

THIRD EDITION

# MODERN PRINCIPLES: MICROECONOMICS



Tyler Cowen • Alex Tabarrok

***this page left intentionally blank***

# The compelling examples enhance the story and illuminate concepts...

**KEY:** **CHAPTER OPENING** means chapter opening example;  
**RUNNING EXAMPLE** means running example in the chapter.

## Chapter 1: The Big Ideas

Page 1 **CHAPTER OPENING**: A small change in wording has a big effect on the incentives of captains transporting convicts to Australia.

Page 3: How can drugs be too safe?

## Chapter 2: The Power of Trade and Comparative Advantage

Page 21: Economics is about cooperation, not just competition.

## Chapter 3: Supply and Demand

Page 29 **CHAPTER OPENING** and **RUNNING EXAMPLE**: Intuitive picture of the demand for oil and why it slopes downward

Page 36: Intuitive picture of the supply of oil and why it slopes upward

## Chapter 4: Equilibrium: How Supply and Demand Determine Prices

Page 47 **CHAPTER OPENING** and **RUNNING EXAMPLE**: What pushes and pulls prices toward their equilibrium values?

Page 49: Why does a free market maximize consumer plus producer surplus?

## Chapter 5: Elasticity and Its Applications

Page 74: How have American farmers worked themselves out of a job?

Page 75: Why is the war on drugs hard to win?

Page 80: How successful are gun buyback programs?

Page 81: The economics of slave redemption in Africa

Page 84: How much would the price of oil fall if the Arctic National Wildlife Refuge were opened up to drilling?

## Chapter 6: Taxes and Subsidies

Page 101: Health insurance mandates and tax analysis

Page 102: Who pays the cigarette tax?

Page 106: What is the deadweight loss of California's water subsidies to cotton growers?

Page 108 : Wage subsidies?

## Chapter 7: The Price System: Signals, Speculation, and Prediction

Page 115 **CHAPTER OPENING**: The Invisible Hand and a Valentine's Day rose

Page 117: How does the price of oil affect the price of brick driveways?

## Chapter 8: Price Ceilings and Floors

Page 133 **CHAPTER OPENING** and **RUNNING EXAMPLE**: Why did Nixon's price controls lead to shortages and lines?

Page 143: How do rent controls work: and fail?

## Chapter 9: International Trade

Page 163: What is the cost of the sugar tariff?

Page 168: How does trade affect child labor?

## Chapter 10: Externalities: When the Price is Not Right

Page 177 **CHAPTER OPENING**: The death of Calvin Coolidge's son from a burst blister

Page 182: How is beekeeping a private solution to externality problems?

Page 187: How do tradable pollution allowances really work?

## Chapter 11: Costs and Profit Maximization Under Competition

Page 195 **CHAPTER OPENING** and **RUNNING EXAMPLE**: What are nodding donkeys?

## Chapter 12: Competition and the Invisible Hand

Page 230: How does the invisible hand minimize the total industry costs of production?

## Chapter 13: Monopoly

Page 235 **CHAPTER OPENING** and **RUNNING EXAMPLE**: Why is the life-saving drug Combivir that fights AIDS priced so much higher than marginal cost?

Page 242: How prone are monopolies to corruption?

Page 244: Are patent buyouts a possible solution to monopolies of vital drugs?

Page 247: Why can cable TV be so bad and so good?

Page 248: How did regulation make California's 2000 power crisis worse?

## Chapter 14: Price Discrimination and Pricing Strategy

Page 259 **CHAPTER OPENING**: Why is the AIDS drug Combivir priced high in Europe and lower in Africa?

Page 264: How do universities practice perfect price discrimination?

Page 268: Tying: Why does Hewlett-Packard force you to buy their ink if you use their printers?

Page 269: Why does Microsoft bundle together a bunch of programs in their office software?

## Chapter 15: Oligopoly and Game Theory

Page 288: How prevalent is the Prisoner's Dilemma?

Page 292: Why do price matching guarantees tend to lead to higher prices?

Page 294: What is the cost of loyalty programs to you?

## Chapter 16: Competing for Monopoly: The Economics of Network Goods

Page 310: Why did the QWERTY keyboard win out over the Dvorak keyboard?

Page 313: Is music a network good?

**Chapter 17: Monopolistic Competition and Advertising**

Page 319: How much market power does Stephen King have?

Page 325: What aspects of Coca-Cola are advertised?

**Chapter 18: Labor Markets**

Page 335: How much is education worth?

Page 340: How much of labor market outcomes can be attributed to discrimination?

**Chapter 19: Public Goods**

Page 353: How likely will an asteroid hit Earth and cause a catastrophe?

Page 360: How New Zealand prevented a tragedy of the commons

**Chapter 20: Political Economy and Public Choice**

Page 373: How do special interests such as U.S. sugar growers push for favorable legislation?

Page 380: Democracies and the mean voter theorem

Page 383: Democracies and famine

**Chapter 21: Economics, Ethics, and Public Policy**

Page 396: Should eating horses be banned?

Page 397: Is the French government paternalistic?

**Chapter 22: Managing Incentives**

Page 411: Is it smart to have profit-seeking firms run prisons?

Page 420: Do nudges work?

**Chapter 23: Stock Markets and Personal Finance**

Page 440: Can speculative bubbles be identified?

**Chapter 24: Asymmetric Information: Moral Hazard and Adverse Selection**

Page 451: Adverse selection in the used-car market

Page 456: How do you signal your skills in the job market?

**Chapter 25: Consumer Choice**

Page 478: How much should Costco charge for membership?

Page 482: Labor supply and welfare programs

# MODERN PRINCIPLES: MICROECONOMICS

Third Edition

**Tyler Cowen**

George Mason University

**Alex Tabarrok**

George Mason University

**WORTH  
PUBLISHERS**

A **Macmillan** Education Imprint  
New York

*Economics is the study of how to get the most out of life.*

*Tyler and Alex*

Vice President, Editorial: Charles Linsmeier  
Vice President, Editing, Design, and Media Production: Catherine Woods  
Executive Editor: Carlise Stembridge  
Marketing Manager: Tom Digiano  
Consulting Editor: Paul Shensa  
Senior Developmental Editor: Bruce Kaplan  
Supplements and Media Editor: Lindsay Neff  
Art Director: Diana Blume  
Cover and Text Designer: Diana Blume  
Director of Editing, Design, and Media Production: Tracey Kuehn  
Managing Editor: Lisa Kinne  
Project Editor: Fred Dahl, TS!evolve  
Photo Editor: Robin Fadool  
Production Manager: Barbara Anne Seixas  
Supplements Production Manager: Stacey Alexander  
Supplements Project Editor: Edgar Doolan  
Composition: TS!evolve  
Printing and Binding: RR Donnelley  
Cover Image: © Oleh Barabash/Alamy and Jim Roof/myLoupe.com

Library of Congress Preassigned Control Number: 2014952565

ISBN-13: 978-1-4292-7841-6

ISBN-10: 1-4292-7841-2

© 2015, 2013, 2010 by Worth Publishers

All rights reserved.

Printed in the United States of America

First printing

Worth Publishers  
41 Madison Avenue  
New York, NY 10010  
www.worthpublishers.com



## ABOUT THE AUTHORS

Tyler Cowen (left, in North Korea) is Holbert C. Harris Professor of Economics at George Mason University. His latest book is *The Great Stagnation*. With Alex Tabarrok, he writes an economics blog at [MarginalRevolution.com](http://MarginalRevolution.com). He has published in the *American Economic Review*, *Journal of Political Economy*, and many other economics journals. He also writes regularly for the popular press, including the *New York Times*, the *Washington Post*, *Forbes*, the *Wilson Quarterly*, *Money Magazine*, and many other outlets.

Alex Tabarrok (right, in South Korea) is Bartley J. Madden Chair in Economics at the Mercatus Center at George Mason University. His latest book is *Launching the Innovation Renaissance*. His research looks at bounty hunters, judicial incentives and elections, crime control, patent reform, methods to increase the supply of human organs for transplant, and the regulation of pharmaceuticals. He is the editor of the books *Entrepreneurial Economics: Bright Ideas from the Dismal Science* and *The Voluntary City: Choice, Community, and Civil Society*, among others. His papers have appeared in the *Journal of Law and Economics*, *Public Choice*, *Economic Inquiry*, the *Journal of Health Economics*, the *Journal of Theoretical Politics*, the *American Law and Economics Review*, and many others. Popular articles have appeared in the *New York Times*, the *Wall Street Journal*, *Forbes*, and many other magazines and newspapers.

# BRIEF CONTENTS

Preface.....	xvi
<b>CHAPTER 1</b> The Big Ideas.....	1
<b>CHAPTER 2</b> The Power of Trade and Comparative Advantage.....	13
<b>Part I: Supply and Demand</b>	
<b>CHAPTER 3</b> Supply and Demand.....	27
<b>CHAPTER 4</b> Equilibrium: How Supply and Demand Determine Prices.....	47
<b>CHAPTER 5</b> Elasticity and Its Applications.....	67
<b>CHAPTER 6</b> Taxes and Subsidies.....	95
<b>Part 2: The Price System</b>	
<b>CHAPTER 7</b> The Price System: Signals, Speculation, and Prediction.....	115
<b>CHAPTER 8</b> Price Ceilings and Floors.....	133
<b>CHAPTER 9</b> International Trade.....	161
<b>CHAPTER 10</b> Externalities: When the Price Is Not Right.....	177
<b>Part 3: Firms and Factor Markets</b>	
<b>CHAPTER 11</b> Costs and Profit Maximization Under Competition.....	195
<b>CHAPTER 12</b> Competition and the Invisible Hand.....	225
<b>CHAPTER 13</b> Monopoly.....	235
<b>CHAPTER 14</b> Price Discrimination and Pricing Strategy.....	259
<b>CHAPTER 15</b> Oligopoly and Game Theory.....	281
<b>CHAPTER 16</b> Competing for Monopoly: The Economics of Network Goods.....	307
<b>CHAPTER 17</b> Monopolistic Competition and Advertising.....	319
<b>CHAPTER 18</b> Labor Markets.....	329
<b>Part 4: Government</b>	
<b>CHAPTER 19</b> Public Goods and the Tragedy of the Commons.....	353
<b>CHAPTER 20</b> Political Economy and Public Choice.....	371
<b>CHAPTER 21</b> Economics, Ethics, and Public Policy.....	393
<b>Part 5: Decision Making for Businesses, Investors, and Consumers</b>	
<b>CHAPTER 22</b> Managing Incentives.....	409
<b>CHAPTER 23</b> Stock Markets and Personal Finance.....	429
<b>CHAPTER 24</b> Asymmetric Information: Moral Hazard and Adverse Selection.....	445
<b>CHAPTER 25</b> Consumer Choice.....	465
<b>APPENDIX A</b> Reading Graphs and Making Graphs.....	A-1
<b>APPENDIX B</b> Solutions to Check Yourself Questions.....	B-1
Glossary G-1	
References R-1	
Index I-1	



