

Subject: Cost-Benefit Analysis

Cost–benefit analysis (CBA),

- **Cost–benefit analysis (CBA)**, sometimes also called **benefit–cost analysis**, is a systematic approach to estimating the strengths and weaknesses of alternatives used to determine options which provide the best approach to achieving benefits while preserving savings (for example, in transactions, activities, and functional business requirements).
- A CBA may be used to compare completed or potential courses of actions, or to estimate (or evaluate) the value against the cost of a decision, project, or policy. It is commonly used in commercial transactions, business or policy decisions (particularly public projects), and project investments.

What is a cost benefit analysis?

- Cost Benefit Analysis (CBA) refers to a mathematical approach that helps in the comparison of the cost and expected benefits of two or more options or projects.
- Therefore, it helps an individual or an organization to determine which potential decision can make the most financial sense when it comes to investment.
- Also, it identifies the benefits associated with a particular investment and the involved costs and deducting the costs from the benefits. It is applied in various institutions such as software development, construction, education, healthcare, among other businesses.

Public Good/Projects

- In economics, a public good is a good that contains both the characteristics of non-excludable and non-rivalness.
- That individuals cannot be excluded from use or could benefit from without paying for it, and where use by one individual does not reduce availability to others or the good can be used simultaneously by more than one person.

The relationship between Cost Benefit Analysis and Net Present Value

1. Well, before you engage in any kind of project, or buying a property, it is always recommended that you weight the expected costs against the benefits. This will help you reach an informed and rational decision. In most cases, CBA is often done for long-term goals.
2. However, because of the fluctuations, inflations, and other changing factors in the market, it's always good to know the net present value. Net present value in economic terms refers to a method whereby future benefits or costs are calculated based on the present values.
3. Therefore, if the net present is positive, then that is an indication that the decision is good for investment since benefits overshadow costs.
4. Nonetheless, if the result is negative, then the investment decision shouldn't be recommended.

How to calculate Cost Benefit Analysis

- Most companies do look for ways to make their investment returns positive. For this reason, they do try as much as they can to minimize their risks by conducting an exhaustive CBA.
- However, while some find it a long and tedious process, other individuals/companies simply don't know where to start. Therefore, if you are such an individual/organization, know that you are in the right place.

The following is a step by step guide on how you can calculate

Step 1: Identify costs

- First and foremost, you should compile a comprehensive list of all the expenses that are associated with your planned investment or action. Remember, costs are categorized into different varieties i.e., direct costs, indirect costs, tangible costs, intangible costs, and real costs.
- **Direct costs**— these are costs that are directly associated with the production of the project or investment.

- **Indirect costs**— are costs that are not directly accounted for the investment. They are either fixed or variable.
- **Tangible costs**— are costs associated with an identifiable source or asset. They include rents, payrolls, among others.
- **Intangible costs**— these costs are difficult to identify and fluctuates with consumer demands.
- **Real cost**— these are costs that are involved in the actual production process, such as labor costs and raw materials.
- **Step 2: Identify Benefits**
- Once you've compiled a comprehensive list of all the costs incurred in the project/investment, you need to embark on identifying and quantifying all benefits anticipated should the investment/project implemented. First, identify the monetary benefits such as, profits from products and services, the contribution from investors, reduction in production, among others.
- Also, you need to identify some of the nonmonetary benefits that are likely to arise. These include reliability, increased durability, improved customer satisfaction, etc.

Step 3: Evaluate costs and Benefits

- This is the final step of cost-benefit analysis. Here, you can take all the benefits as well as the sum of the costs and put them in a b/c equation. If the sum of costs is greater than the total benefits, this is an indication that the project/investment is not worth undertaking.
- However, if the total costs and benefits are more or less equal, then it's recommended that you re-evaluate the CBA. In many a time, such cases do arise due to errors or incorrect calculations.
- If the sum of the benefits is higher than the sum of the cost incurred, then that's an indication that the project or investment is potentially worthwhile.

EXAMPLE

- Good Health' is a startup hospital that has been in operation for close to two years now. The manager, however, plans to expand its operations in the third working year. The hospital management decides to run a cost-benefit analysis to determine whether or not the decision is beneficial or feasible.
- The management analyzes a time horizon of one year and estimates that the total revenue collected will amount to \$200,000. However, this will be possible if 2 more physicians are hired and more hospital equipment worth \$100,000 bought. The salary of the physicians will be \$ 70,000, and the cost of hiring and training will be \$5,000.
- Therefore, when calculating the CBA, we first get the total costs by adding all the costs.

In this case, it will be salaries + equipment+ cost of hiring and training

= 100,000+ 70,000+ 5,000

= \$ 175,000

Additionally, there is the cost of expanding consultation rooms which stands at \$10,000.

On the other hand, the benefits that will come after the implementation of the plan will be \$200,000. Therefore, using the benefit-cost ration, we get $175,000/200,000= 0.875$. Given that the value is positive and that the total benefits are greater than the costs, the CBA indicates that the decision to expand the hospital's operation is feasible and beneficial to the company.

Limitations of Cost-Benefit Analysis

1. For projects that involve small- to mid-level capital expenditures and are short to intermediate in terms of time to completion, an in-depth cost-benefit analysis may be sufficient enough to make a well-informed, rational decision. For very large projects with a long-term time horizon, a cost-benefit analysis might fail to account for important financial concerns such as inflation, interest rates, varying cash flows, and the present value of money.
2. Alternative capital budgeting analysis methods, including net present value, could be more appropriate for these situations. The concept of present value states that an amount of money or cash in the present day is worth more than receiving the amount in the future since today's money could be invested and earn income.
3. One of the benefits of using net present value for deciding on a project is that it uses an alternative rate of return that could be earned if the project had never been done. That return is discounted from the results. In other words, the project needs to earn at least more than the rate of return that could be earned elsewhere or the discount rate.

Thank You..