

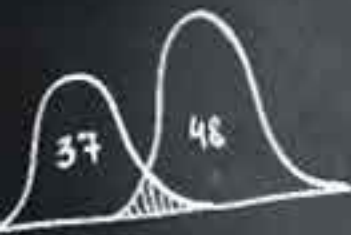
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HIRSCHEY
AND BENTZEN

MANAGERIAL ECONOMICS

FOURTEENTH EDITION



14e

Managerial Economics

Mark Hirschey

University of Kansas

Eric Bentzen

Copenhagen Business School



Australia • Brazil • Mexico • Singapore • United Kingdom • United States

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Dedication

For Christine - I still do.
(Mark Hirschey)

To Birgitte
(Eric Bentzen)

About the Author

Eric Bentzen, (Copenhagen Business School), is Associate Professor at Copenhagen Business School, where he teaches undergraduate and graduate courses in managerial economics and financial econometrics. He is a member of several professional organizations. He has published in *Applied Financial Economics*, *European Journal of Finance*, *Management Decision*, *Financial Markets and Portfolio Management*, and other leading academic journals.

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Brief Contents

Preface xvi

Part 1: Overview of Managerial Economics 1

1. Nature and Scope of Managerial Economics 3
2. Economic Optimization 23
3. Demand and Supply 77

Part 2: Demand Analysis and Estimation 109

4. Demand Analysis 111
5. Demand Estimation 159
6. Forecasting 195

Part 3: Production and Competitive Markets 237

7. Production Analysis and Compensation Policy 239
8. Cost Analysis and Estimation 281
9. Linear Programming 321
10. Competitive Markets 369
11. Performance and Strategy in Competitive Markets 403

Part 4: Imperfect Competition 445

12. Monopoly and Monopsony 447
13. Monopolistic Competition and Oligopoly 489
14. Game Theory and Competitive Strategy 537
15. Pricing Practices 573

Part 5: Long-Term Investment Decisions 617

16. Risk Analysis 619
17. Capital Budgeting 659
18. Organization Structure and Corporate Governance 701
19. Government in the Market Economy 735

Appendix A: Compounding and the Time Value of Money 775

Appendix B: Interest Factor Tables 791

Appendix C: Statistical Tables 799

Selected Figures for End of Chapter Problems 805

Index 811

Contents

Part 1: Overview of Managerial Economics

1

Chapter 1: Nature and Scope of Managerial Economics	3	Chapter 2: Economic Optimization	23
How is Managerial Economics Useful?	3	Economic Optimization Process	23
<i>Evaluating Choice Alternatives, 3 • Making the Best Decision, 5</i>		<i>Optimal Decisions, 23 • Maximizing the Value of the Firm, 24</i>	
Managerial Application 1.1 Business Ethics	5	Revenue Relations	25
Theory of the Firm	6	<i>Demand and Total Revenue, 25 • Marginal Revenue, 28 • Revenue Maximization Example, 29</i>	
<i>Expected Value Maximization 6 • Constraints and the Theory of the Firm 7 • Limitations of the Theory of the Firm, 8</i>		Managerial Application 2.1 Ethical Aspects of Corporate Governance	25
Managerial Application 1.2 The World is Turning to Capitalism and Democracy	9	Managerial Application 2.2 Do Firms Really Optimize?	30
Profit Measurement	9	Cost Relations	30
<i>Business Versus Economic Profit 9 • Variability of Business Profits, 10</i>		<i>Total Cost, 30 • Marginal and Average Cost, 32 • Average Cost Minimization Example, 33</i>	
Why do Profits Vary Among Firms?	12	Profit Relations	34
<i>Disequilibrium Profit Theories, 12 • Compensatory Profit Theories, 12 • Role of Profits in the Economy, 13</i>		<i>Total and Marginal Profit, 34 • Profit Maximization Example, 35</i>	
Managerial Application 1.3 Google on Social Responsibility	13	Incremental Concept in Economic Analysis	37
Role of Business in Society	14	<i>Marginal Versus Incremental Concept, 37 • Incremental Profits, 38 • Incremental Concept Example, 39</i>	
<i>Why Firms Exist, 14 • Social Responsibility of Business, 15</i>		Managerial Application 2.3 Behavioral Economics	38
Managerial Application 1.4 The IKEA way	16	Summary	41
Structure of this Text	16	Questions	42
<i>Objectives, 16 • Development of Topics, 16</i>		Self-Test Problems and Solutions	42
Summary	18	Problems	47
Questions	19	Case Study: Spreadsheet Analysis of the EOQ at the Neighborhood Pharmacy, Inc.	52
Case Study: Is Coca-Cola the 'Perfect' Business?	19	Selected References	53
Selected References	22	Appendix 2A: Math Analysis for Managers	54
		Properties of Real Numbers	54

Transitive Property, 54 • Commutative Properties, 54 • Associative Properties, 55 • Distributive Properties, 55 • Inverse Properties, 55 • Exponents and Radicals, 55

Equations 56
Equivalent Operations, 56 • Linear Equations, 57 • Quadratic Equations, 57 • Multiplicative Equations, 57 • Exponential Functions, 57 • Logarithmic Functions, 58

Concept of a Marginal 59

Rules for Differentiating a Function 61
Constants, 61 • Powers, 62 • Sums and Differences, 62 • Products, 63 • Quotients, 64 • Logarithmic Functions, 64 • Function of a Function (Chain Rule), 65

Appendix 2B: Multivariate Optimization and the Lagrangian Technique 67
Partial Derivative Concept, 67 • Maximizing Multivariate Functions, 68

Constrained Optimization 69
Role of Constraints, 70 • Lagrangian Multipliers, 71

Problem 75

Chapter 3: Demand and Supply 77

Basis for Demand 77
Direct Demand, 77 • Derived Demand, 78

Managerial Application 3.1: How the Internet Affects Demand and Supply 79

Market Demand Function 79
Determinants of Demand, 79 • Industry Demand Versus Firm Demand, 80

Demand Curve 81
Demand Curve Determination, 81 • Relation Between the Demand Curve and Demand Function, 82

Basis for Supply
How Output Prices Affect Supply, 84 • Other Factors that Influence Supply, 85

Market Supply Function 85
Determinants of Supply, 85 • Industry Supply Versus Firm Supply, 87

Supply Curve 87
Supply Curve Determination, 87 • Relation Between Supply Curve and Supply Function, 89

Market Equilibrium 91
Surplus and Shortage, 91 • Comparative Statics: Changing Demand, 93 • Comparative Statics: Changing Supply, 95 • Comparative Statics: Changing Demand and Supply, 96

Summary 97

Questions 97

Self-Test Problems and Solutions 98

Problems 101

Case Study: Spreadsheet Analysis of Demand and Supply for Sunbest Orange Juice 105

Selected Reference 107

Part 2: Demand Analysis and Estimation

Chapter 4: Demand Analysis 111

Utility Theory 111
Basic Assumptions, 111 • Utility Functions, 112 • Marginal Utility, 113 • Law of Diminishing Marginal Utility, 114

Managerial Application 4.1: Odd-Number Pricing Riddle 116

Indifference Curves 116
Basic Characteristics, 116 • Perfect Substitutes and Perfect Complements, 118

Budget Constraints 118
Characteristics of Budget Constraints, 118 • Effects of Changing Income and Changing Prices, 121 • Income and Substitution Effects, 122

Individual Demand 122
Price–Consumption Curve, 122 • Income–Consumption Curve, 125 • Engle Curves, 125

Managerial Application 4.2: Relationship Marketing 128

Optimal Consumption 128
Marginal Utility and Consumer Choice, 128 • Marginal Rate of Substitution, 129 • Utility Maximization, 131

Demand Sensitivity Analysis: Elasticity 132
Elasticity Concept, 132 • Point Elasticity, 132 • Arc Elasticity, 133

Price Elasticity of Demand 133
Price Elasticity Formula, 133 • Price Elasticity and Total Revenue, 135

