

INVESTMENT APPRAISAL IN THE PUBLIC SECTOR

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This guide or article will consider investment appraisal in the [public sector](#) so If you are a student of public sector accounting then your back is covered when it comes to investment appraisal in the public sector.

Investment decisions in the public sector are long-run decisions where consumptions and investment alternatives are balanced over time in the hope that investment now will generate extra returns and consumption in the future.

An investment can be defined as an activity for which the required outlays and benefits will occur at different points of time, and capital expenditure provides a prime example of such a situation.

Many public sector programme involves investment in roads, water and sewage facilities, air and seaports, education, and other projects that provided social capital that enhances the productivity of inputs employed by both public and private sectors.

Public sector investments usually take several years to develop and construct but once completed yield a stream of benefits to citizens for many years to come.

However, because public sector investment projects do not necessarily result in output sold in the marketplace, a way of estimating net return to public investments to determine whether they provide net benefits to society is therefore needed.

This guide or article discusses some practical techniques that can be used to appraise alternatives public sector investments according to their net benefits.

THE BASIC REQUIREMENTS OF INVESTMENT APPRAISAL

These requirements involve the following stages:

- Defining the objectives of the public sector organization
- Identifying the capital projects that will achieve the objectives
- Evaluating the costs and benefits of each project, and
- Making decisions on were there to accept or reject the projects.

DEFINING OBJECTIVES

Objectives are to be defined in relation to the long-term fundamental aims of the public sector organization concerned. There are difficulties in deciding on the precise objectives of many public sector organizations. Nevertheless, provided realistic assumptions are made, a workable and generally acceptable definition of the goals of the organization can usually be found.

It is important that the objectives should not be too broad otherwise they will be of little use in investment appraisal. On the other hand, they must not be defined so narrowly that they effectively conceal the ultimate purpose of the services.

IDENTIFYING INVESTMENTS POSSIBILITIES

There will often be a wide range of alternative ways of meeting objectives and it will be necessary to list these in some way. Some may be technically feasible but may have to be ruled out because of legal or political constraints, and there is therefore little point in appraising these in great detail.

However, there will always be at least two options, i.e., a 'do nothing' option and an investment option. Proposed investment projects may have an impact on other projects or may be dependent on the acceptance of other projects and the relationship of projects will have to be taken into consideration.

EVALUATING THE COSTS AND BENEFITS OF INVESTMENTS

The first requirement is to assess the magnitude of the cost and benefits of each project and also the time when these will be expected to occur.

The use of discounting techniques in private sector investment appraisal is well established. Thus, there is a commercial output, costs and benefits can be expressed in monetary amounts and the appraisal is normally restricted to cash flows.

In the public sector, this is not possible because many of the costs and benefits are not directly measurable in monetary terms. Again, for private sector organizations, it is generally agreed that the discount rate should

reflect the cost of capital of each firm. In the public sector, the choice of the discount rate is less obvious as it is based on social costs. Investment appraisal in the public sector is thus based on the techniques of cost/benefit analysis or cost-effectiveness analysis.

CHOOSING PROJECTS

The discounted cost/benefits ratios or cost-effectiveness profiles do offer no more than a starting point for deciding on which projects to accept.

There are many uncertainties that could affect the calculations.

The analysis indicated those projects that appear to give the best value for money, but political factors and the need to respond to changes in governmental and societal pressures may often cause cost/benefit considerations to be overruled.

APPRAISAL METHODS / TECHNIQUES

The two main methods/techniques for investment appraisal in the public sector are:

- a. Cost/benefit analysis, and
- b. Cost-effectiveness Analysis.

COST-BENEFIT ANALYSIS

Cost-benefit analysis is concerned with assessing all of the economic and social advantages (benefits) and disadvantages (costs) of a project and then quantifying these in monetary terms.

Cost-benefit analysis is developed as a means of establishing criteria for public sector investment appraisal in terms of the net social benefits accruing from the investment.

