CHAPTER 1

MARKET ORGANIZATION AND STRUCTURE

Larry Harris
Los Angeles, CA, U.S.A.

LEARNING OUTCOMES

After completing this chapter, you will be able to do the following:

- Explain and illustrate the main functions of the financial system.
- Describe classifications of assets and markets.
- Describe the major types of securities, currencies, contracts, commodities, and real assets that trade in organized markets, including their distinguishing characteristics and major subtypes.
- Describe the types of financial intermediaries and the services that they provide.
- Compare and contrast the positions an investor can take in an asset.
- Calculate and interpret the leverage ratio, the rate of return on a margin transaction, and the security price at which the investor would receive a margin call.
- Compare and contrast execution, validity, and clearing instructions.
- Compare and contrast market orders with limit orders.
- Describe the primary and secondary markets and explain how secondary markets support primary markets.
- Describe how securities, contracts, and currencies are traded in quote-driven markets, order-driven markets, and brokered markets.
- Describe the characteristics of a well-functioning financial system.
- Describe the objectives of market regulation.

1. INTRODUCTION

Financial analysts gather and process information to make investment decisions, including those related to buying and selling assets. Generally, the decisions involve trading securities, currencies, contracts, commodities, and real assets such as real estate. Consider several examples:

- Fixed-income analysts evaluate issuer creditworthiness and macroeconomic prospects to determine which bonds and notes to buy or sell to preserve capital while obtaining a fair rate of return.
- Stock analysts study corporate values to determine which stocks to buy or sell to maximize the value of their stock portfolios.
- Corporate treasurers analyze exchange rates, interest rates, and credit conditions to determine which currencies to trade and which notes to buy or sell to have funds available in a needed currency.
- Risk managers work for producers or users of commodities to calculate how many commodity futures contracts to buy or sell to manage inventory risks.

Financial analysts must understand the characteristics of the markets in which their decisions will be executed. This chapter, by examining those markets from the analyst's perspective, provides that understanding.

This chapter is organized as follows. Section 2 examines the functions of the financial system. Section 3 introduces assets that investors, information-motivated traders, and risk managers use to advance their financial objectives and presents ways practitioners classify these assets into markets. These assets include such financial instruments as securities, currencies, and some contracts; certain commodities; and real assets. Financial analysts must know the distinctive characteristics of these trading assets.

Section 4 is an overview of financial intermediaries (entities that facilitate the functioning of the financial system). Section 5 discusses the positions that can be obtained while trading assets. You will learn about the benefits and risks of long and short positions, how these positions can be financed, and how the financing affects their risks. Section 6 discusses how market participants order trades and how markets process those orders. These processes must be understood to achieve trading objectives while controlling transaction costs.

Section 7 focuses on describing primary markets. Section 8 describes the structures of secondary markets in securities. Sections 9 and 10 close the chapter with discussions of the characteristics of a well-functioning financial system and of how regulation helps make financial markets function better. A conclusions and summary section reviews the chapter's major ideas and points, and practice problems conclude.

2. THE FUNCTIONS OF THE FINANCIAL SYSTEM

The financial system includes markets and various financial intermediaries that help transfer financial assets, real assets, and financial risks in various forms from one entity to another, from one place to another, and from one point in time to another. These transfers take place whenever someone exchanges one asset or financial contract for another. The assets and contracts that people (people act on behalf of themselves, companies, charities, governments, etc., so the term "people" has a broad definition in this chapter) trade include notes, bonds, stocks, exchange-traded funds, currencies, forward contracts, futures contracts, option contracts, swap contracts, and certain commodities. When the buyer and seller voluntarily arrange their trades, as is usually the case, the buyer and the seller both expect to be better off.

People use the financial system for six main purposes:

1. To save money for the future.
2. To borrow money for current use.

3. To raise equity capital.
4. To manage risks.
5. To exchange assets for immediate and future deliveries.
6. To trade on information.

The main functions of the financial system are to facilitate:

1. The achievement of the purposes for which people use the financial system.
2. The discovery of the rates of return that equate aggregate savings with aggregate borrowings.
3. The allocation of capital to the best uses.

These functions are extremely important to economic welfare. In a well-functioning financial system, transaction costs are low, analysts can value savings and investments, and scarce capital resources are used well.

Sections 2.1 through 2.3 expand on these three functions. The subsections of Section 2.1 cover the six main purposes for which people use the financial system and how the financial system facilitates the achievement of those purposes. Sections 2.2 and 2.3 discuss determining rates of return and capital allocation efficiency, respectively.

2.1. Helping People Achieve Their Purposes in Using the Financial System

People often arrange transactions to achieve more than one purpose when using the financial system. For example, an investor who buys the stock of an oil producer may do so to move her wealth from the present to the future, to hedge the risk that she will have to pay more for energy in the future, and to exploit insightful research that she conducted that suggests the company's stock is undervalued in the marketplace. If the investment proves to be successful, she will have saved money for the future, managed her energy risk exposure, and obtained a return on her research.

The separate discussions of each of the six main uses of the financial system by people will help you better identify the reasons why people trade. Your ability to identify the various uses of the financial system will help you avoid confusion that often leads to poor financial decisions. The financial intermediaries that are mentioned in these discussions are explained further in Section 4.

2.1.1. Saving

People often have money that they choose not to spend now and that they want available in the future. For example, workers who save for their retirements need to move some of their current earnings into the future. When they retire, they will use their savings to replace the wages that they will no longer be earning. Similarly, companies save money from their sales revenue so that they can pay vendors when their bills come due, repay debt, or acquire assets (for example, other companies or machinery) in the future.

To move money from the present to the future, savers buy notes, certificates of deposit, bonds, stocks, mutual funds, or real assets such as real estate. These alternatives generally provide a better expected rate of return than simply storing money. Savers then sell these assets in the future to fund their future expenditures. When savers commit money to earn a financial return, they commonly are called investors. They *invest* when they purchase assets, and they *divest* when they sell them.

Investors require a fair rate of return while their money is invested. The required fair rate of return compensates them for the use of their money and for the risk that they may lose money if the investment fails or if inflation reduces the real value of their investments.

The financial system facilitates savings when institutions create investment vehicles, such as bank deposits, notes, stocks, and mutual funds, that investors can acquire and sell without paying substantial transaction costs. When these instruments are fairly priced and easy to trade, investors will use them to save more.

2.1.2. Borrowing

People, companies, and governments often want to spend money now that they do not have. They can obtain money to fund projects that they wish to undertake now by borrowing it. Companies can also obtain funds by selling ownership or equity interests (covered in Section 2.1.3). Banks and other investors provide those requiring funds with money because they expect to be repaid with interest or because they expect to be compensated with future disbursements, such as dividends and capital gains, as the ownership interest appreciates in value.

People may borrow to pay for such items as vacations, homes, cars, or education. They generally borrow through mortgages and personal loans, or by using credit cards. People typically repay these loans with money they earn later.

Companies often require money to fund current operations or to engage in new capital projects. They may borrow the needed funds in a variety of ways, such as arranging a loan or a line of credit with a bank, or selling fixed-income securities to investors. Companies typically repay their borrowing with income generated in the future. In addition to borrowing, companies may raise funds by selling ownership interests.

Governments may borrow money to pay salaries and other expenses, to fund projects, to provide welfare benefits to their citizens and residents, and to subsidize various activities. Governments borrow by selling bills, notes, or bonds. Governments repay their debt using future revenues from taxes and in some instances from the projects funded by these debts.

Borrowers can borrow from lenders only if the lenders believe that they will be repaid. If the lenders believe, however, that repayment in full with interest may not occur, they will demand higher rates of interest to cover their expected losses and to compensate them for the discomfit they experience wondering whether they will lose their money. To lower the costs of borrowing, borrowers often pledge assets as collateral for their loans. The assets pledged as collateral often include those that will be purchased by the proceeds of the loan. If the borrowers do not repay their loans, the lenders can sell the collateral and use the proceeds to settle the loans.

Lenders often will not loan to borrowers who intend to invest in risky projects, especially if the borrowers cannot pledge other collateral. Investors may still be willing to supply capital for these risky projects if they believe that the projects will likely produce valuable future cash flows. Rather than lending money, however, they will contribute capital in exchange for equity in the projects.

The financial system facilitates borrowing. Lenders aggregate from savers the funds that borrowers require. Borrowers must convince lenders that they can repay their loans, and that, in the event they cannot, lenders can recover most of the funds lent. Credit bureaus, credit rating agencies, and governments promote borrowing; credit bureaus and credit rating agencies do so by collecting and disseminating information that lenders need to analyze credit prospects and governments do so by establishing bankruptcy codes and courts that define and enforce the rights of borrowers and lenders. When the transaction costs of loans (i.e., the costs of arranging, monitoring, and collecting them) are low, borrowers can borrow more to fund current expenditures with credible promises to return the money in the future.

2.1.3. Raising Equity Capital

Companies often raise money for projects by selling (issuing) ownership interests (e.g., corporate common stock or partnership interests). Although these equity instruments legally represent ownership in companies rather than loans to the companies, selling equity to raise capital is simply another mechanism for moving money from the future to the present. When shareholders or partners contribute capital to a company, the company obtains money in the present in exchange for equity instruments that will be entitled to distributions in the future. Although the repayment of the money is not scheduled as it would be for loans, equity instruments also represent potential claims on money in the future.

The financial system facilitates raising equity capital. Investment banks help companies issue equities, analysts value the securities that companies sell, and regulatory reporting requirements and accounting standards attempt to ensure the production of meaningful financial disclosures. The financial system helps promote capital formation by producing the financial information needed to determine fair prices for equity. Liquid markets help companies raise capital. In these markets, shareholders can easily divest their equities as desired. When investors can easily value and trade equities, they are more willing to fund reasonable projects that companies wish to undertake.

EXAMPLE 1-1 Financing Capital Projects

As a chief financial officer (CFO) of a large industrial firm, you need to raise cash within a few months to pay for a project to expand existing and acquire new manufacturing facilities. What are the primary options available to you?

Solution: Your primary options are to borrow the funds or to raise the funds by selling ownership interests. If the company borrows the funds, you may have the company pledge some or all of the project as collateral to reduce the cost of borrowing.

2.1.4. Managing Risks

Many people, companies, and governments face financial risks that concern them. These risks include default risk and the risk of changes in interest rates, exchange rates, raw material prices, and sale prices, among many other risks. These risks are often managed by trading contracts that serve as hedges for the risks.

For example, a farmer and a food processor both face risks related to the price of grain. The farmer fears that prices will be lower than expected when his grain is ready for sale whereas the food processor fears that prices will be higher than expected when she has to buy grain in the future. They both can eliminate their exposures to these risks if they enter into a binding forward contract for the farmer to sell a specified quantity of grain to the food processor at a future date at a mutually agreed upon price. By entering into a forward contract that sets the future trade price, they both eliminate their exposure to changing grain prices.

In general, hedgers trade to offset or insure against risks that concern them. In addition to forward contracts, they may use futures contracts, option contracts, or insurance contracts to transfer risk to other entities more willing to bear the risks (these contracts will be covered in Section 3.4). Often the hedger and the other entity face exactly the opposite risks, so the transfer makes both more secure, as in the grain example.

The financial system facilitates risk management when liquid markets exist in which risk managers can trade instruments that are correlated (or inversely correlated) with the risks that concern them without incurring substantial transaction costs. Investment banks, exchanges, and insurance companies devote substantial resources to designing such contracts and to ensuring that they will trade in liquid markets. When such markets exist, people are better able to manage the risks that they face and often are more willing to undertake risky activities that they expect will be profitable.

2.1.5. Exchanging Assets for Immediate Delivery (Spot Market Trading)

People and companies often trade one asset for another that they rate more highly or, equivalently, that is more useful to them. They may trade one currency for another currency, or money for a needed commodity or right. Following are some examples that illustrate these trades:

- Volkswagen pays its German workers in euros, but the company receives dollars when it sells cars in the United States. To convert money from dollars to euros, Volkswagen trades in the foreign exchange markets.
- A Mexican investor who is worried about the prospects for peso inflation or a potential devaluation of the peso may buy gold in the spot gold market. (This transaction may hedge against the risk of devaluation of the peso because the value of gold may increase with inflation.)
- A plastic producer must buy carbon credits to emit carbon dioxide when burning fuel to comply with environmental regulations. The carbon credit is a legal right that the producer must have to engage in activities that emit carbon dioxide.

In each of these cases, the trades are considered spot market trades because the instruments trade for immediate delivery. The financial system facilitates these exchanges when liquid spot markets exist in which people can arrange and settle trades without substantial transaction costs.

2.1.6. Information-Motivated Trading

Information-motivated traders trade to profit from information that they believe allows them to predict future prices. Like all other traders, they hope to buy at low prices and sell at higher prices. Unlike pure investors, however, they expect to earn a return on their information in addition to the normal return expected for bearing risk through time.

Active investment managers are information-motivated traders who collect and analyze information to identify securities, contracts, and other assets that their analyses indicate are under- or overvalued. They then buy those that they consider undervalued and sell those that they consider overvalued. If successful, they obtain a greater return than the unconditional return that would be expected for bearing the risk in their positions. The return that they expect to obtain is a conditional return earned on the basis of the information in their analyses. Practitioners often call this process active portfolio management.

Note that the distinction between pure investors and information-motivated traders depends on their motives for trading and not on the risks that they take or their expected holding periods. Investors trade to move wealth from the present to the future whereas information-motivated traders trade to profit from superior information about future values. When trading to move wealth forward, the time period may be short or long. For example, a bank treasurer may only need to move money overnight and might use money market instruments trading in an interbank funds market to accomplish that. A pension fund, however, may need to move money 30 years forward and might do that by using shares trading in a stock market. Both are investors although their expected holding periods and the risks in the instruments that they trade are vastly different.

In contrast, information-motivated traders trade because their information-based analyses suggest to them that prices of various instruments will increase or decrease in the future at a rate faster than others without their information or analytical models would expect. After establishing their positions, they hope that prices will change quickly in their favor so that they can close their positions, realize their profits, and redeploy their capital. These price changes may occur almost instantaneously, or they may take years to occur if information about the mispricing is difficult to obtain or understand.

The two categories of traders are not mutually exclusive. Investors also are often information-motivated traders. Many investors who want to move wealth forward through time collect and analyze information to select securities that will allow them to obtain conditional returns that are greater than the unconditional returns expected for securities in their assets classes. If they have rational reasons to expect that their efforts will indeed produce superior returns, they are information-motivated traders. If they consistently fail to produce such returns, their efforts will be futile, and they would have been better off simply buying and holding well-diversified portfolios.

EXAMPLE 1-2 Investing versus Information-Motivated Trading

The head of a large labor union with a pension fund asks you, a pension consultant, to distinguish between investing and information-motivated trading. You are expected to provide an explanation that addresses the financial problems that she faces. How would you respond?

Solution: The object of investing for the pension fund is to move the union's pension assets from the present to the future when they will be needed to pay the union's retired pensioners. The pension fund managers will typically do this by buying stocks, bonds, and perhaps other assets. The pension fund managers expect to receive a fair rate of return on the pension fund's assets without paying excessive transaction costs and management fees. The return should compensate the fund for the risks that it bears and for the time that other people are using the fund's money.

The object of information-motivated trading is to earn a return in excess of the fair rate of return. Information-motivated traders analyze information that they collect with the hope that their analyses will allow them to predict better than others where prices will be in the future. They then buy assets that they think will produce excess returns and sell those that they think will underperform. Active investment managers are information-motivated traders.

The characteristic that most distinguishes investors from information-motivated traders is the return that they expect. Although both types of traders hope to obtain extraordinary returns, investors rationally expect to receive only fair returns during the periods of their investments. In contrast, information-motivated traders expect to make returns in excess of required fair rates of return. Of course, not all investing or information-motivated trading is successful (in other words, the actual returns may not equal or exceed the expected returns).

The financial system facilitates information-motivated trading when liquid markets allow active managers to trade without significant transaction costs. Accounting standards and reporting requirements that produce meaningful financial disclosures reduce the costs of being well informed, but do not necessarily help informed traders profit because they often compete with each other. The most profitable well-informed traders are often those who have the most unique insights into future values.

2.1.7. Summary

People use the financial system for many purposes, the most important of which are saving, borrowing, raising equity capital, managing risk, exchanging assets in spot markets, and information-motivated trading. The financial system best facilitates these uses when people can trade instruments that interest them in liquid markets, when institutions provide financial services at low cost, when information about assets and about credit risks is readily available, and when regulation helps ensure that everyone faithfully honors their contracts.

2.2. Determining Rates of Return

Saving, borrowing, and selling equity are all means of moving money through time. Savers move money from the present to the future whereas borrowers and equity issuers move money from the future to the present.

Because time machines do not exist, money can travel forward in time only if an equal amount of money is travelling in the other direction. This equality always occurs because borrowers and equity sellers create the securities in which savers invest. For example, the bond sold by a company that needs to move money from the future to the present is the same bond bought by a saver who needs to move money from the present to the future.

The aggregate amount of money that savers will move from the present to the future is related to the expected rate of return on their investments. If the expected return is high, they will forgo current consumption and move more money to the future. Similarly, the aggregate amount of money that borrowers and equity sellers will move from the future to the present depends on the costs of borrowing funds or of giving up ownership. These costs can be expressed as the rate of return that borrowers and equity sellers are expected to deliver in exchange for obtaining current funds. It is the same rate that savers expect to receive when delivering current funds. If this rate is low, borrowers and equity sellers will want to move more money to the present from the future. In other words, they will want to raise more funds.

Because the total money saved must equal the total money borrowed and received in exchange for equity, the expected rate of return depends on the aggregate supply of funds through savings and the aggregate demand for funds. If the rate is too high, savers will want to move more money to the future than borrowers, and equity issuers will want to move to the present. The expected rate will have to be lower to discourage the savers and to encourage the borrowers and equity issuers. Conversely, if the rate is too low, savers will want to move less money forward than borrowers and equity issuers will want to move to the present. The expected rate will have to be higher to encourage the savers and to discourage the borrowers and equity issuers. Between rates too high and too low, an expected rate of return exists, in theory, in which the aggregate supply of funds for investing (supply of funds saved) and the aggregate demand for funds through borrowing and equity issuing are equal.

Economists call this rate the equilibrium interest rate. It is the price for moving money through time. Determining this rate is one of the most important functions of the financial system. The equilibrium interest rate is the only interest rate that would exist if all securities were equally risky, had equal terms, and were equally liquid. In fact, the required rates of return for securities vary by their risk characteristics, terms, and liquidity. For a given issuer, investors generally require higher rates of return for equity than for debt, for long-term securities than for short-term securities, and for illiquid securities than for liquid ones. Financial analysts recognize that all required rates of return depend on a common equilibrium interest rate plus adjustments for risk.

EXAMPLE 1-3 Interest Rates

For a presentation to private wealth clients by your firm's chief economist, you are asked to prepare the audience by explaining the most fundamental facts concerning the role of interest rates in the economy. You agree. What main points should you try to convey?

Solution: Savers have money now that they will want to use in the future. Borrowers want to use money now that they do not have, but they expect that they will have money in the future. Borrowers are loaned money by savers and promise to repay it in the future.

The interest rate is the return that lenders, the savers, expect to receive from borrowers for allowing borrowers to use the savers' money. The interest rate is the price of using money.

Interest rates depend on the total amount of money that people want to borrow and the total amount of money that people are willing to lend. Interest rates are high when, in aggregate, people value having money now substantially more than they value having money in the future. In contrast, if many people with money want to use it in the future and few people presently need more money than they have, interest rates will be low.

2.3. Capital Allocation Efficiency

Primary capital markets (**primary markets**) are the markets in which companies and governments raise capital (funds). Companies may raise funds by borrowing money or by issuing equity. Governments may raise funds by borrowing money.

Economies are said to be allocationally efficient when their financial systems allocate capital (funds) to those uses that are most productive. Although companies may be interested in getting funding for many potential projects, not all projects are worth funding. One of the most important functions of the financial system is to ensure that only the best projects obtain scarce capital funds; the funds available from savers should be allocated to the most productive uses.

