Economics Training Series

Introductory Course

Distribution and Poverty Impact Analysis

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Why Distribution of Project Effects?

Equity Considerations

- Who benefits from the project by how much?
- Are distribution of effects consistent with project objectives?
- How do benefits reach target groups?

Incentive Considerations

- Who receives, by how much?
- Who pays, by how much?

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Examples of Distribution Analysis

- Understand effects of price changes on stakeholder groups, net benefits of service projects
- Assess effects of foreign resources such as BOT projects with foreign sponsors - net capital flows, host country and foreign investor benefits division
- Assess the distribution of economic and financial costs and benefits, and net benefits between poor groups and other stakeholders

➔ Poverty reduction addressed where components effectively reach poor groups

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Analytical Focus of Distribution and Poverty Impact Assessment

- Channels of effect: access to employment, markets, resources and assets, services, transfers
- Distribution effects: who receives, who pays
- Time dimensions and directness of effect: short to longer run and direct and indirect effects
- Design implications: mitigation and enhancement measures

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Start Distribution Analysis During Sector Work

- Assess without project access to employment, markets, resources and assets, services, transfers
- Assess differences in access by group (such as income) and geographic location
- Identify stakeholder groups that stand to gain or lose by investments
- Assess alternatives that are likely to be effective and sustainable in increasing access, benefit incidence

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During Feasibility and Appraisal

- Have the channels of effect been identified to see how costs will be incurred and benefits realized?
- How much are gains/losses from distributing project effects, do they provide an incentive for response?
- How much is the cost burden to those who will pay, is the burden acceptable?
- How do targeting/equity considerations affect the overall project performance and returns?
- Can the project and component design be modified and/or complementary measures be taken to enhance impact on target beneficiaries, minimize effect in efficiency?

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How Far Can We Take Distribution Analysis?

- Revenue generating projects with quantitative financial/economic analysis

  → quantitative distribution analysis and poverty impact ratio

- Non-revenue generating projects with quantitative benefit analysis

  → quantitative benefit incidence analysis

- Limited quantitative analysis

  → qualitative channel of effect analysis

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Stakeholder Groups Analysis

- Owners, operators of project enterprises
- Consumers, users of project outputs
- Goods and service suppliers to the project
- Hired workers, labor for the project
- The government
- Rest of the economy
- Lenders to the project

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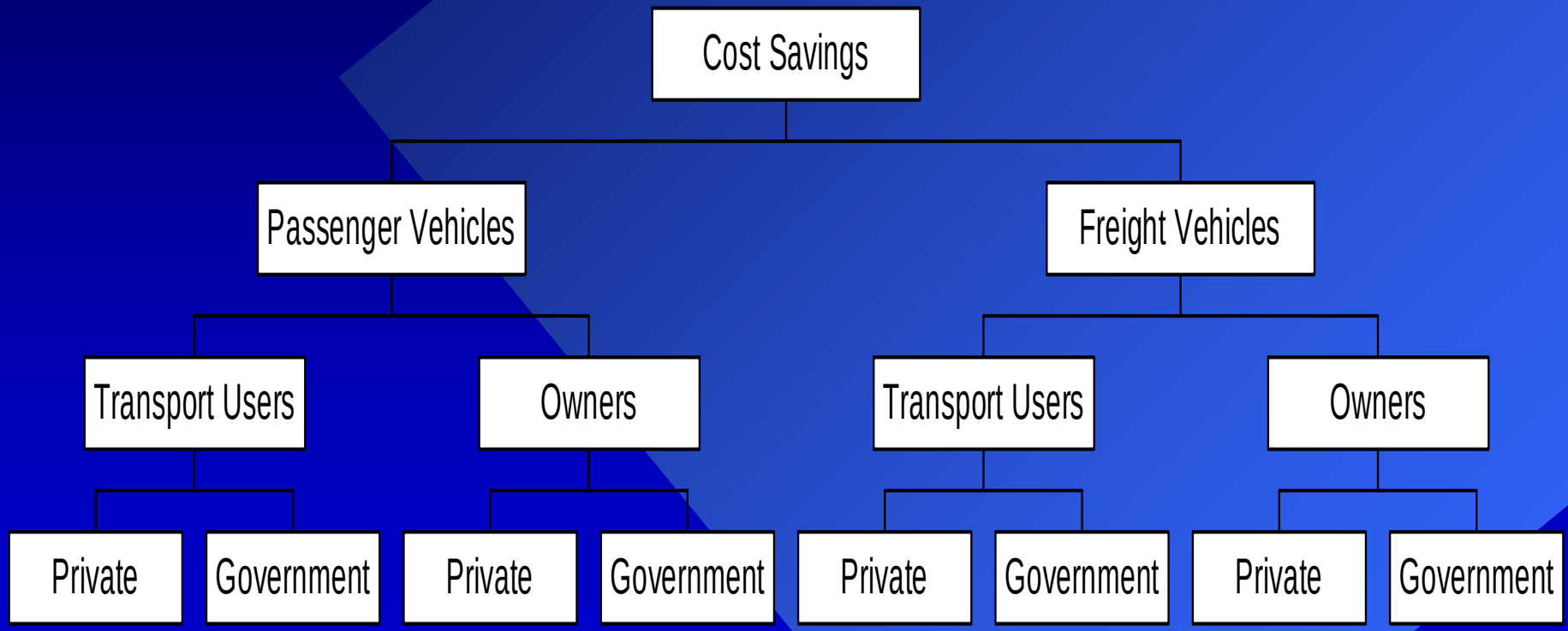
Distribution Tree: Example From Road Project



