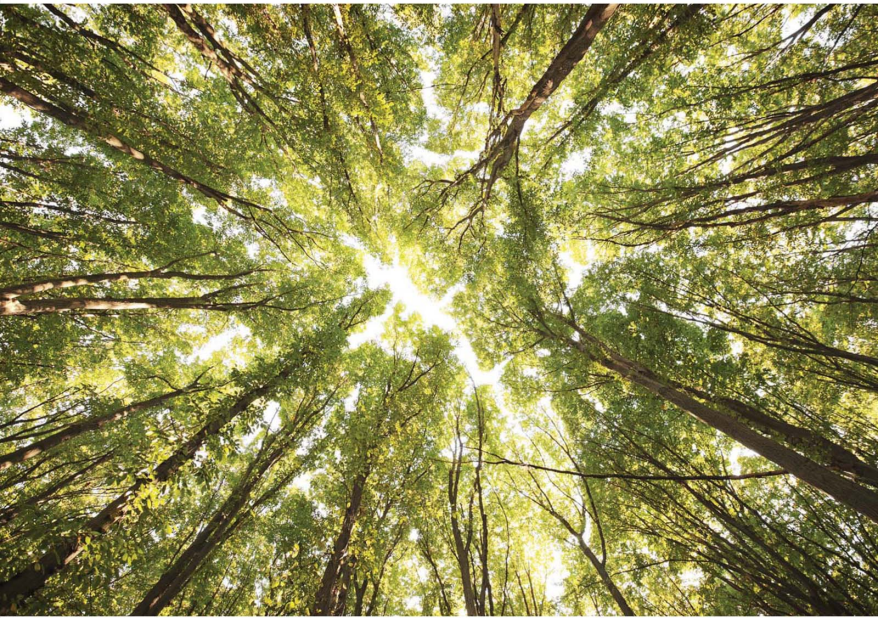


 Eighth Canadian Edition

CORPORATE FINANCE



ROSS | WESTERFIELD | JAFFE | ROBERTS | DRISS

CORPORATE FINANCE

EIGHTH CANADIAN EDITION

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Corporate Finance
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IN MEMORIAM

We at McGraw-Hill Education Canada lost one of our most esteemed authors with the passing of Gordon S. Roberts in March of 2017. Gordon was a professor emeritus of finance at the Schulich School of Business at York University and a McGraw-Hill author for many years.

Gordon S. Roberts will be remembered as an extremely creative and thoughtful scholar with a rigorous approach to questions of great importance. His contributions to the field of finance are unquestioned and are reflected in his outstanding international reputation, research contributions, and many awards and honours. In particular, Gordon will be remembered for making significant contributions to the current textbook. His expertise and rigorous approach were key to making this textbook exciting, accurate, fair, well-paced, and immediately useful.



Prior to development work on this eighth Canadian edition text, our very own portfolio manager, Alwynn Pinard, had the pleasure of working closely with Gordon. Of him she says, “Gordon’s professionalism, adherence to deadlines and commitment to quality were all attributes that endeared him to us here at McGraw-Hill Education and created the Canadian resource you are reading, today. Thank you, Gordon. We will miss your dedication to your work and your students and perhaps most of all, your warmth and wit.”

On behalf of the entire staff at McGraw-Hill Education who had the pleasure of working with Gordon personally, or the pleasure of working on all the legacy projects he helped to build, we offer our deepest sympathies to Gordon’s wife, Sonita, and his family. Gordon’s contributions to learning will be treasured and never forgotten.

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PREFACE

The teaching and practice of corporate finance in Canada are more challenging and exciting than ever before. The last decade alone has seen fundamental changes in financial markets and financial instruments. In the early years of the twenty-first century, announcements in the financial press about takeovers, junk bonds, financial restructuring, initial public offerings, bankruptcy, and derivatives are still commonplace. In addition, there is the new recognition of “real” options (Chapter 9), private equity and venture capital (Chapter 20), and the reappearing dividend (Chapter 19). The world’s financial markets are more integrated than ever before. Both the theory and practice of corporate finance have been moving ahead with uncommon speed, and our teaching, as always, must keep pace.

These developments place new burdens on the teaching of corporate finance. On the one hand, the changing world of finance makes it more difficult to keep materials up to date. On the other hand, the teacher must distinguish the permanent from the temporary and avoid the temptation to follow fads. Our solution to this problem is to emphasize the modern fundamentals of the theory of finance and make the theory come to life with contemporary examples. All too often, the novice student views corporate finance as a collection of unrelated topics that are unified largely because they are bound together between the covers of one book. As in the previous editions, our aim is to present corporate finance as the collaboration of a small number of integrated and powerful institutions.

This book has been written for the introductory courses in corporate finance at the MBA level and for the intermediate courses in many undergraduate programs. Some instructors will find this text appropriate for the introductory course at the undergraduate level as well.

It is assumed that most students either will take, or will be concurrently enrolled in, courses in accounting, statistics, and economics. This exposure will help students understand some of the more difficult material. However, the book is self-contained, and prior knowledge of these areas is not essential. The only mathematics prerequisite is basic algebra.

NEW TO THE EIGHTH CANADIAN EDITION

- Executive summaries have been updated.
- Minicases have been reviewed and replaced where necessary to ensure that each is related to the material covered in the corresponding chapter.
- Practice problems have been updated and new ones have been added.
- Tables, figures, and examples have been updated throughout the text.
- New and recent Canadian examples have been added.
- Concept questions have been updated and new ones have been added.
- End-of-chapter material has been substantially updated and refreshed.
- New highlighted concepts have been added.
- The discussion on taxes in Chapter 1 has been updated.
- The discussion on capital cost allowance in Chapter 8 has been streamlined and special cases have been introduced.
- New examples on real options have been added in Chapter 9.
- Capital market data have been updated through 2016 in Chapter 10.

