Potential Applications of Social Accounting Matrices for Green Growth Policy Analysis and Monitoring

Workshop
Emeralda Ninh Binh Resort, Ninh Binh Province, Vietnam
22-23 July 2013
Outline

- What are Social Accounting Matrices?
- Why construct SAMs?
  - A powerful way of looking at the economy
  - Data tool
  - Basis for Models
- Energy & Carbon Data
What are Social Accounting Matrices?

- Way of presenting economic data
- A consistent and exhaustive representation of economic flows in an economy over a given period
- Divide economy into an exhaustive set of accounts representing all the economic actors in the economy
- Create a matrix or spreadsheet in which we record for each and every account
  - Payments made in the columns
  - Incomes received in the rows
SAM Accounts and Structure

The set of accounts and level of detail vary widely depending on purpose and data.

But conventional to have some general types of accounts:
- Activities
- Commodities
- Factors
- Institutions
  - Households
  - Government
  - Rest of the World
- Accumulation
## A BASIC SOCIAL ACCOUNTING MATRIX FRAMEWORK

<table>
<thead>
<tr>
<th>INCOMES RECEIVED BY</th>
<th>PAYMENTS MADE BY</th>
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IN PRACTICE MORE DETAIL

- Can disaggregate accounts any way we want
  - What are we investigating?
  - What data are available?
- Factors
  - Different labour (skills, education, occupations, gender)
  - Land
  - Different types of capital (informal/formal; private/state-owned)
- Enterprises
- Households – by income group, location, education
- Government
  - Show different types of taxes
- Rest of the World
  - Trading partners
Why construct SAMs?

- A powerful way of looking at the economy
- Data tool
- Basis for Models
SAMs as a view of the economy

- Shows the whole economy
- Integrated picture of production, income distribution, macroeconomics
- Shows the interactions between different parts of the economy that are often treated in isolation
- Important to interrogate any SAM
  - What does it say about the economy?
  - Does that seem right?
- Must look at a SAM for Vietnam
  - Interpret numbers
SAMs as a data tool

- Data come from multiple sources
  - Production surveys
  - Labour Force Surveys
  - Household Income and Expenditure Surveys
  - National Accounts
  - Balance of Payments, trade data, government statistics
  - Micro data
- Sources are generally inconsistent
- Emphasizes gaps in knowledge and data
- Adding up property allows one to see and try to correct inconsistencies
  - Search for better data
SAM Building Toolkit: Background

- Work in progress initiated by James Thurlow at UNU-WIDER
- Flexible but systematic framework to guide building and updating SAMs using published data
- Being adapted and improved through applications in various countries
- Vietnam CIEM DANIDA
- Elsewhere – South Africa, Zambia, Zimbabwe, Botswana
SAM Building Toolkit: Components

1. Assemble data from all available sources
2. Fit data “as-is” into SAM framework
   ➔ **Unbalanced initial SAM**
   - Highlights inconsistencies in original data
3. Investigate why these arise and look for better data where possible
   ➔ **Initial SAM with persistent inconsistencies**
4. Use statistical process to balance, subject to constraints
   ➔ **Final balanced SAM**
5. Make it public and subject it to expert interrogation
   - Importance of SAM as a descriptive model
SAMs as the basis for models

- Consistency requires for each account
  - total payments made = total incomes received
- Therefore if one number changes, others must change
- Models are rules for how the numbers change
- Based on our understanding of how different decision makers adjust
  - To policy interventions
  - To shocks from outside
SAMs as the basis for models

- For example, when exports rise:
  - How does production change?
  - How does that affect incomes?
  - How does that affect household saving and spending?
  - How does that affect government revenue and spending?

- ‘Sectoral models’ derive behavioural rules for the different actors in isolation

- SAM-based models show how they interact with each other to produce economy-wide effects
SAMs as the basis for models

- Varieties of SAM-based models
- Multiplier models
  - Simple behavioural rules – everything is in fixed proportions
- CGE models
  - Permit substitution and changing proportions
# SAM Models: Endogenous and Exogenous

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What is the economy-wide impact of a rise in demand for a product?

Producers produce more

Therefore demand raw materials and other inputs

- direct impact

But producers of those inputs need to produce more

- Therefore they demand more inputs

- But producers of those inputs need to produce more

  - Therefore they demand more inputs
  
  - But producers of those inputs need to produce more
    
    - Therefore they demand more inputs
  

- indirect impacts

Multiplier = sum of direct and indirect effects, per unit of initial rise in demand
SAM Multipliers

- Multiplier = sum of direct and indirect effects per unit of initial rise in demand
- Multipliers can show impact on
  - Gross output of each sector
  - Total supply of each commodity (domestic and imported)
  - Gross output of the economy
- Can also be used to calculate direct and indirect impacts on variables related to gross output
  - Employment
  - Value added
  - Energy use
  - Green house gas emissions
Energy and GHG content of products

- Production of a commodity uses energy directly as an input.
- But also uses energy indirectly by using inputs that were produced using energy.
- When assessing which products use energy most we need to include direct and indirect use.
- Use multipliers.
- Same principle and method applies to emissions of CO2 and other greenhouse gases.
Computable General Equilibrium Models

- Provide richer rules for rebalancing SAM after a shock
- Price flexibility
- Substitution in production and consumption
- More macroeconomic options
- Can be dynamic – over period of time
- Richness comes at a cost - more complex
Conclusions

- Economy-wide thinking very important for many policy questions including those related to green economy
- SAMs provide data for such thinking
- Constructing SAMs also helps improve data by revealing gaps and inconsistencies
- Models built on SAMs give insights into many policy issues
- But models are tools to help us think about issues, not substitutes for thinking
- Use them, but use them wisely