CORPORATE FINANCE

sixth edition

BERK | DeMARZO

CORPORATE FINANCE

SIXTH EDITION

GLOBAL EDITION
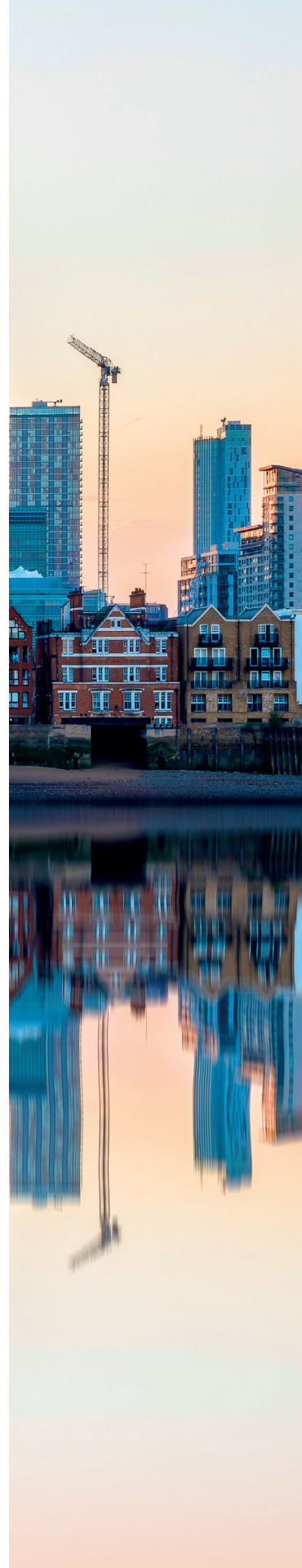
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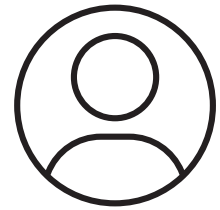
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Bridging Theory and Practice

The Law of One Price as the Unifying Valuation Framework

The Law of One Price framework reflects the modern idea that the absence of arbitrage is the unifying concept of valuation. This critical insight is introduced in Chapter 3, revisited in each part opener, and integrated throughout the text—motivating all major concepts and connecting theory to practice.

FINANCE IN TIMES OF DISRUPTION | Diversification Benefits During Market Crashes

The figure below illustrates the benefits of diversification over the past 50 years. The blue graph shows the historical volatility of the S&P 500 portfolio (annualized based on daily returns each quarter). The pink graph is the average volatility of the individual stocks in the portfolio (weighted according to the size of each stock). Thus, the pink shaded area is idiosyncratic risk—risk that has been diversified away

demonstrates, during the 1987 stock market crash, the 2008 financial crisis, the Eurozone debt crisis and the COVID-19 pandemic, this fraction fell dramatically, so that less than 20% of the volatility of individual stocks could be diversified. The combined effect of increased volatility and reduced diversification during the 2008 financial crisis was so severe that the risk that investors care about—market risk—increased *seven*-

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Focus on Financial Crises and Disruptions

Finance in Times of Disruption boxes reflect the reality of the recent COVID-19 pandemic, the global financial crisis, and sovereign debt crises, illustrating important lessons learned. Twenty four boxes across the book illustrate and analyze key details.

Study Aids with a Practical Focus

To be successful, students need to master the core concepts and learn to identify and solve problems that today's practitioners face.

Common Mistakes boxes alert students to frequently made mistakes stemming from misunderstanding core concepts and calculations—in the classroom and in the field.

COMMON MISTAKE | Discounting One Too Many Times

The perpetuity formula assumes that the first payment occurs at the end of the first period (at date 1). Sometimes perpetuities have cash flows that start later in the future. In this case, we can adapt the perpetuity formula to compute the present value, but we need to do so carefully to avoid a common mistake.

To illustrate, consider the MBA graduation party described in Example 4.7. Rather than starting immediately, suppose that the first party will be held two years from today (for the current entering class). How would this delay change the amount of the donation required?

