
ECONOMICS

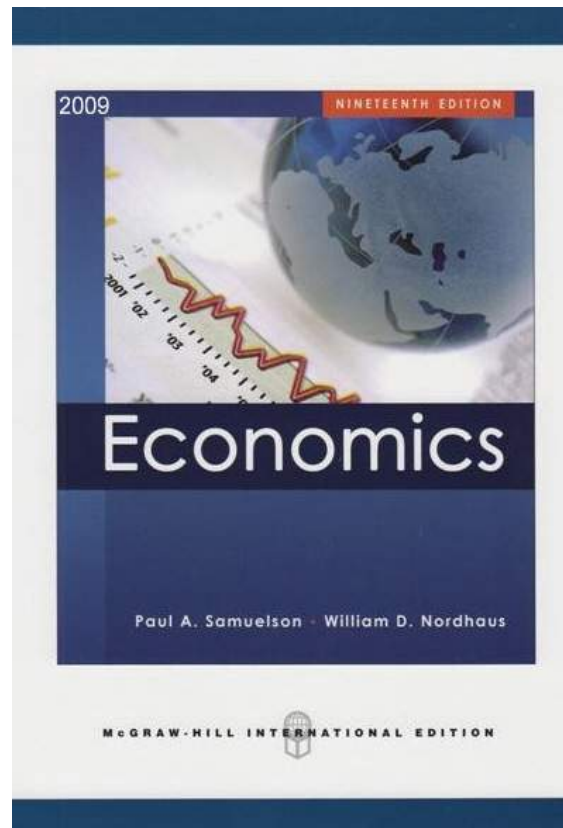
Nineteenth Edition

PAUL A. SAMUELSON

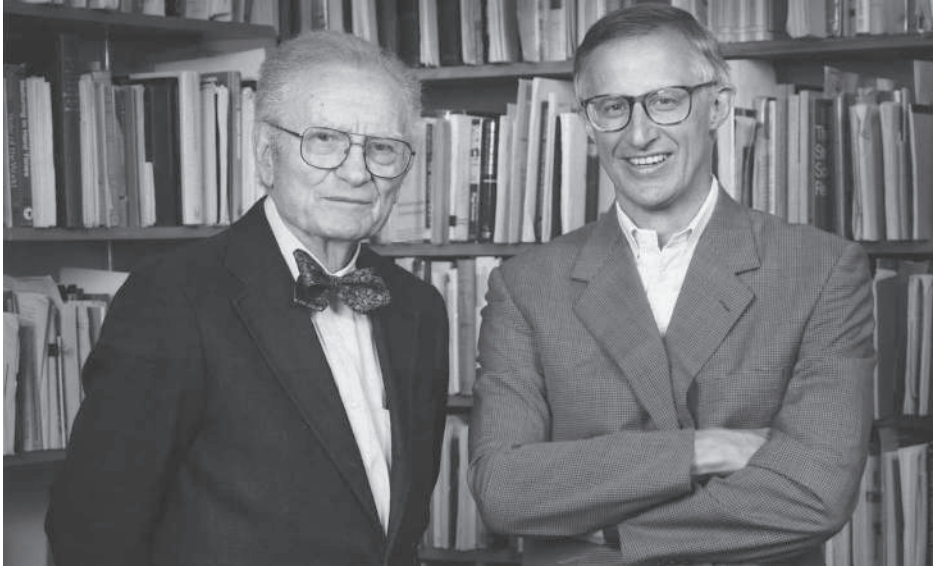
Institute Professor Emeritus
Massachusetts Institute of Technology

WILLIAM D. NORDHAUS

Sterling Professor of Economics
Yale University



ABOUT THE AUTHORS



PAUL A. SAMUELSON, founder of the renowned MIT graduate department of economics, was trained at the University of Chicago and Harvard. His many scientific writings brought him world fame at a young age, and in 1970 he was the first American to receive a Nobel Prize in economics. One of those rare scientists who can communicate with the lay public, Professor Samuelson wrote an economics column for *Newsweek* for many years and was economic adviser to President John F. Kennedy. He testifies often before Congress and serves as academic consultant to the Federal Reserve, the U.S. Treasury, and various private, nonprofit organizations. Professor Samuelson, between researches at MIT and tennis games, is a visiting professor at New York University. His six children (including triplet boys) have contributed 15 grandchildren.

WILLIAM D. NORDHAUS is one of America's eminent economists. Born in Albuquerque, New Mexico, he received his B.A. from Yale and his Ph.D. in economics at MIT. He is Sterling Professor of Economics at Yale University and on the staff of the Cowles Foundation for Research in Economics and the National Bureau of Economic Research. His research has spanned much of economics—including the environment, energy, technological change, economic growth, and trends in profits and productivity. In addition, Professor Nordhaus takes a keen interest in economic policy. He served as a member of President Carter's Council of Economic Advisers from 1977 to 1979, serves on many government advisory boards and committees, and writes occasionally for *The New York Review of Books* and other periodicals. He regularly teaches the Principles of Economics course at Yale. Professor Nordhaus lives in New Haven, Connecticut, with his wife, Barbara. When not writing or teaching, he devotes his time to music, travel, skiing, and family.

To our families, students, and colleagues

ECONOMICS

Published by McGraw-Hill/Irwin, a business unit of The McGraw-Hill Companies, Inc., 1221 Avenue of the Americas, New York, NY, 10020. Copyright © 2010, 2005, 2001, 1998, 1995, 1992, 1989, 1985, 1980, 1976, 1973, 1970, 1967, 1964, 1961, 1958, 1955, 1951, 1948 by The McGraw-Hill Companies, Inc. All rights reserved. No part of this publication may be reproduced or distributed in any form or by any means, or stored in a database or retrieval system, without the prior written consent of The McGraw-Hill Companies, Inc., including, but not limited to, in any network or other electronic storage or transmission, or broadcast for distance learning.

Some ancillaries, including electronic and print components, may not be available to customers outside the United States.

This book is printed on acid-free paper.

1 2 3 4 5 6 7 8 9 0 WCK / WCK 0 9

ISBN 978-0-07-351129-0

MHID 0-07-351129-3

Publisher: *Douglas Reiner*

Developmental editor II: *Karen L. Fisher*

Editorial coordinator: *Noelle Fox*

Senior marketing manager: *Jen Lambert*

Senior project manager: *Susanne Riedell*

Full-service project manager: *Lori Hazard, Macmillan Publishing Solutions*

Lead production supervisor: *Michael R. McCormick*

Lead designer: *Matthew Baldwin*

Media project manager: *Balaji Sundararaman, Hurix Systems Pvt. Ltd.*

Cover image: *The globes on the front and back covers are courtesy of the GEcon Project, Yale University, and were created by Xi Chen and William Nordhaus. The height of the bars is proportional to output in each location. For more details on the data and methods, go to gecon.yale.edu.*

Typeface: *10/12 New Baskerville*

Compositor: *Macmillan Publishing Solutions*

Printer: *Quebecor World Versailles Inc.*

Library of Congress Cataloging-in-Publication Data

Samuelson, Paul Anthony, 1915-

Economics / Paul A. Samuelson, William D. Nordhaus.—19th ed.

p. cm.—(The McGraw-Hill series economics)

Includes index.

ISBN-13: 978-0-07-351129-0 (alk. paper)

ISBN-10: 0-07-351129-3 (alk. paper)

1. Economics. I. Nordhaus, William D. II. Title.

HB171.5.S25 2010

330—dc22

2009003178

Contents in Brief

A Centrist Proclamation	xvi
Preface	xviii
For the Student: Economics and the Internet	xxiii

PART ONE BASIC CONCEPTS I

Chapter 1	The Central Concepts of Economics	3
Appendix 1	How to Read Graphs	18
Chapter 2	The Modern Mixed Economy	25
Chapter 3	Basic Elements of Supply and Demand	45

PART TWO MICROECONOMICS: SUPPLY, DEMAND, AND PRODUCT MARKETS 63

Chapter 4	Supply and Demand: Elasticity and Applications	65
Chapter 5	Demand and Consumer Behavior	84
Appendix 5	Geometrical Analysis of Consumer Equilibrium	101
Chapter 6	Production and Business Organization	107
Chapter 7	Analysis of Costs	126
Appendix 7	Production, Cost Theory, and Decisions of the Firm	144
Chapter 8	Analysis of Perfectly Competitive Markets	149
Chapter 9	Imperfect Competition and Monopoly	169
Chapter 10	Competition among the Few	187
Chapter 11	Economics of Uncertainty	211