Cost-benefit the analysis involves the following steps:

- a. Determine the primary objectives
- b. Enumerate the alternative means of achieving the objectives, subject to the legal, political, technological budgetary, and other constraints that limit the scope of action.
- c. Evaluated all primary, secondary and intangible benefits and costs associated with each alternative.
- d. Discount the benefits and costs using a social discount rate to arrive at an overall measure of the desirability of each alternative (for example benefit-cost ratio); and

- e. Choose (or recommend) the best alternative based on the overall measure of desirability and the relative magnitude of non-quantifiable intangibles. The starting point for evaluating the benefits and costs of a project is the observable market values. Under a competitive economy, benefits may be measured by market values. Under a competitive economy, benefits may be measured by the market price of the outputs from a public programme or by the price consumers are willing to pay if they are charged. Similarly, costs are measured as the monetary expenditures necessary to undertake a project. Under imperfect competition, the estimates of benefits and cost must be modified to take account of such situation. Benefits and costs may be classified into direct and indirect.

Direct Benefits

Direct benefits of a project consist of the value of goods or services produced if the project is undertaken compared with conditions without the project.

For example, the direct benefit of an irrigation project is the value of the additional crops produced on the irrigated land less the cost of seeds, labor, and equipment required to produce the crops.

Direct cost includes the capital cost necessary to undertake the project, operating and maintenance costs incurred over the life of the project, and personnel expenses.

Remember that the costs being measured are opportunity costs or the social value foregone because factors of production have been moved into the projected area of activity.

Public sector investments invariably create secondary or indirect costs and benefits. Secondary costs and benefits may be of two types

- i. Real or technological effects and
- ii. Pecuniary effects.

Real secondary benefits may include reductions in necessary outlays for other government projects, as for example, an irrigation dam may reduce flooding and create a recreational area.

Secondary costs may include damages caused by dams when they cause floods. Pecuniary benefits generally arise in the form of lower inputs,

increased volume of business, or changes in land values resulting from a project.

OTHER RELATED TOPIC

A final group of investment benefits and costs in intangibles. These are recognizable impacts of a project for which it is either extremely difficult or impossible to calculate a monetary value. Intangibles may include such notions as the quality of life.

Several approaches have been used to value intangible benefits and costs and these include the following.

- a. Surrogate prices can be established by finding out what consumers would be willing to pay if there were a market in the intangible cost or benefit. This involves undertaking a survey of consumers. For example, attempts to value a benefit such as “savings in traveling time” might be achieved by asking travelers what they would be willing to pay to save an extra 30 minutes in traveling time.
- b. Surrogate prices can be implied by observing behavior. Thus a passenger, when faced with the choice of traveling by bus or taxi, choose the faster but more expensive form of transport. It is argued that this implicitly values time saved as the difference between the costs of the two methods.
- c. A third approach involves tracing the effects of a programme as far as possible and then trying to place a value on the costs and benefits of each effect. For example, a program to provide a school infrastructure might be expected to provide a variety of benefits.

Tracing just on benefit, such as a reduction in juvenile delinquency, may, in turn, reveal several further benefits; a reduction in crime, which might result in reductions in police work, savings in detention costs, and so on.

In reality, the relationships are so tenuous and the impact of the program on each of these benefits is so imprecise that any attempt to place monetary values on intangibles of this nature is usually abandoned.

Intangibles may be merely listed if it proves impossible to translate them into reasonable estimated monetary benefits and costs.

When the benefits or costs of an investment extend beyond a one-year time limit, they must be discounted back to some common point in time for purposes of comparison.

This is so because most people prefer current to future consumption. The social discount rate is used to adjust for this preference. The choice of the appropriated discount rate to evaluate public investments is critical to the conclusions of any cost-benefit analysis.

THE CHOICE OF DISCOUNT RATE

Assuming that all the costs and benefits of a project can be adequately valued, the next problem to be considered concerns the appropriate discount rate to be used.

It is clear that where costs and benefits occur at different points of time, it will be necessary to discount them to some common time period before they can be realistically compared.

For cost-benefit analysis purposes, the social discount rate is used, but there is considerable disagreement over how such a rate should be derived. The following are the summaries of the issues concerning how the social discount rate is derived.

1. One possible approach is to attempt to express the social discount rate as a rate that reflects society's preference for present benefits over future benefits. In other words, the social time preference rate (STPR). The problem here is that the reasons for preferring present benefits may be because individuals underestimate the pleasures that future consumption (benefits) might provide.
2. A further possibility is to try to determine a social opportunity cost rate (SOCR). The philosophy underlying the use of SOCR is that as resources are limited, their use in public sector investments means that they are not available for use elsewhere. It is usually assumed that it is private sector investments that will be foregone and so the rate that could have been earned in the private sector reflects the opportunity cost of public sector investments. The obvious difficulty is that of determining the rate of return in the private sector.