Now the timeline looks like this:

We need to determine the present value of these cash flows, as it tells us the amount of money in the bank needed today to finance the future parties. We cannot apply the perpetuity formula directly, however, because these cash flows are not *exactly* a perpetuity as we defined it. Specifically, the cash flow in the first period is "missing." But consider the situation on date 1—at that point,

the first party is one period away and then the cash flows are periodic. From the perspective of date 1, this *is* a perpetuity, and we can apply the formula. From the preceding calculation, we know we need $375,000 on date 1 to have enough to start the parties on date 2. We rewrite the timeline as follows:

Our goal can now be restated more simply: How much do we need to invest today to have $375,000 in one year? This is a simple present value calculation:

$$PV = \$375,000/1.08 = \$347,222 \text{ today}$$

A common mistake is to discount the $375,000 twice because the first party is in two periods. *Remember—the present value formula for the perpetuity already discounts the cash flows to one period prior to the first cash flow.* Keep in mind that this common mistake may be made with perpetuities, annuities, and all of the other special cases discussed in this section. All of these formulas discount the cash flows to one period prior to the first cash flow.

EXAMPLE 4.14 | Evaluating an Annuity with Monthly Cash Flows

Problem

You are about to purchase a new car and have two options to pay for it. You can pay $20,000 in cash immediately, or you can get a loan that requires you to pay $500 each month for the next 48 months (four years). If the monthly interest rate you earn on your cash is 0.5%, which option should you take?

Solution

Let's start by writing down the timeline of the loan payments:

The timeline shows that the loan is a 48-period annuity. Using the annuity formula the present value is

$$PV\left(48\text{-period annuity of }\$500\right) = \$500 \times \frac{1}{0.005}\left(1 - \frac{1}{1.005^{48}}\right)$$
$$= \$21,290$$

Alternatively, we may use the annuity spreadsheet to solve the problem:

	NPER	RATE	PV	PMT	FV	Excel Formula
Given	48	0.50%		500	0	
Solve for PV			(21,290)			=PV(0.005,48,500,0)

Thus, taking the loan is equivalent to paying $21,290 today. So, by paying $20,000 in cash rather than taking the loan, you save the equivalent of $1290 today.

Worked Examples accompany every important concept using a step-by-step procedure that guides students through the solution process. Clear labels make them easy to find for help with homework and studying.

Applications that Reflect Real Practice

Corporate Finance features actual companies and leaders in the field.

Interviews with notable practitioners—four new for this edition—highlighting leaders in the field and addressing topical subjects.

General Interest boxes highlight timely material from financial publications that shed light on business problems and real-company practices.

Fahmi Quadir is the Founder and Chief Investment Officer of Safkhet Capital Management. Her investments focus on short selling by deploying investigative and forensic methods to identify businesses potentially engaged in fraud, money laundering, and other predatory activity.

QUESTION: *What is the role of short-sellers in the market, and why are they important for market efficiency?*

ANSWER: At times of market exuberance, without meaningful short interest to weigh on valuations, prices can climb quite literally to the moon, thus rendering the end of the cycle even more painful. Short-sellers are thus necessary for healthy market function and historically we have seen that in markets where short selling is either restricted or banned, there are meaningful consequences on the price of securities.

The public broadly has the misconception that short selling is conducted by greed-blind individuals, hiding behind their screens, betting against economic prosperity. However, the vast majority of short- selling volume is largely agnostic, driven by algorithms and technical signals. Short selling allows market participants to access additional leverage and further build their long bets, but also importantly provides a way to hedge portfolios and protect against losses. ...there are instances where a company h...

INTERVIEW WITH
FAHMI QUADIR

ANSWER: Unfortunately, all arguments levied against short selling are rooted in human psychology and not in market theory, or logic for that matter. As humans, we are perennially optimistic about our own prospects, and that extends to the prospects of the businesses we invest in. The idea that someone could bet against those prospects feels inherently distasteful. In fact, this idea goes hand-in-hand with the susceptibility of the vast majority of us to be defrauded. Human progress has largely been reliant on faith in our fellow man, so I make no complaints about these qualities. However, the consequence is that most struggle to find the capacity to understand short selling, particularly in times of crisis. Company executives looking to place blame and shift accountability can cry "criminal short-seller" and suggest market manipulation rather than admit to their own mistakes. Politicians too, can point to short-sellers, and even restrict short selling when markets fall, as that would be easier than remedying their own policy-making failures.

