques to value benefits and costs.	**Value quantified costs and benefits** • Use market prices or robust non-market valuation techniques to value benefits and costs. • Include information on qualitative impacts (where quantification is not reasonably practical).

Step	TPG23-08 NSW Government Guide to CBA step	Ex-post CBA considerations
	• Include information on qualitative impacts (where quantification is not practical).	
6	**Assess net benefit (NPV and BCR) with sensitivity analysis** (Section 2.6): • Establish present values by discounting values to the year of the ex-ante analysis using the real discount rate of 5 per cent as per the CBA Guide. • Test the sensitivity of results to key risks or changes in key assumptions or parameters.	**Assess net benefit (NPV and BCR) with sensitivity analysis** • Establish present values by converting nominal values into real ones and discount to the base year of the ex-post analysis, using the 5 per cent real discount rate as per the CBA Guide. • The central estimate should reflect the most robust estimate considering the distribution of possible outcomes and the impact of uncertainty. Generally, the central estimate should be the expected (average) values of costs and benefits. (refer to p.36 TPG23-08) • Account for risk and uncertainty by testing the sensitivity of results, such as estimates of key assumptions, parameters or the counterfactual. • Sensitivity testing can also help identify and account for measurement errors in ex-post CBA.
7	**Assess distributional and equity impacts** (Section 2.7) Assess the distribution of gains and losses.	**Assess distributional and equity impacts** • Assess the actual distribution of gains and losses to analyse whether the targeted beneficiaries received the expected outcomes. • Report any specific groups that have been disproportionately or unexpectedly affected or benefited
8	**Report results and key findings in executive summary format** (Section 2.8)	**Report results and key findings in executive summary format** • Where relevant, compare ex-ante and ex-post CBA results, and explain any observed divergence • Explore factors that may have impacted the results • Provide insight into the relative effectiveness of alternative options to inform future decisions • Summarise lessons learnt to formulate actionable recommendations.

Evidence in ex-post CBA

Ex-post CBA should use the best available information, including from initiative monitoring and/or outcome evaluation. When undertaken during the life of the initiative, or for complex, wide-ranging initiatives, the analysis should draw on a mix of actual data and evidence-based forecasts.

Ex-post CBA should capture all significant impacts, including any additional costs and benefits not captured in an ex-ante appraisal or monitoring design, and any negative impacts (dis-benefits).

Evaluations undertaken over the life of the initiative can provide inputs. For example:

- Process evaluation can be designed to identify the costs associated with implementing an initiative.
- Outcome evaluation will identify the contribution of the initiative to outcomes (controlling for exogenous factors), including identifying unanticipated outcomes. The benefits associated with outcomes can then be identified and valued (see Technical note: Outcome evaluation design and Step 3. Identifying and valuing costs and benefits).

When to undertake ex-post CBA

Ex-post CBA should be undertaken at the intervals that are useful to inform decision-making.

When an initiative is underway[1] ex-post CBA may:

- review the total expected costs and benefits
- update an ex-ante CBA in light of new data collected
- assess whether outcomes and benefits are likely to continue
- inform adaptive management of the current initiative or similar initiatives to maximise net benefits.

Benefits may continue for years or decades following implementation. An ex-post CBA completed after delivery may:

- assess whether the initiative was a good investment
- compare the actual costs and benefits of an initiative with the ex-ante estimates
- inform initiative design and forecasting of future or similar initiatives
- forecast future benefits (if relevant).

Re-appraisal of an initiative to inform a decision about whether to continue should be treated as a revision of the ex-ante CBA. In this process, it is important to use actual data whenever available. It is also important to exclude sunk costs and benefits, which are costs or benefits that have already been incurred and cannot be recovered or changed. By excluding sunk costs and benefits, resources can be more efficiently allocated by focusing on potential social returns and impacts, rather than on past expenditure. Please refer to Appendix 3.5 of the CBA Guide for more information.

Forecasting values in an ex-post CBA

The robustness of the previous forecasting methodology should be assessed by comparing forecasts with actual outcomes. Where there is substantial deviation from previous estimates, or where forecasts were achieved, but the composition of outcomes differ significantly, then the forecasting methodology should be revised. For example, a demand forecast can be informed by assuming a continuation of past trends. But turning points or structural breaks in past trends can occur, particularly when the underlying policy setting changes.

