

MICROECONOMICS

GOOLSBEE LEVITT SYVERSON

SECOND EDITION



Examples and Applications

With carefully crafted features, students are shown the practical uses of theory and how to apply theory to a variety of situations. Here's what your fellow students are saying about the examples and applications in *Microeconomics*:

"It makes economics more than a theory, it makes it become real."

–Bryan Meek, student at Michigan State University



FIGURE IT OUTS

"I absolutely love the Figure It Out boxes. They help so much when I am trying to study for exams or just grasp a concept that is confusing to only read about. I really like that the solution is worked out so you know the process rather than there just being an answer."

–Hannah Hagy, student at University of Mary Washington



APPLICATIONS/EXAMPLES

"I really appreciate the Applications. It makes the theory seem more applicable to real life."

–Katherine Walker, student at Tufts University



FREAKONOMICS

"I really like the Freakonomics (I also bought the book!) in the text book. I think it relates to the real world in a very interesting way."

–Yingjie Liu, student at University at Virginia

1 Adventures in Microeconomics

Application

Rideshare Driving the Microeconomics Way 5

The Benefits of Studying Economics 9



Freakonomics

Thomas Thwaites's Toaster 3

Make the Grade

Holding the Rest of the World Constant 4

2 Supply and Demand

Application

Supply Shifts and the Video Game Crash 30

The Supply Curve of Housing and Housing Prices:

A Tale of Two Cities 35

Demand Elasticities and the Availability of
Substitutes 41



Figure It Out

2.1 Equilibrium in Monthly Cell Phone Plans 24

2.2 Demand and Supply in a Paperback Book
Market 26

2.3 Demand and Supply in the Lemonade Market 29

2.4 Demand and Supply in the Market for
Asparagus 32

2.5 Calculating the Price Elasticity for Gym
Membership 46

2.6 Price Elasticity and the Demand for Cereal and
Milk 50



Freakonomics

What Do President Obama and Taylor Swift Have in
Common? 28



Make the Grade

Does Quantity Supplied Equal Quantity Demanded in
Equilibrium? 22

Did the Curve Shift, or Was It Just a Movement along the Curve? 33

3 Using Supply and Demand to Analyze Markets

Application

- The Value of Innovation 62
- What Is LASIK Eye Surgery Worth to Patients? 63
- How Much Did 9/11 Hurt the Airline Industry? 66
- The Cost of the Black-Liquor Loophole 97

Figure It Out

- 3.1 Surplus in the Newspaper Market 60
- 3.2 Changes in Surplus in the Tire Market 69
- 3.3 Tax Incidence in the Soda Market 95
- 3.4 Analyzing Subsidies in an Ethanol Market 98

Freakonomics

Unintended Consequences of a Tax on Garbage 89

Make the Grade

Did I Measure Deadweight Loss Correctly? 93

4 Consumer Behavior

Application

- Indifference Curves for Breakfast Cereal 119
- Indifference Curves for “Bads” 126

Figure It Out

- 4.1 The Marginal Rate of Substitution for Music Downloads and Concert Tickets 118
- 4.2 The Marginal Rate of Substitution for Baseball and Reality Shows 125
- 4.3 A Budget Constraint for Candy Bars and Video Games 131
- 4.4 Maximizing the Utility of Burgers and Fries 137
- 4.5 Pizza Promotion and Consumption 140

Freakonomics

Do Minnesotans Bleed Purple? 115

Make the Grade

Draw Some Indifference Curves to Really Understand the Concept 113

5 Individual and Market Demand

Application

Engel Curves and House Sizes 161

Someone Actually Found a Giffen Good! 180

Movies in a Theater and at Home—Substitutes or Complements? 184

Figure It Out

- 5.1 Distinguishing Normal from Luxury Goods: Pancakes and Golf 163
- 5.2 Substitution Effects and the Demand for Theater Tickets 168
- 5.3 Consumption of Cakes and Pies 176
- 5.4 Market Demand in a Small Gasoline Market 188

Freakonomics

Even Animals Like Sales 167

Make the Grade

Computing Substitution and Income Effects from a Price Change 174

Simple Rules to Remember about Income and Substitution Effects 181

Adding Demand Curves Horizontally, Not Vertically 187

6 Producer Behavior

Application

- Hospitals’ Input Choices and Medicare Reimbursement Rules 221
- Technological Change in U.S. Manufacturing 227

Figure It Out

- 6.1 Calculating the Marginal and Average Product of Labor 208
- 6.2 Drawing a Firm’s Isocost Lines 217
- 6.3 Determining Whether a Firm Is Minimizing Its Costs 220
- 6.4 Determining Returns to Scale 225

Freakonomics

Why do Indian Fishermen Love Their Cell Phones So Much? 228

Make the Grade

How to Determine a Production Function’s Returns to Scale 223

7 Costs

Application

Making Big Money by *Not* Operating Your Business—A Lesson about Opportunity Cost 248

Gym Memberships 251

Why Do Film Studios Make Movies That They Know Will Lose Money? 252

Economies of Scale in Retail: Goodbye, Mom and Pop? 274

Figure It Out

7.1 Calculating Accounting Cost, Economic Cost, and Economic Profit 249

7.2 Calculating Marginal Cost 262

7.3 Finding a Firm's Fixed, Variable, and Average Costs 265

7.4 Solving for a Firm's Cost-Minimizing Combination of Labor and Capital 270

7.5 Determining Economies and Diseconomies of Scale 274

Freakonomics

3D Printers and Manufacturing Cost 261

8 Supply in a Competitive Market

Application

Do Firms Always Maximize Profits? 293

The Supply Curve of a Power Plant 300

The Short-Run Supply of Crude Oil 304

Short-Run Industry Supply and Producer Surplus in Electricity Generation 307

Entry and Exit at Work in Markets—Residential Real Estate 312

The Increased Demand for Corn 318

Figure It Out

8.1 Solving for the Profit-Maximizing Output Level 296

8.2 Determining the Shut-Down Price for a Competitive Firm 297

8.3 Deriving the Industry Supply and Calculating Producer Surplus 306

8.4 The Long-Run Impact of a Decrease in Demand 319

Freakonomics

The Not-So-Simple Economics of Blackmail 314

Make the Grade

A Tale of Three Curves 298

9 Market Power and Monopoly

Application

Natural Monopoly in Satellite Radio 333

Controlling a Key Input—The Troubled History of Fordlandia, Brazil 335

Market Power versus Market Share 350

Southwest Airlines 357

Patent Length and Drug Development 364

Figure It Out

9.1 Calculating Marginal Revenue for a Firm with Market Power 344

9.2 Determining the Profit-Maximizing Output Quantity and Price 347

9.3 Determining the Effects of a Decrease in the Demand on the Firm's Profit-Maximizing Output and Price 354

9.4 Calculating the Deadweight Loss of Market Power 359

Freakonomics

Why Drug Dealers Want Peace, Not War 337

10 Pricing Strategies for Firms with Market Power

Application

How Priceline Learned That You Can't Price-Discriminate without Market Power 384

Segmenting by Location in the European Market for Cars 394

Figure It Out

10.1 Calculating Producer and Consumer Surplus in Perfect Price Discrimination 382

10.2 Solving for the Profit-Maximizing Price in Segmenting 392

10.3 Evaluating the Incentive Compatibility of a Quantity Discount 400

10.4 Determining the Profit-Maximizing Bundle Price 407

10.5 Calculating the Optimal Two-Part Tariff 412

Freakonomics

Victoria's Not-So-Secret Price Discrimination 393

Make the Grade

Is It Really Price Discrimination? 391

11 Imperfect Competition

Application

- An Example of Nash Equilibrium: Marketing Movies 422
- OPEC and the Control of Oil 429
- The Indianapolis Concrete Cartel 431
- Computer Parts—Differentiation Out of Desperation 452

Figure It Out

- 11.1 Evaluating a Collusive Agreement 430
- 11.2 Determining the Cournot Equilibrium for Two Firms 440
- 11.3 Determining the Optimal Pricing Strategy for a Stackelberg First-Mover 446
- 11.4 Calculating the Impact of an Increase in the Demand for One Firm's Product in a Differentiated Bertrand Equilibrium 451
- 11.5 Calculating the Profit-Maximizing Price and Output Quantity for a Monopolistically Competitive Firm 457

Freakonomics

- Apple Always Wins, or Does It? 425

12 Game Theory

Application

- Random Mixed Strategies in Soccer 476
- Fun in the Sun: Wine Making for Irrational Billionaires 478
- Dr. Strangelove and the Perils of Secrecy 497
- Incumbent Airlines' Responses to Threatened Entry by Southwest 500

Figure It Out

- 12.1 Solving for the Nash Equilibrium 472
- 12.2 Solving for Equilibria in Repeated Games 484
- 12.3 Nash Equilibria in a Sequential Game 490
- 12.4 Examining Strategic Moves in the Pharmaceutical Industry 496

Freakonomics

- Game Theory in Track Cycling Competitions 492

Make the Grade

- The Check Method 471
- Backward Induction and Trimming Trees 488

13 Factor Markets

Application

- Tiger Woods's Backward-Bending Labor Supply Curve 521
- Smartphones, Coltan, and Conflict Minerals 526
- The Rookie Pay Schedule in the NBA 531
- Longshore Workers' Wage Premium 534

Figure It Out

- 13.1 Calculating the Optimal Quantity of Labor to Hire and the Wage Rate 514
- 13.2 The Optimal Quantity of Labor to Hire and the Wage Rate under Monopsony 532

Freakonomics

- Competition in the Market for Economists 524

14 Investment, Time, and Insurance

Application

- Replacing Planes 550
- The Insurance Value of Medicare 563

Figure It Out

- 14.1 Calculating Present Discounted Value 547
- 14.2 Using Net Present Value Analysis 553
- 14.3 Calculating the Expected Returns of an Investment 558
- 14.4 Examining the Relationship between Risk Aversion and Expected Utility 566

Freakonomics

- Insurance for Subway Fare Evaders 565

15 General Equilibrium

Application

- The General Equilibrium of Carmageddon 581
- General Equilibrium Interaction of Cities' Housing and Labor Markets 585
- Output Efficiency among Manufacturing Firms in India 606

Figure It Out

- 15.1 Solving for the General Equilibrium Price and Quantity 580
- 15.2 Calculating Social Welfare 588
- 15.3 Using Edgeworth Boxes to Find Pareto Improvements 596

