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CHAPTER 1

Financial Economics

OBJECTIVES

- Define finance.
- Explain why finance is worth studying.
- Introduce two of the main players in the world of finance—households and firms—and the kinds of financial decisions they make. The other main players, financial intermediaries and government, are introduced in chapter 2.

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- You have started to save for the future and all of your savings are in a bank account. Should you invest in mutual funds? What kind of mutual funds?
- You have decided to get a car. Should you buy it or lease it?
- You worked as a waiter during your college years and are thinking about starting your own restaurant when you graduate. Is it worth doing? How much money do you need to start? Where can you get the money?
- You are advising the chief financial officer (CFO) of a major computer manufacturer whether to expand into the telecommunications business. It is expected to cost $3 billion over the next few years to enter the business, and the expected benefits are increased profits of $1 billion per year thereafter. What do you recommend?
- You are part of a team working at the World Bank analyzing an application for a loan to a small country in Latin America to finance a major hydroelectric project. How do you decide what to recommend?

These are all examples of financial decisions. This book will provide you with a way of addressing these and similar questions by exploring the basic principles of finance. In this chapter we define finance and consider why it is worth studying; then we introduce the main players in the world of finance—households and firms—and the kinds of financial decisions they make.

1.1 Defining Finance

Finance is the study of how people allocate scarce resources *over time.* Two features that distinguish financial decisions from other resource allocation decisions are that the costs and benefits of financial decisions are (1) spread out over time and (2) usually not known with certainty in advance by either the decision makers or anybody else. In deciding whether to start your own restaurant, for example, you must weigh the *costs* (such as the investment in fixing up the place and buying the stoves, tables, chairs, little paper umbrellas for exotic drinks, and other equipment you need) against the uncertain *benefits* (your future profits) that you expect to reap over several years.

In implementing their decisions people make use of the **financial system,** defined as *the set of markets and other institutions used for financial contracting and the exchange of assets and risks.* The financial system includes the markets for stocks, bonds, and other financial instruments; financial intermediaries (such as banks and insurance companies); financial service firms (such as financial advisory firms); and the regulatory bodies that govern all of these institutions. The study of how the financial system evolves over time is an important part of the subject matter of finance.

Finance theory consists of a set of concepts that help you to organize your thinking about how to allocate resources over time and a set of quantitative models to help you evaluate alternatives, make decisions, and implement them. The same basic concepts and quantitative models apply at all levels of decision making, from your decision to lease a car or to start a business, to the decision of the CFO of a major corporation to enter the telecommunications business, to the decision of the World Bank about which development projects to finance.

A basic tenet of finance is that the ultimate function of the system is to satisfy people's *consumption preferences,* including all the basic necessities of life, such as food, clothing, and shelter. Economic organizations such as firms and governments exist in order to facilitate the achievement of that ultimate function.

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1.2 Why Study Finance?

There are at least five good reasons to study finance:

- to manage your personal resources.
- to deal with the world of business.
- to pursue interesting and rewarding career opportunities.
- to make informed public choices as a citizen.
- to expand your mind.

Let us elaborate on each of these reasons one at a time.

First, knowing some finance helps you to manage your own resources. Can you get along without knowing anything about finance? Perhaps. But if you are completely ignorant, then you are at the mercy of others. Remember the old adage: "A fool and his money are soon parted."

In some cases you will seek the help of experts. There are many finance professionals and financial service firms that provide financial advice—bankers, stockbrokers, insurance brokers, and firms selling mutual funds and other financial products and services. Often the advice is "free" if you are a potential customer. But how do you evaluate the advice you are given? The study of finance provides a conceptual framework for doing so.

A second reason to study finance is that a basic understanding of finance is essential in the business world. Even if you do not intend to specialize in finance, you must have a sufficient understanding of the concepts, techniques, and terminology employed by finance specialists to communicate with them and to recognize the limits of what they can do for you.

Box 1.1 Job Opportunities in Financial Engineering

At the prestigious Ecole Polytechnique in Paris, mathematics professor Nicole El Karoui continues to lead the way in teaching the modeling of derivatives to future quantitative analysts. Professor El Karoui has been instrumental in providing knowledge on derivatives through classes in financial mathematics. Her students are highly sought after by the world's top investment banks for their understanding of these increasingly important financial instruments.

Derivatives—financial contracts that derive their values from the performance of an underlying asset—were once used primarily as a hedge for banks against market risk. In the past, investment banks made most of their profits from underwriting and trading stocks and bonds in addition to providing financial advice. Presently, around 30% of their stock-related revenue comes from derivatives. Professor El Karoui's classes teach the necessary skill for students to become competitive in working in the service-sector firms driven by much of the demand caused by this change in investment structure.

El Karoui first became interested in modeling derivatives during a six-month sabbatical she spent working at a consumer credit bank. She noticed that employees in the derivatives department experienced problems similar to those facing students of stochastic calculus—the study of the impact of random variation over time. When she returned to teaching she implemented a postgraduate mathematical finance program, meeting the growing demand for understanding of derivatives among banks. Professor El Karoui's students are eagerly sought after by recruiters for their technical skills, which enable them to understand the underlying behavior of derivatives. These core quantitative skills have come to constitute an integral part of the work of investment bankers.

Source: "Why Students of Prof. El Karoui Are in Demand," *Wall Street Journal,* March 9, 2006.

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Box 1.2 Debt Finance in Higher Education, University Bonds

Universities across the country are realizing the financing potential of issuing debt in order to raise money for operations and investment. For many years colleges have entrusted financial planners to manage their endowment funds, and now several wealthier schools have shown an increased eagerness to raise money by issuing bonds. In 2006, an estimated $33 billion was raised in the initial issue market for higher-education debt, and this figure is expected to rise rapidly in the future.

Public and not-for-profit private institutions can issue tax-free debt—due to their nonprofit status—and invest this money in high-yield markets. This strategy has been shown to be extremely profitable, aided by the fact that public and not-for-profit private universities are also exempt from taxes on the investment earnings produced. In turn, universities can use these expanded resources to help build new facilities, such as stadiums, athletic facilities, and theaters—all in high demand by incoming students. It is likely that as students continue to expect top-notch facilities in their universities, schools will continue to finance a significant portion of their operations by issuing more bonds.

Source: "An Education in Finance," *The Economist,* May 18, 2006.

