Fundamentals of Corporate Finance



Richard A. Brealey

London Business School

Stewart C. Myers

Sloan School of Management, Massachusetts Institute of Technology

Alan J. Marcus

Carroll School of Management, Boston College



Contents in Brief

Part One Introduction	 Goals and Governance of the Corporation 2 Financial Markets and Institutions 32 Accounting and Finance 54 Measuring Corporate Performance 82
Part Two Value	 5 The Time Value of Money 116 6 Valuing Bonds 164 7 Valuing Stocks 192 8 Net Present Value and Other Investment Criteria 234 9 Using Discounted Cash-Flow Analysis to Make Investment Decisions 270 10 Project Analysis 298
Part Three Risk	 Introduction to Risk, Return, and the Opportunity Cost of Capital 326 Risk, Return, and Capital Budgeting 356 The Weighted-Average Cost of Capital and Company Valuation 386
Part Four Financing	 14 Introduction to Corporate Financing 414 15 How Corporations Raise Venture Capital and Issue Securities 436
Part Five Debt and Payout Policy	16 Debt Policy 46017 Payout Policy 496
Part Six Financial Analysis and Planning	 Long-Term Financial Planning Short-Term Financial Planning Working Capital Management 576
Part Seven Special Topics	 21 Mergers, Acquisitions, and Corporate Control 606 22 International Financial Management 634 23 Options 660 24 Risk Management 686
Part Eight Conclusion	25 What We Do and Do Not Know about Finance 706
	Appendix: Present Value and Future Value Tables A-1 Glossary G-1 Global Index IND-1 Subject Index IND-5 Credits C-1

Contents

Part One

Introduction

Chapter 1 Goals and Governance of the Corporation 2

- 1.1Investment and Financing Decisions4The Investment (Capital Budgeting) Decision6The Financing Decision6
- 1.2 What Is a Corporation? 8 Other Forms of Business Organization 9
- 1.3 Who Is the Financial Manager? 10
- 1.4 Goals of the Corporation 12 Shareholders Want Managers to Maximize Market Value 12
- 1.5 Agency Problems, Executive Compensation, and Corporate Governance 15 Executive Compensation 16 Corporate Governance 17
- 1.6 The Ethics of Maximizing Value 18
- 1.7 Careers in Finance 20
- 1.8 Preview of Coming Attractions 22
- 1.9 Snippets of Financial History 23

Summary 25

Questions and Problems 26

Chapter 2

Financial Markets and Institutions 32

- 2.1 The Importance of Financial Markets and Institutions 34
- 2.2 The Flow of Savings to Corporations 35 The Stock Market 37 Other Financial Markets 37 Financial Intermediaries 39 Financial Institutions 42 Total Financing of U.S. Corporations 43
- 2.3 Functions of Financial Markets and Intermediaries 44 Transporting Cash across Time 45 Risk Transfer and Diversification 45 Liquidity 46 The Payment Mechanism 46 Information Provided by Financial Markets 47

2.4 The Crisis of 2007-2009 49

Summary 50

Questions and Problems 51

Chapter 3

Accounting and Finance 54

- 3.1 The Balance Sheet 56 Book Values and Market Values 58
- 3.2 The Income Statement 61 Income versus Cash Flow 62
- 3.3 The Statement of Cash Flows 65 Free Cash Flow 67
- 3.4 Accounting Practice and Malpractice 68
- 3.5 Taxes 71 Corporate Tax 71 Personal Tax 72

Summary 74 Questions and Problems 74

Chapter 4

Measuring Corporate Performance 82

- 4.1 Value and Value Added 84 How Financial Ratios Help to Understand Value Added 84
- 4.2 Measuring Market Value and Market Value Added 85
- 4.3 Economic Value Added and Accounting Rates of Return 87 Accounting Rates of Return 89 Problems with EVA and Accounting Rates of Return 91
- 4.4 Measuring Efficiency 92
- 4.5 Analyzing the Return on Assets: The Du Pont System 93 The Du Pont System 94
- 4.6 Measuring Financial Leverage 96 Leverage and the Return on Equity 98
- 4.7 Measuring Liquidity 99
- 4.8 Interpreting Financial Ratios 100
- 4.9 The Role of Financial Ratios 104