PART THREE FACTOR MARKETS: LABOR, LAND, AND CAPITAL 227

Chapter 12	How Markets Determine Incomes	229
Chapter 13	The Labor Market	248
Chapter 14	Land, Natural Resources, and the Environment	267
Chapter 15	Capital, Interest, and Profits	283

PART FOUR	APPLICATIONS OF ECONOMIC PRINCIPLES	301
Chapter 16	Government Taxation and Expenditure	303
Chapter 17	Efficiency vs. Equality: The Big Tradeoff	323
Chapter 18	International Trade	339
PART FIVE	MACROECONOMICS: ECONOMIC GROWTH AND BUSINESS CYCLES	365
Chapter 19	Overview of Macroeconomics	367
Appendix 19	Macroeconomic Data for the United States	385
Chapter 20	Measuring Economic Activity	386
Chapter 21	Consumption and Investment	408
Chapter 22	Business Cycles and Aggregate Demand	428
Chapter 23	Money and the Financial System	453
Chapter 24	Monetary Policy and the Economy	475
PART SIX	GROWTH, DEVELOPMENT, AND THE GLOBAL ECONOMY	499
Chapter 25	Economic Growth	501
Chapter 26	The Challenge of Economic Development	521
Chapter 27	Exchange Rates and the International Financial System	543
Chapter 28	Open-Economy Macroeconomics	564
PART SEVEN	UNEMPLOYMENT, INFLATION, AND ECONOMIC POLICY	587
Chapter 29	Unemployment and the Foundations of Aggregate Supply	589
Chapter 30	Inflation	609
Chapter 31	Frontiers of Macroeconomics	630
Glossary of Terms		654
Index		677

Contents

A Centrist Proclamation xvi

Preface xviii

For the Student: Economics and
the Internet xxiii

PART ONE BASIC CONCEPTS

I

Chapter 1

The Central Concepts of Economics 3

A. Why Study Economics? 3

For Whom the Bell Tolls • Scarcity and Efficiency:
The Twin Themes of Economics 3 • Definitions of
Economics • Scarcity and Efficiency • Microeconomics
and Macroeconomics • The Logic of Economics 5 •
Cool Heads at the Service of Warm Hearts 6 •

B. The Three Problems of Economic Organization 7

Market, Command, and Mixed Economies 8 •

C. Society's Technological Possibilities 8

Inputs and Outputs 9 • The Production-Possibility
Frontier 9 • Applying the PPF to Society's
Choices • Opportunity Costs • Efficiency •

Summary 15 • Concepts for Review 15 • Further
Reading and Internet Websites 16 • Questions for
Discussion 16 •

Appendix I

How to Read Graphs 18

The Production-Possibility Frontier 18 • Production-
Possibility Graph • A Smooth Curve • Slopes and
Lines • Slope of a Curved Line • Slope as the Marginal
Value • Shifts of and Movement along Curves • Some
Special Graphs •

Summary to Appendix 23 • Concepts for
Review 24 • Questions for Discussion 24 •

Chapter 2

The Modern Mixed Economy 25

A. The Market Mechanism 26

Not Chaos, but Economic Order • How Markets
Solve the Three Economic Problems • The Dual
Monarchy • A Picture of Prices and Markets • The
Invisible Hand •

B. Trade, Money, and Capital 30

Trade, Specialization, and Division of Labor 31 •
Money: The Lubricant of Exchange 33 • Capital 33 •
Capital and Private Property •

C. The Visible Hand of Government 34

Efficiency 35 • Imperfect Competition •
Externalities • Public Goods • Equity 38 •
Macroeconomic Growth and Stability 39 • The Rise of
the Welfare State 40 • Conservative Backlash •
The Mixed Economy Today •

Summary 41 • Concepts for Review 42 • Further
Reading and Internet Websites 43 • Questions for
Discussion 43 •

Chapter 3

Basic Elements of Supply and Demand 45

A. The Demand Schedule 46

The Demand Curve 47 • Market Demand • Forces
behind the Demand Curve • Shifts in Demand •

B. The Supply Schedule 51

The Supply Curve 51 • Forces behind the Supply
Curve • Shifts in Supply •

C. Equilibrium of Supply and Demand 53

Equilibrium with Supply and Demand Curves 54 • Effect
of a Shift in Supply or Demand • Interpreting
Changes in Price and Quantity • Supply, Demand, and
Immigration • Rationing by Prices 59 •

Summary 60 • Concepts for Review 61 • Further
Reading and Internet Websites 61 • Questions for
Discussion 61 •

PART TWO
**MICROECONOMICS: SUPPLY, DEMAND,
AND PRODUCT MARKETS**

63

Chapter 4

Supply and Demand: Elasticity and Applications 65

A. Price Elasticity of Demand and Supply 65

Price Elasticity of Demand 65 • Calculating Elasticities • Price Elasticity in Diagrams • A Shortcut for Calculating Elasticities • The Algebra of Elasticities • Elasticity Is Not the Same as Slope • **Elasticity and Revenue 70** • The Paradox of the Bumper Harvest • **Price Elasticity of Supply 72** •

B. Applications to Major Economic Issues 73

The Economics of Agriculture 73 • Long-Run Relative Decline of Farming • **Impact of a Tax on Price and Quantity 75** • **Minimum Floors and Maximum Ceilings 77** • The Minimum-Wage Controversy • Energy Price Controls • Rationing by the Queue, by Coupons, or by the Purse? •

Summary 81 • **Concepts for Review 82** • **Further Reading and Internet Websites 82** • **Questions for Discussion 82** •

Chapter 5

Demand and Consumer Behavior 84

Choice and Utility Theory 84 • Marginal Utility and the Law of Diminishing Marginal Utility • A Numerical Example • **Derivation of Demand Curves 87** • The Equimarginal Principle • Why Demand Curves Slope Downward • Leisure and the Optimal Allocation of Time • Analytical Developments in Utility Theory • **An Alternative Approach: Substitution Effect and Income Effect 89** • Substitution Effect • Income Effect • **From Individual to Market Demand 91** • Demand Shifts • Substitutes and Complements • Empirical Estimates of Price and Income Elasticities • **The Economics of Addiction 94** • **The Paradox of Value 95** • **Consumer Surplus 96** • Applications of Consumer Surplus •

Summary 98 • **Concepts for Review 99** • **Further Reading and Internet Websites 99** • **Questions for Discussion 99** •

Appendix 5

Geometrical Analysis of Consumer Equilibrium 101

The Indifference Curve 101 • Law of Substitution • The Indifference Map • **Budget Line or Budget Constraint 103** • **The Equilibrium Position of Tangency 104** • **Changes in Income and Price 104** • Income Change • Single Price Change • **Deriving the Demand Curve 105** •

Summary to Appendix 106 • **Concepts for Review 106** • **Questions for Discussion 106** •

Chapter 6

Production and Business Organization 107

A. Theory of Production and Marginal Products 107

Basic Concepts 107 • The Production Function • Total, Average, and Marginal Product • The Law of Diminishing Returns • **Returns to Scale 111** • **Short Run and Long Run 112** • **Technological Change 113** • **Productivity and the Aggregate Production Function 116** • Productivity • Productivity Growth from Economies of Scale and Scope • Empirical Estimates of the Aggregate Production Function •

B. Business Organizations 118

The Nature of the Firm 118 • **Big, Small, and Infinitesimal Businesses 119** • The Individual Proprietorship • The Partnership • The Corporation • Ownership, Control, and Executive Compensation •

Summary 123 • **Concepts for Review 124** • **Further Reading and Internet Websites 124** • **Questions for Discussion 124** •

Chapter 7

Analysis of Costs 126

A. Economic Analysis of Costs 126

Total Cost: Fixed and Variable 126 • Fixed Cost • Variable Cost • **Definition of Marginal Cost 127** • **Average Cost 129** • Average or Unit Cost • Average Fixed and Variable Costs • The Relation between Average Cost and Marginal Cost • **The Link between Production and Costs 132** • Diminishing Returns and U-Shaped Cost Curves • **Choice of Inputs by the Firm 134** • Marginal Products and the Least-Cost Rule •

B. Economic Costs and Business Accounting 135

The Income Statement, or Statement of Profit and Loss 135 • **The Balance Sheet 136** • Accounting Conventions • Financial Finagling •

C. Opportunity Costs 139
Opportunity Cost and Markets 140 •

Summary 141 • **Concepts for Review** 142 • **Further Reading and Internet Websites** 142 • **Questions for Discussion** 142 •

Appendix 7
Production, Cost Theory, and Decisions of the Firm 144

A Numerical Production Function 144 • **The Law of Diminishing Marginal Product** 144 • **Least-Cost Factor Combination for a Given Output** 145 • **Equal-Product Curves** • **Equal-Cost Lines** • **Equal-Product and Equal-Cost Contours: Least-Cost Tangency** • **Least-Cost Conditions** •