PEDAGOGY

Keeping the theory and concepts current is only one phase of developing our corporate finance text. To be an effective teaching tool, the text must present the theory and concepts in a coherent way that can be easily learned. With this in mind, we have included the following study features.

Executive Summary

Each chapter begins with a road map that describes the objectives of the chapter and how it connects with concepts already learned in previous chapters. Real company examples that will be discussed are highlighted in this section.

EXECUTIVE SUMMARY

Barrick Gold Corporation has long been known as the largest gold mining company in the world. With the recent recession, gold prices and Barrick's share price increased as investors sought a safe investment. However, in 2013 Barrick's shares plunged in value by 54 percent to a 20-year low. While the accompanying fall in the value of gold was beyond the company's control, the poor performance was attributed primarily to the failure of key projects, misallocation of capital resources, and the legal mess associated with the Pascua-Lama mine in Chile. Accompanying this poor performance, the company's proxy circular revealed that six executives were to be compensated for a combined \$47.4 million and board chair Peter Munk was to receive \$4.3 million. In addition, the company awarded a US\$11.9 million signing bonus to John Thornton for joining the company as co-chair. Consequently, several major shareholders of Barrick Gold Corporation invoked a "say on pay" vote, which rejected the pay packages and led to the appointment of new independent directors and to Munk stepping down as board chair. Recent events at Barrick Gold Corporation illustrate both the importance of governance issues and the need for management to make key corporate finance decisions relating to the following questions:

In Their Own Words Boxes

Located throughout the chapters, this unique series consists of articles written by distinguished scholars or practitioners on key topics.

IN THEIR OWN WORDS

B. ESPEN ECKBO on corporate governance

The substantial growth in equity index investing over the past twenty years has lowered average shareholder incentives to monitor the management of individual portfolio companies. The resulting shareholder absenteeism effectively transfers corporate control rights to increasingly powerful corporate executives and other insiders. Today, an important counterweight to this massive shift in the balance of power between the firm's owners and managers is a small set of active investors who occasionally decide to bear the cost of challenging incumbent management teams.

In countries with highly developed financial systems, much of the governance debate focuses on this shift in the balance of power between shareholders, boards, and top executives in widely held public companies. The balance is affected by four major factors, which tend to differ greatly across countries: (1) The cost of taking legal action and the strength of law enforcement. (2) The efficiency of the director election process and the cost of challenging and replacing directors. (3) The cost of shareholder activism and of transacting in the market for corporate control. (4) The political strength of employee unions.

Early in a firm's lifecycle, when share ownership is highly concentrated, this balance of power is hardly an issue. However, as the company grows and prospers, and founders diversify their initial investment by bringing in new and smaller owners, the balance starts to change. Corporate insiders, who themselves have much of their human capital invested in the firm, increasingly view shareholders as a remote constituency and even as irrelevant for the company on a daily basis. By choosing to diversify, shareholders for their part agree to play a diminished role in the company's affairs.

easily swamps investment returns. As a result, they no longer show up to annual meetings and either vote with management or simply throw the proxy form in the wastebasket. The resulting combination of voluntary shareholder absenteeism and strong corporate insiders creates a problem that lies at the heart of many of today's governance controversies. An important historical lesson is that the absentee shareholder system can breed arrogance on the part of corporate insiders. A vigorous corporate governance system is thus required to prevent shareholder rights being expropriated by insiders.

A major task of the board is to hire and fire top managers and to set their compensation. Therefore, corporate insiders come with an inherent conflict of interest when they sit on boards. Nevertheless, corporate insiders sit on boards in major developed countries. In the United States, until twenty years ago, it was even common for the chief executive officer (CEO) to occupy the post of board chair. Several companies have since voluntarily replaced this practice with a split-chair role (using a combination of CEO chair and a "lead" director) or a complete separation of the roles of CEO and chair.

In Europe, the tradition has been not to place the CEO in the chair, in some countries by statute. However, while non-executive members make up a clear majority of directors in the United States, there is a tradition in Europe for placing a greater portion of employees on boards, which also raises conflict of interest issues.

The typical defence of having insiders on boards is one of efficiency: the board requires CEO and other management input to make proper decisions. What this defence

Concept Questions

Included after each major section in a chapter, Concept Questions point to essential material and allow students to test their recall and comprehension before moving forward.

CONCEPT QUESTIONS ?

- What are three basic questions of corporate finance?
- Describe capital structure.
- List three reasons why value creation is difficult.

Figures and Tables

This text makes extensive use of real data and presents them in various figures and tables. Explanations in the narrative, examples, and end-of-chapter problems will refer to many of these exhibits.

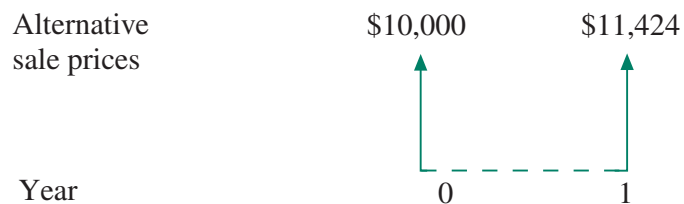
Examples

Separate called-out examples are integrated throughout the chapters. Each example illustrates an intuitive or mathematical application in a step-by-step format. There is enough detail in the explanations that students don't have to look elsewhere for additional information.