15.4 Examining Production Efficiency in a Two-Good Economy 601

15.5 Examining Output Efficiency in a Two-Good Economy 605

Freakonomics

Horse Meat and General Equilibrium 584

16 Asymmetric Information

Application

Reputations in Collectibles Sales 622

Adverse Selection in Credit Cards 626

Usage-Based Auto Insurance 633

The Principal–Agent Problem in Residential Real Estate Transactions 637

Advertising as a Signal of Quality 644

Figure It Out

16.1 Describing the Effects of Asymmetric Information in the Market for Used Laptops 621

16.2 Examining Moral Hazard in a Market with and without Insurance 630

16.3 Solving for the Nash Equilibrium in a Principal-Agent Situation 638

16.4 Using Signals in the Used Car Market 644

Freakonomics

Online Ratings and Information Asymmetries 625

17 Externalities and Public Goods

Application

Phone-Finding Apps and Positive Externalities 658

Facebook Fixes an Externality 663

Would Higher Driving Taxes Make Us Happier Drivers? 665

Sometimes the Coase Theorem Takes a While 674

Figure It Out

17.1 Calculating the Socially Optimal Output and Price in a Market with Externalities 655

17.2 Using a Pigouvian Tax to Achieve the Socially Optimal Productive Output 664

17.3 Analyzing the Socially Optimal Outcome in an Industry with Pollution 674

17.4 Finding the Socially Optimal Quantity of a Public Good 680

Freakonomics

Is Fire Protection a Public Good? 682

18 Behavioral and Experimental Economics

Application

The Sunk Cost Fallacy and Professional Athletes 698

Do Animals Care about Fairness? 701

Freakonomics

Going to the Ends of the World (Literally) to Test Economic Theory 706

Microeconomics

SECOND EDITION

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From Austan

To my teachers—Paul Volcker, James Tobin, and Jim Poterba: the immortals.

From Steve

To the next generation of economists, whose wisdom will shape the future.

From Chad

*To my teachers, professors, and mentors, who showed me
how fantastic being an economist could be.*

From all

*And to the University of Chicago, where people don't just study economics,
they live it, breathe it, eat it, and sleep it. The world of economics would
never be the same without you, and neither would we.*

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Handy as a Swiss Army Knife



Resources for Students and Instructors

www.macmillanhigher.com/launchpad/gls2e

Just like the versatile Swiss Army knife on the book's cover, LaunchPad, Macmillan Education's next generation coursespace, shows its versatility by combining an interactive e-Book with high-quality tools for teaching and learning intermediate microeconomics, including multimedia content and ready-made assessment options. Pre-built, curated units are easy to assign or adapt with your own material, such as readings, videos, quizzes, discussion groups, and more. LaunchPad also provides access to a gradebook that provides a clear window on performance for your whole class, for individual students, and for individual assignments.

Worth Publishers has collaborated with a number of experienced and committed instructors of intermediate microeconomics to develop resources to complement the text and provide useful tools and resources for teaching the course and learning the material.



Krasyuk Volodymyr/Veer/Corbis

The following resources are available in LaunchPad:

For Students



LearningCurve is an adaptive quizzing engine that automatically adjusts questions to the student's mastery level. With LearningCurve activities, each student follows a unique path to understanding the material. The more questions a student answers correctly, the more difficult the questions become. Each question is written specifically for the text and is linked to the relevant e-Book section. LearningCurve also provides a personal study plan for students as well as complete metrics for instructors. Proven to raise student performance, LearningCurve serves as an ideal formative assessment and learning tool. For detailed information, visit <http://learningcurveworks.com>.

LEARNINGCurve 3.2.2 Understanding Shifts of the Demand Curve

Suppose that clothes from the thrift store are inferior goods. If incomes decrease

- demand will decrease.
- demand will increase.
- demand will decrease and then shift back to its original level.
- demand will remain the same.

Whoops. The correct answer is not:
demand will remain the same.
→ If incomes decrease, demand for inferior goods will increase.
Try again, check the e-book, GET A HINT, or click SHOW ME to see the answer and try another question.

• Index 511
• Topic: Test Questions
• Level: 2
• Answer: demand will increase.
• HELLLOO

Get a Hint Show Me

NEW Figure It Out Tutorials

New to this edition, these tutorials expand on the text's popular feature of the same name and guide students through the process of applying economic analysis and using math to solve select Figure It Out problems found in the text. These detailed, worked-out problems will better prepare students to complete the end-of-chapter exercises and questions found on quizzes and exams. The tutorials include thorough feedback and video explanations, providing students with interactive assistance for each step of the problem. For more information about the text's Figure It Outs, see p. xiv.

eFigure Animations

Based on key figures from the text, the narrated eFigure animations walk students through important graphical concepts of intermediate micro. These animations are embedded in the e-Book and are also available as assignable activities, accompanied with multiple-choice assessment.

Online Calculus Appendices, Figure It Outs, and End-of-Chapter Problems

In addition to the five in-text appendices, ten additional calculus appendices are available online for students and instructors. These appendices include examples and Figure It Out problems, which are often the same as the algebra-based ones in the chapter. All of the calculus appendices are linked in the e-Book. In addition, the e-Book contains calculus versions of Figure It Out problems and end-of-chapter problems. For more information about calculus coverage in this text, see the section "How We Deal with Math" on p. xvii.

Flashcards

Students can test their knowledge of the definitions in the glossary with these virtual flashcards.

For Instructors

Lecture Notes with Teaching Tips

Linda Ghent (Eastern Illinois University) has developed detailed lecture notes covering all of the chapters of *Microeconomics*, Second Edition. These lecture notes contain teaching tips and additional Figure It Out problems. Instructors can use these to prepare their lectures, and they can reproduce whatever pages they choose as handouts for students.

Solutions Manual

Debbie Evercloud (University of Colorado Denver) has updated the *Solutions Manual* for all of the end-of-chapter problems found in the text. Instructors can choose to make these detailed solutions available to their students.

Test Bank

The *Test Bank* makes building tests easy with multiple-choice and short-answer problems covering each chapter of the text. Kevin Beckwith (Salem State University) has revised the *Test Bank* for this edition. For this edition, the *Test Bank* also includes calculus-based problems, authored by Anita Pena (Colorado State University), to accompany the content found in the book's calculus appendices. The *Test Bank* provides a wide range of questions appropriate for assessing your students' comprehension, interpretation, analysis, and synthesis skills.

Lecture Slides

Revised for this edition by Martin Gray Hunter (University of Kentucky), the lecture slides feature animated graphs with careful explanations and additional Figure It Out, Applications, data, and helpful notes to the instructor.

Graphing Questions

As a further question bank for instructors building assignments and tests, the electronically gradable graphing problems utilize our own robust graphing engine. In these problems, students will be asked to draw their response to a question, and the software will automatically grade that response. Graphing questions are tagged to appropriate textbook sections and range in difficulty and skill level.

Get your feet wet with our graphing tools: Let's imagine a market for Tabloid Newspapers.

Part 1: Select the Line tool and draw a downward-sloping line. Label it "Demand 1". Next, using the same tool, draw an upward-sloping line that intersects "Demand 1" and label it "Supply 1".

Part 2: Use the Double Drop Line tool to identify the price and quantity where the two lines intersect. Label it "Equilibrium 1".

Part 3: With the Line tool, draw a new downward-sloping line that is to the LEFT of "Demand 1". Label it "Demand 2". Use the Double Drop Line tool to show the new equilibrium price and quantity in the global market for this Alien Bigfoot Journalism. Label this point "Equilibrium 2". Feel momentarily happy that demand for sensational stories has fallen, then remember that it's only because of the rise in demand for substitute goods like reality TV.

Continue to play with the graph if you like. We know you are an economist, after all.

Coordinates: (100, 20) (400, 400)

Price of Tabloid Newspapers

Quantity of Tabloid Newspapers

- Demand 1
- Supply 1
- Equilibrium 1
- Demand 2
- Equilibrium 2
- Unselected

Done All Cancel Submit Answer Try Again


Feedback: **Well done!** With these of the universal having used its set publishing days, both the price and equilibrium quantity of Tabloid Newspapers will drop. Now we'll have more time for the more serious content of *Realism*.

Next Question

Pre-Built Homework Assignments

Each LaunchPad unit concludes with a pre-built assignment, providing instructors with a curated set of multiple-choice and graphing questions that can be easily assigned for practice or graded assessment.

Brief Contents



See the
detailed
Contents
beginning on
page xxv.

Preface x

Part 1 Basic Concepts

- 1** Adventures in Microeconomics 1
- 2** Supply and Demand 11
- 3** Using Supply and Demand to Analyze Markets 57

Part 2 Consumption and Production

- 4** Consumer Behavior 105
- 5** Individual and Market Demand 155
- 6** Producer Behavior 201
- 7** Costs 247

Part 3 Markets and Prices

- 8** Supply in a Competitive Market 287
- 9** Market Power and Monopoly 331
- 10** Pricing Strategies for Firms with Market Power 377
- 11** Imperfect Competition 421
- 12** Game Theory 465
- 13** Factor Markets 511

Part 4 Beyond the Basics

- 14** Investment, Time, and Insurance 541
- 15** General Equilibrium 573
- 16** Asymmetric Information 615
- 17** Externalities and Public Goods 651
- 18** Behavioral and Experimental Economics 691

Math Review Appendix MR-1

Solutions to Review Questions SA-1

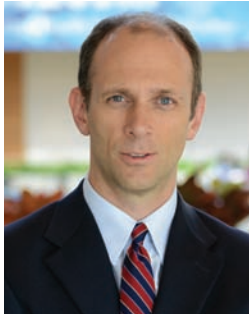
Solutions to Select End-of-Chapter Problems SB-1

Glossary G-1

References R-1

Index I-1

About the Authors



Den Dry

Austan Goolsbee is the Robert P. Gwinn Professor of Economics at the University of Chicago Booth School of Business where he joined the faculty in 1995. From 2009 to 2011, he served in Washington as a Member and then Chairman of the Council of Economic Advisers and the youngest member of the President's Cabinet. He is a past Alfred P. Sloan Fellow and Fulbright Scholar. He earned bachelor's and master's degrees from Yale University and a PhD in economics from the Massachusetts Institute of Technology.