Summary to Appendix 147 • **Concepts for Review** 148 • **Questions for Discussion** 148 •

Chapter 8
Analysis of Perfectly Competitive Markets 149

A. Supply Behavior of the Competitive Firm 149
Behavior of a Competitive Firm 149 • **Profit Maximization** • **Perfect Competition** • **Competitive Supply Where Marginal Cost Equals Price** • **Total Cost and the Shutdown Condition** •

B. Supply Behavior in Competitive Industries 154
Summing All Firms' Supply Curves to Get Market Supply 154 • **Short-Run and Long-Run Equilibrium** 155 • **The Long Run for a Competitive Industry** •

C. Special Cases of Competitive Markets 157
General Rules 157 • **Constant Cost** • **Increasing Costs and Diminishing Returns** • **Fixed Supply and Economic Rent** • **Backward-Bending Supply Curve** • **Shifts in Supply** •

D. Efficiency and Equity of Competitive Markets 160
Evaluating the Market Mechanism 160 • **The Concept of Efficiency** • **Efficiency of Competitive Equilibrium** • **Equilibrium with Many Consumers and Markets** • **Marginal Cost as a Benchmark for Efficiency** • **Qualifications** 163 • **Market Failures** • **Two Cheers for the Market, but Not Three** •

Summary 165 • **Concepts for Review** 166 • **Further Reading and Internet Websites** 166 • **Questions for Discussion** 166 •

Chapter 9
Imperfect Competition and Monopoly 169

A. Patterns of Imperfect Competition 169
Definition of Imperfect Competition • **Varieties of Imperfect Competitors** 171 • **Monopoly** • **Oligopoly** • **Monopolistic Competition** • **Sources of Market Imperfections** 173 • **Costs and Market Imperfection** • **Barriers to Entry** •

B. Monopoly Behavior 177
The Concept of Marginal Revenue 177 • **Price, Quantity, and Total Revenue** • **Marginal Revenue and Price** • **Elasticity and Marginal Revenue** • **Profit-Maximizing Conditions** 180 • **Monopoly Equilibrium in Graphs** • **Perfect Competition as a Polar Case of Imperfect Competition** • **The Marginal Principle: Let Bygones Be Bygones** 183 • **Loss Aversion and the Marginal Principle** •

Summary 184 • **Concepts for Review** 185 • **Further Reading and Internet Websites** 185 • **Questions for Discussion** 186 •

Chapter 10
Competition among the Few 187

A. Behavior of Imperfect Competitors 187
Measures of Market Power • **The Nature of Imperfect Competition** 189 • **Theories of Imperfect Competition** 189 • **Collusive Oligopoly** • **Monopolistic Competition** • **Rivalry among the Few** • **Price Discrimination** 193 •

B. Game Theory 195
Thinking about Price Setting • **Basic Concepts** 196 • **Alternative Strategies** • **Games, Games, Everywhere . . .** •

C. Public Policies to Combat Market Power 199
Economic Costs of Imperfect Competition 199 • **The Cost of Inflated Prices and Reduced Output** • **The Static Costs of Imperfect Competition** • **Public Policies on Imperfect Competition** • **Regulating Economic Activity** 201 • **Why Regulate Industry?** • **Containing Market Power** • **Remedying Information Failures** • **Antitrust Law and Economics** 203 • **The Framework Statutes** • **Basic Issues in Antitrust Law: Conduct and Structure** 204 • **Illegal Conduct** • **Structure: Is Bigness Badness?** • **Antitrust Laws and Efficiency** •

Summary 207 • **Concepts for Review** 208 • **Further Reading and Internet Websites** 208 • **Questions for Discussion** 209 •

Chapter 11
Economics of Uncertainty 211
A. Economics of Risk and Uncertainty 211

Speculation: Shipping Assets or Goods Across Space and Time 212 • Arbitrage and Geographic Price Patterns • Speculation and Price Behavior over Time • Shedding Risks through Hedging • The Economic Impacts of Speculation • **Risk and Uncertainty 215** •

B. The Economics of Insurance 216

Capital Markets and Risk Sharing • **Market Failures in Information 217** • Moral Hazard and Adverse Selection • **Social Insurance 218** •

C. Health Care: The Problem That Won't Go Away 219

The Economics of Medical Care 219 • Special Economic Features of Health Care • Health Care as a Social Insurance Program • Rationing Health Care •

D. Innovation and Information 221

Schumpeter's Radical Innovation • The Economics of Information • Intellectual Property Rights • The Dilemma of the Internet •

Summary 224 • **Concepts for Review 225** • **Further Reading and Internet Websites 225** • **Questions for Discussion 225** •

PART THREE
FACTOR MARKETS: LABOR, LAND, AND CAPITAL
227

Chapter 12
How Markets Determine Incomes 229
A. Income and Wealth 229

Income 230 • Factor Incomes vs. Personal Incomes • Role of Government • **Wealth 231** •

B. Input Pricing by Marginal Productivity 232

The Nature of Factor Demands 233 • Demands for Factors Are Derived Demands • Demands for Factors Are Interdependent • **Distribution Theory and Marginal Revenue Product 235** • Marginal Revenue Product • **The Demand for Factors of Production 236** • Factor Demands for Profit-Maximizing Firms • Marginal Revenue Product and the Demand for Factors • **Supply of Factors of Production 238** • **Determination of Factor Prices by Supply and Demand 239** • **The Distribution of National Income 241** • Marginal-Productivity Theory with Many Inputs • **An Invisible Hand for Incomes? 243** •

Summary 244 • **Concepts for Review 245** • **Further Reading and Internet Websites 245** • **Questions for Discussion 245** •

Chapter 13
The Labor Market 248
A. Fundamentals of Wage Determination 248

The General Wage Level 248 • **Demand for Labor 249** • Marginal Productivity Differences • International Comparisons • **The Supply of Labor 251** • Determinants of Supply • Empirical Findings • **Wage Differentials 253** • Differences in Jobs: Compensating Wage Differentials • Differences in People: Labor Quality • Differences in People: The "Rents" of Unique Individuals • Segmented Markets and Noncompeting Groups •

B. Labor Market Issues and Policies 257

The Economics of Labor Unions 257 • Government and Collective Bargaining • **How Unions Raise Wages 258** • Theoretical Indeterminacy of Collective Bargaining • **Effects on Wages and Employment 259** • Has Unionization Raised Wages? • Unions and Classical Unemployment • **Discrimination 260** • **Economic Analysis of Discrimination 261** • Definition of Discrimination • Discrimination by Exclusion • Taste for Discrimination • Statistical Discrimination • **Economic Discrimination Against Women 263** • Empirical Evidence 263 • **Reducing Labor Market Discrimination 264** • Uneven Progress •

Summary 264 • **Concepts for Review 265** • **Further Reading and Internet Websites 265** • **Questions for Discussion 266** •

Chapter 14
Land, Natural Resources, and the Environment 267
A. The Economics of Natural Resources 267

Resource Categories 268 • **Fixed Land and Rents 269** • Rent as Return to Fixed Factors • Taxing Land •

B. Environmental Economics 271

Externalities 271 • Public vs. Private Goods • **Market Inefficiency with Externalities 272** • Analysis of Inefficiency • Valuing Damages • Graphical Analysis of Pollution • **Policies to Correct Externalities 275** • Government Programs • Private Approaches • **Climate Change: To Slow or Not to Slow 278** • Quarrel and Pollute, or Reason and Compute? •

Summary 280 • **Concepts for Review 281** • **Further Reading and Internet Websites 281** • **Questions for Discussion 281** •

Chapter 15
Capital, Interest, and Profits 283
A. Basic Concepts of Interest and Capital 283

What Is Capital? • Prices and Rentals on Investments • Capital vs. Financial Assets • The Rate of Return on Investments • **Rates of Return and Interest Rates 284** • Rate of Return on Capital • Financial Assets and Interest Rates • **The Present Value of Assets 285** • Present Value for Perpetuities • General Formula for Present Value • Acting to Maximize Present Value • **The Mysterious World of Interest Rates 287** • Real vs. Nominal Interest Rates •

B. The Theory of Capital, Profits, and Interest 291

Basic Capital Theory 291 • Roundaboutness • Diminishing Returns and the Demand for Capital • Determination of Interest and the Return on Capital • Graphical Analysis of the Return on Capital • **Profits as a Return to Capital 295** • Reported Profit Statistics • Determinants of Profits • Empirical Evidence on Returns to Labor and Capital •