Price Elasticity And Marginal Revenue 137

<i>Elasticity Varies Along a Linear Demand Curve</i> , 137			
• <i>Price Elasticity and Price Changes</i> , 138			
Managerial Application 4.3: Haggling in the Car Business	141		
Price Elasticity and Optimal Pricing Policy	141		
<i>Optimal Price Formula</i> , 141 • <i>Optimal Pricing Policy Example</i> , 142			
Cross-Price Elasticity of Demand	143		
<i>Cross-Price Elasticity Formula</i> , 143 • <i>Substitutes and Complements</i> , 144			
Income Elasticity of Demand	144		
• <i>Income Elasticity Formula</i> , 144 • <i>Normal Versus Inferior Goods</i> , 145			
Managerial Application 4.4: What's in a Name?	146		
Summary	146		
Questions	147		
Self-Test Problems and Solutions	148		
Problems	153		
Case Study: Optimal Level of Advertising	156		
Selected References	157		
Chapter 5: Demand Estimation	159		
Interview and Experimental Methods	159		
<i>Consumer Interviews</i> , 159 • <i>Market Experiments</i> , 160			
Simple Demand Curve Estimation	160		
• <i>Simple Linear Demand Curves</i> , 160			
• <i>Using Simple Linear Demand Curves</i> , 162			
Managerial Application 5.1: Sampling Technology for TV Advertising	161		
Simple Market Demand Curve Estimation	163		
<i>Graphing the Market Demand Curve</i> , 163			
• <i>Evaluating Market Demand</i> , 164			
Identification Problem	166		
<i>Changing Nature of Demand Relations</i> , 166			
• <i>Interplay of Demand and Supply</i> , 166 • <i>Shifts in Demand and Supply</i> , 167 • <i>Simultaneous Relations</i> , 169			
Regression Analysis	169		
<i>What is a Statistical Relation?</i> , 169 • <i>Specifying the Regression Model</i> , 172 • <i>Least Squares Method</i> , 173			
Managerial Application 5.2: Market Experiments on the Web	170		
Measures of Regression Model Significance	175		
<i>Standard Error of the Estimate</i> , 175 • <i>Goodness of Fit</i> , 176 • <i>F Statistic</i> , 178			
Judging Variable Significance	179		
<i>Two-Tail t Tests</i> , 179 • <i>One-Tail t Tests</i> , 181			
Summary	182		
Questions	183		
Self-Test Problems and Solutions	183		
Problems	188		
Case Study: Demand Estimation for Mrs Smyth's Pies	192		
Selected Reference	194		
Chapter 6: Forecasting	195		
Forecasting Applications	195		
<i>Macroeconomic Applications</i> , 195 • <i>Microeconomic Applications</i> , 196 • <i>Forecast Techniques</i> , 196			
Managerial Application 6.1: Economic Forecasting: The Art and the Science	197		
Qualitative Analysis	198		
<i>Expert Opinion</i> , 198 • <i>Survey Techniques</i> , 198			
Trend Analysis and Projection	199		
<i>Trends in Economic Data</i> , 199 • <i>Linear Trend Analysis</i> , 199 • <i>Growth Trend Analysis</i> , 202			
• <i>Linear and Growth Trend Comparison</i> , 204			
Managerial Application 6.2: Prediction Markets	204		
Business Cycle	205		
<i>What is the Business Cycle?</i> , 205 • <i>Economic Indicators</i> , 207 • <i>Economic Recessions</i> , 208			
• <i>Sources of Forecast Information</i> , 210			
Managerial Application 6.3: The Stock Market and the Business Cycle	211		
Exponential Smoothing	212		
<i>Exponential Smoothing Concept</i> , 212			
• <i>One-Parameter (Simple) Exponential Smoothing</i> , 212 • <i>Two-Parameter (Holt) Exponential Smoothing</i> , 213 • <i>Three-Parameter (Winters) Exponential Smoothing</i> , 214 • <i>Practical Use of Exponential Smoothing</i> , 214			
Econometric Forecasting	215		
<i>Advantages of Econometric Methods</i> , 215			
• <i>Single-Equation Models</i> , 217 • <i>Multiple-Equation Systems</i> , 218			
Managerial Application 6.4: How Good is Your Forecasting Ability?	216		
Judging Forecast Reliability	220		

<i>Tests of Predictive Capability, 220 • Correlation Analysis, 220 • Sample Mean Forecast Error Analysis, 220</i>		Questions	224
Choosing the Best Forecast Technique	221	Self-Test Problems and Solutions	225
<i>Data Requirements, 221 • Time Horizon Considerations, 221 • Role of Judgment, 223</i>		Case Study: Forecasting Global Performance for a Mickey Mouse Organization	233
Summary	223	Selected Reference	236

Part 3: Production and Competitive Markets

237

Chapter 7: Production Analysis and Compensation Policy	239	Productivity Measurement	262
Production Functions	239	<i>Economic Productivity, 263 • Productivity and Investment in Computer Technology (ICT), 264</i>	
<i>Properties of Production Functions, 239 • Returns to Scale and Returns to a Factor, 240</i>		Managerial Application 7.4: Labor productivity growth in selected countries 2009–2012.	263
Total, Marginal, and Average Product	240	Summary	265
• <i>Total Product, 241 • Marginal and Average Product, 242</i>		Questions	266
Law of Diminishing Returns to a Factor	245	Self-Test Problems and Solutions	266
<i>Illustration of Diminishing Returns to a Factor, 247</i>		Problems	269
Managerial Application 7.1: Efficiency Wages	246	Case Study: Worker Productivity Among Giant US Corporations	274
Input Combination Choice	248	Selected References	276
<i>Production Isoquants, 248 • Input Factor Substitution, 248 • Marginal Rate of Technical Substitution, 251 • Rational Limits of Input Substitution, 251</i>		Appendix 7A: A Constrained Optimization Approach to Developing the Optimal Input Combination Relationships	277
Marginal Revenue Product and Optimal Employment	252	Constrained Production Maximization	277
<i>Marginal Revenue Product, 252 • Optimal Level of a Single Input, 253 • Illustration of Optimal Employment, 254</i>		Constrained Cost Minimization	279
Managerial Application 7.2: National minimum wages in the EU	253	Problem	280
Optimal Combination of Multiple Inputs	255	Chapter 8: Cost Analysis and Estimation	281
<i>Budget Lines, 255 • Expansion Path, 257 • Illustration of Optimal Input Proportions, 258</i>		Economic and Accounting Costs	281
Managerial Application 7.3: The Future of Manufacturing in Europe 2015–2020	259	<i>Historical Versus Current Costs, 281 • Opportunity Costs, 282</i>	
Optimal Levels of Multiple Inputs	259	Role of Time in Cost Analysis	283
<i>Optimal Employment and Profit Maximization, 259 • Illustration of Optimal Levels of Multiple Inputs, 260</i>		<i>Incremental Versus Sunk Cost, 283 • How is the Operating Period Defined?, 284</i>	
Returns to Scale	260	Managerial Application 8.1: GE's '20-70-10' Plan	284
• <i>Output Elasticity and Returns to Scale, 260 • Returns to Scale Estimation, 261</i>		Short-Run Cost Curves	285
		<i>Short-Run Cost Categories, 285 • Short-Run Cost Relations, 286</i>	
		Managerial Application 8.2: GAAP and IRFS	288
		Long-Run Cost Curves	288
		<i>Long-Run Total Costs, 288 • Economies of Scale, 290 • Cost Elasticities and Economies of Scale, 290 • Long-Run Average Costs, 291</i>	

Managerial Application 8.3: Cost Stickiness	293	<i>Objective Function Specification, 330 • Constraint Equation Specification, 331 • Non-negativity Requirement, 331</i>	
Minimum Efficient Scale	293		
<i>Competitive Implications of Minimum Efficient Scale, 293 • Transportation Costs and MES, 293</i>			
Firm Size and Plant Size	295	Graphic Specification and Solution	332
<i>Multiplant Economies and Diseconomies of Scale, 295 • Economics of Multiplant Operation: an Example, 296 • Plant Size and Flexibility, 298</i>		<i>Analytic Expression, 332 • Graphing the Feasible Space, 332 • Graphing the Objective Function, 334 • Graphic Solution, 335</i>	
Learning Curves	300	Algebraic Specification and Solution	336
<i>Learning Curve Concept, 300 • Learning Curve Example, 302 • Strategic Implications of the Learning Curve Concept, 303</i>		<i>Algebraic Specification, 336 • Algebraic Solution, 338</i>	
Managerial Application 8.4: Bigger isn't Always Better	301	Managerial Application 9.3: LP on the PC!	341
Economies of Scope	304	Dual in Linear Programming	342
<i>Economies of Scope Concept, 304 • Exploiting Scope Economies, 305</i>		<i>Duality Concept, 342 • Shadow Prices, 342</i>	
Cost-Volume-Profit Analysis	305	Dual Specification	343
• <i>Cost-Volume-Profit Charts, 305 • Degree of Operating Leverage, 307</i>		<i>Dual Objective Function, 343 • Dual Constraints, 343 • Dual Slack Variables, 344</i>	
Summary	309	Solving the Dual Problem	345
Questions	310	<i>Dual Solution, 345 • Using the Dual Solution to Solve the Primal, 346</i>	
Self-Test Problems and Solutions	311	Summary	348
Problems	313	Questions	349
Case Study: Estimating Hospitalization Costs for Regional Hospitals	317	Self-Test Problems and Solutions	349
Selected References	320	Problems	357
Chapter 9: Linear Programming	321	Case Study: A LP Pension Funding Model	362
Basic Assumptions	321	Appendix 9A: Rules for Forming the Dual Linear Programming Problem	365
<i>Inequality Constraints, 321 • Linearity Assumption, 322</i>		Primal Problem	365
Managerial Application 9.1: Karmarkar's LP Breakthrough	322	Dual Problem	366
Production Planning for a Single Product	323	Selected References	367
<i>Production Processes, 323 • Production Isoquants, 324 • Least-Cost Input Combinations, 326 • Optimal Input Combinations with Limited Resources, 327</i>		Chapter 10: Competitive Markets	369
Managerial Application 9.2: LP: More than a Visual Approach	330	Competitive Environment	369
Production Planning for Multiple Products	330	<i>What is Market Structure?, 369 • Vital Role of Potential Entrants, 370</i>	
		Factors that Shape the Competitive Environment	370
		<i>Product Differentiation, 370 • Production Methods, 372 • Entry and Exit Conditions, 372</i>	
		Managerial Application 10.1: Benefits From Free Trade	371
		Competitive Market Characteristics	373
		<i>Basic Features, 373 • Examples of Competitive Markets, 373 • Profit Maximization Imperative, 375 • Role of Marginal Analysis, 375</i>	