New external inputs or policy settings may require new assumptions, additional modelling, and revised forecasting methodologies to reflect changes in:

- ongoing direct and indirect costs
- relationships between outputs and outcomes, or between outcomes and benefits
- benefits and costs (including dis-benefits) categories
- outcome volumes or benefit values
- risks.

[1] A CBA that is conducted during the implementation of an initiative rather than before or at the end of implementation is sometimes referred to as 'in medias res' (IMR) (Latin: in the midst of things).

Steps of an ex-post CBA

Step 1: Define the evaluation purpose, scope and timeframe

Purpose

Defining the purpose and intended outcomes of the evaluation from the outset will allow evaluators to align the subsequent steps of data collection and analysis. For example, is the purpose to assess performance against an ex-ante CBA? Or is it to provide information to assess whether a similar project would be justified if commenced today?

Objectives from the initial business case (where available) should also be revisited and restated, generally without change. Objectives should be stated in terms of welfare outcomes and not tied to specific outputs. Further information on stating the objectives is available in Section 2.1 of the CBA Guide.

Scope

Changes in scope from the business case may be required, for example, due to contractor capability or cost increases. Scope of analysis should be considered and defined on a case-by-case basis.

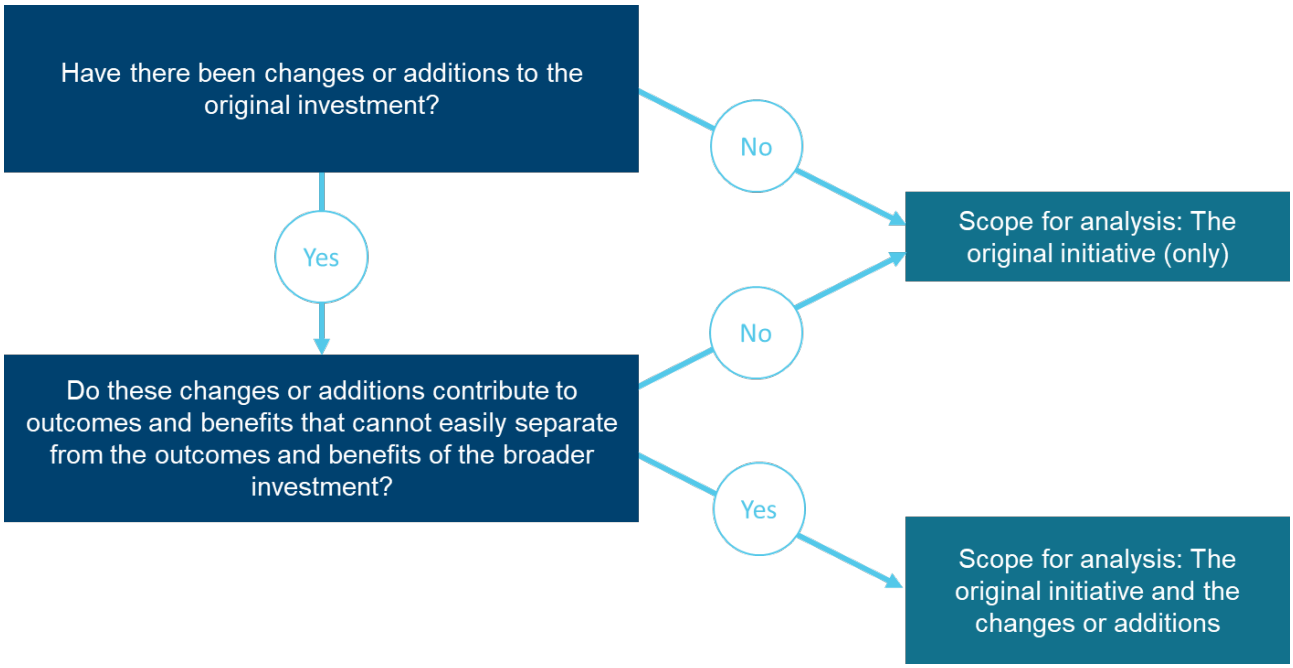
If an initiative is **part of a larger set of coordinated initiatives** with related outcomes, individual sub initiatives with distinct objectives can be analysed separately. For example, in a transport program, the sub initiative might aim to relieve traffic congestion by building new roads, while another sub initiative focuses on increasing public transport access through additional bus services. In this case, evaluating each sub initiative individually allows for a focused analysis of costs and benefits.

