

SELECTION OF ECONOMICALLY RATIONAL INVESTMENTS THROUGH COST BENEFIT ANALYSIS

Nedeljka Dedović¹

Academy of Vocational Studies of Kosovo and Metohija, Department
Peć in Leposavić, Leposavić

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Corresponding: neda.dedovic@gmail.com¹

¹<https://orcid.org/0000-0002-2755-5976>

Abstract: Business decision making is an act of choosing between at least two competing simultaneously available investment alternatives. Cost benefit analysis enables direct and indirect measurement of all relevant costs and benefits expected in the future based on a given investment project. It enables the justification of investments and the expediency of redirecting capital to investment projects. However, cost benefit analysis is not a method of general optimization because it deals with the comparison of two or more alternatives, neither of which has to be the economic optimum. The goal of cost benefit analysis is the careful selection of alternatives that best meet the set objectives in the field of relevant constraints. The choice of economically rational investments through cost benefit analysis is the topic of this paper.

Keywords: Cost benefit analysis, investment, constraints, investment rationality, optimization, costs and benefits.

Introduction

Cost-benefit analysis has its roots in the 19th century and many theorists link it to the welfare economy. [Nikolić & Paunović, 1997] Welfare is the sum of the well-being of individuals, that is, to increase social well-being by increasing the well-being of each individual. However, when project activities affect the well-being of others, beyond market mechanisms, this impact is called the external effect. [Rosen & Gayer, 2009]

By the way, the concept of cost-benefit analysis dates from the articles of Jules Dupuit from 1848, [Michael & Rebeca Richard, 2013] who pioneered this approach, the first calculation of the social profitability of a project such as road or bridge construction [Sandmo, 2011]

Cost benefit analysis quantifies the monetary value of all effects and costs related to the implementation of the investment project, or investment planning in general, on the basis of which the calculation of net profit.

All offered alternatives are evaluated, on the basis of which the option that achieves the highest profit and the lowest realization costs is selected. [Dedović, 2004]

Cost benefit analysis is a method of economic analysis that compares and evaluates all the advantages and disadvantages of an investment project by cost-benefit analysis. The main goal of cost benefit analysis is the cost identification of the most cost-effective solution for a given investment goal, in order to determine the financial viability of the project, measuring total investment, costs and revenues. This reflects all the relevant factors that management takes into account in the ranking phase of alternative directions of activity.

1. Cost and Benefit Analysis of Investment Projects

Cost benefit analysis is used for those investment projects that bring significant and immeasurable effects. Therefore, it is not possible to make correct, cost-effective and economically justified decisions if this method is not applied to business entities before carrying out investment activities.

Benefit and cost analysis means measuring and comparing all costs and benefits of an investment project, as follows:

- specification of the investment project;

- description of project inputs and outputs;
- assessment of social utility;
- comparing costs and benefits.

In order to realize an investment project, it is necessary to make a decision on the project study, as well as to define the elements of the project (location, groups, course of realization, time, etc.).

The second step of the Cost benefit analysis is a quantitative description of the inputs and outputs of the investment project in order to get an indicator of how the total costs are deducted from the total benefits and the net benefit is obtained.

Cost benefit analysis is an analytical approach to solving the problem of choice that requires defining goals and appropriate alternatives that give the greatest benefit at a given cost or that give a given benefit for the lowest cost.

Cost benefit analysis enables cost analysis, evaluates the profitability of the introduction of a new product, controls the outflow of funds, measures the profitability of investments and realistically considers the benefits that have an impact on the business of economic entities.

The basic rules on which Cost benefit analysis is based are:

- Cost benefit analysis considers that there is a difference in the contribution of different investment projects, as well as their effects;
- Cost benefit analysis should take into account all costs and benefits;
- lost costs should be taken into account as costs, and costs reduced as benefits;
- Cost benefit analysis is suitable for projects that bring multiple effects;
- Cost benefit analysis contributes to the optimal allocation of economic resources;
- Some of the groups of costs can be: contingencies, upfront costs, transfer payments, etc.

After determining the costs and benefits that an investment project brings, it is necessary to evaluate and express those same costs and benefits in monetary terms. For the measurement of the effects brought by the investment project, the calculation prices or shadow prices are used, which differ from the market prices.