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Photo by JasonSmith.com

Chad Syverson is the J. Baum Harris Professor of Economics at the University of Chicago Booth School of Business. His research spans several topics, with a particular focus on the interactions of firm structure, market structure, and productivity. His work has earned multiple National Science Foundation awards. He is on the editorial boards of several economics and business journals, has served on National Academies committees, and is a research associate of the National Bureau of Economic Research. He earned bachelor's degrees in economics and mechanical engineering from the University of North Dakota, and a PhD in economics from the University of Maryland. Syverson joined the Chicago faculty in 2001.

Preface

Why Us?

The three of us have been friends for a long time. When we agreed to write this book together, we wanted to bring an important, practical, and diverse perspective to the presentation of intermediate microeconomics. We teach in economics departments and in business schools, and we are active empirical microeconomics researchers. Our grounding in different areas of empirical research allows us to present the evidence developed in the last 20 years that has tested and refined the fundamental theories. We are confident that our teaching and professional experiences are reflected in an outstanding presentation of microeconomics theories and applications.

Teaching in both economics departments *and* business schools has a further benefit. As teachers, we are often challenged by students who want to make sure they are getting their money's worth. These students want to see how realistic theory can be if used in practical settings. We wrote this book with such students in mind.

Why Our Book Is Different

We couldn't have been more obvious or explicit about our approach to microeconomics: We put a Swiss Army knife on the cover of the book, a theme we've continued in this edition. The Swiss Army knife contains many basic tools that you can use to accomplish many varied tasks. And this is how we view microeconomics:

- It introduces tools that are **fundamental** to all the various forms and extensions of economics, and
- It is extremely **useful** for making decisions in business, government, and everyday life.

We believe that microeconomics should inspire and excite students with its elegance and usefulness, and that a textbook should support this goal. We want to help each student grow from someone who has learned some economic principles to someone who can apply the tools of economic analysis to real situations, as economists do. And in envisioning and writing this book we wanted to deal effectively with two questions we hear regularly from students about the micro course: *Do people and firms really act as theory suggests?* and *How can someone use microeconomic theory in a practical way?*

Do people and firms really act as theory suggests?

All microeconomics texts present the standard tools and theory of economics and all have examples. In their presentations, however, they do little to address a student's natural skepticism and they expect students to take on faith that these theories work. They do not always show effectively that these theories can be used in specific and practical ways.

Furthermore, the ease with which data can be collected and analyzed has led to a radical shift in microeconomics and current texts have not fully kept up with the dramatic rise of empirical work in applied microeconomics research. Undergraduates and business

school students will find microeconomics compelling if it not only explains the theory, but also demonstrates how to use it, and provides real-world data to back it up. We show students the reality behind the theory in our plentiful and up-to-date examples, Applications, and Freakonomics essays. We have developed and selected events, topics, and empirical studies with a clear eye toward *how* economists use real data to test ideas. By including this empirical dimension, *Microeconomics* shows, often in surprising ways, that the theories can explain real behavior and where theories need to be modified.

How can someone use microeconomics in a practical way?

Students often view the intermediate microeconomics course as abstract and theoretical. Because this course requires a high degree of effort from students, they should know why and how the material they learn will be useful. Without that knowledge, they will be bored and unmotivated. So we wanted to write a book of **useful economics**. When done the right way, economics *is* extremely useful: useful for business, useful for policy, useful for life. By illustrating how theory and research can explain and illuminate everyday events, market characteristics, business strategies, and government policies, our book shows students how to take the tools they learn and *do* something with them.

Our Second Edition

We are happy to report that comments from instructors *and* students tell us that we achieved our goals. Our accessible writing and patient explanations, along with our current, vivid, and occasionally quirky examples (some of them found in Steve's Freakonomics boxes) have helped students see the beauty, power, utility, and practicality of economic thinking. And the extensive online resources helped instructors enhance the course, improved assessment, and presented students with a wide variety of tools to help them succeed in the course.

Improving Our Book

In preparing this revision, we, with the help of Worth Publishers, have benefited greatly from direct reports and reviews from those most engaged with the book: instructors and students. We were gratified to learn that both groups found our book to be

- clear and accessible in its exposition of theory,
- loaded with plentiful, engaging examples and applications of real-life events and decisions, and
- patient and helpful in teaching students just how to think about, approach, and solve problems.

We also received excellent feedback on what content to clarify, add, or delete. This feedback directly influenced decisions on content, pedagogy, and supplementary resources.

Enhanced Content

Foremost among instructors' suggestions was the request for a full chapter on factor markets. In this edition, we have written **a new chapter, Chapter 13: Factor Markets**, which covers the operation of perfectly and imperfectly competitive markets. In addition to a

thorough analysis of the theory, the chapter features many interesting applications such as “Tiger Woods’s Backward-Bending Labor Supply Curve,” “Smartphones, Coltan, and Conflict Minerals,” “The Rookie Pay Schedule in the NBA,” and “Longshore Workers’ Wage Premium.” To see the coverage in this completely new chapter, see p. viii in the Brief Contents, or turn to p. 511. While we thoroughly cover labor, land, and other factor markets in this new chapter, we kept our coverage of the capital market in Chapter 14, which deals with the issues of time and uncertainty. We felt that was a more natural place to discuss capital, which is unique among factors in terms of the prominence of time and uncertainty in shaping market outcomes.

Also following the requests of many instructors, we have moved some of the more detailed coverage of particular topics (such as price elasticity of demand and expenditures; binding price ceilings and floors; direct government provision of goods and services; expenditure minimization versus profit maximization and the “dual”; Giffen goods; risk aversion and investment decisions under uncertainty; and tradable permits) out of the main text in order to streamline it. All of that material is still available under Instructor Resources on the book’s LaunchPad site for anyone who wants to cover the subjects at more length.

Real World, Real Life

Microeconomics provides examples that offer unusual perspectives on the seemingly ordinary. We were gratified by the overwhelmingly positive response to the many ways in which we integrated real-life, up-to-date, and, above all, interesting examples and Applications into our presentation. Instructors especially appreciated our extensive inclusion of empirical examples. All told, we have over 200 examples (20% of them new in this edition), Applications, and Freakonomics boxes that illustrate how useful the microeconomic toolbox is in illuminating and understanding all aspects of economics and life.

Our Freakonomics boxes, in particular, show how (in often surprising ways) economic analysis can illuminate not only common phenomena but also things not normally thought to be within the economist’s purview.

Here are a just few of our **new Applications and Freakonomics** essays. For a complete list of these features, please look inside the front cover.

Applications:

Rideshare Driving the Microeconomics Way

Economies of Scale in Retail: Goodbye, Mom and Pop?

Patent Length and Drug Development (cites new research by economists Eric Budish, Benjamin Roin, and Heidi Williams)

Facebook Fixes an Externality

Freakonomics:

3D Printers and Manufacturing Cost

Horsemeat and General Equilibrium



Application: Rideshare Driving the Microeconomics Way

In microeconomics, we focus in large part on two key economic players, consumers (buyers) and producers (firms). We all have ample experience as consumers. Every time we go to the supermarket or the college bookstore, we are consumers. This makes it easier to grasp the economic intuition of the consumer's problem. It's often more difficult to understand producers and the issues they face because the majority of us will make far fewer production decisions over our lifetimes.

When we think about production, big firms like Procter & Gamble or United Airlines might come to mind. But, there are also many small producers including, among thousands of others, mom and pop stores, plumbers, and people selling anything and everything on eBay. At a fundamental level, these small sellers face many of the same sorts of decisions

Let's look at the production decisions a car driver for a ridesharing service faces.

Suppose you are interested in working for one of these alternatives to taxicabs. The first decision you need to make is which ridesharing company to affiliate with. Uber and Lyft are the two biggest companies, so many drivers consider these to be their principal options. Uber is larger and aims to be slightly more upscale (the business requires the driver to have a newer-model car, offers limo/sedan services, and the like); Lyft sells itself as fun and cool, with drivers sometimes greeting customers with fist bumps and glowing pink mustaches on their dashboards. You must decide which one is likely to bring you more income.



Jeff Chiu/AP Photo

Deciding whether to join Uber or Lyft is only one of many decisions you will make.

stance, for a company for both companies, s

Once you're signed you will provide. The weekends to whether customers' experience more business in the Uber driver, for instance, higher wages. While y



Application: Patent Length and Drug Development

In the United States as with most countries' patent systems, the monopoly right granted by the patent lasts for a period (20 years in the United States). This period begins when the patent application is filed, not when the application is approved or when the product is first sold. This timing detail is important in explaining what kinds of drugs are developed, and often it distorts development away from drugs that could have greater benefits than the ones that are actually brought to market.

Economists Eric Budish, Benjamin Roin, and Heidi Williams looked at how this issue affected the development of cancer drugs.¹⁰ Different drugs are designed to fight cancer at different stages of the disease. Some are more effective for early-stage

cancers, others, this entire range of they can halt or cancer altogether is found that the ely designed for

development process. before it begins released as public of the developers rers cannot start g has to first earned only after the means that there year patent clock poly power. The

parts of the cancer designed to treat age cancer don't ll show relatively study was a treat- ment 12.8 months ls for a few years



FREAKONOMICS

3D Printers and Manufacturing Cost

Star Trek is full of far-fetched technologies that we can only dream about—things like messages that travel faster than the speed of light, cloaking devices, transporters that beam humans from one place to another, and the “replicator” that reconstitutes matter to create items needed on-board the *Starship Enterprise*, like food or spare parts.

As crazy as it sounds, though, the “replicator” is no longer science fiction. We don't call such products replicators, but rather 3D printers. 3D printers take raw materials such as plastic and gold and convert them into forks and knives for your dining room table or an eccentric sculpture for your living room. The new “Foodini” 3D printer can even print food, a Trekkie's dream come true. If their cost falls enough, 3D printers will become as common as microwave ovens or toasters. Instead of going to the store to buy food or ordering a meal online, you will simply punch a few buttons and manufacture the desired items right in your own home.

As with many new technologies, the costs right now are extremely high. The fixed costs of a commercial-grade printer aren't insignificant (around \$500,000), and the variable costs, while not staggering (the average cost is about \$4 per cubic inch), are enough so that printed products can't generally compete with today's mass-produced offerings. Shapeways.com offers consumers the ability to order over 3 million 3D printer-made products, but they aren't cheap. A *SORRY!* game board piece will cost you \$6.45 and a Cuisinart EasyPop Popcorn Maker handle will run you \$7.28.

