

Economic and Financial Analyses of Transport Projects

An introduction



THE WORLD BANK

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Economic and Financial Analyses

- Two different set of questions:
 - Does the project deliver economic value for the society? Who are the beneficiaries?
 - Is the project financially viable?
- Defining the project vis-à-vis other options
- Policymaker decision
 - Can we improve the project?
 - Projects maybe financially profitable but economically not desirable or vice versa
- These analyses are part of most public investment management frameworks
 - It is recommended for any investment and policy analysis

		Economic Net Present value	
		Positive	Negative
Economic Net Present value	Positive	Accept Project	Reject project
	Negative	Accept the project without budget constraint or review the project fundamentals	

Why are these questions relevant?

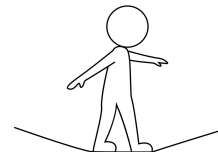
Economic analysis

- **Economic sustainability** (resource allocation): the benefits should compensate for the cost
- **Environmental sustainability** (another case of resource allocation): GHG emissions, waterways
- **Social sustainability** (economic agents): projects are likely to impact on different stakeholders by affecting their revenues in absolute and relative value – distributional effects

Financial analysis

- **Macro-fiscal level** (fiscal sustainability): Projects' budget impact should not undermine the client government's fiscal sustainability.
- **Sector, entity and project level** (financial sustainability): Project entities depending on cost recovery for sustainability should eventually be able to self-finance their activities.
- **Customer level** (affordability of users): project/entities resulting cost of service should be affordable for customers to ensure feasibility of the project

For some projects, the equilibrium between economic and financial drivers is more complex



Financial analysis vs. economic analysis

	Economic analysis	Financial analysis
Scope of analysis	Society	Entity or project
Data being analyzed	Financial and non-financial flow (externalities)	Financial flows
Cost definition	Opportunity cost	Financial cost
Return definition	Net economic benefit	Net financial benefit
Relevant discount rate	Social cost of capital	Project-specific cost of financing
Prices	Economic prices (exclude taxes, subsidies, interest)	Market (actual) prices

ECONOMIC ANALYSIS PROVIDES A BROADER ANALYSIS OF NET ECONOMIC BENEFITS, WHEREAS FINANCIAL ANALYSIS ONLY CONSIDERS FINANCIAL FLOWS AND DIRECT IMPACTS

Economic analysis

- Different approaches depending the objective
 - Policy impact analysis: general equilibrium and other (econometric) models
 - Investment projects: Cost-Benefit and Multicriteria analyses

Cost Benefit Analysis

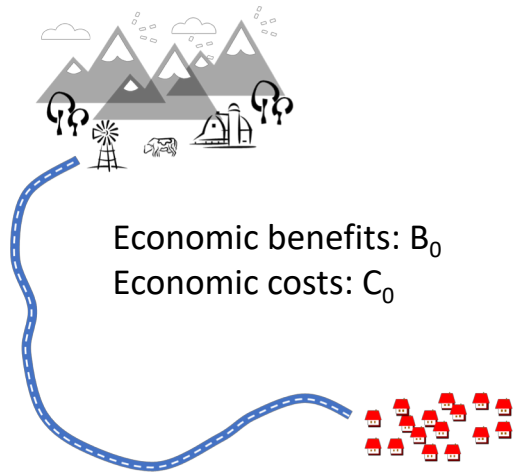
- A decision-making tool
- A stand-alone methodology or used to produce inputs for multi-criteria analysis
- At a project level
 - At concept stage: determine whether the project should be implemented or not
 - At feasibility stage: consider alternatives and select optimal design
 - Economic Net Present Value (ENPV) and ERR (Economic Rate of Return)
- At a program level
 - ENPV and ERR can be used as inputs to screen and prioritize among multiple projects

CBA for a road investment projects

Scenario 0 (baseline)

