FUNDAMENTALS OF
CORPORATE FINANCE

5TH EDITION

Berk | DeMarzo | Harford

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Corporate Finance

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Jonathan Berk
STANFORD UNIVERSITY

Peter DeMarzo
STANFORD UNIVERSITY

Jarrad Harford
UNIVERSITY OF WASHINGTON

Pearson

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To Natasha and Hannah for all the joy you bring to my life. —*J. B.*

To Kaui, Pono, Koa, and Kai for all the love and laughter. —*P. D.*

To Katrina, Evan, and Cole for your love and support. —*J. H.*

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Brief Contents

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Detailed Contents

About the Authors

Jonathan Berk, Peter DeMarzo, and Jarrad Harford

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 is the Staehelin Family Professor of Finance at the Graduate School of Business, Stanford University and Faculty Director of the Stanford LEAD program. He is past President and Fellow 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. In addition to his experience at the Stanford Graduate School of Business, Professor DeMarzo has taught at the Haas School of Business and the Kellogg Graduate School of Management, and he was a 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*, *Financial Management*, and the *B.E. Journals in Economic Analysis and Policy*, as well as 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 also received numerous awards including the Western Finance Association Corporate Finance Best-Paper Award, the Charles River Associates Best-Paper Award, and the Barclays Global Investors/Michael Brennan Best-Paper of the Year Award from *The Review of Financial Studies*.

Professor DeMarzo was born in Whitestone, New York, and is married with three boys. He and his family enjoy hiking, biking, and skiing.

Jarrad Harford is the Paul Pigott - PACCAR Professor of Finance at the University of Washington's Foster School of Business. Prior to Washington, Professor Harford taught at the University of Oregon. He received his PhD in Finance with a minor in Organizations and Markets from the University of Rochester. Professor Harford has taught the core undergraduate finance course, Business Finance, for over twenty years, as well as an elective in Mergers and Acquisitions, and "Finance for Non-financial Executives" in the executive education program. He has won numerous awards for his teaching, including the UW Finance Professor of the Year (2010, 2012, 2016), Panhellenic/Interfraternity Council Business Professor of the Year Award (2011, 2013), ISMBA Excellence in Teaching Award (2006), and the Wells Fargo Faculty Award for Undergraduate Teaching (2005). Professor Harford is currently a Managing Editor of the Journal of Financial and Quantitative Analysis, and serves as an Associate Editor for the *Journal of Financial Economics*, and the *Journal of Corporate Finance*. His main research interests are understanding the dynamics of merger and acquisition activity as well as the interaction of corporate cash management policy with governance, payout and global tax considerations. Professor Harford was born in Pennsylvania, is married, and has two sons. He and his family enjoy traveling, hiking, and skiing.

Bridging Theory and Practice

EXAMPLE 7.1
Stock Prices and Returns

PROBLEM

Suppose you expect Longs Drug Stores to pay an annual dividend of $0.56 per share in the coming year and to trade for $45.50 per share at the end of the year. If investments with equivalent risk to Longs' stock have an expected return of 6.80%, what is the most you would pay today for Longs' stock? What dividend yield and capital gain rate would you expect at this price?

SOLUTION

PLAN

We can use Eq. 7.1 to solve for the beginning price we would pay now (P_0) given our expectations about dividends ($Div_1 = \$0.56$) and future price ($P_1 = \$45.50$) and the return we need to expect to earn to be willing to invest ($r_E = 0.068$). We can then use Eq. 7.2 to calculate the dividend yield and capital gain rate.

EXECUTE

Using Eq. 7.1, we have

$$P_0 = \frac{Div_1 + P_1}{1 + r_E} = \frac{\$0.56 + \$45.50}{1.0680} = \$43.13$$

Referring to Eq. 7.2, we see that at this price, Longs' dividend yield is $Div_1/P_0 = 0.56/43.13 = 1.30\%$. The expected capital gain is $\$45.50 - \$43.13 = \$2.37$ per share, for a capital gain rate of $2.37/43.13 = 5.50\%$.

EVALUATE

At a price of $43.13, Longs' expected total return is $1.30\% + 5.50\% = 6.80\%$, which is equal to its equity cost of capital (the return being paid by investments with equivalent risk to Longs'). This amount is the most we would be willing to pay for Longs' stock. If we paid more, our expected return would be less than 6.8% and we would rather invest elsewhere.

PERSONAL FINANCE

EXAMPLE 4.5
Retirement Savings Plan Annuity

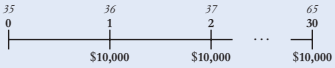
PROBLEM

Ellen is 35 years old and she has decided it is time to plan seriously for her retirement. At the end of each year until she is 65, she will save $10,000 in a retirement account. If the account earns 10% per year, how much will Ellen have in her account at age 65?

SOLUTION

PLAN

As always, we begin with a timeline. In this case, it is helpful to keep track of both the dates and Ellen's age:



Ellen's savings plan looks like an annuity of $10,000 per year for 30 years. (*Hint*: It is easy to become confused when you just look at age, rather than at both dates and age. A common error is to think there are only $65 - 36 = 29$ payments. Writing down both dates and age avoids this problem.)

To determine the amount Ellen will have in her account at age 65, we'll need to compute the future value of this annuity.

EXECUTE

$$FV = \$10{,}000 \times \frac{1}{0.10}(1.10^{30} - 1)$$

$$= \$10{,}000 \times 164.49$$

$$= \$1.645 \text{ million at age 65}$$

Using a financial calculator or Excel:

	N	I/Y	PV	PMT	FV
Given:	30	10	0	−10,000	
Solve for:					1,644,940

Excel Formula: =FV(RATE,NPER, PMT, PV)=FV(0.10,30,−10000,0)

EVALUATE

By investing $10,000 per year for 30 years (a total of $300,000) and earning interest on those investments, the compounding will allow Ellen to retire with $1.645 million.

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.

- The **Valuation Principle** is presented as the foundation of all financial decision making: The central idea is that a firm should take projects or make investments that increase the *value* of the *firm*. The tools of finance determine the impact of a project or investment on the firm's value by comparing the costs and benefits in equivalent terms. The Valuation Principle is first introduced in Chapter 3, revisited in the part openers, and integrated throughout the text.
- **Guided Problem Solutions (GPS)** are Examples that accompany every important concept using a consistent problem-solving methodology that breaks the solution process into three steps: *Plan*, *Execute*, and *Evaluate*. This approach aids student comprehension, enhances their ability to model the solution process when tackling problems on their own, and demonstrates the importance of interpreting the mathematical solution.
- **Personal Finance GPS** Examples showcase the use of financial analysis in everyday life by setting problems in scenarios, such as purchasing a new car or house and saving for retirement.
- **Common Mistake** boxes alert students to frequently made mistakes stemming from misunderstanding of core concepts and calculations—in the classroom and in the field.

COMMON MISTAKE

Summing Cash Flows Across Time

Once you understand the time value of money, our first rule may seem straightforward. However, it is very common, especially for those who have not studied finance, to violate this rule, simply treating all cash flows as comparable regardless of when they are received. One example is in sports contracts. In 2019, Mike Trout signed a contract extension with the Los Angeles Angels that was repeatedly referred to as a "$430 million" contract. The $430 million comes from simply adding up all the payments Trout would receive over the 12 years of the contract—treating dollars received in 12 years the same as dollars received today. The same thing occurred when Lionel Messi signed a contract extension with FC Barcelona in 2017, giving him a "$320 million" contract through 2021, and in 2011 when Albert Pujols agreed to a "240 million" ten-year contract with the Los Angeles Angels.

Applications That Reflect Real Practice

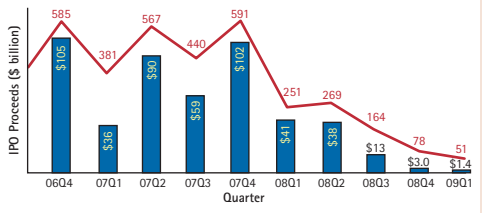
Global Financial Crisis boxes reflect the reality of the recent financial crisis and sovereign debt crisis, noting lessons learned. Boxes interspersed through the book illustrate and analyze key details.

GLOBAL FINANCIAL CRISIS

2008–2009: A Very Cold IPO Market

The drop in IPO issues during the 2008 financial crisis was both global and dramatic. The bar graph shows the total worldwide dollar volume of IPO proceeds in billions of dollars (blue bars) and number of deals (red line) by quarter, from the last quarter of 2006 to the first quarter of 2009. Comparing the fourth quarter of 2007 (a record quarter for IPO issues) to the fourth quarter of 2008, dollar volume dropped a stunning 97% from $102 billion to just $3 billion. Things got even worse in the first quarter of 2009 with just $1.4 billion raised. The market for IPOs essentially dried up altogether.

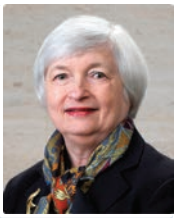
During the 2008 financial crisis, IPO markets were not the only equity issue markets that saw a collapse in volume. Markets for seasoned equity offerings and leveraged buyouts also collapsed. The extreme market uncertainty at the time created a "flight to quality." Investors, wary of taking risk, sought to move their capital into risk-free investments like U.S. Treasury securities. The result was a crash in existing equity prices and a greatly reduced supply of new capital to risky asset classes.



Source: Shifting Landscape—Are You Ready? Global IPO Trends report 2009, Ernst & Young.

Practitioner Interviews from notable professionals featured in many chapters highlight leaders in the field and address the effects of the financial crisis.

INTERVIEW WITH DR. JANET YELLEN



Dr. Janet L. Yellen served as the Chair of the Board of Governors of the Federal Reserve System from 2014 to 2018, and as Vice Chair from 2010 to 2014. Previously she was President and Chief Executive Officer of the Federal Reserve Bank of San Francisco; Chair of the White House Council of Economic Advisers under President Bill Clinton; and business professor at the University of California, Berkeley, Haas School of Business. She is currently Distinguished Fellow in Residence—Economic Studies, at The Brookings Institution's Hutchins Center on Fiscal and Monetary Policy.

QUESTION: ***What are the main policy instruments used by central banks to control the economy, and how did they change as a result of the financial crisis?***

ANSWER: Before the financial crisis, short-term interest rates were the main tool of monetary policy. The Federal Reserve (The Fed) controlled these rates by adjusting the quantity of bank reserves (cash in the banking system) it made available. By purchasing or selling Treasury securities the Federal Reserve raised or lowered the available quantity of reserves and thereby controlled short-term interest rates.

In the aftermath of the crisis, short-term interest rates remain a prime tool of monetary policy, but they are now set in a different way and the quantity of reserves is an order-of-magnitude larger—peaking at around $2.5 trillion compared to about $25 billion precrisis. At the height of the financial crisis (December 2008), the Fed set the interest rate on reserves at 25 basis points, bringing the general level of safe short-term rates down to near zero (its so-called "effective lower bound"), where it remained for seven years. It also began buying long-term Treasury bonds and agency mortgage-backed securities—"unconventional" policies that lowered longer-term interest rates once short rates had reached the effective lower bound. In addition, the Federal Reserve began providing more detailed forward guidance about the likely path of short-term rates. These "unconventional" policies were intended to lower longer-term interest rates once short rates had reached the effective lower bound.

QUESTION: ***What challenges does the Fed face in the aftermath of the financial crisis?***

ANSWER: The Fed faces the challenge of raising interest rates and shrinking the quantity of reserves at an appropriate pace as the economy recovers and no longer needs the level of stimulus required post-crisis. The danger of raising rates too slowly is the risk of the economy overheating and inflation significantly overshooting the Fed's 2% target level; raising rates too quickly, on the other hand, could stall economic growth. As of March 2018, the Fed had raised rates six times, bringing the fed funds rate to almost 1.75%. It also began a gradual process of shrinking its massive balance sheet by diminishing its reinvestments of principal.

QUESTION: ***In the last 10 years we have witnessed a period of very low interest rates. Is this a new norm, or do you think rates will eventually rise to their historic averages?***

ANSWER: The evidence suggests, and I concur, that low interest rates may be the "new norm" in developed countries. Short-term interest rates appeared to be falling in the United States and other developed countries even before the financial crisis. Estimates now place the "neutral rate"—the rate consistent with stable growth and low inflation—at a bit under 1% in real terms. Two key factors that influence the level of neutral rates are productivity growth and demographics. Productivity growth in most developed countries has been slow relative to the postwar period; at the same time, populations are aging and labor force growth has slowed. These factors tend to boost a society's saving rate and reduce investment spending, pushing the level of neutral rates down.

QUESTION: ***How will the recent tax cuts affect future Fed policy?***

ANSWER: Monetary policy is designed to achieve the Fed's Congressionally mandated goals of maximum or "full" employment and 2% inflation. This means that all factors that affect these dimensions of economic performance will influence Fed policy. Tax cuts serve to boost domestic demand—both consumer and investment spending. Higher investment spending, over time, boosts the economy's capital stock and its potential output to some extent. Moreover, lower marginal tax rates may boost labor supply. Over the next few years, the demand impact of the spending increases and tax cuts seems likely to dominate any supply effects. With the economy near full employment, the Fed may need to raise interest rates a bit faster as a consequence.

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

The Credit Crisis and Bond Yields

The financial crisis that engulfed the world's economies in 2008 originated as a credit crisis that first emerged in August 2007. At that time, problems in the mortgage market had led to the bankruptcy of several large mortgage lenders. The default of these firms, and the downgrading of many of the bonds backed by mortgages these firms had made, caused many investors to reassess the risk of other bonds in their portfolios. As perceptions of risk increased, and investors attempted to move into safer U.S. Treasury securities, the prices of corporate bonds fell and so their credit spreads rose relative to Treasuries, as shown in Figure 6.7. Panel (a) shows the yield spreads for long-term corporate bonds, where we can see that spreads of even the highest-rated Aaa bonds increased dramatically, from a typical level of 0.5% to over 2% by the fall of 2008. Panel (b) shows a similar pattern for the rate banks had to pay on short-term loans compared to the yields of short-term Treasury bills. This increase in borrowing costs made it more costly for firms to raise the capital needed for new investment, slowing economic growth. The decline in these spreads in early 2009 was viewed by many as an important first step in mitigating the ongoing impact of the financial crisis on the rest of the economy.