Third, you may be interested in a career in finance. There are varied and potentially rewarding career opportunities in the field of finance and many possible paths you can follow as a finance professional. Most finance professionals are employed in the financial services sector of the economy—such as banking, insurance, or investment management. However, many others work as financial managers in nonfinancial firms or in government. Some even pursue academic careers.

Households, businesses, and government agencies often seek the advice of financial consultants. Moreover, a background in finance provides a good foundation for a career in general management. Many of the chief executives of major corporations around the world started in finance.

Fourth, to make informed public choices as a citizen, you should have a basic understanding of how the financial system works. The financial system is an important part of the infrastructure of any market-oriented society. Indeed, a sound set of financial institutions is believed by many to be an essential element in economic growth and development. As citizens we sometimes must make political choices that affect the functioning of the financial system. For example, do you want to vote for a political candidate who favors abolishing government deposit insurance or one who would impose strict controls on stock-market trading?

Fifth, finance can be a fascinating field of study on purely intellectual grounds. It expands your understanding of how the real world works. The scientific study of finance has a long history. Adam Smith's *The Wealth of Nations,* published in 1776, is widely regarded as the beginning of the science of economics. Finance theorists today are generally economists specializing in financial economics. Indeed, in 1990 and again in 1997, the Nobel Prize in economics was awarded to scholars for their scientific contributions in the field of finance (see Box 1.3).

1.3 Financial Decisions of Households

Most households are families. Families come in many forms and sizes. At one extreme is the *extended family,* which consists of several generations living together under one roof and sharing their economic resources. At the other extreme is the single person living

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Box 1.3 Nobel Prize in Economics for Work in Finance

In 1990 the Nobel Prize in economics was awarded to three scholars—Harry Markowitz, Merton Miller, and William Sharpe—for scientific contributions that have had a powerful impact on both the theory and practice of finance. Let us briefly explain their contributions.

Harry Markowitz is the father of modern portfolio theory, the scientific study of how to trade off risk and reward in choosing among risky investments. In his seminal article, "Portfolio Selection," which appeared in the *Journal of Finance* in 1952, he developed a mathematical model showing how investors could achieve the lowest possible risk for any given target rate of return. The Markowitz model has been incorporated into basic finance theory and is widely used by practicing investment managers.

William Sharpe took Markowitz's results as his starting point and developed their implications for asset prices. By adding the assumption that at all times asset prices will adjust to equate demand and supply for each risky asset, he showed that a very specific structure must exist among the expected rates of return on risky assets ("Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk," *Journal of Finance,* 1964). The structure suggested by Sharpe's theory is widely used today as the basis for making risk adjustments in many areas of finance theory and practice.

Merton Miller has contributed mainly to the theory of corporate finance. He and Franco Modigliani (an earlier recipient of the Nobel Prize in economics) addressed the dividend and borrowing policies of firms in a series of articles, starting with "The Cost of Capital, Corporation Finance, and the Theory of Investment," which appeared in the *American Economic Review* in 1958. Their fundamental contribution was to focus the attention of theorists and practitioners of finance on how corporate dividend and financing policies affect the total value of a firm. The M&M (Modigliani-Miller) propositions developed in their joint papers are among the basic building blocks of modern corporate finance.

Again in 1997 the Nobel Prize in economics was awarded to financial economists. The laureates were Robert C. Merton (one of the authors of this textbook) and Myron Scholes. The prize committee also mentioned a third scholar, Fischer Black, whose untimely death in 1995 at age 57 made him ineligible to share the prize. These three men discovered a mathematical formula for the pricing of options and other derivative securities that has had an enormous impact on both the theory and practice of finance. It is generally known as the Black-Scholes option pricing formula.

alone, whom most people wouldn't think of as a "family." In finance, however, all are classified as households.

Households face four basic types of financial decisions:

- *Consumption and saving decisions:* How much of their current wealth should they spend on consumption and how much of their current income should they save for the future?
- *Investment decisions:* How should they invest the money they have saved?
- *Financing decisions:* When and how should households use other people's money to implement their consumption and investment plans?
- *Risk-management decisions:* How and on what terms should households seek to reduce the financial uncertainties they face or when should they increase their risks?

As a result of saving part of their income for use in the future, people accumulate a pool of wealth, which can be held in any number of different forms. One form is bank accounts, another might be a piece of real estate or a share in a business venture. All of these are **assets.** *An asset is anything that has economic value.*

When people choose how to hold their pool of accumulated savings, it is called *personal investing* or **asset allocation.** In addition to investing in their own homes, people will often choose to invest in financial assets, such as stocks or bonds.

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Box 1.4 New Trends in the Market for College Loans

Private student loans have become a growing, lucrative segment of consumer finance. Their profitability is derived from the relatively high interest rates they carry and the continually increasing demand generated by a growing number of students financing college tuition. Unlike federal loans, private loans can earn revenue by charging market rates in addition to up-front fees. These fees, which make private loans so rewarding for investors, can constitute 6% to 7% of the total amount of the loan. Furthermore, tuition increases around the country, combining with a growing number of baby boomers' children attending colleges, are the main factors that underlie a strong demand for student loans. Not only do college costs continue to rise, but federal aid in the form of grants and loans has remaining stagnant—and in many cases actually declined. The gap between the higher price of an education and the ability of families to pay is widening; private student loans have come to fill this gap.

Private loans, packaged by lenders such as Sallie Mae, have recently exploded in popularity, currently capturing 22% of the volume of federal student loans, up from 5% in 1994–1995. They are being praised as the fastest-growing and most profitable segment of consumer finance, with a total of $13.8 billion in student loans in the 2004–2005 school year—with the expectation of a further doubling within the following three years. As the number of college students continues to increase along with their tuitions, the private student loan industry is expected to maintain its strong record of growth.

Source: "Thanks to the Banks," *The Economist,* February 16, 2006.

When people borrow, they incur a **liability,** which is just another word for debt. A household's wealth or **net worth** is measured by the value of its assets minus its liabilities. Say you own a house worth $100,000 and have a $20,000 bank account. You also owe $80,000 to the bank on your home mortgage loan (a liability) and have a $5,000 credit card debt outstanding. Your net worth is $35,000: your total assets ($120,000) minus your total liabilities ($85,000). Ultimately, all of society's resources belong to households because they own the firms (either directly or through their ownership of shares of stock, pension plans, or life insurance policies) and pay the taxes spent by governments.