But when an activity is part of an **integrated suite of initiatives** working together to achieve shared outcomes, evaluating the broader initiative as a unit of analysis may be more appropriate. Integrated initiatives involve multiple interdependent components that are designed to work together synergistically. For example, signalling upgrades across different routes and phases may minimise congestion and wait times across the network. Integrated initiatives can be complex, and the appropriate approach should be considered on a case by case basis.

Unforeseen **additions** may impact expected outcomes and benefits. For example, benefits of a new train line may be influenced by later additions to the network. Where additions have been made:

- The additional, but separate, investment with distinct objectives and costs and benefits should be excluded. It may, however, be appropriate to include the additional investment as a sensitivity test.
- An additional investment that cannot be easily distinguished should be included in the analysis and reasons for divergence in costs and benefits with an ex-ante CBA noted (see Figure 1). For example, unforeseen investment to resolve inoperability of imported assets.

Figure 1: Determining the scope for the ex-post CBA



Timeframe

Analysis period

The period of analysis should start from the first financial year that funding was expended and extend through to the expected end of the initiative life (end of the benefits realisation period). If implementation has been deferred, the analysis period may be different to the ex-ante CBA. The end year for the analysis should be adjusted if new information suggests a shorter or longer initiative life than assumed in the ex-ante CBA.

The basis for any change in lifespan or period of analysis should be identified. Different lengths of the analysis period may change the ex-post NPV and BCR results. NPV and BCR results may also change if costs or benefits change as a result of delayed implementation.

For longer term recurrent activities, the analysis period can be tied to a relevant set of inputs and impacts. For example, for evaluation of a long term ongoing educational program, focus on the inputs associated with a specific cohort of students, and follow the costs, outcomes and benefits for this cohort.

Base year for analysis

The choice of the base year for calculating the net present value (NPV) and benefit cost ratio (BCR) depends on the evaluation purpose. When updating estimates or comparing against other recent initiatives, the analysis should be conducted from today's viewpoint and consider net benefits in today's dollars. But when evaluating the initial investment, or comparing with ex-ante appraisal, it is appropriate to use the year the investment commenced as the base year.

See *Step 6. Assess the net benefit* (in this document) for information on how to convert benefit and cost values to real prices and present values for the chosen base year of analysis.

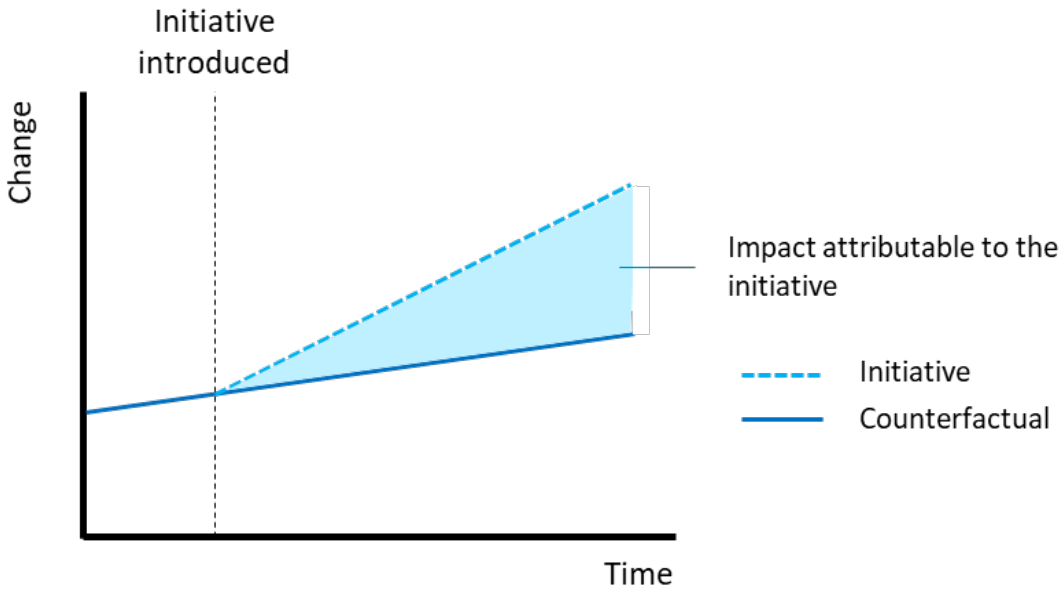
Step 2: Define the counterfactual and assess options

