GLOBAL EDITION

Fundamentals of Corporate Finance

THIRD EDITION

Jonathan Berk • Peter DeMarzo • Jarrad Harford

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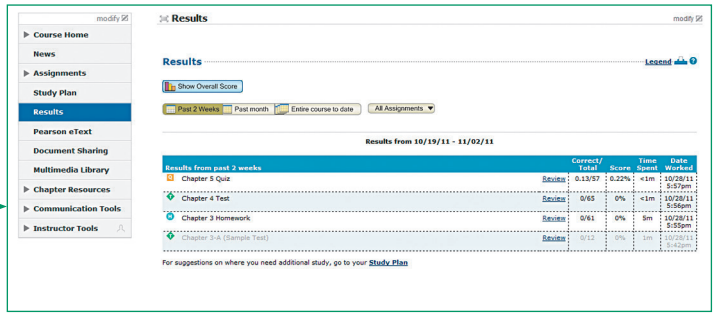

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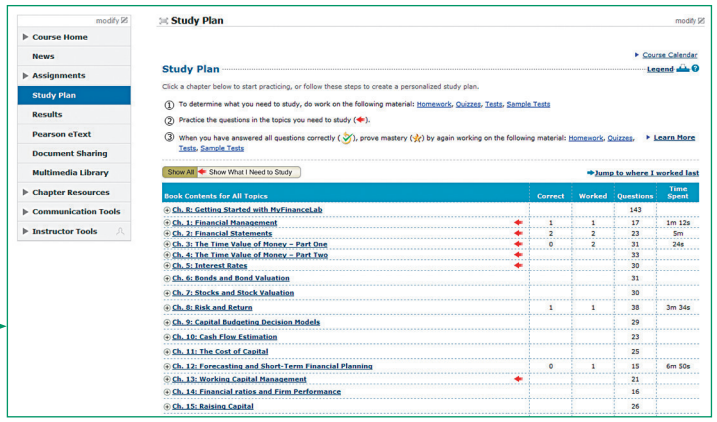

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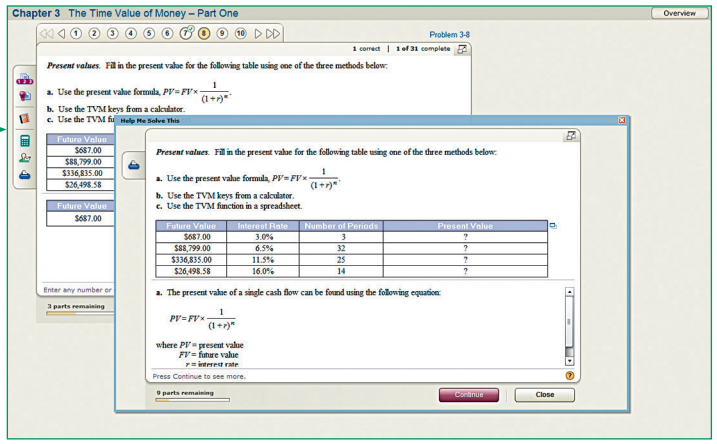

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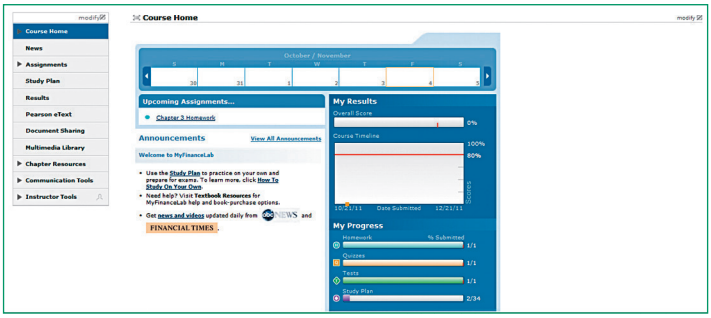

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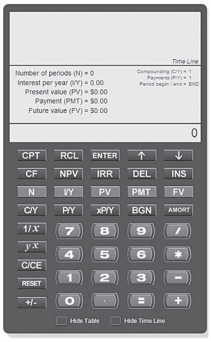

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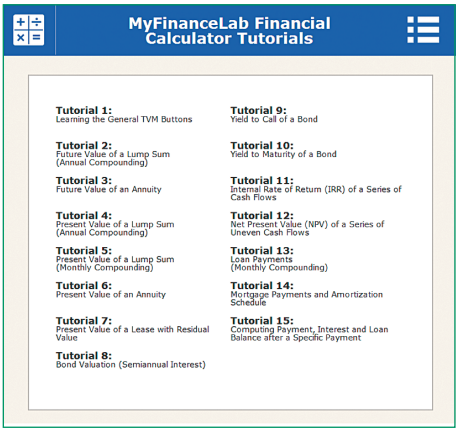

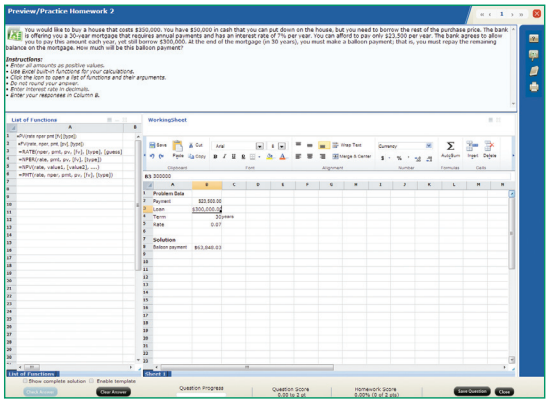

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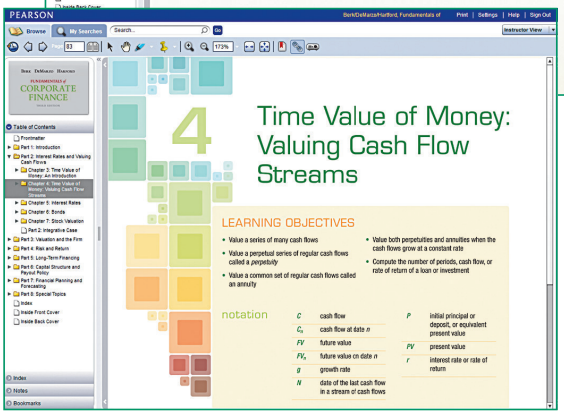

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COMMON SYMBOLS AND NOTATION

A	premerger total value of acquirer
APR	annual percentage rate
APY	annual percentage yield
β_i	beta of security i with respect to the market portfolio
C	cash flow
$CapEx$	capital expenditures
CCC	cash conversion cycle
C_{FC}	foreign currency cash flow
C_n, CF_n	cash flow that arrives at date n
$Corr(R_i, R_j)$	correlation between the returns of security i and security j
CPN	coupon payment on a bond
D	market value of debt
$D\%$	fraction of the firm financed with debt
Div_1	dividend due in one year
Div_{pfd}	dividend on preferred stock
Div_t	dividends paid in year t
E	market value of equity
$E[R_i]$	expected return of security i
$E[R_{Mkt}]$	expected return of the market portfolio
$E[R_P]$	expected return of a portfolio
$E\%$	fraction of the firm financed with equity
EAR	effective annual rate
$EBIT$	earnings before interest and taxes
$EBITDA$	earnings before interest, taxes, depreciation, and amortization
EPS_t	earnings per share on date t
F	forward exchange rate
FCF_t	free cash flow on date t
FV	future value; face value of a bond
FV_n	future value on date n
g	growth rate
IRR	internal rate of return
m	number of compounding periods per year
$MIRR$	modified internal rate of return
n	number of periods
N	date of the last cash flow in a stream of cash flows; terminal date
N_A	premerger number of shares of acquirer outstanding
NPV	net present value
N_T	premerger number of shares of target outstanding
NWC_t	net working capital in year t
P	price; initial principal or deposit, or equivalent present value
P/E	price-earnings ratio
$P\%$	fraction of the firm financed with preferred stock
P_A	premerger share price of acquirer
P_{cum}	cum-dividend stock price
P_E	price of common stock equity
P_{ex}	ex-dividend stock price
P_{pfd}	price of preferred stock
P_{rep}	stock price with share repurchase
P_T	premerger share price of target
P_t	price on date t
PV	present value
r	interest rate; discount rate; cost of capital
$\bar{R}$	average return
$r_\$$	dollar risk-free interest rate
$r^*_\$$	dollar cost of capital
r_D	expected return (cost of capital) of debt
r_E	expected return (cost of capital) of equity
r_f	risk-free interest rate
r_{FC}	foreign currency risk-free interest rate
r^*_{FC}	foreign currency cost of capital
R_i	return of security i
r_n	interest rate or discount rate for an n-year term
ROA	return on assets
ROE	return on equity
R_P	return of portfolio P
r_{pfd}	required return (cost of capital) for preferred stock
R_t	realized or total return of a security from date $t-1$ to t
r_U	expected return (cost of capital) of unlevered equity
r_{wacc}	weighted average cost of capital
S	spot exchange rate; value of all synergies
$SD(R_i)$	standard deviation (volatility) of the return of security i
SGR	sustainable growth rate
T	premerger total value of target
T_C	marginal corporate tax rate
$Var(R_i)$	variance of the return of security i
V^L	value of the firm with leverage
V^L_0	initial levered value
V_t	enterprise value on date t
V^U	value of the unlevered firm
w_i	fraction of the portfolio invested in security i (its relative *weight* in the portfolio)
x	number of new shares issued by acquirer to pay for target
y, YTM	yield to maturity
YTC	yield to call on a callable bond

Fundamentals of Corporate Finance

THIRD EDITION

GLOBAL EDITION

Jonathan Berk
STANFORD UNIVERSITY

Peter DeMarzo
STANFORD UNIVERSITY

Jarrad Harford
UNIVERSITY OF WASHINGTON

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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

Detailed Contents

CHAPTERS ON THE WEB

These Web Chapters are on MyFinanceLab at www.myfinancelab.com

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. 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 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* and one of the top 100 papers published in the history of Oxford University Press. 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 as an Associate Editor of the *Journal of Finance* for eight years, and is currently a Director of the American Finance Association and is a member of the advisory board of the *Journal of Portfolio Management*. He has also served as an Academic Director of the Financial Management Association. Born in Johannesburg, South Africa, Professor Berk is married, with two daughters, and is an avid skier and biker.

Peter DeMarzo is the Mizuho Financial Group Professor of Finance and former Senior Associate Dean for Academic Affairs at the Stanford Graduate School of Business. He is also a Research Associate at the National Bureau of Economic Research. He currently 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 in 2004 and 2006, and the Earl F. Cheit Outstanding Teaching Award at U.C. Berkeley in 1998. 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 a Director of the American Finance Association. He has served as Vice President and President of the Western Finance Association. Professor DeMarzo's research is in the area of corporate investment and financing, asset securitization, financial contracting, and market regulation. His recent work has examined issues of the optimal design of contracts and securities, the regulation of insider trading and broker-dealers bank capital regulation,

and the influence of information asymmetries on corporate disclosures and investment. He has received numerous awards including the Western Finance Association Corporate Finance Award and the Barclays Global Investors/Michael Brennan best-paper 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 Marion B. Ingersoll Professor of Finance at the University of Washington. Prior to Washington, Professor Harford taught at the Lundquist College of Business 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 sixteen 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), 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*, *Review of Financial Studies*, and *Journal of Corporate Finance*. 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

MyFinanceLab

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

MyFinanceLab

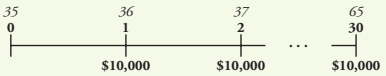
PROBLEM

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

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

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

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

(*Continued*)

Study Aids with a Practical Focus

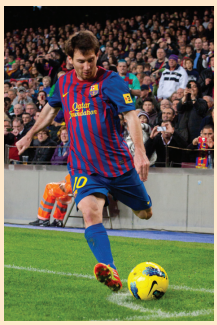
To be successful, students need to master the core concepts and learn to identify and solve problems that today's practitioners face.

- 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 2011, Albert Pujols signed a contract with the Los Angeles Angels that was repeatedly referred to as a "$240 million" contract. The $240 million comes from simply adding up all the payments Pujols would receive over the 10 years of the contract—treating dollars received in 10 years the same as dollars received today. The same thing occurred when Lionel Messi signed a contract extension with FC Barcelona in 2013, giving him a "$150 million" contract through 2018.



Applications That Reflect Real Practice

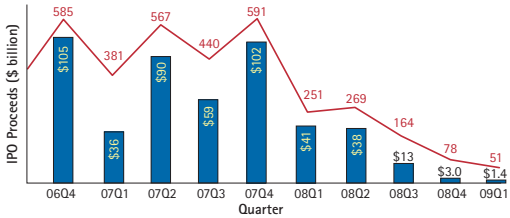
Global Financial Crisis boxes reflect the reality of the recent financial crisis and ongoing sovereign debt crisis, noting lessons learned. Boxes interspersed through the book illustrate and analyze key details.

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

KEVIN M. WARSH

Kevin M. Warsh, *a lecturer at Stanford's Graduate School of Business and a distinguished visiting fellow at the Hoover Institution*, was a Federal Reserve governor from 2006 to 2011, serving as chief liaison to the financial markets.

QUESTION: ***What are the main policy instruments used by central banks to control the economy?***

ANSWER: The Federal Reserve (Fed) deploys several policy tools to achieve its goals of price stability, maximum sustainable employment, and financial stability. Lowering the federal funds short-term interest rate, the primary policy instrument, stimulates the economy. Raising the federal funds rate generally slows the economy. Buying and selling short-term U.S. Treasury securities through *open market operations* is standard practice. Prior to the 2007–2009 financial crisis, the Fed's balance sheet ranged from $700–$900 billion. But when the Fed was unable to lower interest rates further because rates were so close to zero already, it resorted to large-scale, longer-term open market operations to increase liquidity in the financial system in the hopes of stimulating the economy further, thus growing its balance sheet significantly. With *open mouth operations*, the Fed's announcements of its intent to buy or sell assets indicates its desired degree of future policy accommodation, often prompting markets to react by adjusting interest rates immediately. The Fed's Lender-of-Last-Resort authority allows it to lend money against good collateral to troubled institutions under the financial wherewithal of each other. One effective, innovative tool, the *Term Auction Facility (TAF)*, stimulated the economy by providing cheap and readily available term funding to banks, large and small, on the front lines of the economy, thus encouraging them to extend credit to businesses and consumers. After reducing the policy rate to near zero to help revive the economy, the Fed instituted two *Quantitative Easing (QE)* programs—special purchases of government and agency securities—to increase money supply, promote lending, and according to some proponents, increase prices of riskier assets.

The Fed also addressed the global financial crisis by establishing temporary *central bank liquidity swap lines* with the European Central Bank and other major central banks. Using this facility, a foreign central bank is able to obtain dollar funding for its customers by swapping euros for dollars or another currency and agreeing to reverse the swap at a later date. The Fed does not take exchange rate risk, but it is subject to the credit risk of its central bank counterparty.