EXAMPLE 5.1

Antony Robart is trying to sell a piece of land in Saskatchewan. Yesterday, he was offered \$10,000 for the property. He was ready to accept the offer when another individual offered him \$11,424. However, the second offer was to be paid a year from now. Antony has satisfied himself that both buyers are honest, so he has no fear that the offer he selects will fall through. These two offers are pictured as cash flows in Figure 5.1. Which offer should Antony choose?

FIGURE 5.1
Cash Flow for Antony's Sale



Equations

Key equations are numbered and highlighted for easy reference.

Highlighted Concepts

Throughout the text, important ideas are pulled out and presented in a box—signalling to students that this material is particularly relevant and critical to their understanding.

A Comparison of Partnerships and Corporations		
	Corporation	Partnership
Liquidity and marketability	Common stock can be listed on a stock exchange.	Units are subject to substantial restrictions on transferability. There is no established trading market for partnership units.
Voting rights	Usually each share of common stock entitles each holder to one vote per share on matters requiring a vote and on the election of the directors. Directors determine top management.	Limited partners have some voting rights. However, general partners have exclusive control and management of operations.
Taxation	Corporate income is taxable at the corporate tax rate. Dividends to shareholders are also taxable with partial integration through use of the dividend tax credit.	Partnership income is taxed as personal income to the partners.
Reinvestment and dividend payout	Corporations have broad latitude on dividend payout decisions.	Partnerships are generally prohibited from reinvesting partnership cash flow. All net cash flow is distributed to partners.
Liability	Shareholders are not personally liable for obligations of the corporation.	Limited partners are not liable for obligations of partnerships. General partners may have unlimited liability.
Continuity of existence	Corporations have a perpetual life.	Partnerships have a limited life.

End-of-Chapter Material

The end-of-chapter material reflects and builds upon the concepts learned in the chapter.

Summary and Conclusions

The numbered summary provides a quick review of key concepts in the chapter.

2.5 SUMMARY AND CONCLUSIONS

Besides introducing you to corporate accounting, the purpose of this chapter was to teach you how to determine cash flow from the accounting statements of a typical company.

1. Cash flow is generated by the firm and paid to creditors and shareholders. It can be classified as
 - a. Cash flow from operations.
 - b. Cash flow from changes in long-term assets.
 - c. Cash flow from changes in working capital.
2. There is a cash flow identity that says that cash flow from assets equals cash flow to bondholders and shareholders.
3. Calculations of cash flow are not difficult, but they require care and particular attention to detail in properly accounting for non-cash expenses such as depreciation and deferred taxes. It is especially important that you do not confuse cash flow with changes in net working capital and net income.

List of Key Terms

A list of the boldfaced key terms in the text with page numbers is included for easy reference.

Questions and Problems

Because solving problems is so critical to a student's learning, new questions and problems have been added and existing questions and problems have been revised. All problems have also been thoroughly reviewed and checked for accuracy. Problems have been grouped according to the concepts they test, with the concept headings listed at the beginning of each group.

Additionally, we have tried to make the problems in the critical "concept" chapters—such as those on value, risk, and capital structure—especially challenging and interesting. We provide answers to selected problems in Appendix B, available on Connect.

Microsoft Excel Problems

Indicated by the Microsoft Excel icon in the margin, these Microsoft Excel problems can be found at the end of almost all chapters. Located on Connect, Microsoft Excel templates have been created for each of these problems, where students can use the data in the problem to work out the solution using Microsoft Excel skills.



Minicases

These Minicases, located in most chapters, apply what is learned in a number of chapters to a real-world scenario. After presenting the facts, the case gives students guidance in rationalizing a sound business decision.

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- Access instructor resources.
- View assignments and resources created for past sections.
- Post your own resources for students to use.

Instructor Resources

- **Instructor's Manual.** Prepared by **Larbi Hammami**, *Desautels Faculty of Management, McGill University*.
- **Instructor's Solutions Manual.** Prepared by **Hamdi Driss**, *Sobey School of Management, St. Mary's University*.

- **Microsoft PowerPoint Presentations.** Updated by **Tsvetanka Karagyozyova**, *Department of Economics, Faculty of Liberal Arts and Professional Studies, York University.*
- **Computerized Test Bank.** Prepared by **Shantanu Dutta**, *Telfer School of Management, University of Ottawa.*
- **Microsoft Excel Templates (with solutions).** Prepared by **Vishaal Baulkaran**, *Dhillon School of Business, University of Lethbridge.*

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ACKNOWLEDGMENTS

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Through the development of this edition, our team has taken great care to discover and eliminate errors. Our goal is to provide the best Canadian textbook available on this subject. Please send comments and feedback to:

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Sincerely,
Hamdi Driss

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Chapter

1

Introduction to Corporate Finance

EXECUTIVE SUMMARY

Barrick Gold Corporation has long been known as the largest gold mining company in the world. With the recent recession, gold prices and Barrick's share price increased as investors sought a safe investment. However, in 2013 Barrick's shares plunged in value by 54 percent to a 20-year low. While the accompanying fall in the value of gold was beyond the company's control, the poor performance was attributed primarily to the failure of key projects, misallocation of capital resources, and the legal mess associated with the Pascua-Lama mine in Chile. Accompanying this poor performance, the company's proxy circular revealed that six executives were to be compensated for a combined \$47.4 million and board chair Peter Munk was to receive \$4.3 million. In addition, the company awarded a US\$11.9 million signing bonus to John Thornton for joining the company as co-chair.¹ Consequently, several major shareholders of Barrick Gold Corporation invoked a "say on pay" vote, which rejected the pay packages and led to the appointment of new independent directors and to Munk stepping down as board chair. Recent events at Barrick Gold Corporation illustrate both the importance of governance issues and the need for management to make key corporate finance decisions relating to the following questions:

1. What long-term investment strategy should a company take on?
2. How can cash be raised?
3. How much short-term cash flow does a company need to pay its bills?