Identifying outcomes directly attributable to the initiative requires comparison to a counterfactual scenario, that is, the projection of costs and benefits 'without' the initiative (see Figure 2). The counterfactual should be the most likely scenario without the initiative. This may be a 'business as usual' (no policy change), a 'do minimum' scenario, or a reasonable alternative option that would have been undertaken in the absence of the initiative. For example, a school building could be either re-built or undergo significant maintenance. If the "do nothing" approach made a required asset unusable, then the maintenance option might be a better base case.

An ex-ante CBA base case may be used where there have been no significant changes in policy or circumstances that would impact projections. If, however, significant changes occur or better data becomes available, the counterfactual should be updated. This may include revising the projections for key variables that were used to project the initial base case (e.g. projected health trends or road usage).

Where no ex-ante CBA base case exists, a counterfactual should be established based on what would likely have happened without the initiative and include realistic trend analysis (consistent with Section 2.2 of the CBA Guide).

Figure 2: Impact attributable to the initiative



Outcome evaluations establish counterfactuals that can be used to inform the ex-post CBA. Experimental or quasi-experimental outcome evaluations use control or comparison groups as the counterfactual to compare against the intervention group. Experimental designs involve random assignment of participants to groups, while quasi experimental designs use non-random assignment to establish a comparison group. In cases where these methods are not feasible, non-experimental methods, such as statistical modelling or observational studies, can establish a logical counterfactual for evaluating the outcomes of an intervention (see *Technical note: Outcome evaluation design*).

Consider risk and uncertainty around the estimated counterfactual. See *Step 6: Assess the net benefit (NPV and BCR) with sensitivity analysis* for further details.

Options analysis

The ex-post CBA can assess reasonable alternative options to test if they may have generated a higher net benefit. This is particularly valuable where findings from the ex-post CBA will inform design and implementation of similar initiatives. Feasible options should be identified in the context of the problem or opportunity being addressed. For example, they may include options from the ex-ante analysis or approach used in other jurisdictions or similar projects.

Step 3: Identify and describe all actual and anticipated costs and benefits

The analysis should capture the full range of costs and benefits attributable to the initiative. This includes all economic, social, environmental and cultural impacts on welfare.

The ex-ante CBA appraisal, benefit register and logic model should inform identification of costs and benefits. New cost and benefit categories may be included as appropriate. Unintended outcomes (and their costs and benefits) should also be identified.

Best-practice is to work with stakeholders to test assumptions about outcomes and benefits and explore the breadth of impacts (including identifying unintended impacts) of an initiative. It may be appropriate to share preliminary findings with key stakeholders to test how results are understood.

Section 2.3 of the CBA Guide provides further detail on identifying and categorising costs and benefits, disaggregating them into direct and indirect impacts.

Step 4: Measure or forecast all quantifiable costs and benefits

An evidence base is required to identify the extent of change (outcomes) attributable to the initiative. An outcome evaluation is one way to do this (see *Technical note. Outcome evaluation design*). Performance monitoring (see *Workbook II: Monitoring and evaluation framework*), including as part of a Benefits Realisation Management (BRM) framework may also be used. A benefits register will track the key outcomes and benefits with the greatest likelihood of being realised, and (under best practice) will be reviewed and updated over time. Attribution of change also needs to be investigated and changes caused by other factors should be excluded (see *Step 2. Define the counterfactual*).