In market-based economies, savers determine, directly or indirectly, which projects obtain capital. Savers determine capital allocations directly by choosing which securities they will invest in. Savers determine capital allocations indirectly by giving funds to financial intermediaries that then invest the funds. Because investors fear the loss of their money, they will lend at lower interest rates to borrowers with the best credit prospects or the best collateral, and they will lend at higher rates to other borrowers with less secure prospects. Similarly, they will buy only those equities that they believe have the best prospects relative to their prices and risks.

To avoid losses, investors carefully study the prospects of the various investment opportunities available to them. The decisions that they make tend to be well informed, which helps ensure that capital is allocated efficiently. The fear of losses by investors and by those raising funds to invest in projects ensures that only the best projects tend to be funded. The process works best when investors are well informed about the prospects of the various projects.

In general, investors will fund an equity project if they expect that the value of the project is greater than its cost, and they will not fund projects otherwise. If the investor expectations are accurate, only projects that should be undertaken will be funded and all such projects will be funded. Accurate market information thus leads to efficient capital allocation.

EXAMPLE 1-4 Primary Market Capital Allocation

How can poor information about the value of a project result in poor capital allocation decisions?

Solution: Projects should be undertaken only if their value is greater than their cost. If investors have poor information and overestimate the value of a project in which its true value is less than its cost, a wealth-diminishing project may be undertaken. Alternatively, if investors have poor information and underestimate the value of a project in which its true value is greater than its cost, a wealth-enhancing project may not be undertaken.

3. ASSETS AND CONTRACTS

People, companies, and governments use many different assets and contracts to further their financial goals and to manage their risks. The most common assets include financial assets (such as bank deposits, certificates of deposit, loans, mortgages, corporate and government bonds and notes, common and preferred stocks, real estate investment trusts, master limited partnership interests, pooled investment products, and exchange-traded funds), currencies, certain commodities (such as gold and oil), and real assets (such as real estate). The most common contracts are option, futures, forward, swap, and insurance contracts. People, companies, and governments use these assets and contracts to raise funds, to invest, to profit from information-motivated trading, to hedge risks, and/or to transfer money from one form to another.

3.1. Classifications of Assets and Markets

Practitioners often classify assets and the markets in which they trade by various common characteristics to facilitate communications with their clients, with each other, and with regulators.

The most actively traded assets are securities, currencies, contracts, and commodities. In addition, real assets are traded. Securities generally include debt instruments, equities, and shares in pooled investment vehicles. Currencies are monies issued by national monetary authorities. Contracts are agreements to exchange securities, currencies, commodities, or other contracts in the future. Commodities include precious metals, energy products, industrial metals, and agricultural products. Real assets are tangible properties such as real estate, airplanes, or machinery. Securities, currencies, and contracts are classified as financial assets whereas commodities and real assets are classified as physical assets.

Securities are further classified as debt or equity. Debt instruments (also called fixed-income instruments) are promises to repay borrowed money. Equities represent ownership in companies. Pooled investment vehicle shares represent ownership of an undivided interest in an investment portfolio. The portfolio may include securities, currencies, contracts, commodities, or real assets. Pooled investment vehicles, such as exchange-traded funds, which exclusively own shares in other companies generally are also considered equities.

Securities are also classified by whether they are public or private securities. Public securities are those registered to trade in public markets, such as on exchanges or through dealers. In most jurisdictions, issuers must meet stringent minimum regulatory standards, including reporting and corporate governance standards, to issue publicly traded securities.

Private securities are all other securities. Often, only specially qualified investors can purchase private equities and private debt instruments. Investors may purchase them directly from the issuer or indirectly through an investment vehicle specifically formed to hold such securities. Issuers often issue private securities when they find public reporting standards too burdensome or when they do not want to conform to the regulatory standards associated with public equity. **Venture capital** is private equity that investors supply to companies when or shortly after they are founded. Private securities generally are illiquid. In contrast, many public securities trade in liquid markets in which sellers can easily find buyers for their securities.

Contracts are derivative contracts if their values depend on the prices of other underlying assets. Derivative contracts may be classified as physical or financial depending on whether the underlying instruments are physical products or financial securities. Equity derivatives are contracts whose values depend on equities or indices of equities. Fixed-income derivatives are contracts whose values depend on debt securities or indices of debt securities.

Practitioners classify markets by whether the markets trade instruments for immediate delivery or for future delivery. Markets that trade contracts that call for delivery in the future are forward or futures markets. Those that trade for immediate delivery are called spot markets to distinguish them from forward markets that trade contracts on the same underlying instruments. Options markets trade contracts that deliver in the future, but delivery takes place only if the holders of the options choose to exercise them.

When issuers sell securities to investors, practitioners say that they trade in the **primary market**. When investors sell those securities to others, they trade in the **secondary market**. In the primary market, funds flow to the issuer of the security from the purchaser. In the secondary market, funds flow between traders.

Practitioners classify financial markets as money markets or capital markets. Money markets trade debt instruments maturing in one year or less. The most common such instruments are repurchase agreements (defined in Section 3.2.1), negotiable certificates of deposit, government bills, and commercial paper. In contrast, capital markets trade instruments of longer duration, such as bonds and equities, whose values depend on the creditworthiness of the issuers and on payments of interest or dividends that will be made in the future and may be uncertain. Corporations generally finance their operations in the capital markets, but some also finance a portion of their operations by issuing short-term securities, such as commercial paper.

Finally, practitioners distinguish between traditional investment markets and alternative investment markets. Traditional investments include all publicly traded debts and equities and shares in pooled investment vehicles that hold publicly traded debts and/or equities. Alternative investments include hedge funds, private equities (including venture capital), commodities, real estate securities and real estate properties, securitized debts, operating leases, machinery, collectibles, and precious gems. Because these investments are often hard to trade and hard to value, they may sometimes trade at substantial deviations from their intrinsic values. The discounts compensate investors for the research that they must do to value these assets and for their inability to easily sell the assets if they need to liquidate a portion of their portfolios.

The remainder of this section describes the most common assets and contracts that people, companies, and governments trade.

EXAMPLE 1-5 Asset and Market Classification

The investment policy of a mutual fund permits the fund to invest only in public equities traded in secondary markets. Would the fund be able to purchase:

1. Common stock of a company that trades on a large stock exchange?
2. Common stock of a public company that trades only through dealers?
3. A government bond?
4. A single stock futures contract?
5. Common stock sold for the first time by a properly registered public company?
6. Shares in a privately held bank with €10 billion of capital?

Solutions:
1. Yes. Common stock is equity. Those common stocks that trade on large exchanges invariably are public equities that trade in secondary markets.
2. Yes. Dealer markets are secondary markets and the security is a public equity.
3. No. Although government bonds are public securities, they are not equities. They are debt securities.

4. No. Although the underlying instruments for single stock futures are invariably public equities, single stock futures are derivative contracts not equities.
5. No. The fund would not be able to buy these shares because a purchase from the issuer would be in the primary market. The fund would have to wait until it could buy the shares from someone other than the issuer.
6. No. These shares are private equities, not public equities. The public prominence of the company does not make its securities public securities unless they have been properly registered as public securities.

3.2. Securities

People, companies, and governments sell securities to raise money. Securities include bonds, notes, commercial paper, mortgages, common stocks, preferred stocks, warrants, mutual fund shares, unit trusts, and depository receipts. These can be classified broadly as fixed-income instruments, equities, and shares in pooled investment vehicles. Note that the legal definition of a security varies by country and may or may not coincide with the usage here. Securities that are sold to the public or that can be resold to the public are called issues. Companies and governments are the most common issuers.

3.2.1. Fixed Income

Fixed-income instruments contractually include predetermined payment schedules that usually include interest and principal payments. Fixed-income instruments generally are promises to repay borrowed money but may include other instruments with payment schedules, such as settlements of legal cases or prizes from lotteries. The payment amounts may be prespecified or they may vary according to a fixed formula that depends on the future values of an interest rate or a commodity price. Bonds, notes, bills, certificates of deposit, commercial paper, repurchase agreements, loan agreements, and mortgages are examples of promises to repay money in the future. People, companies, and governments create fixed-income instruments when they borrow money.

Corporations and governments issue bonds and notes. Fixed-income securities with shorter maturities are called "notes," those with longer maturities are called "bonds." The cutoff is usually at 10 years. In practice, however, the terms are generally used interchangeably. Both become short-term instruments when the remaining time until maturity is short, usually taken to be one year or less.

Some corporations issue convertible bonds, which are typically convertible into stock, usually at the option of the holder after some period. If stock prices are high so that conversion is likely, convertibles are valued like stock. Conversely, if stock prices are low so that conversion is unlikely, convertibles are valued like bonds.

Bills, certificates of deposit, and commercial paper are respectively issued by governments, banks, and corporations. They usually mature within a year of being issued; certificates of deposit sometimes have longer initial maturities.

Repurchase agreements (repos) are short-term lending instruments. The term can be as short as overnight. A borrower seeking funds will sell an instrument—typically a high-quality bond—to a lender with an agreement to repurchase it later at a slightly higher price based on an agreed-upon interest rate.

Practitioners distinguish between short-term, intermediate-term, and long-term fixed-income securities. No general consensus exists about the definition of short-term, intermediate-term, and long-term. Instruments that mature in less than one to two years are considered short-term instruments whereas those that mature in more than five to ten years are considered long-term instruments. In the middle are intermediate-term instruments.

Instruments trading in money markets are called money market instruments. Such instruments are traded debt instruments maturing in one year or less. Money market funds and corporations seeking a return on their short-term cash balances typically hold money market instruments.

3.2.2. Equities

Equities represent ownership rights in companies. These include common and preferred shares. Common shareholders own residual rights to the assets of the company. They have the right to receive any dividends declared by the boards of directors, and in the event of liquidation, any assets remaining after all other claims are paid. Acting through the boards of directors that they elect, common shareholders usually can select the managers who run the corporations.

Preferred shares are equities that have preferred rights (relative to common shares) to the cash flows and assets of the company. Preferred shareholders generally have the right to receive a specific dividend on a regular basis. If the preferred share is a cumulative preferred equity, the company must pay the preferred shareholders any previously omitted dividends before it can pay dividends to the common shareholders. Preferred shareholders also have higher claims to assets relative to common shareholders in the event of corporate liquidation. For valuation purposes, financial analysts generally treat preferred stocks as fixed-income securities when the issuers will clearly be able to pay their promised dividends in the foreseeable future.

Warrants are securities issued by a corporation that allow the warrant holders to buy a security issued by that corporation, if they so desire, usually at any time before the warrants expire or, if not, upon expiration. The security that warrant holders can buy usually is the issuer's common stock, in which case the warrants are considered equities because the warrant holders can obtain equity in the company by exercising their warrants. The warrant exercise price is the price that the warrant holder must pay to buy the security.

EXAMPLE 1-6 Securities

What factors distinguish fixed-income securities from equities?

Solution: Fixed-income securities generate income on a regular schedule. They derive their value from the promise to pay a scheduled cash flow. The most common fixed-income securities are promises made by people, companies, and governments to repay loans.

Equities represent residual ownership in companies after all other claims—including any fixed-income liabilities of the company—have been satisfied. For corporations, the claims of preferred equities typically have priority over the claims of common equities. Common equities have the residual ownership in corporations.

3.2.3. Pooled Investments

Pooled investment vehicles are mutual funds, trusts, depositories, and hedge funds that issue securities that represent shared ownership in the assets that these entities hold. The securities created by mutual funds, trusts, depositories, and hedge funds are respectively called *shares*, *units*, *depository receipts*, and *limited partnership interests* but practitioners often use these terms interchangeably. People invest in pooled investment vehicles to benefit from the investment management services of their managers and from diversification opportunities that are not readily available to them on an individual basis.

Mutual funds are investment vehicles that pool money from many investors for investment in a portfolio of securities. They are often legally organized as investment trusts or as corporate investment companies. Pooled investment vehicles may be open-ended or closed-ended. Open-ended funds issue new shares and redeem existing shares on demand, usually on a daily basis. The price at which a fund redeems and sells the fund's shares is based on the net asset value of the fund's portfolio, which is the difference between the fund's assets and liabilities, expressed on a per share basis. Investors generally buy and sell open-ended mutual funds by trading with the mutual fund.

In contrast, closed-end funds issue shares in primary market offerings that the fund or its investment bankers arrange. Once issued, investors cannot sell their shares of the fund back to the fund by demanding redemption. Instead, investors in closed-end funds must sell their shares to other investors in the secondary market. The secondary market prices of closed-end funds may differ—sometimes quite significantly—from their net asset values. Closed-end funds generally trade at a discount to their net asset values. The discount reflects the expenses of running the fund and sometimes investor concerns about the quality of the management. Closed-end funds may also trade at a discount or a premium to net asset value when investors believe that the portfolio securities are overvalued or undervalued. Many financial analysts thus believe that discounts and premiums on closed-end funds measure market sentiment.

Exchange-traded funds (ETFs) and exchange-traded notes (ETNs) are open-ended funds that investors can trade among themselves in secondary markets. The prices at which ETFs trade rarely differ much from net asset values because a class of investors, known as authorized participants (APs), has the option of trading directly with the ETF. If the market price of an equity ETF is sufficiently below its net asset value, APs will buy shares in the secondary market at market price and redeem shares at net asset value with the fund. Conversely, if the price of an ETF is sufficiently above its net asset value, APs will buy shares from the fund at net asset value and sell shares in the secondary market at market price. As a result, the market price and net asset values of ETFs tend to converge.

Many ETFs permit only in-kind deposits and redemptions. Buyers who buy directly from such a fund pay for their shares with a portfolio of securities rather than with cash. Similarly, sellers receive a portfolio of securities. The transaction portfolio generally is very similar—often essentially identical—to the portfolio held by the fund. Practitioners sometimes call such funds "depositories" because they issue depository receipts for the portfolios that traders deposit with them. The traders then trade the receipts in the secondary market. Some warehouses holding industrial materials and precious metals also issue tradable warehouse receipts.

Asset-backed securities are securities whose values and income payments are derived from a pool of assets, such as mortgage bonds, credit card debt, or car loans. These securities typically pass interest and principal payments received from the pool of assets through to their holders on a monthly basis. These payments may depend on formulas that give some classes of securities—called tranches—backed by the pool more value than other classes.

Hedge funds are investment funds that generally organize as limited partnerships. The hedge fund managers are the general partners. The limited partners are qualified investors who are wealthy enough and well informed enough to tolerate and accept substantial losses, should they occur. The regulatory requirements to participate in a hedge fund and the regulatory restrictions on hedge funds vary by jurisdiction. Most hedge funds follow only one investment strategy, but no single investment strategy characterizes hedge funds as a group. Hedge funds exist that follow almost every imaginable strategy ranging from long–short arbitrage in the stock markets to direct investments in exotic alternative assets.

The primary distinguishing characteristic of hedge funds is their management compensation scheme. Almost all funds pay their managers with an annual fee that is proportional to their assets and with an additional performance fee that depends on the wealth that the funds generate for their shareholders. A secondary distinguishing characteristic of many hedge funds is the use of leverage to increase risk exposure and to hopefully increase returns.

3.3. Currencies

Currencies are monies issued by national monetary authorities. Approximately 175 currencies are currently in use throughout the world. Some of these currencies are regarded as reserve currencies. Reserve currencies are currencies that national central banks and other monetary authorities hold in significant quantities. The primary reserve currencies are the U.S. dollar and the euro. Secondary reserve currencies include the British pound, the Japanese yen, and the Swiss franc.

Currencies trade in foreign exchange markets. In spot currency transactions, one currency is immediately or almost immediately exchanged for another. The rate of exchange is called the spot exchange rate. Traders typically negotiate institutional trades in multiples of large quantities, such as US$1 million or ¥100 million. Institutional trades generally settle in two business days.

Retail currency trades most commonly take place through commercial banks when their customers exchange currencies at a location of the bank, use ATM machines when traveling to withdraw a different currency than the currency in which their bank accounts are denominated, or use credit cards to buy items priced in different currencies. Retail currency trades also take place at airport kiosks, at storefront currency exchanges, or on the street.

3.4. Contracts

A contract is an agreement among traders to do something in the future. Contracts include forward, futures, swap, option, and insurance contracts. The values of most contracts depend on the value of an underlying asset. The underlying asset may be a commodity, a security, an index representing the values of other instruments, a currency pair or basket, or other contracts.

Contracts provide for some physical or cash settlement in the future. In a physically settled contract, settlement occurs when the parties to the contract physically exchange some item, such as tomatoes, pork bellies, or gold bars. Physical settlement also includes the delivery of such financial instruments as bonds, equities, or futures contracts even though the delivery is electronic. In contrast, cash settled contracts settle through cash payments. The amount of the payment depends on formulas specified in the contracts.

Financial analysts classify contracts by whether they are physical or financial based on the nature of the underlying asset. If the underlying asset is a physical product, the contract is a physical; otherwise, the contract is a financial. Examples of assets classified as physical include contracts for the delivery of petroleum, lumber, and gold. Examples of assets classified as financial include option contracts and contracts on interest rates, stock indices, currencies, and credit default swaps.

Contracts that call for immediate delivery are called spot contracts, and they trade in spot markets. Immediate delivery generally is three days or less, but depends on each market. All other contracts involve what practitioners call futurity. They derive their values from events that will take place in the future.

EXAMPLE 1-7 Contracts for Difference

Contracts for difference (CFD) allow people to speculate on price changes for an underlying asset, such as a common stock or an index. Dealers generally sell CFDs to their clients. When the clients sell the CFDs back to their dealer, they receive any appreciation in the underlying asset's price between the time of purchase and sale (open and close) of the contract. If the underlying asset's price drops over this interval, the client pays the dealer the difference.

1. Are contracts for difference derivative contracts?
2. Are contracts for difference based on copper prices cash settled or physically settled?

Solution to 1: Contracts for difference are derivative contracts because their values are derived from changes in the prices of the underlying asset on which they are based.

Solution to 2: All contracts for difference are cash-settled contracts regardless of the underlying asset on which they are based because they settle in cash and not in the underlying asset.

3.4.1. Forward Contracts

A **forward contract** is an agreement to trade the underlying asset in the future at a price agreed upon today. For example, a contract for the sale of wheat after the harvest is a forward contract. People often use forward contracts to reduce risk. Before planting wheat, farmers like to know the price at which they will sell their crop. Similarly, before committing to sell flour to bakers in the future, millers like to know the prices that they will pay for wheat. The farmer and the miller both reduce their operating risks by agreeing to trade wheat forward.

Practitioners call such traders hedgers because they use their contractual commitments to hedge their risks. If the price of wheat falls, the wheat farmer's crop will drop in value on the spot market but he has a contract to sell wheat in the future at a higher fixed price. The forward contract has become more valuable to the farmer. Conversely, if the price of wheat rises, the miller's future obligation to sell flour will become more burdensome because of the high price he would have to pay for wheat on the spot market, but the miller has a contract to buy wheat at a lower fixed price. The forward contract has become more valuable to the miller. In both cases, fluctuations in the spot price are hedged by the forward contract. The forward contract offsets the operating risks that the hedgers face.

Consider a simple example of hedging. A tomato farmer in southern Ontario, Canada, grows tomatoes for processing into tomato sauce. The farmer expects to harvest 250,000 bushels and that the price per bushel at harvest will be $1.03. That price, however, could fluctuate significantly before the harvest. If the price of tomatoes drops to $0.75, the farmer would lose $0.28 per bushel ($1.03 – $0.75) relative to his expectations, or a total of $70,000. Now, suppose that the farmer can sell tomatoes forward to Heinz at $1.01 for delivery at the harvest. If the farmer sells 250,000 bushels forward, and the price of tomatoes drops to $0.75, the farmer would still be able to sell his tomatoes for $1.01, and thus would not suffer from the drop in price of tomatoes.

EXAMPLE 1-8 Hedging Gold Production

An Indonesian gold producer invests in a mine expansion project on the expectation that gold prices will remain at or above 35,000 rupiah per gram when the new project starts producing ore.