These are not the only questions of corporate finance. For example, another important question covered in this text is: How should a company divide earnings between payouts to shareholders (dividends) and reinvestment? The three questions on our list are among the most important, however, and, taken in order, they provide a rough outline of our book. In Section 1.1 we introduce the basic ideas of corporate finance.

One way that companies raise cash to finance their investment activities is by selling or issuing securities. The securities, sometimes called *financial instruments* or *claims*, may be roughly classified as *equity* or *debt*, loosely called *stocks* or *bonds*. The difference between equity and debt is a basic distinction in the modern theory of finance. All securities of a firm are claims that depend on or are contingent on the value of the firm.² In Section 1.2 we show how debt and equity securities depend on the firm's value, and we describe them as different contingent claims.

In Section 1.3 we discuss different organizational forms and the pros and cons of the decision to become a corporation.

In Section 1.4 we take a close look at the goals of the corporation and discuss why maximizing shareholder wealth is likely to be its primary goal. Throughout the rest of the book, we assume that the firm's performance depends on the value it creates for its shareholders. Shareholders are made better off when the value of their shares is increased by the firm's decisions.

A company raises cash by issuing securities in the financial markets. In Section 1.5 we describe some of the basic features of the financial markets. Roughly speaking, there are two types of financial markets: money markets and capital markets.

Section 1.6 covers trends in financial markets and management, and the last section of this chapter (Section 1.7) outlines the rest of the book.

¹ Theresa Tedesco, "Barrick Gold could have avoided say-on-pay public backlash," Financial Post, April 23, 2013. <http://business.financialpost.com/news/fp-street/barrick-gold-executive-compensation-wednesday>

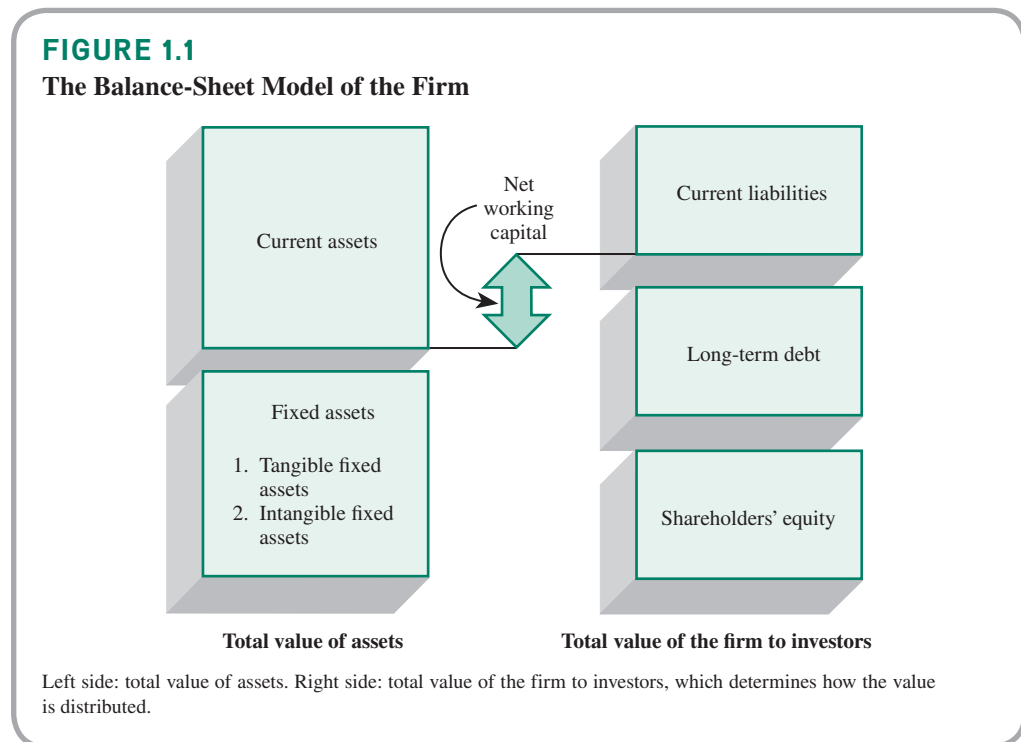
² We tend to use the words *firm*, *company*, and *business* interchangeably. However, there is a difference between these and a corporation. We discuss this difference in Section 1.3.

1.1 WHAT IS CORPORATE FINANCE?

Suppose you decide to start a firm to make tennis balls. To do this, you hire managers to buy raw materials and assemble a workforce that will produce and sell finished tennis balls. In the language of finance, you make an investment in assets, such as inventory, machinery, land, and labour. The amount of cash you invest in assets must be matched by an equal amount of cash raised by financing. When you begin to sell tennis balls, your firm will generate cash. This is the basis of value creation. The purpose of the firm is to create value for you, the owner (shareholder). In other words, the goal of the firm and its managers should be to maximize the value of the shareholders' wealth. The value is reflected in the framework of the simple balance-sheet model of the firm.

The Balance-Sheet Model of the Firm

Suppose we take a financial snapshot of the firm and its activities at a single point in time. Figure 1.1, a graphic conceptualization of the balance sheet, will help introduce you to corporate finance.