Finance theory treats people's consumption preferences as given. Although preferences may change over time, how and why they change is not addressed by the theory.[1] People's behavior is explained as an attempt to satisfy those preferences. The behavior of firms and governments is viewed from the perspective of how it affects the welfare of people.

Quick Check 1-1

What are the four basic types of financial decisions households have to make? Give an example of each.

1.4 Financial Decisions of Firms

By definition, business firms—or simply firms—are entities whose primary function is to produce goods and services. Like households, firms come in many different shapes and sizes. At the one extreme are small workshops, retail outlets, and restaurants owned by a

[1]Elements of a theory that are not explained by the theory itself are called ***exogenous.*** In contrast, those elements that are explained by the theory are called ***endogenous.*** In finance, people's preferences are exogenous to the theory, but the objectives of firms are endogenous.

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single individual or family. At the other extreme are giant corporations, such as Mitsubishi or General Motors, with a workforce of hundreds of thousands of people and an even greater number of owners. The branch of finance dealing with financial decisions of firms is called *business finance* or *corporate finance.*

In order to produce goods and services, all firms—small and large—need *capital.* The buildings, machinery, and other intermediate inputs used in the production process are called *physical capital.* The stocks, bonds, and loans used to finance the acquisition of the physical capital are called *financial capital.*

The first decision any firm must make is what businesses it wants to be in. This is called *strategic planning.* Because strategic planning involves the evaluation of costs and benefits spread out over time, it is largely a financial decision-making process.

Often a firm will have a core business defined by its main product line, and it may branch out into related lines of business. For example, a firm that produces computer hardware may also choose to produce the software. It may also choose to service computers.

A firm's strategic goals may change over time, sometimes quite dramatically. Some corporations enter into businesses that are seemingly unrelated to each other. They may even abandon their original core business altogether so that the company's name ceases to have any connection with its current business.

For example, ITT Corporation started out as a telephone company in 1920. Its name stood for International Telephone and Telegraph. In the 1970s ITT became a large multinational conglomerate, operating a diverse set of businesses including insurance, munitions, hotels, bakeries, automobile rentals, mining, forest products, and gardening products in addition to telecommunications. During the 1980s, ITT shed many of its businesses and focused on operating hotels and casinos. By 1996 it had abandoned its original core business of producing telephone equipment and telecommunication services.

Once a firm's managers have decided what businesses they are in, they must prepare a plan for acquiring factories, machinery, research laboratories, showrooms, warehouses, and other such long-lived assets and for training the personnel who will operate them all. This is the *capital budgeting process.*

The basic unit of analysis in capital budgeting is an *investment project.* The process of capital budgeting consists of identifying ideas for new investment projects, evaluating them, deciding which ones to undertake, and then implementing them.

Once a firm has decided what projects it wants to undertake, it must figure out how to finance them. Unlike capital budgeting decisions, the unit of analysis in *capital structure* decisions is *not* the individual investment project but the firm as a whole. The starting point in making capital structure decisions is determining a feasible financing plan for the firm. Once a feasible financing plan has been achieved, the issue of the optimal financing mix can be addressed.

Firms can issue a wide range of financial instruments and claims. Some are standardized securities that can be traded in organized markets, such as common stock, preferred stock, bonds, and convertible securities. Others are nonmarketable claims, such as bank loans, employee stock options, leases, and pension liabilities.

A corporation's capital structure determines who gets what share of its future cash flows. For example, bonds promise fixed cash payments, whereas stocks pay the residual value left over after all other claimants have been paid. Capital structure also partially determines who gets to control the company. In general, shareholders have control through their right to elect the board of directors. But often bonds and other loans include contractual provisions, called *covenants,* restricting the activities of management. These covenant restrictions give the creditors some control over the company's affairs.

Working capital management is extremely important to the success of a firm. The best long-term plans can go away if the firm's management does not attend to the day-to-day

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financial affairs of the business. Even in a growing, successful firm, cash flows in and out may not match up exactly in time. Managers must worry about collecting from customers, paying bills as they come due, and generally managing the firm's cash flow to ensure that operating cash-flow deficits are financed and that cash-flow surpluses are efficiently invested to earn a good return.

The choices that a firm makes in all areas of financial decision making—investment, financing, and working capital management—depend on its technology and on the specific regulatory, tax, and competitive environment in which it operates. The policy choices are also highly interdependent.

Quick Check 1-2

What are the basic types of financial decisions firms have to make? Give an example of each.

1.5 Forms of Business Organization

There are three basic types of organizational form for a firm: a sole proprietorship, a partnership, and a corporation. A **sole proprietorship** is a firm owned by an individual or a family, in which the assets and liabilities of the firm are the personal assets and liabilities of the proprietor. A sole proprietor has *unlimited liability* for the debts and other liabilities of the firm. This means that if the firm cannot pay its debts, the proprietor's other personal assets can be seized to satisfy the demands of the firm's creditors.

Many firms start out as sole proprietorships and then change their organizational form as they become established and expand. But frequently a business such as a restaurant, a real estate agency, or a small workshop will remain a sole proprietorship throughout its existence.

A **partnership** is a firm with two or more owners, called the partners, who share the equity in the business. A partnership agreement usually stipulates how decisions are to be made and how profits and losses are to be shared. Unless otherwise specified, all partners have unlimited liability as in the sole proprietorship.

However, it is possible to limit the liability for some partners called *limited partners.* At least one of the partners, called the general partner, has unlimited liability for the debts of the firm. Limited partners typically do not make the day-to-day business decisions of the partnership; the general partner does.

Unlike a sole proprietorship or a partnership, a **corporation** is a firm that is a legal entity distinct from its owners. Corporations can own property, borrow, and enter into contracts. They can sue and be sued. They are usually taxed according to rules that differ from the rules that apply to the other forms of business organization.

The charter of a corporation sets down the rules that govern it. Shareholders are entitled to a share of any distributions from the corporation (e.g., cash dividends) in proportion to the number of shares they own. The shareholders elect a *board of directors,* which in turn selects managers to run the business. Usually there is one vote per share, but sometimes there are different classes of stocks with different voting rights.