2. Assessment of Weaknesses and Strengths of Offered Investment Alternatives

In Cost benefit analysis, the weakness and strength of all offered alternatives are assessed, on the

basis of which the option that generates the highest profit with the lowest realization costs is selected.

Cost benefit analysis is a systematic approach to assessing the strengths and weaknesses of alternatives used for specific options and providing the best approach to achieving benefits while preserving savings. Cost benefit analysis is used to compare potential stock

flows or to estimate value in relation to the cost of a decision.

Cost benefit analysis is an important method in the decision-making process or in the correction of investment projects. The key areas of its application are: financial transactions, managerial decision making, project selection, selection of the most profitable investment.

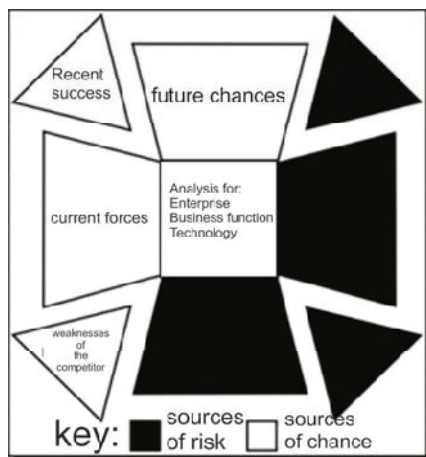


Figure 1. Current strengths, weaknesses and future opportunities

The stages of cost benefit analysis are:

- defining the investment project to be analyzed;
- defining the time period to which the analysis refers;
- determining the costs and benefits for a given investment project;

- determining costs and benefits in value (money) form;
- determining the method used;
- determining the discount rate;
- calculating and comparing the values of individual criteria for the investment project with certain definitions of measures as well as additional criteria;
- decision making.

Cost benefit analysis provides insight into whether investments (and by how much) exceed costs, ie the total expected costs and benefits are compared. It presents an analysis of the expected balance of costs and benefits and, based on that, ranks investment alternatives.

3. Choosing the Best Investment Alternative

Cost benefit analysis is used in the economic analysis of investment projects as opposed to financial analysis which determines the effects arising from the exploitation of the project for the investor. [Perović & Jovanović-Kisić, 2011]

The two integral parts of the Cost benefit analysis are the financial and economic analysis on the basis of which the best investment alternative is selected. Financial analysis includes analysis of cash inflows and outflows, ie analysis of estimated cash flows during the implementation of a project or investment. As far as economic analysis is concerned, the mathematical (statistical) method is used as an indicator of economic efficiency. One of the most commonly used methods is ROI (Return of Investment) or payback period.

The application of this method comes down to determining the payback period (expressed in months or years) in which the invested investment funds will be returned - investment costs, as well as the period in which total investments will be equated with the current value of net benefits from investment projects. Therefore, since it is easily calculated, this criterion is most often used as an indicator of economic efficiency.

When making a decision, after evaluating the alternatives, managers have two options: the first is to make a decision, and the second is to eventually gather more information that the choice will become clearer. [Welsch & Anthony Recce, 1985, 356]

As cost benefit analysis must offer the best alternatives, modern assessment of all future costs and benefits is difficult. In this regard, stakeholders may try to include (or exclude) significant costs in the analysis, in order to influence its outcome. Cost benefit analysis is aimed at maximizing the present value of future cash flows, rather than its distribution among individuals in the company. [Drury, 1996]

The use of cost benefit analysis requires consideration of several important issues, namely: [Layard, 1976, 73-74]

- a) What costs and benefits should be included in the Cost benefit analysis?
- b) how should they be evaluated?
- c) how to ensure their correct comparison?

d) what are the relevant limitations when comparing them?