Step 5: Value quantified costs and benefits

Costs

Costs should be based on actual (observed) direct and indirect costs. These may be identified as part of a process evaluation, which examines initiative implementation and delivery. Where actual costs differ from those projected in the ex-ante CBA, costs should be updated and variations explained (for example, determine if changes are due to a scope modification or changes in unit costs).

Benefits (and dis-benefits)

Observed data should be used to estimate benefits where possible. For example, an ex-ante appraisal may have used willingness-to-pay (WTP) to estimate expected benefits of green space access, while the ex-post evaluation may measure the actual green space access benefits attributable to the initiative (See Figure 3*)*.

Figure 3: Ex-post CBA-valuation example

A benefit estimation of a drinking water treatment initiative could measure the changes to water quality (outcome), and then estimate a value of the purified water to the community (using standard parameters where these have been used in an ex-ante CBA). Alternatively, the appraisal could directly measure the benefit to health generated by the systematic provision of purified water, in terms such as avoided costs for hospitalisation (CSIL & DKM 2012, p.99). Care should be taken in attributing savings to the initiative. While a drinking water treatment may be expected to lead to reduced hospitalisation costs (through reduction of water quality-related disease), the costs saved due to reduced water quality related disease need to be separated out from other factors that may have reduced (or increased) hospitalisations (Florio & Vignetti 2013, p.12).

Non-market valuation methods

Market values should be used where feasible. Where outcomes do not have a clear market price alternative approaches may be used to generate ‘shadow prices’ (see Non-market valuation methods under Appendix 2.2 of the CBA Guide). Ex-ante CBA values may be used where they remain credible. If new evidence requires development of new estimates, this must be identified in the

analysis. It may also be appropriate to calculate the benefits under both the old and new parameters, to isolate and demonstrate the effects of the updated values used.

Where non-market valuation methods are required, it may be appropriate to use a willingness-to-accept (WTA) survey. WTA values existing goods and services (for example, clean air) at the value that individuals or firms are willing to accept in compensation for the loss of these goods or services.

WTA is typically used when the individual or firm already possess a right or entitlement to the good or service, and the valuation focuses on the minimum compensation they would accept to give up that right. On the other hand, WTP is employed when individuals or firms do not have initial ownership or access the good or services, and their valuation reflects the amount they are willing to pay to obtain it. WTA generally leads to larger values than WTP and may be more appropriate for valuation of dis-benefits.

Changes in outcomes (volume of change) and the benefits associated with these outcomes (value of change) should be distinguished, noting that the relation between the two may not be constant. For example, the marginal value of the benefit from an outcome may diminish as outcome volumes increase, or potentially anticipated benefits may not be realised (at all) where the change in outcome is less than anticipated.

Dis-benefits

Additional costs may include the costs imposed on others as 'dis-benefits', such as negative externalities (third party costs on the community). For the purposes of calculating a BCR, the CBA Guide subtracts dis-benefits from total benefits (see Appendix 7 of the CBA Guide).

Describing benefits in qualitative terms

Where valuations are not feasible, costs and benefits should be described in qualitative terms with evidence. Where there are no quantifiable benefits, cost-effectiveness analysis (CEA) may be used to assess the value for money when accompanied by clear evidence of outcomes and attribution).

Step 6: Assess the net benefit (NPV and BCR) with sensitivity analysis

CBA uses discounting to compare costs and benefits occurring at different times and enable calculation of a net present value[2] (NPV) and a benefit-cost ratio[3] (BCR). Nominal benefit and cost values should be converted to **real prices** for the base year of analysis, and then to **present values** for the same base year.

Because inflation changes the value of money from year to year, NPV will vary depending on the base year of analysis. Present values can be calculated for the current year instead of the initial year of implementation. This approach enables the comparison of ex-post CBA results with recent projects, as it is reported in current dollar values (Figure 4). The BCR is not sensitive to base year effects as it is a ratio.

While the ex-post BCR may therefore be compared to the ex-ante result without base year adjustment, the ex-post NPV would be significantly higher. To ensure comparability, NPVs must be adjusted to the same base year.

