Why use a Social Accounting Matrix (SAM)?

- A SAM analysis supplements the input-output analysis by focusing on the income-generating mechanism for each institutional sector (i.e., households, private firms, government).

- A SAM provides information on:
  - Intersectoral linkages
  - Interregional flows within an economy
  - Income distribution by socioeconomic groups
  - The relationship of a regional economy to other local economies and to the rest of the world
What is a SAM?

- A comprehensive, disaggregated, consistent, and complete data set that describes transactions among producers, factors of production, and institutions.

- An extension of the input-output table, or just a different view
What is a SAM? (Cont’d)

Basic Characteristics of a SAM

- Double entry bookkeeping principle (law of conservation of energy in physics)
  - Sum of a row (receipts) = Sum of a column (expenditure)

- Entries in rows sum to same as those in columns.
  - In the input-output table, this is true only for rows and columns for the interindustry transactions.
## Structure of a SAM

<table>
<thead>
<tr>
<th>Expenditures</th>
<th>Endogenous</th>
<th>Exogenous</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Production Activities</strong></td>
<td>T11</td>
<td>0</td>
</tr>
<tr>
<td><strong>Factors of Production</strong></td>
<td>T21</td>
<td>0</td>
</tr>
<tr>
<td><strong>Households</strong></td>
<td>0</td>
<td>T32</td>
</tr>
<tr>
<td><strong>Firms</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Gov’t</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Capital Account</strong></td>
<td>L1</td>
<td>L2</td>
</tr>
<tr>
<td><strong>Rest of the Nation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Rest of the World</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>Y1</td>
<td>Y2</td>
</tr>
</tbody>
</table>
Social Accounting Analyses

- Multiplier analysis
  - Unconstrained multiplier
  - Constrained (mixed) multiplier

- Structural path analysis

- Computable general equilibrium (CGE) model
Social Accounting Analyses: Unconstrained Multiplier

- Assumption of excess capacity and unused resources: Demand creates supply.

- Accounting multiplier matrix ($M_a$)
  - Unitary expenditure elasticity

$$y_n = (I - A_n)^{-1} f = M_a f \iff dy_n = (I - A_n)^{-1} df = M_a df$$

$$A_n = \begin{bmatrix} A_{11} & 0 & A_{13} \\ A_{21} & 0 & 0 \\ 0 & A_{32} & A_{33} \end{bmatrix}$$

($A_{11}$: I-O coefficient matrix)
Social Accounting Analyses: Constrained (Mixed) Multiplier

- Allows upper ceilings in sectoral capacity.
  - In some sectors (e.g., agriculture), assumption of excess capacity and unused resources is unrealistic.
  - Prices are still fixed, however.

- Strategy of Mixed SAM multipliers
  - When excess capacity is available in a constrained sector, we can use a fixed price multiplier \( M_c \).
  - If the capacity is used up, however, a mixed multiplier \( M_m \) can be used for the remaining demand, instead of \( M_c \).
  - Thus, the final multiplier matrix would be \( M_c + M_m \).
Social Accounting Analyses: Structural Path Analysis

- Examines different ways an exogenous change affects a target group.
- Three types of influences:

  - Direct influence: $c_{xi} c_{yx} c_{jy}$
  - Total influence: $c_{xi} c_{yx} c_{zy} \left[1 - c_{yx}(c_{xy} + c_{zy}c_{xz})\right]^{-1}$
  - Global influence: Sum of relevant total influences
Social Accounting Analyses: Computable General Equilibrium (CGE) Model

- A CGE model takes information from a base-year SAM for its initial conditions.

- But it includes a number of behavioral and structural relationships to describe the behavior of the various actors over time: e.g., utility maximization for households, profit maximization for firms.

- In a CGE model, most prices are endogenously determined.

- CGE framework is suitable for long time-series analyses.
Synthesis and Conclusion

- A SAM complements missing dimensions of the input-output framework.
  - Socio-economic analyses are feasible with a SAM.
  - Entries for a SAM can be simplified and specified by research purpose.

- However, a SAM needs considerable time and thought for its construction.
  - Data for SAM come from various sources.
  - Supplementary surveys are often necessary.
Synthesis and Conclusion

- Some SAM-based approaches still have the same weaknesses that the input-output model has.
  - E.g., SAM multipliers and structural analysis
  - Demand-oriented; fixed prices; constant returns to scale; fixed input coefficients; no joint production of goods among sectors
  - Not suitable for long-term simulation

- CGE model, which also uses a SAM as major data sources, can resolve some of those problems.
  - Prices and input coefficients are endogenously determined.
  - More realistic predictions for the future
  - But this model also needs various assumptions.