Teaching Every Student to Think Finance

notation

C	cash flow	N	date of the last cash flow in a stream of cash flows
C_n	cash flow at date n	P	initial principal or deposit, or equivalent present value
FV	future value	PV	present value
FV_n	future value on date n	r	interest rate or rate of return
g	growth rate		

Simplified Presentation of Mathematics

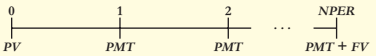
Because one of the hardest parts of learning finance for non-majors is mastering the jargon, math, and non-standardized notation, *Fundamentals of Corporate Finance* systematically uses:

- **Notation Boxes.** Each chapter begins with a Notation box that defines the variables and the acronyms used in the chapter and serves as a "legend" for students' reference.
- **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 summary and in end papers.
- **Timelines.** Introduced in Chapter 3, timelines are emphasized as the important first step in solving *every* problem that involves cash flows over time.
- **Financial Calculator** instructions, including a box in Chapter 4 on solving for future and present values, and appendices to Chapters 4, 6, and 15 with keystrokes for HP-10bII+ and TI BAII Plus calculators, highlight this problem-solving tool.
- **Spreadsheet Tables.** Select tables are available as Excel® files, enabling students to change inputs and manipulate the underlying calculations.
- **Using Excel** boxes describe Excel techniques and include screenshots to serve as a guide for students using this technology.

Using a Financial Calculator: Solving for Present and Future Values of Cash Flow Streams

So far, we have used formulas to compute present values and future values of cash flow streams. As we discussed at the end of Chapter 3, both financial calculators and spreadsheets have these formulas preprogrammed to quicken the process. In this box, we focus on financial calculators, but spreadsheets such as Excel have very similar shortcut functions.

Financial calculators have a set of functions that perform the calculations that finance professionals do most often. These functions are all based on the following timeline, which among other things can handle most types of loans:

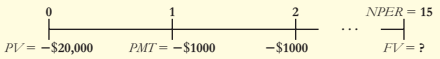


There are a total of five variables: number of periods (*N* or *NPER*), present value (*PV*), cash flow or "payment" (*PMT*), future value (*FV*), and the interest rate, denoted *I/Y*. Each function takes four of these variables as inputs and returns the value of the fifth one that ensures that the sum of the present value of the cash flows is zero.

By setting the recurring payments equal to 0, you could compute present and future values of single cash flows such as we have done above using Eqs. 4.2 and 4.1. In the examples shown in Sections 4.2 through 4.4, we will calculate cash flows using the PMT button. The best way to learn to use a financial calculator is by practicing. We present one example below. We will also show the calculator buttons for any additional examples in this chapter that can be solved with financial calculator functions. Finally, the appendix to this chapter contains step-by-step instructions for using the two most popular financial calculators.

Example

Suppose you plan to invest $20,000 in an account paying 8% interest. You will invest an additional $1000 at the end of each year for 15 years. How much will you have in the account in 15 years? We represent this problem with the following timeline:



To compute the solution, we enter the four variables we know, $N = 15$, $I/Y = 8$, $PV = -20{,}000$, $PMT = -\$1000$, and solve for the one we want to determine: *FV*. Specifically, for the HP-10bII+ or TI BAII Plus calculators:

1. Enter 15 and press the N button.
2. Enter 8 and press the I/Y button (I/YR for the HP calculator).
3. Enter −20,000 and press the PV button.
4. Enter −$1000 and press the PMT button.
5. Press the FV button (for the Texas Instruments calculator, press CPT and then FV).

	N	I/Y	PV	PMT	FV
Given:	15	8	−20,000	−1000	
Solve for:					90,595.50

Excel Formula: =FV(0.08,15,−1000,−20000)

The calculator then shows a future value of $90,595.50.

Note that we entered *PV* and *PMT* as negative numbers (the amounts we are putting *into* the bank), and *FV* is shown as a positive number (the amount we can take *out* of the bank). It is important to use signs correctly to indicate the direction in which the money is flowing when using the calculator functions. You will see more examples of getting the sign of the cash flows correct throughout the chapter.

Excel has the same functions, but it calls "N," "NPER" and "I/Y," "RATE." ***Also, it is important to note that you enter an interest rate of 8% as "8" in a financial calculator, but as "0.08" in Excel.***

TABLE 18.18
Pro Forma Statement of Cash Flows for KMS, 2019–2024

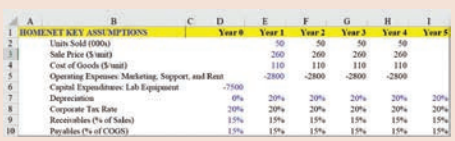
	Year	2019	2020	2021	2022	2023	2024
2	**Statement of Cash Flows ($000s)**						
3	**Net Income**		8,769	10,162	12,854	15,852	19,184
4	Depreciation		7,444	7,499	7,549	7,594	7,635
5	**Changes in Working Capital**						
6	Accounts Receivable		−2,561	−2,827	−3,144	−3,491	−3,872
7	Inventory		−2,696	−2,976	−3,309	−3,675	−4,076
8	Accounts Payable		2,157	2,381	2,647	2,940	3,261
9	**Cash from Operating Activities**		13,112	14,239	16,598	19,221	22,132
10	Capital Expenditures		−25,000	−8,000	−8,000	−8,000	−8,000
11	Other Investment		—	—	—	—	—
12	**Cash from Investing Activities**		−25,000	−8,000	−8,000	−8,000	−8,000
13	Net Borrowing		20,000	—	—	—	—
14	Dividends		−5,955	−3,858	−5,951	−8,280	−10,871
15	**Cash from Financing Activities**		14,045	−3,858	−5,951	−8,280	−10,871
16							
17	**Change in Cash (9 + 12 + 15)**		**2,157**	**2,381**	**2,647**	**2,940**	**3,261**

USING EXCEL
Capital Budgeting Using a Spreadsheet Program

Capital budgeting forecasts and analysis are most easily performed in a spreadsheet program. Here, we highlight a few best practices when developing your own capital budgets.

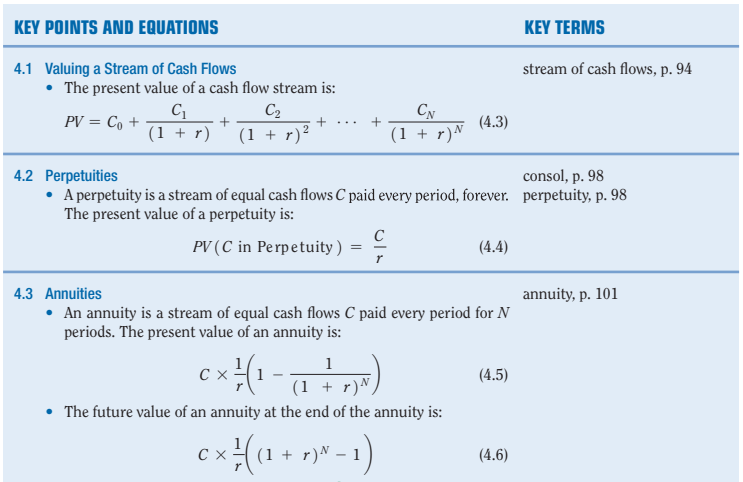
Create a Project Dashboard

All capital budgeting analyses begin with a set of assumptions regarding future revenues and costs associated with the investment. Centralize these assumptions within your spreadsheet in a project dashboard so they are easy to locate, review, and potentially modify. Here, we show an example for the HomeNet project.



	A	B	C	D	E	F	G	H	I
1	HOMENET KEY ASSUMPTIONS			Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
2		Units Sold (000s)			50	50	50	50	
3		Sale Price ($/unit)			260	260	260	260	
4		Cost of Goods ($/unit)			110	110	110	110	
5		Operating Expenses: Marketing, Support, and Rent			-2800	-2800	-2800	-2800	
6		Capital Expenditures: Lab Equipment		-7500					
7		Depreciation		0%	20%	20%	20%	20%	20%
8		Corporate Tax Rate		20%	20%	20%	20%	20%	20%
9		Receivables (% of Sales)		15%	15%	15%	15%	15%	15%
10		Payables (% of COGS)		15%	15%	15%	15%	15%	15%

Practice Finance to Learn Finance



KEY POINTS AND EQUATIONS | **KEY TERMS**

4.1 Valuing a Stream of Cash Flows — stream of cash flows, p. 94

- The present value of a cash flow stream is:

$$PV = C_0 + \frac{C_1}{(1 + r)} + \frac{C_2}{(1 + r)^2} + \cdots + \frac{C_N}{(1 + r)^N} \quad (4.3)$$

4.2 Perpetuities — consol, p. 98; perpetuity, p. 98

- A perpetuity is a stream of equal cash flows C paid every period, forever. The present value of a perpetuity is:

$$PV(C \text{ in Perpetuity}) = \frac{C}{r} \quad (4.4)$$

4.3 Annuities — annuity, p. 101

- An annuity is a stream of equal cash flows C paid every period for N periods. The present value of an annuity is:

$$C \times \frac{1}{r}\left(1 - \frac{1}{(1 + r)^N}\right) \quad (4.5)$$

- The future value of an annuity at the end of the annuity is:

$$C \times \frac{1}{r}\left((1 + r)^N - 1\right) \quad (4.6)$$

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

End-of-Chapter Materials Reinforce Learning

Testing understanding of central concepts is crucial to learning finance.

- **The Chapter Summary** presents the key points and conclusions from each chapter, provides a list of key terms with page numbers, and indicates online practice opportunities.
- **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.
- **Integrative Cases** occur at the end of most parts and present a capstone extended problem for each part with a scenario and data for students to analyze based on that subset of chapters.

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 the annual income statements, balance sheets, and cash flow statements for the last four fiscal years from Morningstar (www.morningstar.com) company's stock symbol and then go to "financials." Copy and paste the financial statements into Excel.

2. Find historical stock prices for each firm from Yahoo Finance (finance.yahoo.com). Enter the stock symbol, click "Historical Prices" in the left column, and enter the proper date range to cover the last day of the month corresponding to the date 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 by the firm's historic stock price. You can find the number of shares by using "Basic" under "Weighted average shares outstanding" at the bottom of the Income Statement.

Preface

Finance professors are united by their commitment to shaping future generations of financial professionals as well as instilling financial awareness and skills in non-majors. Our goal with *Fundamentals of Corporate Finance* is to provide an accessible presentation for both finance and non-finance majors. We know from experience that countless undergraduate students have felt that corporate finance is challenging. It is tempting to make finance *seem* accessible by de-emphasizing the core principles and instead concentrating on the results. In our over 75 years of combined teaching experience, we have found that emphasizing the core concepts in finance—which are clear and intuitive at heart—is what makes the subject matter accessible. 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.

The 2007–2009 financial crisis was fueled in part by many practitioners' poor decision making when they did not understand—or chose to ignore—the core concepts that underlie finance and the pedagogy in this book. With this point in mind, we present finance as one unified whole based on two simple, powerful ideas: (1) valuation drives decision making—the firm should take projects for which the value of the benefits exceeds the value of the costs, and (2) in a competitive market, market prices (rather than individual preferences) determine values. We combine these two ideas with what we call the *Valuation Principle*, and from it we establish all of the key ideas in corporate finance.

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:

- Updates made throughout the text to reflect the Tax Cuts and Jobs Act of 2017. Extensive updates made to Chapter 9 (Fundamentals of Capital Budgeting), Chapter 16 (Capital Structure), and Chapter 23 (International Corporate Finance).
- Added discussion of Finance and Technology (Fintech) in Chapter 1 (Corporate Finance and the Financial Manager).
- Added a new interview with Janet L. Yellen in Chapter 5 (Interest Rates).
- Incorporated new and/or revised features throughout, including Common Mistakes, Global Financial Crisis, Nobel Prize, and General Interest boxes, as well as Examples.
- Extensively revised and updated Data Cases and end-of-chapter problems, once again personally writing and solving each one.
- Updated tables and figures to reflect current data.

Emphasis on Valuation

While the global financial crisis was not a formative experience for many of today's students, financial topics ranging from speculative start-up valuations to sovereign debt crises continue to dominate the news. As a result, today's undergraduate students arrive in the classroom with an interest in finance. We strive to use that natural interest and motivation to overcome their fear of the subject and communicate time-tested core principles. Again, we take what has worked in the classroom and apply it to the text: By providing examples involving familiar companies such as Starbucks and Apple, making consistent use of real-world data, and demonstrating personal finance applications of core concepts, we strive to keep both non-finance and finance majors engaged.

By learning to apply the Valuation Principle, students develop the skills to make the types of comparisons—among loan options, investments, projects, and so on—that turn them into knowledgeable, confident financial consumers and managers. When students see how to apply finance to their personal lives and future careers, they grasp that finance is more than abstract, mathematically based concepts.

Table of Contents Overview

Fundamentals of Corporate Finance offers coverage of the major topical areas for introductory-level undergraduate courses. Our focus is on financial decision making related to the corporation's choice of which investments to make or how to raise the capital required to fund an investment. We designed the book with the need for flexibility and with consideration of time pressures throughout the semester in mind.