QUESTION: ***What tools is the European Central Bank (ECB) using to address the sovereign debt crisis? How does its approach compare to the Fed's approach to the 2007–2009 financial crisis?***

(*Continued*)

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

Using a Financial Calculator

Financial calculators are programmed to perform most present and future value calculations. However, we recommend that you develop an understanding of the formulas before using the shortcuts. We provide a more extensive discussion of financial calculators on page 95 and in the appendix to Chapter 4, but we'll cover the relevant functions for this chapter here. To use financial calculator functions, you always enter the known values first and then the calculator solves for the unknown.

To answer Example 3.4 with a financial calculator, do the following:

Concept	Number of Periods	Interest Rate per Period	Recurring Payments	Future Value
Calculator Key	N	I/Y	PMT	FV
Enter	10	6	0	15000

Because you are solving for the present value (PV), press the PV key last (on an HP calculator), or press CPT then the PV key on a TI calculator. The calculator will return −8375.92. Note that the calculator balances inflows with outflows, so because the FV is positive (an inflow), it returns the PV as a negative (an outflow).

If you were solving for the future value instead, you would enter:

N	I/Y	PV	PMT
10	6	−8375.92	0

And finally, on an HP, press the FV key or on a TI, press CPT and then the FV key.

TABLE 18.18
Pro Forma Statement of Cash Flows for KMS, 2014–2018

	Year	2013	2014	2015	2016	2017	2018
2	**Statement of Cash Flows ($000s)**						
3	**Net Income**		7,600	8,807	11,141	13,739	16,627
4	Depreciation		7,443	7,498	7,549	7,594	7,634
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**		11,942	12,884	14,884	17,107	19,574
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		−4,786	−2,503	−4,237	−6,167	−8,313
15	**Cash from Financing Activities**		15,214	−2,503	−4,237	−6,167	−8,313
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	J
1	**HomeNet Capital Budget**									
2	***Key Assumptions***									
3		*Revenues & Costs*		**Year 0**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	
4		HomeNet Units Sold			50	50	50	50		
5		HomeNet Ave. Price/Unit			$ 260.00	$ 260.00	$ 260.00	$ 260.00		
6		HomeNet Cost/Unit			$ 110.00	$ 110.00	$ 110.00	$ 110.00		
7		*Operating Expenses*								
8		Marketing, Support & Rent			(2,800)	(2,800)	(2,800)	(2,800)		
9		*Capital Expenditures*								
10		Purchase Equipment		(7,500)						
11		*Other Assumptions*								
12		Depreciation Schedule		0.0%	20.0%	20.0%	20.0%	20.0%	20.0%	
13		Corporate Tax Rate		40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	
14		Receivables (% sales)		15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	
15		Payables (% expenses)		15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	
16										

(*Continued*)

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 Professional calculators, highlight this problem-solving tool.
- **Spreadsheet Tables.** Select tables are available on MyFinanceLab as Excel® files, enabling students to change inputs and manipulate the underlying calculations. Icons in the text show students where spreadsheets are available in the eText.
- **Using Excel** boxes describe Excel techniques and include screenshots to serve as a guide for students using this technology.
- **Excel End-of-Chapter Problems** indicated by an Excel icon have instructor solutions and student templates available in MyFinanceLab. New to this edition, select Excel questions are now available to assign in MyFinanceLab as Simulated Excel problems with algorithmically generated values. Students can solve the problem using Excel as they would in the real world.

Practice Finance to Learn Finance

MyFinanceLab Here is what you should know after reading this chapter. MyFinanceLab will help you identify what you know, and where to go when you need to practice.

Key Points and Equations	Key Terms	Online Practice
4.1 Valuing a Stream of Cash Flows • The present value of a cash flow stream is: $PV = C_0 + \frac{C_1}{(1+r)} + \frac{C_2}{(1+r)^2} + \cdots + \frac{C_N}{(1+r)^N}$ (4.3)	stream of cash flows, p. 92	MyFinanceLab Study Plan 4.1
4.2 Perpetuities • A perpetuity is a stream of equal cash flows C paid every period, forever. The present value of a perpetuity is: $PV(C \text{ in Perpetuity}) = \frac{C}{r}$ (4.4)	consol, p. 96 perpetuity, p. 96	MyFinanceLab Study Plan 4.2
4.3 Annuities • An annuity is a stream of equal cash flows C paid every period for N periods. The present value of an annuity is: $C \times \frac{1}{r}\left(1 - \frac{1}{(1+r)^N}\right)$ (4.5) • The future value of an annuity at the end of the annuity is: $C \times \frac{1}{r}\left((1+r)^N - 1\right)$ (4.6)	annuity, p. 99	MyFinanceLab Study Plan 4.3 Interactive Annuity Calculator Financial Calculator Tutorials: Calculating the Present Value of an Annuity and Solving for the Future Value of an Annuity

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. All end-of-chapter problems are available in MyFinanceLab, the fully integrated homework and tutorial system. Both the problems and solutions, which were also prepared by the authors, have been class-tested and accuracy checked to ensure quality. Excel icons indicate the availability of instructor solutions and student templates in the Textbook Resources tab of MyFinanceLab.

End-of-Chapter Materials Reinforce Learning

Testing understanding of central concepts is crucial to learning finance.

- **MyFinanceLab 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—Caterpillar (CAT) 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 MarketWatch (www.marketwatch.com). Enter each 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 (see "Basic Weighted Shares Outstanding" on the income statement) by the firm's historic stock price.

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 50 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

All text discussions and figures, tables, and facts have been updated to accurately reflect exciting developments in the field of finance in the last three years. Specific highlights include the following:

- **Expanded discussion of the Global Financial Crisis.** Special boxes throughout the text tie the material to aspects of the 2007–2009 financial crisis. These boxes highlight the connection between what the students are learning and the Dodd-Frank Act, Bernie Madoff's Ponzi scheme, teaser rates and subprime loans, yield spreads, hot and cold IPO markets, capital structure, bailouts, and more. We also include a new interview with Kevin Warsh, a former Federal Reserve Governor.
- **Real-world examples** have been updated to reflect data through 2013.
- **New Media-Rich Pearson eText** includes Author Solution Videos that walk through the in-text examples using math, the financial calculator, and spreadsheets. Select in-text graphs and figures have been digitally enhanced to allow students to interact with variables to affect outcomes and bring concepts to life.
- **Using Excel boxes** have been expanded and provide hands-on instruction of how to use Excel to solve financial problems and include screenshots to serve as a guide for students.
- **Time value of money chapters** have been reorganized to quickly build the fundamental concepts and then apply them to both annual and more frequent cash flows.

- **New centralized coverage of financial ratios** in a specific section in Chapter 2 provides students with the tools to analyze financial statements.
- **We added over 50 new problems** and refined many others, once again personally writing and solving each one. In addition, every single problem is available in MyFinanceLab, the groundbreaking homework and tutorial system that accompanies the book.
- **We replaced and added Data Cases and Integrative Cases** throughout the book, giving students a chance to apply the material with realistic data-analyzing exercises and problems that integrate material across chapters in each major part of the book.
- **A new algorithmic Test Bank** is now available through TestGen and in MyFinanceLab.

Emphasis on Valuation

As painful as the financial crisis was, there is a silver lining: with the increasing focus on finance in the news, 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 the Dodd-Frank Act
	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; New examples with non-annual interest rates 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
	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; New 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
	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
Part 5	**Long-Term Financing**	
	Ch. 14: Raising Equity Capital	Overview of the stages of equity financing, from venture capital to IPO to seasoned equity offerings; New Data Case on Facebook IPO
	Ch. 15: Debt Financing	Overview of debt financing, including covenants, convertible bonds and call provisions
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 Trade-off 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 a 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
Online Chapters (on **MyFinanceLab** at www.myfinancelab.com)	
Leasing Insurance and Risk Management Corporate Governance	Opportunities for course customization with online-only chapter offerings

A Complete Instructor and Student Support Package

MyFinanceLab

This fully integrated online homework system gives students the hands-on practice and tutorial help they need to learn finance efficiently. Ample opportunities for online practice and assessment in **MyFinanceLab** (www.myfinancelab.com) are seamlessly integrated into each chapter and organized by section within the chapter summaries. For more details, see the inside front cover.

Videos

Video clips available in MyFinanceLab profile well-known firms such as Boeing and Intel through interviews and analysis. The videos focus on core topical areas such as capital budgeting and risk and return. New author-recorded problem videos walk through and explain problems in major chapters.

Solutions Manual

The **Solutions Manual** provides students with detailed, accuracy-verified solutions to the problems in the book. The solutions, like the problems, were written by the authors themselves. Spreadsheet solutions in Excel, which allow the student to see the effect of changes in the input variables on the outcome, are also available to instructors for designated problems at the Instructor Resource Center (www.pearsonglobaleditions.com/Berk).

PowerPoint Presentations

The **PowerPoint Presentation**, authored by Janet Payne and William Chittenden of Texas State University, is available in lecture form and includes art and tables from the book and additional examples. The PowerPoint presentation includes all tables and figures, examples, key terms, and spreadsheet tables from the textbook. All PowerPoint presentations are also available for download from the Instructor Resource Center at www.pearsonglobaleditions.com/Berk.

Test Bank

The **Test Bank** provides a wealth of accuracy-verified, algorithmic testing material. Each chapter offers a wide variety of true/false, short answer, and multiple-choice questions contributed by Salil Sarkar of the University of Texas at Arlington, Karan Bhanot of the University of Texas at San Antonio, and instructional designer David Stuart. Questions are verified by difficulty level and skill type, and correlated to the chapter topics. Numerical problems include step-by-step solutions and have been made algorithmic so they can be assigned for repeated practice.

Every question in the Test Bank is available in **TestGen® software** for both Windows and Macintosh® computers. This easy-to-use testing software is a valuable test preparation tool that allows professors to view, edit, and add questions. Both the Test Item File and the TestGen computerized test bank are available for download from the Instructor Resource Center at www.pearsonglobaleditions.com/Berk, and all questions can be assigned via MyFinanceLab.

Instructor's Manual

The **Instructor's Manual** was written by Mary R. Brown of the University of Illinois–Chicago, and contains annotated chapter outlines, lecture launchers, and questions for further class discussion. It also contains the solutions to the Data Cases and part-ending case problems, as well as answers to the end-of-chapter Critical Thinking questions in the book. As an additional resource to guide instructors with students who are planning to take the CFA exam, CFA learning outcomes met in each chapter are listed. A section also details how the end-of-chapter problems map to the accreditation standards set by the Association to Advance Collegiate Schools of Business (AACSB), so that instructors can track students' mastery of the AACSB standards. The **Instructor's Manual** is available for download as Microsoft Word files or as Adobe® PDF files from the Instructor Resource Center at www.pearsonglobaleditions.com/Berk.

Acknowledgments

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 developed the array of print supplements that accompany the book: Janet Payne and William Chittenden for the PowerPoint presentations; Mary R. Brown, for the Instructor's Manual; James Linck, for serving as advisor for the videos; and our MyFinanceLab content development team, including Melissa Honig, Miguel Leonarte, Noel Lotz, Sarah Peterson, and Susan Schoenberg. 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. Robert James subjected the text and problem solutions to his exacting standards, Kathleen Cantwell provided a critical copyeditor's eye, and Holly McLean-Aldis carefully proofread the text. We are indebted to Jared Stanfield for his adept research support throughout the writing process.

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Reviewers

Pankaj Agrrawal, *University of Maine*
Daniel Ahern, *California State University–Chico*
Paul Asabere, *Temple University*
Ajeyo Banerjee, *University of Colorado–Denver*
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*
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*
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*
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*
James Morris, *University of Colorado–Denver*
Belinda Mucklow, *University of Wisconsin–Madison*
Rick Nelson, *University of Minnesota*
Tom C. Nelson, *University of Colorado–Boulder*
Curtis Nicholls, *Bucknell University*
Anthony C. Ng, *Hong Kong Polytechnic 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*
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*
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*
Andrew Samwick, *Dartmouth College*
Salil K. Sarkar, *University of Texas–Arlington*
Oliver Schnusenberg, *University of North Florida*
Kenneth Scislaw, *University of Alabama–Huntsville*
Roger Severns, *Minnesota State University–Mankato*
Tatyana Sokolyk, *University of Wyoming*
Andrew C. Spieler, *Hofstra University*
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*
Emery Trahan, *Northeastern University*
Joe Ueng, *University of St. Thomas*
Mo Vaziri, *California State University–San Bernardino*
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*
Xiaoyan Xu, *San Jose State 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*

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Contributors:

Jenny Robertson, *University of Brighton*
Pauline Ho, *Hong Kong Community College, Hong Kong Polytechnic University*

Reviewers:

Stefan Hirth, *Aarhus University*
Alain Praet, *University of Leuven*
Mohamed Sherif, *Heriot-Watt University*

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. The focus of this book is how to make optimal corporate financial decisions. 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 the next section of the book, we will introduce and begin applying the Valuation Principle.

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 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 main types of firms. We stress corporations, however, because of their significance in most developed countries. 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 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.

In each chapter you will hear from a former student—someone who opened a book like this one not that long ago—who talks about his or her job and the critical role finance plays in it. 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 Types of Firms

We begin our study of corporate finance by introducing the types of firms that financial managers run. The major types of firms are sole proprietorships, partnerships, and limited liability companies or 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.

Statistics indicate that 71% of businesses in the United States are sole proprietorships, although they generated only 5% 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 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 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 a form that limits the owner's liability.

Partnerships

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

A **partnership** is identical to a sole proprietorship except it has more than one owner. Key features include the following:

1. *All* partners are liable for the firm's debt (unlimited liability). 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 a (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. Private equity funds and venture capital funds are two examples of industries dominated by limited partnerships. In these firms, a few general partners contribute some of their own capital and raise additional capital from outside investors who are limited partners. The general partners control how all the capital is

[1] www.bizstats.com

invested. Most often they will actively participate in running the businesses they choose to invest in. The outside investors play no active role in the partnership other than monitoring how their investments are performing.

Limited Liability Companies

limited liability company The owners' liability is limited to their investment in shares.

A **limited liability company or corporation** limits the owners' liability to their investment, which means the owners cannot be held personally liable for the company's debts. There are two types of limited liability company: *private companies* and *public companies*. The owners of private limited companies are not allowed to trade their shares on an organized exchange. Private limited companies are a relatively new phenomena in the United States. Elsewhere, however, they are more established and known by a variety of names. For example, in Germany they are called *Gesellschaft mit beschränkter Haftnung (GmbH)*; in France, *Société à responsabilité limitée (SARL)*; and there are similar names in Italy (SRL) and Spain (SL). Public limited companies are allowed to have their shares traded on an organized exchange. They also have different names in different countries. For example, in the United Kingdom they are called *public limited companies (plc or PLC)*; in Germany, *Aktiengesellschaft (AG)*; in France, *Société Anonyme (SA)*; and in Spain, *Sociedade Anónima (SA)*. Only public limited companies are allowed to be listed; however, most choose not to be.

Features of Corporations

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

The distinguishing feature of a **corporation** (or company) is that it 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, as we have already established, it enjoys protection under most jurisdictions 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.

Formation of a Corporation. Corporations must be legally formed, which means a legal document (known as a corporate charter in the United States) is created upon the formation of the company. Setting up a corporation is therefore considerably more costly than setting up a sole proprietorship. In the United States, 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.

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 or equity in a corporation.

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

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.

