Getting Ready: Structure of the UNI-CGE Model

Organization of Model Code into Sections

A CGE model is a system of equations. The model's code can become lengthy because it not only defines the equations but also must include information on items that support the equations. For example, model commands are needed to select a country database, calibrate equation parameters, prepare model results, and more.

Because even simple models can become large, they are typically organized in logical sections. Each section has a different function. For example, different sections address the definitions of variables and parameters, equations for consumer demand and producer supply, model calibration, equilibrium constraints, and report-writing.

Folded Sections of Model Code

To facilitate viewing a model's structure, its sections of code can be "folded" up, similar to closing an accordion. Folding provides a summary view of the structure of the model, which aids modelers in understanding the role of each section.

Table 1 describes the structure of the UNI-CGE model by listing its folded sections and their functions.

STRUCTURE OF THE UNI-CGE MODEL	
INTRODUCTION	
1. SETS	Defines the sets in the UNI-CGE model
2. INPUT AND SAM DATA	Defines the country data file that will be used in the UNI-CGE model
3. MODEL PARAMETERS	Defines all parameters
4. MODEL VARIABLES	Defines all variables
5. MODEL EQUATIONS	Presents all equations in the model, divided into sections
a. DEMAND	Consumption choices by households, government, and investors
b. PRODUCTION	Output, demand for intermediate and factor inputs
c. TRADE	Export supply and import demand
d. EQUILIBRIUM CONSTRAINTS	Market clearing conditions that ensure supply and demand are in equilibrium in all markets – commodities, factors, and trade with the Rest of the World
e. PRICE INDICES	Model numeraire options – CPI, DPI

5. PARAMETER ESTIMATION AND CALIBRATION	Calibration process calculates the coefficients used in demand and supply equations. The code is in an include file, 1Calibaration-UNI.inc
6. VARIABLE INITIALIZATION	Variables are initialized at their base values in the SAM, to make it easier for the model to solve.
7. MODEL CLOSURES	Modeler selects appropriate closures for investment-savings, government fiscal balance, the trade balance, and factor markets.
8. MODEL SOLUTION	Run the model using the PATH solver in GAMS. Output is baseline equilibrium.
9. REPORT BASE MODEL	The base data is generated and reported in GDX files.
EXPERIMENTS	Experiments are defined. Model is re-solved. Output is equilibrium following the shock.

Folding and Unfolding Sections of Code

You can fold and unfold all sections of the model at once using these commands:

ALT + O folds the entire model into its sections

ALT + Shift + O unfolds the entire model

You can also choose to unfold or fold only one section. Click on the arrow next to any "$onfold" statement and only that section will unfold. Click on the $onfold arrow again to fold it up.

Figure 1. Click on $onFold to open a single section of model code

An Exercise: The UNI-CGE Model will be unfolded when you download it from the course website. Try to fold and unfold it and compare its folded structure with the sections described in Table 1.