As unlikely as it seemed in 1910 that the assembly line would replace master craftsmen, it happened. The same was the case with laptops and cell phones, which were science fiction 50 years ago. What was once conceivable only in the world of Star Trek might soon be a regular part of your daily life. You may have to wait just a bit longer, though, to acquire a transporter beam for your living room.

Helping Students Succeed in Microeconomics

Figure It Out

We have been especially pleased with the overwhelmingly positive responses from instructors *and* students alike to our efforts to help students hone and improve their problem-solving abilities. As we were writing the first edition, reviewers, focus group participants, and class testers continually told us that their students have difficulty translating what they have learned into the ability to solve problems *using* what they have learned. To address this problem, each chapter has several Figure It Out exercises. These detailed, worked-out problems patiently and completely walk students through analyzing exactly what a problem asks them to do, identifying what tools they need to solve the problem, and using those tools to arrive at an answer.

The Figure It Out exercises are carefully coordinated with the end-of-chapter problem sets so that students are well prepared to successfully work out not only the end-of-chapter exercises, but also questions on quizzes and exams. With this second edition, students can further improve their problem-solving skills by going to LaunchPad to work through tutorials based on key Figure It Outs from the text.



figure it out 4.4



For interactive, step-by-step help in solving the following problem, visit LaunchPad at <http://www.macmillanhigher.com/launchpad/gls2e>

Suppose Antonio gets utility from consuming two goods, burgers and fries. His utility function is given by

$$U = \sqrt{BF} = B^{0.5}F^{0.5}$$

where B is the amount of burgers he eats and F the servings of fries. Antonio's marginal utility of a burger $MU_B = 0.5B^{-0.5}F^{0.5}$, and his marginal utility of an order of fries $MU_F = 0.5B^{0.5}F^{-0.5}$. Antonio's income is \$20, and the prices of burgers and fries are \$5 and \$2, respectively. What are Antonio's utility-maximizing quantities of burgers and fries?

Solution:

We know that the optimal solution to the consumer's maximization problem sets the marginal rate of substitution—the ratio of the goods' marginal utilities—equal to the goods' price ratio:

$$MRS_{BF} = \frac{MU_B}{MU_F} = \frac{P_B}{P_F}$$

where P_B and P_F are the goods' prices. Therefore, to find the utility-maximizing quantities of burgers and fries, we set the ratio of marginal utilities equal to the goods' price ratio and simplify:

$$\begin{aligned} \frac{MU_B}{MU_F} &= \frac{P_B}{P_F} \\ \frac{0.5B^{-0.5}F^{0.5}}{0.5B^{0.5}F^{-0.5}} &= \frac{5}{2} \\ \frac{0.5F^{0.5}F^{0.5}}{0.5B^{0.5}B^{0.5}} &= \frac{5}{2} \\ \frac{F}{B} &= \frac{5}{2} \\ 2F &= 5B \\ F &= 2.5B \end{aligned}$$

This condition tells us that Antonio maximizes his utility when he consumes fries to burgers at a 5 to 2 ratio. We now know the ratio of the optimal quantities, but do not yet know exactly what quantities Antonio will choose to consume. To figure that out, we can use the budget constraint, which pins down the total amount Antonio can spend, and therefore the total quantities of each good he can consume.

Antonio's budget constraint can be written as

$$\begin{aligned} \text{Income} &= P_B B + P_F F \text{ or} \\ B &= \frac{\text{Income}}{P_B} - \frac{P_F}{P_B} F \end{aligned}$$

Substituting in the values from the problem gives

$$\begin{aligned} B &= \frac{20}{5} - \frac{2}{5}F \\ B &= 4 - 0.4F \end{aligned}$$

Now, we can substitute the utility-maximization condition $F = 2.5B$ into the budget constraint to find the quantity of burgers Antonio will consume:

$$\begin{aligned} B &= 4 - 0.4F \\ B &= 4 - 0.4(2.5B) \\ B &= 4 - B \\ 2B &= 4 \\ B &= 2 \end{aligned}$$

And because $F = 2.5B$, then $F = 5$.

Therefore, given his budget constraint, Antonio maximizes his utility by consuming 2 burgers and 5 servings of fries.

End-of-Chapter Problem Sets

There are over 350 problems, 30% of which are new to this edition. In response to instructor requests, we have revised these problems sets so that there are problems for every chapter section. We have also worked particularly hard to coordinate our problems with the Figure It Out exercises in the main chapter. If students have worked through the Figure It Outs, they will be successful in tackling the solutions to each problem. Each problem set was exhaustively reviewed by instructors to ensure its validity and usefulness in testing the chapter’s coverage.

Make the Grade Essays

Make the Grade essays point out common pitfalls that students may encounter, help them navigate through the finer points of microeconomic theory, and present practical advice on topics that frequently trip up students during homework and tests. Examples include “Simple Rules to Remember about Income and Substitution Effects” (Chapter 5, p. 181), “Is It Really Price Discrimination?” (Chapter 10, p. 391), and “The Check Method” (Chapter 12, p. 471).

✓+ make the grade

Simple rules to remember about income and substitution effects

It is easy to get tripped up when you’re asked to identify income and substitution effects. First, remember to always start your analysis on the indifference curve associated with the consumption bundle *before* the price change. If

you want to know why consumption changed going from one bundle to the other, you must start with the initial bundle. Next, keep in mind the key distinctions between the two effects listed in the table below.

Substitution Effects	Income Effects
Involve comparisons of bundles that lie on the same indifference curve.	Involve comparisons of bundles that lie on two different indifference curves.
The direction of the effect on quantity consumed for a given change in the relative price of the good is unambiguous.	The direction of the effect on quantity consumed for a given change in the relative price of the good is ambiguous and depends on whether the good is normal or inferior.
If the good’s relative price falls, the substitution effect causes the consumer to want more of it.	If the good is normal, then a fall in either its price or the price of the other good will cause the consumer to want more of it. (A drop in any price, even of another good, increases the effective income of the consumer.) If the good is inferior, then a price drop will cause the consumer to want less of it.
If the good’s relative price rises, the substitution effect causes the consumer to want less of it.	If the good is normal, then a rise in either its price or the price of the other good will cause the consumer to want less of it. If the good is inferior, then a rise in either price will cause the consumer to want more of it.

Finally, remember that the total effect of a price change (for either good) on quantity consumed depends on the relative size of the substitution and income effects. If the price of one good falls, the quantities of both goods consumed may rise, or consumption of one good may rise

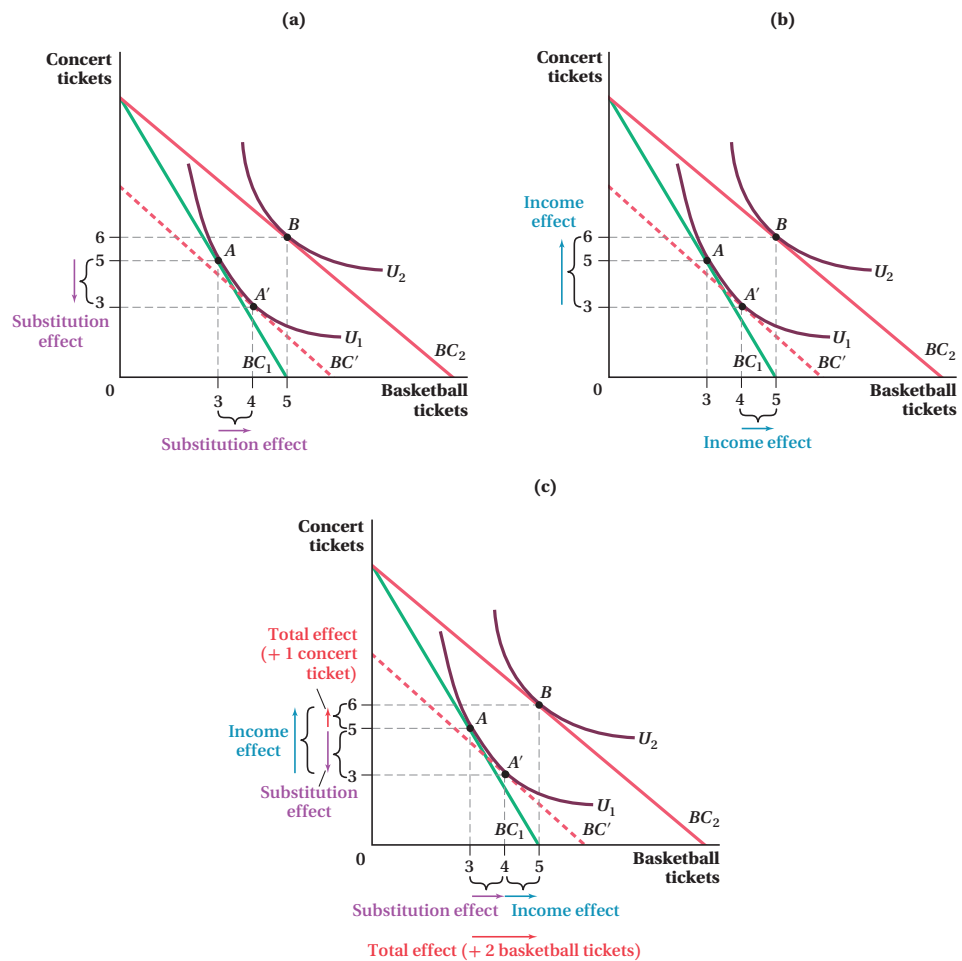
and consumption of the other good may decline. But the quantities consumed of both goods cannot both decline, because this would mean the consumer would not be on her budget constraint.

Words and Pictures

Outstanding presentation in an economics text depends on two main factors. We have ensured that our book delivers on each one.

- First, we use **straightforward and accessible writing** without sacrificing rigor. Powerful, complex, and useful ideas should not be conveyed in abstract, dry, or complicated language.
- Almost as important as a clear verbal explanation is a **clear graphical presentation**. Through color, clear labels, and detailed explanatory captions, each graph complements our words and provides students with a powerful tool for deeper understanding.