# CONTENTS

Preface xvi

**CHAPTER 1** The Big Ideas..... 1

**Big Idea One: Incentives Matter 2**

**Big Idea Two: Good Institutions Align Self-Interest with the Social Interest 2**

**Big Idea Three: Trade-offs Are Everywhere 3**

Opportunity Cost 4

**Big Idea Four: Thinking on the Margin 4**

**Big Idea Five: The Power of Trade 5**

**Big Idea Six: The Importance of Wealth and Economic Growth 6**

**Big Idea Seven: Institutions Matter 7**

**Big Idea Eight: Economic Booms and Busts Cannot Be Avoided  
but Can Be Moderated 8**

**Big Idea Nine: Prices Rise When the Government Prints Too Much Money 9**

**Big Idea Ten: Central Banking Is a Hard Job 9**

**The Biggest Idea of All: Economics Is Fun 10**

**Chapter Review 11**

**CHAPTER 2** The Power of Trade and Comparative Advantage..... 13

**Trade and Preferences 13**

**Specialization, Productivity, and the Division of Knowledge 14**

**Comparative Advantage 15**

The Production Possibility Frontier 16

Opportunity Costs and Comparative Advantage 16

Comparative Advantage and Wages 19

Adam Smith on Trade 21

**Trade and Globalization 21**

**Takeaway 21**

**Chapter Review 22**

**Work It Out 25**

## Part I: Supply and Demand

**CHAPTER 3** Supply and Demand..... 27

**The Demand Curve for Oil 27**

**Consumer Surplus 30**

**What Shifts the Demand Curve? 30**

Important Demand Shifters 31

**Produce Surplus 36**

**What Shifts the Supply Curve? 37**

Important Supply Shifters 37

**Takeaway 40**

**Chapter Review 41**

**Work It Out 45**

**CHAPTER 4** Equilibrium: How Supply and Demand Determine Prices..... 47

**Equilibrium and the Adjustment Process 47**

Who Competes with Whom? 49

**A Free Market Maximizes Producer Plus Consumer Surplus  
(the Gain from Trade) 49**

**Does the Model Work? Evidence from the Laboratory 52**

**Shifting Demand and Supply Curves 54**

**Terminology: Demand Compared with Quantity Demanded  
and Supply Compared with Quantity Supplied 56**

**Understanding the Price of Oil 58**

**Takeaway 60**

**Chapter Review 61**

**Work It Out 66**

**CHAPTER 5** Elasticity and Its Applications ..... 67

**The Elasticity of Demand 68**

Determinants of the Elasticity of Demand 68

Calculating the Elasticity of Demand 70

Total Revenues and the Elasticity of Demand 72

**Applications of Demand Elasticity 74**

How American Farmers Have Worked Themselves Out of a Job 74

Why the War on Drugs Is Hard to Win 75

**The Elasticity of Supply 76**

Determinants of the Elasticity of Supply 77

Calculating the Elasticity of Supply 79

**Applications of Supply Elasticity 79**

Gun Buyback Programs 80

The Economics of Slave Redemption 81

**Using Elasticities for Quick Predictions (Optional) 84**

How Much Would the Price of Oil Fall if the Arctic National Wildlife Refuge Were  
Opened Up for Drilling? 84

**Takeaway 85**

**Chapter Review 86**

**Work It Out 90**

**CHAPTER 5 APPENDIX 1:** Other Types of Elasticities ..... 91

**CHAPTER 5 APPENDIX 2:** Using Excel to Calculate Elasticities ..... 93

**CHAPTER 6** Taxes and Subsidies ..... 95

**Commodity Taxes 96**

**Who Ultimately Pays the Tax Does Not Depend on Who Writes the Check 96**

**Who Ultimately Pays the Tax Depends on the Relative Elasticities of Supply  
and Demand 99**

- The Wedge Shortcut 99
- Health Insurance Mandates and Tax Analysis 101
- Who Pays the Cigarette Tax? 102

**A Commodity Tax Raises Revenue and Creates a Deadweight Loss (Reduces the Gains from Trade) 102**

- Elasticity and Deadweight Loss 104

**Subsidies 105**

- King Cotton and the Deadweight Loss of Water Subsidies 106
- Wage Subsidies 108

**Takeaway 109**

**Chapter Review 109**

**Work It Out 114**

**Part 2: The Price System**

**CHAPTER 7 The Price System: Signals, Speculation, and Prediction..... 115**

**Markets Link the World 115**

**Markets Link to One Another 116**

- From Oil to Candy Bars and Brick Driveways 117

**Solving the Great Economic Problem 117**

**A Price Is a Signal Wrapped Up in an Incentive 120**

**Speculation 121**

**Signal Watching 125**

**Prediction Markets 127**

**Takeaway 127**

**Chapter Review 127**

**Work It Out 131**

**CHAPTER 8 Price Ceilings and Floors ..... 133**

**Price Ceilings 133**

- Shortages 134
- Reductions in Quality 135
- Wasteful Lines and Other Search Costs 135
- Lost Gains from Trade (Deadweight Loss) 137
- Misallocation of Resources 138
- The End of Price Ceilings 142

**Rent Controls (Optional Section) 143**

- Shortages 143
- Reductions in Product Quality 144
- Wasteful Lines, Search Costs, and Lost Gains from Trade 145
- Misallocation of Resources 146
- Rent Regulation 146

**Arguments for Price Ceilings 146**

**Universal Price Controls 147**

**Price Floors 149**

- Surpluses 149
- Lost Gains from Trade (Deadweight Loss) 150

Wasteful Increases in Quality	152
The Misallocation of Resources	153
<b>Takeaway</b>	<b>154</b>
<b>Chapter Review</b>	<b>154</b>
<b>Work It Out</b>	<b>160</b>
<b>CHAPTER 9 International Trade</b> .....	<b>161</b>
<b>Analyzing Trade with Supply and Demand</b>	<b>161</b>
Analyzing Tariffs with Demand and Supply	162
<b>The Costs of Protectionism</b>	<b>163</b>
Winners and Losers from Trade	166
<b>Arguments Against International Trade</b>	<b>167</b>
Trade and Jobs	167
Child Labor	168
Trade and National Security	170
Key Industries	170
Strategic Trade Protectionism	171
<b>Takeaway</b>	<b>172</b>
<b>Chapter Review</b>	<b>172</b>
<b>Work It Out</b>	<b>176</b>
<b>CHAPTER 10 Externalities: When the Price Is Not Right</b> .....	<b>177</b>
<b>External Costs, External Benefits, and Efficiency</b>	<b>178</b>
External Costs	179
External Benefits	181
<b>Private Solutions to externality Problems</b>	<b>182</b>
<b>Government Solutions to externality Problems</b>	<b>184</b>
Command and Control	184
Tradable Allowances	186
Comparing Tradable Allowances and Pigouvian Taxes—Advanced Material	188
<b>Takeaway</b>	<b>189</b>
<b>Chapter Review</b>	<b>190</b>
<b>Work It Out</b>	<b>194</b>
 <b>Part 3: Firms and Factor Markets</b>	
<b>CHAPTER 11 Costs and Profit Maximization Under Competition</b> .....	<b>195</b>
<b>What Price to Set?</b>	<b>195</b>
<b>What Quantity to Produce?</b>	<b>197</b>
Don't Forget: Opportunity Costs!	198
Maximizing Profit	199
<b>Profits and the Average Cost Curve</b>	<b>202</b>
<b>Entry, Exit, and Shutdown Decisions</b>	<b>204</b>
The Short-Run Shutdown Decision	204
Entry and Exit with Uncertainty and Sunk Costs	204
<b>Entry, Exit, and Industry Supply Curves</b>	<b>206</b>
Increasing Cost Industries	207

Constant Cost Industries	208
A Special Case: The Decreasing Cost Industry	211
Industry Supply Curves: Summary	212
<b>Takeaway</b>	<b>213</b>
<b>Chapter Review</b>	<b>213</b>
<b>Work It Out</b>	<b>220</b>
<b>CHAPTER 11 APPENDIX: Using Excel to Graph Cost Curves</b>	<b>221</b>
<b>CHAPTER 12 Competition and the Invisible Hand</b>	<b>225</b>
<b>Invisible Hand Property 1: The Minimization of Total Industry Costs of Production</b>	<b>226</b>
<b>Invisible Hand Property 2: The Balance of Industries</b>	<b>228</b>
<b>Creative Destruction</b>	<b>229</b>
<b>The Invisible Hand Works with Competitive Markets</b>	<b>230</b>
<b>Takeaway</b>	<b>231</b>
<b>Chapter Review</b>	<b>232</b>
<b>Work It Out</b>	<b>234</b>
<b>CHAPTER 13 Monopoly</b>	<b>235</b>
<b>Market Power</b>	<b>236</b>
<b>How a Firm Uses Market Power to Maximize Profit</b>	<b>236</b>
The Elasticity of Demand and the Monopoly Markup	239
<b>The Costs of Monopoly: Deadweight Loss</b>	<b>241</b>
<b>The Costs of Monopoly: Corruption and Inefficiency</b>	<b>242</b>
<b>The Benefits of Monopoly: Incentives for Research and Development</b>	<b>243</b>
Patent Buyouts—A Potential Solution?	244
<b>Economies of Scale and the Regulation of Monopoly</b>	<b>245</b>
I Want My MTV	247
Electric Shock	248
California’s Perfect Storm	248
<b>Other Sources of Market Power</b>	<b>250</b>
<b>Takeaway</b>	<b>251</b>
<b>Chapter Review</b>	<b>251</b>
<b>Work It Out</b>	<b>257</b>
<b>CHAPTER 14 Price Discrimination and Pricing Strategy</b>	<b>259</b>
<b>Price Discrimination</b>	<b>259</b>
Preventing Arbitrage	261
<b>Price Discrimination Is Common</b>	<b>262</b>
Universities and Perfect Price Discrimination	264
<b>Is Price Discrimination Bad?</b>	<b>266</b>
Why Misery Loves Company and How Price Discrimination Helps to Cover Fixed Costs	267
<b>Tying and Bundling</b>	<b>268</b>
Tying	268
Bundling	269
Bundling and Cable TV	270

<b>Takeaway</b>	<b>271</b>
<b>Chapter Review</b>	<b>272</b>
<b>Work It Out</b>	<b>276</b>
<b>CHAPTER 14 APPENDIX: Solving Price Discrimination Problems with Excel (Advanced Section)</b>	<b>277</b>
<b>CHAPTER 15 Oligopoly and Game Theory</b>	<b>281</b>
<b>Cartels</b>	<b>282</b>
The Incentive to Cheat	284
No One Wins the Cheating Game	285
<b>The Prisoner’s Dilemma</b>	<b>286</b>
The Prisoner’s Dilemma and Repeated Interaction	286
The Prisoner’s Dilemma Has Many Applications	288
<b>Oligopolies</b>	<b>289</b>
<b>When Are Cartels and Oligopolies Most Successful?</b>	<b>290</b>
<b>Governmental Policy toward Cartels and Oligopolies</b>	<b>291</b>
Government-Supported Cartels	291
<b>Business Strategy and Changing the Game</b>	<b>292</b>
The Danger of Price Matching Guarantees	292
The High Price of Loyalty	294
Other Ways of Changing the Game	295
<b>Takeaway</b>	<b>296</b>
<b>Chapter Review</b>	<b>296</b>
<b>Work It Out</b>	<b>302</b>
<b>CHAPTER 15 APPENDIX: Nash Equilibrium</b>	<b>303</b>
<b>CHAPTER 16 Competing for Monopoly: The Economics of Network Goods</b>	<b>307</b>
<b>Network Goods Are Usually Sold by Monopolies or Oligopolies</b>	<b>308</b>
<b>The “Best” Product May Not Always Win</b>	<b>308</b>
<b>Competition Is “For the Market” Instead of “In the Market”</b>	<b>310</b>
<b>Contestable Markets</b>	<b>308</b>
Limiting Contestability with Switching Costs	311
<b>Antitrust and Network Goods</b>	<b>312</b>
<b>Music Is a Network Good</b>	<b>313</b>
<b>Takeaway</b>	<b>313</b>
<b>Chapter Review</b>	<b>314</b>
<b>Work It Out</b>	<b>317</b>
<b>CHAPTER 17 Monopolistic Competition and Advertising</b>	<b>319</b>
<b>Sources of Product Differentiation</b>	<b>320</b>
<b>The Monopolistic Competition Model</b>	<b>320</b>
Is Monopolistic Competition Inefficient? ...	323
<b>The Economics of Advertising</b>	<b>323</b>
Informative Advertising	324