Part **1**	**Introduction**	
	Ch. 1: Corporate Finance and the Financial Manager	Introduces the corporation and its governance; updated to include comparison of traditional trading venues, new electronic exchanges, and how the market for trading stocks is changing
	Ch. 2: Introduction to Financial Statement Analysis	Introduces key financial statements; Coverage of financial ratios has been centralized to prepare students to analyze financial statements holistically
Part **2**	**Interest Rates and Valuing Cash Flows**	
	Ch. 3: Time Value of Money: An Introduction	Introduces the Valuation Principle and time value of money techniques for single-period investments
	Ch. 4: Time Value of Money: Valuing Cash Flow Streams	Introduces the mechanics of discounting; Includes examples with non-annual interest rates that provide time value of money applications in a personal loan context
	Ch. 5: Interest Rates	Presents how interest rates are quoted and compounding for all frequencies; Discusses key determinants of interest rates and their relation to the cost of capital; New discussion of negative interest rates
	Ch. 6: Bonds	Analyzes bond prices and yields; Discusses credit risk and the effect of the financial crisis on credit spreads
	Ch. 7: Stock Valuation	Introduces stocks and presents the dividend discount model as an application of the time value of money

Part 3	**Valuation and the Firm**	
	Ch. 8: Investment Decision Rules	Introduces the NPV rule as the "golden rule" against which we evaluate other investment decision rules
	Ch. 9: 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; Using Excel boxes demonstrate best-practices and sensitivity analysis
	Ch. 10: Stock Valuation: A Second Look	Builds on capital budgeting material by valuing the ownership claim to the firm's free cash flows and discusses market efficiency and behavioral finance
Part 4	**Risk and Return**	
	Ch. 11: Risk and Return in Capital Markets	Establishes the intuition for understanding risk and return; Explains the distinction between diversifiable and systematic risk; New Global Financial Crisis box "Diversification Benefits During Market Crashes"
	Ch. 12: Systematic Risk and the Equity Risk Premium	Develops portfolio risk, the CAPM, beta and the Security Market Line
	Ch. 13: The Cost of Capital	Calculates and uses the firm's overall costs of capital with the WACC method; New Common Mistake box "Using a Single Cost of Capital in Multi-Divisional Firms
Part 5	**Long-Term Financing**	
	Ch. 14: Raising Equity Capital	Chapter-long example of Facebook from founding to SEO; Overview of the stages of equity financing, from venture capital to IPO to seasoned equity offerings; Discussion of crowdfunding and direct listings
	Ch. 15: Debt Financing	Overview of debt financing, including covenants, convertible bonds and call provisions; Other types of debt; Boxes on "Detroit's Art Museum at Risk" and "CDOs, Subprime Mortgages, and the Financial Crisis"
Part 6	**Capital Structure and Payout Policy**	
	Ch. 16: Capital Structure	Analyzes the tax benefits of leverage, including the debt tax shield; Discusses distress costs and the Tradeoff Theory
	Ch. 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
Part 7	**Financial Planning and Forecasting**	
	Ch. 18: Financial Modeling and Pro Forma Analysis	Demonstrates careful pro forma modeling of an expansion plan
	Ch. 19: Working Capital Management	Introduces the Cash Conversion Cycle and methods for managing working capital
	Ch. 20: Short-Term Financial Planning	Develops methods for forecasting and managing short-term cash needs
Part 8	**Special Topics**	
	Ch. 21: Option Applications and Corporate Finance	Introduces the concept of financial options, how they are used and exercised
	Ch. 22: Mergers and Acquisitions	Considers motives and methods for mergers and acquisitions, including leveraged buyouts
	Ch. 23: International Corporate Finance	Analyzes the valuation of projects with foreign currency cash flows with integrated or segregated capital markets

Acknowledgments

With five editions behind us, we are heartened by the book's success and its impact on the profession by shaping future practitioners. As any textbook writer will tell you, achieving this level of success requires a substantial amount of help. First and foremost we thank Donna Battista, whose leadership, talent, and market savvy are imprinted on all aspects of the project and were central to its more than 10 years of success; Adrienne D'Ambrosio, for her efforts and commitment to the success of the book, and for taking on Donna's leadership role for this edition; Denise Clinton, a friend and a leader in fact not just in name, whose experience and knowledge were indispensable in the earliest stages; Rebecca Ferris-Caruso, for her unparalleled expertise in managing the complex writing, reviewing, and editing processes and patience in keeping us on track—it is impossible to imagine writing the first edition without her; Kate Fernandes, for her energy and fresh perspective as our former editor; Emily Biberger, for her enthusiasm and excellent guidance on this edition; Miguel Leonarte, for his central role on MyLab Finance; and Gina Linko for getting the book from draft pages into print. We were blessed to be approached by the best publisher in the business and we are both truly thankful for the indispensable help provided by these and other professionals, including Catherine Cinque, Meredith Gertz, Melissa Honig, Roxanne McCarley, and Carol Melville.

Updating a textbook like ours requires a lot of painstaking work, and there are many who have provided insights and input along the way. We would especially like to call out Jared Stanfield for his important contributions and suggestions throughout. We're also appreciative of Marlene Bellamy's work conducting the lively interviews that provide a critically important perspective, and to the interviewees who graciously provided their time and insights.

Given the scope of this project, identifying the many people who made it happen is a tall order. This textbook was the product of the expertise and hard work of many talented colleagues. We are especially gratified with the work of those who revised the supplements that accompany the book: William Chittenden for the PowerPoint presentations; Mary R. Brown, for the Instructor's Manual; Brian Nethercutt, for the Test Bank; James Linck, for serving as advisor for the videos; and our MyLab Finance content development team, including Melissa Honig, Miguel Leonarte, Noel Lotz, and Sarah Peterson. We're also deeply appreciative of Susan White's contributions to the part-ending cases.

Creating a truly error-free text is a challenge we could not have lived up to without our team of expert error checkers. Jared Stanfield subjected the text and problem solutions to his exacting standards. We are also indebted to Jared for his adept research support throughout the writing process and Michael Wittry's assistance in providing updates.

We are indebted to our colleagues for the time and expertise invested as manuscript reviewers, class testers, and focus group participants. We list all of these contributors on the following pages, but want to single out one group, our First Edition editorial board, for special notice: Tom Berry, *DePaul University*; Elizabeth Booth, *Michigan State University*; Julie Dahlquist, the *University of Texas–San Antonio*; Michaël Dewally, *Marquette University*; Robert M. Donchez, the *University of Colorado–Boulder*; Belinda Mucklow, the *University of Wisconsin–Madison*; Coleen Pantalone, *Northeastern University*; and Susan White, the *University of Maryland*. We strived to incorporate every contributor's input and are truly grateful for each comment and suggestion. The book has benefited enormously from this input.

Reviewers

Pankaj Agrrawal, *University of Maine*
Daniel Ahern, *California State University–Chico*
Paul Asabere, *Temple University*
Victor Bahhouth, *University of North Carolina-Pembroke*
Ajeyo Banerjee, *University of Colorado–Denver*
Michael Bennett, *Curry College*
Tom Berry, *DePaul University*
Karan Bhanot, *University of Texas–San Antonio*
Rafiqul Bhuyan, *California State University–San Bernardino*
Eugene Bland, *Texas A&M University–Corpus Christi*
Matej Blasko, *University of Georgia*
Elizabeth Booth, *Michigan State University*
Mary Brown, *University of Illinois–Chicago*
Bill Brunsen, *Eastern New Mexico University*
David G. Cazier, *Brigham Young University–Provo*
Leo Chan, *Delaware State University*
Cindy Chen, *California State University–Long Beach*
Haiyu Chen, *Youngstown State University*
James F. Cotter, *Wake Forest University*
Vicentiu Covrig, *California State University–Northridge*
Julie Dahlquist, *University of Texas–San Antonio*
Pieter de Jong, *University of Texas–Arlington*
Andrea L. DeMaskey, *Villanova University*
Xiaohui Deng, *California State University–Fresno*
Michaël Dewally, *Marquette University*
Prakash Dheeriya, *California State University–Dominguez Hills*
Robert M. Donchez, *University of Colorado Boulder*
Gang Dong, *Rutgers University*
Dean Drenk, *Montana State University*
Robert Dubil, *University of Utah*
Hsing Fang, *California State University–Los Angeles*
David O. Fricke, *University of North Carolina–Pembroke*
Scott Fung, *California State University–East Bay*
Sharon Garrison, *University of Arizona*
Rakesh Gupta, *Central Queensland University*
Joseph D. Haley, *St. Cloud State University*
Thomas Hall, *Christopher Newport University*
Karen Hallows, *University of Maryland*
Karen L. Hamilton, *Georgia Southern University*
Robert Hanson, *Eastern Michigan University*
Mahfuzul Haque, *Indiana State University*
Edward C. Howell, *Northwood University*
Ping Hsiao, *San Francisco State University*
Xiaoqing Hu, *University of Illinois at Chicago*
Pankaj Jain, *University of Memphis*
Robert James, *Boston College*
Susan Ji, *Baruch College, City University of New York*
Zi Jia, *University of Arkansas at Little Rock*
Domingo Joaquin, *Illinois State University*
Fred R. Kaen, *University of New Hampshire*
Terrill Keasler, *Appalachian State University*
Howard Keen, *Temple University*
Brett A. King, *University of North Alabama*
Daniel Klein, *Bowling Green State University*
Gregory Kuhlemeyer, *Carroll University*
Rose Neng Lai, *University of Macau*
Keith Lam, *University of Macau*
Reinhold P. Lamb, *University of North Florida*
Douglas Lamdin, *University of Maryland–Baltimore County*
Mark J. Laplante, *University of Georgia*
Sie Ting Lau, *Nanyang Technological University*
Richard LeCompte, *Wichita State University*
Adam Y.C. Lei, *Midwestern State University*
Qian Li, *Midwestern State University*
Lubomir Litov, *University of Oklahoma*
Chang Liu, *Washington State University*
Wei Liu, *Texas A&M University*
Hugh Marble III, *University of Vermont*
James Milanese, *University of North Carolina at Greensboro*
Sunil K. Mohanty, *University of St. Thomas*
Ted Moorman, *Northern Illinois University*
Mike Morgan, *University of Southern Mississippi*
James Morris, *University of Colorado–Denver*
Belinda Mucklow, *University of Wisconsin–Madison*
Rick Nelson, *University of Minnesota*
Tom C. Nelson, *University of Colorado–Boulder*
Anthony C. Ng, *Hong Kong Polytechnic University*
Curtis Nicholls, *Bucknell University*
Coleen Pantalone, *Northeastern University*
Daniel Park, *Azusa Pacific University*
Janet Payne, *Texas State University*
Jay Peroni, *College of Charleston*
Lynn Pi, *Hong Kong University of Science and Technology*
J. Michael Pinegar, *Brigham Young University*
Natalia Piqueira, *University of Houston*
Michael Portnoy, *University of Tampa*
Annette Poulsen, *University of Georgia*
Eric Powers, *University of South Carolina*
Rose M. Prasad, *Central Michigan University*
Shoba Premkumar, *Iowa State University*
Mark K. Pyles, *College of Charleston*
Jue Ren, *Texas Christian University*
A.A.B. Resing, *Hogeschool Van Amsterdam*
Greg Richey, *California State University, San Bernardino*

Scott Roark, *Boise State University*
David L. Robbins, *University of New Mexico*
Rob Ryan, *DePaul University*
Andrew Samwick, *Dartmouth College*
Mukunthan Santhanakrishnan, *Southern Methodist University*
Salil K. Sarkar, *University of Texas–Arlington*
Oliver Schnusenberg, *University of North Florida*
Michael Schor, *Ohio University*
Kenneth Scislaw, *University of Alabama–Huntsville*
Roger Severns, *Minnesota State University–Mankato*
Tatyana Sokolyk, *University of Wyoming*
Andrew C. Spieler, *Hofstra University*
Steven Stelk, *University of Southern Mississippi*
Timothy G. Sullivan, *Bentley College*
Janikan Supanvanij, *St. Cloud State University*
Hugo Tang, *Purdue University*
Oranee Tawatnuntachai, *Pennsylvania State University–Harrisburg*
Robert Terpstra, *University of Macau*
Thomas Thomson, *University of Texas–San Antonio*
Olaf J. Thorp, *Babson College*
Ed Tiryakian, *Duke University*
Mary Kathleen Towle, *University of New Mexico*
Emery Trahan, *Northeastern University*
Joe Ueng, *University of St. Thomas*
Mo Vaziri, *California State University–San Bernardino*
Gautam Vora, *University of New Mexico*
Premal P. Vora, *Pennsylvania State University– Harrisburg*
Hefei Wang, *University of Illinois–Chicago*
Gwendolyn Webb, *Baruch College*
Paul M. Weinstock, *Ohio State University*
Susan White, *University of Maryland*
Annie Wong, *Western Connecticut State University*
Wentao Wu, *Clarkson University*
Xiaoyan Xu, *San Jose State University*
Qianqian Yu, *Lehigh University*
Zhong-gou Zhou, *California State University–Northridge*
Kermit C. Zieg, Jr., *Florida Institute of Technology*

Focus Group Participants

Anne-Marie Anderson, *Lehigh University*
Sung Bae, *Bowling Green State University*
H. Kent Baker, *American University*
Steven Beach, *Radford University*
Rafiqul Bhuyan, *California State University–San Bernardino*
Deanne Butchey, *Florida International University*
Leo Chan, *Delaware State University*
George Chang, *Grand Valley State University*
Haiwei Chen, *California State University–San Bernardino*
Haiyu Chen, *Youngstown State University*
Massimiliano De Santis, *Dartmouth College*
Jocelyn Evans, *College of Charleston*
Kathleen Fuller, *University of Mississippi*
Xavier Garza Gomez, *University of Houston–Victoria*
William Gentry, *Williams College*
Axel Grossmann, *Radford University*
Pankaj Jain, *University of Memphis*
Zhenhu Jin, *Valparaiso University*
Steve Johnson, *University of Northern Iowa*
Steven Jones, *Samford University*
Yong-Cheol Kim, *University of Wisconsin–Milwaukee*
Robert Kiss, *Eastern Michigan University*
Ann Marie Klingenhagen, *DePaul University*
Thomas J. Krissek, *Northeastern Illinois University*
Olivier Maisondieu Laforge, *University of Nebraska–Omaha*
Douglas Lamdin, *University of Maryland–Baltimore County*
D. Scott Lee, *Texas A&M University*
Stanley A. Martin, *University of Colorado–Boulder*
Jamshid Mehran, *Indiana University, South Bend*
Sunil Mohanty, *University of St. Thomas*
Karyn L. Neuhauser, *State University of New York–Plattsburgh*
Thomas O'Brien, *University of Connecticut*
Hyuna Park, *Minnesota State University–Mankato*
G. Michael Phillips, *California State University–Northridge*
Wendy Pirie, *Valparaiso University*
Antonio Rodriguez, *Texas A&M International University*
Camelia S. Rotaru, *St. Edward's University*
Salil Sarkar, *University of Texas at Arlington*
Mark Sunderman, *University of Wyoming*
Chu-Sheng Tai, *Texas Southern University*
Oranee Tawatnuntachai, *Pennsylvania State University–Harrisburg*
Benedict Udemgba, *Alcorn State University*
Rahul Verma, *University of Houston–Downtown*
Angelo P. Vignola, *Loyola University–Chicago*
Premal Vora, *Pennsylvania State University–Harrisburg*
Eric Wehrly, *Seattle University*
Yan A. Xie, *University of Michigan–Dearborn*
Fang Zhao, *Siena College*
Sophie Zong, *California State University–Stanislaus*