TREATMENT OF INFLATION

Inflation created a problem in cost-benefit analysis by making the measuring rod of money a poor standard of comparing benefits and costs over time.

There are two alternative ways of dealing with the problem of inflation.

1. Both benefits and costs could be measured through time in nominal values by estimating the rate of inflation over time and inflating both future benefits and cost accordingly. The nominal interest rate is the sum of the real interest rate and the rate inflation. Nominal interest rates are used to discount future net benefits in nominal values.
2. If benefits and costs are measured over time in real terms, meaning that future benefits and costs are deflated, the real interest rate (the nominal rate less the rate of inflation) is used to discount future benefits and costs.

The important thing to remember is that like should always be discounted by like. Thus if a real discount rate is used, the costs and benefits should also be in real terms. If a market-determined discount rate is used (the nominal rate) the costs and benefits should also reflect anticipated price changes.

RISK AND UNCERTAINTY

The whole question of attitudes to risk and uncertainty in public sector investment decisions offers a further example of a departure from the position in the private sector.

It is generally assumed that private investments are not selected simply on the basis of maximizing the present value of expected returns, but that the riskiness of the returns is also an important consideration.

For public sector investments the situation is even more controversial:

1. First, there is the suggestion that public sector organizations should behave as though they are indifferent to risk. This means that projects should be assessed on the basis of their expected present values and that the variability of the outcomes around the expected value should not influence the decision. The arguments supporting this line of reasoning are that many of the uncertainties that exist in the private sector are not present in the public sector and also that for the public sector as a whole diversification will occur.
2. A second suggestion is that risk should not be treated differently in the public into account would result in an overinvestment in the public sector. In other words, public sector organizations should not be indifferent to risk.

Different discount rates can be uses to take account of the uncertainty surrounding the correct discount rate to use. This provides a means of dealing with the uncertainty inherent in investment appraisal by showing the sensitivity of the outcome of a project to different discount rates.

This should be distinguished from the uncertainty about the number of future costs and benefits. As far as the uncertainty about the number of future costs and benefits is concerned, it is usual to adopt a sensitivity analysis approach, whereby attention is focused on those assumptions on which the outcome of the appraisal is heavily dependent.

The sensitivity of the outcome to changes in the assumptions can then be examined.

RANKING OF INVESTMENT PROJECTS

Projects are usually ranked according to the present value of their discounted net benefits (B-C) or according to the ratio of the present value of benefits to the present value of cost (B/C). All projects with positive net benefits are considered for approval.

Similarly, all projects with benefit as ratios in excess of a value of one (1) are considered for approval.

COST-EFFECTIVENESS ANALYSIS

It is because social costs and benefits are not always easily measurable that cost-effectiveness analysis, with its more realistic requirements, is more widely used.

Cost-effectiveness analysis involves a careful appraisal of the quantifiable costs and benefits, both now and in the future, of undertaking a project with non-quantifiable effects described but not evaluated.

In other words, the cost-effectiveness analysis concentrates on measuring the measurable.

The steps to be followed are:

1. Determine the amount and timing of all capital costs.
2. Estimate the annual running costs over the expected life of the project
3. Estimate the measurable outputs over the expected life of the project, for example, revenues from fees and charges

4. Estimate the effect of costs and revenues on existing activities
5. Discount the costs and measurable benefits to enable comparisons to be made. The usual procedure is to calculate present values, but where projects with different expected lifetimes are being compared the use of equivalent annual costs may be more appropriate. And
6. Describe, in as realistic a manner as possible the non-quantifiable costs and benefits that will result from the project.

The practical difficulties associated with cost-effectiveness analysis are nevertheless quite considerable. Although only the measurable costs and benefits are included in the analysis, there are obviously going to be very real problems in forecasting the magnitude and timing of future amounts.

Also, the difficulties of selecting the correct discount rate or adjusting for risk and uncertainty as described under cost-benefit analysis are equally applicable under cost-effectiveness analysis.

However, the actual mechanics of discounting are not different from those used in the private sector applications.