A unique feature of a corporation is that there is no limitation on who can own its shares. That is, an owner of a corporation need not have any special expertise or qualification. For publicly owned companies, this feature allows free trade in the shares of the corporation and provides one of the most important advantages of organizing a firm as a corporation rather than as sole proprietorship, partnership, or private limited company. 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, Walmart Stores, as an example. Walmart had over 2 million employees and reported annual revenue of $422 billion in 2011. Indeed, the top five companies by sales volume in 2012 (Walmart, Exxon Mobil, Chevron, ConocoPhillips, and General Motors) had combined sales exceeding $1.5 trillion, an amount comparable to the total sales of the more than 22 million U.S. sole proprietorships.

Tax Implications for Corporate Entities

An important difference between the types of 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* and is known as the "classical system." In addition to the United States, some European countries, such as Austria, Belgium, Denmark, and the Netherlands, have classical systems.

EXAMPLE 1.1
Taxation of Corporate Earnings

MyFinanceLab

PROBLEM

You are a shareholder in a corporation. The corporation earns $5.00 per share before taxes. After it has paid taxes, it will distribute the rest of its earnings to you as a dividend. The dividend is income to you, so you will then pay taxes on these earnings. The corporate tax rate is 40% and your tax rate on dividend income is 15%. How much of the earnings remains after all taxes are paid?

SOLUTION

PLAN

Earnings before taxes: $5.00 Corporate tax rate: 40% Personal dividend tax rate: 15%

To calculate the corporation's earnings after taxes, first we subtract the taxes paid at the corporate level from the pretax earnings of $5.00. The taxes paid will be 40% (the corporate tax rate) of $5.00. Since all of the after-corporate tax earnings will be paid to you as a dividend, you will pay taxes of 15% on that amount. The amount leftover is what remains after all taxes are paid.

EXECUTE

$5.00 per share $\times$ 0.40 = $2.00 in taxes at the corporate level, leaving $5.00 − $2.00 = $3.00 in after-corporate tax earnings per share to distribute.

You will pay $3.00 $\times$ 0.15 = $0.45 in taxes on that dividend, leaving you with $2.55 from the original $5.00 after all taxes.

EVALUATE

As a shareholder, you keep $2.55 of the original $5.00 in earnings; the remaining $2.00 + $0.45 = $2.45 is paid as taxes. Thus, your total effective tax rate is 2.45/5 = 49%.

An alternative system is known as the imputation system, whereby the dividend is regarded as a flow of profits direct to the shareholders and is therefore considered to be only one source of income that is not subject to double taxation. For example, in the United States the U.S. Internal Revenue Code allows an exemption from double taxation for "S" corporations, which are corporations that elect subchapter S tax treatment. Under these 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 Cooperation 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 2012, dividend income is taxed at 15%, which, for most investors, is significantly below their personal income tax rate.

EXAMPLE 1.2

Taxation of S Corporation Earnings

MyFinanceLab

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 30%.

SOLUTION

PLAN

Earnings before taxes: $5.00 Corporate tax rate: 0% Personal tax rate: 30%

In this case, the corporation pays no taxes. It earned $5.00 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 30% tax rate on those earnings.

EXECUTE

Your income taxes are $0.30 \times \$5.00 = \$1.50$, leaving you with $\$5.00 - \$1.50 = \$3.50$ in after-tax earnings.

EVALUATE

The $1.50 in taxes that you pay is substantially lower than the $2.45 you paid in Example 1.1. As a result, you are left with $3.50 per share after all taxes instead of $2.55.

The U.S. 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, the main types of firms are sole proprietorships, partnerships (general and limited), and limited liability companies or corporations. 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	Can be unlimited	Yes; each partner is liable	Yes	Yes	Personal
Limited Partnership	One general partner (GP), no limit on limited partners (LP)	GP–Yes LP–No	GP–Yes LP–No	GP–Yes LP–No	Personal
Private Limited Company	Unlimited (private owners)	No	No (but they legally may)	No	Corporation tax
Public Limited Company	Unlimited (may be listed or unlisted)	No	No (but they legally may)	No	Corporation tax

Concept Check

1. What is a limited company? 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 January 2013, Apple, Inc. had just over 939 *million* shares of stock held by 27,450 owners.[2] Because there are many owners of a corporation, each of whom can freely trade their shares, 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 shareholders. Within the corporation, the financial manager has three main tasks:

1. Making investment decisions.
2. Making financing decisions.
3. Managing the firm's cash flows.

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 all investments and projects and decide which of them qualify as good uses of the money shareholders 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, we will develop the tools necessary to make these investment decisions.

[2]Apple, Inc., Notice of 2013 Annual Meeting of Shareholders, January 7, 2013.

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. As of mid-2012, two years since Dodd-Frank's passage, 129 of the reforms have been finalized, providing a clear picture of the Dodd-Frank regulatory framework. But another 271 rules or actions, containing many of the core Dodd-Frank reforms, await completion.

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 (equity) or to borrow the money (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 funds and how to decide which one to use in the context of the corporation's overall mix of debt and equity.

Cash for Treasury Management

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,*[3] may seem straightforward, but in a young or growing company, it can mean the difference between success and failure. Consider the $150 million Apple spent during its secretive development of the iPhone, or the costs to Boeing of producing the 787—the latter spent billions of dollars before the 787 left the ground. A company typically spends 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 Firm

In theory, the goal of a firm should be determined by the firm's owners. A sole proprietorship has a single owner who runs the firm, so the goals of a sole proprietorship are the same as the owner's goals. But in organizational forms with multiple owners, the appropriate goal of the firm—and thus of its managers—is not as clear.

[3] *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.

Many corporations have thousands of owners (shareholders). Each owner is likely to have different interests and priorities. Whose interests and priorities determine the goals of the firm? Later in the book, we examine this question in more detail. However, you might be surprised to learn that the interests of shareholders are aligned for many, if not most, important decisions. That is because, regardless of their own personal financial position and stage in life, all the shareholders will agree that they are better off if management makes decisions that increase the value of their shares. For example, by June 2012, Apple shares were worth over 60 times as much as they were in October 2001, when the first iPod was introduced. Clearly, regardless of their preferences and other differences, all investors who held shares of Apple stock over this period have benefited from the investment decisions Apple's managers have made.

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 discuss the financial manager's place in the corporation and how the owners exert control over the organization.

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 offer lower wages 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 firm?

1.4 The Financial Manager's Place in the Corporation

We've established that the shareholders 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 shareholders 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 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.

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

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

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 chairman of the board of directors. The most senior financial manager is the chief financial officer (CFO) or financial director, often reporting directly to the CEO. Figure 1.1 presents part of a typical organizational chart for a corporation, highlighting the positions a financial manager may take.

Ethics and Incentives Within 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?

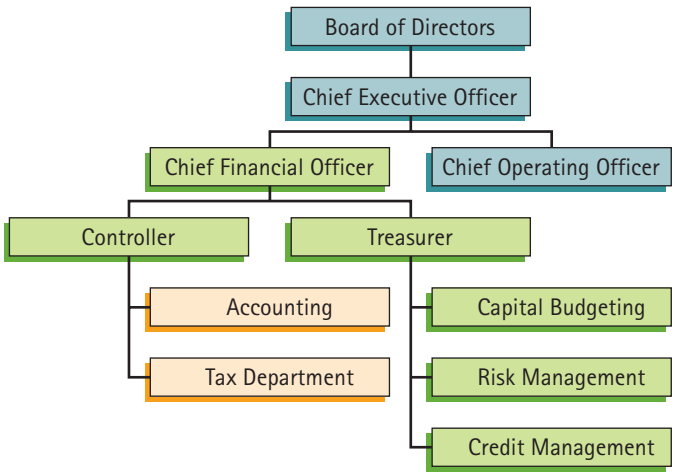
Agency Problems. Many people claim that because of the separation of ownership and control in a corporation, managers have little incentive to work in the interests of the shareholders when this means working against their self-interest. Economists call this an **agency problem**—when managers, despite 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 interest. This agency problem is commonly addressed in practice by minimizing the number of decisions managers must make for which their own self-interest substantially differs from the interests of the shareholders. For example, managers' compensation contracts are designed to ensure that most decisions

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

FIGURE 1.1

The Financial Functions Within a Corporation

The board of directors, representing the shareholders, 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).



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 share price. There is, however, a limitation to this strategy. By tying compensation too closely to performance, the 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. On the other hand, if compensation contracts reduce managers' risk by rewarding good performance but limiting the penalty associated with poor performance, managers may have an incentive to take excessive risk.

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 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 charitable and political causes. For example, in 2010, Walmart Stores gave $320 million in cash to charity (making it the largest corporate donor of cash in that year). These actions are costly and reduce shareholder wealth. Thus, while some shareholders might support such policies because they feel that they reflect their own moral and ethical priorities, it is unlikely that all shareholders will feel this way, leading to potential conflicts of interest amongst shareholders.

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 Yahoo's Scott Thompson were all reportedly forced to resign by their boards. Despite these high-profile examples, directors and top executives are rarely replaced through a grassroots shareholder uprising.

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.

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 share price up. Thus, the share price of the corporation is a barometer for corporate leaders that continuously gives them feedback on the shareholders' opinion of their performance.

When the share price deteriorates, 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 will to replace them. Often, the reluctance to fire results because the board members 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 decrease the share price. Low share prices create a profit opportunity. In a **hostile takeover**, an individual or organization—sometimes known as a *corporate raider*—can purchase a large fraction of equity and acquire enough votes to replace the board of directors and the CEO. With a new, superior management team, the shares are 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 shareholders. The value of the owners' investments in the corporation is determined by the price of a share of the corporation. Because private companies have a limited number of owners their shares are not generally traded and the value of their shares is difficult to determine. But many corporations are public companies whose 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.

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.

An investment is **liquid** if it can easily be turned into cash by selling it immediately at a competitive market price. This liquidity is attractive to outside investors, as it provides flexibility regarding the timing and duration of their investment in the firm. In this section, we provide an overview of the world's major stock markets. The research and trading by participants in these markets give rise to share prices that provide constant feedback to managers regarding investors' views and their decisions.

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. Other U.S. stock markets include the American Stock Exchange (AMEX), the National Association of Security Dealers Automated Quotation system (NASDAQ), and regional exchanges such as the Midwest Stock Exchange. Most other countries have at least one stock market. Outside the United States, the largest and most active stock markets are the London Stock Exchange (LSE), the Tokyo Stock Exchange (TSE), and NYSE Euronext. Figure 1.2 ranks the world's largest stock exchanges by trading volume.

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

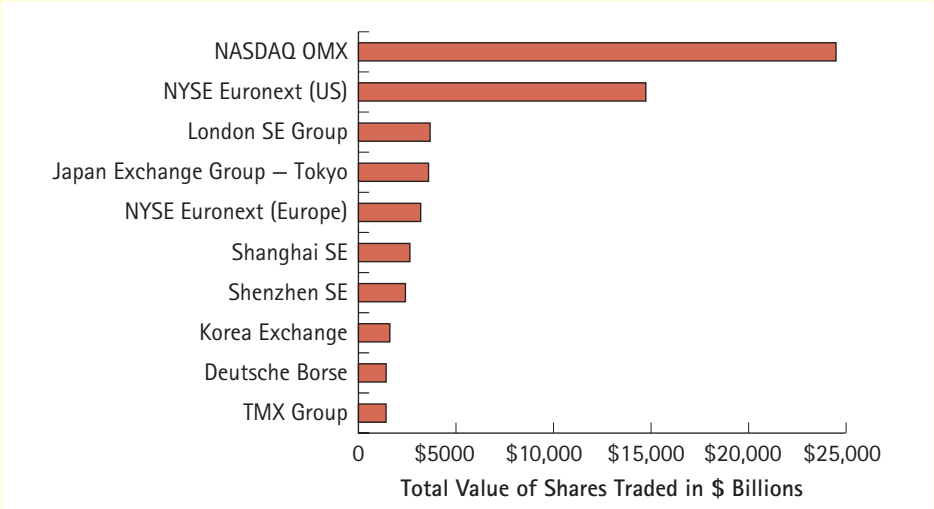
secondary market Markets, such as NYSE or NASDAQ, where shares of a corporation are traded between investors without the involvement of the corporation.

Primary and Secondary Markets

The **primary market** refers to a corporation issuing new shares 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.

FIGURE 1.2
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 2012.



Source: www.world-exchanges.org.

NYSE

market makers Individuals on a stock exchange who match buyers with sellers.

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

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

The NYSE is an example of a physical market. On the floor of the NYSE, **market makers**, (known on the NYSE as specialists) match buyers and sellers. They post two prices for every stock they make a market in: the price they stand willing to buy the stock at (the **bid price**) and the price they stand willing to sell the stock for (the **ask price**). If a customer comes to them wanting to make a trade at these prices, they will honor the price (up to a limited number of shares) and make the trade even if they do not have another customer willing to take the other side of the trade. In this way, they ensure that the market is liquid because the exchange has rules that attempt to ensure that bid and ask prices do not get too far apart and that large price changes take place through a series of small changes, rather than in one big jump. Large investment banks and brokerages buy trading licenses that entitle them to access the floor and trade on the exchange.

INTERVIEW WITH

JEAN-FRANÇOIS THÉODORE*

Jean-François Théodore is the Deputy CEO of NYSE Euronext, the largest stock exchange group in the world.

QUESTION: ***How have technological innovations shaped financial markets?***

ANSWER: At the end of the 1980s, the electronic execution of market orders transformed the organization and operation of the financial markets, resulting in continuous securities trading. Since then, technology has become a key driver of change in the financial industry, enabling markets to become faster and increasingly more competitive, at a time when client requirements are growing and diversifying, particularly regarding the speed of execution and volumes, notably from algorithmic traders.

QUESTION: ***The Paris Stock Exchange has experienced profound upheavals recently. What have the most important changes been?***

ANSWER: The Paris Stock Exchange, like other leading stock markets, has changed significantly in recent years.

With the decompartmentalization and globalization of financial activities, securities markets, which were once national, public, or cooperative institutions, have abandoned their cooperative status or listed for trading on their own market. This change is transforming securities markets into real capitalistic enterprises oriented toward innovation and the optimization of their resources. It also favors mergers among the various market operators, with the objective of creating greater homogeneity in the financial markets, capital fluidity, diversity in the service offering, and reduced costs for publicly traded companies, investors, and intermediaries.

A few months after the introduction of the euro in September 2000, the Paris Stock Exchange played a pioneering role by merging with the Amsterdam and Brussels exchanges to become the first pan-European stock exchange: Euronext. Two years later, after its own initial public offering, Euronext acquired the British derivatives market Liffe and integrated the Lisbon exchange. In April 2007, in an unprecedented event for our business sector, Euronext merged with the New York Stock Exchange, resulting in NYSE Euronext, the largest and most liquid securities market group in the world.

QUESTION: ***What benefits do companies and investors receive from the merger of NYSE and Euronext?***

ANSWER: In 2007, over 4000 companies from 55 different countries were listed for trading on NYSE Euronext, representing a total market capitalization of close to 21,000 billion euros, more than the next four exchanges combined.

Present in six countries in the world, NYSE Euronext has an unequaled listing offer, with increased visibility and liquidity and expanded financing opportunities for issuers. Backed by a globally recognized label, NYSE Euronext enables companies to be listed on a market adapted to their size and location, within a stable regulatory environment, in dollarsand/or in euros (the world's two leading currencies), and under the accounting standards of their choice (IFRS or US GAAP).