Class Testers

Tom Berry, *DePaul University*
Eugene Bland, *Texas A&M University–Corpus Christi*
Charles Blaylock, *Murray State University*
Mary Brown, *University of Illinois–Chicago*
Bill Brunsen, *Eastern New Mexico University*
Sarah Bryant Bower, *Shippensburg University of Pennsylvania*
Alva Wright Butcher, *University of Puget Sound*
David G. Cazier, *Brigham Young University–Provo*
Asim G. Celik, *University of Nevada–Reno*
Michaël Dewally, *Marquette University*
Richard Gaddis, *Oklahoma Wesleyan University*
TeWhan Hahn, *Auburn University–Montgomery*
Matthew Hood, *University of Southern Mississippi*
Zhenhu Jin, *Valparaiso University*
Travis Jones, *Florida Gulf Coast University*
Francis E. Laatsch, *Bowling Green State University*
Diane Lander, *Saint Michael's College*
Vance Lesseig, *Texas State University*
Frances Maloy, *University of Washington*
Jamshid Mehran, *Indiana University–South Bend*
Belinda Mucklow, *University of Wisconsin–Madison*
Kuo-Chung Tseng, *California State University–Fresno*
Kermit C. Zieg, Jr., *Florida Institute of Technology*

PART 1

Introduction

Valuation Principle Connection. What is *corporate finance*? No matter what your role in a corporation, an understanding of why and how financial decisions are made is essential. Even the best and most innovative business ideas require an investment of resources. The tools of finance allow you to assess whether that investment is worthwhile, how it might be improved, and how it might be funded. And while the main focus of this book is how to make optimal corporate financial decisions, along the way you will learn skills that will guide you in your own personal financial decisions as well.

In Part 1, we lay the foundation for our study of corporate finance. In Chapter 1, we begin by introducing the corporation and related business forms. We then examine the role of financial managers and outside investors in decision making for the firm. To make optimal decisions, a decision maker needs information. As a result, in Chapter 2, we review and analyze an important source of information for corporate decision making—the firm's accounting statements. These chapters will introduce us to the role and objective of the financial manager and some of the information the financial manager uses in applying the Valuation Principle to make optimal decisions. Then, in Part 2, we will introduce and begin applying the Valuation Principle.

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1

Corporate Finance and the Financial Manager

LEARNING OBJECTIVES

- Grasp the importance of financial information in both your personal and business lives
- Understand the important features of the four main types of firms and see why the advantages of the corporate form have led it to dominate economic activity
- Explain the goal of the financial manager and the reasoning behind that goal, as well as understand the three main types of decisions a financial manager makes
- Know how a corporation is managed and controlled, the financial manager's place in it, and some of the ethical issues financial managers face
- Understand the importance of financial markets, such as stock markets, to a corporation and the financial manager's role as liaison to those markets
- Recognize the role that financial institutions play in the financial cycle of the economy

This book focuses on how people in corporations make financial decisions. Despite its name, much of what we discuss in corporate finance applies to the financial decisions made within any organization, including not-for-profit entities such as charities and universities. In this chapter, we introduce the four main types of firms. We stress corporations, however, because they represent 82% of U.S. business revenue. We also highlight the financial manager's critical role inside any business enterprise. What products to launch, how to pay to develop those products, what profits to keep and how to return profits to investors—all of these decisions and many more fall within corporate finance. The financial manager makes these decisions with the goal of maximizing the value of the business, which is determined in the financial markets. In this chapter and throughout the book, we will focus on this goal, provide you with the tools to make financial management decisions, and show you how the financial markets provide funds to a corporation and produce market prices that are key inputs to any financial manager's investment analysis.

1.1 Why Study Finance?

Finance and financial thinking are everywhere in our daily lives. Consider your decision to go to college. You surely weighed alternatives, such as starting a full-time job immediately, and then decided that college provided you with the greatest net benefit. More and more, individuals are taking charge of their personal finances with decisions such as:

- When to start saving and how much to save for retirement.
- Whether a car loan or lease is more advantageous.
- Whether a particular stock is a good investment.
- How to evaluate the terms of a home mortgage.

Our career paths have become less predictable and more dynamic. In previous generations, it was common to work for one employer your entire career. Today, that would be highly unusual. Most of us will instead change jobs, and possibly even careers, many times. With each new opportunity, we must weigh all the costs and benefits, financial and otherwise.

Some financial decisions, such as whether to pay $3.00 for your morning coffee, are simple, but most are more complex. In your business career, you may face questions such as:

- Should your firm launch a new product?
- Which supplier should your firm choose?
- Should your firm produce a part of the product or outsource production?
- Should your firm issue new stock or borrow money instead?
- How can you raise money for your start-up firm?

In this book, you will learn how all of these decisions in your personal life and inside a business are tied together by one powerful concept, the *Valuation Principle*. The Valuation Principle shows how to make the costs and benefits of a decision comparable so that we can weigh them properly. Learning to apply the Valuation Principle will give you the skills to make the types of comparisons—among loan options, investments, and projects—that will turn you into a knowledgeable, confident financial consumer and manager.

From 2007 to 2009 we witnessed a credit freeze, a severe stock market decline, and the failures of well-known financial institutions. Attempts to understand these elements of the crisis, their origins, and how they affect our businesses and personal finances have highlighted the need for learning core financial principles and concepts.

Whether you plan to major in finance or simply take this one course, you will find the fundamental financial knowledge gained here to be essential in your personal and business lives.

1.2 The Four Types of Firms

We begin our study of corporate finance by examining the types of firms that financial managers run. As shown in Figure 1.1, There are four major types of firms: sole proprietorships, partnerships, limited liability companies, and corporations. We explain each organizational form in turn, but our primary focus is on the most important form—the corporation.

Sole Proprietorships

sole proprietorship A business owned and run by one person.

A **sole proprietorship** is a business owned and run by one person. Sole proprietorships are usually very small with few, if any, employees. Although they do not account for much sales revenue in the economy, they are the most common type of firm in the world. In 2013, an estimated 72% of businesses in the United States were sole proprietorships, although they generated only 4% of the revenue.[1]

We now consider the key features of a sole proprietorship.

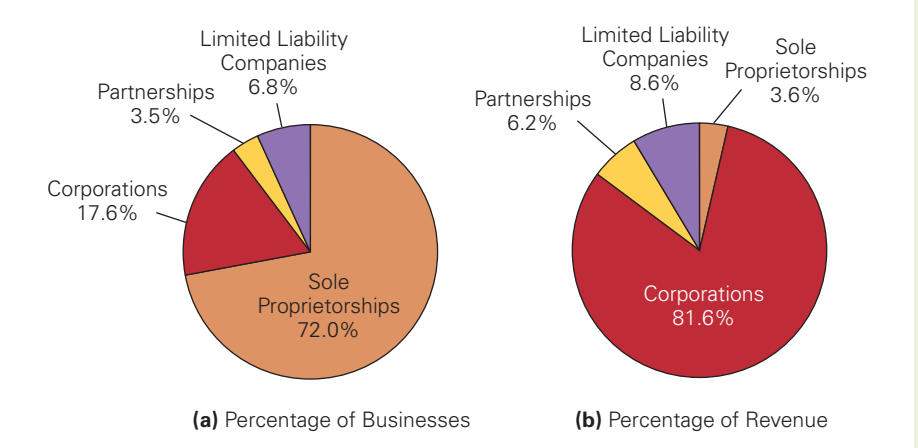
1. Sole proprietorships have the advantage of being straightforward to set up. Consequently, many new businesses use this organizational form.
2. The principal limitation of a sole proprietorship is that there is no separation between the firm and the owner—the firm can have only one owner who runs the business. If there are other investors, they cannot hold an ownership stake in the firm.
3. The owner has unlimited personal liability for the firm's debts. That is, if the firm defaults on any debt payment, the lender can (and will) require the owner to repay the loan from personal assets. An owner who cannot afford to repay a loan for which he or she is personably liable must declare personal bankruptcy.
4. The life of a sole proprietorship is limited to the life of the owner. It is also difficult to transfer ownership of a sole proprietorship.

For most growing businesses, the disadvantages of a sole proprietorship outweigh the advantages. As soon as the firm reaches the point at which it can borrow without the owner agreeing to be personally liable, the owners typically convert the business into another form. Conversion also has other benefits that we will consider as we discuss the other forms below.

FIGURE 1.1

Types of U.S. Firms

There are four major types of firms in the United States. As (a) and (b) show, although the majority of U.S. firms are sole proprietorships, they generate only a small fraction of total revenue, in contrast to corporations.



(a) Percentage of Businesses **(b)** Percentage of Revenue

Source: United States Department of the Treasury, Retrieved from www.irs.gov.

[1]U.S. Census Bureau National Data Book.

Partnerships

partnership A business owned and run by more than one owner.

A **partnership** is a business owned and run by more than one owner. Key features include the following:

1. *All* partners are liable for the firm's debt. That is, a lender can require *any* partner to repay all the firm's outstanding debts.
2. The partnership ends in the event of the death or withdrawal of any single partner.
3. Partners can avoid liquidation if the partnership agreement provides for alternatives such as a buyout of a deceased or withdrawn partner.

Some old and established businesses remain as partnerships or sole proprietorships. Often these firms are the types of businesses in which the owners' personal reputations are the basis for the businesses. For example, law firms, medical practices, and accounting firms are frequently organized as partnerships. For such enterprises, the partners' personal liability increases the confidence of the firm's clients that the partners will strive to maintain the firm's reputation.

limited partnership A partnership with two kinds of owners: general partners and limited partners.

limited liability When an investor's liability is limited to her investment.

A **limited partnership** is a partnership with two kinds of owners: general partners and limited partners. In this case, the general partners have the same rights and privileges as partners in any general partnership—they are personally liable for the firm's debt obligations. Limited partners, however, have **limited liability**—that is, their liability is limited to their investment. Their private property cannot be seized to pay off the firm's outstanding debts. Furthermore, the death or withdrawal of a limited partner does not dissolve the partnership, and a limited partner's interest is transferable. However, a limited partner has no management authority and cannot legally be involved in the managerial decision making for the business.

Limited Liability Companies

limited liability company (LLC) A limited partnership without a general partner.

A **limited liability company (LLC)** is like a limited partnership but without a general partner. That is, all the owners (referred to as *members*) have limited liability, but unlike limited partners, they can also run the business (as managing members). The LLC is a relatively new entity in the United States. The first state to pass a statute allowing the creation of an LLC was Wyoming in 1977; the last was Hawaii in 1997. Internationally, companies with limited liability are much older and established. LLCs first rose to prominence in Germany over 100 years ago as a *Gesellschaft mit beschränkter Haftung* (GmbH) and then in other European and Latin American countries. An LLC is known in France as a Société à responsabilité limitée (SAR), and by similar names in Italy (SRL) and Spain (SL).

Corporations

corporation A legally defined, artificial being, separate from its owners.

A **corporation** is a legally defined, artificial being (a legal entity), separate from its owners. As such, it has many of the legal powers that people have. It can enter into contracts, acquire assets, and incur obligations, and it enjoys protection under the U.S. Constitution against the seizure of its property. Because a corporation is a legal entity separate and distinct from its owners, it is solely responsible for its own obligations. Consequently, the owners of a corporation (or its employees, customers, etc.) are not liable for any obligations the corporation enters into. Similarly, the corporation is not liable for any personal obligations of its owners.

In the same way that it is difficult to imagine modern business life without e-mail and cell phones, the corporation revolutionized the economy. On February 2, 1819, the U.S. Supreme Court established the legal precedent that the property of a corporation,

similar to that of a person, is private and entitled to protection under the U.S. Constitution.[2] This decision led to dramatic growth in the number of U.S. corporations from fewer than 1000 in 1830 to 50,000 in 1890. Today, the corporate structure is ubiquitous, not only in the United States (where it is responsible for 82% of business revenue), but all over the world.

Formation of a Corporation. A corporation must be legally formed, which means that the state in which it is incorporated must formally give its consent to the incorporation by chartering it. Setting up a corporation is therefore considerably more costly than setting up a sole proprietorship. The state of Delaware has a particularly attractive legal environment for corporations, so many corporations choose to incorporate there. For jurisdictional purposes, a corporation is a citizen of the state in which it is incorporated. Most firms hire lawyers to create a corporate charter that includes formal articles of incorporation and a set of bylaws. The corporate charter specifies the initial rules that govern how the corporation is run.

Ownership of a Corporation. There is no limit to the number of owners a corporation can have. Because most corporations have many owners, each owner owns only a fraction of the corporation. The entire ownership stake of a corporation is divided into shares known as **stock**. The collection of all the outstanding shares of a corporation is known as the **equity** of the corporation. An owner of a share of stock in the corporation is known as a **shareholder, stockholder,** or **equity holder**. Shareholders are entitled to **dividend payments**; that is, payments made at the discretion of the corporation to its equity holders. Shareholders usually receive a share of the dividend payments that is proportional to the amount of stock they own. For example, a shareholder who owns 25% of the firm's shares would be entitled to 25% of the total dividend payment.

stock The ownership or equity of a corporation divided into shares.

equity The collection of all the outstanding shares of a corporation.

shareholder (also stockholder or equity holder) An owner of a share of stock or equity in a corporation.

dividend payments Payments made at the discretion of the corporation to its equity holders.

An important feature of a corporation is that there is no limitation on who can own its stock. That is, an owner of a corporation need not have any special expertise or qualification. This feature allows free and anonymous trade in the shares of the corporation and provides one of the most important advantages of organizing a firm as a corporation. Corporations can raise substantial amounts of capital because they can sell ownership shares to anonymous outside investors.