- Advertising as Signaling 324
- Advertising as Part of the Product 325

### Takeaway 326

### Chapter Review 326

### Work It Out 328

## CHAPTER 18 Labor Markets..... 329

### The Demand for Labor and the Marginal Product of Labor 329

### Supply of Labor 331

### Labor Market Issues 333

- Why Do Janitors in the United States Earn More Than Janitors in India Even When They Do the Same Job? 333

Human Capital 335

Compensating Differentials 336

Do Unions Raise Wages? 339

### How Bad Is Labor Market Discrimination, or Can Lakisha Catch a Break? 340

Statistical Discrimination 340

Preference-Based Discrimination 341

Why Discrimination Isn't Always Easy to Identify 344

### Takeaway 346

### Chapter Review 346

### Work It Out 351

## Part 4: Government

## CHAPTER 19 Public Goods and the Tragedy of the Commons..... 353

### Four Types of Goods 354

### Private Goods and Public Goods 355

### Club Goods 357

The Peculiar Case of Advertising 357

### Common Resources and the Tragedy of the Commons 358

Happy Solutions to the Tragedy of the Commons 360

### Takeaway 362

### Chapter Review 362

### Work It Out 368

## CHAPTER 19 APPENDIX: The Tragedy of the Commons: How Fast?..... 369

## CHAPTER 20 Political Economy and Public Choice ..... 371

### Voters and the Incentive to Be Ignorant 372

Why Rational Ignorance Matters 373

### Special Interests and the Incentive to Be Informed 373

### A Formula for Political Success: Diffuse Costs, Concentrate Benefits 375

### Voter Myopia and Political Business Cycles 377

### Two Cheers for Democracy 379

The Median Voter Theorem 380

Democracy and Nondemocracy 382

Democracy and Famine	383
Democracy and Growth	385
<b>Takeaway</b>	<b>387</b>
<b>Chapter Review</b>	<b>387</b>
<b>Work It Out</b>	<b>392</b>
<b>CHAPTER 21</b> Economics, Ethics, and Public Policy.....	393
<b>The Case for Exporting Pollution and Importing Kidneys</b>	<b>394</b>
<b>Exploitation</b>	<b>395</b>
<b>Meddlesome Preferences</b>	<b>396</b>
<b>Fair and Equal Treatment</b>	<b>397</b>
<b>Cultural Goods and Paternalism</b>	<b>397</b>
<b>Poverty, Inequality, and the Distribution of Income</b>	<b>398</b>
Rawls's Maximin Principle	398
Utilitarianism	399
Robert Nozick's Entitlement Theory	400
<b>Who Counts? Immigration</b>	<b>402</b>
<b>Economic Ethics</b>	<b>403</b>
<b>Takeaway</b>	<b>404</b>
<b>Chapter Review</b>	<b>404</b>
<b>Work It Out</b>	<b>407</b>
<b>Part 5: Decision Making for Businesses, Investors, and Consumers</b>	
<b>CHAPTER 22</b> Managing Incentives .....	409
<b>Lesson One: You Get What You Pay For</b>	<b>409</b>
Prisons for Profit?	411
Piece Rates vs. Hourly Wages	412
<b>Lesson Two: Tie Pay to Performance to Reduce Risk</b>	<b>413</b>
Tournament Theory	414
Improving Executive Compensation with Pay for Relative Performance	415
Environment Risk and Availability Risk	416
Tournaments and Grades	417
<b>Lesson Three: Money Isn't Everything</b>	<b>418</b>
<b>Lesson Four: Nudges Can Work</b>	<b>420</b>
<b>Takeaway</b>	<b>422</b>
<b>Chapter Review</b>	<b>423</b>
<b>Work It Out</b>	<b>428</b>
<b>CHAPTER 23</b> Stock Markets and Personal Finance .....	429
<b>Passive vs. Active Investing</b>	<b>430</b>
<b>Why Is It Hard to Beat the Market?</b>	<b>431</b>
<b>How to Really Pick Stocks, Seriously</b>	<b>433</b>
Diversify	433



- Avoid High Fees 435
- Compound Returns Build Wealth 436
- The No-Free-Lunch Principle, or No Return without Risk 437

**Other Benefits and Costs of Stock Markets 440**

- Bubble, Bubble, Toil, and Trouble 440

**Takeaway 442**

**Chapter Review 442**

**Work It Out 444**

**CHAPTER 24 Asymmetric Information: Moral Hazard and Adverse Selection..... 445**

**Moral Hazard 446**

- Overcoming Moral Hazard by Providing More Information 447
- Overcoming Moral Hazard by Creating Better Incentives 449

**Adverse Selection 450**

- Adverse Selection in Health Insurance 452

**Signaling as a Response to Asymmetric Information 456**

- Signaling in the Job Market 456
- Signaling in Dating, Marriage, and the Animal Kingdom 457
- Is Signaling Good? 458

**Takeaway 459**

**Chapter Review 459**

**Work It Out 463**

**CHAPTER 25 Consumer Choice..... 465**

**How to Compare Apples and Oranges 465**

**The Demand Curve 468**

**The Budget Constraint 469**

**Preferences and Indifference Curves 472**

**Optimization and Consumer Choices 473**

**The Income and Substitution Effects 476**

**Applications of Income and Substitution Effects 477**

- Losing Your Ticket 478
- How Much Should Costco Charge for Membership? 478
- Labor Supply 479
- Labor Supply and Welfare Programs 482

**Takeaway 484**

**Chapter Review 484**

**Work It Out 488**

**APPENDIX A Reading Graphs and Making Graphs..... A-1**

**APPENDIX B Solutions to Check Yourself Questions .....B-1**

Glossary G-1

References R-1

Index I-1

# PREFACE: TO THE INSTRUCTOR

The prisoners were dying of scurvy, typhoid fever, and smallpox, but nothing was killing them more than bad incentives.

That is the opening from Chapter 1 of *Modern Principles: Microeconomics*, and only an economist could write such a sentence. Only an economist could see that incentives are operating just about everywhere, shaping every aspect of our lives, whether it be how good a job you get, how much wealth an economy produces, and, yes, how a jail is run and how well the prisoners end up being treated. We are excited about this universal and powerful applicability of economics, and we have written this book to get you excited too.

In the first two editions, we wanted to accomplish several things. We wanted to show the power of economics for understanding our world. We wanted to create a book full of vivid writing and powerful stories. We wanted to present modern economics, not the musty doctrines or repetitive examples of a generation ago. We wanted to show—again and again—that incentives matter, whether discussing the tragedy of the commons, political economy, or what economics has to say about wise investing. Most generally, we wanted to make the invisible hand visible, namely to show there is a hidden order behind the world and that order can be illuminated by economics.

## Make the Invisible Hand Visible

One of the most remarkable discoveries of economic science is that under the right conditions the pursuit of self-interest can promote the social good. Nobel laureate Vernon Smith put it this way:

At the heart of economics is a scientific mystery . . . a scientific mystery as deep, fundamental and inspiring as that of the expanding universe or the forces that bind matter. . . . How is order produced from freedom of choice?

We want students to be inspired by this mystery and by how economists have begun to solve it. Thus, we will explain how markets generate cooperation from people across the world, how prices act as signals and coordinate appropriate responses to changes in economic conditions, and how profit maximization leads to the minimization of industry costs (even though no one intends such an end).

We strive to make the invisible hand visible, and we do so with the core idea of supply and demand as the organizing principle of economics. Thus, we start with supply and demand, including producer and consumer surplus and the two ways of reading the curves, and then we build equilibrium in its own chapter, then elasticity, then taxes and subsidies, then the price system, then price ceilings

and floors, then international trade, and then externalities. All of this material is based on supply and demand so that students are continually gaining experience using the same tools to solve more and deeper problems as they proceed. The interaction of supply and demand generates market prices and quantities, which in turn lies behind the spread of information from one part of a market economy to another. Thus, we show how the invisible hand works through the *price system*.

In Chapter 7 we show how the invisible hand links romantic American teenagers with Kenyan flower growers, Dutch clocks, British airplanes, Colombian coffee, and Finnish cell phones. We also show how prices signal information and how markets help to solve the *great economic problem* of arranging our limited resources to satisfy as many of our wants as possible.

The focus on the invisible hand, or *the price system*, continues in Chapter 8. As in other texts, we show how a price ceiling causes a shortage. But a shortage in one market can spill over into other markets (e.g., shortages of oil in the 1970s meant that oil rigs off the coast of California could not get enough oil to operate). In addition, a price ceiling reduces the incentive to move resources from low-value uses to high-value uses, so in the 1970s we saw long lines for gasoline in some states yet *at the same time* gas was plentiful in other states just a few hours away. Price ceilings, therefore, cause a misallocation of resources across markets as well as a shortage within a particular market. We think of Chapters 7 and 8 as a package: Chapter 7 illustrates the price system when it is working and Chapter 8 illustrates what happens when the price system is impeded.

Students who catch even a glimpse of the invisible hand learn something of great importance. Civilization is possible only because under some conditions the pursuit of self-interest promotes the public good.

In discussing the invisible hand, we bring more Hayekian economics into the classroom without proselytizing for Hayekian politics. That is, we want to show how prices communicate information and coordinate action while still recognizing that markets do not always communicate the right information. Thus, our chapters on the price system are rounded out with what we think is an equally interesting and compelling chapter on externalities. The subtitle of Chapter 10, “When the Price Is Not Right,” harkens directly back to Chapter 7. By giving examples where the price signal is right and examples where the price signal is wrong, we convey a sophisticated understanding of the role of prices.

## Demonstrate the Power of Incentives

Our second goal in writing *Modern Principles: Microeconomics* is to show—again and again—that incentives matter. In fact, incentives are the theme throughout *Modern Principles*, whether discussing the supply of oil, the effects of price controls, or the gains from international trade. We also include Chapter 22, “Managing Incentives.” In this chapter, we explain topics such as the trade-offs between fixed salaries and piece rates, when tournaments work well, and how best to incentivize executives. This chapter can be read profitably by anyone with an interest in *incentive design*—by managers, teachers, even parents! Chapter 22 will be of special interest to business and MBA students (and professors).

## Present Modern Models and Vivid Applications

“Modern” is our third goal in writing *Modern Principles*. For example, we include an entire chapter on price discrimination, in which we cover not just traditional models but also tying and bundling. Students today are familiar with tied goods like cell phones and minutes, or printers and ink, as well as with bundles like Microsoft Office. A modern economics textbook should help students to *understand their world*.

We include business examples and topics throughout the text. We cover business issues as diverse as why businesses cluster and how network externalities push businesses to compete “for the market” rather than “in the market,” to how successful cartels such as the NBA deal with the incentive to cheat, to how businesses actually go about price discriminating. Our chapter on incentives, already mentioned, is critical for managers in a variety of fields.

We also present a modern perspective on the costs and benefits of market power. A significant amount of market power today is tied to innovation, patents, and high fixed costs. Understanding the trade-offs involved with pricing AIDS drugs at marginal cost, for example, is critically important to understanding pharmaceutical policy. Similar issues arise with music, movies, software, chip design, and universities. Our material on monopoly and innovation is consistent with and provides a foundation for modern theories of economic growth.

Our chapters on monopoly and price discrimination (Chapters 13 and 14) are filled with business applications, real-world examples, and insightful discussions of policy.

Our game theory chapters (Chapters 15 and 16) are especially geared toward modern real-world choices and problems. Naturally, we cover cartel behavior. We also cover network externalities extensively. In many high-tech and online markets, the value of a good depends on how many other people are using the same good. Students are very familiar with examples such as Facebook and they want to know how the principles of economics apply to these contemporary goods. We even challenge students by showing how the principles of network externalities apply to cultural goods and even to the songs they listen to!

A modern text needs to place economics in context. We have a whole chapter on normative judgments (Chapter 21). It covers the assumptions behind cost-benefit analysis, the idea of a Pareto improvement, and the ethical judgments that have been used to praise or condemn economic reasoning. Rightly or wrongly, commentators often mix economic and moral judgments and we teach students to recognize which is which. We stress to the student that economics cannot answer normative issues but the student should be aware of what those normative issues are.