Managerial Application 10.2: Seasonality on Stock Markets?	374	Role for Government	410
Marginal Cost and Firm Supply	379	<i>How Government Influences Competitive Markets, 410 • Broad Social Considerations, 411</i>	
<i>Short-Run Firm Supply Curve, 379 • Long-Run Firm Supply Curve, 381</i>		Managerial Application 11.2: Corn Growers Discover Oil!	411
Managerial Application 10.3: Dot.com	382	Subsidy and Tax Policy	411
Competitive Market Supply Curve	382	<i>Anti-Subsidy Rules, 412 • Deadweight Loss from Taxes, 412</i>	
<i>Market Supply with a Fixed Number of Competitors, 382 • Market Supply with Entry and Exit, 384</i>		Tax Incidence and Burden	414
Competitive Market Equilibrium	385	<i>Role of Elasticity, 414 • Tax Cost–Sharing Example, 415</i>	
<i>Balance of Supply and Demand, 386 • Normal Profit Equilibrium, 387</i>		Managerial Application 11.3: Measuring Economic Profits	418
Managerial Application 10.4: The Enron Debacle	388	Price Controls	418
Summary	388	<i>Price Floors, 418 • Price Ceilings, 420</i>	
Questions	389	Business Profit Rates	422
Self-Test Problems and Solutions	390	<i>Return on Stockholders' Equity, 422 • Typical Profit Rates, 423</i>	
Problems	395	Market Structure and Profit Rates	425
Case Study: Profitability Effects of Firm Size for DJIA Companies	399	<i>Profit Rates in Competitive Markets, 425 • Mean Reversion in Profit Rates, 426</i>	
Selected References	401	Competitive Market Strategy	426
Chapter 11: Performance and Strategy in Competitive Markets	403	<i>Short-Run Firm Performance, 427</i>	
Competitive Market Efficiency	403	Long-Run Firm Performance	428
<i>Why is it Called Perfect Competition?, 403 • Deadweight Loss Problem, 404 • Deadweight Loss Illustration, 406</i>		Summary	428
Managerial Application 11.1: The Wal-Mart Phenomenon	407	Questions	430
Market Failure	408	Self-Test Problems and Solutions	431
<i>Structural Problems, 408 • Incentive Problems, 409</i>		Problems	437
		Case Study: The Most Profitable S&P 500 Companies	441
		Selected References	444

Part 4: Imperfect Competition

445

Chapter 12: Monopoly and Monopsony	447	<i>Price–Output Decisions, 449 • Role of Marginal Analysis, 451</i>	
Monopoly Market Characteristics	447	Social Costs of Monopoly	453
<i>Basic Features, 447 • Examples of Monopoly, 448</i>		<i>Monopoly Underproduction, 453 • Deadweight Loss from Monopoly, 453</i>	
Managerial Application 12.1: The EU Commission fines parking heaters producer €68 million in cartel settlement	449	Social Benefits of Monopoly	457
Profit Maximization Under Monopoly	449	<i>Economies of Scale, 457 • Invention and Innovation, 457</i>	

Monopoly Regulation	458	Oligopoly	498
<i>Dilemma of Natural Monopoly, 458 • Utility Price and Profit Regulation, 460 • Utility Price and Profit Regulation Example, 462 • Problems with Utility Price and Profit Regulation, 464</i>		<i>Oligopoly Market Characteristics, 499 • Examples of Oligopoly, 499</i>	
Managerial Application 12.2: Is Ticketmaster a Monopoly?	459	Cartels and Collusion	500
Monopsony	464	<i>Overt and Covert Agreements, 500 • Enforcement Problems, 501</i>	
<i>Buyer Power, 464 • Bilateral Monopoly Illustration, 465</i>		Oligopoly Output-Setting Models	501
Managerial Application 12.3: is this why they Call it 'Hardball'?	468	<i>Cournot Oligopoly, 501 • Stackelberg Oligopoly, 504</i>	
Antitrust Policy	468	Oligopoly Price-Setting Models	507
<i>Overview of Antitrust Law, 468</i>		<i>Bertrand Oligopoly: Identical Products, 507 • Bertrand Oligopoly: Differentiated Products, 508 • Sweezy Oligopoly, 511 • Oligopoly Model Comparison, 512</i>	
Managerial Application 12.4: Price Fixing by the Insurance Cartel	469	Managerial Application 13.3: Contestable Airline Passenger Service Markets	513
Competitive Strategy in Monopoly Markets	469	Market Structure Measurement	513
<i>Market Niches, 469 • Information Barriers to Competitive Strategy, 470</i>		<i>Economic Census, 513 • NAICS System, 514</i>	
Summary	472	Census Measures of Market Concentration	516
Questions	473	<i>Concentration Ratios, 516 • Herfindahl–Hirschmann Index, 518 • Limitations of Census Information, 518</i>	
Self-Test Problems and Solutions	473	Managerial Application 13.4: Horizontal Merger Guidelines	519
Problems	480	Summary	522
Case Study: Effect of R&D on Tobin's q	484	Questions	524
Selected References	487	Self-Test Problems and Solutions	524
Chapter 13: Monopolistic Competition and Oligopoly	489	Problems	528
Contrast Between Monopolistic Competition and Oligopoly	489	Case Study: Market Structure Analysis at Columbia Drugstores, Inc.	533
<i>Monopolistic Competition, 489 • Oligopoly, 490 • Dynamic Nature of Competition, 491</i>		Selected References	535
Monopolistic Competition	491	Chapter 14: Game Theory and Competitive Strategy	537
<i>Monopolistic Competition Characteristics, 491 • Monopolistic Competition Price–Output Decisions, 493</i>		Game Theory Basics	537
Managerial Application 13.1: Dell's Price War with Dell	492	<i>Types of Games, 537 • Role of Interdependence, 538 • Strategic Considerations, 539</i>	
Managerial Application 13.2: Intel: Running Fast to Stay in Place	495	Managerial Application 14.1: Asymmetric Information	539
Monopolistic Competition Process	495	Prisoner's Dilemma	540
<i>Short-Run Monopoly Equilibrium, 495 • Long-Run High-Price/Low-Output Equilibrium, 496 • Long-Run Low-Price/High-Output Equilibrium, 498</i>		<i>Classic Riddle, 540 • Business Application, 541 • Broad Implications, 542</i>	
		Nash Equilibrium	543
		<i>Nash Equilibrium Concept, 543 • Nash Bargaining, 544</i>	

Infinitely Repeated Games	545	Price Discrimination Example	580
<i>Role of Reputation, 545 • Product Quality Games, 546</i>		<i>Price–Output Determination Case I, 581 • One-Price Alternative, 583 • Price–Output Determination Case II, 585</i>	
Managerial Application 14.2: The Market for Lemons	547	Managerial Application 15.2: Do Colleges Price Discriminate?	581
Finitely Repeated Games	547	Two-Part Pricing	586
<i>Uncertain Final Period, 547 • End-of-Game Problem, 548</i>		<i>One-Price Policy and Consumer Surplus, 586 • Capturing Consumer Surplus with Two-Part Pricing, 588 • Consumer Surplus and Bundle Pricing, 588</i>	
Game Theory and Auction Strategy	549	Multiple-Product Pricing	589
<i>First-Mover Advantages, 549 • Auction Types, 549 • Public Policy Applications, 550</i>		<i>Demand Interrelations, 589 • Production Interrelations, 590</i>	
Managerial Application 14.3: Wrigley’s Success Formula	551	Joint Products	591
Competitive Strategy	551	<i>Joint Products in Variable Proportions, 591 • Joint Products in Fixed Proportions, 591</i>	
<i>Competitive Advantage, 551 • When Large Size is a Disadvantage, 553</i>		Joint Product Pricing Example	593
Pricing Strategies	553	<i>Joint Products without Excess By-Product, 593 • Joint Production with Excess By-Product (Dumping), 596</i>	
<i>Limit Pricing, 553 • Network Externalities, 555 • Market Penetration Pricing, 555</i>		Managerial Application 15.3: 10¢ for a Gallon of Gas in Dayton, Ohio	594
Managerial Application 14.4: Network Switching Costs	556	Managerial Application 15.4: Why Some Price Wars Never End	598
Nonprice Competition	556	Summary	598
<i>Advantages of Nonprice Competition, 556 • Optimal Level of Advertising, 557 • Optimal Advertising Example, 559</i>		Questions and Answers	599
Summary	561	Self-Test Problems and Solutions	600
Questions	562	Problems	602
Self-Test Problems and Solutions	562	Case Study: Pricing Practices in the Denver, Colorado, Newspaper Market	606
Problems	565	Selected References	608
Case Study: Time Warner, Inc., is Playing Games with Stockholders	570	Appendix 15A: Transfer Pricing	609
Selected References	572	Transfer Pricing Problem	609
Chapter 15: Pricing Practices	573	<i>Divisional Relationships, 609 • Products without External Markets, 610 • Products with Competitive External Markets, 610 • Products with Imperfectly Competitive External Markets, 611</i>	
Pricing Rules-of-Thumb	573	Global Transfer Pricing Example	611
<i>Competitive Markets, 573 • Imperfectly Competitive Markets, 574</i>		<i>Profit Maximization for an Integrated Firm, 611 • Transfer Pricing with No External Market, 612 • Competitive External Market with Excess Internal Demand, 613 • Competitive External Market with Excess Internal Supply, 614</i>	
Managerial Application 15.1: Mark-Up Pricing Technology	575	Problem	615
Mark-Up Pricing and Profit Maximization	575		
<i>Optimal Mark-Up on Cost, 575 • Optimal Mark-Up on Price, 576 • Why Do Optimal Mark-Ups Vary?, 577</i>			
Price Discrimination	578		
<i>Profit-Making Criteria, 578 • Degrees of Price Discrimination, 579</i>			