The availability of outside funding has enabled corporations to dominate the economy. Let's look at one of the world's largest firms, Microsoft Corporation, as an example. Microsoft reported annual revenue of $110.4 billion over the 12 months from July 2017 through June 2018. The total value of the company (the owners' collective wealth in the company) as of June 2018 was $768 billion. The company employed 131,000 people. Putting these numbers into perspective, treating the sales of $110.4 billion as gross domestic product (GDP) in 2017 would rank Microsoft (just ahead of Morocco) as the 62nd richest *country* (out of almost 200).[3] Morocco has almost 35.8 million people, about 272 times as many people as employees at Microsoft. Indeed, if the number of Microsoft employees were used as the "population" of the corporation, Microsoft would rank just above Curacao as the 32nd least populous country on Earth!

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[2] The case was Dartmouth v. Woodward and the full text of John Marshall's decision can be found at www.constitution.org/dwebster/dartmouth_decision.htm.

[3] World Development Indicators database, March 24, 2019. For quick reference tables on GDP, go to http://data.worldbank.org/indicator/NY.GDP.MKTP.CD.

Tax Implications for Corporate Entities

An important difference among the types of corporate organizational forms is the way they are taxed. Because a corporation is a separate legal entity, a corporation's profits are subject to taxation separate from its owners' tax obligations. In effect, shareholders of a corporation pay taxes twice. First, the corporation pays tax on its profits, and then when the remaining profits are distributed to the shareholders, the shareholders pay their own personal income tax on this income. This system is sometimes referred to as *double taxation*.

EXAMPLE 1.1
Taxation of Corporate Earnings

PROBLEM

You are a shareholder in a corporation. The corporation earns $8.00 per share before taxes. After it has paid taxes, it will distribute the rest of its earnings to you as a dividend (we make this simplifying assumption, but should note that most corporations retain some of their earnings for reinvestment). The dividend is income to you, so you will then pay taxes on these earnings. The corporate tax rate is 25% and your tax rate on dividend income is 20%. How much of the earnings remains after all taxes are paid?

SOLUTION

PLAN

Earnings before taxes: $8.00 Corporate tax rate: 25% Personal dividend tax rate: 20%

To calculate the corporation's earnings after taxes, first we subtract the taxes paid at the corporate level from the pretax earnings of $8.00. The taxes paid will be 25% (the corporate tax rate) of $8.00. Since all of the after-corporate tax earnings will be paid to you as a dividend, you will pay taxes of 20% on that amount. The amount leftover is what remains after all taxes are paid.

EXECUTE

$8.00 per share $\times$ 0.25 $=$ $2.00 in taxes at the corporate level, leaving $8.00 $-$ $2.00 $=$ $6.00 in after-corporate tax earnings per share to distribute.

You will pay $6.00 $\times$ 20% $=$ $1.20 in taxes on that dividend, leaving you with $4.80 from the original $8.00 after all taxes.

EVALUATE

As a shareholder, you keep $4.80 of the original $8.00 in earnings; the remaining $2.00 $+$ $1.20 $=$ $3.20 is paid as taxes. Thus, your total effective tax rate is 3.20/8 $=$ 40%.

S corporations Those corporations that elect subchapter S tax treatment and are exempted by the U.S. Internal Revenue Service's tax code from double taxation.

S Corporations. The corporate organizational structure is the only organizational structure subject to double taxation. However, the U.S. Internal Revenue Code exempts **S corporations** from double taxation because they elect subchapter S tax treatment. Under subchapter S tax regulations, the firm's profits (and losses) are not subject to corporate taxes, but instead are allocated directly to shareholders based on their ownership share. The shareholders must include these profits as income on their individual tax returns (even if no money is distributed to them). However, after the shareholders have paid income taxes on these profits, no further tax is due.

Corporate Taxation Around the World

Most countries offer investors in corporations some relief from double taxation. Thirty countries make up the Organization for Economic Co-operation and Development (OECD), and of these countries, only Ireland offers no relief whatsoever. A few countries, including Australia, Finland, Mexico, New Zealand, and Norway, offer complete relief by effectively not taxing dividend income. The United States offers partial relief by having a lower tax rate on dividend income than on other sources of income. As of 2018, for most investors qualified dividends are taxed at up to 20%, a rate significantly below their personal income tax rate. Despite this relief, the effective corporate tax rate in the U.S. had been one of the highest in the world— nearly 30% above the median for the OECD in 2017. The Tax Cut and Jobs Act of 2017 (TCJA) significantly reduced this differential by lowering the federal corporate tax rate from 35% to 21% in 2018.

EXAMPLE 1.2
Taxation of S Corporation Earnings

PROBLEM

Rework Example 1.1, assuming the corporation in that example has elected subchapter S tax treatment and your tax rate on non-dividend income is 35%.

SOLUTION

PLAN

Earnings before taxes: $8.00 Corporate tax rate: 0% Personal tax rate: 35%

In this case, the income is not taxed at the corporate level. It earned $8.00 per share. In an S corporation, all income is treated as personal income to you, whether or not the corporation chooses to distribute or retain this cash. As a result, you must pay a 35% tax rate on those earnings.

EXECUTE

Your income taxes are $0.35 \times \$8.00 = \$2.80$, leaving you with $\$8.00 - \$2.80 = \$5.20$ in after-tax earnings.

EVALUATE

The $2.80 in taxes that you pay is lower than the $3.20 you paid in Example 1.1. As a result, you are left with $5.20 per share after all taxes instead of $4.80. In reality the tax savings might be even higher. Under the new tax code some owners of S Corporations will be able to shield 20% of their income from taxes. However, note that in a C corporation, you are only taxed when you receive the income as a dividend, whereas in an S corporation, you pay taxes on the income immediately regardless of whether the corporation distributes it as a dividend or reinvests it in the company.

C corporations
Corporations that have no restrictions on who owns their shares or the number of shareholders; they cannot qualify for subchapter S tax treatment and are subject to direct taxation.

C Corporations. The government places strict limitations on the qualifications for subchapter S tax treatment. In particular, the shareholders of such corporations must be individuals who are U.S. citizens or residents, and there can be no more than 100 of them. Because most corporations have no restrictions on who owns their shares or the number of shareholders, they cannot qualify for subchapter S tax treatment. Thus, most corporations are **C corporations**, which are corporations subject to corporate taxes.

As we have discussed, there are four main types of firms: sole proprietorships, partnerships (general and limited), limited liability companies, and corporations ("S" and "C"). To help you see the differences among them, Table 1.1 compares and contrasts the main characteristics of each.

TABLE 1.1
Characteristics of the Different Types of Firms

	Number of Owners	Liability for Firm's Debts	Owners Manage the Firm	Ownership Change Dissolves Firm	Taxation
Sole Proprietorship	One	Yes	Yes	Yes	Personal
Partnership	Unlimited	Yes; each partner is liable for the entire amount	Yes	Yes	Personal
Limited Partnership	At least one general partner (GP), no limit on limited partners (LP)	GP-Yes LP-No	GP-Yes LP-No	GP-Yes LP-No	Personal
Limited Liability Company	Unlimited	No	Yes	No*	Personal
S Corporation	At most 100	No	No (but they legally may)	No	Personal
C Corporation	Unlimited	No	No (but they legally may)	No	Double

*However, most LLCs require the approval of the other members to transfer your ownership.

CONCEPT CHECK

1. What is a limited liability company (LLC)? How does it differ from a limited partnership?
2. What are the advantages and disadvantages of organizing a business as a corporation?

1.3 The Financial Manager

As of December 2018, Apple, Inc. had over 4.7 *billion* shares of stock held by 24,000 owners.[4] Because there are many owners of a corporation, each of whom can freely trade their stock, it is often not feasible for the owners of a corporation to have direct control of the firm. It falls to the financial manager to make the financial decisions of the business for the stockholders. Within the corporation, the financial manager has three main tasks:

1. Make investment decisions.
2. Make financing decisions.
3. Manage short-term cash needs.

We will discuss each of these in turn, along with the financial manager's overarching goal.

Making Investment Decisions

The financial manager's most important job is to make the firm's investment decisions. The financial manager must weigh the costs and benefits of each investment or project and decide which ones qualify as good uses of the money stockholders have invested in the firm. These investment decisions fundamentally shape what the firm does and whether it will add value for its owners. For example, it may seem hard to imagine now, but there was a time when Apple's financial managers were evaluating whether to invest in the development of the first iPhone. They had to weigh the substantial development and production costs against uncertain future sales. Their analysis indicated that it was a good investment, and the rest is history. In this book, you will learn all the tools necessary to make these investment decisions.

GLOBAL FINANCIAL CRISIS

The Dodd-Frank Act

In response to the 2008 financial crisis, the U.S. federal government reevaluated its role in the control and management of financial institutions and private corporations. Signed into law on July 21, 2010, the **Dodd-Frank Wall Street Reform and Consumer Protection Act** brought a sweeping change to financial regulation in response to widespread calls for financial regulatory system reform after the near collapse of the world's financial system in the fall of 2008 and the ensuing global credit crisis. History indeed repeats itself: It was in the wake of the 1929 stock market crash and subsequent Great Depression that Congress passed the Glass-Steagall Act establishing the Federal Deposit Insurance Corporation (FDIC) and instituted significant bank reforms to regulate transactions between commercial banks and securities firms.

The Dodd-Frank Act aims to (1) promote U.S. financial stability by "improving accountability and transparency in the financial system," (2) put an end to the notion of "too big to fail," (3) "protect the American taxpayer by ending bailouts," and (4) "protect consumers from abusive financial services practices." Time will tell whether the Act will actually achieve these important goals.

Implementing the wide-ranging financial reforms in the Dodd-Frank Act requires the work of many federal agencies, either through rulemaking or other regulatory actions. By mid-2018, just over two-thirds of the rules had been finalized. But as the financial crisis has faded from memory and political priorities have changed, there is increasing pressure to roll back many of the Dodd-Frank reforms. For example, small- and medium-sized banks have been exempted from many of the Act's regulations, and the Consumer Financial Protection Board, which was created by the Act, has sharply curtailed its activity under new leadership. Finally, significant changes to the "Volcker rule," which bars banks from engaging in speculative trading, are being considered by the Federal Reserve. While these changes are intended to reduce the cost of financial services, the extent to which they increase the risk of another financial crisis remains to be seen.

[4] Apple, Inc., Notice of 2019 Annual Meeting of Shareholders, January 8, 2019.

Making Financing Decisions

Once the financial manager has decided which investments to make, he or she also decides how to pay for them. Large investments may require the corporation to raise additional money. The financial manager must decide whether to raise more money from new and existing owners by selling more shares of stock (equity) or to borrow the money instead (bonds and other debt). A bond is a security sold by governments and corporations to raise money from investors today in exchange for a promised future payment. It can be viewed as a loan from those investors to the issuer. In this book, we will discuss the characteristics of each source of money and how to decide which one to use in the context of the corporation's overall mix of debt and equity.

Managing Short-Term Cash Needs

The financial manager must ensure that the firm has enough cash on hand to meet its obligations from day to day. This job, also commonly known as *managing working capital*,[5] may seem straightforward, but in a young or growing company, it can mean the difference between success and failure. Even companies with great products require a lot of money to develop and bring those products to market. Consider the costs to Starbucks of launching their VIA instant coffee, which included developing the instant coffee crystals and creating a big marketing campaign for them, or the costs to Boeing of producing the 787—billions of dollars were spent before the first 787 finally left the ground in December 2009. A company typically burns through a significant amount of cash before the sales of the product generate income. The financial manager's job is to make sure that limited access to cash does not hinder the firm's success.

The Goal of the Financial Manager

All of these decisions by the financial manager are made within the context of the overriding goal of financial management—*to maximize the wealth of the owners, the stockholders*. The stockholders have invested in the corporation, putting their money at risk to become the owners of the corporation. Thus, the financial manager is a caretaker of the stockholders' money, making decisions in their interests. Many corporations have thousands of owners (shareholders). These shareholders vary from large institutions to small first-time investors, from retirees living off their investments to young employees just starting to save for retirement. Each owner is likely to have different interests and priorities. Whose interests and priorities determine the goals of the firm? You might be surprised to learn that the interests of shareholders are aligned for many, if not most, important decisions. Regardless of their own personal financial position and stage in life, all the shareholders will agree that they are better off if the value of their investment in the corporation is maximized. For example, suppose the decision concerns whether to develop a new product that will be a profitable investment for the corporation. All shareholders will very likely agree that developing this product is a good idea. Returning to our iPhone example, by October 2010, Apple shares were worth three times as much as they were in January 2007, when the first iPhone was introduced. All Apple shareholders at the time of the development of

[5] *Working capital* refers to things such as cash on hand, inventories, raw materials, loans to suppliers, and payments from customers—the grease that keeps the wheels of production moving. We will discuss working capital in more detail in Chapter 2 and devote all of Chapter 19 to working capital management.

the first iPhone are clearly much better off because of it, whether they have since sold their shares of Apple to pay for retirement, or are still holding those shares in their retirement savings account.

Even when all the owners of a corporation agree on the goals of the corporation, these goals must be implemented. In the next section, we will discuss the financial manager's place in the corporation and how owners exert control over the corporation.

Shareholder Value Versus Stakeholder Value

While the goal of a financial manager is to increase the value of the firm to its shareholders, this responsibility does not imply that the impact of the firm's decisions on other stakeholders, such as employees or customers, can be ignored. By creating additional value for customers, the firm can raise prices and increase profits. Similarly, if the firm makes decisions that benefit employees (for example, increasing their job security), it will be able to attract the best employees or benefit from increased productivity. On the other hand, if customers or employees anticipate that the firm is likely to exploit them, they will demand lower prices or higher wages. Thus, to maximize shareholder value, the financial manager must consider the impact of her decision on all stakeholders of the firm.

CONCEPT CHECK

3. What are the main types of decisions that a financial manager makes?
4. What is the goal of the financial manager?

1.4 The Financial Manager's Place in the Corporation

We've established that the stockholders own the corporation but rely on financial managers to actively manage the corporation. The *board of directors* and the management team headed by the *chief executive officer* possess direct control of the corporation. In this section, we explain how the responsibilities for the corporation are divided between these two entities and describe conflicts that arise between stockholders and the management team.