We offer an entire chapter (Chapter 23) on the stock market, a topic of direct practical concern to many students. We teach the basic trade-off between risk and return (no free lunches) and explain why it is a good idea to diversify investments. We also explain the microeconomics of bubbles, which of course bridges to current macroeconomic issues.

## Guiding Principles and Innovations: In a Nutshell

*Modern Principles* offers the following features and benefits:

1. We teach the economic way of thinking.

2. *Modern Principles* has a more intuitive development of markets and their interconnectedness than does any other textbook. More than any other textbook, we teach students how the *price system* works.
3. *Modern Principles* helps students to see the invisible hand. We offer an intuitive proof of several “invisible hand theorems.” For example, we show that through the operation of incentives and the price system, well functioning markets will minimize the aggregate sum of the costs of production even though no one intends this result. Local knowledge creates a global benefit.
4. We offer an entire chapter on incentives and how they apply to business decisions, sports, and incentive design. When, for instance, should you reward your employees with a tournament form of compensation, and when a straight salary? Most texts are oddly silent on such practical issues, but it is precisely such issues that interest many students and show them the relevance of the economic way of thinking. We also offer an entire chapter on network goods, including the value of Facebook, the tech sector, and how markets for music work.
5. We offer an entire chapter on the stock market, a topic of concern to many students. We teach the basic trade-off between risk and return and explain why it is a good idea to diversify investments. We also explain the microeconomics of bubbles.
6. Today’s students live in a globalized economy. Events in China, India, Europe, and the Middle East affect their lives. *Modern Principles* features international examples and applications throughout, rather than just segregating all of the international topics in a single chapter.
7. Less is more. This is a textbook of *principles*, not a survey or an encyclopedia. A textbook that focuses on what is important helps the student to focus on what is important. There are fewer yet more consistent and more comprehensive models.
8. No tools without applications. Real-world vivid applications are used to develop theory. Applications are not pushed aside into distracting boxes that students do not read.
9. Excel is used as a tool in appendices to help students develop insight, hands-on experience, and modeling ability.

## What’s New in the Third Edition?

Every book must change with the time and ours has too. The new edition of *Modern Principles: Microeconomics* includes many additions and structural changes:

1. We include a new Chapter 24, “Asymmetric Information: Moral Hazard and Adverse Selection.” This chapter covers principal-agent problems and how producers may attempt to take advantage of consumers, for instance, when the producer knows more about the quality of the good than does the consumer. The key concepts of *moral hazard* and *adverse selection* are stressed and illustrated with examples, including automobile mechanics, used car salespeople, doctors, health insurance, and online Internet reviews. We also discuss signaling, such as how candidates prove they are worthy of jobs and why engagement rings are bought to signal the quality and commitment of a potential mate.

2. We have reorganized our chapters on game theory, added new material on game theory and new applications, and turned two chapters into three. In addition to the new chapter on asymmetric information (previously mentioned), the new Chapter 15 is “Oligopoly and Game Theory.” It has more on cheating games, prisoner’s dilemma, and cartel stability than the previous edition did. There are also new discussions of price matching games and also consumer loyalty programs, such as frequent flyer miles and buyer clubs. We again use game theory to help illuminate the world that students actually spend their money in.
3. The new version of Chapter 16 is now “Competing for Monopoly: The Economics of Network Goods.” This chapter considers goods that are more valuable as the number of users increases, such as Facebook, where users wish to share a common network with their friends. Or perhaps listeners wish to share and discuss a common favorite song. We consider whether consumers can be stuck in the wrong network, why these markets often have concentrated supply (there is no close competitor to Facebook), and how such markets can drive high rates of innovation.
4. As part of this extension of the coverage of game theory, we have pulled out our coverage of monopolistic competition and now have an entirely separate Chapter 17, “Monopolistic Competition and Advertising.” In this chapter we also cover the ideas of advertising as information, advertising as signaling, and the behavioral economics of advertising. Advertising of course is especially important in monopolistically competitive market structures.
5. Following up on the introduction of this feature in the second edition, we continue to have extensive coverage of indifference curves and income and substitution effects in Chapter 25, “Consumer Choice.”
6. We have created free, online videos for most chapters in this book. These videos are short (five to seven minutes, usually), visually appealing, and easy to use. We all know that videos can be a very effective medium for teaching and a complement to the classroom and to the written text. We use videos to show supply and demand, the economics of price controls, externalities, trade and the division of labor, the history of economic growth, and many other centrally useful economic concepts. These videos are lively and to the point, in some cases using formal animation techniques, others with a virtual blackboard, à la Khan Academy. Our videos are supplemented with a personally curated list of other video material that wonderfully illustrates economic concepts and history. If you wish to start with a video to see how these work, just try the QR code in the margin to the left. What’s a QR code? You just scan the code with a smartphone and it brings you to a useful Web site or video for illustrating economic concepts. No more typing in long or difficult to remember URLs. A book called *Modern Principles* should be taking advantage of modern technology. Links to the videos are also in our new coursespace, LaunchPad, along with assessment. The videos can also be found online at MRUniversity.com. And don’t forget that a video, unlike your lecture, can be rewound, rewatched, or taken on a trip if a student misses class. It’s also a lot more portable than a heavy textbook.



Most importantly, we’ve kept all of the qualities and features that made the first two editions so popular.

## What's in the Chapters?

We review the key aspects of supply and demand and the price system, done in six chapters. We present incentives as the most important idea in microeconomics. Microeconomics should be intuitive, should teach the skill of thinking like an economist, and should be drawn from examples from everyday life. Along these lines, these chapters run as follows.

**Chapter 1: The Big Ideas in Economics** What is economics all about? We present the core ideas of incentives, opportunity cost, trade, the importance of economic growth, thinking on the margin, and some of the key insights of economics such as that tampering with the laws of supply and demand has consequences and good institutions align self-interest with the social interest. The point is to make economics intuitive and compelling and to hook the student with examples from everyday life.

**Chapter 2: The Power of Trade and Comparative Advantage** Why is trade so important and why is it a central idea of economics? We introduce ideas of gains from trade, the production possibilities frontier, and comparative advantage to show the student some core ideas behind the economic way of thinking. The key here is to illustrate the power of economic concepts in explaining the prosperity of the modern world. An instructor can either use this material to entice the student, or postpone the subject and move directly to the supply and demand chapters.

## Part 1: Supply and Demand

**Chapter 3: Supply and Demand** This chapter focuses on demand curves, supply curves, how and why they slope, and how they shift. The chapter presents some basic fundamentals of economic theory, using the central example of the market for oil. We also take special care to illustrate how demand and supply curves can be read “horizontally” or “vertically.” That is, a demand curve tells you the quantity demanded at every price and the maximum willingness to pay (per unit) for any quantity.

It takes a bit more work to explain these concepts early on, but students who learn to read demand curves in both ways get a deeper understanding of the curves and they find consumer and producer surplus, taxes, and the analysis of price controls much easier to understand.

**Chapter 4: Equilibrium: How Supply and Demand Determine Prices** Market clearing is an essential idea for both microeconomics and macroeconomics. In this chapter, students learn how a well functioning market operates, how prices clear markets, the meaning of maximizing gains from trade, and how to shift supply and demand curves. The chapter concludes with a section on understanding the price of oil, a topic that recurs throughout the text.

**Chapter 5: Elasticity and Its Applications** Elasticity is often considered a dull topic so we begin this chapter with a shocking story:

In fall 2000, Harvard sophomore Jay Williams flew to the Sudan where a terrible civil war had resulted in many thousands of deaths. Women and children captured in raids by warring tribes were being enslaved and held for ransom. Working with Christian Solidarity International, Williams was able to pay for the release of 4,000 people. But did Williams do the right thing?

What is a discussion of modern slavery doing in a principles of economics book? We want to show students that economics is a social science, that it asks important questions and provides important answers for people who want to understand their world. We take economics seriously and in *Modern Principles* we analyze serious topics.

Once we have shocked readers out of their complacency, we offer them an implicit deal—we are going to develop some technical concepts in economics, which at first may seem dry, but if you learn this material, there is going to be a payoff. We will use the tools to understand the economics of slave redemption as well as why the war on drugs can generate violence, why gun buyback programs are unlikely to work, and how to evaluate proposals to increase drilling in the Arctic National Wildlife Refuge.

**Chapter 6: Taxes and Subsidies** We analyze commodity taxes and subsidies, two core topics, to test, refine, and improve an understanding of microeconomics. We have all heard the question “Who pays?” and the statement “Follow the money,” but few people understand how to apply these ideas correctly. The economist knows that the final incidence of a tax depends not on the laws of Congress but on the laws of economics, and this can be taught as yet another invisible hand result. Teaching the incidence of taxes and subsidies also gives yet another way of driving home the concept of elasticity, its intuitive meaning, and its real-world importance. We also include in this chapter a timely discussion of wage subsidies to which we compare the minimum wage.

## Part 2: The Price System

**Chapter 7: The Price System: Signals, Speculation, and Prediction** “A price is a signal wrapped up in an incentive.” That’s one of the most important ideas of economics, even if it takes a little work on the part of the students. And that is an idea that we drive home in this chapter. Partial equilibrium analysis can sometimes obscure the big picture of markets and how they fit together. General equilibrium analysis, either done mathematically or with an Edgeworth box, captures neither the “marvel of the market” (to use Hayek’s phrase) nor the student’s interest. We give a fast paced, intuitive, general equilibrium view of markets and how they tie together. We are linked to the world economy, and goods and services are shipped from one corner of the globe to another, yet without the guidance of a central planner. We show how the price of oil is linked to the price of candy bars. We also show how markets can predict the future, even the future of a movie like *American Pie 2!* For those familiar with Leonard Read’s classic essay, this chapter is “I, Pencil” for the twenty-first century.

**Chapter 8: Price Ceilings and Floors** There is no better way to understand how the price system works than to see what happens when the price system does *not* work very well. That price controls bring shortages is one of the most basic and most solid results of microeconomics. When it comes to price controls, however, the bad consequences extend far beyond shortages. Price controls lead to quality reductions, wasteful lines, excess search, corruption, rent-seeking behavior, misallocated resources, and many other secondary consequences. Price controls are an object lesson in many important economic ideas and we teach the topic as such. Sometimes we’re all better off if the university charges more for parking! Price controls also offer a good chance to teach



some political economy lessons about why bad economic policies happen in the first place.

Sometimes governments prop up prices instead of keeping them down—the minimum wage for labor is one example, and airline regulation before the late 1970s is another. As with price ceilings, price floors bring misallocated resources, distortions in the quality of the good or service being sold, and rent seeking. Maybe the government can prop up the price of an airline ticket, as it did in 1974, but each airline will offer lobster dinners to lure away customers.

**Chapter 9: International Trade** We build on the basics of international trade—the division of knowledge, economies of scale, and comparative advantage—covered in Chapter 2, to show students how they can use the tools of supply and demand to understand the microeconomics of trade. We consider the costs of protectionism, international trade and market power, trade and wages, and most of all trade and jobs. Is protectionism ever a good idea? The chapter also offers a brief history of globalization as it relates to trade. We emphasize that the principles covering trade across nations are the same as those that govern trade within nations.

**Chapter 10: Externalities: When the Price Is Not Right** When do markets fail or otherwise produce undesired results? Prices do not always signal the right information and incentives, most of all when external costs and benefits are present. A medical patient may use an antibiotic, for instance, without taking into account the fact that disease-causing microorganisms evolve and mutate, and that antibiotic use can in the long run lead to bacteria that are antibiotic-resistant. Similarly, not enough people get flu vaccinations, because they don't take into account how other people benefit from a lower chance of catching a contagious ailment. Private markets sometimes can “internalize” these external costs and benefits by writing good contracts, and we give students the tools to understand when such contracts will be possible and when not. Market contracts, tradable permits, taxes, and command and control are alternative means of treating externalities. Building on our previous understanding of the invisible hand, we consider when these approaches will produce efficient results and when not.