The assets of the firm are on the left side of the balance sheet. These assets can be thought of as current and fixed. *Fixed assets* are those that will last a long time, such as a building. Some fixed assets are tangible, such as machinery and equipment. Other fixed assets are intangible, such as patents, trademarks, and the quality of management. The other category of assets, *current assets*, comprises those that have short lives, such as inventory. The tennis balls that your firm has made but not yet sold are part of its inventory. Unless you have overproduced, they will leave the firm shortly.

Before a company can invest in an asset, it must obtain financing, which means that it must raise the money to pay for the investment. The forms of financing are represented on the right side of the balance sheet. A firm will issue (sell) pieces of paper called *debt* (loan agreements) or *equity shares* (share certificates). Just as assets are classified as long lived or short lived, so too are liabilities. A short-term debt is called a *current liability*. Short-term debt represents loans and other obligations that must be repaid within one year. Long-term debt is debt that does not have to be repaid within one year. Shareholders' equity represents the difference between the value of the assets and the debt of the firm. In this sense, it is a residual claim on the firm's assets.

From the balance-sheet model of the firm, it is easy to see why finance can be thought of as the study of the following three questions:

1. In what long-lived assets should the firm invest? This question concerns the left side of the balance sheet. Of course, the types and proportions of assets the firm needs tend to be set by the nature of the business. We use the terms **capital budgeting** and *capital expenditure* to describe the process of making and managing expenditures on long-lived assets.
2. How can the firm raise cash for required capital expenditures? This question concerns the right side of the balance sheet. The answer involves the firm's **capital structure**, which represents the proportions of the firm's financing from current and long-term debt and equity.
3. How should short-term operating cash flows be managed? This question concerns the upper portion of the balance sheet. There is a mismatch between the timing of cash inflows and cash outflows during operating activities. Furthermore, the amount and timing of operating cash flows are not known with certainty. Financial managers must attempt to manage the gaps in cash flow. From an accounting perspective, short-term management of cash flow is associated with a firm's **net working capital**, defined as current assets minus current liabilities. From a financial perspective, the short-term cash flow problem comes from the mismatching of cash inflows and outflows. It is the subject of short-term finance.

Capital Structure

Financing arrangements determine how the value of the firm is sliced up like a pie. The persons or institutions that buy debt from the firm are called *creditors*.³ The holders of equity shares are called *shareholders*.

Thinking of the firm as a pie, initially, the size of the pie will depend on how well the firm has made its investment decisions. After the firm has made its investment decisions, financial markets determine the value of its assets (e.g., its buildings, land, and inventories).

The firm can then determine its capital structure. It might initially have raised the cash to invest in its assets by issuing more debt than equity; now it can consider changing that mix by issuing more equity and using the proceeds to buy back some of its debt. Financing decisions like this can be made independently of the original investment decisions. The decisions to issue debt and equity affect how the pie is sliced.

The pie we are thinking of is depicted in Figure 1.2. The size of the pie is the value of the firm in the financial markets. We can write the value of the firm, V , as

$$V = B + S$$

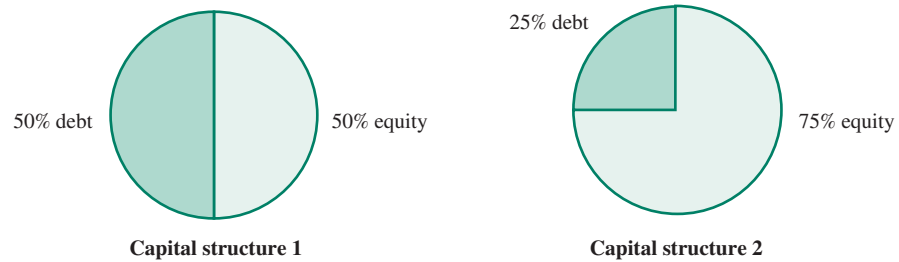
where B is the value of the debt (bonds) and S is the value of the equity (shares). The pie diagram considers two ways of slicing the pie: 50 percent debt and 50 percent equity, and 25 percent debt and 75 percent equity. The way the pie is sliced could affect its value. If so, the goal of the financial manager is to choose the ratio of debt to equity that makes the value of the pie—that is, the value of the firm, V —as large as it can be.

The Financial Manager

In large firms, the finance activity is usually associated with a senior officer of the firm (such as a chief financial officer (CFO)) and some lesser officers. Figure 1.3 depicts one example of a general organizational structure emphasizing the finance activity within the firm. Reporting to the CFO are the treasurer and the controller. The treasurer is responsible for handling cash flows, analyzing capital expenditures, and making financing plans. The controller handles the accounting function, which includes taxes, cost and financial accounting, and information systems. Our discussion of corporate finance is much more relevant to the treasurer's function.

³ We tend to use the words *creditors*, *debtholders*, and *bondholders* interchangeably. In later chapters we examine the differences among the kinds of creditors.