Summary 297 • **Concepts for Review 298** • **Further Reading and Internet Websites 298** • **Questions for Discussion 299** •

PART FOUR
APPLICATIONS OF ECONOMIC
PRINCIPLES
301

Chapter 16
Government Taxation and Expenditure 303
A. Government Control of the Economy 303

The Tools of Government Policy 304 • Trends in the Size of Government • The Growth of Government Controls and Regulation • **The Functions of Government 306** • Improving Economic Efficiency • Reducing Economic Inequality • Stabilizing the Economy through Macroeconomic Policies • Conducting International Economic Policy • **Public-Choice Theory 308** •

B. Government Expenditures 309

Fiscal Federalism 309 • Federal Expenditures • State and Local Expenditures • **Cultural and Technological Impacts 311** •

C. Economic Aspects of Taxation 312

Principles of Taxation 312 • Benefit vs. Ability-to-Pay Principles • Horizontal and Vertical Equity • Pragmatic

Compromises in Taxation • **Federal Taxation 314** • The Individual Income Tax • Social Insurance Taxes • Corporation Taxes • Consumption Taxes • **State and Local Taxes 317** • Property Tax • Other Taxes • **Efficiency and Fairness in the Tax System 318** • The Goal of Efficient Taxation • Efficiency vs. Fairness • **Final Word 320** •

Summary 320 • **Concepts for Review 321** • **Further Reading and Internet Websites 321** • **Questions for Discussion 321** •

Chapter 17
Efficiency vs. Equality: The Big Tradeoff 323
A. The Sources of Inequality 323

The Distribution of Income and Wealth 324 • How to Measure Inequality among Income Classes • Distribution of Wealth • Inequality across Countries • **Poverty in America 327** • Who Are the Poor? • Who Are the Rich? • Trends in Inequality •

B. Antipoverty Policies 330

The Rise of the Welfare State • **The Costs of Redistribution 331** • Redistribution Costs in Diagrams • How Big Are the Leaks? • Adding Up the Leaks • **Antipoverty Policies: Programs and Criticisms 333** • Income-Security Programs • Incentive Problems of the Poor • **The Battle over Welfare Reform 334** • Two Views of Poverty • Income-Support Programs in the United States Today • The Earned-Income Tax Credit • The 1996 U.S. Welfare Reform • **Economic Policy for the 21st Century 336** •

Summary 336 • **Concepts for Review 337** • **Further Reading and Internet Websites 337** • **Questions for Discussion 338** •

Chapter 18
International Trade 339
A. The Nature of International Trade 339

International vs. Domestic Trade • Trends in Foreign Trade • **The Reasons for International Trade in Goods and Services 340** • Diversity in Natural Resources • Differences in Tastes • Differences in Costs •

B. Comparative Advantage among Nations 341

The Principle of Comparative Advantage 341 • Uncommon Sense • Ricardo's Analysis of Comparative Advantage • The Economic Gains from Trade •

Outsourcing as Another Kind of Trade • **Graphical Analysis of Comparative Advantage 344** • America without Trade • Opening Up to Trade • **Extensions to Many Commodities and Countries 347** • Many Commodities • Many Countries • Triangular and Multilateral Trade • **Qualifications and Conclusions 348** •

C. Protectionism 349
Supply-and-Demand Analysis of Trade and Tariffs 350 • Free Trade vs. No Trade • Trade Barriers • The Economic Costs of Tariffs • **The Economics of Protectionism 355** • Noneconomic Goals • Unsound Grounds for Tariffs • Potentially Valid Arguments for Protection • Other Barriers to Trade • **Multilateral Trade Negotiations 359** • Negotiating Free Trade • Appraisal •

Summary 361 • **Concepts for Review 362** • **Further Reading and Internet Websites 362** • **Questions for Discussion 363** •

PART FIVE MACROECONOMICS: ECONOMIC GROWTH AND BUSINESS CYCLES 365

Chapter 19 367
Overview of Macroeconomics

A. Key Concepts of Macroeconomics 368
The Birth of Macroeconomics 368 • Objectives and Instruments of Macroeconomics 370 • Measuring Economic Success • The Tools of Macroeconomic Policy • **International Linkages 376** •

B. Aggregate Supply and Demand 377
Inside the Macroeconomy: Aggregate Supply and Demand 377 • Definitions of Aggregate Supply and Demand • Aggregate Supply and Demand Curves • **Macroeconomic History: 1900–2008 380** • The Role of Macroeconomic Policy •

Summary 382 • **Concepts for Review 383** • **Further Reading and Internet Websites 383** • **Questions for Discussion 384** •

Appendix 19 385
Macroeconomic Data for the United States

Chapter 20 386
Measuring Economic Activity

Gross Domestic Product: The Yardstick of an Economy's Performance 386 • Two Measures of National Product: Goods Flow and Earnings Flow • National Accounts Derived from Business Accounts • The Problem of “Double Counting” • **Details of the National Accounts 391** • Real vs. Nominal GDP: “Deflating” GDP by a Price Index • Consumption • Investment and Capital Formation • Government Purchases • Net Exports • Gross Domestic Product, Net Domestic Product, and Gross National Product • GDP and NDP: A Look at Numbers • From GDP to Disposable Income • Saving and Investment • **Beyond the National Accounts 400** • **Price Indexes and Inflation 402** • Price Indexes • **Accounting Assessment 404** •

Summary 405 • **Concepts for Review 406** • **Further Reading and Internet Websites 406** • **Questions for Discussion 406** •

Chapter 21 408
Consumption and Investment

A. Consumption and Saving 408
 Budgetary Expenditure Patterns • **Consumption, Income, and Saving 411** • The Consumption Function • The Saving Function • The Marginal Propensity to Consume • The Marginal Propensity to Save • Brief Review of Definitions • **National Consumption Behavior 416** • Determinants of Consumption • The National Consumption Function • Alternative Measures of Saving •

B. Investment 420
Determinants of Investment 420 • Revenues • Costs • Expectations • **The Investment Demand Curve 421** • Shifts in the Investment Demand Curve • **On to the Theory of Aggregate Demand 424** •

Summary 424 • **Concepts for Review 425** • **Further Reading and Internet Websites 425** • **Questions for Discussion 426** •

Chapter 22 428
Business Cycles and Aggregate Demand

A. What Are Business Cycles? 429
 Features of the Business Cycle 429 • **Business-Cycle Theories 431** • Financial Crises and Business Cycles •

B. Aggregate Demand and Business Cycles 432
 The Theory of Aggregate Demand 432 • The Downward-Sloping Aggregate Demand Curve 433 • Shifts in Aggregate Demand • Business Cycles and Aggregate Demand • Is the Business Cycle Avoidable? •

C. The Multiplier Model 437
 Output Determined by Total Expenditures 437 • Reminder on the Meaning of Equilibrium • The Adjustment Mechanism • A Numerical Analysis • **The Multiplier** 440 • The Multiplier Model Compared with the AS-AD Model •

D. Fiscal Policy in the Multiplier Model 441
 How Government Fiscal Policies Affect Output 442 • Impact of Taxation on Aggregate Demand • A Numerical Example • **Fiscal-Policy Multipliers** 446 • Impact of Taxes • The Multiplier Model and the Business Cycle • The Multiplier Model in Perspective •

Summary 449 • **Concepts for Review** 450 • **Further Reading and Internet Websites** 451 • **Questions for Discussion** 451 •

Chapter 23
Money and the Financial System 453
 Overview of the Monetary Transmission Mechanism •

A. The Modern Financial System 454
 The Role of the Financial System • The Functions of the Financial System • The Flow of Funds • **A Menu of Financial Assets** 456 • Review of Interest Rates •

B. The Special Case of Money 458
 The Evolution of Money 458 • The History of Money • Components of the Money Supply • **The Demand for Money** 461 • Money's Functions • The Costs of Holding Money • Two Sources of Money Demand •

C. Banks and the Supply of Money 463
 How Banks Developed from Goldsmith Establishments • Fractional-Reserve Banking • Final System Equilibrium • A Modern Banking System •

D. The Stock Market 465
 Risk and Return on Different Assets • Bubbles and Crashes • Efficient Markets and the Random Walk • **Personal Financial Strategies** 470 •

Summary 471 • **Concepts for Review** 472 • **Further Reading and Internet Websites** 473 • **Questions for Discussion** 473 •