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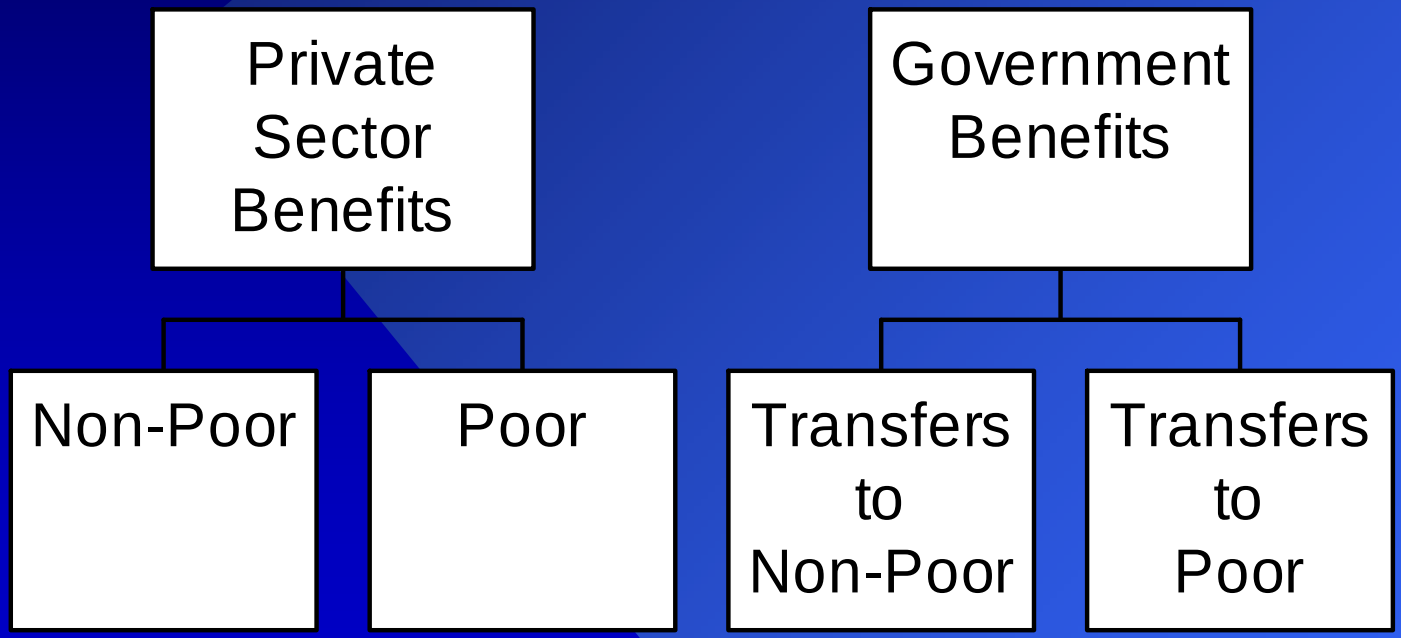
Poverty Impact Tree: Example From Road Project