Part 5: Long-Term Investment Decisions

617

Chapter 16: Risk Analysis	619	<i>Sequence of Project Valuation, 660 • Cash Flow Estimation, 661 • Incremental Cash Flow Evaluation, 661</i>
Concepts of Risk and Uncertainty	619	
<i>Economic Risk and Uncertainty, 619 • General Risk Categories, 620 • Special Risks of Global Operations, 621</i>		
Probability Concepts	621	
• <i>Probability Distribution, 622 • Expected Value, 623 • Absolute Risk Measurement, 625 • Relative Risk Measurement, 627 • Other Risk Measures, 627</i>		
Managerial Application 16.1: Behavioral Finance	622	
Standard Normal Concept	628	
<i>Normal Distribution, 628 • Standardized Variables, 629 • Use of the Standard Normal Concept: an Example, 629</i>		
Managerial Application 16.2: Why are Lotteries Popular?	630	
Utility Theory and Risk Analysis	630	
<i>Possible Risk Attitudes, 631 • Relation Between Money and its Utility, 631</i>		
Adjusting the Valuation Model for Risk	632	
<i>Basic Valuation Model, 632 • Certainty Equivalent Adjustments, 633 • Certainty Equivalent Adjustment Example, 635 • Risk-Adjusted Discount Rates, 636, • Risk-Adjusted Discount Rate Example, 637</i>		
Managerial Application 16.3: Stock Option Backdating Scandal	633	
Decision Trees and Computer Simulation	638	
<i>Decision Trees, 638 • Computer Simulation, 639 • Computer Simulation Example, 640</i>		
Managerial Application 16.4: Internet Fraud	642	
Summary	643	
Questions	644	
Self-Test Problems and Solutions	645	
Problems	649	
Case Study: Stock-Price Beta Estimation for Google, Inc.	653	
Selected References	657	
Chapter 17: Capital Budgeting	659	
Capital Budgeting Process	659	
<i>What is Capital Budgeting?, 659 • Project Classification Types, 660</i>		
Steps in Capital Budgeting	660	
<i>Managerial Application 17.1: Market-Based Capital Budgeting</i>	662	
<i>Cash Flow Estimation Example</i>	662	
<i>Project Description, 662 • Cash Flow Estimation and Analysis, 663</i>		
<i>Capital Budgeting Decision Rules</i>	665	
<i>Net Present-Value Analysis, 665 • Profitability Index or Benefit/Cost Ratio Analysis, 668 • Internal Rate of Return Analysis, 668 • Payback Period Analysis, 669</i>		
<i>Project Selection</i>	670	
<i>Decision Rule Conflict Problem, 670</i>		
<i>Managerial Application 17.2: Is the Sun Setting on Japan's Vaunted MOF?</i>	671	
<i>Reasons for Decision Rule Conflict, 672 • Ranking Reversal Problem, 672 • Making the Correct Investment Decision, 675</i>		
<i>Cost of Capital</i>	675	
<i>Component Cost of Debt Financing, 675 • Component Cost of Equity Financing, 676 • Weighted-Average Cost of Capital, 679</i>		
<i>Managerial Application 17.3: Federal Government Support for R&D</i>	676	
<i>Managerial Application 17.4: Capital Allocation at Berkshire Hathaway, Inc.</i>	681	
<i>Optimal Capital Budget</i>	681	
<i>Investment Opportunity Schedule, 681 • Marginal Cost of Capital, 683 • Postaudit, 683</i>		
Summary	684	
Questions	684	
Self-Test Problems and Solutions	685	
Problems	689	
Case Study: Sophisticated NPV Analysis at Level 3 Communications, Inc.	694	
Selected References	698	
Chapter 18: Organization Structure and Corporate Governance	701	
Organization Structure	701	
<i>What is Organization Structure?, 701 • Optimal Design is Dynamic, 702</i>		
Transaction Cost Theory of the Firm	703	
<i>Nature of Firms, 703 • Coase Theorem, 704</i>		

The Firm's Agency Problem	704	<i>Rivalry and Exclusion, 740 • Free Riders and Hidden Preferences, 741</i>	
<i>Sources of Conflict within Firms, 704 • Risk Management Problems, 705 • Investment Horizon Problems, 707 • Information Asymmetry Problems, 707</i>			
Managerial Application 18.1: Organization Design at GE	705		
Organization Design	708		
<i>Resolving Unproductive Conflict within Firms, 708 • Centralization Versus Decentralization, 709</i>			
Decision Management and Control	710		
<i>Assigning Decision Rights, 710 • Decision Process, 711</i>			
Corporate Governance	712		
<i>Role Played by Boards of Directors, 712</i>			
Managerial Application 18.2: Company Information on the Internet	713		
<i>Corporate Governance Inside the Firm, 714</i>			
Managerial Application 18.3: Sarbanes–Oxley	715		
Ownership Structure as a Corporate Governance Mechanism	715		
<i>Dimensions of Ownership Structure, 715 • Is Ownership Structure Endogenous?, 719</i>			
Managerial Application 18.4: Institutional Investors are Corporate Activists	720		
Agreements and Alliances Among Firms	720		
<i>Franchising, 720 • Strategic Alliances, 721</i>			
Legal and Ethical Environment	722		
<i>Sarbanes–Oxley Act, 722 • Business Ethics, 723</i>			
Summary	723		
Questions	725		
Self-Test Problems and Solutions	726		
Problems	728		
Case Study: Do Boards of Directors Make Good Corporate Watchdogs?	731		
Selected References	734		
Chapter 19: Government in the Market Economy	735		
Externalities	735		
<i>Negative Externalities, 735 • Positive Externalities, 736</i>			
Managerial Application 19.1: 'Tobacco' Ethics	738		
Solving Externalities	738		
<i>Government Solutions, 738 • Market Solutions, 739</i>			
Public Goods	740		
		Managerial Application 19.2: Political Corruption	743
		Optimal Allocation of Social Resources	744
		<i>Pareto Improvement, 744 • Marginal Social Costs and Benefits, 744</i>	
		Benefit–Cost Methodology	746
		<i>Benefit–Cost Concepts, 746 • Social Rate of Discount, 747</i>	
		Benefit–Cost Criteria	748
		<i>Social Net Present-Value, 748 • Benefit–Cost Ratio, 750 • Social Internal Rate of Return, 751 • Limitations of Benefit–Cost Analysis, 752</i>	
		Additional Methods of Improving Public Management	752
		<i>Cost-Effectiveness Analysis, 752 • Privatization, 753</i>	
		Managerial Application 19.3: Free Trade Helps Everyone	753
		Regulatory Reform in the New Millennium	755
		<i>Promoting Competition in Electric Power Generation, 755 • Fostering Competition in Telecommunications, 755 • Reforming Environmental Regulation, 756 • Improving Regulation of Health and Safety, 756</i>	
		Managerial Application 19.4: Price Controls for Pharmaceutical Drugs	757
		Health Care Reform	757
		<i>Managed Competition, 757 • Outlook for Health Care Reform, 759</i>	
		Summary	760
		Questions	761
		Self-Test Problems and Solutions	762
		Problems	767
		Case Study: Oh, Lord, Won't You Buy Me a Mercedes-Benz (Factory)?	772
		Selected References	774
		Appendix A: Compounding and the Time Value of Money	775
		Appendix B: Interest Factor Tables	791
		Appendix C: Statistical Tables	799
		Selected Check Figures for End-of-Chapter Problems	805
		Index	811

Preface

Economic concepts show how to apply common sense to understand business and solve managerial problems. Economic intuition is really useful. It helps managers decide on which products to produce, costs to consider, and prices to charge. It also helps them decide on the best hiring policy and the most effective style of organization. Students and future managers need to learn these things. The topics covered in managerial economics are powerful tools that can be used to make them more effective and their careers more satisfying. By studying managerial economics, those seeking to further their business careers learn how to more effectively collect, organize and analyze information.