Figure 5.10 Substitution and Income Effects for Two Normal Goods



(a) The substitution effect is the change in quantities demanded due to the change in relative prices of basketball and concert tickets after the price of basketball tickets decreases. The budget constraint BC' is parallel to Carlos's new budget constraint BC_1 but tangent to his original utility level U_1 . The point of tangency between BC' and U_1 , consumption bundle A' , is the bundle Carlos would purchase if relative prices changed but his purchasing power did not. The change from bundle A to bundle A' is the substitution effect.

(b) The income effect is the change in quantities demanded due to the change in the consumer's purchasing power after the change in prices. When the price of basketball tickets decreases, Carlos can afford to purchase a larger bundle than he could before the price change. The change in the quantity of goods consumed from bundle A' to B represents the income effect.

(c) The total effect is the sum of the substitution and income effects. In this case, Carlos buys 1 more concert ticket and 2 more basketball tickets.

How We Deal with Math

Math is a powerful tool for economic analysis, and we want students of every skill level to be able to use it effectively. We have provided a text that will work for a diverse population of students and encourage them to use their math skills to unlock the potential of economic analysis. Our versatile text and its accompanying resources will allow you to use our book in a course with a standard algebraic and geometric focus or in one that relies more on calculus.

Our clear, accessible verbal and graphical presentations are supported by thorough, step-by-step explanations. The whys and wherefores of each step in the mathematical development of concepts are always clearly explained, and allow even math-shy students to easily understand how the use of math can enhance and simplify economic analysis. The main text uses algebra and geometry, but our in-text and online calculus appendices and accompanying resources allow calculus to be integrated easily into our book's presentation of theory, practice, and application.

Math Review Appendix

Most students entering this course will benefit from a math review, whether it is a review of basic algebra or of calculus. The Math Review Appendix at the back of the book provides the review necessary to prepare students for the math they will use throughout the text.

Calculus

The calculus is presented in appendices that employ the same conversational tone and intuitive approach as the text and include examples and Figure It Out problems (which are often the same as the algebra-based ones in the chapter). In this way, students can see how the calculus analysis buttresses the algebraic analysis. To give students an opportunity to practice what they have learned, each appendix includes problems that require the use of calculus.

To connect the material presented in the chapter with that in the calculus appendices, we have placed marginal notes in the chapter. These notes direct students to the appropriate appendix, and explain specifically how calculus will be used to understand the concepts. We hope these notes will encourage students familiar with calculus to utilize it on their own.

All online appendices can be found at <http://glsmicro.com/appendices>.

In-text and Online Calculus appendices (* indicates an online appendix)

- Chapter 2:** * The Calculus of Equilibrium and Elasticities
- Chapter 3:** * The Calculus of Consumer and Producer Surplus
- Chapter 4:** The Calculus of Utility Maximization and Expenditure Minimization
 - * The Mathematics of Utility Functions
- Chapter 5:** The Calculus of Income and Substitution Effects
 - * The Calculus of Demand
- Chapter 6:** The Calculus of Cost Minimization
 - * The Calculus of Production Functions and Input Demand
- Chapter 7:** The Calculus of a Firm's Cost Structure
 - * The Calculus of a Firm's Cost Structure Expanded
- Chapter 8:** * The Calculus of Long-Run Competitive Equilibria
- Chapter 9:** The Calculus of Profit Maximization
- Chapter 10:** * The Calculus of Price Strategies

Chapter 11: * The Calculus of Cournot and Differentiated Bertrand Competition Equilibria

Chapter 12: * The Mathematics of Mixed Strategies in Game Theory

How Our Book Is Organized

Here is a brief snapshot of the chapters in the book with a bit of discussion on particular subjects that received some special attention or might be different from what you would find in other books. We consider Chapters 1–11 the core chapters that most instructors will teach. The remaining chapters, 12–18, can be taught independently of one another.

Chapter 1, Adventures in Microeconomics: We open the book with a brief introductory chapter and a story about the markets for making and for buying coffee to entice and excite students about the study of microeconomics. Through an Application and a Freakonomics box, we show students right away how the microeconomic tools developed in this course are useful, not just in the study of economics and business, but in the pursuit of everyday life.

Chapter 2, Supply and Demand: In Chapters 2 and 3, we lay a solid foundation by going deeply into supply and demand before we move on to consumer and producer behavior. Most microeconomics texts separate the presentation and the application of this simple yet powerful model. Presenting all aspects of this model at the beginning makes logical sense, and we (and those who have used our book) have experienced success with this approach in classes.

Chapter 2 presents the basics of the supply-and-demand model. Of particular note is the section “Key Assumptions of the Supply and Demand Model,” which exemplifies the care and clarity with which we develop and explain microeconomic theory.

Chapter 3, Using Supply and Demand to Analyze Markets: In Chapter 3, we use the supply-and-demand model to analyze extensively consumer and producer surplus, price and quantity regulations, and taxes and subsidies. We believe that the earlier these concepts are introduced and the more completely they are explained, the easier it is to use them throughout the course. Note that the presentation of the topics in Chapter 3 is designed to be flexible: You don’t have to cover every topic in the chapter; you can pick and choose.

Chapter 4, Consumer Behavior: How do consumers decide what and how much to consume given the enormous variety of goods and services available to them? We begin this crucial chapter by clearly laying out, in one section, the assumptions we make about consumer behavior. Actual tests among professors consistently showed this approach as being especially helpful for their students.

Chapter 5, Individual and Market Demand: Here we show how consumer preferences are used to derive market demand. Section 5.3, “Decomposing Consumer Responses to Price Changes into Income and Substitution Effects,” takes extra care in explaining this topic, which students often find challenging. Abundant applications and a discussion of pitfalls to avoid make this material particularly accessible and interesting.

Chapter 6, Producer Behavior: How do companies decide which combination of inputs to use in production, and how does this decision affect production costs? In this chapter, we begin by clearly laying out the simplifying assumptions about firms’ production behavior. Later in the chapter, we devote a complete section to the role technological change plays in firms’ productivity over time. Several applications and examples (including a Freakonomics box on how cell phones have altered the behavior of producers in the Indian fish market) bring this material alive for students.

Chapter 7, Costs: Cost curves illustrate how costs change with a firm's output level and are crucial in deriving market supply. Because opportunity costs and sunk costs are often difficult concepts for students to master, we take extra care at the start of Chapter 7 to distinguish these concepts and illustrate the role they play in decision making. Our examples (including studies of gym membership usage and why movie studios release films they know will lose money) engage students so that they can better understand the often challenging concepts in this chapter.

Chapter 8, Supply in a Competitive Market: This chapter begins our coverage of market structure, and it uses real-life industries such as the Texas electricity industry and housing markets in Boston, Massachusetts, and Fargo, North Dakota, to explain how competitive markets work. We clearly, carefully, and patiently explain a firm's shutdown decision, a topic that students often find confusing.

Chapter 9, Market Power and Monopoly: This chapter begins with a thorough discussion of the origin of market power and how having such power affects a firm's production and pricing decisions. Our three-step process for determining profit maximization for a firm with market power clarifies this topic for students. We bring the concept of monopolistic market power to life using examples of real firms with near-monopoly power, such as Durkee-Mower, Inc., the firm that makes Marshmallow Fluff, and Dr. Brown's, a manufacturer of specialty sodas. Abundant applications, including a discussion of how Southwest Airlines enters the stronghold airports of incumbent carriers and drives down fares, further engage students' interest.

Chapter 10, Pricing Strategies for Firms with Market Power: This practical chapter will appeal especially to business students. We thoroughly discuss the many ways in which a firm can take advantage of pricing power, and we clearly describe pricing strategies that can be effective in a variety of situations. Particularly useful to students are Figure 10.1, "An Overview of Pricing Strategies," and a pedagogical device called *When to Use It*, which explains at the start of each strategy what a firm needs to know about its market and customers to use each pricing strategy most effectively.

Chapter 11, Imperfect Competition: This chapter looks at oligopolies and monopolistically competitive firms. Unlike perfectly competitive and monopolistic firms, these firms must consider their competitors' actions and strategize to maximize their profits. To help students understand the various models of imperfect competition, each section starts with a Model Assumptions box that lists the conditions an industry must meet for that model to apply.

Chapter 12, Game Theory: The tools of game theory can be used to explain strategic interactions among firms and to predict market outcomes. Students will find our game theory analysis (presented in one chapter for better comprehension) easy to follow and understand because of our use of the *check method* (p. 471), which simplifies games and helps students easily identify Nash equilibria and dominant/dominated strategies. Varied topics from penalty kicks in soccer to airlines' responses to threats of entry show the usefulness of game theory not just in business, but also in everyday decision making.

Chapter 13, Factor Markets: This chapter, which is new to this edition, covers many features of factor markets. To make the concepts more concrete, we use the labor market as an example in much of the development, but we also discuss the unique features of other factor markets. Factor demand and supply are built up from the individual firm or worker level, and then aggregated to an industry equilibrium. We cover perfectly competitive factor markets and those with market power, including monopsony and bilateral monopoly.

In all cases, we draw out the many similarities between factor markets and the markets for other goods, so that students can use these connections to help them understand this new material.

Chapter 14, Investment, Time, and Insurance: Understanding the role of risk and uncertainty over time helps individuals and firms make better economic decisions about investments and insurance. We clearly explain how current costs, future payoffs, time, and uncertainty play a fundamental role in the many decisions firms and consumers face every day. Reviewers especially appreciated our coverage of all these topics in one concise chapter. We kept our coverage of the capital market in this chapter because we felt it was a more natural place to discuss capital and the related salient issues of time and uncertainty. Instructors who prefer to cover this topic with the other factor markets in Chapter 13 will be able to do so using the largely self-contained sections in this chapter.

Chapter 15, General Equilibrium: We explain intuitively the concepts of general equilibrium, using an extension of the supply-and-demand framework. Examples include the use of horsemeat in Ikea meatballs and the interaction between housing and labor markets. We also explain the connections among exchange, input, and output efficiencies and tie them to the Welfare Theorems.

Chapter 16, Asymmetric Information: After discussing in earlier chapters what conditions must hold for markets to work well, we look at situations in which markets might not work well. Chapter 16 shows how market outcomes are distorted when information is not equally shared by all potential parties in a transaction. As always, a variety of examples, from auto insurance to credit cards to online reviews, shows students that concepts learned in microeconomics are useful in many areas of life.