1. What risks does the gold producer face with respect to the price of gold?
2. How might the gold producer hedge its gold price risk?

Solution to 1: The gold producer faces the risk that the price of gold could fall below 35,000 rupiah before it can sell its new production. If so, the investment in the expansion project will be less profitable than expected, and may even generate losses for the mine.

Solution to 2: The gold producer could hedge the gold price risk by selling gold forward, hopefully at a price near 35,000 rupiah. Even if the price of gold falls, the gold producer would get paid the contract price.

Forward contracts are very common, but two problems limit their usefulness for many market participants. The first problem is counterparty risk. **Counterparty risk** is the risk that the other party to a contract will fail to honor the terms of the contract. Concerns about counterparty risk ensure that generally only parties who have long-standing relationships with each other execute forward contracts. Trustworthiness is critical when prices are volatile because, after a large price change, one side or the other may prefer not to settle the contract.

The second problem is liquidity. Trading out of a forward contract is very difficult because it can only be done with the consent of the other party. The liquidity problem ensures that forward contracts tend to be executed only among participants for whom delivery is economically efficient and quite certain at the time of contracting so that both parties will want to arrange for delivery.

The counterparty risk problem and the liquidity problem often make it difficult for market participants to obtain the hedging benefits associated with forward contracting. Fortunately, futures contracts have been developed to mitigate these problems.

3.4.2. Futures Contracts

A **futures contract** is a standardized forward contract for which a clearinghouse guarantees the performance of all traders. The buyer of a futures contract is the side that will take physical delivery or its cash equivalent. The seller of a futures contract is the side that is liable for the delivery or its cash equivalent. A **clearinghouse** is an organization that ensures that no trader is harmed if another trader fails to honor the contract. In effect, the clearinghouse acts as the buyer for every seller and as the seller for every buyer. Buyers and sellers, therefore, can trade futures without worrying whether their counterparties are creditworthy. Because futures contracts are standardized, a buyer can eliminate his obligation to buy by selling his contract to anyone. A seller similarly can eliminate her obligation to deliver by buying a contact from anyone. In either case, the clearinghouse will release the trader from all future obligations if his or her long and short positions exactly offset each other.

To protect against defaults, futures clearinghouses require that all participants post with the clearinghouse an amount of money known as **initial margin** when they enter a contract. The clearinghouse then settles the margin accounts on a daily basis. All participants who have lost on their contracts that day will have the amount of their losses deducted from their margin by the clearinghouse. The clearinghouse similarly increases margins for all participants who gained on that day. Participants whose margins drop below the required **maintenance margin** must replenish their accounts. If a participant does not provide sufficient additional margin when required, the participant's broker will immediately trade to offset the participant's position. These **variation margin payments** ensure that the liabilities associated with futures contracts do not grow large.

EXAMPLE 1-9 Futures Margin

NYMEX's Light Sweet Crude Oil futures contract specifies the delivery of 1,000 barrels of West Texas Intermediate (WTI) Crude Oil when the contract finally settles. A broker requires that its clients post an initial overnight margin of $7,763 per contract and an overnight maintenance margin of $5,750 per contract. A client buys 10 contracts at $75 per barrel through this broker. On the next day, the contract settles for $72 per barrel. How much additional margin will the client have to provide to his broker?

Solution: The client lost three dollars per barrel (he is the side committed to take delivery or its cash equivalent at $75 per barrel). This results in a $3,000 loss on each of his 10 contracts, and a total loss of $30,000. His initial margin of $77,630 is reduced by $30,000 leaving $47,630 in his margin account. Because his account has dropped below the maintenance margin requirement of $57,500, the client will get a margin call. The client must provide an additional $30,000 = $77,630 – $47,630 to replenish his margin account; the account is replenished to the amount of the initial margin. The client will only receive another margin call if his account drops to below $57,500 again.

Futures contracts have vastly improved the efficiency of forward contracting markets. Traders can trade standardized futures contracts with anyone without worrying about counterparty risk, and they can close their positions by arranging offsetting trades. Hedgers for whom the terms of the standard contract are not ideal generally still use the futures markets because the contracts embody most of the price risk that concerns them. They simply offset (close out) their futures positions at the same time they enter spot contracts on which they make or take ultimate delivery.

EXAMPLE 1-10 Forward and Futures Contracts

What feature most distinguishes futures contracts from forward contracts?

Solution: A futures contract is a standardized forward contract for which a clearinghouse guarantees the performance of all buyers and sellers. The clearinghouse reduces the counterparty risk problem. The clearinghouse allows a buyer who has bought a contract from one person and sold the same contract to another person to net out the two obligations so that she is no longer liable for either side of the contract; the positions are closed. The ability to trade futures contracts provides liquidity in futures contracts compared with forward contracts.

3.4.3. Swap Contracts

A **swap contract** is an agreement to exchange payments of periodic cash flows that depend on future asset prices or interest rates. For example, in a typical **interest rate swap**, at periodic intervals, one party makes fixed cash payments to the counterparty in exchange for variable cash payments from the counterparty. The variable payments are based on a prespecified variable interest rate such as the London Interbank Offered Rate (LIBOR). This swap effectively exchanges fixed interest payments for variable interest payments. Because the variable rate is set in the future, the cash flows for this contract are uncertain when the parties enter the contract.

Investment managers often enter interest rate swaps when they own a fixed long-term income stream that they want to convert to a cash flow that varies with current short-term interest rates, or vice versa. The conversion may allow them to substantially reduce the total interest rate risk to which they are exposed. Hedgers often use swap contracts to manage risks.

In a **commodity swap**, one party typically makes fixed payments in exchange for payments that depend on future prices of a commodity such as oil. In a **currency swap**, the parties exchange payments denominated in different currencies. The payments may be fixed, or they may vary depending on future interest rates in the two countries. In an **equity swap**, the parties exchange fixed cash payments for payments that depend on the returns to a stock or a stock index.

EXAMPLE 1-11 Swap and Forward Contracts

What feature most distinguishes a swap contract from a cash-settled forward contract?

Solution: Both contracts provide for the exchange of cash payments in the future. A forward contract only has a single cash payment at the end that depends on an underlying price or index at the end. In contrast, a swap contract has several scheduled periodic payments, each of which depends on an underlying price or index at the time of the payment.

3.4.4. Option Contracts

An **option contract** allows the holder (the purchaser) of the option to buy or sell, depending on the type of option, an underlying instrument at a specified price at or before a specified date in the future. Those who do buy or sell are said to **exercise** their contracts. An option to buy is a **call option**, and an option to sell is a **put option**. The specified price is called the strike price (exercise price). If the holders can exercise their contracts only when they mature, they are **European-style contracts**. If they can exercise the contracts earlier, they are **American-style contracts**. Many exchanges list standardized option contracts on individual stocks, stock indices, futures contracts, currencies, swaps, and precious metals. Institutions also trade many customized option contracts with dealers in the over-the-counter derivative market.

Option holders generally will exercise call options if the strike price is below the market price of the underlying instrument, in which case, they will be able to buy at a lower price than the market price. Similarly, they will exercise put options if the strike price is above the underlying instrument price so that they sell at a higher price than the market price. Otherwise, option holders allow their options to expire as worthless.

The price that traders pay for an option is the option premium. Options can be quite expensive because, unlike forward and futures contracts, they do not impose any liability on the holder. The premium compensates the sellers of options—called option writers—for giving the call option holders the right to potentially buy below market prices and put option holders the right to potentially sell above market prices. Because the writers must trade if the holders exercise their options, option contracts may impose substantial liabilities on the writers.

EXAMPLE 1-12 Option and Forward Contracts

What feature most distinguishes option contracts from forward contracts?

Solution: The holder of an option contract has the right, but not the obligation, to buy (for a call option) or sell (for a put option) the underlying instrument at some time in the future. The writer of an option contract must trade the underlying instrument if the holder exercises the option.

In contrast, the two parties to a forward contract must trade the underlying instrument (or its equivalent value for a cash-settled contract) at some time in the future if either party wants to settle the contract.

3.4.5. Other Contracts

Insurance contracts pay their beneficiaries a cash benefit if some event occurs. Life, liability, and automobile insurance are examples of insurance contracts sold to retail clients. People generally use insurance contracts to compensate for losses that they will experience if bad things happen unexpectedly. Insurance contracts allow them to hedge risks that they face.

Credit default swaps (CDS) are insurance contracts that promise payment of principal in the event that a company defaults on its bonds. Bondholders use credit default swaps to convert risky bonds into more secure investments. Other creditors of the company may also buy them to hedge against the risk they will not be paid if the company goes bankrupt.

Well-informed traders who believe that a corporation will default on its bonds may buy credit default swaps written on the corporation's bonds if the swap prices are sufficiently low. If they are correct, the traders will profit if the payoff to the swap is more than the cost of buying and maintaining the swap position.

People sometimes also buy insurance contracts as investments, especially in jurisdictions where payouts from insurance contracts are not subject to as much taxation as are payouts to other investment vehicles. They may buy these contracts directly from insurance companies, or they may buy already issued contracts from their owners. For example, the life settlements market trades life insurance contracts that people sell to investors when they need cash.

3.5. Commodities

Commodities include precious metals, energy products, industrial metals, agricultural products, and carbon credits. Spot commodity markets trade commodities for immediate delivery whereas the forward and futures markets trade commodities for future delivery. Managers seeking positions in commodities can acquire them directly by trading in the spot markets or indirectly by trading forward and futures contracts.

The producers and processors of industrial metals and agricultural products are the primary users of the spot commodity markets because they generally are best able to take and make delivery and to store physical products. They undertake these activities in the normal course of operating their businesses. Their ability to handle physical products and the information that they gather while operating businesses also gives them substantial advantages as information-motivated traders in these markets. Many producers employ financial analysts to help them analyze commodity market conditions so that they can best manage their inventories to hedge their operational risks and to speculate on future price changes.

Commodities also interest information-motivated traders and investment managers because they can use them as hedges against risks that they hold in their portfolios or as vehicles to speculate on future price changes. Most such traders take positions in the futures markets because they usually do not have facilities to handle most physical products nor can they easily obtain them. They also cannot easily cope with the normal variation in qualities that characterizes many commodities. Information-motivated traders and investment managers also prefer to trade in futures markets because most futures markets are more liquid than their associated spot markets and forward markets. The liquidity allows them to easily close their positions before delivery so that they can avoid handling physical products.

Some information-motivated traders and investment managers, however, trade in the spot commodity markets, especially when they can easily contract for low-cost storage. Commodities for which delivery and storage costs are lowest are nonperishable products for which the ratio of value to weight is high and variation in quality is low. These generally include precious metals, industrial diamonds, such high-value industrial metals as copper, aluminum, and mercury, and carbon credits.

3.6. Real Assets

Real assets include such tangible properties as real estate, airplanes, machinery, or lumber stands. These assets normally are held by operating companies, such as real estate developers, airplane leasing companies, manufacturers, or loggers. Many institutional investment managers, however, have been adding real assets to their portfolios as direct investments (involving direct ownership of the real assets) and indirect investments (involving indirect ownership, for example, purchase of securities of companies that invest in real assets or real estate investment trusts). Investments in real assets are attractive to them because of the income and tax benefits that they often generate, and because changes in their values may have a low correlation with other investments that the managers hold.

Direct investments in real assets generally require substantial management to ensure that the assets are maintained and used efficiently. Investment managers investing in such assets must either hire personnel to manage them or hire outside management companies. Either way, management of real assets is quite costly.

Real assets are unique properties in the sense that no two assets are alike. An example of a unique property is a real estate parcel. No two parcels are the same because, if nothing else, they are located in different places. Real assets generally differ in their conditions, remaining useful lives, locations, and suitability for various purposes. These differences are very important to the people who use them, so the market for a given real asset may be very limited. Thus, real assets tend to trade in very illiquid markets.

The heterogeneity of real assets, their illiquidity, and the substantial costs of managing them are all factors that complicate the valuation of real assets and generally make them unsuitable for most investment portfolios. These same problems, however, often cause real assets to be misvalued in the market, so astute information-motivated traders may occasionally identify significantly undervalued assets. The benefits from purchasing such assets, however, are often offset by the substantial costs of searching for them and by the substantial costs of managing them.

Many financial intermediaries create entities, such as real estate investment trusts (REITs) and master limited partnerships (MLPs), to securitize real assets and to facilitate indirect investment in real assets. The financial intermediaries manage the assets and pass through the net benefits after management costs to the investors who hold these securities. Because these securities are much more homogenous and divisible than the real assets that they represent, they tend to trade in much more liquid markets. Thus, they are much more suitable as investments than the real assets themselves.

Of course, investors seeking exposure to real assets can also buy shares in corporations that hold and operate real assets. Although almost all corporations hold and operate real assets, many specialize in assets that particularly interest investors seeking exposure to specific real asset classes. For example, investors interested in owning aircraft can buy an aircraft leasing company such as Waha Capital (Abu Dhabi Securities Exchange) and Aircastle Limited (NYSE).

EXAMPLE 1-13 Assets and Contracts

Consider the following assets and contracts:

Bank deposits	Hedge funds
Certificates of deposit	Master limited partnership interests

Common stocks	Mortgages
Corporate bonds	Mutual funds
Currencies	Stock option contracts
Exchange-traded funds	Preferred stocks
Lumber forward contracts	Real estate parcels
Crude oil futures contracts	Interest rate swaps
Gold	Treasury notes

1. Which of these represent ownership in corporations?
2. Which of these are debt instruments?
3. Which of these are created by traders rather than by issuers?
4. Which of these are pooled investment vehicles?
5. Which of these are real assets?
6. Which of these would a home builder most likely use to hedge construction costs?
7. Which of these would a corporation trade when moving cash balances among various countries?

Solutions:
1. Common and preferred stocks represent ownership in corporations.
2. Bank deposits, certificates of deposit, corporate bonds, mortgages, and Treasury notes are all debt instruments. They respectively represent loans made to banks, corporations, mortgagees (typically real estate owners), and the Treasury.
3. Lumber forward contracts, crude oil futures contracts, stock option contracts, and interest rate swaps are created when the seller sells them to a buyer.
4. Exchange-traded funds, hedge funds, and mutual funds are pooled investment vehicles. They represent shared ownership in a portfolio of other assets.
5. Real estate parcels are real assets.
6. A builder would buy lumber forward contracts to lock in the price of lumber needed to build homes.
7. Corporations often trade currencies when moving cash from one country to another.

4. FINANCIAL INTERMEDIARIES

Financial intermediaries help entities achieve their financial goals. These intermediaries include commercial, mortgage, and investment banks; credit unions, credit card companies, and various other finance corporations; brokers and exchanges; dealers and arbitrageurs; clearinghouses and depositories; mutual funds and hedge funds; and insurance companies. The services and products that financial intermediaries provide allow their clients to solve the financial problems that they face more efficiently than they could do so by themselves. Financial intermediaries are essential to well-functioning financial systems.

Financial intermediaries are called intermediaries because the services and products that they provide help connect buyers to sellers in various ways. Whether the connections are easy to identify or involve complex financial structures, financial intermediaries stand between one or more buyers and one or more sellers and help them transfer capital and risk between them. Financial intermediaries' activities allow buyers and sellers to benefit from trading, often without any knowledge of the other.

This section introduces the main financial intermediaries that provide services and products in well-developed financial markets. The discussion starts with those intermediaries whose services most obviously connect buyers to sellers and then proceeds to those intermediaries whose services create more subtle connections. Because many financial intermediaries provide many different types of services, some are mentioned more than once. The section concludes with a general characterization of the various ways in which financial intermediaries add value to the financial system.

4.1. Brokers, Exchanges, and Alternative Trading Systems

Brokers are agents who fill orders for their clients. They do not trade with their clients. Instead, they search for traders who are willing to take the other side of their clients' orders. Individual brokers may work for large brokerage firms, the brokerage arm of banks, or at exchanges. Some brokers match clients to clients personally. Others use specialized computer systems to identify potential trades and help their clients fill their orders. Brokers help their clients trade by reducing the costs of finding counterparties for their trades.

Block brokers provide brokerage service to large traders. Large orders are hard to fill because finding a counterparty willing to do a large trade is often quite difficult. A large buy order generally will trade at a premium to the current market price, and a large sell order generally will trade at a discount to the current market price. These price concessions encourage other traders to trade with the large traders. They also make large traders reluctant, however, to expose their orders to the public before their trades are arranged because they do not want to move the market. Block brokers, therefore, carefully manage the exposure of the orders entrusted to them, which makes filling them difficult.

Investment banks provide advice to their mostly corporate clients and help them arrange transactions such as initial and seasoned securities offerings. Their corporate finance divisions help corporations finance their business by issuing securities, such as common and preferred shares, notes, and bonds. Another function of corporate finance divisions is to help companies identify and acquire other companies (i.e., in mergers and acquisitions).

Exchanges provide places where traders can meet to arrange their trades. Historically, brokers and dealers met on an exchange floor to negotiate trades. Increasingly, exchanges arrange trades for traders based on orders that brokers and dealers submit to them. Such exchanges essentially act as brokers. The distinction between exchanges and brokers has become quite blurred. Exchanges and brokers that use electronic order matching systems to arrange trades among their clients are functionally indistinguishable in this respect. Examples of exchanges include the NYSE-Euronext, Eurex, Deutsche Börse, the Chicago Mercantile Exchange, the Tokyo Stock Exchange, and the Singapore Exchange.

Exchanges are easily distinguished from brokers by their regulatory operations. Most exchanges regulate their members' behavior when trading on the exchange, and sometimes away from the exchange.

Many securities exchanges regulate the issuers that list their securities on the exchange. These regulations generally require timely financial disclosure. Financial analysts use this information to value the securities traded at the exchange. Without such disclosure, valuing securities could be very difficult and market prices might not reflect the fundamental values of the securities. In such situations, well-informed participants may profit from less-informed participants. To avoid such losses, the less-informed participants may withdraw from the market, which can greatly increase corporate costs of capital.

Some exchanges also prohibit issuers from creating capital structures that would concentrate voting rights in the hands of a few owners who do not own a commensurate share of the equity. These regulations attempt to ensure that corporations are run for the benefit of all shareholders and not to promote the interests of controlling shareholders who do not have significant economic stakes in the company.

Exchanges derive their regulatory authority from their national or regional governments, or through the voluntary agreements of their members and issuers to subject themselves to the exchange regulations. In most countries, government regulators oversee the exchange rules and the regulatory operations. Most countries also impose financial disclosure standards on public issuers. Examples of government regulatory bodies include the Japanese Financial Services Agency, the Hong Kong Securities and Futures Commission, the British Financial Services Authority, the German Bundesanstalt für Finanzdienstleistungsaufsicht, the U.S. Securities and Exchange Commission, the Ontario Securities Commission, and the Mexican Comisión Nacional Bancaria y de Valores.

Alternative trading systems (ATSs), also known as electronic communications networks (ECNs) or multilateral trading facilities (MTFs) are trading venues that function like exchanges but that do not exercise regulatory authority over their subscribers except with respect to the conduct of their trading in their trading systems. Some ATSs operate electronic trading systems that are otherwise indistinguishable from the trading systems operated by exchanges. Others operate innovative trading systems that suggest trades to their customers based on information that their customers share with them or that they obtain through research into their customers' preferences. Many ATSs are known as **dark pools** because they do not display the orders that their clients send to them. Large investment managers especially like these systems because market prices often move to their disadvantage when other traders know about their large orders. ATSs may be owned and operated by broker–dealers, exchanges, banks, or by companies organized solely for this purpose, many of which may be owned by a consortia of brokers–dealers and banks. Examples of ATSs include PureTrading (Canada), the Order Machine (Netherlands), Chi-X Europe, BATS (U.S.), POSIT (U.S.), Liquidnet (U.S.), Baxter-FX (Ireland), and Turquoise (Europe). Many of these ATSs provide services in many markets besides the ones in which they are domiciled.