A key feature of this book is its depiction of the firm as a cohesive organization. Effective management involves an integration of the accounting, finance, marketing, personnel, and production functions. This integrative approach demonstrates that important managerial decisions are *interdisciplinary* in the truest sense of the word.

Although both microeconomic and macroeconomic relations have implications for managerial decision making, this book concentrates on microeconomic topics. Following development of the economic model of the firm, the vital role of profits is examined. Because economic decision making often requires an elementary understanding of optimization techniques and statistical relations, those basic concepts are described early in the text. Because demand for a firm's products plays a crucial role in determining its profitability and ongoing success, demand analysis and estimation is an essential area of study. An important part of this study is an investigation of the basic forces of demand and supply. This naturally leads to discussion of economic forecasting and methods for assessing forecast reliability. Production theory and cost analysis are then explored as means for understanding the economics of resource allocation and employment.

Once the internal workings of a successful firm are understood, attention can turn toward consideration of the firm's external economic environment. Market structure analysis provides the foundation for studying the external economic environment and for defining an effective competitive strategy. The role of government in the market economy, including the constraints it imposes on business, requires a careful examination of regulation and antitrust law. Risk analysis and capital budgeting are also shown as methods for introducing marginal analysis into the long-range strategic planning and control process. Finally, given government's increasing role in managing demand and supply for basic services, such as education and health care, the use of economic principles to understand and improve public management is also considered.

Managerial Economics, 14th Edition, takes a practical problem-solving approach. The focus is on the economics—not the mathematics—of the managerial decision process. Quantitative tools are sometimes employed, but the emphasis is on economic intuition.

THIS 14TH EDITION

Students and instructors will find that *Managerial Economics*, 14th Edition provides an efficient calculus-based introduction and guide to the optimization process. Chapter 2, *Economic Optimization*, illustrates how the concept of a derivative can be used as a practical tool to understand and apply marginal analysis. *Multivariate Optimization and the Lagrangian Technique*, Appendix 2B, examines the optimization process for equations with three or more variables. Such techniques are especially helpful when managers face constrained optimization problems, or decision situations with limited alternatives. Throughout the text, a wide variety of problems describing real-world decisions can be solved using such techniques.

Managerial Economics, 14th Edition provides an intuitive guide to marginal analysis and basic economic relations. Although differential calculus is an obviously helpful tool for understanding the process of economic optimization, it is important that students not let mathematical manipulation get in the way of their basic grasp of economic concepts. The concept of a marginal can also be described graphically in an intuitive noncalculus-based approach. Once students learn to grasp the importance of marginal revenue and marginal cost concepts, the process of economic optimization becomes intuitively obvious. Although those using a non-calculus based approach can safely skip parts of Chapter 2 and Appendix 2B, all other material is fully and completely assessable. With practice using a wide variety of problems and examples throughout the text, all students are able to gain a simple, practical understanding of how economics can be used to understand and improve managerial decisions.

Learning Aids

- Each chapter incorporates a wide variety of simple numerical examples and detailed practical illustrations of chapter concepts. These features portray the valuable use and real-world implications of covered material.
- Each chapter includes short Managerial Applications boxes to show current examples of how the concepts introduced in managerial economics apply to real-world situations. New Managerial Applications based on articles from the Internet or *Barron's*, *Business Week*, *Forbes*, *Fortune*, and *The Wall Street Journal* are provided. This feature stimulates student interest and offers a popular basis for classroom discussion.
- The book incorporates several new regression-based illustrations of chapter concepts using actual company data, or hypothetical data adapted from real-world situations. Like all aspects of the text, this material is self-contained and intuitive.
- Effective managers must be sensitive to the special challenges posed by an increasingly global marketplace. To increase student awareness of such issues, a number of examples, Managerial Applications, and case studies that relate to global business topics are featured.
- Each chapter is accompanied by a case study that provides in-depth treatment of chapter concepts. To meet the needs of all instructors and their students, these case studies are written to allow, but do not require, a computer-based approach. These case studies are fully self-contained and especially helpful to instructors who wish to more fully incorporate the use of basic spreadsheet and statistical software in their courses.
- New end-of-chapter questions and problems are provided, after having been subject to necessary revision and class testing. Questions are designed to give students the opportunity to grasp basic concepts on an intuitive level and express their understanding in a nonquantitative fashion. Problems cover a wide variety of decision situations and illustrate the role of economic analysis from within a simple numerical framework.

- Each chapter includes self-test problems with detailed solutions to show students how economic tools and techniques can be used to solve practical business problems. These self-test problems are a proven study aid that greatly enhances the learning value of end-of-chapter questions and problems.

Ancillary Package

Managerial Economics, 14th Edition, is supported by the most comprehensive ancillary package available in managerial economics to make teaching and learning the material both easy and enjoyable.

Instructor's Manual *The Instructor's Manual* offers learning suggestions, plus detailed answers and solutions for all chapter questions and problems. Case study data are also provided to adopters with the *Instructor's Manual*. The Instructor's Manual files can be found on the website international.cengage.com.

Test Bank A comprehensive *Test Bank* is also provided that offers a variety of multiple-choice questions, one-step, and multistep problems for every chapter. Full solutions are included, of course. With nearly 1,000 questions and problems, the *Test Bank* is a valuable tool for exam preparation. The Test Bank files can be found on the website international.cengage.com.

Acknowledgments

A number of people have aided in the preparation of *Managerial Economics*. Helpful suggestions and constructive comments have been received from a great number of instructors and students who have used previous editions. Numerous reviewers have also provided insights and assistance in clarifying difficult material. Among those who have been especially helpful in the development of previous editions are: Barry Keating, University of Notre Dame; Stephen Conroy, University of San Diego; Xu Wang, Texas A&M University; Michael Brandl, University of Texas—Austin; Neil Garston, California State University—Los Angeles; Albert Okunade, University of Memphis; David Carr, University of South Dakota; Steven Rock, Western Illinois University; Mel Borland, Western Kentucky University; Tom Staley, San Francisco State University.

For the present edition I thank Kjeld Tyllesen and Carsten Scheibye both from Copenhagen Business School.

I am also indebted to staff at Cengage Learning for making the 14th a reality.

Many thanks to the reviewers of this edition, Gu Guowei of London South Bank University, UK and Dr Tendeukayi Mugadza of Monash University, South Africa.

Every effort has been made to minimize errors in the book. However, errors do occasionally slip through despite diligent efforts to provide an error-free package of text and ancillary materials. Readers are invited to correspond with me directly concerning any corrections or other suggestions.

It is obvious that economic efficiency is an essential ingredient in the successful management of both business and public-sector organizations. Like any dynamic area of study, the field of managerial economics continues to undergo profound change in response to the challenges imposed by a rapidly evolving environment. It is exciting to participate in these developments. I sincerely hope that *Managerial Economics* contributes to a better understanding of the usefulness of economic theory.

Finally, I would like to thank my wife Birgitte for her patience and understanding.

Eric Bentzen
bentzen@cbs.dk
November 2015

Overview of Managerial Economics

1

CHAPTER 1
Nature and Scope
of Managerial Economics

CHAPTER 2
Economic Optimization

CHAPTER 3
Demand and Supply

PART

Nature and Scope of Managerial Economics

Warren E. Buffett, celebrated chairman of Omaha, Nebraska-based Berkshire Hathaway, Inc., started an investment partnership with \$100 in 1956 and went on to accumulate a personal net worth in excess of \$50 billion.

Buffett is famous for his razor-sharp focus on the competitive advantages of Berkshire's wide assortment of operating companies, including Benjamin Moore (paints), Borsheim's (jewelry), Clayton Homes, Dairy Queen, Fruit of the Loom, GEICO (insurance), General Re Corporation (reinsurance), MidAmerican Energy, the Nebraska Furniture Mart, See's Candies and Shaw's Industries (carpet and floor coverings). Berkshire subsidiaries commonly earn more than 30 per cent per year on invested capital, compared with the 10 per cent to 12 per cent rate of return earned by other well-managed companies. Additional contributors to Berkshire's outstanding performance are substantial common stock holdings in American Express, Coca-Cola, Procter & Gamble and Wells Fargo among others. As both a skilled manager and an insightful investor, Buffett likes wonderful businesses with high rates of return on investment, lofty profit margins and consistent earnings growth. Complicated businesses that face fierce competition and require large capital investment are shunned.¹

Buffett's success is powerful testimony to the practical usefulness of managerial economics. Managerial economics answers fundamental questions. When is the market for a product so attractive that entry or expansion becomes appealing? When is exit preferable to continued operation? Why do some professions pay well, while others offer only meager pay? Successful managers make good decisions, and one of their most useful tools is the methodology of managerial economics.

HOW IS MANAGERIAL ECONOMICS USEFUL?

Economic theory and methodology lay down rules for improving business and public policy decisions.

Evaluating Choice Alternatives

Managerial economics helps managers recognize how economic forces affect organizations and describes the economic consequences of managerial behavior. It also links economic concepts, data and quantitative methods to develop vital tools for managerial decision-making. This process is illustrated in Figure 1.1.