Chapter 17, Externalities and Public Goods: This chapter continues our examination of market failure by looking at what happens to market outcomes when transactions affect people who are neither the buying nor the selling party, and what happens when a good's benefits are shared by many people at the same time. Our coverage makes clear to students why externalities occur and how they can be remedied (including a discussion of tradable emissions permits). In our coverage of public goods, we show why a fire department might have an incentive to allow a house to burn down.

Chapter 18, Behavioral and Experimental Economics: The recent growth of behavioral economics poses a challenge to traditional microeconomics because it questions whether people actually behave the way traditional theory predicts they will. This question presents any intermediate microeconomics book with a conundrum because embracing behavioral economics seems to undermine the methods learned in the book.

Our chapter on behavioral economics explains how to think rationally in an irrational world. If some people make irrational economic decisions (and we present the behavioral evidence of situations in which they tend to make mistakes), other market participants can use this irrationality to their advantage.

Gratitude

We are grateful for the many, many people who helped us achieve our goals for writing a book of useful microeconomics.

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Final Thoughts

Heartfelt thanks to our families for their continued support of our work (especially when we are too busy to let them know how much we appreciate it).

Ultimately, any text is only a tool and a complement to what students learn in the classroom and from one another. We hope that this text will help you to start them on that journey to using economics.



Austan Goolsbee

September 30, 2015



Steven Levitt



Chad Syverson

Contents


Preface x

Part 1 Basic Concepts

1 Adventures in Microeconomics 1

1.1 Microeconomics (and What It Can Teach Us about Rosa and Lauren) 1

Learning the Tools of Microeconomics 2

 **FREAKONOMICS** Thomas Thwaites's Toaster 3

Using the Tools of Microeconomics 3

 **Make the Grade** Holding the Rest of the World Constant 4

1.2 This Book (and How Rosa and Lauren Would See It) 5

Consumers' and Producers' Decisions 5

 **Application** Rideshare Driving the Microeconomics Way 5

Market Supply 6

Beyond the Basics 7

Focus on Data 8

Let the Fun Begin! 8

 **Application** The Benefits of Studying Economics 9

Summary 9

Review Questions 10

2 Supply and Demand 11

2.1 Markets and Models 11

What Is a Market 12

Key Assumptions of the Supply and Demand Model 12

2.2 Demand 14

Factors That Influence Demand 14

Demand Curves 15

Shifts in Demand Curves 16

Why Is Price Treated Differently from the Other Factors That Affect Demand? 17

2.3 Supply 18

Factors That Influence Supply 18

Supply Curves 18

Shifts in the Supply Curve 19
Why Is Price Also Treated Differently for Supply? 20

2.4 Market Equilibrium 21

The Mathematics of Equilibrium 21

 **Make the Grade** Does Quantity Supplied Equal Quantity Demanded in Equilibrium? 22

Why Markets Move toward Equilibrium 22

 **Figure It Out 2.1** 24

The Effects of Demand Shifts 24

 **Figure It Out 2.2** 26

The Effects of Supply Shifts 26

 **FREAKONOMICS** What Do President Obama and Taylor Swift Have in Common? 28

 **Figure It Out 2.3** 29

Summary of Effects 30

 **Application** Supply Shifts and the Video Game Crash 30

 **Figure It Out 2.4** 32

What Determines the Size of Price and Quantity Changes? 33

 **Make the Grade** Did the Curve Shift, or Was It Just a Movement along the Curve? 33

 **Application** The Supply Curve of Housing and Housing Prices: A Tale of Two Cities 35


Changes in Market Equilibrium When Both Curves Shift 37

2.5 Elasticity 38

Slope and Elasticity Are Not the Same 39

The Price Elasticities of Demand and Supply 39

Price Elasticities and Price Responsiveness 40

 **Application** Demand Elasticities and the Availability of Substitutes 41
Elasticities and Linear Demand and Supply Curves 43

 **Figure It Out 2.5** 46

Perfectly Inelastic and Perfectly Elastic Demand and Supply 46

Income Elasticity of Demand 48

Cross-Price Elasticity of Demand 49

 **Figure It Out 2.6** 50

2.6 Conclusion 50

Summary 51

Review Questions 51

Problems 52

3 Using Supply and Demand to Analyze Markets 57

3.1 Consumer and Producer Surplus: Who Benefits in a Market? 57

Consumer Surplus 57


Producer Surplus 59

 **Figure It Out 3.1** 60

 **Application** The Value of Innovation 62

 **Application** What Is LASIK Eye Surgery Worth to Patients? 63

The Distribution of Gains and Losses from Changes in Market Conditions 65

 **Application** How Much Did 9/11 Hurt the Airline Industry? 66

 **Figure It Out 3.2** 69

3.2 Price Regulations 70

Price Ceilings 71

Price Floors 77

3.3 Quantity Regulations 80

Quotas 80

3.4 Taxes 84

Tax Effects on Markets 84

 **FREAKONOMICS** Unintended Consequences of a Tax on Garbage 89

Why Taxes Create a Deadweight Loss 90

Why a Big Tax Is Much Worse Than a Small Tax 90

The Incidence of Taxation: The Payer Doesn't Matter 91

 **Make the Grade** Did I Measure Deadweight Loss Correctly? 93

 **Figure It Out 3.3** 95

3.5 Subsidies 95

 **Application** The Cost of the Black-Liquor Loophole 97

 **Figure It Out 3.4** 98

3.6 Conclusion 99

Summary 100

Review Questions 100

Problems 101

Part 2 Consumption and Production

4 Consumer Behavior 105

4.1 The Consumer's Preferences and the Concept of Utility 106

Assumptions about Consumer Preferences 106

The Concept of Utility 107

Marginal Utility 108
 Utility and Comparisons 108

4.2 Indifference Curves 109

Characteristics of Indifference Curves 111

 **Make the Grade** Draw Some Indifference Curves to Really Understand the Concept 113

The Marginal Rate of Substitution 114

 **FREAKONOMICS** Do Minnesotans Bleed Purple? 115

The Marginal Rate of Substitution and Marginal Utility 116

The Steepness of Indifference Curves 117

 **Figure It Out 4.1** 118

 **Application** Indifference Curves for Breakfast Cereal 119

The Curvature of Indifference Curves: Substitutes and Complements 121

 **Figure It Out 4.2** 125

 **Application** Indifference Curves for “Bads” 126

4.3 The Consumer’s Income and the Budget Constraint 127

The Slope of the Budget Constraint 129

Factors That Affect the Budget Constraint’s Position 130

 **Figure It Out 4.3** 131

Nonstandard Budget Constraints 132

4.4 Combining Utility, Income, and Prices: What Will the Consumer Consume? 134

Solving the Consumer’s Optimization Problem 134

 **Figure It Out 4.4** 137

Implications of Utility Maximization 137

A Special Case: Corner Solutions 139

 **Figure It Out 4.5** 140

4.5 Conclusion 141

Summary 142

Review Questions 142

Problems 143

Appendix The Calculus of Utility Maximization and Expenditure Minimization 147

 **Figure It Out 4A.1** 151

5 Individual and Market Demand 155

5.1 How Income Changes Affect an Individual’s Consumption Choices 156

Normal and Inferior Goods 157

Income Elasticities and Types of Goods 158

The Income Expansion Path 159

The Engel Curve 160

 **Application** Engel Curves and House Sizes 161

 **Figure It Out 5.1** 163

5.2 How Price Changes Affect Consumption Choices 164

Deriving a Demand Curve 164

Shifts in the Demand Curve 166

 **FREAKONOMICS** Even Animals Like Sales 167

 **Figure It Out 5.2** 168

5.3 Decomposing Consumer Responses to Price Changes into Income and Substitution Effects 169

Isolating the Substitution Effect 171

Isolating the Income Effect 173

The Total Effects 173

 **Make the Grade** Computing Substitution and Income Effects from a Price Change 174


What Determines the Size of the Substitution and Income Effects? 174

 **Figure It Out 5.3** 176

An Example of the Income and Substitution Effects with an Inferior Good 177

Giffen Goods 179

 **Application** Someone Actually Found a Giffen Good! 180

 **Make the Grade** Simple Rules to Remember about Income and Substitution Effects 181

5.4 The Impact of Changes in Another Good's Price: Substitutes and Complements 181

A Change in the Price of a Substitute Good 182

Indifference Curve Shapes, Revisited 184

 **Application** Movies in a Theater and at Home—Substitutes or Complements? 184

5.5 Combining Individual Demand Curves to Obtain the Market Demand Curve 185

The Market Demand Curve 186

Using Algebra to Move from Individual to Market Demand 187

 **Make the Grade** Adding Demand Curves Horizontally, Not Vertically 187

 **Figure It Out 5.4** 188

5.6 Conclusion 188

Summary 189

Review Questions 189

Problems 190

Appendix The Calculus of Income and Substitution Effects 195 **Figure It Out 5A.1** 197**6 Producer Behavior 201****6.1 The Basics of Production 201**

Simplifying Assumptions about Firms' Production Behavior 202

Production Functions 204

6.2 Production in the Short Run 204

Marginal Product 206

Average Product 207

 **Figure It Out 6.1** 208**6.3 Production in the Long Run 209**

The Long-Run Production Function 209

6.4 The Firm's Cost-Minimization Problem 210

Isoquants 210


Isocost Lines 214

 **Figure It Out 6.2** 217

Identifying Minimum Cost: Combining Isoquants and Isocost Lines 217

Cost Minimization—A Graphical Approach 218

Input Price Changes 220

 **Figure It Out 6.3** 220 **Application** Hospitals' Input Choices and Medicare Reimbursement Rules 221**6.5 Returns to Scale 223** **Make the Grade** How to Determine a Production Function's Returns to Scale 223

Factors Affecting Returns to Scale 224

 **Figure It Out 6.4** 225**6.6 Technological Change 226** **Application** Technological Change in U.S. Manufacturing 227 **FREAKONOMICS** Why do Indian Fishermen Love Their Cell Phones So Much? 228**6.7 The Firm's Expansion Path and Total Cost Curve 230****6.8 Conclusion 232****Summary 232****Review Questions 233****Problems 233**