4.2. Dealers

Dealers fill their clients' orders by trading with them. When their clients want to sell securities or contracts, dealers buy the instruments for their own accounts. If their clients want to buy securities, dealers sell securities that they own or have borrowed. After completing a transaction, dealers hope to reverse the transaction by trading with another client on the other side of the market. When they are successful, they effectively connect a buyer who arrived at one point in time with a seller who arrived at another point in time.

The service that dealers provide is liquidity. **Liquidity** is the ability to buy or sell with low transactions costs when you want to trade. By allowing their clients to trade when they want to trade, dealers provide liquidity to them. In over-the-counter markets, dealers offer liquidity when their clients ask them to trade with them. In exchange markets, dealers offer liquidity to anyone who is willing to trade at the prices that the dealers offer at the exchange. Dealers profit when they can buy at prices that on average are lower than the prices at which they sell.

Dealers may organize their operations within proprietary trading houses, investment banks, and hedge funds, or as sole proprietorships. Some dealers are traditional dealers in the sense that individuals make trading decisions. Others use computerized trading to make all trading decisions. Examples of companies with large dealing operations include Deutsche Securities (Germany), RBC Capital Markets (Canada), Nomura (Japan), Timber Hill (U.S.), Knight Securities (U.S.), Goldman Sachs (U.S.), and IG Group plc (U.K.). Almost all investment banks have large dealing operations.

Most dealers also broker orders, and many brokers deal to their customers. Accordingly, practitioners often use the term **broker–dealer** to refer to dealers and brokers. Broker–dealers have a conflict of interest with respect to how they fill their customers' orders. When acting as a broker, they must seek the best price for their customers' orders. When acting as dealers, however, they profit most when they sell to their customers at high prices or buy from their customers at low prices. The problem is most serious when the customer allows the broker–dealer to decide whether to trade the order with another trader or to fill it as a dealer. Consequently, when trading with a broker–dealer, some customers specify how they want their orders filled. They may also trade only with pure agency brokers who do not also deal.

Primary dealers are dealers with whom central banks trade when conducting monetary policy. They buy bills, notes, and bonds when the central banks sell them to decrease the money supply. The dealers then sell these instruments to their clients. Similarly, when the central banks want to increase the money supply, the primary dealers buy these instruments from their clients and sell them to the central banks.

EXAMPLE 1-14 Brokers and Dealers

What characteristic *most likely* distinguishes brokers from dealers?

Solution: Brokers are agents who arrange trades on behalf of their clients. They do not trade with their clients. In contrast, dealers are proprietary traders who trade with their clients.

4.3. Securitizers

Banks and investment companies create new financial products when they buy and repackage securities or other assets. For example, mortgage banks commonly originate hundreds or thousands of residential mortgages by lending money to homeowners. They then place the mortgages in a pool and sell shares of the pool to investors as mortgage pass-through securities, which are also known as mortgage-backed securities. All payments of principal and interest are passed through to the investors each month, after deducting the costs of servicing the mortgages. Investors who purchase these pass-through securities obtain securities that in aggregate have the same net cash flows and associated risks as the pool of mortgages.

The process of buying assets, placing them in a pool, and then selling securities that represent ownership of the pool is called securitization.

Mortgage-backed securities have the advantage that default losses and early repayments are much more predictable for a diversified portfolio of mortgages than they are for individual mortgages. They are also attractive to investors who cannot efficiently service mortgages but wish to invest in mortgages. By securitizing mortgage pools, the mortgage banks allow investors who are not large enough to buy hundreds of mortgages to obtain the benefits of diversification and economies of scale in loan servicing.

Securitization greatly improves liquidity in the mortgage markets because it allows investors in the pass-through securities to buy mortgages indirectly that they otherwise would not buy. Because the financial risks associated with mortgage-backed securities (debt securities with specified claims on the cash flows of a portfolio of mortgages) are much more predictable than those of individual mortgages, mortgage-backed securities are easier to price and thus easier to sell when investors need to raise cash. These characteristics make the market for mortgage-backed securities much more liquid than the market for individual mortgages. Because investors value liquidity—the ability to sell when they want to—they will pay more for securitized mortgages than for individual mortgages. The homeowners benefit because higher mortgage prices imply lower interest rates.

The mortgage bank is a financial intermediary because it connects investors who want to buy mortgages to homeowners who want to borrow money. The homeowners sell mortgages to the bank when the bank lends them money.

Some mortgage banks form mortgage pools from mortgages that they buy from other banks that originate the loans. These mortgage banks are also financial intermediaries because they connect sellers of mortgages to buyers of mortgage-backed securities. Although the sellers of the mortgages are the originating lenders and not the borrowers, the benefits of creating liquid mortgage-backed securities ultimately flow back to the borrowers.

The creation of the pass-through securities generally takes place on the accounts of the mortgage bank. The bank buys mortgages and sells pass-through securities whose values depend on the mortgage pool. The mortgages appear on the bank's accounts as assets and the mortgage-backed securities appear as liabilities.

In many securitizations, the financial intermediary avoids placing the assets and liabilities on its balance sheet by setting up a special corporation or trust that buys the assets and issues the securities. Those corporations and trusts are called **special purpose vehicles** (SPVs) or alternatively **special purpose entities** (SPEs). Conducting a securitization through a special purpose vehicle is advantageous to investors because their interests in the asset pool are better protected in an SPV than they would be on the balance sheet of the financial intermediary if the financial intermediary were to go bankrupt.

Financial intermediaries securitize many assets. Besides mortgages, banks securitize car loans, credit card receivables, bank loans, and airplane leases, to name just a few assets. As a class, these securities are called asset-backed securities.

When financial intermediaries securitize assets, they often create several classes of securities, called tranches, that have different rights to the cash flows from the asset pool. The tranches are structured so that some produce more predictable cash flows than do others. The senior tranches have first rights to the cash flow from the asset pool. Because the overall risk of a given asset pool cannot be changed, the more junior tranches bear a disproportionate share of the risk of the pool. Practitioners often call the most junior tranche toxic waste because it is so risky. The complexity associated with slicing asset pools into tranches can make the resulting securities difficult to value. Mistakes in valuing these securities contributed to the financial crisis that started in 2007.

Investment companies also create pass-through securities based on investment pools. For example, an exchange-traded fund is an asset-backed security that represents ownership in the securities and contracts held by the fund. The shareholders benefit from the securitization because they can buy or sell an entire portfolio in a single transaction. Because the transaction cost savings are quite substantial, exchange-traded funds often trade in very liquid markets. The investment companies (and sometimes the arbitrageurs) that create exchange-traded funds are financial intermediaries because they connect the buyers of the funds to the sellers of the assets that make up the fund portfolios.

More generally, the creators of all pooled investment vehicles are financial intermediaries that transform portfolios of securities and contracts into securities that represent undivided ownership of the portfolios. The investors in these funds thus indirectly invest in the securities held by the fund. They benefit from the expertise of the investment manager and from obtaining a portfolio that may be more diversified than one they might otherwise be able to hold.

4.4. Depository Institutions and Other Financial Corporations

Depository institutions include commercial banks, savings and loan banks, credit unions, and similar institutions that raise funds from depositors and other investors and lend it to borrowers. The banks give their depositors interest and transaction services, such as check writing and check cashing, in exchange for using their money. They may also raise funds by selling bonds or equity in the bank.

These banks are financial intermediaries because they transfer funds from their depositors and investors to their borrowers. The depositors and investors benefit because they obtain a return (in interest, transaction services, dividends, or capital appreciation) on their funds without having to contract with the borrowers and manage their loans. The borrowers benefit because they obtain the funds that they need without having to search for investors who will trust them to repay their loans.

Many other financial corporations provide credit services. For example, acceptance corporations, discount corporations, payday advance corporations, and factors provide credit to borrowers by lending them money secured by such assets as consumer loans, machinery, future paychecks, or accounts receivables. They finance these loans by selling commercial paper, bonds, and shares to investors. These corporations are intermediaries because they connect investors to borrowers. The investors obtain investments secured by a diversified portfolio of loans while the borrowers obtain funds without having to search for investors.

Brokers also act as financial intermediaries when they lend funds to clients who want to buy securities on margin. They generally obtain the funds from other clients who deposit them in their accounts. Brokers who provide these services to hedge funds and other similar institutions are called prime brokers.

Banks, financial corporations, and brokers can only raise money from depositors and other lenders because their equity owners retain residual interests in the performance of the loans that they make. If the borrowers default, the depositors and other lenders have priority claims over the equity owners. If insufficient money is collected from the borrowers, shareholders' equity is used to pay their depositors and other lenders. The risk of losing capital focuses the equity owners' and management's attention so that credit is not offered foolishly.

Because the ability of these companies to cover their credit losses is limited by the capital that their owners invest in them, the depositors and other investors who lend them money pay close attention to how much money the owners have at risk. For example, if a finance corporation is poorly capitalized, its shareholders will lose little if its clients default on the loans that the finance corporation makes to them. In that case, the finance corporation will have little incentive to lend only to creditworthy borrowers and to effectively manage collection on those loans once they have been made. Worse, it may even choose to lend to borrowers with poor credit because the interest rates that they can charge such borrowers are higher. Until those loans default, the higher income will make the corporation appear to be more profitable than it actually is. Depositors and other investors are aware of these problems and generally pay close attention to them. Accordingly, poorly capitalized financial institutions cannot easily borrow money to finance their operations at favorable rates.

Depository banks and financial corporations are similar to securitized asset pools that issue pass-through securities. Their depositors and investors own securities that ultimately are backed by an asset pool consisting of their loan portfolios. The depositors generally hold the most senior tranche, followed by the other creditors. The shareholders hold the most junior tranche. In the event of bankruptcy, they are paid only if everyone else is paid.

EXAMPLE 1-15 Commercial Banks

What services do commercial banks provide that make them financial intermediaries?

Solution: Commercial banks collect deposits from investors and lend them to borrowers. They are intermediaries because they connect lenders to borrowers. Commercial banks also provide transaction services that make it easier for the banks' depository customers to pay bills and collect funds from their own customers.

4.5. Insurance Companies

Insurance companies help people and companies offset risks that concern them. They do this by creating insurance contracts (policies) that provide a payment in the event that some loss occurs. The insured buy these contracts to hedge against potential losses. Common examples of insurance contracts include auto, fire, life, liability, medical, theft, and disaster insurance contracts.

Credit default swaps are also insurance contracts, but historically they have not been subject to the same reserve requirements that most governments apply to more traditional insurance contracts. They may be sold by insurance companies or by other financial entities, such as investment banks or hedge funds.

Insurance contracts transfer risk from those who buy the contracts to those who sell them. Although insurance companies occasionally broker trades between the insured and the insurer, they more commonly provide the insurance themselves. In that case, the insurance company's owners and creditors become the indirect insurers of the risks that the insurance company assumes. Insurance companies also often transfer risks that they do not wish to bear by buying reinsurance policies from reinsurers.

Insurers are financial intermediaries because they connect the buyers of their insurance contracts with investors, creditors, and reinsurers who are willing to bear the insured risks. The buyers benefit because they can easily obtain the risk transfers that they seek without searching for entities that would be willing to assume those risks.

The owners, creditors, and reinsurers of the insurance company benefit because the company allows them to sell their tolerance for risk easily without having to manage the insurance contracts. Instead, the company manages the relationships with the insured—primarily collections and claims—and hopefully controls the various problems—fraud, moral hazard, and adverse selection—that often plague insurance markets. Fraud occurs when people deliberately cause or falsely report losses to collect on insurance. Moral hazard occurs when people are less careful about avoiding insured losses than they would be if they were not insured so that losses occur more often than they would otherwise. Adverse selection occurs when only those who are most at risk buy insurance so that insured losses tend to be greater than average.

Everyone benefits because insurance companies hold large diversified portfolios of policies. Loss rates for well-diversified portfolios of insurance contracts are much more predictable than for single contracts. For such contracts as auto insurance in which losses are almost uncorrelated across policies, diversification ensures that the financial performance of a large portfolio of contracts will be quite predictable and so holding the portfolio will not be very risky. The insured benefit because they do not have to pay the insurers much to compensate them for bearing risk (the expected loss is quite predictable so the risk is relatively low). Instead, their insurance premiums primarily reflect the expected loss rate in the portfolio plus the costs of running and financing the company.

4.6. Arbitrageurs

Arbitrageurs trade when they can identify opportunities to buy and sell identical or essentially similar instruments at different prices in different markets. They profit when they can buy in one market for less than they sell in another market. Arbitrageurs are financial intermediaries because they connect buyers in one market to sellers in another market.

The purest form of arbitrage involves buying and selling the same instrument in two different markets. Arbitrageurs who do such trades sell to buyers in one market and buy from sellers in the other market. They provide liquidity to the markets because they make it easier for buyers and sellers to trade when and where they want to trade.

Because dealers and arbitrageurs both provide liquidity to other traders, they compete with each other. The dealers connect buyers and sellers who arrive in the same market at different times whereas the arbitrageurs connect buyers and sellers who arrive at the same time in different markets. In practice, traders who profit from offering liquidity rarely are purely dealers or purely arbitrageurs. Instead, most traders attempt to identify and exploit every opportunity they can to manage their inventories profitably.

If information about prices is readily available to market participants, pure arbitrages involving the same instrument will be quite rare. Traders who are well informed about market conditions usually route their orders to the market offering the best price so that arbitrageurs will have few opportunities to match traders across markets when they want to trade the exact same instrument.

Arbitrageurs often trade securities or contracts whose values depend on the same underlying factors. For example, dealers in equity option contracts often sell call options in the contract market and buy the underlying shares in the stock market. Because the values of the call options and of the underlying shares are closely correlated (the value of the call increases with the value of the shares), the long stock position hedges the risk in the short call position so that the dealer's net position is not too risky.

Similar to the pure arbitrage that involves the same instrument in different markets, these arbitrage trades connect buyers in one market to sellers in another market. In this case, however, the buyers and sellers are interested in different instruments whose values are closely related. In the example, the buyer is interested in buying a call options contract, the value of which is a nonlinear function of the value of the underlying stock; the seller is interested in selling the underlying stock.

Options dealers buy stock and sell calls when calls are overpriced relative to the underlying stocks. They use complicated financial models to value options in relation to underlying stock values, and they use financial engineering techniques to control the risk of their portfolios. Successful arbitrageurs must know valuation relations well and they must manage the risk in their portfolios well to trade profitably. They profit by buying the relatively undervalued instrument and selling the relatively overvalued instrument.

Buying a risk in one form and selling it another form involves a process called replication. Arbitrageurs use various trading strategies to replicate the returns to securities and contracts. If they can substantially replicate those returns, they can use the replication trading strategy to offset the risk of buying or selling the actual securities and contracts. The combined effect of their trading is to transform risk from one form to another. This process allows them to create or eliminate contracts in response to the excess demand for, and supply of, contracts.

For example, when traders want to buy more call contracts than are presently available, they push the call contract prices up so that calls become overvalued relative to the underlying stock. The arbitrageurs replicate calls by using a particular financial engineering strategy to buy the underlying stock, and then create the desired call option contracts by selling them short. In contrast, if more calls have been created than traders want to hold, call prices will fall so that calls become undervalued relative to the underlying stock. The arbitrageurs will trade stocks and contracts to absorb the excess contracts. Arbitrageurs who use these strategies are financial intermediaries because they connect buyers and sellers who want to trade the same underlying risks but in different forms.

EXAMPLE 1-16 Dealers and Arbitrageurs

With respect to providing liquidity to market participants, what characteristics most clearly distinguish dealers from arbitrageurs?

Solution: Dealers provide liquidity to buyers and sellers who arrive at the same market at different times. They move liquidity through time. Arbitrageurs provide liquidity to buyers and sellers who arrive at different markets at the same time. They move liquidity across markets.

4.7. Settlement and Custodial Services

In addition to connecting buyers to sellers through a variety of direct and indirect means, financial intermediaries also help their customers settle their trades and ensure that the resulting positions are not stolen or pledged more than once as collateral.

Clearinghouses arrange for final settlement of trades. In futures markets, they guarantee contract performance. In other markets, they may act only as escrow agents, transferring money from the buyer to the seller while transferring securities from the seller to the buyer.

The members of a clearinghouse are the only traders for whom the clearinghouse will settle trades. To ensure that their members settle the trades that they present to the clearinghouse, clearinghouses require that their members have adequate capital and post-performance bonds (margins). Clearinghouses also limit the aggregate net (buy minus sell) quantities that their members can settle.

Brokers and dealers who are not members of the clearinghouse must arrange to have a clearinghouse member settle their trades. To ensure that the nonmember brokers and dealers can settle their trades, clearinghouse members require that their customers (the nonmember brokers and dealers) have adequate capital and postmargins. They also limit the aggregate net quantities that their customers can settle and they monitor their customers' trading to ensure that they do not arrange trades that they cannot settle.

Brokers and dealers similarly monitor the trades made by their retail and institutional customers, and regulate their customers to ensure that they do not arrange trades that they cannot settle.

This hierarchical system of responsibility generally ensures that traders settle their trades. The brokers and dealers guarantee settlement of the trades they arrange for their retail and institutional customers. The clearinghouse members guarantee settlement of the trades that their customers present to them, and clearinghouses guarantee settlement of all trades presented to them by their members. If a clearinghouse member fails to settle a trade, the clearinghouse settles the trade using its own capital or capital drafted from the other members.

Reliable settlement of all trades is extremely important to a well-functioning financial system because it allows strangers to confidently contract with each other without worrying too much about counterparty risk, the risk that their counterparties will not settle their trades. A secure clearinghouse system thus greatly increases liquidity because it greatly increases the number of counterparties with whom a trader can safely arrange a trade.

In many national markets, clearinghouses clear all securities trades so that traders can trade securities through any exchange, broker, alternative trading system, or dealer. These clearinghouse systems promote competition among these exchange service providers.

In contrast, most futures exchanges have their own clearinghouses. These clearinghouses usually will not accept trades arranged away from their exchanges so that a competing exchange cannot trade another exchange's contracts. Competing exchanges may create similar contracts, but moving traders from one established market to a new market is extraordinarily difficult because traders prefer to trade where other traders trade.

Depositories or custodians hold securities on behalf of their clients. These services, which are often offered by banks, help prevent the loss of securities through fraud, oversight, or natural disaster. Broker–dealers also often hold securities on behalf of their customers so that the customers do not have to hold the securities in certificate form. To avoid problems with lost certificates, securities increasingly are issued only in electronic form.

EXAMPLE 1-17 Financial Intermediaries

As a relatively new member of the business community, you decide it would be advantageous to join the local lunch club to network with businesspeople. Upon learning that you are a financial analyst, club members soon enlist you to give a lunch speech. During the question and answer session afterward, a member of the audience asks, "I keep reading in the newspaper about the need to regulate 'financial intermediaries,' but really don't understand exactly what they are. Can you tell me?" How do you answer?

Solution: Financial intermediaries are companies that help their clients achieve their financial goals. They are called intermediaries because, in some way or another, they stand between two or more people who would like to trade with each other, but for various reasons find it difficult to do so directly. The intermediary arranges the trade for them, or more often, trades with both sides.

For example, a commercial bank is an intermediary that connects investors with money to borrowers who need money. The investors buy certificates of deposit from the bank, buy bonds or stock issued by the bank, or simply are depositors in the bank. The borrowers borrow this money from the bank when they arrange loans. Without the bank's intermediation, the investors would have to find trustworthy borrowers themselves, which would be difficult, and the borrowers would have to find trusting lenders, which would also be difficult.

Similarly, an insurance company is an intermediary because it connects customers who want to insure risks with investors who are willing to bear those risks. The investors own shares or bonds issued by the insurance company, or they have sold reinsurance contracts to the insurance company. The insured benefit because they can more easily buy a policy from an insurance company than they can find counterparties who would be willing to bear their risks. The investors benefit because the insurance company creates a diversified portfolio of risks by selling insurance to thousands or millions of customers. Diversification ensures that the net risk borne by the insurance company and its investors will be predictable and thus financially manageable.

In both cases, the financial intermediary also manages the relationships with its customers and investors so that neither side has to worry about the creditworthiness or trustworthiness of its counterparties. For example, the bank manages credit quality and collections on its loans and the insurance company manages risk exposure and collections on its policies. These services benefit both sides by reducing the costs of connecting investors to borrowers or of insured to insurers.

