SESSION 2.4

CONVERSION TO ECONOMIC PRICES

Introductory Course on Economic Analysis of Investment Projects

Economics and Research Department (ERD)

Conversion Factors (CF)

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

Usual Conversion Factors Used

- Standard conversion factor (SCF)
- Shadow exchange rate factor (SERF)
- 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 DPav > WPav, where DP and WP are domestic and world prices and av is average

- Common price level for analysis (numeraire): border price or domestic price

Standard Conversion Factor

- Ratio or economic price value of all goods in the economy at their border price equivalent values to their domestic market price value

- Generally is less than one.

- If using world price numeraire, apply to all project items valued at their domestic market price values to convert these to border price equivalent; items already valued at border price equivalent value are not adjusted.

- is the inverse of SERF

- $SCF = (M^{cif} + X^{fob})/(M^{cif} + T^M - S^M + X^{fob} - T^x + S^x)$

   So, $SERF = 1/SCF$

Shadow Exchange Rate Factor (SERF)

• Ratio of economic price of foreign currency to its market price.

• Is generally greater than one

• For economic analysis using the domestic price numeraire, SERF is applied to all outputs and inputs, including labor and land, that have been valued at border price equivalent values; project outputs and inputs measured at domestic price values are left unadjusted.

• SERF is the inverse of the SCF

• 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)

Shadow Wage Rates

- For workers in short supply (usually skilled) use market wage
    - Assume skilled labor is mobile and hence economy-wide average is appropriate
- For unskilled labor, need to determine a shadow price
    - Opportunity cost in best alternative
    - If otherwise employed in activities for which market distortions then must allow for this
    - is project specific and depends on source of labor

Using Conversion Factors

- Economic calculations on projects can use different currencies at different price levels
  - Choice of currency and price level specifies the numeraire or unit in which project effects are measures
  - If world price numeraire is used, then project effects are expressed in local currency and valued at world price level
  - Using domestic price numeraire will give identical investment decisions

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 are 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

Item	Using Domestic Price Numeraire	Using World Price Numeraire
Traded goods	Border price multiplied by SERF	Border price
Non-traded goods	Domestic price	Domestic price multiplied by SCF
Scarce labor	Calculated opportunity cost at domestic prices	Calculated opportunity cost at domestic prices, multiplied by SCF
Surplus labor	Calculated opportunity cost at domestic prices	Calculated opportunity cost at domestic prices, multiplied by SCF

Example of Using Conversion Factors

1. Assume a water supply project:

Financial benefits	
Local	900
Financial costs	
Foreign	400
Local	300
Net Benefits	200

2. However, not all local costs are non-traded but are broken down as follows:

Labor	50
Traded	100
Non-traded	130
Taxes	20

3. Now we can express the project as

Benefits	
Non-traded	900
Costs	
Traded	400
Non-traded	130
Labor	50
Taxes	20
Net Benefit	200

Assumptions:
- SWRF= 0.70
- Specific CF for non-traded = 0.60

Example of Using Conversion Factors

Conversion from financial prices to economic values:

	Financial Prices	CF	Economic Prices
Benefits			
Non-traded	900	1.0	900.0
Costs			
Traded	500	1.1	550.0
Non-traded	130	0.60	78.0
Labor	50	0.70	35.0
Taxes	20	0	0
Net Benefit			237

Thank you.