Do-nothing is not necessary do-nothing option

Other scenarios



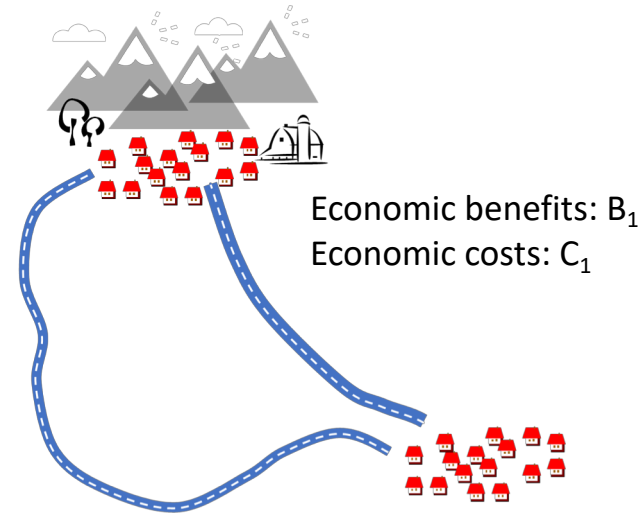
Economic Net Present Value

$$ENPV = \sum_{t=0}^T \frac{(B_t - C_t)}{(1 + i)^t}$$

$$ENPV \geq 0$$

Scenario 1

Construction of new road



Economic Rate of Return

$$0 = \sum_{t=0}^T \frac{(B_t - C_t)}{(1 + ERR)^t}$$

$$ERR \geq i \text{ (social discount rate)}$$

Variables and assumptions

- **Benefits:** value of the travel time savings, reduction in vehicle operating costs, GHG emission reduction, road safety improvements
- **Cost:** construction and maintenance cost, other environmental impacts (negative benefits)
- **Discount rate:** opportunity cost for the society
- **Uncertainty** can be factored in the analysis
- **Other usual assumptions:** competitive markets, no distortions
- **Limitations & incentives** (political economy)
- Capturing benefits and costs for urban transport projects is more **complex**. Modeling **CBA is sector/mode specific**
- **HDM4**

Multicriteria analysis

No.	Criteria	High Score (10 to 8)	Moderate Score (7 to 4)	Low Score (3 to 0)
1	Financial feasibility /Fiscal support	Likely viable: >20%, and No fiscal support	Likely Viable: >20%, and No fiscal support	Not viable <14%; and High fiscal support
2	Readiness and risk	Few major issues/risks and project ready	Identified risks can be largely mitigated and the project can be made ready	Many risks, few can be mitigated sufficiently and project not ready
3	Economic feasibility: socio-economic benefits	EIRR>15%; Major macro impact	EIRR 12%-15%; Moderate macro impact	EIRR<12%; Minor macro impact
4	Regional development / integration/contribution to GDP	Impact on low GDP provinces and/or high poverty alleviation potential	Impact on low-medium gross regional domestic product provinces and/or medium poverty alleviation potential	Impact on high gross regional domestic product provinces and/or low poverty alleviation potential
5	Sector network role importance in sector plan	Forms integral part of the sector plan	Included in the sector plan	Ad-hoc project but not in conflict with sector plan
6	National security/ national integration	Strengthens national security/integration	Medium impact	Low impact
7	Land acquisition	All/most land acquired (e.g. over 80%)	Some land acquired (25%-80%)	None or little land acquired (<25%)
8	a. Likely environmental impacts b. Involuntary resettlement	Few issues: a. Low impact; b. Few people affected	Some issues; a. Mid impact b. Mid affected	Many issues; a. Severe impact b. Many people affected
9	Impact on export earnings	Major overseas trade and/or tourism impact:	Limited overseas trade or tourism impact	Little overseas trade or tourism impact
10	Safety	High safety focus	Moderate safety focus	Low safety focus
11	Project Cost	> 100m US dollars	100m US dollars - 50m US dollars	< 50m US dollars
12	Demand Growth %/ Traffic Volume or the Demand/Capacity Ratio	a. >15% pa b. >20 thousand vpd c. >1.2	a. 15%-5% pa b. 10-20 thousand vpd c. 1.2-0.8	a. <5% pa b. <10 thousand vpd c. <0.8