

	Preface xix				
PART ONE	Introduction 1				
	CHAPTER 1 Economic Models 3				
	CHAPTER 2 Mathematics for Microeconomics 21				
PART TWO	Choice and Demand 83				
	CHAPTER 3 Preferences and Utility 85				
	CHAPTER 4 Utility Maximization and Choice 109				
	CHAPTER 5 Income and Substitution Effects 133				
	CHAPTER 6 Demand Relationships among Goods 169				
PART					
THREE	Uncertainty and Strategy 187				
	CHAPTER 7 Uncertainty 189				
	CHAPTER 8 Game Theory 225				
PART FOUR	Production and Supply 271				
	CHAPTER 9 Production Functions 273				
	CHAPTER 10 Cost Functions 299				
	CHAPTER 11 Profit Maximization 333				
PART					
FIVE Competitive Markets 363					
	CHAPTER 12 The Partial Equilibrium Competitive Model 365				
	CHAPTER 13 General Equilibrium and Welfare 409				
PART					
SIX	Market Power 447				
	CHAPTER 14 Monopoly 449				
	CHAPTER 15 Imperfect Competition 477				
PART SEVEN	Pricing in Input Markets 519				
	CHAPTER 16 Labor Markets 521				
	CHAPTER 17 Capital and Time 547				
PART EIGHT	Market Failure 577				
	CHAPTER 18 Asymmetric Information 579				
	CHAPTER 19 Externalities and Public Goods 619				
	Extensions 649 Brief Answers to Queries 697 Solutions to Odd-Numbered Problems 707 Glossary of Frequently Used Terms 719 Index 729				
er	diaitalisiert d				

Contents

Preface	. xix
Introduction	
CHAPTER 1 Economic Models	3
Theoretical Models 3	
Verification of Economic Models 4	
General Features of Economic Models 5	
Development of the Economic Theory of Value 9	
Modern Developments 17	
Summary 18	
Suggestions for Further Reading 19	
CHAPTER 2	
Mathematics for Microeconomics	21
Maximization of a Function of One Variable 21	
Functions of Several Variables 26	
Maximization of Functions of Several Variables 33	
The Envelope Theorem 35	
Constrained Maximization 39	
Envelope Theorem in Constrained Maximization Problems 45	
Inequality Constraints 46	
Second-Order Conditions and Curvature 48	
Homogeneous Functions 55	
Integration 58	
Dynamic Optimization 63	
Mathematical Statistics 67	
Summary 76	
Problems 77	
Suggestions for Further Reading 82	

PART TWO

PART ONE

Choice and Demand

CHAPTER 3

Trades and Substitution 88 The Mathematics of Indifference Curves 95 98 Utility Functions for Specific Preferences The Many-Good Case 102 Summary 102 Problems 103 Suggestions for Further Reading 106 CHAPTER 4 An Initial Survey 110 The Two-Good Case: A Graphical Analysis 111 The n-Good Case 114 Indirect Utility Function 120 The Lump Sum Principle 121 Expenditure Minimization 123 Properties of Expenditure Functions 126 Summary 128 Problems 128 Suggestions for Further Reading 132 CHAPTER 5 Demand Functions 133 Changes in Income 135 Changes in a Good's Price 137 The Individual's Demand Curve 140 Compensated (Hicksian) Demand Curves and Functions 143 A Mathematical Development of Response to Price Changes 148 Demand Elasticities 151 Consumer Surplus 157 Revealed Preference and the Substitution Effect 162 Summary 164 Problems 165 Suggestions for Further Reading 168 **CHAPTER 6** The Two-Good Case 169 Substitutes and Complements 171 Net (Hicksian) Substitutes and Complements 173 Substitutability with Many Goods 175 Composite Commodities 175

Home Production, Attributes of Goods, and Implicit Prices 179 Summary 182 Problems 182 Suggestions for Further Reading 185

PART Uncertainty and Strategy

CHAPTER 7

Mathematical Statistics 189 Fair Gambles and the Expected Utility Hypothesis 190 Expected Utility 191 The von Neumann-Morgenstern Theorem 192 Risk Aversion 194 Measuring Risk Aversion 197 Methods for Reducing Uncertainty and Risk 202 Insurance 202 Diversification 203 Flexibility 204 Information 211 The State-Preference Approach to Choice Under Uncertainty 212 Asymmetry of Information 218 Summary 218 Problems 219 Suggestions for Further Reading 222 CHAPTER 8 Basic Concepts 225 Prisoners' Dilemma 226 Nash Equilibrium 228 Mixed Strategies 234 Existence of Equilibrium 239 Continuum of Actions 239 Sequential Games 242 Repeated Games 248 Incomplete Information 251 Simultaneous Bayesian Games 252 Signaling Games 256 Experimental Games 262 Evolutionary Games and Learning 264 Summary 264 265 Problems Suggestions for Further Reading 269