These are only two examples of financial intermediation. Many others involve firms engaged in brokerage, dealing, arbitrage, securitization, investment management, and the clearing and settlement of trades. In all cases, the financial intermediary stands between a buyer and a seller, offering them services that allow them to better achieve their financial goals in a cost effective and efficient manner.

4.8. Summary

By facilitating transactions among buyers and sellers, financial intermediaries provide services essential to a well-functioning financial system. They facilitate transactions in the following ways:

1. Brokers, exchanges, and various alternative trading systems match buyers and sellers interested in trading the same instrument at the same place and time. These financial intermediaries specialize in discovering and organizing information about who wants to trade.
2. Dealers and arbitrageurs connect buyers to sellers interested in trading the same instrument but who are not present at the same place and time. Dealers connect buyers to sellers who are present at the same place but at different times whereas arbitrageurs connect buyers to sellers who are present at the same time but in different places. These financial intermediaries trade for their own accounts when providing these services. Dealers buy or sell with one client and hope to do the offsetting transaction later with another client. Arbitrageurs buy from a seller in one market while simultaneously selling to a buyer in another market.
3. Many financial intermediaries create new instruments that depend on the cash flows and associated financial risks of other instruments. The intermediaries provide these services when they securitize assets, manage investment funds, operate banks and other finance corporations that offer investments to investors and loans to borrowers, and operate insurance companies that pool risks. The instruments that they create generally are more attractive to their clients than the instruments on which they are based. The new instruments also may be differentiated to appeal to diverse clienteles. Their efforts connect buyers of one or more instruments to sellers of other instruments, all of which in aggregate provide the same cash flows and risk exposures. Financial intermediaries thus effectively arrange trades among traders who otherwise would not trade with each other.
4. Arbitrageurs who conduct arbitrage among securities and contracts whose values depend on common factors convert risk from one form to another. Their trading connects buyers and sellers who want to trade similar risks expressed in different forms.
5. Banks, clearinghouses, and depositories provide services that ensure traders settle their trades and that the resulting positions are not stolen or pledged more than once as collateral.

5. POSITIONS

People generally solve their financial and risk management problems by taking positions in various assets or contracts. A **position** in an asset is the quantity of the instrument that an entity owns or owes. A portfolio consists of a set of positions. (See Exhibit 1-1.)

People have **long positions** when they own assets or contracts. Examples of long positions include ownership of stocks, bonds, currencies, contracts, commodities, or real assets. Long positions benefit from an appreciation in the prices of the assets or contracts owned.

People have **short positions** when they have sold assets that they do not own, or when they write and sell contracts. Short positions benefit from a decrease in the prices of the assets or contracts sold. Short sellers profit by selling at high prices and repurchasing at lower prices. Information-motivated traders sell assets and contract short positions when they believe that prices will fall.

Hedgers also often sell instruments short. They short securities and contracts when the financial risks inherent in the instruments are positively correlated with the risks to which they are exposed. For example, to hedge the risk associated with holding copper inventories, a wire manufacturer would sell short copper futures. If the price of copper falls, the manufacturer will lose on his copper inventories but gain on his short futures position. (If the risk in an instrument is inversely correlated with a risk to which hedgers are exposed, the hedgers will hedge with long positions.)

Contracts have long sides and short sides. The long side of a forward or futures contract is the side that will take physical delivery or its cash equivalent. The short side of such contracts is the side that is liable for the delivery. The long side of a futures contract increases in value when the value of the underlying asset increases in value.

The identification of the two sides can be confusing for option contracts. The long side of an option contract is the side that holds the right to exercise the option. The short side is the side that must satisfy the obligation. Practitioners say that the long side *holds* the option and the short side *writes* the option, so the long side is the holder and the short side is the writer. The put contracts are the source of the potential confusion. The put contract holder has the right to sell the underlying to the writer. The holder will benefit if the price of the underlying falls, in which case the price of the put contract will rise. The holder is long the put contract and has an indirect short position in the underlying instrument. Analysts call the indirect short position short exposure to the underlying. The put contract holders have long exposure to their option contract and short exposure to the underlying instrument.

EXHIBIT 1-1 Option Positions and Their Associated Underlying Risk Exposures

Type of Option	Option Position	Exposure to Underlying Risk
Call	Long	Long
Call	Short	Short
Put	Long	Short
Put	Short	Long

The identification of the long side in a swap contract is often arbitrary because swap contracts call for the exchange of contractually determined cash flows rather than for the purchase (or the cash equivalent) of some underlying instrument. In general, the side that benefits from an increase in the quoted price is the long side.

The identification of the long side in currency contracts also may be confusing. In this case, the confusion stems from symmetry in the contracts. The buyer of one currency is the seller of the other currency, and vice versa for the seller. Thus, a long forward position in one currency is a short forward position in the other currency. When practitioners describe a position, they generally will say, "I'm long the dollar against the yen," which means they have bought dollars and sold yen.

5.1. Short Positions

Short sellers create short positions in contracts by selling contracts that they do not own. In a sense, they become the issuers of the contract when they create the liabilities associated with their contracts. This analogy will also help you better understand risk when you study corporate finance: Corporations create short positions in their bonds when they issue bonds in exchange for cash. Although bonds are generally considered to be securities, they are also contracts between the issuer and the bondholder.

Short sellers create short positions in securities by borrowing securities from security lenders who are long holders. The short sellers then sell the borrowed securities to other traders. Short sellers close their positions by repurchasing the securities and returning them to the security lenders. If the securities drop in value, the short sellers profit because they repurchase the securities at lower prices than the prices at which they sold the securities. If the securities rise in value, they will lose. Short sellers who buy to close their positions are said to cover their positions.

The potential gains in a long position generally are unbounded. For example, the stock prices of such highly successful companies as Yahoo! have increased more than 50-fold since they were first publicly traded. The potential losses on long positions, however, are limited to no more than 100 percent—a complete loss—for long positions without any associated liabilities.

In contrast, the potential gains on a short position are limited to no more than 100 percent whereas the potential losses are unbounded. The unbounded potential losses on short positions make short positions very risky in volatile instruments. For example, if you shorted 100 shares of Yahoo! in July 1996 at $20 and you kept your position open for four years, you would have lost $148,000 on your $2,000 initial short position. During this period, Yahoo! rose 75-fold to $1,500 on a split-adjusted equivalent basis.

Although security lenders generally believe that they are long the securities that they lend, in fact, they do not actually own the securities during the periods of their loans. Instead, they own promises made by the short sellers to return the securities. These promises are memorialized in security lending agreements. These agreements specify that the short sellers will pay the long sellers all dividends or interest that they otherwise would have received had they not lent their securities. These payments are called payments-in-lieu of dividends (or of interest), and they may have different tax treatments than actual dividends and interest. The security lending agreements also protect the lenders in the event of a stock split.

To secure the security loans, lenders require that the short seller leave the proceeds of the short sale on deposit with them as collateral for the stock loan. They invest the collateral in short-term securities, and they rebate the interest to the short sellers at rates called short rebate rates. The short rebate rates are determined in the market and generally are available only to institutional short-sellers and some large retail traders. If a security is hard to borrow, the rebate rate may be very small or even negative. Such securities are said to be "on special." Otherwise, the rebate rate is usually 10 basis points less than the overnight rate in the interbank funds market. Most security lending agreements require various margin payments to keep the credit risk among the parties from growing when prices change.

Securities lenders lend their securities because the short rebate rates they pay on the collateral are lower than the interest rates they receive from investing the collateral. The difference is because of the implicit loan fees that they receive from the borrowers for borrowing the stock. The difference also compensates lenders for risks that the lenders take when investing the collateral and for the risk that the borrowers will default if prices rise significantly.

EXAMPLE 1-18 Short Positions in Securities and Contracts

How is the process of short selling shares of Siemens different from that of short selling a Siemens equity call option contract?

Solution: To short sell shares of Siemens, the seller (or his broker) must borrow the shares from a long holder so that he can deliver them to the buyer. To short sell a Siemens equity call option contract, the seller simply creates the contract when he sells it to the buyer.

5.2. Levered Positions

In many markets, traders can buy securities by borrowing some of the purchase price. They usually borrow the money from their brokers. The borrowed money is called the **margin loan**, and they are said to buy on margin. The interest rate that the buyers pay for their margin loan is called the **call money rate**. The call money rate is above the government bill rate and is negotiable. Large buyers generally obtain more favorable rates than do retail buyers. For institutional-size buyers, the call money rate is quite low because the loans are generally well secured by securities held as collateral by the lender.

Trader's equity is that portion of the security price that the buyer must supply. Traders who buy securities on margin are subject to minimum margin requirements. The **initial margin requirement** is the minimum fraction of the purchase price that must be trader's equity. This requirement may be set by the government, the exchange, or the exchange clearinghouse. For example, in the United States, the Federal Reserve Board sets the initial margin requirement through Regulation T. In Hong Kong, the Securities and Futures Commission sets the margin requirements. In all markets, brokers often require more equity than the government-required minimum from their clients when lending to them.

Many markets allow brokers to lend their clients more money if the brokers use risk models to measure and control the overall risk of their clients' portfolios. This system is called portfolio margining.

Buying securities on margin can greatly increase the potential gains or losses for a given amount of equity in a position because the trader can buy more securities on margin than he could otherwise. The buyer thus earns greater profits when prices rise and suffers greater losses when prices fall. The relation between risk and borrowing is called **financial leverage** (often simply called leverage). Traders leverage their positions when they borrow to buy more securities. A highly leveraged position is large relative to the equity that supports it.

The leverage ratio is the ratio of the value of the position to the value of the equity investment in it. The leverage ratio indicates how many times larger a position is than the equity that supports it. The maximum leverage ratio associated with a position financed by the minimum margin requirement is one divided by the minimum margin requirement. If the requirement is 40 percent, then the maximum leverage ratio is $2.5 = 100\%$ position $\div$ 40% equity.

The leverage ratio indicates how much more risky a leveraged position is relative to an unleveraged position. For example, if a stock bought on 40 percent margin rises 10 percent, the buyer will experience a 25 percent (2.5 × 10%) return on the equity investment in her leveraged position. But if the stock falls by 10 percent, the return on the equity investment will be −25 percent (before the interest on the margin loan and before payment of commissions).

Financial analysts must be able to compute the total return to the equity investment in a leveraged position. The total return depends on the price change of the purchased security, the dividends or interest paid by the security, the interest paid on the margin loan, and the commissions paid to buy and sell the security. The following example illustrates the computation of the total return to a leveraged purchase of stock that pays a dividend.

EXAMPLE 1-19 Computing Total Return to a Leveraged Stock Purchase

A buyer buys stock on margin and holds the position for exactly one year, during which time the stock pays a dividend. For simplicity, assume that the interest on the loan and the dividend are both paid at the end of the year.

Purchase price	\$20/share
Sale price	\$15/share
Shares purchased	1,000
Leverage ratio	2.5
Call money rate	5%
Dividend	\$0.10/share
Commission	\$0.01/share

1. What is the total return on this investment?
2. Why is the loss greater than the 25 percent decrease in the market price?

Solution to 1: To find the return on this investment, first determine the initial equity and then determine the equity remaining after the sale. The total purchase price is \$20,000. The leverage ratio of 2.5 indicates that the buyer's equity financed 40 percent = (1 ÷ 2.5) of the purchase price. Thus, the equity investment is \$8,000 = 40% of \$20,000. The \$12,000 remainder is borrowed. The actual investment is slightly higher because the buyer must pay a commission of \$10 = \$0.01/share × 1,000 shares to buy the stock. The total initial investment is \$8,010.

At the end of the year, the stock price has declined by \$5/share. The buyer lost \$5,000 = \$5/share × 1,000 shares as a result of the price change. In addition, the buyer has to pay interest at 5 percent on the \$12,000 loan, or \$600. The buyer also receives a dividend of \$0.10/share, or \$100. The trader's equity remaining after the sale is computed from the initial equity investment as follows:

Initial investment	$8,010
Purchase commission	−10
Trading gains/losses	−5,000
Margin interest paid	−600
Dividends received	100
Sales commission paid	−10
Remaining equity	$2,490

or

Proceeds on sale	$15,000
Payoff loan	−12,000
Margin interest paid	−600
Dividends received	100
Sales commission paid	−10
Remaining equity	$2,490

so that the return on the initial investment of $8,010 is (2,490 − 8,010)/8,010 = −68.9%.

Solution to 2: The realized loss is substantially greater than the stock price return of ($15 − $20)/$20 = −25%. Most of the difference is because of the leverage, with the remainder primarily the result of the interest paid on the loan. Based on the leverage alone and ignoring the other cash flows, we would expect that the return on the equity would be −62.5% = 2.5 leverage times the –25% stock price return.

In the preceding example, if the stock dropped more than the buyer's original 40 percent margin (ignoring commissions, interest, and dividends), the trader's equity would have become negative. In that case, the investor would owe his broker more than the stock is worth. Brokers often lose money in such situations if the buyer does not repay the loan out of other funds.

To prevent such losses, brokers require that margin buyers always have a minimum amount of equity in their positions. This minimum is called the **maintenance margin requirement**. It is usually 25 percent of the current value of the position, but it may be higher or lower depending on the volatility of the instrument and the policies of the broker.

If the value of the equity falls below the maintenance margin requirement, the buyer will receive a **margin call**, or request for additional equity. If the buyer does not deposit additional equity with the broker in a timely manner, the broker will close the position to prevent further losses and thereby secure repayment of the margin loan.

When you buy securities on margin, you must know the price at which you will receive a margin call if prices drop. The answer to this question depends on your initial equity and on the maintenance margin requirement.

EXAMPLE 1-20 Margin Call Price

A trader buys stock on margin posting 40 percent of the initial stock price of \$20 as equity. The maintenance margin requirement for the position is 25 percent. At what price will a margin call occur?

Solution: The trader's initial equity is 40 percent of the initial stock price of \$20, or \$8 per share. Subsequent changes in equity per share are equal to the share price change so that equity per share is equal to $\$8 + (P - 20)$ where P is the current share price. The margin call takes place when equity drops below the 25 percent maintenance margin requirement. The price at which a margin call will take place is the solution to the following equation:

$$\frac{\text{Equity/share}}{\text{Price/share}} = \frac{\$8 + P - 20}{P} = 25\%$$

which occurs at $P = 16$. When the price drops to \$16, the equity will be worth \$4/share, which will be exactly 25 percent of the price.

Traders who sell securities short are also subject to margin requirements because they have borrowed securities. Initially, the trader's equity supporting the short position must be at least equal to the margin requirement times the initial value of the short position. If prices rise, equity will be lost. At some point, the short seller will have to contribute additional equity to meet the maintenance margin requirement. Otherwise, the broker will buy the security back to cover the short position to prevent further losses and thereby secure repayment of the stock loan.

6. ORDERS

Buyers and sellers communicate with the brokers, exchanges, and dealers that arrange their trades by issuing **orders**. All orders specify what instrument to trade, how much to trade, and whether to buy or sell. Most orders also have other instructions attached to them. These additional instructions may include execution instructions, validity instructions, and clearing instructions. **Execution instructions** indicate how to fill the order, **validity instructions** indicate when the order may be filled, and **clearing instructions** indicate how to arrange the final settlement of the trade.

In this section, we introduce various order instructions and explain how traders use them to achieve their objectives. We discuss execution mechanisms—how exchanges, brokers, and dealers fill orders—in the next section. To understand the concepts in this section, however, you need to know a little about order execution mechanisms.

In most markets, dealers and various other proprietary traders often are willing to buy from, or sell to, other traders seeking to sell or buy. The prices at which they are willing to buy are called **bid** prices and those at which they are willing to sell are called **ask** prices, or sometimes offer prices. The ask prices are invariably higher than the bid prices.

The traders who are willing to trade at various prices may also indicate the quantities that they will trade at those prices. These quantities are called **bid sizes** and **ask sizes**, depending on whether they are attached to bids or offers.

Practitioners say that the traders who offer to trade *make a market*. Those who trade with them *take the market*.

The highest bid in the market is the **best bid**, and the lowest ask in the market is the **best offer**. The difference between the best bid and the best offer is the **market bid–ask spread**. When traders ask, "What's the market?" they want to know the best bid and ask prices and their associated sizes. Bid–ask spreads are an implicit cost of trading. Markets with small bid–ask spreads are markets in which the costs of trading are small, at least for the sizes quoted. Dealers often quote both bid and ask prices, and in that case, practitioners say that they quote a two-sided market. The market spread is never more than any dealer spread.

6.1. Execution Instructions

Market and limit orders convey the most common execution instructions. A **market order** instructs the broker or exchange to obtain the best price immediately available when filling the order. A **limit order** conveys almost the same instruction: Obtain the best price immediately available, but in no event accept a price higher than a specified limit price when buying or accept a price lower than a specified limit price when selling.

Many people mistakenly believe that limit orders specify the prices at which the orders will trade. Although limit orders do often trade at their limit prices, remember that the first instruction is to obtain the best price available. If better prices are available than the limit price, brokers and exchanges should obtain those prices for their clients.

Market orders generally execute immediately if other traders are willing to take the other side of the trade. The main drawback with market orders is that they can be expensive to execute, especially when the order is placed in a market for a thinly traded security, or more generally, when the order is large relative to the normal trading activity in the market. In that case, a market buy order may fill at a high price, or a market sell order may fill at a low price if no traders are willing to trade at better prices. High purchase prices and low sale prices represent price concessions given to other traders to encourage them to take the other side of the trade. Because the sizes of price concessions can be difficult to predict, and because prices often change between when a trader submits an order and when the order finally fills, the execution prices for market orders are often uncertain.

Buyers and sellers who are concerned about the possibility of trading at unacceptable prices add limit price instructions to their orders. The main problem with limit orders is that they may not execute. Limit orders do not execute if the limit price on a buy order is too low, or if the limit price on a sell order is too high. For example, if an investment manager submits a limit order to buy at the limit price of 20 (buy limit 20) and nobody is willing to sell at or below 20, the order will not trade. If prices never drop to 20, the manager will never buy. If the price subsequently rises, the manager will have lost the opportunity to profit from the price rise.

Whether traders use market orders or limit orders when trying to arrange trades depends on their concerns about price, trading quickly, and failing to trade. On average, limit orders trade at better prices than do market orders, but they often do not trade. Traders generally regret when their limit orders fail to trade because they usually would have profited if they had traded. Limit buy orders do not fill when prices are rising, and limit sell orders do not fill when prices are falling. In both cases, traders would be better off if their orders had filled.

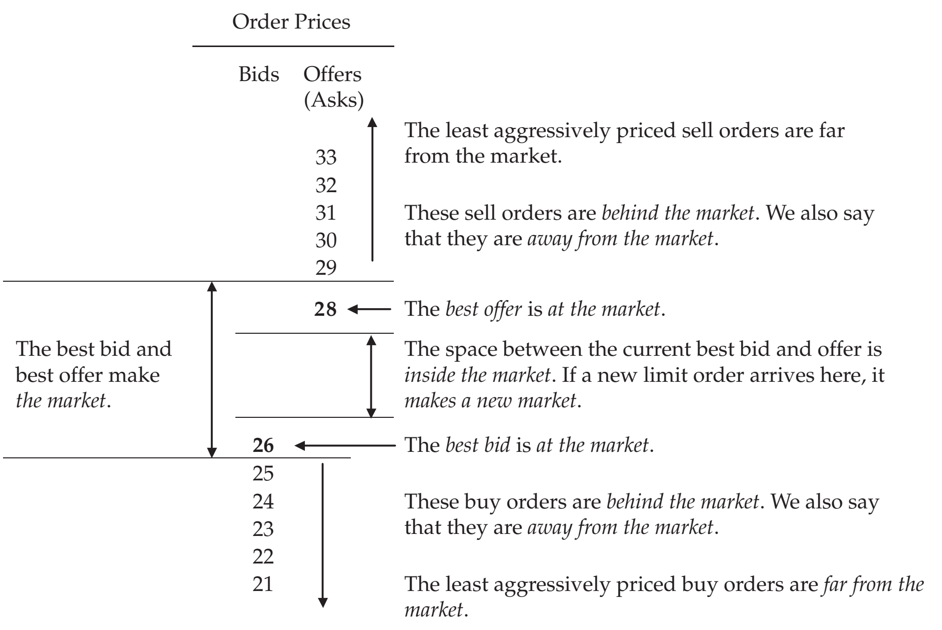
The probability that a limit order will execute depends on where the order is placed relative to market prices. An aggressively priced order is more likely to trade than is a less aggressively priced order. A limit buy order is aggressively priced when the limit price is high relative to the market bid and ask prices. If the limit price is placed above the best offer, the buy order generally will partially or completely fill at the best offer price, depending on the size available at the best offer. Such limit orders are called **marketable limit orders** because at least part of the order can trade immediately. A limit buy order with a very high price relative to the market is essentially a market order.