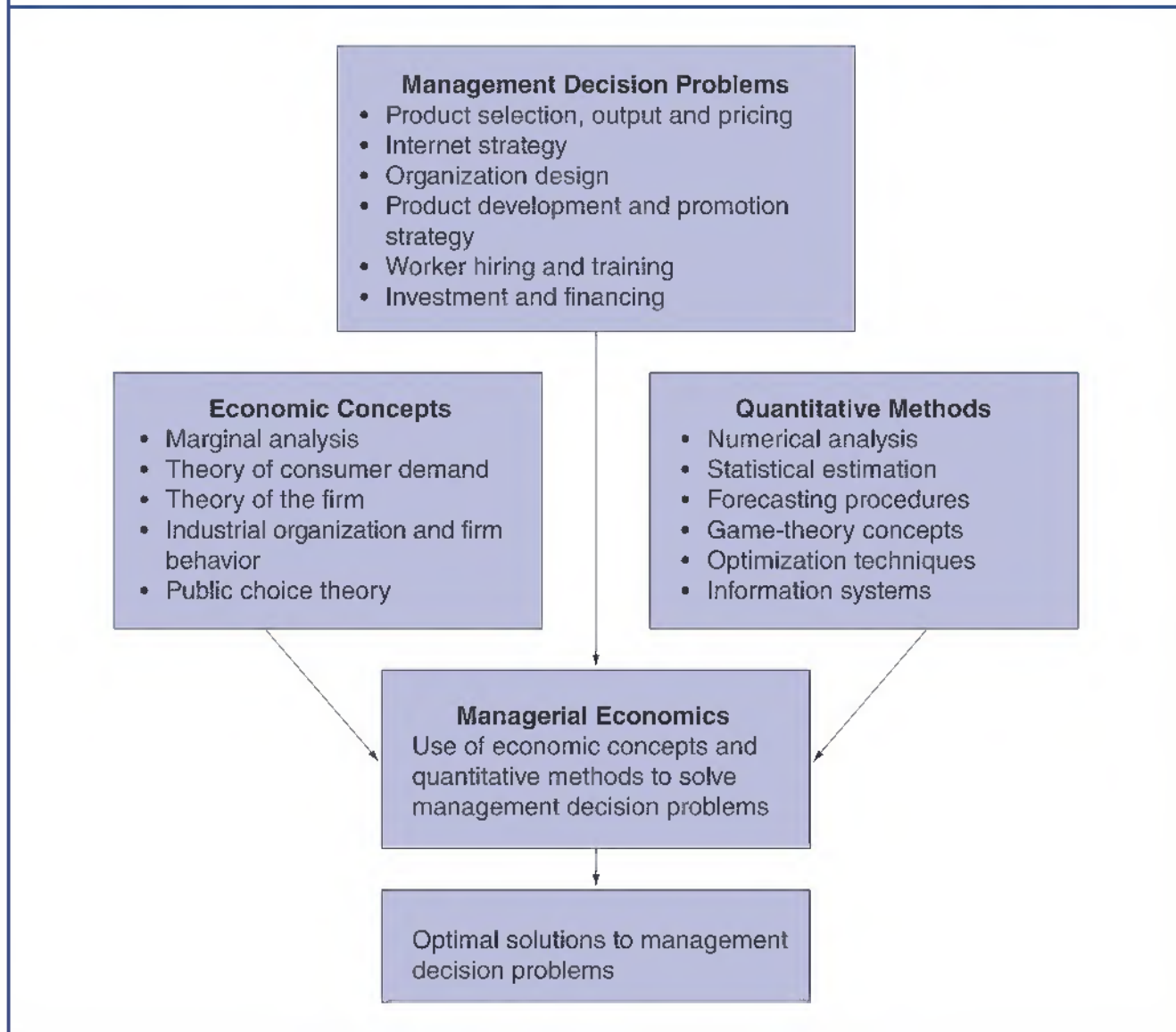
Managerial Economics

Applies economic tools and techniques to business and administrative decision-making.

¹ Information about Warren Buffett's investment philosophy and Berkshire Hathaway, Inc., can be found on the Internet, <http://www.berkshirehathaway.com>

Figure 1.1 Managerial Economics is a Tool for Improving Management Decision-Making

Managerial economics uses economic concepts and quantitative methods to solve managerial problems.



Managerial economics identifies ways to achieve goals efficiently. For example, suppose a small business seeks rapid growth to reach a size that permits efficient use of national media advertising, managerial economics can be used to identify pricing and production strategies to help meet this short-run objective quickly and effectively. Similarly, managerial economics provides production and marketing rules that permit the company to maximize net profits once it has achieved growth or market share objectives.

Managerial economics has applications in both profit and not-for-profit sectors. For example, an administrator of a nonprofit hospital strives to provide the best medical care possible given limited medical staff, equipment, and related resources. Using the tools and concepts of managerial economics, the administrator can determine the optimal allocation of these limited resources. In short, managerial economics helps managers arrive at a set of operating rules that aid in the efficient use of scarce human and capital

resources. By following these rules, businesses, nonprofit organizations and government agencies are able to meet objectives efficiently.

Making the Best Decision

To establish appropriate decision rules, managers must understand the economic environment in which they operate. For example, a grocery retailer may offer consumers a highly price-sensitive product, such as milk, at an extremely low markup over cost – say, 1 per cent to 2 per cent – while offering less price-sensitive products, such as nonprescription drugs, at markups of as high as 40 per cent over cost. Managerial economics describes the logic of this pricing practice with respect to the goal of profit maximization. Similarly, managerial economics reveals that auto import quotas reduce the availability of substitutes for domestically produced cars, raise auto prices, and create the possibility of monopoly profits for domestic manufacturers. It does not explain whether imposing quotas is good public policy; that is a decision involving broader political considerations. Managerial economics only describes the predictable economic consequences of such actions.

Managerial economics offers a comprehensive application of economic theory and methodology to management decision-making. It is as relevant to the management of government agencies, cooperatives, schools, hospitals, museums, and similar not-for-profit institutions as it is to the management of profit-oriented businesses. Although this text focuses primarily on business applications, it also includes examples and problems from the government and nonprofit sectors to illustrate the broad relevance of managerial economics.

Managerial Application 1.1

Business Ethics

In *Financial Times*, you can sometimes find evidence of unscrupulous business behavior. However, unethical conduct is inconsistent with value maximization and contrary to the enlightened self-interest of management and other employees. If honesty didn't pervade corporations, the ability to conduct business would collapse. Eventually, the truth always comes out, and when it does the unscrupulous lose out. For better or worse, we are known by the standards we adopt. To become successful in business, everyone must adopt a set of principles. Ethical rules to keep in mind when conducting business include:

- Above all else, keep your word. Say what you mean, and mean what you say.
- Do the right thing. A handshake with an honorable person is worth more than a ton of legal documents from a corrupt individual.

- Accept responsibility for your mistakes, and fix them. Be quick to share credit for success.
- Leave something on the table. Profit *with* your customer, not *off* your customer.
- Stick by your principles. Principles are not for sale at any price.

Does the 'high road' lead to corporate success? Consider the experience of A.P. Moller/Maersk – a Scandinavian company. At A.P. Moller/Maersk their founder used the phrase: '*no loss should hit us, which by due diligence could be averted*'.

See: <http://www.maersk.com>

THEORY OF THE FIRM

Firms are useful for producing and distributing goods and services.

Expected Value Maximization

At its simplest level, a business enterprise represents a series of contractual relationships that specify the rights and responsibilities of various parties (see Figure 1.2). People directly involved include customers, stockholders, management, employees, and suppliers. Society is also involved because businesses use scarce resources, pay taxes, provide employment opportunities, and produce much of society's material and services output. The model of business is called the **theory of the firm**. In its simplest version, the firm is thought to have profit maximization as its primary goal. The firm's owner-manager is assumed to be working to maximize the firm's short-run profits. Today, the emphasis on profits has been broadened to encompass uncertainty and the time value of money. In this more complete model, the primary goal of the firm is long-term **expected value maximization**.

The **value of the firm** is the present value of the firm's expected future net cash flows. If cash flows are equated to profits for simplicity, the value of the firm today, or its **present value**, is the value of expected profits, discounted back to the present at an appropriate interest rate.²

This model can be expressed as follows

Value of the Firm = Present Value of Expected Future Profits

$$\begin{aligned} &= \frac{\pi_1}{(1+i)^1} + \frac{\pi_2}{(1+i)^2} + \dots + \frac{\pi_n}{(1+i)^n} \\ &= \sum_{t=1}^n \frac{\pi_t}{(1+i)^t} \end{aligned} \quad 1.1$$

Here, $\pi_1, \pi_2, \dots, \pi_n$ represent expected profits in each year, t , and i is the appropriate interest, or discount, rate. The final form for Equation (1.1) is simply a shorthand expression in which sigma (Σ) stands for 'sum up' or 'add together'. The term

$$\sum_{t=1}^n$$

means, 'Add together as t goes from 1 to n the values of the term on the right'. For Equation (1.1), the process is as follows: Let $t=1$ and find the value of the term $\pi_1/(1+i)^1$, the present value of year 1 profit; then let $t=2$ and calculate $\pi_2/(1+i)^2$, the present value of year 2 profit; continue until $t=n$, the last year included in the analysis; then add up these present-value equivalents of yearly profits to find the current or present value of the firm.