QUESTION: ... *Common gov-*

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Teaching Students to Think Finance

With a consistency in presentation and an innovative set of learning aids that have set the standard since the very first edition, *Corporate Finance* simultaneously meets the needs of both future financial managers and non-financial managers. This textbook truly shows every student how to "think finance."

Simplified Presentation of Mathematics

One of the hardest parts of learning finance is mastering the jargon, math, and non-standardized notation. *Corporate Finance* systematically uses:

Notation Boxes: Each chapter opens by defining the variables and acronyms used in the chapter as a "legend" for students' reference.

Timelines: Introduced in Chapter 4, timelines are emphasized as the important first step in solving *every* problem that involves cash flows.

Numbered and Labeled Equations: The first time a full equation is given in notation form it is numbered. Key equations are titled and revisited in the chapter summary.

Using Excel Boxes: Provide hands-on instruction of Excel techniques and include screenshots to serve as a guide for students.

Spreadsheet Tables: Select tables are available as Excel files, enabling students to change inputs and manipulate the underlying calculations.

TABLE 8.1 SPREADSHEET **HomeNet's Incremental Earnings Forecast**

	Year	0	1	2	3	4	5
Incremental Earnings Forecast ($000s)							
1	Sales	—	26,000	26,000	26,000	26,000	—
2	Cost of Goods Sold	—	(11,000)	(11,000)	(11,000)	(11,000)	—
3	**Gross Profit**	—	15,000	15,000	15,000	15,000	—
4	Selling, General, and Administrative	—	(2,800)	(2,800)	(2,800)	(2,800)	—
5	Research and Development	(15,000)	—	—	—	—	—
6	Depreciation	—	(1,500)	(1,500)	(1,500)	(1,500)	(1,500)
7	**EBIT**	(15,000)	10,700	10,700	10,700	10,700	(1,500)
8	Income Tax at 20%	3,000	(2,140)	(2,140)	(2,140)	(2,140)	300
9	**Unlevered Net Income**	**(12,000)**	**8,560**	**8,560**	**8,560**	**8,560**	**(1,200)**

Practice Finance to Learn Finance

Working problems is the proven way to cement and demonstrate an understanding of finance.

Concept Check questions at the end of each section enable students to test their understanding and target areas in which they need further review.

End-of-chapter problems written personally by Jonathan Berk and Peter DeMarzo offer instructors the opportunity to assign first-rate materials to students for homework and practice with the confidence that the problems are consistent with chapter content. Both the problems and solutions, which also were written by the authors, have been class-tested and accuracy-checked to ensure quality.

Data Cases present in-depth scenarios in a business setting with questions designed to guide students' analysis. Many questions involve the use of Internet resources and Excel techniques.

Data Case This is your second interview with a prestigious brokerage firm for a job as an equity analyst. You survived the morning interviews with the department manager and the Vice President of Equity. Everything has gone so well that they want to test your ability as an analyst. You are seated in a room with a computer and a list with the names of two companies—Ford (F) and Microsoft (MSFT). You have 90 minutes to complete the following tasks:

1. Download each company's annual income statements, balance sheets, and cash flow statements for the last four fiscal years and export the statements to Excel.

2. Find historical stock prices for each firm for the dates of each financial statement. Use the closing stock prices (not the adjusted close). To calculate the firm's market capitalization at each date, multiply the number of shares outstanding at the time by the firm's historic stock price.

3. For each of the four years of statements, compute the following ratios for each firm:

Valuation Ratios
Price-Earnings Ratio (for EPS use Diluted EPS Total)
Market-to-Book Ratio
Enterprise Value-to-EBITDA
(For debt, include long-term and short-term debt; for cash, include marketable securities.)

