
Cost Benefit Analysis: Main Topics

A CBA depends on and requires the calculation of the costs of operations, the total profit or return and building a considered project over its functional life-time as well as the suggested time-stream of profits expected to accrue from the project. These timelines of costs/expense and benefits/profits of the project are needed to be converted to a mutual time base due to the time-merit of money. Cost benefit analysis is utilized as a financial decision tool. Analysis differ for the most part in which cost and benefits are taken into account, how they are quantified, the time duration considered.

While the details of cost benefit analysis often vary significantly from place to place and project to project, the basic principles of cost benefit analysis remain unchange. Cost benefit analysis permits for comparison of often quite different projects using standardized procedures. The 'do nothing' scenario must also be considered as an option, and evaluated. The time frame a project is evaluated over is a key choice in the of cost benefit analysis process.

In theory a cost benefit analysis captures all the costs, expenses, benefits and profit of the project it is assessing. In practice, what can be practically predicted and/or assessed and the approach taken to choosing the time line of the analysis limit the scope of cost benefit analysis s. A cost–benefit analysis calculates both the positive and negative parts of the project.

Cost benefit analysis processes consistently value savings and increases in safety. However, beyond these, the inclusion of different kinds of benefits, especially civil and environmental welfare such as greenhouse gas savings, air quality and noise effects are incorporated in cost benefit analysis s are inconsistent.

The impacts included in the cost benefit analysis, the factors used and the time period chosen are critical to the results of a cost benefit analysis. Research has shown that the same projects evaluated using cost benefit analysis guidelines from different countries can lead to divergent result that would change the evaluation decision from build to no build and vice versa.

The gradation of costs related with a transport project is more straightforward to calculate than the benefits. They consist, in the first instance, of the fixed costs and costs related with operation and maintenance. Inputs to costs general come from easily available data or outputs of standard models

Cost-benefit analysis, is one of the most commonly used project evaluation analysis tools for projects. The CBA quantifies and evaluate the net influence of a project from the viewpoint of the gain and profit over the expense and investment. Measuring net impacts of a project can be complex, because a project can impact the whole freight network and numerous modes.

A CBA is a tool that takes into all relevant consequences of a policy into consideration and compares the benefits with costs. If benefits and profit outweigh the expenses, the project is feasible and could be implemented as it could generate business and profit for the company. If the costs and expenses outweigh the benefits, the project is not feasible and should be cancelled as it can a source of loss for the company.

Cost-benefit analysis is a tool and a method to determine predict whether a project, program, policy or an activity is feasible given the objectives and requirement that have been given and the assumptions that have been made. In general, a cost-benefit analysis aims at answering whether a project or activity or program should be executed and if funds are limited, which elements should be selected. In doing this, the specific project is compared to its next-best alternative.

With proceeding to cost benefit analysis there are factors that impacts on different users or non-user group are poorly understood and that some impacts are not well quantified (Iacono, 2013). Early cost benefit analysis largely avoided assessing environmental, civil and social impacts and focused on the direct costs (construction) and savings (travel time) related with transportation projects.

In dealing with environmental impacts, cost benefit analysis often monetizes the value of nature using people's willingness to pay to protect it. This ignores the intrinsic value of nature and the impact of nature on society rather than on an individual. Many also criticize the monetization process saying that it debases the environment. Further a review of the modelled impacts of external factors (like the environment) finds wide discrepancies in the way they are priced.

Many proposals have been made to better the CBA process. It is suggested to use changing in land value to assess local user benefits on the micro-economic scale rather than evaluating times savings multiplied by the value of time (Iacono & levinson, 2013). While doing a cost benefit analysis it might be necessary to do a quantitative risk analysis (QRA). This type of cost benefit analysis is called CBA-DK. Rather than produce one result CBA-DK uses Monte Carlo simulations to analyze the range of likely possibilities for all the factors used in the CBA. This allows for a final result showing the most likely and well as the distribution of other results based on the range of inputs.

Cost Benefit Analysis remains the most common approach to quantitative evaluation of the net impacts of a transportation project. It has, however, a number of shortcomings. These include the difficulty in monetizing non-monetary impacts such as impacts to health and the environment Constructing a CBA is both helpful and informative to break it down into a number of component steps, and examine each one of these steps individually.

First, the analyst needs to specify the set of alternative projects. This is especially helpful if there are a number of ways to proceed to a given result. Second, and very importantly, one must look at whose benefits and costs matter. If, however, there are a number of stakeholders located in various counties or states, the impact on them must be considered as well.

Third, the literature suggests that the person conducting the CBA should identify impact categories, catalogue them, and set measurement indicators. The term "impact categories" refers to the gains and costs themselves. Costs are generally thought of as the expense of a project and profits are generally thought of here as the return and the profit of a project. While cataloguing this list may be tedious and time consuming, it is necessary that it be as complete and well thought out as possible so that the analyst can avoid mistakes that may ultimately lead to incorrect conclusions.

Fourth, the analyst must attempt to predict the impacts quantitatively over the life of a project. Most projects are designed to last more than a single year. Furthermore, the benefits of a

project may not be accruing until several years into the project. Nevertheless, the analyst should attempt to make the best predictions as to what those benefits may be in order to see if the future benefits are worth the present costs.

Fifth, all of the required costs and gains of a project should be authentic. In a very real sense this is the most crucial step in the whole analysis since the ultimate goal of the analysis is to compare the value of the profits and cost of the project. Nonetheless, this may be very difficult for a number of reasons. Prices and costs may occur at future dates and may not be known with certainty.

Furthermore, certain costs (i.e. the cost of someone being injured on the job) may be hard to quantify. It may thus be helpful to look at past analyses of similar projects or to borrow estimates from other researchers on these costs to include in the analysis. Indeed, even, if no explicit data on these things can be obtained, they need to be mentioned in the analysis to aid in making the final go/no go decision (Metrolinx, 2015).

Before a recommendation can be made by the analyst performing the CBA two other important considerations must be made. Inputs and outputs must be discounted over time and sensitivity analysis must be performed. As we have already noted, both profits and expense occur over time and those expenses and profits that occur in different years must be summed together if we are to have a single cost and a single benefit number. (Williamson, 1992).

In a case study written by the authors Decorla-Souza, Lee, Hans D, & Mayer, J states that only after a detailed analysis is done, and all the alternatives are consider, and the factors concerning those alternatives are taken into consideration, only then a cost benefit analysis can be carried out. After evaluating and comparing the results from these calculations, a decision is made based on the gain, profit of the project and if the project costs such as the preliminary investment and maintenance cost outweighs these benefits than a project might be dropped overall.