Because profits (π) are equal to total revenues (TR) minus total costs (TC), Equation (1.1) can be rewritten as

$$\text{Value} = \sum_{t=1}^n \frac{TR_t - TC_t}{(1+i)^t} \quad 1.2$$

- 2 Discounting is required because profits obtained in the future are less valuable than profits earned presently. One euro today is worth more than €1 to be received a year from now because €1 today can be invested and, with interest, grow to a larger amount by the end of the year. One euro invested at 10 per cent interest would grow to €1.10 in 1 year. Thus, €1 is defined as the present value of €1.10 due in 1 year when the appropriate interest rate is 10 per cent.

Theory of the Firm

Basic model of business.

Expected Value Maximization

Optimization of profits in light of uncertainty and the time value of money.

Value of the Firm

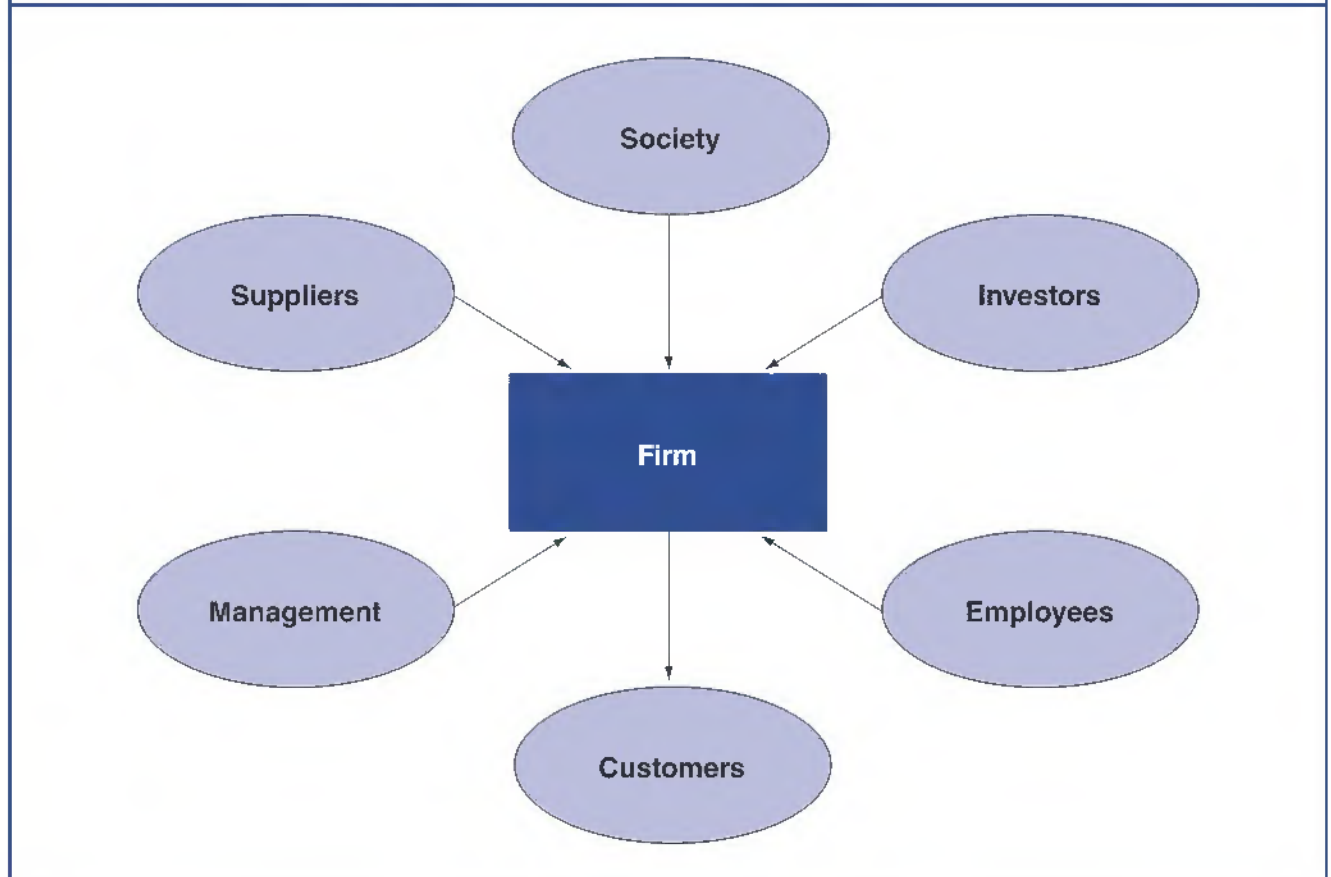
Present value of the firm's expected future net cash flows.

Present Value

Worth in current dollars.

Figure 1.2 The Corporation is a Legal Device

The firm can be viewed as a series of contractual relationships that connect suppliers, investors, workers and management in a joint effort to serve customers.



This expanded equation can be used to examine how the expected value maximization model relates to a firm's various functional departments. The marketing department often has primary responsibility for promotion and sales (TR); the production department has primary responsibility for development costs (TC); and the finance department has primary responsibility for acquiring capital and, hence, for the discount factor (i) in the denominator. Important overlaps exist among these functional areas. The marketing department can help reduce costs for a given level of output by influencing customer order size and timing. The production department can stimulate sales by improving quality. Other departments, for example, accounting, human resources, transportation, and engineering, provide information and services vital to sales growth and cost control. The determination of TR and TC is a difficult and complex task. All managerial decisions should be analyzed in terms of their effects on value, as expressed in Equations (1.1) and (1.2).

Constraints and the Theory of the Firm

Organizations frequently face limited availability of essential inputs, such as skilled labor, raw materials, energy, specialized machinery and warehouse space. Managers often face limitations on the amount of investment funds available for a particular project or activity. Decisions can also be constrained by contractual requirements. For example, labor contracts limit flexibility in worker scheduling and job assignments. Contracts sometimes require that a minimum level of output be produced to meet delivery requirements. In most instances, output must also meet quality requirements. Some common examples

of output quality constraints are nutritional requirements for feed mixtures, audience exposure requirements for marketing promotions, reliability requirements for electronic products, and customer service requirements for minimum satisfaction levels.

Legal restrictions, which affect both production and marketing activities, can also play an important role in managerial decisions. Laws that define minimum wages, health and safety standards, pollution emission standards, fuel efficiency requirements, and fair pricing and marketing practices all limit managerial flexibility.

The role that constraints play in managerial decisions makes the topic of constrained optimization a basic element of managerial economics. Later chapters consider important economic implications of self-imposed and social constraints. This analysis is important because value maximization and allocative efficiency in society depend on the efficient use of scarce economic resources.

Limitations of the Theory of the Firm

Optimize
Seek the best solution.

Satisfice
Seek satisfactory rather than optimal results.

In practice, do managers try to **optimize** (seek the best result) or merely **satisfice** (seek satisfactory rather than optimal results)? Do managers seek the sharpest needle in a haystack (optimize), or do they stop after finding one sharp enough for sewing (satisfice)? How can one tell whether company support of the United Way, for example, leads to long-run value maximization? Are generous salaries and stock options necessary to attract and retain managers who can keep the firm ahead of the competition? When a risky venture is turned down, is this inefficient risk avoidance? Or does it reflect an appropriate decision from the standpoint of value maximization?

It is impossible to give definitive answers to questions like these, and this dilemma has led to the development of alternative theories of firm behavior. Some of the more prominent alternatives are models in which size or growth maximization is the assumed primary objective of management, models that argue that managers are most concerned with their own personal utility or welfare maximization, and models that treat the firm as a collection of individuals with widely divergent goals rather than as a single, identifiable unit. These alternative theories, or models, of managerial behavior have added to our understanding of the firm. Still, none can supplant the basic value maximization concept as a foundation for analyzing managerial decisions. Examining why provides additional insight into the value of studying managerial economics.

Research shows that vigorous competition typically forces managers to seek value maximization in their operating decisions. Competition in the capital markets forces managers to seek value maximization in their financing decisions as well. Stockholders are, of course, interested in value maximization because it affects their rates of return on common stock investments. Managers who pursue their own interests instead of stockholders' interests run the risk of losing their job. Unfriendly takeovers are especially hostile to inefficient management that is replaced. Moreover, recent studies show a strong correlation between firm profits and managerial compensation. Management has strong economic incentives to pursue value maximization through their decisions.

It is sometimes overlooked that managers must consider all relevant costs and benefits before they can make reasoned decisions. It is unwise to seek the best technical solution to a problem if the costs of finding such a solution greatly exceed resulting benefits. As a result, what often appears to be satisficing on the part of management can be interpreted as value-maximizing behavior once the costs of information gathering and analysis are considered. Similarly, short-run growth maximization strategies are often consistent with long-run value maximization when the production, distribution and promotional advantages of large firm size are better understood.