Profitability Ratios
Operating Margin
Net Profit Margin
Return on Equity

Financial Strength Ratios
Current Ratio

Engaging with Concepts and Data

Available in both the Sixth Edition eTextbook and MyLab Finance, interactive graphs and tools offer exploration of the current and historical yield curve (and how it moves in relation to other macro data), analysis of common financial statement data and valuation metrics across firms and industries, a compound interest calculator, use of an annuity calculator with an amortization table, a Modigliani and Miller WACC tool, and an efficient frontier portfolio explorer. Instructors also can link to these tools with pre-populated default values for efficient use in the classroom.

Yield Curve Tool

See the history of the U.S. yield curve (back to 1990) and animate its evolution along with important macroeconomic data including GDP growth, inflation, housing starts, home prices, corporate investment, bond spreads, and the S&P 500 index.
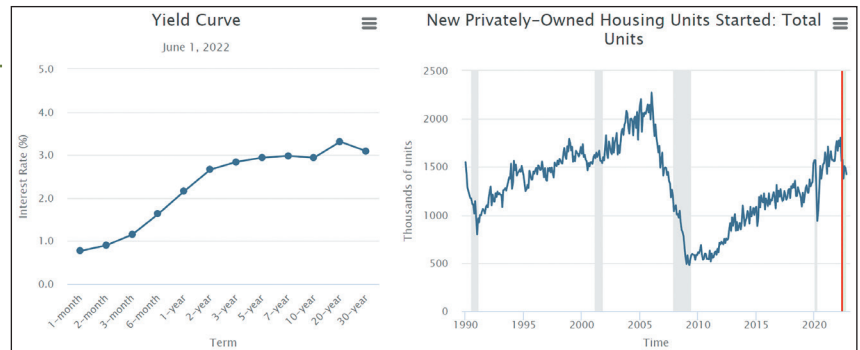
Annuity Calculator

An interactive annuity calculator allows students to solve standard time value of money problems and track the corresponding account balance over time. Students can also toggle to see the discounted cash flow solution and the corresponding Excel formula. (See further description in box on page 161 in Chapter 4.)
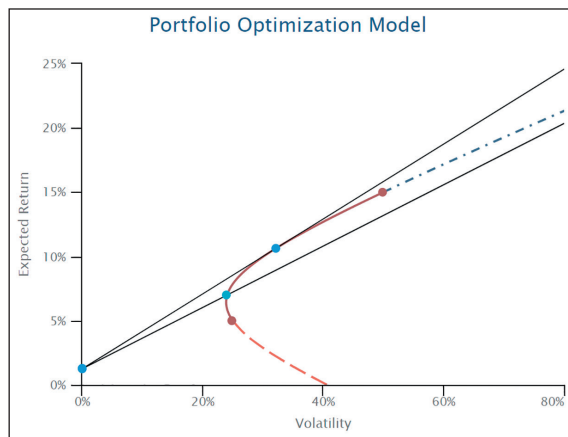
Portfolio Optimizer

The portfolio optimizer tool allows students to explore two-stock portfolios including short-sales and risk-free borrowing and lending, providing an interactive visualization of the two-fund separation that is the foundation for understanding risk and return.

Corporate Data Analysis

The data analysis tool illustrates the current distribution of standard accounting margins and ratios, as well as key leverage and valuation measures, for U.S. stocks by size and industry.
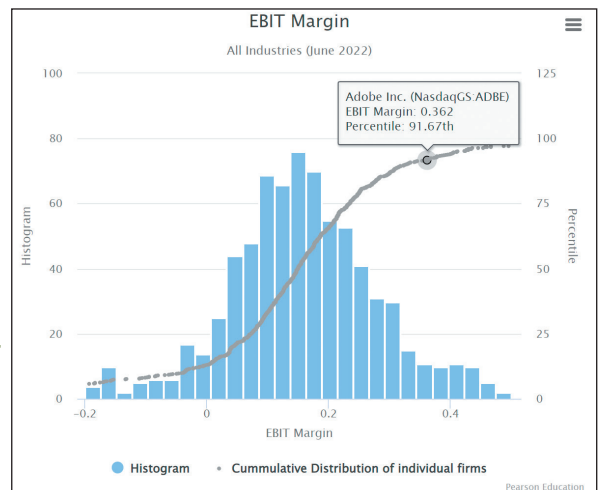
About the Authors

