Standard CGE Model

Short Course on CGE Modeling, United Nations ESCAP

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- We have now learned enough about the basic building blocks of computable general equilibrium models to be a position to build a 'standard' CGE model.
- In this session we will pull all of the pieces together, considering how to construct a typical competitive model for a single, open economy.

Demand

- A typical model features four distinct sources of final demand. There is a single representative household. The household optimization problem generates household demand.
- Government and investment are also sources of final demand, both in fixed quantities.
- The rest of world (the external sector) is a source of demand for exports. Foreign demand is modeled using the constant elasticity of demand function approach.

Supply

- Industries operate under competitive conditions.
- Firms use primary factors in variable proportions (modeled via CES), combined with intermediate goods used in fixed proportions.
- Each industry produces a good aimed at foreign markets and a good aimed at the domestic market. The transformation function takes the CET form.

- International trade is modeled via the Armington assumption.
- A single Armington composite for household, intermediate, government and investment demands. The Armington aggregator function is of the CES form.
- The economy is assumed to be small with respect to import markets.

- Typical policy distortions include tariffs and other trade taxes/subsidies, production taxes, consumption taxes and factor taxes.

- Other policy distortions are incorporated as necessary to study the policy questions at hand.

Closure

- In most models of developed economies the factor market closure is neoclassical.
- All factors of production are available in fixed supply, and are fully employed.
- Mobility will depend on time horizon under study and the characteristics of factor use.
- On the macroeconomic side, a Johansen-style savings-investment closure is typical. Investment at the commodity level is fixed, as are government purchases. Government revenues are determined endogenously, with all tax rates exogenous. Government saving is endogenous, financed by (implicit) transfers from the household. Household savings vary to match the value of total investment.
- The current account balance is generally fixed, and the foreign exchange rate is the numéraire.

Further Reading

- An excellent overview of the basic CGE model structure is Devaragan *et al.* (1990).
- Other useful readings on constructing a CGE model include the classic work of Shoven and Whalley (1992), and Gunning and Keyzer (1995).
- For a detailed exposition of welfare measures in CGE models see Francois and Martin (2010).
- GAMS modeling issues are discussed in more detail Gilbert and Tower (2013), chapter 27, and in Hosoe *et al.* (2010) and Burfisher (2011).