In addition, the integration of the different NYSE Euronext markets, combined with the technological excellence of its digital market information system and the diverse array of financial products and services, encourages cross-border trading and increased liquidity, benefiting all users. In fact, more than one spot trade out of every three trades in the world is made on NYSE Euronext.

*This interview was conducted by Gunther Capelle-Blancard and Nicolas Couderc.

Because license holders can go to IBM's trading post, for example, and directly sell IBM shares to the highest bidder or buy IBM shares at the lowest offered price, the exchange is an **auction market**.

auction market A market where share prices are set through direct interaction of buyers and sellers.

Ask prices exceed bid prices. This difference is called the **bid-ask spread**. Because investors buy at the ask (the higher price) and sell at the bid (the lower price), the bid-ask spread is a **transaction cost** they have to pay in order to trade. When specialists in a physical market such as the NYSE take the other side of the trade from their customers, this transaction cost accrues to them as a profit. It is the compensation they demand for providing a liquid market by standing ready to honor any quoted price. Investors also pay other forms of transactions costs such as commissions.

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

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.

Over-the-Counter Stock Markets

In today's technology-driven economy, a stock market does not need to have a physical location. Investors can make stock transactions (perhaps more efficiently) over the phone or by a computer network. Consequently, stock markets such as NASDAQ, which are called **over-the-counter (OTC) markets**, are a collection of dealers or market makers connected by computer networks and telephones. An important difference between the NYSE and NASDAQ is that on the NYSE, each share has only one market maker. On NASDAQ, shares can and do have multiple market makers who compete with each other. Each market maker must post bid and ask prices in the NASDAQ network, where they can be viewed by all participants. Because investors do not directly interact to set the prices, NASDAQ and other over-the-counter markets are **dealer markets**. The NASDAQ system posts the best prices first and fills orders accordingly. This process guarantees investors the best possible price at the moment, whether they are buying or selling.

over-the-counter (OTC) market A market without a physical location, in which dealers are connected by computers and telephones.

dealer market A market where dealers buy and sell for their own accounts.

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, AMEX, 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, AMEX, 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 September 2013. 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)

3M Co.	General Electric Co.	Nike Inc.
AT&T Inc	Goldman Sachs Group Inc.	Pfizer Inc.
American Express Co.	Home Depot Inc.	Procter & Gamble Co.
Boeing Co.	Intel Corp.	Travelers Co.
Caterpillar Inc.	International Business Machines	UnitedHealth Group Inc.
Chevron Corp.	Johnson & Johnson	United Technologies Corp.
Cisco Systems Inc.	J.P. Morgan Chase & Co.	Verizon Communications Inc.
Coca-Cola Co.	McDonald's Corp.	Visa Inc.
Du Pont	Merck & Co.	Walmart Stores Inc.
Exxon Mobil Co.	Microsoft Corp.	Walt Disney Co.

Source: djindexes.com.

Concept Check

8. What advantage does a stock market provide to corporate investors?
9. What are the main differences between the NYSE and NASDAQ?

1.6 Financial Institutions

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

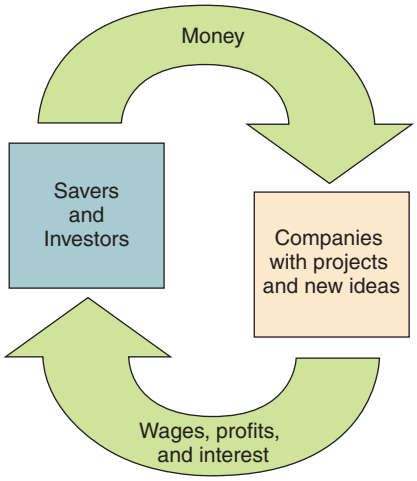
The spread of the 2008 financial crisis from subprime mortgages to Wall Street to traditional banks and businesses drew everyone's attention to *financial institutions* and their role in the economy. In general, **financial institutions** are entities that provide financial services, such as taking deposits, 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 1.3, 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 1.3
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, Soros Fund*	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

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?

MyFinanceLab

Here is what you should know after reading this chapter. MyFinanceLab will help you identify what you know, and where to go when you need to practice.

Key Points and Equations	Key Terms	Online Practice

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 Types of Firms

- The main types of firms are sole proprietorships, partnerships, and limited liability companies, or corporations.
- Firms with unlimited personal liability include sole proprietorships and partnerships.
- Firms with limited liability include limited partnerships and limited liability companies, which include private and public companies (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 some jurisdictions against the seizure of its property.
- Under the classical system, shareholders in most companies effectively must pay tax twice. The corporation pays tax once and then investors must pay personal tax on any funds that are distributed. In the United States, S corporations are exempt from the corporate income tax.
- The ownership of a corporation is divided into shares collectively known as equity. Investors in these shares are called shareholders, stockholders, or equity holders.

corporation, p. 34
dividend payments, p. 34
equity, p. 34
equity holder, p. 34
limited liability, p. 33
limited liability company, p. 34
limited partnership, p. 33
partnership, p. 33
shareholder, p. 34
sole proprietorship, p. 32
stock, p. 34
stockholder, p. 34

MyFinanceLab Study Plan 1.2

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 price).

MyFinanceLab Study Plan 1.3

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. 40
board of directors, p. 39
chief executive officer (CEO), p. 40
hostile takeover, p. 42

MyFinanceLab Study Plan 1.4

1.5 The Stock Market

- The shares of public corporations are traded on stock markets. The shares of private corporations do not usually trade on a stock market.
- When a firm sells shares to investors, that is a primary market function. The stock markets, such as NYSE and NASDAQ, are secondary markets where investors trade shares among each other.
- NASDAQ is a dealer market, characterized by market makers trading for their own accounts.

ask price, p. 44
auction market, p. 45
bid-ask spread, p. 45
bid price, p. 44
bourse, p. 42
dealer market, p. 45
liquid, p. 43
listing standards, p. 45
market makers, p. 44
over-the-counter (OTC) market, p. 45
primary market, p. 43
secondary market, p. 43
stock exchange, p. 42
stock market, p. 42
transaction cost, p. 45

MyFinanceLab Study Plan 1.5

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. 46	MyFinanceLab Study Plan 1.6

PROBLEMS

All problems are available in MyFinanceLab.

The 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 in the United States.
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 40% and the personal tax rate on (both dividend and non-dividend) income is 30%. 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?

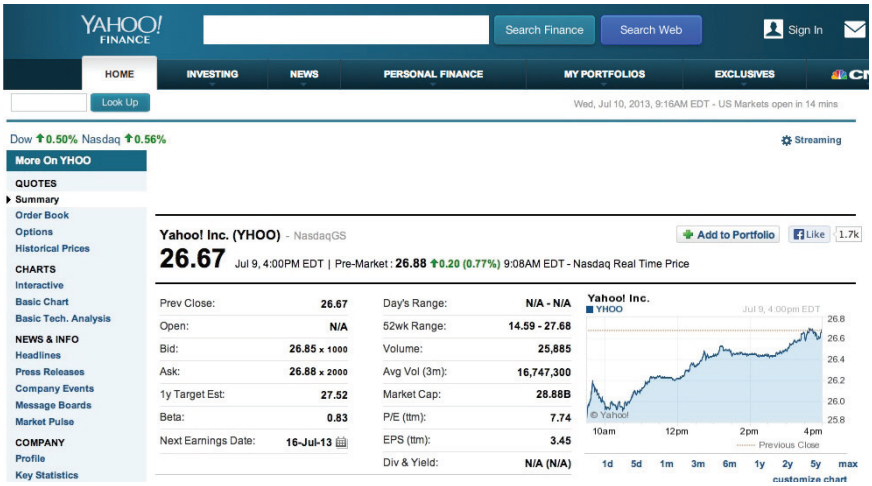
The Stock Market

14. What is the difference between a public and a private company?

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

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

17. The following quote on Yahoo! stock appeared on July 10, 2013, on Yahoo! Finance:



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

Financial Institutions

18. What is the financial cycle?

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

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

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

2 Introduction to Financial Statement Analysis

LEARNING OBJECTIVES

- Know why the disclosure of financial information through financial statements is critical to investors
- Understand the function of the balance sheet (or statement of financial position)
- Use the financial statements to analyze the firm
- Understand how the income statement is used
- Interpret a statement of cash flows
- Know what management's discussion and analysis and the statement of changes in shareholders' equity are
- Understand the main purpose and aspects of the Sarbanes-Oxley reforms following Enron and other scandals

As we discussed in Chapter 1, anyone with money to invest is a potential investor who can own shares in a corporation. As a result, corporations are often widely held, with investors ranging from individuals who hold one share to large financial institutions that own millions of shares. For example, in 2012, International Business Machines Corporation (IBM) had about 1.2 billion shares outstanding held by nearly 600,000 shareholders. Although the corporate organizational structure greatly facilitates the firm's access to investment capital, it also means that stock ownership is most investors' sole tie to the company. How, then, do investors learn enough about a company to know whether or not they should invest in it? One way firms evaluate their performance and communicate this information to investors is through their *financial statements.* Financial statements also enable financial managers to assess the success of their own firm and compare it to competitors.

Firms regularly issue financial statements to communicate financial information to the investment community. A detailed description of the preparation and analysis of these statements is sufficiently complicated that to do it justice would require an entire book. In this chapter, we briefly review the subject, emphasizing only the material that investors and corporate financial managers need in order to make the corporate finance decisions we discuss in the text.

We review the four main types of financial statements, present examples of these statements for a firm, and discuss where an investor or manager might find various types of information about the company. We also discuss some of the financial ratios used to assess a firm's performance and value. We close the chapter with a look at financial reporting abuses and the Sarbanes-Oxley regulatory response.

2.1 Firms' Disclosure of Financial Information

financial statements Accounting reports issued by a firm quarterly and/or annually that present past information and a snapshot of the firm's financial position.

annual report The yearly summary of business, accompanying or including financial statements, sent by public companies to their shareholders.

Financial statements are accounting reports issued by a firm periodically (usually quarterly and annually) that present past performance information and a snapshot of the firm's financial position. Public companies around the world are required to file their financial statements with the relevant listing authorities. They must also send an **annual report** with their financial statements to their shareholders each year. Private companies often prepare financial statements as well, but they usually do not have to disclose these reports to the public. Financial statements are important tools through which investors, financial analysts, and other interested outside parties (such as creditors) obtain information about a corporation. They are also useful for managers within the firm as a source of information for the corporate financial decisions we discussed in the previous chapter. In this section, we examine the guidelines for preparing financial statements and introduce the different types of financial statements.

Preparation of Financial Statements

Generally Accepted Accounting Principles (GAAP) A common set of rules and a standard format for public companies to use when they prepare their financial reports.

Reports about a company's performance must be understandable and accurate. **Generally Accepted Accounting Principles (GAAP)** together with the **International Financial Reporting Standards** (issued by the IASB) provide a common set of rules and a standard format for public companies to use when they prepare their reports. This standardization also makes it easier to compare the financial results of different firms.

International Financial Reporting Standards

Generally Accepted Accounting Principles (GAAP) differ among countries. As a result, companies face tremendous accounting complexities when they operate internationally. Investors also face difficulty interpreting financial statements of foreign companies, which discourages them from investing abroad. As companies and capital markets become more global, however, interest in harmonization of accounting standards across countries has increased.

The most important harmonization project began in 1973 when representatives of 10 countries (including the United States) established the International Accounting Standards Committee. This effort led to the creation of the International Accounting Standards Board (IASB) in 2001, with headquarters in London. Now the IASB has issued a set of International Financial Reporting Standards (IFRS).

The IFRS are taking root throughout the world. The European Union (EU) approved an accounting regulation in 2002 requiring all publicly traded EU companies to follow IFRS in their consolidated financial statements starting in 2005. As of 2012, more than 120 jurisdictions either require or permit the use of IFRS, including the EU, Australia, Brazil, Canada, Russia, Hong Kong, Taiwan, and Singapore. China, India, and Japan will soon follow suit. In fact, currently all major stock exchanges around the world accept IFRS except the United States and Japan, which maintain their local GAAP.

The main difference between U.S. GAAP and IFRS is conceptual—U.S. GAAP are based primarily on accounting rules with specific guidance in applying them, whereas IFRS are based more on principles requiring professional judgment by accountants, and specific guidance in application is limited. Even so, some differences in rules also exist. For example, U.S. GAAP generally prohibit the upward revaluation of non-financial assets, whereas the IFRS allow the revaluation of some such assets to fair value. U.S. GAAP also rely more heavily on historical cost, as opposed to "fair value," to estimate the value of assets and liabilities.

Effort to achieve convergence between U.S. GAAP and IFRS was spurred by the Sarbanes-Oxley Act of 2002 in the United States. It included a provision that U.S. accounting standards move toward international convergence on high-quality accounting standards. Currently, SEC regulations still require public U.S. firms to report using U.S. GAAP. That said, modifications to both IFRS and U.S. GAAP have brought the two closer together, with the key remaining differences in the areas of revenue recognition, impairment charges, leasing, insurance, and the treatment of financial instruments. As of the end of 2013, the SEC is re-evaluating convergence between U.S. GAAP and IFRS, but U.S. and international standard setters work together on new accounting issues that arise.

INTERVIEW WITH

SUE FRIEDEN

Sue Frieden is Ernst & Young's Global Managing Partner, Quality & Risk Management. A member of the Global Executive board, she is responsible for every aspect of quality and risk management—employees, services, procedures, and clients.

QUESTION: ***Do today's financial statements give the investing public what they need?***

ANSWER: Globally, we are seeing an effort to provide more forward-looking information to investors. But fundamental questions remain, such as how fully do investors understand financial statements and how fully do they read them? Research shows that most individual investors don't rely on financial statements much at all. We need to determine how the financial statement and related reporting models can be improved. To do that we will need a dialogue involving investors, regulators, analysts, auditors, stock exchanges, academics, and others to ensure that financial statements and other reporting models are as relevant as they can be.

QUESTION: ***Ernst & Young is a global organization. How do accounting standards in the U.S. compare to those elsewhere?***

ANSWER: In January of 2005, 100 countries outside the U.S. began the process of adopting new accounting standards (International Financial Reporting Standards) that would in large measure be based on principles rather than rules. As global markets become more complex, we all need to be playing by the same set of rules. As a first step, we need consistency from country to country. There are definite challenges to overcome in reconciling principle-based and rules-based systems, but we are optimistic that these challenges will inevitably get resolved. At the same time, there are efforts underway to ensure that auditing standards are globally consistent. Ultimately, financial statements prepared under global standards and audited under consistent global auditing standards will better serve investors.

QUESTION: ***What role does the audit firm play in our financial markets, and how has that changed since the collapse of Arthur Andersen?***

ANSWER: The accounting profession has seen unprecedented change recently. The passage of Sarbanes-Oxley and other changes are helping to restore public trust. We're now engaging on a regular basis with a wider range of stakeholders—companies, boards, policymakers, opinion leaders, investors, and academia. And we've had the chance to step back and ask ourselves why we do what we do as accounting professionals, and why it matters. In terms of the services we offer, much of what we do helps companies comply with regulations, guard against undue risks, and implement sound transactions. Part of the value in what we do is providing all stakeholders the basis to understand whether companies are playing by the rules—be they accounting, financial reporting, or tax rules. We help create confidence in financial data. The public may not understand precisely what auditors do or how we do it, but they care that we exist, because it provides them the confidence they so badly need and want.