Jonathan Berk is the A.P. Giannini Professor of Finance at the Graduate School of Business, Stanford University and is a Research Associate at the National Bureau of Economic Research. Before coming to Stanford, he was the Sylvan Coleman Professor of Finance at Haas School of Business at the University of California, Berkeley. Prior to earning his Ph.D., he worked as an Associate at Goldman Sachs (where his education in finance really began).

Professor Berk's research interests in finance include corporate valuation, capital structure, mutual funds, asset pricing, experimental economics, and labor economics. His work has won a number of research awards including the Stephen A. Ross Prize in Financial Economics, TIAA-CREF Paul A. Samuelson Award, the Smith Breeden Prize, Best Paper of the Year in *The Review of Financial Studies,* and the FAME Research Prize. His paper, "A Critique of Size-Related Anomalies," was selected as one of the two best papers ever published in *The Review of Financial Studies*. In recognition of his influence on the practice of finance he has received the Bernstein-Fabozzi/Jacobs Levy Award, the Graham and Dodd Award of Excellence, and the Roger F. Murray Prize. He served two terms as an Associate Editor of the *Journal of Finance,* and a term as a director of the American Finance Association, the Western Finance Association, and academic director of the Financial Management Association. He is a Fellow of the Financial Management Association and a member of the advisory board of the *Journal of Portfolio Management.*

Born in Johannesburg, South Africa, Professor Berk has two daughters, and is an avid skier and biker.

Peter DeMarzo and Jonathan Berk shortly before the first edition was published.

Peter DeMarzo is the John G. McDonald Professor of Finance at the Graduate School of Business, Stanford University, and Faculty Director of Stanford LEAD. He is the former President of the American Finance Association and a Research Associate at the National Bureau of Economic Research. He teaches MBA and Ph.D. courses in Corporate Finance and Financial Modeling. Professor DeMarzo has also taught at the Haas School of Business and the Kellogg Graduate School of Management. He is a Fellow of the Econometric Society, the American Finance Association, and former National Fellow at the Hoover Institution.

Professor DeMarzo received the Sloan Teaching Excellence Award at Stanford and the Earl F. Cheit Outstanding Teaching Award at U.C. Berkeley. Professor DeMarzo has served as an Associate Editor for *The Review of Financial Studies* and *Financial Management,* as well as Vice President and director of the American Finance Association and President of the Western Finance Association. Professor DeMarzo's research is in the area of corporate finance, asset securitization, and contracting, as well as market structure and regulation. His recent work has examined issues of the optimal design of contracts and securities, leverage dynamics and the role of bank capital regulation, and the influence of information asymmetries on stock prices and corporate investment. He has received numerous awards including the Western Finance Association Corporate Finance Best-Paper Award, the Charles River Associates Best-Paper Award, the Barclays Global Investors/Michael Brennan Best-Paper of the Year Award from *The Review of Financial Studies*, and the Brattle Prize for the best corporate finance paper from the *Journal of Finance.*

Professor DeMarzo was born in Whitestone, New York. He and his family enjoy hiking, biking, and skiing.

Preface

THE WORLD HAS CHANGED DRAMATICALLY since we first sat down together and conceived of this book. We have now published 6 editions and reached millions of students worldwide. We were originally motivated to write this textbook by a central insight: The core concepts in finance are simple and intuitive. What makes the subject challenging is that it is often difficult for a novice to distinguish between these core ideas and other intuitively appealing approaches that, if used in financial decision making, will lead to incorrect decisions. In this regard, nothing has changed in the intervening years. De-emphasizing the core concepts that underlie finance strips students of the essential intellectual tools they need to differentiate between good and bad decision making. The book's continued success is a testament to the value of this approach.