Finally, the value maximization model also offers insight into a firm's voluntary 'socially responsible' behavior. The criticism that the traditional theory of the firm emphasizes profits and value maximization while ignoring the issue of social responsibility is important and will be discussed later in the chapter. For now, it will prove useful to examine the concept of profits, which is central to the theory of the firm.

PROFIT MEASUREMENT

Free enterprise depends upon profits and the profit motive. Both play a role in the efficient allocation of economic resources worldwide.

Business Versus Economic Profit

Profit is usually defined as the residual of sales revenue minus the explicit costs of doing business. It is the amount available to fund equity capital after payment for all other resources used by the firm. This definition of profit is accounting profit, or **business profit**.

The economist also defines profit as the excess of revenues over costs. However, inputs provided by owners, including entrepreneurial effort and capital, are resources that must be compensated. The economist includes a normal rate of return on equity capital plus an opportunity cost for the effort of the owner-entrepreneur as costs of doing business, just as the interest paid on debt and the wages are costs in calculating

Business Profit

Residual of sales revenue minus the explicit accounting costs of doing business.

Managerial Application 1.2

The World is Turning to Capitalism *and* Democracy

Capitalism and democracy are mutually reinforcing. Some philosophers have gone so far as to say that capitalism and democracy are intertwined. Without capitalism, democracy may be impossible. Without democracy, capitalism may fail. At a minimum, freely competitive markets give consumers broad choices, and reinforce the individual freedoms protected in a democratic society. In democracy, government does not grant individual freedom. Instead, the political power of government emanates from the people. Similarly, the flow of economic resources originates with the individual customer in a capitalistic system. It is not centrally directed by government.

Capitalism is socially desirable because of its decentralized and customer-oriented nature. The menu of products to be produced is derived from market price and output signals originating in competitive markets, not from the output schedules of a centralized planning agency. Resources and products are also allocated through market forces. They are not earmarked on the basis of favoritism or social status. Through their purchase decisions, customers dictate the quantity and quality of products brought to market.

Competition is a fundamentally attractive feature of the capitalistic system because it keeps costs and prices low. By operating efficiently, firms are able to produce the maximum quantity and quality of goods and services. Mass production is, by definition, production for the masses. Competition also limits concentration of economic and political power. Similarly, the democratic form of government is inconsistent with consolidated economic influence and decision-making.

Totalitarian forms of government are in retreat. China has experienced violent upheaval as the country embarks on much-needed economic and political reforms. In the former Soviet Union, Eastern Europe, India and Latin America, years of economic failure forced governments to dismantle entrenched bureaucracy and install economic incentives. Rising living standards and political freedom have made life in the West the envy of the world. Against this backdrop, the future is bright for capitalism *and* democracy!

See: Thomas B. Edsall 'Capitalism vs. Democracy,' The New York Times, January 28, 2014, <http://www.wsj.com>

Normal Rate of Return

Average profit necessary to attract and retain investment.

Economic Profit

Business profit minus the implicit costs of capital and any other owner-provided inputs.

business profit. The risk-adjusted **normal rate of return** on capital is the minimum return necessary to attract and retain investment. Similarly, the opportunity cost of owner effort is determined by the value that could be received in alternative employment. In economic terms, profit is business profit minus the implicit (noncash) costs of capital and other owner-provided inputs used by the firm. This profit concept is called **economic profit**.

The concepts of business profit and economic profit can be used to explain the role of profits in a free-enterprise economy. A normal rate of return is necessary to induce individuals to invest funds rather than spend them for current consumption. Normal profit is simply a cost for capital; it is no different from the cost of other resources, such as labor, materials, and energy. A similar price exists for the entrepreneurial effort of a firm's owner-manager and for other resources that owners bring to the firm. Opportunity costs for owner-provided inputs are often a big part of business profits, especially among small businesses.

Variability of Business Profits

In practice, reported profits fluctuate widely. Table 1.1 shows business profits for a sample of 30 well-known industrial giants: companies that comprise the Dow Jones Industrial Average. Business profit is often measured in dollar terms or as a percentage of sales revenue, called **profit margin**, as in Table 1.1. The economist's concept of a normal rate of profit is typically assessed in terms of the realized rate of **return on stockholders' equity** (ROE). Return on stockholders' equity is defined as accounting net income divided by the book value of the firm. As seen in Table 1.1, the average ROE for industrial giants found in the Dow Jones Industrial Average falls in a broad range around 15 per cent to 25 per cent per year. Although an average annual ROE of roughly 20 per cent can be regarded as a typical or normal rate of return in the USA and Canada, this standard is routinely exceeded by companies such as Boeing Company, which has consistently earned a ROE in excess of 35 per cent per year.

Some of the variation in ROE depicted in Table 1.1 represents the influence of differential risk premiums. In the pharmaceuticals industry, for example, hoped-for discoveries of effective therapies for important diseases are often a long shot at best. Thus, profit rates reported by Merck, Pfizer, and other leading pharmaceutical companies overstate the relative profitability of the drug industry; it could be cut by one-half with proper risk adjustment. Similarly, reported profit rates can overstate differences in economic profits if accounting error or bias causes investments with long-term benefits to be omitted from the balance sheet. For example, current accounting practice often fails to consider advertising or research and development expenditures as intangible investments with long-term benefits. Because advertising and research and development expenditures are immediately expensed rather than capitalized and written off over their useful lives, intangible assets can be grossly understated for certain companies. The balance sheet of Coca-Cola does not reflect the hundreds of millions of dollars spent to establish and maintain the brand-name recognition of Coca-Cola, just as Pfizer's balance sheet fails to reflect research dollars spent to develop important product names like cholesterol-lowering Lipitor (the world's best-selling drug), Inspra (for the treatment of congestive heart failure) and Viagra (for the treatment of male impotence). As a result, business profit rates for both Coca-Cola and Pfizer overstate each company's true economic performance.

Profit Margin

Accounting net income divided by sales.

Return on Stockholders' Equity

Accounting net income divided by the book value of total assets minus total liabilities.

Table 1.1 Profitability of Corporate Giants Included in the Dow Jones Industrial Average

Symbol	Name	Company Information	Sales Revenue (\$ million)	Net Income (\$ million)	Profit Margin (%)	Return on Equity (ROE, %)
AAPL	Apple Inc.	Consumer electronics	182.80	39.51	29.26	47.95
AXP	American Express Company	Consumer finance	34.29	5.89	26.22	43.49
BA	The Boeing Company	Aerospace and defense	90.62	5.45	7.86	82.37
CAT	Caterpillar Inc.	Construction and mining equipment	55.18	3.70	9.21	30.35
CSCO	Cisco Systems, Inc.	Computer networking	47.14	7.85	20.61	17.15
CVX	Chevron Corporation	Oil & gas	199.94	19.24	15.61	20.13
DD	E.I. du Pont de Nemours and Company	Chemical industry	34.91	3.62	14.30	37.47
DIS	Walt Disney Company	Broadcasting and entertainment	48.13	7.50	25.09	27.24
GE	General Electric Company	Conglomerate	148.59	15.23	11.60	13.44
GS	Goldman Sachs Group, Inc.	Banking, Financial services	34.53	8.48	35.79	14.85
HD	The Home Depot, Inc.	Wholesale and retail trade	83.18	6.35	11.99	107.02
IBM	International Business Machines Corporation	Computers and technology	92.79	12.02	21.54	168.40
INTC	Intel Corporation	Semiconductors	55.87	11.70	28.28	21.06
JNJ	Johnson & Johnson	Pharmaceuticals	74.33	16.23	27.66	29.48
JPM	JPMorgan Chase & Co	Banking	94.21	21.76	31.63	12.84
KO	The Coca-Cola Company	Beverages	46.00	7.10	20.27	30.76
MCD	McDonald's Corporation	Fast food	27.44	4.76	26.87	57.35
MMM	3M Company	Conglomerate	31.82	4.96	22.08	53.60
MRK	Merck & Co., Inc.	Pharmaceuticals	42.24	11.92	40.92	35.53
MSFT	Microsoft Corporation	Software	86.83	22.07	32.04	30.99
NKE	Nike, Inc.	Apparel	27.80	2.69	12.75	32.74
PFE	Pfizer, Inc.	Pharmaceuticals	49.61	9.13	24.68	17.17
PG	Procter & Gamble Company	Consumer goods	83.06	11.39	17.92	21.51
TRV	The Travelers Companies, Inc.	Insurance	25.63	3.69	19.85	20.49
UNH	UnitedHealth Group	Managed health care	115.30	5.62	8.38	29.75
UTX	United Technologies Corporation	Conglomerate	65.10	6.22	13.65	28.47
V	Visa, Inc.	Consumer banking	12.70	5.44	60.81	28.18
VZ	Verizon Communications Inc.	Telecommunication	127.08	9.63	12.02	124.17
WMT	Walmart Stores, Inc.	Retail	476.29	16.02	5.18	32.33
XOM	Exxon Mobil Corporation	Oil & gas	394.11	32.52	13.10	29.61

Data source: <http://www.msn.com>