An advantage of the corporate form is that ownership shares can usually be transferred without disrupting the business. Another advantage is *limited liability,* which means that if the corporation fails to pay its debts, the creditors can seize the assets of the corporation but have no recourse to the personal assets of the shareholders. In that sense a corporation serves the same function as a general partner in a partnership, and its shareholders are like limited partners.

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Box 1.5 How to Identify That a Firm Is a Corporation

In the United States, corporations are identified by the letters *Inc*. after their name. It stands for the English word *incorporated*. In France the letters are *SA* (Societé Anonime); in Italy *SpA* (Societa per Azioni); in the Netherlands *NV* (Naamloze Vennootschap); and in Sweden *AB* (Aktiebolag).

In Germany, public corporations are called Aktiengesellschaften, identifiable by the letters *AG* after the company name, whereas private corporations are Gesellschaften mit beschränkter Haftung, denoted by *GmbH*. The parallel designations in the United Kingdom are *PLC* for public limited company, and *LTD* for private corporations.

The earliest known corporations were formed in Amsterdam and in London in the 1600s and were called *joint stock companies* in English. That term has fallen into disuse.

Around the world, large firms are almost always organized as corporations, although ownership of the corporation may be restricted to a single person or family. In the United States, corporations with broadly dispersed ownership are called *public corporations;* those with concentrated ownership are called *private corporations.*

Laws governing the corporate form of organization differ in their details from country to country, and even within a country they may differ from one jurisdiction to another. In the United States, for example, laws governing corporations are created and administered at the state level (see Box 1.5).

Quick Check 1-3

A corporation owned by a single person is not a sole proprietorship. Why?

1.6 Separation of Ownership and Management

In sole proprietorships and even in many partnerships the owners and the active managers of the business are the same people. But in many firms, especially the large ones, the owners do not themselves manage the business. Instead they delegate that responsibility to professional managers, who may not own any shares in the business. There are at least five reasons for the owners of a firm to turn over the running of the business to others to manage.

First, professional managers may be found who have a superior ability to run the business. This may be because the professional managers have better technological knowledge, more experience, or a more suitable personality to run the business. In a structure in which the owner is also the manager, the owner must have both the talents of a manager and the financial resources necessary to carry out production. In the separated structure, no such coincidence is required.

For example, consider the entertainment industry. The people most qualified to manage a film studio or a television network may not have the financial resources to own the business, and the people with the wealth to own such a business may have no ability to manage it. Therefore, it makes sense for the managerially competent people to produce and distribute the movies and for the wealthy people to simply provide the capital.

Second, to achieve the efficient scale of a business the resources of many households may have to be pooled. For example, the cost of producing a single movie is in the millions of dollars for a low-budget film, and the average feature-length movie costs many millions

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of dollars to produce. The need to pool resources to achieve an efficient scale of production calls for a structure with many owners, not all of whom can be actively involved in managing the business.

Third, in an uncertain economic environment, owners will want to diversify their risks across many firms. To diversify optimally requires the investor to hold a portfolio of assets, in which each security is but a small part. Such efficient diversification is difficult to achieve without separation of ownership and management.

For example, suppose an investor thinks that firms in the entertainment industry will do well over the next few years and would like to buy a diversified stake in that industry. If the investor had to also manage the firms she invests in, there is no way she could diversify across many firms. The corporate form is especially well suited to facilitating diversification by investor-owners because it allows them to own a relatively small share of each firm.

Fourth, the separated structure allows for savings in the costs of information gathering. Managers can gather the most accurate information available about the firm's production technology, the costs of its inputs, and the demand for its products. The owners of the firm need to know relatively little about the technology of the firm, the intensity at which it is being operated, and the demand for the firm's products.

Again, consider the entertainment industry. The information needed to successfully manage the production and distribution of a movie is substantial. Although information about top actors and directors who might be hired to star in a movie is readily available at low cost, this is not so with respect to other resource inputs to movie production and distribution. Establishing information networks of agents and jobbers is costly and is most efficiently handled by having movie executives specialize in doing it.

Fifth, there is the "learning curve" or "going concern" effect, which favors the separated structure. Suppose the owner wants to sell all or part of his technology either now or at a later date. If the owner must also be the manager, the new owners have to learn the business from the former owner in order to manage it efficiently. However, if the owner does *not* have to be the manager, then when the business is sold, the manager continues in place and works for the new owners. When a company issues shares to the public for the first time, the original owner-managers often continue to manage the business even if they no longer own any shares in the business.

The corporate form is especially well suited to the separation of owners and managers because it allows relatively frequent changes in owners by share transfer without affecting the operations of the firm. Millions of shares in corporations around the world change hands and rarely is there any effect on the management or operations of the business.

Quick Check 1-4

What are the main reasons for having a separation of management and ownership of firms? How does the corporate form of organization facilitate this separation?

Offsetting all the reasons in favor of a separation of ownership and management, the separated structure creates the potential for a *conflict of interest* between the owners and the managers. Because the owners of a corporation have only incomplete information about whether the managers are serving their interests effectively, managers may neglect their obligations to the shareholders. In extreme cases, managers may even act *contrary* to the interests of their shareholders. Adam Smith, the father of classical economics, summed it up as follows:

> The directors of such [joint-stock] companies, however, being the managers rather of other people's money than of their own, it cannot well be expected, that they should

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> watch over it with the same anxious vigilance with which the partners in a private copartnery frequently watch over their own. Like the stewards of a rich man, they are apt to consider attention to small matters as not for their master's honour, and very easily give themselves a dispensation from having it. Negligence and profusion, therefore, must always prevail, more or less, in the management of the affairs of such a company.[2]

In those business environments in which the potential for conflicts of interest between owners and managers can be resolved at a reasonable cost, we would expect to find that the owners of business firms will not be the managers. And we would expect that the ownership of firms is dispersed among many individuals. Furthermore, we would expect to observe that, over time, the changes in the composition of the ownership would be far more common than the changes in the composition of the management.

1.7 The Goal of Management

Because the managers of corporations are hired by the shareholders (through the board of directors), the managers' primary commitment is to make decisions that are in the best interests of the shareholders. This is not the exclusive goal of management. Like everyone else in society, corporate managers must obey the law. They are also expected to respect ethical norms and to promote desirable social goals when it is possible to do so at a reasonable cost to shareholders.[3]

However, even if we restrict the goal of corporate management exclusively to serving the best interests of the shareholders, it is not obvious how managers can achieve this goal. In principle, managers could review each decision with the owners including the production choices, cost of obtaining capital, and so on and ask them which combination they prefer. But, in that case, the owners would have to have the same knowledge and spend essentially the same amount of time as they would if they were managing the business themselves. There would, therefore, be little point in hiring managers to run the business.