Chapter 24
Monetary Policy and the Economy 475

A. Central Banking and the Federal Reserve System 475
 The Essential Elements of Central Banking 476 • History • Structure • Goals of Central Banks • Functions of the Federal Reserve • Central-Bank Independence • **How the Central Bank Determines Short-Term Interest Rates** 478 • Overview of the Fed's Operations • Balance Sheet of the Federal Reserve Banks • Operating Procedures • **How the Federal Reserve Affects Bank Reserves** 479 • Open-Market Operations • Discount-Window Policy: A Backstop for Open-Market Operations • The Role of Reserve Requirements • Determination of the Federal Funds Rate •

B. The Monetary Transmission Mechanism 484
 A Summary Statement • The Effect of Changes in Monetary Policy on Output • The Challenge of a Liquidity Trap • Monetary Policy in the AS-AD Framework • Monetary Policy in the Long Run •

C. Applications of Monetary Economics 489
 Monetarism and the Quantity Theory of Money and Prices 489 • The Roots of Monetarism • The Equation of Exchange and the Velocity of Money • The Quantity Theory of Prices • Modern Monetarism • The Monetarist Platform: Constant Money Growth • The Monetarist Experiment • The Decline of Monetarism • **Monetary Policy in an Open Economy** 493 • International Linkages • **Monetary Transmission in the Open Economy** 494 • **From Aggregate Demand to Aggregate Supply** 495 •

Summary 495 • **Concepts for Review** 496 • **Further Reading and Internet Websites** 497 • **Questions for Discussion** 497 •

PART SIX GROWTH, DEVELOPMENT, AND THE GLOBAL ECONOMY 499

Chapter 25
Economic Growth 501
 The Long-Term Significance of Growth •

A. Theories of Economic Growth 502
 The Four Wheels of Growth 502 • Human Resources • Natural Resources • Capital • Technological Change and Innovation • **Theories of Economic Growth** 506 • The Classical Dynamics of Smith and Malthus •

Economic Growth with Capital Accumulation: The Neoclassical Growth Model • Geometrical Analysis of the Neoclassical Model • The Central Role of Technological Change • Technological Change as an Economic Output •

B. The Patterns of Growth in the United States 512

The Facts of Economic Growth • Relationship of the Seven Trends to Economic-Growth Theories • The Sources of Economic Growth • **Recent Trends in Productivity 516** • The Productivity Rebound •

Summary 518 • Concepts for Review 519 • Further Reading and Internet Websites 519 • Questions for Discussion 520 •

Chapter 26

The Challenge of Economic Development 521

A. Population Growth and Development 521

Malthus and the Dismal Science 521 • Limits to Growth and Neo-Malthusianism •

B. Economic Growth in Poor Countries 524

Aspects of a Developing Country 524 • Human Development • **The Four Elements in Development 525** • Human Resources • Natural Resources • Capital • Technological Change and Innovations • Vicious Cycles to Virtuous Circles • **Strategies of Economic Development 531** • The Backwardness Hypothesis • Industrialization vs. Agriculture • State vs. Market • Growth and Outward Orientation • Summary Judgment •

C. Alternative Models for Development 533

A Bouquet of “ISMS” 533 • The Central Dilemma: Market vs. Command • **The Asian Models 534** • Asian Dragons • The Rise of China • **Socialism 535** • **The Failed Model: Centrally Planned Economies 536** • Baleful Prophecies • From Textbooks to Tactics: Soviet-Style Command Economy • From Marx to Market • A Final Note of Cautious Optimism •

Summary 539 • Concepts for Review 540 • Further Reading and Internet Websites 540 • Questions for Discussion 541 •

Chapter 27

Exchange Rates and the International Financial System 543

Trends in Foreign Trade 544 •

A. The Balance of International Payments 545

Balance-of-Payments Accounts 545 • Debits and Credits • Details of the Balance of Payments •

B. The Determination of Foreign Exchange Rates 548

Foreign Exchange Rates 548 • **The Foreign Exchange Market 549** • Effects of Changes in Trade • Exchange Rates and the Balance of Payments • Purchasing-Power Parity and Exchange Rates •

C. The International Monetary System 553

Fixed Exchange Rates: The Classical Gold Standard 554 • Hume’s Adjustment Mechanism • Updating Hume to Modern Macroeconomics • **International Monetary Institutions After World War II 557** • The International Monetary Fund • The World Bank • The Bretton Woods System • Intervention • **Flexible Exchange Rates 559** • **Today’s Hybrid System 560** • Concluding Thoughts •

Summary 560 • Concepts for Review 561 • Further Reading and Internet Websites 562 • Questions for Discussion 562 •

Chapter 28

Open-Economy Macroeconomics 564

A. Foreign Trade and Economic Activity 564

Net Exports and Output in the Open Economy • Determinants of Trade and Net Exports • **Short-Run Impact of Trade on GDP 566** • The Marginal Propensity to Import and the Spending Line • The Open-Economy Multiplier • **Trade and Finance for the United States Under Flexible Exchange Rates 569** • **The Monetary Transmission Mechanism in an Open Economy 571** •

B. Interdependence in the Global Economy 574

Economic Growth in the Open Economy 574 • **Saving and Investment in the Open Economy 574** • Determination of Saving and Investment at Full Employment • **Promoting Growth in the Open Economy 578** •

C. International Economic Issues 580

Competitiveness and Productivity 580 • “The Deindustrialization of America” • Trends in Productivity • **The European Monetary Union 581** • Toward a Common Currency: The Euro • Costs and Benefits of Monetary Union • **Final Assessment 583** •

Summary 583 • Concepts for Review 585 • Further Reading and Internet Websites 585 • Questions for Discussion 585 •

PART SEVEN
UNEMPLOYMENT, INFLATION,
AND ECONOMIC POLICY
587

Chapter 29

Unemployment and the Foundations of Aggregate Supply 589

A. The Foundations of Aggregate Supply 589

Determinants of Aggregate Supply 590 • Potential Output • Input Costs • **Aggregate Supply in the Short Run and Long Run 593** • Sticky Wages and Prices and the Upward-Sloping AS Curve •

B. Unemployment 594

Measuring Unemployment 595 • Impact of Unemployment 595 • Economic Impact • Social Impact • **Okun's Law 597** • **Economic Interpretation of Unemployment 597** • Equilibrium Unemployment • Disequilibrium Unemployment • Microeconomic Foundations of Inflexible Wages • **Labor Market Issues 601** • Who Are the Unemployed? • Duration of Unemployment • Sources of Joblessness • Unemployment by Age •

Summary 606 • Concepts for Review 607 • Further Reading and Internet Websites 607 • Questions for Discussion 607 •

Chapter 30

Inflation 609

A. Definition and Impact of Inflation 609

What Is Inflation? 609 • The History of Inflation • Three Strains of Inflation • Anticipated vs. Unanticipated Inflation • **The Economic Impacts of Inflation 614** • Impacts on Income and Wealth Distribution • Impacts on Economic Efficiency • Macroeconomic Impacts • What Is the Optimal Rate of Inflation? •

B. Modern Inflation Theory 616

Prices in the AS-AD Framework 617 • Expected Inflation • Demand-Pull Inflation • Cost-Push Inflation and “Stagflation” • Expectations and Inflation • Price Levels vs. Inflation • **The Phillips Curve 620** • Short-Run Phillips Curve • The Nonaccelerating Inflation Rate of Unemployment • From Short Run to Long Run • The Vertical Long-Run Phillips Curve • Quantitative Estimates • Doubts about the NAIRU • Review •

C. Dilemmas of Anti-Inflation Policy 624

How Long Is the Long Run? • How Much Does It Cost to Reduce Inflation? • Credibility and Inflation • Policies to Lower Unemployment •

Summary 627 • Concepts for Review 628 • Further Reading and Internet Websites 628 • Questions for Discussion 629 •

Chapter 31

Frontiers of Macroeconomics 630

A. The Economic Consequences of the Government Debt 630

Fiscal History 631 • **Government Budget Policy 632** • Actual, Structural, and Cyclical Budgets • **The Economics of the Debt and Deficits 633** • **The Short-Run Impact of Government Deficits 633** • Short Run vs. Long Run • Fiscal Policy and the Multiplier Model • **Government Debt and Economic Growth 634** • Historical Trends • External vs. Internal Debt • Efficiency Losses from Taxation • Displacement of Capital • Debt and Growth •

B. Advances in Modern Macroeconomics 638

Classical Macroeconomics and Say's Law 639 • Say's Law of Markets • **Modern Classical Macroeconomics 639** • Rational Expectations • Real Business Cycles • The Ricardian View of Fiscal Policy • Efficiency Wages • Supply-Side Economics • **Policy Implications 642** • Policy Ineffectiveness • The Desirability of Fixed Rules • A New Synthesis? •

C. Stabilizing the Economy 643

The Interaction of Monetary and Fiscal Policies 643 • Demand Management • The Fiscal-Monetary Mix • **Rules vs. Discretion 646** • Budget Constraints on Legislatures? • Monetary Rules for the Fed? •

D. Economic Growth and Human Welfare 648

The Spirit of Enterprise 649 • Fostering Technological Advance •

Summary 650 • Concepts for Review 652 • Further Reading and Internet Websites 652 • Questions for Discussion 652 •

Glossary of Terms 654

Index 677

A Centrist Proclamation

Sciences advance. But they can also recede. That is true of economics as well. By the end of World War II, the leading introductory textbooks in economics had lost their vitality and relevance. Nature abhors a vacuum. The first edition of this textbook appeared as the 1948 edition of Samuelson's *ECONOMICS*. It introduced macroeconomics into our colleges and served as the gold standard for teaching economics in an increasingly globalized world.