QUESTION: ***Accounting standards seem to be shifting from historical cost-based methods to methods that rely on current market values of assets. During the financial crisis, however, many financial institutions complained that "mark-to-market" rules exacerbated their financial difficulties. Do you believe accounting professionals should rethink the wisdom of moving to market-based accounting methods?***

ANSWER: Fair value accounting can certainly be improved, particularly in light of the difficulty in applying fair value in illiquid markets, which the financial crisis highlighted, and because of some of the anomalies that fair value accounting can produce. But, by and large, fair value accounting provided transparency into reality for investors. It is the most transparent way to reflect the economic reality of prevailing market conditions and provide investors and companies with current financial information on which they can base investment and management decisions. Fair value accounting did not cause the economic crisis; it simply kept a fair scorecard.

auditor A neutral third party, which corporations are required to hire, that checks a firm's annual financial statements to ensure they are prepared according to accounting standards and provides evidence to support the reliability of the information.

Investors also need some assurance that the financial statements are prepared accurately. Corporations are required to hire a neutral third party, known as an **auditor**, to check the annual financial statements, to ensure that the annual financial statements are reliable and prepared according to accounting standards, and provide evidence to support the reliability of the information.

Types of Financial Statements

Every public company is required to produce four financial statements: the *balance sheet or statement of financial position*, the *income statement*, the *statement of cash flows*,

and the *statement of changes in shareholders' equity*. These financial statements provide investors and creditors with an overview of the firm's financial performance. In the sections that follow, we take a close look at the content of these financial statements.

Concept Check

1. What is the role of an auditor?
2. What are the main financial statements that all public companies must produce?

2.2 The Balance Sheet or Statement of Financial Position

balance sheet, statement of financial position A list of a firm's assets and liabilities that provides a snapshot of the firm's financial position at a given point in time.

assets The cash, inventory, property, plant, and equipment, and other investments a company has made.

liabilities A firm's obligations to its creditors.

shareholders' equity, stockholders' equity An accounting measure of a firm's net worth that represents the difference between the firm's assets and its liabilities.

The **balance sheet**, or **statement of financial position**,[1] lists the firm's *assets* and *liabilities*, providing a snapshot of the firm's financial position at a given point in time. Table 2.1 shows the balance sheet for Vodafone Group Plc as of March 31 in 2013 and 2012. Notice that the balance sheet is divided into two parts with the assets on the left side and the liabilities and shareholders' equity on the right side.

1. The **assets** list the firm's cash, inventory, property, plant and equipment, and other investments the company has made.
2. The **liabilities** show the firm's obligations to creditors.
3. Also shown with liabilities on the right side of the balance sheet is the *shareholders' equity*. **Shareholders' equity** (or **stockholders' equity**), the difference between the firm's assets and liabilities, is an accounting measure of the firm's net worth.

The assets on the left side show how the firm uses its capital (its investments), and the information on the right side summarizes the sources of capital, or how the firm raises the money it needs. Because of the way shareholders' equity is calculated, the left and right sides must balance:

The Balance Sheet Equation

$$\text{Assets} = \text{Liabilities} + \text{Shareholders' Equity} \tag{2.1}$$

In Table 2.1, total assets for 2013 (£142,698 million) are equal to total liabilities (£70,210 million) plus shareholders' equity (£72,488 million).

Let's examine Vodafone's assets, liabilities, and shareholders' equity in more detail.

Assets

current assets Cash or assets that can be converted into cash within one year.

marketable securities Short-term, low-risk investments that can be easily sold and converted to cash.

In Table 2.1, Vodafone's assets are divided into *current* and *non-current assets*. We discuss each in turn.

Current Assets. **Current assets** are either cash or assets that can be converted into cash within one year. This category includes the following:

1. Cash and other **marketable securities**, which are short-term, low-risk investments that can be easily sold and converted to cash (such as money market investments, like government debt, that mature within a year);

[1] In IFRS and recent U.S. GAAP pronouncements, the balance sheet is referred to as the *statement of financial position*.

TABLE 2.1

Vodafone Group Plc Consolidated Statements of Financial Position prepared according to IFRS (reformatted) in £m

Assets	2013	2012	Equity and Liabilities	2013	2012
Non-Current Assets			Total Shareholders' Equity	72,488	78,202
Goodwill & other intangible assets	52,397	59,514	Non-Current Liabilities		
Net property plant and equipment	20,331	18,655	Long-term borrowings	38,986	37,349
Other non-current assets	46,683	41,382			
	119,411	119,551			
Current Assets			Current Liabilities		
Inventory	450	486	Short-term financial debt	15,026	8,789
Accounts receivable	9,412	10,744	Accounts payable	16,198	15,236
Other current assets	5,802	1,657		31,224	24,025
Bank and cash	7,623	7,138	**Total Liabilities**	**70,210**	**61,374**
	23,287	20,025			
Total Assets	**142,698**	**139,576**	**Total Equity and Liabilities**	**142,698**	**139,576**

accounts receivable Amounts owed to a firm by customers who have purchased goods or services on credit.

inventories A firm's raw materials as well as its work-in-progress and finished goods.

non-current assets Assets that produce tangible benefits for more than one year.

depreciation expense A yearly deduction a firm makes from the amount of its fixed assets (other than land) over time, according to a depreciation schedule that depends on an asset's life span.

book value The acquisition cost of an asset less its accumulated depreciation.

2. **Accounts receivable**, which are amounts owed to the firm by customers who have purchased goods or services on credit;
3. **Inventories**, which are composed of raw materials as well as work-in-progress and finished goods; and
4. Other current assets, which is a catch-all category that includes items such as prepaid expenses (expenses that have been paid in advance such as rent or insurance).

Non-Current Assets. Assets such as property or machinery that produce tangible benefits for more than one year are called **non-current (or fixed) assets**. If Vodafone spends £2 million on new equipment, this £2 million will be included with net property, plant, and equipment under non-current assets on the balance sheet. Because equipment tends to wear out or become obsolete over time, Vodafone will reduce the amount recorded for this equipment each year by deducting a **depreciation expense**. An asset's accumulated depreciation is the total amount deducted over its life. The firm reduces the amount of fixed assets (other than land) over time according to a depreciation schedule that depends on an asset's life span. Depreciation is not an actual cash expense that the firm pays; it is a way of recognizing that buildings and equipment wear out and thus it is an allocation of the asset's cost. The **book value** (or carrying amount) of an asset, which is the value shown in the firm's financial statements, is equal to its acquisition cost less accumulated depreciation. The figures for property, plant, and equipment show the total book value of these assets. When a firm acquires another company, it will acquire a set of tangible assets (such as inventory or property, plant and equipment) that will then be included on its balance sheet. In many cases, however, the firm may pay more for the company than the total book value of the assets it acquires. In this case, the difference between the price paid for the company and the book value assigned to its tangible assets is recorded separately as goodwill (an intangible asset).

Other non-current assets can include such items as property not used in business operations, start-up costs in connection with a new business, trademarks and patents, and

property held for sale. The sum of all the firms' assets is the total assets at the bottom of the left side of the balance sheet in Table 2.1.

Liabilities

We now examine the liabilities, shown on the right side of the balance sheet, which are divided into *current* and *non-current liabilities*.

current liabilities Liabilities that will be satisfied within one year.

Current Liabilities. Liabilities that will be satisfied within one year are known as **current liabilities**. They include the following:

1. **Accounts payable**, the amounts owed to suppliers for products or services purchased with credit.
2. **Short-term debt (or notes payable)** are: loans that must be repaid in the next year. Any repayment of non-current debt that will occur within the next year would also be listed here as current maturities of long-term debt.
3. Accrual items, such as salary or taxes, that are owed but have not yet been paid, and deferred or unearned revenue, which is revenue that has been received for products or services that have not yet been delivered.

accounts payable The amounts owed to suppliers for products or services purchased with credit.

short-term debt, notes payable Loans that must be repaid in the next year.

The difference between current assets and current liabilities is the firm's **net working capital**, the capital available in the short term to run the business.

$$\text{Net Working Capital} = \text{Current Assets} - \text{Current Liabilities} \tag{2.2}$$

net working capital The difference between a firm's current assets and current liabilities that represents the capital available in the short term to run the business.

For example, in 2013, Vodafone's net working capital totaled − £7,937 million (i.e., negative, £23,287 million in current assets − £31,224 million in current liabilities). Firms with low (or negative) net working capital may face a shortage of funds. In such cases, the liabilities due in the short term exceed the company's cash and expected payments on receivables.

Non-Current (Long-Term) Liabilities. Non-current liabilities are liabilities that extend beyond one year. When a firm needs to raise funds to purchase an asset or make an investment, it may borrow those funds through a long-term loan. That loan would appear on the balance sheet as **long-term debt**, which is any loan or debt obligation with a maturity of more than a year.

long-term debt Any loan or debt obligation with a maturity of more than a year.

Shareholders' Equity

The sum of the current liabilities and non-current liabilities is total liabilities. The difference between the firm's assets and liabilities is the *shareholders' equity*; it is also called the **book value of equity**. As we stated earlier, it represents an accounting measure of the net worth of the firm. The two main components are share capital and retained earnings. These two components form the book value of shareholders' ownership claims, stemming from their direct investment and reinvestment of profits.

book value of equity The difference between the book value of a firm's assets and its liabilities; also called *shareholders' equity*, it represents the net worth of a firm from an accounting perspective.

Ideally, the balance sheet would provide us with an accurate assessment of the true value of the firm's equity. Unfortunately, this is unlikely to be the case. First, many of the assets listed on the balance sheet are valued based on their historical cost rather than their true value today. For example, an office building is listed on the balance sheet according to its historical cost less its accumulated depreciation. But the actual

value of the office building today may be very different (and possibly much more) than the amount the firm paid for it years ago. The same is true for other property, plant, and equipment: The true value today of an asset may be very different from, and even exceed, its book value. A second, and probably more important, problem is that *many of the firm's valuable assets are not captured on the balance sheet*. Consider, for example, the expertise of the firm's employees, the firm's reputation in the marketplace, the relationships with customers and suppliers, and the quality of the management team. These are all assets that add to the value of the firm but do not appear on the balance sheet.

Market Value Versus Book Value

For the reasons cited above, the book value of equity is an inaccurate assessment of the actual value of the firm's equity. Thus, it is not surprising that it will often differ substantially from the amount investors are willing to pay for the equity. The total market value of a firm's equity equals the number of shares outstanding times the firm's market price per share, referred to as the company's **market capitalization**. The market value of a share does not depend on the historical cost of the firm's assets; instead, it depends on what investors expect those assets to produce in the future.

market capitalization
The total market value of equity; equals the market price per share times the number of shares.

Finally, we note that the book value of equity can be negative (liabilities exceed assets), and that a negative book value of equity is not necessarily an indication of poor performance. Successful firms are often able to borrow in excess of the book value of their assets because creditors recognize that the market value of the assets is far higher. For example, in June 2005 Amazon.com had total liabilities of $2.6 billion and a book value of equity of −$64 million. At the same time, the market value of its equity was over $15 billion. Clearly, investors recognized that Amazon's assets were worth far more than the book value reported on the balance sheet. By 2013, several years of strong growth had brought its book value of equity to over $8 billion and its market value of equity to more than $120 billion!

EXAMPLE 2.1
Market Versus Book Value

MyFinanceLab

PROBLEM

On March 31, 2013, Vodafone had 49,190 million shares outstanding, and these shares are trading for a price of £1.86 per share. What is Vodafone's market capitalization? How does the market capitalization compare to Vodafone's book value of equity?

SOLUTION

PLAN

Market capitalization is equal to price per share times shares outstanding. We can find Vodafone's book value of equity at the bottom of its balance sheet.

EXECUTE

Vodafone's market capitalization is (49,190 shares) × (£1.86/share) = £91,493 million. This market capitalization is significantly higher than Vodafone's book value of equity of £72,488 million.

EVALUATE

Thus, investors are willing to pay 91,493/72,488 = 1.3 times the amount Vodafone's shares are "worth" according to their book value.

Market-to-Book Ratio

market-to-book ratio (price-to-book [P/B] ratio) The ratio of a firm's market (equity) capitalization to the book value of its shareholders' equity.

In Example 2.1, we compared the market and book values of Vodafone's equity. A common way to make this comparison is to compute the **market-to-book ratio** (also called the **price-to-book [P/B] ratio**), which is the ratio of a firm's market capitalization to the book value of shareholders' equity.

$$\text{Market-to-Book Ratio} = \frac{\text{Market Value of Equity}}{\text{Book Value of Equity}} \tag{2.3}$$

It is one of many financial ratios used to evaluate a firm. The market-to-book ratio for most successful firms substantially exceeds 1, indicating that the value of the firm's assets when put to use exceeds their historical cost. The ratio will vary across firms due to differences in fundamental firm characteristics as well as the value added by management. Thus, this ratio is one way a company's share price provides feedback to its managers on the market's assessment of their decisions.

In mid-2013, AmeriServ Financial, Inc. (ASRV) had a market-to-book ratio of 0.64, a reflection of investors' assessment that many of AmeriServ's assets were unlikely to be profitable and were worth less than their book value. Citigroup's market-to-book ratio of 0.83 tells a similar story. Figure 2.1 shows that at the same time, the average market-to-book ratio for the financial services industry was about 1, and for large U.S. firms it was close to 3. In contrast, consider that Amazon.com, Inc. (AMZN) had a market-to-book ratio of over 14, and the average for technology firms was about 5. Analysts often classify firms with low market-to-book ratios as **value stocks (shares)**, and those with high market-to-book ratios as **growth stocks (shares)**.

value stocks (shares) Firms with low market-to-book ratios.

growth stocks (shares) Firms with high market-to-book ratios.

Enterprise Value

enterprise value, total enterprise value The total market value of a firm's equity and debt, less the value of its cash and marketable securities. It measures the value of the firm's underlying business.

A firm's market capitalization measures the market value of the firm's equity, or the value that remains after the firm has paid its debts. So it includes any cash the firm holds. But what is the value of the business itself? The **enterprise value** of a firm (also called the **total enterprise value** or TEV) assesses the value of the underlying business assets, unencumbered by debt and separate from any cash and marketable securities. We compute it as follows:

$$\text{Enterprise Value} = \text{Market Value of Equity} + \text{Debt} - \text{Cash} \tag{2.4}$$

From Example 2.1, Vodafone's market capitalization in 2013 is £91,493 million. Its debt is £54,012 million (£15,026 million of short-term financial debt and long-term borrowings of £38,986 million). Therefore, given its cash balance of £7,623 million, Vodafone's enterprise value is 91,493 + 54,012 − 7,623 = £137,882 million. The enterprise value can be interpreted as the cost to take over the business. That is, it would cost 91,493 + 54,012 = £145,505 million to buy all of Vodafone's equity and pay off its debts, but because we would acquire Vodafone's £7,623 million in cash, the net cost of the business is only 145,505 − 7,623 = £137,882 million.