## Part 3: Firms and Factor Markets

**Chapter 11: Costs and Profit Maximization under Competition** This chapter makes cost theory *intuitive* once again. Costs are indeed an important economic concept; prices and costs send signals to firms and guide their production decisions, just as a price at Walmart shapes the behavior of consumers. But how exactly does this work? We've all seen textbooks that serve up an overwhelming confusion of different cost curves, all plastered on the same graph and not always corresponding in a simple or direct manner to economic intuition.

This chapter reduces the theory of cost and the theory of production to the essentials. A firm must make three key decisions: What price to set? What quantity to produce? When to enter and exit an industry? A simple notion of average cost suffices to cover decisions of firm entry and exit, while avoiding a tangle of excess concepts. Unlike many books, we stress the importance of “wait and see” and option value strategies. We can show firm-level and industry-level supply responses; constant, decreasing, and increasing cost industries; and how comparative statics differ for these cases.

**Chapter 12: Competition and the Invisible Hand** Profit maximization leads competitive firms to produce where  $P = MC$ , but why is this condition truly important? Most textbooks don't teach the marvelous result that when each firm produces where  $P = MC$ , total industry costs are minimized. Competitive firms minimize total industry costs despite the fact that no firm intends this result and perhaps never even understands this result. As Hayek says, the minimization of total industry costs is "a product of human action but not of human design." We also show in this chapter how profit and loss signals result in a balancing of industries in a way that solves the great economic problem of getting the most value from our finite resources.

This material is so important that we have given it its own chapter. This chapter gives a deeper insight into Adam Smith's invisible hand, and how it relates to profit maximization, than does any other principles text.

**Chapter 13: Monopoly** When they can, firms use market power to maximize profit and this chapter shows how. (Some budding entrepreneurs in the class may take this as a how-to manual!) We build on concepts such as cost curves and elasticity to flesh out the economics and also the public policy of monopoly. If you own the intellectual property rights to an important anti-AIDS drug, just how much power do you have? It's good for you, but does this help or hurt broader society? Monopolies sometimes bring higher rates of innovation but in other cases, such as natural monopolies on your water supply, monopolies raise prices and reduce quantity with few societal benefits. Again, formal economic concepts such as elasticity and cost help us see the very real costs and benefits of such regulations as we experience them in our daily lives.

**Chapter 14: Price Discrimination and Pricing Strategy** *Modern Principles* devotes an entire chapter to this topic, which is fun, practical, and contains lots of economics. Students, in their roles as consumers, face (or, as sellers, practice!) price discrimination all the time, and that includes from their colleges and universities—remember in-state vs. out-of-state tuition? A lot of what students already "know" can be turned into more systematic economic intuition, including the concepts of demand and elasticity, and whether marginal cost is rising or falling. The pricing of printers and ink, pharmaceuticals, and cable TV all derive naturally from this analysis. Once students understand price discrimination, their eyes will be open to a world of economics in practice every day.

**Chapter 15: Oligopoly and Game Theory** Can OPEC nations really collude to force up the price of oil? Or is the price of oil set by normal competitive forces of supply and demand in world markets? Understanding when businesses "control price" and when they do not is one of the biggest gaps in understanding between someone with economics training and someone without such training. Cartels usually collapse because of cheating by cartel members, new entrants into the market, and legal prosecution from governments. Despite the challenges that cartels like OPEC face, many businesses nevertheless would love to cartelize their markets, even if they find it difficult to succeed for very long.

The incentive to cheat on cartels is a key to introducing game theory and also the prisoner's dilemma, which we cover in depth in this chapter. We consider the basic logic of the game, the motive for defecting, and how repeated interaction may induce cooperation, including in this context cooperation among the colluding cartel members. The appendix formally outlines

the concept of Nash equilibrium. This chapter also introduces the concrete examples of a price-matching game and customer loyalty programs, such as frequent flier miles, to show how sellers may use game-theoretic tricks to maintain collusion.

### **Chapter 16: Competing for Monopoly: The Economics of Network Goods**

Students are eager to understand the world they live in. *Modern Principles* talks not about the market for ice cream but the market for oil, printers and ink, smartphones, Google, Facebook, and Match.com. In this chapter we focus on network goods, which have obtained a greater foothold in most of our lives with the coming of the digital age.

A lot of us use Microsoft Word because so many other people also do, thus making it easier to share word processing files. Facebook beat out MySpace and other social network services because it had more useful features and innovated more rapidly. Once Facebook had a big enough lead, more and more users switched to that system, so they could follow their friends more easily. Markets like this have some unusual properties. They tend to have lots of monopoly and lots of innovation, namely competition “for the market” vs. competition “in the market.” If the dominant supplier switches, the market may change suddenly in fits and starts, rather than gradually. We show students how dating services work—in economic terms—and why friends so often seek out and enjoy the same musical songs. This hands-on chapter serves up a lot of topics of immediate interest to students and relates them to core microeconomic concepts.

### **Chapter 17: Monopolistic Competition and Advertising**

We cover monopolist competition in depth, focusing on the intuitions behind the concept. Monopolistic competition is in fact the most common market structure that students (and faculty!) encounter in daily life. Brands matter, and there is some market control over pricing, but it is far from absolute monopoly power. We show the basics of a monopolistic competition model, including how demand and the cost curves interact, and explain this in terms of markets that a person faces in everyday life. We also consider the motives and effects of advertising—a common feature of monopolistically competitive markets—in some detail. Advertising may boost price competition, may signal the quality of products, and may sometimes persuade or even trick consumers into buying goods and services they otherwise would be less interested in.

### **Chapter 18: Labor Markets**

Work touches almost all of our lives and most of the fundamental matters and conditions of work are ruled by economics. Wages. Working conditions. Bonuses. Investments in human capital and education. It’s the marginal product of labor that has the strongest influence over the wage of a particular job. Risky jobs, like going out on dangerous fishing boats, pay more. Labor unions boost the wages of some workers but will hurt the wages of others. There is also the controversial topic of discrimination in labor markets. We show how some kinds of discrimination may survive, while others will tend to fall away, due to the pressure of market forces.

## **Part 4: Government**

### **Chapter 19: Public Goods and the Tragedy of the Commons**

Public goods and externalities help us understand when private property rights do not always lead to good outcomes. The concepts of excludability and nonrivalry

help us classify why governments have to provide national defense but why movie theaters are usually left to the private sector.

Why is it that the world is running out of so many kinds of fish? Economics has the best answer and it involves the tragedy of the commons. We show that economics is the single best entry point for understanding many common dilemmas of the environment.

**Chapter 20: Political Economy and Public Choice** If economics is so good, why doesn't the world always listen? Political economy is one of the most important topics. Economics has a lot to say about how politics works and the results aren't always pretty. Voters have a rational incentive to be ignorant or underinformed, and the end result is that special interests have a big say over many economic policies. Dairy farmers have a bigger say over milk subsidies than do the people who drink milk, and that is why the United States has milk price supports.

That said, democratic systems still outperform the available alternatives. We present the median voter theorem and also explain why political competition produces results that are at least somewhat acceptable to the "person in the street."

**Chapter 21: Economics, Ethics, and Public Policy** Most principles students leave the classroom still underequipped to understand real-world policy debates over economic issues. So often the debate descends into ethics: Are markets fair? Is the distribution of income just? Is it important that individual rights be respected? When is paternalism justified? We do *not* try to provide final, takeaway answers to these questions, but we do give the students the tools to unpack how these questions intersect with the economic issues they have been studying.

Should we give physically handicapped individuals better access to public facilities, or should the government simply send them more cash? Should there be a free market in transplantable human organs such as kidneys? For all the power of economics, virtually any public debate on questions like these will quickly bring in lots of ethical questions. We think that students should be familiar with the major ethical objections to "the economic way of thinking," and the strengths and weaknesses of those objections. We introduce the ideas of John Rawls and Robert Nozick, as well as the philosophy of utilitarianism. In our view this chapter is an important supplement to the power of economic reasoning.

## Part 5: Decision Making for Businesses, Investors, and Consumers

**Chapter 22: Managing Incentives** Incentives matter! That may be the key single lesson of economics but a lot of textbooks don't have a complete chapter on incentives. Business applications, sports applications, and personal life all provide plenty of illustrations of economic principles. You get what you pay for, so if you can't measure quality very well, a lot of incentive schemes will backfire. Piece rates make a lot of workers more productive but strong incentives can impose risk on workers and induce them to quit their jobs altogether. As with grading on a curve, sometimes a boss wishes to pay workers relative to the performance of other workers. A lot of the most important incentives are about pride, fun, and fame, not just money.

Economists can never be doing enough to communicate what they know about incentives to a broader public. By making it easy, we want to increase the incentives here!

**Chapter 23: Stock Markets and Personal Finance** The stock market is the one topic that just about every student of economics cares about, and yet it is neglected in many textbooks. We view the stock market as a “teaching moment” as well as an important topic in its own right. What other economic topic commands so much attention from the popular press? Yet not every principles course gives the student the tools to understand media discussions or to dissect fallacies. We remedy that state of affairs. This chapter covers passive vs. active investing, the trade-off between risk and return, “how to really pick stocks,” diversification, why high fees should be avoided, compound returns, and asset price bubbles. The operation of asset markets is something students need to know if they are to understand today’s economy and the financial crisis.

And, yes, we do offer students some very direct and practical investment advice. Most people should diversify and “buy and hold,” and we explain why. In terms of direct, practical value, we try to make this book worth its price!

**Chapter 24: Asymmetric Information: Moral Hazard and Adverse Selection** Some of the most important microeconomic problems in practical life concern asymmetric information. For instance, sometimes sellers know things that buyers do not. Imagine taking your car to an automechanic and being told it needs \$500 worth of repairs—how do you know whether to believe the mechanic? The problem with asymmetric information is that it increases transactions costs and makes mutually beneficial market trades harder to pull off. We introduce a general class of issues known as *principal-agent problems*, namely that some individuals may try to take advantage of each other in market settings. These problems also include adverse selection, which plagues insurance markets, the sale of used cars, and the sale of art on eBay. Sometimes it is hard to assure quality as a buyer and, for related reasons, it can be hard to get a fair price as a seller of quality merchandise. We show that problems of asymmetric information are extremely common, but also that markets often can overcome them to a considerable degree. We also use the concepts of moral hazard and adverse selection to help explain some aspects of recent debates over President Obama’s Affordable Care Act (Obamacare).

We close this chapter with the concept of signaling. Signaling occurs when a person undertakes a costly action to signal quality or reliability. A man may spend a lot of money on an engagement ring to show he is a serious courter who will make a reliable husband and life companion. One advantage of going to school is that you show the world you have discipline and the ability to finish projects and meet deadlines, above and beyond whatever you may learn there. We consider how signaling helps solve or at least alleviate many problems of asymmetric information.

**Chapter 25: Consumer Choice** This chapter adds an extensive and foundational treatment of indifference curves to the book. It starts with the notions of diminishing marginal utility and relative price ratios to derive indifference curves. A budget constraint is added to indifference curves to generate the standard propositions of consumer theory, including marginal rates of

substitution, income effects, substitution effects, and the idea of a consumer optimum. The chapter includes novel applications, such as a unique and relevant application to Costco and why a company might charge consumers entry fees for membership.

## Alternative Paths through the Book

*Modern Principles: Microeconomics* has been written with trade-offs in mind and it's easy to pick and choose from among the chapters when time constrains. We offer a few quick suggestions. Chapter 7 is fun to teach but more difficult to test than some of the other chapters. But don't worry, you will find plenty of testable material in other chapters, and for your best students the introduction to the price system in Chapters 7 and 8 will be an eye-opener!

