

BOSTON COLLEGE
Department of Economics

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EC741 - Microeconomic Theory
General Equilibrium Module
Syllabus

Lecture 1: Introduction

- what is general equilibrium theory?
- partial vs general equilibrium analysis
 - pitfalls of partial equilibrium analysis
 - optimal commodity tax problem
- computable general equilibrium models
- informal introduction to the 2-individual, 2-good exchange economy (Chs. 10. A, B and 15. A, B MWG)

Lecture 2: Informal introduction to the 2-individual, 2-good exchange economy (Ch. 3. A-D MWG)

- local non-satiation, strong monotonicity, convexity, strict convexity
- offer curves, Edgeworth exchange box
- excess demand
- Walras' Law, Walrasian equilibrium (Varian, Ch. 17. 1-4)
- numerical example

Lecture 3:

- informal introduction to some more advanced topics
 - boundary equilibria
 - existence
 - preferences that are not strictly convex and discontinuity in demand function
 - uniqueness of equilibrium
 - stability of equilibrium
 - tâtonnement and non- tâtonnement processes
- introduction to efficiency properties of Walrasian equilibrium and welfare theorems
 - weak Pareto efficiency (Varian, p.323-4)
 - strong Pareto efficiency (Varian, p. 323-4)
 - continuity of preferences
 - Pareto set (possibly including boundary)
 - utility-possibility frontier.
 - First and Second Fundamental Theorems of Welfare Economics
 - interpretation of Theorems
- dated, locationally-indexed, and state-contingent commodities
- completeness of markets

Lecture 4:

- 1) Proof of existence of equilibrium
 - some mathematical preliminaries
 - consumption sets (p.18, MWG)
 - continuous functions and compact sets (pps. 943-5, MWG)
 - Prop. 17. B.2' (pps. 581-2, MWG) on relationship between properties of consumer preferences and properties of aggregate excess demand functions
 - Prop. 17. C.2' (MWG), Varian 17.5
 - Simple proof of existence
 - line of proof
 - Brouwer's Fixed Point Theorem (MWG, p. 952)
 - unit simplex
- 2) Sonnenschein-Mantel-Debreu Theorem (Ch. 17. E, MWG)
 - WARP (Weak Axiom of Revealed Preference)
 - properties of aggregate excess demand functions
 - Prop. 17. E.3 (statement only)

Lecture 5:

- 1) Uniqueness of equilibrium in exchange economies (Varian, pps. 394-396; MGW pps. 611-4)
 - general equilibrium definition of gross substitutability
 - Prop. 17. F.3: Gross substitutability \Rightarrow uniqueness in exchange economy
- 2) Tâtonnement stability (Varian, Ch. 21.4; MWG, pps. 620-5)
- 3) Large economies and nonconvexities (Varian, 21. 2; MWG, 17.I)

Lecture 6:

- informal introduction to general equilibrium with production (MWG, pps. 525-35)
 - one-producer, one-consumer economy (also Varian 18. 8)
 - production sets, convexity of production sets
 - first and second welfare theorems
 - Walrasian equilibrium
 - ownership shares
 - 2x2 production model
 - Shepard's Lemma, unit cost functions, CRS
 - factor-intensity in production
 - Pareto set
- (- classic g.e. trade theory, pps. 535-8, not covered)

Lecture 7:

- the 2x2 model: examples and illustrative applications: "Putting the pieces together"
 - derivation of production-possibility frontier
 - efficiency conditions
 - derivation of Walrasian equilibrium with CRS in production, algebraic and geometric treatments
 - construction of computational g.e. models

- numerical solution of computational g.e. model
- tax incidence analysis with a tax on an output
- tax incidence analysis with a tax on a sector-specific input
- (effects of minimum wage, not covered)

Lecture 8:

- I) General equilibrium theory with production: some definitions and mathematical preliminaries (MWG Ch. 10. B, 16. B, 17. B; Varian, Ch. 18.1-4)
 - production vector, production set
 - economic and feasible allocations
 - Pareto optimality
 - Walrasian equilibrium
 - Walras' Law
- II) Proof of First Welfare Theorem with production (MWG, Ch. 16. C)
 - price equilibrium with transfers

Lecture 9:

- proof of Second Welfare Theorem with production (MWG, Ch. 16. D)
 - price quasi-equilibrium with transfers

Lecture 10:

- scope of application
 - location in g.e. theory
 - time in g.e. theory (Varian, Ch. 19. 4)
 - dated commodities
 - own rate of interest
 - OG models
 - uncertainty in g.e. theory
 - state-contingent commodities (Varian, Ch. 19. 4)
- restrictiveness of assumption of market completeness
- examples of market incompleteness
 - externalities
 - public goods
 - asymmetric information
 - adverse selection
 - moral hazard
- absence of commodity markets
 - transaction costs
 - new products
- absence of security markets
- absence of insurance markets
- the Arrow-Debreu model in perspective