We present corporate finance as an application of a set of simple, powerful ideas. At the heart is the principal of the absence of arbitrage opportunities, or Law of One Price—*in life, you don't get something for nothing*. This simple concept is a powerful and important tool in financial decision making. By relying on it, and the other core principles in this book, financial decision makers can avoid the bad decisions brought to light by the financial crisis and still ongoing every day. We use the Law of One Price as a compass; it keeps financial decision makers on the right track and is the backbone of the entire book.

New to This Edition

We have updated all text discussions and figures, tables, data cases, and facts to accurately reflect developments in the field in the last few years. Specific highlights include the following:

- Broadened the Global Financial Crisis boxes to be about Finance in Times of Disruption and included discussion of the COVID-19 pandemic.
- Developed interactive graphs and tools for the eTextbook, including an interactive exploration of the historical yield curve, a tool to analyze common financial statement data and ratios across firms and industries, an annuity calculator with an amortization table, a Modigliani and Miller WACC tool, and an efficient frontier portfolio explorer.
- Enhanced discussion of stakeholder and ESG concerns in Chapter 1 to put them in the context of the shareholder value maximization goal.
- Updated discussion of accounting scandals (Chapter 2) and cryptocurrency and stock price bubbles (Chapter 9).
- Added a new section on SPACs in Chapter 23 as an alternative to IPOs.
- Updated the coverage of leasing to reflect accounting treatment changes in Chapter 25 on Leasing.
- Updated and added new interviews: Fahmi Quadi on the role of short sellers, Adena Friedman on the ongoing evolution of stock exchanges, Kenneth Frazier on real options analysis at Merck, and Sally Johnson on managing international risk.
- Incorporated new and/or revised features throughout, including Common Mistakes, Finance in Times of Disruption, Nobel Prize, and General Interest boxes, as well as Examples.
- Revised and redesigned the data cases so that they will be more robust to changes in available data sources. Revised problems, once again personally writing and solving each one.
- Updated tables and figures to reflect current data.

The Law of One Price as a Unifying Principle of Valuation

This book presents corporate finance as an application of a small set of simple core ideas. Modern finance theory and practice is grounded in the idea of the absence of arbitrage—or the Law of One Price—as the unifying concept in valuation. We introduce the Law of One Price concept as the basis for NPV and the time value of money in Chapter 3, Financial Decision Making and the Law of One Price. In the opening of each part and as pertinent throughout the remaining chapters, we relate major concepts to the Law of One Price, creating a framework to ground the student reader and connect theory to practice.

Table of Contents Overview

Corporate Finance offers coverage of the major topical areas for introductory-level MBA students as well as the depth required in a reference textbook for upper-division courses. Most professors customize their classes by selecting a subset of chapters reflecting the subject matter they consider most important. We designed this book from the outset with this need for flexibility in mind. Parts 2 through 6 are the core chapters in the book. We envision that most MBA programs will cover this material—yet even within these core chapters instructors can pick and choose.

Single quarter course: Cover Chapters 3–15; if time allows, or students are previously familiar with the time value of money, add on Chapters 16 –19.

Semester-long course: Incorporate options (Chapters 20–22) and Part 10, *Special Topics,* chapters as desired.

Single mini-semester: Assign Chapters 3–10, 14, and 15 if time allows.

