SESSION 2.2

FINANCIAL / ECONOMIC ANALYSIS AND SHADOW PRICING

Introductory Course on Economic Analysis of Investment Projects

Economics and Research Department (ERD)
## Differences between Economic & Financial Analyses

<table>
<thead>
<tr>
<th></th>
<th>Financial</th>
<th>Economic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perspective</td>
<td>Project entity or participants</td>
<td>Economy-wide, all members of society</td>
</tr>
<tr>
<td>Benefits and Costs</td>
<td>Financial flows – revenue minus costs</td>
<td>Welfare Changes – measured by costs savings, WTP, exports minus costs</td>
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</tbody>
</table>

- **Financial Flows**: Revenue minus costs.
- **Welfare Changes**: Measured by costs savings, WTP, exports minus costs.
Financial Analysis

- Undertaken from the individual’s/project agency's perspective
- Consider only benefits and costs faced by production/decision making units
- Benefits and costs are evaluated using existing market prices
- Measures the project’s profitability for its participants
- Narrow focus on direct benefit/cost of project participants
- Verifies sustainability of project
Financial vs Economic Analysis

Economic Analysis

- Undertaken from society’s perspectives
- Costs: Opportunity Cost/ Welfare Losses
- Benefits: Welfare Gains/ Resource savings
- Convert financial to economic benefits/costs
- Shadow Pricing: financial prices of costs and benefits must be *adjusted* to allow for effects of

  - government intervention (taxes, subsidies, controls, quotas, etc.)
  - opportunity costs of resource use
  - market distortions (trade taxes and controls, labor market distortions)
  - externalities (largely environmental)
Conversion Factors (CF)

- CF = EP/FP  (EP=economic price, FP= financial price)
  - Labor unskilled
  - Labor skilled
- Composite CFs  eg Construction based on breakdown
- Other commodities, remove transfers (taxes, subsidies), other distortions
- For imports, adjust for transport, distribution costs
Specific Conversion Factors

- Shadow wage rate factor (SWRF), CF for labor
- Unskilled labor typically 0 to 0.75 in labor surplus economies
- Implies output lost elsewhere is 0% to 75% of wage; opportunity cost of unskilled labor
- SWRF = opportunity cost/wage rate
- Skilled labor: SWRF = 1.0
**Protected Economy**

- With taxes, subsidies and controls on trade, domestic prices and world prices for trade goods will diverge.
- Typically $DP_{av} > WP_{av}$, where $DP$ and $WP$ are domestic and world prices and $av$ is average.
- Common price level for analysis (numeraire): border price or domestic price.
Shadow Exchange Rate Factor (SERF)

- SERF = RER/OER*(1 +t –s)
- OER is actual exchange rate, t is average rate of tax on trade and s is average rate of subsidy on trade
- RER is long-run real exchange rate for the economy
- RER=OER (P_f/P)
Standard Conversion Factor (SCF)

Typically derived from SERF formula

\[
SCF = \frac{1}{SERF}
\]

Also

\[
SCF = \frac{(M_{\text{cif}} + X_{\text{fob}})}{(M_{\text{cif}} + T^M - S^M + X_{\text{fob}} + T^x - S^x)}
\]

So, \(SERF = \frac{1}{SCF}\)
Pricing Project Costs and Benefits: Numeraire and Price Level

- **Domestic price numeraire** = all economic prices expressed at equivalent domestic market price level
  - Adjust all items valued at border prices (e.g., traded inputs and outputs) by a factor (*SERF*) to convert to the domestic price level

**OR**

- **Border (world) price numeraire** = all economic prices expressed at equivalent world market price level
  - Adjust all items valued at domestic prices (e.g., nontraded inputs and outputs, scarce labor) by a conversion factor (*SCF*) to convert to the world (border) price level
Equivalence of Approaches

- If SERF = 1.1, then on average domestic prices 10% above world prices and SCF = 1/1.1

- If NPV at DP = 100 then NPV at WP = 100/1.1 = 91

- If NPV at WP = 100 then NPV at DP = 110

- But EIRR (as a ratio) will be the same
## Application of Conversion Factors by Chosen Price Numeraire

<table>
<thead>
<tr>
<th>Item</th>
<th>Using Domestic Price Numeraire</th>
<th>Using World Price Numeraire</th>
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</thead>
<tbody>
<tr>
<td>Traded goods</td>
<td>Border price multiplied by SERF</td>
<td>Border price</td>
</tr>
<tr>
<td>Non-traded goods</td>
<td>Domestic price</td>
<td>Domestic price multiplied by SCF</td>
</tr>
<tr>
<td>Scarce labor</td>
<td>Calculated opportunity cost at domestic prices</td>
<td>Calculated opportunity cost at domestic prices, multiplied by SCF</td>
</tr>
<tr>
<td>Surplus labor</td>
<td>Calculated opportunity cost at domestic prices</td>
<td>Calculated opportunity cost at domestic prices, multiplied by SCF</td>
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Thank you