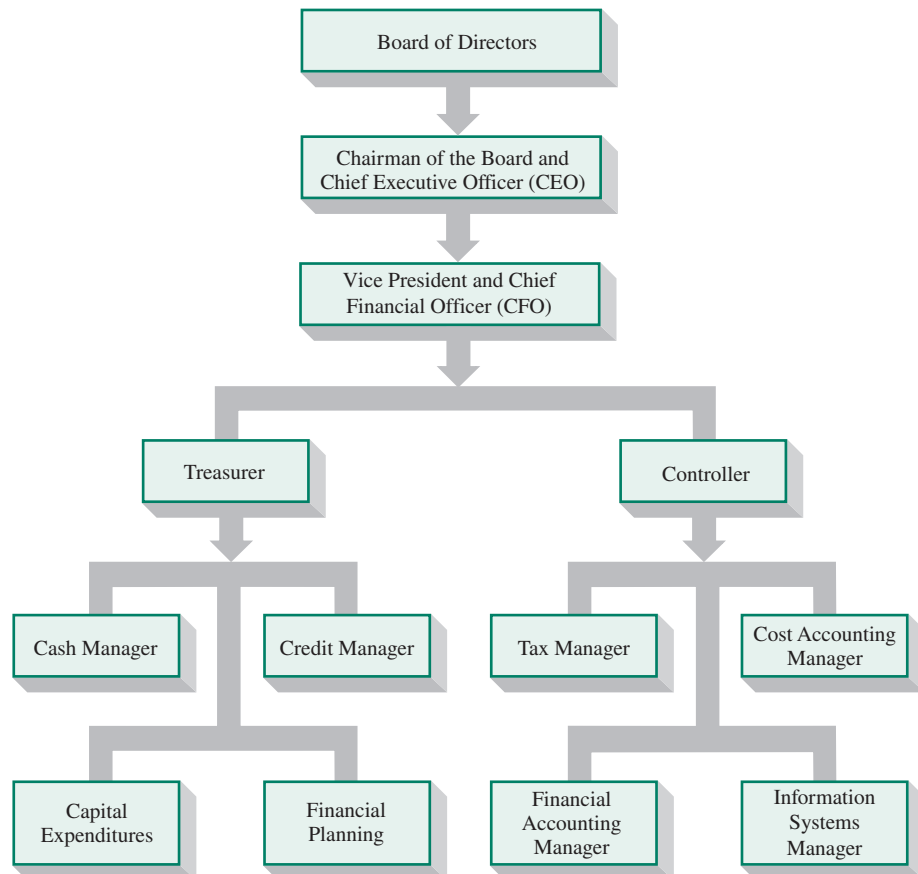
FIGURE 1.2
Two Pie Models of the Firm



As Figure 1.3 shows, there are four general position categories under the treasurer. Corporations usually hire BA or MBA graduates with a finance background for these positions. In contrast, the positions under the controller are geared more toward graduates with accounting majors or professional designations, such as CGA, CMA, or CA.

We think that a financial manager's most important job is to create value from the firm's capital budgeting, financing, and liquidity activities. How do financial managers create value?

FIGURE 1.3
Hypothetical Organization Chart



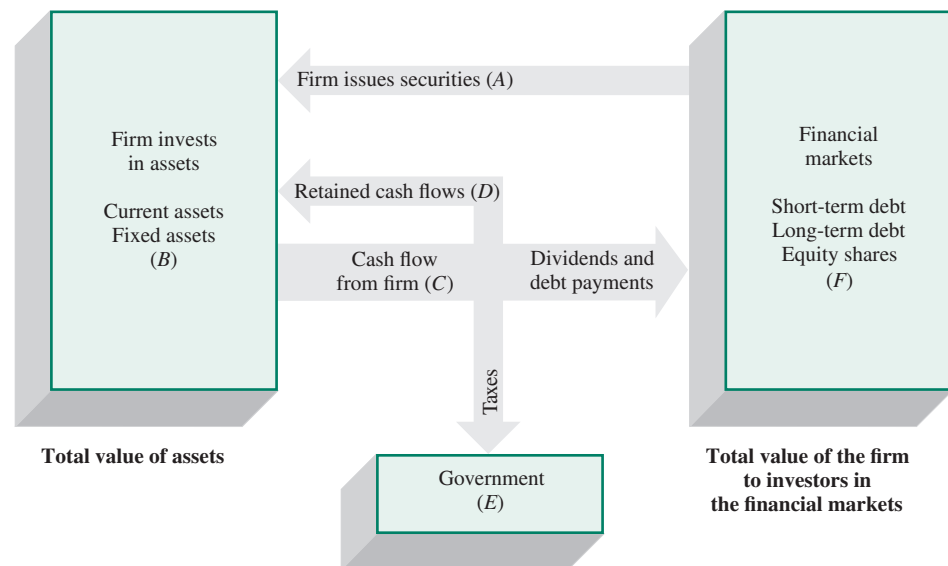
1. The firm should try to buy assets that generate more cash than they cost.
2. The firm should sell bonds, shares, and other financial instruments that raise more cash than they cost.

Thus, the firm must create more cash flow than it uses. The cash flow paid to bondholders and shareholders of the firm should be higher than the cash flows put into the firm by the bondholders and shareholders. To see how this is done, we can trace the cash flows from the firm to the financial markets and back again.

The interplay of the firm's finance with the financial markets is illustrated in Figure 1.4. To finance its planned investment, the firm sells debt and equity shares to participants in the financial markets. The result is cash flows from the financial markets to the firm (*A*). This cash is used by the firm's management to fund the investment activities of the firm (*B*). The cash generated by the firm (*C*) is paid to shareholders and bondholders (*F*). Shareholders receive cash from the firm in the form of dividends or as share repurchases; bondholders who lent funds to the firm receive interest and, when the initial loan is repaid, principal. Not all of the firm's cash is paid out to shareholders and bondholders. Some is retained (*D*), and some is paid to governments as taxes (*E*).

FIGURE 1.4

Cash Flows Between the Firm and the Financial Markets



- (A) Firm issues securities to raise cash (the financing decision).
 (B) Firm invests in assets (capital budgeting).
 (C) Firm's operations generate cash flows.
 (D) Retained cash flows are reinvested in firm.
 (E) Cash is paid to government as taxes.
 (F) Cash is paid out to investors in the form of interest and dividends.