Appendix The Calculus of Cost Minimization 239

 **Figure It Out 6A.1** 244

 **Figure It Out 6A.2** 245

7 Costs 247

7.1 Costs That Matter for Decision Making: Opportunity Costs 248

 **Application** Making Big Money by *Not* Operating Your Business—A Lesson about Opportunity Cost 248

 **Figure It Out 7.1** 249

7.2 Costs That Do Not Matter for Decision Making: Sunk Costs 250

Sunk Costs and Decisions 251

 **Application** Gym Memberships 251

 **Application** Why Do Film Studios Make Movies That They Know Will Lose Money? 252

7.3 Costs and Cost Curves 254

Fixed Cost 255

Variable Cost 255

Flexibility and Fixed versus Variable Costs 255

Deriving Cost Curves 257

Fixed Cost Curve 258

Variable Cost Curve 258

Total Cost Curve 258

7.4 Average and Marginal Costs 258

Average Cost Measures 259

 **FREAKONOMICS** 3D Printers and Manufacturing Cost 261

Marginal Cost 261

 **Figure It Out 7.2** 262

Relationships between Average and Marginal Costs 263

 **Figure It Out 7.3** 265

7.5 Short-Run and Long-Run Cost Curves 265

Short-Run Production and Total Cost Curves 266

Short-Run versus Long-Run Average Total Cost Curves 268

 **Figure It Out 7.4** 270

Short-Run versus Long-Run Marginal Cost Curves 271

7.6 Economies in the Production Process 272

Economies of Scale 273

Economies of Scale versus Returns to Scale 273

 **Figure It Out 7.5** 274

- **Application** Economies of Scale in Retail: Goodbye, Mom and Pop? 274
 - Economies of Scope 275
 - Why Economies of Scope Arise 276

7.7 Conclusion 276

Summary 277

Review Questions 277

Problems 278

Appendix The Calculus of a Firm's Cost Structure 281

 **Figure It Out 7A.1 283**

Part 3 Markets and Prices

8 Supply in a Competitive Market 287

8.1 Market Structures and Perfect Competition in the Short Run 287

- Perfect Competition 288
- The Demand Curve as Seen by a Price Taker 290

8.2 Profit Maximization in a Perfectly Competitive Market 290

- Total Revenue, Total Cost, and Profit Maximization 291
- How a Perfectly Competitive Firm Maximizes Profit 292

- **Application** Do Firms Always Maximize Profits? 293
 - Measuring a Firm's Profit 294

 **Figure It Out 8.1 296**

 **Figure It Out 8.2 297**

✔+ **Make the Grade** A Tale of Three Curves 298

8.3 Perfect Competition in the Short Run 299

- A Firm's Short-Run Supply Curve in a Perfectly Competitive Market 299

➤ **Application** The Supply Curve of a Power Plant 300

- The Short-Run Supply Curve for a Perfectly Competitive Industry 300

➤ **Application** The Short-Run Supply of Crude Oil 304





- Producer Surplus for a Competitive Firm 304
- Producer Surplus and Profit 306
- Producer Surplus for a Competitive Industry 306

 **Figure It Out 8.3 306**

➤ **Application** Short-Run Industry Supply and Producer Surplus in Electricity Generation 307

8.4 Perfectly Competitive Industries in the Long Run 310

- Entry 310
- Exit 312

	Application Entry and Exit at Work in Markets—Residential Real Estate	312
	Graphing the Industry Long-Run Supply Curve	313
	FREAKONOMICS The Not-So-Simple Economics of Blackmail	314
	Adjustments between Long-Run Equilibria	315
	Application The Increased Demand for Corn	318
	Figure It Out 8.4	319
	Long-Run Supply in Constant-, Increasing-, and Decreasing-Cost Industries	320
8.5	Producer Surplus, Economic Rents, and Economic Profits	320
	Cost Differences and Economic Rent in Perfect Competition	320
8.6	Conclusion	323
	Summary	323
	Review Questions	324
	Problems	324
9	Market Power and Monopoly	331
9.1	Sources of Market Power	332
	Extreme Scale Economies: Natural Monopoly	332
	Application Natural Monopoly in Satellite Radio	333
	Switching Costs	333
	Product Differentiation	334
	Absolute Cost Advantages or Control of Key Inputs	335
	Application Controlling a Key Input—The Troubled History of Fordlandia, Brazil	335
	Government Regulation	336
	Where There's a Will (and Producer Surplus), There's a Way	336
9.2	Market Power and Marginal Revenue	336
	FREAKONOMICS Why Drug Dealers Want Peace, Not War	337
	Market Power and Monopoly	338
	Marginal Revenue	338
	Figure It Out 9.1	344
9.3	Profit Maximization for a Firm with Market Power	344
	How to Maximize Profit	344
	Profit Maximization with Market Power: A Graphical Approach	345
	Profit Maximization with Market Power: A Mathematical Approach	346
	Figure It Out 9.2	347
	A Markup Formula for Companies with Market Power: The Lerner Index	348
	Application Market Power versus Market Share	350
	The Supply Relationship for a Firm with Market Power	351

9.4	How a Firm with Market Power Reacts to Market Changes	351
	Response to a Change in Marginal Cost	352
	Response to a Change in Demand	353
	 Figure It Out 9.3	354
	The Big Difference: Changing the Price Sensitivity of Customers	355
9.5	The Winners and Losers from Market Power	356
	Consumer and Producer Surplus under Market Power	356
	Consumer and Producer Surplus under Perfect Competition	357
	 Application Southwest Airlines	357
	The Deadweight Loss of Market Power	358
	 Figure It Out 9.4	359
	Differences in Producer Surplus for Different Firms	360
9.6	Governments and Market Power: Regulation, Antitrust, and Innovation	360
	Direct Price Regulation	361
	Antitrust	362
	Promoting Monopoly: Patents, Licenses, and Copyrights	363
	 Application Patent Length and Drug Development	364
9.7	Conclusion	365
	Summary	366
	Review Questions	366
	Problems	367
	Appendix The Calculus of Profit Maximization	371
	 Figure It Out 9A.1	374
	 Figure It Out 9A.2	374
10	Pricing Strategies for Firms with Market Power	377
10.1	The Basics of Pricing Strategy	377
	When Can a Firm Pursue a Pricing Strategy?	378
10.2	Direct Price Discrimination I: Perfect/First-Degree Price Discrimination	380
	When to Use It Perfect/First-Degree Price Discrimination	380
	 Figure It Out 10.1	382
	Examples of Perfect Price Discrimination	383
	 Application How Priceline Learned That You Can't Price-Discriminate without Market Power	384
10.3	Direct Price Discrimination II: Segmenting/Third-Degree Price Discrimination	385
	When to Use It Segmenting/Third-Degree Price Discrimination	385
	The Benefits of Segmenting: A Graphical Approach	386

The Benefits of Segmenting: A Mathematical Approach 388

How Much Should Each Segment Be Charged? 390

 **Make the Grade** Is It Really Price Discrimination? 391

 **Figure It Out 10.2** 392

Ways to Directly Segment Customers 392

 **FREAKONOMICS** Victoria's Not-So-Secret Price Discrimination 393

 **Application** Segmenting by Location in the European Market for Cars 394

10.4 Indirect/Second-Degree Price Discrimination 395

When to Use It Indirect/Second-Degree Price Discrimination 395

Indirect Price Discrimination through Quantity Discounts 396

 **Figure It Out 10.3** 400

Indirect Price Discrimination through Versioning 401

Indirect Price Discrimination through Coupons 403

10.5 Bundling 404

When to Use It Bundling 404

Mixed Bundling 406

 **Figure It Out 10.4** 407

10.6 Advanced Pricing Strategies 409

When to Use It Block Pricing and Two-Part Tariffs 409

Block Pricing 409

Two-Part Tariffs 411

 **Figure It Out 10.5** 412

10.7 Conclusion 413

Summary 414

Review Questions 415

Problems 415

11 Imperfect Competition 421

11.1 What Does Equilibrium Mean in an Oligopoly? 422

 **Application** An Example of Nash Equilibrium: Marketing Movies 422

11.2 Oligopoly with Identical Goods: Collusion and Cartels 424

Model Assumptions Collusion and Cartels 424

 **FREAKONOMICS** Apple Always Wins, or Does It? 425





The Instability of Collusion and Cartels 426

 **Application** OPEC and the Control of Oil 429

 **Figure It Out 11.1** 430

What Makes Collusion Easier? 431

 **Application** The Indianapolis Concrete Cartel 431

11.3 Oligopoly with Identical Goods: Bertrand Competition	432
Model Assumptions Bertrand Competition with Identical Goods	432
Setting Up the Bertrand Model	432
Nash Equilibrium of a Bertrand Oligopoly	433
11.4 Oligopoly with Identical Goods: Cournot Competition	435
Model Assumptions Cournot Competition with Identical Goods	435
Setting Up the Cournot Model	435
Equilibrium in a Cournot Oligopoly	436
 Figure It Out 11.2	440
Comparing Cournot to Collusion and to Bertrand Oligopoly	441
What Happens If There Are More Than Two Firms in a Cournot Oligopoly?	442
Cournot versus Bertrand: Extensions	442
11.5 Oligopoly with Identical Goods but with a First-Mover: Stackelberg Competition	443
Model Assumptions Stackelberg Competition with Identical Goods	443
Stackelberg Competition and the First-Mover Advantage	444
 Figure It Out 11.3	446
11.6 Oligopoly with Differentiated Goods: Bertrand Competition	447
Model Assumptions Bertrand Competition with Differentiated Goods	447
Equilibrium in a Differentiated-Products Bertrand Market	448
 Figure It Out 11.4	451
 Application Computer Parts—Differentiation Out of Desperation	452
11.7 Monopolistic Competition	453
Model Assumptions Monopolistic Competition	453
Equilibrium in Monopolistically Competitive Markets	454
 Figure It Out 11.5	457
11.8 Conclusion	457
Summary	458
Review Questions	458
Problems	459
12 Game Theory	465
12.1 What Is a Game?	466
Dominant and Dominated Strategies	467
12.2 Nash Equilibrium in One-Period Games	469
 Make the Grade The Check Method	471
 Figure It Out 12.1	472