If the objective is to compare ex-ante and ex-post analyses, the same base year of analysis can be used (Figure 6). This allows for a more comprehensive analysis of the variation in benefits and costs each year.

Alternatively, if both objectives are desired, consider including calculations using both base years. See Appendix 7 of the CBA Guide for information on constructing the BCR.

[2] The difference between the present value of benefits and the present value of costs.

[3] The ratio of the present value of benefits to the present value of costs.

Step A: Establish 'real prices'

Nominal benefit and cost values need to be adjusted to the 'real prices' of the year of analysis, that is, the year of commencement of the initiative, or the current year. Generally prices should be deflated using the consumer price index (CPI). In some cases, another appropriate index such as the wage price index should be used. Where prices are deflated using an index other than the CPI, reasons should be provided.

Where the ex-post CBA is conducted during the life of an initiative, adjustment will also be required for forecast benefits as in ex-ante CBA. Increase in prices due to inflation or other sources of nominal cost escalation should not be considered in the present values of future benefits and costs.

Step B: Establish 'present values'

Once 'real prices' have been established, the 'present value' of cost and benefits for the base year of analysis should be calculated.

- Where an ex-post CBA is undertaken from the perspective of the initial year of implementation, real prices should be discounted to that year using the social discount rate (see Figure 4).
- Where an ex-post CBA is undertaken using the current year as the base-year of analysis, historical values in real terms should be compounded up to their present value using the social discount rate (for the relevant period) [4] [5](see Figure 6).

In New South Wales, the social discount rate (SDR) is the rate reflecting the long-term opportunity cost of capital. The most recent CBA Guide (published in 2023) sets the central social discount rate at 5 per cent, while previously it has been 7 per cent.

Ex-post CBA should use the current social discount rate of 5 per cent. Applying the current rate ensures a consistent and comparable approach that can be used to assess whether a similar project starting today would be justified. Where a 7 per cent discount rate was used in the ex-ante analysis, sensitivity testing at 7 per cent (as recommended by the CBA Guide) will enable comparison with the previous analysis.

Analysts should investigate whether the BCR and NPV results differ when the discount rate changes during the life of the initiative. The results, and any change in the incremental net benefits, should be documented. The following figures illustrate the processes of establishing real prices and present values depending on the base-year used for analysis and when the ex-post CBA is undertaken (i.e. during the term of, or at the end of, the initiative):

- Figure 4 represents undertaking an ex-post CBA where the base year is the year that the initiative commenced. The ex-post CBA could be undertaken either during or at the end of the analysis period.
- Figure 5 represents an ex-post CBA where the base year is the current year of analysis, and the analysis is undertaken during the life of the initiative. This is usually for in media res initiatives.
- Figure 6 represents an ex-post CBA where the base year is the current year of analysis, and the analysis is undertaken at the end of the initiative's analysis period.

[4] Florio, M. & Vignetti, S. (2013) The use of ex-post Cost Benefit Analysis to assess long-term effect of major infrastructure projects, Working paper N. 2/2013, Working Paper Series, Centre for Industrial Studies.

[5] Florio, M. (2014) Applied Welfare Economics: Cost-Benefit Analysis of Projects and Policies, Routledge, London and New York.

Figure 4: Establishing real prices and present values where the base year is the year the initiative commenced