Summary 105 Questions And Problems 107 Minicase 113 Part Two Value

Chapter 5 The Time Value of Money 116

- 5.1 Future Values and Compound Interest 118
 5.2 Present Values 121
 Finding the Interest Rate 125
- 5.3 Multiple Cash Flows 126 Future Value of Multiple Cash Flows 126 Present Value of Multiple Cash Flows 128
- 5.4 Reducing the Chore of the Calculations: Part 1 129

Using Financial Calculators to Solve Simple Time-Valueof-Money Problems 129 Using Spreadsheets to Solve Simple Time-Value-of-Money Problems 130

- 5.5 Level Cash Flows: Perpetuities and Annuities 133 How to Value Perpetuities 133 How to Value Annuities 134 Future Value of an Annuity 138 Annuities Due 141
- 5.6 Reducing the Chore of the Calculations: Part 2 143 Using Financial Calculators to Solve Annuity Problems 143 Using Spreadsheets to Solve Annuity Problems 143
- 5.7 Effective Annual Interest Rates 144
- 5.8 Inflation and the Time Value of Money 146 Real versus Nominal Cash Flows 146 Inflation and Interest Rates 148 Valuing Real Cash Payments 149 Real or Nominal? 151

Summary 151 Questions and Problems 152 Minicase 163

Chapter 6 Valuing Bonds 164

- 6.1 The Bond Market 166 Bond Characteristics 166
- 6.2 Interest Rates and Bond Prices 167 How Bond Prices Vary with Interest Rates 170 Interest Rate Risk 172
- 6.3 Yield to Maturity 172 Calculating the Yield to Maturity 174
- 6.4 Bond Rates of Return 174
 6.5 The Yield Curve 177
 Nominal and Real Rates of Interest 178

6.6 Corporate Bonds and the Risk of Default 180 Protecting against Default Risk 183 Not All Corporate Bonds Are Plain Vanilla 184

> Summary 184 Questions and Problems 185

Chapter 7 Valuing Stocks 192

- 7.1 Stocks and the Stock Market 194 Reading Stock Market Listings 195
- 7.2 Market Values, Book Values, and Liquidation Values 197
- 7.3 Valuing Common Stocks 199 Valuation by Comparables 199 Price and Intrinsic Value 200 The Dividend Discount Model 202
- 7.4 Simplifying the Dividend Discount Model 205 The Dividend Discount Model with No Growth 205 The Constant-Growth Dividend Discount Model 205 Sustainable Growth 207 A Caveat 208 Estimating Expected Rates of Return 208 Nonconstant Growth 210 Repurchases and the Dividend Discount Model 212
- 7.5 Growth and Growth Opportunities 212 Valuing Growth Stocks 215 Market-Value Balance Sheets 215
- 7.6 There Are No Free Lunches on Wall Street 215 Method 1: Technical Analysis 216 Method 2: Fundamental Analysis 218 A Theory to Fit the Facts 219
- 7.7 Market Anomalies and Behavioral Finance 221 Market Anomalies 221 Bubbles and Market Efficiency 222 Behavioral Finance 223

Summary225Questions and Problems226Minicase232

Chapter 8 Net Present Value and Other Investment Criteria 234

- 8.1 Net Present Value 236
 - A Comment on Risk and Present Value 237 Valuing Long-Lived Projects 238

8.2 The Internal Rate of Return Rule 243

A Closer Look at the Rate of Return Rule 243 Calculating the Rate of Return for Long-Lived Projects 243 A Word of Caution 245

Some Pitfalls with the Internal Rate of Return Rule 245

- 8.3 The Profitability Index 250 Capital Rationing 250 Pitfalls of the Profitability Index 251
- 8.4The Payback Rule251Discounted Payback253

8.5 More Mutually Exclusive Projects 253
 Problem 1: The Investment Timing Decision 254
 Problem 2: The Choice between Long- and Short-Lived Equipment 255
 Problem 3: When to Replace an Old Machine 257

8.6 A Last Look 258

Summary 259

Questions and Problems 260

Minicase 266

Appendix: More on the IRR Rule 267

Using the IRR to Choose between Mutually Exclusive Projects 267

Using the Modified Internal Rate of Return When There Are Multiple IRRs 268

Chapter 9

Using Discounted Cash-Flow Analysis to Make Investment Decisions 270

9.1 Identifying Cash Flows 272

Discount Cash Flows, Not Profits 272 Discount *Incremental* Cash Flows 274 Discount Nominal Cash Flows by the Nominal Cost of Capital 277 Separate Investment and Financing Decisions 278