Over time, if the cash paid to shareholders and bondholders (*F*) is greater than the cash raised in the financial markets (*A*), value will be created.

Identification of Cash Flows

Unfortunately, it is not easy to observe cash flows directly. Much of the information we obtain is in the form of accounting statements, and much of the work of financial analysis is to extract cash flow information from accounting statements. Example 1.1 illustrates how this is done.

EXAMPLE 1.1

The Midland Company refines and trades gold. At the end of the year it sold some gold for \$1 million. The company had acquired the gold for \$900,000 at the beginning of the year. The company paid cash for the gold when it was purchased. Unfortunately, it has yet to collect from the customer to whom the gold was sold.

The following is a standard accounting of Midland's financial circumstances at year-end:

THE MIDLAND COMPANY
Accounting View
Income Statement
Year Ended December 31

Sales	\$1,000,000
Costs	<u>−900,000</u>
Profit	\$ 100,000

By International Financial Reporting Standards (IFRS), the sale is recorded even though the customer has yet to pay. It is assumed that the customer will pay soon. From the accounting perspective, Midland seems to be profitable. The perspective of corporate finance is different. It focuses on cash flows:

THE MIDLAND COMPANY
Corporate Finance View
Income Statement
Year Ended December 31

Cash inflow	0
Cash outflow	<u>−\$900,000</u>
	−\$900,000

The perspective of corporate finance examines whether cash flows are being created by the gold-trading operations of Midland. Value creation depends on cash flows. For Midland, value creation depends on whether and when it actually receives the \$1 million.

Timing of Cash Flows

The value of an investment made by the firm depends on the timing of cash flows. One of the most important principles of finance is that individuals prefer to receive cash flows earlier rather than later. One dollar received today is worth more than one dollar received next year because today's dollar can be invested to earn interest.

EXAMPLE 1.2

The Midland Company is attempting to choose between two proposals for new products. Both proposals will provide cash flows over a four-year period and will initially cost \$10,000. The cash flows from the proposals are as follows:

Year	New Product A	New Product B
1	0	\$ 4,000
2	0	4,000
3	0	4,000
4	<u>\$20,000</u>	<u>4,000</u>
Total	\$20,000	\$16,000

At first it appears that new product A is better. However, the cash flows from proposal B come earlier than those of A. Without more information, we cannot decide which set of cash flows would create greater value. It depends on whether the value of getting cash from B upfront outweighs the extra total cash from A.

Risk of Cash Flows

The firm must consider risk. The amount and timing of cash flows are not usually known with certainty. Most investors have an aversion to risk.

EXAMPLE 1.3

The Midland Company is considering expanding operations overseas. It is evaluating Europe and Japan as possible sites. Europe is considered to be relatively safe, whereas Japan is seen as very risky. In both cases the company would close down operations after one year.

After doing a complete financial analysis, Midland has come up with the following cash flows of the alternative plans for expansion under three scenarios: pessimistic, realistic, and optimistic.

	Pessimistic	Realistic	Optimistic
Europe	\$75,000	\$100,000	\$125,000
Japan	0	150,000	200,000

If we ignore the pessimistic scenario, perhaps Japan is the better alternative. When we take the pessimistic scenario into account, the choice is unclear. Japan appears to be riskier, but it may also offer a higher expected level of cash flow. What is risk and how can it be defined? We must try to answer this important question. Corporate finance cannot avoid coping with risky alternatives, and much of our book is devoted to developing methods for evaluating risky opportunities.

CONCEPT QUESTIONS ?

- What are three basic questions of corporate finance?
- Describe capital structure.
- List three reasons why value creation is difficult.

1.2 CORPORATE SECURITIES AS CONTINGENT CLAIMS ON TOTAL FIRM VALUE

What is the essential difference between debt and equity? The answer can be found by thinking about what happens to the payoffs to debt and equity when the value of the firm changes.

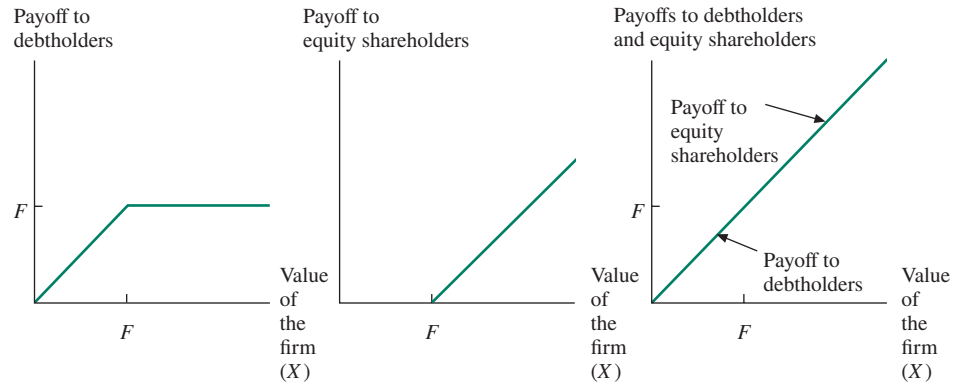
The basic feature of debt is that it is a promise by the borrowing firm to repay a fixed dollar amount by a certain date. The shareholders' claim on firm value at the end of the period is the amount that remains after the debtholders are paid. Of course, shareholders get nothing if the firm's value is equal to or less than the amount promised to the debtholders.

EXAMPLE 1.4

The Canadian Corporation promises to pay \$100 to the True North Insurance Company at the end of one year. This is a debt of the Canadian Corporation. Holders of the Canadian Corporation's debt will receive \$100 if the value of the Canadian Corporation's assets equals \$100 or more at the end of the year.