	2.4		
H	J	U	

FIVE

Production and Supply

Marginal Productivity 273	
soquant Maps and the Rate of Technical Substitution	276
Returns to Scale 280	
The Elasticity of Substitution 283	
Four Simple Production Functions 286	
Technical Progress 290	
Summary 294	
Problems 295	
Suggestions for Further Reading 298	
CHAPTER 10	
Cost Functions	
Definitions of Costs 299	
Cost-Minimizing Input Choices 302	
Cost Functions 307	
Cost Functions and Shifts in Cost Curves 311	
Shephard's Lemma and the Elasticity of Substitution	321
Short-Run, Long-Run Distinction 321	
Summary 328	
Problems 329	
Suggestions for Further Reading 332	
CHAPTER 11	
Profit Maximization	
The Nature and Behavior of Firms 333	
Profit Maximization 335	
Marginal Revenue 337	
Short-Run Supply by a Price-Taking Firm 342	
Profit Functions 345	
Profit Maximization and Input Demand 351	
Summary 357	
Problems 358	
Suggestions for Further Reading 362	
Competitive Markets	

Timing of the Supply Response 369 Pricing in the Very Short Run 369 Short-Run Price Determination 371 Shifts in Supply and Demand Curves: A Graphical Analysis 375 Mathematical Model of Market Equilibrium 378 Long-Run Analysis 381 Long-Run Equilibrium: Constant Cost Case 382 Shape of the Long-Run Supply Curve 384 Long-Run Elasticity of Supply 387 Comparative Statics Analysis of Long-Run Equilibrium 387 Producer Surplus in the Long Run 391 Economic Efficiency and Welfare Analysis 394 Price Controls and Shortages 397 Tax Incidence Analysis 398 Summary 403 Problems 403 Suggestions for Further Reading 407

CHAPTER 13

General Equilibrium and Welfare	. 409
Perfectly Competitive Price System 409	
A Graphical Model of General Equilibrium with Two Goods 410	
Comparative Statics Analysis 419	
Seneral Equilibrium Modeling and Factor Prices 421	
A Mathematical Model of Exchange 423	
A Mathematical Model of Production and Exchange 434	
Computable General Equilibrium Models 437	
Summary 441	
Problems 442	
Suggestions for Further Reading 446	

SIX

Market Power

CHAPTER 14

 Monopoly
 449

 Barriers to Entry
 449

 Profit Maximization and Output Choice
 451

 Monopoly and Resource Allocation
 455

 Monopoly, Product Quality, and Durability
 458

 Price Discrimination
 461

 Second-Degree Price Discrimination through Price Schedules
 465

 Regulation of Monopoly
 467

 Dynamic Views of Monopoly
 471

 Summary
 471

 Problems
 472

 Suggestions for Further Reading
 475

CHAPTER 15

Short-Run Decisions: Pricing and Output 477 Bertrand Model 479 Cournot Model 480 486 Capacity Constraints Product Differentiation 487 Tacit Collusion 493 Longer-Run Decisions: Investment, Entry, and Exit 497 Strategic Entry Deterrence 503 Signaling 505 How Many Firms Enter? 508 Innovation 512 Summary 514 Problems 515 Suggestions for Further Reading 518

SEVEN

Pricing in Input Markets

CHAPTER 16

Allocation of Time 521 A Mathematical Analysis of Labor Supply 524 Market Supply Curve for Labor 528 Labor Market Equilibrium 529 Wage Variation 531 Monopsony in the Labor Market 535 Labor Unions 538 Summary 541 Problems 541 Suggestions for Further Reading 545 **CHAPTER 17** Capital and the Rate of Return 547 Determining the Rate of Return 549 The Firm's Demand for Capital 556 Present Discounted Value Approach to Investment Decisions 558 Natural Resource Pricing 563 Summary 566 Problems 566

Suggestions for Further Reading 570

APPENDIX

EIGHT

Market Failure

CHAPTER 18 Asymmetric Informat

Complex Contracts as a Response to Asymmetric Information 579 Principal-Agent Model 580 Hidden Actions 583 Owner-Manager Relationship 584 Moral Hazard in Insurance 588 Hidden Types 593 Nonlinear Pricing 594 Adverse Selection in Insurance 601 Market Signaling 608 Auctions 610 Summary 614 Problems 614 Suggestions for Further Reading 617 **CHAPTER 19** Defining Externalities 619 Externalities and Allocative Inefficiency 621 Solutions to the Externality Problem 625 Attributes of Public Goods 628 Public Goods and Resource Allocation 630 Lindahl Pricing of Public Goods 634 Voting and Resource Allocation 637 A Simple Political Model 639 Voting Mechanisms 642 Summary 644 Problems 644 Suggestions for Further Reading 647 Extensions: Second-Order Conditions and Matrix Algebra 649 Extensions: Special Preferences 652 Extensions: Budget Shares 655 Extensions: Demand Concepts and the Evaluation of Price Indices 658 Extensions: Simplifying Demand and Two-Stage Budgeting 662 Extensions: The Portfolio Problem 664

Extensions: Existence of Nash Equilibrium 669 Extensions: Many-Input Production Functions 672 Extensions: The Translog Cost Function 675 Extensions: Boundaries of the Firm 677 Extensions: Demand Aggregation and Estimation 681 Extensions: Computable General Equilibrium Models 684 Extensions: Optimal Linear Two-Part Tariffs 686 Extensions: Strategic Substitutes and Complements 688 Extensions: Nonlinear Pricing with a Continuum of Types 692 Extensions: Pollution Abatement 695

Brief Answers to Queries	
Solutions to Odd-Numbered Problems	
Glossary of Frequently Used Terms	
Index	729

- Andrew