Part Three Risk

Chapter 11 Introduction to Risk, Return, and the Opportunity Cost of Capital 326

- 11.1 Rates of Return: A Review 328
- 11.2 A Century of Capital Market History 329 Market Indexes 329 The Historical Record 329

9.2 Calculating Cash Flow 279 Capital Investment 279 Operating Cash Flow 279 Changes in Working Capital 281

9.3 An Example: Blooper Industries 282

Cash-Flow Analysis 282 Calculating the NPV of Blooper's Project 284 Further Notes and Wrinkles Arising from Blooper's Project 285

Summary289Questions and Problems290Minicase295

Chapter 10

Project Analysis 298

10.1 How Firms Organize the Investment Process 300

Stage 1: The Capital Budget300Stage 2: Project Authorizations300Problems and Some Solutions301

10.2 Some "What-If" Questions 302Sensitivity Analysis 303Scenario Analysis 305

10.3 Break-Even Analysis 306

Accounting Break-Even Analysis 306 NPV Break-Even Analysis 308 Operating Leverage 311

10.4 Real Options and the Value of Flexibility 313 The Option to Expand 313

A Second Real Option: The Option to Abandon 315 A Third Real Option: The Timing Option 315 A Fourth Real Option: Flexible Production Facilities 316

Summary 316 Questions and Problems 317 Minicase 324

Using Historical Evidence to Estimate Today's Cost of Capital 332

11.3 Measuring Risk 334

Variance and Standard Deviation 334

A Note on Calculating Variance 337

Measuring the Variation in Stock Returns 337 11.4 Risk and Diversification 339 Diversification 339 Asset versus Portfolio Risk 340 Market Risk versus Specific Risk 346 11.5 Thinking about Risk 347

Message 1: Some Risks Look Big and Dangerous but Really Are Diversifiable 348 Message 2: Market Risks Are Macro Risks 349 Message 3: Risk Can Be Measured 349

Summary 350 Questions and Problems 351

Chapter 12

Risk, Return, and Capital Budgeting 356

12.1 Measuring Market Risk 358

Measuring Beta 358 Betas for Dow Chemical and Consolidated Edison 361 Total Risk and Market Risk 361

12.2 What Can You Learn from Beta? 363

Portfolio Betas 363 The Portfolio Beta Determines the Risk of a Diversified Portfolio 366

12.3 Risk and Return 367

Why the CAPM Makes Sense 369 The Security Market Line 370 Using the CAPM to Estimate Expected Returns 371 How Well Does the CAPM Work? 371

12.4 The CAPM and the Opportunity Cost of Capital 374

The Company Cost of Capital 376 What Determines Project Risk? 376 Don't Add Fudge Factors to Discount Rates 377

Summary 377

Questions and Problems 378

Chapter 13

The Weighted-Average Cost of Capital and Company Valuation 386

- 13.1 Geothermal's Cost of Capital 388
- 13.2 The Weighted-Average Cost of Capital 389 Calculating Company Cost of Capital as a Weighted Average 390 Use Market Weights, Not Book Weights 392 Taxes and the Weighted-Average Cost of Capital 392 What If There Are Three (or More) Sources of Financing? 394 Wrapping Up Geothermal 394 Checking Our Logic 395
- 13.3 Measuring Capital Structure 396
- 13.4 Calculating the Weighted-Average Cost of Capital 398

The Expected Return on Bonds 398 The Expected Return on Common Stock 398 The Expected Return on Preferred Stock 400 Adding It All Up 400 Real-Company WACCs 400

13.5 Interpreting the Weighted-Average Cost of Capital 401

> When You Can and Can't Use WACC 401 Some Common Mistakes 401

How Changing Capital Structure Affects Expected Returns 402

What Happens When the Corporate Tax Rate Is Not Zero 403

13.6 Valuing Entire Businesses 403

Calculating the Value of the Concatenator Business 404

Summary 405 Questions and Problems 406

Minicase 411

Part Four Financing

Chapter 14 Introduction to Corporate Financing 414

14.1 Creating Value with Financing Decisions 416

- 14.2 Patterns of Corporate Financing 416 Are Firms Issuing Too Much Debt? 419
- 14.3 Common Stock 420 Ownership of the Corporation 422 Voting Procedures 423 Classes of Stock 424

- 14.4 Preferred Stock 424
- 14.5 Corporate Debt 425 Debt Comes in Many Forms 425 Innovation in the Debt Market 428
- 14.6 Convertible Securities 430