Both the economy and economics have changed greatly over the years. Successive editions of this textbook, which became Samuelson-Nordhaus *ECONOMICS*, have documented the evolutionary changes in the world economy and have provided the latest rigorous economic thinking at the frontier of the discipline.

To our surprise, this nineteenth edition may be one of the most significant of all revisions. We call this the *centrist edition*. It proclaims the value of the mixed economy—an economy that combines the tough discipline of the market with fair-minded governmental oversight.

Centrism is of vital importance today because the global economy is in a terrible meltdown—perhaps worse than any cyclical slump since the Great Depression of the 1930s. Alas, many textbooks have strayed too far toward over-complacent libertarianism. They joined the celebration of free-market finance and supported dismantling regulations and abolishing oversight. The bitter harvest of this celebration was seen in the irrationally exuberant housing and stock markets that collapsed and led to the current financial crisis.

The centrism we describe is not a prescription that is intended to persuade readers away from their beliefs. We are analysts and not cult prescribers. It is not ideology that breeds centrism as our theme. We sift facts and theories to determine the consequences of Hayek-Friedman libertarianism or Marx-Lenin bureaucratic communism. All readers are free to make up their own minds about best ethics and value judgments.

Having surveyed the terrain, this is our reading: Economic history confirms that neither unregulated capitalism nor overregulated central planning can organize a modern society effectively.

The follies of the left and right both mandate centrism. Tightly controlled central planning, which was widely advocated in the middle decades of the last century, was abandoned after it produced stagnation and unhappy consumers in communist countries.

What exactly was the road to serfdom that Hayek and Friedman warned us against? They were arguing against social security, a minimum wage, national parks, progressive taxation, and government rules to clean up the environment or slow global warming. People who live in high-income societies support these programs with great majorities. Such mixed economies involve both the rule of law and the limited liberty to compete.

We survey the centrist approach to economics in the pages that follow. Millions of students in China, India, Latin America, and emerging societies have sought economic wisdom from these pages. Our task is to make sure that the latest and best thinking of economists is contained here, describing the logic of the modern mixed economy, but always presenting in a fair manner the views of those who criticize it from the left and the right.

But we go a step further in our proclamation. We hold that there must be a *limited centrism*. Our knowledge is imperfect, and society's resources are limited. We are also mindful of our current predicament. We see that unfettered capitalism has generated painful inequalities of income and wealth, and that supply-side fiscal doctrines have produced large government deficits. We observe that the major innovations of modern finance, when operating in an unregulated system, have produced trillions of dollars of losses and led to the ruin of many venerable financial institutions.

Only by steering our societies back to the limited center can we ensure that the global economy returns to full employment where the fruits of progress are more equally shared.

Paul A. Samuelson
February 2009

Preface

As we complete this nineteenth edition of *Economics*, the U.S. economy has fallen into a deep recession as well as the most serious financial crisis since the Great Depression of the 1930s. The federal government has invested hundreds of billions of dollars to protect the fragile network of the U.S. and indeed the world financial system. The new Obama administration has worked with Congress to pass the largest stimulus package in American history. The economic turmoil, and the manner in which countries respond to it, will shape the American economy, its labor market, and the world financial system for years to come.

We should remember, however, that the financial crisis of 2007–2009 came after more than a half-century of spectacular increases in the living standards of most of the world, particularly those living in the affluent countries of North America, Western Europe, and East Asia. People are asking, “Will the twenty-first century repeat the successes of the last century? Will the affluence of the few spread to poor countries? Alternatively, will the four horsemen of the economic apocalypse—famine, war, environmental degradation, and depression—spread to the North? Do we have the wisdom to reshape our financial systems so that they can continue to provide the investments that have fueled economic growth up to now? And what should we think about environmental threats such as global warming?”

These are ultimately the questions we address in this new edition of *Economics*.

The Growing Role of Markets

You might think that prosperity would lead to a declining interest in economic affairs, but paradoxically an understanding of the enduring truths of economics has become even more vital in the affairs of people and nations. Those who remember history recognize that the crises that threatened

financial markets in the twenty-first century were the modern counterpart of banking panics of an earlier era.

In the larger scene, the world has become increasingly interconnected as computers and communications create an ever more competitive global marketplace. Developing countries like China and India—two giants that relied heavily on central planning until recently—need a firm understanding of the institutions of a market economy if they are to attain the living standards of the affluent. At the same time, there is growing concern about international environmental problems and the need to forge agreements to preserve our precious natural heritage. All these fascinating changes are part of the modern drama that we call economics.

ECONOMICS Reborn

For more than half a century, this book has served as the standard-bearer for the teaching of introductory economics in classrooms in America and throughout the world. Each new edition distills the best thinking of economists about how markets function and about what countries can do to improve people’s living standards. But economics has changed profoundly since the first edition of this text appeared in 1948. Moreover, because economics is above all a living and evolving organism, *Economics* is born anew each edition as the authors have the exciting opportunity to present the latest thinking of modern economists and to show how the subject can contribute to a more prosperous world.

Our task then is this: We strive to present a clear, accurate, and interesting introduction to the principles of modern economics and to the institutions of the American and world economies. Our primary goal is to emphasize the core economic principles that will endure beyond today’s headlines.

THE NINETEENTH EDITION

As economics and the world around it evolve, so does this book. Our philosophy continues to emphasize six basic principles that underlie earlier editions and this revision:

1. The Core Truths of Economics. Often, economics appears to be an endless procession of new puzzles, problems, and dilemmas. But as experienced teachers have learned, there are a few basic concepts that underpin all of economics. Once these concepts have been mastered, learning is much quicker and more enjoyable. *We have therefore chosen to focus on the central core of economics—on those enduring truths that will be just as important in the twenty-first century as they were in the twentieth.* Microeconomic concepts such as scarcity, efficiency, the gains from specialization, and the principle of comparative advantage will be crucial concepts as long as scarcity itself exists. In macroeconomics, we emphasize the two central approaches: Keynesian economics to understand business cycles, and the neoclassical growth model to understand longer-term growth trends. Within these frameworks, established approaches such as the consumption function take place alongside new developments in financial macroeconomics.

2. Innovation in Economics. Economics has made many advances in understanding the role of innovation. We are accustomed to the dizzying speed of invention in software, where new products appear monthly. The Internet is revolutionizing communications and study habits and is making inroads into commerce.

In addition, we emphasize innovations in economics itself. Economists are innovators and inventors in their own way. History shows that economic ideas can produce tidal waves when they are applied to real-world problems. Among the important innovations we survey is the application of economics to our environmental problems through emissions-trading plans. We explain how behavioral economics has changed views of consumer theory and finance. One of the most important innovations for our common future is dealing with global public goods like climate change, and we analyze new ways to deal with international environmental problems, including approaches such as the Kyoto Protocol. We must

also track innovations in policy, such as the changing approach to monetary policy in the Federal Reserve.

3. Small Is Beautiful. Economics has increased its scope greatly over the past half-century. The flag of economics flies over its traditional territory of the marketplace, but it also covers the environment, legal studies, statistical and historical methods, gender and racial discrimination, and even family life. But at its core, economics is the science of choice. That means that we, as authors, must choose the most important and enduring issues for this text. In a survey, as in a meal, small is beautiful because it is digestible.

Choosing the subjects for this text required many hard choices. To select these topics, we continually survey teachers and leading scholars to determine the issues most crucial for an informed citizenry and a new generation of economists. We drew up a list of key ideas and bid farewell to material we judged inessential or dated. *At every stage, we asked whether the material was, as best we could judge, necessary for a student's understanding of the economics of the twenty-first century.* Only when a subject passed this test was it included. The result of this campaign is a book that has lost more than one-quarter of its weight in the last few editions and has trimmed three chapters for this edition. Farm economics, the history of labor unions, Marxian economics, advanced treatment of general equilibrium, regulatory developments, and the lump-of-labor fallacy have been trimmed to make room for modern financial theory, real business cycles, and global public goods.