We spend more time on price controls than do other books because we don't confine ourselves to the usual shortage diagram, but we also illustrate the general equilibrium effects of price controls. We have also included a section of advanced material on the losses from random allocation that may be skipped in larger classes or if time constrains.

We have greatly simplified the presentation on cost curves and removed most of production theory, so do take the time to cover monopoly and the chapter on price discrimination. Students love the material on price discrimination because once they understand the concepts, they see the applications all around them. Chapter 16, "Competing for Monopoly: The Economics of Network Goods," is a very appealing chapter for students, and we recommend it for its applications, but if you don't have time, it can be skipped.

Asteroid deflection and the decline of the tuna fisheries are a must, so do cover Chapter 19 on public goods and the tragedy of the commons. Once again, students appreciate the focus on important, real-world applications of the economic way of thinking.

Chapters 20 and 21 on political economy and ethics are optional. If you can teach only one chapter, we think Chapter 20 on political economy has crucial material for avoiding the nirvana fallacy: We should always compare real-world markets with real-world governments when doing political economy. Chapter 21 on ethics works very well in smaller classes with lots of student interaction—we think it important that the philosophy professors are not the ones who get the only say on questions of ethics!

Chapter 22, "Managing Incentives," is fun to teach but it goes beyond the core and can be skipped. We believe this chapter will be especially appropriate for management, MBA, and pre-law students.

We encourage everyone to teach Chapter 23 on stock markets, time permitting.

Chapter 25, "Consumer Choice," is for those instructors who wish to cover indifference curves in considerable detail.

Most of all, we hope that *Modern Principles* helps you, the teacher, to have fun! We love economics and we have fun teaching economics. We have written this text for people not afraid to say the same. Don't hesitate to e-mail us with your questions, thoughts, and experiences, or just to say hello!

# Media and Supplements



## RESOURCES FOR STUDENTS AND INSTRUCTORS

[www.macmillanhighered.com/launchpad/cowentabarrokecon3e](http://www.macmillanhighered.com/launchpad/cowentabarrokecon3e)

Our new coursespace, LaunchPad, combines an interactive e-Book with high-quality multimedia content and ready-made assessment options, including LearningCurve adaptive quizzing. Pre-built, curated units are easy to assign with or adapt to 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.

*The following resources are available on 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>.
- **NEW Work It Out Tutorials** New to this edition, these tutorials guide students through the process of applying economic analysis and math skills to solve the final problem in each chapter. Choice-specific feedback and video explanations provide students with interactive assistance for each step of the problem.
- **NEW Assignable Videos and Assessment** Author-created short, fun, and professionally produced instructional videos are

available for most chapters. The videos are available from the text via QR code or at MRUniversity.com. LaunchPad provides assignable, automatically graded quizzes to accompany each of the videos.

### For Instructors

- **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 level and skill.
- **Test Bank** The Test Bank provides a wide range of questions appropriate for assessing your students' comprehension, interpretation, analysis, and synthesis skills. The Test Bank offers multiple-choice, true/false, and short-answer questions designed for comprehensive coverage of the text concepts. Questions are categorized according to difficulty level (easy, medium, and challenging) and skill descriptor (fact-based, definitional, concept-based, critical thinking, and analytical thinking) and are tagged to their appropriate textbook section.
- **End-of-Chapter Quizzes** The end-of-chapter problems from the text have been converted to a multiple-choice format with answer-specific feedback. These problems can be assigned in homework assignments or quizzes.
- **Practice and Graded Homework Assignments** Each LaunchPad unit contains prebuilt assignments, providing instructors with a curated set of multiple-choice and graphing questions that can be easily assigned for practice or graded assessment.
- **Instructor's Resource Manual** The Instructor's Resource Manual provides suggested in-class and homework activities.
- **Solutions Manual** The Solutions Manual contains detailed solutions to all of the end-of-chapter problems from the textbook.

## ADDITIONAL ONLINE OFFERINGS

### Online Offerings



Worth/Aplia courses are all available with digital textbooks, interactive assignments, and detailed feedback.

 [www.saplinglearning.com](http://www.saplinglearning.com)

Sapling Learning provides the most effective interactive homework and instruction that improve student-learning outcomes for the problem-solving disciplines.

## Acknowledgments

We are most grateful to the following reviewers, both users and nonusers, for their careful chapter reviews used in the development of the third edition of *Modern Principles*.

Scott Baier <i>Clemson University</i>	Patricia Euzent <i>The University of Central Florida</i>	Karl A. Mitchell <i>Queens College—The City University of New York</i>
Justin Barnette <i>Kent State University</i>	Alan Grant <i>Baker University</i>	Chuck Moul <i>Miami University (Ohio)</i>
Jodi Beggs <i>Northeastern University</i>	Mike Hammock <i>Middle Tennessee State University</i>	Paul Roscelli <i>Canada College</i>
James Bolchalk <i>Kent State University—Geauga Campus</i>	Andrew Hanssen <i>Clemson University</i>	Jason C. Rudbeck <i>The University of Georgia</i>
Anoshua Chaudhuri <i>San Francisco State University</i>	Robert Krol <i>California State University, Northridge</i>	James K. Self <i>Indiana University—Bloomington</i>
Gregory Colson <i>The University of Georgia</i>	Susane Leguizamon <i>Western Kentucky University</i>	Daniel M. Settlage <i>The University of Arkansas—Fort Smith</i>
Harold Elder <i>The University of Alabama</i>	Daniel Lin <i>American University</i>	Jennifer Sobotka <i>Radford University</i>
Carlos Elias <i>Radford University</i>	Melody Lo <i>The University of Texas at San Antonio (UTSA)</i>	Steven Yamarik <i>California State University at Long Beach</i>

We are most grateful to the following reviewers, both users and nonusers of the first edition, for their careful in-depth chapter reviews used in the development of the second edition of *Modern Principles*.

Rashid Al-Hmoud <i>Texas Tech University</i>	Paul Fisher <i>Henry Ford College</i>	Michael Mace <i>Sierra College</i>
Scott Baier <i>Clemson University</i>	Bill Gibson <i>The University of Vermont</i>	Michael Makowsky <i>Towson University</i>
David Beckworth <i>Texas State University</i>	David Gillette <i>Truman State University</i>	Norman Maynard <i>The University of Oklahoma</i>
Randall Campbell <i>Mississippi University</i>	Gerhard Glomm <i>Indiana University</i>	Joan Nix <i>Queens College, The City University of New York</i>
Suparna Chakraborty <i>Baruch College and Graduate Center, The City University of New York</i>	Bradley Hobbs <i>Florida Gulf Coast University</i>	Zuohong Pan <i>Western Connecticut State University</i>
John Dawson <i>Appalachian State University</i>	Kate Krause <i>University of New Mexico</i>	Steven Peterson <i>The University of Idaho</i>
Timothy M. Diette <i>Washington and Lee University</i>	Daniel Kuo <i>Orange Coast College</i>	Jeff Sarbaum <i>University of North Carolina at Greensboro</i>
Harold Elder <i>University of Alabama</i>	Daniel Lin <i>American University</i>	James Self <i>Indiana University</i>
Patricia Euzent <i>University of Central Florida</i>	Solina Lindahl <i>California State Polytechnic University</i>	Randy Simmons <i>Utah State University</i>



Richard Stahl  
*Louisiana State University*

Yoav Wachsmann  
*Coastal Carolina University*

Tyler Watts  
*Ball State University*

Robert Whaples  
*Wake Forest University*

Jonathan Wight  
*University of Richmond*

Steven Yamarik  
*California State University, Long Beach*

We would like to thank the following instructors who have aided us in the preparation and extensive review of the ancillary package. This list of contributors and reviewers is comprehensive of those who have contributed across editions at this time and will continue to grow as new resources are developed.

Jim Swofford  
*University of South Alabama*

John Dawson  
*Appalachian State University*

Benjamin Powell  
*Suffolk University*

Paul Fisher  
*Henry Ford College*

Solina Lindahl  
*California Polytechnic State University*

Michael Applegate  
*Oklahoma State University,  
Main Campus*

David Gillette  
*Truman State University*

David Youngberg  
*George Mason University*

Eli Dourado  
*George Mason University*

Garett Jones  
*George Mason University*

Jennifer Platania  
*University of West Florida*

David Kalist  
*Shippensburg University of  
Pennsylvania*

Mark Wheeler  
*Western Michigan University*

Bhavneet Walia  
*Western Illinois University*

Sheng Yang  
*Black Hills State University*

Lillian Kamal  
*University of Hartford*

James Self  
*Indiana University*

Kyle Hampton  
*University of Alaska, Anchorage*

Kenneth Slaysman  
*York College of Pennsylvania*

Alanna Holowinsky  
*Red River College*

Irina Pritchett  
*North Carolina State University*

James Watson  
*University of Colorado—Boulder*

Pat Euzent  
*University of Central Florida*

Brett Block  
*University of Colorado—Boulder*

Douglas Campbell  
*University of Memphis*

Ryan Oprea  
*University of California, Santa Cruz*

Margaret Aproberts-Warren  
*University of California, Santa Cruz*

Tyler Watts  
*Ball State University*

We were fortunate to have eagle-eyed readers of the proofs of the book during the production process: Paul Fisher, Henry Ford College, and Daniel Lin, American University. Paul Fisher, Henry Ford College, contributed numerous new problems and solutions. Our student Michael Lauck provided invaluable help in updating figures and tables. The Mercatus Center supplied an essential work environment. Jane Perry helped us to proof many of the chapters and with Lisa Hill-Corley provided important daily assistance. Teresa Hartnett has done a great job as our agent.

Most of all we are grateful to the team at Worth. The idea for this book was conceived by Paul Shensa, who has seen it through with wise advice from day one until the end. Chuck Linsmeier has been a wonderful publisher and Carlise Stenbridge has led the editing work and been a joy to work with. Becca Hicks was a delight to work with and introduced us to the key elements of a textbook. Bruce Kaplan, our primary development editor, is the George Martin of book production; he has done a tremendous amount of nitty-gritty work on the manuscript to make every note just right and he has offered excellent counsel throughout.

We are fortunate to have had such a talented production and design group for our book. Fred Dahl coordinated the entire production process with the help of Lisa Kinne. Diana Blume created the beautiful interior design and the cover. Robin Fadool went beyond the call of duty in tracking down sometimes obscure photos. Barbara Seixas showed a deft hand with the manufacturing aspects of the book. It has been a delight to work with all of them.

The supplements were put together by several people. Lindsay Neff put together the supplements team and ably brought the supplements and media package to market. Stacey Alexander and Edgar Doolan helped finalize and produce the content.

Tom Digiano stands out in the marketing of this book. He has been energetic and relentless.

Most of all, we want to thank our families for their support and understanding. Tyler wishes to offer his personal thanks to Natasha and Yana. It is Alex's great fortune to be able to thank Monique, Connor, and Maxwell and his parents for years of support and encouragement.

Tyler Cowen  
Alex Tabarrok

# 1

## The Big Ideas

**T**he prisoners were dying of scurvy, typhoid fever, and smallpox, but nothing was killing them more than bad incentives. In 1787, the British government had hired sea captains to ship convicted felons to Australia. Conditions on board the ships were monstrous; some even said the conditions were worse than on slave ships. On one voyage, more than one-third of the men died and the rest arrived beaten, starved, and sick. A first mate remarked cruelly of the convicts, “Let them die and be damned, the owners have [already] been paid for their passage.”<sup>1</sup>

The British public had no love for the convicts, but it wasn’t prepared to give them a death sentence either. Newspapers editorialized in favor of better conditions, clergy appealed to the captains’ sense of humanity, and legislators passed regulations requiring better food and water, light and air, and proper medical care. Yet the death rate remained shockingly high. Nothing appeared to be working until an economist suggested something new. Can you guess what the economist suggested?