If the buy order is placed above the best bid but below the best offer, traders say the order makes a new market because it becomes the new best bid. Such orders generally will not immediately trade, but they may attract sellers who are interested in trading. A buy order placed at the best bid is said to make market. It may have to wait until all other buy orders at that price trade first. Finally, a buy order placed below the best bid is **behind the market**. It will not execute unless market prices drop. Traders call limit orders that are waiting to trade **standing limit orders**.

Sell limit orders are aggressively priced if the limit price is low relative to market prices. The limit price of a marketable sell limit order is below the best bid. A limit sell order placed between the best bid and the best offer makes a new market on the sell side, one placed at the best offer makes market, and one placed above the best offer is behind the market.

Exhibit 1-2 presents a simplified **limit order book** in which orders are presented ranked by their limit prices for a hypothetical market. The market is “26 bid, offered at 28” because the best bid is 26 and the best offer (ask) is 28.

EXHIBIT 1-2 Terms Traders Use to Describe Standing Limit Orders



Source: Harris, 2003.

EXAMPLE 1-21 Making and Taking

1. What is the difference between making a market and taking a market?
2. What order types are most likely associated with making a market and taking a market?

Solution to 1: A trader makes a market when the trader offers to trade. A trader takes a market when the trader accepts an offer to trade.

Solution to 2: Traders place standing limit orders to give other traders opportunities to trade. Standing limit orders thus make markets. In contrast, traders use market orders or marketable limit orders to take offers to trade. These marketable orders take the market.

A trade-off exists between how aggressively priced an order is and the ultimate trade price. Although aggressively priced orders fill faster and with more certainty than do less aggressively priced limit orders, the prices at which they execute are inferior. Buyers seeking to trade quickly must pay higher prices to increase the probability of trading quickly. Similarly, sellers seeking to trade quickly must accept lower prices to increase the probability of trading quickly.

Some order execution instructions specify conditions on size. For example, **all-or-nothing orders** (AON) can only trade if their entire sizes can be traded. Traders can similarly specify minimum fill sizes. This specification is common when settlement costs depend on the number of trades made to fill an order and not on the aggregate size of the order.

Exposure instructions indicate whether, how, and perhaps to whom orders should be exposed. **Hidden orders** are exposed only to the brokers or exchanges that receive them. These agencies cannot disclose hidden orders to other traders until they can fill them. Traders use hidden orders when they are afraid that other traders might behave strategically if they knew that a large order was in the market. Traders can discover hidden size only by submitting orders that will trade with that size. Thus, traders can only learn about hidden size after they have committed to trading with it.

Traders also often indicate a specific **display size** for their orders. Brokers and exchanges then expose only the display size for these orders. Any additional size is hidden from the public but can be filled if a suitably large order arrives. Traders sometimes call such orders **iceberg orders** because most of the order is hidden. Traders specify display sizes when they do not want to display their full sizes, but still want other traders to know that someone is willing to trade at the displayed price. Traders on the opposite side who wish to trade additional size at that price can discover the hidden size only if they trade the displayed size, at which point the broker or exchange will display any remaining size up to the display size. They also can discover the hidden size by submitting large orders that will trade with that size.

EXAMPLE 1-22 Market versus Limit and Hidden versus Displayed Orders

You are the buy-side trader for a very clever investment manager. The manager has hired a commercial satellite firm to take regular pictures of the parking lots in which new car dealers store their inventories. It has also hired some part-time workers to count the cars on the lots. With this information and some econometric analyses, the manager can predict weekly new car sale announcements more accurately than can most analysts. The manager typically makes a quarter percent each week on this strategy. Once a week, a day before the announcements are made, the manager gives you large orders to buy or sell car manufacturers based on his insights into their dealers' sales. What primary issues should you consider when deciding whether to:

1. Use market or limit orders to fill his orders?
2. Display the orders or hide them?

Solution to 1: The manager's information is quite perishable. If his orders are not filled before the weekly sales are reported to the public, the manager will lose the opportunity to profit from the information as prices immediately adjust to the news. The manager, therefore, needs to get the orders filled quickly. This consideration suggests that the orders should be submitted as market orders. If submitted as limit orders, the orders might not execute and the firm would lose the opportunity to profit.

Large market orders, however, can be very expensive to execute, especially if few people are willing to trade significant size on the other side of the market. Because transaction costs can easily exceed the expected quarter percent return, you should submit limit orders to limit the execution prices that you are willing to accept. It is better to fail to trade than to trade at losing prices.

Solution to 2: Your large orders could easily move the market if many people were aware of them, and even more so if others were aware that you are trading on behalf of a successful information-motivated trader. You thus should consider submitting hidden orders. The disadvantage of hidden orders is that they do not let people know that they can trade the other side if they want to.

6.2. Validity Instructions

Validity instructions indicate when an order may be filled. The most common validity instruction is the **day order**. A day order is good for the day on which it is submitted. If it has not been filled by the close of business, the order expires unfilled.

Good-till-cancelled orders (GTC) are just that. In practice, most brokers limit how long they will manage an order to ensure that they do not fill orders that their clients have forgotten. Such brokers may limit their GTC orders to a few months.

Immediate or cancel orders (IOC) are good only upon receipt by the broker or exchange. If they cannot be filled in part or in whole, they cancel immediately. In some markets these orders are also known as **fill or kill** orders. When searching for hidden liquidity, electronic algorithmic trading systems often submit thousands of these IOC orders for every order that they fill.

Good-on-close orders can only be filled at the close of trading. These orders often are market orders, so traders call them market-on-close orders. Traders often use on-close orders when they want to trade at the same prices that will be published as the closing prices of the day. Mutual funds often like to trade at such prices because they value their portfolios at closing prices. Many traders also use **good-on-open** orders.

6.2.1. Stop Orders

A **stop order** is an order in which a trader has specified a stop price condition. The stop order may not be filled until the stop price condition has been satisfied. For a sell order, the stop price condition suspends execution of the order until a trade occurs at or below the stop price. After that trade, the stop condition is satisfied and the order becomes valid for execution, subject to all other execution instructions attached to it. If the market price subsequently rises above the sell order's stop price before the order trades, the order remains valid. Similarly, a buy order with a stop condition becomes valid only after a price rises above the specified stop price.

Traders often call stop orders *stop-loss orders* because many traders use them with the hope of stopping losses on positions that they have established. For example, a trader who has bought stock at 40 may want to sell the stock if the price falls below 30. In that case, the trader might submit a "GTC, stop 30, market sell" order. If the price falls to or below 30, the market order becomes valid and it should immediately execute at the best price then available in the market. That price may be substantially lower than 30 if the market is falling quickly. The stop-loss order thus does not guarantee a stop to losses at the stop price. If potential sellers are worried about trading at too low of a price, they can attach stop instructions to limit orders instead of market orders. In this example, if the trader is unwilling to sell below 25, the trader would submit a "GTC, stop 30, limit 25 sell" order.

If a trader wants to guarantee that he can sell at 30, the trader would buy a put option contract struck at 30. The purchase price of the option would include a premium for the insurance that the trader is buying. Option contracts can be viewed as limit orders for which execution is guaranteed at the strike price. A trader similarly might use a stop-buy order or a call option to limit losses on a short position.

A portfolio manager might use a stop-buy order when the manager believes that a security is undervalued but is unwilling to trade without market confirmation. For example, suppose that a stock currently trades for 50 RMB and a manager believes that it should be worth 100 RMB. Further, the manager believes that the stock will much more likely be worth 100 RMB if other traders are willing to buy it above 65 RMB. To best take advantage of this information, the manager would consider issuing a "GTC, stop 65 RMB, limit 100 RMB buy" order. Note that if the manager relies too much on the market when making this trading decision, however, he may violate CFA Standard of Professional Conduct V.A.2, which requires that all investment actions have a reasonable and adequate basis supported by appropriate research and investigation.

Because stop-sell orders become valid when prices are falling and stop-buy orders become valid when prices are rising, traders using stop orders contribute to market momentum as their sell orders push prices down further and their buy orders push prices up. Execution prices for stop orders thus are often quite poor.

EXAMPLE 1-23 Limit and Stop Instructions

In what ways do limit and stop instructions differ?

Solution: Although both limit and stop instructions specify prices, the role that these prices play in the arrangement of a trade are completely different. A limit price places a limit on what trade prices will be acceptable to the trader. A buyer will accept prices only at or lower than the limit price whereas a seller will accept prices only at or above the limit price.

In contrast, a stop price indicates when an order can be filled. A buy order can only be filled once the market has traded at a price at or above the stop price. A sell order can only be filled once the market has traded at a price at or below the stop price.

Both order instructions may delay or prevent the execution of an order. A buy limit order will not execute until someone is willing to sell at or below the limit price. Similarly, a sell limit order will not execute until someone is willing to buy at or above the limit sell price. In contrast, a stop-buy order will not execute if the market price never rises to the stop price. Similarly, a stop-sell order will not execute if the market price never falls to the stop price.

6.3. Clearing Instructions

Clearing instructions tell brokers and exchanges how to arrange final settlement of trades. Traders generally do not attach these instructions to each order—instead they provide them as standing instructions. These instructions indicate what entity is responsible for clearing and settling the trade. For retail trades, that entity is the customer's broker. For institutional trades, that entity may be a custodian or another broker. When a client uses one broker to arrange trades and another broker to settle trades, traders say that the first broker gives up the trade to the other broker, who is often known as the prime broker. Institutional traders provide these instructions so they can obtain specialized execution services from different brokers while maintaining a single account for custodial services and other prime brokerage services, such as margin loans.

An important clearing instruction that must appear on security sale orders is an indication of whether the sale is a long sale or a short sale. In either case, the broker representing the sell order must ensure that the trader can deliver securities for settlement. For a long sale, the broker must confirm that the securities held are available for delivery. For a short sale, the broker must either borrow the security on behalf of the client or confirm that the client can borrow the security.

7. PRIMARY SECURITY MARKETS

When issuers first sell their securities to investors, practitioners say that the trades take place in the primary markets. An issuer makes an **initial public offering** (IPO)—sometimes called a placing—of a security issue when it sells the security to the public for the first time.

A **seasoned security** is a security that an issuer has already issued. If the issuer wants to sell additional units of a previously issued security, it makes a **seasoned offering** (sometimes called a secondary offering). Both types of offerings occur in the primary market where issuers sell their securities to investors. Later, if investors trade these securities among themselves, they trade in secondary markets. This section discusses primary markets and the procedures that issuers use to offer their securities to the public.

7.1. Public Offerings

Corporations generally contract with an investment bank to help them sell their securities to the public. The investment bank then lines up subscribers who will buy the security. Investment bankers call this process **book building**. In London, the book builder is called the book runner. The bank tries to build a book of orders to which they can sell the offering. Investment banks often support their book building by providing investment information and opinion about the issuer to their clients and to the public. Before the offering, the issuer generally makes a very detailed disclosure of its business, of the risks inherent in it, and of the uses to which the new funds will be placed.

When time is of the essence, issuers in Europe may issue securities through an **accelerated book build**, in which the investment bank arranges the offering in only one or two days. Such sales often occur at discounted prices.

The first public offering of common stock in a company consists of newly issued shares to be sold by the company. It may also include shares that the founders and other early investors in the company seek to sell. The initial public offering provides these investors with a means of liquidating their investments.

In an **underwritten offering**—the most common type of offering—the investment bank guarantees the sale of the issue at an offering price that it negotiates with the issuer. If the issue is undersubscribed, the bank will buy whatever securities it cannot sell at the offering price. In the case of an IPO, the underwriter usually also promises to make a market in the security for about a month to ensure that the secondary market will be liquid and to provide price support, if necessary. For large issues, a syndicate of investment banks and broker–dealers helps the lead underwriter build the book. The issuer usually pays an underwriting fee of about 7 percent for these various services. The underwriting fee is a placement cost of the offering.

In a **best efforts offering**, the investment bank acts only as broker. If the offering is undersubscribed, the issuer will not sell as much as it hoped to sell.

For both types of offerings, the issuer and the bank usually jointly set the offering price following a negotiation. If they set a price that buyers consider too high, the offering will be undersubscribed, and they will fail to sell the entire issue. If they set the price too low, the offering will be oversubscribed, in which case the securities are often allocated to preferred clients or on a pro-rata basis.

(Note that CFA Standard of Professional Conduct III.B—fair dealing—requires that the allocation be based on a written policy disclosed to clients and suggests that the securities be offered on a pro-rata basis among all clients who have comparable relationships with their broker–dealers.)

Investment banks have a conflict of interest with respect to the offering price in underwritten offerings. As agents for the issuers, they generally are supposed to select the offering price that will raise the most money. But as underwriters, they have strong incentives to choose a low price. If the price is low, the banks can allocate valuable shares to benefit their clients and thereby indirectly benefit the banks. If the price is too high, the underwriters will have to buy overvalued shares in the offering and perhaps also during the following month if they must support the price in the secondary market, which directly costs the banks. These considerations tend to lower initial offering prices so that prices in the secondary market often rise immediately following an IPO. They are less important in a seasoned offering because trading in the secondary market helps identify the proper price for the offering.

First time issuers generally accept lower offering prices because they and many others believe that an undersubscribed IPO conveys very unfavorable information to the market about the company's prospects at a time when it is most vulnerable to public opinion about its prospects. They fear that an undersubscribed initial public offering will make it substantially harder to raise additional capital in subsequent seasoned offerings.

EXAMPLE 1-24 The Playtech Initial Public Offering

Playtech is a designer, developer, and licensor of software for the gambling industry. On 28 March 2006, Playtech raised approximately £265 million gross through an initial public offering of 103,142,466 ordinary shares at £2.57 per ordinary share. After the initial public offering, Playtech had 213,333,333 ordinary shares issued and outstanding.

Playtech received gross proceeds of approximately £34.3 million and net proceeds of £31.8 million. The ordinary shares that were sold to the public represented approximately 48 percent of Playtech's total issued ordinary shares.

The shares commenced trading at 8:00 A.M. on the AIM market of the London Stock Exchange where Playtech opened at £2.74, traded 37 million shares between £2.68 and £2.74, and closed at £2.73.

1. Approximately how many new shares were issued by the company and how many shares were sold by the company's founders? What fraction of their holdings in the company did the founders sell?
2. Approximately what return did the subscribers who participated in the IPO make on the first day it traded?
3. Approximately how much did Playtech pay in placement costs as a percentage of the new funds raised?

Solution to 1: Playtech received gross proceeds of £34.3 million at £2.57 per share so the company issued and sold 13,346,304 shares (= £34.3 million/£2.57 per share). The total placement was for 103,142,466 shares, so the founders sold 89,796,162 shares (= 103,142,466 shares − 13,346,304 shares). Because approximately 200 million = 213.3 million − 13.3 million shares were outstanding before the placement, the founders sold approximately 45 percent (= 90 million/200 million) of the company.

Solution to 2: The subscribers bought the stock for £2.57 per share and it closed at £2.73. The first day return thus was $6.2\% = \frac{2.73 - 2.57}{2.57} \times 100$.

Solution to 3: Playtech obtained gross proceeds of £34.3 million, but only raised net proceeds of £31.8 million. The £2.5 million difference was the total cost of the placement to the firm, which is 7.9 percent of £31.8 million net proceeds.

7.2. Private Placements and Other Primary Market Transactions

Corporations sometimes issue their securities in private placements. In a **private placement**, corporations sell securities directly to a small group of qualified investors, usually with the assistance of an investment bank. Qualified investors have sufficient knowledge and experience to recognize the risks that they assume, and sufficient wealth to assume those risks responsibly. Most countries allow corporations to do private placements without nearly as much public disclosure as is required for public offerings. Private placements, therefore, may be cheaper than public offerings, but the buyers generally require higher returns (lower purchase prices) because they cannot subsequently trade the securities in an organized secondary market.

Corporations sometimes sell new issues of seasoned securities directly to the public on a piecemeal basis via a shelf registration. In a **shelf registration**, the corporation makes all public disclosures that it would for a regular offering, but it does not sell the shares in a single transaction. Instead, it sells the shares directly into the secondary market over time, generally when it needs additional capital. Shelf registrations provide corporations with flexibility in the timing of their capital transactions, and they can alleviate the downward price pressures often associated with large secondary offerings.

Many corporations may also issue shares via dividend reinvestment plans (DRPs or DRIPs, for short) that allow their shareholders to reinvest their dividends in newly issued shares of the corporation (in particular, DRPs specify that the corporation issue new shares for the plan rather than purchase them on the open market). These plans sometimes also allow existing shareholders and other investors to buy additional stock at a slight discount to current prices.

Finally, corporations can issue new stock via a rights offering. In a rights offering, the corporation distributes rights to buy stock at a fixed price to existing shareholders in proportion to their holdings. Because the rights need not be exercised, they are options. The exercise price, however, is set below the current market price of the stock so that buying stock with the rights is immediately profitable. Consequently, shareholders will experience dilution in the value of their existing shares. They can offset the dilution loss by exercising their rights or by selling the rights to others who will exercise them. Shareholders generally do not like rights offerings because they must provide additional capital (or sell their rights) to avoid losses through dilution. Financial analysts recognize that these securities, although called rights, are actually short-term stock warrants and value them accordingly.

The national governments of financially strong countries generally issue their bonds, notes, and bills in public auctions organized by a government agency (usually associated with the finance ministry). They may also sell them directly to dealers.

Smaller and less financially secure national governments and most regional governments often contract with investment banks to help them sell and distribute their securities. The laws of many governments, however, require that they auction their securities.

EXAMPLE 1-25 Private and Public Placements

In what ways do private placements differ from public placements?

Solution: Issuers make private placements to a limited number of investors who generally are financially sophisticated and well informed about risk. The investors generally have some relationship to the issuer. Issuers make public placements when they sell securities to the general public. Public placements generally require substantially more financial disclosure than do private placements.

7.3. Importance of Secondary Markets to Primary Markets

Corporations and governments can raise money in the primary markets at lower cost when their securities will trade in liquid secondary markets. In a **liquid market**, traders can buy or sell with low transaction costs and small price concessions when they want to trade. Buyers value liquidity because they may need to sell their securities to meet liquidity needs. Investors thus will pay more for securities that they can easily sell than for those that they cannot easily sell. Higher prices translate into lower costs of capital for the issuers.

8. SECONDARY SECURITY MARKET AND CONTRACT MARKET STRUCTURES

Trading is the successful outcome to a bilateral search in which buyers look for sellers and sellers look for buyers. Many market structures have developed to reduce the costs of this search. Markets are liquid when the costs of finding a suitable counterparty to a trade are low.

Trading in securities and contracts takes place in a variety of market structures. The structures differ by when trades can be arranged, who arranges the trades, how they do so, and how traders learn about possible trading opportunities and executed trades. This section introduces the various market structures used to trade securities and contracts. We first consider trading sessions, then execution mechanisms, and finally market information systems.

8.1. Trading Sessions

Markets are organized as call markets or as continuous trading markets. In a **call market**, trades can be arranged only when the market is called at a particular time and place. In contrast in a **continuous trading market**, trades can be arranged and executed any time the market is open.