4. Policy Issues for Today. For many students, the lure of economics is its relevance to public policy. The nineteenth edition emphasizes policy in both microeconomics and macroeconomics. As human societies grow, they begin to overwhelm the environment and ecosystems of the natural world. Environmental economics helps students understand the externalities associated with economic activity and then analyzes different approaches to making human economies compatible with natural systems. New examples bring the core principles of microeconomics to life.

A second area of central importance is financial and monetary economics. We have completely revised our treatment here. Previous treatment emphasized the quantity of money as the prime channel through which the central bank influences the economy. This

approach no longer reflects the realities of a modern financial system. Today, the Fed exercises its policies by targeting the short-run interest rate and providing liquidity to financial markets. With the nineteenth edition, we fully incorporate these changes in three central chapters.

5. Debates about Globalization. The last decade has witnessed pitched battles over the role of international trade in our economies. Some argue that “outsourcing” is leading to the loss of thousands of jobs to India and China. Immigration has been a hot-burner issue, particularly in communities with high unemployment rates. Whatever the causes, the United States was definitely faced with the puzzle of rapid output growth and a very slow growth in employment in the first decade of the twenty-first century.

One of the major debates of recent years has been over “globalization,” which concerns the increasing economic integration of different countries. Americans have learned that no country is an economic island. Immigration and international trade have profound effects on the goods that are available, the prices we pay, and the wages we earn. Terrorism can wreak havoc on the economy at home, while war causes famines, migration, and reduced living standards in Africa. No one can fully understand the impact of growing trade and capital flows without a careful study of the theory of comparative advantage. We will see how the flow of financial capital has an enormous influence on trading patterns as well as understand why poor countries like China save while rich countries like the United States are borrowers. The nineteenth edition continues to increase the material devoted to international economics and the interaction between international trade and domestic economic events.

6. Clarity. Although there are many new features in the nineteenth edition, the pole star for our pilgrimage for this edition has been to present economics clearly and simply. Students enter the classroom with a wide range of backgrounds and with many preconceptions about how the world works. Our task is not to change students’ values. Rather, we strive to help students understand enduring economic principles so that they may better be able to apply them—to make the world a better place for themselves, their families, and their communities. Nothing aids understanding better than clear, simple exposition. We have labored

over every page to improve this survey of introductory economics. We have received thousands of comments and suggestions from teachers and students and have incorporated their counsel in the nineteenth edition.

Optional Matter

Economics courses range from one-quarter surveys to year-long intensive honors courses. This textbook has been carefully designed to meet all situations. If yours is a fast-paced course, you will appreciate the careful layering of the more advanced material. Hard-pressed courses can skip the advanced sections and chapters, covering the core of economic analysis without losing the thread of the economic reasoning. This book will challenge the most advanced young scholar. Indeed, many of today’s leading economists have written to say they have relied upon *Economics* all along their pilgrimage to the Ph.D.

Format

The nineteenth edition employs in-text logos and material to help illustrate the central topics. You will find a distinctive logo indicating warnings for the fledgling economist, examples of economics in action, and biographical material on the great economists of the past and present. But these central topics are not drifting off by themselves in unattached boxes. Rather, they are integrated right into the chapter so that students can read them and see how they illustrate the core material. Keep these sections in mind as you read through the text. Each one is either:

- A warning that students should pause to ensure that they understand a difficult or subtle point.
- An interesting example or application of the analysis, often representing one of the major innovations of modern economics.
- A biography of an important economic figure.

New features in this edition include fresh end-of-chapter questions, with a special accent on short problems that reinforce the major concepts surveyed in the chapter.

Terms printed in **bold type** in the text mark the first occurrence and definition of the most important words that constitute the language of economics.

But these many changes have not altered one bit the central stylistic beacon that has guided *Economics* since the first edition: to use simple sentences, clear explanations, and concise tables and graphs.

For Those Who Prefer Macro First

Although, like the previous edition, this new edition has been designed to cover microeconomics first, many teachers continue to prefer beginning with macroeconomics. Many believe that the beginning student finds macro more approachable and will more quickly develop a keen interest in economics when the issues of macroeconomics are encountered first. We have taught economics in both sequences and find both sequences work well.

Whatever your philosophy, this text has been carefully designed for it. Instructors who deal with microeconomics first can move straight through the chapters. Those who wish to tackle macroeconomics first should skip from Part One directly to Part Five, knowing that the exposition and cross-references have been tailored with their needs in mind.

In addition, for those courses that do not cover the entire subject, the nineteenth edition is available in two paperback volumes, *Microeconomics* (Chapters 1 to 18 of the full text) and *Macroeconomics* (Chapters 1 to 3, 15, and 19 to 31 of the full text).

Auxiliary Teaching and Study Aids

Students of this edition will benefit greatly from the *Study Guide*. This carefully designed supplement was updated by Walter Park of the American University. When used alongside classroom discussions and when employed independently for self-study, the *Study Guide* has proved to be an impressive success. There is a full-text *Study Guide*, as well as micro and macro versions. The *Study Guides* are available electronically for online purchase or packaged with the text via code-card access.

In addition, instructors will find both the *Instructor's Resource Manual*, updated for this edition by Carlos Liard-Muriente of Central Connecticut State University, and the *Test Bank*, fully revised by Craig Jumper of Rich Mountain Community College. These supplements are incredibly useful for instructors planning their courses and preparing multiple sets of test questions in both print and computerized formats. The graphs and figures in this edition can also be viewed electronically as PowerPoint slides. The slides can be downloaded from our website (www.mhhe.com/samuelson19e). The website also contains chapter summaries, self-grading practice quizzes, and links to the websites suggested for further research at the end of each chapter.

CourseSmart eTextbook

For roughly half the cost of a print book, you can reduce your impact on the environment by purchasing the electronic edition of the nineteenth edition of Samuelson and Nordhaus, *Economics*. CourseSmart eTextbooks, available in a standard online reader, retain the exact content and layout of the print text, plus offer the advantage of digital navigation to which students are accustomed. Students can search the text, highlight, take notes, and use e-mail tools to share notes with their classmates. CourseSmart also includes tech support in case help is ever needed. To buy *Economics*, 19e as an eTextbook, or to learn more about this digital solution, visit www.CourseSmart.com and search by title, author, or ISBN.

Economics in the Computer Age

The electronic age has revolutionized the way that scholars and students can access information. In economics, the information revolution allows us quick access to economic statistics and research. An important feature of the nineteenth edition is the section "Economics and the Internet," which appears just before Chapter 1. This little section provides a road map for the state of economics on the Information Superhighway.

In addition, each chapter has an updated section at the end with suggestions for further reading and addresses of websites that can be used to deepen student understanding or find data and case studies.

Acknowledgments

This book has two authors but a multitude of collaborators. We are profoundly grateful to colleagues, reviewers, students, and McGraw-Hill's staff for contributing to the timely completion of the nineteenth edition of *Economics*. Colleagues at MIT, Yale, and elsewhere who have graciously contributed their comments and suggestions over the years include William C. Brainard, E. Cary Brown, John Geanakoplos, Robert J. Gordon, Lyle Gramley, Gerald Jaynes, Paul Joskow, Alfred Kahn, Richard Levin, Robert Litan, Barry Nalebuff, Merton J. Peck, Gustav Ranis, Herbert Scarf, Robert M. Solow, James Tobin, Janet Yellen, and Gary Yohe.

In addition, we have benefited from the tireless devotion of those whose experience in teaching elementary economics is embodied in this edition. We

are particularly grateful to the reviewers of the nineteenth edition. They include:

Esmael Adibi, *Chapman University*
 Abu Dowlah, *Saint Francis College*
 Adam Forest, *University of Washington, Tacoma*
 Harold Horowitz, *Touro College*
 Jui-Chi Huang, *Harrisburg Area Community College*
 Carl Jensen, *Iona College, New Rochelle*
 Craig Jumper, *Rich Mountain Community College*
 Carlos Liard-Muriente, *Central Connecticut State University*
 Phillip Letting, *Harrisburg Area Community College*
 Ibrahim Oweiss, *Georgetown University*
 Walter Park, *American University*
 Gordana Pesakovic, *Argosy University, Sarasota*
 Harold Peterson, *Boston College*
 David Ruccio, *University of Notre Dame*
 Derek Trunkey, *George Washington University*
 Mark Witte, *Northwestern University*
 Jiawen Yang, *George Washington University*

Students at MIT, Yale, and other colleges and universities have served as an “invisible college.” They constantly challenge and test us, helping to make this edition less imperfect than its predecessor. Although they are too numerous to enumerate, their influence is woven through every chapter. Nancy King helped in logistics at the New Haven end of the operation. We are particularly grateful for the contribution of Caroleen Verly, who read the manuscript and made many suggestions for improvement. We are grateful to Dr. Xi Chen, who prepared the economic globes and reviewed the manuscript.