Summary 431 Questions and Problems 432

Chapter 15

How Corporations Raise Venture Capital and Issue Securities 436

15.1 Venture Capital 438

Venture Capital Companies 439

15.2 The Initial Public Offering 440 Arranging a Public Issue 441 Other New-Issue Procedures 445 The Underwriters 445

- **15.3 General Cash Offers by Public Companies 446** General Cash Offers and Shelf Registration 447 Costs of the General Cash Offer 448 Market Reaction to Stock Issues 448
- 15.4 The Private Placement 449

Summary450Questions and Problems451Minicase455Appendix:Hotch Pot's New-Issue Prospectus456

Part Five Debt and Payout Policy

Chapter 16 Debt Policy 460

16.1 How Borrowing Affects Value in a Tax-Free Economy 462

> MM's Argument—A Simple Example 463 How Borrowing Affects Earnings per Share 464 How Borrowing Affects Risk and Return 466

16.2 Debt and the Cost of Equity 467

No Magic in Financial Leverage 470

16.3 Debt, Taxes, and the Weighted-Average Cost of Capital 471

Debt and Taxes at River Cruises 472

How Interest Tax Shields Contribute to the Value of Stockholders' Equity 473

Corporate Taxes and the Weighted-Average Cost of Capital 474

The Implications of Corporate Taxes for Capital Structure 475

16.4 Costs of Financial Distress 476

Bankruptcy Costs 476

Costs of Bankruptcy Vary with Type of Asset 478 Financial Distress without Bankruptcy 479

16.5 Explaining Financing Choices 481

The Trade-Off Theory 481

A Pecking Order Theory 482

The Two Faces of Financial Slack 483

Summary 484

Questions and Problems 485

Minicase 492

Appendix: Bankruptcy Procedures 493

Chapter 17 Payout Policy 496

17.1 How Corporations Pay Out Cash to Shareholders 498

How Firms Pay Dividends 499 Limitations on Dividends 499 Stock Dividends and Stock Splits 500 Stock Repurchases 501

17.2 The Information Content of Dividends and Repurchases 501

17.3 Dividends or Repurchases? The Payout Controversy 503

Dividends or Repurchases? An Example 504

Repurchases and the Dividend Discount Model 505

Dividends and Share Issues 506

17.4 Why Dividends May Increase Value 507

17.5 Why Dividends May Reduce Value 509

Taxation of Dividends and Capital Gains under Current Tax Law 509

17.6 Payout Policy and the Life Cycle of the Firm 510

> Summary 511 Questions and Problems 512

Minicase 517

Part Six Financial Analysis and Planning

Chapter 18 Long-Term Financial Planning 520

- 18.1 What Is Financial Planning? 522Financial Planning Focuses on the Big Picture 522Why Build Financial Plans? 523
- 18.2 Financial Planning Models 524
 Components of a Financial Planning Model 524
 Percentage of Sales Models 525
 An Improved Model 526
- 18.3 Planners Beware 530
 Pitfalls in Model Design 530
 The Assumption in Percentage of Sales Models 531
 The Role of Financial Planning Models 532
- 18.4 External Financing and Growth 533

Summary 537 Questions and Problems 538 Minicase 543

Chapter 19 Short-Term Financial Planning 544

19.1 Links between Long-Term and Short-Term Financing 546

19.2 Working Capital 549
 The Components of Working Capital 549
 Working Capital and the Cash Conversion Cycle 551
 The Working Capital Trade-Off 554

- 19.3 Tracing Changes in Cash and Working Capital 556
- 19.4Cash Budgeting557Forecast Sources of Cash558Forecast Uses of Cash559The Cash Balance559

19.5 A Short-Term Financing Plan 561

Dynamic Mattress's Financing Plan 562 Evaluating the Plan 563

19.6 Sources of Short-Term Financing 564
 Bank Loans 564
 Secured Loans 564
 Commercial Paper 566

Summary 567 Questions and Problems 568

Minicase 574

Chapter 20 Working Capital Management 576

- 20.1 Accounts Receivable and Credit Policy 578 Terms of Sale 578
 - Credit Agreements 580 Credit Analysis 580 The Credit Decision 583 Collection Policy 587
- 20.2 Inventory Management 589
- 20.3 Cash Management 591 Check Handling and Float 592 Other Payment Systems 593 Electronic Funds Transfer 594 International Cash Management 595
- 20.4 Investing Idle Cash: The Money Market 596 Yields on Money Market Investments 597 The International Money Market 598