Buyers can easily find sellers and vice versa in call markets because all traders interested in trading (or orders representing their interests) are present at the same time and place. Call markets thus have the potential to be very liquid when they are called. But they are completely illiquid between trading sessions. In contrast, traders can arrange and execute their trades at any time in continuous trading markets, but doing so can be difficult if the buyers and sellers (or their orders) are not both present at the same time.

Most call markets use single price auctions to match buyers to sellers. In these auctions, the market constructs order books representing all buy orders and all seller orders. The market then chooses a single trade price that will maximize the total volume of trade. The order books are supply and demand schedules, and the point at which they cross determines the trade price.

Call markets usually are organized just once a day, but some markets organize calls at more frequent intervals.

Many continuous trading markets start their trading with a call market auction. During a preopening period, traders submit their orders for the market call. At the opening, any possible trades are arranged and then trading continues in the continuous trading session. Some continuous trading markets also close their trading with a call. In these markets, traders who are only interested in trading in the closing call submit market- or limit-on-close orders.

EXAMPLE 1-26 Call Markets and Continuous Trading Markets

1. What is the main advantage of a call market compared with a continuous trading market?
2. What is the main advantage of a continuous trading market compared with a call market?

Solution to 1: By gathering all traders to the same place at the same time, a call market makes it easier for buyers to find sellers and vice versa. In contrast, if buyers and sellers (or their orders) are not present at the same time in a continuous market, they cannot trade.

Solution to 2: In a continuous trading market, a willing buyer and seller can trade any time the market is open. In contrast, in a call market trading can take place only when the market is called.

8.2. Execution Mechanisms

The three main types of market structures are quote-driven markets (sometimes called price-driven or dealer markets), order-driven markets, and brokered markets. In **quote-driven markets**, customers trade with dealers. In **order-driven markets**, an order matching system run by an exchange, a broker, or an alternative trading system uses rules to arrange trades based on the orders that traders submit. Most exchanges and ECNs organize order-driven markets. In **brokered markets**, brokers arrange trades between their customers. Brokered markets are common for transactions of unique instruments, such as real estate properties, intellectual properties, or large blocks of securities. Many trading systems use more than one type of market structure.

8.2.1. Quote-Driven Markets

Worldwide, most trading, other than in stocks, takes place in quote-driven markets. Almost all bonds and currencies and most spot commodities trade in quote-driven markets. Traders call them quote-driven (or price-driven or dealer) because customers trade at the prices quoted by dealers. Depending on the instrument traded, the dealers work for commercial banks, for investment banks, for broker–dealers, or for proprietary trading houses.

Quote-driven markets also often are called over-the-counter (OTC) markets because securities used to be literally traded over the dealer's counter in the dealer's office. Now, most trades in OTC markets are conducted over proprietary computer communications networks, by telephone, or sometimes over instant messaging systems.

8.2.2. Order-Driven Markets

Order-driven markets arrange trades using rules to match buy orders to sell orders. The orders may be submitted by customers or by dealers. Almost all exchanges use order-driven trading systems, and every automated trading system is an order-driven system.

Because rules match buyers to sellers, traders often trade with complete strangers. Order-driven markets thus must have procedures to ensure that buyers and sellers perform on their trade contracts. Otherwise, dishonest traders would enter contracts that they would not settle if a change in market conditions made settlement unprofitable.

Two sets of rules characterize order-driven market mechanisms: Order matching rules and trade pricing rules. The order matching rules match buy orders to sell orders. The trade pricing rules determine the prices at which the matched trades take place.

8.2.2.1. Order Matching Rules

Order-driven trading systems match buyers to sellers using rules that rank the buy orders and the sell orders based on price, and often along with other secondary criteria. The systems then match the highest-ranking buy order with the highest-ranking sell order. If the buyer is willing to pay at least as much as the seller is willing to receive, the system will arrange a trade for the minimum of the buy and sell quantities. The remaining size, if any, is then matched with the next order on the other side and the process continues until no further trades can be arranged.

The **order precedence hierarchy** determines which orders go first. The first rule is **price priority**: The highest priced buy orders and the lowest prices sell orders go first. They are the most aggressively priced orders. **Secondary precedence rules** determine how to rank orders at the same price. Most trading systems use time precedence to rank orders at the same price. The first order to arrive has precedence over other orders. In trading systems that permit hidden and partially hidden orders, displayed quantities at a given price generally have precedence over the undisplayed quantities. So the complete precedence hierarchy is given by price priority, display precedence at a given price, and finally time precedence among all orders with the same display status at a given price. These rules give traders incentives to improve price, display their orders, and arrive early if they want to trade quickly. These incentives increase market liquidity.

8.2.2.2. Trade Pricing Rules

After the orders are matched, the trading system then uses its trade pricing rule to determine the trade price. The three rules that various order-driven markets use to price their trades are the uniform pricing rule, the discriminatory pricing rule, and the derivative pricing rule.

Call markets commonly use the uniform pricing rule. Under this rule, all trades execute at the same price. The market chooses the price that maximizes the total quantity traded.

Continuous trading markets use the **discriminatory pricing rule**. Under this rule, the limit price of the order or quote that first arrived—the standing order—determines the trade price. This rule allows a large arriving trader to discriminate among standing limit orders by filling the most aggressively priced orders first at their limit prices and then filling less aggressively priced orders at their less favorable (from the point of view of the arriving trader) limit prices. If trading systems did not use this pricing rule, large traders would break their orders into pieces to price discriminate on their own.

EXAMPLE 1-27 Filling a Large Order in a Continuous Trading Market

Before the arrival of a large order, a market has the following limit orders standing on its book:

Buyer	Bid Size	Limit Price	Offer Size	Seller
Takumi	15	¥100.1		
Hiroto	8	¥100.2		
Shou	10	¥100.3		
		¥100.4	4	Hina
		¥100.5	6	Sakur
		¥100.6	12	Miku

Buyer Tsubasa submits a day order to buy 15 contracts, limit ¥100.5. With whom does he trade, what is his average trade price, and what does the limit order book look like afterward?

Solution: Tsubasa's buy order first fills with the most aggressively priced sell order, which is Hina's order for four contracts. A trade takes place at ¥100.4 for four contracts, Hina's order fills completely, and Tsubasa still has 11 more contracts remaining.

The next most aggressively priced sell order is Sakur's order for six contracts. A second trade takes place at ¥100.5 for six contracts, Sakur's order fills completely, and Tsubasa still has five more contracts remaining.

The next most aggressively priced sell order is Miku's order at ¥100.6. No further trade is possible, however, because her limit sell price is above Tsubasa's limit buy price.

$$\text{Tsubasa's average trade price is ¥100.46} = \frac{4 \times \text{¥}100.4 + 6 \times \text{¥}100.5}{4 + 6}$$

Because Tsubasa issued a day order, the remainder of his order is placed on the book on the buy side at ¥100.5. The following orders are then on the book:

Buyer	Bid Size	Limit Price	Offer Size	Seller
Takumi	15	¥100.1		
Hiroto	8	¥100.2		
Shou	10	¥100.3		
		¥100.4		
Tsubasa	5	¥100.5		
		¥100.6	12	Miku

If Tsubasa had issued an immediate-or-cancel order, the remaining five contracts would have been cancelled.

Crossing networks use the derivative pricing rule. **Crossing networks** are trading systems that match buyers and sellers who are willing to trade at prices obtained from other markets. Most systems cross their trades at the midpoint of the best bid and ask quotes published by the exchange at which the security primarily trades. This pricing rule is called a **derivative pricing rule** because the price is derived from another market. In particular, the price does not depend on the orders submitted to the crossing network. Some crossing networks are organized as call markets and others as continuously trading markets. The most important crossing market is the equity trading system POSIT.

8.2.3. Brokered Markets

The third execution mechanism is the brokered market, in which brokers arrange trades among their clients. Brokers organize markets for instruments for which finding a buyer or a seller willing to trade is difficult because the instruments are unique and thus of interest only to a limited number of people or institutions. These instruments generally are also infrequently traded and expensive to carry in inventory. Examples of such instruments include very large blocks of stock, real estate properties, fine art masterpieces, intellectual properties, operating companies, liquor licenses, and taxi medallions. Because dealers generally are unable or unwilling to hold these assets in their inventories, they will not make markets in them. Organizing order-driven markets for these instruments is not sensible because too few traders would submit orders to them.

Successful brokers in these markets try to know everyone who might now or in the future be willing to trade. They spend most of their time on the telephone and in meetings building their networks.

EXAMPLE 1-28 Quote-Driven, Order-Driven, and Brokered Markets

What are the primary advantages of quote-driven, order-driven, and brokered markets?

Solution: In a quote-driven market, dealers generally are available to supply liquidity. In an order-driven market, traders can supply liquidity to each other. In a brokered market, brokers help find traders who are willing to trade when dealers would not be willing to make markets and when traders would not be willing to post orders.

8.3. Market Information Systems

Markets vary in the type and quantity of data that they disseminate to the public. Traders say that a market is pretrade transparent if the market publishes real-time data about quotes and orders. Markets are posttrade transparent if the market publishes trade prices and sizes soon after trades occur.

Buy-side traders value transparency because it allows them to better manage their trading, understand market values, and estimate their prospective and actual transaction costs. In contrast, dealers prefer to trade in opaque markets because, as frequent traders, they have an information advantage over those who know less than they do. Bid–ask spreads tend to be wider and transaction costs tend to be higher in opaque markets because finding the best available price is harder for traders in such markets.

9. WELL-FUNCTIONING FINANCIAL SYSTEMS

The financial system allows traders to solve financing and risk management problems. In a well-functioning financial system:

- Investors can easily move money from the present to the future while obtaining a fair rate of return for the risks that they bear.
- Borrowers can easily obtain funds that they need to undertake current projects if they can credibly promise to repay the funds in the future.
- Hedgers can easily trade away or offset the risks that concern them.
- Traders can easily trade currencies for other currencies or commodities that they need.

If the assets or contracts needed to solve these problems are available to trade, the financial system has **complete markets**. If the costs of arranging these trades are low, the financial system is **operationally efficient**. If the prices of the assets and contracts reflect all available information related to fundamental values, the financial system is **informationally efficient**.

Well-functioning financial systems are characterized by:

- The existence of well-developed markets that trade instruments that help people solve their financial problems (complete markets).
- Liquid markets in which the costs of trading—commissions, bid–ask spreads, and order price impacts—are low (operationally efficient markets).
- Timely financial disclosures by corporations and governments that allow market participants to estimate the fundamental values of securities (support informationally efficient markets).
- Prices that reflect fundamental values so that prices vary primarily in response to changes in fundamental values and not to demands for liquidity made by uninformed traders (informationally efficient markets).

Such complete and operationally efficient markets are produced by financial intermediaries who:

- Organize exchanges, brokerages, and alternative trading systems that match buyers to sellers.
- Provide liquidity on demand to traders.
- Securitize assets to produce investment instruments that are attractive to investors and thereby lower the costs of funds for borrowers.
- Run banks that match investors to borrowers by taking deposits and making loans.
- Run insurance companies that pool uncorrelated risks.
- Provide investment advisory services that help investors manage and grow their assets at low cost.
- Organize clearinghouses that ensure everyone settles their trades and contracts.
- Organize depositories that ensure nobody loses their assets.

The benefits of a well-functioning financial system are huge. In such systems, investors who need to move money to the future can easily connect with entrepreneurs who need money now to develop new products and services. Similarly, producers who would otherwise avoid valuable projects because they are too risky can easily transfer those risks to others who can better bear them. Most importantly, these transactions generally can take place among strangers so that the benefits from trading can be derived from an enormous number of potential matches.

In contrast, economies that have poorly functioning financial systems have great difficulties allocating capital among the many companies who could use it. Financial transactions tend to be limited to arrangements within families when people cannot easily find trustworthy counterparties who will honor their contracts. In such economies, capital is allocated inefficiently, risks are not easily shared, and production is inefficient.

An extraordinarily important by-product of an operationally efficient financial system is the production of informationally efficient prices. Prices are informationally efficient when they reflect all available information about fundamental values. Informative prices are crucially important to the welfare of an economy because they help ensure that resources go where they are most valuable. Economies that use resources where they are most valuable are **allocationally efficient**. Economies that do not use resources where they are most valuable waste their resources and consequently often are quite poor.

Well-informed traders make prices informationally efficient. When they buy assets and contracts that they think are undervalued, they tend to push the assets' prices up. Similarly, when they sell assets and contracts that they think are overvalued, they tend to push the assets' prices down. The effect of their trading thus causes prices to reflect their information about values.

How accurately prices reflect fundamental information depends on the costs of obtaining fundamental information and on the liquidity available to well-informed traders. Accounting standards and reporting requirements that produce meaningful and timely financial disclosures reduce the costs of obtaining fundamental information and thereby allow analysts to form more accurate estimates of fundamental values. Liquid markets allow well-informed traders to fill their orders at low cost. If filling orders is very costly, informed trading may not be profitable. In that case, information-motivated traders will not commit resources to collect and analyze data and they will not trade. Without their research and their associated trading, prices would be less informative.

EXAMPLE 1-29 Well-Functioning Financial Systems

As a financial analyst specializing in emerging market equities, you understand that a well-functioning financial system contributes to the economic prosperity of a country. You are asked to start covering a new small market country. What factors will you consider when characterizing the quality of its financial markets?

Solution: In general, you will consider whether:

- The country has markets that allow its companies and residents to finance projects, save for the future, and exchange risk.
- The costs of trading in those markets is low.
- Prices reflect fundamental values.

You may specifically check to see whether:

- Fixed income and stock markets allow borrowers to easily obtain capital from investors.
- Corporations disclose financial and operating data on a timely basis in conformity to widely respected reporting standards, such as IFRS.
- Forward, futures, and options markets trade instruments that companies need to hedge their risks.
- Dealers and arbitrageurs allow traders to trade when they want to.
- Bid—ask spreads are small.
- Trades and contracts invariably settle as expected.
- Investment managers provide high-quality management services for reasonable fees.
- Banks and other financing companies are well capitalized and thus able to help investors provide capital to borrowers.
- Securitized assets are available and represent reasonable credit risks.
- Insurance companies are well capitalized and thus able to help those exposed to risks insure against them.
- Price volatility appears consistent with changes in fundamental values.

10. MARKET REGULATION

Government agencies and practitioner organizations regulate many markets and the financial intermediaries that participate in them. The regulators generally seek to promote fair and orderly markets in which traders can trade at prices that accurately reflect fundamental values without incurring excessive transaction costs. This section identifies the problems that financial regulators hope to solve and the objectives of their regulations.

Regrettably, some people will steal from each other if given a chance, especially if the probability of detection is low or if the penalty for being caught is low. The number of ways that people can steal or misappropriate wealth generally increases with the complexity of their relationships and with asymmetries in their knowledge. Because financial markets tend to be complex, and because customers are often much less sophisticated than the professionals that serve them, the potential for losses through various frauds can be unacceptably high in unregulated markets.

Regulators thus ensure that systems are in place to protect customers from fraud. In principle, the customers themselves would demand such systems as a condition of doing business. When customers are unsophisticated or poorly informed, however, they may not know how to protect themselves. When the costs of learning are large—as they often are in complex financial markets—having regulators look out for the public interest can be economically efficient.

More customer money is probably lost in financial markets through negligence than through outright fraud. Most customers in financial markets use various agents to help them solve problems that they do not understand well. These agents include securities brokers, financial advisers, investment managers, and insurance agents. Because customers generally do not have much information about market conditions, they find it extremely difficult to measure the added value they obtain from their agents. This problem is especially challenging when performance has a strong random component. In that case, determining whether agents are skilled or lucky is very difficult. Moreover, if the agent is a good salesman, the customer may not critically evaluate their agent's performance. These conditions, which characterize most financial markets, ensure that customers cannot easily determine whether their agents are working faithfully for them. They tend to lose if their agents are unqualified or lazy, or if they unconsciously favor themselves and their friends over their clients, as is natural for even the most honest people.

Regulators help solve these agency problems by setting minimum standards of competence for agents and by defining and enforcing minimum standards of practice. CFA Institute provides significant standard-setting leadership in the areas of investment management and investment performance reporting through its Chartered Financial Analyst program and its Global Investment Performance Standards. In principle, regulation would not be necessary if customers could identify competent agents and effectively measure their performance. In the financial markets, doing so is very difficult.

Regulators often act to level the playing field for market participants. For example, in many jurisdictions, insider trading in securities is illegal. The rule prevents corporate insiders and others with access to corporate information from trading on material information that has not been released to the public. The purpose of the rule is to reduce the profits that insiders could extract from the markets. These profits would come from other traders who would lose when they trade with well-informed insiders. Because traders tend to withdraw from markets when they lose, rules against insider trading help keep markets liquid. They also keep corporate insiders from hoarding information.

Many situations arise in financial markets in which common standards benefit everyone involved. For example, having all companies report financial results on a common basis allows financial analysts to easily compare companies. Accordingly, the International Accounting Standards Board (IASB) and the U.S.-based Financial Accounting Standards Board, among many others, promulgate common financial standards to which all companies must report. The benefits of having common reporting standards have led to a very successful and continuing effort to converge all accounting standards to a single worldwide standard. Without such regulations, investors might eventually refuse to invest in companies that do not report to a common standard, but such market-based discipline is a very slow regulator of behavior, and it would have little effect on companies that do not need to raise new capital.

Regulators generally require that financial firms maintain minimum levels of capital. These capital requirements serve two purposes. First, they ensure that the companies will be able to honor their contractual commitments when unexpected market movements or poor decisions cause them to lose money. Second, they ensure that the owners of financial firms have substantial interest in the decisions that they make. Without a substantial financial interest in the decisions that they make, companies often take too many risks and exercise poor judgment about extending credit to others. When such companies fail, they impose significant costs on others. Minimum capital requirements reduce the probability that financial firms will fail and they reduce the disruptions associated with those failures that do occur. In principle, a firm's customers and counterparties could require minimum capital levels as a condition of doing business with the firm, but they have more difficulty enforcing their contracts than do governments who can imprison people.

Regulators similarly regulate insurance companies and pension funds that make long-term promises to their clients. Such entities need to maintain adequate reserves to ensure that they can fund their liabilities. Unfortunately, their managers have a tendency to underestimate these reserves if they will not be around when the liabilities come due. Again, in principle, policyholders and employees could regulate the behavior of their insurance funds and their employers by refusing to contract with them if they do not promise to adequately fund their liabilities. In practice, however, the sophistication, information, and time necessary to write and enforce contracts that control these problems are beyond the reach of most people. The government thus is a sensible regulator of such problems.

Many regulators are self-regulating organizations (SROs) that regulate their members. Exchanges, clearinghouses, and dealer trade organizations are examples of self-regulating organizations. In some cases, the members of these organizations voluntarily subject themselves to the SRO's regulations to promote the common good. In other cases, governments delegate regulatory and enforcement authorities to SROs, usually subject to the supervision of a government agency, such as a national securities and exchange authority. Exchanges, dealer associations, and clearing agencies often regulate their members with these delegated powers.

By setting high standards of behavior, SROs help their members obtain the confidence of their customers. They also reduce the chance that members of the SRO will incur losses when dealing with other members of the SRO.

When regulators fail to solve the problems discussed here, the financial system does not function well. People who lose money stop saving and borrowers with good ideas cannot fund their projects. Similarly, hedgers withdraw from markets when the costs of hedging are high. Without the ability to hedge, producers become reluctant to specialize because specialization generally increases risk. Because specialization also decreases costs, however, production becomes less efficient as producers chose safer technologies. Economies that cannot solve the regulatory problems described in this section tend to operate less efficiently than do better regulated economies, and they tend to be less wealthy.

To summarize, the objectives of market regulation are to:

1. Control fraud.
2. Control agency problems.
3. Promote fairness.
4. Set mutually beneficial standards.
5. Prevent undercapitalized financial firms from exploiting their investors by making excessively risky investments.
6. Ensure that long-term liabilities are funded.

Regulation is necessary because regulating certain behaviors through market-based mechanisms is too costly for people who are unsophisticated and uninformed. Effectively regulated markets allow people to better achieve their financial goals.