Instead of paying the captains for each prisoner placed on board ship in Great Britain, the economist suggested paying for each prisoner that walked off the ship in Australia. In 1793, the new system was implemented and immediately the survival rate shot up to 99%. One astute observer explained what had happened: “Economy beat sentiment and benevolence.”<sup>2</sup>

The story of the convict ships illustrates the first big lesson that runs throughout this book and throughout economics: *incentives matter*.

By **incentives**, we mean rewards and penalties that motivate behavior. Let’s take a closer look at incentives and some of the other big ideas in economics. On first reading, some of these ideas may seem surprising or difficult to understand. Don’t worry: we will be explaining everything in more detail.

### CHAPTER OUTLINE

#### Big Ideas in Economics

1. Incentives Matter
2. Good Institutions Align Self-Interest with the Social Interest
3. Trade-offs Are Everywhere
4. Thinking on the Margin
5. The Power of Trade
6. The Importance of Wealth and Economic Growth
7. Institutions Matter
8. Economic Booms and Busts Cannot Be Avoided but Can Be Moderated
9. Prices Rise When the Government Prints Too Much Money
10. Central Banking Is a Hard Job

**The Biggest Idea of All: Economics Is Fun**

**Incentives** are rewards and penalties that motivate behavior.

We see the following list as the most important and fundamental contributions of economics to human understanding; we call these contributions *Big Ideas*. Some economists might arrange this list in a different manner or order, but these are generally accepted principles among good economists everywhere.

## Big Idea One: Incentives Matter

When the captains were paid for every prisoner that they took on board, they had little incentive to treat the prisoners well. In fact, the incentives were to treat the prisoners badly. Instead of feeding the prisoners, for example, some of the captains hoarded the prisoners' food, selling it in Australia for a tidy profit.

When the captains were paid for prisoners who survived the journey, however, their incentives changed. Whereas before, the captains had benefited from a prisoner's death, now the incentive system "secured to every poor man who died at least one sincere mourner."<sup>3</sup> The sincere mourner? The captain, who was at least sincere about mourning the money he would have earned had the poor man survived.

Incentives are everywhere. In the United States, we take it for granted that when we go to the supermarket, the shelves will be stocked with kiwi fruit from New Zealand, rice from India, and wine from Chile. Every day we rely on the work of millions of other people to provide us with food, clothing, and shelter. Why do so many people work for our benefit? In his 1776 classic, *The Wealth of Nations*, Adam Smith explained:

It is not from the benevolence of the butcher, the brewer, or the baker, that we expect our dinner, but from their regard to their own interest.

Do economists think that everyone is self-interested all the time? Of course not. We love our spouses and children just like everyone else! But economists do think that people respond in predictable ways to incentives of all kinds. Fame, power, reputation, sex, and love are all important incentives. Economists even think that benevolence responds to incentives. It's not surprising to an economist, for example, that charities publicize the names of their donors. Some people do give anonymously, but how many buildings on your campus are named Anonymous Hall?

## Big Idea Two: Good Institutions Align Self-Interest with the Social Interest

The story of the convict ships hints at a second lesson that runs throughout this book: When self-interest aligns with the broader public interest, we get good outcomes, but when self-interest and the social interest are at odds, we get bad outcomes, sometimes even cruel and inhumane outcomes. Paying the ship captains for every prisoner who walked off the ship was a good payment system because it created incentives for the ship captains to do the right thing, not just for themselves but also for the prisoners and for the government that was paying them.

It's a remarkable finding of economics that under the right conditions markets align self-interest with the social interest. You can see what we mean by thinking back to the supermarket example. The supermarket is stocked with products from around the world because markets channel and coordinate the self-interest of millions of people to achieve a social good.

The farmer who awoke at 5 AM to tend his crops, the trucker who delivered the goods to the market, the entrepreneur who risked his or her capital to build the supermarket—all of these people acted in their own interest, but in so doing, they also acted in your interest.

In a striking metaphor, Adam Smith said that when markets work well, those who pursue their own interest end up promoting the social interest, as if led to do so by an “invisible hand.” The idea that the pursuit of self-interest can be in the social interest—that at least sometimes, “greed is good”—was one of the most surprising discoveries of economic science, and after several hundred years this insight is still not always appreciated. Throughout this book, we emphasize ways in which individuals acting in their self-interest produce outcomes that were not part of their intention or design, but that nevertheless have desirable properties.

Markets, however, do not always align self-interest with the social interest. Sometimes the invisible hand is absent, not just invisible. Market incentives, for example, can be too strong. A firm that doesn’t pay for the pollution that it emits into the air has too great an incentive to emit pollution. Fishermen sometimes have too strong an incentive to catch fish, thereby driving the stock of fish into collapse. In other cases, market incentives are too weak. Did you get your flu shot this year? The flu shot prevents you from getting the flu (usually) but it also reduces the chances that other people will get the flu. When deciding whether to get a flu shot, did you take into account the social interest or just your self-interest?

When markets don’t properly align self-interest with the social interest, another important lesson of economics is that government can sometimes improve the situation by changing incentives with taxes, subsidies, or other regulations.

### Big Idea Three: Trade-offs Are Everywhere

Vioxx users were outraged when in September 2004 Merck withdrew the arthritis drug from the market after a study showed that it could cause strokes and heart attacks. Vioxx had been on the market for five years and had been used by millions of people. Patients were angry at Merck and at the Food and Drug Administration (FDA). How could the FDA, which is charged with ensuring that new pharmaceuticals are safe and effective, have let Vioxx onto the market? Many people demanded more testing and safer pharmaceuticals. Economists worried that approved pharmaceuticals could become too safe.

Too safe! Is it possible to be too safe?! Yes, because trade-offs are everywhere. Researching, developing, and testing a new drug cost time and resources. On average, it takes about 12 years and \$1 billion to bring a new drug to market. More testing means that approved drugs will have fewer side effects, but there are two important trade-offs: *drug lag* and *drug loss*.

Testing takes time so more testing means that good drugs are delayed, just like bad drugs. On average, new drugs work better than old drugs. So the longer it takes to bring new drugs to market, the more people are harmed who could have benefited if the new drugs had been approved earlier.<sup>4</sup> You can die because an unsafe drug is approved—you can also die because a safe drug has *not yet* been approved. This is *drug lag*.



ANTONINA SOTNYKOVA/SHUTTERSTOCK

**Not from benevolence but from self-interest**



MAXX-STUDIO/SHUTTERSTOCK

**Are pharmaceuticals too safe?**

Testing not only takes time, it is costly. The greater the costs of testing, the fewer new drugs there will be. The costs of testing are a hurdle that each potential drug must leap if it is to be developed. Higher costs mean a higher hurdle, fewer new drugs, and fewer lives saved. You can die because an unsafe drug is approved—you can also die because a safe drug is *never* developed. This is *drug loss*.

Thus, society faces a trade-off. More testing means the drugs that are (eventually) approved will be safer but it also means more drug lag and drug loss. When thinking about FDA policy, we need to look at both sides of the trade-off if we are to choose wisely.

Trade-offs are closely related to another important idea in economics, opportunity cost.

## Opportunity Cost

The **opportunity cost** of a choice is the value of the opportunities lost.

Every choice involves something gained and something lost. The **opportunity cost** of a choice is the value of the opportunities lost. Consider the choice to attend college. What is the cost of attending college? At first, you might calculate the cost by adding together the price of tuition, books, and room and board—that might be \$15,000 a year. But that's not the opportunity cost of attending college. What opportunities are you losing when you attend college?

The main opportunity lost when you attend college is (probably) the opportunity to have a full-time job. Most of you reading this book could easily get a job earning \$25,000 a year or maybe quite a bit more (Bill Gates was a college dropout). If you spend four years in college, that's \$100,000 that you are giving up to get an education. The opportunity cost of college is probably higher than you thought. Perhaps you ought to ask more questions in class to get your money's worth! (But go back to the list of items we totaled earlier—tuition, books, and room and board—one of these items should *not* count as part of the opportunity cost of college. Which one? Answer: Room and board is not a cost of college if you would have to pay for it whether you go to college or not.)

The concept of opportunity cost is important for two reasons. First, if you don't understand the opportunities you are losing when you make a choice, you won't recognize the real trade-offs that you face. Recognizing trade-offs is the first step in making wise choices. Second, most of the time people do respond to changes in opportunity costs—even *when money costs have not changed*—so if you want to understand behavior, you need to understand opportunity cost.

What would you predict, for example, would happen to college enrollment during a recession? The price of tuition, books, and room and board doesn't fall during a recession but the opportunity cost of attending college does fall. Why? During a recession, the unemployment rate increases so it's harder to get a high-paying job. That means you lose less by attending college when the unemployment rate is high. We therefore predict that college enrollments increase when the unemployment rate increases; in opportunity costs terms, it is cheaper to go to college. In 2009, as the unemployment rate soared, the college enrollment rate hit 70.1%, the highest rate ever.

## Big Idea Four: Thinking on the Margin

Robert is cruising down Interstate 80 toward Des Moines, Iowa. Robert wants to get to his destination quickly and safely and he doesn't want to get a speeding ticket. The speed limit is 70 mph but he figures the risk of a ticket is low if

he travels just a little bit faster, so Robert sets the cruise control to 72 mph. The road is straight and flat, and after 20 minutes he hasn't seen another car, so he thumbs it up a few clicks to 75. As he approaches Des Moines, Robert spots a police cruiser and thumbs it down to 70. After Des Moines it's nothing but quiet cornfields once again, so he thumbs it up to 72. Crossing the state line into Nebraska, Robert notices that the speed limit is 75, so he thumbs it up to 77 before thumbing it down again as he approaches Omaha.

Robert and his thumb illustrate what economists mean by thinking on the margin. As Robert drives, he constantly weighs benefits and costs and makes a decision: a little bit faster or a little bit slower?

Thinking on the margin is just making choices by thinking in terms of marginal benefits and marginal costs, the benefits and costs of a little bit more (or a little bit less). Most of our decisions in life involve a little bit more of something or a little bit less, and it turns out that thinking on the margin is also useful for understanding how consumers and producers make decisions. Should the consumer buy a few more apples or a few less? Should the oil well produce a few more barrels of oil or a few less?

In this book, you will find lots of talk about marginal choices, which includes marginal cost (the additional cost from producing a little bit more), marginal revenue (the additional revenue from producing a little bit more), and marginal tax rates (the tax rate on an additional dollar of income). This point about margins is really just a way of restating the importance of trade-offs. If you wish to understand human behavior, look at the trade-offs that people face. Those trade-offs usually involve choices about a little bit more or a little bit less.

The importance of thinking on the margin did not become commonplace in economics until 1871, when marginal thinking was simultaneously described by three economists: William Stanley Jevons, Carl Menger, and Leon Walras. Economists refer to the “marginal revolution” to explain this transformation in economic thought.

## Big Idea Five: The Power of Trade

When Alex and Shruti trade, both of them are made better off. (Alex does regret buying a certain polka-dot sweater so take this as a general principle, not a mathematical certainty.) The principle is simple but important because exchange makes Alex and Shruti better off whether Alex and Shruti live in the same country and share the same language and religion or they live worlds apart geographically and culturally. The benefits of trade, however, go beyond those of exchange. The real power of trade is the power to increase production through specialization.

Few of us could survive if we had to produce our own food, clothing, and shelter (let alone our own cell phones and jet aircraft). Self-sufficiency is death. We survive and prosper only because specialization increases productivity. With specialization, the auto mechanic learns more about cars and the thoracic surgeon learns more about hearts than either could if each one of them needed to repair both cars and hearts. Through the division of knowledge, the sum total of knowledge increases and in this way so does productivity.