Summary 598 Questions and Problems 599 Minicase 605

Part Seven Special Topics

Chapter 21

Mergers, Acquisitions, and Corporate Control 606

21.1 Sensible Motives for Mergers 608 Economies of Scale 610 Economies of Vertical Integration 611 Combining Complementary Resources 611 Mergers as a Use for Surplus Funds 611 Eliminating Inefficiencies 612 Industry Consolidation 612

- **21.2 Dubious Reasons for Mergers 612** Diversification 613 The Bootstrap Game 613
- 21.3 The Mechanics of a Merger 614 The Form of Acquisition 614 Mergers, Antitrust Law, and Popular Opposition 615
- 21.4 Evaluating Mergers 615 Mergers Financed by Cash 615 Mergers Financed by Stock 617 A Warning 618 Another Warning 618
- 21.5 The Market for Corporate Control 619
- 21.6 Method 1: Proxy Contests 620
- 21.7 Method 2: Takeovers 620
- **21.8 Method 3: Leveraged Buyouts 623** Barbarians at the Gate? 624
- 21.9 Method 4: Divestitures, Spin-Offs, and Carve-Outs 625
- 21.10The Benefits and Costs of Mergers 626 Merger Waves 626

Summary628Questions and Problems629Minicase632

Chapter 22

International Financial Management 634

- 22.1 Foreign Exchange Markets 636 Spot Exchange Rates 636 Forward Exchange Rates 638
- 22.2 Some Basic Relationships 639 Exchange Rates and Inflation 639 Real and Nominal Exchange Rates 642 Inflation and Interest Rates 642 The Forward Exchange Rate and the Expected Spot Rate 645 Interest Rates and Exchange Rates 646
- 22.3 Hedging Exchange Rate Risk 647 Transaction Risk 647 Economic Risk 648
- 22.4 International Capital Budgeting 649 Net Present Values for Foreign Investments 649 Political Risk 651

The Cost of Capital for Foreign Investment 652 Avoiding Fudge Factors 652

Summary 653 Questions and Problems 654

Minicase 659

Chapter 23 Options 660

- 23.1 Calls and Puts 662 Selling Calls and Puts 664 Payoff Diagrams Are Not Profit Diagrams 665 Financial Alchemy with Options 666 Some More Option Magic 667
- 23.2 What Determines Option Values? 668 Upper and Lower Limits on Option Values 668 The Determinants of Option Value 669 Option-Valuation Models 671
- 23.3 Spotting the Option 674 Options on Real Assets 674 Options on Financial Assets 675

Summary 678 Questions and Problems 679

Chapter 24

Risk Management 686

- 24.1 Why Hedge? 688 The Evidence on Risk Management 689
- 24.2 Reducing Risk with Options 690
- 24.3 Futures Contracts 690 The Mechanics of Futures Trading 693 Commodity and Financial Futures 694
- 24.4 Forward Contracts 696
- 24.5 Swaps 696
- 24.6 Innovation in the Derivatives Market 699
- 24.7 Is "Derivative" a Four-Letter Word? 700

Summary 701 Questions and Problems 701

Part Eight Conclusion

Chapter 25 What We Do and Do Not Know about Finance 706

25.1 What We Do Know: The Six Most Important Ideas in Finance 708 Net Present Value (Chapter 5) 708 Risk and Return (Chapters 11 and 12) 708 Efficient Capital Markets (Chapter 7) 708

MM's Irrelevance Propositions (Chapters 16 and 17) 709 Option Theory (Chapter 23) 709 Agency Theory 710

25.2 What We Do Not Know: Nine Unsolved Problems in Finance 710

What Determines Project Risk and Present Value? 710 Risk and Return—Have We Missed Something? 711 Are There Important Exceptions to the Efficient-Market Theory? 711 Is Management an Off-Balance-Sheet Liability? 712 How Can We Explain Capital Structure? 713 How Can We Resolve the Payout Controversy? 713 How Can We Explain Merger Waves? 713 What Is the Value of Liquidity? 713 Why Are Financial Systems Prone to Crisis? 714

25.3 A Final Word 714 Questions and Problems 715

> Appendix A A-1 Glossary G-1 Global Index IND-1 Subject Index IND-5 Credits C-1