Moreover, although this procedure might be feasible when there are a few owners of the firm, it becomes completely impractical as the number of shareholders becomes large. Indeed, for a large multinational corporation, the number of shareholders can exceed a million, and they may reside in many different countries. Hence, it is essential to find a goal or rule to guide managers of the firm without having to "poll" the owners about most decisions.

To be effective, such a rule should not require the managers to know the risk preferences or opinions of the shareholders because such data are virtually impossible to obtain. And even if the data were available at one point in time, they change over time. Indeed, because shares of stock change hands every day, the owners of the corporation change every day. Thus, to be feasible, the right rule should be independent of who the owners are.

If a feasible rule for the managers to follow were found that would lead them to make the same investment and financing decisions that each of the individual owners would have made had they made the decisions themselves, then such a rule would clearly be the right one. To *maximize the wealth of current stockholders* is just such a rule.[4] Let us explain why.

For example, suppose you are the manager of a corporation trying to decide between two alternative investments. The choice is between a very risky investment project and

[2]Adam Smith, *The Wealth of Nations* (Chicago: University of Chicago Press, 1977).
[3]We assume that the goal of maximizing shareholder wealth does not necessarily conflict with other desirable social goals.
[4]This rule, like any all-encompassing dictum, is not always correct. It needs to be qualified in several respects. First, it assumes well-functioning and competitive capital markets. It also assumes that managers do not make decisions that are illegal or unethical.

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a very safe one. Some shareholders might want to avoid taking these risks, and others might be pessimistic about the future of the investment. Still other shareholders might be risk lovers or might be optimistic about the outcome of the investment. How then can management make a decision in the best interests of all shareholders?

Suppose that undertaking the risky project would increase the market value of the firm's shares more than would the safe project. Even if some shareholders ultimately want to invest their money in safer assets, it would not be in their best interests for you as the firm's manager to choose the safer project.

This is because in well-functioning capital markets shareholders can adjust the riskiness of their personal portfolios by selling some of the shares in the firm you manage and investing the proceeds in safe assets. By your accepting the riskier project, even these risk-averse shareholders will wind up better off. They will have extra dollars today, which they can invest or consume as they see fit.

Thus, we see that individual owners would want managers to choose the investment project that maximizes the market value of their shares. The only risks relevant to the decision by managers are those of the project that affect the market value of the firm's shares.

The shareholder-wealth-maximization rule depends on the firm's production technology, market interest rates, market risk premiums, and security prices. It leads managers to make the same investment decisions that each of the individual owners would have made had they made the decisions themselves. At the same time, it does not depend upon the *risk aversion* or *wealth* of the owners, and so it can be made without any specific information about the owners. Thus, the shareholder-wealth-maximization rule is the "right" rule for managers to follow in running the firm. They can follow it without polling the owners each time a decision arises.

Scholars and other commentators on corporate behavior sometimes assert that the goal of managers is to maximize the firm's *profits.* Under certain specialized conditions, profit maximization and maximizing shareholder wealth lead to the same decisions. But in general there are two fundamental ambiguities with the profit-maximization criterion:

- If the production process requires many periods, then which period's profit is to be maximized?
- If either future revenues or expenses are uncertain, then what is the meaning of "maximize profits" when profits are described by a probability distribution?

Let us illustrate each of these problems with the profit-maximization criterion. First, the problem of many periods.

Suppose the firm faces a choice between two projects, both of which require an initial outlay of $1 million but last for a different number of years. Project A will return $1.05 million one year from now and then is over. Its profit is, therefore, $50,000 ($1.05 million–$1 million). Project B will last for two years, return nothing in the first year, and then $1.1 million two years from now. How do you apply a profit-maximization criterion in this case?

Now let us illustrate the difficulty of using a profit maximization criterion in an uncertain environment. Suppose you are the manager of a firm trying to choose between two investment projects, both of which require an initial outlay of $1 million and produce all of their returns one period from now. As in the previous example, project A will pay $1.05 million with certainty. We can, therefore, say unambiguously that the profit on project A is $50,000 ($1.05 million–$1 million).

Project C has an uncertain return. It will either pay $1.2 million or $0.9 million, each with probability 0.5. Thus, project C will either produce a profit of $200,000 or a loss of $100,000. What does it mean in this context to say "choose the project that maximizes the firm's profits"?

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Unlike profits, it is clear that the current market value of the firm's shareholders' equity is still well defined (e.g., the future cash flows of the IBM corporation are uncertain, but there is a current price for its stock that is not uncertain). Hence, unlike the profit-maximization rule, the shareholder-wealth-maximization rule causes no ambiguities when future cash flows of the firm are uncertain.

Quick Check 1-5

Why is the shareholder-wealth-maximization rule a better one for corporate managers to follow than the profit-maximization rule?

Of course, management still has the difficult task of estimating the impact of its decision on the value of the firm's shares. Thus, in our preceding illustrations, in order to choose between projects A and B, or between A and C, management would have to determine which of them is likely to increase the value of the firm the most. This is not easy, but the criterion for making the decision is unambiguous.

Thus, the goal of management is to make decisions so as to maximize the firm's value to its shareholders. The main challenge in implementing this criterion is to obtain information about the likely impact of its decisions on the firm's value. Management's task is made much easier when it can observe market prices of its own and other firms' shares.

Indeed, in the absence of such market price information, it is difficult to see how they can implement this criterion at all. Although it is reasonable to assume that good managers will have as much information about their firm's production technology as anyone, such *internal* (to the firm) information is not sufficient to make effective decisions. In the absence of a stock market, managers would require *external* (to the firm) information that is costly if not impossible to obtain: namely, the wealth, preferences, and other investment opportunities of the owners.

Thus, the existence of a stock market allows the manager to substitute one set of external information that is relatively easy to obtain—namely, stock prices—for another set that is virtually impossible to obtain—information about the shareholders' wealth, preferences, and other investment opportunities. The existence of a well-functioning stock market, therefore, facilitates the efficient separation of the ownership and management of firms.