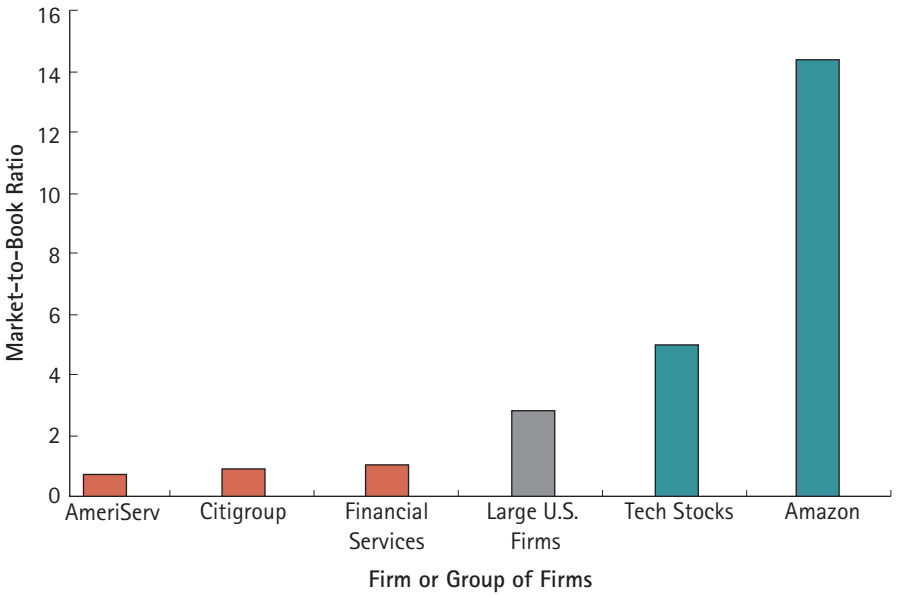
Concept Check

3. What is depreciation designed to capture?
4. The book value of a company's assets usually does not equal the market value of those assets. What are some reasons for this difference?

FIGURE 2.1

Market-to-Book Ratios in 2013

This figure presents market-to-book ratios of different firms and groups of firms in 2013. Firms that might be classified as value stocks (low market-to-book ratios) are in red and those that might be classified as growth stocks (high market-to-book ratios) are in blue.



EXAMPLE 2.2

Computing Enterprise Value

MyFinanceLab

PROBLEM

In June 2013, H. J. Heinz Co. (HNZ) had 320.7 million shares outstanding, a share price of $72.36, a book value of debt of $4.98 billion, and cash of $1.1 billion. What was Heinz's market capitalization (its market value of equity)? What was its enterprise value?

SOLUTION

PLAN

Share Price	$72.36
Shares Outstanding	320.7 million
Cash	$1.10 billion
Debt (book)	$4.98 billion

We will solve the problem using Eq. 2.4: Enterprise Value = Market Value of Equity + Debt − Cash. We can compute the market capitalization by multiplying the share price times the number of shares outstanding. We are given the amount of cash and the amount of debt.

EXECUTE

Heinz had a market capitalization of $72.36/share × 320.7 million shares = $23.21 billion. Thus, Heinz's enterprise value was 23.21 + 4.98 − 1.10 = $27.09 billion.

EVALUATE

The value of Heinz's underlying business, separate from any cash it holds, should be equal to the total value of the financial claims (equity and debt) on that business, which is its enterprise value of $27.09 billion.

2.3 The Income Statement

income statement A list of a firm's revenues and expenses over a period of time.

net income, profit, or earnings The last or "bottom" line of a firm's income statement that is a measure of the firm's income over a given period of time.

When you want someone to get to the point, you might ask them for the "bottom line." This expression comes from the *income statement*. The **income statement**, or statement of comprehensive income, lists the firm's revenues and expenses over a period of time. The last or "bottom" line of the income statement shows the firm's **net income (or net profit)**, which is a measure of its profitability during the period. The income statement is sometimes called a *profit and loss* or *P&L account*, and the net income is also referred to as the firm's **earnings**. In this section, we examine the components of the income statement in detail and introduce ratios we can use to analyze this data.

Earnings Calculations

Whereas the statement of financial position or balance sheet shows the firm's assets and liabilities at a given point in time, the income statement shows the flow of revenues and expenses generated by those assets and liabilities between two dates. Table 2.2 shows Vodafone's income statement for 2013. We examine each category on the statement.

gross profit The third line of an income statement that represents the difference between a firm's sales revenues and its costs.

Gross Profit. The first two lines of the income statement list the revenues from sales of products and the costs incurred to make and sell the products. Cost of sales shows costs directly related to producing the goods or services being sold, such as manufacturing costs. Other costs, such as administrative expenses, research and development, and interest expenses, are not included in the cost of sales. The third line is **gross profit**, which is the difference between sales revenues and the cost of sales.

TABLE 2.2

Vodafone Group plc Income Statement for 2013 and 2012 in £m

VODAFONE GROUP PLC
Income Statement
Year ended 31 March (in £m)

	2013	2012
Revenue	44,445	46,417
Cost of sales	−30,505	−31,546
Gross Profit	13,940	14,871
Selling, distribution, and administrative expenses	−8,457	−8,302
Impairment losses/Depreciation	−7,700	−4,050
Share of results in associated companies	6,477	4,963
Other income	468	3,705
Operating Income	4,728	11,187
Other income	315	294
Earnings Before Interest and Taxes (EBIT)	5,043	11,481
Interest income (expense)	−1,788	−1,932
Profit before taxation	3,255	9,549
Tax	−2,582	−2,546
Net Income	673	7,003
Earnings per share:	0.87p	13.74p
Diluted earnings per share:	0.87p	13.65p

Operating Expenses. The next group of items is operating expenses. These are expenses from the ordinary course of running the business that are not directly related to producing the goods or services being sold. They include administrative expenses and overhead, salaries, marketing costs, and research and development expenses. The third type of operating expense, depreciation and amortization, is not an actual cash expense but represents an estimate of the costs that arise from wear and tear or obsolescence of the firm's assets.[2] The firm's gross profit less its operating expenses is called **operating income** (or profit).

operating income A firm's gross profit less its operating expenses.

Earnings Before Interest and Taxes. We next include other sources of income or expenses that arise from activities that are not the central part of a company's business. Income from the firm's financial investments is one example of other income that would be listed here. After we have adjusted for other sources of income or expenses, we have the firm's earnings before interest and taxes, or **EBIT**.

EBIT A firm's earnings before interest and taxes are deducted.

Pretax and Net Income. From EBIT, we deduct the interest paid on outstanding debt to compute Vodafone's pretax income (profit before taxation), and then we deduct corporate taxes to determine the firm's net income (or net profit).

Net income represents the total earnings of the firm's equity holders. It is often reported on a per-share basis as the firm's **earnings per share (EPS)**, which we compute by dividing net income by the total number of shares outstanding:

earnings per share (EPS) A firm's net income divided by the total number of shares outstanding.

$$\text{EPS} = \frac{\text{Net Income}}{\text{Shares Outstanding}} = \frac{£429^{*}\text{ million}}{49{,}190\text{ million shares}} = 0.87\text{p per share} \qquad (2.5)$$

Although Vodafone has 49,190 million shares outstanding as of the end of March 2013, the number of shares outstanding may grow if Vodafone has made commitments that would cause it to issue more shares. Consider these two examples:

1. Suppose Vodafone compensates its employees or executives with **share options** that give the holder the right to buy a certain number of shares by a specific date at a specific price. If the options are "exercised," the company issues new shares and the number of shares outstanding will grow.
2. The number of shares may also grow if the firm issues **convertible bonds**, a form of debt that can be converted into shares.

share options The right to buy a certain number of shares by a specific date at a specific price.

convertible bonds Corporate bonds with a provision that gives the bondholder an option to convert each bond owned into a fixed number of shares.

In the cases of share options and convertible bonds, because there will be more total shares to divide the same earnings, this growth in the number of shares is referred to as **dilution**. Firms disclose the potential for dilution by reporting **diluted EPS**, which shows the earnings per share the company would have if the share options were exercised or convertible debt had been converted. For example, in 2013, Vodafone's diluted EPS was £429 million/49,190 million shares = 0.87p.

dilution An increase in the total number of shares that will divide a fixed amount of earnings.

diluted EPS The earnings per share a company would have based on the total number of shares including the effects of all share options and convertible bonds.

EBITDA

As will become clear when we discuss the Statement of Cash Flows in the next section, neither EBIT nor net income are the same as the firm's cash flow. So, financial analysts often compute a firm's earnings before interest, taxes, depreciation, and amortization, or **EBITDA**. Because depreciation and amortization are not cash expenses for the firm,

[2]Only certain types of amortization are deductible as a pretax expense (e.g., amortization of the cost of an acquired patent). Amortization of goodwill is not a pretax expense and is generally included as an extraordinary item after taxes are deducted.

*Adjusted for non-controlling interests (i.e., shareholders outside the Vodafone Group).

EBITDA A computation of a firm's earnings before interest, taxes, depreciation, and amortization are deducted.

EBITDA reflects the cash a firm has earned from its operations. If we add back Vodafone's depreciation and amortization to its EBIT, we find that its EBITDA in 2013 was 5,043 + 7,700 = £12,743 million.

Concept Check

5. What do a firm's earnings measure?
6. What is dilution?

2.4 The Statement of Cash Flows

The income statement provides a measure of the firm's profit over a given time period. However, it does not indicate the amount of *cash* the firm has earned. There are two reasons that net income does not correspond to cash earned. First, there are non-cash entries on the income statement, such as depreciation and amortization. Second, certain uses of cash, such as the purchase of a building or expenditures on inventory, are not reported on the income statement. The firm's **statement of cash flows** utilizes the information from the income statement and statement of financial position or balance sheet to determine how much cash the firm has generated, and how that cash has been allocated, during a set period. As we will see from the perspective of an investor attempting to value the firm, the statement of cash flows provides what may be the most important information of the four financial statements.

statement of cash flows An accounting statement that shows how a firm has used the cash it earned during a set period.

The statement of cash flows is divided into three sections: operating activities, investment activities, and financing activities. These sections roughly correspond to the three major jobs of the financial manager.

1. *Operating activity* starts with net income from the income statement. It then adjusts this number by adding back all non-cash entries related to the firm's operating activities.
2. *Investment activity* lists the cash used for investment.
3. *Financing activity* shows the flow of cash between the firm and its investors.

Vodafone Group's statement of cash flows is shown in Table 2.3. In this section, we take a close look at each component of the statement of cash flows.

Operating Activity

The first section of Vodafone's statement of cash flows adjusts net income by all non-cash items related to operating activity. For instance, depreciation is deducted when computing net income, but it is not an actual cash outflow. Thus, we add it back to net income when determining the amount of cash the firm has generated. Similarly, we add back any other non-cash expenses (for example, deferred taxes).

Next, we adjust for changes to net working capital that arise from changes to accounts receivable, accounts payable, or inventory. When a firm sells a product, it records the revenue as income even though it may not receive the cash from that sale immediately. Instead, it may grant the customer credit and let the customer pay in the future. The customer's obligation adds to the firm's accounts receivable. We use the following guidelines to adjust for changes in working capital:

1. Accounts receivable: When a sale is recorded as part of net income, but the cash has not yet been received from the customer, we must adjust the cash flows by

deducting the increases in accounts receivable. This increase represents additional lending by the firm to its customers and it reduces the cash available to the firm.

2. Accounts payable: Conversely, we *add* increases in accounts payable. Accounts payable represents borrowing by the firm from its suppliers. This borrowing increases the cash available to the firm.
3. Inventory: Finally, we *deduct* increases in inventory. Increases in inventory are not recorded as an expense and do not contribute to net income (the cost of the goods are only included in net income when the goods are actually sold). However, the cost of increasing inventory is a cash expense for the firm and must be deducted.

Working capital adjustments address the difference between the time when sales and costs are recorded on the income statement and when the cash actually goes in and out of the firm. The statement of cash flows in Table 2.3 shows Vodafone's accounts receivable and accounts payable increased by £184 million and £430 million, respectively, from 2012. We deduct the increase of £184 million and add the increase of £430 million on the statement of cash flows. The net result of accounts receivable and accounts payable is positive on cash flow from operations.

TABLE 2.3

Vodafone Group Plc Statement of Cash Flows for 2013 and 2012 in £m

VODAFONE GROUP PLC
Statement of Cash Flows
Year ended 31 March (in £m)

	2013	2012
Operating activities		
Net income	673	7,003
Depreciation and amortization	7,700	4,050
Cash effect of changes in:		
Accounts receivable	−184	−689
Accounts payable	430	871
Inventory	72	24
Other adjustments	2,003	1,496
Cash from operating activities	**10,694**	**12,755**
Investment activities		
Capital expenditures	−8,702	−7,852
Acquisitions and other investing activity	1,304	11,695
Cash from investing activities	**−7,398**	**3,843**
Financing activities		
Dividends paid	−5,185	−6,947
Interest paid	−1,644	−1,633
Increase/decrease in share capital	−1,501	−6,117
Increase/decrease in borrowings	5,374	−672
Cash from financing activities	**−2,956**	**−15,369**
Foreign exchange adjustment	**145**	**−343**
Change in cash and cash equivalents	**485**	**886**

We must make a similar adjustment for inventory. Vodafone has reduced the level of inventory. Decreases in inventory are recorded as part of the cost of goods sold expense. However, the cost of the decrease in inventory effectively increases the cash available to the firm and must be added.

Finally, we add depreciation to net income before calculating operating cash flow. Depreciation is an accounting adjustment to book value that is an expense, but not a cash outflow. That is, when Vodafone's property, plant, and equipment depreciate by £7,700 million, it does not literally cost Vodafone £7,700 million in cash flow. Because this is an expense that reduces net income, but not an actual cash outflow, we must add it back to calculate cash flow. We will talk more about depreciation when we do capital budgeting in Chapter 9. For ease of preparation, other adjustments relating to operating activities are included after changes to net working capital. All these adjustments mean that cash flow can be very different from net income. Although Vodafone showed positive net income on the income statement, its cash flow from operating activity is much greater at £10,694 million.

Investment Activity

capital expenditures
Purchases of new property, plant, and equipment.

The next section of the statement of cash flows shows the cash required for investment activities. Purchases of new property, plant, and equipment are **capital expenditures**. Recall that capital expenditures do not appear immediately as expenses on the income statement. Instead, the firm depreciates these assets and deducts depreciation expenses

EXAMPLE 2.3

The Impact of Depreciation on Cash Flow

MyFinanceLab

PROBLEM

Suppose Vodafone had an additional £100 million depreciation expense in 2013. If Vodafone's tax rate on pretax income is 26%, what would be the impact of this expense on Vodafone's earnings? How would it impact Vodafone's cash at the end of the year?

SOLUTION

PLAN

Depreciation is an operating expense, so Vodafone's operating income, EBIT, and pretax income would be affected. With a tax rate of 26%, Vodafone's tax bill will decrease by 26 pence for every pound that pretax income is reduced. In order to determine how Vodafone's cash would be impacted, we have to determine the effect of the additional depreciation on cash flows. Recall that depreciation is not an actual cash outflow, even though it is treated as an expense, so the only effect on cash flow is through the reduction in taxes.