Linking Distribution and Poverty Analysis to Cost Benefit Analysis

1. Estimate the economic costs and benefits relative to financial costs and benefits, i.e., EPV-FPV
2. Distribution Analysis: Distribute differences between financial and economic costs and benefits between project stakeholders
3. Poverty Impact Ratio: Estimate the proportion of the net economic benefits designed to go to the poor compared to total project net economic benefits

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Case Study: Water Supply Project - 1

- Project supplies piped water in a small town
- Three main stakeholders
  - Government/economy
  - Construction labor
  - Water consumers
- Consumers pay for water supplied
- Use domestic price numeraire
- Use discount rate of 12% for FPV and EPV

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Case Study: Water Supply Project - 2

Methodology:

1. **Identify project stakeholders**, for example, water consumers, labor, government, economy.
2. Calculate present value of financial costs and revenues by component
3. Calculate present value of economic costs and benefits by component

PV(EC) = PV financial costs -/+ NPV transfers

PV(EB) = PV consumer surplus + PV financial revenues +/- PV externalities

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Case Study: Water Supply Project - 3

Methodology cont.:

4. Calculate the **difference** between economic and financial present values
5. Differences between EPV and FPV show **project effects**
6. **Distribute project effects** between stakeholders using the identity:

   EPV = FPV + (EPV – FPV)

7. Identify **net project effects** using the identity:

   ENPV = FNPV + (ENPV – FNPV)

8. To get distribution of Economic Net Benefits, must **adjust for net financial effects** incurred by stakeholders

Case Study: Water Supply Project - 4

	1. Project Financial and Economic Effects			2. Distribution of Project Effects Among Stakeholders			
Project Costs and Benefits	FNPV	ENPV	ENPV-FNPV	Consumers	Labor	Government/ Economy	Total
Output Benefits	1000	1800	800	800			800
Capital Costs	-650	-600	50			50	50
Power Costs	-330	-250	80			80	80
Labor Costs	-80	-56	24		24		24
Project Effects	-60	894	**954**	800	24	130	**954**
Net Financial Effects	**-60**					-60	**-60**
Net Economic Effects		**894**		800	24	70	**894**

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Poverty Impact Ratio

- An extension of distribution analysis with stakeholders further defined by income or other poverty indicators
- Identify the proportion of poor in stakeholder groups
- Calculate the benefits to poor stakeholders
- Calculate the Poverty Impact Ratio:

$$PIR = ENPV_{poor} / ENPV_{total}$$

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Case Study: Water Supply Project - 5

	Consumers	Labor	Government/ Economy	Total
Proportion of Poor in Stakeholder Group	0.25	0.33	0.5	
Benefits to Poor Stakeholders	200	8	35	243
Poverty Impact Ratio (Benefits to Poor/Net Economic Effects)	243 / 894 = 0.27			

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Use Poverty Impact Ratio with Caution

- PIR is a ratio and can reach ∞ in limiting case of NPV = 0

  → how much NPV actually going to the poor (absolute poverty impact)

  → how much NPV going to the poor per project cost (efficiency of poverty impact)

- Highly sensitive to assumptions on proportion of poor
- If uncertain about proportion of poor, test effect on PIR through sensitivity analysis

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ADB Experience

1. Application is confined to energy and transport and communications sectors
2. Identification/categorization of stakeholder groups done routinely; relevant disaggregation that is location-specific could be made to make analyses more insightful to inform project design
3. Analyses not supported by systematic specification of assumptions and parameters
4. Only general statements on the estimated PIR with limited interpretation

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Thank you.

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