Note that in one respect the corporation's own senior managers and outside stock analysts who follow the corporation face a common task. Both groups are concerned with answering the question: How will the actions taken by management affect the market price of the firm's shares? The big difference is that the managers are the ones who actually make the decisions and have responsibility for implementing them.

One place to look for a statement of the goals of a corporation's top managers is the annual report to shareholders. Often the opening letter from the company's chief executive officer states what management's financial goals are and the general strategic plan for achieving them (see Box 1.6).

Quick Check 1-6

How does the existence of a well-functioning stock market facilitate the separation of ownership and management of firms?

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Box 1.6 Corporate Financial Goals and the Annual Report

Here is an excerpt from Honeywell Corporation's 1994 annual report to shareholders. Honeywell's chairman and chief executive officer, Michael R. Bonsignore, writes in his letter to the shareholders:

> Profitable growth. Delighted customers. Worldwide leadership in control. This is the vision for Honeywell that I and Honeywell people around the world have set for ourselves. It embodies what we want to be. It underpins how we set our goals. And it defines how we will fulfill the purpose of the company—which is to create value for our shareholders. . . .
>
> The company is now poised to achieve our primary financial objective: first-quartile total shareholder returns among our peers. We define total shareholder returns as share price appreciation plus dividends reinvested in the stock.
>
> Our management team is steadfast in achieving this objective. It is a key goal in our long-range incentive system. Our short-term executive compensation program rewards economic value added. We have constructed an integrated financial plan that sets aggressive targets in each driver of shareholder value: sales growth, operating margins, working capital, capital expenditures, and taxes.

1.8 Market Discipline: Takeovers

What forces are there to compel managers to act in the best interests of the shareholders? The shareholders could fire the managers by voting them out. But because a major benefit of the separated structure is that the owners can remain relatively uninformed about the operations of the firm, it is not apparent how these owners could know whether their firm is being mismanaged.

The value of voting rights as a means of enforcement is further cast into doubt if ownership of the firm is widely dispersed. If that is the situation, then the holdings of any single owner are likely to be so small that he or she would not incur the expense to become informed and to convey this information to other owners.[5] Thus, voting rights alone can do little to solve this dilemma.

The existence of a competitive stock market offers another important mechanism for aligning the incentives of managers with those of shareholders. It is called the *takeover*.

To see how the threat of a takeover can compel managers to act in the best interests of shareholders, suppose some entity, call it the takeover bidder, has identified a significantly mismanaged firm (i.e., one whose management has chosen an investment plan that leads to a market value that is significantly less than the maximum value that could be achieved from the firm's resources). If the bidder successfully buys enough shares of the undervalued firm to gain control, it replaces the managers with ones who will operate it optimally.

Having announced the change in the firm's investment plans, the bidder now sells the shares of the firm at the new market price for an immediate profit. Note that the bidder did not have to add any tangible resources to the firm to achieve this profit. Hence, the only expenses incurred are the cost of identifying a mismanaged firm and the cost of acquiring the firm's shares.

Although the cost of identifying a mismanaged firm will vary, it can be quite low if the takeover bidder happens to be a supplier, customer, or competitor of the firm because much of the information required may have been gathered for other purposes already. For this

[5]This is called the "paradox" of voting. The paradox is that when there are many voters, none of whose individual vote would appreciably affect the final outcome, it does not pay any individual voter to incur the costs of becoming informed and exercising the right to vote.

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reason, the takeover mechanism can work even if resources are not spent for the explicit reason of identifying mismanaged firms.

However, if significant mismanagement of firms were widespread, then it would pay to spend resources in search of such firms in much the same way that resources are spent on research of new physical investment projects. There are indeed firms that specialize in making hostile (to the management) takeovers. Therefore, the threat of a takeover is credible and the subsequent replacement of management provides a strong incentive for current managers (acting in their self-interest) to act in the interests of the firm's current shareholders by maximizing market value.

Indeed, even in the absence of any explicit instructions from the shareholders or knowledge of the theory for good management, one might expect managers to move in the direction of value maximization as a matter of self-preservation. Moreover, it should be noted that it does not matter whether the source of the mismanagement is incompetence or the pursuit of different objectives, the takeover mechanism serves equally well to correct either one.

The effectiveness of the takeover mechanism can be reduced by government policies. For example, in an attempt to prevent the formation of monopolies in various product markets, the U.S. Department of Justice will take legal action under the antitrust laws to prevent mergers or acquisitions that might reduce competition. Because it is more likely that a supplier, customer, or competitor will be the takeover bidder who identifies the mismanaged firm, this public policy will tend to reduce the threat of takeover.

Quick Check 1-7

How does the threat of a takeover serve as a mechanism to deal with the conflict of interest between owners and managers of a corporation?

1.9 The Role of the Finance Specialist in a Corporation

Virtually all decisions made in a corporation are at least partially financial because they involve making trade-offs between costs and benefits that are spread over time. Therefore, in large corporations virtually all managers from the chief executive at the top down to managers of individual production units, marketing units, research labs, or other departments make use of the services of finance specialists.

The Financial Executives Institute, a voluntary organization of corporate executives who specialize in finance, offers a broad definition of a financial executive as anyone who has authority for one of the functions listed in Table 1.1.

The organization of the finance function and its relation to other departments vary from company to company, but Figure 1.1 shows a typical organization chart in a large corporation.

At the top is the firm's chief executive officer (CEO) who often is also the president. The chief financial officer (CFO) is a senior vice president with responsibility for all the financial functions in the firm and reports directly to the CEO. The firm also has senior vice presidents in charge of marketing and operations. In large firms, there is sometimes a chief operating officer (COO), who takes responsibility for implementing the CEO's strategy for the firm.

The CFO has three departments reporting to him or her: financial planning, treasury, and control, each headed by a vice president. The vice president for financial planning has responsibility for analyzing major capital expenditures such as proposals to enter new lines

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TABLE 1.1 Financial Functions in a Corporation

1. PLANNING

Establishment, coordination, and administration, as an integral part of management, of an adequate plan for the control of operations. Such a plan, to the extent required in the business, would provide the following:

a. Long- and short-range financial and corporate planning
b. Budgeting for capital expenditures and/or operations
c. Sales forecasting
d. Performance evaluation
e. Pricing policies
f. Economic appraisal
g. Analysis of acquisitions and divestments

2. PROVISION OF CAPITAL

Establishment and execution of programs for the provision of the capital required by the business.

