Planning & Economic Analysis I

Session on Planning & Policy

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Session Description

- The session covers the following topics:
  - Linkages between network planning and identification of projects
  - Difference between financial and economic analysis
  - Basics of economic analysis

The views expressed here are those of the presenter and do not necessarily reflect the views or policies of the Asian Development Bank (ADB), or its Board of Directors, or the governments they represent.
What Is Economic Analysis?

- The economic analysis of projects is similar to financial analysis:
  - Both appraise the profit of an investment
  - Financial analysis is about profit for project entity
  - Economic analysis is for the national government or the economy
- The economic analysis looks at any investment decision from the perspective of improving welfare of its citizens
- For a project to be economically viable, it must be financially sustainable, because if project is not financially sustainable, economic benefits will not be realized.
- Financial analysis and economic analysis are therefore two sides of the same coin and complementary

Economic Analysis Basics

- Economic analysis needs to be undertaken prior to financing of projects, but should also be carried out for all stages of project cycle:
  - Design and financing
  - Implementation
  - Evaluation
- There are four basic steps to analyzing the economic viability of a project
  - Identify the economic costs and benefits;
  - Quantify the costs and benefits, as much as possible;
  - Value the costs and benefits;
  - Compare the benefits with the costs
Economic Analysis Basics

Useful definitions

- Economic analysis helps us to make decentralized decisions on the appropriate choices between competing uses of resources, with costs and benefits being defined and valued so as to measure impacts of the projects on the broad development objectives of the country.

- ‘With’ and ‘without’ project concept is at the heart of the economic analysis. Difference between the future situation without a proposed project and the future situation with the proposed project will affect the economic viability of the project.

Useful definitions

- ‘With’ and ‘without’ project is different than ‘before’ and ‘after’ the project

- Current price is the term used to define the value of the inputs and outputs, and includes the effects of general price inflation.

- Constant price refers to a value from which the overall effect of a general price inflation has been removed.

- Shadow prices are used to take into account the major impacts of a project where economic values differ from financial values.

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Economic Analysis Basics

Many different cost concepts are used

- **Investment costs** (Initial investment costs, replacement or maintenance cost and residual values)
- **System costs** (if a project is part of a larger system and if project benefits do not accrue without some other systems costs, these need to be included in the project costs)
- **Sunk costs** (Costs for the use of facilities already in existence and should not be included in the projects cost, provided their use in the project involves no opportunity cost.)
- **Opportunity costs** (defined as the maximum alternative benefits forgone by not using the resources elsewhere)
- **External costs** (Effects that go beyond the financial analysis. They may include significant costs that must be taken into account in the economic analysis.)

Economic Analysis Basics

Measuring economic benefits

- The economic benefits from a project constitute the extent to which the project contributes to increasing the value of the consumption available to society.
- Consumption can be defined broadly. Societal consumption may apply equally well to a society’s willingness to pay for preservation of plant or animal species, as to society’s willingness to pay for the consumption of agricultural produce or clean drinking water.
- Projects can produce marketable goods (e.g. power) or non-marketable goods (preserving biodiversity of a national park). It is possible to carry out economic analysis of both types of projects.

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Economic Analysis Basics

Many different concepts are used to measure economic benefits

- Direct benefits (benefits value of production sold, e.g. power)
- Indirect benefits (that can be quantified from factors such as time savings, improved health impacts, enhanced access)
- Opportunity costs (defined as the maximum alternative benefits forgone by not using the resources elsewhere)
- External costs (Effects that go beyond the financial analysis. They may include significant costs that must be taken into account in the economic analysis.)

10 Key Questions

1. Project rationale
   - What is the rationale for public sector involvement?
   - What is the rationale of the project: what market or government failure does it address?
   - What is the main alternative to the project?
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10 Key Questions

2. Macroeconomic and sectoral context
   ➔ How does the project relate to the overall development strategy?
   ➔ What is the policy environment for the project: taxes and subsidies, trade controls, exchange rate and interest rate policy?
   ➔ How does the project relate to sectoral strategy?
   ➔ What is the sectoral policy context in terms of market structure and regulation?
   ➔ Is the project a priority public investment?

3. Project alternatives
   ➔ Have project alternatives been considered in terms of location, scale, timing?
   ➔ How has the best alternative been chosen?
   ➔ Has the least cost alternative been identified for the project or major subprojects?
   ➔ Is it possible to import services?

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10 Key Questions

4. Demand analysis
   ➤ What is the basis for projecting the demand for project output?
   ➤ How will demand be affected by income growth?
   ➤ What other sources of supply are there for meeting the demand?
   ➤ How will demand be affected by an increase in price or user charge?

5. Identification of costs and benefits
   ➤ Have the without and with project situations both been described?
   ➤ Have all project costs, comparing the with and without project situations, been identified?
   ➤ Have all project benefits, comparing the with and without project situations, been identified?