The Corporate Management Team

board of directors A group of people elected by shareholders who have the ultimate decision-making authority in the corporation.

The shareholders of a corporation exercise their control by electing a **board of directors**, a group of people who have the ultimate decision-making authority in the corporation. In most corporations, each share of stock gives a shareholder one vote in the election of the board of directors, so investors with more shares have more influence. When one or two shareholders own a very large proportion of the outstanding stock, these shareholders might either be on the board of directors themselves, or they may have the right to appoint a number of directors.

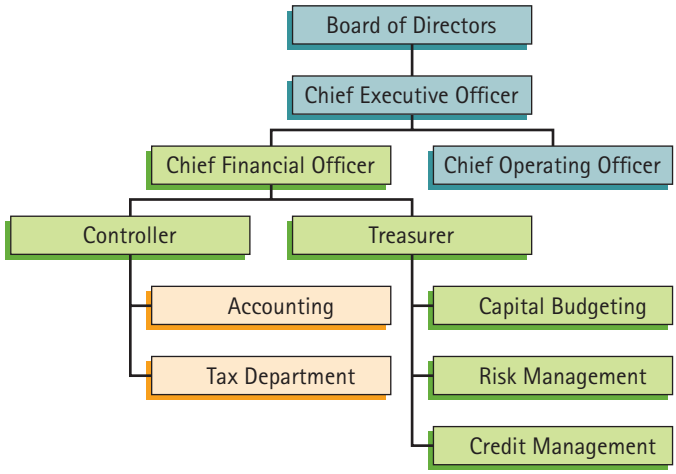
chief executive officer (CEO) The person charged with running the corporation by instituting the rules and policies set by the board of directors.

The board of directors makes rules on how the corporation should be run (including how the top managers in the corporation are compensated), sets policy, and monitors the performance of the company. The board of directors delegates most decisions that involve the day-to-day running of the corporation to its management. The **chief executive officer (CEO)** is charged with running the corporation by instituting the rules and policies set by the board of directors. The size of the rest of the management team varies from corporation to corporation. In some corporations, the separation of powers between the board of directors and CEO is not always distinct. In fact, the CEO can also be the chair of the board of directors (although in that case, there would also be a lead independent director to balance the CEO's power). The most senior financial manager is the chief financial officer (CFO), often reporting directly to the CEO. Figure 1.2 presents part of a typical organizational chart for a corporation, highlighting the positions a financial manager may take.

FIGURE 1.2

The Financial Functions Within a Corporation

The board of directors, representing the stockholders, controls the corporation and hires the top management team. A financial manager might hold any of the green-shaded positions, including the Chief Financial Officer (CFO) role. The controller oversees accounting and tax functions. The treasurer oversees more traditional finance functions, such as capital budgeting (making investment decisions), risk management (managing the firm's exposure to movements in the financial markets), and credit management (managing the terms and policies of any credit the firm extends to its customers).



Ethics and Incentives in Corporations

A corporation is run by a management team, separate from its owners. How can the owners of a corporation ensure that the management team will implement their goals?

agency problem When managers, despite being hired as the agents of shareholders, put their self-interest ahead of the interests of those shareholders.

Agency Problems. Many people claim that because of the separation of ownership and control in a corporation, managers have little incentive to work in the interests of the shareholders when this means working against their self-interest. Economists call this an **agency problem**—when managers, despite being hired as the agents of shareholders, put their self-interest ahead of the interests of those shareholders. Managers face the ethical dilemma of whether to adhere to their responsibility to put the interests of shareholders first, or to do what is in their personal best interests. This problem is commonly addressed in practice by minimizing the number of decisions managers make that require putting their self-interest against the interests of the shareholders. For example, managers' compensation contracts are designed to ensure that most decisions in the shareholders' interest are also in the managers' interests; shareholders often tie the compensation of top managers to the corporation's profits or perhaps to its stock price. There is, however, a limitation to this strategy. By tying compensation too closely to performance, shareholders might be asking managers to take on more risk than they are comfortable taking. As a result, the managers may not make decisions that shareholders want them to, or it might be hard to find talented managers willing to accept the job. For example, biotech firms take big risks on drugs that fight cancer, AIDS, and other widespread diseases. The market for a successful drug is huge, but the risk of failure is high. Investors who put only some of their money in biotech may be comfortable with this risk, but managers who have all of their compensation tied to the success of such a drug might opt to develop a less risky drug that has a smaller market.

GLOBAL FINANCIAL CRISIS

The Dodd-Frank Act on Corporate Compensation and Governance

Compensation is one of the most important conflicts of interest between corporate executives and shareholders. To limit senior corporate executives' influence over their own compensation and prevent excessive compensation, the Act directs the SEC to adopt new rules that:

- Mandate the independence of a firm's compensation committee and its advisers.
- Provide shareholders the opportunity to approve—in a non-binding, advisory vote—the compensation of executive officers at least once every three years (referred to as a "Say-on-Pay" vote).
- Require firm disclosure and shareholder approval of large bonus payments (so-called "golden parachutes") to ousted senior executives as the result of a takeover.
- Require disclosure of the relationship of executive pay to the company's performance, as well as the ratio between the CEO's total compensation and that of the median employee.
- Create "clawback" provisions that allow firms to recoup compensation paid based on erroneous financial results.

Further potential for conflicts of interest and ethical considerations arise when some stakeholders in the corporation benefit and others lose from a decision. Shareholders and managers are two stakeholders in the corporation, but others include the regular employees and the communities in which the company operates, for example. Managers may decide to take the interests of other stakeholders into account in their decisions, such as keeping a loss-generating factory open because it is the main provider of jobs in a small town, paying above local market wages to factory workers in a developing country, or operating a plant at a higher environmental standard than local law mandates.

In some cases, these actions that benefit other stakeholders may also benefit the firm's shareholders by creating a more dedicated workforce, generating positive publicity with customers, or other indirect effects. In other instances, when these decisions benefit other stakeholders at shareholders' expense, they represent a form of corporate charity. Indeed, many if not most corporations explicitly donate (on behalf of their shareholders) to local and global causes. Shareholders often approve of such actions, even though they are costly and so reduce their wealth. While it is the manager's job to make decisions that maximize shareholder value, shareholders—who own the firm—also want the firm's actions to reflect their moral and ethical values. Of course, shareholders may not have identical preferences in these matters, leading to potential sources of conflict.

The CEO's Performance. Another way shareholders can encourage managers to work in the interests of shareholders is to discipline them if they do not. If shareholders are unhappy with a CEO's performance, they could, in principle, pressure the board to oust the CEO. Disney's Michael Eisner, Hewlett-Packard's Carly Fiorina, and Home Depot's Robert Nardelli were all forced to resign by their boards. Despite these high-profile examples, directors and top executives are rarely replaced through a grassroots shareholder uprising. Instead, dissatisfied investors often choose to sell their shares. Of course, somebody must be willing to buy the shares from the dissatisfied shareholders. If enough shareholders are dissatisfied, the only way to entice investors to buy (or hold) the shares is to offer them a low price. Similarly, investors who see a well-managed corporation, will want to purchase shares, which drives the stock price up. Thus, the stock price of the corporation

Citizens United v. Federal Election Commission

On January 21, 2010, the U.S. Supreme Court ruled on what some scholars have argued is the most important First Amendment case in many years. In *Citizens United v. Federal Election Commission*, the Court held, in a controversial 5–4 decision, that the First Amendment allows corporations and unions to make political expenditures in support of a particular candidate. This ruling overturned existing restrictions on political campaigning by corporations. Because it is highly unlikely that all shareholders of a corporation would unanimously support a particular candidate, allowing such activities effectively guarantees a potential conflict of interest.

is a barometer for corporate leaders that continuously gives them feedback on the shareholders' opinion of their performance.

When the stock performs poorly, the board of directors might react by replacing the CEO. In some corporations, however, the senior executives might be entrenched because boards of directors do not have the independence or motivation to replace them. Often, the reluctance to fire results when the board is comprised of people who are close friends of the CEO and lack objectivity. In corporations in which the CEO is entrenched and doing a poor job, the expectation of continued poor performance will cause the stock price to be low. Low stock prices create a profit opportunity. In a **hostile takeover**, an individual or organization—sometimes known as a *corporate raider*—purchases a large fraction of a company's stock and in doing so gets enough votes to replace the board of directors and the CEO. With a new superior management team, the stock is a much more attractive investment, which would likely result in a price rise and a profit for the corporate raider and the other shareholders. Although the words "hostile" and "raider" have negative connotations, corporate raiders provide an important service to shareholders. The mere threat of being removed as a result of a hostile takeover is often enough to discipline bad managers and motivate boards of directors to make difficult decisions. Consequently, the fact that a corporation's shares can be publicly traded creates a "market for corporate control" that encourages managers and boards of directors to act in the interests of their shareholders.

hostile takeover A situation in which an individual or organization—sometimes referred to as a *corporate raider*—purchases a large fraction of a company's stock and in doing so gets enough votes to replace the board of directors and its CEO.

CONCEPT CHECK

5. How do shareholders control a corporation?
6. What types of jobs would a financial manager have in a corporation?
7. What ethical issues could confront a financial manager?

1.5 The Stock Market

In Section 1.3, we established the goal of the financial manager: to maximize the wealth of the owners, the stockholders. The value of the owners' investments in the corporation is determined by the price of a share of the corporation's stock. Corporations can be private or public. A private corporation has a limited number of owners and there is no organized market for its shares, making it hard to determine the market price of its shares at any point in time. A public corporation has many owners and its shares trade on an organized market, called a **stock market (or stock exchange or bourse)**. These markets provide *liquidity* for a company's shares and determine the market price for those shares. An investment is **liquid** if it can be easily turned into cash by selling it immediately at a competitive market price. An investor in a public company values the ability to turn his investment into cash easily and quickly by simply selling his shares on one of these markets. In this section, we provide an overview of the functioning of the major stock markets. The analysis and trading by participants in these markets provides an evaluation of the financial managers' decisions that determines the stock price and provides essential feedback to the managers on their decisions.

stock market (also stock exchange or bourse) Organized market on which the shares of many corporations are traded.

liquid Describes an investment that can be easily turned into cash because it can be sold immediately at a competitive market price.

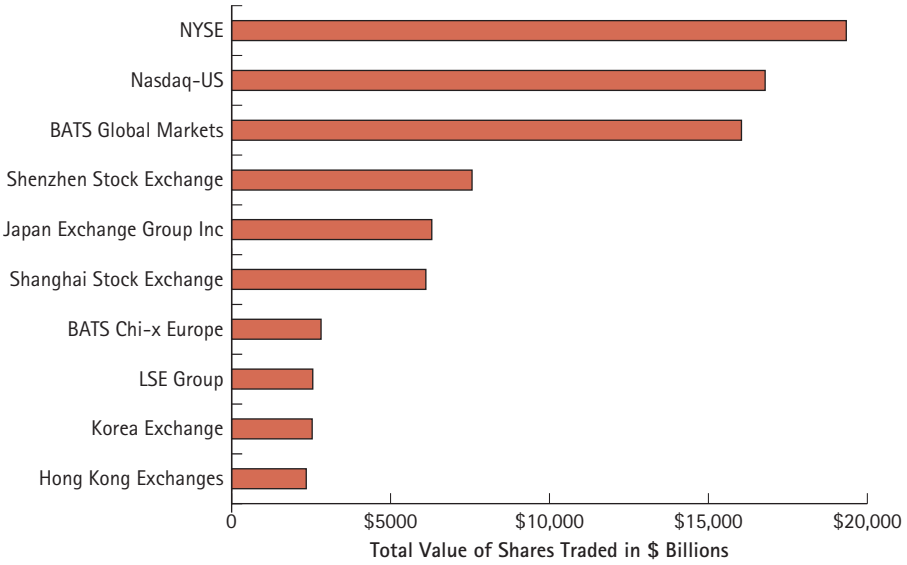
The Largest Stock Markets

The best known U.S. stock market and one of the largest stock markets in the world is the New York Stock Exchange (NYSE). Billions of dollars of stock are exchanged every day on the NYSE. The other well-known U.S. stock market is the Nasdaq (the National Association of Security Dealers Automated Quotations). Most other countries have at least one stock market. The biggest outside the U.S. are the Shenzhen Exchange in China and the combined Tokyo and Osaka Exchanges in Japan. Figure 1.3 ranks the world's largest stock exchanges by trading volume and reflects the recent rise in importance of electronic exchanges such as BATS Global Markets and BATS Chi-x, which we discuss later in this section.

FIGURE 1.3

Worldwide Stock Markets Ranked by Volume of Trade

The bar graph shows the 10 biggest stock markets in the world ranked by total value of shares traded on exchange in 2018.



Source: www.world-exchanges.org.

primary market When a corporation issues new shares of stock and sells them to investors.

secondary market Markets, such as NYSE or Nasdaq, where shares of a corporation are traded between investors without the involvement of the corporation.

market makers Individuals or companies at an exchange who match buyers with sellers.

specialists Market makers at the NYSE.

bid price The price at which a market maker is willing to buy a security.

ask price The price at which a market maker is willing to sell a security.

Primary Versus Secondary Markets

All of the markets in Figure 1.3 are secondary markets. The **primary market** refers to a corporation issuing new shares of stock and selling them to investors. After this initial transaction between the corporation and investors, the shares continue to trade in a **secondary market** between investors without the involvement of the corporation. For example, if you wish to buy 100 shares of Starbucks Coffee, you could place an order on the Nasdaq, where Starbucks trades under the ticker symbol SBUX. You would buy your shares from someone who already held shares of Starbucks, not from Starbucks itself. Because firms only occasionally issue new shares, secondary market trading accounts for the vast majority of trading in the stock market.

Traditional Trading Venues

Historically, firms would choose one stock exchange to list their stock, and almost all trade in the stock would occur on that exchange. In the U.S., the two most important exchanges are the New York Stock Exchange (NYSE) and the Nasdaq.

