A Basic Course in Economic Simulation Modeling using GAMS

Preface etc.

Chapter 1: Introduction to GAMS for economic problems
(Jesper Jensen's Welcome to GAMS)

Chapter 2: Examples of economic equilibrium problems translated into GAMS

2.1 Simple supply-demand problem illustrating complementarity
Model M2-1

2.2 Maximization of utility subject to a linear budget constraint
Formulated as a NLP problem:
Formulated as an MCP using first-order conditions:
Formulated as an MCP using Marshallian and Hicksian demand functions:
Model M2-2

2.3 Extension of the utility optimization problem: add a rationing constraint
Formulated as a NLP problem and an MCP.
Formulated as an MPEC
Automating scenario generation
Model M2-3

2.4 Brief introduction to sets: Model M2-3 in set notation
Model M2-4

2.5 Toward general equilibrium: a simple one-good, one-factor, one consumer example
Model M2-5

Chapter 3: The Basic Closed-Economy General-Equilibrium Model as an MCP

3.1 The structure of a general-equilibrium model: optimization at the sector and household level

3.2 Micro-consistent data: product exhaustion and market clearing

3.3 Calibration and replication: background: production, cost and expenditure functions, Shepard's lemma for the Cobb-Douglas function

Chapter 6: General Equililbrium with Distortionary Taxes, Public Goods, Externalities, Optimal Taxation and Redistribution Policies

6.1 Taxes in the benchmark data
Model M6-1

6.2 Labor supply taxation: introducing equal-yield tax reform
Model M6-2a
Model M6-2b introduces equal yield constraint

6.3 Public consumption goods
Model M6-3

6.4 Optimal provision using a Samuelson rule
Model M6-4

6.5 Public intermediate (infrastructure) good with optimal provision
Model M6-5

6.6 Pollution from production affects utility
Model M6-6a
Model M6-6b uses MPEC to solve for the optimal pollution tax
Model M6-6c uses constraint equation to solve for the optimal pollution tax

6.7 Optimal taxation and redistribution
Model M6-7 adapts M3-7 to an MPEC maximizing social welfare

Chapter 7: Adding Scale Economies and Imperfect Competition to General Equilibrium

7.1 A brief introduction to the CES function - more later

7.2 Monopoly, with fixed costs (increasing returns)
Model M7-2

7.3 Oligopoly: Cournot competition with identical products and free entry
Model M7-3

7.4 Monopolistic-competition I: large group
Model M7-4

7.5 Monopolistic-competition II: small group
Model M7-5