Chapter	Highlights and Changes
1 The Corporation and Financial Markets	Introduces the corporation and its governance, financial markets, and financial intermediation; updated discussion of ESG and stakeholder considerations in the context of shareholder value maximization; new interview with Nasdaq CEO Adena Friedman.
2 Introduction to Financial Statement Analysis	Introduces key financial statements; coverage of financial ratios is centralized to prepare students to analyze financial statements holistically. The eTextbook includes an interactive data analyzer for common financial statement information and ratios. Updated discussion of financial scandals.
3 Financial Decision Making and the Law of One Price	Introduces the Law of One Price and net present value as the basis of the book's unifying framework.
4 The Time Value of Money	Introduces the mechanics of discounting with applications to personal finance; Using Excel boxes familiarizes students with spreadsheet functionality. The eTextbook includes extensive use of the new interactive annuity calculator.
5 Interest Rates	Discusses key determinants of interest rates and their relation to the cost of capital; Interview with Janet L. Yellen, current U.S. Treasury Secretary and former Chair of the Board of Governors of the Federal Reserve System.
6 Valuing Bonds	Analyzes bond prices and yields, as well as the risk of fixed-income securities as illustrated by the sovereign debt crisis and the COVID-19 pandemic; expanded Finance in Times of Disruption box on negative bond yields; Data Case on corporate yield curves and case study on sovereign default.
7 Investment Decision Rules	Introduces the NPV rule as the "golden rule" against which we evaluate other investment decision rules; introduces the use of Data Tables for sensitivity analysis.

Chapter	Highlights and Changes
8 Fundamentals of Capital Budgeting	Provides a clear focus on the distinction between earnings and free cash flow, and shows how to build a financial model to assess the NPV of an investment decision (including tips on using Excel); Common Mistake box on corporate tax rates and investment; updates to align with corporate tax changes.
9 Valuing Stocks	Provides a unifying treatment of projects within the firm and the valuation of the firm as a whole; updated box on cryptocurrencies and financial bubbles; new interview with Fahmi Quadir on the role of short sellers.
10 Capital Markets and the Pricing of Risk	Establishes the intuition for understanding risk and return, explains the distinction between diversifiable and systematic risk, and introduces beta and the CAPM; extensive data updates throughout to reflect current market conditions.
11 Optimal Portfolio Choice and the Capital Asset Pricing Model	Presents the CAPM and develops the details of mean-variance portfolio optimization; interview with Anne Martin, Wesleyan University Chief Investment Officer; updated examples and Data Case.
12 Estimating the Cost of Capital	Demonstrates the practical details of estimating the cost of capital for equity, debt, or a project, and introduces asset betas, and the unlevered and weighted-average cost of capital; Using Excel box on estimating beta.
13 Investor Behavior and Capital Market Efficiency	Examines the role of behavioral finance and ties investor behavior to the topic of market efficiency and alternative models of risk and return; expanded discussion of fund manager performance; Nobel Prize box on Behavioral Finance; discussion of "Smart Beta".
14 Capital Structure in a Perfect Market	Presents Modigliani and Miller's results and introduces the market value balance sheet, discussion of important leverage fallacies with application to bank capital regulation.
15 Debt and Taxes	Analyzes the tax benefits of leverage, including the debt tax shield and the after-tax WACC; Common Mistake box on retirement investing; updates to align with corporate tax changes.
16 Financial Distress, Managerial Incentives, and Information	Examines the role of asymmetric information and introduces agency costs including debt overhang and leverage ratchet effects; Nobel Prize boxes on asymmetric information and adverse selection, and bank runs and default.
17 Payout Policy	Considers alternative payout policies including dividends and share repurchases; analyzes the role of market imperfections in determining the firm's payout policy; updated discussion of corporate cash retention.
18 Capital Budgeting and Valuation with Leverage	Develops in depth the three main methods for capital budgeting with leverage and market imperfections: the weighted average cost of capital (WACC) method, the adjusted present value (APV) method, and the flow-to-equity (FTE) method; appendix explains the relation between DCF and residual income valuation methods.
19 Valuation and Financial Modeling: A Case Study	Builds a financial model for a leveraged acquisition; Using Excel box "Summarizing Model Outputs".
20 Financial Options	Introduces the concept of financial options, how they are used and exercised; demonstrates how corporate securities may be interpreted using options.
21 Option Valuation	Develops the binomial, Black-Scholes, and risk-neutral pricing methods for option pricing.
22 Real Options	Analyzes real options using decision tree and Black-Scholes methods, and considers the optimal staging of investment; discussion of decision tree methodology with examples; new interview with Kenneth Frazier on real options in drug development at Merck.
23 Raising Equity Capital	Overview of the stages of equity financing, from angel financing and venture capital to IPO to seasoned equity offerings; venture capital financing including common deal terms and protections as well as an illustration of typical funding patterns and success rates; new section on SPACs with examples.