Prior to 2005, almost all trade on the NYSE took place on the exchange's trading floor in lower Manhattan. **Market makers** (known then on the NYSE as **specialists**) matched buyers and sellers. They posted two prices for every stock they made a market in: the price they stood willing to buy the stock at (the **bid price**) and the price they stood willing to sell the stock for (the **ask price**). When a customer arrived wanting to make a trade at these prices, they would honor the price (up to a limited number of shares) and would make the trade even if they did

INTERVIEW WITH FRANK HATHEWAY

As Chief Economist and Senior Vice President for Nasdaq, Dr. Frank Hatheway leads a team of 20 professionals who serve as an internal consultancy for the Nasdaq markets. Their work includes designing new features, evaluating operations markets, and advising on strategic initiatives.

QUESTION: ***Compared to 15 years ago, the number of potential trading venues for investors has changed dramatically. Who have these changes benefited?***

ANSWER: The number of trading venues has increased dramatically. In 2000 you placed an order on Nasdaq or the NYSE, and the majority of trading activity in that stock occurred on the same market as your order. That's not the case anymore. Your trade may be executed on the National Stock Exchange, BATS, or one of 10 other exchanges. To deal with the soaring number of venues, trading became highly automated and highly competitive, benefiting both individual and institutional investors. A fast retail trade in the 1980s took about three minutes and cost over $100 (in 1980s money). Now it's a mouse click, browser refresh, and maybe $20 (in 2016 money). Trading costs for individual investors are down over 90 percent since 2000. Institutional-size block orders are also cheaper and easier to trade today.

Automation has virtually removed traditional equity traders like the market makers, specialists, and floor brokers at the exchanges. As the head of the trading desk for a major firm quipped around 2006, "I used to have 100 traders and 10 IT guys. I now have 100 IT guys and 10 traders." The once bustling New York Stock Exchange floor is now essentially a TV studio.

QUESTION: ***How have these changes affected market liquidity?***

ANSWER: Liquidity is very transitory. The computer algorithms controlling trading constantly enter orders into the market and remove orders if the order fails to trade or if market conditions change. The algorithms quickly re-enter removed orders into the market, leading to rapidly changing prices and quantities. Also, numerous studies show that there is more liquidity in the market today. To control an order 15 years ago, you phoned your broker with your instructions. Today, the algorithm you selected controls the order and can change the order almost instantly. Because computers have more control over orders than human traders did, there is less risk associated with placing an order. Consequently there are more orders and greater liquidity.

QUESTION: ***How has Nasdaq been affected by these changes and what does the future hold?***

ANSWER: Nasdaq has become an innovative, technologically savvy company—much like the companies we list. Fifteen years ago we operated a single stock market in the United States. Thanks to increased technological efficiency, today we operate three stock markets, three listed-options markets, and a futures market. Operating these seven markets requires less than half the personnel required for a single market 15 years ago. To compete in this environment, Nasdaq had to develop a better trading system to handle our increased order volume. Order volume that took an entire day to process 15 years ago, today takes a few seconds. We've also transformed our culture from supporting an industry based on human traders to one based on algorithmic traders and the IT professionals who design those algorithms.

QUESTION: ***Is High Frequency Trading a cause for concern in the market? Should it be limited?***

ANSWER: Specific concerns about High Frequency Trading are generally about market disruptions and manipulation, and cases center around the operation of trading algorithms. I believe market oversight is evolving to appropriately address disruptive or manipulative activity.

These days essentially every order in the United States is handled by a computer trading algorithm. Simply put, we are all High Frequency Traders. Consequently, limiting High Frequency Trading should not be a policy objective. What should be a policy objective is making sure that equity markets benefit investors and issuers by ensuring that the algorithms do not disrupt the markets and that they operate in a manner that is fair to investors. The market exists to support capital formation and economic growth. Market operators such as Nasdaq work with regulators and others to look after the interests of investors and issuers.

liquidity Extent to which the market for an asset is liquid, meaning that assets can be easily turned into cash because they can be sold immediately at competitive market prices.

bid-ask spread The amount by which the ask price exceeds the bid price.

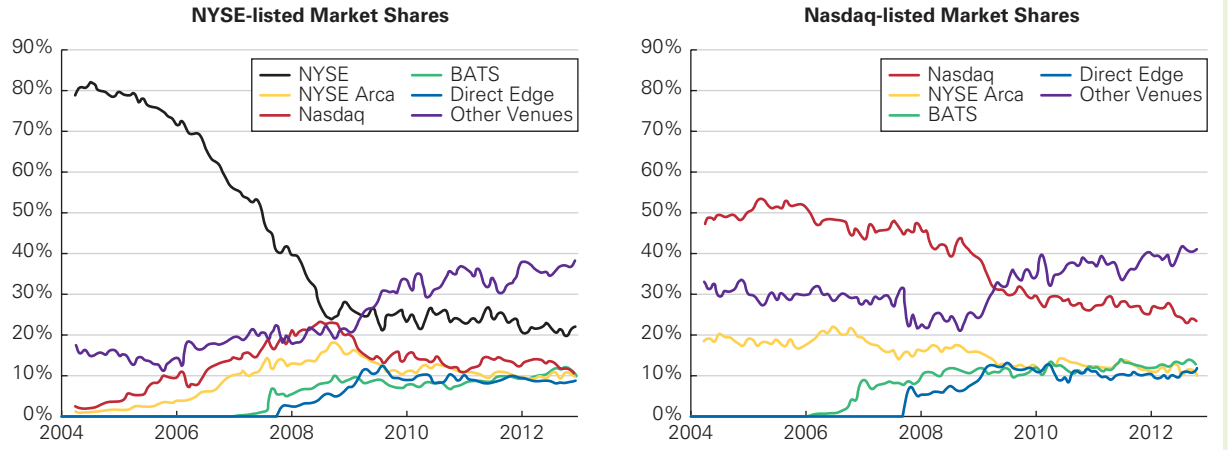
not have another customer willing to take the other side of the trade. In this way, they provided **liquidity** by ensuring market participants that they always had somebody to trade with.

In contrast to the NYSE, the Nasdaq market never had a trading floor. Instead all trades were completed over the phone or on a computer network. An important difference between the NYSE and Nasdaq was that on the NYSE, each stock had only one market maker. On Nasdaq, stocks had multiple market makers who competed with each other. Each market maker posted bid and ask prices in the Nasdaq network which were viewed by all participants.

Market makers make money because ask prices exceed bid prices. This difference is called the **bid-ask spread**. Customers always buy at the ask (the higher price) and sell at

FIGURE 1.4

Distribution of trading volume for NYSE-listed (left panel) and Nasdaq-listed (right panel) stocks. NYSE Arca is the electronic trading platform of the NYSE. BATS and Direct Edge merged in 2014; these new electronic exchanges now handle about 20% of all trades. Other venues, including internal dealer platforms and so called "dark pools," accounted for almost 40% of all trades in 2015.



Source: J. Angel, L. Harris, and C. Spatt, "Equity Trading in the 21st Century: An Update," *Quarterly Journal of Finance* 5 (2015): 1–39.

transaction cost In most markets, an expense such as a broker commission and the bid-ask spread investors must pay in order to trade securities.

the bid (the lower price). The bid-ask spread is a **transaction cost** investors pay in order to trade. Because specialists on the NYSE took the other side of the trade from their customers, this cost accrued to them as a profit. This was the compensation they earned for providing a liquid market by standing ready to honor any quoted price. Investors also paid other forms of transactions costs like commissions.

New Competition and Market Changes

Stock markets have gone through enormous changes in the last 15 years. In 2005, the NYSE and Nasdaq exchanges accounted for over 75% of all trade in U.S. stocks. Since that time, however, competition from new fully electronic exchanges and alternative trading systems has caused their market share to dramatically decline, as shown in Figure 1.4. Today, these new entrants handle more than 50% of all trades.

With this change in market structure, the role of an official market maker has largely disappeared. Because all transactions occur electronically with computers matching buy and sell orders, anybody can make a market in a stock by posting a **limit order**. A limit order is an order to buy or sell a set amount at a fixed price. For example, an order to buy 100 shares of IBM at a price of $138/share is a limit buy order. The bid-ask spread of a stock is determined by the outstanding limit orders. The limit sell order with the lowest price is the ask price. The limit buy order with the highest price is the bid price. Traders make the market in the stock by posting limit buy and sell orders. The collection of all limit orders is known as the **limit order book**. Exchanges make their limit order books public so that investors (or their brokers) can see the best bid and ask prices when deciding where to trade.

limit order Order to buy or sell a set amount of a security at a fixed price.

limit order book Collection of all current limit orders for a given security.

market orders Orders to trade immediately at the best outstanding limit order available.

Traders who post limit orders provide liquidity to the market. On the other hand, traders who place **market orders**—orders that trade immediately at the best outstanding limit order—are said to be "takers" of liquidity. Providers of liquidity earn the bid-ask spread, but in doing so they risk the possibility that their orders will become stale: When news about the stock arrives that causes the price of the stock to move, smart traders will quickly take advantage of the existing limit orders by executing trades at the old prices. To protect

themselves against this possibility, liquidity providers need to constantly monitor the market, cancelling old orders and posting new orders when appropriate. So called **high frequency traders (HFTs)** are a class of traders who, with the aid of computers, place, update, cancel, and execute trades many times per second in response to new information as well as other orders, profiting by both providing liquidity and taking advantage of stale limit orders.

high frequency traders (HFTs) Traders who place, update, cancel, and execute trades many times per second.

Dark Pools

When trading on an exchange, investors are guaranteed the opportunity to trade immediately at the current bid or ask price, and transactions are visible to all traders when they occur. In contrast, alternative trading systems called **dark pools** do not make their limit order books visible. Instead, these dark pools offer investors the ability to trade at a better price (for example, the average of the bid and ask, thus saving the bid-ask spread) with the tradeoff that their order might not be filled if an excess of either buy or sell orders is received. Trading on a dark pool is therefore attractive to traders who do not want to reveal their demand and who are willing to sacrifice the guarantee of immediacy for potential price improvement.

dark pools Trading venues in which the size and price of orders are not disclosed to participants. Prices are within the best bid and ask prices available in public markets, but traders face the risk their orders may not be filled if an excess of either buy or sell orders is received.

When dark pools are included, researchers estimate that in the U.S. alone there could be as many 50 venues to trade stocks. These venues compete with one another for order volume. Because traders value liquid markets, an important area of competition is liquidity—exchanges try to ensure that their limit order books are deep, that is, contain many orders. As a result exchanges have been experimenting with different rules designed to encourage traders who provide liquidity and discourage traders who take advantage of stale limit orders. For example, some trading venues pay traders to post limit orders and charge traders who place market orders. Others pay for volume from retail investors, and impose additional charges on high frequency trading. The proliferation of exchange venues has generated a wide variety of different compensation schemes. Indeed, BATS (which stands for Better Alternative Trading System) operates different markets with different rules, essentially tailoring their markets to the perceived needs of their customers. It is highly unlikely that we have seen the end of these changes. Stock markets remain in a state of flux, and only time will tell what the eventual shakeout will look like.

Listing Standards

Each exchange has its own **listing standards**, outlines of the requirements a company must meet to be traded on the exchange. These standards usually require that the company has enough shares outstanding for shareholders to have a liquid market and to be of interest to a broad set of investors. The NYSE's standards are more stringent than those of Nasdaq; traditionally, there has been a certain pride in being listed on the NYSE. Many companies would start on the Nasdaq and then move to the NYSE as they grew. However, Nasdaq has retained many big, successful companies such as Starbucks, Apple, and Microsoft. The two exchanges compete actively over listings of larger companies (Nasdaq landed Facebook and the NYSE won Twitter's listing) and the decision of where to list often comes down to which exchange the company's board believes will give its stockholders the best execution and liquidity for their trades.

listing standards Outlines of the requirements a company must meet to be traded on the exchange.

Other Financial Markets

Of course, stock markets are not the only financial markets. There are markets to trade practically anything—some of them are physical places like the NYSE and others are purely electronic, like the Nasdaq. Two of the largest financial markets in the world, the bond market and the foreign exchange market, are simply networks of dealers connected by phone and computer. We will discuss these markets in more detail in later chapters (Chapters 6 and 15 for bonds and Chapter 23 for foreign exchange). Commodities like oil, wheat, and soybeans are traded on physical exchanges like the New York Mercantile Exchange. *Derivative securities*, which are complicated financial products used to hedge risks, are traded in locations like the Chicago Board Options Exchange (discussed in Chapter 21).

NYSE, BATS, DJIA, S&P 500: Awash in Acronyms

With all of these acronyms floating around, it's easy to get confused. You may have heard of the "Dow Jones" or "Dow Jones (Industrial) Average" and the "S&P 500" on news reports about the stock markets. The NYSE, BATS, and Nasdaq are all stock markets where the prices of stocks are determined through trading. However, when commentators talk about whether stocks are up or down in general in a given day, they often refer to the Dow Jones Industrial Average (DJIA) and the Standard and Poor's 500 (S&P 500). The DJIA and S&P 500 are simply measures of the aggregate price level of collections of preselected stocks—30 in the case of the DJIA and 500 in the case of the S&P 500. These stocks were selected by Dow Jones (the publisher of the *Wall Street Journal*) or Standard & Poor's as representative of the overall market. The S&P 500 consists of 500 of the highest-valued U.S. companies. While fewer in number, the 30 stocks in the DJIA include companies such as Microsoft, Walmart, Boeing, and 3M, and are selected to cover the important sectors in the U.S. economy. The table below shows the 30 stocks in the DJIA as of March 2019. Dow Jones editors choose these stocks to reflect the overall U.S. economy. The membership of the index has changed over time to reflect the U.S. economy's transition from being industrial-driven to being more services and technology based. For example, they added Chevron in 2008 to capture the growing importance of energy. In 2012, they added UnitedHealth, the United States' largest insurer, to reflect the importance of healthcare for an aging U.S. population. Both the DJIA and S&P 500 include stocks that are traded on the NYSE and stocks that are traded on Nasdaq and so are distinct from the exchanges themselves.