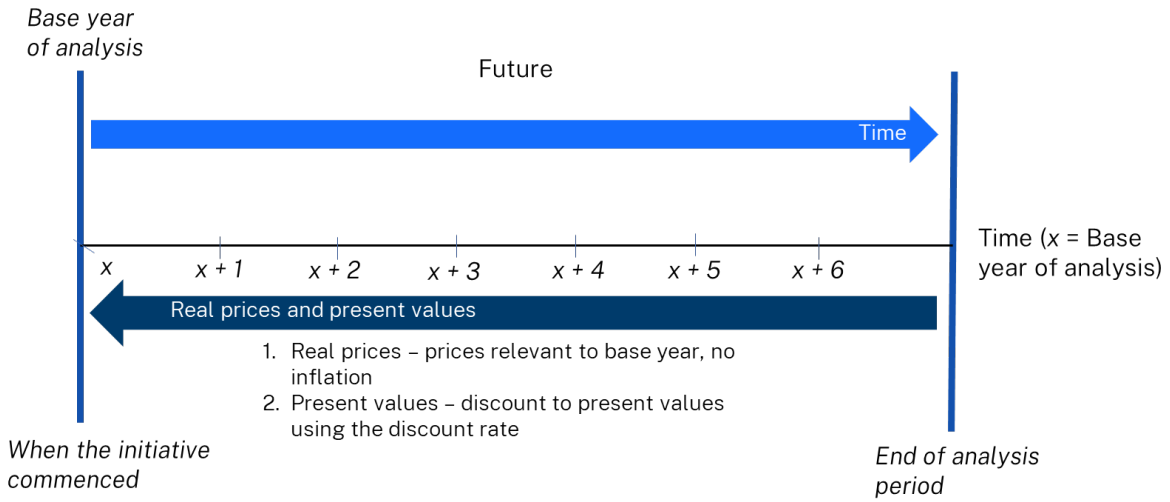


Figure 5: Establishing real prices and present values where the base year is the current year of analysis and the analysis is undertaken during the life of the initiative

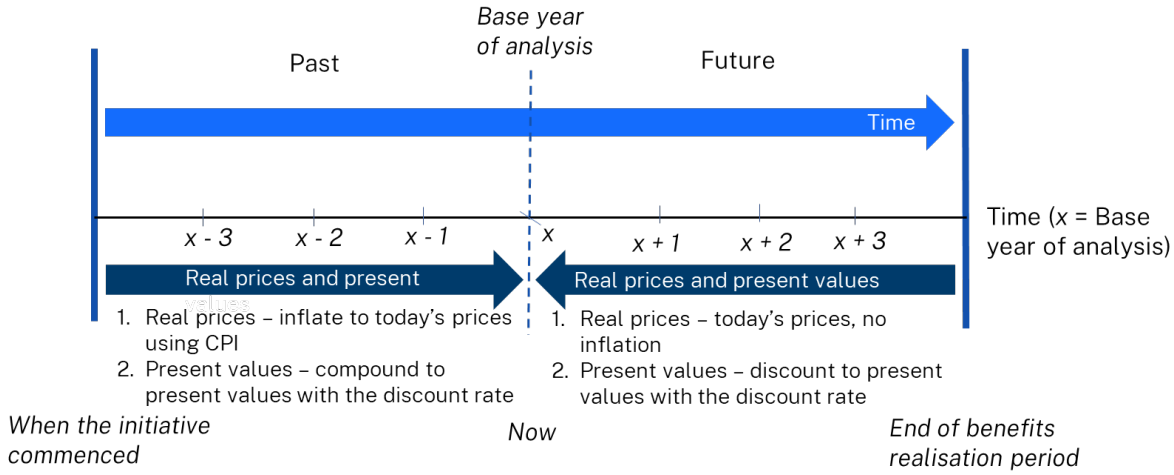
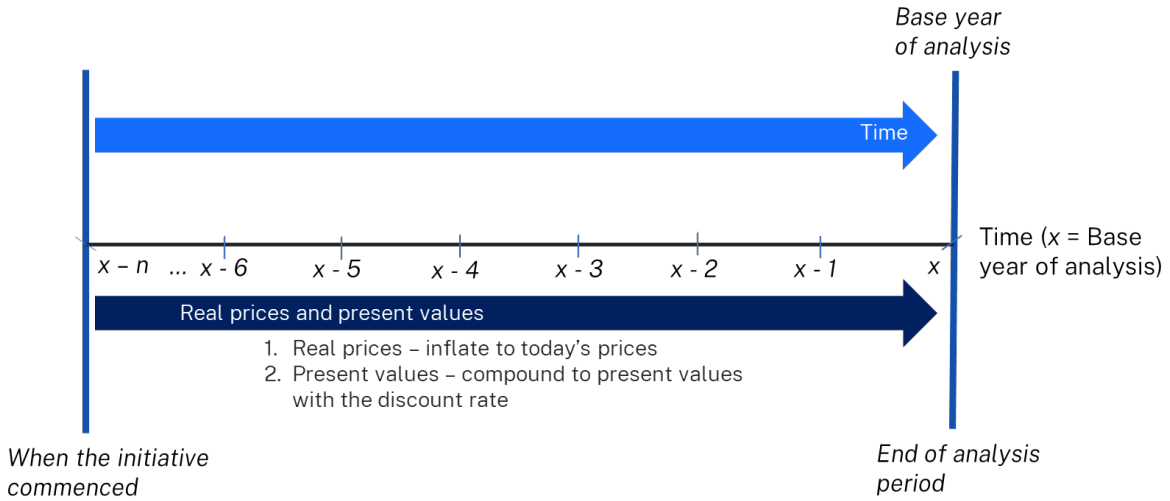


