

University of Colorado, Boulder  
Economics 8858  
Simulation Techniques for Applied Microeconomics  
Fall 2013, MW 13:30-14:45

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solving square systems of equations and inequalities. But the user's guide will give you the syntax and notation as I indicated.

After you have gone through the two "Introduction.." files, you can start on the models themselves, which are found by clicking on the bullet "GAMS examples 2012". The model



- 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
- 3.4 Two goods, two factors, one representative consumer
  - Model M3-4a
  - Model M3-4b adds taxes
- 3.5 Initially slack activities
  - Model M3-5
- 3.6 Labor-leisure decision
  - Model M3-6
- 3.7 Two households with different preferences and endowments
  - Model M3-7
  
- Chapter 4: Examples of Familiar Industrial-Organization Problems Modeled in GAMS
  - 4.1 Cournot and Bertrand oligopoly with continuous strategies
    - Application to strategic trade policy
    - Model M4-1
  - 4.2 Nash equilibria with discrete strategies
    - Model M4-2
  - 4.3 An insurance problem illustrating moral hazard and adverse selection
    - Model M4-3a modeled as an NLP
    - Model M4-3b modeled as an MCP
  
- Chapter 5: Examples of Uses of the NLP Solver in Familiar Economics and Statistics Uses
  - 5.1 OLS as an NLP problem
    - Model M5-1
  - 5.2 OLS one step up: constrained non-linear least squares with the NLP solver
    - Model M5-2
  - 5.5 Reading and Writing to/from Excel
    - Model M5-3
  - 5.3 Balancing a matrix to create micro-consistent data using NLP
    - Model M5-4

- 5.4 Matrix inversion as an MCP  
Model M5-5
- 5.6 Structural estimation and general-equilibrium counterfactuals using MPEC  
Model M5-6
- Chapter 6: General Equilibrium 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
  
- Chapter 8: Open Economy Models for Competitive Economies
  - 8.1 Small open economy  
Model M8-1
  - 8.2 Small open economy: tariffs versus trade costs  
Model M8-2
  - 8.3 Small open economy: calibrating to tariffs in the benchmark  
Model M8-3
  - 8.4 Small open economy: modeling a quota  
Model M8-4a modeled with an endogenous (variable) tax equivalent  
Model M8-4b modeled as supply/demand for licenses
  - 8.5 Large economy and the optimal tariff (rest of world not explicitly modeled)  
Model M8-5
  - 8.6 Two-country Heckscher-Ohlin model: Nash tariffs as an iterative MPEC  
Model M8-6a scalar version  
Model M8-6b same model in set notation
  
- Chapter 9: Open Economy Models for Imperfect Competition and Scale Economies
  - 9.1 A two-country oligopoly model  
Model M9-1
  - 9.2 A two-country monopolistic-competition model  
Model M9-2
  - 9.3 Monopolistic-competition with horizontal multinationals  
Model M9-3
  
- Chapter 10: Toward CGE Modeling;
  - 10.1 CES functions and the calibrated-share form

10.2 The MPS/GE subsystem of GAMS

10.3 The Armington assumption

10.4 From an IO Table into GAM

Chapter 11: Basics of Dynamic Modeling:

11.1 Comparative steady-state analysis  
Model M10-1

11.2 Converting an Infinite Horizon Problem to an MCP  
Model M10-2 (currently only available in an MPS/GE format)

### **Special Accommodations Policy**

If you have specific physical, psychiatric, or learning disabilities and require accommodations, let me know early in the semester so that your needs may be appropriately met. You will need to provide documentation of your disability to the Disability Services Office in Willard 322 (telephone 303-492-8671)