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10 Key Questions

6. Use of shadow prices
   - Which numeraire has been used in the application of shadow prices? Has it been used consistently?
   - Have project outputs been identified as nonincremental*?
   - Have benefits and especially costs been broken down into traded and nontraded items?
   - What value of the SERF/SCF has been used: has it been correctly applied?
   - Have more specific conversion factors been used for some items: how were they derived?
   - What discount rate has been used: to choose between alternatives, and to assess economic viability?

*Incremental outputs & inputs -

- Incremental output is additional output produced by a project over and above what would be available and demanded in the without project situation.
- Incremental inputs are inputs that are supplied from an increase in production of the input over and above what would be produced and supplied in the without project situation.

Source: Guidelines for the Economic Analysis of Projects, ADB
10 Key Questions

7. Financial and fiscal sustainability
   - Has the FIRR for the project been calculated?
   - Have the financial returns to different project participants been calculated?
   - What is the level of charges for goods and services? Is the economic analysis related to the charge level?
   - What is the difference between the FIRR and EIRR, and what accounts for the difference?
   - Have the average incremental financial and economic costs been calculated?

7. Financial and fiscal sustainability (continued)
   - What is the level of cost recovery?
   - Is there any explicit or implicit subsidy to the project? What is the justification for the subsidy?
   - Has the fiscal impact on the capital and recurrent budget been calculated?
   - What will be the source of funds to meet net fiscal requirements: extra taxation, extra borrowing, or a reallocation of expenditure?

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10 Key Questions

8. Environmental sustainability
   ➔ Have the environmental effects of the project been identified: costs and benefits?
   ➔ How have they been quantified and valued?
   ➔ Are they expressed in the same numeraire as the basic economic analysis?
   ➔ Have they been integrated into the economic analysis: for choosing between project alternatives; for assessing economic viability?
   ➔ Have required mitigatory and monitoring expenditures been identified and included in economic costs?

9. Benefit monitoring and evaluation
   ➔ What are the key variables necessary to identify project impact during implementation & operation?
   ➔ Does this include key performance variables, physical or financial, for the implementing agency?
   ➔ Is a system in place to collect data on all the key variables?

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10 Key Questions

10. Distribution analysis

- Has a distribution analysis been undertaken for the project?
- Has the effect of different levels of charges for goods and services been assessed for operators, customers and government?
- Has the distribution of costs, especially on the poor, been identified?
- Has the distribution of benefits, especially to the poor, been identified?

10 Key Questions

10. Distribution analysis (continued)

- What proportion of net benefits will go to poor people?
- Is the distribution of costs and benefits analyzed by gender?
- Is there a substantial foreign involvement in investment and operation?
- Has the proportion of incomes and revenues going to foreign investors, lenders and workers been identified?
10 Key Questions

• Overall assessment
  ➤ Have the major conclusions of the economic analysis been clearly spelt out?
  ➤ Does the project incorporate the best alternative?
  ➤ Is the project economically viable?
  ➤ Are any policy changes necessary to complement project implementation?
  ➤ Are any capacity building measures necessary: to provide incentives or training to the executing agency and other participants?

10 Key Questions

• Sensitivity analysis
  ➤ What type of sensitivity analysis has been applied?
  ➤ Does it relate to underlying benefit and cost variables?
  ➤ Have the key variables been identified?
  ➤ Have switching values been calculated?
  ➤ What measures are proposed to monitor the key variables?

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10 Key Questions

- Risk analysis
  - Is there a quantitative risk analysis?
  - Have probabilities been attached to any of the key sensitivity variables?
  - Have institutional risks been assessed?
  - Are there sufficient incentives for government participants in the project?
  - What measures have been proposed for reducing project risks?

Figure 1. Estimating Gross Benefits

Gross Revenue = (b + c)
Consumer Surplus = (a + d)
Gross Benefits = (a + b + c + d)
Economic Analysis Usually Involves -

- Defining project objectives and economic rationale;
- Forecasting effective demand for project outputs;
- Choosing the least-cost design for meeting demand or the most cost-effective way of attaining the project objectives;
- Determining whether economic benefits exceed economic costs;

Economic Analysis Usually Involves (continued)

- Assessing whether the project's net benefits will be sustainable throughout the life of the project;
- Testing for risks associated with the project;
- Identifying the distributional effects of the project on each participating country;
- Enumerating the nonquantifiable effects of the project that may influence project design and the investment decision.

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Cross-Border Projects

- Typically involve two or more countries
- Economic analysis is extended to analyze impacts over the region adopting multi-country framework
- Usually cross border or subregional projects are intended to generate benefits for the participating countries that would not be available if they were to act independently by investing the same funds in national projects
- Such project may be a commercial project (NT2) where output is marketable or non-marketable outputs such as watershed protection or a road project.

Key Messages

- Financial analysis at current market prices is not adequate to judge the merit of projects and programs.
- Financial engineering cannot fix poor project economics or poor policies for infrastructure.
- Economic analysis of cross-border infrastructure is essential to ensure selection of the right type of projects.

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