Figure 6: Establishing real and present values where the base year is the current year of analysis, and the analysis is undertaken at the end of the initiative's benefits realisation period



Assess risks and sensitivities

Ex-post CBA counterfactuals and other estimated values are subject to risk and uncertainty in the same manner as ex-ante CBAs. Risk and uncertainty should be considered throughout the analysis and methods to account for it applied as appropriate. Appendix 4.3 of the CBA Guide discusses relevant methods, including simple parameter testing, Monte Carlo analysis and scenario planning.

Sensitivity testing is relevant to the estimates of costs and benefits already realised (particularly where the credibility of data are uncertain, or where values are based on estimates rather than actual data), and to accommodate an appropriate range in values under the counterfactual. Sensitivity testing can be used to examine the possible range of values for estimates that have potential for error (see Sensitivity Analysis under Section 2.6 of the CBA Guide).

When making forecasts for an analysis undertaken during the life of the initiative, a range of realistic possible values for the major cost or benefit variables can be tested to accommodate key risks or changes in key assumptions.

Step 7: Assess distributional and equity impacts

Distributional analysis can support analysis of equity by highlighting actual gains and losses (see the CBA Guide, p.17 and Appendix 5. Table A5.1, p.87 presents potential categories to consider when developing distributional analysis). It is important to consider whether initiative was effective in delivering the relevant outcomes to the targeted beneficiaries. Any specific groups that disproportionately or unexpectedly affected or benefited from the initiative should be reported.

Step 8: Report results and key findings in executive summary format

The CBA report should include a clear and concise summary of key information (see CBA Guide Section 2.8). This should include key categories of benefits and costs, consideration of the counterfactual and the net social benefit of the program using the NPV and BCR as measures, significant costs and benefits that could not be quantified, and all critical assumptions.

The summary should also compare results with the ex-ante CBA (where available). This can support assessment of the strengths and weaknesses of the ex-ante CBA and inform future improvements. This involves assessing:

- whether anticipated outcomes, and costs and benefits, are being (or have been) realised
- whether planned milestones had been reached
- where the extent of intended change has unexpectedly increased or decreased
- where unforeseen and exogenous circumstances may have increased or decreased the value of costs and benefits (for example, unanticipated policy changes or prices changes resulting from altered market conditions).

An ex-post result may differ from an ex-ante forecast for several reasons, including because:

- the initiative delivered may have a different scope or timeframe
- the design may not have led to intended outcomes, or the actual benefits achieved may be different
- the external context, for example, demand, may have changed.

Evaluation findings should inform lessons learnt to formulate actionable recommendations. These recommendations aim to improve future initiative design, implementation and decision-making processes. Areas that this may cover include policy adjustments, resource allocation, stakeholder engagement, monitoring frameworks and risk mitigation strategies. The evaluation purpose should be considered when preparing the evaluation conclusions.

Where differences are significant, a variation analysis can be added as an attachment to explain variations in costs and benefits (refer to *Evaluation Workbook VII: Example evaluation report template*). Monitoring, including under a BRM framework, may help identify divergence from forecast outcomes, and their costs and benefits. Where the change is unexpected or irregular due to certain factors (for example, market distortion or natural disaster), it is appropriate to also consider what costs and benefits may have otherwise been without them.

Feasible options considered should be summarised in the evaluation's executive summary or elaborated further in the lessons learned report to help decision makers understand potential changes or modifications that could be made to this, or other similar, initiatives.

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