PROJECT APPRAISAL AND INVESTMENT ANALYSIS

METHODS OF ANALYSIS:

- MEASURING OF COST EFFECTIVENESS
- CONSTANT EFFECT METHOD
- CONSTANT COST METHOD

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COST EFFECTIVENESS ANALYSIS

Cost-effectiveness analysis (CEA) is an alternative to cost-benefit analysis (CBA). The technique compares the relative costs to the outcomes (effects) of two or more courses of action.

An appraisal and program monitoring technique used primarily in social programs and projects.

EXAMPLE

CEA is commonly used in healthcare, for example, where it is difficult to put a value on outcomes, but where outcomes themselves can be counted and compared, e.g. ‘the number of lives saved’.

Note:

Health, nutrition and education where identification and quantification of benefits in money terms is not straightforward but, at the same time, the desirability of the activity is not in question.

COST EFFECTIVENESS ANALYSIS

Cost effectiveness Analysis Can be Used in Two Forms:

- Constant Effects Method
- Constant Cost Method

COST EFFECTIVENESS ANALYSIS

Constant Effects Method

Uses least-cost analysis to determine the lowest cost alternative for meeting the same level of benefits.

Example:

Choosing from two water pipes of different sizes that yield the same quality of water per day (smaller pipe has lower investment cost but higher operating or pumping costs)

CONSTANT EFFECTS METHOD- CONT.

Selecting from two alternatives for generating the same amount of electricity (thermal and hydro generation units, the former with a lower investment and higher operating cost compared to the latter)

COST EFFECTIVENESS ANALYSIS

This approach is very useful where aim is to choose from a set of alternative technologies and approaches that will provide the same service.

Examples:

- Choosing from two school systems that give same educational benefits - Centralized schools that require bus transportation and more expensive smaller schools to which students can walk

COST EFFECTIVENESS ANALYSIS

- Two systems of electricity generation - Thermal versus hydro
- Two types of court systems with same disposal of cases - More court rooms at the headquarters or mobile courts
- Choosing amongst alternative ways of supplying portable water to communities
- Two or more kinds of health treatment to save lives

COST EFFECTIVENESS ANALYSIS

- Cost effectiveness analysis involves a series of steps similar to those of a normal investment appraisal except that the benefits are not measured as monetary values, but as quantitative impacts.
- The focus is on evaluating the costs of the alternatives
- Comparison of economic costs of alternatives.

CONSTANT COST METHOD

Calculates the cost per unit of benefit

Example:

Benefits are simply measured as effectiveness (the number of Premature Deaths Prevented)

Two different health programs: DPT-BCG vaccination campaign for children or AIDS treatment program.

The cost per child vaccination and per patient will be computed in this case. Here the purpose is to see which programs yield more value per dollar of expenditure.

CONSTANT COST METHOD CONT.

CEA measures costs in a common monetary value and the effectiveness of an option in terms of physical units. Because the two are incommensurable, they cannot be added or subtracted to obtain a single criterion measure. One can only compute the ratio of costs to effectiveness in the following ways:

CE ratio = C1/E1

EC ratio = E1/C1

CONSTANT COST METHOD -CONT.

where: C1 = the cost; and E1 = the effectiveness (in physical units).

The first equation above represents the cost per unit of effectiveness. Projects can be rank ordered by CE ratio from lowest to highest. The most cost-effective project has the lowest CE ratio. The second equation is the effectiveness per unit of cost (e.g. lives saved per $ spent). Projects should be ranked from highest to lowest EC ratios.

INCREMENTAL (OR MARGINAL) COST-EFFECTIVENESS RATIO

- The decision makers need to compute marginal cost-effectiveness ratios.
- This need arises when a new alternative is compared with existing situation.
- The numerator now contains the difference between the cost of the new and old alternatives, and the denominator is also the difference between the effectiveness of the new and old alternatives

CONT....

This ratio can be interpreted as the incremental cost per unit of effectiveness. When there are several alternatives available, the marginal cost-effectiveness ratio can be used to rank the new measures versus the existing one.

CONT....

Marginal Benefit Formula

$$\text{Marginal Benefit} = \frac{\text{Change in Total Benefit } (\Delta TB)}{\text{Change in Quantity}(\Delta Q)}$$

$$\text{Marginal Benefit} = \frac{TB_1 - TB_0}{Q_1 - Q_0}$$

LIMITATIONS OF CEA

1. **Does not measure Willing to pay (WTP)**

- Cost-effectiveness ratios are a poor measure of consumers' WTP.
- The taxpayers.
- The link between the intermediate measure of effectiveness and final output, such as reduction in crime, is not explicitly stated.

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2. Excludes some external benefits

- The concept of cost-effectiveness analysis excludes most externalities on the benefit side.
- An improvement in education will not only increase lifetime earnings of the students but also likely to contribute to a reduction in the rates of unemployment and crime.

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- In healthcare, there are external benefits due to such treatments as the vaccination of children, i.e., other people do not catch the infectious diseases.
- If a complete cost-benefit analysis does not seem possible, the analyst doing the evaluation should be careful not to exclude important benefits arising from a particular project

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3. Excludes some external costs

- While computing the cost-effectiveness ratio for a particular project, attention should be paid to the treatment of costs, which may include not only financial but also social costs.
- In the education sector, the enhancement of primary schooling is sometimes viewed in terms of the additional number of school blocks and improvement of their physical condition. Many other costs must be included to get the desired outcome.

CONT…

- The economic cost-effectiveness analysis carried out for such projects must account for all costs, and should also be based on the economic instead of financial prices of goods and services.

CONT…

4. Does not account for scale of project

- Scale difference may distort the choice of an “optimal” decision.
- A project with smaller size but higher efficiency level may get accepted, while another project may provide more quantity of output at a reasonable cost.