3. ADMINISTRATION OF FUNDS

a. Management of cash
b. Maintenance of banking arrangements
c. Receipt, custody, and disbursement of the company's monies and securities
d. Credit and collection management
e. Management of pension funds
f. Management of investments
g. Custodial responsibilities

4. ACCOUNTING AND CONTROL

a. Establishment of accounting policies
b. Development and reporting of accounting data
c. Cost standards
d. Internal auditing
e. Systems and procedures (accounting)
f. Government reporting
g. Report and interpretation of results of operations to management
h. Comparison of performance with operating plans and standards

5. PROTECTION OF ASSETS

a. Provision of insurance coverage as required
b. Assure protection of business assets and loss prevention through internal control and internal auditing
c. Real estate management

6. TAX ADMINISTRATION

a. Establishment and administration of tax policies and procedures
b. Relations with taxing agencies
c. Preparation of tax reports
d. Tax planning

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TABLE 1.1 Continued

7. INVESTOR RELATIONS
   a. Establishment and maintenance of liaison with the investment community
   b. Establishment and maintenance of communications with company stockholders
   c. Counseling with analysts—public financial information

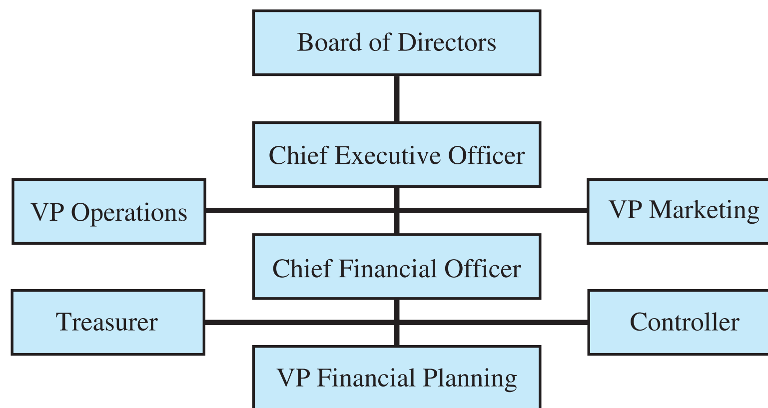
8. EVALUATION AND CONSULTING
   Consultation with and advice to other corporate executives on company policy, operations, objectives, and the effectiveness thereof

9. MANAGEMENT INFORMATION SYSTEMS
   a. Development and use of electronic data processing facilities
   b. Development and use of management information systems
   c. Development and use of systems and procedures

Source: Financial Executives Institute.

FIGURE 1.1

Organization Chart for ZYX Corporation



of business or to exit existing businesses. This includes analyzing proposed mergers, acquisitions, and spin-offs.

The treasurer has responsibility for managing the financing activities of the firm and for working capital management. The treasurer's job includes managing relations with the external investor community, managing the firm's exposure to currency and interest rate risks, and managing the tax department.

The controller oversees the accounting and auditing activities of the firm. This includes preparation of internal reports comparing planned and actual costs, revenues, and profits from the corporation's various business units. It also includes preparation of financial statements for use by shareholders, creditors, and regulatory authorities.

Summary

Finance is the study of how to allocate scarce resources over time. The two features that distinguish finance are that the costs and benefits of financial decisions are spread out over time and are usually not known with certainty in advance by either the decision maker or anybody else.

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A basic tenet of finance is that the ultimate function of the system is to satisfy people's *consumption preferences.* Economic organizations such as firms and governments exist in order to facilitate the achievement of that ultimate function. Many financial decisions can be made strictly on the basis of improving the trade-offs available to people without knowledge of their consumption preferences.

There are at least five good reasons to study finance:

- To manage your personal resources.
- To deal with the world of business.
- To pursue interesting and rewarding career opportunities.
- To make informed public choices as a citizen.
- To expand your mind.

The players in finance theory are households, business firms, financial intermediaries, and governments. Households occupy a special place in the theory because the ultimate function of the system is to satisfy the preferences of people, and the theory treats those preferences as given. Finance theory explains household behavior as an attempt to satisfy those preferences. The behavior of firms is viewed from the perspective of how it affects the welfare of households.

Households face four basic types of financial decisions:

- *Saving decisions:* How much of their current income should they save for the future?
- *Investment decisions:* How should they invest the money they have saved?
- *Financing decisions:* When and how should they use other people's money to satisfy their wants and needs?
- *Risk-management decisions:* How and on what terms should they seek to reduce the economic uncertainties they face or to take calculated risks?

There are three main areas of financial decision making in a business: capital budgeting, capital structure, and working capital management.

There are five reasons for separating the management from the ownership of a business enterprise:

- Professional managers may be found who have a superior ability to run the business.
- To achieve the efficient scale of a business the resources of many households may have to be pooled.
- In an uncertain economic environment, owners will want to diversify their risks across many firms. Such efficient diversification is difficult to achieve without separation of ownership and management.
- To achieve savings in the costs of gathering information.
- The "learning curve" or "going concern" effect: When the owner is also the manager, the new owner has to learn the business from the former owner in order to manage it efficiently. If the owner is not the manager, then when the business is sold, the manager continues in place and works for the new owner.

The corporate form is especially well suited to the separation of ownership and management of firms because it allows relatively frequent changes in owners by share transfer without affecting the operations of the firm.

The primary goal of corporate management is to maximize shareholder wealth. It leads managers to make the same investment decisions that each of the individual owners would have made had they made the decisions themselves.

A competitive stock market imposes a strong discipline on managers to take actions to maximize the market value of the firm's shares.

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Key Terms

- finance 2
- financial system 2
- assets 5
- asset allocation 5
- liability 6
- net worth 6
- sole proprietorship 8
- partnership 8
- corporation 8

Answers to Quick Check Questions

Quick Check 1-1 What are the four basic types of financial decisions households have to make? Give an example of each.

Answer:

- Consumption/saving decisions, such as how much to save for a child's education or for retirement.
- Investment decisions, such as how much to invest in stocks or bonds.
- Financing decisions, such as what type of loan to take to finance the purchase of a home or a car.
- Risk-management decisions, such as whether to buy disability insurance.