EXAMPLE 1-30 Bankrupt Traders

You are the chief executive officer of a brokerage that is a member of a clearinghouse. A trader who clears through your firm is bankrupt at midday, but you do not yet know it even though your clearing agreement with him explicitly requires that he immediately report significant losses. The trader knows that if he takes a large position, prices might move in his favor so that he will no longer be bankrupt. The trader attempts to do so and succeeds. You find out about this later in the evening.

1. Why does the clearinghouse regulate its members?
2. What should you do about the trader?
3. Why would the clearinghouse allow you to keep his trading profits?

Solution to 1: The clearinghouse regulates its members to ensure that no member imposes costs on another member by failing to settle a trade.

Solution to 2: You should immediately end your clearing relationship with the trader and confiscate his trading profits. The trader was trading with your firm's capital after he became bankrupt. Had he lost, your firm would have borne the loss.

Solution to 3: If the clearinghouse did not permit you to keep his trading profits, other traders similarly situated might attempt the same strategy.

11. SUMMARY

This chapter introduces how the financial system operates and explains how well-functioning financial systems lead to wealthy economies. Financial analysts need to understand how the financial system works because their analyses often lead to trading decisions.

The financial system consists of markets and the financial intermediaries that operate in them. These institutions allow buyers to connect with sellers. They may trade directly with each other when they trade the same instrument or they only may trade indirectly when a financial intermediary connects the buyer to the seller through transactions with each that appear on the intermediary's balance sheet. The buyer and seller may exchange instruments, cash flows, or risks.

The following points, among others, were made in this chapter:

- The financial system consists of mechanisms that allow strangers to contract with each other to move money through time, to hedge risks, and to exchange assets that they value less for those that they value more.

- Investors move money from the present to the future when they save. They expect a normal rate of return for bearing risk through time. Borrowers move money from the future to the present to fund current projects and expenditures. Hedgers trade to reduce their exposure to risks they prefer not to take. Information-motivated traders are active investment managers who try to identify under- and overvalued instruments.
- Securities are first sold in primary markets by their issuers. They then trade in secondary markets.
- People invest in pooled investment vehicles to benefit from the investment management services of their managers.
- Forward contracts allow buyers and sellers to arrange for future sales at predetermined prices. Futures contracts are forward contracts guaranteed by clearinghouses. The guarantee ensures that strangers are willing to trade with each other and that traders can offset their positions by trading with anybody. These features of futures contract markets make them highly attractive to hedgers and information-motivated traders.
- Many financial intermediaries connect buyers to sellers in a given instrument, acting directly as brokers and exchanges or indirectly as dealers and arbitrageurs.
- Financial intermediaries create instruments when they conduct arbitrage, securitize assets, borrow to lend, manage investment funds, or pool insurance contracts. These activities all transform cash flows and risks from one form to another. Their services allow buyers and sellers to connect with each other through instruments that meet their specific needs.
- Financial markets work best when strangers can contract with each other without worrying about whether their counterparts are able and willing to honor their contract. Clearinghouses, variation margins, maintenance margins, and settlement guarantees made by creditworthy brokers on behalf of their clients help manage credit risk and ultimately allow strangers to contract with each other.
- Information-motivated traders short sell when they expect that prices will fall. Hedgers short sell to reduce the risks of a long position in a related contract or commodity.
- Margin loans allow people to buy more securities than their equity would otherwise permit them to buy. The larger positions expose them to more risk so that gains and losses for a given amount of equity will be larger. The leverage ratio is the value of a position divided by the value of the equity supporting it. The returns to the equity in a position are equal to the leverage ratio times the returns to the unleveraged position.
- To protect against credit losses, brokers demand maintenance margin payments from their customers who have borrowed cash or securities when adverse price changes cause their customer's equity to drop below the maintenance margin ratio. Brokers close positions for customers who do not satisfy these margin calls.
- Orders are instructions to trade. They always specify instrument, side (buy or sell), and quantity. They usually also provide several other instructions.
- Market orders tend to fill quickly but often at inferior prices. Limit orders generally fill at better prices if they fill, but they may not fill. Traders choose order submission strategies on the basis of how quickly they want to trade, the prices they are willing to accept, and the consequences of failing to trade.
- Stop instructions are attached to other orders to delay efforts to fill them until the stop condition is satisfied. Although stop orders are often used to stop losses, they are not always effective.
- Issuers sell their securities using underwritten public offerings, best efforts public offerings, private placements, shelf registrations, dividend reinvestment programs, and rights offerings. Investment banks have a conflict of interest when setting the initial offering price in an IPO.

- Well-functioning secondary markets are essential to raising capital in the primary markets because investors value the ability to sell their securities if they no longer want to hold them or if they need to disinvest to raise cash. If they cannot trade their securities in a liquid market, they will not pay as much for them.
- Matching buyers and sellers in call markets is easy because the traders (or their orders) come together at the same time and place.
- Dealers provide liquidity in quote-driven markets. Public traders as well as dealers provide liquidity in order-driven markets.
- Order-driven markets arrange trades by ranking orders using precedence rules. The rules generally ensure that traders who provide the best prices, display the most size, and arrive early trade first. Continuous order-driven markets price orders using the discriminatory pricing rule. Under this rule, standing limit orders determine trade prices.
- Brokers help people trade unique instruments or positions for which finding a buyer or a seller is difficult.
- Transaction costs are lower in transparent markets than in opaque markets because traders can more easily determine market value and more easily manage their trading in transparent markets.
- A well-functioning financial system allows people to trade instruments that best solve their wealth and risk management problems with low transaction costs. Complete and liquid markets characterize a well-functioning financial system. Complete markets are markets in which the instruments needed to solve investment and risk management problems are available to trade. Liquid markets are markets in which traders can trade when they want to trade at low cost.
- The financial system is operationally efficient when its markets are liquid. Liquid markets lower the costs of raising capital.
- A well-functioning financial system promotes wealth by ensuring that capital allocation decisions are well made. A well-functioning financial system also promotes wealth by allowing people to share the risks associated with valuable products that would otherwise not be undertaken.
- Prices are informationally efficient when they reflect all available information about fundamental values. Information-motivated traders make prices informationally efficient. Prices will be most informative in liquid markets because information-motivated traders will not invest in information and research if establishing positions based on their analyses is too costly.
- Regulators generally seek to promote fair and orderly markets in which traders can trade at prices that accurately reflect fundamental values without incurring excessive transaction costs. Governmental agencies and self-regulating organizations of practitioners provide regulatory services that attempt to make markets safer and more efficient.
- Mandated financial disclosure programs for the issuers of publicly traded securities ensure that information necessary to estimate security values is available to financial analysts on a consistent basis.

PROBLEMS

1. Akihiko Takabe has designed a sophisticated forecasting model, which predicts the movements in the overall stock market, in the hope of earning a return in excess of a fair return for the risk involved. He uses the predictions of the model to decide whether to

buy, hold, or sell the shares of an index fund that aims to replicate the movements of the stock market. Takabe would *best* be characterized as a(n):

A. Hedger.
B. Investor.
C. Information-motivated trader.

2. James Beach is young and has substantial wealth. A significant proportion of his stock portfolio consists of emerging market stocks that offer relatively high expected returns at the cost of relatively high risk. Beach believes that investment in emerging market stocks is appropriate for him given his ability and willingness to take risk. Which of the following labels *most appropriately* describes Beach?

   A. Hedger.
   B. Investor.
   C. Information-motivated trader.

3. Lisa Smith owns a manufacturing company in the United States. Her company has sold goods to a customer in Brazil and will be paid in Brazilian real (BRL) in three months. Smith is concerned about the possibility of the BRL depreciating more than expected against the U.S. dollar (USD). Therefore, she is planning to sell three-month futures contracts on the BRL. The seller of such contracts generally gains when the BRL depreciates against the USD. If Smith were to sell these futures contracts, she would *most appropriately* be described as a(n):

   A. Hedger.
   B. Investor.
   C. Information-motivated trader.

4. Which of the following is *not* a function of the financial system?

   A. To regulate arbitrageurs' profits (excess returns).
   B. To help the economy achieve allocational efficiency.
   C. To facilitate borrowing by businesses to fund current operations.

5. An investor primarily invests in stocks of publicly traded companies. The investor wants to increase the diversification of his portfolio. A friend has recommended investing in real estate properties. The purchase of real estate would *best* be characterized as a transaction in the:

   A. Derivative investment market.
   B. Traditional investment market.
   C. Alternative investment market.

6. A hedge fund holds its excess cash in 90-day commercial paper and negotiable certificates of deposit. The cash management policy of the hedge fund is *best described* as using:

   A. Capital market instruments.
   B. Money market instruments.
   C. Intermediate-term debt instruments.

7. An oil and gas exploration and production company announces that it is offering 30 million shares to the public at $45.50 each. This transaction is *most likely* a sale in the:

   A. Futures market.
   B. Primary market.
   C. Secondary market.

8. Consider a mutual fund that invests primarily in fixed-income securities that have been determined to be appropriate given the fund's investment goal. Which of the following is *least likely* to be a part of this fund?

   A. Warrants.
   B. Commercial paper.
   C. Repurchase agreements.

9. A friend has asked you to explain the differences between open-end and closed-end funds. Which of the following will you *most likely* include in your explanation?

   A. Closed-end funds are unavailable to new investors.
   B. When investors sell the shares of an open-end fund, they can receive a discount or a premium to the fund's net asset value.
   C. When selling shares, investors in an open-end fund sell the shares back to the fund whereas investors in a closed-end fund sell the shares to others in the secondary market.

10. The usefulness of a forward contract is limited by some problems. Which of the following is *most likely* one of those problems?

    A. Once you have entered into a forward contract, it is difficult to exit from the contract.
    B. Entering into a forward contract requires the long party to deposit an initial amount with the short party.
    C. If the price of the underlying asset moves adversely from the perspective of the long party, periodic payments must be made to the short party.

11. Tony Harris is planning to start trading in commodities. He has heard about the use of futures contracts on commodities and is learning more about them. Which of the following is Harris *least likely* to find associated with a futures contract?

    A. Existence of counterparty risk.
    B. Standardized contractual terms.
    C. Payment of an initial margin to enter into a contract.

12. A German company that exports machinery is expecting to receive $10 million in three months. The firm converts all its foreign currency receipts into euros. The chief financial officer of the company wishes to lock in a minimum fixed rate for converting the $10 million to euro but also wants to keep the flexibility to use the future spot rate if it is favorable. What hedging transaction is *most likely* to achieve this objective?

    A. Selling dollars forward.
    B. Buying put options on the dollar.
    C. Selling futures contracts on dollars.

13. A book publisher requires substantial quantities of paper. The publisher and a paper producer have entered into an agreement for the publisher to buy and the producer to supply a given quantity of paper four months later at a price agreed upon today. This agreement is a:

    A. Futures contract.
    B. Forward contract.
    C. Commodity swap.

14. The Standard & Poor's Depositary Receipts (SPDRs) is an investment that tracks the S&P 500 stock market index. Purchases and sales of SPDRs during an average trading day are *best* described as:

    A. Primary market transactions in a pooled investment.
    B. Secondary market transactions in a pooled investment.
    C. Secondary market transactions in an actively managed investment.

15. The Standard & Poor's Depositary Receipts (SPDRs) is an exchange-traded fund in the United States that is designed to track the S&P 500 stock market index. The current price of a share of SPDRs is \$113. A trader has just bought call options on shares of SPDRs for a premium of \$3 per share. The call options expire in five months and have an exercise price of \$120 per share. On the expiration date, the trader will exercise the call options (ignore any transaction costs) if and only if the shares of SPDRs are trading:

    A. Below \$120 per share.
    B. Above \$120 per share.
    C. Above \$123 per share.

16. Which of the following statements about exchange-traded funds is *most correct*?

    A. Exchange-traded funds are not backed by any assets.
    B. The investment companies that create exchange-traded funds are financial intermediaries.
    C. The transaction costs of trading shares of exchange-traded funds are substantially greater than the combined costs of trading the underlying assets of the fund.

17. Jason Schmidt works for a hedge fund and he specializes in finding profit opportunities that are the result of inefficiencies in the market for convertible bonds—bonds that can be converted into a predetermined amount of a company's common stock. Schmidt tries to find convertibles that are priced inefficiently relative to the underlying stock. The trading strategy involves the simultaneous purchase of the convertible bond and the short sale of the underlying common stock. The above process could best be described as:

    A. Hedging.
    B. Arbitrage.
    C. Securitization.

18. Pierre-Louis Robert just purchased a call option on shares of the Michelin Group. A few days ago he wrote a put option on Michelin shares. The call and put options have the same exercise price, expiration date, and number of shares underlying. Considering both positions, Robert's exposure to the risk of the stock of the Michelin Group is:

    A. Long.
    B. Short.
    C. Neutral.

19. An online brokerage firm has set the minimum margin requirement at 55 percent. What is the maximum leverage ratio associated with a position financed by this minimum margin requirement?
    A. 1.55.
    B. 1.82.
    C. 2.22.
20. A trader has purchased 200 shares of a non-dividend-paying firm on margin at a price of \$50 per share. The leverage ratio is 2.5. Six months later, the trader sells these shares at \$60 per share. Ignoring the interest paid on the borrowed amount and the transaction costs, what was the return to the trader during the six-month period?
    A. 20 percent.
    B. 33.33 percent.
    C. 50 percent.
21. Jason Williams purchased 500 shares of a company at \$32 per share. The stock was bought on 75 percent margin. One month later, Williams had to pay interest on the amount borrowed at a rate of 2 percent per month. At that time, Williams received a dividend of \$0.50 per share. Immediately after that he sold the shares at \$28 per share. He paid commissions of \$10 on the purchase and \$10 on the sale of the stock. What was the rate of return on this investment for the one-month period?
    A. −12.5 percent.
    B. −15.4 percent.
    C. −50.1 percent.
22. Caroline Rogers believes the price of Gamma Corp. stock will go down in the near future. She has decided to sell short 200 shares of Gamma Corp. at the current market price of €47. The initial margin requirement is 40 percent. Which of the following is an appropriate statement regarding the margin requirement that Rogers is subject to on this short sale?
    A. She will need to contribute €3,760 as margin.
    B. She will need to contribute €5,640 as margin.
    C. She will only need to leave the proceeds from the short sale as deposit and does not need to contribute any additional funds.
23. The current price of a stock is \$25 per share. You have \$10,000 to invest. You borrow an additional \$10,000 from your broker and invest \$20,000 in the stock. If the maintenance margin is 30 percent, at what price will a margin call first occur?
    A. \$9.62.
    B. \$17.86.
    C. \$19.71.
24. You have placed a sell market-on-open order—a market order that would automatically be submitted at the market's open tomorrow and would fill at the market price. Your instruction, to sell the shares at the market open, is a(n):
    A. Execution instruction.
    B. Validity instruction.
    C. Clearing instruction.

25. A market has the following limit orders standing on its book for a particular stock. The bid and ask sizes are number of shares in hundreds.

Bid Size	Limit Price	Offer Size
5	€9.73	
12	€9.81	
4	€9.84	
6	€9.95	
	€10.02	5
	€10.10	12
	€10.14	8

What is the market?

A. 9.73 bid, offered at 10.14.
B. 9.81 bid, offered at 10.10.
C. 9.95 bid, offered at 10.02.

26. Consider the following limit order book for a stock. The bid and ask sizes are number of shares in hundreds.

Bid Size	Limit Price	Offer Size
3	¥122.80	
8	¥123.00	
4	¥123.35	
	¥123.80	7
	¥124.10	6
	¥124.50	7

A new buy limit order is placed for 300 shares at ¥123.40. This limit order is said to:

A. Take the market.
B. Make the market.
C. Make a new market.

27. Currently, the market in a stock is "$54.62 bid, offered at $54.71." A new sell limit order is placed at $54.62. This limit order is said to:

A. Take the market.
B. Make the market.
C. Make a new market.

28. Jim White has sold short 100 shares of Super Stores at a price of $42 per share. He has also simultaneously placed a "good-till-cancelled, stop 50, limit 55 buy" order. Assume

that if the stop condition specified by White is satisfied and the order becomes valid, it will get executed. Excluding transaction costs, what is the maximum possible loss that White can have?

A. $800.
B. $1,300.
C. Unlimited.

29. You own shares of a company that are currently trading at $30 a share. Your technical analysis of the shares indicates a support level of $27.50. That is, if the price of the shares is going down, it is more likely to stay above this level rather than fall below it. If the price does fall below this level, however, you believe that the price may continue to decline. You have no immediate intent to sell the shares but are concerned about the possibility of a huge loss if the share price declines below the support level. Which of the following types of orders could you place to most appropriately address your concern?

A. Short sell order.
B. Good-till-cancelled stop sell order.
C. Good-till-cancelled stop buy order.

30. In an underwritten offering, the risk that the entire issue may not be sold to the public at the stipulated offering price is borne by the:

A. Issuer.
B. Investment bank.
C. Buyers of the part of the issue that is sold.

31. A British company listed on the Alternative Investment Market of the London Stock Exchange, announced the sale of 6,686,665 shares to a small group of qualified investors at £0.025 per share. Which of the following *best describes* this sale?

A. Shelf registration.
B. Private placement.
C. Initial public offering.

32. A German publicly traded company, to raise new capital, gave its existing shareholders the opportunity to subscribe for new shares. The existing shareholders could purchase two new shares at a subscription price of €4.58 per share for every 15 shares held. This is an example of a(n):

A. Rights offering.
B. Private placement.
C. Initial public offering.

33. Consider an order-driven system that allows hidden orders. The following four sell orders on a particular stock are currently in the system's limit order book. Based on the commonly used order precedence hierarchy, which of these orders will have precedence over others?

Order Number	Time of Arrival (HH:MM:SS)	Limit Price	Special Instruction (If any)
I	9:52:01	€20.33	
II	9:52:08	€20.29	Hidden order

Order Number	Time of Arrival (HH:MM:SS)	Limit Price	Special Instruction (If any)
III	9:53:04	€20.29	
IV	9:53:49	€20.29	

A. Order I (time of arrival of 9:52:01).
B. Order II (time of arrival of 9:52:08).
C. Order III (time of arrival of 9:53:04).

34. Zhenhu Li has submitted an immediate-or-cancel buy order for 500 shares of a company at a limit price of CNY 74.25. There are two sell limit orders standing in that stock's order book at that time. One is for 300 shares at a limit price of CNY 74.30 and the other is for 400 shares at a limit price of CNY 74.35. How many shares in Li's order would get cancelled?

A. None (the order would remain open but unfilled).
B. 200 (300 shares would get filled).
C. 500 (there would be no fill).

35. A market has the following limit orders standing on its book for a particular stock:

Buyer	Bid Size (number of shares)	Limit Price	Offer Size (number of shares)	Seller
Keith	1,000	£19.70		
Paul	200	£19.84		
Ann	400	£19.89		
Mary	300	£20.02		
		£20.03	800	Jack
		£20.11	1,100	Margaret
		£20.16	400	Jeff

Ian submits a day order to sell 1,000 shares, limit £19.83. Assuming that no more buy orders are submitted on that day after Ian submits his order, what would be Ian's average trade price?

A. £19.70.
B. £19.92.
C. £20.05.

36. A financial analyst is examining whether a country's financial market is well functioning. She finds that the transaction costs in this market are low and trading volumes are high. She concludes that the market is quite liquid. In such a market:

A. Traders will find it hard to make use of their information.
B. Traders will find it easy to trade and their trading will make the market less informationally efficient.
C. Traders will find it easy to trade and their trading will make the market more informationally efficient.

37. The government of a country whose financial markets are in an early stage of development has hired you as a consultant on financial market regulation. Your first task is to prepare a list of the objectives of market regulation. Which of the following is *least likely* to be included in this list of objectives?

    A. Minimize agency problems in the financial markets.
    B. Ensure that financial markets are fair and orderly.
    C. Ensure that investors in the stock market achieve a rate of return that is at least equal to the risk-free rate of return.