EXECUTE

Vodafone's operating income, EBIT, and pretax income would fall by £100 million because of the £100 million in additional operating expense due to depreciation.

This £100 million decrease in pretax income would reduce Vodafone's tax bill by 26% $\times$ £100 million = £26 million. Therefore, net income would fall by 100 − 26 = £74 million.

On the statement of cash flows, net income would fall by £74 million, but we would add back the additional depreciation of £100 million because it is not a cash expense. Thus, cash from operating activities would rise by $-74 + 100 =$ £26 million. Therefore, Vodafone's cash balance at the end of the year would increase by £26 million, the amount of the tax savings that resulted from the additional depreciation deduction.

EVALUATE

The increase in cash balance comes completely from the reduction in taxes. Because Vodafone pays £26 million less in taxes even though its cash expenses have not increased, it has £26 million more in cash at the end of the year.

over time. To determine the firm's cash flow, we already added back depreciation because it is not an actual cash expense. Now, we subtract the actual capital expenditure that the firm made. Similarly, we also deduct other assets purchased or long-term investments made by the firm, such as acquisitions or purchases of marketable securities. In Table 2.3, we see that in 2013, Vodafone saved £7,398 million in cash on investing activities.

Financing Activity

The last section of the statement of cash flows shows the cash flows from financing activities. Dividends paid to shareholders are a cash outflow. Vodafone paid £5,185 million to its shareholders as dividends in 2013.

The difference between a firm's net income and the amount it spends on dividends is referred to as the firm's retained earnings for that year:

$$\text{Retained Earnings} = \text{Net Income} - \text{Dividends} \tag{2.6}$$

payout ratio The ratio of a firm's dividends to its net income.

In 2013, Vodafone paid more in dividends compared to its net income. However, in 2012, Vodafone retained £7,003 million − £6,947 million = £56 million. This makes its payout ratio for 2012 equal to 99%. A firm's **payout ratio** is the ratio of its dividends to its net income.

Also listed under financing activity is any cash the company received from the sale of its own shares, or cash spent buying (repurchasing) its own shares. Vodafone issued and repurchased its shares in 2013.

The last items to include in this section result from changes to Vodafone's short-term and long-term borrowing. Vodafone raised money by issuing debt, so the increases in borrowing represent a cash inflow. The final line of the statement of cash flows combines the cash flows from these three activities to calculate the overall change in the firm's cash balance over the period of the statement. In this case, Vodafone had cash inflows of £485 million in 2013, which matches the change in cash from 2012 to 2013 shown earlier in the statement of financial position. By looking at the statement in Table 2.3 as a whole, we can determine that Vodafone has spent cash on financing activities (including the dividend and interest payments) and capital expenditure and has covered the cost by generating cash from investing activity together with a cash inflow from operating activities. This has resulted in an increase in Vodafone's cash balance.

Concept Check

7. Why does a firm's net income not correspond to cash earned?
8. What are the components of the statement of cash flows?

2.5 Other Financial Statement Information

The most important elements of a firm's financial statements are the statement of financial position or balance sheet, the income statement, and the statement of cash flows, which we have already discussed. Several other pieces of information contained in the financial statements warrant brief mention: the *statement of changes in shareholders' equity*, the *management discussion and analysis*, and *notes to the financial statements*.

statement of shareholders' equity An accounting statement that breaks down the shareholders' equity computed on the balance sheet into the amount that came from issuing new shares versus retained earnings.

Statement of Changes in Shareholders' Equity

The **statement of changes in shareholders' equity** provides a reconciliation of the opening and closing equity position. It provides details of the movements in share capital and reserves, for example, a revaluation reserve and retained earnings derived from the income statement. Its usefulness for financial managers is limited because of the use of book values rather than the market value. The statement breaks down the shareholders' equity

computed on the statement of financial position into the amount that came from issuing shares (par value plus paid-in capital) versus retained earnings. Because the book value of shareholders' equity is not a useful assessment of value for financial purposes, financial managers use the statement of changes in shareholders' equity infrequently (so we will skip the computational details here). We can, however, determine the change in shareholder's equity using information from the firm's other financial statements as follows:[3]

$$\begin{aligned}\text{Change in Shareholders' Equity} &= \text{Retained Earnings} + \text{Net sales of Shares} \\ &= \text{Net Income} - \text{Dividends} + \text{Sales of Shares} \\ &\quad - \text{Repurchases of Shares}\end{aligned} \tag{2.7}$$

For example, during 2013, Vodafone made share sales and repurchases and together with the addition of net income and the payment of dividends, the result was a decrease in its shareholders' equity shown earlier on Vodafone's statement of financial position.

Management Discussion and Analysis

management discussion and analysis (MD&A) A preface to the financial statements in which a company's management discusses the recent year's performance providing a background on the company and any significant events that may have occurred.

The **management discussion and analysis (MD&A)** or business and operating review is a preface to the financial statements in which the company's management discusses the recent year's performance, providing a background on the company and any significant events that may have occurred. Management may also discuss the coming year, and outline goals, new projects, and future plans.

Management should also discuss any important risks that the firm faces or issues that may affect the firm's liquidity or resources. Management is also required to disclose any **off-balance sheet transactions**, which are transactions or arrangements that can have a material impact on the firm's future performance yet do not appear on the balance sheet. For example, if a firm has made guarantees that it will compensate a buyer for losses related to an asset purchased from the firm, these guarantees represent a potential future liability for the firm that must be disclosed as part of the review.

off-balance sheet transactions Transactions or arrangements that can have a material impact on a firm's future performance yet do not appear on the balance sheet.

Notes to the Financial Statements

In addition to the four financial statements, companies provide extensive notes with additional details on the information provided in the statements. For example, the notes document important accounting assumptions that were used in preparing the statements. They often provide information specific to a firm's subsidiaries or its separate product lines. They show the details of the firm's share-based compensation plans for employees and the different types of debt the firm has outstanding. Details of acquisitions, spin-offs, leases, taxes, debt repayment schedules, and risk management activities are also given. The information provided in the notes is often very important to fully interpret the firm's financial statements.

Concept Check

9. Where do off-balance sheet transactions appear in a firm's financial statements?
10. What information do the notes to financial statements provide?

2.6 Financial Statement Analysis

Investors often use accounting statements to evaluate a firm in one of two ways:

1. Compare the firm with itself by analyzing how the firm has changed over time.
2. Compare the firm to other similar firms using a common set of financial ratios.

[3] Sales of stock would also include any stock-based compensation.

In this section, we will describe the most commonly used ratios—related to profitability, liquidity, working capital, interest coverage, leverage (or gearing), valuation, and operating returns—and explain how each one is used in practice.

Profitability Ratios

We introduce three profitability ratios: *gross margin*, *operating margin*, and *net profit margin*.

gross margin The ratio of gross profit to revenues (sales), it reflects the ability of the company to sell a product for more than the sum of the direct costs of making it.

Gross Margin. The **gross margin** of a firm is the ratio of gross profit to revenues (sales):

$$\text{Gross Margin} = \frac{\text{Gross Profit}}{\text{Sales}} \tag{2.8}$$

The gross margin simply reflects the ability of the company to sell a product for more than the cost of producing it. In 2013, Vodafone had a gross margin of 13,940/44,445 = 31.37%.

operating margin The ratio of operating income to revenues, it reveals how much a company has earned from each dollar of sales before deducting interest and taxes.

Operating Margin. Because there are additional expenses of operating a business beyond the direct costs of goods sold, another important profitability ratio is the **operating margin**, the ratio of operating income to revenues:

$$\text{Operating Margin} = \frac{\text{Operating Income}}{\text{Sales}} \tag{2.9}$$

The operating margin reveals how much a company earns before interest and taxes from each pound of sales. Vodafone's operating margin in 2013 was 4,728/44,445 = 10.64%, a decrease from its 2012 operating margin of 11,187/46,417 = 24.10%. We can similarly compute the firm's **EBIT margin** (EBIT/Sales). By comparing operating or EBIT margins across firms within an industry, we can assess the relative efficiency of firms' operations. For example, in 2012, United Continental Holdings (UAL) had an operating margin of 0.2% (i.e., they gained 0.2 cents for each dollar in revenues). However, competitor Alaska Air Group (ALK) had an operating margin of 12.02%.

In addition to the efficiency of operations, differences in operating margins can also result from differences in strategy. For example, in 2010, Walmart Stores had an operating margin of 5.97% while high-end retailer Nordstrom had an operating margin of 11.07%. In this case, Walmart's lower operating margin is not a result of its inefficiency but is part of its strategy of offering lower prices to sell common products in high volume. Indeed, Walmart's sales were more than 38 times higher than those of Nordstrom.

net profit margin The ratio of net income to revenues, it shows the fraction of each dollar in revenues that is available to equity holders after the firm pays its expenses, plus interest and taxes.

Net Profit Margin. A firm's **net profit margin** is the ratio of net income to revenues:

$$\text{Net Profit Margin} = \frac{\text{Net Income}}{\text{Sales}} \tag{2.10}$$

The net profit margin shows the fraction of each pound in revenues that is available to equity holders after the firm pays interest and taxes. Vodafone's net profit margin in 2013 was 673/44,445 = 1.51%. Differences in net profit margins can be due to differences in efficiency, but they can also result from differences in leverage (or gearing), which is the firm's reliance on debt financing, and which determines the amount of interest expense, as well as differences in accounting assumptions.

Liquidity Ratios

Financial analysts often use information in the firm's balance sheet or statement of financial position to assess its financial solvency or liquidity. Specifically, creditors often compare a firm's current assets and current liabilities to assess whether the firm has sufficient working capital to meet its short-term needs. This comparison can be summarized in the firm's **current ratio**, the ratio of current assets to current liabilities.

current ratio The ratio of current assets to current liabilities.

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}} \tag{2.11}$$

Vodafone's current ratio decreased from 20,025/24,025 = 0.83 in 2012 to 23,287/31,224 = 0.75 in 2013.

A more stringent test of the firm's liquidity is the **quick ratio ("acid-test" ratio)**, which compares only cash and "near cash" assets, such as short-term investments and accounts receivable, to current liabilities.

quick ratio ("acid-test" ratio) The ratio of current assets other than inventory to current liabilities.

$$\text{Quick Ratio} = \frac{\text{Current Assets} - \text{Inventory}}{\text{Current Liabilities}} \tag{2.12}$$

In 2013, Vodafone's quick ratio was (7,623 + 9,412)/31,224 = 0.55. A higher current or quick ratio implies less risk of the firm experiencing a cash shortfall in the near future. A reason to exclude inventory is that it may not be that liquid; indeed an increase in the current ratio that results from an unusual increase in inventory could be an indicator that the firm is having difficulty selling its products.

Ultimately, firms need cash to pay employees and meet other obligations. Running out of cash can be very costly for a firm, so firms often gauge their cash position by calculating the **cash ratio**, which is the most stringent liquidity ratio:

cash ratio The ratio of cash to current liabilities.

$$\text{Cash Ratio} = \frac{\text{Cash}}{\text{Current Liabilities}} \tag{2.13}$$

Asset Efficiency

A financial manager can use the combined information in the firm's income statement and the statement of financial position or balance sheet to gauge how efficiently his or her firm is utilizing its assets. A first broad measure of efficiency is **asset turnover**, the ratio of sales to total assets:

asset turnover The ratio of sales to total assets.

$$\text{Asset Turnover} = \frac{\text{Sales}}{\text{Total Assets}} \tag{2.14}$$

Low values of asset turnover indicate that the firm is not generating much revenue (sales) per pound of assets. In 2013, Vodafone's £142,698 million in assets generated £44,445 million in sales for an asset turnover ratio of 0.3 (44,445/142,698). Since total assets includes assets, such as cash, that are not directly involved in generating sales, Vodafone's manager might also look at Vodafone's fixed asset turnover, which is equal to sales divided by fixed assets:

$$\text{Fixed Asset Turnover} = \frac{\text{Sales}}{\text{Fixed Assets}} \tag{2.15}$$

Vodafone's fixed assets in 2013 were £20,331 million worth of property, plant, and equipment, yielding a fixed asset turnover of 2.2 (= 44,445/20,331). Low asset turnover ratios indicate that the firm is generating relatively few sales given the amount of assets it employs.

accounts receivable days An expression of a firm's accounts receivable in terms of the number of days' worth of sales that the accounts receivable represents.

accounts payable days An expression of a firm's accounts payable in terms of the number of days' worth of cost of goods sold that the accounts payable represents.

inventory days An expression of a firm's inventory in terms of the number of days' worth of cost of goods sold that the inventory represents.

inventory turnover ratio The cost of goods sold divided by either the latest cost of inventory or the average inventory over the year, it shows how efficiently companies turn their inventory into sales.

Working Capital Ratios

Vodafone's managers might be further interested in how efficiently they are managing their net working capital. We can express the firm's accounts receivable in terms of the number of days' worth of sales that it represents, called the **accounts receivable days**, **average collection period**, or **days sales outstanding**:[4]

$$\text{Accounts Receivable Days} = \frac{\text{Accounts Receivable}}{\text{Average Daily Sales}} \tag{2.16}$$

Given average daily sales of £44,445 million/365 = £121.77 million in 2013, Vodafone's receivables of £9,412 million represent 9,412/121.77 = 77 days' worth of sales. In other words, Vodafone takes almost two-and-a-half months to collect payment from its customers, on average. In 2012, Vodafone's accounts receivable represented only 85 days worth of sales. Although the number of receivable days can fluctuate seasonally, a significant unexplained increase could be a cause for concern (perhaps indicating the firm is doing a poor job collecting from its customers or is trying to boost sales by offering generous credit terms). There are similar ratios for accounts payable and inventory. These ratios are called **accounts payable days** (accounts payable divided by average daily cost of goods sold) and **inventory days** (inventory divided by average daily cost of goods sold).

We can also compute how efficiently firms use inventory. The **inventory turnover ratio** is equal to the cost of goods sold divided by either the latest cost of inventory or the average inventory over the year. We use the cost of goods (or cost of sales) sold because that is how inventory costs are reflected on the income statement.

$$\text{Inventory Turnover} = \frac{\text{Cost of Goods Sold}}{\text{Inventory}} \tag{2.17}$$

EXAMPLE 2.4

Computing Working Capital Ratios

MyFinanceLab

PROBLEM

Compute Vodafone's accounts payable, inventory days, and inventory turnover for 2013.

SOLUTION

PLAN AND ORGANIZE

Working capital ratios require information from both the statement of financial position and the income statement. For these ratios we need inventory and accounts payable from the statement of financial position and cost of goods sold from the income statement (often listed as cost of sales).

Inventory = 450, Accounts payable = 16,198, Cost of goods sold (cost of sales) = 30,505

EXECUTE

$$\text{Accounts payable days} = \frac{\text{Accounts Payable}}{\text{Average Daily Cost of Goods Sold}} = \frac{16{,}198}{(30{,}505/365)} = 193.81$$

$$\text{Inventory days} = \frac{\text{Inventory}}{\text{Average Daily Cost of Goods Sold}} = \frac{450}{(30{,}505/365)} = 5.38$$

$$\text{Inventory turnover} = \frac{\text{Cost of Goods Sold}}{\text{Inventory}} = \frac{30{,}505}{450} = 67.79$$

(*Continued*)

[4]Accounts receivable days can also be calculated based on the average accounts receivable at the end of the current and prior years.