Quick Check 1-2 What are the basic types of financial decisions firms have to make? Give an example of each.

Answer:

- Capital budgeting decisions, such as whether to build a plant to produce a new product.
- Financing decisions, such as how much debt and how much equity it should have in its capital structure.
- Working capital decisions, such as whether it should extend credit to customers or demand cash on delivery.

Quick Check 1-3 A corporation owned by a single person is not a sole proprietorship. Why?

Answer: In a corporation the liability of the single shareholder would be limited to the assets of the corporation.

Quick Check 1-4 What are the main reasons for having a separation of management and ownership of firms? How does the corporate form of organization facilitate this separation?

Answer: Five reasons:

- Professional managers may be found who have a superior ability to run the business.
- To achieve the efficient scale of a business the resources of many households may have to be pooled.
- In an uncertain economic environment, owners will want to diversify their risks across many firms. Such efficient diversification is difficult to achieve without separation of ownership and management.
- To achieve savings in the costs of gathering information.
- The "learning curve" or "going concern" effect: When the owner is also the manager, the new owner has to learn the business from the former owner in order to manage it efficiently. If the owner is not the manager, then when the business is sold, the manager continues in place and works for the new owner.

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The corporate form is especially well suited to the separation of ownership and management of firms because it allows relatively frequent changes in owners by share transfer without affecting the operations of the firm.

Quick Check 1-5 Why is the shareholder-wealth-maximization rule a better one for corporate managers to follow than the profit-maximization rule?

Answer: There are two fundamental ambiguities with the profit-maximization criterion:

- If the production process requires many periods, then which period's profit is to be maximized?
- If either future revenues or expenses are uncertain, then what is the meaning of "maximize profits" when profits are described by a probability distribution?

Quick Check 1-6 How does the existence of a well-functioning stock market facilitate the separation of ownership and management of firms?

Answer: In the absence of a stock market, managers would require information that is costly if not impossible to obtain: namely, the wealth, preferences, and other investment opportunities of the owners.

Quick Check 1-7 How does the threat of a takeover serve as a mechanism to deal with the conflict of interest between owners and managers of a corporation?

Answer: Managers know that if they fail to maximize the market value of the firm's shares, the firm will be vulnerable to a takeover in which managers might lose their jobs.

Sources of Information

On the Internet you can complement your understanding of the core structures of financial markets and corporations with the following links:

Survey on Corporate Social Responsibility, ***The Economist,*** January 20, 2005,
http://www.economist.com/surveys/displayStory.cfm?Story_ID=3574392

Financial Market Trends, Organization for Economic Cooperation and Development
http://www.oecd.org/document/36/0,2340,en_2649_201185_1962020_1_1_1_1,00.html

Quarterly Review, Bank for International Settlements
http://www.bis.org/publ/quarterly.htm

EDGAR Database, U.S. Securities and Exchange Commission
http://www.sec.gov/edaux/searches.htm

Questions and Problems

Defining Finance

1. What are your main goals in life? How does finance play a part in achieving those goals? What are the major tradeoffs you face?

Financial Decisions of Households

2. What is your net worth? What have you included among your assets and your liabilities? Would you list the value of your potential lifetime earning power as an asset or liability? How does it compare in value to other assets you have listed?

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3. How are the financial decisions faced by a single person living alone different from those faced by the head of a household with responsibility for several children of school age? Are the tradeoffs they have to make different, or will they evaluate the tradeoffs differently?
4. Family A and Family B both consist of a father, mother, and two children of school age. In Family A both spouses have jobs outside the home and earn a combined income of $100,000 per year. In Family B, only one spouse works outside the home and earns $100,000 per year. How do the financial circumstances and decisions faced by the two families differ?
5. Suppose we define financial independence as the ability to engage in the four basic household financial decisions without resort to the use of relatives' resources when making financing decisions. At what age should children be expected to become financially independent?
6. You are thinking of buying a car. Analyze the decision by addressing the following issues:
   a. Are there other ways to satisfy your transportation requirements besides buying a car? Make a list of all the alternatives and write down the pros and cons.
   b. What are the different ways you can finance the purchase of a car?
   c. Obtain information from at least three different providers of automobile financing on the terms they offer.
   d. What criteria should you use in making your decision?
7. Match each of the following examples with one of the four categories of basic types of household financial decisions.
   - At the Safeway paying with your debit card rather than taking the time to write a check
   - Deciding to take the proceeds from your winning lottery ticket and use it to pay for an extended vacation on the Italian Riviera
   - Following Hillary's advice and selling your Microsoft shares to invest in pork belly futures
   - Helping your 15-years-old son learn to drive by putting him behind the wheel on the back road into town
   - Taking up the offer from the pool supply company to pay off your new hot tub with a 15-month loan with zero payments for the first three months

Forms of Business Organization

8. You are thinking of starting your own business, but have no money.
   a. Think of a business that you could start without having to borrow any money.
   b. Now think of a business that you would want to start if you could borrow any amount of money at the going market interest rate.
   c. What are the risks you would face in this business?
   d. Where can you get financing for your new business?
9. Choose an organization that is not a firm, such as a club or church group, and list the most important financial decisions it has to make. What are the key tradeoffs the organization faces? What role do preferences play in choosing among alternatives? Interview the financial manager of the organization and check to see whether he or she agrees with you.

Market Discipline: Takeovers

10. *Challenge Question:* While there are clear advantages to the separation of management from ownership of business enterprises, there is also a fundamental disadvantage in that it may be costly to align the goals of management with those of the owners. Suggest at

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least two methods, other than the takeover market, by which the conflict can be reduced, albeit at some cost.

11. *Challenge Question:* Consider a poorly run local coffee shop with its prime location featuring a steady stream of potential clients passing by on their way to and from campus. How does the longtime disgruntled, sloppy, and inefficient owner-manager of Cup-a-Joe survive and avoid disciplining from the takeover market?

The Role of the Finance Specialist in a Corporation

12. Which of the following tasks undertaken within a corporate office are likely to fall under the supervision of the treasurer? The controller?

- Arranging to extend a line of credit from a bank
- Arranging with an investment bank for a foreign exchange transaction
- Producing a detailed analysis of the cost structure of the company's alternative product lines
- Taking cash payments for company sales and purchasing U.S. Treasury Bills
- Filing quarterly statements with the Securities and Exchange Commission