Trade also allows us to take advantage of economies of scale, the reduction in costs created when goods are mass-produced. No farmer could ever afford



YE LIEW/ISTOCKPHOTO

**Thinking on the margin** A little bit faster? Or a little bit slower?

a combine harvester if he was growing wheat only for himself, but when a farmer grows wheat for thousands, a combine harvester reduces the cost of bread for all.

A surprising feature of trade is that everyone can benefit from trade, even those who are not especially productive. The reason is that especially productive people can't do everything! Martha Stewart may be able to iron a blouse better than anyone else in the world, but she still hires people to do her ironing because for her an hour of ironing comes at the price of an hour spent running her business. Given the choice of spending an hour ironing or running her business, Martha Stewart is better off running her business. In other words, Martha Stewart's *opportunity cost* of ironing is very high.

The theory of comparative advantage says that when people or nations specialize in goods in which they have a low opportunity cost, they can trade to mutual advantage. Thus, Martha Stewart can benefit by buying ironing services even from people who are not as good at ironing as she is. Notice that the better Martha Stewart gets at running her business, the greater her cost of ironing. So when Martha becomes more productive, this increases her demand to trade. In a similar way, the greater the productivity of American business in producing jet aircraft or designing high-technology devices, the greater will be our demand to trade for textiles or steel.

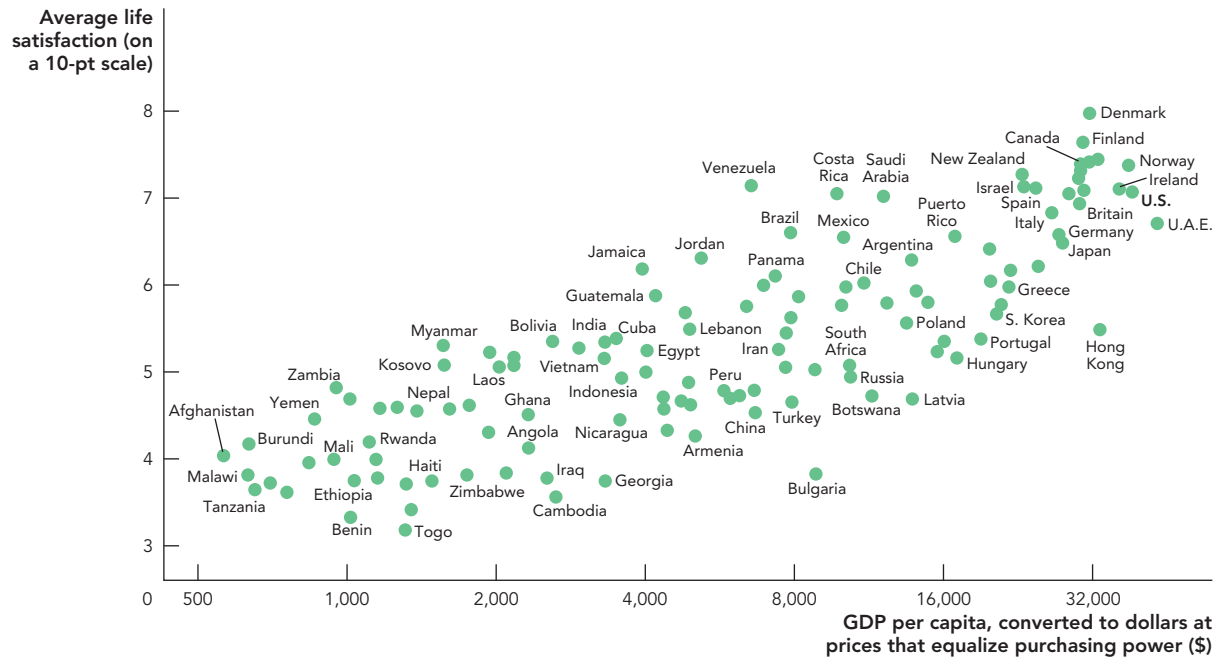
## Big Idea Six: The Importance of Wealth and Economic Growth

Every year, several hundred million people contract malaria. In mild cases, malaria causes fever, chills, and nausea. In severe cases, malaria can cause kidney failure, coma, brain damage and, for about a million people a year—mostly children—death. Today, we think of malaria as a “tropical” disease but malaria was once common in the United States. George Washington caught malaria, as did James Monroe, Andrew Jackson, Abraham Lincoln, Ulysses S. Grant, and James A. Garfield. Malaria was present in America until the late 1940s, when the last cases were wiped out by better drainage, removal of mosquito breeding sites, and the spraying of insecticides. The lesson? Wealth—the ability to pay for the prevention of malaria—ended the disease in the United States. And wealth comes from economic growth. So the incidence of malaria is not just about geography; it's also about economics.

Malaria is far from the only problem that diminishes with wealth and economic growth. In the United States, one of the world's richest countries, 993 out of every 1,000 children born survive to the age of 5. In Liberia, one of the world's poorest countries, only about 765 children survive to age 5 (i.e., 235 of every 1,000 children die before seeing their fifth birthday). Overall, it's the wealthiest countries that have the highest rates of infant survival.

Indeed, if you look at most of the things that people care about, they are much easier to come by in wealthier economies. Wealth brings us flush toilets, antibiotics, higher education, the ability to choose the career we want, fun vacations, and, of course, a greater ability to protect our families against catastrophes. Wealth also brings women's rights and political liberty, at least in most (but not all) countries. Wealthier economies lead to richer and more fulfilled, even happier lives, as seen in Figure 1.1. In short, *wealth matters, and understanding economic growth is one of the most important tasks of economics.*



**FIGURE 1.1**

**Money and Happiness Are Positively Correlated** People in countries with higher GDP per capita tend to have happier, more satisfied lives. Within a country, people with higher incomes also tend to be a little bit happier.

Source: Betsey Stevenson and Justin Wolfers, Wharton School at the University of Pennsylvania, as found in the *New York Times*, <http://www.marketobservation.com/blogs/media/blogs/Statistics/> on 2/21/2014.

## Big Idea Seven: Institutions Matter

If wealth is so important, what makes a country rich? The most proximate cause is that wealthy countries have lots of physical and human capital per worker and they produce things in a relatively efficient manner, using the latest technological knowledge. But why do some countries have more physical and human capital and why is it organized well using the latest technological knowledge? In a word, incentives, which of course brings us back to Big Idea One.

Entrepreneurs, investors, and savers need incentives to save and invest in physical capital, human capital, innovation, and efficient organization. Among the most powerful institutions for supporting good incentives are property rights, political stability, honest government, a dependable legal system, and competitive and open markets.

Consider South and North Korea. South Korea has a per capita income more than 10 times greater than its immediate neighbor, North Korea. South Korea is a modern, developed economy but in North Korea people still starve or can go for months without eating meat. And yet both countries were equally poor in 1950 and, of course, the two countries share the same language and cultural and historical background. What differs is their economic systems and the incentives at work.

Macroeconomists are especially interested in the incentives to produce new ideas. If the world never had any new ideas, the standard of living would eventually stagnate. But entrepreneurs draw on new ideas to create new products like iPhones, new pharmaceuticals, self-driving cars, and many other innovations. Just about any device you use in daily life is based on a multitude of ideas and discoveries, the lifeblood of economic growth. New ideas, of course, require incentives and that means an active scientific community and the freedom and incentive to put new ideas into action. Ideas also have peculiar properties. One apple feeds one person but one idea can feed the world. Ideas, in other words, aren't used up when they are used and that has tremendous implications for understanding the benefits of trade, the future of economic growth, and many other topics.

## Big Idea Eight: Economic Booms and Busts Cannot Be Avoided but Can Be Moderated

We have seen that growth matters and that the right institutions foster growth. But no economy grows at a constant pace. Economies advance and recede, rise and fall, boom and bust. In a recession, wages fall and many people are thrown into miserable unemployment. Unfortunately, we cannot avoid all recessions. Booms and busts are part of the normal response of an economy to changing economic conditions. When the weather is bad in India, for example, crops fail and the economy grows more slowly or perhaps it grows not at all. The weather doesn't much affect the economy in the United States, but the U.S. economy is buffeted by other unavoidable shocks.

Although some booms and busts are part of the normal response of an economy to changing economic conditions, not all booms and busts are normal. The Great Depression (1929–1940) was not normal, but rather it was the most catastrophic economic event in the history of the United States. National output plummeted by 30 percent, unemployment rates exceeded 20 percent, and the stock market lost more than two-thirds of its value. Almost overnight the United States went from confidence to desperation. The Great Depression, however, didn't have to happen. Most economists today believe that if the government, especially the U.S. Federal Reserve, had acted more quickly and more appropriately, the Great Depression would have been shorter and less deep. At the time, however, the tools at the government's disposal—monetary and fiscal policy—were not well understood.

Today, the tools of monetary and fiscal policy are much better understood. When used appropriately, these tools can reduce swings in unemployment and GDP. Unemployment insurance can also reduce some of the misery that accompanies a recession. The tools of monetary and fiscal policy, however, are not all-powerful. At one time it was thought that these tools could end all recessions, but we know now that this is not the case. Furthermore, when used poorly, monetary and fiscal policy can make recessions worse and the economy more volatile.

A significant task of macroeconomic theory is to understand both the promise and the limits of monetary and fiscal policy in smoothing out the normal booms and busts of the macroeconomy.

## Big Idea Nine: Prices Rise When the Government Prints Too Much Money

Yes, economic policy can be useful but sometimes policy goes awry, for instance, when **inflation** gets out of hand. Inflation, one of the most common problems in macroeconomics, refers to an increase in the general level of prices. Inflation makes people feel poorer but, perhaps more important, rising and especially volatile prices make it harder for people to figure out the real values of goods, services, and investments. For these and other reasons, most people (and economists) dislike inflation.

But where does inflation come from? The answer is simple: Inflation comes about when there is a sustained increase in the supply of money. When people have more money, they spend it, and without an increase in the supply of goods, prices must rise. As Nobel laureate Milton Friedman once wrote: “Inflation is always and everywhere a monetary phenomenon.”

The United States, like other advanced economies, has a central bank; in the United States that bank is called the Federal Reserve. The Federal Reserve has the power and the responsibility to regulate the supply of money in the American economy. This power can be used for good, such as when the Federal Reserve holds off or minimizes a recession. But the power also can be used for great harm if the Federal Reserve encourages too much growth in the supply of money. The result will be inflation and economic disruption.

In Zimbabwe, the government ran the printing presses at full speed for many years. By the end of 2007, prices were rising at an astonishing rate of 150,000 percent per year. The United States has never had a problem of this scope or anything close to it but inflation remains a common concern.

Amazingly, the inflation rate in Zimbabwe kept rising. In January of 2008, the government had to issue a 10-million-dollar bank note (worth about 4 U.S. dollars), and a year later they announced a 20-trillion-dollar note that bought about what 10 million dollars had a year earlier. In early 2009, the inflation rate leaped to billions of percent per month! Finally, in April of 2009 the government stopped issuing the Zimbabwean dollar altogether and permitted trade using foreign currencies such as the South African rand and U.S. dollar.

**Inflation** is an increase in the general level of prices.



A billionaire in Zimbabwe

AP PHOTO

## Big Idea Ten: Central Banking Is a Hard Job

The Federal Reserve (“the Fed”), is often called on to combat recessions. But this is not always easy to do. Typically, there is a lag—often of many months—between when the Fed makes a decision and when the effects of that decision on the economy are known. In the meantime, economic conditions have changed so you should think of the Fed as shooting at a moving target. No one can foresee the future perfectly and so the Fed’s decisions are not always the right ones.

As mentioned, too much money in the economy means that inflation will result. But not enough money in the economy is bad as well and can lead to a recession or a slowing of economic growth. These ideas are an important and extensive topic in macroeconomics, but the key problem is that a low or falling money supply forces people to cut their prices and wages and this adjustment doesn’t always go smoothly.