Multiple Equilibria 473

Mixed Strategies 475

✎ **Application** Random Mixed Strategies in Soccer 476

What If My Opponent Is an Idiot? The Maximin Strategy 477

✎ **Application** Fun in the Sun: Wine Making for Irrational Billionaires 478

12.3 Repeated Games 479

Finitely Repeated Games 480

Infinitely Repeated Games 481

 **Figure It Out 12.2** 484

12.4 Sequential Games 485

✓+ **Make the Grade** Backward Induction and Trimming Trees 488

Another Sequential Game 489

 **Figure It Out 12.3** 490

12.5 Strategic Moves, Credibility, and Commitment 491

 **FREAKONOMICS** Game Theory in Track Cycling Competitions 492

Side Payments 493

Commitment 494

 **Figure It Out 12.4** 496

✎ **Application** Dr. Strangelove and the Perils of Secrecy 497

Entry Deterrence: Credibility Applied 497

✎ **Application** Incumbent Airlines' Responses to Threatened Entry by

Southwest 500

Reputation 502

12.6 Conclusion 502

Summary 503

Review Questions 503

Problems 504

13 Factor Markets 511

13.1 Demand in a Perfectly Competitive Factor Market 511

The Firm's Demand for Labor 511

The Firm's Labor Demand: A Graphical Approach 512

 **Figure It Out 13.1** 514

Shifts in the Firm's Labor Demand Curve 515

Market Labor Demand Curve 516

13.2 Supply in a Perfectly Competitive Factor Market 517

Work, Leisure, and Individual Labor Supply 518

Income and Substitution Effects of a Change in Wages 519

Backward-Bending Supply Curves 520

 **Figure It Out 14.2** 553

14.3 The Correct Interest Rate to Use, and Capital Markets 553

Nominal versus Real Interest Rates 554

Other Rate Adjustments 554

14.4 Evaluating Risky Investments 555

NPV with Uncertainty: Expected Value 555

Risk and the Option Value of Waiting 556

 **Figure It Out 14.3** 558

14.5 Uncertainty, Risk, and Insurance 559

Expected Income, Expected Utility, and the Risk Premium 559

Insurance Markets 561

 **Application** The Insurance Value of Medicare 563

The Degree of Risk Aversion 564

 **FREAKONOMICS** Insurance for Subway Fare Evaders 565

 **Figure It Out 14.4** 566

14.6 Conclusion 567

Summary 567

Review Questions 567

Problems 568

15 General Equilibrium 573

15.1 General Equilibrium Effects in Action 574

An Overview of General Equilibrium Effects 574

Quantitative General Equilibrium: The Corn Example with Demand-Side
Market Links 576

 **Figure It Out 15.1** 580

 **Application** The General Equilibrium of Carmageddon 581

Quantitative General Equilibrium: The Corn Example with Supply-Side
Market Links 582

 **FREAKONOMICS** Horse Meat and General Equilibrium 584

 **Application** General Equilibrium Interaction of Cities' Housing and
Labor Markets 585

15.2 General Equilibrium: Equity and Efficiency 587

Standards for Measuring Market Performance: Social Welfare Functions 587

 **Figure It Out 15.2** 588

Standards for Measuring Market Performance: Pareto Efficiency 589

Looking for Pareto Efficiency in Markets 589

Efficiency in Markets—Three Requirements 590

15.3 Efficiency in Markets: Exchange Efficiency 591

The Edgeworth Box 591

Gains from Trade in the Edgeworth Box 592

 **Figure It Out 15.3** 596

15.4 Efficiency in Markets: Input Efficiency 597

The Production Possibilities Frontier 600

 **Figure It Out 15.4** 601

15.5 Efficiency in Markets: Output Efficiency 602

The Marginal Rate of Transformation 602

 **Figure It Out 15.5** 605

15.6 Markets, Efficiency, and the Welfare Theorems 605

 **Application** Output Efficiency among Manufacturing Firms in India 606

15.7 Conclusion 608

Summary 609

Review Questions 609

Problems 610

16 Asymmetric Information 615

16.1 The Lemons Problem and Adverse Selection 616

Observable Quality 616

Unobservable Quality 616

Adverse Selection 617

Other Examples of the Lemons Problem 618

Institutions That Mitigate Lemons Problems 619

 **Figure It Out 16.1** 621

 **Application** Reputations in Collectibles Sales 622

Adverse Selection When the Buyer Has More Information: Insurance Markets 623

Mitigating Adverse Selection in Insurance 624

 **FREAKONOMICS** Online Ratings and Information Asymmetries 625

 **Application** Adverse Selection in Credit Cards 626

16.2 Moral Hazard 627

An Extreme Example of Moral Hazard 628

 **Figure It Out 16.2** 630

Examples of Moral Hazard in Insurance Markets 630

Moral Hazard outside Insurance Markets 631

Lessening Moral Hazard 632

 **Application** Usage-Based Auto Insurance 633

16.3 Asymmetric Information in Principal–Agent Relationships 633

Principal–Agent and Moral Hazard: An Example 634

The Principal–Agent Relationship as a Game 635

More General Principal–Agent Relationships 637

 **Application** The Principal–Agent Problem in Residential Real Estate Transactions 637

 **Figure It Out 16.3** 638

16.4 Signaling to Solve Asymmetric Information Problems 639

The Classic Signaling Example: Education 639

Other Signals 643

 **Application** Advertising as a Signal of Quality 644

 **Figure It Out 16.4** 644

16.5 Conclusion 645

Summary 645

Review Questions 645

Problems 646

17 Externalities and Public Goods 651

17.1 Externalities 652

Why Things Go Wrong: The Economic Inefficiencies from Externalities 652

Negative Externalities: Too Much of a Bad Thing 653

 **Figure It Out 17.1** 655

Positive Externalities: Not Enough of a Good Thing 656

 **Application** Phone-Finding Apps and Positive Externalities 658

17.2 Correcting Externalities 659

The Efficient Level of Pollution 659

Using Prices to Correct Externalities 661

 **Application** Facebook Fixes an externality 663

 **Figure It Out 17.2** 664

 **Application** Would Higher Driving Taxes Make Us Happier Drivers? 665

Quantity Mechanisms to Correct Externalities 666

Price-Based versus Quantity-Based Interventions with Uncertainty 668

A Market-Oriented Approach to Reducing Externalities: Tradable Permits Markets 671

17.3 The Coase Theorem: Free Markets Addressing Externalities on Their Own 672

 **Figure It Out 17.3** 674

 **Application** Sometimes the Coase Theorem Takes a While 674

The Coase Theorem and Tradable Permits Markets 675

17.4 Public Goods 676

The Optimal Level of Public Goods 678

 **Figure It Out 17.4 680**

Solving the Free-Rider Problem 680

The Tragedy of the Commons 681

 **FREAKONOMICS Is Fire Protection a Public Good? 682**

17.5 Conclusion 683

Summary 684

Review Questions 684

Problems 685

18 Behavioral and Experimental Economics 691

18.1 When Human Beings Fail to Act the Way Economic Models Predict 692

Systematic Bias 1: Overconfidence 693

Systematic Bias 2: Self-Control Problems and Hyperbolic Discounting 694

Systematic Bias 3: Falling Prey to Framing 969

Systematic Bias 4: Paying Attention to Sunk Costs 698

 **Application The Sunk Cost Fallacy and Professional Athletes 698**

Systematic Bias 5: Generosity and Selflessness 699


 **Application Do Animals Care about Fairness? 701**

18.2 Does Behavioral Economics Mean Everything We've Learned Is Useless? 702

18.3 Testing Economic Theories with Data: Experimental Economics 703

Lab Experiments 704

Natural Experiments and Field Experiments 705

 **FREAKONOMICS Going to the Ends of the World (Literally) to Test Economic Theory 706**

18.4 Conclusions and the Future of Microeconomics 707

Summary 708

Review Questions 708

Problems 709

Math Review Appendix MR-1

Solutions to Review Questions SA-1

Solutions to Select End-of-Chapter Problems SB-1

Glossary G-1

References R-1

Index I-1

Adventures in Microeconomics

1

It is morning in Peru’s Selva Alta hills, and the sun has been up for a few hours. Rosa Valencia looks admiringly at the coffee plants she’s grown. The coffee plants’ fruits, called *cherries* because of the red hue they take on when ripe, are ready for harvest. Rosa’s workers handpick the fruit and carry it to the outbuilding where it is processed. There, other workers sort the cherries, then remove the fruits’ flesh to expose the two seeds—the coffee beans—inside. The beans are washed and prepared for drying and roasting.



Marshall Konography/Alamy

A woman peels back the red skin of a ripe coffee cherry to reveal the two coffee beans inside.

That same morning, about 5,000 miles away in Seattle, Washington, home of Starbucks, Lauren Russell grapples with a physics problem. She’s at her favorite coffee shop, a block off campus, for her mid-morning break. Sitting on the table next to her book is her usual, a skinny cappuccino. Every few moments, between calculations, Lauren takes a sip and savors the deep, rich flavor of the coffee.

Lauren and Rosa have never met each other, and likely never will. Yet, their morning routines are connected to each other because the two women are part of the same market, the market for coffee. Lauren’s taste in drinks connects her to Rosa, who provides a critical input for that drink. Both women benefit from this connection: Rosa profits from growing coffee, and Lauren gets a cappuccino at a price she is willing to pay. This is microeconomics at work.

1.1 Microeconomics (and What It Can Teach Us about Rosa and Lauren)

- 1.1 **Microeconomics (and What It Can Teach Us about Rosa and Lauren)**
- 1.2 **This Book (and How Rosa and Lauren Would See It)**

microeconomics
The branch of economics that studies the specific choices made by consumers and producers.

Rosa and Lauren’s connection is the consequence of a large number of decisions and transactions that combine to make Rosa believe that growing coffee is worth her time and effort, and make Lauren feel that her skinny cappuccino is worth the money. This book investigates those many decisions and transactions, and how they interact in markets.

Before we delve deeper into this book’s topics, we need to be very clear about how we’re going to approach the study of markets. We will be looking at these decisions through the framework of *microeconomics*. **Microeconomics** is the branch of economics that studies the specific choices made by consumers (like Lauren) and producers (like Rosa). In contrast, *macroeconomics* looks at the world through a wider lens and is a description of the larger, complex system in which consumers and firms operate. Macroeconomics takes hundreds of millions of individual producers and consumers like Rosa and Lauren, and tries to describe and predict the behavior and outcome of the combined total of their individual decisions. In this book, we steer clear of the macroeconomic questions.