Chapter	Highlights and Changes
24 Debt Financing	Overview of debt financing, including a discussion of asset-backed securities and their role in the financial crisis.
25 Leasing	Introduces leasing as an alternative form of levered financing; update on new FASB rules for lease accounting; new examples and discussion of potential benefits of leasing.
26 Working Capital Management	Introduces the Cash Conversion Cycle and methods for managing working capital; new Finance in Times of Disruption box on supply chain disruptions during COVID-19.
27 Short-Term Financial Planning	Develops methods for forecasting and managing short-term cash needs.
28 Mergers and Acquisitions	Considers motives and methods for mergers and acquisitions, including leveraged buyouts; expanded discussion of valuation and premiums paid.
29 Corporate Governance	Evaluates direct monitoring, compensation policies, and regulation as methods to manage agency conflicts within the firm; addresses impact of Dodd-Frank Act; discussion of shareholder activism and its recent impact on corporate governance; Common Mistake box on celebrity boards.
30 Risk Management	Analyzes the methods and motives for the use of insurance, commodity futures, currency forwards and options, and interest rate swaps to hedge risk.
31 International Corporate Finance	Analyzes the valuation of projects with foreign currency cash flows with integrated or segregated capital markets; updates to align with corporate tax changes; new interview with Sally Johnson on managing international risks.

Acknowledgments

Creating a truly error-free text is a challenge we could not have lived up to without our team of expert error checkers; we owe particular thanks to Sukarnen Suwanto, Siddharth Bellur, Robert James, Anand Goel, Ian Drummond Gow, Janet Payne, Mike Casey, and Jared Stanfield. Thomas Gilbert and Miguel Palacios tirelessly worked examples and problems in the first edition, while providing numerous insights along the way.

A corporate finance textbook is the product of the talents and hard work of many talented colleagues. We are especially gratified with the work of those who updated the impressive array of supplements to accompany the book: Janet Payne for the Instructor's Manual; William Chittenden for the PowerPoint; and Michael Woodworth for the Test Bank.

As a colleague of both of us, Mark Rubinstein inspired us with his passion to get the history of finance right by correctly attributing the important ideas to the people who first enunciated them. We have used his book, *A History of the Theory of Investments: My Annotated Bibliography,* extensively in this text and we, as well as the profession as a whole, owe him a debt of gratitude for taking the time to write it all down.

We could not have written this text if we were not once ourselves students of finance. As any student knows, the key to success is having a great teacher. In our case we are lucky to have been taught and advised by the people who helped create modern finance: Ken Arrow, Darrell Duffie, Mordecai Kurz, Stephen Ross, and Richard Roll. It was from them that we learned the importance of the core principles of finance, including the Law of One Price, on which this book is based. The learning process does not end at graduation and like most people we have had especially influential colleagues and mentors from which we learned a great deal during our careers and we would like to recognize them explicitly here: Mike Fishman, Richard Green, Vasant Naik, Art Raviv, Mark Rubinstein, Joe Williams, and Jeff Zwiebel. We continue to learn from all of our colleagues and we are grateful to all of them. Finally, we would like to thank those with whom we have taught finance classes over the years: Anat Admati, Ming Huang, Dirk Jenter, Robert Korajczyk, Paul Pfleiderer, Sergio Rebelo, Richard Stanton, and Raman Uppal. Their ideas and teaching strategies have without a doubt influenced our own sense of pedagogy and found their way into this text.

Finally, and most importantly, we owe our biggest debt of gratitude to Rebecca Schwartz and Kaui Chun DeMarzo. Little did we (or they) know how much this project would impact our lives, and without their love and support—and especially their patience and understanding—this text could not have been completed. We owe a special thanks to Kaui DeMarzo, for her inspiration and support at the start of this project, and for her willingness to be our in-house editor, contributor, advisor, and overall sounding-board throughout each stage of its development.

Jonathan Berk
Peter DeMarzo

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