In practice, the decision-making process should take place in certain stages, avoiding bad decisions and mistakes. The decision-making process could be graphically represented as follows. [Schremerhorn, 1996]

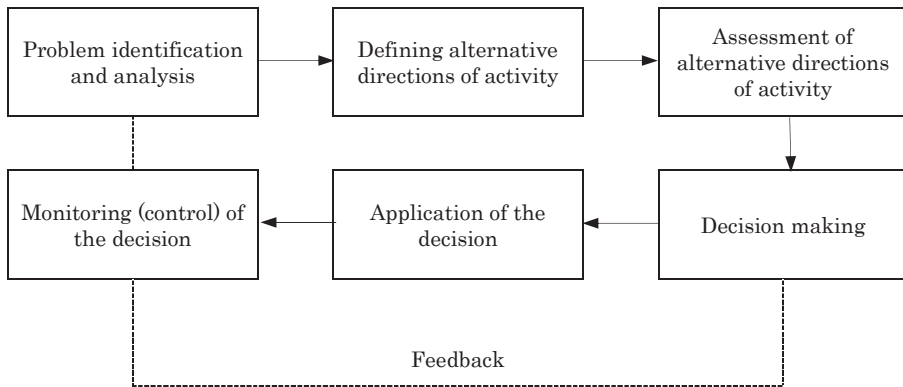


Table No.1. The decision-making process

4. How to get Rational Investment through Cost Benefit Analysis

Cost benefit analysis is a cost-benefit analysis. Advantages and strengths, that is, costs and effects are expressed in monetary units and adjusted for the time component expressed on a common basis in terms of net present benefit, risk-benefit analysis and social return on investment.

The criteria used in cost benefit analysis are:

- net present value criterion,
- internal rate of return criterion,
- cost-benefit criterion,
- investment return deadline criterion.

The net present value criterion implies the difference between the total discounted benefits and the total discounted costs realized by

one investment project. [Rodić, 1990]

$$Kns = K_S - T_S$$

where are:

Kns - net present value criterion

K_S - total discounted benefits

T_S - total discounted costs

The criterion of the internal rate of return implies that the internal rate of return is the discount rate at which the sum of discounted benefits is equal to the sum of discounted costs, ie the present value of net benefits is equal to 0 (zero), therefore:

$$Kns = K_S - T_S = 0$$

Cost-benefit ratio means the ratio of total discounted costs to total discounted benefits. It is calculated from the following formula:

$$K = K_S / T_S$$

The return on investment criterion is the period expressed in years for which the present value of the net benefit of the investment will repay the invested funds.

Conclusion

The investment process is characterized by one-time or multiple investments in the present as well as a series of effects expected in the

future. The most common division of effects brought by one investment is economic and non-economic. Economic effects are reflected in the value of a particular production or service. As well as on the efficiency of investment, while non-economic effects in certain cases may be more significant than economic ones. Therefore, all the effects that one investment brings should be taken into account. Since economic and non-economic effects are very difficult to measure, most often only direct effects that can be measured and quantified are taken into account.

When it comes to the evaluation of investment projects, this method of evaluation brings a cost-benefit analysis (Cost benefit analysis) which takes into account all the costs and benefits brought by one investment project.

The advantage of this analysis is that it directs responsible entities to identify possible costs and effects, in order to avoid relying on unreliable estimates. Its leading characteristic is economic efficiency, and its purpose is that through the choice of investment alternative, relevant information is provided on the price of achieving that goal.

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IZBOR EKONOMSKI RACIONALNIH INVESTICIJA KROZ COST BENEFIT ANALIZU

Nedeljka Dedović

Akademija strukovnih studija Kosovsko Metohijska, Odsek Peć-
Leposavić, Leposavić

Korespondencija: neda.dedovic@live.com

Rezime: Poslovno odlučivanje predstavlja akt izbora između najmanje dve konkurentne istovremeno raspoložive investicione alternative. Cost benefit analiza omogućava neposredno i posredno merenje svih relevantnih troškova i koristi koji se očekuju u budućnosti na osnovu datog investicionog projekta. Ona omogućava da se dode do opravdanosti ulaganja i celishodnosti preusmeravanja kapitala u investicione projekte. Ipak, cost benefit analiza nije metod opšte optimisacije jer se bavi poređenjem dve ili više alternativa od kojih ni jedna ne mora biti ekonomski optimum. Cilj cost benefit analize je pažljiv odabir alternative koje u domenu relevantnih ograničenja najbolje zadovoljavaju postavljene ciljeve. Izbor ekonomski racionalnih investicija kroz cost benefit analizu tema je ovog rada.

Ključne reči: Cost benefit analiza, investiciona ulaganja, ograničenja, racionalnost investicija, optimizacija, troškovi i koristi.