Composition of the Dow Jones Industrial Average (DJIA) as of March 2019

3M Co.	Goldman Sachs Group Inc.	Pfizer Inc.
American Express Co.	Home Depot Inc.	Procter & Gamble Co.
Apple Inc.	Intel Corp.	Travelers Co.
Boeing Co.	International Business Machines	UnitedHealth Group Inc.
Caterpillar Inc.	Johnson & Johnson	United Technologies Corp.
Chevron Corp.	J.P. Morgan Chase & Co.	Verizon Communications Inc.
Cisco Systems Inc.	McDonald's Corp.	Visa Inc.
Coca-Cola Co.	Merck & Co.	Walgreens Boots Alliance Inc.
Dow DuPont Inc.	Microsoft Corp.	Walmart Stores Inc.
Exxon Mobil Co.	Nike Inc.	Walt Disney Co.

Source: djindexes.com.

CONCEPT CHECK

8. What advantage does a stock market provide to corporate investors? To financial managers?
9. What are the important changes that have occurred in stock markets since 2005?

1.6 Financial Institutions

financial institutions Entities that provide financial services, such as taking deposits, managing investments, brokering financial transactions, or making loans.

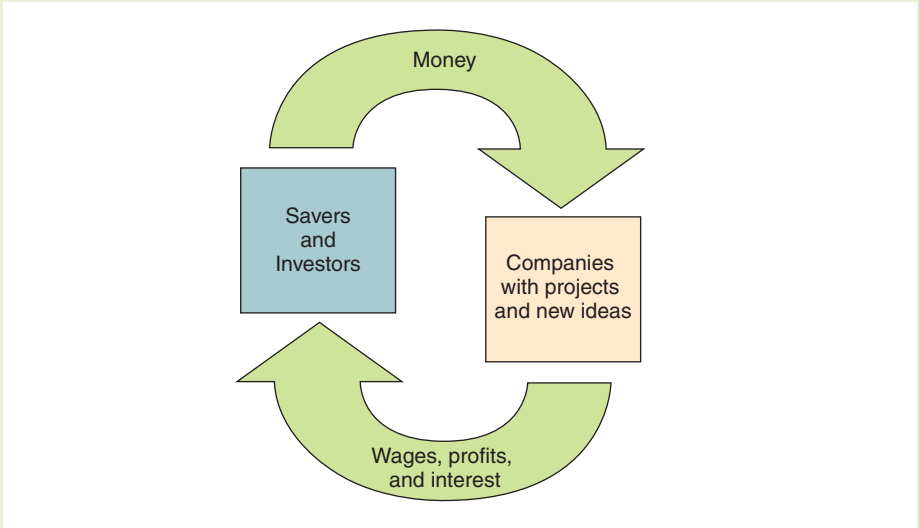
The spread of the 2008 financial crisis from subprime mortgages to Wall Street to traditional banks and businesses drew everyone's attention to *financial institutions* and their role in the economy. In general, **financial institutions** are entities that provide financial services, such as taking deposits, managing investments, brokering financial transactions, or making loans. In this section, we describe the key types of financial institutions and their functions.

The Financial Cycle

Keeping the names and roles of the different types of financial institutions straight can be challenging. It is helpful to think of the basic financial cycle, depicted in Figure 1.5, as context. In the financial cycle, (1) people invest and save their money, (2) that money, through loans and stock, flows to companies who use it to fund growth through new

FIGURE 1.5
The Financial Cycle

This figure depicts the basic financial cycle, which matches funds from savers to companies that have projects requiring funds and then returns the profits from those projects back to the savers and investors.



products, generating profits and wages, and (3) the money then flows back to the savers and investors. All financial institutions play a role at some point in this cycle of connecting money with ideas and returning the profits back to the savers and investors.

Types of Financial Institutions

Table 1.2 lists the major categories of financial institutions, provides examples of representative firms, and summarizes the institutions' sources and uses of funds.

Financial conglomerates, sometimes referred to as *financial services firms*, combine more than one type of institution. Examples include Bank of America, JPMorgan Chase, and Deutsche Bank, all of which engage in commercial banking (like Wells Fargo) as well as investment banking. Investment banking refers to the business of advising companies in major financial transactions. Examples include buying and selling companies or divisions, and raising new capital by issuing stock or bonds. Goldman Sachs and Morgan Stanley are financial institutions that are focused on investment banking activities.

Role of Financial Institutions

Financial institutions have a role beyond moving funds from those who have extra funds (savers) to those who need funds (borrowers and firms): They also move funds through time. For example, suppose you need a $20,000 car loan. You need $20,000 now, but do not have it. However, you will have it in the future as you earn a salary. The financial institution, in this case a bank or credit union, helps transfer your future salary into funds today by issuing you a loan.

Financial institutions also help spread out risk-bearing. Insurance companies essentially pool premiums together from policyholders and pay the claims of those who have an accident, fire, medical need, or who die. This process spreads the financial risk of these events out across a large pool of policyholders and the investors in the insurance company. Similarly, mutual funds and pension funds take your savings and spread them out among the stocks and bonds of many different companies, limiting your risk exposure to any one company.

TABLE 1.2

Financial Institutions and Their Roles in the Financial Cycle

Institution	Source of Money	Use of Money
Banks and Credit Unions Examples: *Wells Fargo, SunTrust*	Deposits (savings)	Loans to people and businesses
Insurance Companies Examples: *Liberty Mutual, Allstate*	Premiums and investment earnings	Invests mostly in bonds and some stocks, using the investment income to pay claims
Mutual Funds Examples: *Vanguard, Fidelity*	People's investments (savings)	Buys stocks, bonds, and other financial instruments on behalf of its investors
Pension Funds Examples: *CalPERS, REST*	Retirement savings contributed through the workplace	Similar to mutual funds, except with the purpose of providing retirement income
Hedge Funds Examples: *Bridgewater, Citadel*	Investments by wealthy individuals and endowments	Invests in any kind of investment in an attempt to maximize returns
Venture Capital Funds Examples: *Kleiner Perkins, Sequoia Capital*	Investments by wealthy individuals and endowments	Invests in start-up, entrepreneurial firms
Private Equity Funds Examples: *TPG Capital, KKR*	Investments by wealthy individuals and endowments	Purchases whole companies by using a small amount of equity and borrowing the rest

"Fintech" is aimed at disrupting many of the intermediation functions these institutions perform.

There are many subareas of fintech:

- Lending tech (Prosper, LendingTree, RocketMortgage, SoFi, Lu.com, etc.)
- Payments/billing tech (PayPal, Alipay, Clover, Square)
- Personal finance/wealth management (Wealthfront, Betterment, Robinhood)
- Money transfer/remittance (PayPal, Alipay, WePay, Payoneer, Venmo, Square Cash)
- Blockchain (Bitcoin, Ethereum, R3, Corda)
- Institutional/capital markets tech (Symphony, Plaid, InvestCloud)
- Equity crowdfunding (KickStarter, Initial Coin Offerings)
- Insurance tech (Oscar, Bright Health, Metromile, HNA Easylife,)

As fintech companies test their approaches in the market and incumbents respond, we will undoubtedly see a shakeout as some new approaches thrive and others fall short. Nonetheless, with so much innovation taking place, it is an exciting time for finance and for consumers of financial services.

While you may have seen coverage of the stock markets and discussion of financial institutions on the news, it is unlikely that you have been exposed to the finance function within a firm. In this chapter, we provided a sense of what corporate finance is all about, what a financial manager does, and the importance of stock markets and financial institutions. In upcoming chapters, you will learn how to make financial management decisions and how to use financial market information. We will explore the tools of financial analysis hand-in-hand with a clear understanding of when to apply them and why they work.

CONCEPT CHECK

10. What is the basic financial cycle?
11. What are the three main roles financial institutions play?

KEY POINTS AND EQUATIONS	KEY TERMS
1.1 Why Study Finance? • Finance and financial decisions are everywhere in our daily lives. • Many financial decisions are simple, but others are complex. All are tied together by the Valuation Principle—the foundation for financial decision making—which you will learn in this book.	
1.2 The Four Types of Firms • There are four types of firms in the United States: sole proprietorships, partnerships, limited liability companies, and corporations. • Firms with unlimited personal liability include sole proprietorships and partnerships. • Firms with limited liability include limited partnerships, limited liability companies, and corporations. • A corporation is a legally defined artificial being (a judicial person or legal entity) that has many of the legal powers people have. It can enter into contracts, acquire assets, and incur obligations, and it enjoys protection under the U.S. Constitution against the seizure of its property. • The shareholders in a C corporation effectively must pay tax twice. The corporation pays tax once and then investors must pay personal tax on any funds that are distributed. S corporations are exempt from the corporate income tax. • The ownership of a corporation is divided into shares of stock collectively known as equity. Investors in these shares are called shareholders, stockholders, or equity holders.	C corporations, p. 9 corporation, p. 6 dividend payments, p. 7 equity, p. 7 equity holder, p. 7 limited liability, p. 6 limited liability company (LLC), p. 6 limited partnership, p. 6 partnership, p. 6 S corporations, p. 8 shareholder, p. 7 sole proprietorship, p. 5 stock, p. 7 stockholder, p. 7
1.3 The Financial Manager • The financial manager makes investing, financing, and cash flow management decisions. • The goal of the financial manager is to maximize the wealth of the shareholders (maximize the stock price).	
1.4 The Financial Manager's Place in the Corporation • The ownership and control of a corporation are separate. Shareholders exercise their control indirectly through the board of directors.	agency problem, p. 13 board of directors, p. 12 chief executive officer (CEO), p. 12 hostile takeover, p. 15
1.5 The Stock Market • The shares of public corporations are traded on stock markets. The shares of private corporations do not trade on a stock market. • When a firm sells shares to investors, that is a primary market. The stock markets, such as NYSE and Nasdaq, are secondary markets where investors trade shares among each other. • Traders provide liquidity in stock markets by posting limit orders. • The bid-ask spread is determined by the best bid and offer prices in the limit order book.	ask price, p. 16 bid-ask spread, p. 17 bid price, p. 16 bourse, p. 15 dark pools, p. 19 high frequency traders (HFTs), p. 19 limit order, p. 18 limit order book, 18

	liquid, p. 15 liquidity, p. 17 listing standards, p. 19 market makers, p. 16 market orders, p. 18 primary market, p. 16 secondary market, p. 16 specialists, p. 16 stock exchange, p. 15 stock market, p. 15 transaction cost, p. 18
1.6 Financial Institutions • In the basic financial cycle, money flows from savers and investors to companies and entrepreneurs with ideas, and then back to the savers and investors in the form of profits and interest. • Financial institutions all play some role in this cycle. • Financial institutions also help move money through time (e.g., loans against future wages) and spread risk across large investor bases.	financial institutions, p. 20

PROBLEMS

The Four Types of Firms

1. What is the most important difference between a corporation and *all* other organizational forms?
2. What does the phrase *limited liability* mean in a corporate context?
3. Which organizational forms give their owners limited liability?
4. What are the main advantages and disadvantages of organizing a firm as a corporation?
5. Explain the difference between an S and a C corporation.
6. You are a shareholder in a C corporation. The corporation earns $2.00 per share before taxes. Once it has paid taxes it will distribute the rest of its earnings to you as a dividend. Assume the corporate tax rate is 25% and the personal tax rate on all income is 20%. How much is left for you after all taxes are paid?
7. Repeat Problem 6 assuming the corporation is an S corporation.

The Financial Manager

8. What is the most important type of decision that the financial manager makes?
9. Why do all shareholders agree on the same goal for the financial manager?

The Financial Manager's Place in the Corporation

10. Corporate managers work for the owners of the corporation. Consequently, they should make decisions that are in the interests of the owners, rather than in their own interests. What strategies are available to shareholders to help ensure that managers are motivated to act this way?

11. Recall the last time you ate at an expensive restaurant where you paid the bill. Now think about the last time you ate at a similar restaurant, but your parents paid the bill. Did you order more food (or more expensive food) when your parents paid? Explain how this relates to the agency problem in corporations.

12. Suppose you are considering renting an apartment. You, the renter, can be viewed as an agent while the company that owns the apartment can be viewed as the principal. What agency conflicts do you anticipate? Suppose, instead, that you work for the apartment company. What features would you put into the lease agreement that would give the renter incentives to take good care of the apartment?

13. You are the CEO of a company and you are considering entering into an agreement to have your company buy another company. You think the price might be too high, but you will be the CEO of the combined, much larger company. You know that when the company gets bigger, your pay and prestige will increase. What is the nature of the agency conflict here and how is it related to ethical considerations?

14. You are a financial manager in a public corporation. One of your engineers says that they can increase the profit margin on your flagship product by using a lower quality vendor. However, the product is likely to fail more often and will generally not last as long. Will taking your engineer's suggestion necessarily make shareholders better off? Why or why not?

15. You sit on the board of a public corporation. Your CEO has proposed taking steps to offset the carbon impact of your company's manufacturing process. Doing so will add to the company's overall expenses. Your CEO argues, however, that this action will actually increase the stock price, maximizing shareholder wealth. Why might socially responsible activities also be value-maximizing?

The Stock Market

16. What is the difference between a public and a private corporation?

17. What is the difference between a primary and a secondary market?

18. How are limit orders and market orders different?

19. Explain why the bid-ask spread is a transaction cost.

20. What are the tradeoffs in using a dark pool?

21. The following quote on Apple stock appeared on August 21, 2019, on Yahoo Finance:

If you wanted to buy Apple, what price would you pay per share? How much would you receive per share if you wanted to sell Apple?

Apple Inc. (AAPL)

NasdaqGS - NasdaqGS Real Time Price. Currency in USD

☆ Add to watch

Previous Close	243.26	Market Cap	1.124T
Open	247.24	Beta (3Y Monthly)	1.10
Bid	248.87 x 1100	PE Ratio (TTM)	20.92
Ask	248.91 x 900	EPS (TTM)	11.89
Day's Range	243.26 - 249.17	Earnings Date	Jan 27, 2020 - Jan 31, 2020
52 Week Range	142.00 - 249.75	Forward Dividend & Yield	3.08 (1.27%)
Volume	30,256,901	Ex-Dividend Date	2019-08-09
Avg. Volume	28,709,893	1y Target Est	236.55

Financial Institutions

22. What is the financial cycle?

23. How do financial institutions help with risk-bearing?

24. What role do investment banks play in the economy?

25. What are some of the similarities and differences among mutual funds, pension funds, and hedge funds?