This project would have been impossible without the skilled team from McGraw-Hill who nurtured the book at every stage. We particularly would like to thank, in chronological order to their appearance on the scene: Douglas Reiner, Karen Fisher, Noelle Fox, Susanne Reidell, Lori Hazzard, Matt Baldwin, and Jen Lambert. This group of skilled professionals turned many megabytes and a mountain of paper into a finely polished work of art.

A WORD TO THE SOVEREIGN STUDENT

You have read in history books of revolutions that shake civilizations to their roots—religious conflicts, wars for political liberation, struggles against

colonialism and imperialism. Two decades ago, economic revolutions in Eastern Europe, in the former Soviet Union, in China, and elsewhere tore those societies apart. Young people battered down walls, overthrew established authority, and agitated for democracy and a market economy because of discontent with their centralized socialist governments.

Students like yourselves were marching, and even going to jail, to win the right to study radical ideas and learn from Western textbooks like this one in the hope that they may enjoy the freedom and economic prosperity of democratic market economies.

The Intellectual Marketplace

Just what is the market that students in repressed societies are agitating for? In the pages that follow, you will learn about the promise and perils of globalization, about the fragility of financial markets, about unskilled labor and highly trained neurosurgeons. You have probably read in the newspaper about the gross domestic product, the consumer price index, the Federal Reserve, and the unemployment rate. After you have completed a thorough study of this textbook, you will know precisely what these words mean. Even more important, you will also understand the economic forces that influence and determine them.

There is also a marketplace of ideas, where contending schools of economists fashion their theories and try to persuade their scientific peers. You will find in the chapters that follow a fair and impartial review of the thinking of the intellectual giants of our profession—from the early economists like Adam Smith, David Ricardo, and Karl Marx to modern-day titans like John Maynard Keynes, Milton Friedman, and James Tobin.

Skoal!

As you begin your journey into the land of the mixed economy, it would be understandable if you are anxious. But take heart. The fact is that we envy you, the beginning student, as you set out to explore the exciting world of economics for the first time. This is a thrill that, alas, you can experience only once in a lifetime. So, as you embark, we wish you bon voyage!

Paul A. Samuelson
 William D. Nordhaus

For the Student: Economics and the Internet

The Information Age is revolutionizing our lives. Its impact on scholars and students has been particularly profound because it allows inexpensive and rapid access to vast quantities of information. The Internet, which is a huge and growing public network of linked computers and information, is changing the way we study, shop, share our culture, and communicate with our friends and family.

In economics, the Internet allows us quick access to economics statistics and research. With just a few clicks of a mouse, we can find out about the most recent unemployment rate, track down information on poverty and incomes, or investigate the intricacies of our banking system. A few years ago, it might have taken weeks to dig out the data necessary to analyze an economic problem. Today, with a computer and a little practice, that same task can be done in a few minutes.

This book is not a manual for driving on the Information Superhighway. That skill can be learned in classes on the subject or from informal tutorials. Rather, we want to provide a road map that shows the locations of major sources of economic data and research. With this map and some rudimentary navigational skills, you can explore the various sites and find a rich array of data, information, studies, and chat rooms. Additionally, at the end of each chapter there is a list of useful websites that can be used to follow up the major themes of that chapter.

Note that some of these sites may be free, some may require a registration or be available through your college or university, and others may require paying a fee. Pricing practices change rapidly, so while we have attempted to include primarily free sites, we have not excluded high-quality sites that may charge a fee.

Data and Institutions

The Internet is an indispensable source of useful data and other information. Since most economic data are provided by governments, the first place to

look is the web pages of government agencies and international organizations. The starting point for U.S. government statistics, www.fedstats.gov, provides one-stop shopping for federal statistics with links to over 70 government agencies that produce statistical information. Sources are organized by subject or by agency, and the contents are fully searchable. Another good launching site into the federal statistical system is the Economic Statistics Briefing Room at www.whitehouse.gov/fsbr/esbr.html. Additionally, the Commerce Department operates a huge database at www.stat-usa.gov, but use of parts of this database requires a subscription (which may be available at your college or university).

The best single statistical source for data on the United States is the *Statistical Abstract of the United States*, published annually. It is available online at www.census.gov/compendia/statab. If you want an overview of the U.S. economy, you can read the *Economic Report of the President* at www.gpoaccess.gov/eop/index.html.

Most of the major economic data are produced by specialized agencies. One place to find general data is the Department of Commerce, which encompasses the Bureau of Economic Analysis (BEA) (www.bea.gov) and the Census Bureau (www.census.gov). The BEA site includes all data and articles published in the *Survey of Current Business*, including the national income and product accounts, international trade and investment flows, output by industry, economic growth, personal income and labor series, and regional data.

The Census Bureau site goes well beyond a nose count of the population. It also includes the economic census as well as information on housing, income and poverty, government finance, agriculture, foreign trade, construction, manufacturing, transportation, and retail and wholesale trade. In addition to making Census Bureau publications available, the site allows users to create custom extracts of popular microdata sources including the Survey of Income and Program Participation, Consumer Expenditure

Survey, Current Population Survey, American Housing Survey, and, of course, the most recent census.

The Bureau of Labor Statistics (at www.bls.gov) provides easy access to commonly requested labor data, including employment and unemployment, prices and living conditions, compensation, productivity, and technology. Also available are labor-force data from the Current Population Survey and payroll statistics from the Current Employment Statistics Survey.

A useful source for financial data is the website of the Federal Reserve Board at www.federalreserve.gov. This site provides historical U.S. economic and financial data, including daily interest rates, monetary and business indicators, exchange rates, balance-of-payments data, and price indexes. In addition, the Office of Management and Budget at www.gpo.gov/usbudget/index.html makes available the federal budget and related documents.

International statistics are often harder to find. The World Bank, at www.worldbank.org, has information on its programs and publications at its site, as does the International Monetary Fund, or IMF, at www.imf.org. The United Nations website (www.unsystem.org) is slow and confusing but has links to most international institutions and their databases. A good source of information about high-income countries is the Organisation for Economic Cooperation and Development, or OECD, at www.oecd.org. The OECD's website contains an array of data on economics, education, health, science and technology, agriculture, energy, public management, and other topics.

Economic Research and Journalism

The Internet is rapidly becoming the world's library. Newspapers, magazines, and scholarly publications are increasingly posting their writing in electronic form. Most of them present what is already available in the paper publications. Some interesting sources can be found at the *Economist* at www.economist.com and the *Financial Times* (www.ft.com). The *Wall Street Journal* at www.wsj.com is currently expensive and not a cost-effective resource. Current policy issues are discussed at www.policy.com. The online magazine *Slate* at www.slate.com occasionally contains excellent essays on economics.

For scholarly writings, many journals are making their contents available online. WebEc at www.helsinki.fi/WebEc/ contains a listing of websites for many economic journals. The archives of many journals are available at www.jstor.org.

There are now a few websites that bring many resources together at one location. One place to start is *Resources for Economists on the Internet*, sponsored by the American Economic Association and edited by Bill Goffe, at www.rfe.org. Also see *WWW Resources in Economics*, which has links to many different branches of economics at netec.wustl.edu/WebEc/WebEc.html. For working papers, the National Bureau of Economic Research (NBER) website at www.nber.org contains current economic research. The NBER site also contains general resources, including links to data sources and the official U.S. business-cycle dates.

An excellent site that archives and serves as a depository for working papers is located at econwpa.wustl.edu/wpawelcome.html. This site is particularly useful for finding background material for research papers.

Did someone tell you that economics is the dismal science? You can chuckle over economist jokes (mostly at the expense of economists) at netec.mcc.ac.uk/JokEc.html.

A Word of Warning

It is an unfortunate fact that, because of rapid technological change, this list will soon be out of date. New sites with valuable information and data are appearing every day . . . and others are disappearing almost as rapidly.

Before you set off into the wonderful world of the Web, we would pass on to you some wisdom from experts. Remember the old adage: You only get what you pay for.

Warning: Be careful to determine that your sources and data are reliable. The Internet and other electronic media are easy to use and equally easy to abuse.

The Web is the closest thing in economics to a free lunch. But you must select your items carefully to ensure that they are palatable and digestible.