Formally, the debtholders have been promised an amount, F , at the end of the year. If the value of the firm, X , is equal to or greater than F at year-end, debtholders will get F . Of course, if the firm does not have enough to pay off the promised amount, the firm will be broke. It may be forced to liquidate its assets for whatever they are worth, and bondholders will receive X . Mathematically, this means that the debtholders have a claim to X or F , whichever is smaller. Figure 1.5 illustrates the general nature of the payoff structure to debtholders.

Suppose at year-end the Canadian Corporation's value is \$100. The firm has promised to pay the True North Insurance Company \$100, so the debtholders will get \$100.

FIGURE 1.5**Debt and Equity as Contingent Claims**

F is the promised payoff to debtholders. $X - F$ is the payoff to equity shareholders if $X - F > 0$. Otherwise the payoff is 0.

Now suppose the Canadian Corporation's value is \$200 at year-end and the debtholders are promised \$100. How much will the debtholders receive? It should be clear that they will receive the same amount as when the Canadian Corporation was worth \$100.

Suppose the firm's value is \$75 at year-end and debtholders are promised \$100. How much will the debtholders receive? In this case the debtholders will get \$75.

Suppose the Canadian Corporation will sell its assets for \$200 at year-end. The firm has promised to pay the insurance company \$100 at that time. The shareholders will get the residual value of \$100.

Algebraically, the shareholders' claim is $X - F$ if $X > F$ and zero if $X \leq F$. The sum of the debtholders' claim and the shareholders' claim is always the value of the firm at the end of the period.

The debt and equity securities issued by a firm derive their value from the total value of the firm. In the words of finance theory, debt and equity securities are **contingent claims** on the total firm value.

When the value of the firm exceeds the amount promised to debtholders, the shareholders obtain the residual of the firm's value over the amount promised the debtholders, and the debtholders obtain the amount promised. When the value of the firm is less than the amount promised to the bondholders, the shareholders receive nothing and the debtholders get the value of the firm.

CONCEPT QUESTIONS ?

- What is a contingent claim?
- Describe equity and debt as contingent claims.

1.3 BUSINESS ORGANIZATION FORMS

The firm is a means of organizing the economic activity of many individuals. There are many reasons why so much economic activity is carried out by firms and not by individuals. The theory of firms does not tell us much about why most large firms are corporations rather than any of the other legal forms that firms can assume, however.

A basic problem of the firm is how to raise cash. The corporate form of business (that is, organizing the firm as a corporation) is the standard method for solving problems encountered in raising large amounts of cash. However, business can take other forms. In this section we consider the three basic legal forms of organizing firms (sole proprietorship, partnership, and corporation), and we see how firms raise cash under each form. We also introduce the income trust, a non-corporate form of business organization.

The Sole Proprietorship

A **sole proprietorship** is a business owned by one person. Suppose you decide to start a business to produce mousetraps. Going into business is simple: Announce to all who will listen, “Today I am going to build a better mousetrap.”

Most large cities require that you obtain a business licence. Afterward, you can try to hire as many people as you need and borrow whatever money you need. At year-end all the profits and the losses will be yours.

Here are some important factors in considering a sole proprietorship:

1. The sole proprietorship is the cheapest type of business to form. No formal charter is required, and few government regulations must be satisfied.
2. A sole proprietorship pays no corporate income taxes. All profits of the business are taxed as individual income.
3. The sole proprietorship has unlimited liability for business debts and obligations. No distinction is made between personal and business assets.
4. The life of the sole proprietorship is limited by the life of the sole proprietor.
5. Because the only money invested in the firm is the proprietor’s, the equity money that can be raised by the sole proprietor is limited to the proprietor’s personal wealth.

The Partnership

Any two or more people can get together and form a **partnership**. Partnerships fall into two categories: general partnerships and limited partnerships.

In a *general partnership* all partners agree to provide some fraction of the work and cash and to share the profits and losses. Each partner is liable for the debts of the partnership. A partnership agreement specifies the nature of the arrangement. The partnership agreement may be an oral agreement or a formal document setting forth the understanding.

Limited partnerships permit the liability of some of the partners to be limited to the amount of cash each has contributed to the partnership. Limited partnerships usually require that (1) at least one partner be a general partner and (2) the limited partners do not participate in managing the business.

Here are some points that are important when considering a partnership:

1. Partnerships are usually inexpensive and easy to form. In complicated arrangements, including general and limited partnerships, written documents are required. Business licences and filing fees may be necessary.
2. General partners have unlimited liability for all debts. The liability of limited partners is usually limited to the contribution each has made to the partnership. If one general partner is unable to meet his or her commitment, the shortfall must be made up by the other general partners.
3. The general partnership is terminated when a general partner dies or withdraws (but this is not so for a limited partner). It is difficult for a partnership to transfer ownership without dissolving. Usually, all general partners must agree. However, limited partners may sell their interest in a business.
4. It is difficult for a partnership to raise large amounts of cash. Equity contributions are limited to a partner’s ability and desire to contribute to the partnership. Sometimes the partners have no choice about contributing. For example, in 2001, a major global management consulting firm, McKinsey & Company, called on its partners to contribute up to \$300,000 each to finance growing accounts receivable. Many companies start life as a proprietorship or partnership, but at some point they need to convert to corporate form. For example, Tim Hortons Inc., which was founded in 1964, went public in March 2006.
5. Income from a partnership is taxed as personal income to the partners.
6. Management control resides with the general partners. Usually a majority vote is required on important matters, such as the amount of profit to be retained in the business.