EVALUATE

Assuming that Vodafone's accounts payable at year-end on its balance sheet is representative of the normal amount during the year, Vodafone is able, on average, to take about 194 days to pay its suppliers. This compares with the 77 days we calculated that it waits on average to be paid (its accounts receivable days). Vodafone typically takes 5 days to sell its inventory. Note that inventory turnover and inventory days tells us the same thing in different ways—if it takes Vodafone about 5 days to sell its inventory, then it turns over its inventory about 68 times per 365-day year. In the later chapter on working capital management, we will see how a company's receivable, inventory, and payable days make up its operating cycle.

As with the other ratios in this section, a normal level for this ratio can vary substantially for different industries, although a higher level (more pounds of cost of sales per pound of inventory) is generally better.

Interest Coverage Ratios

interest coverage ratio or times interest earned (TIE) ratio An assessment by lenders of a firm's leverage, it is equal to a measure of earnings divided by interest.

Lenders often assess a firm's leverage by computing an **interest coverage ratio**, also known as a **times interest earned (TIE) ratio**, which is equal to a measure of earnings divided by interest. Financial managers watch these ratios carefully because they assess how easily the firm will be able to cover its interest payments. There is no one accepted measure of earnings for these ratios; it is common to consider operating income, EBIT, or EBITDA as a multiple of the firm's interest expenses. When this ratio is high, it indicates that the firm is earning much more than is necessary to meet its required interest payments.

EXAMPLE 2.5

Computing Interest Coverage Ratios

MyFinanceLab

PROBLEM

Assess Vodafone's ability to meet its interest obligations by calculating interest coverage ratios using both EBIT and EBITDA.

SOLUTION

PLAN AND ORGANIZE

Gather the EBIT, depreciation, and amortization and interest expense for each year from Vodafone's Income Statement.

2012: EBIT = 11,481, EBITDA = 11,481 + 4,050, Interest expense = 1,932

2013: EBIT = 5,043, EBITDA = 5,043 + 7,700, Interest expense = 1,788

EXECUTE

In 2012 and 2013, Vodafone had the following interest coverage ratios:

$$2012: \frac{\text{EBIT}}{\text{Interest}} = \frac{11{,}481}{1{,}932} = 5.94 \quad \text{and} \quad \frac{\text{EBITDA}}{\text{Interest}} = \frac{11{,}481 + 4{,}050}{1{,}932} = 8.04$$

$$2013: \frac{\text{EBIT}}{\text{Interest}} = \frac{5{,}043}{1{,}788} = 2.82 \quad \text{and} \quad \frac{\text{EBITDA}}{\text{Interest}} = \frac{5{,}043 + 7{,}700}{1{,}788} = 7.13$$

EVALUATE

The coverage ratios indicate that Vodafone is generating enough cash to cover its interest obligations. However, Vodafone's declining interest coverage may be a source of concern for its creditors

Leverage (Gearing) Ratios

leverage A measure of the extent to which a firm relies on debt as a source of financing.

Another important piece of information that we can learn from a firm's statement of financial position or balance sheet is the firm's **leverage** (gearing), or the extent to which it relies on debt as a source of financing. The **debt-equity ratio** is a common ratio used to assess a

debt-equity ratio The ratio of a firm's total amount of short- and long-term debt (including current maturities) to the value of its equity, which may be calculated based on market or book values.

firm's leverage. We calculate this ratio by dividing the total amount of short- and long-term debt (including current maturities) by the total shareholders' equity:

$$\text{Debt-Equity Ratio} = \frac{\text{Total Debt}}{\text{Total Equity}} \tag{2.18}$$

We can calculate this ratio using either book or market values for equity and debt. From Table 2.1, Vodafone's debt in 2013 includes short-term financial debt (£15,026 million) and long-term borrowings (£38,986 million), for a total of £54,012 million. Therefore, using the book value of equity, its *book* debt-equity ratio is 54,012/72,488 = 0.75. Note the large increase from 2012, when the book debt-equity ratio was only (8,789 + 37,349)/78,202 = 0.59.

Because of the difficulty interpreting the book value of equity, the book debt-equity ratio is not especially useful. It is more informative to compare the firm's debt to the market value of its equity. Vodafone's debt-equity ratio in 2013, using the market value of equity (from Example 2.1), is 54,012/91,493 = 0.59, which means Vodafone's debt is around half of the market value of its equity.[5] As we will see later in the text, a firm's *market* debt-equity ratio has important consequences for the risk and return of its stock.

debt-to-capital ratio The ratio of total debt to total debt plus total equity.

We can also calculate the fraction of the firm financed by debt in terms of its **debt-to-capital ratio**:

$$\text{Debt-to-Capital Ratio} = \frac{\text{Total Debt}}{\text{Total Equity} + \text{Total Debt}} \tag{2.19}$$

Again, this ratio can be computed using book or market values.

While leverage increases the risk to the firm's equity holders, firms may also hold cash reserves in order to reduce risk. Thus, another useful measure to consider is the firm's **net debt**, or debt in excess of its cash reserves:

net debt Debt in excess of a firm's cash reserves.

$$\text{Net Debt} = \text{Total Debt} - \text{Excess Cash \& Short-Term Investments} \tag{2.20}$$

To understand why net debt may be a more relevant measure of leverage, consider a firm with more cash than debt outstanding: Because such a firm could pay off its debts immediately using its available cash, it has not increased its risk and has no effective leverage.

debt-to-enterprise value ratio The ratio of a firm's net debt to its enterprise value.

Analogous to the debt-to-capital ratio, we can use the concept of net debt to compute the firm's **debt-to-enterprise value ratio**:

$$\text{Debt-to-Enterprise Value Ratio} = \frac{\text{Net Debt}}{\text{Market Value of Equity} + \text{Net Debt}} = \frac{\text{Net Debt}}{\text{Enterprise Value}} \tag{2.21}$$

Given Vodafone's 2013 cash balance of £7,623 million, and total long- and short-term debt of £54,012 million, its net debt is 54,012 − 7,623 = £46,389 million.[6] Given its market value of equity of £91,493 million, Vodafone's enterprise value in 2013 is 91,493 + 46,389 = £137,882 million, and thus its debt-to-enterprise value ratio is 46,389/137,882 = 33.64%. That is, 33.64% of Vodafone's underlying business activity is financed via debt.

[5] In this calculation, we have compared the market value of equity to the book value of debt. Strictly speaking, it would be best to use the market value of debt. But because the market value of debt is generally not very different from its book value, this distinction is often ignored in practice.

[6] While net debt should ideally be calculated by deducting cash in excess of the firm's operating needs, absent additional information, it is typical in practice to deduct all cash on the balance sheet.

equity multiplier A measure of leverage equal to total assets divided by total equity.

A final measure of leverage is a firm's **equity multiplier**, measured in book value terms as Total Assets/Book Value of Equity. As we will see shortly, this measure captures the amplification of the firm's accounting returns that results from leverage. The market value equity multiplier, which is generally measured as Enterprise Value/Market Value of Equity, indicates the amplification of shareholders' financial risk that results from leverage.

Valuation Ratios

price-earnings ratio (P/E) The ratio of the market value of equity to the firm's earnings, or its share price to its earnings per share.

Analysts and investors use a number of ratios to gauge the market value of a firm. The most important is the firm's **price-earnings ratio (P/E)**:

$$\text{P/E Ratio} = \frac{\text{Market Capitalization}}{\text{Net Income}} = \frac{\text{Share Price}}{\text{Earnings per Share}} \tag{2.22}$$

That is, the P/E ratio is the ratio of the value of equity to the firm's earnings, either on a total basis or on a per-share basis. For example, Vodafone's P/E ratio in 2013 was 91,493/429 = 1.86/0.0087 = 214. The P/E ratio is a simple measure that is often used to assess whether a share is over- or under-valued, based on the idea that the value of a share should be proportional to the level of earnings it can generate for its shareholders. P/E ratios can vary widely across industries and tend to be higher for industries with high growth rates. For example, in 2012, the average large U.S. firm had a P/E ratio of about 17. But software firms, which tend to have above-average growth rates, had an average P/E ratio of 32. One way to capture the idea that a higher P/E ratio can be justified by a higher growth rate is to compare it to the company's expected earnings growth rate. For example, if Vodafone's expected growth rate is 214%, then it would have a P/E to Growth, or **PEG ratio**, of 1. Some investors consider PEG ratios of 1 or below as indicating the stock is fairly priced, but would question whether the company is potentially overvalued if the PEG is higher than 1.

PEG ratio The ratio of a firm's P/E to its expected earnings growth rate.

Because the P/E ratio considers the value of the firm's equity is sensitive to the firm's choice of leverage. Recall that the amount of assets controlled by the equity holders can be increased through the use of leverage. The P/E ratio is therefore of limited usefulness when comparing firms with markedly different leverage. We can avoid this limitation by instead assessing the market value of the underlying business using valuation ratios based on the firm's enterprise value. Typical ratios include the ratio of enterprise value to revenue, or enterprise value to operating income, EBIT or EBITDA. These ratios compare the value of the business to its sales, operating profits, or cash flow. Similar to the P/E ratio, these ratios are used to make intra-industry comparisons of how firms are priced in the market.

COMMON MISTAKE

Mismatched Ratios

When considering valuation (and other) ratios, be sure that the items you are comparing both represent amounts related to the entire firm or that both represent amounts related solely to equity holders. For example, a firm's share price and market capitalization are values associated with the firm's equity. Thus, it makes sense to compare them to the firm's earnings per share or net income, which are amounts to equity holders after interest has been paid to debt holders. We must be careful, however, if we compare a firm's market capitalization to its revenues, operating income, or EBITDA. These amounts are related to the whole firm, and both debt and equity holders have a claim to them. Therefore, it is better to compare revenues, operating income, or EBITDA to the enterprise value of the firm, which includes both debt and equity.

The P/E ratio or ratios to EBIT or EBITDA are not meaningful if the firm's earnings are negative. In this case, it is common to look at the firm's enterprise value relative to sales. The risk in doing so, however, is that earnings might be negative because the firm's underlying business model is fundamentally flawed, as was the case for many Internet firms in the late 1990s.

EXAMPLE 2.6

Computing Profitability and Valuation Ratios

MyFinanceLab

PROBLEM

Consider the following data as of December 2011 for Deutsche Telekom and France Telecom (in € billion):

	Deutsche Telekom	France Telecom
Sales	58.7	45.3
EBIT	5.6	7.9
Net Income	0.6	3.8
Market Capitalization	38.3	22.3
Cash	3.7	8.0
Debt	40.1	32.3

Compare Deutsche Telekom's and France Telecom's EBIT margins, net profit margins, P/E ratios, and the ratio of enterprise value to EBIT and sales.

SOLUTION

PLAN

The table contains all of the raw data but we need to compute the ratios using the inputs in the table.

EBIT Margin = EBIT/Sales
Net Profit Margin = Net Income/Sales
P/E Ratio = Price/Earnings = Market Capitalization/Net Income
Enterprise Value to EBIT = Enterprise Value/EBIT
Enterprise Value to Sales = Enterprise Value/Sales

EXECUTE

Deutsche Telekom had an EBIT margin of 5.6/58.7 = 9.5%, a net profit margin of 0.6/58.7 = 1.0%, and a P/E ratio of 38.3/0.6 = 63.8. Its enterprise value was 38.3 + 40.1 − 3.7 = €74.7 billion. Its ratio to EBIT is 74.7/5.6 = 13.34, and its ratio to sales is 74.7/58.7 = 1.27.

France Telecom had an EBIT margin of 7.9/45.3 = 17.4%, a net profit margin of 3.8/45.3 = 8.4%, and a P/E ratio of 22.3/3.8 = 5.9. Its enterprise value was 22.3 + 32.3 − 8.0 = €46.6 billion. Its ratio to EBIT is 46.6/7.9 = 5.90, and its ratio to sales is 46.6/45.3 = 1.03.

EVALUATE

Note that although France Telecom's profitability margins exceeded those of Deutsche Telekom's, with the exception of EBIT, the other valuation multiples are quite close.

Investment Returns

return on equity (ROE) The ratio of a firm's net income to the book value of its equity.

Analysts and financial managers often evaluate the firm's return on investment by comparing its income to its investment using ratios such as the firm's **return on equity (ROE)**:[7]

$$\text{Return on Equity} = \frac{\text{Net Income}}{\text{Book Value of Equity}} \tag{2.23}$$

Vodafone's ROE in 2013 was 673/72,488 = 0.93%. The ROE provides a measure of the return that the firm has earned on its past investments. A high ROE may indicate the firm is able to find investment opportunities that are very profitable. Of course, one weakness of this measure is the difficulty in interpreting the book value of equity.

[7]Because net income is measured over the year, the ROE can also be calculated based on the average book value of equity at the end of the current and prior years.

return on assets (ROA) The ratio of net income plus interest expense to the total book value of the firm's assets.

Another common measure is the **return on assets (ROA)**, which is net income plus interest expense divided by the total assets. The ROA calculation includes interest expense in the numerator because the assets in the denominator have been funded by both debt and equity investors. A firm must earn both a positive ROE and ROA to grow.

As a performance measure, ROA has the benefit that it is less sensitive to leverage than ROE. However, it is sensitive to working capital—for example, an equal increase in the firm's receivables and payables will increase total assets and thus lower ROA. To avoid this problem, we can consider the firm's **return on invested capital (ROIC)**:

return on invested capital (ROIC) The ratio of the after-tax profit before interest to the book value of invested capital not being held as cash (book equity plus net debt).

$$\text{Return on Invested Capital} = \frac{\text{EBIT}\ (1 - \text{Tax Rate})}{\text{Book Value of Equity} + \text{Net Debt}} \tag{2.24}$$

The return on invested capital measures the after-tax profit generated by the business itself, excluding any interest expenses (or interest income), and compares it to the capital raised from equity and debt holders that has already been deployed (i.e., is not held as cash). Of the three measures of operating returns, ROIC is the most useful in assessing the performance of the underlying business.

EXAMPLE 2.7 Computing Operating Returns

MyFinanceLab

PROBLEM

Assess how Vodafone's ability to use its assets effectively has changed in the last year by computing the change in its return on assets.

SOLUTION

PLAN AND ORGANIZE

In order to compute ROA, we need net income, interest expense, and total assets.

	2012	2013
Net Income	7,003	673
Interest Expense	1,932	1,788
Total Assets	139,576	142,698

EXECUTE

In 2013, Vodafone's ROA was $(673 + 1{,}788)/142{,}698 = 1.7\%$, compared to an ROA in 2012 of $(7{,}003 + 1{,}932)/139{,}576 = 6.4\%$.

EVALUATE

The deterioration in Vodafone's ROA from 2012 to 2013 suggests that Vodafone was unable to use its assets effectively and its return decreased over this period.

DuPont Identity Expresses return on equity as the product of profit margin, asset turnover, and a measure of leverage.

The DuPont Identity

We can gain further insight into a firm's return on equity (ROE) using a tool called the **DuPont Identity** (named after the company that popularized its use), which expresses the return on equity as the product of profit margin, asset turnover, and a measure of leverage.